Attorney Docket No. 9301-74REI PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Peter D. Karabinis
Application No.: 11/325,696
Filed: January 4, 2006
Reissue of Pat. No.: 6,785,543
For: FILTERS FOR COMBINED RADIOTELEPHONE/GPS TERMINAS

Confirmation No. 9229
Group Art Unit: 2618
Examiner: R. Chan

Date: October 4, 2007

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT PURSUANT TO 37 C.F.R. § 1.97(b)

Sir:

Attached is a list of documents, together with a copy of any listed foreign patent document and/or non-patent literature. A copy of any listed U.S. patent and/or U.S. patent application publication is not provided herewith in accordance with the amendment by the U.S. Patent and Trademark Office to 37 C.F.R. § 1.98(a)(2)(ii) effective October 21, 2004.

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. § 1.97(b), within three months of the filing date of the above-referenced application or before the mailing of a first Office Action on the merits, whichever event occurs last. Therefore, no fee is believed due. However, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-0220.

It is requested that these documents be considered by the Examiner and officially made of record in accordance with the provisions of 37 C.F.R. § 1.56 and Section 609 of the MPEP.

Respectfully submitted,

Scott C. Hatfield
Registration No. 38,176

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CERTIFICATION OF TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on October 4, 2007.

Signature: _____
Joyce Padli

Substitute form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Application Number	11/325,696
		Filing Date	January 4, 2006
		First Named Inventor	Peter D. Karabinis
		Confirmation No.	9229
(use as many sheets as necessary)		Examiner Name	R. Chan
Sheet 1	of A4	Attorney Docket Number	9301-74RE

U.S. PATENTS AND PATENT PUBLICATIONS					
Examiner Initials*	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code (if known)		

U.S. PATENT APPLICATIONS				
Examiner Initials*	Cite No.	U.S. Serial No.	Name of Applicant of Cited Document	Date of Filing of Cited Document MM-DD-YYYY
		US-		
		US-		
		US-		
		US-		

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Translation
		Office	Number	Kind Code (if known)			

OTHER NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T
	1.	Declaration of Gary Churan Regarding Frequency Response of a Garmin GA 27C GPS ANTENNA Module and attached Summary of Laboratory Results Entitled "Desensitization Performance of GPS Receivers and MSV System Implications".	
	2.	Braasch, Michael et al.; "GPS Receiver Architectures and Measurements" Proceeding of the IEEE, Vol. 87. No. 1, January 1999.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Attorney Docket No. 9301-74RE PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Peter D. Karabinis Confirmation No: 9229
Serial No. 11/325,696 Group Art Unit: 2684
Filed: January 4, 2006
For: *Filters For Combined Radiotelephon/GPS Terminals*

DECLARATION OF GARY CHURAN REGARDING FREQUENCY RESPONSE OF A GARMIN GA 27C GPS ANTENNA MODULE

Sir:

I, Gary Churan, declare as follows:

1. I am Director of System Analysis at Mobile Satellite Ventures, LP, (also referred to as "MSV") assignee of the above referenced Reissue Patent Application No. 11/325,696 entitled "*Filters For Combined Radiotelephone/GPS Terminals*", filed January 4, 2006.

2. In 2001, I measured frequency responses of commercially available GPS (Global Positioning System) antenna modules including a Garmin GA 27C GPS antenna module, and the results of these measurements were included in an internal MSV report entitled "Desensitization Performance Of GPS Receivers And MSV System Implications: Summary of MSV Laboratory Test Results," October 10, 2001 (the "internal MSV report"). A copy of the internal MSV report is attached hereto as Appendix A.

3. A diagram of the laboratory test configuration used to measure the frequency responses is provided at page 2 of Appendix A. A graph illustrating the measured frequency responses (normalized to 1575 MHz (dB)) is provided at page 4 of Appendix A.

4. As shown in the graph of page 4 of Appendix A, the Garmin GA 27C GPS antenna module includes a front-end filter that suppresses at least 10 dB of energy at frequencies at and below 1560 MHz. More particularly, the front-end filter of the Garmin GA 27C antenna module suppresses at least 20 dB of energy at frequencies at and below 1560MHz.

5. The Garmin GA 27C GPS antenna module having the frequency response illustrated in the graph of page 4 of Appendix A was on sale at least before July 19, 2001.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Gary Churan

