

Attachment A

Key Documents Supporting
Prompt Commission Action,
December 10, 2008



Jeanine Poltronieri
Assistant Vice President
Federal Regulatory

AT&T Inc.
1120 20th Street, N.W.
Suite 1000
Washington, D.C. 20036

202.457.2042 Phone
202.457.2062 Fax

December 10, 2008

Julius Knapp
Chief, Office of Engineering & Technology
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Dear Julie:

AT&T urges the Commission to declare that the Communications Act and the Commission's rules prohibit the manufacture, importation, sale and use of boosters and repeaters absent prior carrier authorization. As the attached documents show, parties representing a diverse group of interests have built a robust record over the past two years regarding increasingly frequent interference events stemming from the unauthorized sale and use of these devices and the resulting public safety and consumer harms. Members of Congress, public safety agencies, and the wireless industry all have urged the Commission to ban unauthorized boosters and repeaters because of the harmful interference caused by these devices on a daily basis. This interference occurs nationwide, and no market, geography, or carrier is immune. In many cases, the entity causing the interference is not even aware that they were transmitting.

To assist your review of this matter, please find attached key documents supporting prompt Commission action. We look forward to working with you and other interested parties to resolve this important issue.

Sincerely,

/s/ Jeanine Poltronieri
Jeanine Poltronieri
AT&T Inc.
1120 20th Street, N.W.
Suite 1000
Washington, D.C. 20036

Appendix: Documents that Address Unlawful Boosters and Repeaters

Document #	Document Name
1	Congressional Letter to FCC (Signatories include Rep. Doyle, Rep. Bono, Rep. Stupak, Rep. Ferguson, Rep. Schakowsky, Rep. Rogers, Rep. Green, Rep. Radanovich, and Rep. Inslee)
2	Letter from Palm Beach County Public Safety to FCC
3	Letter from St. Lucie County Public Safety to FCC
4	AT&T Mobility Booster Interference Presentation to FCC
5	Local Interference Reports
6	Local Interference Maps
7	CTIA Petition for Declaratory Ruling
8	CTIA White Paper on the Harmful Impacts of Unauthorized Wireless Repeaters

Document 1

Congress of the United States
Washington, DC 20515

March 6, 2008

The Honorable Kevin Martin
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Dear Chairman Martin:

Over 250 million consumers and businesses use wireless services and increasingly rely on their mobile handsets for personal safety. The public safety community is also increasingly looking to commercial wireless networks to provide essential communications during emergencies and disasters.

Regrettably, the dependability of all wireless communications – either commercial or public safety communications in bands adjacent to commercial frequencies – is now being threatened by the marketing and use of devices that unlawfully transmit radio signals on frequencies licensed for commercial wireless services. Although the Communications Act and the Commission’s rules prohibit intentional interference with wireless communications, it is our understanding that the FCC recently has received requests to operate or relax the use of “jamming” equipment that fail to acknowledge the potential resulting harms. We fear that the unauthorized use of such devices will hinder wireless subscribers’ and first responders’ access to reliable wireless communications in emergency situations.

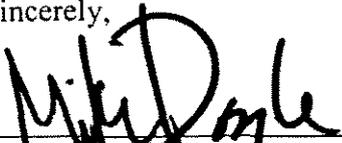
Additionally, businesses and individuals are increasingly engaging in the “self-help” practice of installing and operating wireless boosters and repeaters in an unauthorized manner. Boosters and repeaters work at the expense of surrounding users who suffer reduced quality and availability of service and impaired access to the personal and public safety benefits of commercial wireless service, including enhanced 911.

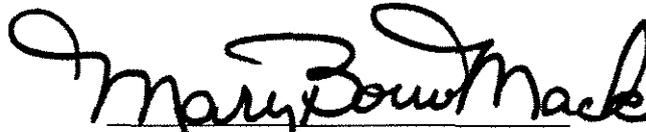
Accordingly, we urge the Commission to dismiss the jammer petitions and issue a declaratory ruling that 1) makes it explicit that the sale and use of cellular jammers, with the exception of sales to and use by the federal government, is unlawful; and 2) the unauthorized sale and use of wireless boosters and repeaters is unlawful.

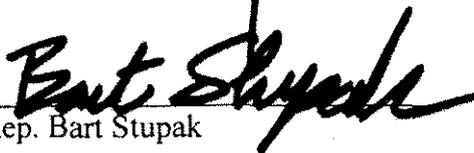
Page 2
The Honorable Kevin Martin
March 6, 2008

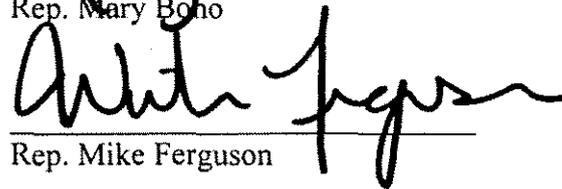
Congress and the Commission have wisely and repeatedly recognized the important role of commercial wireless services in promoting public safety and the reliance of the public on wireless services during times of crisis and emergency. It would be contrary to the intent of E-911, Priority Access Service, the Warning, Alert, and Response Network (WARN) Act and the Communications Act to permit the unlawful sale and use of cellular jamming and unauthorized booster and repeater equipment.

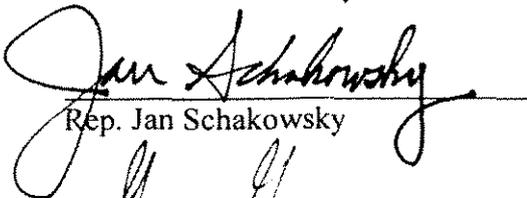
Sincerely,


Rep. Mike Doyle

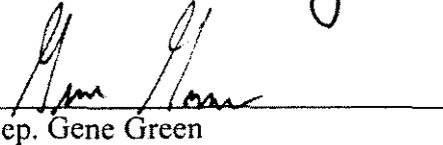

Rep. Mary Bono

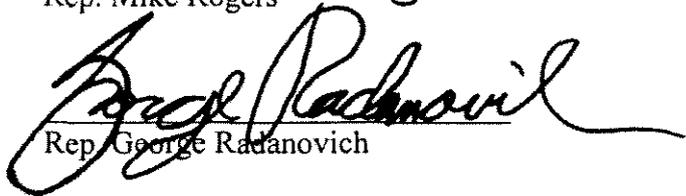

Rep. Bart Stupak


Rep. Mike Ferguson


Rep. Jan Schakowsky


Rep. Mike Rogers


Rep. Gene Green


Rep. George Radanovich


Rep. Jay Inslee

cc: Commissioner Michael Copps
Commissioner Jonathan Adelstein
Commissioner Deborah Tate
Commissioner Robert McDowell

Document 2



**Facilities Development &
Operations
Electronic Systems &
Security Division**

2601 Vista Parkway
West Palm Beach, FL 33411
TELEPHONE: (561) 233-0801
FAX: (561) 233-0802



**Palm Beach County
Board of County Commissioners**

Addie L. Greene, Chairperson

Jeff Koons, Vice Chair

Karen T. Marcus

Robert J. Kanjian

Mary McCarty

Burt Aaronson

Jess R. Santamaria

County Administrator

Robert Weisman, P.E.

www.pbcgov.com

*"An Equal Opportunity
Affirmative Action Employer"*

March 27, 2008

Chairman Kevin J. Martin
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Chairman Martin:

As an FCC licensee that operates a public safety communication system, we are writing this letter to express our serious concerns regarding the use of cellular wireless boosters and repeaters. In recent months we have been advised of a dangerous increase in the amount of interference to 800 MHz public safety systems in the immediate area, which we largely attribute to the growing use of Part 15 wireless boosters and repeaters by end users. In Florida, interference problems are particularly pronounced due to the numerous amounts of Public Safety 800 MHz systems state-wide and the area has experienced multiple instances of interference that threatened the soundness of those licensed communications systems. This interference jeopardizes the safety of the public, as well as the lives of first responders and emergency workers that rely on 800 MHz public safety systems for robust and secure communications.

In response to the escalating interference problems in Florida, the public safety agencies have worked closely with wireless carriers and the Commission to address interference problems on a case-by-case basis. But this piecemeal enforcement approach is woefully inadequate and will not preserve the integrity of public safety communications systems over the long run. Accordingly, we urge the Commission to quickly develop and implement a national plan to resolve the interference problems caused by these wireless boosters and repeaters. Absent Commission action, interference events will continue to detrimentally affect public safety radio systems.

We look forward to working with the Commission to resolve this serious matter as soon as possible.

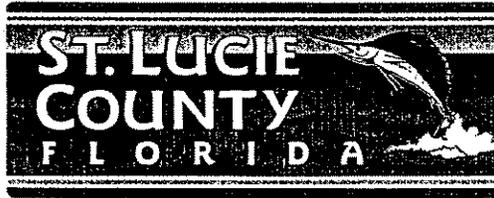
Respectfully submitted,

Audrey Wolf, Director
Facilities Development & Operations

cc: The Honorable Michael Copps, Commissioner, FCC
The Honorable Jonathan Adelstein, Commissioner, FCC
The Honorable Deborah Tate, Commissioner, FCC
The Honorable Robert McDowell, Commissioner, FCC
Derek Poarch, Chief of the Public Safety and Homeland Security Bureau
Fred Campbell, Chief of the Wireless Telecommunications Bureau
Julius Knapp, Chief of the Office of Engineering and Technology
Kris Monteith, Chief of the Enforcement Bureau
Robert Weisman, County Administrator, Palm Beach County
Mark Filla, Radio System Manager, Palm Beach County
Ric Bradshaw, Sheriff, Palm Beach County Sheriff's Office
Herman Brice, Chief, Palm Beach County Fire Rescue

Document 3

BOARD OF
COUNTY
COMMISSIONERS



DEPARTMENT OF
PUBLIC SAFETY

JACK T. SOUTHA
DIRECTOR

March 25, 2008

Chairman Kevin J. Martin
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Chairman Martin:

As the Dispatch and Communications provider for:

The St. Lucie County Sheriff's Office
The St. Lucie County Fire District
The Ft. Pierce Police Department
The Port St. Lucie Police Department

We write this letter to express our serious concerns regarding the use of wireless boosters and repeaters. In recent months, we have witnessed a dangerous increase in the amount of interference to our 800 MHz public safety system (WPXK779), which we largely attribute to the growing use of wireless boosters and repeaters. In Florida, interference problems are particularly pronounced. We have experienced multiple instances of interference that threatened the soundness of communications systems. This interference jeopardizes the safety of the public, as well as the lives of first responders and emergency workers that rely on 800 MHz public safety systems for robust and secure communications.

In response to the escalating interference problems in Florida, the public safety agencies above have worked closely with wireless carriers and the Commission to address interference problems on a case-by-case basis. But this piecemeal enforcement approach is woefully inadequate and will not preserve the integrity of public safety communications systems over the long run. Accordingly, we urge the Commission to quickly develop and implement a national plan to resolve the interference problems caused by wireless boosters and repeaters. Absent Commission action, interference events will continue to detrimentally affect public safety radio systems.

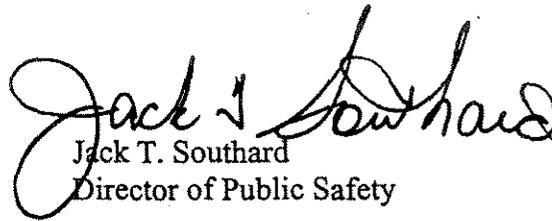
We look forward to working with the Commission to resolve this serious matter as soon as possible.

RECEIVED - FCC

APR - 8 2008

Federal Communications Commission
Bureau / Office

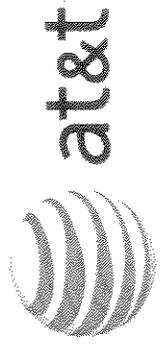
Respectfully submitted,


Jack T. Southard
Director of Public Safety

cc: The Honorable Michael Copps
The Honorable Jonathan Adelstein
The Honorable Deborah Tate
The Honorable Robert McDowell
Derek Poarch, Chief of the Public Safety and Homeland Security Bureau
Fred Campbell, Chief of the Wireless Telecommunications Bureau
Julius Knapp, Chief of the Office of Engineering and Technology
Kris Monteith, Chief of the Enforcement Bureau
Sheriff Ken Mascara, SLSO
Fire Chief Ron Parrish, SLCFD
Chief Sean Baldwin, FPPD
Chief John Skinner, PSLPD
Douglas Anderson, County Administrator
Faye Outlaw, Asst. County Administrator
Lee Ann Lowery, Asst. County Administrator

Document 4

WIRELESS BOOSTER INTERFERENCE



PROBLEM

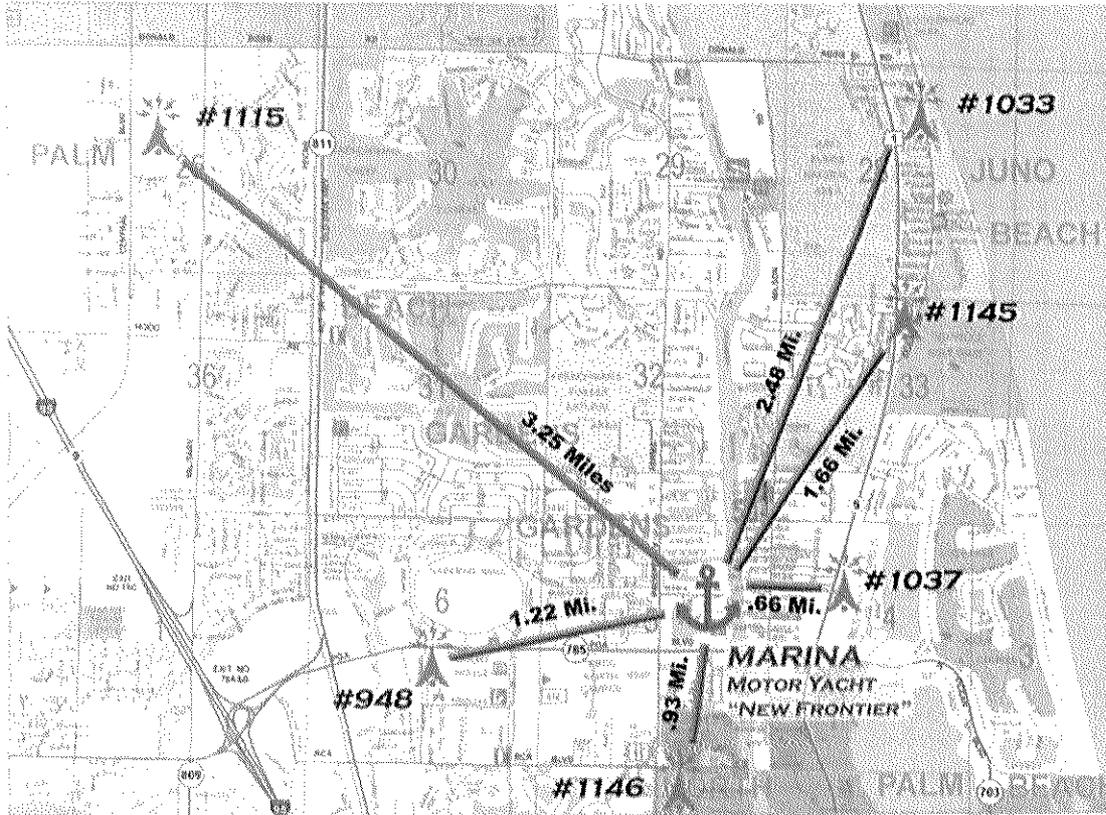
Wireless Boosters today:

- ...are not authorized by carriers
- ...interfere with customers and public safety
- ...have proliferated to the point that spot enforcement is ineffective

Existing FCC Rules prohibit booster use without licensee authorization.

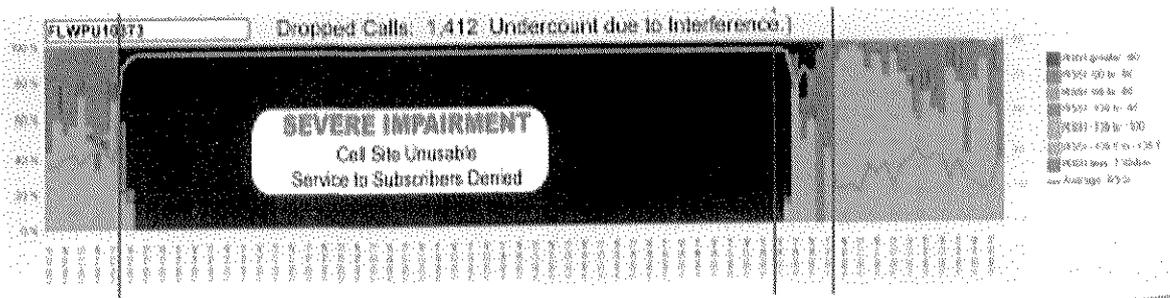
Increasing use due to widespread availability of boosters to consumers, who operate devices without authorization from wireless licensees.

One Example: 6 Sites Received Interference from a Single Booster



EVENT SUMMARY

21 hour event
2,795 dropped calls
~ 81,000 blocked or impaired calls
Drops/blocks likely include 911 calls
Many customer complaints



Interference is Occurring Daily

Between August 2007 and December 2007 over 14 incidents of booster interference were documented in South Florida alone. Total volume of incidents in South Florida was much higher – 2-3 per week.

DATE	TYPE	DESCRIPTION
8/01/2007	Manufacturer's Agent	Fort Lauderdale, FL
8/16/2007	Motor Yacht	"Soul Mate"
8/22/2007	Motor Yacht	"Sea Slipper"
8/30/2007	Motor Yacht	"Integrity"
10/26/2007	Motor Yacht	"Lady Joy" Boat Show
10/27/2007	Motor Yacht	"Dolce far Niete"
10/30/2007	Motor Yacht	"Miralis"
11/03/2007	Motor Yacht	"Karli Won"
11/20/2007	Motor Yacht	"Coral Seas"
11/26/2007	Tug Boat	"Betty" Florida Keys
11/28/2007	Motor Yacht	"Mystique"
11/29/2007	Motor Yacht	"New Frontier"
12/20/2007	Motor Yacht	"Weez in the Keys"
12/21/2007	Motor Yacht	"Exhale"
12/28/2007	In-Building Device	Stuart, FL

SCOPE OF THE PROBLEM

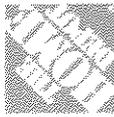
Nationwide, not limited by market or geography:

- In addition to Florida, incidents reported in Massachusetts, Minnesota, Missouri, Louisiana, Nevada, Oklahoma, Oregon and California
- Not carrier-specific – AT&T has worked with GSM and CDMA carriers to resolve incidents

Discrete, market-specific enforcement action is insufficient. Clear FCC guidance and vigorous, nationwide enforcement are necessary.

Readily Available

625 models, 80 manufacturers on 3 continents

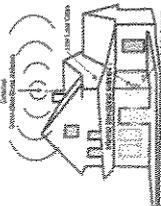


TigerDirect.com
800-800-8300

amazon.com

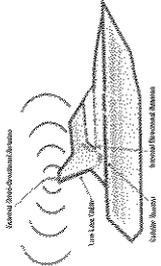
WOLFCAMERA.COM
A RITZ INTERACTIVE WEBSITE

Home Installation



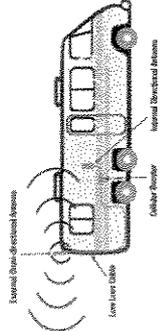
Enhanced signal penetrates up to two interior walls with 70dB gain system.

Boat Installation



Internal antenna must be used inside. Enhances signals inside the cabin only.

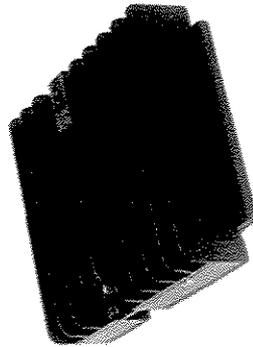
RV Installation



Directional inside antenna must face forward, away from external antenna.

Wireless Extender Signal Booster Auto Kit

COMPEXUSA.com
1-800-COMPUSA



Item Number: H319-0006
Availability: In Stock

Price: \$219.99

Protect Your Investment

Extended Service Plans at Low as \$11.99

Quantity: 1

ADD TO CART

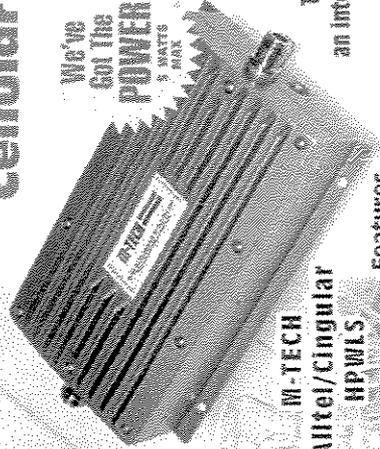


9 Larger Photos

Wi-EX
More Wireless Extender Products

High Performance Wireless Cellular Amplifier

Wi-Fi
Got The
POWER
5 WATTS
MAX



SINGLE BAND FOR NORTH AMERICAN
800 MHz SYSTEMS (excluding Nextel)

Marine Technologies.net amplifiers seamlessly bridge RF amplification between cell towers and today's elaborate handsets without disrupting the carrier's tower management networks. Thus the entire Marine Technologies.net line of amplifiers becomes an integral part of all wireless network solutions.

MI-TECH
Alltel/Cingular
HPWLS

Features

Keeps customers connected to utilize the full potential of their phones and network services at dramatically greater distances.

Transmits both VOICE & DATA

Allows simultaneous, multiple users onboard.

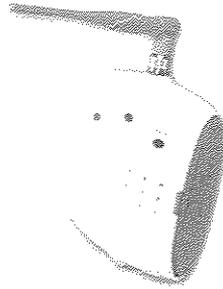
No physical connection to a cell phone required.

SMARTHOME

Home Automation Superstore

TESCO

ebay



Harms to Public Safety, Consumers and Carriers

To Public Safety.....

- Most boosters are broadband amplifiers, causing interference to public safety 800 MHz systems as well as to carriers
- Numerous incidents of booster interference to public safety reported (see next slide)
- Public safety also obtains service from carriers – loss of service

To Consumers.....

- Inability to make 911 calls
- Direct cost – loss of contracted service
- Indirect cost – loss of communication for business, family, entertainment
- Time & effort to seek resolution

To the Carriers:

- Loss of service, including 911 or public safety calls to the network.
- Engineering costs associated with identifying and fixing interference
- Goodwill Impairment
 - Brand enjoyment
 - Word of mouth recommendation
 - Impairment to advertising effort

Increasing occurrence: The problem is rapidly proliferating. In one area of the country alone, AT&T typically has 2-3 booster interference instances per week. Each instance typically results in a 10 hour outage, with 24,000 calls being affected.

Florida Government Agencies Affected by Booster Interference in the Past 90 Days

Complaints of Interference to Public Safety Systems:

- St. Lucie County Sheriff's Office
- Miami-Dade County
 - Sheriff
 - Fire Rescue
- City of Fort Lauderdale

Public Safety Agencies Affected as Network Users:

- Florida Highway Patrol
- Palm Beach County
 - Sheriff
 - Fire Department
- Broward County Sheriff's Office
- City of Tampa Bay Police Department
- City of Jacksonville Police Department
- Boca Raton Police Department
- Lauderhill Police Department
- City of Dania Beach Police Department
- City of Plantation Police Department
- City of Sunrise Police Department
- City of Miramar Police Department

Interference from Unauthorized Boosters Cannot Be Predicted or Controlled

- Broadband devices operate without filtering across frequencies licensed to multiple carriers
- Unlike handsets, unauthorized boosters do not identify their presence on carrier networks
- Improper installation results in oscillation producing interference
- Operation of boosters in close proximity to towers produces interference by over amplifying the uplink
- Operation of boosters in close proximity to other boosters creates interference

FCC Rules Prohibit the Sale and Operation of Unauthorized Boosters

Lawful sale and use of boosters requires licensee authorization.

- License required to operate boosters on licensed spectrum. 47 U.S.C. § 301, 47 C.F.R. §§ 1.903, 22.3.
- Subscriber's authority to operate devices is limited to "end user units" (i.e., handsets), not base stations and other transmitters. 47 C.F.R. § 22.3(b).
- Only licensees may operate base stations and other transmitters, including boosters, within their licensed service area and frequency range. 47 C.F.R. §§ 22.165, 24.11(b).
- Intentional interference to licensed operations is prohibited. 47 U.S.C. § 333.

AT&T allows operation of wireless boosters on its licensed frequencies only with prior carrier authorization.

What is Needed...

Recognition that Booster Harms Outweigh Any Benefits:

- 1) Unauthorized boosters improve ability to make and receive calls for discrete users in particular locations;
- 2) But, sale and operation of such devices creates unpredictable and unmanageable interference resulting in dropped, blocked and impaired calls for public safety and other customers

FCC Action:

- 1) Grant CTIA Petition and Issue Declaratory Ruling Stating that the Sale and Use of Unauthorized Boosters is Unlawful
 - “Unauthorized” = without carrier authorization
 - Potential carrier authorization criteria: (i) fixed use; (ii) band specific filtering; (iii) device identifiable and controllable via carrier networks
- 2) In the Interim, Initiate Enforcement Actions Against Manufacturers of:
 - Broadband devices causing interference across multiple bands
 - Devices intended for use on licensed frequencies without licensee authorization
 - Devices certified as amplifiers but sold and used primarily as boosters

Document 5

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
8/1/2007	Digital Antennas	DA4000SBR	PZODA4000SBR	
9/19/2007	Digital Antennas	PowerMax	PZOSDA4000SBR	CTIX-1190239974
9/26/2007	Digital Antennas	Power Max DA4000SBR	PZO4000SBR	CTIX-1191006086
10/30/2007	Digital Antennas	DASBR4000	PZODA4000	CTIX-1193784205
11/24/2007	Digital Antennas	DA4000SBR	PZODA4000	CTIX-1196095838
11/27/2007	Digital Antennas	DA4000SBR	PZODA4000	CTIX-1196287829
12/16/2007	Digital Antennas	DA4000SBR	PZODA4000	CTIX-1198167773
1/17/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1200591418
1/17/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1200591418
1/18/2008	Digital Antennas	DA4000SBR	n/a	CTIX-1200695618
6/19/2008	Digital Antennas	4KSBR/50U		
7/22/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1216675687
10/24/2008	Digital Antennas			

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
10/27/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1225137625
10/29/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	
11/15/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1226692182
11/17/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1227043192
11/17/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1227042702
11/29/2008	Digital Antennas	DA4000SBR	PZODA4000SBR	CTIX-1227994495
9/21/2007	Glenayre	Glenayre		CTIX-1190671658
8/1/2007	Harris			
7/21/2008	LGC, Meru Networks			CTIX-1216383012
8/16/2007	Marine Technologies			
8/22/2007	Marine Technologies	Unknown	Unknown	
8/30/2007	Marine Technologies	Unknown / Unable to locate	Unknown / Unable to locate	
9/12/2007	Marine Technologies	Not yet located		CTIX-1189605865

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
11/4/2007	Marine Technologies	MT	NA	CTIX-1194176308
11/29/2007	Marine Technologies	DF AMP-60		CTIX-1196397713
1/3/2008	Marine Technologies	Marine Tech		CTIX-1199474567
4/1/2008	Marine Technologies	Unknown	Unknown	CTIX-1207854997
5/22/2008	Marine Technologies	Unknown	Unknown	CTIX-1211491543
6/3/2008	Marine Technologies	MPEL-800	RFKCB AHP800	CTIX-1212525230
7/20/2008	Marine Technologies			CTIX-1216559053
12/21/2007	Wilson	Model 801104	PWO-824WB56	CTIX-1199130730
11/7/2008	Wilson			CTIX-1226114582
7/26/2007	Motorola	3850 N3R	H9P3850C	
8/8/2007	Motorola	3850 N3R	H9P3850C	
8/8/2007	Motorola	3850 N3R	H9P3850C	
8/29/2007	Motorola	H01UCF6PW1BN		

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
11/22/2008	RFS Systems	48760	IWD48760	CTIX-1227384738
8/22/2007	Unknown	AvaLan AW900x		
8/28/2007	Unknown	Unknown	Unknown	
8/31/2007	Unknown	Not yet located		CTIX-1188909526
9/18/2007	Unknown	Not yet located		CTIX-1190234042
10/26/2007	Unknown	Unknown	Unknown	CTIX-1193436363
10/30/2007	Unknown	Unknown	Unknown	CTIX-1193774332
11/14/2008	Unknown			CTIX-1226688846
11/22/2008	Unknown	Unknown		
	Unknown	RFS (Modified)		
11/27/2007				CTIX-1196287372
12/21/2007				
1/17/2008		n/a	n/a	CTIX-1200592101

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
1/17/2008		iLm-1000	Pending	CTIX-1200593295
1/24/2008		USHR-800H	Q4EUSHR-800H	CTIX-1201183717
2/19/2008				CTIX-1203458637
2/20/2008				CTIX-1203630418
2/21/2008				CTIX-1203633958
2/21/2008				CTIX-1203633472
2/21/2008				CTIX-1203631040
2/21/2008				CTIX-1203631693
2/21/2008				CTIX-1203632839
2/21/2008				CTIX-1203633671
2/22/2008				CTIX-1203711080
2/22/2008				CTIX-1203719875
2/22/2008				CTIX-1203908709

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
2/25/2008				CTIX-1203959773
2/25/2008				CTIX-1203965725
2/25/2008				CTIX-1203966675
2/26/2008				CTIX-1204060728
2/26/2008				CTIX-1204061333
2/27/2008				CTIX-1204149169
2/27/2008				CTIX-1204151221
3/6/2008				CTIX-1204821715
3/10/2008				CTIX-1205176218
3/10/2008				CTIX-1205177433
3/12/2008				CTIX-1205365696
3/13/2008				CTIX-1205442973
3/13/2008				CTIX-1205442720

AT&T RF INTERFERENCE LOG - SOUTH FLORIDA

DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
3/13/2008				CTIX-1205441930
3/17/2008				CTIX-1205781602
3/19/2008				CTIX-1205936693
3/21/2008		MT		CTIX-1206112871
3/26/2008				CTIX-1206557074
4/4/2008				CTIX-1207325444
4/11/2008				CTIX-1207924086
4/28/2008				CTIX-1209395129
5/20/2008				CTIX-1211304555
6/10/2008				CTIX-1213121255
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9/19/2008				CTIX-1221849177

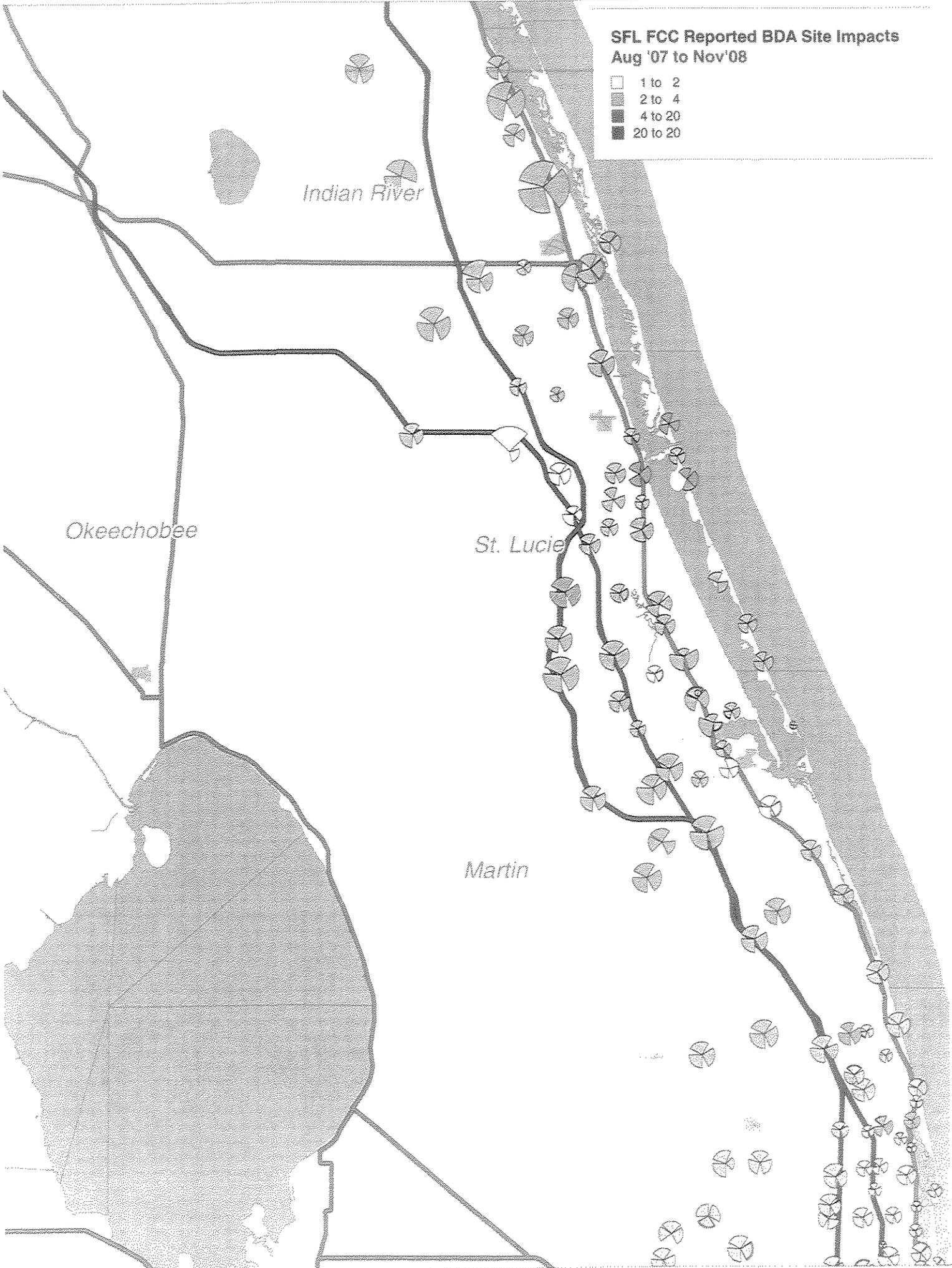
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DATE OPENED	MANUFACTURER	MODEL	FCC ID	FCC TICKET#
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9/19/2008				CTIX-1222100696
10/22/2008		CSI 610080		CTIX-1224707823
10/23/2008				CTIX-1224770443
11/8/2008				
11/11/2008				CTIX-1226414607
11/14/2008				CTIX-1226678268
11/17/2008				Pending
11/29/2008				CTIX-1227980371
12/8/2008				
		DA4000SBR	PZODA4000SBR	CTIX-1224302741

