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**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
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)	
Amendment of Section 90.20(e)(6) of the)	WT Docket No. 06-142
Commission's Rules)	RM-11135
)	
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To: Secretary, Federal Communications Commission

COMMENTS

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September 22, 2006

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COMMENTS

The ABC Owned Television Stations (“ABC”), through their attorneys, hereby submit comments (“Comments”) in the above-captioned proceeding in which the Federal Communications Commission (“Commission” or “FCC”) is considering several changes to its rules governing the stolen vehicle recovery system (“SVRS”), as requested in a petition for rulemaking filed by LoJack Corporation (“LoJack”).¹ As further set forth herein and in the attached engineering statement (“Engineering Statement”), the Commission should retain many of its current rules in order to ensure adequate protection of television (“TV”) operations on channel 7.

I. BACKGROUND

ABC is the owner of ten commercial TV stations serving some of the nation’s largest markets. Four of these stations operate on analog TV channel 7: (i) WABC-TV, New York, NY;

¹ See Amendment of Section 90.20(e)(6) of the Commission’s Rules, *Notice of Proposed Rulemaking*, WT Docket No. 06-142, RM-11135 (rel. July 24, 2006) (“*NPRM*”); LoJack Corporation, Petition for Rulemaking, RM-11135 (filed Oct. 25, 2004) (“*Petition*”).

(ii) KABC-TV, Los Angeles, California; (iii) KGO-TV, San Francisco, California; and (iv) WLS-TV, Chicago, Illinois. The channel 7 spectrum used by these stations—in the 174-180 MHz band—is nearly adjacent to the spectrum used by LoJack at 173.075 MHz for SVRS. All four of these ABC stations have elected to continue using channel 7 as their digital television (“DTV”) channel at the end of the DTV transition.² As a result, any potential interference from SVRS operations to TV stations operating on channel 7 could have a significant impact on ABC.

II. THE COMMISSION SHOULD RETAIN RULES NECESSARY TO PROTECT CHANNEL 7 TV STATIONS AND THEIR VIEWERS

The Commission seeks comment on proposed changes to Section 90.20(e)(6) of its rules regarding SVRS. Several of these proposed changes could increase interference to channel 7 TV operations. Thus, ABC urges the Commission to retain and clarify its current rules in order to protect channel 7 TV stations and their viewers.

A. The Commission Should Not Increase Maximum Permissible Base Station ERP or VLU Output Power

The Commission’s current rules set the permissible base station ERP at 300 watts and the permissible output power for mobile transceivers (“VLUs”) at 2.5 watts. LoJack requests increases in these permissible power levels to 500 watts and 5 watts, respectively, because its future reduction in bandwidth (from 20.0 kHz band to 12.5 kHz band), in its view, will reduce the range of its base stations and VLUs.³

The Commission should not increase the maximum permissible base station ERP or VLU out put power, as proposed. Because LoJack has not demonstrated the level of interference that

² KABC-TV, KGO-TV and WLS-TV each received a tentative channel designation on channel 7. WABC-TV has not yet received a tentative channel designation.

³ See Petition at 1, 5. The NPRM seeks comment on allowing these power increases both during and after the transition to narrowband.

will result to channel 7 or that such interference would be acceptable, there is insufficient basis to adopt these power increases. As the Commission stated in its NPRM, “LoJack has not demonstrated the degree...to which the requested increase in maximum power limits would also increase potential interference to the reception of Channel 7 television stations.”⁴ LoJack’s assertion that no interference will result, without a reliable and substantiated engineering showing, does not justify such power increases.⁵

Additionally, LoJack’s stated reason for needing the power increases—a reduction in bandwidth—is not valid. As shown in the Engineering Statement, the reduction in bandwidth actually will improve certain performance aspects of LoJack’s operations.⁶ Specifically, the 12.5 kHz bandwidth enjoys a 2.08 dB advantage in noise power over the 20.0 kHz bandwidth.⁷ Thus, the transmitter power actually could be *reduced* by approximately 2 dB and the signal to noise ratio would remain the same.⁸ For this and other reasons set forth in the Engineering Statement, LoJack has not shown that its requested power increases are necessary. Ultimately, the Commission should require LoJack to document both the need for the power increases and the resulting interference before adopting any modifications to its rules.

