Pinpoint and Amtech falsely accuse Teletrac of "harassing" other AVM operators through filings with the Commission. These objections consist largely of complaints that Teletrac is trying to protect its validly issued licenses through petitions and other filings with which Pinpoint and Amtech disagree.[53] Of course, had Teletrac not protested, Pinpoint and Amtech would no doubt have argued that Teletrac's silence precluded its objections to any license.

Amtech asserts that Teletrac has filed untimely applications for stays and for review of license grants.[54] As Teletrac has explained in those filings, it was unable to file earlier because the Commission never gave it notice that the authorizations had been granted. Teletrac's attempts under these circumstances to protect its rights cannot fairly be termed improper.[55]

The failure to give notice to existing licensees, and the failure to provide reasoned decision making with respect to these grants, have created a climate of confusion that regularity of procedure would have avoided. One of the results of such confusion is pointed to by Pinpoint and Amtech. In order to protect its

---

[53] Both parties, for example, erroneously claim that Teletrac should not have filed the freeze petition because the Commission has already decided the exclusivity issue against Teletrac. See Amtech Opposition, at 11-12; Pinpoint Opposition, at 12-13.

[54] Amtech Opposition, at 11.

[55] Amtech also argues that Teletrac's petitions lacked the requisite verification, but Pinpoint concedes that Teletrac provided an affidavit supporting its contention that Pinpoint's system would interfere with Teletrac's operations. Pinpoint Opposition, at 13 n.36. Teletrac has also provided affidavits in support of each of its other requests to deny.

rights Teletrac filed a petition to deny based on its belief that Amtech tag readers in Rock Springs, Wyoming would be close enough to an existing Teletrac license in Salt Lake City to create an interference potential.[56] Teletrac has now had the opportunity to examine the matter more closely and has determined that the Wyoming site is outside the area of potential interference.

IV. CONCLUSION

For the reasons stated above, the Commission should refrain pending resolution of this rulemaking from any further licensing of AVM systems in the bands allocated for WBPR AVM operations (904-912 MHz and 918-926 MHz).

Respectfully submitted,

PRESTON GATES ELLIS
& ROUVELAS MEEDS
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(202) 628-1700

By: _____
Stanley M. Gorinson

Counsel for North American Teletrac and Location Technologies, Inc.

Of Counsel:

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Washington, D.C. 20001
(202) 434-4100

Dated: June 16, 1993

CERTIFICATE OF SERVICE

I hereby certify that on this 16th day of June, 1993, a copy of the foregoing NORTH AMERICAN TELETRAC and LOCATION TECHNOLOGIES, INC.'S REPLY TO OPPOSITION TO APPLICATION FOR FREEZE was served by first class United States mail, postage prepaid on the following parties:

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Land Mobile and Microwave
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Ollie Matthews

Exhibit 1

AMTECH
BACKSCATTER™
Volume 1 Number 9 Spring 1993

IN THIS ISSUE

- *Millionth rail tag presented to AAR*
- *APC equips intermodal fleet*
- *Alcatel Canada uses Amtech equipment for Newark Airport People Mover*
- *IntelliTag™ installed at Boston's Tobin Bridge*
- *Maher Terminals installs AEI at New Jersey port*

...AND MORE

American President Companies to equip worldwide facilities

APC takes bold step to automate global container tracking

On March 8, Amtech Corporation and American President Companies (APC) announced a five-year agreement which will ultimately provide Amtech tags, readers, software and associated systems integration services to enhance APC worldwide container operations.

Amtech president and CEO, G. Russell Mortenson, said, "APC and Amtech have worked cooperatively for several years to develop national and international standards for AEI based on Amtech's technology for intermodal transportation applications. It is gratifying to see one of the leading intermodal carriers in the world move ahead with adoption of AEI."

This investment, which is valued at between approximately $15 and $20 million to Amtech, represents the first large-scale implementation of automatic equipment identification (AEI) systemwide by an international carrier.

APC has placed an initial order for 100,000 tags to be delivered in 1993. Approximately 50,000 additional tags will be installed over a three-year period.

"The Amtech system will greatly improve operating efficiency and our industry's ability to meet the demands of customers for timelier, more accurate information," said Lorenz P. Robinson, APC vice president.

AEI helps to speed up container operations, prevent many types of errors and improve productivity and customer service.

Gate processing time is cut dramatically with AEI by automatically identifying (and, optionally, weighing) a truck and container as they approach.

Container handling becomes more precise and efficient when container ID is recorded in the yard management computer along with location and handling equipment ID each time the unit is moved. Costly mishandles can be prevented or corrected so that containers are rarely, if ever, sent out on the wrong ship, truck or train.

The company plans to fit tags on its fleet of containers, chassis, tractors, railcars and other equipment and install reader systems at as many as 130 facilities used by APC in North America, Asia and the Middle East.

