

**Before the
Federal Communications Commission
Washington, DC 20554**

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|--|---|---------------------|
| In the matter of: | } | |
| Interference Immunity Performance Specifications for Radio Receivers | } | ET Docket No. 03-65 |
| Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television | } | MM Docket No. 00-39 |

TO: The Commission

**REPLY COMMENTS OF
PAPPAS TELECASTING COMPANIES**

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SUMMARY

The need for regulatory parity among DTV reception devices is critical for the successful transition to digital television. As reflected in the pending Plug and Play MOU, the consumer electronics and cable industries have developed minimum performance standards for cable interoperability. Since tens of millions of Americans receive their television signals over-the-air, Pappas urges similar regulatory protection for them and submits the Commission can do no less for over-the-air TV consumers than for cable service consumers.

Recent studies conclusively demonstrate the inadequacy of existing over-the-air receiver technology. Pappas urges the Commission to adopt the minimum performance standards that the Advanced Television Systems Committee, Inc. ("ATSC") is expected to adopt by the end of the year. Contrary to the argument of the Consumer Electronics Association ("CEA") and members of the consumer electronics industry that the adoption of minimum performance standard will stifle technological innovation, the adoption of these standards will establish a baseline of acceptable over-the-air receiver performance, which will spur demand for digital television among over-the-air viewers. Moreover, it will establish a performance floor from which innovation and technological advance will proceed. The Commission should also adopt a uniform labeling system for DTV receivers so that customers can readily discern the performance abilities of DTV receivers made available to the marketplace.

Broadcasters have met the requirements for developing, constructing, and now, operating first-class digital television facilities. Now the FCC must ensure that the American public will enjoy the rich benefits of digital television by adopting

meaningful minimum receiver performance standards for the millions of over-the-air viewers in the United States.

TABLE OF CONTENTS

| | |
|---|-----|
| Summary | ii |
| Table of Contents | iii |
| Discussion | |
| A. Commission Precedent and Congressional Direction Requires The Adoption of DTV Minimum Receiver Performance Standards. | 5 |
| B. The Record In This Proceeding Supports the Adoption of Minimum DTV Receiver Performance Standards. | 9 |
| C. Market Forces Have Not Resulted In Consistent, Reliable Digital Television Receiver Performance. | 12 |
| Conclusion | 15 |

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Pappas Telecasting Companies ("Pappas"), by and through its attorneys, submits the following Reply Comments in response to comments filed in the above-referenced proceeding. On March 24, 2003, the Commission released a *Notice of Inquiry*¹ in this proceeding, seeking comment on whether the adoption of minimum DTV receiver performance standards would encourage the efficient utilization of the digital television spectrum, and whether such minimum performance standards are necessary to ensure adequate over-the-air performance of digital television receivers.

In its Comments filed on July 21, 2003 (the "Comments"), Pappas noted that tens of millions of Americans receive their television programming over the air. Pappas further noted that, in mandating the phased-in incorporation of tuners capable of adequately decoding DTV signals in all digital television receivers 13" or

¹ *Interference Immunity Performance Specifications for Radio Receivers, Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, Notice of Inquiry*, 18 FCC Rcd 6039 (2003) (the "NOI").

larger by July of 2007,² the Commission determined that the public interest was served by protecting these tens of millions of over-the-air viewers. Pappas also noted that the consumer electronics industry vehemently opposed the DTV tuner mandate and continues to challenge it through the courts,³ while representatives of the consumer electronics industry have publicly disparaged the importance of over-the-air reception.⁴ At the same time, the Consumer Electronics Association (“CEA”) and representatives of the consumer electronics industry insist that the execution of this crucial public interest requirement ought to be entrusted entirely to an industry which appears to be lacking the market incentives to fulfill its regulatory obligations in a manner consistent with the letter and spirit of the DTV Tuner Order.

With less than eleven months to go before the DTV tuner mandate is to go into effect, it is clear that the consumer electronics industry still has a long way to go in developing DTV receivers that adequately decode over-the-air signals. Contrary to CEA’s unsupported assertions, *several recent studies demonstrate the inadequacy of existing over-the-air receiver technology even when tested in major markets where all or most DTV stations are operating at full power.* Therefore,

² *Review of the Commission’s Rules and Policies Affecting the Conversion to Digital Television*, Second Report and Order and Second Memorandum Opinion and Order, 17 FCC Rcd 15,978 (2002) (“DTV Tuner Order”).

³ *See Consumer Electronics Association v. FCC*, Case No. 02-1312 (D.C. Cir., filed October 11, 2002).

⁴ *See FCC Orders Digital Tuners in TVs by ‘07*, Electronic Media, 1A (Aug. 12, 2002) (“Most consumers don’t need [a DTV tuner] because they get signals through cable”); *See also Feds Mandate Digital TV Tuner*, The Boston Herald, 27 (Aug. 9, 2002) (“With fewer than 13 percent of American households relying on over-the-air reception of their TV signal, we don’t need a digital broadcast tuner embedded in every new television in order to accelerate the DTV transition”); *FCC Orders Set Manufacturers to Include DTV Tuner*, Communications Daily (Aug. 9, 2002) (Quoting CEA President Gary Shapiro “the [DTV Tuner] decision was wrong because 90% of Americans didn’t need tuners because they received their broadcast signals through cable or satellite”).

Pappas respectfully submits that the Commission has both the regulatory authority⁵ and the duty to give substantive effect to the Commission's tuner mandate by ensuring that meaningful minimum performance standards are developed and implemented by representatives of the affected industries.

As Pappas has previously maintained, the transition to digital television will continue to stall in the absence of adoption by over-the-air viewers. The Commission must therefore adopt as active a regulatory approach for over-the-air viewers that it found advisable and necessary to adopt in order to facilitate the transition to DTV by cable viewers as reflected in the pending "plug and play" Memorandum of Understanding.⁶ Having encouraged, and indeed prodded, the cable and consumer electronics industries to reach agreement on cable interoperability in recognition of its critical importance to advancing the digital transition, why would the Commission choose to take a less active approach in ensuring the same degree of protection for consumers who receive television over the air?

As Pappas noted in its Comments, regulatory parity is one of the central tenets of the Commission's regulatory regime.⁷ Therefore Pappas urged the FCC to accord fundamental regulatory parity to over-the-air viewers by adopting the same

⁵ All Channel Receiver Act of 1962, P.L. No. 87-529, 76 Stat. 150 (codified at 47 U.S.C. 303(s)) ("ARCA"). See also footnote 2, *supra*.

⁶ See *Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, and Compatibility Between Cable Systems and Consumer Electronics Equipment*, Further Notice of Proposed Rulemaking, 18 FCC Rcd 518 (2003) ("Plug and Play MOU").

⁷ See footnote 10, *infra*.

type of minimum performance standards the Commission has encouraged and endorsed through the proposed adoption of the "plug-and-play" rules.⁸

Lastly, Pappas urged the Commission to adopt a uniform labeling system which would provide valuable information regarding the performance of digital television sets, and inform consumers whether a particular digital television set meets the ATSC minimum performance standards for receiving over-the-air digital programming, and whether it is "cable-ready", i.e., whether it complied with the Commission's "plug-and-play" rules. Therefore, Pappas urges the Commission to actively monitor and encourage the voluntary minimum receiver performance standards currently being developed by ATSC and to require that the "Recommended Practice" be put out for public comment and incorporation in the Commission's rules along with the adoption of a uniform labeling system for digital television sets. In so doing, the Commission should expect that ATSC would adopt performance standards that, at a minimum, would at least meet the FCC's Planning Standards used in adopting the DTV Table of Allotments.⁹ Thus, the adoption of minimum receiver performance standards would need to address these Planning Standards, and also provide sufficient multipath tolerance.

Given the required development and marketing of television sets with DTV tuners by July 1, 2004, the adoption of minimum performance standards for over-the-air reception is both urgent and vital. When coupled with a labeling regime for compliant television receivers, the adoption of such standards would provide

⁸ *Comments*, p 18..

⁹ *See Advanced Television Systems*, Sixth Report and Order, 12 FCC Rcd 14588, Appendix A (April 21, 1997)(establishing the FCC standards for developing the DTV Table of Allotments) (the "DTV Planning Standards").

incentives for the public to purchase digital television equipment and would thereby jump-start the stalled transition to digital television. Pappas affirms the points raised in its Comments, and herein addresses several of the arguments raised by opponents of the adoption of minimum receiver performance standards. Given the rapid production schedule required by the Commission for DTV tuners, the Commission simply does not have the luxury to wait and see whether the consumer electronics industry faithfully executes the Commission directive in the DTV Tuner mandate. Pappas believes that the Commission must act now to ensure that the American public adequately receives over-the-air digital television signals. It is, after all, the public's interest that should be the Commission's paramount consideration. Before America's consumers invest hundreds of millions or billions of dollars in DTV receivers, Pappas respectfully submits that the Commission has a duty to establish minimum performance standards which at least meet the FCC's Planning Standards used in establishing the DTV Table of Allotments plus a vitally needed multipath standard.

DISCUSSION

A. Commission Precedent and Congressional Direction Requires The Adoption of DTV Minimum Receiver Performance Standards.

The Commission has long stressed the importance of establishing regulatory parity among its regulated industries.¹⁰ In fact, Congress has specifically directed

¹⁰ *Telecommunications Services Inside Wiring*, First Order on Reconsideration and Second Report and Order, 18 FCC Rcd 1342, ¶80 (2003)(establishing regulatory parity among all MVPD providers with respect to inside cable wiring); *See also Review Of The FCC's Broadcast And Cable Equal Employment Opportunity Rules And Policies And Termination Of The EEO Streamlining Proceeding*, Report and Order, 15 FCC Rcd 2329, ¶ 192 (2000) (establishing regulatory parity among broadcasters and cable operators with respect to EEO requirements); *Amendment Of Part 90 Of FCC's Rules To Facilitate Future Development Of SMR Systems In The 800 MHz Frequency Band*, Memorandum Opinion and

the Commission to take the necessary steps to ensure regulatory parity among similarly situated services.¹¹

An early effort to establish regulatory parity was the enactment of the All Channel Receiver Act ("ARCA").¹² In enacting ARCA, Congress sought to ensure parity among the UHF and VHF services. At that time, market forces had not resulted in all television receivers being capable of receiving both VHF and UHF television signals, and Congress found it necessary to provide the Commission with specific authority to require "adequate" reception of ***all*** over-the-air television signals.¹³ The authority granted the Commission in ARCA is clearly applicable in the instant context and, indeed, the Commission has recognized that it has the duty to employ that authority.

Nearly forty years later, the Commission finds itself in very similar circumstances with respect to over-the-air reception of digital television signals. The need for parity among over-the-air, cable, and satellite receivers is highlighted

Order on Remand, 14 FCC Rcd 21679, ¶¶ 12, 23 (1999)(establishing regulatory parity among commercial wireless service providers with respect to build-out requirements); *In The Matter Of Revision Of Part 22, And Part 90 Of The Commission's Rules To Facilitate Future Development Of Paging Systems*, Memorandum Opinion and Order on Reconsideration, 14 FCC Rcd 10,030 (1999); *See also Amendment Of Part 90 Of The Commission's Rules To Adopt Regulations For Automatic Vehicle Monitoring Systems*, Second Report and Order, 13 FCC Rcd 15182, ¶17 (1999); *Amendment Of Part 95 Of The Commission's Rules To Provide Regulatory Flexibility In The 218-219 MHz Service*, Report and Order and Memorandum Opinion and Order, 15 FCC Rcd 1497, ¶ 31 (1999)(establishing regulatory parity among commercial wireless service providers with respect to license terms); *Rule Making to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, To Reallocate the 29.5-30.0 GHz Frequency Band, To Establish Rules and Policies for Local Multipoint Distribution Service And for Fixed Satellite Services*, Fourth Report and Order, 13 FCC Rcd 11655, ¶ 32 (1998).

¹¹ See H.R. Rep. 103-213, 103rd Cong., 1st Sess. 494 (1993) (Conference Report) (requiring the FCC to achieve regulatory parity among Commercial Mobile services.).

¹² See ARCA, *supra* note 5.

¹³ *DTV Tuner Order*, ¶ 27 ("The Senate Committee determined that it was necessary to break this cycle and that to do so "must be done by striking at the root cause of the problem – namely, the lack of television receivers capable of receiving UHF signal").

by the recent adoption of the DTV Tuner Order that requires a graduated roll-out of television sets with DTV tuners.¹⁴ In the DTV Tuner Order, the Commission affirmed its statutory authority to require the inclusion of DTV tuners, and adopted a specific schedule for the roll-out of television sets with digital tuners.¹⁵ The Commission expressly rejected arguments made by CEA that the Commission lacked the necessary authority to adopt requirements for the inclusion of DTV tuners.¹⁶ The Commission specifically determined that its authority under ARCA was not limited to the analog transmission service, but to all VHF and UHF television channels, regardless of the transmission technology.¹⁷

In its Comments, Pappas echoed the Commission's assessment in the NOI that it is now necessary for the Commission to adopt new approaches that focus on the interaction between broadcasters' transmitters and the public's receivers. Moreover, as the Commission's Spectrum Task Force concluded, new approaches, focused on the actual interference environment are needed in order to maximize the significant benefits arising from the use of the digital signal.¹⁸ If the Commission fails to adopt minimum performance standards, this will result in an empty criterion for tuners. Such tuners would be devoid of meaningful performance

¹⁴ Under the DTV Tuner Order, half of the large receivers (36" or greater) must contain a DTV tuner by June 1, 2004, and by June 1, 2007, all television sets 13" or greater imported and sold in the United States must contain a DTV tuner.

¹⁵ *DTV Tuner Order*, ¶ 24 ("the ACRA authority empowers the Commission to adopt requirements that television receivers be able to receive the DTV service provided on those channels.").

¹⁶ *Id.*

¹⁷ *Id.*, at ¶ 27.

¹⁸ *Spectrum Policy Task Force Report*, ET Docket 02-135, pg. 33 (rel. Nov. 15, 2002). See also *NOI*, ¶ 9 ("we believe it will be necessary to shift our current paradigm for assessing interference from approaches based primarily on transmitter operations towards new approaches that focus on the actual RF environment and interaction between transmitters and receiver.").

criteria and standards necessary to achieve the intended consumer benefits and national policy objectives established by Congress.

Assuming that the Commission adopts the proposed rules in the Plug and Play MOU, consumers will have the assurance of knowing that any digital television set they purchase will be able to adequately receive digital cable service. However, for the 81 million television sets receiving their signal over-the-air, there will be no such assurance unless the Commission adopts an equivalent regulatory approach.¹⁹ While concurring with the recommendations of the National Association of Broadcasters (“NAB”) and Maximum Service Television, Inc. (“MSTV”) that the Commission actively monitor the progress of ATSC, Pappas does not believe that FCC encouragement and monitoring alone is sufficient at this very late juncture. Instead, Pappas strongly urges the Commission to review, place on public notice, and adopt the ATSC minimum performance standards currently being developed. The Commission’s adoption of a threshold performance benchmark is necessary to protect the millions of over-the-air viewers and to ensure the continuance of a robust over-the-air television service in the United States.

Therefore, Pappas strongly agrees with the Commission that “there could be benefit to an approach that would encourage the development of minimum performance guidelines for DTV receivers.”²⁰ Not only would the adoption of performance standards prior to the large-scale introduction of digital television sets ensure that the American public will purchase fully-functional digital television sets,

¹⁹ *DTV Tuner Order*, Separate Statement of Chairman Powell (citing that there are 81 million televisions sets, and tens of millions of consumers not receiving service from any multichannel video programming service.).

²⁰ *Notice*, ¶ 36.

it will also ensure regulatory parity among the transmission services that deliver digital television for the benefit of all television viewers. Also, the consumers purchasing digital sets to be used initially with cable service will be able to use the same set if the consumers subsequently choose a DBS service or over the air service. From the consumer's point of view, true interoperability means no less.

Pappas finds the current posture of the consumer electronics industry relative to minimum performance standards for over-the-air reception to be indefensible, particularly in view of the "plug and play" precedent. Pappas notes that ATSC is dominated by representatives of the consumer electronics industry and that ATSC's "Recommended Practice" will be developed by consensus. In view of that, Pappas notes with concern the consumer electronics industry's unwillingness to entertain any commitment whatsoever as relates to the most minimum performance requirements that they themselves are chiefly in charge of developing. CEA's posture in this regard hardly inspires confidence in the consumer electronics industry's commitment to over-the-air performance.

B. The Record In This Proceeding Supports the Adoption of DTV Minimum Receiver Performance Standards.

In the initial round of comments in this proceeding, several parties filed comments discussing the relative merits of adopting over-the-air performance standards for digital television sets.²¹ Comments filed by CEA and Zenith urged the Commission against adopting any minimum receiver standards. Despite being a

²¹ *Comments of Consumers Electronics Association*, filed July 17, 2003 ("CEA Comments"); *Comments of Zenith Electronics Corporation*, filed July 17, 2003 ("Zenith Comments"); *Comments of Sinclair Broadcast Group, Inc.*, filed July 17, 2003 ("Sinclair Comments"); *Joint Comments of the Association for Maximum Service Television, Inc. and the National Association of Broadcasters*, filed July 17, 2003 ("MSTV/NAB Comments"); *Comments of Advanced Television Systems Comments, Inc.*, filed July 14, 2003 ("ATSC Comments").

primary participant in the ATSC effort to establish a minimum receiver “Recommended Practice”, CEA maintained – without plausible explanation - that the adoption of performance standards by the Commission would “weaken or remove marketplace incentives for technological innovation.”²² Zenith argued that adoption of receiver standards would be “difficult to monitor, test and enforce.”²³ CEA also attempted to shift the focus away from inadequate receiver performance by suggesting that the currently authorized low-power operations of some DTV stations in medium and small markets was the primary cause of inadequate over-the-air receiver performance.²⁴

MSTV and NAB endorsed the development of voluntary over-the-air receiver standards and encouraged the development and widespread use of the minimum performance standards that are being developed by ATSC. Although both NAB and MSTV have urged the Commission to adopt performance standards for over-the-air reception in the past, they did not urge the adoption of standards by the Commission at this time.²⁵ Rather, in the instant proceeding, MSTV and NAB urge the Commission to actively monitor the development and implementation of the ATSC performance standards.²⁶

While applauding the efforts of ATSC and its members to develop DTV receiver performance standards, Pappas believes that it is too late in the game for the Commission simply to monitor ATSC’s progress. The “Recommended Practice”

²² *CEA Comments*, pg. 5.

²³ *Zenith Comments*, pg. 2.

²⁴ *CEA Comments*, pg. 7, nt. 13.

²⁵ *MSTV/NAB Comments*, pg. 3-4.

²⁶ *Id.*, pg. 4.

adopted by ATSC's S10 Specialist Group must serve as a baseline measure of "adequate" reception of over-the-air digital television signals, as required by ARCA. Provided that ATSC adopts meaningful standards that do in fact ensure a *consistent and reliable* level of performance for the over-the-air consumer, the Commission should take the affirmative step of adopting these minimum performance standards into its rules after appropriate public notice and comment.

As noted above, CEA argues, without any foundation or support whatsoever, that the adoption of performance standards would stifle innovation.²⁷ However, the Commission's adoption of ATSC's minimum performance standards would in no way hinder the development of more advanced equipment. The Commission's adoption of ATSC's performance standards would merely establish a baseline of acceptability from which growth and innovation could occur, and would parallel the approach taken in the Plug and Play MOU.

Given CEA's acceptance of minimum standards for the cable compatibility reflected in the Plug and Play MOU, the consumer electronics industry's assertion that establishing minimum standards for over-the-air reception would impede future improvement in such technology is contrived at best. As CEA and its members know all too well, the adoption of the ATSC minimum performance standards would not set the ceiling on technological developments; rather it would ensure a floor for the over-the-air public. One need look no further than the Plug and Play MOU to refute CEA's baseless assertions.

While the Plug and Play MOU establishes a performance floor for cable compatibility, it leaves the door wide open for future technological developments to

²⁷ CEA Comments, pg. 5.

be incorporated into DTV cable-ready receivers that go beyond the minimum requirements set forth.²⁸ Specifically, Section 1.2 of the Plug and Play MOU limits the obligations and conditions placed on the signatories to only those contained within the document. Moreover, with respect to the cable-ready receivers, Section 3.6.1 establishes the minimum requirements for the receivers, but certainly does not restrict the inclusion of improvements as they are developed in the future. Therefore, CEA's opposition to the adoption of minimum performance standards for over-the-air receivers on the basis that they would stifle innovation is disingenuous at the very best.

C. Market Forces Have Not Resulted In Consistent, Reliable Over-The-Air Digital Television Receiver Performance.

Pappas' concern regarding the current status of receiver performance technology is well grounded. Indeed, it is based on the published results of recent empirical studies which demonstrate that consumer manufacturers have not yet built a reliable over-the-air DTV receiver.

Two of the most recent tests of DTV receivers – both performed in major markets where DTV operation is at full power -- have demonstrated this inadequate performance. First, in May 2002, the Advanced Television Technology Center (ATTC) did a test of eight different DTV receivers that were commercially available in the Washington, D.C. area, and presented its results at NAB2003 in April 2003. A copy of the presentation is attached hereto as Exhibit One.

In the testing of the available receivers, none met the performance levels assumed by the Commission in developing the DTV Table of Allotments.

²⁸ *Plug and Play MOU*, §§ 1.2, 3.6.1.

Specifically, all eight receivers failed to meet the sensitivity standard of -84 dBm utilized in the DTV Planning Standards.²⁹ In addition, all eight receivers failed to meet the DTV Planning Standards for both lower and upper adjacent channel, and “taboo” channel interference protection. Based on these results, ATTC concluded that the DTV receivers failed to meet the DTV Planning Standards for selectivity and sensitivity, and urged the Commission to adopt specific performance requirements for DTV over-the-air receivers.³⁰

Another study, conducted by Linx Enterprises, Inc. in March 2003, compared two DTV receivers with the LINX prototype receiver in Washington, D.C., Baltimore, Maryland, and Philadelphia, Pennsylvania. The results of that study are attached hereto as Exhibit Two.

While the results for the LINX prototype were encouraging, the performance of both DTV reference receivers was very poor. Specifically, the DTV reference receivers failed to receive and hold a digital signal on average more than 60% of the time more.³¹ In fact, in Philadelphia, both DTV receivers failed 75% of the time, and in Baltimore, the receivers failed more than 62% of the time.³²

Although CEA and its members attempt to shirk responsibility for substandard receiver performance by asserting that the authorized reduced operating power of some DTV stations in medium to small markets is the primary

²⁹ See *Exhibit One*. See also *RF at NAB2003: DTV Reception*, TV Technology, July 9, 2003 (http://www.tvtechnology.com/features/On-RF/f_dl_rf_technology-07.09.03.shtml, last visited August 7, 2003).

³⁰ See *Exhibit One*.

³¹ See *Exhibit Two*.

³² *Id.*

cause of inadequate reception,³³ this argument is yet another red herring. Contrary to CEA's assertions, all of the studies that have been completed have tested the reception of full-power DTV stations in major TV markets. In each case, the *receivers failed to satisfy even the Commission's DTV Planning Standards utilized in adopting the DTV Table of Allotments.*

However, even if the Commission were to focus on the power level of the digital stations, CEA's arguments fail. In the top 30 markets in the United States, which serve more than 57 million households, there are 215 television stations that are operating at their authorized power level.³⁴ In fact, at least three of the major network affiliates in the top 25 markets are operating at their authorized power level, and at least two major network affiliates are broadcasting in each of the top 30 markets.³⁵ Therefore, CEA's argument that the cause for the failure of DTV over-the-air receivers is the lack of stations operating at full power falls flat when one looks at the facts.

Clearly, the Commission's goal of promoting the digital transition cannot be accomplished as long as the receivers available to consumers are unable to adequately and consistently receive and process the very over-the-air digital signals that are at the core of the DTV transition. Regardless of the current operation of

³³ *CEA Comments*, page 7, n 13. See also *Thomson Letter*, pg. 5; See also *Sony Letter*, pg. 3. See also *Zenith Letter*, pg. 3. See also *Letter of Thomas M. Hafner*, Philips Consumer Electronics North America, to W. Kenneth Ferree, dated June 20, 2003, pg. 3. See also *Letter of David Kline*, JVC Americas Corp., pg. 4.