⁴ NPRM at ¶ 11.

⁵ See *Gardner Partners*, 10 FCC Rcd 11612, 11622 (1995) (“A bald conclusion, without any offer of proof or documentary support, has no probative value in determining whether a proposed station would cause harmful interference.”) (citing *Jim Bolton*, 2 FCC Rcd 3207 (CCB 1987)).

⁶ See Engineering Statement at 10.

⁷ *Id.*

⁸ *Id.*

B. The Commission Should Retain its Duty Cycle Limits

Through duty cycle limits, the Commission's rules limit the amount of time during which a base station or VLU may transmit a signal.⁹ The Commission proposes a relaxation of the duty cycle limits pursuant to which a base station could transmit five seconds every minute (a 500% increase) and a VLU could transmit 400 milliseconds every ten seconds (a 100% increase). The Commission seeks comment regarding the effects of these proposed changes on TV Channel 7 reception. Given the potentially harmful interference effect on TV channel 7 reception, ABC urges the Commission to retain its current duty cycle limits.

The primary reason that the Commission adopted duty cycle limits was its concern that SVRS transmissions could interfere with reception of TV stations on channel 7.¹⁰ As recently as 2002, the FCC retained a modified version of the duty cycle limits, concluding that "the duty cycle for mobile units is still needed to minimize the interference potential from the mobile transmitters to TV broadcast Channel 7 operations."¹¹ Neither LoJack nor the Commission has pointed to any significant change since 2002 that would justify changing the duty cycle limits.

Additionally, as set forth in the Engineering Statement, there are lingering questions regarding whether the present duty cycle limits adequately protect channel 7 operations and what levels of interference actually result from LoJack's operations. Specifically, there is no uniform

⁹ A base station may transmit one second for every minute while the duty cycle for VLUs limits transmissions to 200 milliseconds every ten seconds (except when the vehicle is being tracked) or 1800 milliseconds every 300 seconds, with a maximum of six messages in any thirty-minute period or more often if the vehicle is being tracked. *See* 47 C.F.R. § 90.20(e)(6).

¹⁰ *See* Amendment of Parts 2 and 90 of the Commission's Rules to Provide for Stolen Vehicle Recovery Systems, *Report and Order*, 4 FCC Rcd 7558, ¶ 34 (1989) ("First SVRS Report and Order").

¹¹ *See* Amendment of Section 90.20(e)(6) of the Commission's Rules to revise the Authorized Duty Cycle on 173.075 MHz, *Report and Order*, 17 FCC Rcd 16938, ¶ 14 (2002) (concluding that "public interest continues to be served by specification of SVRS duty cycles").

method for evaluating the interference potential of LoJack's operations.¹² LoJack has used different methodologies or mixed methodologies to determine interference and has questioned the accuracy of all of these methods.¹³ In addition, no methodology relied upon by LoJack uses a reliable Desired signal to Undesired signal ratio.¹⁴ To relax the duty cycle limits without first setting an agreed-upon interference calculation methodology—and documenting the likely interference under such methodology—would be premature. Thus, until LoJack or another party demonstrates the present and future levels of interference, the Commission has no basis on which to authorize more relaxed duty cycle limits.

While not submitting any comprehensive technical studies, LoJack has offered two pieces of anecdotal evidence in an effort to justify relaxed duty cycle limits and other requested rule changes. LoJack's first assertion—that there have been no complaints regarding TV channel 7 interference—is not determinative. The fact that LoJack has not received any complaints does not demonstrate that no interference is occurring; at most, it demonstrates that those experiencing interference do not know the cause of such interference. Specifically, viewers experiencing a 1.8 second burst of interference to their TV reception have no way of knowing that such interference is caused by activation of a LoJack system, and thus do not know to whom to complain.¹⁵ The short nature of the interference also makes it less likely that an individual household would make

¹² See Engineering Statement at 2-8 (reviewing LoJack applications including the methodologies used in generating interference studies).

