COMMUNICATIONS
FORUM

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Seminar Notes

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Lo-Jack Corporation

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Michael Marcus of the FCC introduced the first session of the Communications Forum's 1987-88 season with a short history of regulation and formation of regulatory agencies in the United States especially those that emerged out of the New Deal. He noted formal regulation of radio in the United States, beginning in the mid-1920s, existed in a very different environment both legally and technologically than what we have today. In the early days of regulation, according to Marcus, things were very simple technically and there were very few options for implementing new technologies.

According to Marcus, the Administrative Procedures Act was enacted in 1947 to ensure that rules enacted by federal agencies were not done so on an arbitrary and capricious basis and to allow for time consuming administrative and judicial review of decisions.

It is Marcus' view that there is a fundamental conflict which arises in the present day when a technical innovator tries to introduce a new communication product into the marketplace on a timely basis given the current system of federal rules. He raised the issue that in some industries, e.g. pharmaceuticals and pesticides, there are procedures for introducing new products, but not rules distinguishing which products may or may not be sold. He acknowledged that it may be more difficult to introduce a new communications technology today than to launch these other products.

This brought us to the major question of the session: Does Regulation Inhibit Entrepreneurship in Communications?

Thomas Keller of the Washington, D.C. law firm of Verner, Liipfert, Bernhard, McPherson & Hand has been involved in telecommunications law since 1971. He has worked with several companies in the communications industry in dealing with the regulatory process.

He recalled the mixed reactions of his colleagues at the law firm to the title of this session as advertised on the Communications Forum brochure. While some of the attornies said "naturally regulation, almost by instinct, would have a dampening effect on communications," others were on the opposite end of the spectrum. According to Mr. Keller, the answer to this question depends on what we mean by "regulation," "entrepreneurship," and "communications."

In addressing the question "Does Regulation Inhibit Entrepreneurship in Communications, Mr. Keller made reference to his experience with three clients in the following markets:

1. ACSB (Amplitude Compandered Sideband)
2. SMR (Specialized Mobile Radio)
3. International Communication Satellites

1. Mr. Keller related that in the late 1970s some people at Stanford University were encouraged by the FCC to pursue research on ACSB. In contrast, mobile radio was operating within the constraints of regulation (e.g. specific rules regarding frequency modulation and bandwidth). According to Mr. Keller, the FCC came to view ACSB as a more efficient use of bandwidth given ACSB uses 5 KHz of bandwidth as compared with the 25-30 KHz used by mobile radio.

Keller noted that in the 1970s, the FCC granted developmental licenses for ACSB to meet growing mobile radio needs. This was unprecedented for the FCC to allow the sale of ASCB radios and permit their use without formal rules. This was unique for the FCC since most of its actions up to then were governed by specific rules and regulations.

He went on to describe that in 1982/1983 there were thousands of ACSB radios being used in the marketplace by dispatch fleets, oil companies, etc. There were two companies actually marketing the ACSB equipment at this time: (1.) Stevens Engineering Associates, Inc. and (2.) STI (Sideband Technology, Inc.). Mr. Keller stressed that at the time these two companies entered the market there were no rules and no certainty that rules would be formulated. He noted that under these regulatory circumstances Stevens Engineering assumed a lot of risk in going ahead in developing a portable ACSB radio and dash-mounted version.

According to Mr. Keller, it was not until the 1983/1984 timeframe that there was sufficient marketplace acceptance of ACSB such that the FCC proposed rules for use of the service. The FCC structured its rules for ACSB by service category, e.g. broadcasters, business radios, land mobile service radios, and common carriers. Today ACSB is an official service as a result of rules adopted by the FCC.

Mr. Keller believes the case of ACSB illustrates the problems of bringing a new technology to market on a full-scale basis. The two major roadblocks a new technology may face are (1.) the potential for interference with current radio technologies and (2.) no real incentives by users to replace existing radios with new, more efficient, ACSB technology. Related to the latter point, Keller feels consumers are "just concerned with price and reliability." Furthermore, he believes "a fleet wants to have a common system and there is no incentive to replace old technology in one fell swoop."