³⁴ This figure is derived from comparing the number of digital television stations that are operating, minus the number of stations that are operating with special temporary authority. See <http://www.nab.org/Newsroom/issues/digitaltv/DTVStations.asp>; See also <http://www.fcc.gov/mb/video/files/dtvstas.html> (last visited August 14, 2003).

³⁵ See *Exhibit 3*, attached.

the DTV stations, *it is abundantly clear from the ATTC and Linx studies that current DTV receivers do not yet perform adequately, let alone "well."*³⁶

What is also clear is that, despite CEA's protestations to the contrary, DTV receivers are not adequately receiving over-the-air signals. Instead, the "state-of-the-art" DTV receivers being manufactured cannot receive a digital signal transmitted in accordance with the DTV Planning Standards. Without the establishment and adoption of meaningful over-the-air reception standards, the Commission's DTV Tuner mandate is rendered toothless. Moreover, all the efforts of government and industry to implement the DTV transition may be rendered an historic waste of public and private resources.

CONCLUSION

Based on the record, it is clear that the DTV transition will substantially be derailed unless and until the Commission ensures that all DTV receivers adequately receive over-the-air signals.

The consumer electronics industry has already developed minimum standards for plug-and-play DTV receivers. Those minimum standards are intended to be adopted by the Commission, and compliance with those standards will be evidenced through a labeling regime.

The consumer electronics industry has now - somewhat belatedly - turned its attention to developing minimum performance standards for over-the-air DTV receivers. It is expected that those standards will be completed by December 2003. In order to protect the millions of viewers who receive over-the-air television signals, the Commission must adopt meaningful minimum performance standards

³⁶ *CEA Comments*, pg. 7 ("The record of DTV receiver performance results by uninterested third parties makes clear that the DTV receivers perform well.").

as the threshold performance requirements for over-the-air DTV receivers. Finally, the Commission must adopt a uniform labeling regime for all DTV receivers that will encourage consumers to adopt DTV.

Respectfully submitted,

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**Minimum Performance Targets
for
Digital Television Broadcast Receivers**

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Receiver Performance Targets

- ◆ **FCC planning factors for DTV reception**
- ◆ **Actual reception conditions**
- ◆ **Laboratory performance of consumer DTV receivers**
- ◆ **Performance target recommendations**



Receiver Performance Targets

FCC Planning Factors for DTV Reception



FCC Planning Factors

- ◆ **FCC Rules adopted in the *Sixth Report and Order***
- ◆ ***OET Bulletin No. 69 – Longley-Rice Methodology for Evaluating TV Coverage and Interference***
- ◆ **Analog into DTV**
 - ◆ **Lower adjacent channel D/U ratio, -48 dB**
 - ◆ **Co-channel D/U ratio, +2 dB**
 - ◆ **Upper adjacent channel D/U ratio, -49 dB**
 - ◆ **Taboo channels “do not require attention”**
 - ◆ **D/U ratios are approximately -60 dB**



Receiver Sensitivity and the FCC Planning Factors

| System Component | VHF | UHF | |
|---|---------------|---------------|------------|
| Ideal receiver generated noise power | -106.2 | -106.2 | dBm |
| Receiver noise figure matched to source | 5 | 7 | dB |
| Minimum usable signal-to-noise ratio in a Gaussian channel | 15.2 | 15.2 | dB |
| Minimum signal required at receiver input | -86 | -84 | dBm |

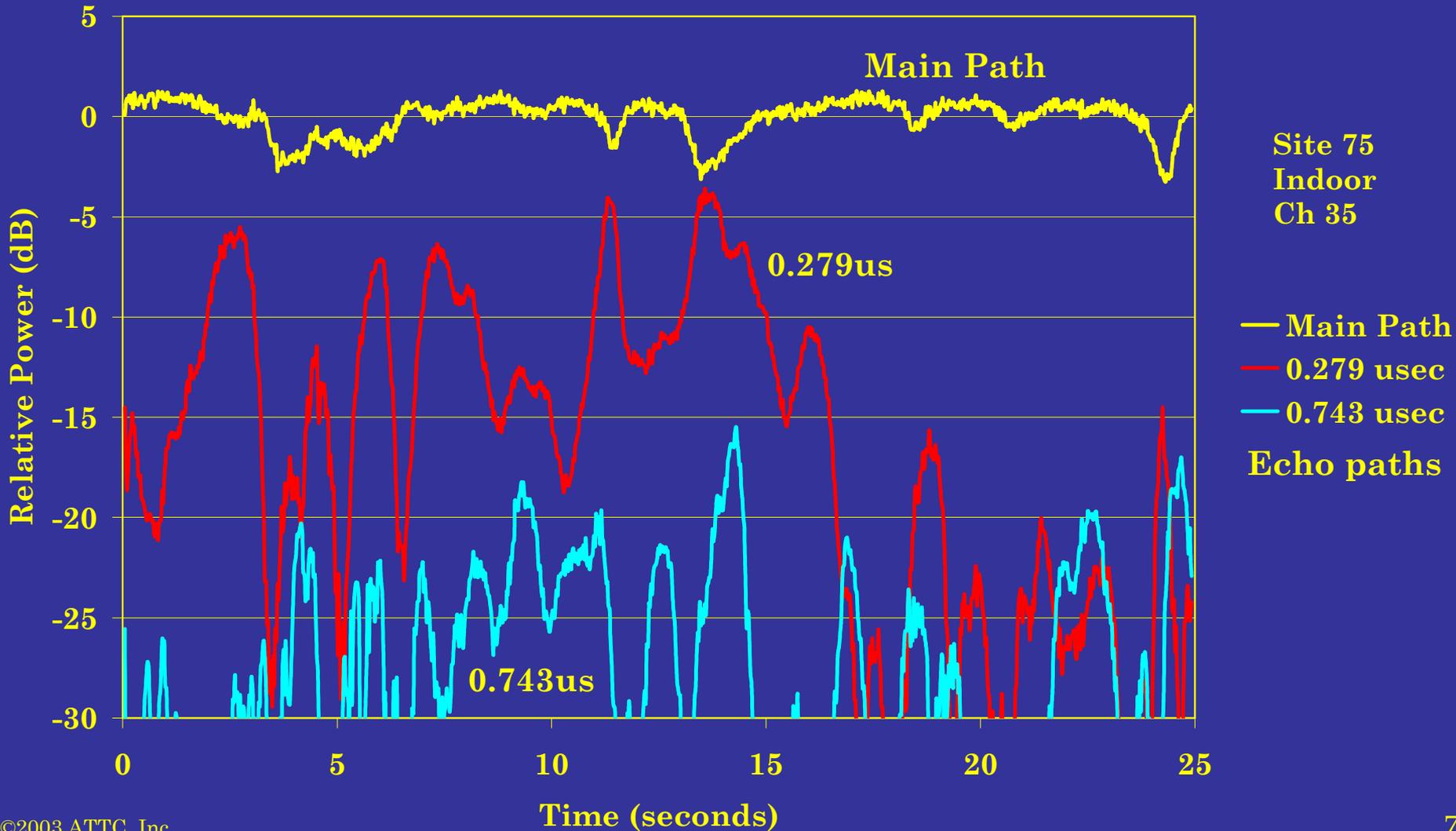


Receiver Performance Targets

Reception Conditions

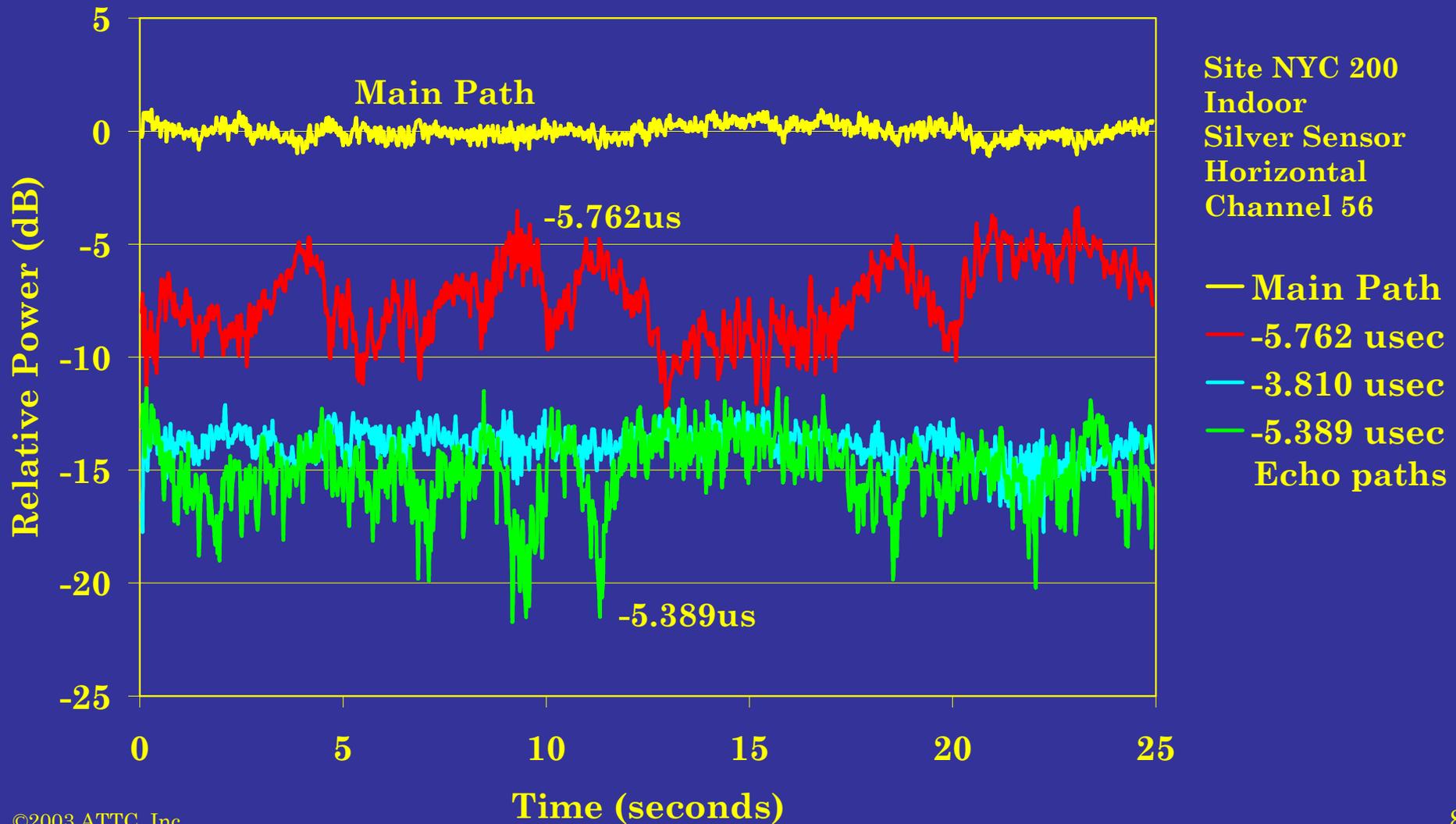


Field Example -- Dynamic Multipath





Field Example -- Variations in Main and Echo Paths





Receiver Performance Targets

Laboratory Performance of Consumer DTV Receivers



Consumer DTV Receivers

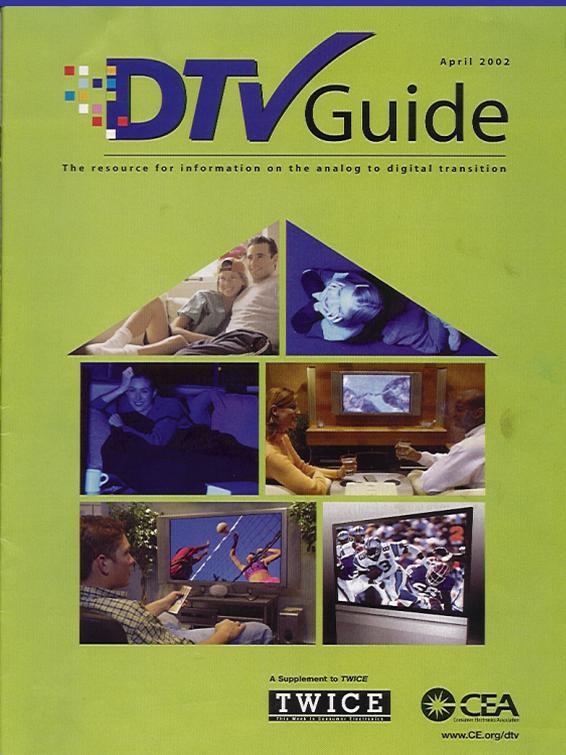
◆ Receiver Selection

◆ CEA DTV Guide – April 2002

- ◆ 20 Models of set-top decoders listed
- ◆ Only FIVE could be acquired via the Internet or at consumer electronics retail outlets in Washington, DC during May 2002
- ◆ One integrated DTV set was included

◆ CEA DTV Website – January 2003

- ◆ 2 new model set-top decoders were acquired





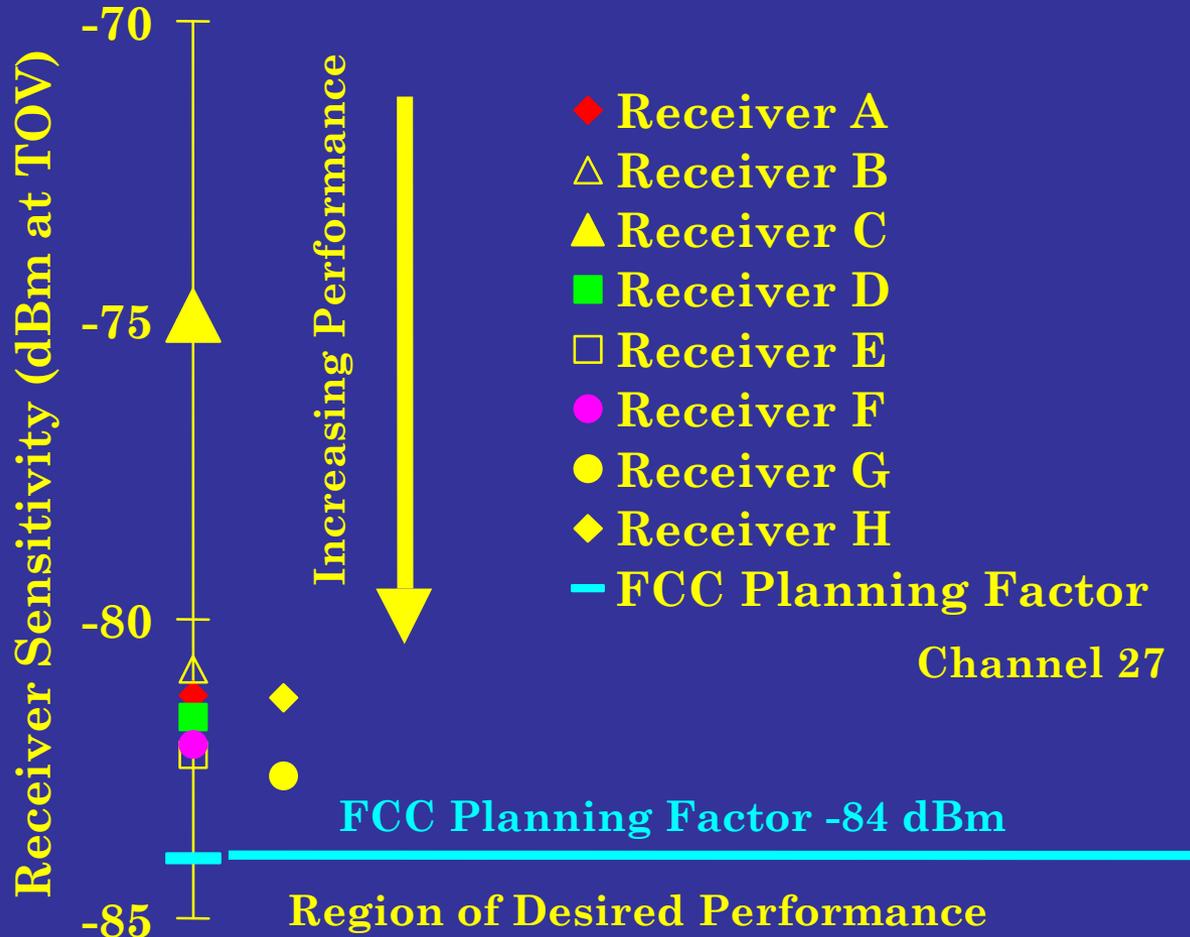
DTV System Performance

- ◆ **Laboratory Testing**
 - ◆ Provides repeatable test environment
 - ◆ Precise control of test parameters
 - ◆ Power
 - ◆ Frequency
 - ◆ Delay
 - ◆ Phase
 - ◆ Quantify limits of DTV performance
 - ◆ Quantify interference mechanisms





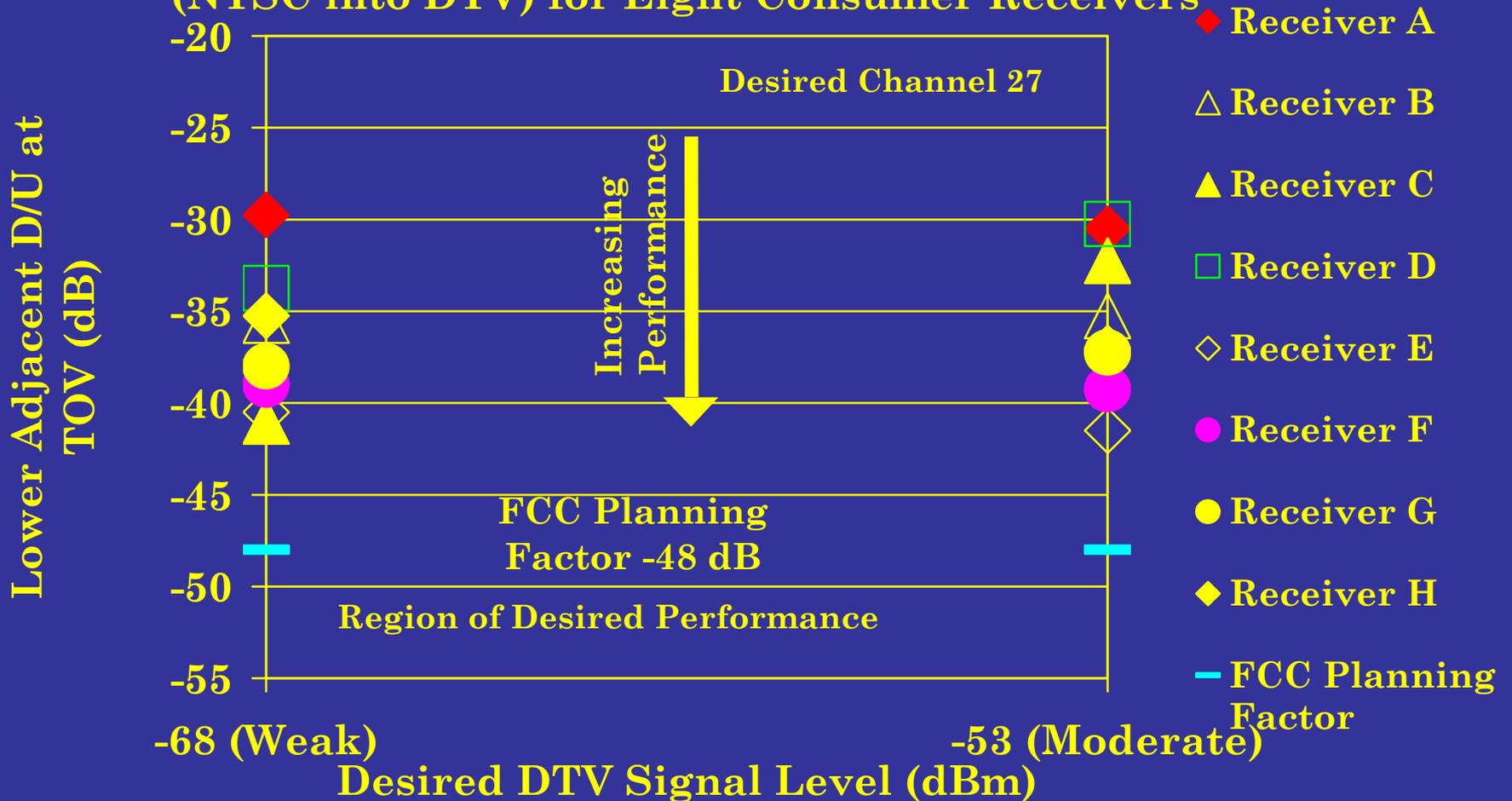
Consumer Receiver Sensitivity





Performance vs Planning Factor -- Lower Adjacent Channel

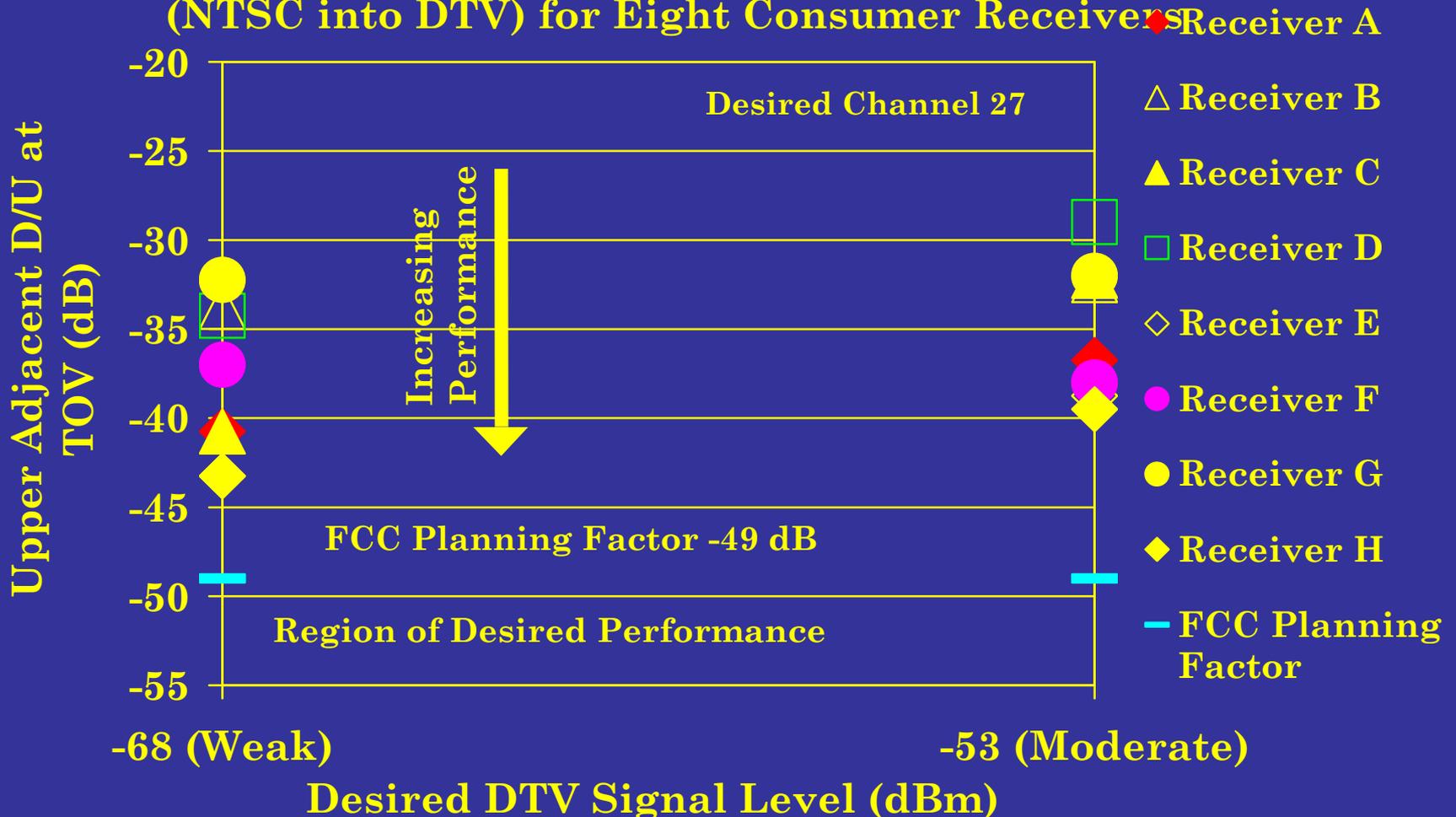
Lower Adjacent Channel Interference Performance
(NTSC into DTV) for Eight Consumer Receivers