Gary Churan

4 October 2007

Date

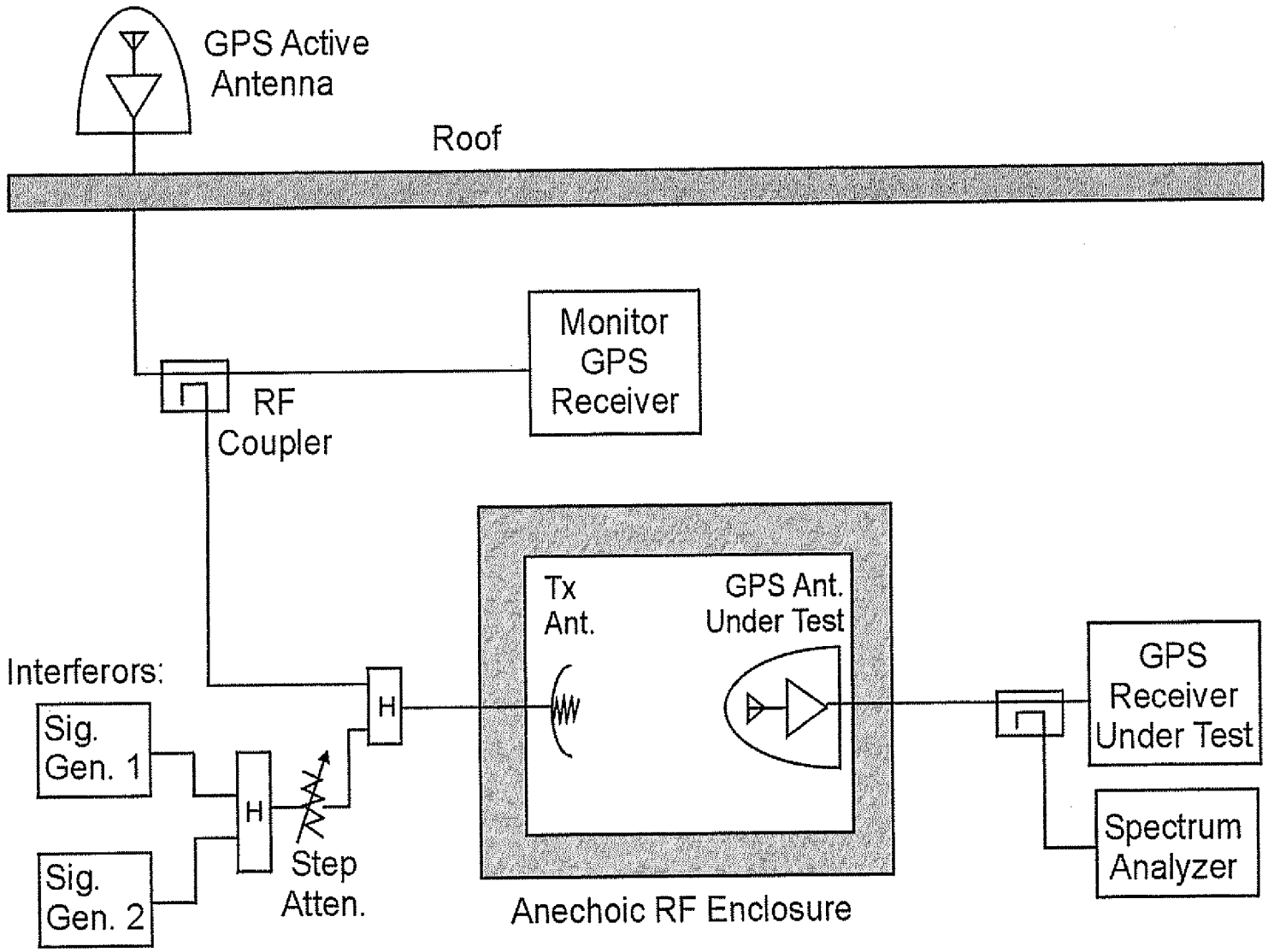
MSV
Mobile Satellite Ventures LLC

Desensitization Performance of GPS Receivers and MSV System Implications

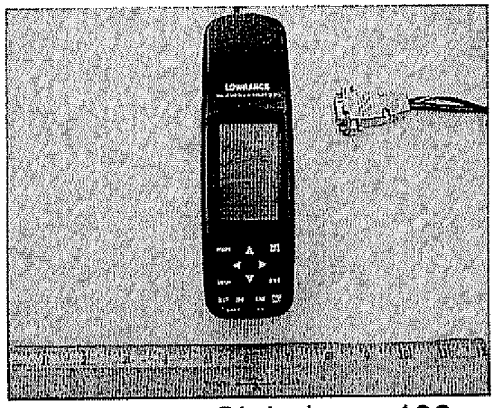
Summary of MSV Laboratory Test Results

October 10, 2001

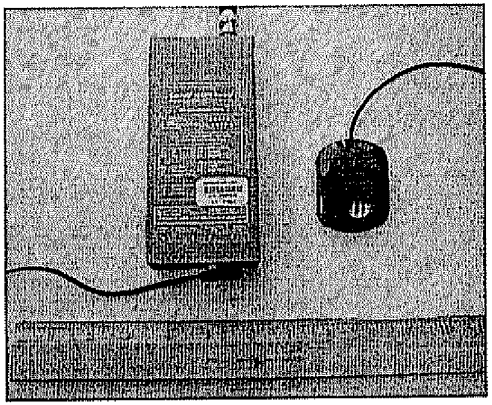
MSV Laboratory Test Configuration



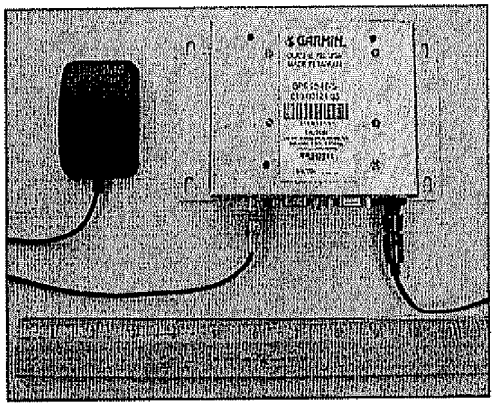
GPS Test Receivers



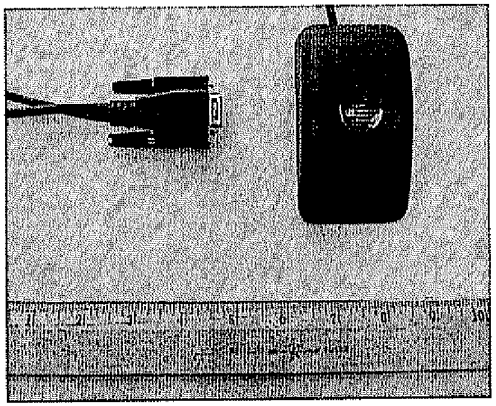
Lowrance Globalmap-100



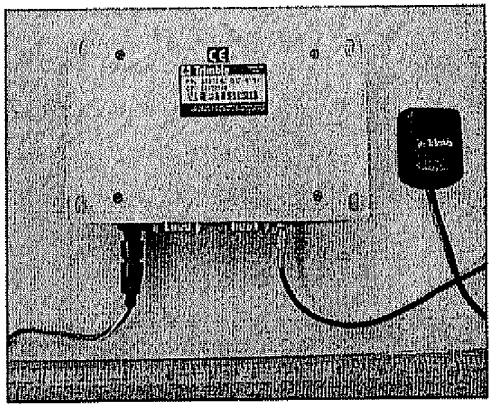
Motorola Oncore M12