2. SMR (specialized mobile radio) technology is another area raised by Mr. Keller as experiencing the same sort of difficulties as ACSB. He noted the roots of SMR regulation are in Docket 18262 (rules governing radio frequency for land mobile use). He explained that the FCC set aside some frequencies for mobile radio use

distinguished by user class (e.g. forest products industry, taxis, etc.). The FCC decided that each user group should not have to buy its own base station and other transmission facilities, instead there would be a common user system using an operator to serve all these user groups.

The FCC went on to award 10 channel blocks to individuals or groups for use of SMR. The FCC made one major demand on SMR users according to Keller: "if you do not use the frequency, you will lose it." This philosophy was mandated in the FCC's "channel take back" rule. Another FCC rule governing SMR, the "40-mile" prohibition, was noted by Keller: no common systems can be operated within 40 mile unless fully loaded.

Keller emphasized that situtation leaves companies involved in developing software to connect multiple SMRs (since a 20 channel system is more efficient than a 10 channel system) in a geographic area in a precarious position. Given the current regulations, Keller believes "these companies do not know what way to go and are afraid, for competitive reasons, to reveal chip designs in FCC procedings.

3. Mr. Keller went on to discuss international communication satellites. He traced the history of satellite regulation, noting the Communications Satellite Act and the creation of COMSAT, as well as INTELSAT (a consortium of approximately 130 countries). Keller stated that "in 1983, some entrepreneurs thought there might be a niche in the satellite services market and thus founded Orion Satellite Corporation." This organization then applied to the FCC to launch and operate a transatlantic, high-powered satellite system. According to Keller, the proposed system was to have spot beams on the European continent and the eastern half of the North American continent.

Keller highlighted the fact that an application for an international satellite system was novel at the time and a "presidential determination" was found to be needed especially in light of the INTELSAT agreement. In addition, Orion's application to the FCC was for authorization for use of an uplink to the satellite.

In reviewing Orion's case, Keller noted "some could say regulation did not inhibit innovation, but it is clear that the regulatory process did cause problems for Orion along the way." Another problem, according to Keller, was the fact that Orion had to reveal its intended target market in its FCC application (a significant part of its business plan). The disclosure of company plans (public notice) and the process of public comments is mandated in the 1947 Administrative Procedures Act.

In comparing the three technology cases he noted some common problems:

In his opinion, "all had difficulty raising capital because of the regulatory aspect" of launching a new service/technology. According to Keller, these companies involved in new technology ventures had to discount regular sources of capital like banks. This often means the entrepreneurs were often forced to go to venture capitalists and, as a result, give up equity.

Furthernmore, it was his view that all experienced a problem of delay in launching their service/technology as a reult of the problem of raising capital and the nature of the regulatory process. The delay issue, according to Keller, often means the public must wait for a product/service. He notes that SMR systems only became a viable force in the land mobile environment in 1984/1985 and in Orion's case the company waited three years to get U.S. approval only to be left waiting for European approval.

In wrapping up his talk, Mr. Keller again raised the question "Does Regulation Inhibit Innovation in Communication?" His answer to this was "it depends." He acknowledged that regulation may have thwarted some innovations. He noted that some companies, e.g. EDS (Electronic Data Systems company) have avoided the regulatory communications business because of regulation. On the otherhand, Keller points out that "regulation has not meant there have not and are not entrepreneurs still trying in the communications field."

Keller raises the question "What is to be done about this?" He acknowledges that we need to protect against mutually destructible interference. The real issue to be addressed, according to Keller, is what kind of balance should be struck: "How much is enough regulation and how much is too much?" He referred to the spectrum auction approach (which would involve buying a block of spectrum for present or future use) as "one of the most apt alternatives on the regulatory horizon." This approach to regulation would, in his opinion, ease the path of entrepreneurship and enable new technologies/products like ACSB to come to the marketplace more quickly.

Michael Daley, President of Lo-Jack Corporation was the second panelist. He described his background as non-technical; he has been in the nursing home business for several years. He noted he became a member of Lo-Jack's board in 1981 and has been the company's full-time president since July 1986.