Performance vs Planning Factor -- Upper Adjacent Channel

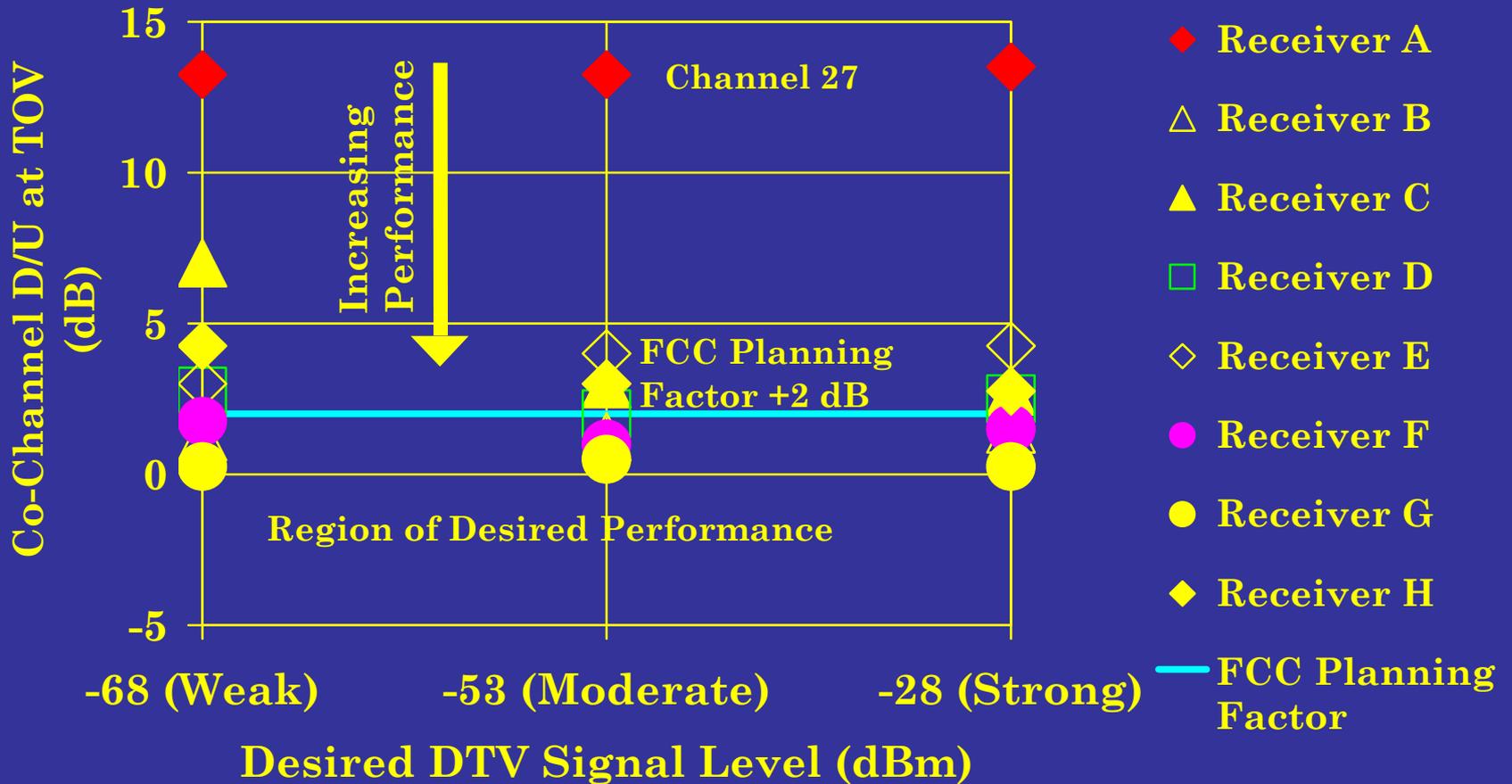
Upper Adjacent Channel Interference Performance
(NTSC into DTV) for Eight Consumer Receivers





Performance vs Planning Factor -- Co-Channel

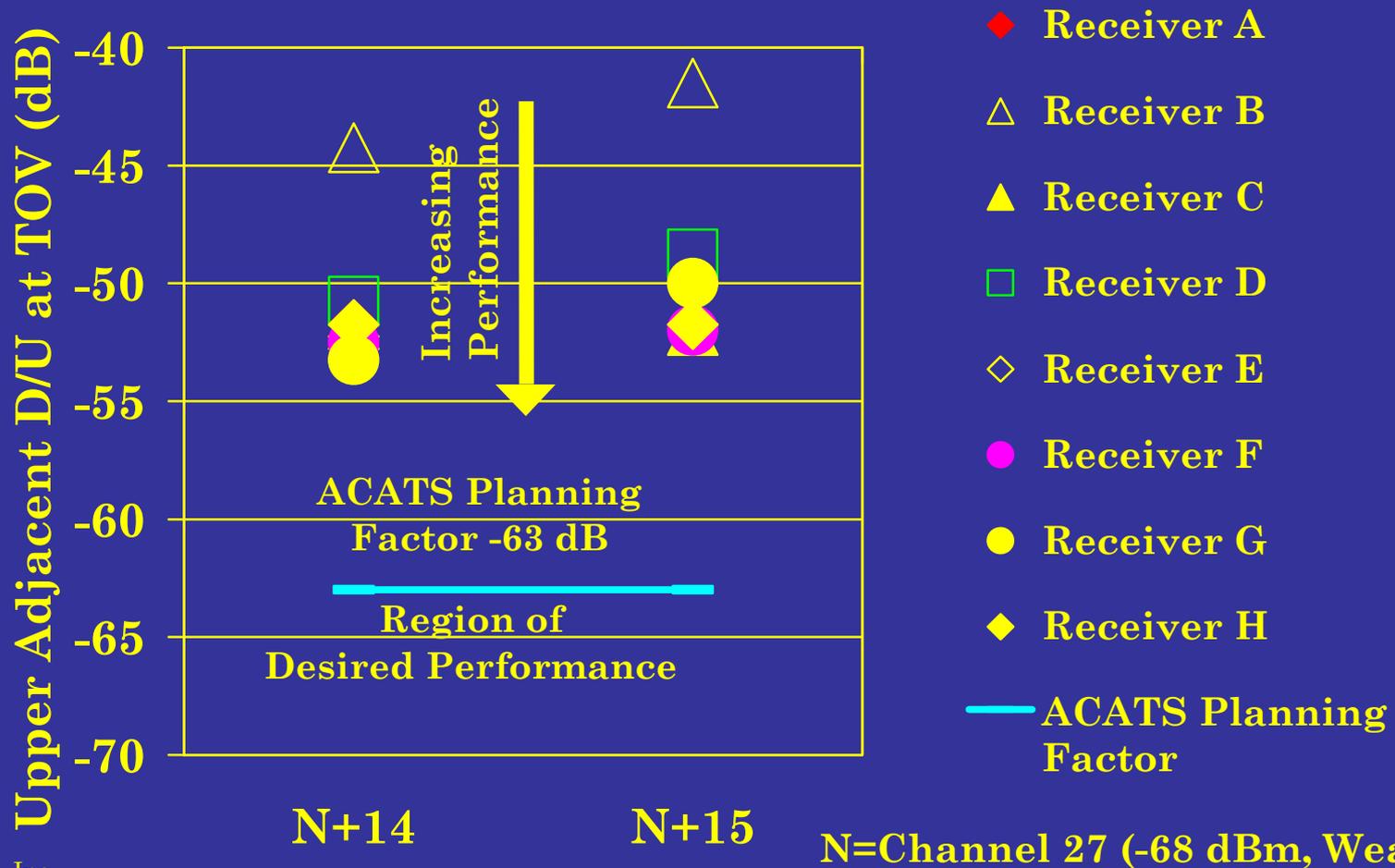
Co-channel Interference Performance
(NTSC into DTV) for Eight Consumer Receivers





Performance vs Planning Factor -- N+14, N+15 "Taboo" Channel

"Taboo" Channel Interference Performance
(NTSC into DTV) for Eight Consumer Receivers