¹³ *Id.*

¹⁴ See Engineering Statement at 3 (“[I]t is not possible to state with any certainty that the Waterway Report D/U Ratios or the D/U Ratios in the Micrologic Report are or are not applicable in a meaningful way to obtain any interference calculation result.”)

¹⁵ See Engineering Statement at 6-7.

an official complaint, even if it knew the cause of the interference.¹⁶ Therefore, the fact that LoJack has not received any complaints does not demonstrate that interference is not occurring, and thus does not support waiver of the duty cycle limits or other rule changes.¹⁷

LoJack's second assertion—that there will be less potential for interference after TV stations transition to digital operation—similarly is mistaken. Many stations operating analog facilities on channel 7 have received tentative channel designations to use channel 7 for their digital operations.¹⁸ Thus, there will be a substantial number of stations operating on channel 7 after the DTV transition. Further, DTV operations involve a several decibel reduction in energy levels from analog operations. Thus, DTV transmissions likely are more susceptible to interference than analog television transmissions. There also is no reliable data regarding what level of interference can be expected in the case of DTV receivers.¹⁹ Finally, when a digital signal suffers interference, it often results in a loss of the entire picture versus analog, which gradually deteriorates, making interference more of a concern in a digital environment than in an analog one. For all of these reasons, the transition from analog to digital operation makes the duty cycle limits more critical to ensuring interference protection, not less, as LoJack asserts.

¹⁶ Although each household may experience only one or two bursts of interference, each burst may affect many households simultaneously, or as the VLU moves, especially in the urban areas in which ABC's stations operate.

¹⁷ If anything, the lack of complaints demonstrates that the duty cycle limits are serving their intended purpose of limiting interference to short bursts of time, and that they should continue to apply in their current form.

¹⁸ As indicated above, all of the ABC channel 7 stations elected to use channel 7 for DTV operations. In total, sixty-four television stations have been awarded channel 7 as a tentative post-transition DTV channel. See Tentative Digital Channel Designations for Stations Participating in the First and Second Rounds of the DTV Channel Election Process, *Public Notice*, Attachment I, DA 06-1082 (rel. May 23, 2006); Third Round of the DTV Channel Election Process: Tentative Channel Designations, *Public Notice*, Attachment I, DA 06-1675 (rel. Aug. 29, 2006).

¹⁹ See Engineering Statement at 6.

C. The Commission Should Continue to Require Meaningful Channel 7 Interference Studies

Section 90.20(e)(6) requires LoJack to submit a technical analysis of interference to TV channel 7 viewers if it proposes a base station within 169 kilometers of a TV channel 7 transmitter. LoJack also must develop an interference plan if the interference contour reaches one hundred residences. The Commission required these studies in order to minimize potential interference to TV Channel 7 transmissions.²⁰ LoJack argues that the studies are onerous and without benefit, primarily because it has not received any interference complaints.²¹ As shown above, the lack of interference complaints is not determinative in this context; a viewer cannot be expected to know that the source of intermittent interference is LoJack's SVRS system. Thus, LoJack has not provided a reason for the Commission to abandon the interference study requirement that it originally imposed in 1989 and retained in 2002.

Additionally, there is evidence that LoJack has not fully complied with the present interference study requirement. As noted above, in those instances in which LoJack's system was predicted to cause interference to greater than one hundred households, Section 90.206(e)(6) requires submission of an interference plan. However, instead of including a detailed plan called for by the rule, LoJack's studies merely state that the interference could be less than predicted and that it would use a filter, if necessary.²² No further details are provided. It is contradictory for LoJack to assert that the study requirement is financially and technically "onerous" when the

²⁰ See *First SVRS Report and Order*, 4 FCC Rcd at 7560-61, ¶ 27.

²¹ Petition at 11-12.