Mr. Daley refered to Lo-Jack as a "company in gestation." He emphasized the steps Lo-Jack has already gone through to take the product from R&D to the market. He raised the issue of how a new

service such as Lo-Jack would fare against other existing systems in the current regulatory climate.

Mr. Daley showed the audience a video segment from the Today Show (January, 1987) featuring a demonstration of the Lo-Jack system. The clip showed a simulated stolen vehicle being recivered in just 10 minutes by the police.

Dailey described the essential parts of the Lo-Jack system: Basically, the consumer can purchase a unit for his/her automobile at a cost of approximately $600. The unit is about the size of an eraser and is installed in a recessed area of the vehicle. Each unit is assigned a unique vehicle identification number which is stored on the police computer. When a vehicle is stolen the owner phones the police department and tells them his/her vehicle has a Lo-Jack device. The device in the stolen car is then activated by the police over the state police broadcasting system (the 5-digit unique alphanumeric code for the Lo-Jack device has been stored on the law enforcement computer). The signal is then picked up by police car units, which have their own Lo-Jack trackers, located in the vicinity of the stolen car. When the Lo-Jack unit is first activated it sends out a signal once every fifteen seconds; once it is activated by police in the vicinity the signal speeds up to once every seven seconds.

Mr. Daley voiced agreement with Tom Keller on the point that "an entrepreneur may have his spirits dimmed by regulation, but perserverance wins out." He believes that this is true in Lo-Jack's case.

He went on to discuss the motivations behind the development of the Lo-Jack product. The founder of the company had been involved in the law enforcement effort and had been concerned with the alarming growth in autotheft ("a social problem") in the state and nationally. The founder had also been disillusioned by the many law enforcement officials killed in pursuit of stolen cars.

At this earlier time, autotheft devices and deterrents were viewed by Lo-Jack's founder as only sometimes useful. Therefore the developer of Lo-Jack wanted to link the existing law enforcement system with a new anti-theft product.

Mr. Daley gave an update of the autotheft situation in the United States. The problem of autotheft is still rampant and growing. He noted there is a 10-18% increase in autotheft annually and thus concluded that current autotheft devices are not useful enough. According to Daley, there are over $5.5 billion in stolen vehicles anually in the U.S. In Massachusetts alone over 50,000 cars are stolen per year.

Addressing the issues of time and finances, Mr. Daley recalled that it took "8 years and $8.5 million to develop the Lo-Jack technology." He acknowledged that raising capital is a major problem in launching a new system. He gave a lot of credit to luck in that Lo-Jack was able to locate and work with engineers at Micrologic. In Daley's words, "these people thought the job might be difficult, but not impossible."

Aside from the technology development issues, Lo-Jack was faced with the problem of finding suitable frequency for its system. According to Daley, Lo-Jack wanted to locate a frequency that spanned the United States and was already in the control of law enforcement. One such frequency was found under the jurisdiction of the FBI and the Justice Department only after years of meetings with regulators, law enforcement officials, politicians, etc. Permission to use this low-band FM frequency was obtained by Lo-Jack on an experimental basis with the help of Massachusetts law enforcement officials.

Daley reiterated that it was key to Lo-Jack to integrate its system in to the existing law enforcement system to avoid creating excess paperwork. Lo-Jack's computer is actually linked to the law enforcement computer. Lo-Jack also uses the existing communication towers belonging to state police, though some electronics had to be added.

Dailey went on to describe the timetable of adoption of the system in Massachusetts (the first state to use the system): In mid-1984 Lo-Jack started testing the Lo-Jack device in conjunction with the Massachusetts police and the FBI. Mr. Daley acknowledged that "it's a lot easier to move about in these regulatory agencies when you have the right people moving it for you."

In April 1985, Massachusetts officials announced that the testing of the system had been successful. Governor Dukakis reported in a press conference that in over 1,000 demonstrations of the Lo-Jack system it experienced no failures and achieved an average recovery time of 11 minutes. It was at this point in time that Massachusetts law enforcement agreed to co-sponsor Lo-Jack's application to the Federal Communications Commission (FCC). Therefore, with the approval of the FBI and the NTIA (National Telecommunications and Information Administration) to use the frequency 173.057 MHz, Lo-Jack applied to the FCC for an experimental license. Daley acknowledged that it was unusual for a private company to be allowed to use a government frequency and should be seen as a sign that government wants to cooperate with industry to maximize the use of scarce spectrum resources.