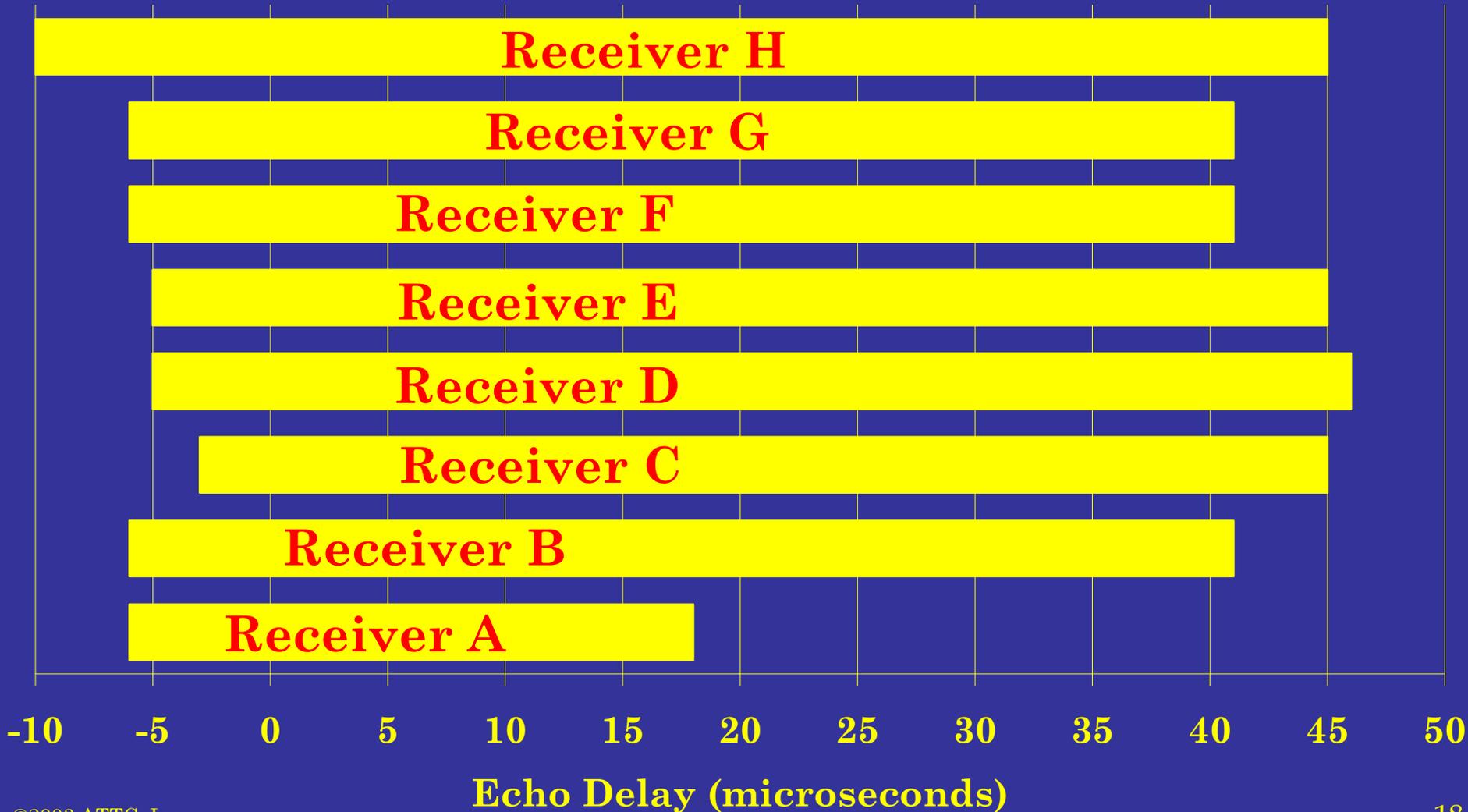


Receiver Performance Targets

Equalizer Performance

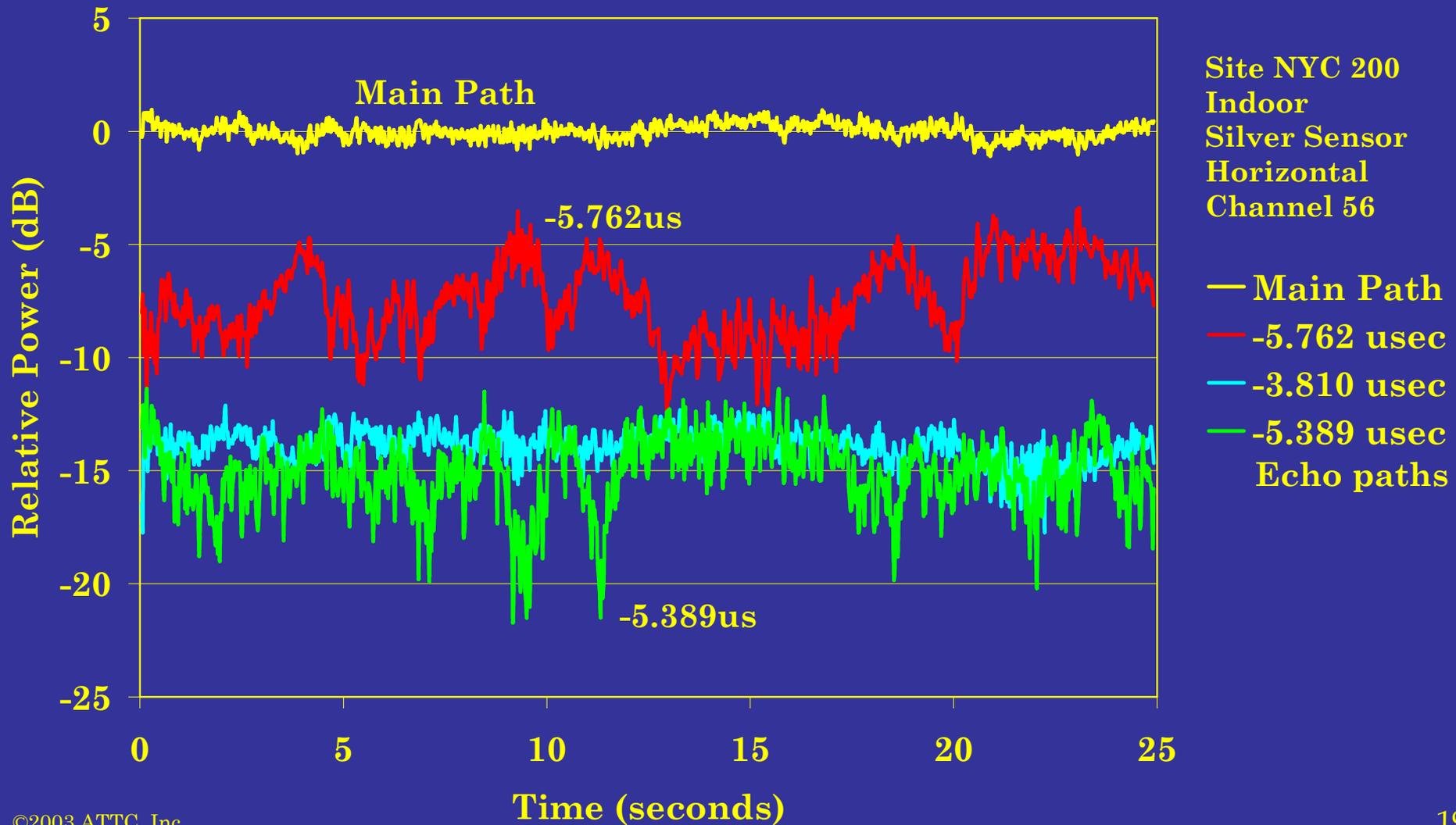


Consumer Receivers – Equalizer Range



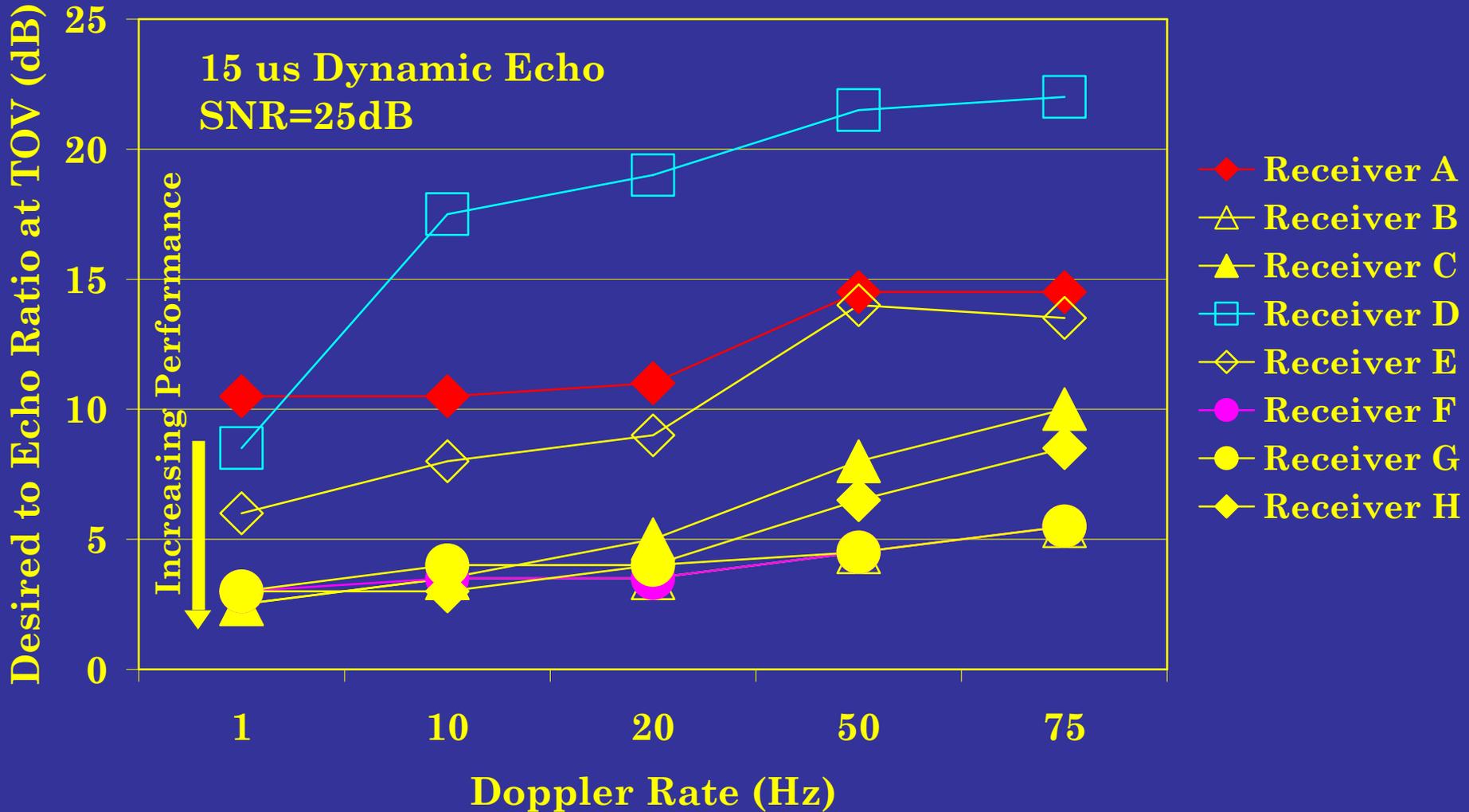


Strong Pre-echoes – All Receivers Failed



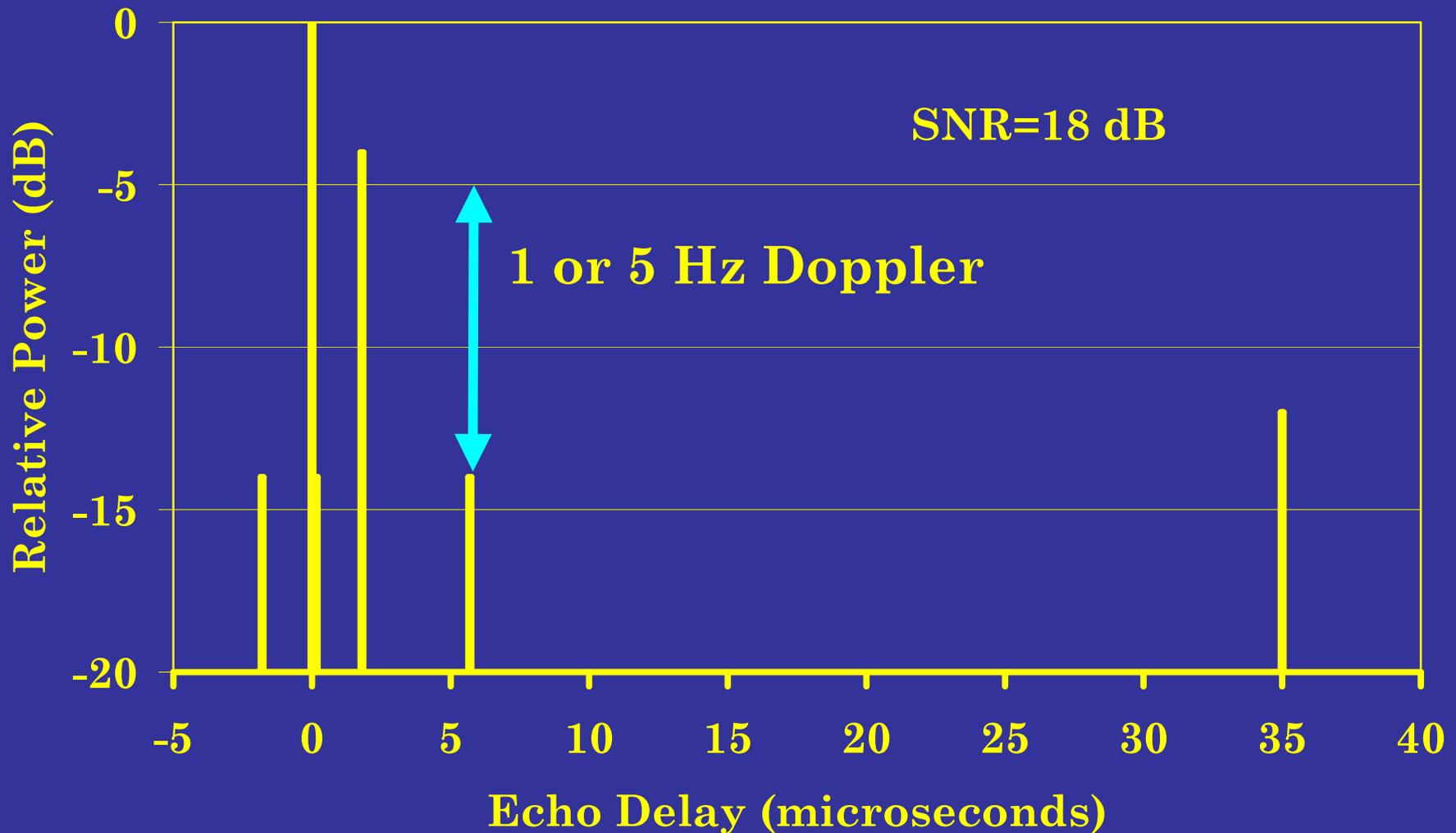


Single 15 us Dynamic Echo Performance



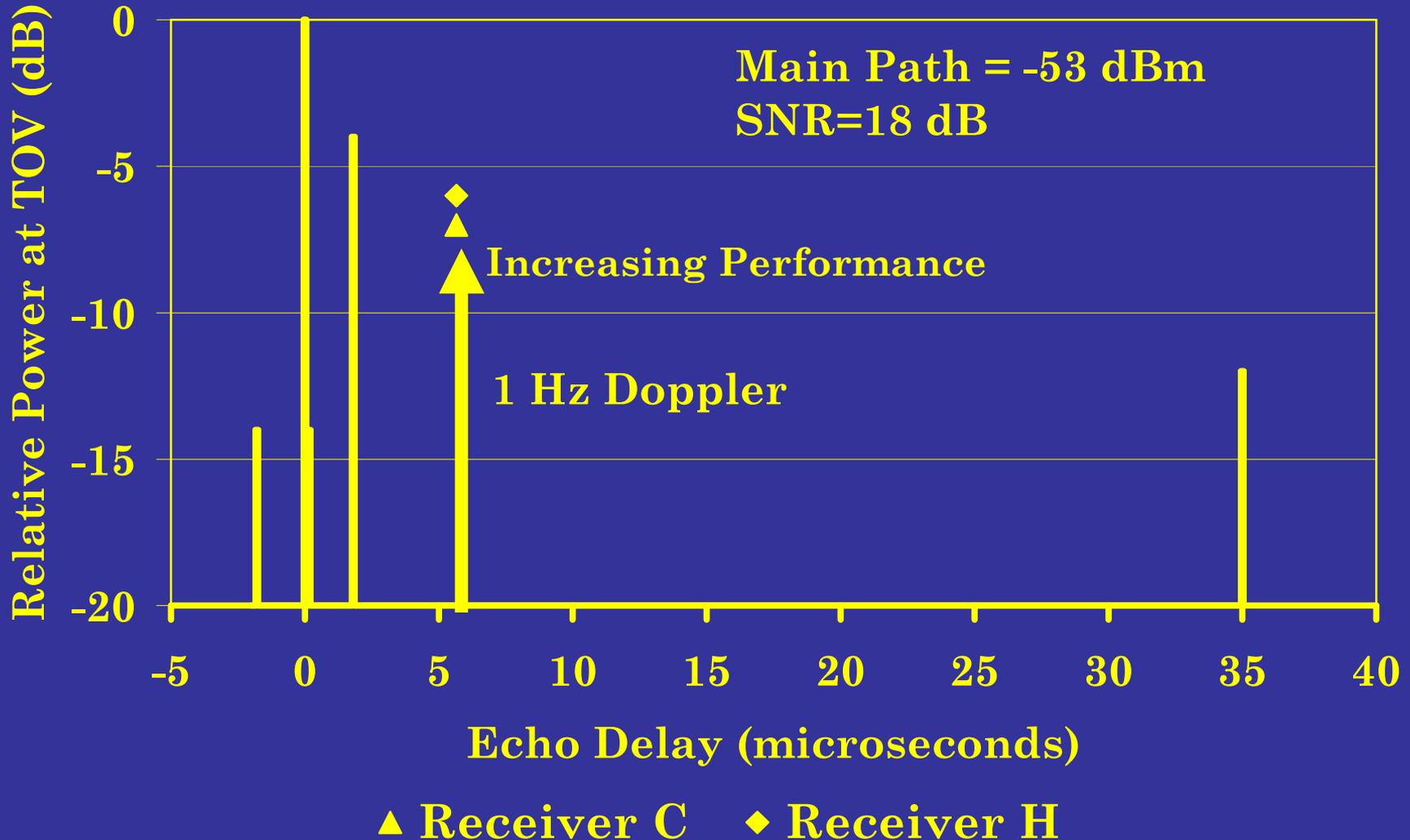


Dynamic Multipath Ensembles – CRC #3



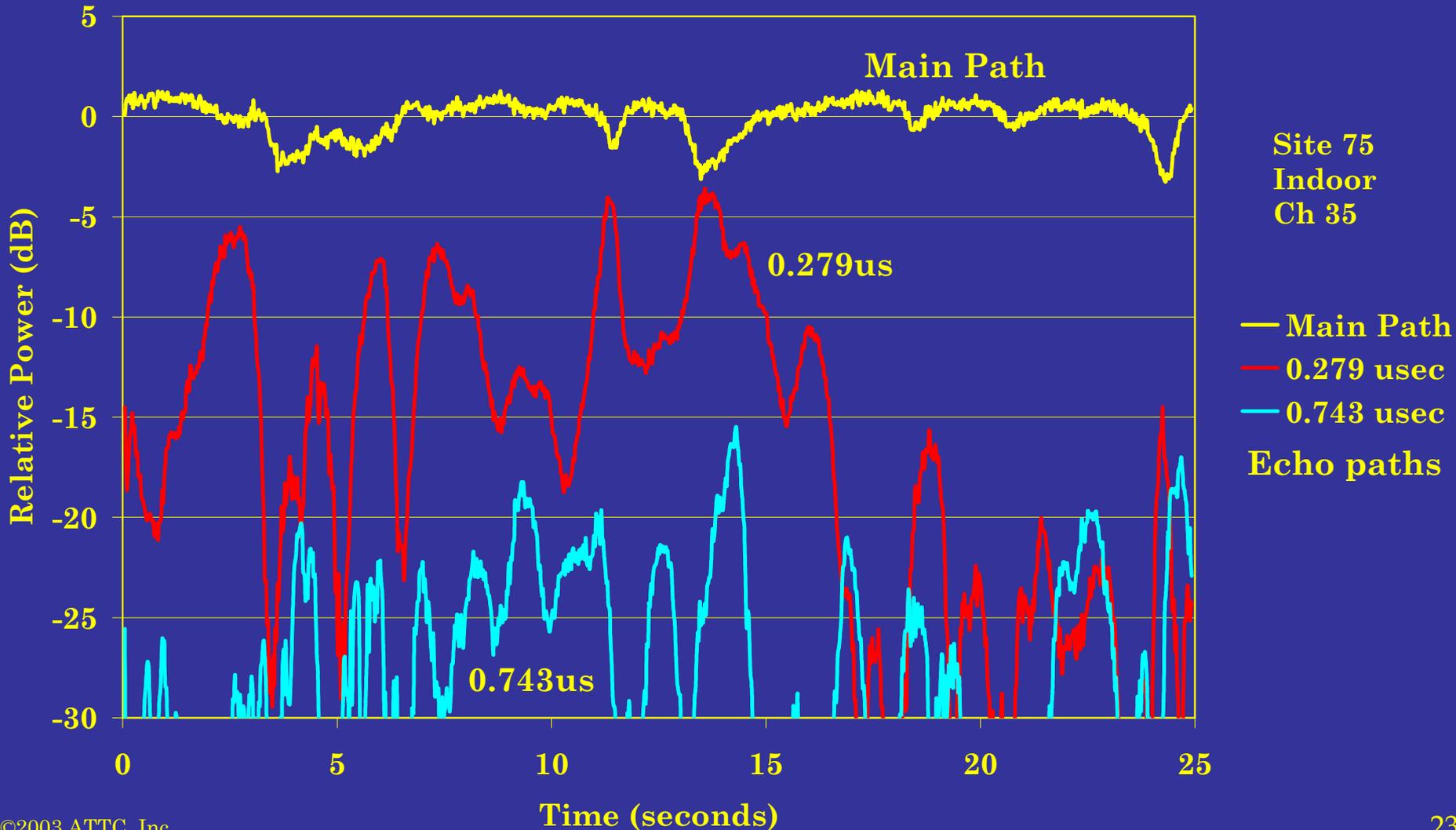


Dynamic Multipath Performance – CRC Ensemble #3





Dynamic Multipath – Recv. C and H showed promise





Receiver Performance Targets

Recommendations



Recommendations

- ◆ **Broadcasters adopt minimum receiver performance targets to ensure receiver compatibility with the FCC planning factors**
 - ◆ Receiver Sensitivity
 - ◆ Receiver Selectivity
 - ◆ Co-, Adjacent, *AND* “Taboo” Channels
- ◆ **Broadcasters adopt minimum equalizer performance targets to ensure improved DTV reception**
 - ◆ Range
 - ◆ Single Dynamic Echoes
 - ◆ Multipath Ensembles



Conclusions

- ◆ **Current terrestrial broadcast receivers do not meet the FCC planning factors**
 - ◆ Sensitivity
 - ◆ Selectivity
- ◆ **Significant improvements have been made in the equalizer performance**



Minimum Performance Targets for Digital Television Broadcast Receivers

Charles W. Einolf, Jr.
Oliver Sichelschmidt
C. Thomas Boyer

Advanced Television Technology Center
Alexandria, Virginia

Field Testing of the LINX Receiver in Washington, Baltimore and Philadelphia Urban Areas

NAB Convention

Las Vegas, NV

April 8, 2003



Goal

- To Independently evaluate the performance of the LINX prototype receiver in locations of severe static and dynamic multipath conditions generally available in urban areas, and compare its performance with the reference receiver used in the VSB Enhancement Project and the earlier generation reference receiver used by LINX in its Chicago measurements

Measurement Program

- Field test measurements were conducted during the last two weeks in March in Washington, Baltimore and Philadelphia urban areas
- Measurement locations were selected in areas that are surrounded by high-rises and multi-story buildings
- A total of six channels in Washington, six channels in Philadelphia and four in Baltimore were measured
- Measurements were conducted at street level using a simple dipole antenna (5 feet)
- Limited indoor measurements were also conducted in Washington & Baltimore

Measurement Program

- Washington transmitters
 - Channel 27, Arlington, DC
 - HAAT: 177 meters ERP: 67 KW
 - Channel 34, Washington, DC
 - HAAT: 254 meters ERP: 646 KW
 - Channel 36, Washington, DC
 - HAAT: 201 meters ERP: 1000 KW
 - Channel 42, Annapolis, MD
 - HAAT: 289 meters ERP: 150 KW
 - Channel 48, Washington, DC
 - HAAT: 312 meters ERP: 813 KW
 - Channel 51, Washington, DC
 - HAAT: 311 meters ERP: 125 KW

Five separate transmitting facilities: Channels 34 & 39 are co-located

Measurement Program

- Baltimore transmitters
 - Channel 38, Baltimore, MD
 - HAAT: 312 meters ERP: 522 KW
 - Channel 46, Baltimore, MD
 - HAAT: 341 meters ERP: 35 KW
 - Channel 52, Baltimore, MD
 - HAAT: 311 meters ERP: 602 KW
 - Channel 59, Baltimore, MD
 - HAAT: 312 meters ERP: 513 KW

*Two separate transmitting locations: Channels 38, 52
& 59 co-located*

Measurement Program

- Philadelphia transmitters
 - Channel 26, Philadelphia, PA
 - HAAT: 375 meters ERP: 770 KW
 - Channel 32, Philadelphia, PA
 - HAAT: 400 meters ERP: 250 KW
 - Channel 42, Philadelphia, PA
 - HAAT: 161 meters ERP: 305 KW
 - Channel 54, Philadelphia, PA
 - HAAT: 354 meters ERP: 500 KW
 - Channel 64, Philadelphia, PA
 - HAAT: 390 meters ERP: 500 KW
 - Channel 67, Washington, DC
 - HAAT: 377 meters ERP: 560 KW

Three separate transmitting locations: Channels 32, 54 & 37 are co-located , Channels 26 & 64 are co-located

Measurement Program

- Washington
 - 13 outdoor sites on six channels for a total of 78 measurements. In addition four in-home locations were also measured
- Baltimore
 - 8 outdoor sites on four channels a total of 32 measurements
- Philadelphia
 - 12 outdoor sites on six channels for a total of 72 measurements
- A total of 206 measurements were taken during this measurement program

Measurement program

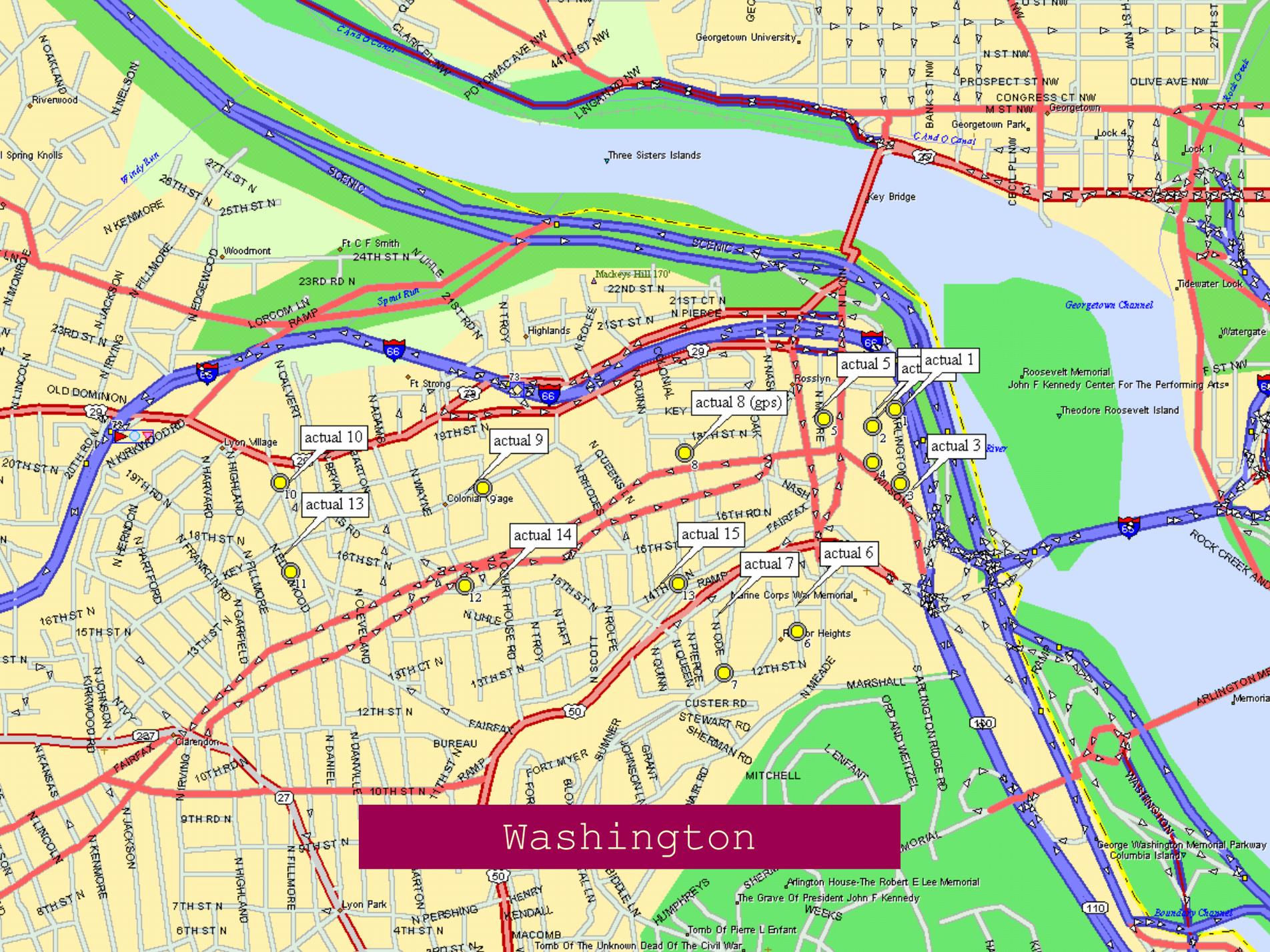
- Measurements were conducted at street level (5 feet) primarily on sidewalks
- A standard dipole antenna was used and set for channel 34 and optimized for maximum reception for the first channel measured at each site and was not rotated for optimum reception or signal level for other channels
- Measurements were taken concurrently on three receivers (two reference receivers and LINX)

Site Data

- In-Band Power (6Mhz Integrated)
- Stop-Band (20Mhz Spectrum Plot)
- Number of video hits in a 3 minute period (maximum of 3 hits for successful reception, 3 to 50 hits for intermittent reception and greater than 50 hits failure)
- Add Noise to reach TOV for each stream
- Measure Added Noise Power (6Mhz Integrated)

Reception Criteria

- Two Criteria for successful reception were developed to allow comparison with the earlier LINX measurements conducted in Chicago and the VSB Enhanced Measurement Program conducted by MSTV for ATSC last fall
 - Reference receiver A was used in the Enhanced Testing program
 - Failure (> 50 hits), Successful (< 4 hits), intermittent (4 to 50 hits)
 - Reference receiver B was used in the LINX Chicago measurement program
 - Failure (> 50 hits), Acceptable reception (0 to 50 hits)



Washington



Washington



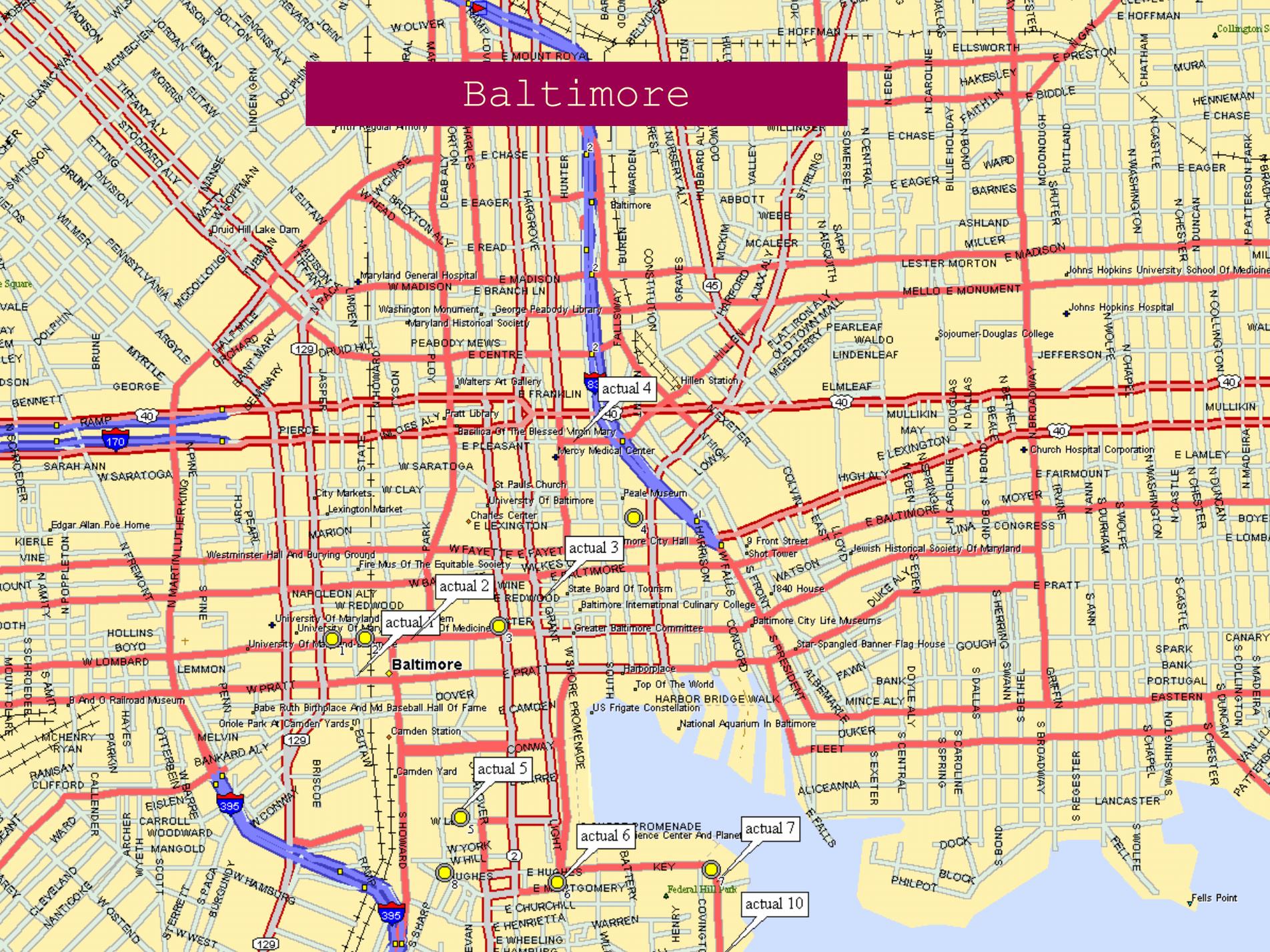
RG4







Baltimore



actual 4

actual 3

actual 2

actual 1

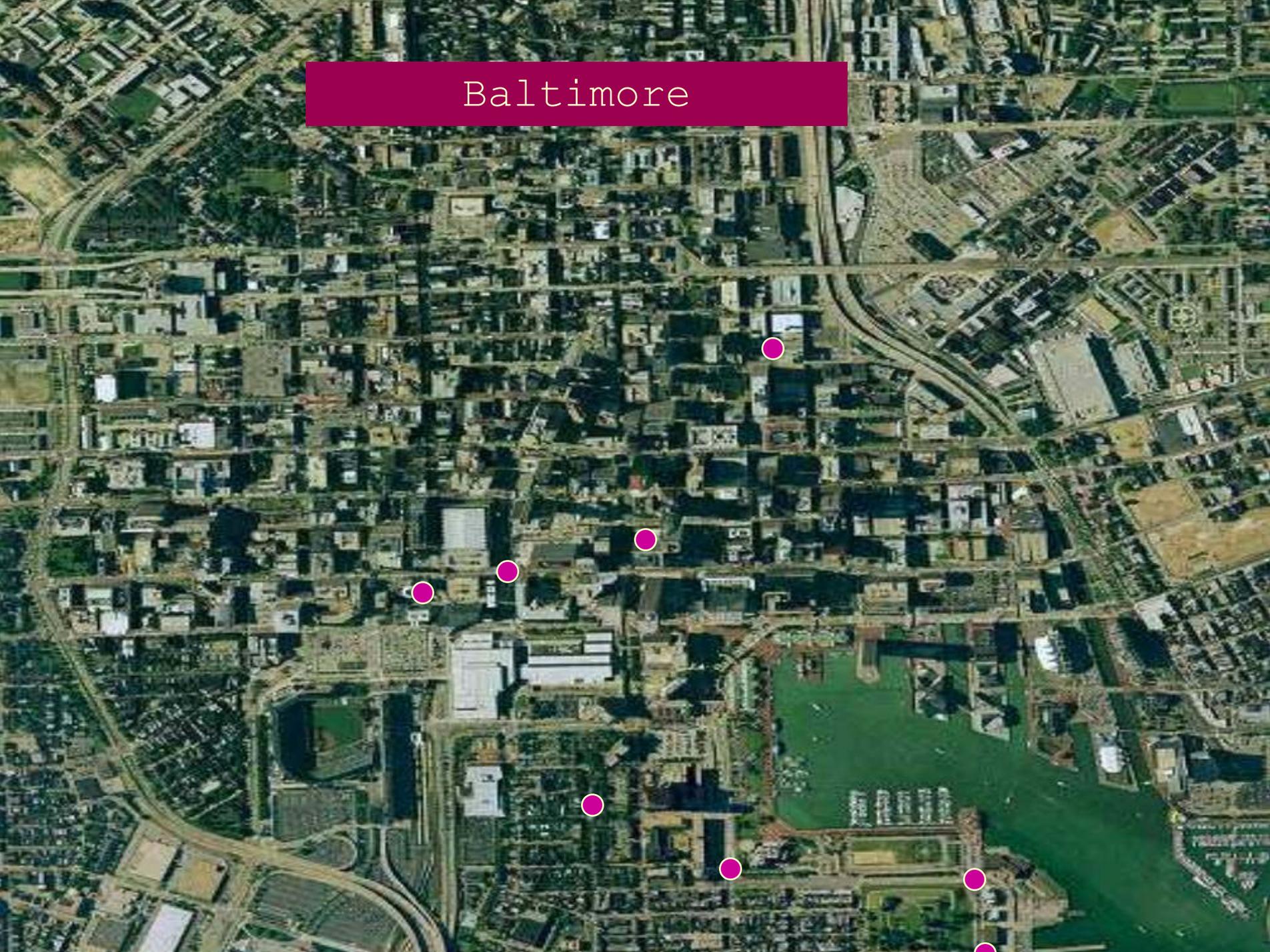
actual 5

actual 6

actual 7

actual 10

Baltimore





Mercy

Mercy

CALVERT ST.