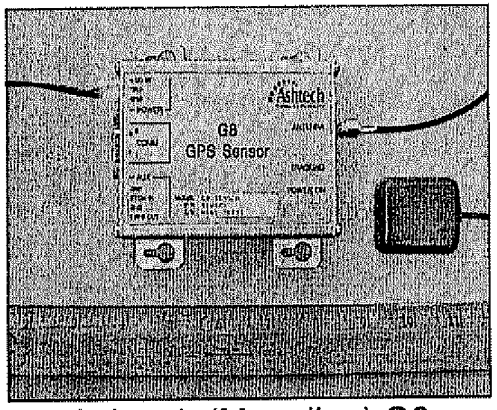
Garmin GPS-25



Garmin GPS-35

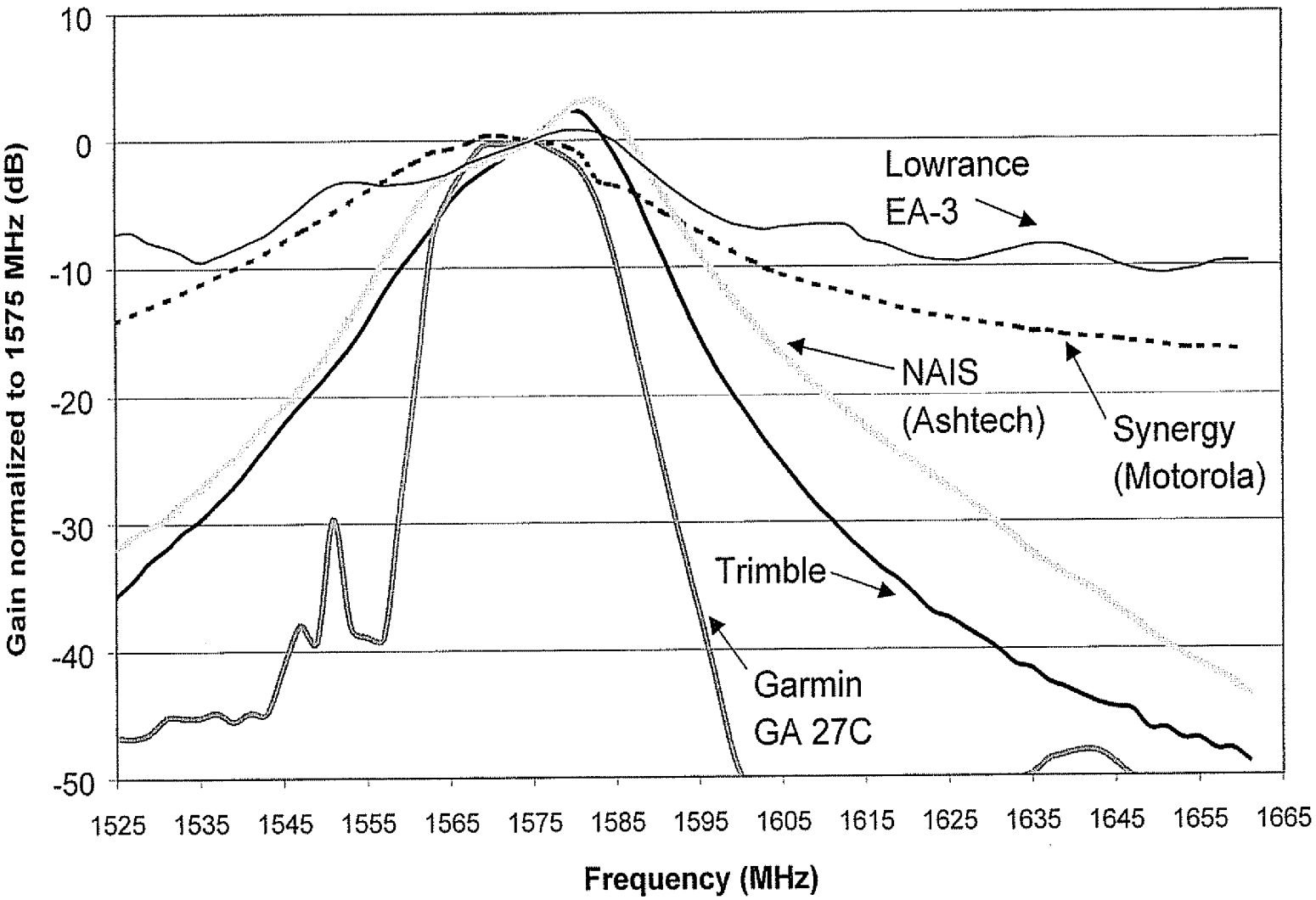


Trimble SVeeEight Plus



Ashtech (Magellan) G8

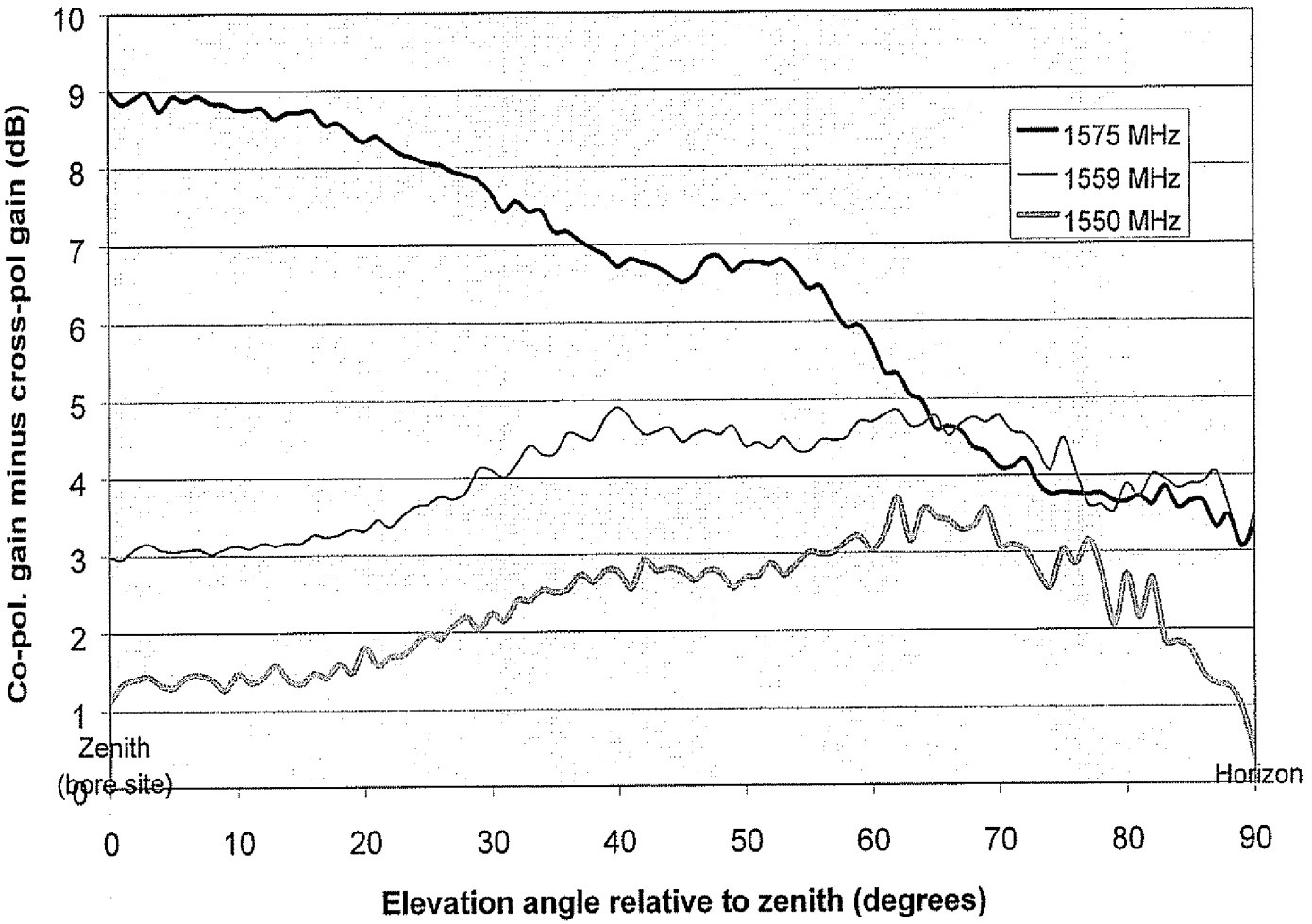
GPS Antenna Module Frequency Response



GPS Antenna Cross-Pol. Isolation vs. Elevation Angle

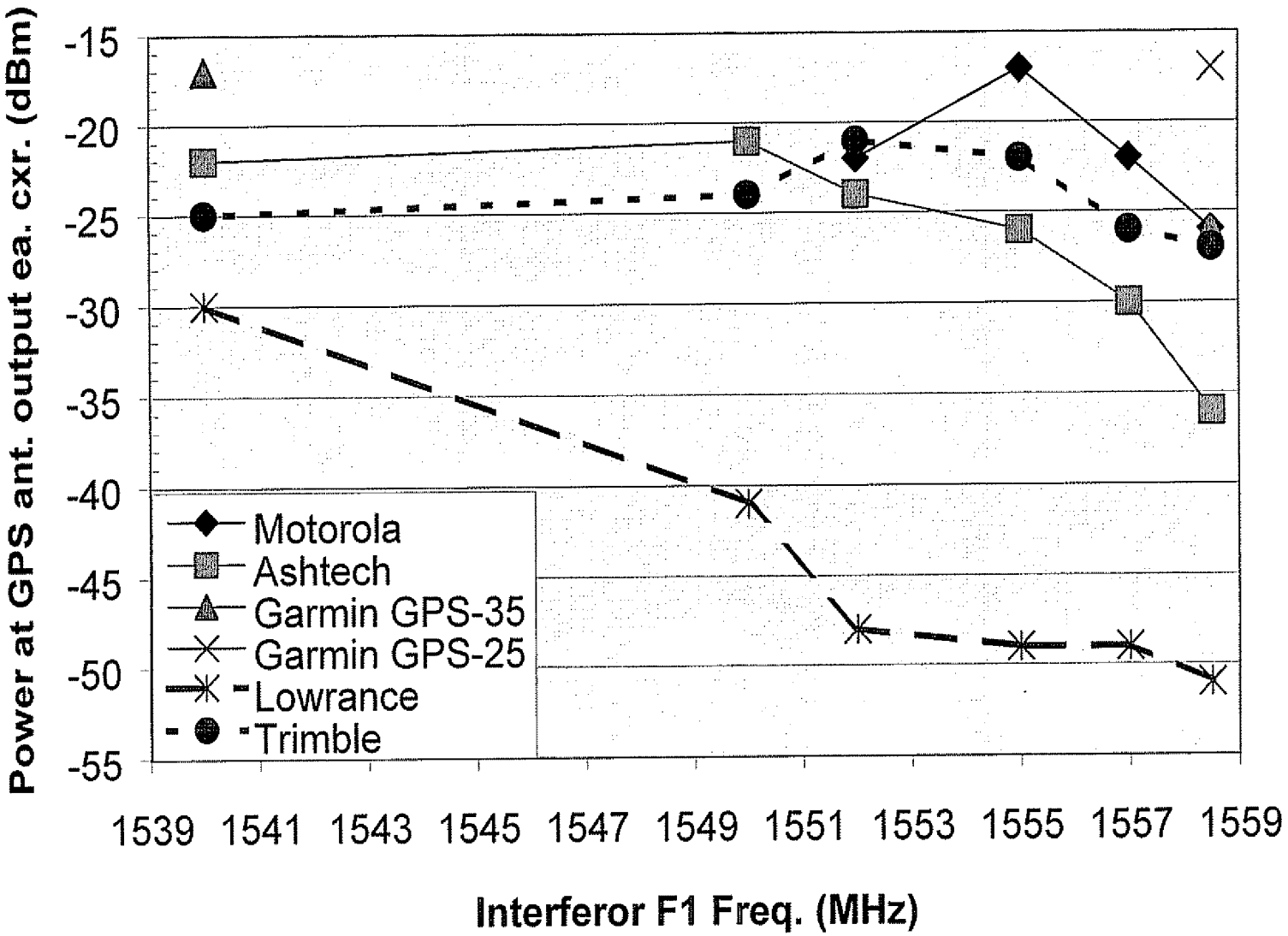
Anechoic Chamber Measurements at CSS Antenna:

(Motorola antenna - values averaged over 6 different azimuth angles)



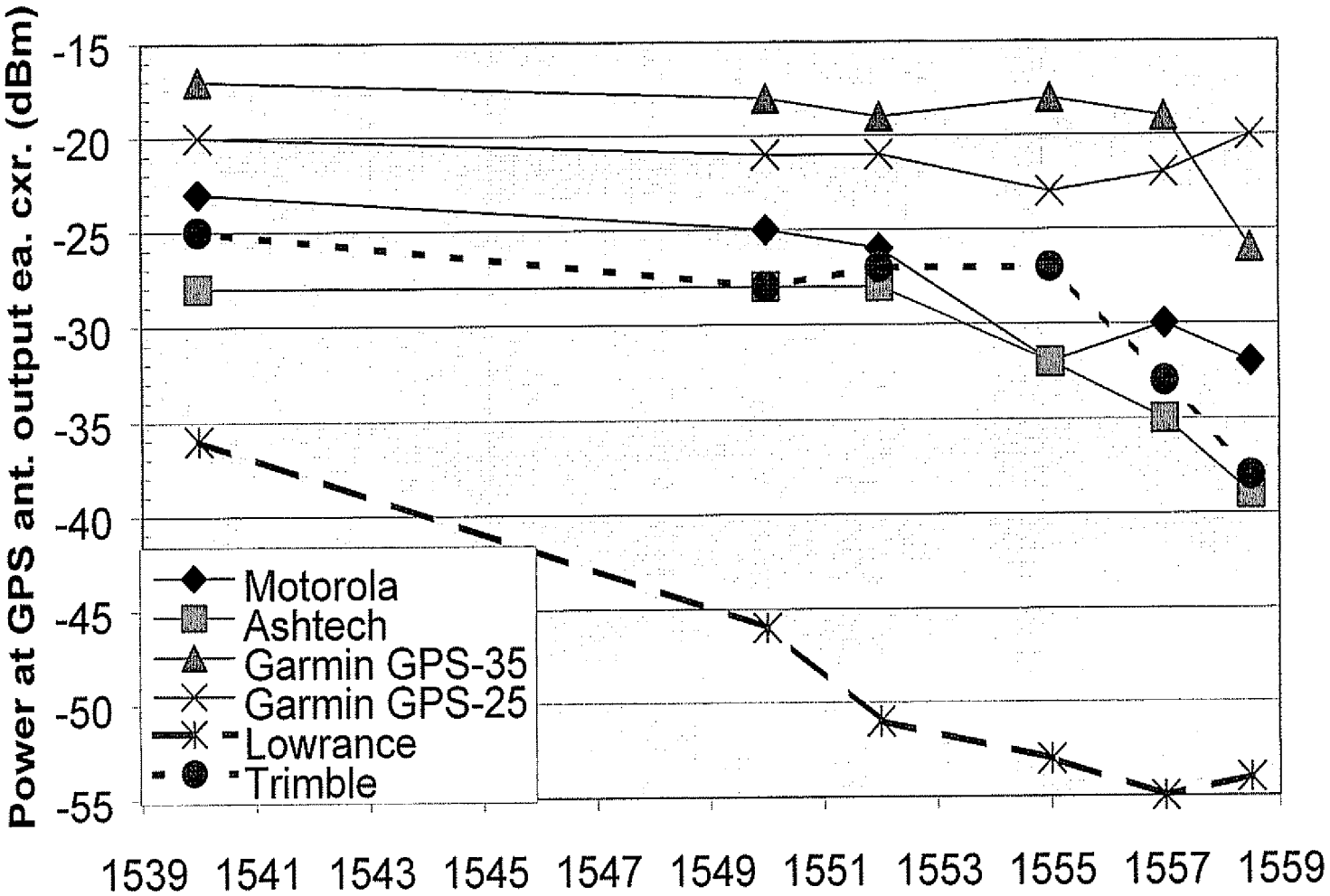
Desensitization Thresholds For a Single GSM/GMSK Interferor