Document 6

**SFL FCC Reported BDA Site Impacts
Aug '07 to Nov '08**

- 1 to 2
- 2 to 4
- 4 to 20
- 20 to 20



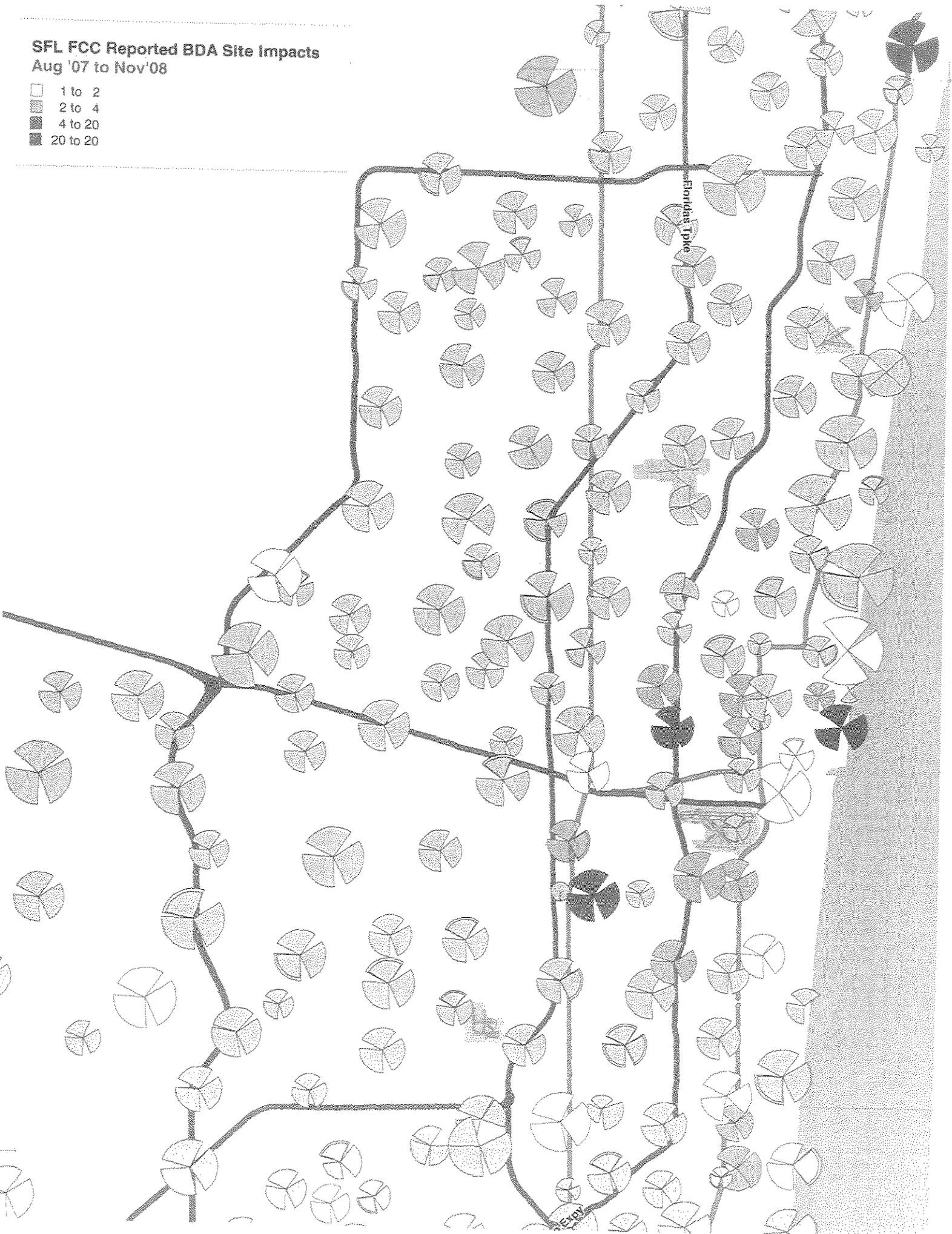
SFL FCC Reported BDA Site Impacts
Aug '07 to Nov '08

- 1 to 2
- ▒ 2 to 4
- 4 to 20
- 20 to 20



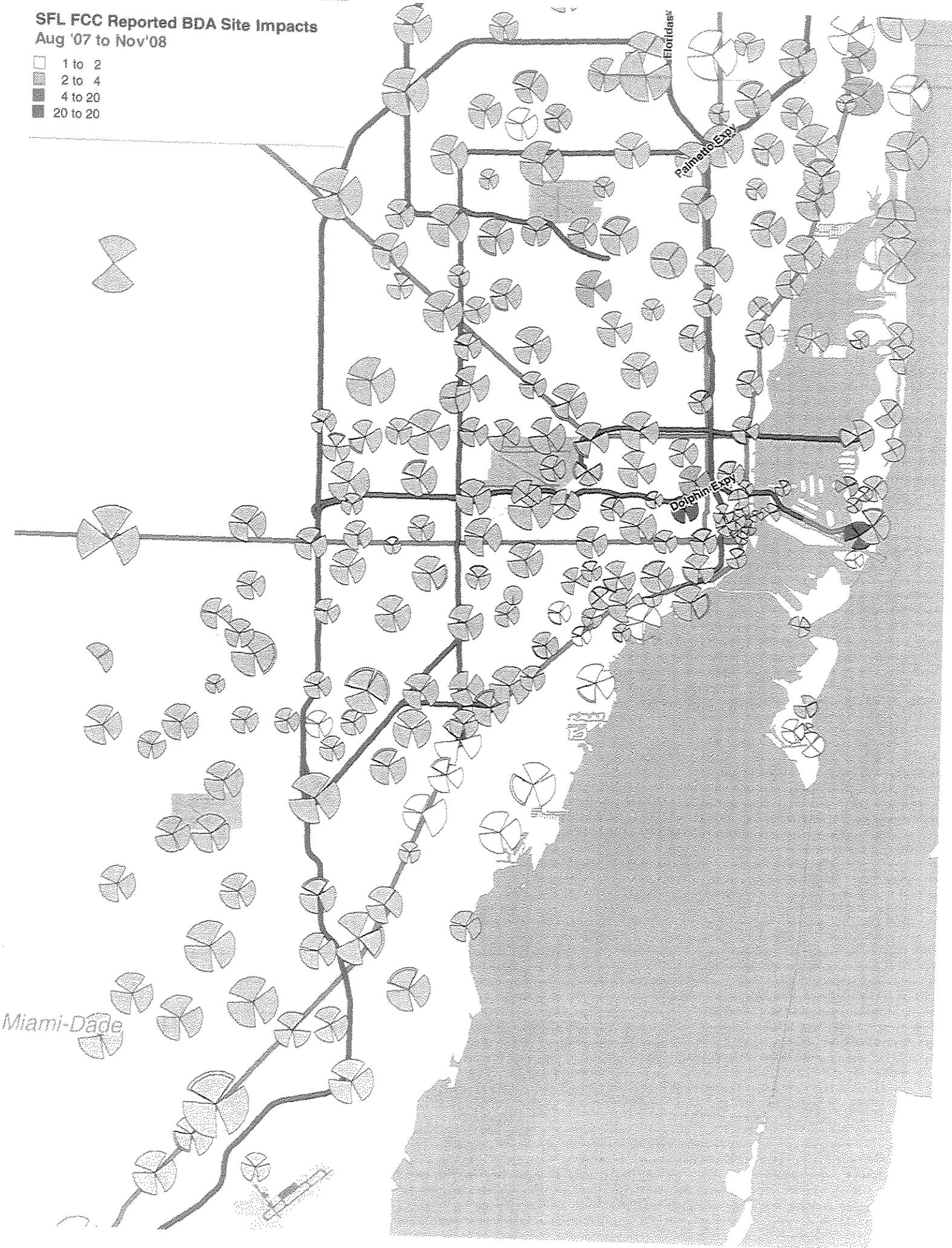
SFL FCC Reported BDA Site Impacts
Aug '07 to Nov'08

- 1 to 2
- 2 to 4
- 4 to 20
- 20 to 20

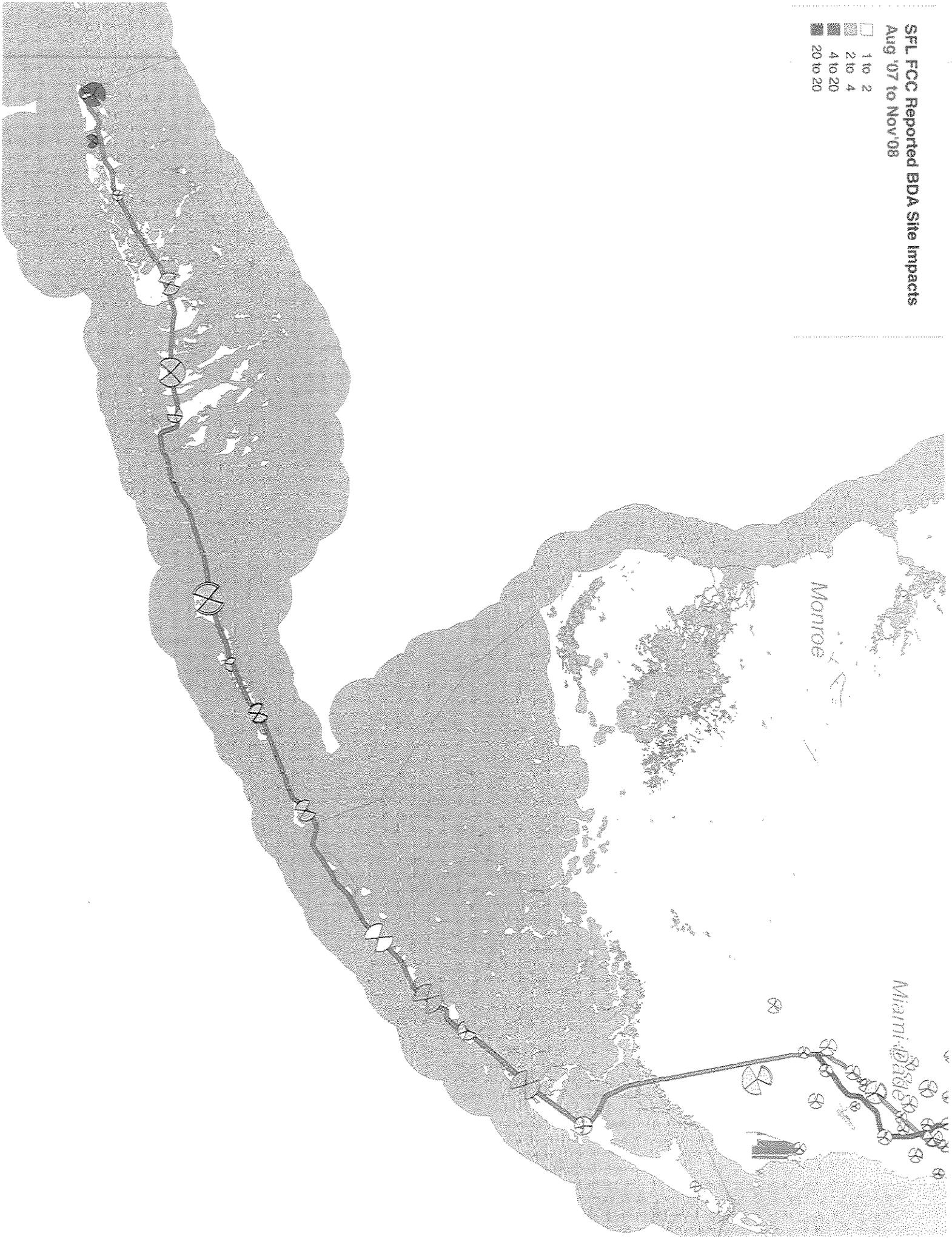
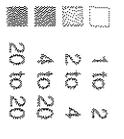


SFL FCC Reported BDA Site Impacts
Aug '07 to Nov '08

- 1 to 2
- 2 to 4
- 4 to 20
- 20 to 20



SFL FCC Reported BDA Site Impacts
Aug '07 to Nov '08



Document 7

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Petition for Declaratory Ruling Regarding the)
Unlawful Sale and Use of Cellular Jammers)
and Wireless Boosters and Repeaters) WT Docket No. ___
)
)
_____)

**PETITION FOR DECLARATORY RULING OF CTIA – THE WIRELESS
ASSOCIATION®**

CTIA – THE WIRELESS ASSOCIATION®
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Its Attorneys

Submitted: November 2, 2007

Document 8

**WHITE PAPER ON THE HARMFUL IMPACTS OF
UNAUTHORIZED WIRELESS REPEATERS**

CTIA – The Wireless Association®

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

Paul W. Garnett
Ass't Vice President, Regulatory Affairs

May 1, 2006

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I. EXECUTIVE SUMMARY

For a number of years, manufacturers have designed and marketed to the public repeaters that amplify wireless signals¹ to attempt to enhance coverage in specific areas, such as within buildings and cars. In many cases, these devices are bought and installed by individual wireless subscribers or property managers without the licensed wireless provider's permission or knowledge. While these devices may better enable service for the party operating them, the interference effects and other service degradations from these types of equipment can be extremely harmful to other parties, including Public Safety licensees. Consumers, who may be unaware of the harmful effects of these devices, should be made aware that under Federal Communications Commission ("Commission" or "FCC") rules, they are not permitted to operate such devices since such operation is expressly prohibited by the Communications Act and the FCC's general and service-specific rules.

Below, CTIA-The Wireless Association® ("CTIA") discusses the relevant law dictating that wireless repeaters may only be operated by (1) licensees and (2) non-licensees operating under the express authority and control of a licensed entity. CTIA discusses ways in which the operation of wireless repeaters without proper authorization is resulting in harmful and costly interference to licensees' operations – resulting in severely degraded mobile wireless services for impacted consumers. The frequency and extent of such interference is increasing over time as more wireless repeaters are operated by non-licensees.

CTIA seeks the help of the FCC, and stresses that wireless carriers cannot fully address the problems posed by wireless repeaters without that help. At a time when the FCC and

¹ For example, these repeaters may amplify Cellular, Personal Communications Service ("PCS"), and/or Specialized Mobile Radio ("SMR") signals.

wireless carriers increasingly are focused on improving service quality, it is critical that the FCC take steps to support the industry's efforts to address this growing problem. CTIA asks the FCC to issue a notice to consumers confirming and informing them that operating wireless repeaters without licensee authorization is unlawful and may result in service outages and other harms to the network. CTIA also asks the FCC to issue a notice to manufacturers, importers, distributors, and retailers clarifying that they are permitted to market and sell repeaters only for use under the clear authority and control of licensees. By taking these two simple steps, the FCC will serve the public interest by ensuring consumers continue to receive the same high quality wireless services they have come to expect.

II. APPLICABLE LAW

A. Customers May Not Lawfully Operate Wireless Repeaters Without the Authority of a Licensee

The Communications Act and the Commission's rules make very clear that radio transmitters may be operated only by, or under the control of, a licensed entity. Section 301 of the Communications Act of 1934, as amended ("Communications Act"), prohibits any person from using or operating any apparatus for the transmission of energy or communications or signals by radio without a license.² Similarly, Section 302 of the Communications Act authorizes the Commission to prohibit the operation of devices that are capable of causing harmful interference to radio communications.³ The Commission's rules governing the operation of commercial wireless systems echo these concepts and provide more detail.

² 47 U.S.C. § 301 ("No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio...except under and in accordance with this Act and with a license in that behalf granted under the provisions of this Act").

³ 47 U.S.C. § 302(a) ("The Commission may, consistent with the public interest, convenience, and necessity, make reasonable regulations . . . governing the interference potential of devices in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radio communications").

Specifically, Section 1.903 of the Commission's rules provides that "[s]tations in the Wireless Radio Services must be used and operated only in accordance...with a valid authorization granted by the Commission."⁴ In this part of the Commission's rules, a "radio station" is defined as a "separate transmitter or a group of transmitters under simultaneous common control, including accessory equipment required for carrying on a radio communications service."⁵ Because wireless repeaters and amplifiers are transmitters and thus could cause interference to other radio communications, the operation of these devices requires a license. As suggested in the definition, the operation of multiple transmitters under common control may be covered by one license.

The Commission's rules governing cellular operations express a similar concept, but in even more detail.⁶ Specifically, Section 22.3 provides that "[s]tations in the Public Mobile Services must be used and operated only in accordance with the rules in this part and with a valid authorization granted by the FCC under the provisions of this part."⁷ In other words, an entity or individual must obtain a license from the FCC prior to operating a transmitter in any frequency band allocated for cellular service.

⁴ 47 C.F.R. § 1.903. Cellular, SMR and PCS services are Wireless Radio Services. *See* 47 C.F.R. § 1.907 (defining Wireless Radio Services as "all radio services authorized in parts...22 [cellular] 24 [PCS] 90 [SMR]"). This rule not only logically extends from Section 301 of the Communications Act but also from Section 302, implying that operation of an unauthorized station in the Wireless Radio Services would likely cause harmful interference to authorized Wireless Radio Services stations.

⁵ 47 C.F.R. § 1.907.

⁶ The Commission's PCS rules do not have a similar requirement. Prior to the adoption of Section 1.903, Section 24.803 required individuals to obtain a license prior to operating a transmitter on PCS spectrum. Section 1.903, however, supplanted this rule.

⁷ 47 C.F.R. § 22.3. This authorization will be granted only if the applicant is a common carrier, 47 C.F.R. § 22.7, and the FCC finds that "the applicant is qualified in regard to citizenship, character, financial, technical and other criteria, and that the public interest, convenience and necessity will be served" upon proper application. 47 C.F.R. § 22.3(a).

As was the case with Section 1.903, this rule refers to licensing “stations.” It is clear that the Commission intended to include within this term transmitters of all types, including cellular repeaters and amplifiers, and not just limit the term to base stations. This part of the Commission’s rules defines “station” as “a station equipped to engage in radio communication or radio transmission of energy.”⁸ Cellular repeaters clearly fall into this definition as the rules specifically define them as “stationary transmitter[s] or device[s] that automatically re-radiate[s] the transmissions of base transmitters at a particular cell site and mobile stations communicating with those base transmitters, with or without channel translation.”⁹ Accordingly, they must be licensed.

Nevertheless, there are several limited exceptions to this license requirement, all of which ensure that transmitters remain under the control of the licensee thereby reducing the potential for interference. None of these exceptions, however, give subscribers or other individuals or businesses, the right to operate repeaters or signal boosters without express authorization from the licensee. First, both the cellular and PCS rules state that a provider’s license provides “blanket” authority for a variety of transmitters operating within the licensee’s geographic area and frequency band.¹⁰ Accordingly, additional transmitters designed to fill out a service area may be operated without a separate license.¹¹ These exceptions, however, apply only to

⁸ 47 C.F.R. § 22.99. This definition is identical to the definition of “radio station” in the Communications Act. 47 U.S.C. § 153(35). “Radio communication” is in turn defined in the Communications Act as “the transmission by radio of writing, signs, signals, pictures, and sounds of all kinds, including all instrumentalities, facilities, apparatus, and services (among other things, the receipt, *forwarding*, and delivery of communications) incidental to such transmission.” 47 U.S.C. § 153(33) (emphasis added).

⁹ 47 C.F.R. § 22.99.

¹⁰ See 47 C.F.R. §§ 22.165, 24.11(b).

¹¹ An intentional radiator utilized as part of a tunnel radio system may also operate on any frequency provided it complies with certain requirements. 47 C.F.R. § 15.211. For example, operation of the tunnel radio system must be contained solely within a tunnel, mine, or other structure that provides attenuation to the radiated signal due to the

transmitters under the control of the licensee.¹² For instance, Section 22.165 of the Commission's rules provides that cellular *licensees* "may operate additional transmitters [including cellular repeaters¹³] at additional locations on the same channel or channel block as its existing system without prior Commission approval provided" the service area boundaries of the additional transmitters do not extend beyond the relevant Cellular Geographic Service Area.¹⁴ Similarly, Section 24.11(b) provides that a PCS licensee is granted a blanket authorization for an entire market and frequency block.¹⁵ Neither of these sections, however, authorizes subscribers to operate transmitters such as cellular repeaters or signal boosters. Obviously, it is the cellular/PCS licensee who is responsible for meeting the technical and operational limits, such as field strength at the geographic boundary, and the operation of these uncontrolled repeaters makes this type of control virtually impossible.

Second, licensees may install and operate in-building radiation systems¹⁶ without applying for authorization or notifying the Commission.¹⁷ This exception does not extend to

presence of naturally surrounding earth and/or water. *Id.* at § 15.211(a). The interference-causing cellular repeaters are not being operated in this manner and are thus not covered by Section 15.211 of the Commission's rules.

¹² *Revision of Part 22 of the Commission's Rules Governing the Public Mobile Services*, Report and Order, 9 FCC Rcd 6513, ¶ 22 (1994).

¹³ *See Amendment of Parts 22, 90, and 94 of the Commission's Rules to Permit Routine Use of Signal Boosters*, Report and Order, FCC 96-223, ¶ 3 (1996) ("Under Part 22, a form of signal booster, generally called a cellular repeater, may be employed by cellular licensees without separate licensing provided that the repeater does not extend the licensee's signal beyond the authorized cellular service area").

¹⁴ 47 C.F.R. § 22.165. *See also Amendment of Parts 22, 90, and 94 of the Commission's Rules to Permit Routine Use of Signal Boosters*, Report and Order, 11 FCC Rcd 16621, ¶ 23 (1996) (indicating that a separate authorization for signal boosters, *i.e.* cellular repeaters, would be "burdensome and unnecessary" because "signal boosters operate on frequencies already authorized to the licensee").

¹⁵ 47 C.F.R. § 24.11(b).

¹⁶ An "in-building radiation system" is "a supplementary system comprised of low power transmitters, receivers, indoor antennas and/or leaky coaxial cable radiators designed to improve service reliability inside buildings or structures located with the service areas of stations in the Public Mobile Services." 47 C.F.R. § 22.99.

third parties. Thus, only if the additional transmitters, such as cellular repeaters, are under the control of the underlying wireless carrier may they be operated without obtaining a specific license from the Commission.

Third, the Commission's general wireless communications rules provide that an operator's subscribers do not need a separate license to operate mobile or fixed stations (which are transmitters that would otherwise need to be licensed).¹⁸ While broadly written, this rule was intended to apply only to "end user units," not base station units or other transmitters, especially those operating in the base-to-mobile spectrum band. Indeed in several orders, the Commission has referred to subscriber operated mobile and fixed stations as "end user units."¹⁹ A repeater is clearly not an end user unit and is not, therefore, authorized under the Commission's subscriber exception. Moreover, the FCC's specific authorization of the operation of cellular repeaters by licensees implies that the subscriber's general authorization to operate fixed and mobile stations was not intended to apply to cellular repeaters or boosters.

The Commission's intention to limit subscriber operations to handsets is demonstrated in several ways. In the cellular context, the Commission specifically limited subscribers' authority to operate mobile stations to those subscribers in good standing and who are under the

¹⁷ See 47 C.F.R. § 22.383 ("Licensees may install and operate in-building radiation systems without applying for authorization or notifying the FCC, provided that the locations of the in-building radiation systems are within the protected service area of the licensee's authorized transmitter(s) on the same channel or channel block"). This provision applies to all Public Mobile Services, including the Cellular Radiotelephone Service. See *Amendment of Part 22 of the Commission's Rules to Delete Section 22.119 and Permit the Concurrent Use of Transmitters in Common Carrier and Non-Common Carrier Services; Amendment of Part 22 of the Commission's Rules Pertaining to Power Limits for Paging Stations Operating in the 931 MHz Band in the Public Land Mobile Service*, Report and Order, 9 FCC Rcd 6513, Appendix A (1994) (noting that in-building radiation systems "could be used in other Public Mobile Services, such as the Cellular Radiotelephone Service").

¹⁸ 47 C.F.R. § 22.3(b).

¹⁹ See *Amendment of Part 22 of the Commission's Rules To Benefit the Consumers of Air-Ground Telecommunications Services*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 4403, ¶ 87 (2005) (referring to subscriber-operated stations as "end user units").

“operational control” of the licensee.²⁰ In other words, the Commission found that licensee authorization and control is essential to cellular subscribers’ operation of mobile stations.²¹ In making this determination, however, the Commission failed to distinguish between mobile and fixed stations or between cellular and other wireless stations. As the current prevalence of interference resulting from both mobile and fixed repeaters in the cellular, PCS, and SMR networks has shown, this analysis extends to all licensed commercial wireless services.

Moreover, as a factual matter, this limitation is logical because licensees retain ultimate control over end users’ units, but are unable to do this with respect to units such as mobile and fixed repeaters. Licensees retain this control by dictating which units customers may and may not use and by monitoring such devices’ access to the licensee’s network. Currently, licensees can monitor these devices and terminate access if they determine the unit is either unauthorized or causing interference to the network. Mobile amplifiers and signal boosters, however, are far more difficult for licensees to control, especially when they have not been informed as to when and where a subscriber proposes to use the device. Moreover, many of these devices are broadband in nature such that they can produce potentially harmful emissions in spectrum for which the licensee is not authorized.

²⁰ 47 C.F.R. § 22.927. Although this rule states that mobile stations of subscribers in good standing “are considered to be operating under the authorization of that cellular system” when receiving service from that system, it also makes clear that “[c]ellular system licensees are responsible for exercising effective operational control over mobile stations receiving service through their cellular systems.”

²¹ More specifically, the Commission indicated that subscribers must “comply with all applicable rules and regulations promulgated by the Commission, ... must provide evidence to the carrier that the subscriber’s mobile unit is compatible with the carrier’s mobile system, must use only those mobile units which the carrier has agreed to serve, and must take prompt action to eliminate any unacceptable interference which the subscriber’s mobile unit may cause to the mobile system or to other users.” *See Amendment of Sections of Part 21 (now Part 22) of the Commission’s Rules to Modify Individual Radio Licensing Procedures in the Domestic Public Radio Services (now Public Mobile Radio Services, Report and Order, 77 FCC 2d 84, ¶ 7 (1980).* Moreover, the Commission indicated that not only does it “retain enforcement jurisdiction over subscribers who fail to comply with the[se] requirements” but also that a carrier “may refuse or suspend service until the subscriber has corrected the deficiency in question.” *Id.* at ¶¶ 8-9. *See also* 47 C.F.R. § 22.571 (providing that licensees are “responsible for exercising effective operational control over mobile stations receiving service through their stations”).

Similarly, in the paging service context, the Commission has specifically limited the operation of signal boosters to licensees.²² In its rules, the Commission has defined a signal booster as a “stationary device that automatically reradiates signals from base transmitters without channel translation, for the purpose of improving the reliability of existing service by increasing the signal strength in dead spots.”²³ In other words, signal boosters and cellular repeaters are intended as a cheaper alternative to the deployment of additional fixed base stations.²⁴ In allowing licensees the use of signal boosters, the Commission acknowledged that signal boosters have the potential of causing harmful interference. Accordingly, the Commission limited signal booster operation to licensees and found that licensees utilizing signal boosters will be responsible for correcting harmful interference caused by their use. The combination of these rules and FCC statements indicate an intention to allow only licensees, not subscribers, to have control over the installation and operation of cellular repeaters and signal boosters. Indeed, in sum, the FCC has:

- Specifically authorized the use of cellular repeaters by licensees in Part 22, implying that the operation of cellular repeaters by subscribers under the general authorization was not intended;
- Specifically limited the use of mobile stations by cellular subscribers to those that are under the “operational control” of a licensee;

²² Although the Commission adopted this limitation through a rulemaking proceeding, the Commission did not need to then and need not now initiate a formal rulemaking proceeding. As CTIA explains below, the Commission can address the current situation simply by issuing public notices interpreting its current rules.

²³ 47 C.F.R. § 22.99. *See also* 47 C.F.R. § 90.7 (defining signal booster as a “device at a fixed location which automatically receives, amplifies, and retransmits on a one-way or two-way basis, the signal received from base, fixed, mobile, and portable stations, with no change in frequency or authorized bandwidth”).

²⁴ *See Amendment of Parts 22, 90, and 94 of the Commission’s Rules to Permit Routine Use of Signal Boosters*, FCC 96-223, ¶¶ 2-3 (June 5, 1996) (signal boosters “allow licensees to improve radio system efficiency at less cost and without imposing an additional licensing burden on either the licensee or the Commission” and describing cellular repeaters as a type of signal booster).

- Specifically authorized licensees to install and operate in-building radiation systems; and
- Found that signal boosters and cellular repeaters have the potential to cause harmful interference to other services, thus requiring licensees to be responsible for correcting any such interference.

For these reasons, CTIA requests that the FCC issue a Public Notice that states that wireless subscribers are expressly prohibited under the Communications Act and the FCC's rules from operating repeaters and signal boosters except under the express authorization and control of system licensees.

We note that the Commission has adopted rules that allow some forms of unlicensed operation in the cellular and PCS bands. However, this type of operation is governed by the rules within Part 15, not Parts 22 or 24. The Part 15 rules for unlicensed devices have power limits that are significantly lower than what is allowed for licensed services. Put simply, the operation of a device in the cellular and PCS bands is either licensed and must be under the direct operational control of a licensee, or it is unlicensed and must adhere to the operation and transmit power limits in Section 15.209. The wireless repeaters at issue here clearly do not meet the requirements of Section 15.209.

B. Repeaters May Not Be Lawfully Marketed to End-User Customers Who Do Not Have Authority to Operate Those Devices

Prior to being operated, cellular and PCS transmitters must be certificated by the FCC.²⁵ Section 22.377 of the Commission's rules requires that all transmitters used in the Public Mobile Services, including in-building radiation systems and cellular repeaters, be certificated prior to operation.²⁶ Similarly, Section 24.51 requires that all transmitters for PCS systems must be

²⁵ 47 C.F.R. § 22.377; 47 C.F.R. § 24.51.

²⁶ 47 C.F.R. § 22.377. The procedures for obtaining certification are set forth in Part 22 of the Commission's rules.

authorized by the Commission under its certification procedures. This certification process is designed to ensure that all devices comply with the applicable technical requirements governing the service in which they will operate. Indeed, the Commission's rules provide that certification is awarded only if "(1) [t]he equipment is capable of complying with pertinent technical standards of the rule part(s) under which it is to be operated; and, (2) [a] grant of the application would serve the public interest, convenience and necessity."²⁷ This obligation falls primarily on the manufacturer because these transmitters may not be marketed until certificated.²⁸

Although the manufacturers of the interfering wireless repeaters have generally received equipment certifications from the FCC, they are violating their certification by marketing and selling their equipment for use by individuals who are not expressly authorized by the licensee to operate such devices. Section 302(b) of the Communications Act prohibits entities from manufacturing, importing, selling, offering for sale, and shipping devices which fail to comply with the FCC's regulations.²⁹ As noted above, only Part 22 cellular or Part 24 PCS licensees can be licensed to operate these devices. The licensee may then authorize other entities to operate these devices provided they remain under the operational control of the licensee. Therefore, marketing these devices to other entities that the manufacturer or distributor has reason to know the licensee has not authorized or will not authorize to operate such a device is prima facie inconsistent with the public interest, convenience and necessity. Accordingly, manufacturers are responsible for ensuring that their marketing efforts do not undercut the licensing requirements by touting their devices as FCC certified while at the same time ignoring

²⁷ 47 C.F.R. § 2.915.

²⁸ See 47 C.F.R. § 2.803.

²⁹ 47 U.S.C. § 302(b) ("No person shall manufacture, import, sell, offer for sale, or ship devices or home electronic equipment and systems, or use devices, which fail to comply with regulations promulgated pursuant to this section").

the requirement that users be expressly authorized by licensees to employ the devices.³⁰ For this reason, as well as the reasons outlined above, CTIA requests that the FCC issue a Public Notice clarifying that manufacturers, under their current equipment authorizations, are prohibited from marketing and selling wireless repeaters directly to consumers and other entities for use without the express authorization by the licensee to operate the devices.

III. INCIDENCES OF INTERFERENCE FROM WIRELESS REPEATERS ARE INCREASING

While the legal case for FCC action to stop the unauthorized installation and operation of wireless repeaters is clear, real life examples demonstrate that FCC action is necessary to prevent the unauthorized installation and operation of wireless repeaters. Customers across the nation have been installing wireless repeaters/boosters in their homes, cars, boats and offices in an attempt to improve their wireless coverage. These customers, as a whole, however, have been installing inexpensive devices that they purchased over the Internet³¹ or from big-box electronics retailers (e.g. Fry's, CompUSA, etc.) that have not been authorized by the licensed wireless carriers. As a result of these unauthorized operations, wireless carriers, including all of the nationwide providers and many regional and smaller providers, are experiencing significant

³⁰ 47 C.F.R. § 2.927(c) provides that “[n]o person shall, in any advertising matter, brochure, etc., use or make reference to an equipment authorization in a deceptive or misleading manner or convey the impression that such equipment authorization reflects more than a Commission determination that the device or product has been shown to be capable of compliance with the applicable technical standards of the Commission’s rules.” The indiscriminate marketing of mobile amplifiers and signal boosters to any prospective purchaser while at the same time boasting that the devices are FCC approved runs afoul of this rule and undercuts the spectrum management efforts of the Commission and its licensees.

³¹ These devices can be purchased at websites such as <http://www.wirelessextenders.com>; <http://www.cellantenna.com>; and <http://www.simplycheap.com>

interference that often results in a portion of a carrier's network going down, cutting off service to all of its customers in a given area.³²

When a customer installs one of these devices, it may work properly for a certain amount of time but it may still cause interference and other problems in the licensed networks in the area. Furthermore, at some point during operation the device may go into oscillation, creating significant debilitating interference to wireless system operations. As some of the examples explain in greater detail herein, this has typically led to two days or more of affected service as the source of the interference is isolated and removed. More robustly developed repeaters installed by carriers can detect when the transmitter has gone into oscillation and automatically shut down transmissions until the device is serviced and corrected. Lower quality equipment being manufactured and sold to consumers does not have a similar level of functionality. Accordingly, when a device begins to malfunction, it will not automatically turn off, in turn magnifying the interference problem. Indeed, both the manner in which these devices are installed (for example in a mobile configuration in a car, boat, etc.) and the lack of robustness of the devices themselves has lead to interference issues for the wireless industry to remedy.

When one of these devices begins to malfunction, it significantly degrades the network coverage and quality of service of the affected carriers.³³ More specifically, one of these malfunctioning devices can effectively bring down an entire sector of a cell site and may, on occasion, shut down the entire cell site. In cases where the malfunctioning device is mobile (*i.e.*, in a car), the device can sequentially impact multiple cell sites as it moves, resulting in a domino effect. Once a cell site is interfered with, it typically takes carriers two or more days to identify

³² Some examples of the types of interference carriers have experienced are attached in Appendix I.

³³ Many times, because these devices often work on all frequencies, they cause interference to all the wireless carriers providing service in that area.

the source of the interference. Additional time is spent making contact with a person at the location of the source and restoring the cell site(s) sector(s) to pre-interference operating conditions.

In addition, it is possible for a repeater to disrupt network-based E911 location solutions, a result that could cause significant harm to end users attempting to obtain emergency assistance at that location. Network-based E911 location systems require precise calculations of field strength and signal timing in the network to accurately estimate the location of subscribers. By operating unknown and uncontrolled wireless repeaters into the network, this delicate network balance is disrupted and disables the ability of the network provider to ensure that it can locate subscribers with the specified degree of accuracy. Therefore, more than simply disrupting routine wireless communications, wireless repeaters that are not controlled by carriers can adversely affect the public safety of wireless subscribers regardless of whether the repeater is operating as intended or if it is malfunctioning.

Virtually all wireless carriers have been experiencing an increasing amount of interference caused by the type of wireless repeaters often purchased and installed by consumers. Carriers are seeing this type of interference occur in ever increasing amounts. And the numbers of instances where this occurs are progressively increasing, in part because of the increasing publicity surrounding these devices. Swift action by both the carriers and the FCC is essential to ensure that this interference does not continue to grow.

IV. CARRIER EFFORTS TO RESOLVE THE PROBLEM

In response to this growing problem, wireless carriers are taking a variety of actions to minimize both the number of customers purchasing, installing, and operating these devices and the amount of interference they cause. For example, in today's extremely competitive

environment, carriers are re-doubling their efforts to make their systems as robust as possible, including adding cell sites and increasing signal strength in areas where their RF signal needs to be improved. Carriers work with various customers to design and install coordinated in-building cell sites and/or repeater systems that will not interfere with the carrier's network or the networks of their competitors. Depending on the carrier's relationship with the customer, the carrier may pay for either the full installation or part of the installation of an in-building system. Carrier installed systems are distinguishable in many respects from the problematic consumer devices discussed in this paper. These in-building systems, however, are often prohibitively expensive for consumer use.

The carriers are also working to improve consumers' awareness regarding the interference that these devices can cause. To date, the majority of the press has revolved around the purported benefits of these devices.³⁴ Little information, however, has been provided regarding the detrimental effect certain of these devices will have on carriers' networks, including networks of carriers with whom the consumer is not associated. To resolve this misconception, several wireless carriers will be adding information to their websites regarding the harmful effects that can result from these devices and making it clear that unauthorized deployment by a consumer of a repeater is prohibited. Wireless carriers also will continue efforts to improve service coverage and quality for consumers – whether by adding cell sites, increasing signal strength, or making available a wider variety of in-building systems.

V. FCC ACTION IS URGENTLY NEEDED

CTIA requests that the FCC take action aid the industry in resolving the growing problem presented by the use of wireless repeaters. As noted above, the industry believes that in order to

³⁴ See, e.g., I.J. Hudson, In-home cell repeaters: Raising the Bars Yourself, nbc4.com, <http://www.nbc4.com/technology/5089407/detail.html>.

fix this problem, it is imperative that the FCC issue Public Notices that advise consumers that operation of these devices is prohibited by the Communications Act and the FCC's rules absent the express permission and control of wireless carriers. In this regard, the FCC has, in the past, issued a Public Notice advising that the use of cellular "jammers" was unlawful because "...in accordance with Section 301 of the Communications Act, 47 USC 301, persons operating or using radio transmitters must be licensed or authorized under the Commission's rules"³⁵, a copy of which is attached as Appendix II. Repeaters not installed and deployed pursuant to the authorization of and control by licensees that operate on Part 22 and Part 24 cellular and PCS frequencies, respectively, and which can cause interference and, in effect, jam a cellular or PCS carrier's network, should be treated no differently. The industry believes that without these actions by the Commission, these devices will continue to proliferate – resulting in significant harm to service coverage and quality and potential errors in E-911 location determination.