²² See Engineering Statement at 2-8 (reviewing applications and interference studies). In making its interference predictions, LoJack sometimes used the Waterways Report while in other instances it relied upon the Micrologic Report. LoJack claimed that each report's method tended to overstate predicted interference and produced inaccurate results. See Engineering Statement at 3. Additional inconsistencies in the LoJack interference studies are addressed in the Engineering Statement.

only studies it submits are virtually identical and lacking in any reliable technical details.²³ Absent these details, there also is no way for the Commission staff to judge the merits of LoJack's proposed operations or proposed interference plan. In addition, the affected channel 7 TV station presently has no meaningful opportunity to comment on LoJack's proposals because the studies are not detailed and because LoJack presently is not required to serve a copy of its application on the TV station or otherwise notify the TV station of its plans.

In sum, LoJack has not fully complied with the interference study requirement and has failed to show that the studies no longer are needed. Accordingly, the Commission should retain the study requirement and should clarify that LoJack must provide additional details regarding its interference calculations and interference reduction plan. In addition, the Commission should require LoJack to serve a copy of its application on any affected channel 7 TV station.

D. The Commission Should Not Expand the Scope of Operations Permissible Under Section 90.20(e)(6)

The Commission also seeks comment on permitting additional uses of the SVRS spectrum, such as the tracking and monitoring of persons or hazardous materials. Expanding the scope of permissible uses would be premature at this time because it is unclear what interference is resulting from the present use of the spectrum for the recovery of stolen vehicles.²⁴ Nor is it clear what additional interference could result from any rule changes made in this proceeding, *e.g.*, those concerning power levels and duty cycle limits. The Commission should not expand the use of the spectrum without first having a solid understanding of the interference associated with SVRS.

²³ See Engineering Statement at 2-8.

²⁴ See Engineering Statement at 3-6, 8 (noting that "there are no parameters advanced by [LoJack] with respect to the system's interfering potential to channel 7 reception, particularly with regard to DTV operations").

III. CONCLUSION

For the reasons set forth above, ABC urges the Commission to retain rules necessary to protect TV channel 7 operations from interference from SVRS.

Respectfully submitted,

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September 22, 2006

Engineering Statement
In Support of Comments of the ABC Owned Television Stations
In the matter of Notice of Proposed Rule Making
Amendment of Section 90.20

I am a consulting engineer, employed by the Carl T. Jones Corporation with offices in Springfield, Virginia. On behalf of the ABC Owned Television Stations, a review of the recent request by Lojack was conducted to determine what impact, if any, the outstanding proposals of the Lojack would cause to the present operation of ABC Owned Television facilities in New York, Los Angeles, Chicago and San Francisco. The ABC Owned Stations KABC-TV, KGO-TV, WABC-TV and WLS-TV operate on channel 7 and three of these stations have tentative designations on channel 7 for post transition DTV operation. WABC-TV has requested channel 7 as its post transition DTV channel, and this matter is presently pending before the Commission.

Introduction

The ABC Owned Television Stations WABC-TV and WLS-TV have been serving their communities of license since 1948 and KABC-TV and KGO-TV have been serving Los Angeles and San Francisco since 1949, each with a long history of operating on channel seven.

Because three of the four ABC Owned Television Stations presently have a tentative channel designations for post transition operation on channel 7, and the fourth station has requested such a designation which is still pending before the Commission, the ABC Owned Television Stations have a strong interest in preserving the environment on channel 7 to foster a robust television broadcast service now and in the post-transition DTV era.

Historically, one of the first expectations of licensing was protection from interference. It has been the wise practice of the Commission to place the burden to show protection of existing services from interference on the proponent of a new service, whether that new service was another new television station, or another new radio service of any sort.

Because the Lojack system operates just below television channel 7, the ABC Owned Television Stations have a strong interest in the technical characteristics of this system when it is operating in and around the ABC Owned Television Stations' service area.

Review of Applications

The Commission's Rules require that an interference study be conducted when a base station operation is proposed within 106 miles of a channel 7 transmitter site.