(Threshold = <4 SVs Tracked)



Desense Thresholds For a 2 GSM Interferors Spaced 1.6 MHz Apart

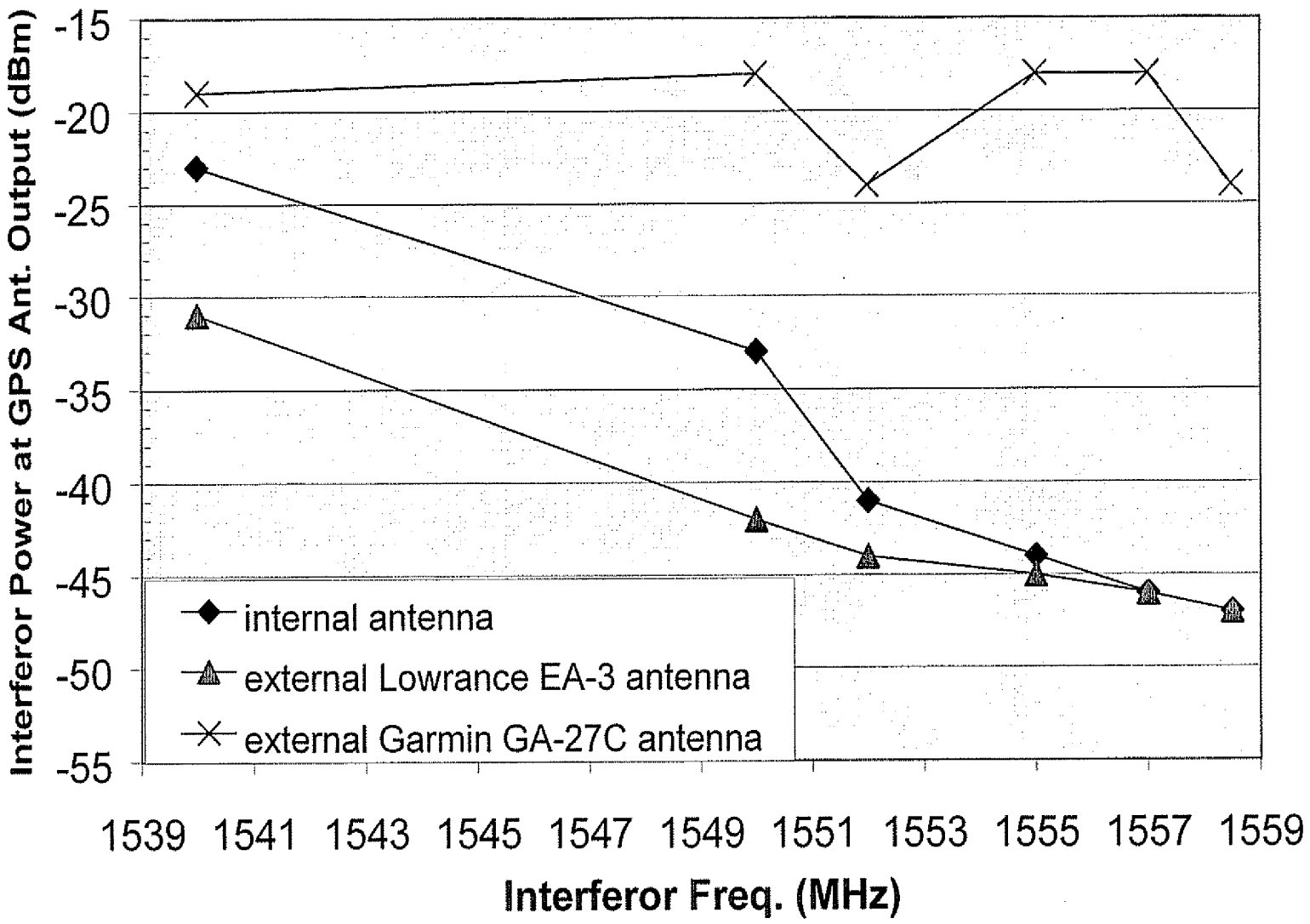
(Threshold = <4 SVs Tracked)



(Interferor F2 Freq. = F1 - 1.6 MHz)

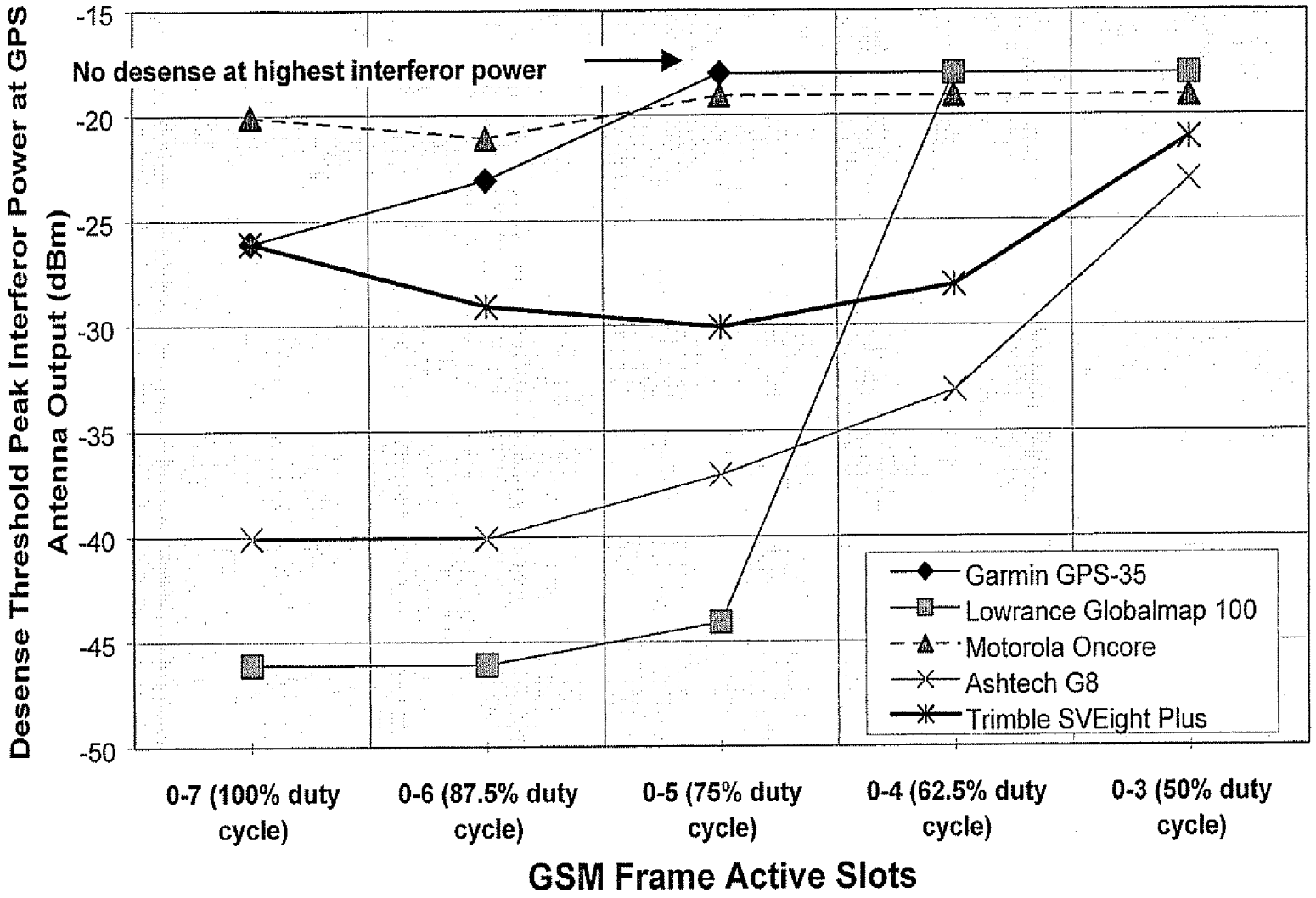
Lowrance Receiver Desense Thresholds for Various Antennas

(GSM Interference)