VI. THE FCC HAS AMPLE AUTHORITY TO ACT WITHOUT INITIATING A RULEMAKING

The Administrative Procedure Act³⁶ ("APA") explicitly states that an agency may act without following APA notice and comment rulemaking procedures when it adopts "interpretive rules,"³⁷ or rules that "merely clarify or explain existing law or regulations."³⁸ Accordingly, the FCC may issue separate Public Notices to both consumers and manufacturers clarifying and

³⁵ See "Office of Engineering and Technology and Compliance Information Bureau Warn Against the Manufacture, Importation, Marketing or Operation of Transmitters Designed to prevent or Otherwise Interfere with Cellular Radio Communications", DA 99-2150 (released October 12, 1999).

³⁶ 5 U.S.C. §§ 551-559.

³⁷ See *id.* at § 553(b)(A); see also *U.S. Telecom Ass'n v. FCC*, 400 F.3d 29, 34 (D.C. Cir. 2005).

³⁸ *Malone v. Bureau of Indian Affairs*, 38 F.3d 433, 438 (9th Cir. 1994) (quotation omitted).

confirming their inability to respectively operate or market wireless repeaters without proper authorization.

The APA and pertinent case law make clear that the FCC can remind persons of their current obligations without triggering the procedural requirements of the APA.³⁹ As described in detail above, consumers are under an existing obligation not to operate wireless repeaters without authorization.⁴⁰ Thus, consistent with the APA and applicable case law, the FCC may issue a Public Notice to consumers reminding them that operating wireless repeaters, except under the express authorization and control of system licensees, is unlawful and may result in service outages and other harms to the wireless network without following APA notice and comment procedures.

As with the consumer Public Notice, the FCC may issue a Public Notice to manufacturers, importers, distributors, and retailers clarifying that they are only permitted to market and sell repeaters for use by authorized users. As outlined above, the FCC may issue Public Notices clarifying that persons must comply with existing FCC regulations. Thus, to the extent that existing FCC regulations (taken together) provide that manufacturers may market

³⁹ See, e.g., *Yale Broadcasting Co. v. FCC*, 478 F.2d 594, 599-600 (D.C. Cir. 1973) (stating that the FCC may remind persons of their existing obligations without having to follow 5 U.S.C. § 553); see also *Orengo Caraballo v. Reich*, 11 F.3d 186, 194-95 (D.C. Cir. 1993) (observing that interpretive statements are those which merely remind affected parties of their existing duties and are, therefore, exempt from the APA's notice and comment procedures); *Chamber of Commerce v. OSHA*, 636 F.2d 464, 46869 (D.C. Cir. 1980) (providing that interpretive rules are those which "only provide a clarification of statutory language") (quotations omitted).

⁴⁰ See 47 U.S.C. § 301 ("No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio . . . except . . . with a license in that behalf granted under the provisions of this Act"); see also 47 C.F.R. § 1.903 ("Stations in the Wireless Radio Services must be used and operated only in accordance . . . with a valid authorization granted by the Commission.").

wireless repeaters for use only by authorized users,⁴¹ then the Commission may, consistent with the APA, issue a Public Notice to those manufacturers outlining their existing obligations.⁴²

Even assuming that the FCC's existing regulations (taken as a whole) do not clearly state that manufacturers may only market wireless repeaters to authorized users, the FCC may issue a Public Notice reminding makers and importers of the devices that the equipment may be marketed only for use by persons who are authorized by licensees to operate the devices. The notice should also inform equipment authorization applicants that the Commission expects their applications to explain the steps taken in the design of the devices to ensure that operation by an authorized user will not simultaneously result in unauthorized radiation within the spectrum licensed to other FCC licensees.⁴³ Such a notice may be issued without using APA notice and comment procedures. The APA expressly provides that a federal agency does not need to use notice and comment procedures when it adopts interpretive rules.⁴⁴ Interpretive rules include statements, such as the requested manufacturer Public Notice, that clarify existing regulations.⁴⁵

⁴¹ Manufacturers are under an existing obligation to only market wireless repeaters that comply with the Communications Act and the FCC's rules. *See* 47 U.S.C. § 302(b). Thus, if a manufacturer knowingly markets a wireless repeater to an unauthorized user, then that device cannot be used in compliance with the Communications Act or FCC rules. The manufacturer is therefore marketing a device that is not capable of complying with the Communications Act or the FCC's rules and is in violation of the Act and the FCC's rules.

⁴² *See, e.g., Yale*, 478 F.2d at 599-600 (stating that the FCC may remind persons of their existing obligations without having to follow 5 U.S.C. § 553); *see also Orengo Caraballo*, 11 F.3d at 194-95 (observing that interpretive statements are those which merely remind affected parties of their existing duties and are, therefore, exempt from the APA's notice and comment procedures); *Chamber of Commerce*, 636 F.2d at 468-69 (providing that interpretive rules are those which "only provide a clarification of statutory language") (quotations omitted).

⁴³ As noted earlier, the broadband nature of many signal boosters and mobile amplifiers can result in radiation within the spectrum authorized for use by licensees, including public safety licensees, operating systems other than the system employed by the user of the device.

⁴⁴ *See* 5 U.S.C. § 553(b)(A); *see also U.S. Telecom*, 400 F.3d at 34.

⁴⁵ *Malone*, 38 F.3d at 438 (quotation omitted).

Moreover, statements are interpretive and exempt from the APA if existing regulations logically justify them.⁴⁶

Issuing the requested Public Notice would fall squarely within the interpretive rule exception to the APA. The FCC's existing regulations logically justify clarifying that manufacturers may only market wireless repeaters to authorized users. As described above, it is a violation of FCC regulations for persons who are not authorized users to operate wireless repeaters. Moreover, numerous regulations and provisions of the Act provide that manufacturers must market their equipment in compliance with federal law.⁴⁷ Thus, the FCC would not be acting inconsistent with any existing regulations if it issued a Public Notice stating that manufacturers may not market wireless repeaters in ways that encourage their operation by unauthorized users.⁴⁸ Indeed, the FCC's rules logically justify issuance of a Public Notice.

What is more, the FCC is due substantial deference when implementing the Communications Act, and "even greater deference" when interpreting its own rules and regulations.⁴⁹ Reviewing courts uphold agency interpretations of their enabling act and rules

⁴⁶ See *Chao v. Rothermel*, 327 F.3d 223, 227 (3d Cir. 2003); see also *Central Texas Telephone Co-op., Inc. v. FCC*, 402 F.3d 205, 212 (D.C. Cir. 2005) (An interpretive rule "must be interpreting something. It must derive a proposition from an existing document whose meaning compels or *logically justifies the proposition*. The substance of the derived proposition must flow fairly from the substance of the existing document." (quotations omitted, emphasis added)).

⁴⁷ See, e.g. 47 U.S.C. § 302(b) ("No person shall manufacture, import, sell, offer for sale, or ship devices . . . which fail to comply with regulations promulgated pursuant to this section."); see also 47 C.F.R. § 2.915 (stating that the Commission shall only certify equipment if doing so would serve the public interest); see also 47 C.F.R. § 2.939(a)(4) (providing that the FCC has authority to revoke equipment authorizations because of conditions coming to the Commission's attention that would warrant refusing to grant the original application).

⁴⁸ See *Shalala v. Guernsey Mem'l Hosp.*, 514 U.S. 87, 100 (1995)

⁴⁹ *Capital Network Sys. v. FCC*, 28 F.3d 201, 206 (D.C. Cir. 1994); *Global NAPs, Inc. v. FCC*, 247 F.3d 252, 257-58 (D.C. Cir. 2001); *Udall v. Tallman*, 380 U.S. 1, 16 (1965) ("When faced with a problem of statutory construction, this Court shows great deference to the interpretation given the statute by the officers or agency charged with its administration. To sustain the Commission's application of this statutory term, we need not find that its construction is the only reasonable one or even that it is the result we would have reached had the question arisen in the first instance in judicial proceedings.").

when they are “reasonable [and] based upon factors within the Commission’s expertise.”⁵⁰

Indeed, “in construing administrative regulations, the ultimate criterion is the administrative interpretation, which becomes of controlling weight unless it is plainly erroneous or inconsistent with the regulation.”⁵¹

Moreover, the FCC has ample authority and jurisdiction to enforce its rules against non-licensee importers, distributors, and retailers. The Communications Act empowers the Commission to impose monetary forfeitures on persons who do not hold an FCC license, permit, certificate, or other authorization.⁵²

Thus, the FCC has sufficient authority to issue the two requested Public Notices without initiating a notice and comment rulemaking or ruling and may, consistent with the public interest, enforce the Communications Act and the FCC’s rules against consumers, manufacturers, and certain non-FCC licensees.

⁵⁰ *Global NAPs*, 247 F.3d at 258 (citation omitted, alteration in original).

⁵¹ *United States v. Larionoff*, 431 U.S. 864, 872 (1977) (quotations omitted).

⁵² *See* 47 U.S.C. § 503(b)(5).

Appendix I

Examples of Harmful Interference

Below are examples of harmful interference carriers (and their customers) have experienced as a result of unlawful operation of wireless repeaters:

1. The carrier became aware of significant problems being encountered at an in-building system utilized by a large customer in an office park. After investigating, the carrier discovered the culprit was a Bi-Directional Amplifier (BDA), owned and operated by a major customer, which had gone into compression. The problem lasted for several weeks and took approximately twenty-five man hours to correct.
2. A city government installed a signal amplification system in a large convention center. After investigating poor signal quality and coverage and exploring the possibility of designing an in-building solution at the convention center, the carrier discovered that the configuration of the existing system would not allow for any such solution. After thirty man hours of investigation and analysis, the matter remains unresolved. The existing system is still in place and operating – to the detriment of the carrier and its customers.
3. A B band cellular provider spent over 48 man hours to locate a customer's defective repeater. Negative impacts from the repeater included increases in bit error rates (BER) reflecting uplink interference and call blocks reflecting customers who did not receive service when requested. The amount of lost revenue may not be calculated, but the negative impact upon the carrier's customers is measured only by the customers who complain about or disconnect their service.
4. The carrier was experiencing uplink interference near a metropolitan airport over the course of an entire year. The interference caused decreased coverage and an increase in dropped calls. After seventy-five man hours, it was discovered that the airport authority was operating a BDA, which adversely impacted four separate cell sites and six individual sectors.
5. A carrier began detecting up link interference in a specific cell site and, after visiting the site, was able to trace the source of interference to a nearby business with a repeater. After being contacted by the carrier, the company uninstalled the repeater. It took the carrier almost three weeks to detect, locate, and decommission the repeater, and this occurred only with the cooperation of the offending user.
6. A carrier began detecting interference to two sectors on adjacent cell sites and, after visiting the site, was able to trace the source of interference – a wireless repeater. The carrier devoted approximately 20 engineering hours to find and address the problem. The cell site sectors were impacted for approximately 100 hours.
7. A carrier began detecting interference to a cell site from a wireless repeater. The carrier devoted approximately 16 engineering hours to find and address the problem. The cell site was degraded for approximately 100 hours.

Appendix II



PUBLIC NOTICE

**Federal Communications Commission
445 Twelfth St., S.W.
Washington, D.C. 20554**

News media information 202 / 418-0500
Fax-On-Demand 202 / 418-2830
Internet: <http://www.fcc.gov>
<ftp.fcc.gov>

**DA 99-2150
Released: October 12, 1999**

**Office of Engineering and Technology and Compliance and Information Bureau
Warn Against the Manufacture, Importation, Marketing
or Operation of Transmitters Designed to Prevent or
Otherwise Interfere with Cellular Radio Communications**

The Commission's Office of Engineering and Technology (OET) and Compliance and Information Bureau (CIB) have received several inquiries concerning the use of transmitters designed to prevent or jam the operation of cellular telephones in hospitals, theaters and other locations. The Communications Act of 1934, as amended, and the Commission's Rules do not permit these devices to be manufactured, imported, marketed or operated within the United States.

Section 302(b) of the Communications Act, 47 USC 302(b), prohibits the manufacture, importation, sale, offer for sale, or use of devices that fail to comply with the regulations promulgated pursuant to this section. Similar prohibitions are contained in the Commission's rules, *e.g.*, 47 CFR Sections 2.803, 2.1203, and 22.377. In addition, in accordance with Section 301 of the Communications Act, 47 USC 301, persons operating or using radio transmitters must be licensed or authorized under the Commission's rules. There are no provisions in the FCC's rules that permit the operation of any device intended to interfere with cellular communications. Further, Section 333 of the Communications Act, 47 USC 333, prohibits any person from willfully or maliciously interfering with the radio communications of any station licensed or authorized under the Communications Act or operated by the U.S. Government.

Based on the above, the operation of transmitters designed to jam cellular communications is a violation of 47 USC 301, 302(b), and 333. The manufacture, importation, sale or offer for sale, including advertising, of such transmitters is a violation of 47 USC 302(b). Parties in violation of these provisions may be subject to the penalties contained within 47 USC 501-510. Fines for a first offense can range as high as \$ 11,000 for each violation or imprisonment for up to one year. The equipment can also be seized and forfeited to the U.S. Government.

OET and CIB wish to emphasize that the above regulations apply to all transmitters that are designed to cause interference to, or prevent the operation of, other radio communication systems.

Questions regarding this Public Notice may be directed to the Commission's National Call Center at 1-888-CALL FCC (1-888-225-5322).

Attachment B

**Booster Manufacturer
Misleading Press Release**



NEWS RELEASE

For more information contact:
Suzanne M. Hawley
Public Relations Specialist
suzannehawley@adelphia.net
603-487-2038

FOR IMMEDIATE RELEASE:

DIGITAL ANTENNA PARTNERS WITH TALLEY COMMUNICATIONS

Leading Wireless Distributor Offers Award Winning Cellular Amplifiers/Repeaters

SUNRISE, FL. (June 7, 2005) – Digital Antenna Inc., leading manufacturer of antenna and cellular

communication products announced Talley Communications has signed a distributor agreement to sell the company's cellular amplifiers and repeaters. Headquartered in Los Angeles, California, Talley Communications is a distributor of wireless communications infrastructure and mobile products.

"Talley has an impeccable reputation as a distributor of top manufacturers in the wireless industry with a focus on customer service," quotes Joanne Johnson, Digital Antenna's Vice President of Operations.

"We are excited about the new partnership and anticipate Talley's expertise in the wireless industry will be key to increased sales of our award winning cellular amplifiers and repeaters," Johnson adds. A privately held company, the wireless giant stocks products from more than 100 leading manufacturers and has additional facilities in Phoenix, San Francisco, Seattle and Kansas City.

"The decision to carry Digital Antenna cellular amplifiers and repeaters was simple," says Jeff Talley, Executive Vice President, Talley Communications. "We identified the products as an innovative solution for improved cellular communications and expect a tremendous response from recreational customers," he adds.

The company's PowerMax amplifiers and repeaters improve receive and transmit signals with up to 3 watts of power, increase cell phone range up to 50 miles, reduce dropped calls and extend the life of cell phone batteries. Systems are designed for specific use in automobiles, homes, offices, RVs and boats. Available in five models, all units are dual band operating on 800 and 1900 MHz and are FCC approved to operate with all U.S. and Canadian carriers including Cingular, AT&T, Verizon, Sprint, Alltel and T-Mobile. Exclusive *dynamic variable gain control* regulates the amplifier's output to any cell carrier's tower providing clear connections. Digital Antenna is the only manufacturer FCC approved for 3 watts at 800 MHz and 2 watts at 1900 MHz for all modulations. The company's cellular amplifiers and repeaters have received multiple industry awards for innovation from CES (Consumer Electronic Show), NMEA (National Marine Electronics Association) and NMMA (National Marine Manufacturers Association).

- more -

About Talley Communications

Talley Communications Corp. is a leading distributor of wireless communications infrastructure and mobile products. Talley's corporate offices are in Los Angeles, CA, with facilities in Kansas City, Phoenix, San Francisco and Seattle. Talley Communications was founded in 1983 and is a privately held family owned company. www.talleycom.com

About Digital Antenna Inc.

Digital Antenna Inc. leads the world in antenna and cellular communication technology with dedication to quality, performance and superior service. Located in Sunrise, Florida, the company provides premium quality antennas, cellular amplifiers and repeaters to marine and land based markets worldwide. The company's continued dedication to developing innovative products includes introduction of the first dual band cellular amplifier and first dual band wireless cellular amplifier/repeater. All products are made in the USA. For additional information on Digital Antenna Inc. or product offerings, visit www.digitalantenna.com or call toll free 877-433-7007.

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Attachment C

Booster Manufacturer
Misleading Product Catalog

CATALOG

GO FURTHER

DIGITAL ANTENNA
2008



AWARD WINNING AMPLIFIERS AND ANTENNAS FOR LAND AND SEA



BOAT | CAR | RV | HOME | OFFICE

2008 CATALOG

GO FURTHER on land and sea with Digital Antenna's award-winning antennas and cellular communication products. Made in the USA, designed by a dedicated team of engineers and supported by qualified sales professionals and retail partners, Digital Antenna is passionate about manufacturing high-performance products and delivering superior customer service.

DEDICATION TO RESEARCH

Digital Antenna continues to bring you the latest technology – FIRST!

Digital Antenna maintains an exceptionally strong discipline to research, resulting in innovative products that surpass the boundaries of tomorrow's technology. We're proud to have many "firsts" in our history. The first dual band cellular amplifier. The first dual band wireless cellular amplifier/repeater. The first easy installation mini-connector system. The first antenna with a power directing ferrite choke bead.

1 IN ANTENNAS

Your antenna is your lifeline. Choose wisely.

Our innovative approach to creating exceptional new technology has made Digital Antenna the #1 name in marine antennas. This attention to detail is evident in every aspect of our product development from engineering and manufacturing to requiring each antenna to be hand-tested and tuned before it leaves our facility. With a range of antennas designed for use on land or sea, Digital Antenna is the clear choice for maximum durability and performance.

1 IN CELLULAR AMPLIFICATION

PowerMax™ –
Award-Winning Cellular Signal Boosters

Digital Antenna is the only award-winning manufacturer FCC approved for 3 watts at 850 MHz and 2 watts at 1900 MHz for all modulations. Our cellular amplifiers and repeaters are the recipients of several prestigious industry awards including: NMEA Top Marine Specialty Product, CES Innovations Design and Engineering Award, NMMA Innovation Award and Editor's Choice Award from SAIL Magazine.

DIGITAL ANTENNA

- unequaled performance you can count on.

Made in the USA

www.digitalantenna.com



GO FURTHER ON LAND AND SEA

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PowerMax™ Global Band Cellular Combiners	NEW 15	Marine Antenna Mounts and Accessories	29
PowerMax™ Cellular Adapter Cables	NEW 16	Connectors and Adapters	30

CUSTOMIZED CELLULAR SOLUTIONS

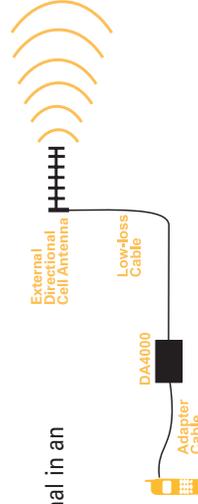
FOR DIRECT CONNECT AND WIRELESS AMPLIFIERS

DESIGNING THE ULTIMATE SYSTEM

PowerMax™ cellular amplifiers are sold individually, with specific external antennas and adapter cables purchased separately. Wireless cellular repeaters are designed and sold as complete systems for ease of installation and optimum performance. However, there are often situations when a customized solution is necessary to create a system that works optimally for a specific application. Here are some examples of how to enhance PowerMax™ systems in different scenarios. More customized solutions are available on our website under e-support.

CUSTOMIZED SOLUTION 1:

Achieve maximum boosted cell signal in an extremely remote fixed location (Home, Office, Building).



Parts Needed:

MODEL NUMBER	DESCRIPTION	PAGE NUMBER
DA4000	Direct connect cell amplifier	5
DAXXX	Cell phone and/or air card adapter cable (model specific)	16
Directional Antenna	High-gain directional antenna (frequency specific for highest gain)	14
Antenna Cable	PowerMax™ low-loss antenna cable	18, 19

CUSTOMIZED SOLUTION 2:

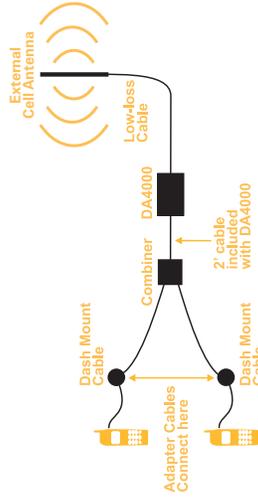
Extend the distance between inside and outside antennas of a wireless system by using longer cable.

Parts Needed:

MODEL NUMBER	DESCRIPTION	PAGE NUMBER
Outside Cable	PowerMax™ external antenna extension cable	18
Inside Cable	PowerMax™ inside antenna extension cable	18

CUSTOMIZED SOLUTION 3:

Use two cell phones and/or air cards at the same time with a DA4000 direct connect cellular amplifier.

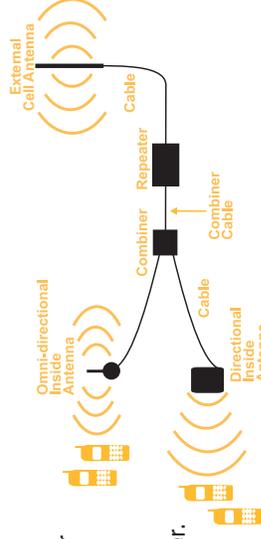


Parts Needed:

MODEL NUMBER	DESCRIPTION	PAGE NUMBER
DA4000	Direct connect cell amplifier	5
DA-2192	2-way cell combiner kit with dash-mount adapter cable	15
DAXXX	Cell phone and/or air card adapter cable (quantity 2) (model specific)	16
External Cell Antenna	Dual band cell antenna for specific application (land or marine)	13, 14, 23
Antenna Cable	Low-loss antenna cable	18, 19

CUSTOMIZED SOLUTION 4:

Provide additional enhanced cellular signal coverage in two separate locations by using multiple inside antennas with a wireless cell booster.



Parts Needed:

MODEL NUMBER	DESCRIPTION	PAGE NUMBER
Repeater System	Application specific repeater system	6 - 11
DA-2100	2-way combiner	15
Combiner Cable	Double mini-UHF male cable	18
Inside Antenna	433-CM or 426-PW dual band inside cell antenna	13
Antenna Cable	Low-loss antenna cable for 433-CM or 426-PW antenna	18

PowerMax™ DIRECT CONNECT AMPLIFIER (ALL PURPOSE)



3 WATT DIRECT CONNECT AMPLIFIER

VEHICLES | BOATS | RVs | CARS | HOMES | OFFICES



DA4000

DA4000 - Direct Connect Amplifier
DUAL BAND: use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or iDEN).

Add increased power and reliability to your cell phone in any application with the PowerMax™ 3 watt cellular amplifier. A direct connect amplifier is the best solution in areas of extremely low outside cellular signal or when optimum data connections are top priority. Cell phone or air card physically attaches to DA4000 amplifier via an adapter cable (pg 16). External antenna and adapter cable sold separately. Maximum input power: 2 watts.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or iDEN).



DA4000E

DA4000E - Direct Connect Amplifier
DUAL BAND: use with all European and Asian cell phones operating on 900 and 1800 MHz

Direct Connect Amplifiers Include:

- 3 watt dual band amplifier (DA4000 or DA4000E)
- 12 VDC cigarette-style power cable (DP742)
- 2' cable with mini-UHF male connectors (240-02MM)

External antenna and adapter cable required and sold separately

Universal Application: Vehicles, boats, RVs, cars, homes, offices.

Range/Performance: Amplifies Cellular signal up to 50+ miles*.

Solution: Designed for areas of extremely low outside cellular signal and when optimum data connections are top priority.

Advantage: Universal use; cell phone or air card physically connects to amplifier via an adapter cable.

**Increased range varies based upon height of outside antenna, type of cable used, cell phone carrier, and location of cell tower. For maximum range, place outside antenna as high as possible using ultra low-loss cable.*

Specifications

Frequency DA4000	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Frequency DA4000E	Downlink: 925-960 MHz and 1805-1880 MHz Uplink: 880-915 MHz and 1710-1785 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain	15dB Max
Receive Sensitivity	-125dBm

For complete specifications visit www.digitalantenna.com



PowerMax™ 40dB REPEATER (VEHICLE INTERIOR)

40dB GAIN 3 WATT WIRELESS MOBILE REPEATER SYSTEM

CARS | SUVs | VANS | TRUCKS

Experience greater cell phone power, range and reliability in your vehicle with Digital Antenna's award-winning PowerMax™ automobile cell booster. The PowerMax™ 4KMR-10A boosts your cell phone and air card's signal strength to 3 watts and increases range up to 20+ miles without a physical connection to your cell phone. The result is clean and clear voice quality with maximum data throughput on all carriers except Nextel or iDEN.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or iDEN).

4KMR-10A System Includes:

- 3 watt, 40dB gain cellular repeater (DA4000MR)
- 12 VDC power converter (DP515)
- Internal slim patch antenna with 6' cable (CA09P)
- External 3dB gain magnetic mount antenna with 10' cable (CA55M)



Complete System 4KMR-10A

Mobile Application: Vehicles with metal roofs (not for use in convertibles or in vehicles with composite roofs).
Range/Performance: Amplifies cellular signals up to 20+ miles.

Advantage: Wirelessly enhances signals of multiple cell phones within a standard vehicle interior*.

Requirement: 3' separation and a metal roof between inside & outside antennas (not for use in a convertible or composite roof).

* Enhanced coverage area from inside antenna varies based upon outside cell signal strength. A weaker outside signal results in a smaller distance from inside antenna.

Specifications

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain	43dB Max
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com



DC074 Cell Booster Travel Bag (sold separately)

Convenient travel bag neatly stores cell booster, antennas, and power supply (sold separately) in multi-accessible zipper compartments. Features mesh pockets for venting. Includes carrying handle and shoulder strap.

PowerMax™ 40dB GAIN REPEATER (UP TO 1,500 SF)



**40dB GAIN 3 WATT
WIRELESS REPEATER SYSTEM**

1 ROOM IN A HOME | OFFICE

Digital Antenna's PowerMax™ SOHO room wireless cellular booster provides enhanced cellular signals in a room up to 1,500 square feet in size. Perfect for use inside homes and offices where cell phone service is poor or non-existent, the 4KMR-30U repeater system brings the outside cellular signal indoors.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KMR-30U 40dB Gain System

Application:

One room in a home or office (up to 1,500 square feet).

Range/Performance:

Enhances multiple cell phones in a room up to 8' to 12' from inside antenna*.

Advantage:

Wirelessly amplifies up to 20 cell phones in one room.

Requirement:

20' separation plus a complete structure between inside and outside antennas.

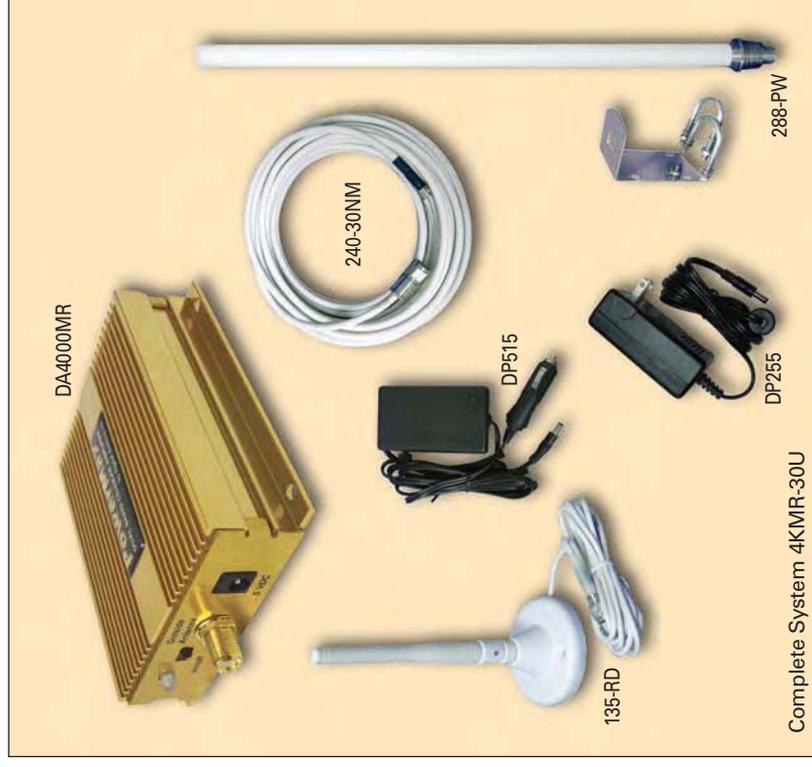
* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an internal or external directional antenna (page 11).



Specifications

Frequency	Downlink: 869-895 MHz and 1930-1900 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	43dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com



Complete System 4KMR-30U

4KMR-30U System Includes:

- 3 watt dual band 40dB gain cellular repeater (DA4000MR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal antenna with 6' cable (135-RD)
- 30' of DA240 cable for external antenna (240-30NM)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)

PowerMax™ 50dB GAIN REPEATER (UP TO 2,500 SF)

50dB GAIN 3 WATT WIRELESS PERSONAL REPEATER SYSTEM

CONDOS | APARTMENTS | DORM ROOMS | HOMES | OFFICES



Complete System 4KPPR-15R

A compact and simple solution to poor cellular reception inside condominiums, apartments, dorm rooms, homes, and offices, the PowerMax™ 4KPR-15R Wireless Personal Repeater provides reliable and clear cell phone communication equivalent to the cell signal strength available outside the building. A simple Do-It-Yourself (with no tools required) installation. Suction cups allow a 9dB gain antenna to securely attach to a window while the 50dB gain repeater sits on any flat surface like a desk or bookcase.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KPR-15R System Includes:

- 3 watt, 50dB gain cellular repeater with built-in 9dB antenna (DA4000PR)
- 110 VAC power supply (DP255)
- Window mounted 9dB gain antenna (426-PW)
- Window-mount for 426-PW antenna (DM426)
- 15' coaxial cable with attached connectors (240-15NM)

Specifications

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain	50dB Max
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

In-Building Application: Condominiums, apartments, homes, offices, dorm rooms.

Range/Performance: Wirelessly enhances signals of multiple cell phones in a room (up to 2,500 square feet)*.

Advantage: Simple Do-It-Yourself installation does not require outside installation.

Requirement: 10' separation between window antenna and repeater unit.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area.

PowerMax™ 50dB GAIN REPEATER (UP TO 3,500 SF)



50dB GAIN 3 WATT WIRELESS REPEATER SYSTEM

HOME | OFFICE | BOAT WITH CABIN | RV

Get more bars with Digital Antenna's PowerMax™ 4KMR-30M wireless cell booster with directional inside antenna. This new 50dB gain wireless cellular repeater system boosts the signal strength of your cell phones or air cards to 3 watts, improves transmit and receive signals and can be used in a variety of locations. Not for use in open console boats.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KMR-30M 50dB Gain System

Application: One to two rooms in Home, Office, RV or Boat with Cabin.
(not for use in open console boats).

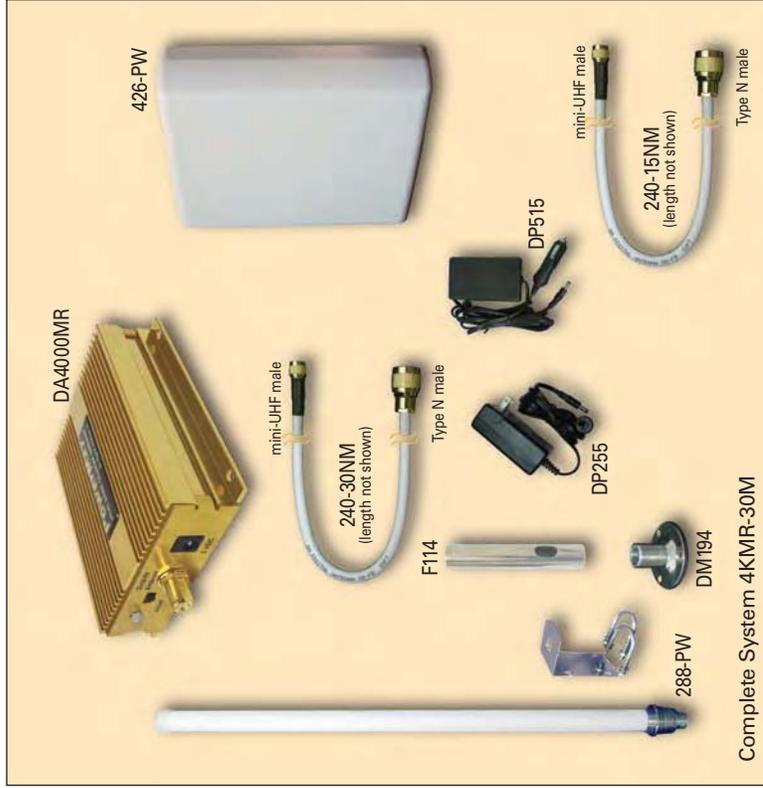
Range/Performance: Enhances multiple cell phones up to 25' from inside antenna*.

Advantage: Wirelessly amplifies up to 20 cell phones in one to two rooms.

Requirement: 12' separation plus a complete structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an external directional antenna for fixed locations only. (page 14).

Complete System 4KMR-30M



Specifications

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic	
Variable Gain (Max)	53dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

4KMR-30M System Includes:

- 3 watt dual band 40dB gain cellular repeater (DA4000MR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal 9dB gain directional antenna (426-PW)
- 30' of DA240 cable for external antenna (240-30NM)
- 15' of DA240 cable for internal antenna (240-15NM)
- 1"-14 threaded mount (DM194)
- 1"-14 threaded mounting ferrule (F114)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)

PowerMax™ 70dB GAIN REPEATER (UP TO 4,000 SF)

70dB GAIN 3 WATT WIRELESS REPEATER SYSTEM

HOME | OFFICE | LARGE YACHT | SAILBOAT | RV

Get more bars with the most powerful repeater system on the market. Digital Antenna's PowerMax™ 4KSR-50M 70dB gain wireless repeater system boosts the signal strength of your cell phones or air cards to 3 watts, greatly improves transmit and receive signals and can be used in a variety of locations. This translates into fewer dropped calls, clearer connections and stronger signals inside your home, office, yacht, sailboat or RV. Not for use in open console boats.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KSR-50M 70dB Gain System

Application: Multiple rooms in Home, Office, RV, Large Yacht or Sailboat. (not for use in open console boats).

Range/Performance: Enhances multiple cell phones up to 60' from inside antenna*.

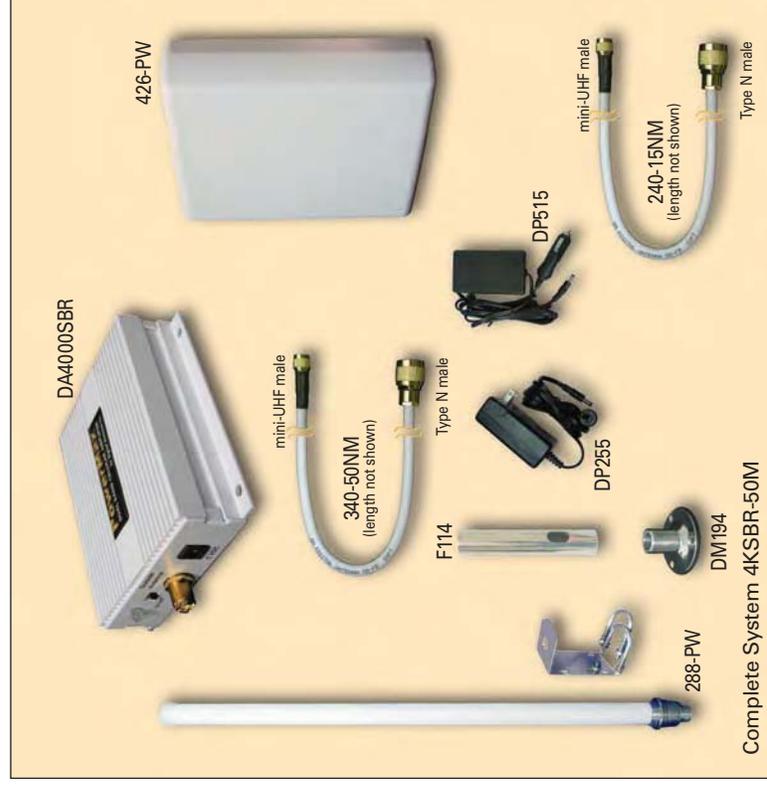
Advantage: Wirelessly amplifies up to 20 cell phones in multiple rooms.