To obtain a better understanding of the system as it exists presently, a review of the license records of the Stolen Vehicle Recovery System (SVRS) was conducted. Additionally, the license records were then searched for those authorizations which are located in those states which are in or nearby ABC Owned channel 7 facilities.

In a search of the license records in the FCC's ULS, a total of 81 license records were found that are applicable to Lojack operations. Many of these records are expired Special Temporary Authorizations (STA's), but 46 authorizations were found which are shown with an 'Active' Status in the ULS.

Several authorizations held by licensees in California, Connecticut, Illinois, New Jersey, and New York were examined in an attempt to determine the manner in which the required interference analysis was done. These applications were selected based the state where the applicant is located, and in many cases, this location was indicated by the name of the applicant.

In the New York Metropolitan area, applications to license the SVRS systems that are located in Connecticut, New Jersey and New York were selected for study. Additionally, an application for license in Illinois, and several Lojack applications for facilities in California were also examined.

Of the thirteen applications studied, eleven were found to contain base stations which were operating from sites that are within the 169 KM range described in the Rules where an interference study is required. Of those eleven applications, six of these applications were filed on paper prior to the Commission's requirement to file by electronic applications in the ULS.

Of the six applications that were originally filed on paper, two were subsequently modified and those modification filings were made electronically. The studies which were filed electronically provided the sample which was studied here.

A single application contained an interference study which was based on the methodology that is described in the Waterways Report. In each of the remaining applications where an interference study was found, the methodology in the Waterways Report was abandoned in favor of the methods described in the Micrologic Report, which was also cautiously applied, as each example of its use cautioned the reader that the interference predicted by the Micrologic Report also tended to overstate predicted interference. This is the same logic that was used to abandon the methodology in the Waterways Report.

Each interference study applied a mixed methodology, except one single study. The common physical constants (the impedance of free space, for example) were stated with associated mathematical expressions, but the parameters used for determination of interference – the Undesired Signal to Desired Signal Ratio (U/D Ratio) where interference is first perceived, was not stated, except in one report.

The application that chose to use only the methodology that is described in the Waterway Report without the benefit of any additional mixed methodology was also the only study that found no interference as a result. This is an interesting result when taken in the context of each of the remaining applications where it is claimed the methodology of the Waterway Report overstates the predicted interference and does not produce results which are accurate.

The Waterway Report describes an Undesired signal to Desired signal ratio (U/D ratio) of 8 dB (for strong desired VHF channel 13 signals). The interfering signal in the case of the Waterway report is a communications signal which is located above the upper limit of the six megahertz that is occupied by channel 13.

In the outstanding case, the Lojack interfering signal is BELOW the lower limit of channel 7, and is located much closer to the video carrier of NTSC signals as well as the pilot signal of DTV signals – both of which have different locations above the lower channel edge, but are asymmetrically placed in the lower frequency portion of the channel bandwidth.

As a consequence, without independent confirmation of the appropriate D/U Ratio, preferably by a disinterested party, it is not possible to state with any certainty that the Waterway Report D/U Ratios or the D/U Ratios in the Micrologic Report are or are not applicable in a meaningful way to obtain any interference calculation result.

As an example, an application to modify the existing WPHK-438, first operated June 15, 1995, was filed in 2003. As required, an engineering study was performed to determine the potential interference to WABC-TV for the proposed facilities in Stamford, Connecticut and Danbury, Connecticut. The initial operation of this facility was described in a paper-based filing prior to the availability of the ULS. The study to support the modification of license was performed by an outside consulting engineering firm on behalf of Lojack.

In the application to modify WPHK-438, the attached engineering study found interference to 106,700 persons was predicted by the methodology described in the Micrologic Report in the Danbury area and interference to 32,000 persons was predicted in the Stamford, Connecticut area.

The interference attachment further stated that even the methodology that is described in the Micrologic Report will overstate interference. In an additional showing, a Longley-Rice Study was performed (with a U/D Ratio that was not stated) which found interference was predicted to 8800 persons in the Danbury area.