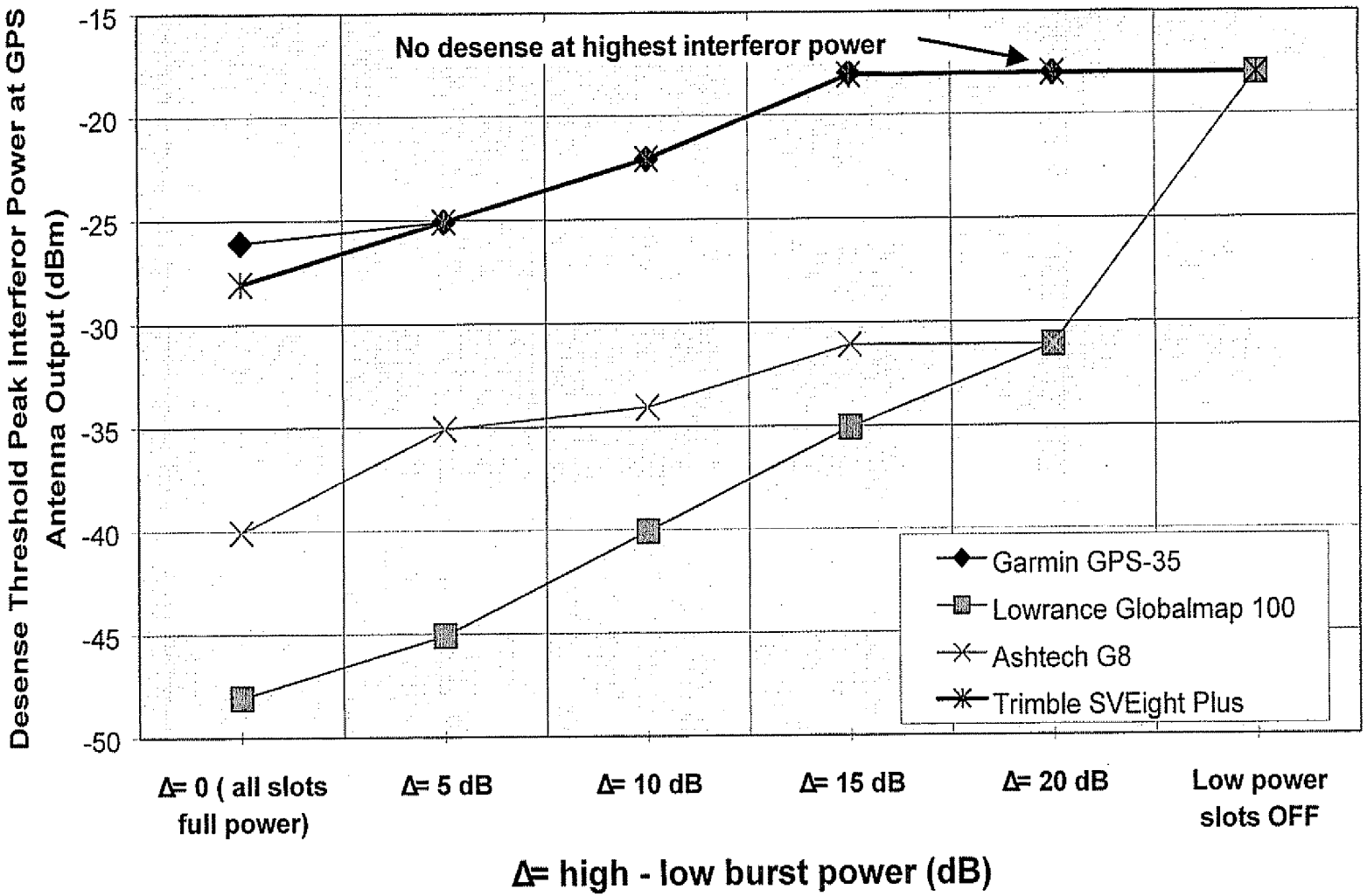
Desense Threshold vs. GSM Duty Cycle

(GMSK Modulation, Interferor Frequency = 1558.5 MHz)



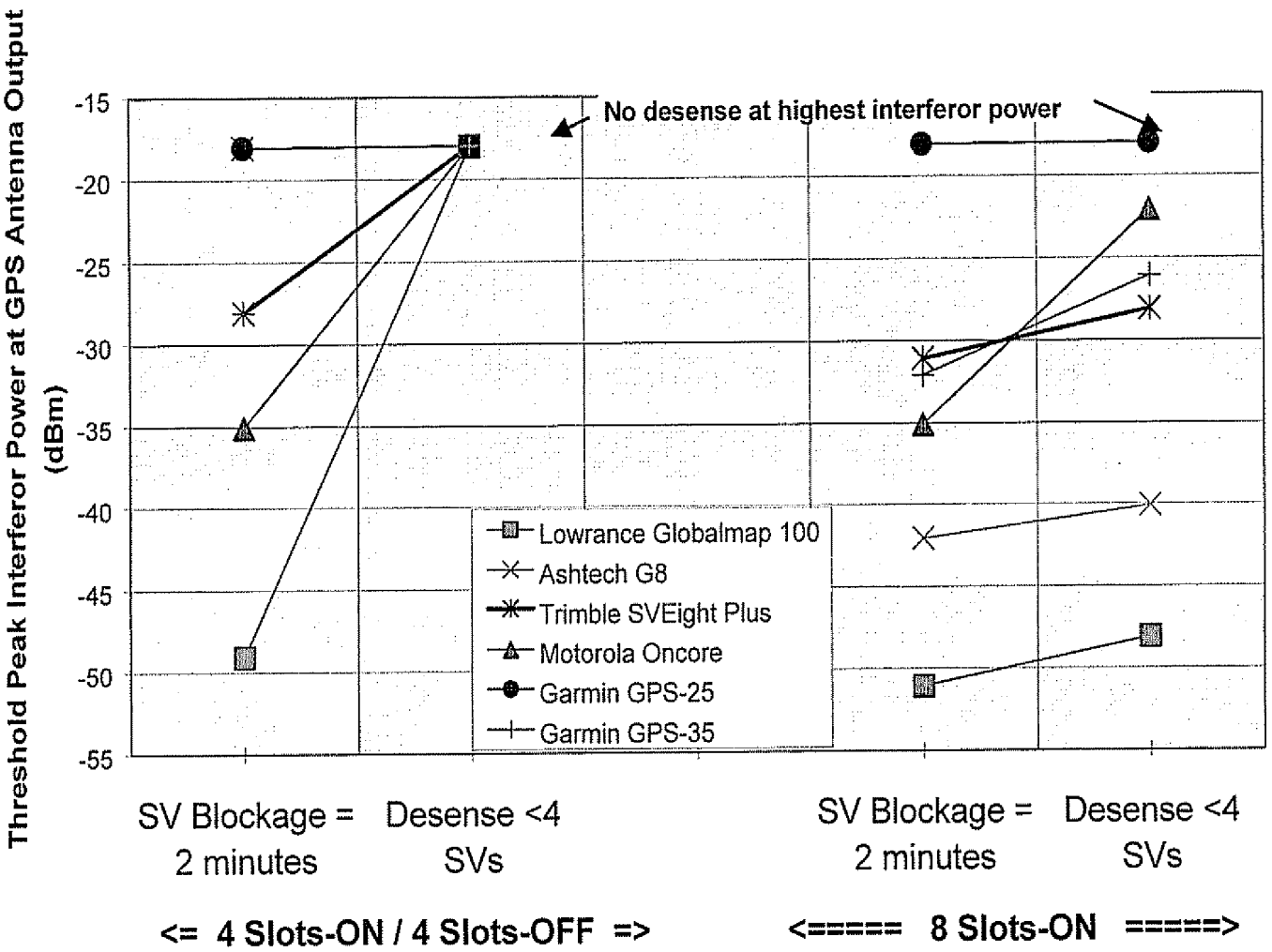
GPS Receiver Desense vs. High/Low Burst Power Delta

(GSM Frame Config.: 4 High Power Slots / 4 Low Power Slots.
Interferor Frequency = 1558.5 MHz.)



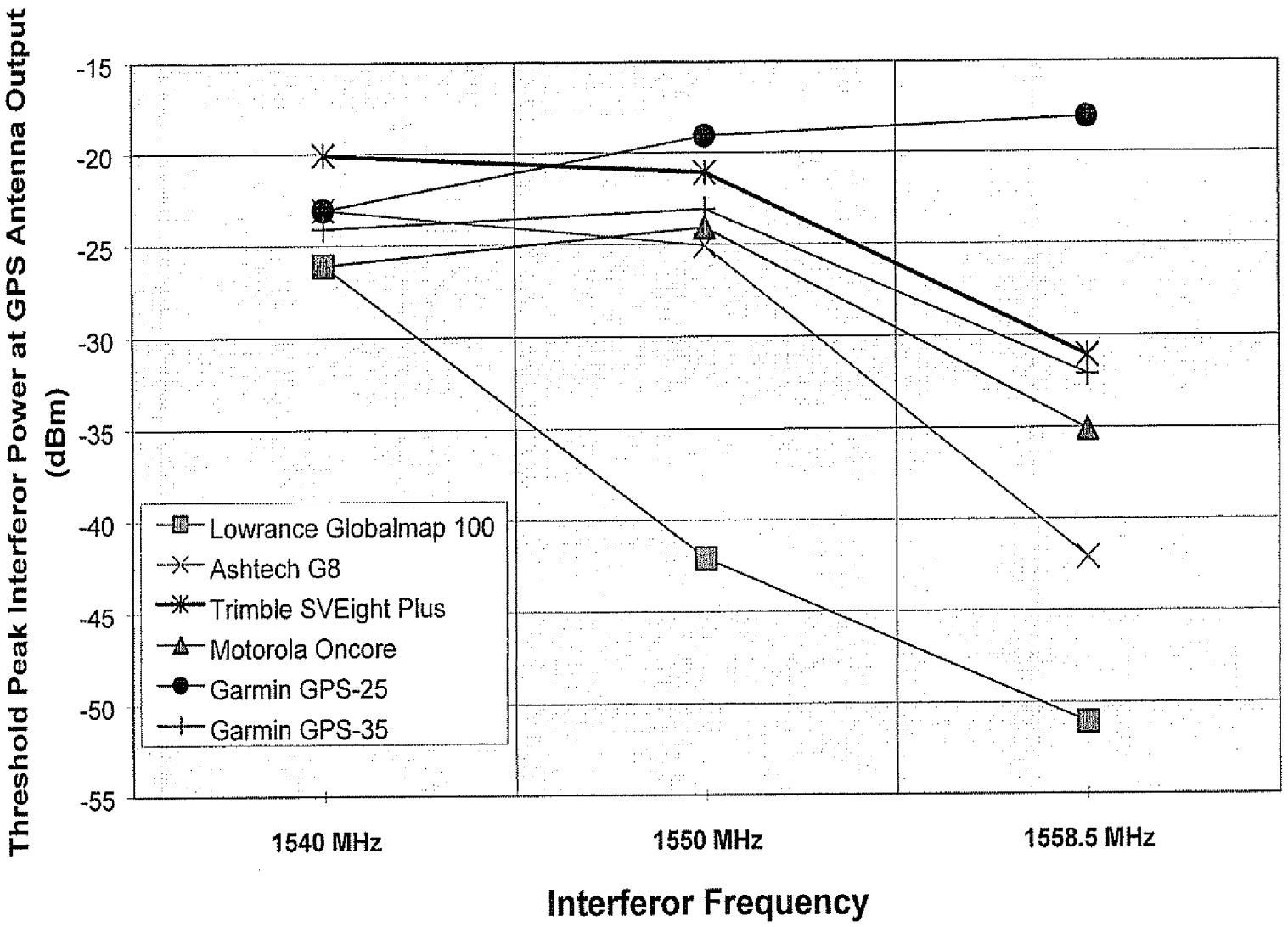
Interference Threshold for GPS Receiver Acquisition Following a Short-Term Blockage