Requirement: 25' separation plus a complete structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an external directional antenna for fixed locations only. (page 14).

4KSR-50M System Includes:

- 3 watt dual band 70dB gain cellular repeater (DA4000SBR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal 9dB gain directional antenna (426-PW)
- 50' of DA340 cable for external antenna (340-50NM)
- 15' of DA240 cable for internal antenna (240-15NM)
- 1"-14 threaded mount (DM194)
- 1"-14 threaded mounting ferrule (F114)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)



Specifications

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	73dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

PowerMax™ 60dB GAIN REPEATER (UP TO 5,000 SF)



60dB GAIN 3 WATT WIRELESS REPEATER SYSTEM

HOMES | OFFICES | LARGE BOATS | SAILBOATS | RVs >40'

Increase cell signals indoors with Digital Antenna's popular PowerMax™ Small Building Repeater. The complete 4KSBR-50U system is a professional grade wireless cellular booster that provides a generous coverage area of up to 5,000 square feet. Perfect for use inside where cell phone service is poor or non-existent, the 4KSBR-50U repeater system brings the outside cellular signal indoors.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KSBR-50U 60dB Gain System

Application:

Multiple rooms in a home, office, RV, large yacht or sailboat (up to 5,000 square feet).

Range/Performance: Enhances multiple cell phones 15' to 50' from inside antenna*.

Advantage: Wirelessly amplifies up to 20 cell phones in multiple rooms.

Requirement: 40' separation plus a structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an internal or external directional antenna (page 14).

Specifications

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	63dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com



Complete System 4KSBR-50U

4KSBR-50U System Includes:

- 3 watt dual band 60dB gain cellular repeater (DA4000SBR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal antenna with 6' cable (135-RD)
- 50' of DA340 cable for external antenna (340-50NM)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)

PowerMax™ 80dB GAIN REPEATER (UP TO 40,000 SF)

80dB GAIN 3 WATT WIRELESS REPEATER

HOME | OFFICE | WAREHOUSE | RETAIL STORE



DA4000LBR

Designed for commercial applications, Digital Antenna's 80dB gain Large Building Repeater is the ideal solution for office buildings, retail stores and large homes where cell phone service is poor or non-existent indoors. With a coverage area up to 40,000 square feet and unlimited user capability, it is the most powerful PowerMax™ wireless repeater featuring an intelligent microprocessor controller for optimum signal conditioning and maximum signal gain. An LCD display indicates full system status or connect to a PC via the USB port for complete system diagnostics.

DUAL BAND: Approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

DA4000LBR Includes:

- 3 watt, 80dB gain cellular repeater (DA4000LBR)
- Two dual band inside antenna ports
- One 850 MHz and one 1900 MHz outside antenna port
- USB Connection
- Instructional CD and manual

NEW

Specifications

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	83dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

DA4000LBR 80dB Gain System (available Q1 2008)

In-Building Application: Multiple rooms (up to 40,000 square feet) in a large home or office.

Range/Performance: Enhances unlimited cell phones up to 80' from each inside antenna*.

Advantage: Wirelessly amplifies an unlimited number of cell phones.

Requirement: 100' separation plus a structure between each directional inside and outside antenna.

Professional Installation Required

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area.

POWERMAX™ CELLULAR ANTENNAS



DUAL BAND AND MULTI-BAND OMNI-DIRECTIONAL
VEHICLES | BOATS | RVs | HOMES | OFFICES

Digital Antenna's PowerMax™ dual band cellular antennas are constructed for high performance and maximum range. A perfect compliment to Digital Antenna's amplifiers and repeater systems, PowerMax™ cellular antennas provide strong and reliable signals. When communication is critical, Digital Antenna's award-winning antennas make the connection.

Model # 288-PW

18" Dual Band Fiberglass Antenna

- Use: Outside Homes | Offices | Boats | RVs
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 9dB
- Connector: Type N female
- Cable Length: Not Included (pg 27-28)
- Mount: L-bracket for 1" pole or wall
- Dimensions: 18" l x 1" OD max



Model # 295-PW

18" Multi-Band Fiberglass Antenna

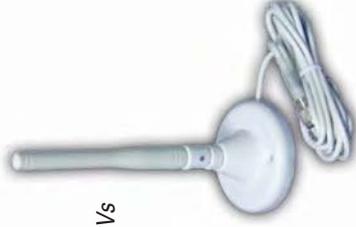
- Use: Outside Homes | Offices | Boats | RVs
- Frequencies: Global 820-960 | 1710-2170 MHz
- Gain: 9dB
- Connector: Type N female
- Cable Length: Not Included (pg 27-28)
- Mount: L-bracket for 1" pole or wall
- Dimensions: 18" l x 1" OD max



Model #135-RD

Dual Band Inside Antenna

- Use: Inside Homes | Offices | Boats | RVs
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 3dB
- Connector: Mini-UHF male
- Cable Length: 6'
- Mount: Swivel base
- Dimensions: 4" l x 2.5" OD max



Model # CA55M

Dual Band Magnetic Mount Antenna

- Use: Outside Automobiles
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 3dB
- Connector: Mini-UHF male
- Cable Length: 10'
- Mount: Strong magnetic base
- Dimensions: 3.5" l x 1.2" OD max



Model #CA09P

Dual Band Slim Patch Antenna

- Use: Inside Automobiles | Convertibles
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 3dB
- Connector: Mini-UHF male
- Cable Length: 6'
- Mount: 3M adhesive
- Dimensions: 5.5" l x 1.2" w x .25" h



POWERMAX™ CELLULAR ANTENNAS

Visit us at
www.digitalantenna.com



DUAL BAND AND MULTI-BAND DIRECTIONAL

HOMES | OFFICES | COMMERCIAL BUILDINGS

With a nearly perfect 50 ohm match, PowerMax™ cellular antennas offer exceptional construction and deliver maximum range. High gain directional antennas are ideal for use in very low signal areas with Digital Antenna's PowerMax™ amplifiers & repeaters. Cable sold separately (page 18-19).

Model #433-CM

Multi-Band Ceiling Mount Antenna

- Use: Inside Homes | Offices | Commercial Buildings
- Frequencies: 824-894 | 1850-1990 | 2400-2500 MHz
- Gain: 3dB
- Connector: Type N female
- Beam Width: H 360° V 60°
- Mount: Ceiling
- Dimensions: 6.8" OD x 3.6" h



Model #489-DB

Multi-Band Directional Antenna

- Use: Outside Homes | Offices | Commercial Buildings
- Frequencies: 800-2500 MHz
- Gain: 10dB
- Connector: Type N female
- Beam Width: H 80° V 60°
- Mount: Integrated brackets for mast/pole
- Dimensions: 18" l x 8.5" h x 2.5" d



Model #426-PW

Multi-Band Panel Antenna

- Use: Inside or Outside Homes | Offices | Commercial Buildings | Boats | RVs
- Frequencies: 824-894 | 1850-1990 | 2400-2500 MHz
- Gain: 9dB
- Connector: Type N female
- Beam Width: H 65° V 55°
- Mount: Included wall bracket
- Dimensions: 7" w x 9" h x 1.75" d



14 Element High Gain Yagi Antenna

Model #408-YB

Low-Band Yagi Cellular Antenna

- Frequencies: 824-894 MHz
- Dimensions: 48" l x 7.25" h x 2" d
- Beam Width: H49° V49°



Model #419-YB

High-Band Yagi Cellular Antenna

- Frequencies: 1850-1990 MHz
- Dimensions: 30" l x 4" h x 2" d
- Beam Width: H51° V31°

• Use: Outside Homes | Offices | Commercial Buildings

• Gain: 14dB

• Connector: Type N female

• Mount: Included U-bolts for pole

PowerMax™ CELLULAR COMBINERS



2-WAY | 4-WAY GLOBAL BAND CELLULAR COMBINERS
USE WITH ALL PowerMax™ CELLULAR BOOSTERS

Getting the most out of your cellular signal booster is easy when you have the right accessories to create a solution that is perfect for your specific application. Digital Antenna's new 2-way and 4-way global cellular combiners allow multiple cellular devices to be used simultaneously with direct-connect amplifiers and wireless repeater systems.

Visit our online Support Center at www.digitalantenna.com for customized installation solutions for PowerMax™ cellular boosters.

NEW



DA-2190

DA-2190 2-Way Global Cell Combiner



Two - 12' Dash-Mount Cables

DA-2384

DA-2384 2-Way Global Cell Combiner Kit Includes:

For easy ordering and installation, 2-way combiners are now available as a kit (# DA-2384) and include two 12' dash-mount adapter cables (C428-12) and a 2-way combiner (DA-2190).

- Two- 12' dash-mount cables (C428-12)
- 2-Way global Cell Combiner (DA-2190)



DA-4190

DA-4190 4-Way Global Cell Combiner

Specifications

Frequency	850 900 1800 1900 2100 MHz Bands
Impedance	50 ohm
Max Input Power	3 watts
Connectors	Mini-UHF female
Insertion loss	3dB (DA-2190) 6dB (DA-4190)
Dimensions	4" x 3.25"

Specifications

Frequency	850 900 1800 1900 2100 MHz Bands
Impedance	50 ohm
Max Input Power	3 watts
Connectors	Mini-UHF
Insertion loss	3dB
Dimensions	4" x 3.25"

Cell Phone and air card adapter cables sold separately.

PowerMax™ CELLULAR ADAPTER CABLES



3' CABLE WITH MINI-UHF MALE CONNECTOR

USE WITH DIRECT CONNECT AMPLIFIER, EXTERNAL ANTENNA, CELL COMBINER

Digital Antenna's cellular adapter cables are a convenient 3' length. The attached mini-UHF male connector easily connects your cell phone or air card to a PowerMax™ DA4000 Amplifier, Multi-Cell Phone Combiner or Dash-Mount Cable.

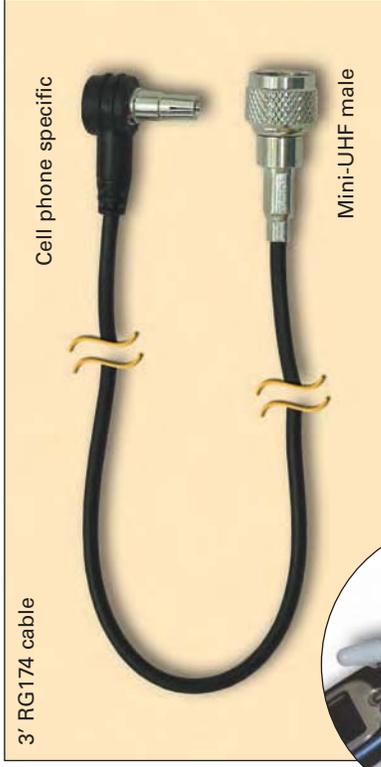
Digital Antenna offers more than 100 external antenna adapters to fit over 500 phones. Please visit www.digitalantenna.com for an updated list of phone and aircard specific adapter cables. If your model number is not listed*, use Digital Antenna's new DA97U universal inductive coupler adapter.

*Your phone's model number should be located under your cell phone's battery. Match the model number to the list on our website to identify the adapter cable for your phone. We also have a variety of adapter cables for your PC aircard.



If your cellular phone model number is not listed at www.digitalantenna.com, use Digital Antenna's new DA97U universal inductive coupler adapter.

This innovative adapter allows any cell phone or aircard to be used with a PowerMax™ direct connect amplifier. For best performance, always use the cellular adapter cable made specifically for your phone or aircard if available.



3' RG174 cable

Cell phone specific



Mini-UHF male

Cell Phone or Aircard Adapter Cable
(cable length not to scale)

Available Manufacturers

We offer adapter cables for the following cellular manufacturers.

Visit www.digitalantenna.com for a complete listing of cell phone and aircard models.

- Audiovox (UT Starcom)
- Curitel
- Denso
- Handspring / Palm
- Hitachi
- HTC Faraday
(manufactured for Cingular)
- Kyocera / Qualcomm
- LG / Lucky Goldstar
- Mitsubishi
- Motorola
- Nokia
- Novatel
- Panasonic
- Pantech
- Samsung
- Sanyo
- Sharp
- Siemens
- Sierra Aircard
- Sony Ericsson
- Uniden
- Verizon



CABLE & CONNECTOR SELECTION GUIDE

FOR MAXIMUM SIGNAL TRANSMISSION

Cable plays one of the most important roles in the antenna installation. Signals are transmitted through the cable and the goal is to maintain as much of the signal as possible when it reaches the antenna. Digital Antenna cables feature exclusive low loss, tinned braid, foil shielded cable with a UV stable jacket for maximum signal transmission.

Cable and Connector Selection Guide:

How long is the cable run?

Cable length must be calculated before determining the cable type. The cable run must not be kinked, crushed, or have a bend radius less than 10 times the cable diameter. Also the cable must be clear of moving objects. Cable should be laid as straight as possible and away from metal. Bends or sharp curves decrease performance and may cause drastic signal loss.

What is return loss?

Return loss is the portion of a signal that is lost due to a reflection of power caused by any discontinuity of the cable. Signal reflections are caused by anything that changes the shape of the cable. Cable kinks or twists, connector insertions/installations and splices are major factors contributing to the total signal efficiency of the installation.

What frequency will you be using: VHF, Cellular, WIFI?

As frequencies increase, there is considerably more signal loss in the cable. Cable characteristics vary by manufacturers and should be compared. (Conductor material, dielectric material, shield type, % coverage and additional foil shielding). A 60% braid coverage would have more signal loss than 95% coverage. A cable with a foil shield is more efficient and effective than one without. Choose the appropriate cable based upon minimum dB loss for your frequency and cable run length.

Cable attenuation (loss) chart per 100'

150 MHz	RG174¹	RG58	DA195	RG-8X²	DA240	RG-8U³	DA340	DA440
	10.7 dB	4.7 dB	5.3 dB	4.0 dB	3.0 dB	2.4 dB	2.5 dB	1.5 dB
300 MHz	16.0 dB	7.0 dB	7.5 dB	5.4 dB	4.3 dB	3.5 dB	3.4 dB	2.2 dB
800 MHz	29.2 dB	12.7 dB	12.4 dB	10.2 dB	7.1 dB	6.4 dB	5.7 dB	3.7 dB
1900 MHz	51.3 dB	22.0 dB	19.6 dB	20.6 dB	11.2 dB	11.2 dB	8.52 dB	5.8 dB
2400 MHz	60.2 dB	25.8 dB	22.1 dB	24.9 dB	12.6 dB	13.2 dB	10.2 dB	6.6 dB
Min. Bend Radius	1"	2"	2"	2.5"	2"	4"	3"	4"

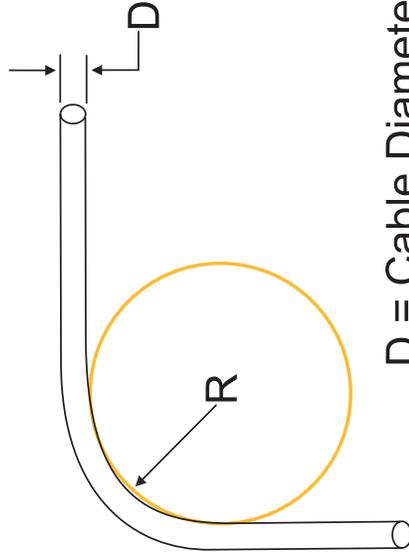
¹ RG174 should only be used for cellular frequencies in lengths less than 10'. For cable runs 100' to 150' on cellular frequencies, use Digital Antenna's ULTRA low-loss DA440 cable. For cable runs greater than 150', contact your installer.

² Digital Antenna's RG-8X with 98% tinned-braid & foil-shield – other manufacturers' RG-8X has higher loss.

³ Belden RG-8U cable specifications.

What connectors should I use?

Frequency range will determine the connector series to be used. Mini-UHF, SMA, TNC and Type N, are all rated up to and beyond 2.5 GHz with type N being rated the highest at 11 GHz. UHF connectors such as PL-259 and PL-258 are rated to 300 MHz and cannot be used at cellular frequencies of 800 and 1900 MHz. Each connector or adapter inserts approximately a .5 dB loss. Never splice cable! Cables can only be extended using the appropriate connectors and cable. Refer to the cable loss chart.



D = Cable Diameter
R = Bend Radius

Additional FAQs
on antennas and cables available at
www.digitalantenna.com

PowerMax™ COAXIAL CABLES

50 OHM COAXIAL CABLES

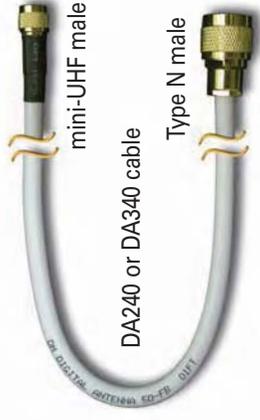
USE WITH PowerMax™ CELLULAR BOOSTERS



Premium coax cables are pre-assembled with connectors and are available in 5' – 100' lengths. Bulk cable is available for runs in excess of 100'. Digital Antenna cables feature exclusive low-loss, tinned-braid, foil-shielded, UV-stable premium cable for maximum signal transmission.

PowerMax™ External Antenna Cables

MODEL NUMBER	LENGTH
240-10NM	10'
240-15NM	15'
240-30NM	30'
340-50NM	50'
340-75NM	75'
340-100NM	100'



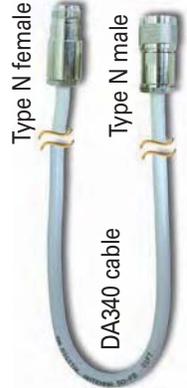
Dash-Mount Cables

MODEL NUMBER	LENGTH
C428-05	5'
C428-12	12'



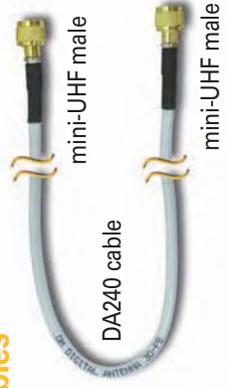
PowerMax™ External Antenna Extension Cable

MODEL NUMBER	LENGTH
340-25NE	25'



Double mini-UHF male Cables

MODEL NUMBER	LENGTH
240-02MM	2'
240-10MM	10'



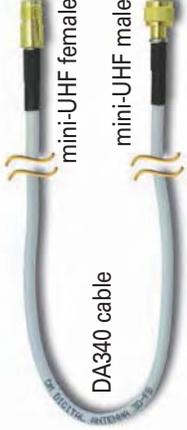
RG-8X External Antenna Cables

MODEL NUMBER	LENGTH
C998-10	10'
C998-20	20'
C998-30	30'
C998-40	40'



PowerMax™ Inside Antenna Extension Cables

MODEL NUMBER	LENGTH
240-10FM	10'
340-20FM	20'
340-25FM	25'



PowerMax™ COAXIAL CABLES

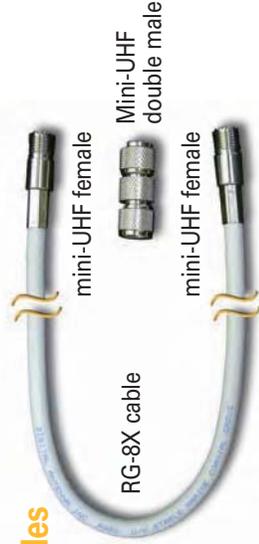


50 OHM COAXIAL CABLES

USE WITH PowerMax™ CELLULAR BOOSTERS | AIS, VHF, XM ANTENNAS

500 Series VHF | AIS Antenna Extension Cables

MODEL NUMBER	LENGTH
C118-10	10'
C118-20	20'



Bulk Cable

Premium PowerMax™ cable offers the lowest loss available. Sold by the foot for a completely custom installation. Up to a 150 foot length of DA440 and up to 100 foot length of DA340 can be used on cellular frequencies.

Sold without connectors. (page 30)
DA440 sold per foot
DA340 sold per foot



XM Antenna Replacement Cable

MODEL NUMBER	LENGTH
195-50NF	50'



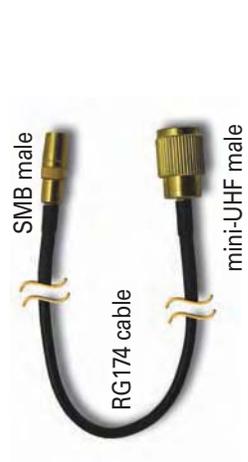
XM Antenna Extension Cable

MODEL NUMBER	LENGTH
195-25FM	25'
195-50FM	50'



XM Antenna Adapter Cable

MODEL NUMBER	LENGTH
DA58F (XM WX)	6"
DA58S (XM WX)	6"





SATELLITE RADIO ANTENNA AND AMPLIFIED SPLITTER

XM & XM WX, SIRIUS

BOATS | BUILDINGS | RVs



Complete Kit 233-XM-50

Harness the power of satellite radio in your home, office or on your boat or RV. Digital Antenna's 233-XM-50 satellite radio antenna provides crystal clear reception of your favorite satellite radio channels anywhere in the continental United States, Canada and up to 250 miles offshore. UV stable acrylic sealed dome is impervious to damage caused by bad weather and salt water. Sold complete with a stainless steel 1"-14 mount and stainless steel mounting ferrule, 50' cable with factory attached connectors and adapters.

Features:

- Crystal clear reception
 - Extended coverage
 - Rugged construction
 - Complete antenna system
- 233-XM-50 Satellite Radio Antenna Includes:**
- 40dB nominal gain antenna (233-XM)
 - 50' cable with attached connectors (195-50NF)
 - Stainless steel 1"-14 mount (DM194)
 - Stainless steel 1"-14 female ferrule (F114)
 - Mini-UHF male to SMA adapter (DA923)
 - Mini-UHF male to SMB adapter (DA947)

Specifications

Frequency	2320 – 2345.0 MHz (SIRIUS, XM, XM WX)
Dimensions	3.5" OD x 2" H (8" H with mount)
Warranty	1 year (limited)

New 2-way amplified satellite radio splitter, model DA-2330, is optimized for use with all satellite radio systems and permits operation of two satellite radio receivers from a single antenna. The splitter is manufactured with a durable black powder-coated finish and high quality gold plated mini-UHF female connectors. Power is supplied from any of the radios connected to the splitter's output. The splitter's 10dB gain allows longer cables to be used to the receivers. Digital Antenna makes installation easy, offering factory assembled cables available in 10, 20, 25 and 50' lengths. If cable extensions greater than 200 feet are desired, DA340 or DA440 cable is recommended.

Features:

- 10dB optimized gain
- Rugged powder coated finish
- Quality gold plated connectors

Specifications

Frequency	2320 – 2345.0 MHz (SIRIUS, XM, XM WX)
Dimensions	2" x 4" w 1.25" h
Warranty	1 year (limited)



DA-2330

NEW



GO FURTHER WITH AWARD-WINNING ANTENNAS



Voted 'Best Marine Antenna' by the National Marine Electronics Association (NMEA). Customers rely on Digital Antenna for quality design and ultimate performance. All antennas have soldered connections, are hand-assembled and tuned for maximum gain then finished with a high-gloss urethane coating, resulting in a product that consistently outperforms the competition even in the harshest of marine environments.

MARINE VHF, SSB, AM/FM, XM, WIFI & CELLULAR ANTENNAS

YOUR ANTENNA IS YOUR LIFELINE ... CHOOSE WISELY!

Which antenna is right for you?

What type and length of boat do you have (sailboat, powerboat, yacht, commercial vessel)?

Choose an antenna based upon available mounting location. A 4' or 8' antenna works well for many applications including a T-top. Larger antennas such as 16' and 24' models must be side-braced approximately 3' to 4' from base.

Is your antenna for communication, navigation or entertainment?

Although antennas look identical, they are very different inside. Each antenna is designed and manufactured for specific frequencies. VHF: 156.8 MHz, Cellular: 800/850 & 1900 MHz, SSB: 2-30MHz, AIS: 159 MHz. The correct antenna must be matched to the equipment's frequency.

What is 'gain' in an antenna?

Gain is measured in decibels (dB). The illustration to the left shows the radiation pattern of three antennas with different gain. As gain increases, the more directed the RF energy becomes, resulting in reaching a greater distance. Your antenna choice should be based upon your application, taking into consideration the rocking or keeling of your boat.

Why does an 18" cellular antenna have 9dB gain and an 8' VHF antenna have 6dB gain?

Due to the physics of the signal's wavelength, an equivalent 9dB gain antenna for VHF would have to be almost 16' in length. The wavelength for cellular frequencies is much shorter than VHF.

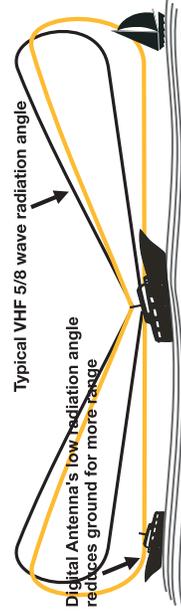
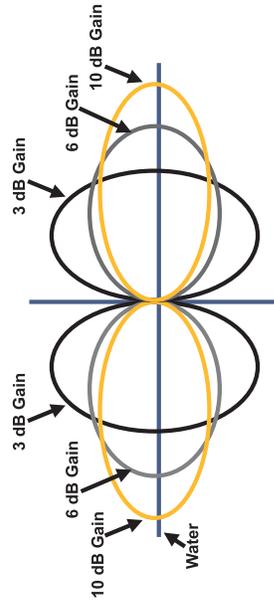
How does line-of-site affect communications?

While lower frequencies (SSB) allow for reliable long-range communication, frequencies above 100 MHz do not follow the curvature of the earth and are limited to line-of-site (the antennas must "see" each other). To achieve the longest range, the antenna should be placed as high as possible.

What makes an antenna reach a greater distance?

The advanced ground system internal to all Digital Antenna marine antennas allows 4.5dB through 10dB gain antennas to have a greater range in any sea conditions. The figure to the left shows the effect that a ground system has on a vertical antenna.

Note that by increasing the ground system efficiency, useful RF power is actually directed closer to the water surface where it is needed. Most well designed 5/8 wavelength 6dB antennas will transmit the same distance in the sky; however, the ground efficiency determines the actual communication range at sea level.



MARINE ANTENNA CUT-AWAY

THE LEADER IN ANTENNA TECHNOLOGY

QUALITY CRAFTSMANSHIP IN EVERY ANTENNA



BRASS RADIATING ELEMENTS

Precision cut & assembled elements for precise tuning and best performance.

BRASS GROUND SYSTEM

Low radiation angle for greater distance.

FIBERGLASS ROD

Features the perfect combination of flexibility and ruggedness.

HIGH-GLOSS POLYURETHANE FINISH

Exclusive state-of-the-art finish seals out the corrosive marine environment to provide long-lasting performance.

POSITIONING FOAM

Exclusive, completely sealed, perfectly centered internal elements to maintain design integrity.

SOLDERED CONNECTIONS

Soldered tinned-braid-to-ground connection for maximum durability and clearest signal.

FERRITE CHOKE BEAD

Eliminates interference with electronics & directs radiating power to antenna for maximum performance.

NEW STAINLESS STEEL FERRULES

Surgical grade, mirror finish stainless steel provides unsurpassed durability and strength.



**AWARD-WINNING
AMPLIFIERS AND ANTENNAS**

**HONORED BY
CES | NMEA | NMMA | SAIL MAGAZINE**

**NEW 500 SERIES
GOLD PLATED MINI-UHF
CONNECTOR**



Innovated by Digital Antenna for easy installation and quality tested performance. (PL259 or mini-UHF adapter included for VHF or Cell)

**UV STABLE
RG-8X CABLE**

Exclusive UV stable, tinned-braid, foil-shielded, low-loss marine cable for maximum signal distance.



MARINE CELLULAR ANTENNAS



9dB GAIN DUAL BAND

USE WITH CELLULAR PHONES AND PowerMax™ BOOSTERS

With professional marine-grade construction, Digital Antenna cellular antennas deliver high performance that will last for years. Available in 30", 4' and 8' lengths, each cellular antenna is designed for easy connection to your cell PowerMax™ Cell Booster. Each omni-directional cell antenna is 9dB gain. Choose the frequency, length and mounting option best suited for your application.

All Cellular Antennas Feature:

- *Powerful brass radiators.*
- *Soldered connections.*
- *High-gloss urethane finish.*
- *Max input 250 watts.*

All antennas are made in the USA, hand-assembled and tuned for maximum performance.

North American Cell Frequencies

Bandwidth VSWR <1.5:1 824-894 & 1850-1990 MHz

SERIES	30"		4'		8'	
	WHITE	BLACK	WHITE	BLACK	WHITE	BLACK
500	561-CW	561-CB	563-CW	563-CB	567-CW	567-CB
800	854-CW	854-CB	883-CW	883-CB	897-CW	897-CB

Global Cell Frequencies

Bandwidth VSWR <1.5:1 824-960 & 1710-2170 MHz

SERIES	30"		4'		8'	
	WHITE	BLACK	WHITE	BLACK	WHITE	BLACK
800	861-CW	861-CB	865-CW	865-CB	869-CW	869-CB



Specifications

	500 GOLD SERIES	800 SERIES
Mount	1" -14 threaded base	1" -14 threaded base
Connector	Mini-UHF female	Type N female
Cable (500 series)	20' exclusive, RG-8X	Not included (pg.27-28)
Includes	Double mini-UHF male adapter	Stainless steel double female ferrule

MARINE VHF AND AIS MARINE ANTENNAS

3dB TO 6dB GAIN

BOATS | SAILBOATS



Digital Antenna's ultimate, award-winning VHF antennas combine ruggedness with a pristine finish for the finest antenna available. Even in the harshest conditions, our antennas will maintain their beautiful glossy finish for years. Built to withstand high speeds, our antennas are ideal for radar arches, T-tops, speedboats, sailboats, yachts and commercial vessels.

VHF and AIS Antennas Feature (except 200 series):

- Powerful brass radiators.
- Soldered connections.
- Power-directing ferrite choke bead.
- High-gloss urethane finish.

All antennas are made in the USA, hand-assembled and tuned for maximum performance.



Specifications

	200 SERIES	500 SERIES	800 SERIES
Mount	L bracket	1"-1/4 threaded base	1"-1/4 threaded base
Connector	UHF female	Mini-UHF female	UHF female (SO239)
Cable (500 Series)	Not included	Exclusive RG-8X	Not included
Includes	Quick disconnect whip	Mini-UHF male to UHF male (PL259) adapter	Stainless steel double ferrule

SERIES	4' White VHF	4' Black VHF	8' White VHF	8' Black VHF
500	528-WW	528-VB	529-WW	529-VB
800	826-WW	826-VB	829-WW	829-VB
Cable (500 series only)	15'	15'	20'	20'
VSWR <2:1	152.8-160.8 MHz		152.8-160.8 MHz	
Gain	4.5 dB		6 dB	

SERIES	3' White VHF	4' White AIS	4' Black AIS
200	222-WW	N/A	N/A
500	N/A	578-SW	578-SB
800	N/A	876-SW	876-SB
Cable (500 series only)	N/A	25'	25'
VSWR <2:1	153.8 - 159.8 MHz		
Gain	3 dB	4.5 dB	4.5 dB

VHF AND SSB MARINE ANTENNAS



EXTENDED LENGTHS

YACHTS | COMMERCIAL VESSELS

A favorite of marine professionals, our largest VHF and SSB antennas offer the power and durability to achieve maximum range and extended performance, even in the roughest seas. Solid construction makes Digital Antenna's 16' and 24' antennas the ideal choice for critical communication on board large yachts, commercial vessels and base stations. Must be used with a side support (page 29).

Bandwidth for complete antenna

VHF Bandwidth VSWR < 2.0:1 = 151.8 - 161.8 MHz (10 MHz)

SSB Bandwidth VSWR < 1.5:1 = .5 - 30 MHz with Tuner

SERIES	24' WHITE*	24' BLACK*	16' WHITE	16' BLACK
500 (VHF) 10dB Gain	N/A	N/A	532-VW	532-VB
500 (SSB)	534-SSW	534-SSB	544-SSW	544-SSB
700 (VHF) 10dB Gain	N/A	N/A	736-VW	736-VB

*24' 3-piece antenna not shown.

SERIES	16' WHITE (w/Rupp)*	16' BLACK (w/Rupp)*	8' WHITE**	8' BLACK**
500 (VHF)	532-VWR	532-VBR	533-VW	533-VB
500 (SSB)	554-SSWR	544-SSB-R	546-SSW	546-SSB
700 (VHF)	N/A	N/A	533-VW	533-VB

*Available with black Rupp collar pre-attached.

**8' top section is available by itself but must be used with 16' VHF or 16' /24' SSB bottom sections.



	VHF 500 Series	SSB 500 Series	VHF 700 Series	TOP REPLACEMENT
MOUNT	1"-14 threaded base	1"-14 threaded base	Pole, tube	1"-14 threaded base
CONNECTOR	Mini-UHF female	Side termination stub	Type N female	N/A
CABLE	20' RG-8X	N/A	Not included	N/A
INCLUDES	Mini-UHF male to UHF male (PL259) adapter	Stainless steel termination stub hardware	Stainless steel clamp set for pole mount	Use with 500 or 700 series bottom sections only

All antennas are made in the USA, hand-assembled and tuned for maximum performance. All 16' and 24' antennas are UPS shippable.

COMBINATION MARINE ANTENNAS

MULTI-PURPOSE VHF/CELL/PCS & AM/FM/CELL/PCS

BOATS



AM/FM Stereo Antennas

When on board entertainment is your passion, Digital Antenna's AM/FM antennas deliver unbeatable reception and clarity. For the most eye-catching aesthetics, Digital Antenna's 4' and 8' AM/FM antennas are designed to match Digital Antenna's 4' and 8' VHF, AIS and cellular antennas.

All AM/FM Antennas Feature:

- Soldered connections
 - High-gloss urethane finish
 - Durable stainless steel ferrules
- | SERIES | 4' WHITE
AM/FM | 4' BLACK
AM/FM | 8' WHITE
AM/FM | 8' BLACK
AM/FM |
|--------|-------------------|-------------------|-------------------|-------------------|
| 500 | 631-AW | 631-AB | 638-AW | 638-AB |

8' Combination Antennas

When space and mounting locations are limited, Digital Antenna's Trifecta™ combination antennas work overtime, providing you with multi-purpose performance to meet your communication, navigation or entertainment needs. Choose from a selection of high quality 8' antennas with VHF, Cell and PCS or AM/FM, Cell and PCS combinations.

All Combination Antennas Feature:

- Two antennas in one rod
- Powerful brass radiators
- Soldered connections
- High-gloss urethane finish



600 SERIES	CELL VHF 8' WHITE	8' BLACK	CELL AM/FM 8' WHITE	8' BLACK
MODEL NUMBER	659-TW	659-TB	634-TW	634-TB
VSWR	152.8-160.8 MHz (VHF)	152.8-160.8 MHz (VHF)	824-894 & 1850-1990 MHz (CELL)	824-894 & 1850-1990 MHz (CELL)
<2:1	824-894 & 1850-1990 MHz (CELL)	824-894 & 1850-1990 MHz (CELL)	N/A (AM/FM)	N/A (AM/FM)
GAIN	9 dB (CELL & PCS) 4.5 dB (VHF)	9 dB (CELL & PCS) 4.5 dB (VHF)	9 dB (CELL & PCS) UNITY (AM/FM)	9 dB (CELL & PCS) UNITY (AM/FM)

SERIES	500 AM/FM	600 COMBINATION
Mount	1" -14 threaded base	1" -14 threaded base
Connector	Un-attached Motorola type plug	Mini-UHF female CELL, VHF Un-attached Motorola type plug, AM/FM
Cable	15' RG-8X	Qty 2 - 20' RG-8X
Includes	N/A	CELL, Double mini-UHF male adapter VHF, Mini-UHF male to UHF male adapter

All antennas are made in the USA, hand-assembled and tuned for maximum performance.

2.4 GHz MARINE ANTENNAS



10dB GAIN WIFI ANTENNAS

BOATS | SAILBOATS

Getting and staying connected on the water has never been easier. Digital Antenna's 2.4GHz premium quality 10dB gain omni-directional antennas achieve optimal signal range on 802.11 b/g wireless LANs, Bluetooth and multipoint radio equipment, where high gain and wide coverage is desired. Designed to match other antennas on your boat, our WiFi antennas are available in lengths of 30", 4' and 8'.

Available in 800 Series only (not available in 500 Series). PowerMax™ low-loss antenna cables or DA440 bulk cable must be used to minimize signal loss (page 18-19).

All antennas are made in the USA, hand-assembled and tuned by hand for maximum performance.