This application for modification of WPHK-438 was granted on or about October 27, 2003.

In contrast, an application for a new license was filed in 2002 to modify WPVV-324. This application was filed by the City of Los Angeles, and the fixed base facilities that were requested in the application are in Riverside County, near Los Angeles, and in Sonoma County, near San Francisco.

This application was returned by the Commission in September of 2003 and the Commission's Notice of Return letter requested additional information pursuant to Section 90.20(e)(6)(i), (ii), and (iii). The Supplemental Information which the Commission requested was supplied in November, 2003, and the application was subsequently granted. The Supplemental Information which was filed did not address the issue of the 8200 persons who reside within the area identified by the channel 7 interference study, but instead addressed the unique attributes of the site.

In contrast, an application for four fixed base facilities was filed in 2004 again by the City of Los Angeles. This application requested facilities in Fresno and Kern Counties in California. These locations exceed the 105 mile limit to the ABC Owned channel 7 facilities in Los Angeles and San Francisco. There is, however, a channel 7 DTV facility in Fresno. This application was accompanied by five waiver requests.

Consequently, WQBQ-818 was authorized to operate under Special Temporary Authority on a non-interference basis on or about November 24, 2004.

In 2001 an application was filed to add a fixed base operation in Solano County to the presently licensed WPRW-899 facilities. The application to modify WPRW-899 was filed in 2003 and contained a showing of interference to 94,957 persons. The interference study was conducted in-house. The exhibits which were attached – maps to show where predicted interference could be generated – were scanned in monochrome. Any original gray-scale in the figures was lost in the scanning process. In addition to providing little in the way of information to the reader, their illegibility reduced their usefulness by a very large degree. This application to add the fixed base facility at Mount Vaca was granted in August of 2003.

A similar application to modify WPHK-438 was granted for base facilities near Danbury and Stamford, Connecticut. In the Danbury area, interference was predicted by application of the techniques in the Micrologic Report to 106,700 persons. This number was reduced to 8800 persons as a result of a Longley-Rice study. Neither the Longley-Rice Study, nor the initial study which was based on the Micrologic Report contained any parameters that one could use to repeat the work.

In the Stamford area, interference was predicted by the techniques in the Micrologic Report to 32,000 persons. No Longley-Rice Study results were contained in the Stamford Interference Study attachment.

The State of Connecticut was authorized to operate WPHK-438 fixed base facilities in Danbury and Stamford on October 27, 2003. WPHK-438 first operated on June 16, 1995.

Except for the single study that predicted no interference at all, the methods that are described in the Waterways Report have not been applied directly in any of the remaining 12 applications that were studied, but instead were abandoned and the interference calculations were done by application of the methods defined in the Micrologic Report, with further statements that the Micrologic Report methodology is not accurate, as it tends to overstate predicted interference. Nonetheless, the techniques in the Micrologic Report were used.

It is clear that a uniform method of evaluating the interference potential of Lojack operations has not been established. Uniform standards have not been applied in the evaluation of potential interference to channel 7. In addition, there are no reliable data to indicate what can be expected in the case of DTV receivers, and because of that, no means of predicting what sort of difficulties will occur when the ERP of NTSC stations with post transition designations for their present NTSC channels is reduced 10 to 13 dB, presuming that the operating power of the Lojack system remains the same.

The licenses that were reviewed were issued over several years, with initial operation of two dating from August 1990, to one which is dated July, 2005. There was operation under STA prior to the facilities being converted to licensed operation. This review was not exhaustive, but did identify licensees with a high probability of operating facilities in or near the ABC Owned Television Stations. What was learned is that the system is not completely built, and that additional base, VTU and subscriber VLU transmitters can be expected to be added in the future.

Lojack reports that it has never had a complaint of interference. This may be true, but this does not mean that interference has never been suffered by a channel 7 viewer that could be attributed to a Lojack fixed base or VLU transmitter. What is most likely, however, is that upon experiencing interference – even from the longer transmissions of 1800 milliseconds duration – the viewer may not realize there was interference until it is over. In addition, the typical viewer has no means to identify the source of the interference.