Since many of the terminals used by APC are multi-user facilities, Amtech anticipates that equipping them may lead to broader industry adoption of AEI technology.

As these facilities are equipped with reader systems, other container shipping companies may choose to install tags on their equipment and utilize these existing readers in cooperation with APC or the terminal operators.

Industry standards for automatic equipment identification for rail, trucking and intermodal shipping are now in place, providing the essential framework for seamless equipment and cargo tracking worldwide.

The International Standards Organization (ISO) and the American National Standards Institute (ANSI) have set standards for automatic

See INTERMODAL on page 8

Maher Terminals forms strategic alliance to implement AEI

Dr. Robert Nortillo, executive vice president of Maher Terminals, Inc., announced that Maher Terminal has developed a strategic alliance with Amtech Corporation and Martec International to install Amtech automatic equipment identification (AEI) systems at its Tripoli Street facility in Elizabeth, New Jersey in April, 1993.

This installation will be the first commercially operational system for expediting cargo in the ports of New York and New Jersey and will showcase the benefits of using AEI technology for marine terminal applications.

This system will make available additional services for delivering and receiving trucks by automatically identifying the tractor immediately upon arrival at the Maher Terminal.

Trucking companies will have the opportunity to equip their tractors with Amtech AEI tags.

The reader system, located at the entry to the Tripoli Street container terminal, will identify the truck via data recorded in the tag, such as license plate number, trucking company and other information.

This technology allows for accurate recording of trucker arrival times and enables efficient management and allocation of terminal resources to enhance service to the trade. ❑

Illustration below depicts the operations enhanced by AEI in intermodal container shipping:

1. *In/out gate processing*
2. *Mobile inventory vehicle*
3. *Gantry crane*
4. *Top pick*
5. *Rail interchange*

INTERMODAL continued from page 1

identification of intermodal shipping containers: standards based on Amtech technology.

The American Trucking Associations' standard for automatic identification of tractors, chassis and other equipment is compatible with the ISO and ANSI standards.

The Association of American Railroads (AAR) has set a mandatory standard for identification of rail equipment which is compatible with the trucking and intermodal standards.

As the AAR completes its mandatory tagging (by June of 1994) of all rail and intermodal equipment used in AAR interchange service, the reader infrastructure that retrieves data from tagged equipment and provides timely location information is also being expanded .

This infrastructure, along with compatible reader networks and equipment tagging in the trucking and traffic industries, establishes the electronic link to track shipments across the North American "landbridge."

Similar adoption of compatible standards now pending and implementation of AEI internationally