All 2.4 GHz WiFi Antennas Feature:

- Powerful brass radiators
- Soldered connections
- High-gloss urethane finish
- 10dB gain

800 Series:

WHITE	BLACK	LENGTH
825-WLW	825-WLB	30"
814-WLW	814-WLB	4'
848-WLW	848-WLB	8'

Specifications

Mount	1" - 14 threaded base
Connector	Type N female
Bandwidth VSWR	<15:1 = 2400-2500 MHz
Cable	Not included (pg 27-28)
Includes	Stainless steel double female ferrule



848-WLB

848-WLW

814-WLB

814-WLW

825-WLB

825-WLW

MARINE ANTENNA EXTENDERS

INCREASE ANTENNA HEIGHT

BOATS



Constructed of high-quality reinforced fiberglass and finished to match Digital Antenna's award-winning antennas, antenna extenders are used to increase the height of an antenna to improve effective range or to place an antenna above on-board obstructions that may interfere with receive and transmit signals.

Model # 528-EW | 528-EB

Straight Extender

- Dimension: 4' - 1" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base



528-EW



528-EB

Model # 518-EW | 518-EB

Straight Extender

- Dimension: 18" - 1" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base



518-EW



518-EB

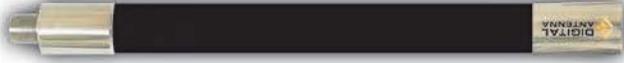
Model # 535-EW | 535-EB

Straight Extender

- Dimension: 8' - 1.5" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base
- Use center brace #DM268



535-EW



535-EB

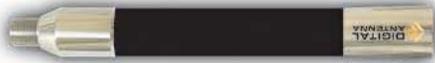
Model # 564-EW | 564-EB

Tapered Extender

- Dimension: 4' - 1.5" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base
- Use center brace #DM268



564-EW



564-EB

Model # 549-EW | 549-EB

Tapered Extender

- Dimension: 8' - 1.5" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base
- Use center brace #DM268



549-EW



549-EB

MARINE ANTENNA MOUNTS



ANTENNA MOUNTS AND ACCESSORIES

ACCESSORIES ARE AVAILABLE AT OUR ONLINE STORE AT WWW.DIGITALANTENNA.COM

Digital Antenna knows the importance of providing strength and durability for mounting antennas. Our premium quality stainless steel antenna mounts work to keep your high-performance antennas steady. Easily accepting antennas with 1" - 14 threads, many styles are available to accommodate marine antennas from 18" to 24' in length. For antennas exceeding 8 feet in length, a side brace must be used.

DM223

- Stainless Steel Ratchet Mount (1" - 14 threads)



DM194

- Stainless Steel Short Straight Mount (1" - 14 threads)



DM283

- Stainless Steel Swivel Mount (1" - 14 threads) (use with DM268)



DM312

- 12" Stainless Steel Extender Top Male 1" - 14, Bottom Female 1" - 14



DM338

- Chrome-on-brass deck/bulkhead feed thru fitting (mini-connector will pass thru)



DM182

- Stainless Steel Straight Mount (1" - 14 threads)



DM178 $\frac{7}{8}$ " - 1" OD

DM191 $1\frac{1}{4}$ " - $1\frac{1}{2}$ " OD

- Stainless Steel Ratcheting Rail Mount (1" - 14 threads) **DM178**



DM268

- White Molded Standoff Bracket for 1" or 1.5" OD (Use with DM283)



F114

- Double 1" - 14 Female Ferrule (Use with 288-PW or 295-PW 18" Cell Antenna)



DM277

- Mounts 3' VHF on a Standard 1" - 14 threaded base



DM925 (900 Series) | DM792 (700 Series)

- Stainless Steel Clamp Set for up to 2" OD (900) or 2.25" OD (700)



DM900

- Converts 800 series antenna to a 900 series wall or pole mount. Includes DM925.



CONNECTORS AND ADAPTERS

50 OHM

TYPE N | MINI-UHF | UHF | TNC | FME

Type N
male crimpType N
male clamp**Connector Name**

N Male (RG-8X)

N Male (DA195)

N Male (DA240)

N Male (DA340)

N Male (DA440)

N Male (DA440)

PN

DA853

DA795

DA229

DA445

DA449

DA473

Type

Crimp

Crimp

Clamp

Clamp

Crimp

Clamp

Type N
female crimpType N
female clamp**Connector Name**

N Female (RG-8X)

N Female (DA240)

N Female (DA240)

N Female (DA340)

N Female (DA440)

PN

DA522

DA325

DA362

DA371

DA390

Type

Crimp

Crimp

Clamp

Clamp

Clamp

Mini-UHF
female crimpMini-UHF
female gold**Connector Name**

Mini-UHF Female (RG-8X)

Mini-UHF Female (DA195)

Mini-UHF Female (RG-8X) GOLD

Mini-UHF Female (DA240)

Mini-UHF Female (DA340)

PN

DA817

DA468

DA817G

DA826

DA857

Type

Crimp

Crimp

Crimp

Crimp

Crimp

Mini-UHF
male crimp**Connector Name**

Mini-UHF Male (RG174)

Mini-UHF Male (RG-8X)

Mini-UHF Male (DA195)

Mini-UHF Male (DA240)

Mini-UHF Male (DA340)

Mini-UHF Male (DA440)

PN

DA274

DA482

DA357

DA247

DA434

DA442

Type

Crimp

Crimp

Crimp

Crimp

Crimp

Crimp



Motorola plug

Connector Name

Motorola (AM/FM) type plug (RG-8X)

PN

DA140

Type

Solder

Adapters

Mini-UHF male to N female DA525

Mini-UHF male to TNC female DA572

Mini-UHF male to UHF male (GOLD) DA645G

Mini-UHF male to UHF male (Nickel) DA645

Mini-UHF male to male (GOLD) DA624G

Mini-UHF male to male (Nickel) DA624

Mini-UHF male to FME Female DA206

Mini-UHF male to FME male DA639

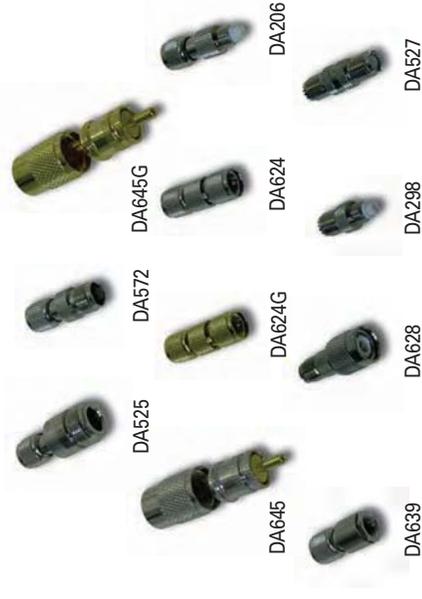
Mini-UHF male to SMB male DA923

Mini-UHF male to SMA male DA947

Mini-UHF female to TNC male DA628

Mini-UHF female to FME Female DA298

Mini-UHF female to mini-UHF Female DA527



DA525

DA645G

DA572

DA645

DA624G

DA624

DA206

DA639

DA628

DA298

DA527

PowerMax™

GO FURTHER

AWARD WINNING AMPLIFIERS AND ANTENNAS

Honored by: CES | NMMA | NMEA | SAIL MAGAZINE



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visit us at: www.digitalantenna.com

CATALOG GO FURTHER

2009
DIGITAL ANTENNA



**COMMUNICATION PRODUCTS
FOR LAND AND SEA**

--- CELLULAR AMPLIFIERS | LAND BASED ANTENNAS | MARINE ANTENNAS | CABLES & CONNECTORS

CATALOG 2009

GO FURTHER

GO FURTHER on land and sea with Digital Antenna's award-winning antennas and cellular communication products. Made in the USA, designed by a dedicated team of engineers and supported by qualified sales professionals and retail partners, Digital Antenna is passionate about manufacturing high-performance products and delivering superior customer service.

DEDICATION TO RESEARCH

DIGITAL ANTENNA continues to bring you the latest technology – FIRST!

Digital Antenna maintains an exceptionally strong discipline to research, resulting in innovative products that surpass the boundaries of tomorrow's technology. We're proud to have many "firsts" in our history. The first dual band cellular amplifier. The first dual band wireless cellular amplifier/repeater. The first easy installation mini-connector system. The first antenna with a power directing ferrite choke bead. The first global band cellular Omni-Directional antenna.

NUMBER ONE NAME ANTENNAS

Your antenna is your lifeline. Choose wisely.

Our innovative approach to creating exceptional new technology has made Digital Antenna the #1 name in marine antennas. This attention to detail is evident in every aspect of our product development from engineering and manufacturing to requiring each antenna to be hand-tested and tuned before it leaves our facility. With a range of antennas designed for use on land or sea, Digital Antenna is the clear choice for maximum durability and performance.

EXPERT CELLULAR AMPLIFICATION

PowerMax™ – Award-Winning Cellular Signal Boosters

Digital Antenna is the only award-winning manufacturer FCC approved for 3 watts at 850 MHz and 2 watts at 1900 MHz for all modulations. Our cellular amplifiers and repeaters are the recipients of several prestigious industry awards including: NMEA Top Marine Specialty Product, CES Innovations Design and Engineering Award, NIMMA Innovation Award and Editor's Choice Award from SAIL Magazine.



unequaled performance you can count on.

Visit us at: www.digitalantenna.com

Made in the USA



GO FURTHER ON LAND AND SEA

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PowerMax™ 40dB AND 60dB REPEATERS

A LA CARTE REPEATERS

VEHICLES | BOATS | RVs | CARS | HOMES | OFFICES

Digital Antenna's 3 watt Dual Band Cellular and PCS repeaters are now available as single units to customize your installation (cabling, inside and outside antennas required and sold separately). These wireless repeaters available in 40 or 60dB models boost the signal strength of your cell phones or air cards up to 3 watts, improve transmit and receive signals and can be customized to use in a variety of locations. No connection to your cell phone is required allowing multiple cell phones and carriers to be used simultaneously.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

- Application DA4000MR:** One room in Home, Office, RV, Automobile or Boat with Cabin. (not for use in open console boats or convertible vehicles).
- Application DA4000SBR:** Multiple rooms in Home, Office, RV, Sailboat or Large Yacht.
- Range/Performance:** Enhanced area based upon cable, antenna style and gain*.
- Advantage:** Wirelessly amplifies up to 20 cell phones.
- Requirement:** A complete structure is always required between inside and outside antennas. In addition to structure, 60dB repeater requires 25' - 40' antenna separation and 40dB repeater requires 5' - 20' antenna separation dependent upon application and antenna selection.



DA4000MR

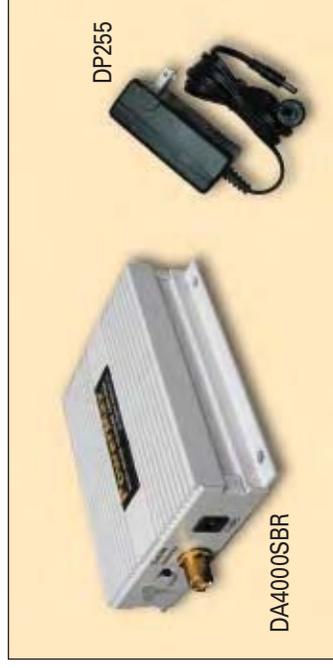
DP515



NEW

DA4000MR Includes:

- 3 watt, 40dB gain cellular and PCS repeater
- 12 VDC power converter (DP515)



DA4000SBR

NEW

DA4000SBR Includes:

- 3 watt, 60dB gain cellular and PCS repeater
- 110 VAC power supply (DP255)

DP255



Specifications DA4000MR | DA4000SBR

Downlink: 869-895 MHz and 1930-1990 MHz

Uplink: 824-849 MHz and 1850-1910 MHz

Modulations All voice and data

Max Output Power 3W (low bands), 2W (high bands)

Dynamic Variable Gain DA4000SBR 53dB Max | DA4000MR 43dB Max

Receive Sensitivity -125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. For maximum inside coverage area, use interior and exterior directional antennas and premium PowerMax™ cable (see page 21).



PowerMax™ DIRECT CONNECT AMPLIFIERS (ALL PURPOSE)



DUAL BAND AMPLIFIERS

VEHICLES | BOATS | RVs | CARS | HOMES | OFFICES | M2M



DA4000

DA4000E - Direct Connect Amplifier

DUAL BAND: use with all European and Asian cell phones operating on 900 and 1800 MHz



DA4000E

Universal Application: Vehicles, boats, RVs, cars, homes, offices.

Range/Performance: Amplifies Cellular signal up to 50+ miles*.

Solution: Designed for areas of extremely low outside cellular signal and when optimum data connections are top priority.

Advantage: Universal use; cell phone or air card physically connects to amplifier via an adapter cable or universal cell phone cradle (see page 13-14).



Add increased power and reliability to your cell phone in any application with the PowerMax™ 3 watt cellular amplifier. A direct connect amplifier is the best solution in areas of extremely low outside cellular signal or when optimum data connections are top priority. Cell phone or air card physically attaches to DA4000 amplifier via an adapter cable (see pg 13). External antenna and adapter cable sold separately. Maximum input power: 2 watts.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or iDEN).

Direct Connect Amplifiers Include:

- 3 watt dual band amplifier (DA4000 or DA4000E)
- 12 VDC cigarette-style power cable (DP742)
- 2' cable with mini-UHF male connectors (240-02MM)

External antenna and adapter cable required and sold separately

Specifications

Frequency DA4000	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Frequency DA4000E	Downlink: 925-960 MHz and 1805-1880 MHz Uplink: 880-915 MHz and 1710-1785 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain	15dB Max
Receive Sensitivity	-125dBm

For complete specifications visit www.digitalantenna.com

*Increased range varies based upon height of outside antenna, type of cable used, cell phone carrier, and location of cell tower. For maximum range, place outside antenna as high as possible using ultra low-loss cable.

PowerMax™ 40dB REPEATER (VEHICLE INTERIOR)

MOBILE REPEATER SYSTEM

CARS | SUVs | VANS | TRUCKS

Experience greater cell phone power, range and reliability in your vehicle with Digital Antenna's award-winning PowerMax™ automobile wireless cell booster. The PowerMax™ 4KMR-10A boosts your cell phone and air card's signal strength to 3 watts and increases range up to 20+ miles without a physical connection to your cell phone. The result is clean and clear voice quality with maximum data throughput on all carriers except Nextel or iDEN.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or iDEN).

4KMR-10A System Includes:

- 3 watt, 40dB gain cellular and PCS repeater (DA4000MR)
- 12 VDC power converter (DP515)
- Internal slim patch antenna with 6' cable (CA09P)
- External 3dB gain magnetic mount antenna with 10' cable (CA55M)



Mobile Application: Vehicles with metal roofs (not for use in convertibles or in vehicles with composite roofs).

Range/Performance: Amplifies cellular signals up to 20+ miles.

Advantage: Wirelessly enhances signals of multiple cell phones within a standard vehicle interior*.

Requirement: 3' separation and a metal roof between inside & outside antennas (not for use in a convertible or composite roof).

DC074 Cell Booster Travel Bag (sold separately)

Convenient travel bag neatly stores cell booster, antennas, and power supply (sold separately) in multi-accessible zipper compartments. Features mesh pockets for venting. Includes carrying handle and shoulder strap.



* Enhanced coverage area from inside antenna varies based upon outside cell signal strength. A weaker outside signal results in a smaller distance from inside antenna.

Specifications 4KMR-10A

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain	43dB Max
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

PowerMax™ 40dB GAIN REPEATER (UP TO 1,500 SF)



SINGLE ROOM REPEATER SYSTEM

1 ROOM IN A HOME | OFFICE

FEATURING
3 WATT
VARIABLE
GAIN

Digital Antenna's PowerMax™ SOHO room wireless cellular booster provides enhanced cellular signals in a room up to 1,500 square feet in size. Perfect for use inside homes and offices where cell phone service is poor or non-existent, the 4KMR-30U repeater system brings the outside cellular signal indoors.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KMR-30U 40dB Gain System

Application:

One room in a home or office (up to 1,500 square feet).

Range/Performance:

Enhances multiple cell phones in a room up to 8' to 12' from inside antenna*.

Advantage:

Wirelessly amplifies up to 20 cell phones in one room.

Requirement:

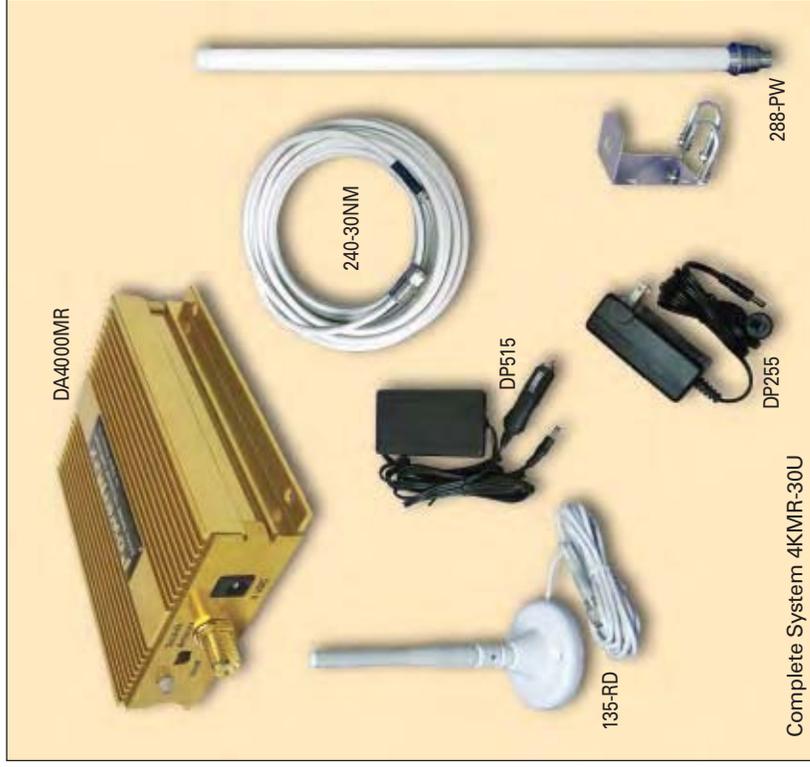
20' separation plus a complete structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an internal or external directional antenna (see page 16).

Specifications 4KMR-30U

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	43dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com



Complete System 4KMR-30U

4KMR-30U System Includes:

- 3 watt dual band 40dB gain cellular and PCS repeater (DA4000MR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal antenna with 6' cable (135-RD)
- 30' of DA240 cable for external antenna (240-30NM)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)



PowerMax™ 50dB GAIN REPEATER (UP TO 2,500 SF)

PERSONAL REPEATER SYSTEM

CONDOS | APARTMENTS | DORM ROOMS | HOMES | OFFICES



A compact and simple solution to poor cellular reception inside condominiums, apartments, dorm rooms, homes, and offices, the PowerMax™ 4KPR-15R Wireless Personal Repeater provides reliable and clear cell phone communication equivalent to the cell signal strength available outside the building. A simple Do-It-Yourself (with no tools required) installation. Suction cups allow a 9dB gain antenna to securely attach to a window while the 50dB gain repeater sits on any flat surface like a desk or bookcase.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KPR-15R System Includes:

- 3 watt, 50dB gain cellular and PCS repeater with built-in 9dB antenna (DA4000PR)
- 110 VAC power supply (DP255)
- Window mounted 9dB gain antenna (426-PW)
- Window-mount for 426-PW antenna (DM426)
- 15' coaxial cable with attached connectors (240-15NM)



Complete System 4KPR-15R

- In-Building Application:** Condominiums, apartments, homes, offices, dorm rooms.
- Range/Performance:** Wirelessly enhances signals of multiple cell phones in a room (up to 2,500 square feet)*.
- Advantage:** Simple Do-It-Yourself installation does not require outside installation.
- Requirement:** 10' separation between window antenna and repeater unit.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase coverage area, place window mount antenna outside the building.

Specifications 4KPR-15R

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain	50dB Max
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

PowerMax™ 50dB GAIN REPEATER (UP TO 3,500 SF)



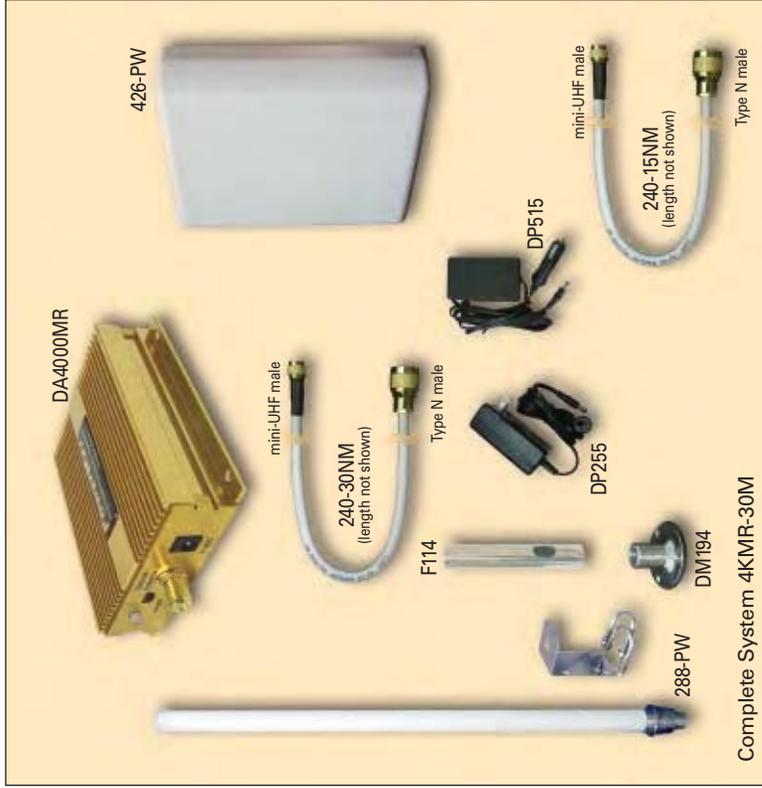
SINGLE ROOM REPEATER SYSTEM

HOME | OFFICE | BOAT WITH CABIN | RV

FEATURING
3 WATT
VARIABLE
GAIN

Get more bars with Digital Antenna's PowerMax™ 4KMR-30M wireless cell booster with directional inside antenna. This new 50dB gain wireless cellular and PCS repeater system boosts the signal strength of your cell phones or air cards to 3 watts, improves transmit and receive signals and can be used in a variety of locations. Not for use in open console boats.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).



4KMR-30M 50dB Gain System

- Application:** One to two rooms in Home, Office, RV or Boat with Cabin. (not for use in open console boats).
- Range/Performance:** Enhances multiple cell phones up to 25' from inside antenna*.
- Advantage:** Wirelessly amplifies up to 20 cell phones in one to two rooms.
- Requirement:** 12' separation plus a complete structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an external directional antenna for fixed locations only (see page 16).

4KMR-30M System Includes:

- 3 watt dual band 40dB gain cellular and PCS repeater (DA4000MR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal 9dB gain directional antenna (426-PW)
- 30' of DA240 cable for external antenna (240-30NM)
- 15' of DA240 cable for internal antenna (240-15NM)
- 1"-14 threaded mount (DM194)
- 1"-14 threaded mounting ferrule (F114)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)

Specifications 4KMR-30M

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	53dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

PowerMax™ 70dB GAIN REPEATER (UP TO 4,000 SF)

MULTIPLE ROOM REPEATER SYSTEM

HOME | OFFICE | LARGE YACHT | SAILBOAT | RV



FEATURING
3 WATT
VARIABLE
GAIN

Get more bars with the most powerful repeater system on the market. Digital Antenna's PowerMax™ 4KSB-50M 70dB gain wireless repeater system boosts the signal strength of your cell phones or air cards to 3 watts, greatly improves transmit and receive signals and can be used in a variety of locations. This translates into fewer dropped calls, clearer connections and stronger signals inside your home, office, yacht, sailboat or RV. Not for use in open console boats.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KSB-50M 70dB Gain System

- Application:** Multiple rooms in Home, Office, RV, Large Yacht or Sailboat. (not for use in open console boats).
- Range/Performance:** Enhances multiple cell phones up to 60' from inside antenna*.
- Advantage:** Wirelessly amplifies up to 20 cell phones in multiple rooms.
- Requirement:** 25' separation plus a complete structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an external directional antenna for fixed locations only (see page 16).

4KSB-50M System Includes:

- 3 watt dual band 70dB gain cellular and PCS repeater (DA4000SBR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal 9dB gain directional antenna (426-PW)
- 50' of DA340 cable for external antenna (340-50NM)
- 15' of DA240 cable for internal antenna (240-15NM)
- 1"-14 threaded mount (DM194)
- 1"-14 threaded mounting ferrule (F114)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)



Specifications

	4KSB-50M
Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	73dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

PowerMax™ 60dB GAIN REPEATER (UP TO 5,000 SF)



MULTIPLE ROOM REPEATER SYSTEM

HOMES | OFFICES | LARGE BOATS | SAILBOATS | RVs >40'

FEATURING
3 WATT
VARIABLE
GAIN

Increase cell signals indoors with Digital Antenna's popular PowerMax™ Small Building Repeater. The complete 4KSBR-50U system is a professional grade wireless cellular booster that provides a generous coverage area of up to 5,000 square feet. Perfect for use inside where cell phone service is poor or non-existent, the 4KSBR-50U repeater system brings the outside cellular signal indoors.

DUAL BAND: FCC and IC approved for use with all North American cell phones operating on 850 or 1900 MHz (except Nextel or IDEN).

4KSBR-50U 60dB Gain System

Application:

Multiple rooms in a home, office, RV, large yacht or sailboat (up to 5,000 square feet).

Range/Performance:

Enhances multiple cell phones 15' to 50' from inside antenna*.

Advantage:

Wirelessly amplifies up to 20 cell phones in multiple rooms.

Requirement:

40' separation plus a structure between inside and outside antennas.

* Range/Performance varies based upon outside cellular signal strength. A weaker outside signal results in a smaller inside coverage area. To increase inside coverage area, add an internal or external directional antenna (see page 16).



Complete System 4KSBR-50U

Specifications 4KSBR-50U

Frequency	Downlink: 869-895 MHz and 1930-1990 MHz Uplink: 824-849 MHz and 1850-1910 MHz
Modulations	All voice and data
Max Output Power	3W (low bands), 2W (high bands)
Dynamic Variable Gain (Max)	63dB
Receive Sensitivity	-125dBm

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

4KSBR-50U System Includes:

- 3 watt dual band 60dB gain cellular and PCS repeater (DA4000SBR)
- 18" external 9dB gain omni-directional antenna (288-PW)
- Internal antenna with 6' cable (135-RD)
- 50' of DA340 cable for external antenna (340-50NM)
- 12 VDC power converter (DP515)
- 110 VAC power supply (DP255)

PowerMax™ CELLULAR COMBINERS

2-WAY | 4-WAY GLOBAL BAND CELLULAR COMBINERS

USE WITH ALL PowerMax™ CELLULAR BOOSTERS

2-Way Global Cell Combiner



DA-2190

4-Way Global Cell Combiner



DA-4190

Getting the most out of your cellular signal booster is easy when you have the right accessories to create a solution that is perfect for your specific application. Digital Antenna's 2-way and 4-way global band cellular combiners work on all cellular bands (850, 900, 1800, 1900 and 2100 MHz) and allow multiple cellular devices to be used simultaneously with direct-connect amplifiers and wireless repeater systems (cell boosters).

Specifications

DA-2190 | DA-4190

Frequency	850 900 1800 1900 2100 MHz
Band	800-2200 MHz
Impedance	50 ohm
Max Input Power	3 watts
Connectors	Mini-UHF female
Insertion loss	3dB (DA-2190) 6dB (DA-4190)
Dimensions	4" length x 3.25" wide x 1.28" high

NEW

2-Way Global Cell Combiner Kit

Digital Antenna's 2-way global cellular combiner works on all cellular bands (850, 900, 1800, 1900 and 2100 MHz) and allows up to two cell phones or other cellular devices to be used simultaneously with a direct-connect amplifier or wireless repeater system. For easy installation, the DA-2192 kit includes a 2-way combiner (DA-2190) and a pair of 12' dash-mount adapter cables (C428-12).

NEW



Two - 12' Dash-Mount Cables

DA-2192

All global band cellular combiners feature mini-uhf female connectors. Cables sold separately.

PowerMax™ CELLULAR ADAPTER CABLES



3' CABLE WITH MINI-UHF MALE CONNECTOR

USE WITH DIRECT CONNECT AMPLIFIER, EXTERNAL ANTENNA, CELL COMBINER

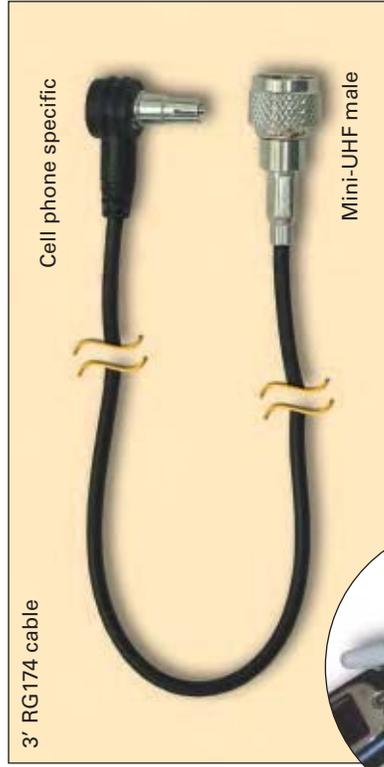
Digital Antenna's cellular adapter cables are a convenient 3' length. The attached mini-UHF male connector easily connects your cell phone or air card to a PowerMax™ DA4000 Amplifier, Multi-Cell Phone Combiner or Dash-Mount Cable.

Digital Antenna offers more than 100 external antenna adapters to fit over 500 phones. Please visit www.digitalantenna.com for an updated list of phone and aircard specific adapter cables. If your model number is not listed*, use Digital Antenna's new DA97U universal inductive coupler adapter.

*Your phone's model number should be located under your cell phone's battery. Match the model number to the list on our website to identify the adapter cable for your phone. We also have a variety of adapter cables for your PC aircard.

If your cellular phone model number is not listed at www.digitalantenna.com, use Digital Antenna's new DA97U universal inductive coupler adapter.

This innovative adapter allows any cell phone or aircard to be used with a PowerMax™ direct connect amplifier. For best performance, always use the cellular adapter cable made specifically for your phone or aircard if available.



3' RG174 cable

Cell phone specific

Mini-UHF male

Cell Phone or Aircard Adapter Cable
(cable length not to scale)

Available Manufacturers

We offer adapter cables for the following cellular manufacturers.

Visit www.digitalantenna.com for a complete listing of cell phone and aircard models.

- Audiovox (UT Starcom)
- Curitel
- Denso
- Handspring / Palm
- Hitachi
- HTC Faraday
(manufactured for Cingular)
- Kyocera / Qualcomm
- LG / Lucky Goldstar
- Mitsubishi
- Motorola
- Nokia
- Novatel
- Panasonic
- Pantech
- Samsung
- Sanyo
- Sharp
- Siemens
- Sierra Aircard
- Sony Ericsson
- Uniden
- Verizon

POWERMAX CELLULAR ACCESSORIES

UNIVERSAL CELL PHONE CRADLE

AUTOMOBILES | TRUCKS | BOATS



Digital Antenna's new Universal Cell Cradle with built-in antenna makes amplifying your cell signal simple. The adjustable cradle holds any size cell phone including PDA phones. The built-in antenna inductively couples to your cell phone's antenna. When used with Digital Antenna's 3 watt 40dB gain dual band repeater, model DA4000MR (sold separately) you will experience up to 10 times the signal strength. Use with Bluetooth products, hands free kits, ear-buds or speaker phone. Includes 3M adhesive back mounting bracket with screw mount option.

Universal Cradle Features:

- Compatible with all cell phones
- Built-in antenna
- Easy to use & flexible
- Includes mounting hardware
- Quick release button
- Adjustable holding feet

NEW

DM585

Gooseneck Power Outlet Cradle Accessory

New gooseneck cradle holder allows for a non-permanent installation of Digital Antenna's Universal Cell Phone Cradle Holder. The gooseneck and swivel head design allows the phone to be placed in countless positions. The holder simply plugs into any cigarette or auxiliary outlet and features a female outlet allowing you to charge allowing you to charge the cell phone while in the cradle.

Model DM547
Cell Phone not included.

Specifications DM547

Frequency	800-2500 MHz
Connector	Mini-UHF male
Cable	10' premium RG174
Dimensions	Impedance 50 ohm
Insertion loss	2dB
Warranty	1 year (limited)

See website for complete product information including electrical specifications and installation instructions. www.digitalantenna.com

POWERMAX™ CELLULAR ANTENNAS



DUAL BAND AND MULTI-BAND OMNI-DIRECTIONAL
VEHICLES | BOATS | RVs | HOMES | OFFICES | M2M

Digital Antenna's PowerMax™ cellular antennas offer professional grade construction and range. A perfect compliment to Digital Antenna's amplifiers and repeater systems, PowerMax™ cellular antennas provide strong and reliable signals. When communication is critical, Digital Antenna's award-winning antennas make the connection.

Model # 288-PW

18" Dual Band Fiberglass Antenna

- Use: Outside Homes | Offices | Boats | RVs
- Frequencies: 820-900 | 1850-1990 MHz
- Bands: 850 | 1900 MHz
- Gain: 9dB
- Connector: Type N female
- Cable Length: Not Included (pg 27-28)
- Mount: L-bracket for 1" pole or wall
- Dimensions: 18" l x 1" OD max



Model # 295-PW

18" Multi-Band Fiberglass Antenna

- Use: Outside Homes | Offices | Boats | RVs
- Frequencies: Global 850, 900, 1800, 1900, 2100 MHz
- Bands: 850 | 900 | 1800 | 1900 | 2100 MHz
- Gain: 9dB
- Connector: Type N female
- Cable Length: Not Included (pg 27-28)
- Mount: L-bracket for 1" pole or wall
- Dimensions: 18" l x 1" OD max



Model #135-RD

Dual Band Inside Antenna

- Use: Inside Homes | Offices | Boats | RVs
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 3dB
- Connector: Mini-UHF male
- Cable Length: 6'
- Mount: Swivel base
- Dimensions: 4" l x 2.5" OD max



Model # CA55M

Dual Band Magnetic Mount Antenna

- Use: Outside Automobiles
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 3dB
- Connector: Mini-UHF male
- Cable Length: 10'
- Mount: Strong magnetic base
- Dimensions: 3.5" l x 1.2" OD max

Model #CA09P

Dual Band Slim Patch Antenna

- Use: Inside Automobiles | Convertibles
- Frequencies: 820-900 | 1850-1990 MHz
- Gain: 3dB
- Connector: Mini-UHF male
- Cable Length: 6'
- Mount: 3M adhesive
- Dimensions: 5.5" l x 1.2" w x .25" h



When more power and range is needed, Digital Antenna offers a complete line of high gain directional antennas for cellular, PCS, WCDMA and WiFi frequencies. With a nearly perfect 50 ohm match, PowerMax™ antennas offer exceptional construction while delivering maximum range. Cable sold separately (see page 20-21).