The duty cycle limit reduces the chance from any individual VLU to cause interference to any individual channel 7 receiver to roughly one in 167,000. With an event as infrequent as the interference from the Lojack system may be, many weeks or months, perhaps even years may pass before a second interference event is experienced by the same typical viewer from the present system. This is particularly likely when one considers that a typical viewer does not watch television continuously, that the installed base of 3 million Lojack VLU's are still a small percentage of the total number of registered vehicles nationwide, and that the present duty cycle limits act in concert to minimize interference to channel 7 viewers. (Lojack claims that its 3 million installed VLU's will require support for 10 years before it can migrate to the narrower 12.5 kHz emission.)

These 3 million vehicles with Lojack VLU's installed represent 2.3 percent of the total of 129.3 million vehicles which were counted in a 1991 Department of Energy report. Because vehicle registration has grown over 21 percent in Los Angeles County alone between 1998 and 2004, the 2.3 percent above provides a reasonable estimate, but is probably overstated.

It is reasonable to assume that Lojack will attempt to increase its market share. As it succeeds in doing so, the instances of Lojack being present in a stolen vehicle will increase in direct proportion to its market share, and so will the activity on the frequency that Lojack uses.

With the present system, operating with a data burst transmitting time of 1800 milliseconds, and staying silent for a period of 300 seconds – or at least averaging to this in any 30 minute period – the present field experience which reports no interference to channel 7 is insufficient to support a blanket statement that the duty cycle requirements are not necessary. Indeed, these duty cycle requirements may be singularly responsible for the instances of interference experienced by a channel 7 viewer remaining below that individual's threshold of becoming sufficiently annoyed to determine its source.

Perhaps this is a key factor in the Lojack system's survivability as well. As long as the instances of interference to channel 7 reception remain below the threshold of irritation for a channel 7 viewer, there will be few, if any, reported instances of interference. The typical viewer is likely to consider the experience to be a fault in the station's transmission, or some other local cause of interference.

Historically, the burden of protecting existing services from interference has been the responsibility of the proponent of the new service. If the proponent of a service cannot uniformly apply some standard procedures to determine the area where interference is predicted in the vicinity of a fixed base station or mobile operations and its likelihood, it is clear that not enough is known about how the system will affect channel seven reception.

This should be the first study - to establish the conditions under which interference can be generated, and reach some sort of working consensus as to the proper application of these parameters in order that realistic and rational results of calculations can be expected. As of yet, there are no parameters advanced by the proponent with respect to the system's interfering potential to channel 7 reception, particularly with regard to DTV operations.

The July 24, 2006 Notice of Proposed Rule Making

On July 24, 2006, the Commission released a Notice of Proposed Rule Making to consider the amendment of Section 90.20(e)(6) of the Rules. This NPRM was released in response to a Petition for Rule Making filed by Lojack Corporation on October 24, 2004.

In the NPRM, several changes are proposed by Lojack. One of the proposed changes seeks to add related services to the SVRS, another to lengthen the duty cycle of the Vehicle Locator Units' transmissions. Lojack also seeks to use any digital emission instead of being required to use only F1D and F2D emissions.

Coupled with the required change in operating bandwidth, Lojack seeks to increase the transmitter output power by a factor of two, or a 3 dB increase.

Additionally, Lojack seeks to expand the services derived from operation of the SVRS to include other functions, but states that these additional services will be consistent with the Rules under which Lojack presently operates.

The Stolen Vehicle Recovery System

The SVRS is described in the Background section of the NPRM. The functions of both activation of the Vehicle Locator Unit (VLU) and the Vehicle Tracking Unit (VTU) functions were described. The receiving functions at the base facilities were not described, but historically, because they operate with higher antennas, presumably, the base station receivers are able to hear the signals at a greater distance than a receiver being operated in a vehicle, such as the VTU.