PLEASANT ST.

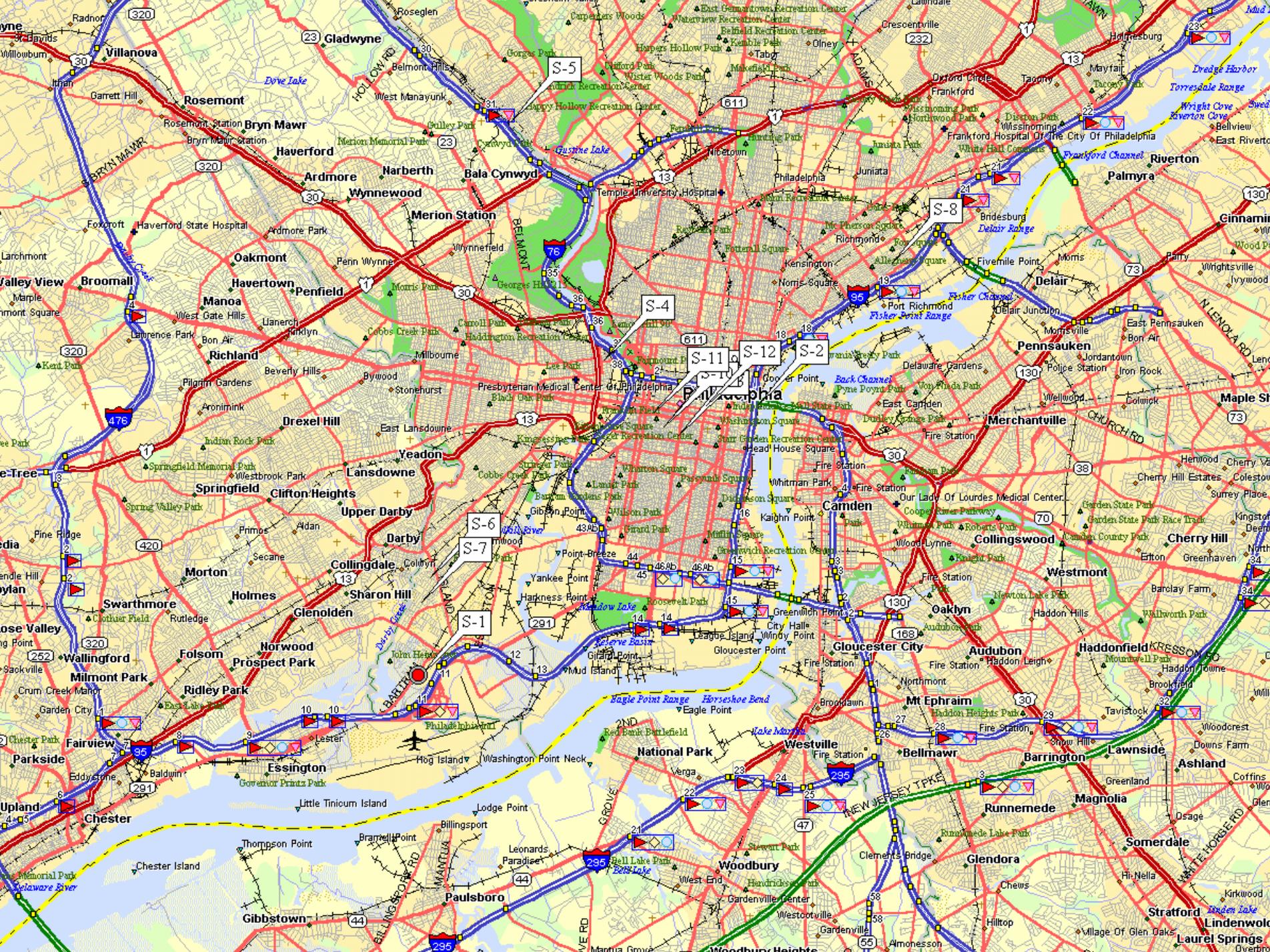
BIG
Main Entrance
Parking Garage
Emergency

CALVERT ST.