Model #433-CM

Multi-Band Ceiling Mount Antenna

- Use: Inside Homes | Offices | Commercial Buildings
- Frequencies: 824-894 | 1850-1990 | 2400-2500 MHz
- Gain: 3dB
- Connector: Type N female
- Beam Width: H 360° V 60°
- Mount: Ceiling
- Dimensions: 6.8" OD x 3.6" h



Model #426-PW

Multi-Band Panel Antenna

- Use: Inside or Outside Homes | Offices | Commercial Buildings | Boats | RVs
- Frequencies: 824-894 | 1850-1990 | 2400-2500 MHz
- Gain: 9dB
- Connector: Type N female
- Beam Width: H 65° V 55°
- Mount: Included wall bracket
- Dimensions: 7" w x 9" h x 1.75" d



Model #489-DB

Multi-Band Directional Antenna

- Use: Outside Homes | Offices | Commercial Buildings
- Frequencies: 800-2500 MHz
- Gain: 10dB
- Connector: Type N female
- Beam Width: H 80° V 60°
- Mount: Integrated brackets for mast/pole
- Dimensions: 18" l x 8.5" h x 2.5" d



14 Element High Gain Yagi Antenna

Model #408-YB

Low-Band Yagi Cellular Antenna

- Frequencies: 824-894 MHz
- Dimensions: 48" l x 7.25" h x 2" d
- Beam Width: H49° V49°



Model #419-YB

High-Band Yagi Cellular Antenna

- Frequencies: 1850-1990 MHz
- Dimensions: 30" l x 4" h x 2" d
- Beam Width: H51° V31°

- Use: Outside Homes | Offices | Commercial Buildings

- Gain: 14dB

- Connector: Type N female

- Mount: Included U-bolts for pole

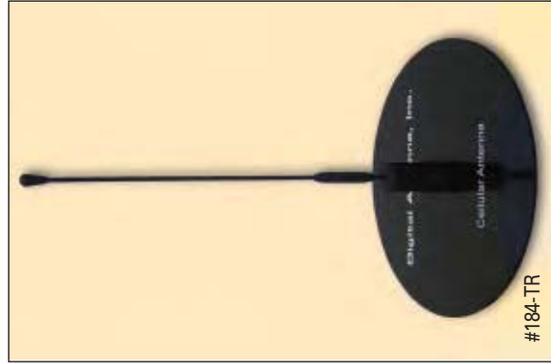


PowerMax™ RV ANTENNA PRODUCTS



THRU ROOF CELLULAR ANTENNA AND CABLE

RVs | FIFTH WHEELS | TRAVEL TRAILERS



#184-TR

NEW

Digital Antenna's new low profile RV Cellular and PCS Antennas offers exceptional range, excellent wind resistance and unsurpassed durability and strength. The antenna and ground plate simply attach to Digital Antenna's RV cable install kit or any Type N female bulkhead connector. For maximum cellular signal range, use with a Digital Antenna cell booster (sold separately). Digital Antenna's award-winning antennas and cell boosters allow you to stay connected to family, business and emergency while on the road.

Specifications

Radiation Pattern	184-TR Omni-Directional
Bandwidth VSWR	< 2:1 = 810 - 900 and 1800 - 1990 MHz
Gain	5dBi
Dimensions	Antenna 10" L x .235" OD Ground Plane (Max) 6.75" D
Weight	6 oz
RF Connector	Type N male
Installation	Installs on Type N female bulkhead connector (sold separately)



#C457-30

NEW

Digital Antenna's new pre-assembled RV cable install kit allows for easy cable installation. Connectors are factory attached to ensure greatest connectivity and reduced install time. Premium low-loss DA240 cable features a tinned braid and foil shield for maximum signal transmission.

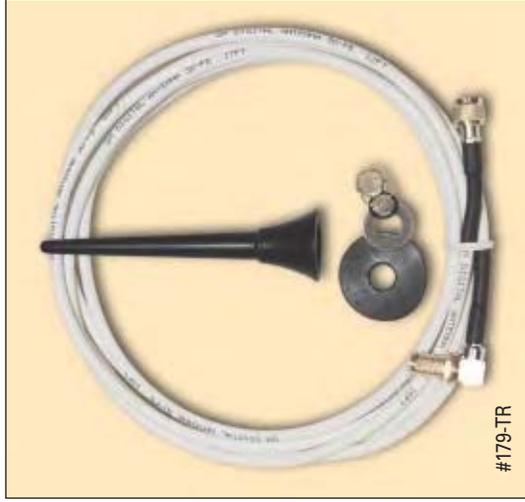
Specifications

Cable Type	C457-30 30' DA240
RF Connectors	Mini-UHF male and Type N female bulkhead
Attenuation (loss)	2.6dB @ 800 MHz and 3.8 @ 1900 MHz
Installation	3" square mounting plate with stainless steel screws

PowerMax™ CAR AND TRUCK ANTENNAS

THRU ROOF CELLULAR ANTENNAS

3dB | 6dB GAIN DUAL BAND OMNI-DIRECTIONAL



#179-TR

Digital Antenna's new 3dB gain cellular and PCS auto antenna provides exceptional performance in a compact design. The low profile thru-roof antenna offers excellent wind resistance with an extremely durable construction. The antenna simply attaches to the included 10' low loss cable. For maximum cellular signal range, use with a Digital Antenna cell booster (sold separately).

Features:

- 3dB gain
- Soldered connections
- Precision tuning
- Durable construction
- Includes 10' low loss cable

NEW

PowerMax™ Series: 179-TR

Mount: Thru-Roof.

Connector: Highest quality mini-UHF male.

Cable: 10' low loss DA240.

Specifications

179-TR

Bandwidth VSWR < 1.5:1 = 810 - 900 and 1800 - 1990 MHz

Gain 3dB

Impedance 50 ohms

Dimensions 4.25" Length x .235" OD (Max)

RF Connectors Mini-UHF

Cable Type & Length DA240 | 10 feet



#196-TR

Digital Antenna's new 6dB gain cellular and PCS truck antenna provides exceptional performance in a rugged, compact design. The low profile antenna rod offers excellent wind resistance while the high grade stainless steel components offer unsurpassed durability and strength. The antenna simply attaches to the included 15' low loss cable. For maximum cellular signal range, use with a Digital Antenna cell booster (sold separately).

Features:

- 5dB gain
- Powerful stainless steel radiators
- Soldered connections
- Precision tuning
- Durable powder coated finish

NEW

PowerMax™ Series: 196-TR

Mount: Thru-Roof.

Connector: Highest quality Type N male.

Cable: 15' low loss DA240.

Specifications

196-TR

Bandwidth VSWR < 1.5:1 = 810 - 900 and 1800 - 1990 MHz

Gain 6dB

Impedance 50 ohms

Dimensions 10" Length x .235" OD (Max)

RF Connectors Type N

Cable Type & Length DA240 | 15 feet



CABLE & CONNECTOR SELECTION GUIDE

FOR MAXIMUM SIGNAL TRANSMISSION

Cable plays one of the most important roles in the antenna installation. Signals are transmitted through the cable and the goal is to maintain as much of the signal as possible when it reaches the antenna. Digital Antenna cables feature exclusive low loss, tinned braid, foil shielded cable with a UV stable jacket for maximum signal transmission.

Cable and Connector Selection Guide:

How long is the cable run?

Cable length must be calculated before determining the cable type. The cable run must not be kinked, crushed, or have a bend radius less than 10 times the cable diameter. Also the cable must be clear of moving objects. Cable should be laid as straight as possible and away from metal. Bends or sharp curves decrease performance and may cause drastic signal loss.

What is return loss?

Return loss is the portion of a signal that is lost due to a reflection of power caused by any discontinuity of the cable. Signal reflections are caused by anything that changes the shape of the cable. Cable kinks or twists, connector insertions/installations and splices are major factors contributing to the total signal efficiency of the installation.

What frequency will you be using: VHF, Cellular, WiFi?

As frequencies increase, there is considerably more signal loss in the cable. Cable characteristics vary by manufacturers and should be compared. (Conductor material, dielectric material, shield type, % coverage and additional foil shielding). A 60% braid coverage would have more signal loss than 95% coverage. A cable with a foil shield is more efficient and effective than one without. Choose the appropriate cable based upon minimum dB loss for your frequency and cable run length.

Cable attenuation (loss) chart per 100'

150 MHz	RG174 10.7 dB	RG58 4.7 dB	DA195 5.3 dB	RG-8X 4.0 dB	DA240 3.0 dB	RG-8U 2.4 dB	DA340 2.5 dB	DA440 1.5 dB
300 MHz	16.0 dB	7.0 dB	7.5 dB	5.4 dB	4.3 dB	3.5 dB	3.4 dB	2.2 dB
800 MHz	29.2 dB	12.7 dB	12.4 dB	10.2 dB	7.1 dB	6.4 dB	5.7 dB	3.7 dB
1900 MHz	51.3 dB	22.0 dB	19.6 dB	20.6 dB	11.2 dB	11.2 dB	8.52 dB	5.8 dB
2400 MHz	60.2 dB	25.8 dB	22.1 dB	24.9 dB	12.6 dB	13.2 dB	10.2 dB	6.6 dB
Min. Bend Radius	1"	2"	2"	2.5"	2"	4"	3"	4"

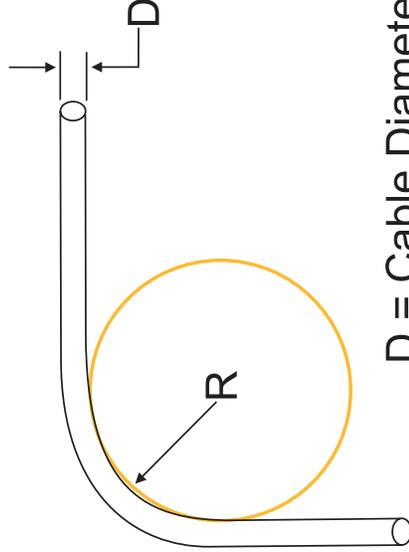
¹ RG174 should only be used for cellular frequencies in lengths less than 10'. For cable runs 100' to 150' on cellular frequencies, use Digital Antenna's ULTRA low-loss DA440 cable. For cable runs greater than 150', contact your installer.

² Digital Antenna's RG-8X with 98% tinned-braid & foil-shield – other manufacturers' RG-8X has higher loss.

³ Belden RG-8U cable specifications.

What connectors should I use?

Frequency range will determine the connector series to be used. Mini-UHF, SMA, TNC and Type N, are all rated up to and beyond 2.5 GHz with type N being rated the highest at 11 GHz. UHF connectors such as PL-259 and PL-258 are rated to 300 MHz and cannot be used at cellular frequencies of 800 and 1900 MHz. Each connector or adapter inserts approximately a .5 dB loss. Never splice cable! Cables can only be extended using the appropriate connectors and cable. Refer to the cable loss chart.



D = Cable Diameter
R = Bend Radius

Additional FAQs
on antennas and cables available at
www.digitalantenna.com

PowerMax™ COAXIAL CABLES

50 OHM COAXIAL CABLES

USE WITH PowerMax™ CELLULAR BOOSTERS

Premium coax cables are pre-assembled with connectors and are available in 5' – 100' lengths. Bulk cable is available for runs in excess of 100'. Digital Antenna cables feature exclusive low-loss, tinned-braid, foil-shielded, UV-stable premium cable for maximum signal transmission.

PowerMax™ External Antenna Cables

MODEL NUMBER	LENGTH
240-10NM	10'
240-15NM1	15'
240-30NM	30'
340-50NM	50'
340-75NM1	75'
340-100NM	100'



Dash-Mount Cables

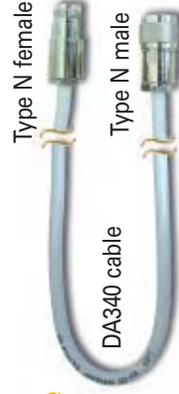
MODEL NUMBER	LENGTH
C428-05	5'
C428-12	12'

INCLUDES BULKHEAD PLATE AND CAP



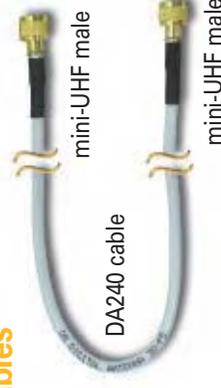
PowerMax™ External Antenna Extension Cable

MODEL NUMBER	LENGTH
340-25NE	25'



Double mini-UHF male Cables

MODEL NUMBER	LENGTH
240-02MM	2'
240-10MM	10'



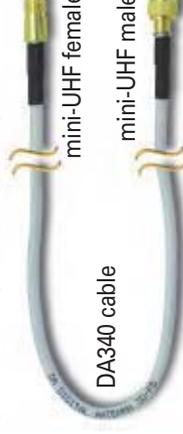
RG-8X External Antenna Cables

MODEL NUMBER	LENGTH
C998-10	10'
C998-20	20'
C998-30	30'
C998-40	40'



PowerMax™ Inside Antenna Extension Cables

MODEL NUMBER	LENGTH
240-10FM	10'
340-20FM	20'
340-25FM	25'



PowerMax™ COAXIAL CABLES

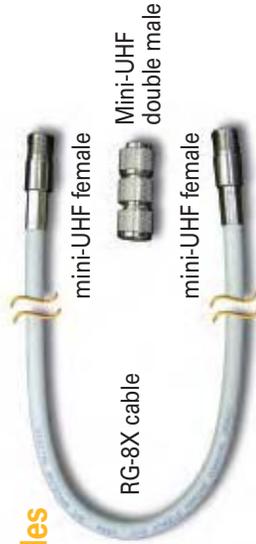


50 OHM COAXIAL CABLES

USE WITH PowerMax™ CELLULAR BOOSTERS | AIS, VHF, XM ANTENNAS

500 Series VHF | AIS Antenna Extension Cables

MODEL NUMBER	LENGTH
C118-10	10'
C118-20	20'



Bulk Cable

Premium PowerMax™ cable offers the lowest loss available. Sold by the foot for a completely custom installation. Up to a 150 foot length of DA440 and up to 100 foot length of DA340 can be used on cellular or PCS frequencies.

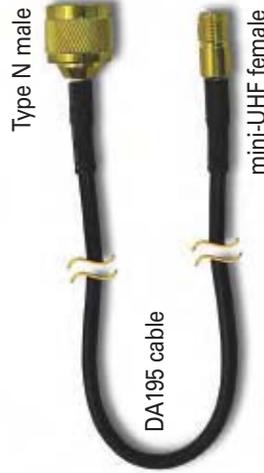
RG-8X cable should not be used on PCS frequencies. Sold without connectors (see page 34)

DA440 sold per foot
DA340 sold per foot
RG-8X sold per foot



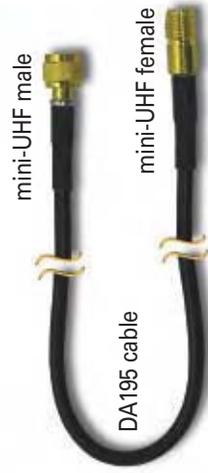
XM Antenna Replacement Cable

MODEL NUMBER	LENGTH
195-50NF	50'



XM Antenna Extension Cable

MODEL NUMBER	LENGTH
195-25FM	25'
195-50FM	50'



XM Antenna Adapter Cable

MODEL NUMBER	LENGTH
DA58F (XM WX)	6"
DA58S (XM WX)	6"



SATELLITE RADIO ANTENNA AND AMPLIFIED SPLITTER

SIRIUS | XM

BOATS | BUILDINGS | RVs



Complete Kit 233-XM-50

Harness the power of satellite radio in your home, office or on your boat or RV. Digital Antenna's 233-XM-50 satellite radio antenna provides crystal clear reception of your favorite satellite radio channels* anywhere in the continental United States, Canada and up to 250 miles offshore. UV stable acrylic sealed dome is impervious to damage caused by bad weather and salt water. Sold complete with a stainless steel 1"-14 mount and stainless steel mounting ferrule, 50' cable with factory attached connectors and adapters.

233-XM-50 Satellite Radio Antenna Includes:

- 40dB nominal gain antenna (233-XM)
- 50' cable with attached connectors (195-50NF)
- Stainless steel 1"-14 mount (DM194)
- Stainless steel 1"-14 female ferrule (F114)
- Mini-UHF male to SMA adapter (DA923)
- Mini-UHF male to SMB adapter (DA947)

Features:

- Crystal clear reception
- Extended coverage
- Rugged construction
- Complete antenna system

Specifications 233-XM-50

Frequency 2320 – 2345.0 MHz (SIRIUS, XM, XM WX)

Dimensions 3.5" OD x 2" H (8" H with mount)

Warranty 1 year (limited)

* Receiver required

New 2-way amplified satellite radio splitter, model DA-2330, is optimized for use with all satellite radio systems and permits operation of two satellite radio receivers from a single antenna. The splitter is manufactured with a durable black powder-coated finish and high quality gold plated mini-UHF female connectors. The splitter's 10dB gain allows longer cables to be used to the receivers. Digital Antenna makes installation easy, offering factory assembled cables available in 10, 20, 25 and 50' lengths. If cable extensions greater than 200 feet are desired, DA340 or DA440 cable is recommended.

Features:

- 10dB optimized gain
- Rugged powder coated finish
- Quality gold plated connectors

Specifications DA-2330

Frequency 2320 – 2345.0 MHz (SIRIUS, XM, XM WX)

Dimensions 2" x 4" w. 1.25" h

Warranty 1 year (limited)



DA-2330

*Subscription to Sirius | XM and/or XM WX and receiver are required. Not for use with XM-ready devices. Visit www.sirius.com and www.xmradio.com



NEW

GO FURTHER WITH AWARD-WINNING ANTENNAS



Voted 'Best Marine Antenna' by the National Marine Electronics Association (NMEA). Customers rely on Digital Antenna for quality design and ultimate performance. All antennas have soldered connections, are hand-assembled and tuned for maximum gain then finished with a high-gloss urethane coating, resulting in a product that consistently outperforms the competition even in the harshest of marine environments.

MARINE VHF, SSB, AM/FM, XM, WIFI & CELLULAR ANTENNAS

YOUR ANTENNA IS YOUR LIFELINE ... CHOOSE WISELY!

Which antenna is right for you?

What type and length of boat do you have (sailboat, powerboat, yacht, commercial vessel)?

Choose an antenna based upon available mounting location. A 4' or 8' antenna works well for many applications including a T-top. Larger antennas such as 16' models must be side-braced approximately 3' to 4' from base.

Is your antenna for communication, navigation or entertainment?

Although antennas look identical, they are very different inside. Each antenna is designed and manufactured for specific frequencies. VHF: 156.8 MHz, Cellular: 800/850 & 1900 MHz, SSB: 2-30MHz, AIS: 159 MHz. The correct antenna must be matched to the equipment's frequency.

What is 'gain' in an antenna?

Gain is measured in decibels (dB). The illustration to the left shows the radiation pattern of three antennas with different gain. As gain increases, the more directed the RF energy becomes, resulting in reaching a greater distance. Your antenna choice should be based upon your application, taking into consideration the rocking or keeling of your boat.

Why does an 18" cellular antenna have 9dB gain and an 8' VHF antenna have 6dB gain?

Due to the physics of the signal's wavelength, an equivalent 9dB gain antenna for VHF would have to be almost 16' in length. The wavelength for cellular frequencies is much shorter than VHF.

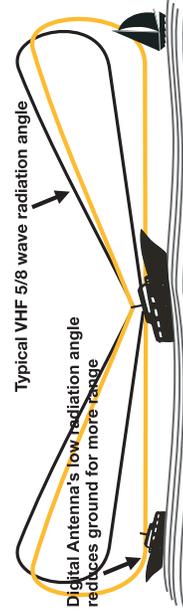
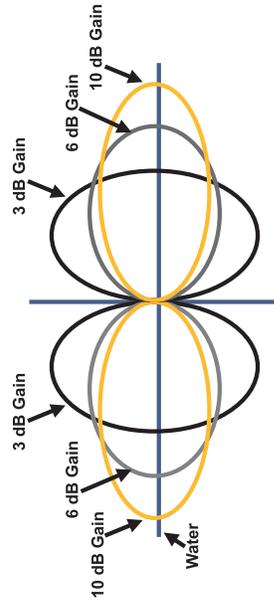
How does line-of-site affect communications?

While lower frequencies (SSB) allow for reliable long-range communication, frequencies above 100 MHz do not follow the curvature of the earth and are limited to line-of-site (the antennas must "see" each other). To achieve the longest range, the antenna should be placed as high as possible.

What makes an antenna reach a greater distance?

The advanced ground system internal to all Digital Antenna marine antennas allows 4.5dB through 10dB gain antennas to have a greater range in any sea conditions. The figure to the left shows the effect that a ground system has on a vertical antenna.

Note that by increasing the ground system efficiency, useful RF power is actually directed closer to the water surface where it is needed. Most well designed 5/8 wavelength 6dB antennas will transmit the same distance in the sky; however, the ground efficiency determines the actual communication range at sea level.



MARINE ANTENNA CUT-AWAY

THE LEADER IN ANTENNA TECHNOLOGY

QUALITY CRAFTSMANSHIP IN EVERY ANTENNA



BRASS RADIATING ELEMENTS

Precision cut & assembled elements for precise tuning and best performance.

BRASS GROUND SYSTEM

Low radiation angle for greater distance.

FIBERGLASS ROD

Features the perfect combination of flexibility and ruggedness.

HIGH-GLOSS POLYURETHANE FINISH

Exclusive state-of-the-art finish seals out the corrosive marine environment to provide long-lasting performance.

POSITIONING FOAM

Exclusive, completely sealed, perfectly centered internal elements to maintain design integrity.

SOLDERED CONNECTIONS

Soldered tinned-braid-to-ground connection for maximum durability and clearest signal.

FERRITE CHOKE BEAD

Eliminates interference with electronics & directs radiating power to antenna for maximum performance.

NEW STAINLESS STEEL FERRULES

Surgical grade, mirror finish stainless steel provides unsurpassed durability and strength.



**AWARD-WINNING
AMPLIFIERS AND ANTENNAS**

**HONORED BY
CES | NMEA | NMMA | SAIL MAGAZINE**

**NEW 500 SERIES
GOLD PLATED MINI-UHF
CONNECTOR**

Innovated by Digital Antenna for easy installation and quality tested performance. (PL259 or mini-UHF adapter included for VHF or Cell)

**UV STABLE
RG-8X CABLE**

Exclusive UV stable, tinned-braid, foil-shielded, low-loss marine cable for maximum signal distance.



CELLULAR ANTENNAS



9dB GAIN DUAL AND GLOBAL BAND

BOATS | YACHTS | HOMES | OFFICES | M2M

With professional marine-grade construction, Digital Antenna cellular antennas deliver high performance that will last for years. Available in 30", 4' and 8' lengths, each cellular antenna is designed for easy connection to your cell PowerMax™ Cell Booster. Each omni-directional cell antenna is 9dB gain. Choose the frequency, length and mounting option best suited for your application.

All Cellular Antennas Feature:

- Powerful brass radiators.
- Soldered connections.
- High-gloss urethane finish.
- Max input 250 watts.

North American Cell Frequencies: 850 | 1900 MHz
Bandwidth VSWR <1.5:1 824-894 & 1850-1990 MHz

SERIES	30" WHITE	30" BLACK	4' WHITE	4' BLACK	8' WHITE	8' BLACK
500	561-CW	561-CB	563-CW	563-CB	567-CW	567-CB
800	864-CW	864-CB	883-CW	883-CB	897-CW	897-CB

Global Cell Frequencies: 850 | 900 | 1800 | 1900 | 2100 MHz
Bandwidth VSWR <1.5:1 824-960 & 1710-2170 MHz

SERIES	30" WHITE	30" BLACK	4' WHITE	4' BLACK	8' WHITE	8' BLACK
800	861-CW	861-CB	865-CW	865-CB	869-CW	869-CB



Specifications

	500 GOLD SERIES	800 SERIES
Mount	1"-14 threaded base	1"-14 threaded base
Connector	Mini-UHF female	Type N female
Cable (500 series)	20' exclusive, RG-8X	Not included (pg 20-21)
Includes	Double mini-UHF male adapter	Stainless steel double female ferrule

MARINE VHF AND AIS MARINE ANTENNAS

3dB TO 6dB GAIN

BOATS | SAILBOATS | YACHTS | COMMERCIAL VESSELS



Digital Antenna's ultimate, award-winning VHF antennas combine ruggedness with a pristine finish for the finest antenna available. Even in the harshest conditions, our antennas will maintain their beautiful glossy finish for years. Built to withstand high speeds, our antennas are ideal for radar arches, T-tops, speedboats, sailboats, yachts and commercial vessels.

VHF and AIS Antennas Feature (except 200 series):

- Powerful brass radiators.
- Soldered connections.
- Power-directing ferrite choke bead.
- High-gloss urethane finish.



Specifications

	200 SERIES	500 SERIES	800 SERIES
Mount	L-bracket	1"-14 threaded base	1"-14 threaded base
Connector	UHF female	Mini-UHF female	UHF female (SO239)
Cable (500 Series)	Not included	Exclusive RG-8X	Not included
Includes	Quick disconnect whip	Mini-UHF male to UHF male (PL259) adapter	Stainless steel double ferrule ferrule

SERIES	4' White VHF	4' Black VHF	8' White VHF	8' Black VHF
500	528-WW	528-VB	529-WW	529-VB
800	826-WW	826-VB	829-WW	829-VB
Cable (500 series only)	15'	15'	20'	20'
VSWR <2:1	152.8-160.8 MHz		152.8-160.8 MHz	
Gain	4.5 dB		6 dB	

SERIES	3' White VHF	4' White AIS	4' Black AIS
200	222-VW	N/A	N/A
500	N/A	578-SW	578-SB
800	N/A	876-SW	876-SB
Cable (500 series only)	N/A	25'	25'
VSWR <2:1	153.8 - 159.8 MHz		
Gain	3 dB		
		156-162 MHz	
		4.5 dB	

All antennas are made in the USA, hand-assembled and tuned for maximum performance, quality and durability.

VHF MARINE ANTENNAS



EXTENDED LENGTHS

YACHTS | COMMERCIAL VESSELS

A favorite of marine professionals, our largest VHF antennas offer the power and durability to achieve maximum range and extended performance, even in the roughest seas. Solid construction makes Digital Antenna's 16' antennas the ideal choice for critical communication on board large yachts, commercial vessels and base stations. Must be used with a side support (page 33).

All Antennas Feature:

- Powerful brass radiators
- Soldered connections
- High-gloss urethane finish
- 316 stainless steel ferrules

Bandwidth for complete antenna

VHF Bandwidth VSWR < 2.0:1 = 151.8 - 161.8 MHz (10 MHz)



SERIES	16' WHITE	16' BLACK	8' WHITE*	8' BLACK*
500 (VHF) 10dB Gain	532-WW	532-VB	533-WW	533-VB
700 (VHF) 10dB Gain	736-WW	736-VB	533-WW	533-VB

*8' top section is available by itself but must be used with 16' VHF or 16' bottom section.

	VHF 500 Series	VHF 700 Series	TOP REPLACEMENT
Mount	1"-14 threaded base	Pole, tube	1"-14 threaded base
Connector	Mini-UHF female	Type N female	N/A
Cable	20' RG-8X	Not Included	N/A
Includes	Mini-UHF male to UHF male (PL259) adapter	Stainless steel clamp set for pole mount	Use with 500 or 700 series bottom sections only

All antennas are made in the USA, hand-assembled and tuned for maximum performance, quality and durability. All 16' antennas are UPS shippable.



EXTENDED LENGTH ANTENNAS AND EXTENDERS

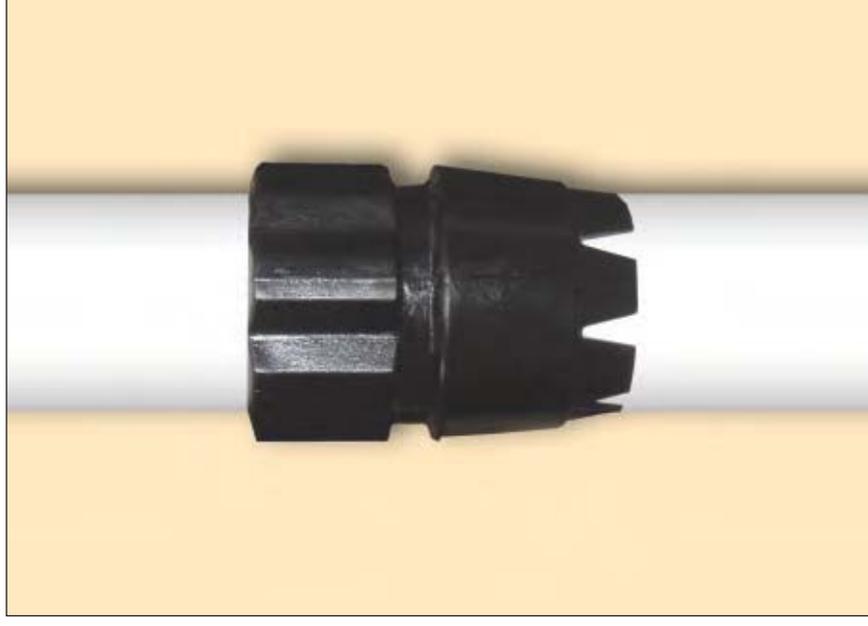
FEATURING FACTORY INSTALLED RUPP COLLARS

BOATS | YACHTS | COMMERCIAL VESSELS

For ease of installation, Digital Antenna now offers longer length antennas with a factory installed RUPP locking collar. The locking collar is installed at the factory assuring a perfect fit. The Rupp locking collar is available on all 16 foot 500 series antenna models and 1 1/2" OD extenders.

All RUPP Antennas and Extenders Feature:

- Pre-installed RUPP collar for perfect fit
- Secure mounting option
- Available in a variety of models



RUPP collar pre-installed.
Mounting arm available through dealer.

MODEL NUMBER	Antenna Type	Antenna Grain	Antenna Length	Antenna Color	RUPP Collar Pre-installed
532-VWR	VHF	10dB	16'	White	Yes
532-VB-R	VHF	10dB	16'	Black	Yes
544-SSWR	SSB	N/A	16'	White	Yes
544-SSB-R	SSB	N/A	16'	Black	Yes
549-EWR	Tapered Extender	N/A	8'	White	Yes
549-EB-R	Tapered Extender	N/A	8'	Black	Yes
535-EWR	Straight Extender	N/A	8'	White	Yes
535-EB-R	Straight Extender	N/A	8'	Black	Yes

All of our antennas are made in the USA, assembled, tested and tuned by hand for maximum performance, quality and durability. UPS shippable.

SSB MARINE ANTENNAS



EXTENDED LENGTHS

YACHTS | COMMERCIAL VESSELS

Digital Antenna's high performance Single Side Band antennas offer exceptional communication over the entire HF frequency range (must use with a tuner). Heavy duty construction for use in the roughest seas, our SSB antennas are a popular choice for boaters when durability, performance and great looks are prerequisites. Digital Antenna's 16' SSB antenna electrically emulates a 24' SSB antenna and tunes to the entire HF band (must use with a tuner). Our 16' SSB antennas require a side support located 3' to 4' from the base of the antenna.

All Antennas Feature:

- Powerful brass radiators
- Soldered connections
- Centering foam insulator
- High gloss urethane finish
- 316 stainless steel ferrule

Bandwidth for complete antenna
SSB Bandwidth VSWR <1.5:1 = .5 - 30 MHz with Tuner



SERIES	16' WHITE	16' BLACK	8' WHITE*	8' BLACK*
500 (SSB)	544-SSW	544-SSB	546-SSW	546-SSB

	SSB 500 Series	TOP REPLACEMENT
Mount	1"-14 threaded base	1"-14 threaded base
Connector	Side termination stub	N/A
Cable	N/A	N/A
Includes	Stainless steel termination stub hardware	Use with 500 or 700 series bottom sections only

*8' top section is available by itself but must be used with 16' SSB bottom sections.

All antennas are made in the USA, hand-assembled and tuned for maximum performance, quality and durability. All 16' antennas are UPS shippable.

AM/FM AND COMBO MARINE ANTENNAS



MULTI-PURPOSE VHF/CELL/PCS & AM/FM/CELL/PCS

BOATS

AM/FM Stereo Antennas

When on board entertainment is your passion, Digital Antenna's AM/FM antennas deliver unbeatable reception and clarity. For the most eye-catching aesthetics, Digital Antenna's 4' and 8' AM/FM antennas are designed to match Digital Antenna's 4' and 8' VHF, AIS and cellular antennas.

All AM/FM Antennas Feature:

- Soldered connections
 - High-gloss urethane finish
 - Durable stainless steel ferrules
- | SERIES | 4' WHITE
AM/FM | 4' BLACK
AM/FM | 8' WHITE
AM/FM | 8' BLACK
AM/FM |
|--------|-------------------|-------------------|-------------------|-------------------|
| 500 | 631-AW | 631-AB | 638-AW | 638-AB |



8' Combination Antennas

When space and mounting locations are limited, Digital Antenna's Trifecta™ combination antennas work overtime, providing you with multi-purpose performance to meet your communication, navigation or entertainment needs. Choose from a selection of high quality 8' antennas with VHF, Cell and PCS or AM/FM, Cell and PCS combinations.

All Combination Antennas Feature:

- Two antennas in one rod
- Powerful brass radiators
- Soldered connections
- High-gloss urethane finish

600 SERIES	CELL VHF 8' WHITE	8' BLACK	CELL AM/FM 8' WHITE	8' BLACK
MODEL NUMBER	659-TW	659-TB	634-TW	634-TB
VSWR	152.8-160.8 MHz (VHF) 824-894 & 1850-1990 MHz (CELL)	824-894 & 1850-1990 MHz (CELL) N/A (AM/FM)	824-894 & 1850-1990 MHz (CELL) N/A (AM/FM)	824-894 & 1850-1990 MHz (CELL) N/A (AM/FM)
GAIN	9 dB (CELL & PCS) 4.5 dB (VHF)	9 dB (CELL & PCS) UNITY (AM/FM)	9 dB (CELL & PCS) UNITY (AM/FM)	9 dB (CELL & PCS) UNITY (AM/FM)

SERIES	500 AM/FM	600 COMBINATION
Mount	1"-14 threaded base	1"-14 threaded base
Connector	Un-attached Motorola type plug	Mini-UHF female CELL, VHF Un-attached Motorola type plug, AM/FM
Cable	15' RG-8X	Qty 2 - 20' RG-8X
Includes	N/A	CELL, Double mini-UHF male adapter VHF Mini-UHF male to UHF male adapter

All antennas are made in the USA, hand-assembled and tuned for maximum performance, quality and durability.

2.4 GHz WiFi ANTENNAS



10dB GAIN WiFi ANTENNAS

BOATS | SAILBOATS | HOMES | OFFICES | M2M

Getting and staying connected on land or water has never been easier. Digital Antenna's 2.4GHz premium quality 10dB gain omni-directional antennas achieve optimal signal range on 802.11 b/g wireless LANs, Bluetooth and multipoint radio equipment, where high gain and wide coverage is desired. Designed to match other antennas on your boat, our WiFi antennas are available in lengths of 30", 4' and 8'.

Available in 800 Series only (not available in 500 Series). PowerMax™ low-loss antenna cables or DA440 bulk cable must be used to minimize signal loss (see page 20-21).

All antennas are made in the USA, hand-assembled and tuned by hand for maximum performance.

All 2.4 GHz WiFi Antennas Feature:

- Powerful brass radiators
- Soldered connections
- High-gloss urethane finish
- 10dB gain

800 Series:

WHITE	BLACK	LENGTH
825-WLW	825-WLB	30"
814-WLW	814-WLB	4'
848-WLW	848-WLB	8'

Specifications 800 Series

Mount	1" - 14 threaded base
Connector	Type N female
Bandwidth VSWR	<1.5:1 = 2400-2500 MHz
Cable	Not included (pg 20-21)
Includes	Stainless steel double female ferrule



All antennas are made in the USA, hand-assembled and tuned for maximum performance, quality and durability.

ANTENNA EXTENDERS

INCREASE ANTENNA HEIGHT

BOATS

Constructed of high-quality reinforced fiberglass and finished to match Digital Antenna's award-winning antennas, antenna extenders are used to increase the height of an antenna to improve effective range or to place an antenna above on-board obstructions that may interfere with receive and transmit signals.



528-EW



528-EB

Model # 528-EW | 528-EB**Straight Extender**

- Dimension: 4' - 1" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base



518-EW



518-EB

Model # 518-EW | 518-EB**Straight Extender**

- Dimension: 18" - 1" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base



535-EW



535-EB

Model # 535-EW | 535-EB**Straight Extender**

- Dimension: 8' - 1.5" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base
- Use center brace #DM268



564-EW



564-EB

Model # 564-EW | 564-EB**Tapered Extender**

- Dimension: 4' - 1.5" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base
- Use center brace #DM268



549-EW



549-EB

Model # 549-EW | 549-EB**Tapered Extender**

- Dimension: 8' - 1.5" OD
- Heavy-duty high-gloss fiberglass
- Stainless steel ferrule
- 1" - 14 threaded top & base
- Use center brace #DM268

ANTENNA MOUNTS



ANTENNA MOUNTS AND ACCESSORIES

ACCESSORIES ARE AVAILABLE AT OUR ONLINE STORE AT WWW.DIGITALANTENNA.COM

Digital Antenna knows the importance of providing strength and durability for mounting antennas. Our premium quality stainless steel antenna mounts work to keep your high-performance antennas steady. Easily accepting antennas with 1" - 14 threads, many styles are available to accommodate marine antennas from 18" to 24' in length. For antennas exceeding 8 feet in length, a side brace must be used.