In the NPRM, Lojack proposes adding other functions to the SVRS. This is not an advantageous move presently, if the goal is to preserve an SVRS that functions robustly, particularly an SVRS with an early warning function in the VLU that will notify the system if the VLU senses a hot-wired engine start or other indication that the vehicle has been moved inappropriately.

As the channel becomes occupied for a greater percentage of time, it also has less probability of being quiet when a VLU attempts a transmission to tell the system it is potentially being stolen – the early warning function. The VLU antenna is near the ground, and has the best chance of being heard by a base station receiving antenna that is typically much higher. The Land Mobile Service has used automatic-relay facilities successfully for many years to enable communication between two mobile stations over distances that are greater than what is possible when attempting to communicate between the mobile stations directly. These automatic relay stations use antennas which are comparable to base station SVRS antennas.

The statistics of a channel operating protocol such as an ‘aloha channel’ protocol are well known. Before any additional services are introduced which would increase active transmitting time on the channel, a study of the impact to the SVRS functions on the channel should be made. In this manner, the determination of operating trade-offs can be systematically determined for both cases of the existing SVRS and the proposed additional services, as well as the additional probability of increase in instances of interference to channel 7 reception.

It is obvious that Lojack will attempt to promote a wider acceptance of the Lojack system, and this will foster additional fixed transmitting operations as well as additional vehicle locator transmitters. The interference potential of the system will increase in direct proportion to the number of fixed and mobile units in operation. Rare instances of interference which once were tolerable may not be tolerable after the instances of interference reach a certain (yet to be undetermined) threshold.

Lojack requests an increase of 3 dB in operating power for each transmitting component of its system. In the NPRM at paragraph 11, the Commission correctly found no support on a technical basis to increase power by a factor of two. If one calculates the noise power in a 12.5 kHz bandwidth and compares that to the noise power in a 20.0 kHz bandwidth, an advantage of 2.08 dB will be found in favor of the 12.5 kHz bandwidth. This would tend to indicate that the transmitter power could be reduced by 2 dB and the signal to noise ratio will remain the same. Also the signaling rate is a function of the modulation technique used and channel bandwidth. Once the signal to noise ratio of the system exceeds a certain threshold, only the channel bandwidth controls the system data rate.

Conversely, increasing the transmitter output power by a factor of two will have an impact on the interference that can be experienced by a channel 7 viewer. The Commission has stated in this proceeding that the factors power and distance are the most important parameters in the determination of the likelihood of interfering conditions at a receiver.

Conclusion

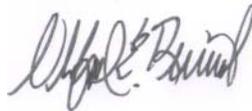
If there is any supportable or reliable information that can be gleaned from the SVRS field experience to date, it is that the small duty cycle of the present Lojack transmissions is the most likely reason that no interference complaints have been received from the presently licensed Lojack systems.

Clearly, Lojack is proposing to increase power and to eliminate all duty cycle requirements – both important factors in keeping interference to channel 7 viewers well below an annoying or irritating level. In doing so, Lojack has an obligation to advance a methodology to quantify the changes through a determination of before and after statistics of the interference in the area where the potential to generate interference exists. This will allow a comparison that is realistic and more accurate than simply using one of several arbitrary methods to determine which area has the potential to suffer interference.

Certification

The information referenced in this statement was collected by me and is taken from the record in this proceeding. This writer has over 45 years experience as a communications technician and engineer. He is a Registered Professional Engineer in the Commonwealth of Pennsylvania, and has relied on this experience and his education to reach the factual conclusion above, and the beliefs stated below.

He is also a television viewer and the owner of an automobile. He believes that both the service provided by broadcasters on channel 7 and the service provided by the SVRS are important. He believes that it is possible to improve both the reception of channel 7 and the performance of the SVRS without causing a loss of performance of either system. He also believes that not enough is known and in the present record to make the decisions requested in the NPRM without the risk of reduced performance as the result of both interference increases to channel 7 viewers and a lessening of the robust operation of the Stolen Vehicle Recovery System.



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