NO STOPPING

BG 4

CKL 515



S-5

S-8

S-4

S-11

S-12

S-2

S-7

S-6

S-1





659133

ups

1 800 PICK UPS
www.ups.com

1DE-5710

NO PARKING
9 AM - 8 PM
EXCEPT SUNDAY

Sg

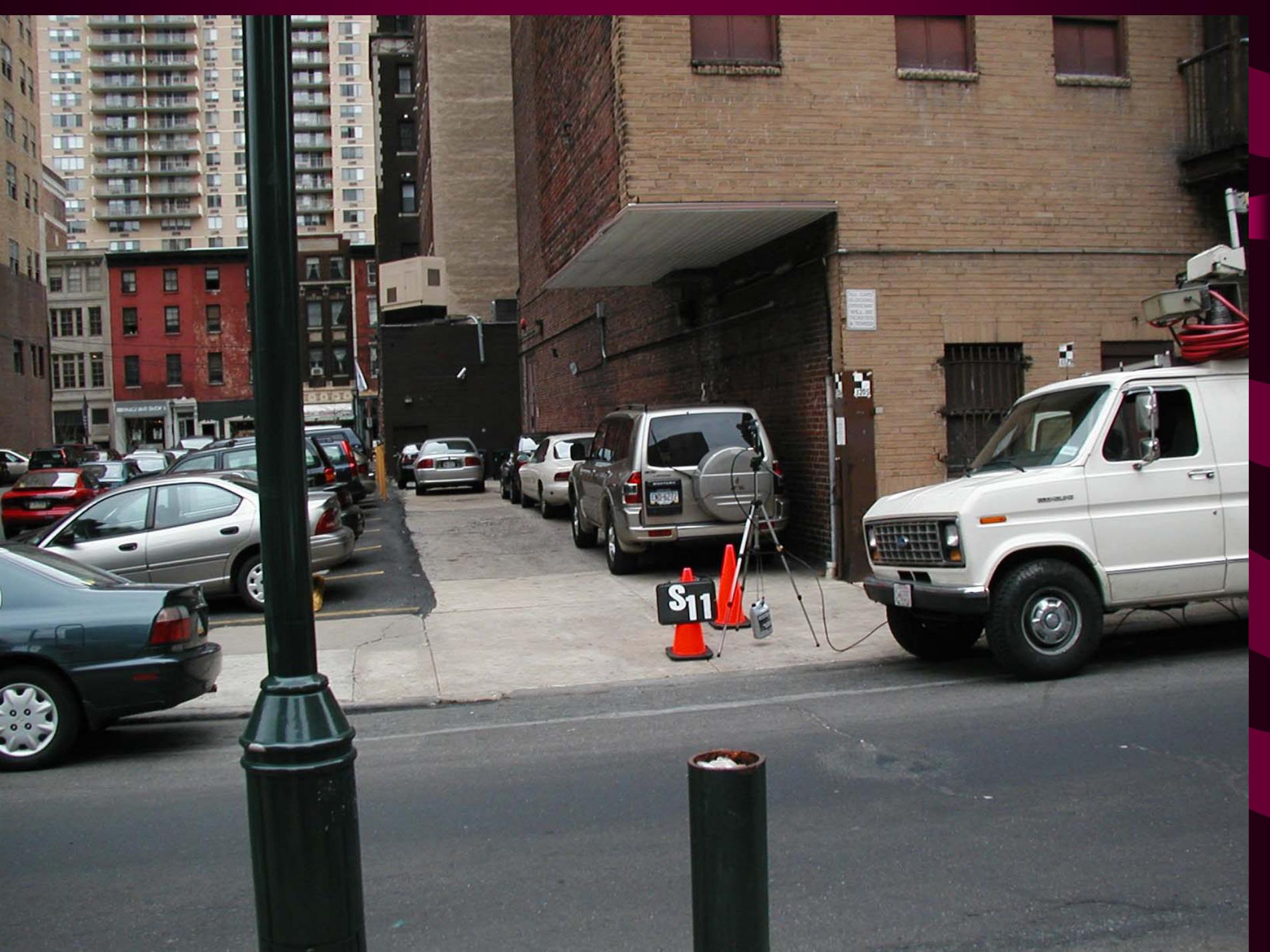
WELERS
nopol

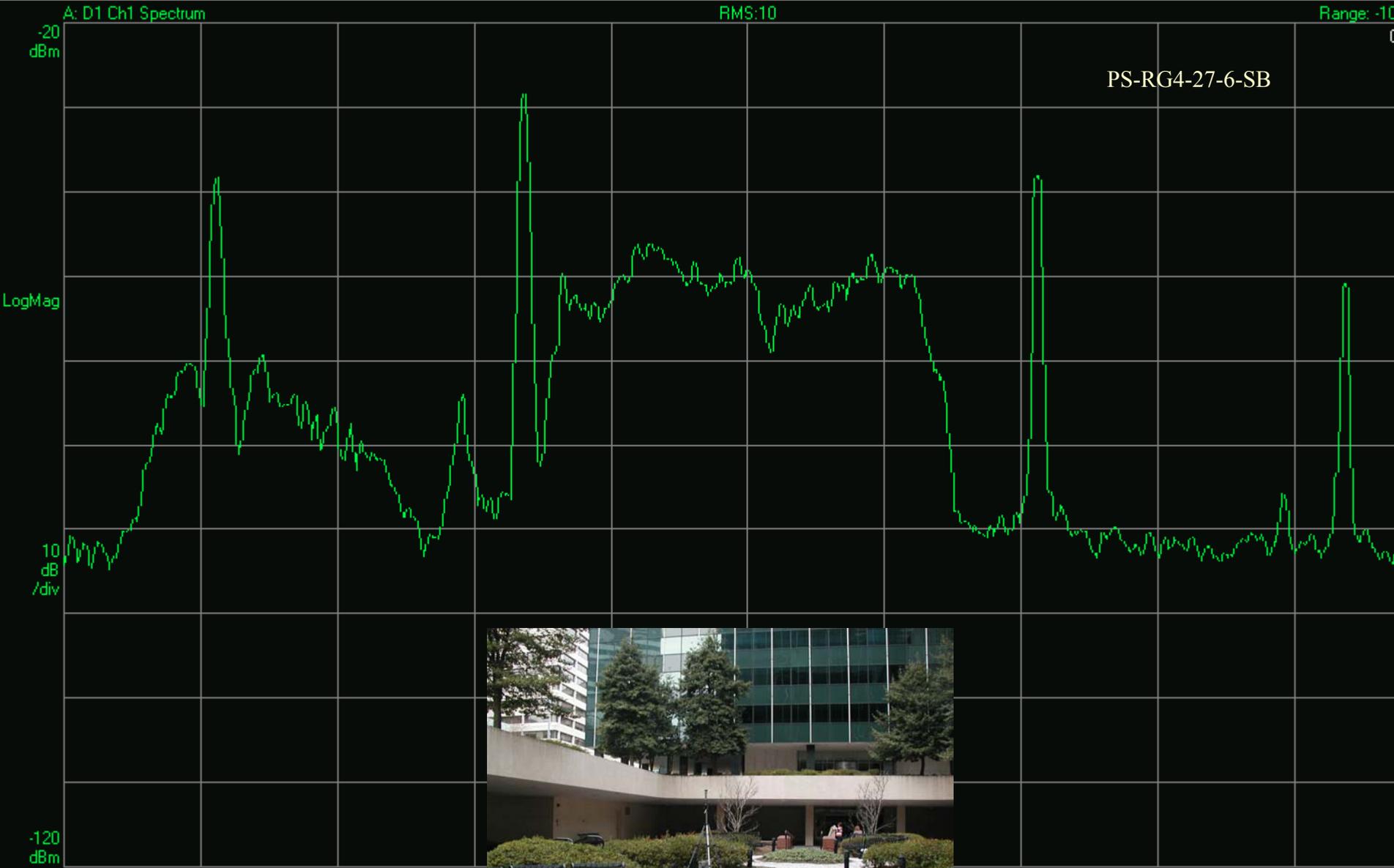
HAPPY ROO

ARK

676

WALKWAYS

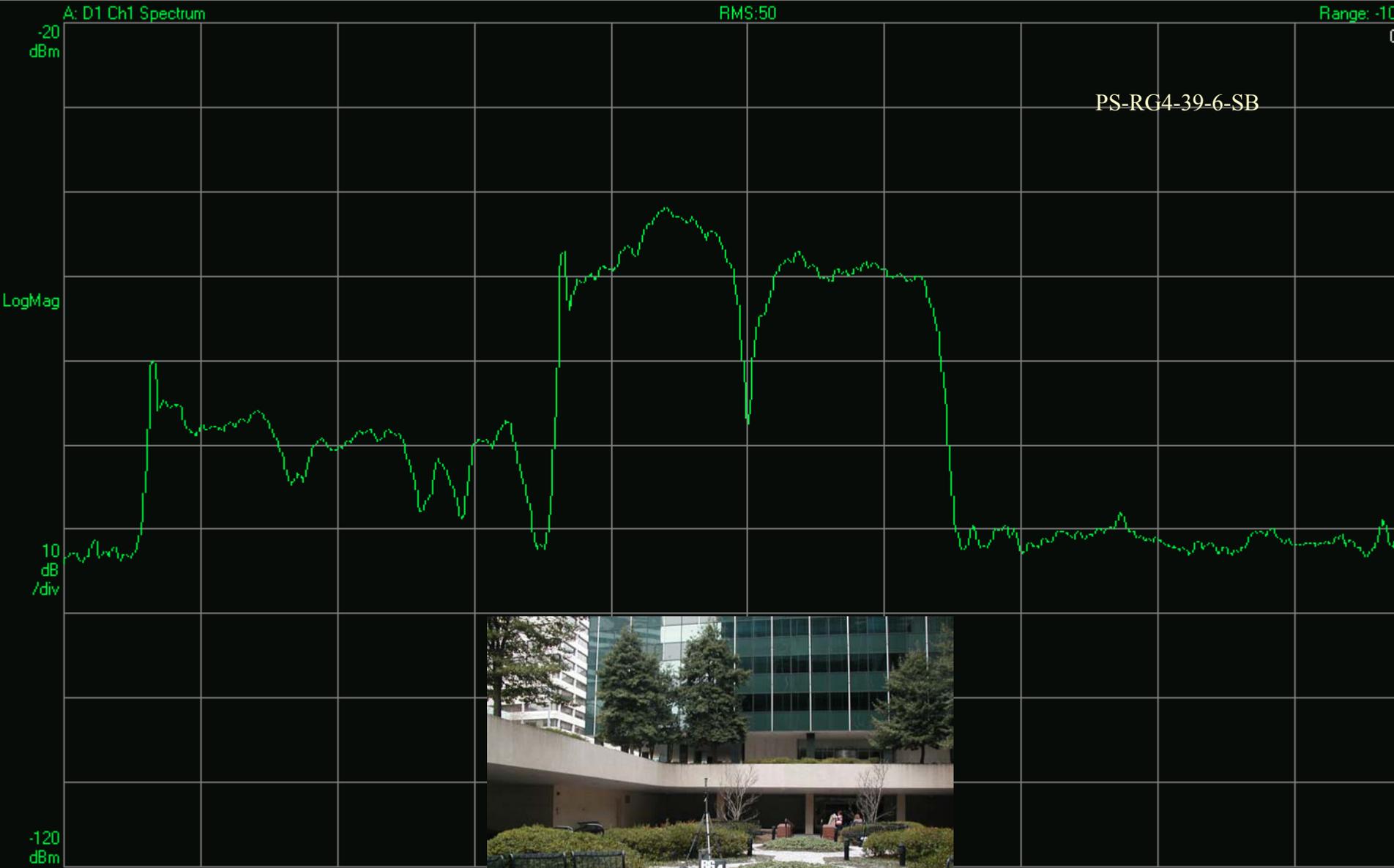




Center: 551 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10



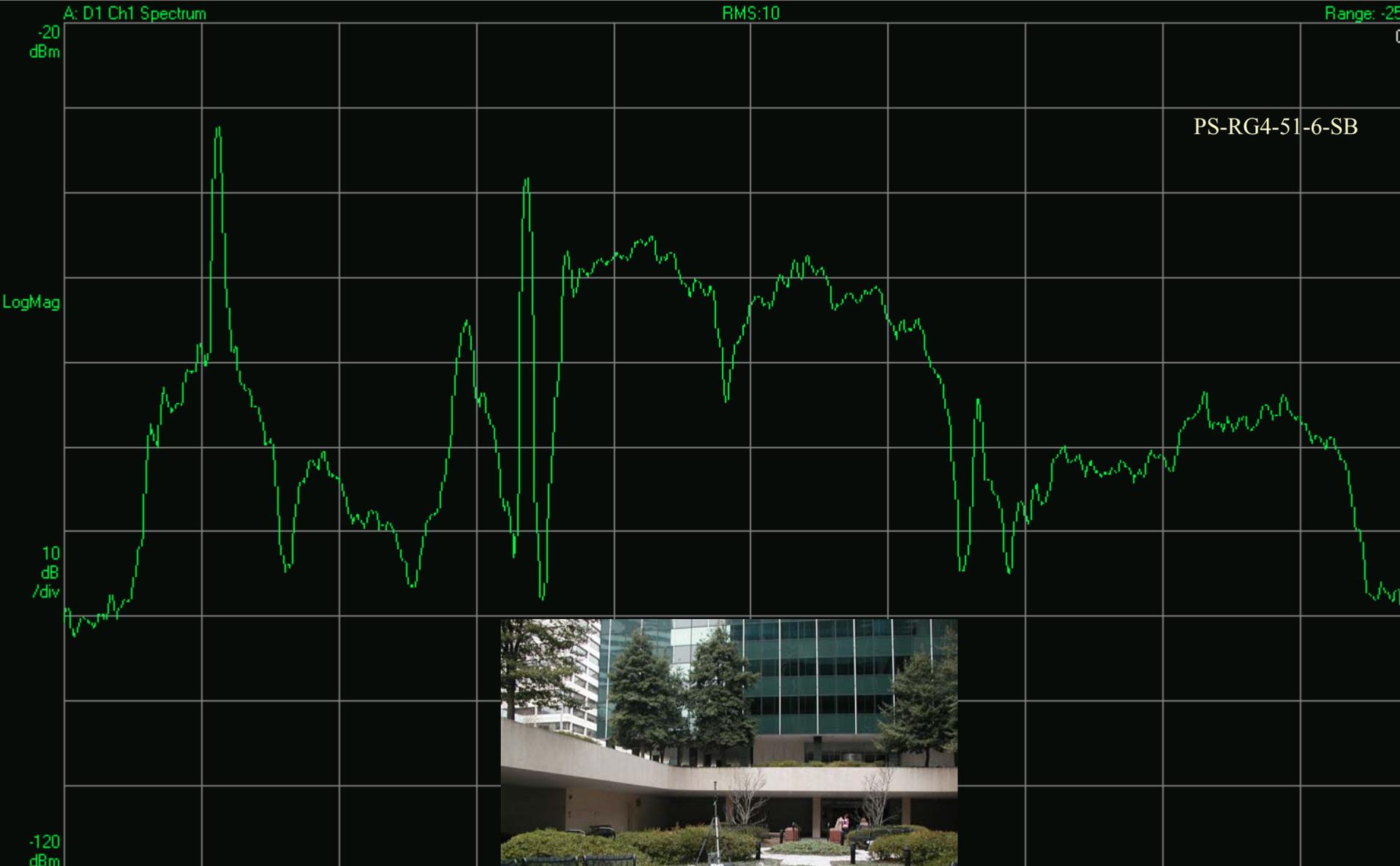




Center: 593 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10

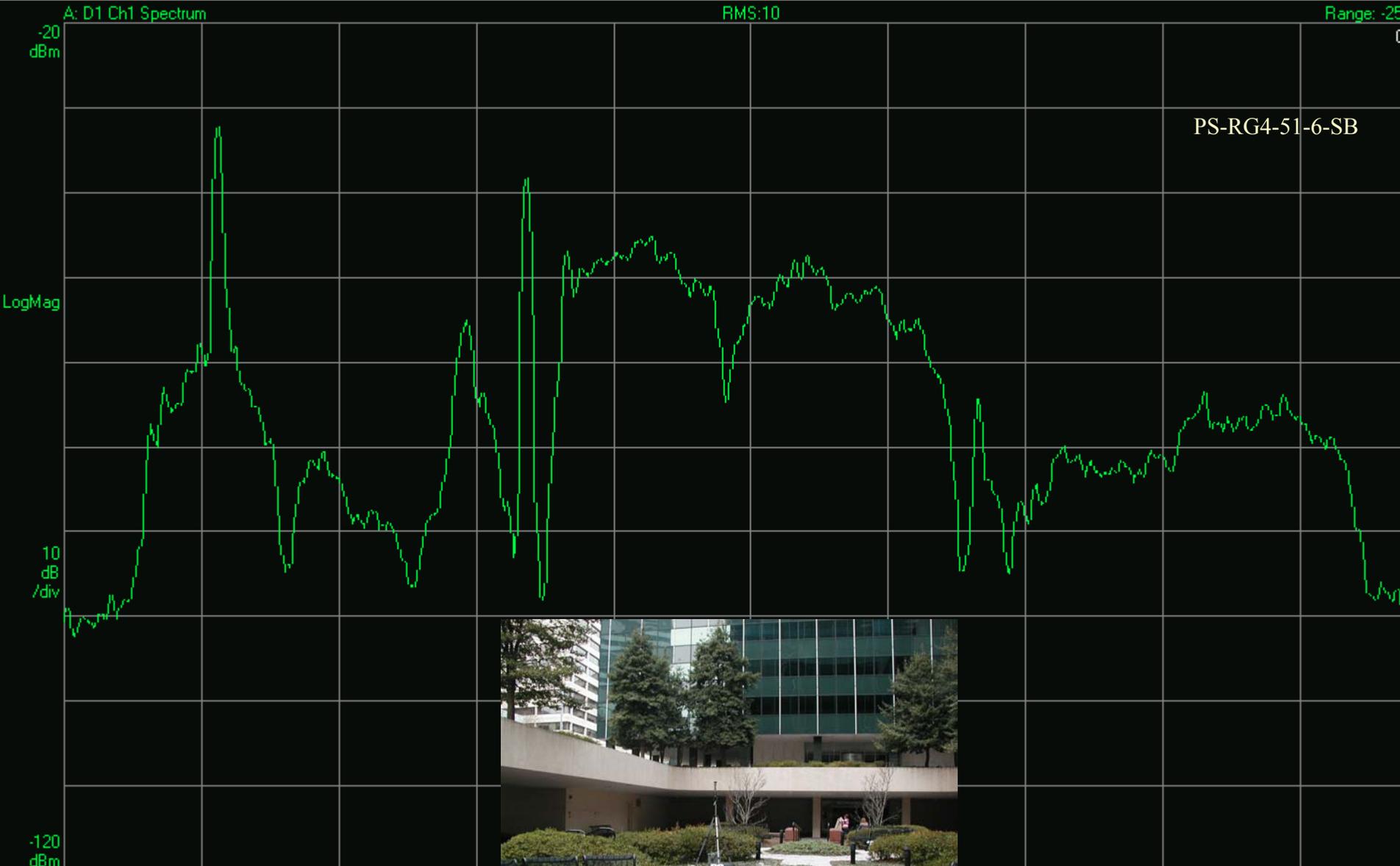




Center: 695 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10

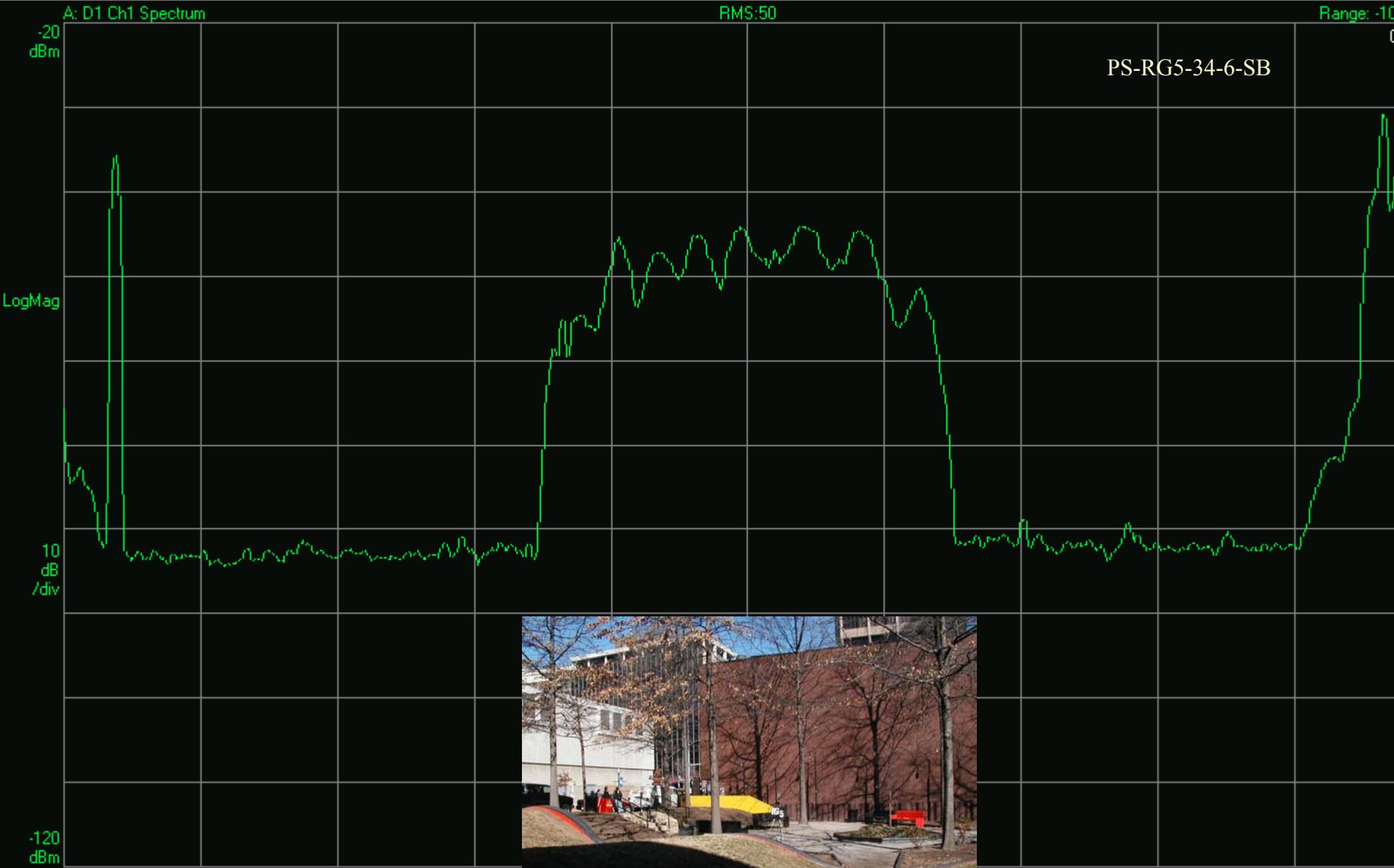




Center: 695 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10

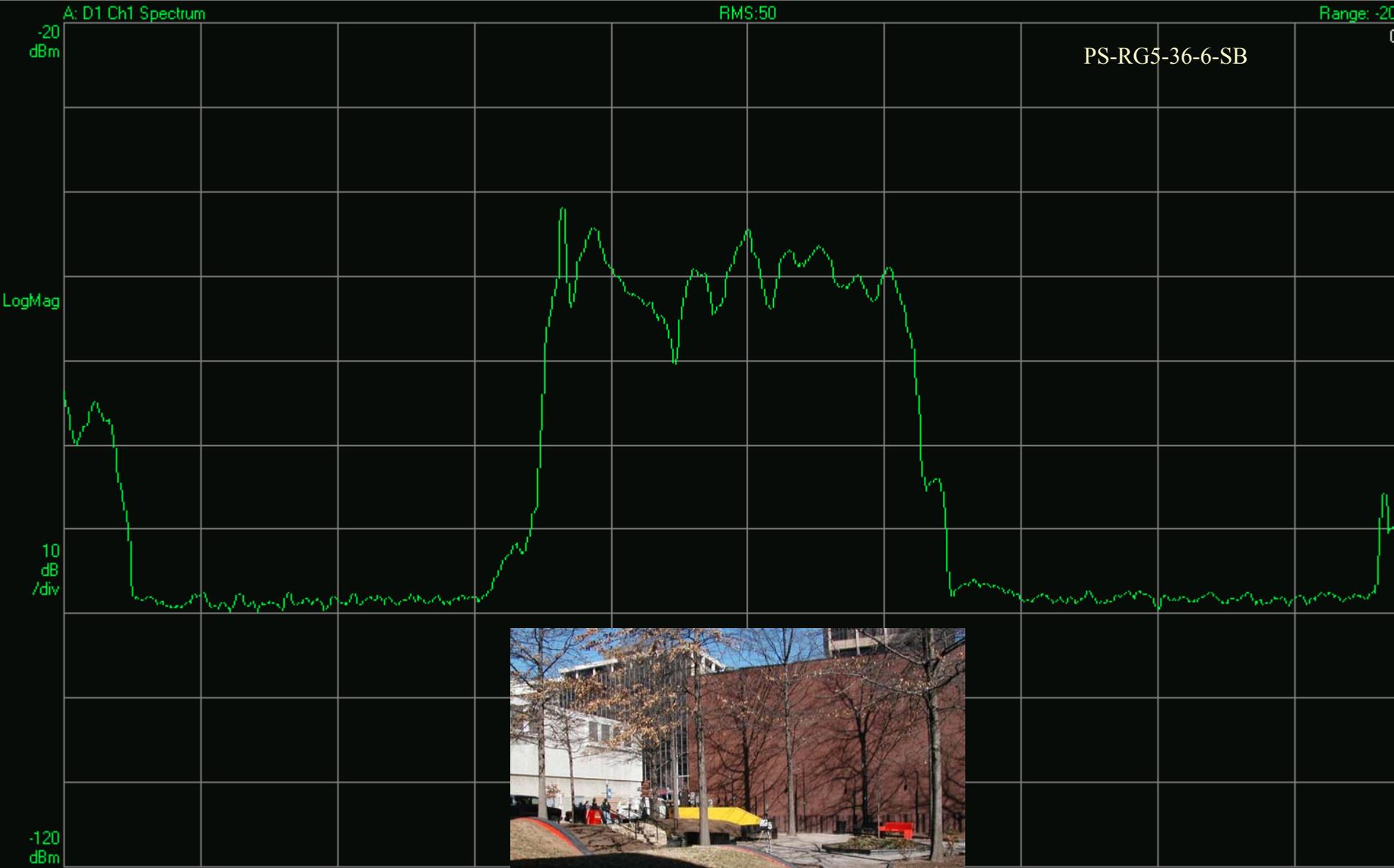


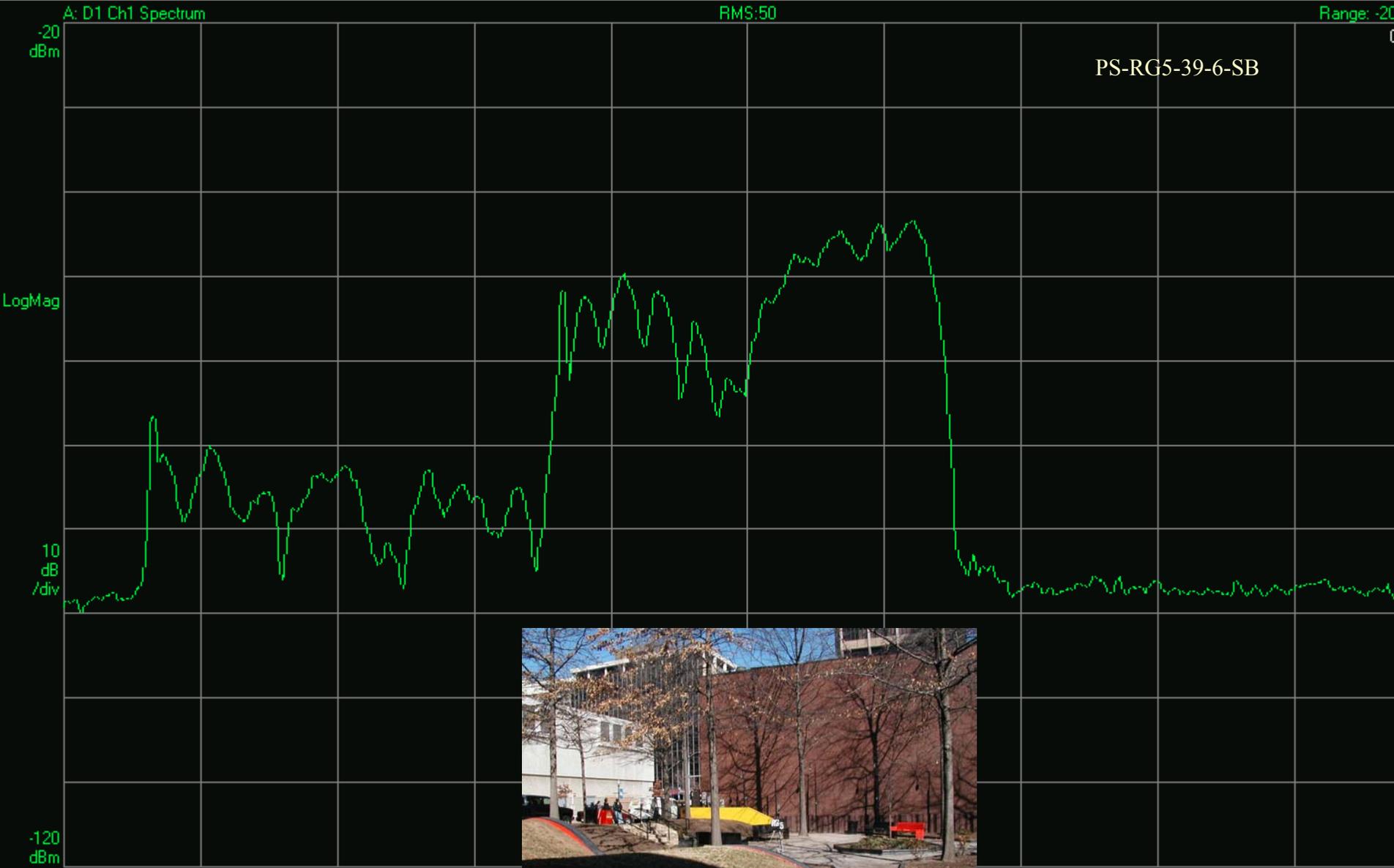


Center: 593 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10

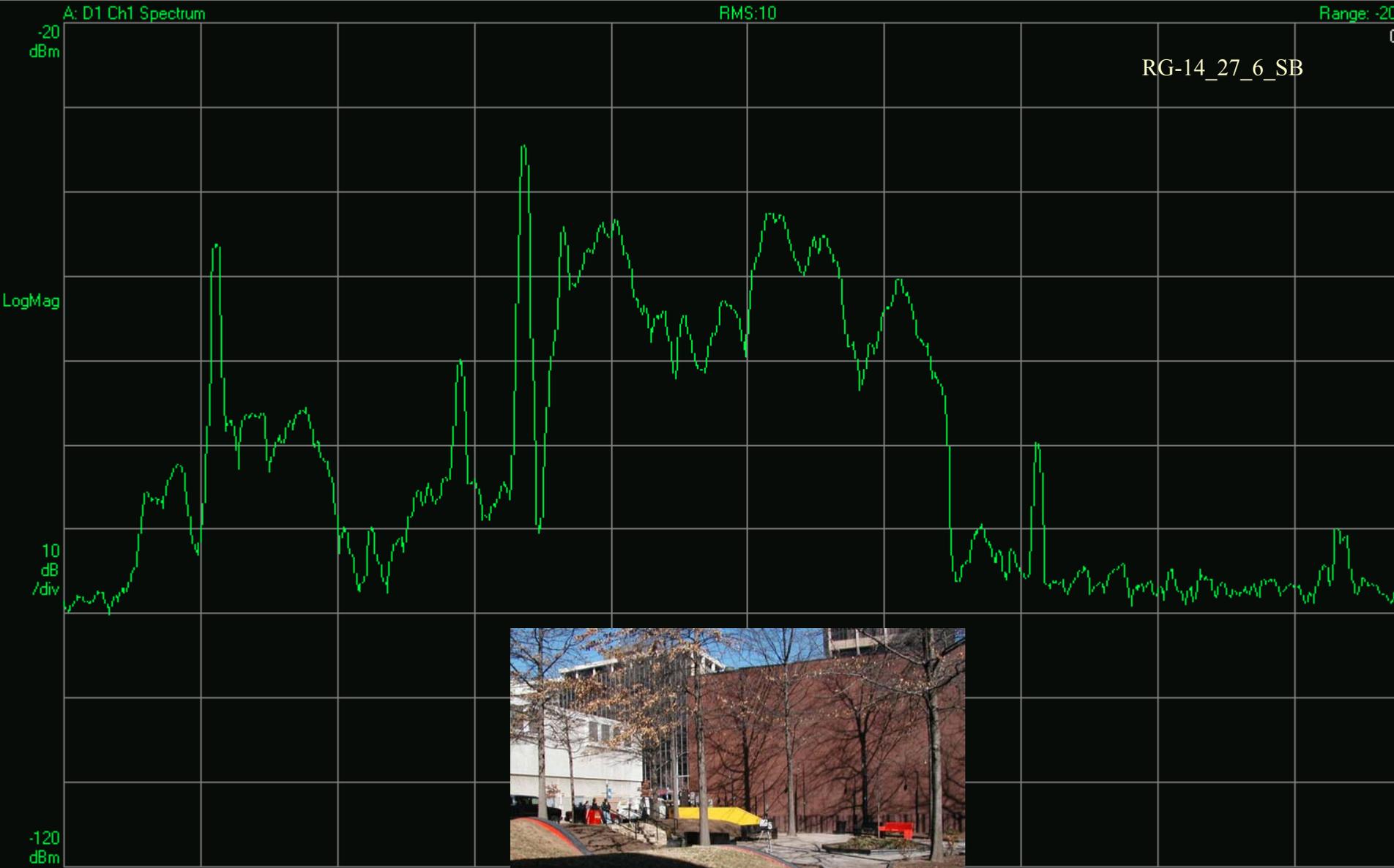