DM223

- Stainless Steel Ratchet Mount (1" - 14 threads)



DM194

- Stainless Steel Short Straight Mount (1" - 14 threads)



DM283

- Stainless Steel Swivel Mount (1" - 14 threads) (use with DM268)



DM312

- 12" Stainless Steel Extender Top Male 1" - 14, Bottom Female 1" - 14



DM338

- Chrome-on-brass deck/bulkhead feed thru fitting (mini-connector will pass thru)



DM182

- Stainless Steel Straight Mount (1" - 14 threads)



DM178 $\frac{7}{8}$ " - 1" OD

DM191 $1\frac{1}{4}$ " - $1\frac{1}{2}$ " OD

- Stainless Steel Ratcheting Rail Mount (1" - 14 threads) **DM178**



DM268

- White Molded Standoff Bracket for 1" or 1.5" OD (Use with DM283)



F114

- Double 1" - 14 Female Ferrule (Use with 288-PW or 295-PW 18" Cell Antenna)



DM277

- Mounts 3' VHF on a Standard 1" - 14 threaded base



DM925 (900 Series) | DM792 (700 Series)

- Stainless Steel Clamp Set for up to 2" OD (900) or 2.25" OD (700)



DM900

- Converts 800 series antenna to a 900 series wall or pole mount. Includes DM925.



CONNECTORS AND ADAPTERS

50 OHM

TYPE N | MINI-UHF | UHF | TNC | FME



Type N male crimp



Type N male clamp

Connector Name

N Male (RG-8X)

N Male (DA195)

N Male (DA240)

N Male (DA340)

N Male (DA440)

N Male (440)

PN

DA853

DA795

DA229

DA459

DA473

DA492

Type

Crimp

Crimp

Clamp

Crimp

Clamp

Crimp



Type N female crimp



Type N female clamp

Connector Name

N Female (RG-8X)

N Female (DA240)

N Female (DA240)

N Female (DA340)

N Female (DA440)

PN

DA522

DA325

DA362

DA371

DA390

Type

Crimp

Crimp

Clamp

Clamp

Clamp



Mini-UHF female crimp

Mini-UHF female gold

Connector Name

Mini-UHF Female (RG-8X)

Mini-UHF Female (DA195)

Mini-UHF Female (RG-8X) GOLD

Mini-UHF Female (DA240)

Mini-UHF Female (DA340)

PN

DA817

DA468

DA817G

DA826

DA857

Type

Crimp

Crimp

Crimp

Crimp

Crimp



Mini-UHF male crimp

Connector Name

Mini-UHF Male (RG174)

Mini-UHF Male (RG-8X)

Mini-UHF Male (DA195)

Mini-UHF Male (DA240)

Mini-UHF Male (DA340)

Mini-UHF Male (DA440)

PN

DA274

DA482

DA357

DA247

DA434

DA442

Type

Crimp

Crimp

Crimp

Crimp

Crimp

Crimp



Motorola plug

Connector Name

Motorola (AM/FM) type plug (RG-8X)

PN

DA140

Type

Solder

Adapters

Mini-UHF male to N female DA525

Mini-UHF male to TNC female DA572

Mini-UHF male to UHF male (GOLD) DA645G

Mini-UHF male to UHF male (Nickel) DA645

Mini-UHF male to male (GOLD) DA624G

Mini-UHF male to male (Nickel) DA624

Mini-UHF male to FME Female DA206

Mini-UHF male to FME male DA639

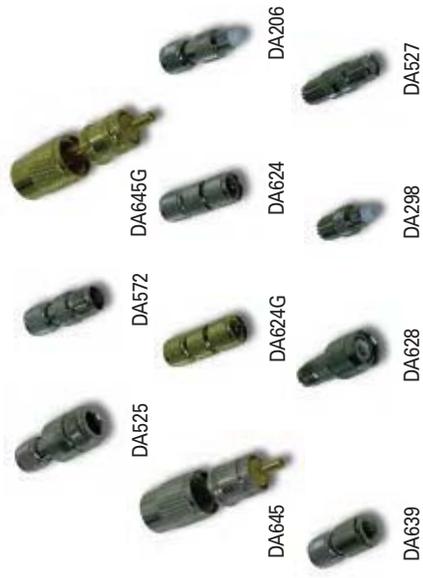
Mini-UHF male to SMA male DA947

Mini-UHF male to SMB male DA923

Mini-UHF female to TNC male DA628

Mini-UHF female to FME Female DA298

Mini-UHF female to mini-UHF Female DA527



DA525

DA572

DA645G

DA645

DA624G

DA624

DA206

DA639

DA628

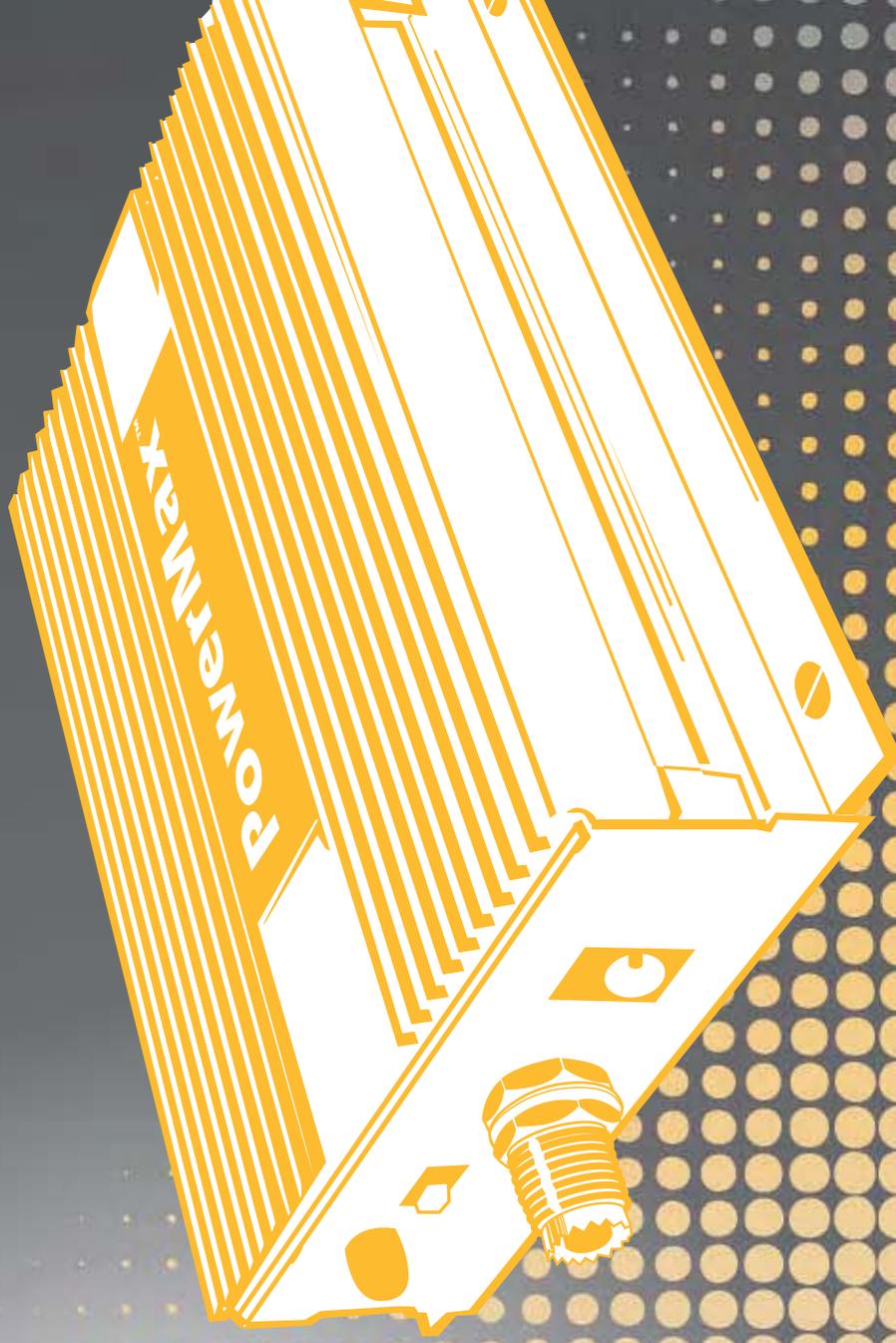
DA298

DA527

PowerMax™ GO FURTHER

AWARD WINNING AMPLIFIERS AND ANTENNAS

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Attachment D

Booster Manufacturer
Misleading FAQs



**Stay Connected
on Land or at Sea!**

Frequently Asked Questions

Answers to Common Questions About Our Products

Select an FAQ Category:

Amplifiers & Amplifier/Repeaters

- ▶ **Selecting the Right Amplifier for Your Application**
- ▶ **DA4000 Series Amplifiers**
- ▶ **DA4000MR Series Amplifier/Repeaters (38 dB Gain)**
- ▶ **DA4000SBR Series Amplifier/Repeaters (60 dB Gain)**
- ▶ **Inside and Outside Antenna Separation**
- ▶ **LED Indicator Light**
- ▶ **Inside Antenna**
- ▶ **Outside Antenna**
- ▶ **Poor Signal Quality**
- ▶ **Cable and Connectors**
- ▶ **FCC and Cellular Carriers**
- ▶ **Instruction Manuals**
- ▶ **General Questions**



Other Products

- ▶ **Antennas and Other Products**

The key to optimal amplifier system performance is proper installation. Read the installation manual and FAQs prior to beginning installation!

▶ **FAQ: Selecting the Right Amplifier for Your Application**

What is the difference between a direct connect amplifier and an amplifier/repeater?

All Digital Antenna amplifiers are dual band 3 watt variable gain RF amplifiers. They are all FCC approved to be used with all carriers in the USA and Canada. The DA4000 is a direct connect amplifier and is used with a cell phone adapter cable. The DA4000SBR and DA4000MR are wireless amplifier/repeaters that are used with an inside antenna to re-broadcast the signal to your cell phone and an outside antenna to communicate with the cell tower.

The DA4000SBR (60dB gain) system requires the outside and inside antennas to be separated a minimum of 40', with an exterior wall and roof structure between the antennas. This system provides up to 5,000 square feet of interior coverage based upon outside cell signal strength. The weaker the cell signal is outside, the less coverage area you will have inside.

The DA4000MR (38dB gain) system requires outside and inside antennas to be

separated a minimum of 2' (DA4KMR-10A) when installed with a metal car roof between antennas, or a minimum of 15' and up to 20' (DA4KMR-30U) with an exterior wall and roof structure between the antennas. The DA4000MR systems provide up to 1,000 square feet, one room interior coverage or a standard car interior (depending upon outside cell signal). With the DA4000MR system, the inside antenna must be visible and cannot be placed behind an object.

Is an amplifier/repeaters' performance the same as that of a direct connect amplifier?

In very remote areas, the DA4000 direct connect amplifier is the best choice. The performance difference is approximately 10% to 15%. This difference is more prominent in remote areas.

Which amplifier should I use?

Choose the product that fits your application. Determine your application by deciding if your primary need is voice communication (cell phone) or data communication (computer). If your primary need is data communication, a direct connect amplifier will provide the best, most reliable connection possible.

Very poor signal area (voice or data) – DA4000
 Poor signal area (building use) – DA4KSBR-50U with yagi antenna
 Poor signal area (auto) – DA4000, DA4KMR-10A
 Poor signal area (RV) – DA4000, DA4KMR-30U, DA4KSBR-50U
 Poor signal area (boat) – DA4000, DA4KMR-30U, DA4KSBR-50U

Recommendations based upon achieving proper antenna separation when using an amplifier/repeater and outside signal strength of -70 to -90 dB.

Wireless amplifier/repeaters (all cell carriers except Nextel and iDEN):
 DA4KMR-10A (38dB gain) – required separation (2') and metal automobile roof
 DA4KMR-30U (38 dB gain) – required separation (20') and roof/wall structure
 DA4KSBR-50U (60 dB gain) – required separation (40') and roof/wall structure

All amplifier/repeaters require the outside antenna be installed outside of the structure (house, car, office, building, boat) and the inside antenna be installed inside the structure. Wireless amplifier/repeaters can not be used with both antennas in open air (i.e., convertible car or open console boat).

Direct connect amplifiers:

DA4000 – direct connect, no antenna separation (all cell carriers except Nextel, iDEN)

Car with metal roof – DA4000 or DA4KMR-10A
 Truck with metal roof – DA4000 or DA4KMR-10A
 Convertible car – DA4000 only
 Open console boat – DA4000 only
 RV 20' to 39' – DA4000 or DA4KMR-30U
 RV 40' and over – DA4000, DA4KMR-30U, DA4KSBR-50U
 Powerboats 36' to 50' – DA4000 or DA4KMR-30U
 Powerboats 50' and over – DA4000, DA4KSBR-50U
 Sailboats 20' to 29' (outside antenna at top of mast) – DA4000 or DA4KMR-30U
 Sailboats 30' and over (outside antenna at top of mast) – DA4000 or DA4KSBR-50U

What is the cost of the amplifiers and amplifier/repeaters?

DA4000 list price: \$299.95
 DA4KMR-10A list price: \$499.95
 DA4KMR-30U list price: \$559.95
 DA4KSBR-50U list price: \$699.95

To purchase Digital Antenna products, visit our [Dealer Locator](#) page. Digital Antenna products are only available through authorized dealers and distributors. Digital Antenna does not sell directly to consumers.

Why should I choose your amplifier?

PowerMax amplifiers designed and manufactured by Digital Antenna are the only amplifiers to be honored for outstanding design and innovation. Digital Antenna amplifiers have been honored by the Consumer Electronic Association (CES), National Marine Electronics Association (NMEA), National Marine Manufacturing Association (NMMA) and Sail's Pittman Award.

► **FAQ: DA4000 Series Amplifiers**

Can I make the DA4000 Dual Band Amplifier a repeater by adding an inside antenna?

No, the DA4000 is a direct connect unit only and must be physically connected to your cell phone or cellular device with the appropriate cable. Click [here](#) for a list of available cell adapter cables.

How do I connect my cell phone to the DA4000?

Most phones with an external antenna port can be connected directly into the amplifier. We carry a full line of adapters for \$19.95; see the complete list [here](#). The amplifier can also be connected to a hands-free car kit, PBX, Tellular or any cellular system that has an external antenna port.

There is no adapter cable for my phone and I have a DA4000. What do I do?

The cell phone manufacturers determine which phones have antenna ports. If the phone is not designed with a port, you must change to a cell phone that has an antenna port or use a wireless amplifier/repeater.

Can I use the DA4000SBR in a car?

No, you cannot use the DA4000SBR in a car due to the minimum separation of 40' or greater between the outside and inside antenna. Use Model # DA4KMR-10A in a car when a metal roof is separating the inside and outside antennas, or use the DA4000 in a car with a convertible top or any application where you cannot meet separation requirements.

Why can I only use your antennas and cables with the DA4000, DA4000MR or DA4000SBR?

The DA4000, DA4000MR and DA4000SBR are high performance, technologically advanced RF amplifiers. They are tested as a system and provide performance specified by the FCC approval. An improperly matched antenna (one with a high SWR) or cable can damage the amplifier unit or cause it to operate in violation of FCC specifications, as well as voiding the warranty. **USING UNAUTHORIZED EQUIPMENT WITH THE DA4000, DA4000MR OR DA4000SBR VOIDS THE WARRANTY.**

Can I use the amplifier with my existing external cellular antenna?

The FCC requires that the amplifier only be used with Digital Antenna brand cellular antennas or an antenna authorized by Digital Antenna, Inc.

Can I hard wire the 12 VDC power connection?

Yes, simply cut off the lighter plug and be certain that the center contact of the amplifier is plus (+).

Does the amplifier boost in both transmit and receive?

Yes, it is a fully duplexed linear RF amplifier.

► **FAQ: DA4000MR Series Amplifier/Repeaters (38 dB Gain)**

What is the difference between the DA4KMR-30U and DA4KMR-10A?

The MR-30U and MR-10A have the same 38 dB amplifier/repeater unit but different antennas and cable.

The DA4KMR-10A includes an outside magnetic mount antenna that MUST be mounted on the center metal roof of the car. This blocks the cell signal from reaching the included inside antenna. The DA4KMR-10A system can only be used with the included antennas and power supply or a cellular antenna manufactured by Digital Antenna.

The DA4KMR-30U includes a 9dB gain 18" fiberglass antenna that is used on a boat, house or RV. This antenna must be 15' to 20' away from the inside antenna and separated by a roof/wall structure. The DA4KMR-30U system can only be used with the included antennas and power supply, or with a cellular antenna manufactured by Digital Antenna.

I am using the DA4KMR-30U. Why don't I have reception in the next room?

The DA4000MR amplifier does not transmit through walls. 38 dB is not enough gain to penetrate a wall. Based upon outside signal strength, the MR-30U will amplify one room or in free air up to 1,000 square feet. The inside antenna for all applications should be

placed in an open area not in a cabinet or under a seat.

Where is the best location to install the inside antenna on the DA4000MR?

Try to locate the inside antenna as central to the desired operation area as possible. The inside antenna should be located away from metal objects and electronics. The inside antenna must be located in a visible location and not behind an object.

I am using the DA4KMR-10A in my car. Why doesn't it amplify my house when the car is in the garage?

The signal from the inside antenna should never reach the outside antenna. The signal from the inside antenna amplifies inside the vehicle only and is not made to amplify beyond the vehicle.

When traveling, why do I have to be very close to the inside antenna to receive a signal increase in some areas ?

In a car, as you travel through poor signal areas, you will find the cell phone works only closer to the inside antenna. The coverage area decreases as the signal outside weakens. If the cell phone antenna is touching the MR inside antenna, the performance will be closer to that of the DA4000 direct connect amplifier.

► FAQ: DA4000SBR Series Amplifier/Repeaters (60 dB Gain)

Should the DA4000SBR be professionally installed?

We highly recommend installation by an individual experienced with high frequency RF equipment. The instruction manual provides an individual with all information necessary for installation; however, the instruction manual must be read and thoroughly understood prior to beginning the installation.

Why do I have to install the outside and inside antenna so far apart?

To achieve the greatest coverage area, the DA4000SBR has a gain of 60dB re-transmitting from the inside antennas. The outside antenna can radiate up to 3 watts. The inside and outside antennas must be isolated from each other so they do not have harmful feedback into each other. The inside and outside antennas MUST be separated by 40', with an exterior wall and roof structure between the antennas.

I installed the inside and outside antenna 40' apart. Why is the system not performing?

In some applications, the inside and outside antenna may require a separation greater than 40'. If you do not have the proper attenuation between the two antennas, more distance is required between the antennas. A fiberglass wall, boat deck, non-insulated exterior wall or glass doors do not equal a concrete or framed wall with foil insulation. Therefore, the separation between antennas must be greater. Poor signal or no signal outside and improper connectors or cable will also result in poor or no performance.

► FAQ: Inside and Outside Antenna Separation

Do I have to install the outside antenna, outside?

Yes, the outside antenna must be installed outside of the yacht, RV, home or office. The outside antenna must be installed outside (with the proper antenna separation based upon model selected), with an exterior wall between the outside and inside antennas and away from windows. It must be installed 6 meters horizontally away from a person.

What happens if I do not install the outside and inside antenna far enough apart?

The outside and inside antenna must be installed with the proper separation, with an exterior wall and roof structure between the antennas. A minimum of 40' of separation (DA4000SBR) or (2' and metal car roof) or 20' (fiberglass boat wall) separation (DA4000MR) between the antennas, plus an exterior wall/roof structure. If you do not have the proper attenuation, more distance is required between the antennas. A fiberglass wall, i.e., a boat deck, does not equal a home or office wall. Therefore, the separation between antennas must be greater. If the antennas are not properly separated, the DA4000SBR and DA4000MR amplifier will be damaged and the warranty voided.

Is a window enough of a separation between the outside and inside antenna?

No, a window does not provide the attenuation required. If you do not have the proper attenuation, more distance is required between the antennas. A window does not equal a

home or office wall. Therefore, the separation between antennas must be greater.

Do I ever need more than 40' of separation between the two antennas?

Yes, if you do not have proper attenuation between the inside and outside antennas plus the wall/roof structure, you will need to place the antennas farther apart.

On my boat, I installed the two antennas 40' apart or more. Why is the light turning red and not green?

A fiberglass wall, i.e., boat deck or bulkhead, does not equal a home or office wall for RF attenuation. Therefore, the separation between antennas must be greater. Marine installations should always be verified with a network analyzer such as an Anritsu Sitemaster.

I have a 24' boat. Why can't I use the DA4000MR or DA4000SBR?

There is no possibility of achieving the proper attenuation between the outside and inside antennas on a 24' fiberglass boat. Use the DA4000 direct connect amplifier on this size boat.

► **FAQ: LED Indicator Light**

What should I do if the light is red on the DA4000SBR?

Immediately turn the DA4000SBR amplifier unit to the off position. A constant red light will damage the unit and may void the warranty. Relocate the two antennas for proper RF attenuation.

Can I bring the two antennas close together and try to make the light red?

DO NOT ATTEMPT TO MAKE THE LIGHT TURN RED! This will damage the amplifier and void the warranty.

The light does not change on the DA4000MR or DA4000SBR. Is it working?

Yes, it is possible that the light will not visibly change with PCS, GSM 1900 and other phones operating on 1900 MHz. This is due to the nature of the phones' transmissions being so fast that your eye cannot see the light change.

What color should the light be after installation?

The light must be green after installation, and when no cell phone is in use. If the light is not green after installation and no cell phone is being used, the two antennas must be relocated farther apart from each other.

► **FAQ: Inside Antenna**

Where is the best location to install the inside antenna on the DA4000SBR?

Try to locate the inside antenna as central to the desired operation area as possible. The inside antenna should be located away from metal objects and electronics. The inside antenna must be located a minimum of 12" from the DA4000SBR amplifier unit. The antenna can be located farther away and extended with the proper coaxial cable.

Where is the best location to install the inside antenna on the DA4000MR?

Try to locate the inside antenna as central to the desired operation area as possible. The inside antenna should be located away from metal objects and electronics. The inside antenna must be located in a visible location and not behind an object. The antenna can be located farther away and extended with the proper coaxial cable.

Can I extend the inside antenna cable?

Yes, the inside antenna cable can be extended up to 10' with Digital Antenna's exclusive DA340 or RG-8X cable. Contact your local dealer.

How far should the inside white antenna be from the DA4000SBR or DA4000MR amplifier box?

The inside antenna must be located a minimum of 12" from the DA4000SBR or DA4000MR amplifier unit. The antenna can be located farther away and extended with the proper coaxial cable.

Can I use a different inside antenna?

Only Digital Antenna authorized products may be used with the DA4000SBR or DA4000MR system. Using unauthorized equipment with the DA4000SBR system will harm the system, void the warranty and can be detected in the event of a failure.

I am next to the white inside antenna, but when I move 1' away, it does not work. Why?

The most likely possibility is the system is improperly installed and has a low level oscillation that desensitizes the receiver electronics of the cell phone. To correct this, relocate the positions of the outside and inside antennas, making them farther apart from each other.

Another possibility is that the outside antenna is mounted in an area that has a very marginal signal. To correct this, relocate the outside antenna to an area that has more signal as indicated by your cell phone. Also, check all connectors and cable. Connectors should be securely connected to the amplifier and antenna. NEVER USE A TOOL TO TIGHTEN THE CONNECTORS!

► **FAQ: Outside Antenna**

What other cellular antenna can I use with your amplifier and amplifier/repeaters?

Any of Digital Antenna's dual band cellular antennas may be used with the DA4000, DA4000MR and DA4000SBR system. They are available in many mounting styles and in a white or black high gloss finish.

Can I use an existing antenna and cable with the DA4000MR or DA4000SBR?

Yes, if it is a dual band cellular antenna manufactured by Digital Antenna Inc. Only Digital Antenna authorized products may be used with the DA4000SBR system. Using unauthorized equipment with the DA4000SBR or DA4000MR will harm the system, void the warranty and can be detected in the event of a failure.

Can I install the outside or inside antenna upside down?

Antenna patterns vary between the top and bottom lobes. For maximum coverage of the DA4000MR or DA4000SBR system, the antennas must be installed with the connectors on the bottom in a vertical position.

Where is the best place to install the outside antenna?

The fiberglass antenna rod must be 3' away from metal and 6 meters horizontally away from persons, in a location high enough to be free from any obstructions, and in the strongest signal area as indicated by your cell phone.

Can I install the outside antenna next to a metal pole? How far does the antenna have to be mounted from other metal objects?

The outside antenna can be mounted on a metal pole, but the fiberglass rod can not be next to metal. The outside antenna fiberglass rod must be at least 1 meter away from any metal object, including a tin roof. For maximum performance, the outside antenna should be clear of all obstructions by 6'.

Can I use a yagi antenna with the DA4000MR or DA4000SBR?

In poor signal areas, you may have to use a yagi antenna to receive a suitable signal from the tower. Using a yagi will limit the repeater unit to only operate on a single band; therefore, it will be necessary to determine whether you want to use the high or low band prior to choosing the yagi. Another option is to use two yagi antennas, one low band and one high band, in combination with our **DA-2100 Combiner**. Your dealer can help you choose a suitable yagi antenna.

► **FAQ: Poor Signal Quality**

Why do I only have a small coverage area?

The most likely possibility is that the system is improperly installed and has a low level oscillation that desensitizes the receiver electronics of the cell phone. To correct this, relocate the positions of the outside and inside antennas, making them farther apart from each other.

Another possibility is that the outside antenna is mounted in an area that has a very marginal signal. To correct this, relocate the outside antenna to an area that has more signal as indicated by your cell phone. Also, check all connectors and cable. Connectors should be securely connected to the amplifier and antenna. NEVER USE A TOOL TO TIGHTEN THE CONNECTORS!

I have no signal outside. Will the DA4000SBR help me?

You must receive at least a -90 dB signal from the tower to operate the DA4000SBR or DA4000MR system. In poor signal areas, you must use a yagi antenna to receive a suitable signal from the tower. Using a yagi will limit the repeater unit to only operate on a single band; therefore, it will be necessary to determine whether you want to use the high or low band prior to choosing the yagi. Another option is to use two yagi antennas, one low band and one high band, in combination with our **DA-2100 Combiner**. Your dealer can help you choose a suitable yagi antenna.

► **FAQ: Cable and Connectors**

Why does the DA4000SBR include 50' of cable?

For the average installation, this will be sufficient for the required 40' of separation. Longer cables in 75' and 100' lengths are available for purchase through your dealer.

I need more cable to install the outside antenna. What cable should I use?

Digital Antenna manufactures pre-assembled cables in 75' and 100' lengths. This low loss PowerMax cable is designed to be used with the PowerMax amplifier and repeater product line. The only suitable replacement is LMR series cables (LMR400 or LMR600).

When I was installing the cable the connector fell off. What do I do?

Only replace a connector with the proper type for the cable and with the proper crimping tool to assure a factory quality connection. NEVER replace a connector with a sub-standard quick connect style connector. NEVER try to push a connector back on the cable; a new connector is required.

Can I use the cable that is already installed on my boat or in my house?

It is best to use the cable included in the system. The DA4000MR and DA4000SBR includes premium low loss cable with a factory attached connector. The system will not work with improper cable. Only 50 Ohm Digital Antenna cellular cable or Times Microwave LMR equivalent cable can be used. Check cable specifications and choose the proper cable type based upon cable run length. If the cable run is too long with the improper cable type, all signal will be lost in the cable.

DO NOT USE RG58 cable for cellular! DO NOT USE TV or satellite cable (such as RG6) for cellular!

What type of connectors can I use?

ONLY USE CONNECTORS RATED FOR CELLULAR FREQUENCIES! Mini-UHF, N-type, TNC and SMA are rated for cellular frequencies. PL-259 or UHF connectors are not rated for cellular frequencies. F-type connectors are 75 ohm and should never be used for cellular. DO NOT USE UHF or F-TYPE CONNECTORS FOR CELLULAR!

What happens if I use a PL-259 or UHF connector with a cellular amplifier or amplifier/repeater?

A PL-259 or UHF connector is rated for a maximum of 300 MHz. Cellular frequencies are 800 and 1900 MHz. A PL-259 or UHF connector will leak 80% or more of the RF signal. No signal will get to the antenna, and RF frequency leaking out of the connector will cause an oscillation.

► **FAQ: FCC and Cellular Carriers**

Does the owner of this equipment (installed location) require an FCC license to operate the repeater?

No, neither the user nor the installer needs an FCC license. All of our products are FCC approved. In the instruction manual, you will find guidelines to follow to comply with all FCC requirements, such as proper separation between antennas, and persons must be 6 meters horizontally away from outside antenna.

Do the cellular providers accept the use of cellular repeaters?

Not all amplifiers are tower friendly. All of our amplifiers have dynamic variable gain control so that the tower is never overpowered. We are the only manufacturer with carrier approvals.

Although the carriers own the frequencies that they operate on, are they permitting others to do the same with the repeaters?

The cell phone, which is paid for by the customer, is transmitting on the specified frequency, not the repeater. The repeater is simply improving the signals. The repeater amplifies only the signal of the cell phone that is authorized to be used at the specific frequency.

If a cellular repeater is installed and causes interference that cannot be corrected, will the FCC or others require it to be removed?

If a repeater is not installed properly, it can create an oscillation that can cause interference on that frequency. The FCC can find this oscillation and require it to be corrected. Digital Antenna repeaters have a power down circuit that will lower the gain of the amplifier when an oscillation is detected. If the oscillation is very strong, it can burn out the amplifier chip. PROPER INSTALLATION IS VERY IMPORTANT. Standard high frequency installation guidelines should be used for the proper cabling, separation and connectors. Improper connectors like PL259s can cause many problems.

Why can I only use your antennas and cables with the DA4000, DA4000MR or DA4000SBR?

The DA4000, DA4000MR and DA4000SBR are high performance, technologically advanced RF amplifiers. They are tested as a system and provide performance specified by the FCC approval. An improperly matched antenna (one with a high SWR) or cable can damage the amplifier unit, cause it to operate in violation of FCC specifications and void the warranty.

Can I use the amplifier with my existing external cellular antenna?

The FCC requires that the amplifier only be used with Digital Antenna brand cellular antennas or an antenna authorized by Digital Antenna, Inc.

► **FAQ: Instruction Manuals**

Where can I get an instruction manual for my DA4KSBR-50U, DA4000MR-10A or DA4000MR-30U?

Our **Product Manuals** page contains instruction manuals for the above products, in convenient Adobe .pdf format.

► **FAQ: General Questions**

Can I leave your amplifier or amplifier/repeater on all the time?

All Digital Antenna amplifiers can remain on all the time; however, do not leave the automobile amplifier on if the vehicle is not going to be used for more than 1 week.

There is no adapter cable for my phone. What do I do?

The cell phone manufacturers determine which phones have antenna ports. If the phone is not designed with a port, you must change to a cell phone that has an antenna port or use a wireless amplifier/repeater.

Can I buy just the amplifier/repeater unit?

No, the DA4000SBR and DA4000MR amplifiers are sold and tested as a system. The antennas and cable are a tuned system. Poorly tuned antennas may cause system failure. Only Digital Antenna authorized products may be used with the DA4000SBR and DA4000MR systems. Using unauthorized equipment with the DA4000SBR and DA4000MR systems will harm the system, void the warranty and can be detected in the event of a failure.

There are no local dealers in my area. Where do I buy your amplifiers?

Digital Antenna only sells its products through a nationwide dealer network. Digital Antenna products may be purchased through many authorized dealers nationwide, including online dealers. Visit our **Dealer Locator** page for more information.

I have tech questions. Who do I contact?

Your first level of technical support is your dealer. If your dealer cannot answer your questions, send your inquiry via e-mail to support@digitalantenna.com.

I need installation help. Who do I contact?

Contact your dealer. Your dealer has the expertise to assist you with installation questions and can provide you with any accessories needed for your custom installation.

The dealer may also be able to direct you to a technician to verify your installation.

Can I send my amplifier or antenna to Digital Antenna to test?

Digital Antenna will test your amplifier or antenna for a fee. Amplifier and amplifier/repeaters have a \$75 bench test fee. An antenna bench test fee is \$25.

I've read all FAQs and followed all instructions and my amplifier doesn't work. How do I send it to Digital Antenna to test?

Have your serial number ready, and call Digital Antenna at 954-747-7022 to receive an RMA (return materials authorization) number.

Every product is 100% tested and working when it leaves the Digital Antenna factory. Digital Antenna warrants all material defects and workmanship (read our **complete warranty**). Any customer alterations or damage voids the warranty. Using unauthorized products with amplifiers can be detected and voids the warranty.

Products repaired under warranty will be returned with the same packaging and accessories as received by Digital Antenna. Refurbishment is available for a fee. If no problem is found, a \$75 bench test fee plus shipping costs will be charged to the customer.

Can I use the DA4000SBR or DA4000MR for Nextel?

No, the DA4000SBR or DA4000MR amplifiers are designed for use with all cellular systems in the USA and Canada, except Nextel's iDEN network.

Can I use a Digital Antenna amplifier in Europe?

Digital Antenna amplifier models DA4000, DA4KMR-10A, DA4KMR-30U and DA4KSBR-50U operate on the 800 and 1900 MHz cellular bands. These models do not operate on iDEN, Nextel or European GSM networks. We currently do not manufacture an amplifier for the European GSM network.

► **FAQ: Antennas and Other Products**

Since the name of the company is Digital Antenna, can I still use the antenna for my analog applications?

Digital Antenna is the company name. All of our antennas perform equally well for both digital and analog communications.

Is a ground plane required for our antennas?

No. As a result of our design and the tuning that we perform at our factory, no ground plane is required.

What makes your antenna different from your competitors?

- All of our antennas are hand assembled and tuned for maximum gain.
- All of our connections are soldered, whereas our competitors use mechanical joints (crimping), which is less reliable and often fails under saltwater conditions.
- Digital Antenna uses its exclusive marine grade low loss UV stable RG-8X cable to reduce transmission line loss in all Digital Antenna marine antennas.
- All of our antenna bases are epoxy glued and filled with silicone base caulking to ensure a complete watertight seal. Our competitors use rubber gaskets and do not fill the ends. Often, the rubber gaskets fail with time.
- Bottom Line: Our antennas are superiorly made, more reliable and outperform all other antennas on a category by category basis.

What should be the main reason to buy your antenna?

The antenna is part of your life support system during an emergency. Reliability should be the main decision factor in purchasing our antenna. The radio and antenna act as one system that must perform in all weather conditions and at maximum range. Simply put, having a good radio with a poor antenna does not give you the best odds when you are in a distress situation. It is our belief that Digital Antenna has the best and most reliable product on the market -- one that beats the competition in both gain and distance,

resulting in an increased safety margin.

Is it true that the higher the antenna, the further the transmission and the better the reception?

Yes, in general, that can be one of the factors influencing performance. However, for most uses, mounting the antenna in the usual locations is acceptable.

Does the gain of the antenna really matter?

Yes, it does. The gain of an antenna translates to greater distance for transmission and reception. A gain of 6db usually results in a performance increase of four times the radio's power output and eight times with a 9dB gain. However, other factors can be equally important, including the tuned frequency of the antenna and its SWR. Digital Antenna tunes all of its products in accordance with the median frequency of usage, (i.e., VHF will be tuned for 156.8 MHz). Our SWR ratio approaches 1:1, reducing most of the losses associated with our competitors' antennas. All of these factors are important when it comes to choosing an antenna.

I seem to have a high SWR reading on my Digital antenna. What should I do?

The Bandwidth VSWR on every Digital Antenna brand antenna is <1.5:1. Every antenna is tested before leaving our facility. It does not ship if it does not meet our specifications. Make sure the cable is not coiled or kinked. Check the adapter and verify that it is securely attached to the mini-UHF female connector on the cable. Also, the antenna must be clear of any metal objects including other antennas.

I have a competitor's antenna and I am unhappy with its performance. Can I use your antenna as a replacement without having to buy a new mount?

Most of our antennas fit into the standard 1"-14 threaded mounts of our competitors. For best results, prior to ordering, please go to the [Contact Us](#) page and e-mail us with any questions.

Why should I purchase your cellular antenna? Isn't the one on the phone good enough?

Our cellular antennas are designed and tuned for maximum gain of 9dB. The little antenna on your cell phone simply does not have any gain or range.

How do I know if the cellular antenna on my boat is dual band?

Competitors' cellular antennas manufactured before the year 2000 are most likely not dual band. All Digital Antenna cellular antennas will work with analog, digital, dual band and tri-mode phones, including the cellular services CDMA, TDMA, PCS, GSM, DCS, iDEN and AMPS. All Digital Antenna cellular antennas manufactured since 1998 will perform with all of these phones and services.

What is the minimum distance that I can mount the antenna from the radio?

In order for no squealing to occur from transmission interference, you must mount the antenna no less than 3' away. Of course, the greater the power of the radio, the greater the minimum distance.

Can I use your antenna for land based applications?

Yes. Our antennas are superiorly constructed and are available with a variety of mounting options. Check your mounting needs.