(GSM/GMSK, Interferor Frequency = 1558.5 MHz.)



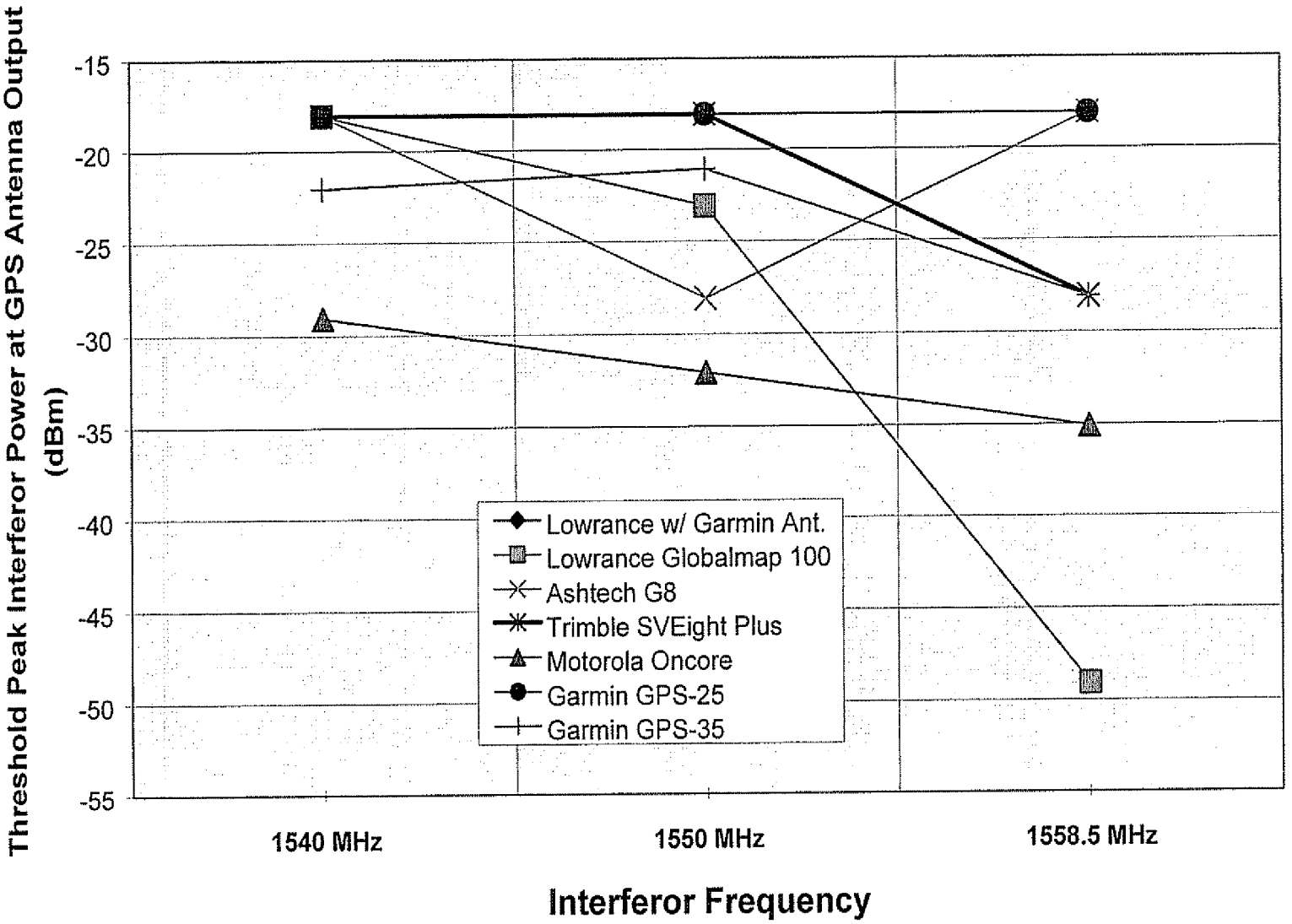
GPS Receiver Acquisition vs. Interferor Frequency

(GSM/GMSK, 8-slots ON - Full Period, 2-minute SV Blockage.)



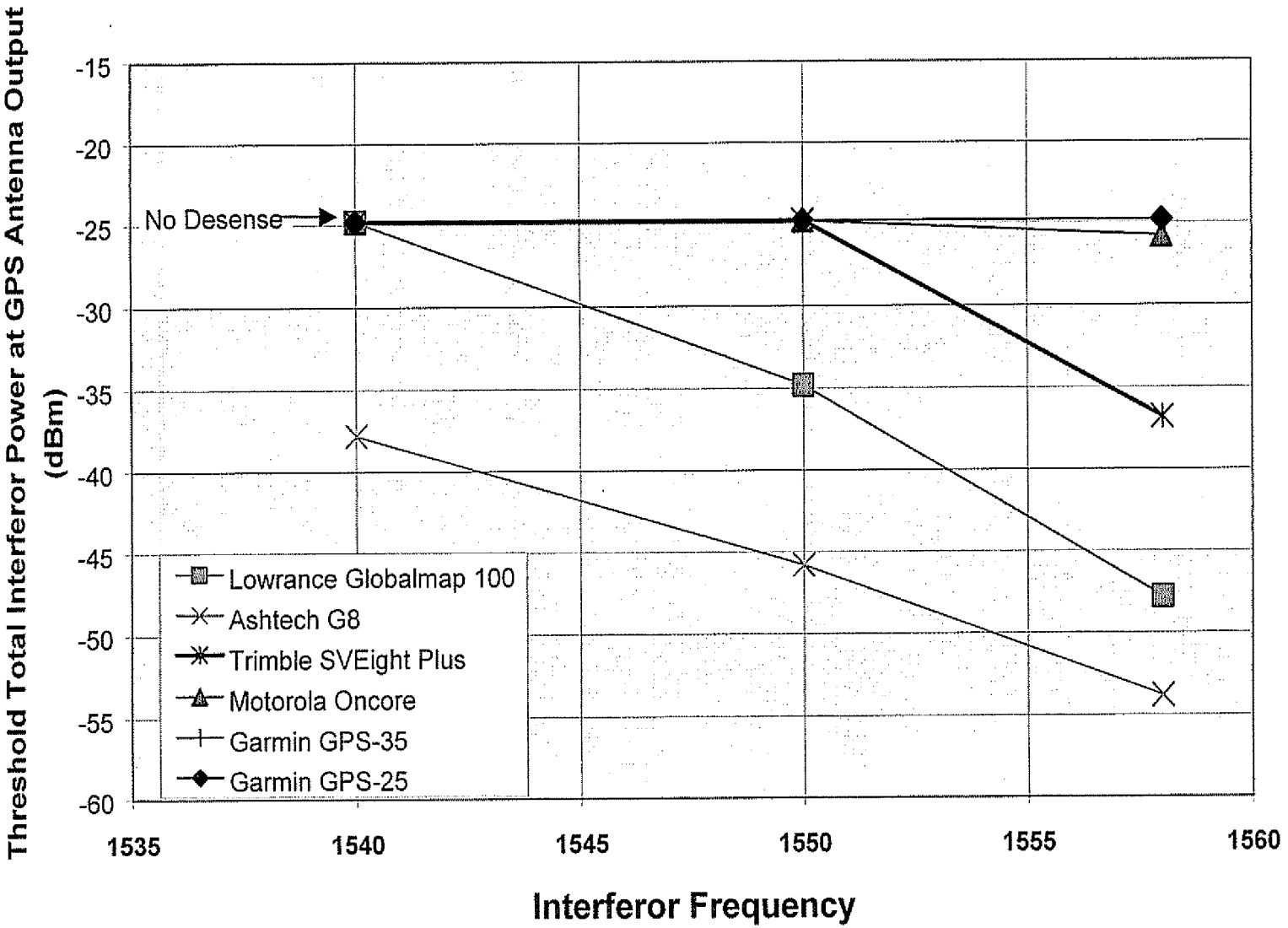
GPS Receiver Acquisition vs. Interferor Frequency

(GSM/GMSK, 4-slots ON / 4-slots OFF - 50% duty cycle, 2-minute SV Blockage.)