Center: 623 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10



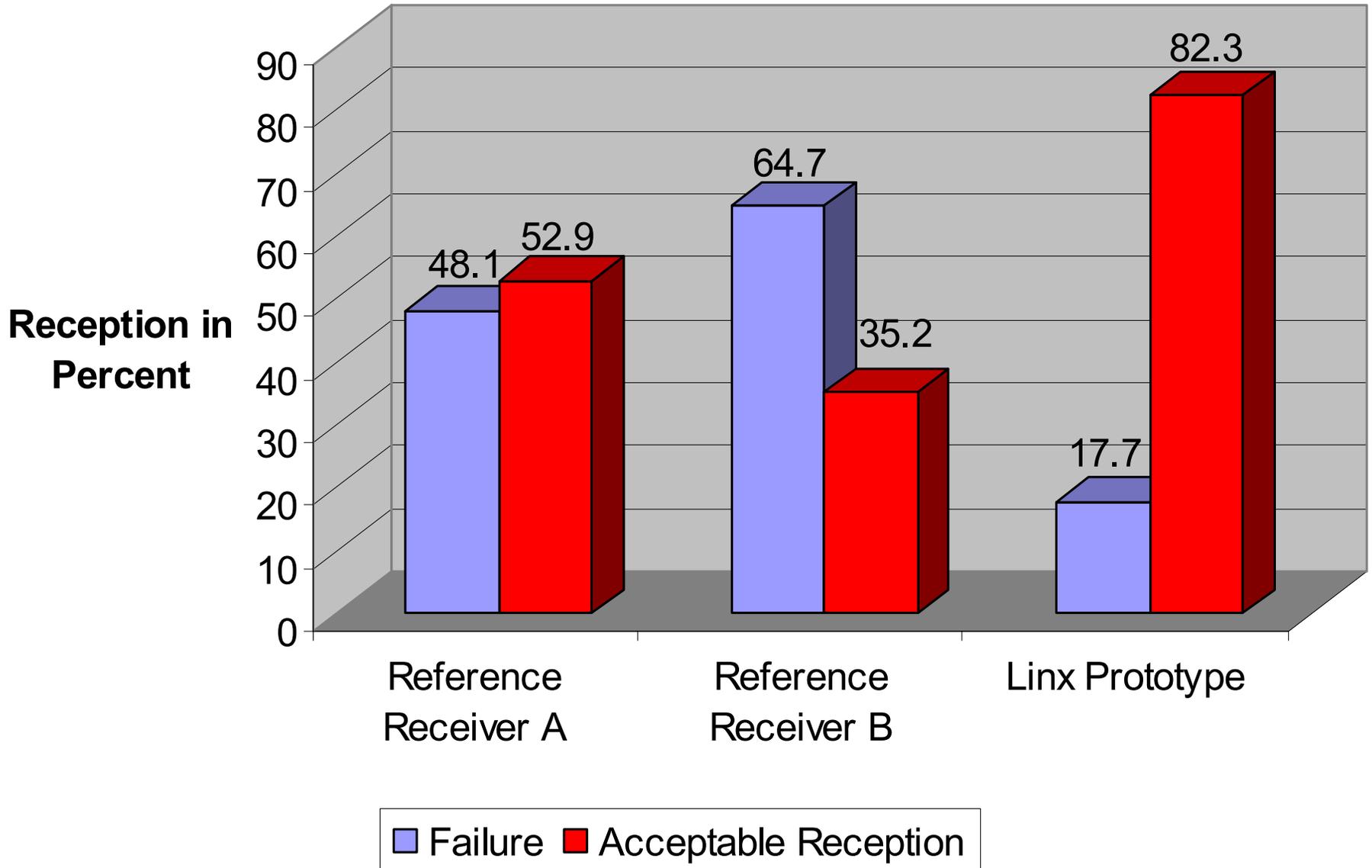
Center: 551 MHz
RBW: 100 kHz

Span: 20
SwpTime: 10

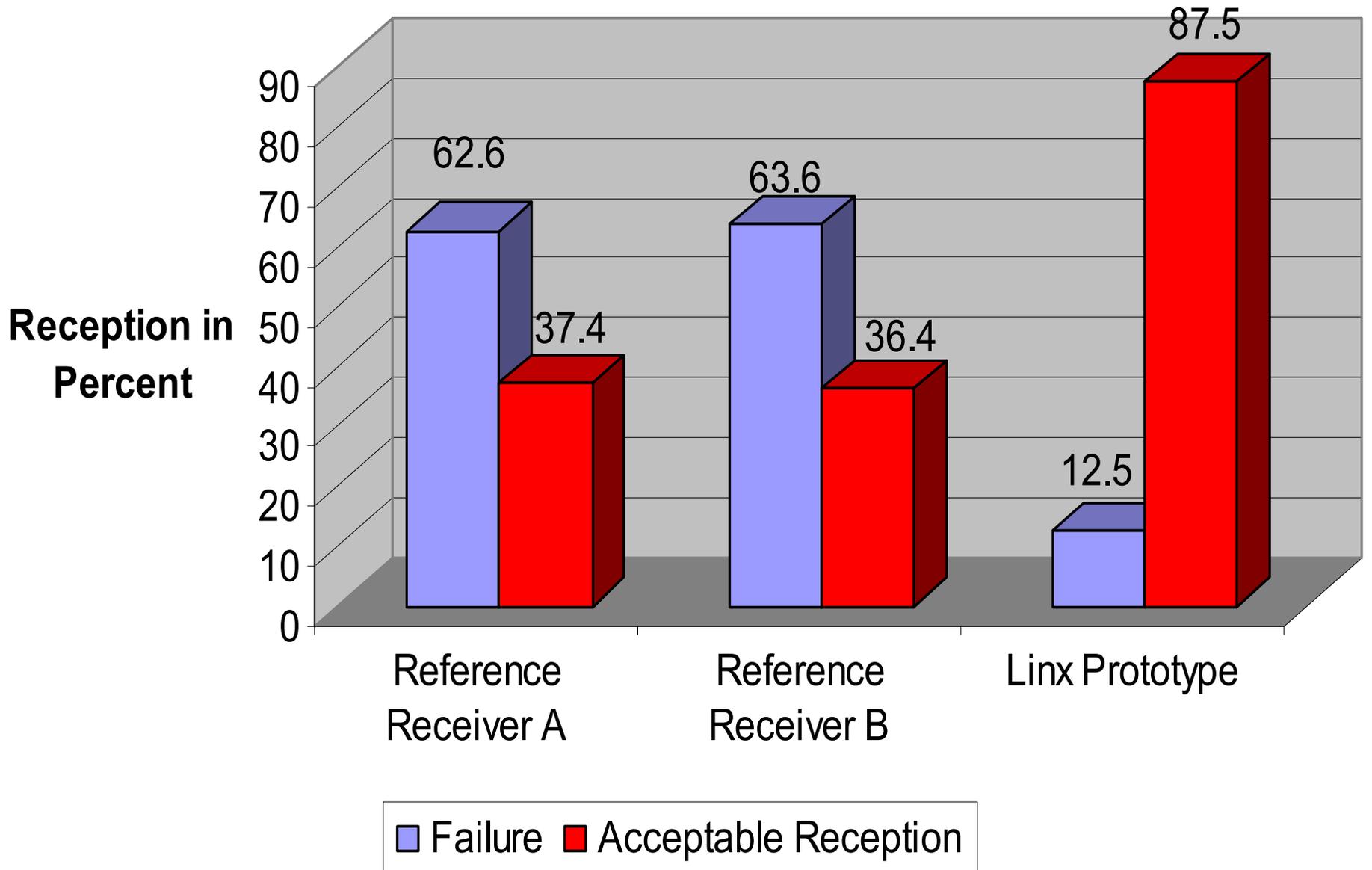


Preliminary Results

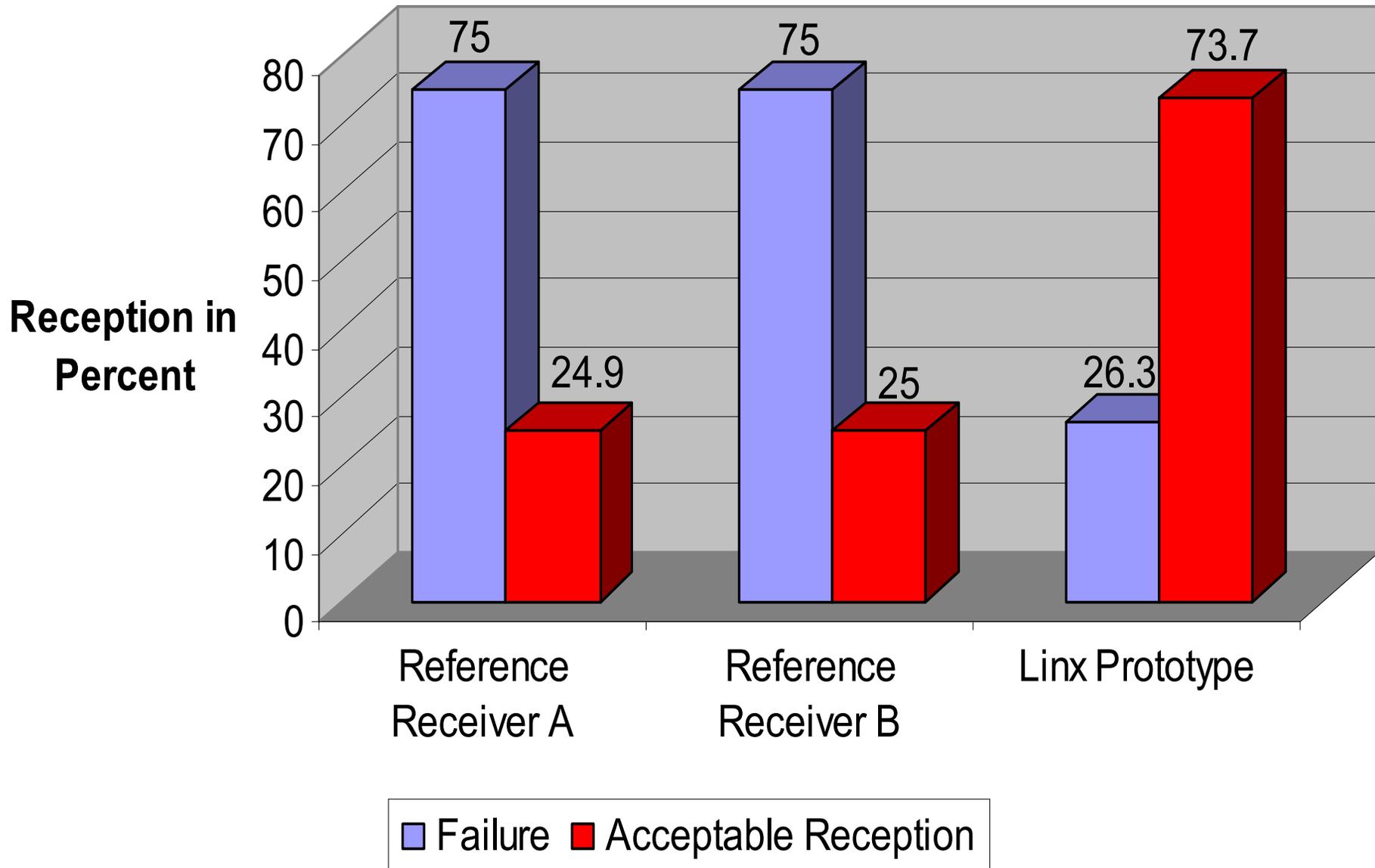
Reception Statistics for Washington



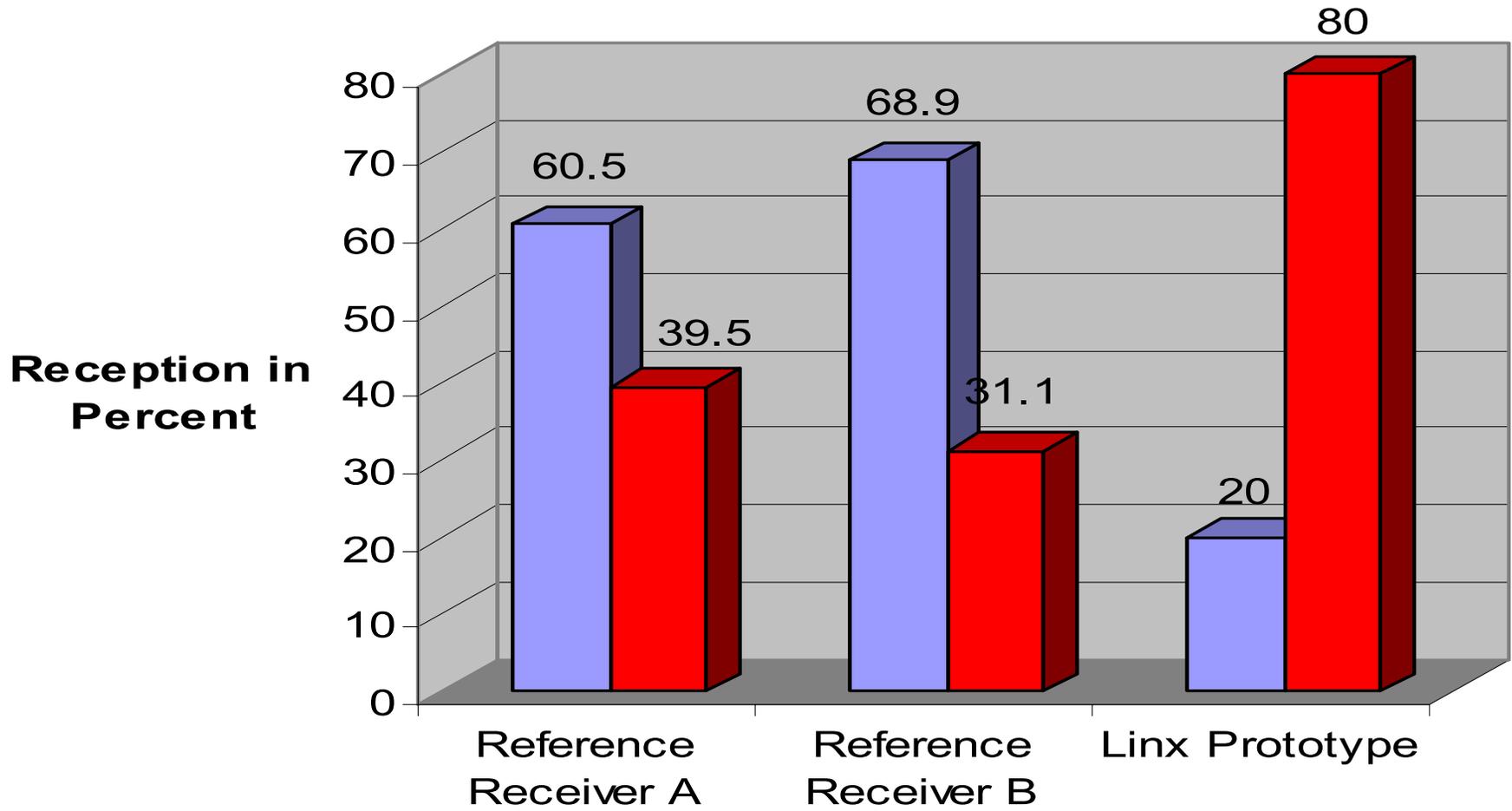
Reception Statistics for Baltimore



Reception Statistics for Philadelphia

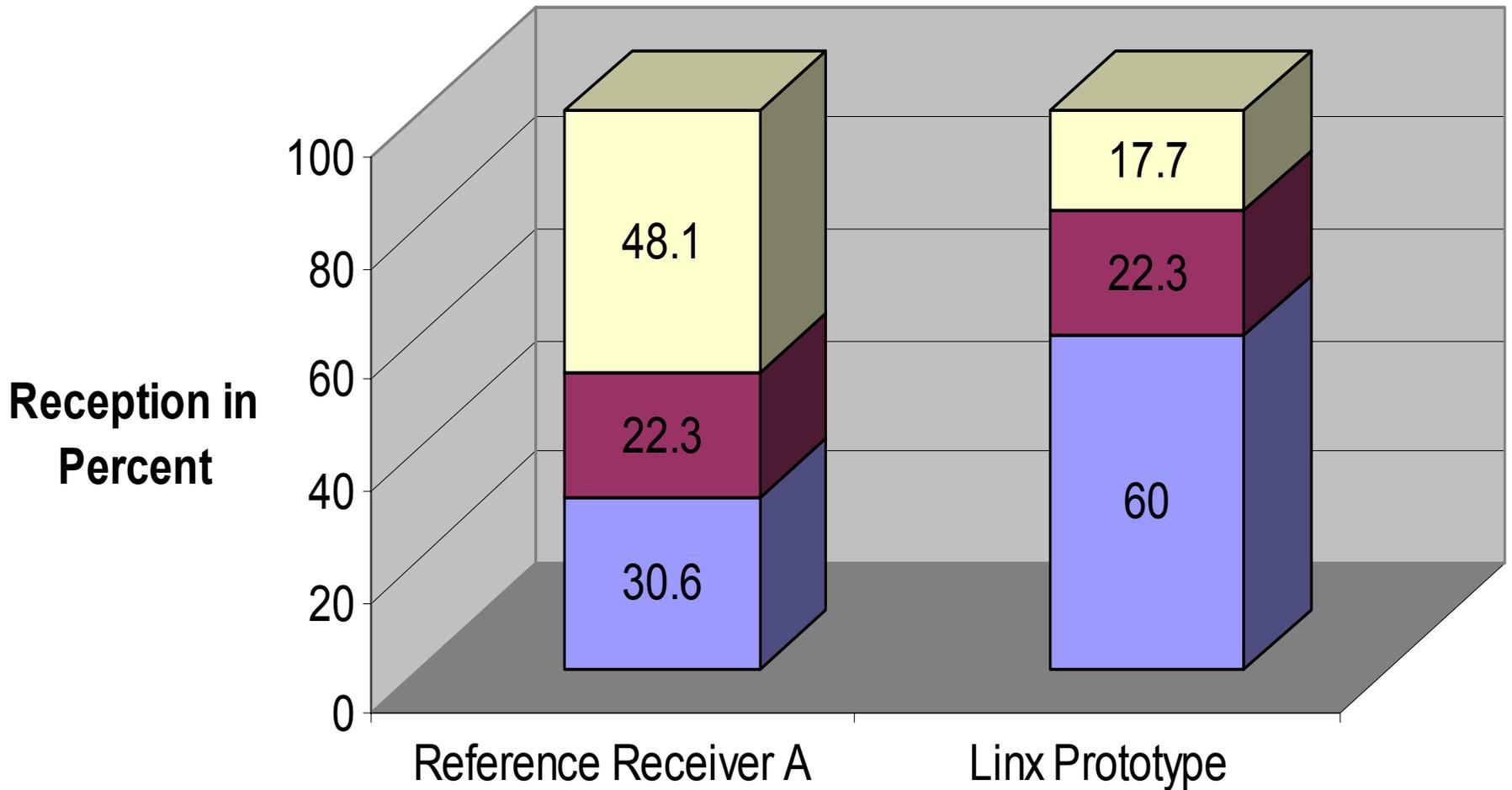


Combined Reception Statistics for all Three Markets



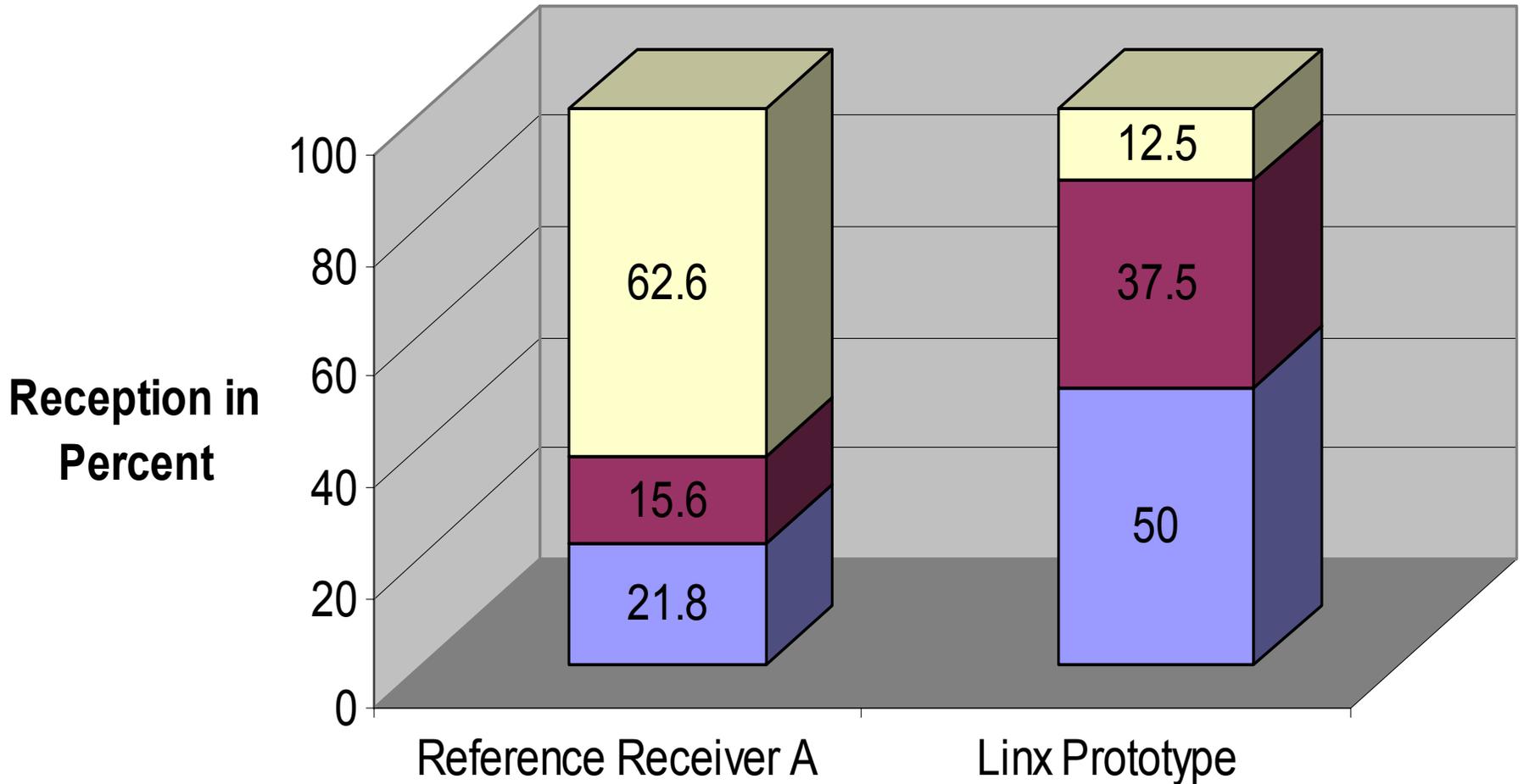
■ Failure ■ acceptable

Reception Statistics for Washington



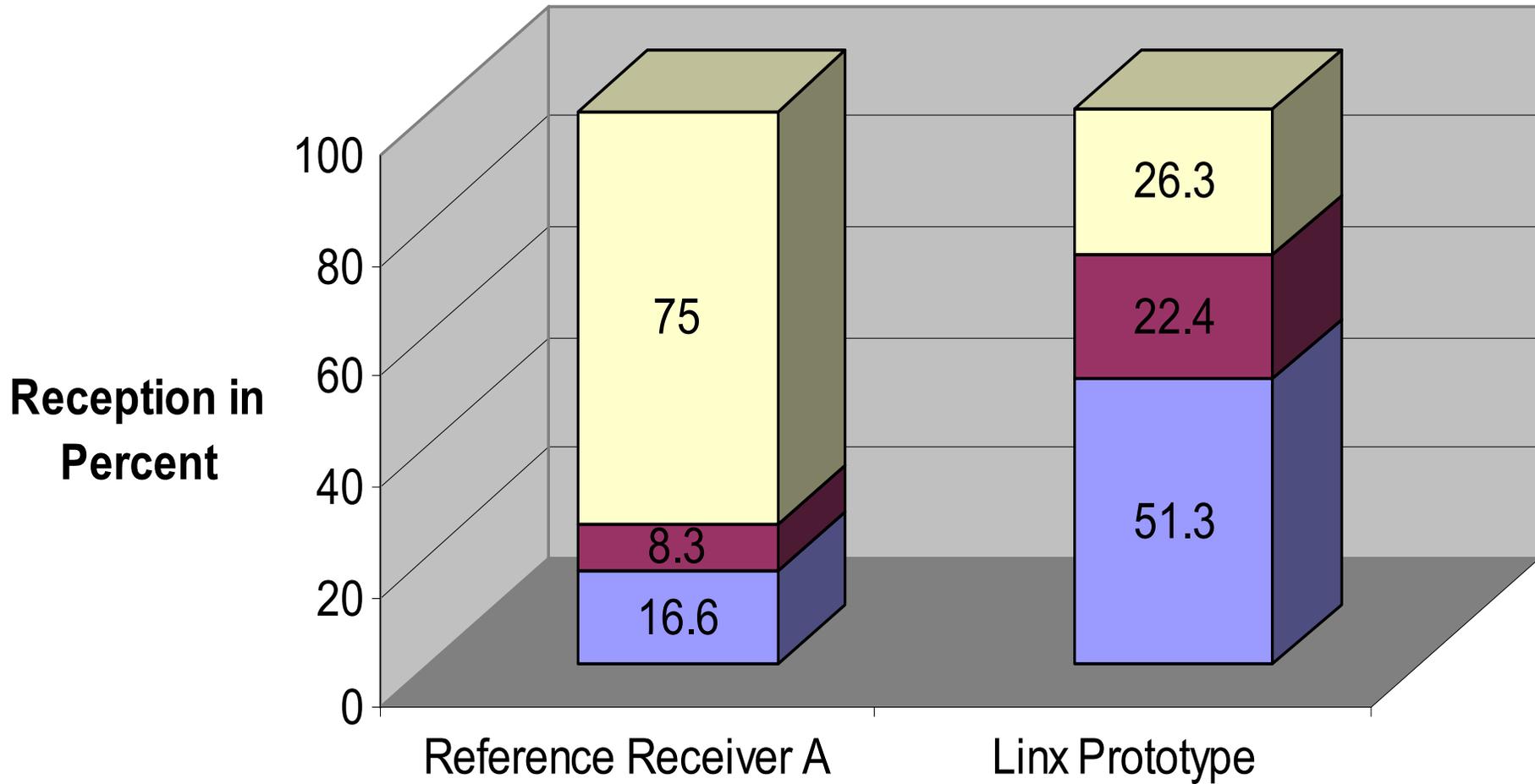
■ Successful Reception ■ Intermittent Picture ■ Failure

Reception Statistics for Baltimore



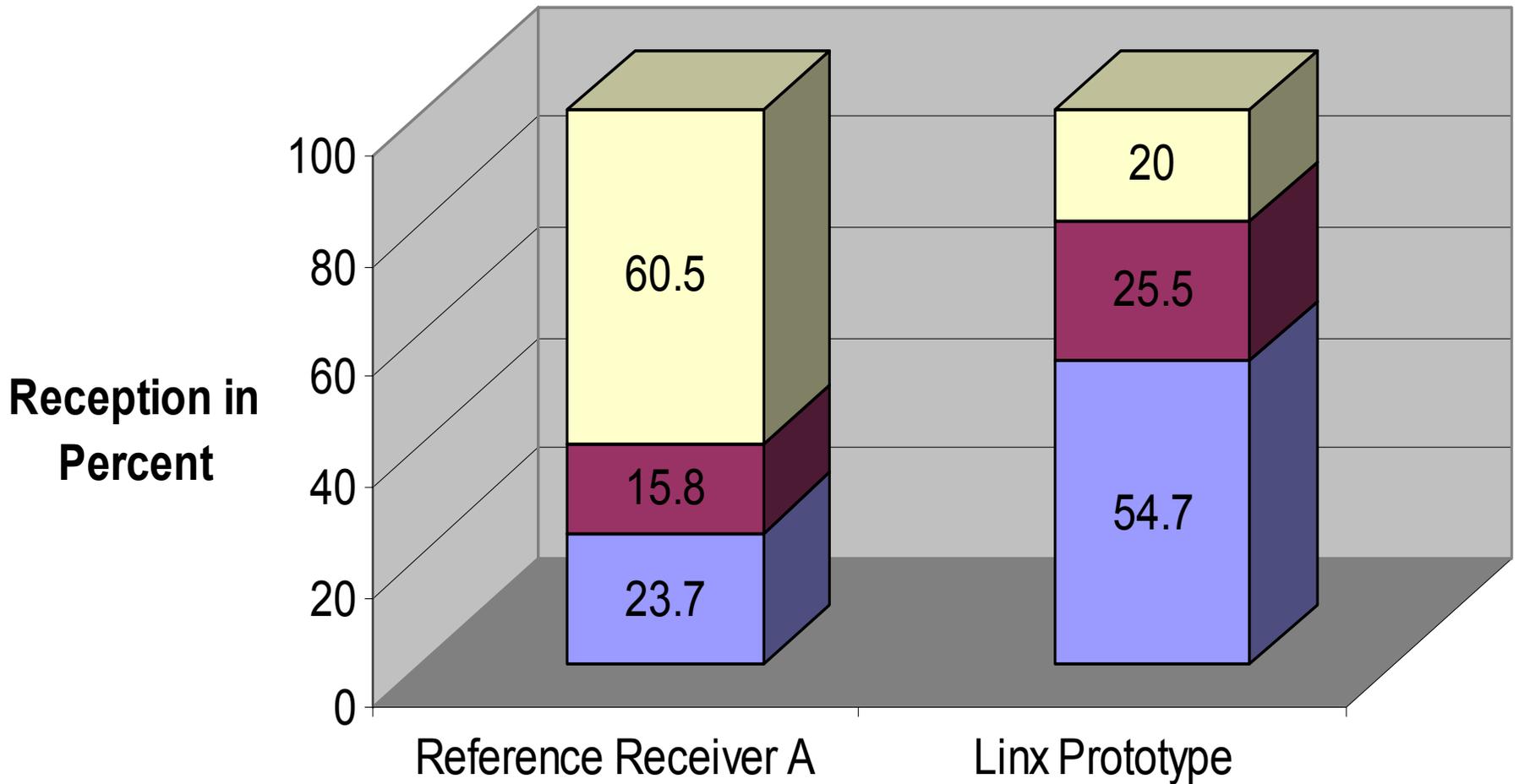
■ Successful Reception ■ Intermittent Picture ■ Failure

Reception Statistics for Philadelphia



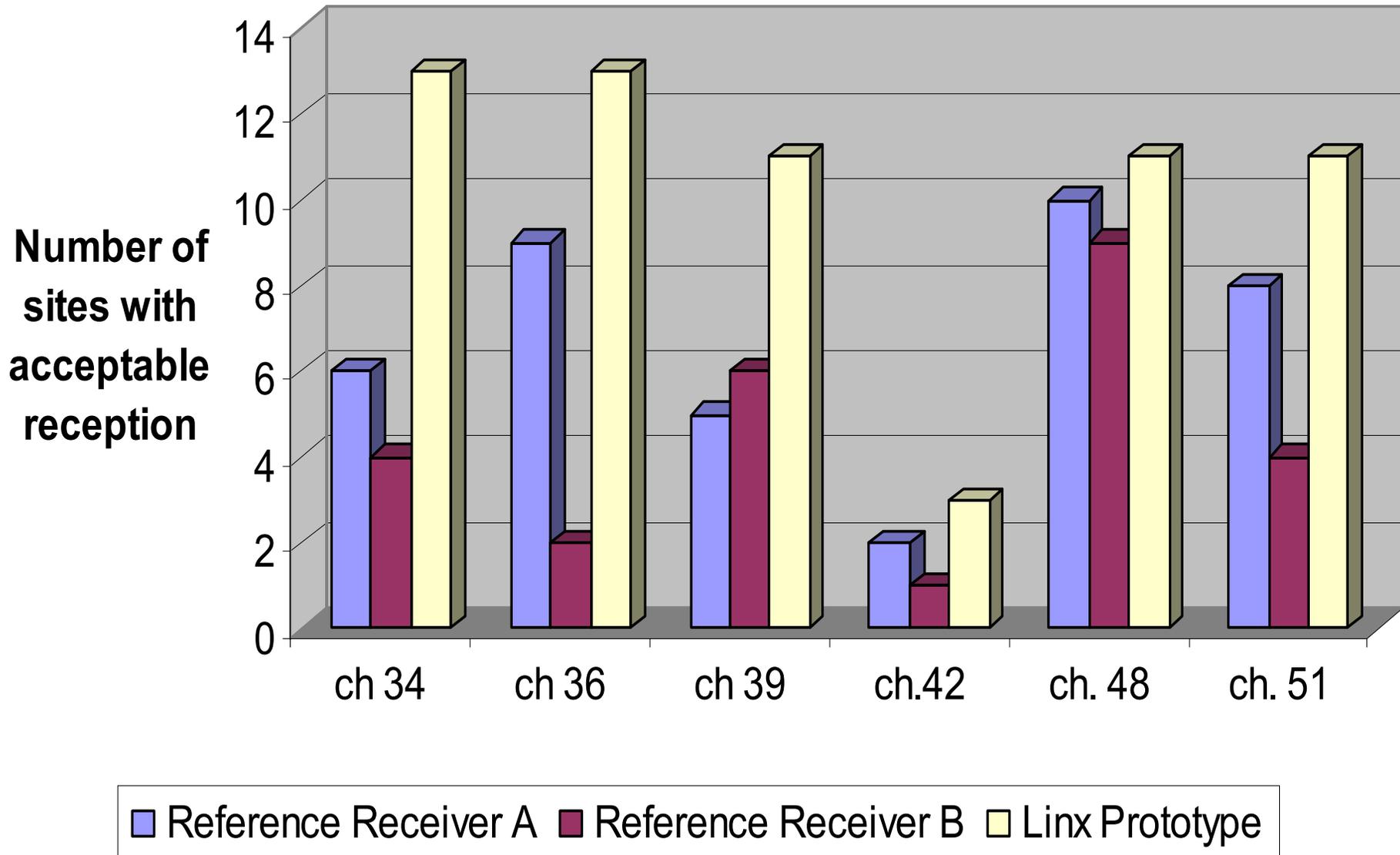
■ Successful Reception ■ Intermittent Picture ■ Failure