How do I use your cellular amplifier with my phone?

Most phones with an external antenna port can be connected directly into the amplifier. We carry a full line of adapters for \$19.95; see the complete list on our [Cellular Adapters](#) page. The amplifier can also be connected to a hands-free car kit, PBX, Telular or any cellular system that has an external antenna port.

How do I know what phone model I have?

The phone's model number is printed on the back of the phone under the battery (the battery has to be removed; doing this will not harm any stored information). Contact your dealer to purchase Digital Antenna products or visit our [Dealer Locator](#) page to locate a dealer near you.

Why should I choose your amplifier?

PowerMax amplifiers designed and manufactured by Digital Antenna are the only

amplifiers to be honored for outstanding design and innovation. Digital Antenna amplifiers have been honored by the Consumer Electronic Association (CES), National Marine Electronics Association (NMEA), National Marine Manufacturing Association (NMMA) and Sail Magazine's Pittman Award. See our [Press Release](#) page for more details.

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Home > Digital Antenna FAQ

Digital Antenna FAQ for Cellular Amplifier/Repeaters

The key to optimal amplifier system performance is proper installation. Read the installation manual and FAQs prior to beginning installation!

Product Links:

- [DA4KSBR-50U, DA4000SBR-50U Dual-Band Cellular Repeater](#)
- [DA4KMR-10A, DA4000MR-10A Dual-Band Cellular Repeater](#)
- [DA4KMR-30U, DA4000MR-30U Dual-Band Cellular Repeater](#)
- [DA4000 Inline Amplifier](#)

FAQ: Selecting the Right Amplifier for Your Application

Which amplifier should I use?

Choose the product that fits your application. Determine your application by deciding if your primary need is voice communication (cell phone) or data communication (computer). If your primary need is data communication, a direct connect amplifier will provide the best, most reliable connection possible.

- Very poor signal area (voice or data) – DA4000
- Poor signal area (building use) – DA4KSBR-50U with yagi antenna
- Poor signal area (auto) – DA4000, DA4KMR-10A
- Poor signal area (RV) – DA4000, DA4KMR-30U, DA4KSBR-50U
- Poor signal area (boat) – DA4000, DA4KMR-30U, DA4KSBR-50U

Recommendations based upon achieving proper antenna separation when using an amplifier/repeater and outside signal strength of -70 to -90 dB.

Wireless amplifier/repeaters (all cell carriers except Nextel and iDEN):
DA4KMR-10A (38dB gain) – required separation (2') and metal automobile roof
DA4KMR-30U (38 dB gain) – required separation (20') and roof/wall structure
DA4KSBR-50U (60 dB gain) – required separation (40') and roof/wall structure

All amplifier/repeaters require the outside antenna be installed outside of the structure (house, car, office, building, boat) and the inside antenna be installed inside the structure. Wireless amplifier/repeaters can not be used with both antennas in open air (i.e., convertible car or open console boat).

Direct connect amplifiers:

- DA4000 – direct connect, no antenna separation (all cell carriers except Nextel, iDEN)
- DA4000N – direct connect, no antenna separation (Nextel, iDEN)

- Car with metal roof – DA4000 or DA4KMR-10A
- Truck with metal roof – DA4000 or DA4KMR-10A
- Convertible car – DA4000 only
- Open console boat – DA4000 only

RV 20' to 39' – DA4000 or DA4KMR-30U
RV 40' and over – DA4000, DA4KMR-30U, DA4KSBR-50U
Powerboats 36' to 50' – DA4000 or DA4KMR-30U
Powerboats 50' and over – DA4000, DA4KSBR-50U
Sailboats 20' to 29' (outside antenna at top of mast) – DA4000 or DA4KMR-30U
Sailboats 30' and over (outside antenna at top of mast) – DA4000 or DA4KSBR-50U

Why should I choose your amplifier?

PowerMax amplifiers designed and manufactured by Digital Antenna are the only amplifiers to be honored for outstanding design and innovation. Digital Antenna amplifiers have been honored by the Consumer Electronic Association (CES), National Marine Electronics Association (NMEA), National Marine Manufacturing Association (NMMA) and Sail's Pittman Award.

FAQ: DA4000MR, DA4KMR Series Amplifier/Repeaters (38 dB Gain)

What is the difference between the DA4KMR-30U and DA4KMR-10A?

The MR-30U and MR-10A have the same 38 dB amplifier/repeater unit but different antennas and cable.

The DA4KMR-10A includes an outside magnetic mount antenna that MUST be mounted on the center metal roof of the car. This blocks the cell signal from reaching the included inside antenna. The DA4KMR-10A system can only be used with the included antennas and power supply or a cellular antenna manufactured by Digital Antenna.

The DA4KMR-30U includes a 9dB gain 18" fiberglass antenna that is used on a boat, house or RV. This antenna must be 15' to 20' away from the inside antenna and separated by a roof/wall structure. The DA4KMR-30U system can only be used with the included antennas and power supply, or with a cellular antenna manufactured by Digital Antenna.

I am using the DA4KMR-30U. Why don't I have reception in the next room?

The DA4000MR amplifier does not transmit through walls. 38 dB is not enough gain to penetrate a wall. Based upon outside signal strength, the MR-30U will amplify one room or in free air up to 1,000 square feet. The inside antenna for all applications should be placed in an open area not in a cabinet or under a seat.

Where is the best location to install the inside antenna on the DA4000MR, DA4KMR?

Try to locate the inside antenna as central to the desired operation area as possible. The inside antenna should be located away from metal objects and electronics. The inside antenna must be located in a visible location and not behind an object.

I am using the DA4KMR-10A in my car. Why doesn't it amplify my house when the car is in the garage?

The signal from the inside antenna should never reach the outside antenna. The signal from the inside antenna amplifies inside the vehicle only and is not made to amplify beyond the vehicle.

When traveling, why do I have to be very close to the inside antenna to receive a signal increase in some areas ?

In a car, as you travel through poor signal areas, you will find the cell phone works only closer to the inside antenna. The coverage area decreases as the signal outside weakens. If the cell phone antenna is touching the MR inside antenna, the performance will be closer to that of the DA4000 direct connect amplifier.

FAQ: DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U Series Amplifier/Repeaters (60 dB Gain)

Should the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U be professionally installed?

We highly recommend installation by an individual experienced with high frequency RF equipment. The instruction manual provides an individual with all information necessary for installation; however, the instruction manual must be read and thoroughly understood prior to beginning the installation.

Why do I have to install the outside and inside antenna so far apart?

To achieve the greatest coverage area, the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U has a gain of 60dB re-transmitting from the inside antennas. The outside antenna can radiate up to 3 watts. The inside and outside antennas must be isolated

from each other so they do not have harmful feedback into each other. The inside and outside antennas MUST be separated by 40', with an exterior wall and roof structure between the antennas.

I installed the inside and outside antenna 40' apart. Why is the system not performing?

In some applications, the inside and outside antenna may require a separation greater than 40'. If you do not have the proper attenuation between the two antennas, more distance is required between the antennas. A fiberglass wall, boat deck, non-insulated exterior wall or glass doors do not equal a concrete or framed wall with foil insulation. Therefore, the separation between antennas must be greater. Poor signal or no signal outside and improper connectors or cable will also result in poor or no performance.

FAQ: Inside and Outside Antenna Separation

Do I have to install the outside antenna, outside?

Yes, the outside antenna must be installed outside of the yacht, RV, home or office. The outside antenna must be installed outside (with the proper antenna separation based upon model selected), with an exterior wall between the outside and inside antennas and away from windows. It must be installed 6 meters horizontally away from a person.

What happens if I do not install the outside and inside antenna far enough apart?

The outside and inside antenna must be installed with the proper separation, with an exterior wall and roof structure between the antennas. A minimum of 40' of separation (DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U) or (2' and metal car roof) or 20' (fiberglass boat wall) separation (DA4000MR, DA4KMR) between the antennas, plus an exterior wall/roof structure. If you do not have the proper attenuation, more distance is required between the antennas. A fiberglass wall, i.e., a boat deck, does not equal a home or office wall. Therefore, the separation between antennas must be greater. If the antennas are not properly separated, the DA4000SBR (DA4000SBR-50U, DA4KSBR, DA4KSBR-50U) and DA4000MR (DA4KMR) amplifier will be damaged and the warranty voided.

Is a window enough of a separation between the outside and inside antenna?

No, a window does not provide the attenuation required. If you do not have the proper attenuation, more distance is required between the antennas. A window does not equal a home or office wall. Therefore, the separation between antennas must be greater.

Do I ever need more than 40' of separation between the two antennas?

Yes, if you do not have proper attenuation between the inside and outside antennas plus the wall/roof structure, you will need to place the antennas farther apart.

On my boat, I installed the two antennas 40' apart or more. Why is the light turning red and not green?

A fiberglass wall, i.e., boat deck or bulkhead, does not equal a home or office wall for RF attenuation. Therefore, the separation between antennas must be greater. Marine installations should always be verified with a network analyzer such as an Anritsu Sitemaster.

I have a 24' boat. Why can't I use the DA4000MR, DA4KMR or DA4000SBR, DA4KSBR?

There is no possibility of achieving the proper attenuation between the outside and inside antennas on a 24' fiberglass boat. Use the DA4000 direct connect amplifier on this size boat.

FAQ: LED Indicator Light

What should I do if the light is red on the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U?

Immediately turn the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U amplifier unit to the off position. A constant red light will damage the unit and may void the warranty. Relocate the two antennas for proper RF attenuation.

Can I bring the two antennas close together and try to make the light red?

DO NOT ATTEMPT TO MAKE THE LIGHT TURN RED! This will damage the amplifier and void the warranty.

The light does not change on the DA4000MR, DA4KMR or DA4000SBR, DA4KSBR. Is it working?

Yes, it is possible that the light will not visibly change with PCS, GSM 1900 and other phones operating on 1900 MHz. This is due to the nature of the phones' transmissions being so fast that your eye cannot see the light change.

What color should the light be after installation?

The light must be green after installation, and when no cell phone is in use. If the light is not green after installation and no cell phone is being used, the two antennas must be relocated farther apart from each other.

FAQ: Inside Antenna

Where is the best location to install the inside antenna on the DA4000SBR, DA4KSBR?

Try to locate the inside antenna as central to the desired operation area as possible. The inside antenna should be located away from metal objects and electronics. The inside antenna must be located a minimum of 12" from the DA4000SBR amplifier unit. The antenna can be located farther away and extended with the proper coaxial cable.

Where is the best location to install the inside antenna on the DA4000MR, DA4KMR?

Try to locate the inside antenna as central to the desired operation area as possible. The inside antenna should be located away from metal objects and electronics. The inside antenna must be located in a visible location and not behind an object. The antenna can be located farther away and extended with the proper coaxial cable.

Can I extend the inside antenna cable?

Yes, the inside antenna cable can be extended up to 10' with Digital Antenna's exclusive DA340 or RG-8X cable. Contact your local dealer.

How far should the inside white antenna be from the DA4000SBR, DA4KSBR or DA4000MR, DA4KMR amplifier box?

The inside antenna must be located a minimum of 12" from the DA4000SBR, DA4KSBR or DA4000MR, DA4KMR amplifier unit. The antenna can be located farther away and extended with the proper coaxial cable.

Can I use a different inside antenna?

Only Digital Antenna authorized products may be used with the DA4000SBR, DA4KSBR or DA4000MR, DA4KMR system. Using unauthorized equipment with the DA4000SBR, DA4KSBR system will harm the system, void the warranty and can be detected in the event of a failure.

I am next to the white inside antenna, but when I move 1' away, it does not work. Why?

The most likely possibility is the system is improperly installed and has a low level oscillation that desensitizes the receiver electronics of the cell phone. To correct this, relocate the positions of the outside and inside antennas, making them farther apart from each other.

Another possibility is that the outside antenna is mounted in an area that has a very marginal signal. To correct this, relocate the outside antenna to an area that has more signal as indicated by your cell phone. Also, check all connectors and cable. Connectors should be securely connected to the amplifier and antenna. NEVER USE A TOOL TO TIGHTEN THE CONNECTORS!

FAQ: Outside Antenna

What other cellular antenna can I use with your amplifier and amplifier/repeaters?

Any of Digital Antenna's dual band cellular antennas may be used with the DA4000, DA4000MR and DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U system. They are available in many mounting styles and in a white or black high gloss finish.

Can I use an existing antenna and cable with the DA4000MR or DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U?

Yes, if it is a dual band cellular antenna manufactured by Digital Antenna Inc. Only Digital Antenna authorized products may be used with the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U system. Using unauthorized equipment with the

DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U or DA4000MR, DA4KMR will harm the system, void the warranty and can be detected in the event of a failure.

Can I install the outside or inside antenna upside down?

Antenna patterns vary between the top and bottom lobes. For maximum coverage of the DA4000MR, DA4KMR or DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U system, the antennas must be installed with the connectors on the bottom in a vertical position.

Where is the best place to install the outside antenna?

The fiberglass antenna rod must be 3' away from metal and 6 meters horizontally away from persons, in a location high enough to be free from any obstructions, and in the strongest signal area as indicated by your cell phone.

Can I install the outside antenna next to a metal pole? How far does the antenna have to be mounted from other metal objects?

The outside antenna can be mounted on a metal pole, but the fiberglass rod can not be next to metal. The outside antenna fiberglass rod must be at least 1 meter away from any metal object, including a tin roof. For maximum performance, the outside antenna should be clear of all obstructions by 6'.

Can I use a yagi antenna with the DA4000MR, DA4KMR or DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U?

In poor signal areas, you may have to use a yagi antenna to receive a suitable signal from the tower. Using a yagi will limit the repeater unit to only operate on a single band; therefore, it will be necessary to determine whether you want to use the high or low band prior to choosing the yagi. Another option is to use two yagi antennas, one low band and one high band, in combination with our [DA-2100 Combiner](#). Your dealer can help you choose a suitable yagi antenna.

FAQ: Poor Signal Quality

Why do I only have a small coverage area?

The most likely possibility is that the system is improperly installed and has a low level oscillation that desensitizes the receiver electronics of the cell phone. To correct this, relocate the positions of the outside and inside antennas, making them farther apart from each other.

Another possibility is that the outside antenna is mounted in an area that has a very marginal signal. To correct this, relocate the outside antenna to an area that has more signal as indicated by your cell phone. Also, check all connectors and cable. Connectors should be securely connected to the amplifier and antenna. NEVER USE A TOOL TO TIGHTEN THE CONNECTORS!

I have no signal outside. Will the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U help me?

You must receive at least a -90 dB signal from the tower to operate the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U or DA4000MR, DA4KMR system. In poor signal areas, you must use a yagi antenna to receive a suitable signal from the tower. Using a yagi will limit the repeater unit to only operate on a single band; therefore, it will be necessary to determine whether you want to use the high or low band prior to choosing the yagi. Another option is to use two yagi antennas, one low band and one high band, in combination with our [DA-2100 Combiner](#). Your dealer can help you choose a suitable yagi antenna.

FAQ: Cable and Connectors

Why does the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U include 50' of cable?

For the average installation, this will be sufficient for the required 40' of separation. Longer cables in 75' and 100' lengths are available for purchase through your dealer.

I need more cable to install the outside antenna. What cable should I use?

Digital Antenna manufactures pre-assembled cables in 75' and 100' lengths. This low loss PowerMax cable is designed to be used with the PowerMax amplifier and repeater product line. The only suitable replacement is LMR series cables (LMR400 or LMR600).

When I was installing the cable the connector fell off. What do I do?

Only replace a connector with the proper type for the cable and with the proper crimping tool to assure a factory quality connection. NEVER replace a connector with a sub-

standard quick connect style connector. NEVER try to push a connector back on the cable; a new connector is required.

Can I use the cable that is already installed on my boat or in my house?

It is best to use the cable included in the system. The DA4000MR, DA4KMR and DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U includes premium low loss cable with a factory attached connector. The system will not work with improper cable. Only 50 Ohm Digital Antenna cellular cable or Times Microwave LMR equivalent cable can be used. Check cable specifications and choose the proper cable type based upon cable run length. If the cable run is too long with the improper cable type, all signal will be lost in the cable.

DO NOT USE RG58 cable for cellular! DO NOT USE TV or satellite cable (such as RG6) for cellular!

What type of connectors can I use?

ONLY USE CONNECTORS RATED FOR CELLULAR FREQUENCIES! Mini-UHF, N-type, TNC and SMA are rated for cellular frequencies. PL-259 or UHF connectors are not rated for cellular frequencies. F-type connectors are 75 ohm and should never be used for cellular. DO NOT USE UHF or F-TYPE CONNECTORS FOR CELLULAR!

What happens if I use a PL-259 or UHF connector with a cellular amplifier or amplifier/repeater?

A PL-259 or UHF connector is rated for a maximum of 300 MHz. Cellular frequencies are 800 and 1900 MHz. A PL-259 or UHF connector will leak 80% or more of the RF signal. No signal will get to the antenna, and RF frequency leaking out of the connector will cause an oscillation.

FAQ: FCC and Cellular Carriers

Does the owner of this equipment (installed location) require an FCC license to operate the repeater?

No, neither the user nor the installer needs an FCC license. All of our products are FCC approved. In the instruction manual, you will find guidelines to follow to comply with all FCC requirements, such as proper separation between antennas, and persons must be 6 meters horizontally away from outside antenna.

Do the cellular providers accept the use of cellular repeaters?

Not all amplifiers are tower friendly. All of our amplifiers have dynamic variable gain control so that the tower is never overpowered. We are the only manufacturer with carrier approvals.

Although the carriers own the frequencies that they operate on, are they permitting others to do the same with the repeaters?

The cell phone, which is paid for by the customer, is transmitting on the specified frequency, not the repeater. The repeater is simply improving the signals. The repeater amplifies only the signal of the cell phone that is authorized to be used at the specific frequency.

If a cellular repeater is installed and causes interference that cannot be corrected, will the FCC or others require it to be removed?

If a repeater is not installed properly, it can create an oscillation that can cause interference on that frequency. The FCC can find this oscillation and require it to be corrected. Digital Antenna repeaters have a power down circuit that will lower the gain of the amplifier when an oscillation is detected. If the oscillation is very strong, it can burn out the amplifier chip. PROPER INSTALLATION IS VERY IMPORTANT. Standard high frequency installation guidelines should be used for the proper cabling, separation and connectors. Improper connectors like PL259s can cause many problems.

Why can I only use your antennas and cables with the DA4000, DA4000MR, DA4KMR or DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U?

The DA4000, DA4000MR, DA4KMR and DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U are high performance, technologically advanced RF amplifiers. They are tested as a system and provide performance specified by the FCC approval. An improperly matched antenna (one with a high SWR) or cable can damage the amplifier unit, cause it to operate in violation of FCC specifications and void the warranty.

Can I use the amplifier with my existing external cellular antenna?

The FCC requires that the amplifier only be used with Digital Antenna brand cellular antennas or an antenna authorized by Digital Antenna, Inc.

FAQ: General Questions

Can I leave your amplifier or amplifier/repeater on all the time?

All Digital Antenna amplifiers can remain on all the time; however, do not leave the automobile amplifier on if the vehicle is not going to be used for more than 1 week.

There is no adapter cable for my phone. What do I do?

The cell phone manufacturers determine which phones have antenna ports. If the phone is not designed with a port, you must change to a cell phone that has an antenna port or use a wireless amplifier/repeater.

Can I buy just the amplifier/repeater unit?

No, the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U and DA4000MR, DA4KMR amplifiers are sold and tested as a system. The antennas and cable are a tuned system. Poorly tuned antennas may cause system failure. Only Digital Antenna authorized products may be used with the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U and DA4000MR, DA4KMR systems. Using unauthorized equipment with the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U and DA4000MR, DA4KMR systems will harm the system, void the warranty and can be detected in the event of a failure.

I have tech questions. Who do I contact?

Your first level of technical support is your dealer. If your dealer cannot answer your questions, send your inquiry via e-mail to support@digitalantenna.com.

I need installation help. Who do I contact?

Contact your dealer. Your dealer has the expertise to assist you with installation questions and can provide you with any accessories needed for your custom installation. The dealer may also be able to direct you to a technician to verify your installation.

Can I send my amplifier or antenna to Digital Antenna to test?

Digital Antenna will test your amplifier or antenna for a fee. Amplifier and amplifier/repeaters have a \$75 bench test fee. An antenna bench test fee is \$25.

I've read all FAQs and followed all instructions and my amplifier doesn't work. How do I send it to Digital Antenna to test?

Have your serial number ready, and call Digital Antenna at 954-747-7022 to receive an RMA (return materials authorization) number.

Every product is 100% tested and working when it leaves the Digital Antenna factory. Digital Antenna warrants all material defects and workmanship (read our [complete warranty](#)). Any customer alterations or damage voids the warranty. Using unauthorized products with amplifiers can be detected and voids the warranty.

Products repaired under warranty will be returned with the same packaging and accessories as received by Digital Antenna. Refurbishment is available for a fee. If no problem is found, a \$75 bench test fee plus shipping costs will be charged to the customer.

Can I use the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U or DA4000MR, DA4KMR for Nextel?

No, the DA4000SBR, DA4000SBR-50U, DA4KSBR, DA4KSBR-50U or DA4000MR, DA4KMR amplifiers are designed for use with all cellular systems in the USA and Canada, except Nextel's iDEN network. For Nextel, use our [DA4000N 3 Watt Dual Band Direct Connect Amplifier](#).

Can I use a Digital Antenna amplifier in Europe?

Digital Antenna amplifier models DA4000, DA4KMR-10A, DA4KMR-30U and DA4KSBR-50U operate on the 800 and 1900 MHz cellular bands. These models do not operate on iDEN, Nextel or European GSM networks. Our DA4000N amplifier operates on the iDEN network. We currently do not manufacture an amplifier for the European GSM network.

FAQ: Antennas and Other Products

Since the name of the company is Digital Antenna, can I still use the antenna for my analog applications?

Digital Antenna is the company name. All of our antennas perform equally well for both digital and analog communications.

Is a ground plane required for our antennas?

No. As a result of our design and the tuning that we perform at our factory, no ground plane is required.

What makes your antenna different from your competitors?

- All of our antennas are hand assembled and tuned for maximum gain.
- All of our connections are soldered, whereas our competitors use mechanical joints (crimping), which is less reliable and often fails under saltwater conditions.
- Digital Antenna uses its exclusive marine grade low loss UV stable RG-8X cable to reduce transmission line loss in all Digital Antenna marine antennas.
- All of our antenna bases are epoxy glued and filled with silicone base caulking to ensure a complete watertight seal. Our competitors use rubber gaskets and do not fill the ends. Often, the rubber gaskets fail with time.
- Bottom Line: Our antennas are superiorly made, more reliable and outperform all other antennas on a category by category basis.

What should be the main reason to buy your antenna?

The antenna is part of your life support system during an emergency. Reliability should be the main decision factor in purchasing our antenna. The radio and antenna act as one system that must perform in all weather conditions and at maximum range. Simply put, having a good radio with a poor antenna does not give you the best odds when you are in a distress situation. It is our belief that Digital Antenna has the best and most reliable product on the market -- one that beats the competition in both gain and distance, resulting in an increased safety margin.

Is it true that the higher the antenna, the further the transmission and the better the reception?

Yes, in general, that can be one of the factors influencing performance. However, for most uses, mounting the antenna in the usual locations is acceptable.

Does the gain of the antenna really matter?

Yes, it does. The gain of an antenna translates to greater distance for transmission and reception. A gain of 6db usually results in a performance increase of four times the radio's power output and eight times with a 9dB gain. However, other factors can be equally important, including the tuned frequency of the antenna and its SWR. Digital Antenna tunes all of its products in accordance with the median frequency of usage, (i.e., VHF will be tuned for 156.8 MHz). Our SWR ratio approaches 1:1, reducing most of the losses associated with our competitors' antennas. All of these factors are important when it comes to choosing an antenna.

I seem to have a high SWR reading on my Digital antenna. What should I do?

The Bandwidth VSWR on every Digital Antenna brand antenna is <1.5:1. Every antenna is tested before leaving our facility. It does not ship if it does not meet our specifications. Make sure the cable is not coiled or kinked. Check the adapter and verify that it is securely attached to the mini-UHF female connector on the cable. Also, the antenna must be clear of any metal objects including other antennas.

Why should I purchase your cellular antenna? Isn't the one on the phone good enough?

Our cellular antennas are designed and tuned for maximum gain of 9dB. The little antenna on your cell phone simply does not have any gain or range.

How do I know if the cellular antenna on my boat is dual band?

Competitors' cellular antennas manufactured before the year 2000 are most likely not dual band. All Digital Antenna cellular antennas will work with analog, digital, dual band and tri-mode phones, including the cellular services CDMA, TDMA, PCS, GSM, DCS, iDEN and AMPS. All Digital Antenna cellular antennas manufactured since 1998 will perform with all of these phones and services.

What is the minimum distance that I can mount the antenna from the radio?

In order for no squealing to occur from transmission interference, you must mount the antenna no less than 3' away. Of course, the greater the power of the radio, the greater the minimum distance.

Can I use your antenna for land based applications?

Yes. Our antennas are superiorly constructed and are available with a variety of mounting options. Check your mounting needs.

How do I know what phone model I have?

The phone's model number is printed on the back of the phone under the battery (the battery has to be removed; doing this will not harm any stored information). Contact your dealer to purchase Digital Antenna products or visit our [Dealer Locator](#) page to locate a dealer near you.

Why should I choose your amplifier?

PowerMax amplifiers designed and manufactured by Digital Antenna are the only amplifiers to be honored for outstanding design and innovation. Digital Antenna amplifiers have been honored by the Consumer Electronic Association (CES), National Marine Electronics Association (NMEA), National Marine Manufacturing Association (NMMA) and Sail Magazine's Pittman Award. See our [Press Release](#) page for more details.

[Home](#) | [About Us](#) | [Contact Us](#) | [My Account](#) | [Policies \(Shipping, Return & Privacy\)](#) | [Sitemap](#) | [Cart Help](#)

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Attachment F

Congressional Letter to
Chairman Martin

Congress of the United States
Washington, DC 20515

March 6, 2008

The Honorable Kevin Martin
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Dear Chairman Martin:

Over 250 million consumers and businesses use wireless services and increasingly rely on their mobile handsets for personal safety. The public safety community is also increasingly looking to commercial wireless networks to provide essential communications during emergencies and disasters.

Regrettably, the dependability of all wireless communications – either commercial or public safety communications in bands adjacent to commercial frequencies – is now being threatened by the marketing and use of devices that unlawfully transmit radio signals on frequencies licensed for commercial wireless services. Although the Communications Act and the Commission's rules prohibit intentional interference with wireless communications, it is our understanding that the FCC recently has received requests to operate or relax the use of "jamming" equipment that fail to acknowledge the potential resulting harms. We fear that the unauthorized use of such devices will hinder wireless subscribers' and first responders' access to reliable wireless communications in emergency situations.

Additionally, businesses and individuals are increasingly engaging in the "self-help" practice of installing and operating wireless boosters and repeaters in an unauthorized manner. Boosters and repeaters work at the expense of surrounding users who suffer reduced quality and availability of service and impaired access to the personal and public safety benefits of commercial wireless service, including enhanced 911.

Accordingly, we urge the Commission to dismiss the jammer petitions and issue a declaratory ruling that 1) makes it explicit that the sale and use of cellular jammers, with the exception of sales to and use by the federal government, is unlawful; and 2) the unauthorized sale and use of wireless boosters and repeaters is unlawful.

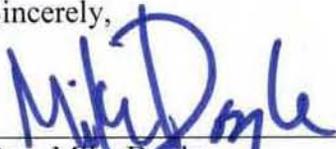
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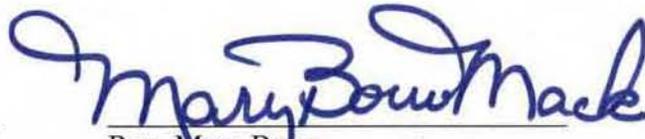
The Honorable Kevin Martin

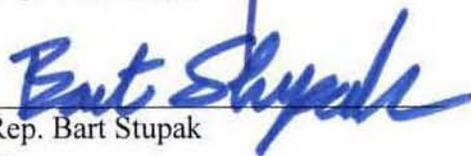
March 6, 2008

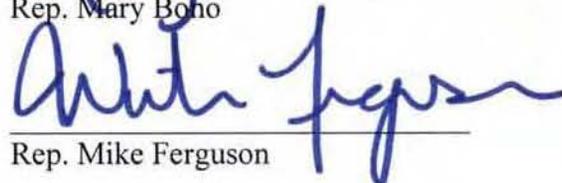
Congress and the Commission have wisely and repeatedly recognized the important role of commercial wireless services in promoting public safety and the reliance of the public on wireless services during times of crisis and emergency. It would be contrary to the intent of E-911, Priority Access Service, the Warning, Alert, and Response Network (WARN) Act and the Communications Act to permit the unlawful sale and use of cellular jamming and unauthorized booster and repeater equipment.

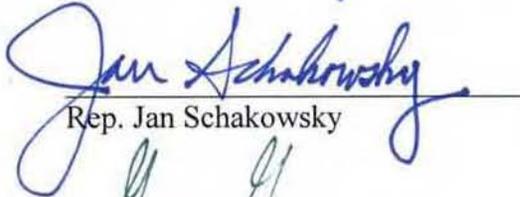
Sincerely,

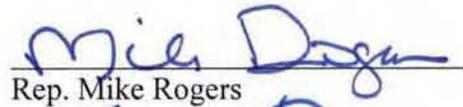

Rep. Mike Doyle


Rep. Mary Bono

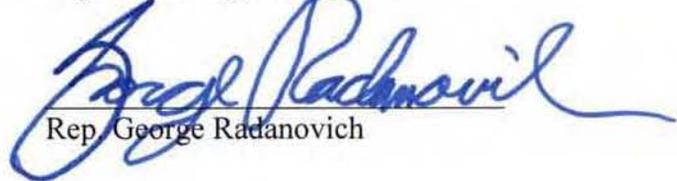

Rep. Bart Stupak


Rep. Mike Ferguson


Rep. Jan Schakowsky


Rep. Mike Rogers


Rep. Gene Green


Rep. George Radanovich


Rep. Jay Inslee

cc: Commissioner Michael Copps
Commissioner Jonathan Adelstein
Commissioner Deborah Tate
Commissioner Robert McDowell

Attachment G

Public Safety Letters to FCC



**Facilities Development &
Operations
Electronic Systems &
Security Division**

2601 Vista Parkway
West Palm Beach, FL 33411
TELEPHONE: (561) 233-0801
FAX: (561) 233-0802



**Palm Beach County
Board of County Commissioners**

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Jeff Koons, Vice Chair

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Mary McCarty

Burt Aaronson

Jess R. Santamaria

County Administrator

Robert Weisman, P.E.

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*"An Equal Opportunity
Affirmative Action Employer"*

March 27, 2008

Chairman Kevin J. Martin
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Chairman Martin:

As an FCC licensee that operates a public safety communication system, we are writing this letter to express our serious concerns regarding the use of cellular wireless boosters and repeaters. In recent months we have been advised of a dangerous increase in the amount of interference to 800 MHz public safety systems in the immediate area, which we largely attribute to the growing use of Part 15 wireless boosters and repeaters by end users. In Florida, interference problems are particularly pronounced due to the numerous amounts of Public Safety 800 MHz systems state-wide and the area has experienced multiple instances of interference that threatened the soundness of those licensed communications systems. This interference jeopardizes the safety of the public, as well as the lives of first responders and emergency workers that rely on 800 MHz public safety systems for robust and secure communications.

In response to the escalating interference problems in Florida, the public safety agencies have worked closely with wireless carriers and the Commission to address interference problems on a case-by-case basis. But this piecemeal enforcement approach is woefully inadequate and will not preserve the integrity of public safety communications systems over the long run. Accordingly, we urge the Commission to quickly develop and implement a national plan to resolve the interference problems caused by these wireless boosters and repeaters. Absent Commission action, interference events will continue to detrimentally affect public safety radio systems.

We look forward to working with the Commission to resolve this serious matter as soon as possible.

Respectfully submitted,

A handwritten signature in black ink that reads "Audrey Wolf".

Audrey Wolf, Director
Facilities Development & Operations

cc: The Honorable Michael Copps, Commissioner, FCC
The Honorable Jonathan Adelstein, Commissioner, FCC
The Honorable Deborah Tate, Commissioner, FCC
The Honorable Robert McDowell, Commissioner, FCC
Derek Poarch, Chief of the Public Safety and Homeland Security Bureau
Fred Campbell, Chief of the Wireless Telecommunications Bureau
Julius Knapp, Chief of the Office of Engineering and Technology
Kris Monteith, Chief of the Enforcement Bureau
Robert Weisman, County Administrator, Palm Beach County
Mark Filla, Radio System Manager, Palm Beach County
Ric Bradshaw, Sheriff, Palm Beach County Sheriff's Office
Herman Brice, Chief, Palm Beach County Fire Rescue

**BOARD OF
COUNTY
COMMISSIONERS**



**DEPARTMENT OF
PUBLIC SAFETY**

JACK T. SOUTHARD
DIRECTOR

March 25, 2008

Chairman Kevin J. Martin
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

CAROLYN DILL-COLLIER — 911 COORDINATOR
CHARLES T. CHRISTOPHER — EMERGENCY MANAGEMENT COORDINATOR
THOMAS E. DALY — RADIOLOGICAL COORDINATOR
KAREN TAYLOR — ANIMAL CONTROL COORDINATOR
ANDREW RITCHIE — MARINE SAFETY COORDINATOR

Dear Chairman Martin:

As the Dispatch and Communications provider for:

The St. Lucie County Sheriff's Office
The St. Lucie County Fire District
The Ft. Pierce Police Department
The Port St. Lucie Police Department

RECEIVED - FCC

APR - 8 2008

Federal Communications Commission
Bureau / Office

We write this letter to express our serious concerns regarding the use of wireless boosters and repeaters. In recent months, we have witnessed a dangerous increase in the amount of interference to our 800 MHz public safety system (WPXK779), which we largely attribute to the growing use of wireless boosters and repeaters. In Florida, interference problems are particularly pronounced. We have experienced multiple instances of interference that threatened the soundness of communications systems. This interference jeopardizes the safety of the public, as well as the lives of first responders and emergency workers that rely on 800 MHz public safety systems for robust and secure communications.

In response to the escalating interference problems in Florida, the public safety agencies above have worked closely with wireless carriers and the Commission to address interference problems on a case-by-case basis. But this piecemeal enforcement approach is woefully inadequate and will not preserve the integrity of public safety communications systems over the long run. Accordingly, we urge the Commission to quickly develop and implement a national plan to resolve the interference problems caused by wireless boosters and repeaters. Absent Commission action, interference events will continue to detrimentally affect public safety radio systems.

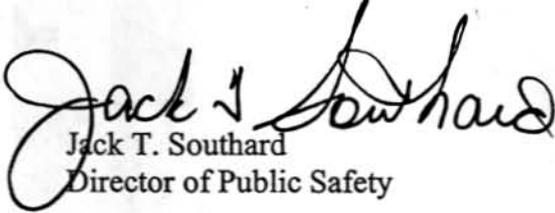
We look forward to working with the Commission to resolve this serious matter as soon as possible.

JOSEPH E. SMITH, District No. 1 • DOUG COWARD, District No. 2 • PAULA A. LEWIS, District No. 3 • CHARLES GRANDE, District No. 4 • CHRIS CRAFT, District No. 5
County Administrator - Douglas M. Anderson

101 North Rock Road • Fort Pierce, Florida 34945-3438

Phone (772) 462-1736 - Public Safety Office • (772) 465-5770 - 911 Office Line • (772) 461-5201 - Emergency Management
Phone (772) 461-6496 - Radiological • (772) 462-2355 - Marine Safety • (772) 461-6177 - Animal Control

Respectfully submitted,


Jack T. Southard
Director of Public Safety

cc: The Honorable Michael Copps
The Honorable Jonathan Adelstein
The Honorable Deborah Tate
The Honorable Robert McDowell
Derek Poarch, Chief of the Public Safety and Homeland Security Bureau
Fred Campbell, Chief of the Wireless Telecommunications Bureau
Julius Knapp, Chief of the Office of Engineering and Technology
Kris Monteith, Chief of the Enforcement Bureau
Sheriff Ken Mascara, SLSO
Fire Chief Ron Parrish, SLCFD
Chief Sean Baldwin, FPPD
Chief John Skinner, PSLPD
Douglas Anderson, County Administrator
Faye Outlaw, Asst. County Administrator
Lee Ann Lowery, Asst. County Administrator