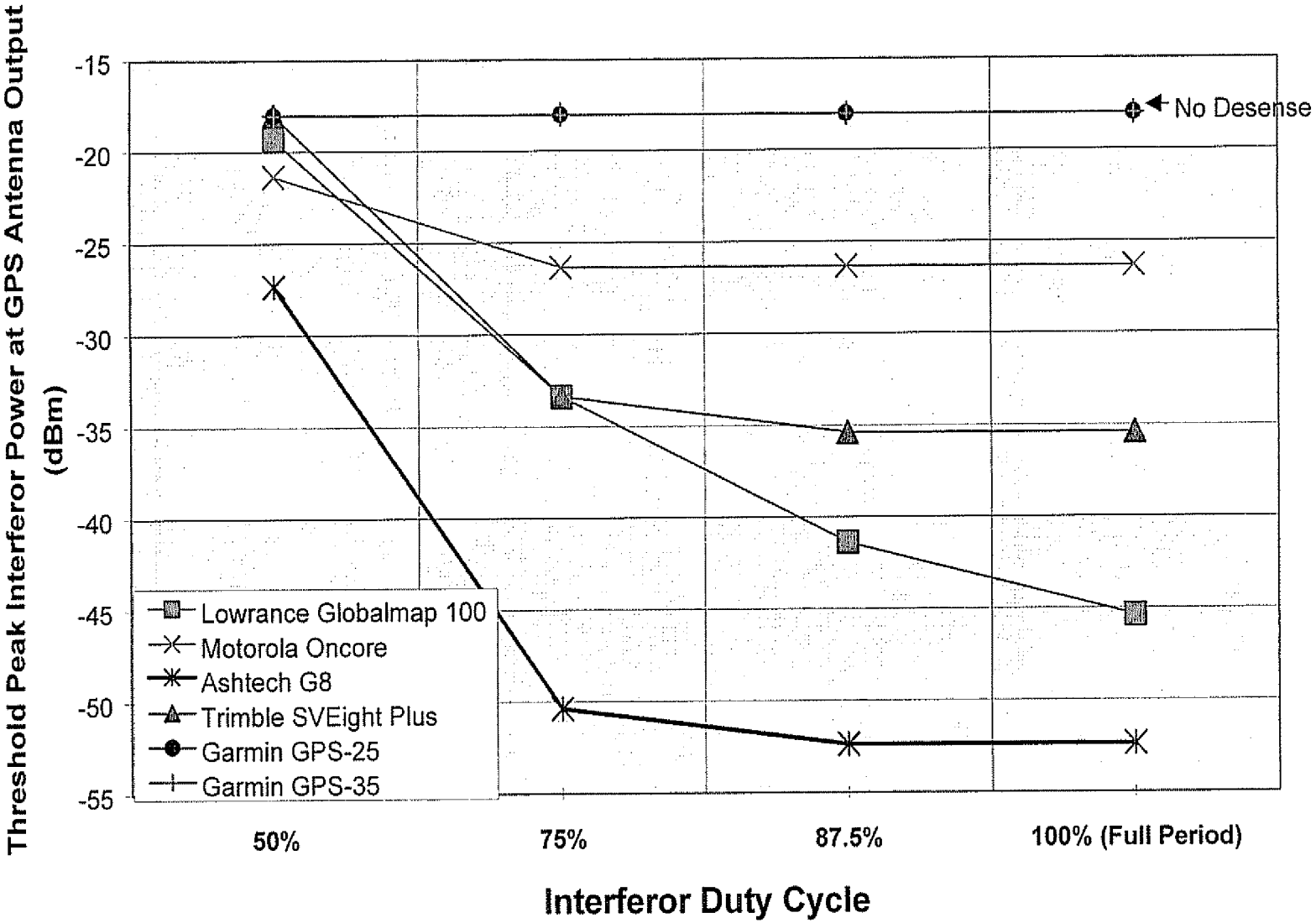
GPS Desense Performance With CDMA Interferor

(IS-95, 32 sub-channels active.)



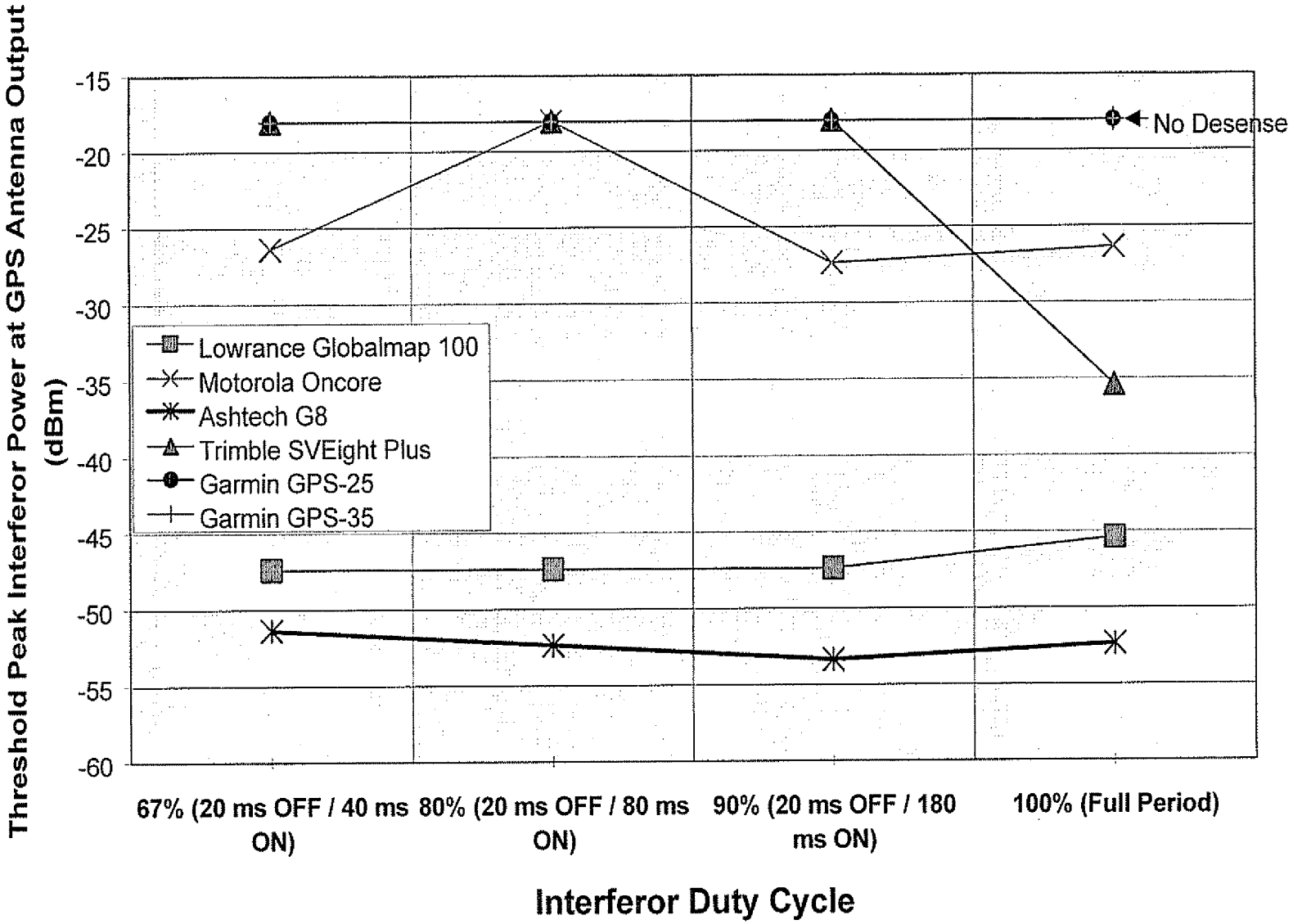
GPS Desense vs. CDMA Duty Cycle: 4.6 ms Gating Period

(IS-95 CDMA, 32 active sub-channels, Interferor frequency = 1558 MHz.)