Reception Statistics for all Three Markets

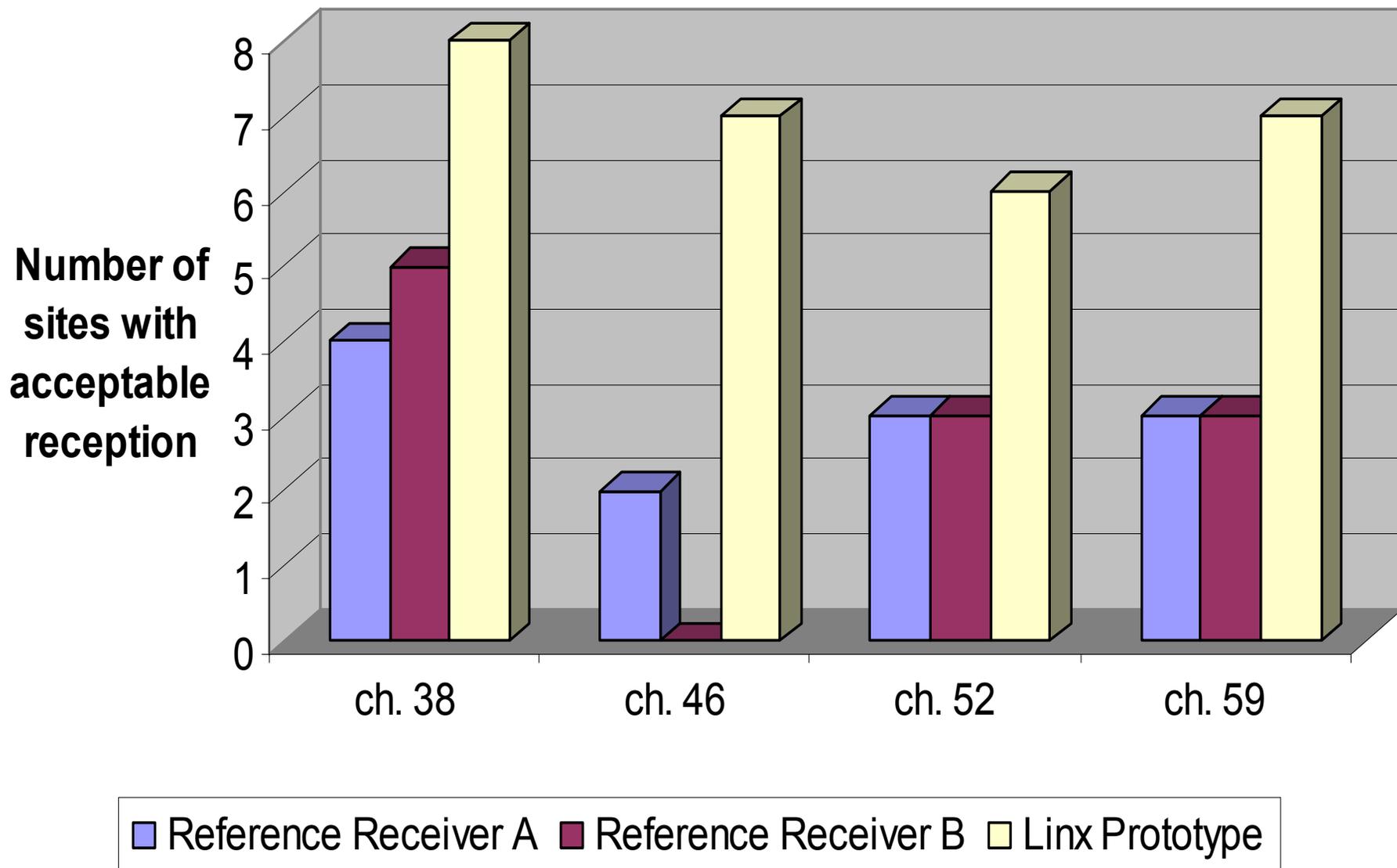


■ Successful Reception ■ Intermittent Picture ■ Failure

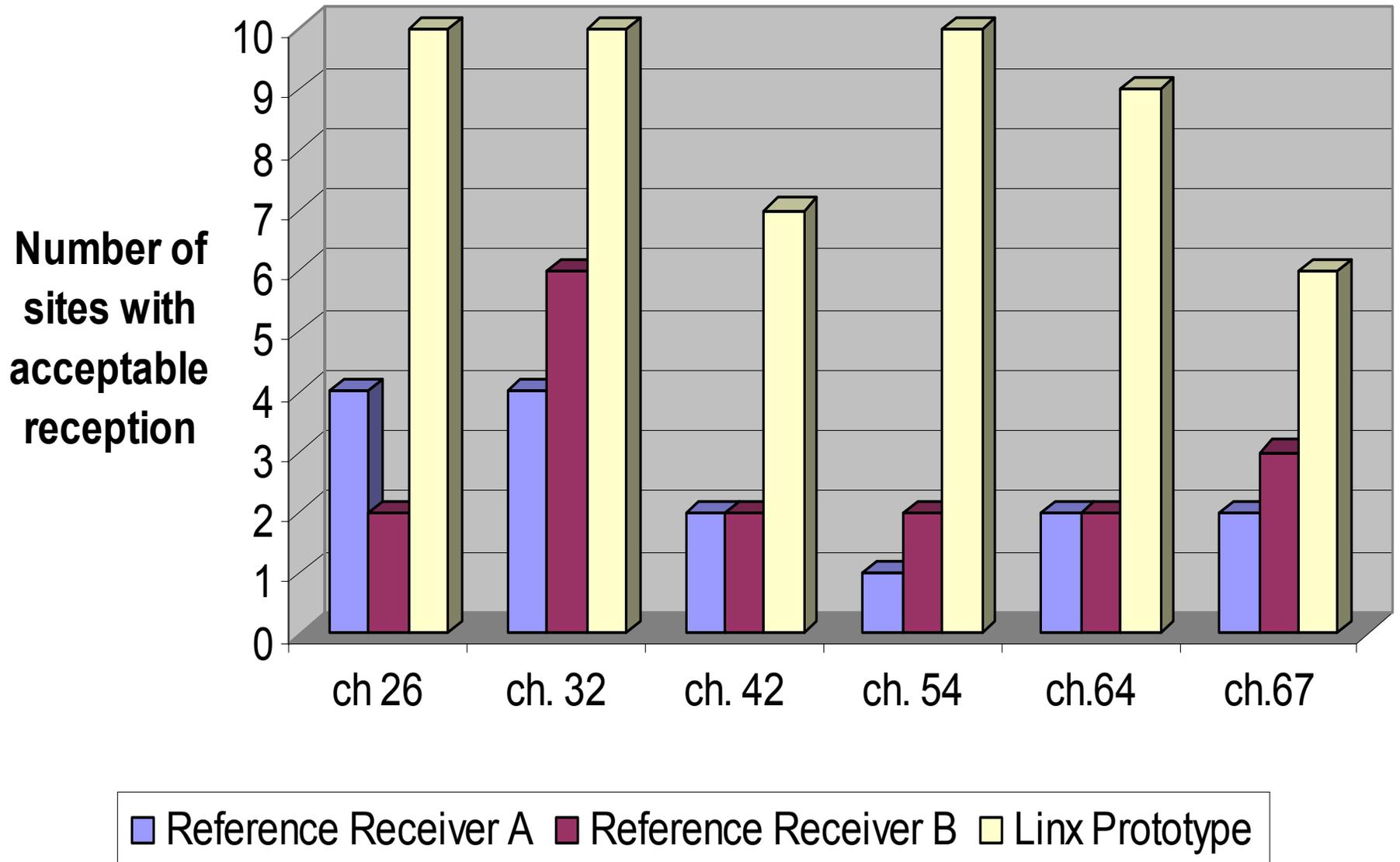
Acceptable Reception by Channel for Washington



Acceptable Reception by Channel for Baltimore



Acceptable Reception by Channel for Philadelphia



Conclusion

- The LINX prototype receiver performed well under severe multipath conditions generally encountered in urban canyon of cities
- The performance of the LINX receiver was significantly better than both of the reference receivers tested

Reply comments of Pappas Telecasting Companies
Exhibit 3

| Market | # | Station | Call Sign |
|---|----------|----------------|------------------|
| New York, NY | 1 | WCBS-TV | CBS |
| | | WNYW | FOX |
| | | WFTY | IND |
| | | WFME-TV | Educational |
| | | WEDW | PBS |
| | | WLIW | PBS |
| Los Angeles, CA | 2 | KTLA | WB |
| | | KCOP | UPN |
| | | KCET | PBS |
| | | KLCS | PBS |
| | | KNBC | NBC |
| | | KCAL-TV | IND |
| | | KSCI | IND |
| | | KRCA-TV | IND |
| | | KMEX-TV | Univision |
| | | KCBS-TV | CBS |
| | | KTTV | FOX |
| | | KABC-TV | ABC |
| Chicago, IL | 3 | WLS -TV | ABC |
| | | WBBM-TV | CBS |
| | | WXFT | IND |
| | | WFLD | FOX |
| | | WMAQ-TV | NBC |
| | | WJYS | IND |
| | | WSNS-TV | Telemundo |
| | | WCPX | PAX |
| | | WYCC | PBS |
| | | WTTW | PBS |
| | | WGN -TV | WB |
| Philadelphia, PA | 4 | WPHL-TV | WB |
| | | WPSG | UPN |
| | | WYBE | PBS |
| | | WNJT | PBS |
| | | WLVT-TV | PBS |
| | | WCAU | NBC |
| | | WTFX-TV | FOX |
| | | WFMZ-TV | IND |
| | | KYW -TV | CBS |
| | | WPVI-TV | ABC |
| San Francisco-Oakland-San Jose, CA | 5 | KGO -TV | ABC |

| Market | # | Station | Call Sign |
|--|----------|---------|-----------|
| | | KPIX | CBS |
| | | KTVU | FOX |
| | | KSTS | Telemundo |
| | | KDTV-TV | Univision |
| | | KCNS-TV | IND |
| | | KRON-TV | IND |
| | | KKPX | PAX |
| | | KNTV-TV | NBC |
| | | KQED | PBS |
| | | KBHK-TV | UPN |
| | | KBWB | WB |
| Boston, MA (Manchester, NH) | 6 | WSBK-TV | UPN |
| | | WGBH-TV | PBS |
| | | WGBX-TV | PBS |
| | | WEKW-TV | PBS |
| | | WENH | PBS |
| | | WHDH | NBC |
| | | WNEU | Telemundo |
| | | WFXT | FOX |
| | | WBZ -TV | CBS |
| | | WMUR-TV | ABC |
| | | WCVB-TV | ABC |
| | | | |
| Dallas-Ft. Worth, TX | | WFAA-TV | ABC |
| | 7 | KTVT | CBS |
| | | KXTX-TV | IND |
| | | KDFW | FOX |
| | | KUVN | Univision |
| | | KFWD | IND |
| | | KSTR-TV | IND |
| | | KPXD | PAX |
| | | KXAS-TV | NBC |
| | | KTXA | UPN |
| | | KDAF | WB |
| | | WBDC-TV | WB |
| Washington, DC (Hagerstown, MD) | | WETA-TV | PBS |
| | | WVPY | PBS |
| | | WWPX | PAX |

| Market | # | Station | Call Sign |
|--|-----------|---------|-----------|
| | | WPXW | PAX |
| | | WRC-TV | NBC |
| | | WTTG-TV | FOX |
| | | WUSA TV | CBS |
| | | WJLA-TV | ABC |
| | | WSB -TV | ABC |
| Atlanta, GA | 9 | WGCL | CBS |
| | | WAGA | FOX |
| | | WXIA-TV | NBC |
| | | WTBS | IND |
| | | WPXA | PAX |
| | | WUPA | UPN |
| | | WATL | WB |
| | | WKBD-TV | UPN |
| Detroit, MI | 10 | WTVS | PBS |
| | | WDIV | NBC |
| | | WADL | FOX |
| | | WJBK | FOX |
| | | WWJ-TV | CBS |
| | | WXYZ-TV | ABC |
| Houston, TX | 11 | KHOU-TV | CBS |
| | | KTRK-TV | ABC |
| | | KRIV | FOX |
| | | KTMD | Telemundo |
| | | KUHT | PBS |
| | | KPRC-TV | NBC |
| | | KTXH | UPN |
| Seattle-Tacoma, WA | 12 | | |
| | | KING-TV | NBC |
| | | KWPX | PAX |
| | | KCTS-TV | PBS |
| | | KBTC-TV | PBS |
| | | KVOS-TV | IND |
| | | KCPQ | FOX |
| | | KOMO-TV | ABC |
| | | KIRO-TV | CBS |
| Tampa-St. Petersburg (Sarasota), FL | 13 | WTSP-TV | CBS |
| | | WFTS | ABC |
| | | WTVT | FOX |
| | | WXPX | PAX |
| | | WFLA-TV | NBC |
| | | WTOG | UPN |

| Market | # | Station | Call Sign |
|--|-----------|---------|-----------|
| | | WTTA | WB |
| Minneapolis-St. Paul, MN | 14 | WFTC | UPN |
| | | KTCA-TV | PBS |
| | | KTCI-TV | PBS |
| | | KARE-TV | NBC |
| | | KAWB | PBS |
| | | KSTC-TV | IND |
| | | KMSP-TV | FOX |
| | | KSTP-TV | ABC |
| | | WCCO-TV | CBS |
| | | WOIO | CBS |
| | | | |
| Cleveland-Akron (Canton), OH | 15 | WEWS | ABC |
| | | WJW | FOX |
| | | WMFD-TV | IND |
| | | WKYC-TV | NBC |
| | | WUAB | UPN |
| Phoenix, AZ | 16 | | |
| | | KAET | PBS |
| | | KPNX-TV | NBC |
| | | KPPX | PAX |
| | | KTVW-TV | Univision |
| | | KSAZ-TV | FOX |
| | | KNXV | ABC |
| | | KPHO-TV | CBS |
| | | WFOR-TV | CBS |
| Miami-Ft. Lauderdale, FL | 17 | WPLG | ABC |
| | | WSVN-TV | FOX |
| | | WSCV | Telemundo |
| | | WAMI-TV | IND |
| | | WLTV | Univision |
| | | WLRN-TV | PBS |
| | | WPBT | PBS |
| | | WBFS-TV | UPN |
| Denver, CO | 18 | KUSA-TV | NBC |
| | | KDVR | FOX |
| | | KXTV | ABC |
| Sacramento-Stockton-Modesto, CA | 19 | KOVR-TV | CBS |
| | | KTXL | FOX |
| | | KUVS | Univision |
| | | KCRA-TV | NBC |
| Orlando-Daytona Beach-Melbourne, FL | 20 | WKCF | WB |

| Market | # | Station | Call Sign |
|-------------------------------------|-----------|---------|-----------|
| | | WOPX | PAX |
| | | WESH | NBC |
| | | WBCC | PBS |
| | | WRDQ | IND |
| | | WKMG-TV | CBS |
| | | WFTV | ABC |
| Pittsburgh, PA | 21 | WPGH-TV | FOX |
| | | KDKA-TV | CBS |
| | | WPCB-TV | IND |
| | | WPXI | NBC |
| St. Louis, MO | 22 | WRBU | UPN |
| | | KETC | PBS |
| | | KSDK | NBC |
| | | KTVI-TV | FOX |
| | | KDNL-TV | ABC |
| | | KMOV | CBS |
| | | KOIN | CBS |
| Portland, OR | 23 | KPTV | FOX |
| | | KGW -TV | NBC |
| | | KPDX | UPN |
| Baltimore, MD | 24 | WNUV-TV | WB |
| | | WMPT | PBS |
| | | WBAL-TV | NBC |
| | | WJZ -TV | CBS |
| | | WISH-TV | CBS |
| Indianapolis, IN | 25 | WRTV | ABC |
| | | WXIN | FOX |
| | | WTHR | NBC |
| | | WFYI | PBS |
| | | WTTK | WB |
| | | WTIU | PBS |
| | | WNDY | UPN |
| San Diego, CA | 26 | KPBS | PBS |
| | | KNSD | NBC |
| | | KFMB-TV | CBS |
| Hartford & New Haven, CT | 27 | WTNH-TV | ABC |
| | | WHPX | PAX |
| | | WEDN | PBS |
| Charlotte, NC | 28 | WTVI | PBS |
| | | WUNG-TV | PBS |
| | | WCNC-TV | NBC |

| Market | # | Station | Call Sign |
|--|-----------|---------|-----------|
| | | WBTV | CBS |
| | | WCCB | FOX |
| Raleigh-Durham (Fayetteville), NC | 29 | | |
| | | WRAL-TV | CBS |
| | | WTVD | ABC |
| | | WRPX | PAX |
| | | WFPX | PAX |
| | | WNCN-TV | NBC |
| | | WUNC-TV | PBS |
| | | WUNP-TV | PBS |
| Nashville, TN | 30 | | |
| | | WKRN-TV | ABC |
| | | WTVF | CBS |
| | | WSMV | NBC |
| | | WTMJ-TV | NBC |
| Milwaukee, WI | 31 | WVCY-TV | IND |
| | | WWRS | IND |
| | | WITI | FOX |
| | | WDJT-TV | CBS |
| | | WISN-TV | ABC |
| | | WVTV | WB |
| | | WCGV-TV | UPN |
| | | WMVS | PBS |
| | | WMVT | PBS |
| | | WCET | PBS |
| Cincinnati, OH | 32 | WSTR-TV | WB |
| | | WCPO-TV | ABC |
| | | WKRC-TV | CBS |
| | | WXIX-TV | FOX |
| | | WLWT | NBC |
| | | WDAF-TV | FOX |
| Kansas City, MO | 33 | KCTV | CBS |
| | | KMBC-TV | ABC |
| | | KSMO-TV | WB |
| | | KCWE | UPN |
| | | KCPT | PBS |
| | | WCMH-TV | NBC |
| Columbus, OH | 34 | WWHO | UPN |
| | | WSYX | ABC |
| | | WBNS-TV | CBS |

| Market | # | Station | Call Sign |
|---|-----------|-------------|-------------|
| | | WTTE | FOX |
| | | WSFJ | IND |
| | | WHNS | FOX |
| Greenville-Spartanburg, SC- Asheville, NC-Anderson, SC | 35 | WSPA-TV | CBS |
| | | WLOS | ABC |
| | | WUNE-TV | PBS |
| | | WUNF-TV | PBS |
| | | WNTV | PBS |
| | | WASV-TV | UPN |
| | | WBSC-TV | WB |
| | | WYFF-TV | NBC |
| | | KSL -TV | NBC |
| Salt Lake City, UT | 36 | KUPX | PAX |
| | | KULC | Educational |
| | | KUED | PBS |
| | | KBYU-TV | PBS |
| | | KUES | PBS |
| | | KUEW | PBS |
| | | KUWB | WB |
| | | KTVX | ABC |
| | | KUTV | CBS |
| | | KUSG | CBS |
| | | KJZZ-TV | IND |
| | | KSTU | FOX |
| | | KENS-TV | CBS |
| San Antonio, TX | 37 | KABB | FOX |
| | | KVDA | Telemundo |
| | | KWEX-TV | Univision |
| | | KSAT-TV | ABC |
| | | KRRT | WB |
| | | KLRN-TV | PBS |
| | | WOAI | NBC |
| | | WZPX | PAX |
| Grand Rapids-Kalamazoo-Battle Creek, MI | 38 | WOTV | ABC |
| | | WZZM- TV | ABC |
| | | WWMT | CBS |
| | | WOOD- TV | NBC |
| | | WXMI | FOX |
| | | WFLX | FOX |
| West Palm Beach-Ft. Pierce, FL | 39 | WPTV | NBC |
| | | WHDT- | IND |

| Market | # | Station | Call Sign |
|--|-----------|---------|-----------|
| | | DT | |
| | | WPEC | CBS |
| | | WPBF | ABC |
| | | WTVX | UPN |
| | | WABM-TV | UPN |
| Birmingham (Anniston, Tuscaloosa), AL | 40 | WTTO | WB |
| | | WPXH | PAX |
| | | WVTM-TV | NBC |
| | | WBIQ | PBS |
| | | WGIQ | PBS |
| | | WIAT | CBS |
| | | WTJP | IND |
| | | WBRC | FOX |
| | | WVBT | FOX |
| Norfolk-Portsmouth-Newport News, VA | 41 | WAVY-TV | NBC |
| | | WTKR-TV | CBS |
| | | WVEC-TV | ABC |
| | | WHRO-TV | PBS |
| | | WPXV | PAX |
| | | WTVZ | WB |
| | | WGNT | UPN |
| | | WUPL | UPN |
| New Orleans, LA | 42 | WDSU-TV | NBC |
| | | WWL-TV | CBS |
| | | WHNO-TV | IND |
| | | WBUY | IND |
| Memphis, TN | 43 | WHBQ-TV | FOX |
| | | WMC-TV | NBC |
| | | WREG-TV | CBS |
| | | WPTY-TV | ABC |
| | | WPXX | PAX |
| | | WLMT | UPN |
| | | WGRZ-TV | NBC |
| Buffalo, NY | 44 | WNED-TV | PBS |
| | | WIVB-TV | CBS |
| | | KOCO-TV | ABC |

| Market | # | Station | Call Sign |
|--|-----------|----------------|------------------|
| Oklahoma City, OK | 45 | KTBO-TV | IND |
| | | KSBI | IND |
| | | KOKH | FOX |
| | | KETA | PBS |
| | | KOPX | PAX |
| | | KFOR-TV | NBC |
| | | KOCB-TV | WB |
| | | WTWB | WB |
| Greensboro-High Point-Winston Salem, NC | 46 | WUNL-TV | PBS |
| | | WUPN-TV | UPN |
| | | WGHP | FOX |
| | | WLXI-TV | IND |
| | | WXII | NBC |
| | | WXLV-TV | ABC |
| | | WFMY-TV | CBS |
| | | WHP -TV | CBS |
| Harrisburg-Lancaster-Lebanon-York, PA | 47 | WPMT | FOX |
| | | WGCB-TV | IND |
| | | WLYH-TV | UPN |
| | | WGAL-TV | NBC |
| | | WITF-TV | PBS |
| | | WPRI-TV | CBS |
| Providence, RI-New Bedford, MA | 48 | KRQE | CBS |
| Albuquerque-Santa Fe, NM | 49 | KOAT-TV | ABC |
| | | KOVT | ABC |
| | | KOCT-TV | ABC |
| | | KASA-TV | FOX |
| | | KNAT | IND |
| | | KENW | PBS |
| | | KNME-TV | PBS |
| | | KOB -TV | NBC |
| | | KOBR-TV | NBC |
| | | WAVE | NBC |
| Louisville, KY | 50 | WBNA | PAX |
| | | WKMJ | PBS |
| | | WKPC-TV | PBS |
| | | WDRB | FOX |
| | | WHAS-TV | ABC |
| | | WLKY | CBS |
| | | | |