Lo-Jack's application for an experimental license was filed in October 1985 and approved by the FCC in March of 1986. Lo-Jack

units then went into full-scale production using Motorola as the manufacturer. Motorola was selected, according to Daley, because they wanted to manufacture in the U.S. and wanted quality production.

In retrospect, Mr. Daley felt Lo-Jack had found a lot of cooperation from all agencies of government in launching its product. He was excited by the media's reaction to the Lo-Jack product as "a James Bond-like concept." He stated that Lo-Jack's operation under the jurisdiction of law enforcement was a positive move. He also feels that Lo-Jack "has successfully obtained the frequency" eventhough it is operating under an experimental license. Ultimately, Daley hopes all stolen car information will be transmitted to Washington to become part of the national law enforcement network (NCIC). He spoke of the Lo-Jack network in the future being able to track stolen cars abroad using the NCIC computer.

Daley believes that obtaining its present frequency has been more vital to his company than the technology and all the patents they have filed. In regard to competition, Mr. Daley noted that at the current time anyone desiring to either have to approach Lo-Jack for the vehicle identification codes or convince the regulators there should be two different systems in the marketplace. He believes that especially the latter will be difficult to accomplish.

Daley pointed to several disadvantages of Lo-Jack's current status: He acknowledged the experimental and temporary nature of Lo-Jack's license. There is the uncertainty surrounding law enforcement officials in other states wanting to co-sponsor the Lo-Jack system. In his opinion, "Lo-Jack could lose its experimental license for little or no reason without the opportunity to defend the license." Lo-Jack's stability as a public company has been threatened by the financially risky nature of the situation (most of the capital for the business was raised in the stock market and through venture capital).

Furthermore, since Lo-Jack is operating under an experimental license, Daley elaborated that Lo-Jack is obligated to inform all its investors and customers of the temporary nature of its license. Also, Daley noted that as long as Lo-Jack operates under this experimental license it is very vulnerable to complaints filed to the FCC by those operating under adjacent frequencies. Interference complaints have already been filed by Channel 7 in the Boston area.

Daley cited the sheer financial costs of maintaining a license (eventhough it's only experimental at this time) can be draining for a company like Lo-Jack. These expenses include the high cost of securing a D.C. law firm, as well as technical and engineering expenses. However, according to Daley, the major obstacle is still to come when Lo-Jack's application for a permanent license will have

to endure the public comment process at the FCC. He believes that "parties will be coming out of the woodwork" to comment at this point.

It is Daley's feeling that the license process will take about a year. (He has been advised to do the application for permanent status one state at a time, instead of seeking temporary status across the United States.) By the time he receives the permanent license for Massachusetts he hopes to have added features to the current Lo-Jack system. He spoke of the LETS System (Lo-Jack Emergency Tracking System), now on the drawing board, which would allow police officers to activate a 911 signal if he/she is not able to use the car radio and alerts others that than officer is in distress. Interest in this system was particularly generated by the recent incident in Miami in which three FBI men died; they were caught in a situation where they could not call for help.

According to Daley, the states of Florida and California are expected to join the Lo-Jack network in the near future. It is expected that Michigan, the District of Columbia, Maryland, Virginia, and Puerto Rico will follow. Lo-Jack has plans to expand in to international markets as well and is currently speaking with people in Canada, Sweden, Venezuela, Israel, Australia and Brazil. Lo-Jack technology will actually be featured in a documentary airing on Australian T.V. this fall.

In conclusion, Daley believes Lo-Jack has a very useful product that has proven to have a good track record. Since the first of the year, Lo-Jack has recovered 54 vehicles using its system and they are achieving one-third arrests of suspects in cars recovered. Lo-Jack hopes to slow down the autotheft problem via law enforcement's apprehension of theives as well as stolen cars. He noted a recent decision by Governor Dukakis which calls for a second time offender to spend a mandatory one year in jail. Dailey hopes this legal change and the successful record of the Lo-Jack system will have a serious deterrent affect.