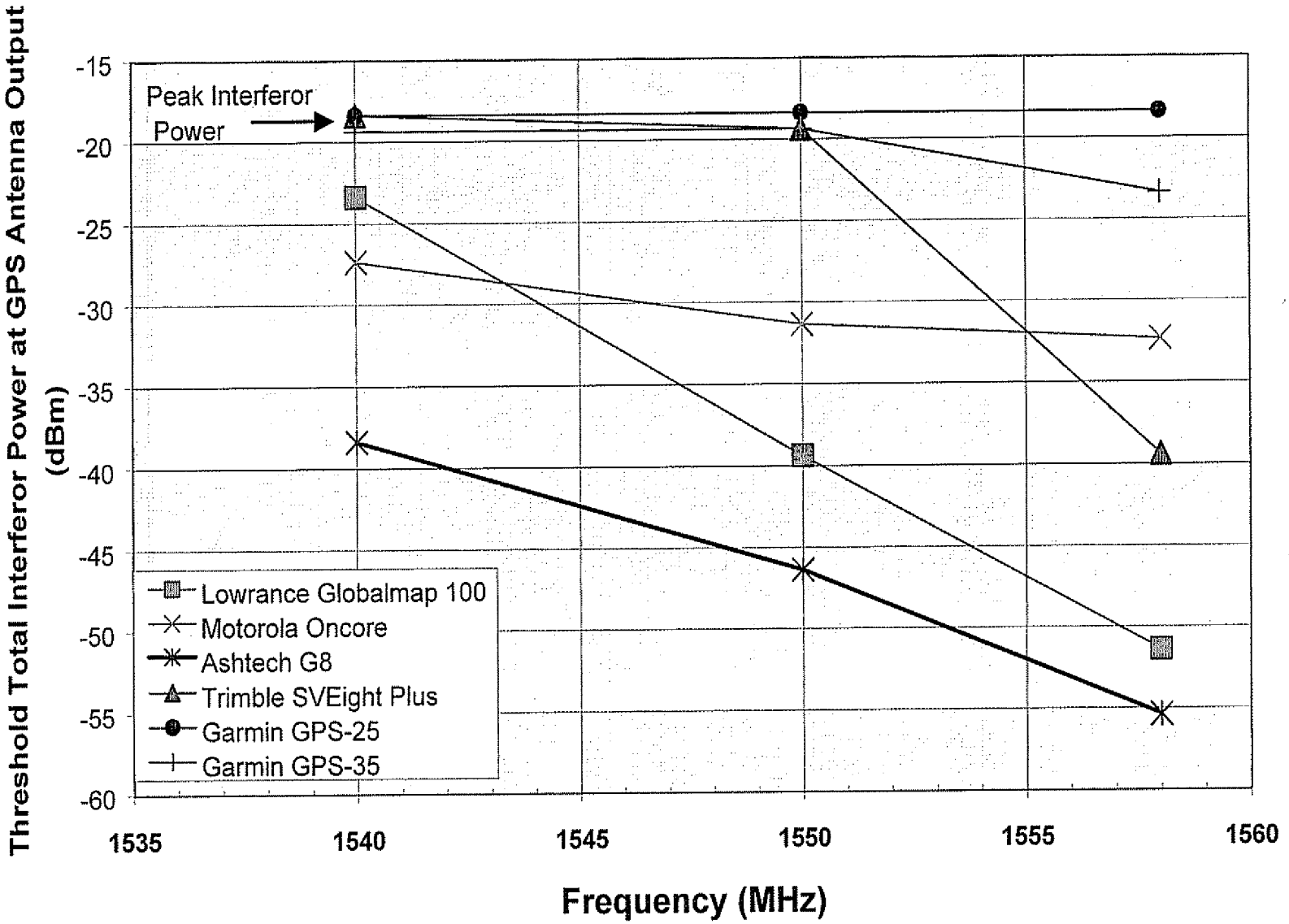
GPS Desense vs. CDMA Duty Cycle: 20 ms OFF Period

(IS-95 CDMA, 32 active sub-channels, Interferor frequency = 1558 MHz.)

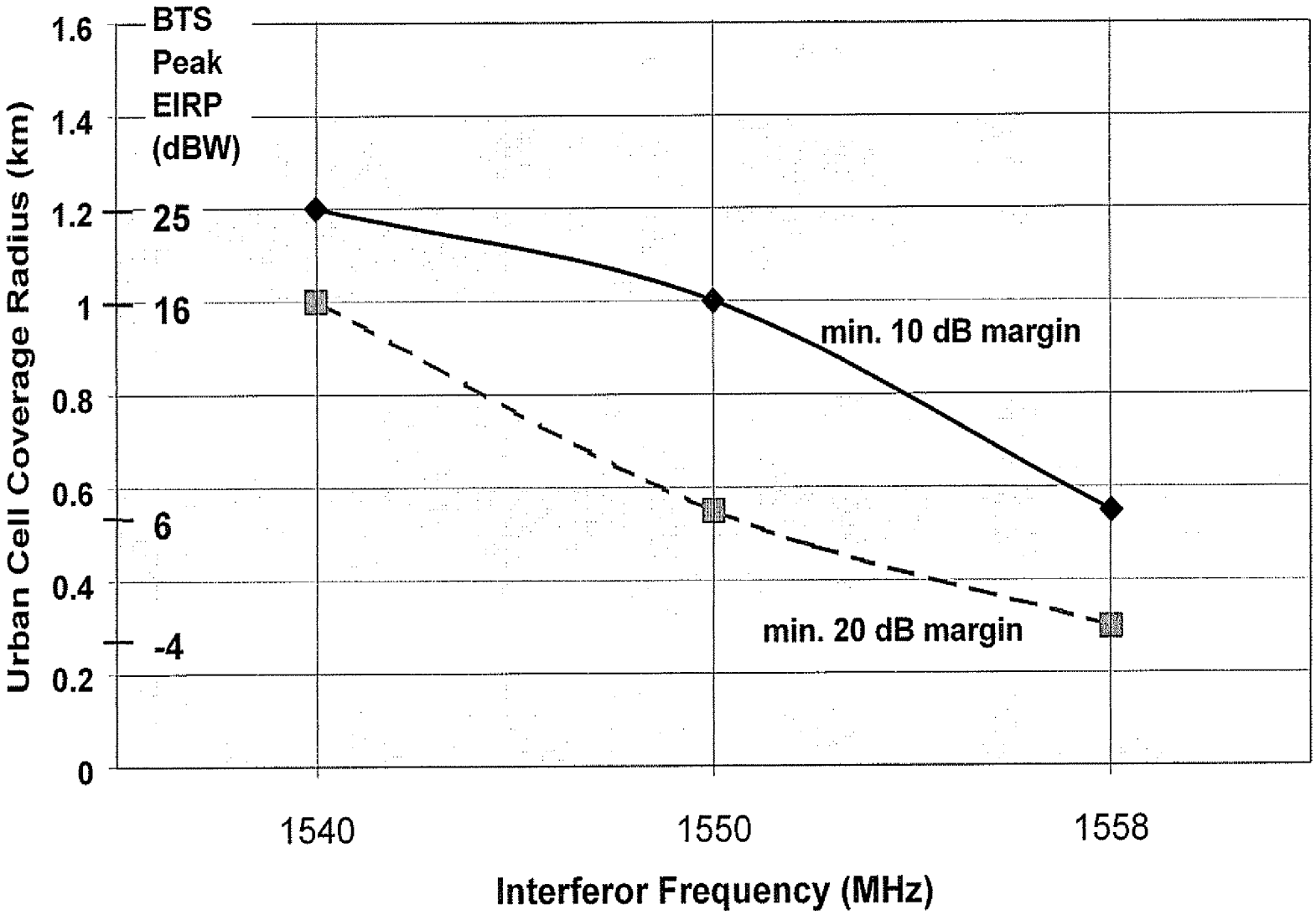


Acquisition Performance with CDMA Interference

(IS-95 CDMA, 32 active sub-channels.)



GPS Acquisition/Tracking Desensitization Margin



Conclusions

- The desensitization threshold of a GPS receiver (in both tracking and acquisition mode) strongly depends on its pre-LNA RF filter characteristic
  - There are commercially-available GPS receivers with no apparent filter prior to their LNA stage. These receivers are very susceptible to desensitization (~ -50 dBm susceptibility level to out-of-band signals near 1559 MHz).
  - There are also commercially-available GPS receivers (Garmin) that do include a good filter prior to their LNA. These receivers are much more robust to desensitization (~ -20 dBm susceptibility level).

Conclusions - cont'd

- In the tracking mode, the relatively short GPS frame (1 msec) allows GSM Radio Resource Management algorithms to increase the desensitization susceptibility threshold of a poorly performing receiver to almost that of Garmin. This is true even for the upper-most block of MSV spectrum (1549-1559 MHz).
  - Partial GSM frame loading with high power users and very-low power users, i.e. 50-50 split.

Conclusions - cont'd

- The maximum out-of-band power levels above which acquisition of at least 4 GPS satellites fails are:
  - ~ -50 dBm at 1558 MHz
  - ~ -40 dBm at 1550 MHz
  - ~ -30 dBm at 1540 MHz

- It is noteworthly that if every GPS receiver had a Garmin front end, the above thresholds would become ~ -20 dBm (and would be independent of frequency)

  – Verified by swapping front ends

Conclusion - cont'd

- GPS receivers intended for safety/emergency operations can be developed with appropriate front-end filters for high levels of desensitization rebustness
  - Compromise between receiver noise figure and desensitization rebustness
  - The January 1999 IEEE Proceedings issue devoted to GPS states the following regarding GPS receivers:
    - "Given the low power of the received signal, out-of-band interference must be suppressed using sharp cutoff filters."
    - "Narrowband filtering in the front end is commonly employed to reduce the receiver's susceptibility to out-of-band interference."

Conclusions - cont'd

- Even with the present state of recreational GPS receiver models, MSV can guarantee 20 dB desensitization margin of GPS receivers everywhere over the BTS coverage region. Desensitization margin becomes more than 30 dB at distances beyond 40 meters from the BTS.
  - BTS must perform appropriate power-to-frequency mapping.
  - GPS receiver is assumed at 1.5 meter height.
  - BTS minimum sidelobe level at 20 dB down from beam center.