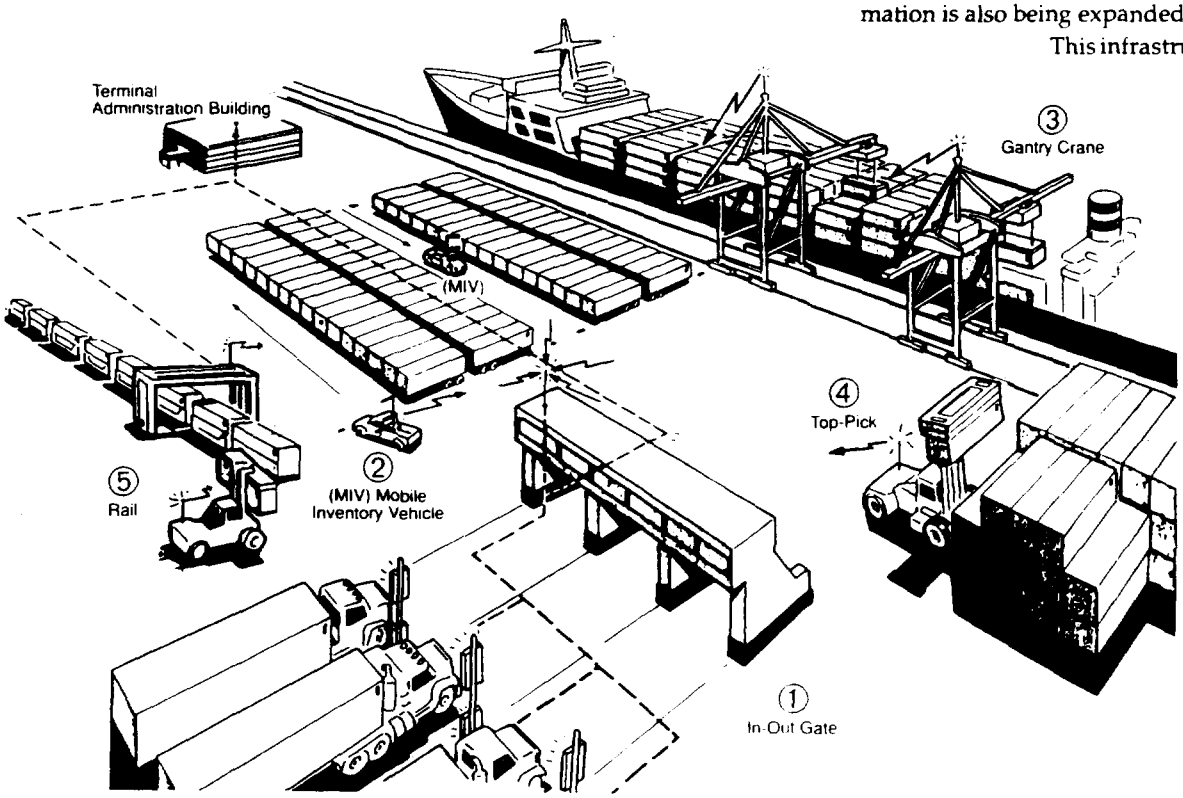


Exhibit 2

INSIDE
INTELLIGENT VEHICLE/HIGHWAY SYSTEMS UPDATE

Amtech to Install AVI for Surveillance On Houston Freeways

Amtech tags sold for various applications to all serve as traffic probes in Houston project. System to use spread spectrum radios to link readers to telephone network. Plans call for AVI surveillance on additional roads.

Plans to use automatic vehicle identification (AVI) transponders as traffic probes on three Houston area freeways will result in "the first traffic monitoring system using AVI/ETTM technology in the world," says Frank Dorrance, director of IVHS programs at Amtech Corp. in Dallas. Amtech recently secured a $1.9 million contract to install AVI antennas and readers at a total of 36 sites on I-10, I-45 and U.S. 290 in northwestern Houston. Amtech is also filling an initial order for 1,000 AVI transponders, which the Texas Department of Transportation (TxDOT) will distribute to volunteers who use the freeways to commute downtown from the suburbs.

It's no surprise that Amtech won the Houston contract, since the Harris County Toll Road Authority (HCTRA) already uses Amtech's equipment to collect

Continued, page 6

Amtech to Install...

Continued from page

tolls on Houston's Hardy and Sam Houston Toll Roads (see *Inside IVHS*, May 24, 1993). TxDOT eventually wants to extend the use of AVI equipment for traffic surveillance to those toll roads as well as to other area freeways. The surveillance systems must be able to read the same transponders. As long as no other company manufactures AVI equipment that's compatible with Amtech's, TxDOT will have to specify the Dallas company's equipment for Houston, says Dick McCasland, a research engineer at the Texas Transportation Institute (TTI) in Houston. TTI is working under contract to TxDOT's Houston office on various IVHS projects, including the AVI surveillance system

Because TxDOT is using the same equipment to measure travel times as HCTRA is using to collect tolls, the state agency will be able to collect data from more than the 1,000 transponders it's putting on the road. Any car equipped with a toll tag obtained from HCTRA that passes through one of the equipped areas on the freeways will be detected by the surveillance system. Between 10,000 and 20,000 drivers are currently using the electronic tags on the toll roads, Dorrance says. TxDOT is also working with HCTRA on arrangements that would permit volunteers in the surveillance project to use their transponders for electronic payments on the toll roads, he says.

> *"Any tag that's moving on these roads provides probe information."*

In addition, vehicles with Amtech tags used for paying tolls in Dallas or New Orleans or on the Oklahoma Turnpike will serve as probes if they pass through Houston. The same goes for trucking fleets using Amtech tags to identify and track their trailers. Star Enterprise, a Houston-based division of Texaco, is using the tags to monitor tank containers that carry fuel; when those tankers travel the freeways, the surveillance system will detect them. "Any tag that's moving on these roads provides probe information," Dorrance says.

Some of the 1,000 vehicles that receive AVI transponders from TxDOT will belong to drivers who took part in an earlier effort to gather travel time information. During an 18 month test, now completed, 200 drivers with cellular phones provided by TxDOT called to report their locations at set intervals as they traveled the roadways. The drivers were recruited from the staffs of major employers in downtown Houston, says McCasland. TxDOT and TTI are now working to recruit those volunteers plus others to participate in the AVI test, he says. In addition, some of the transponders will go on transit vehicles that use the high occupancy vehicle (HOV) lanes on the freeways.

At the 36 surveillance sites, Amtech is installing a total of 161 overhead antennas, each of which will cover between 1 1/2 and two lanes. The an-

tennas will be mounted on overhead sign structures or overpasses. Data obtained from the transponders will be transmitted to a roadside reader connected to a high-speed multiplexer, which allows the reader to receive data from up to eight or nine lanes, Dorrance says.

Amtech is using spread spectrum radio modems from Proxim in Mountain View, Calif. to link the readers to telephone network equipment located 1/4 mile to 1/2 mile away. This eliminates the need to run phone lines to the roadside. "You can usually get electrical power at these sites from lights for signs or something of that nature, but getting the phone service out to these sites is a challenge," Dorrance says. With the spread spectrum link "we're able to eliminate that concern," he says.

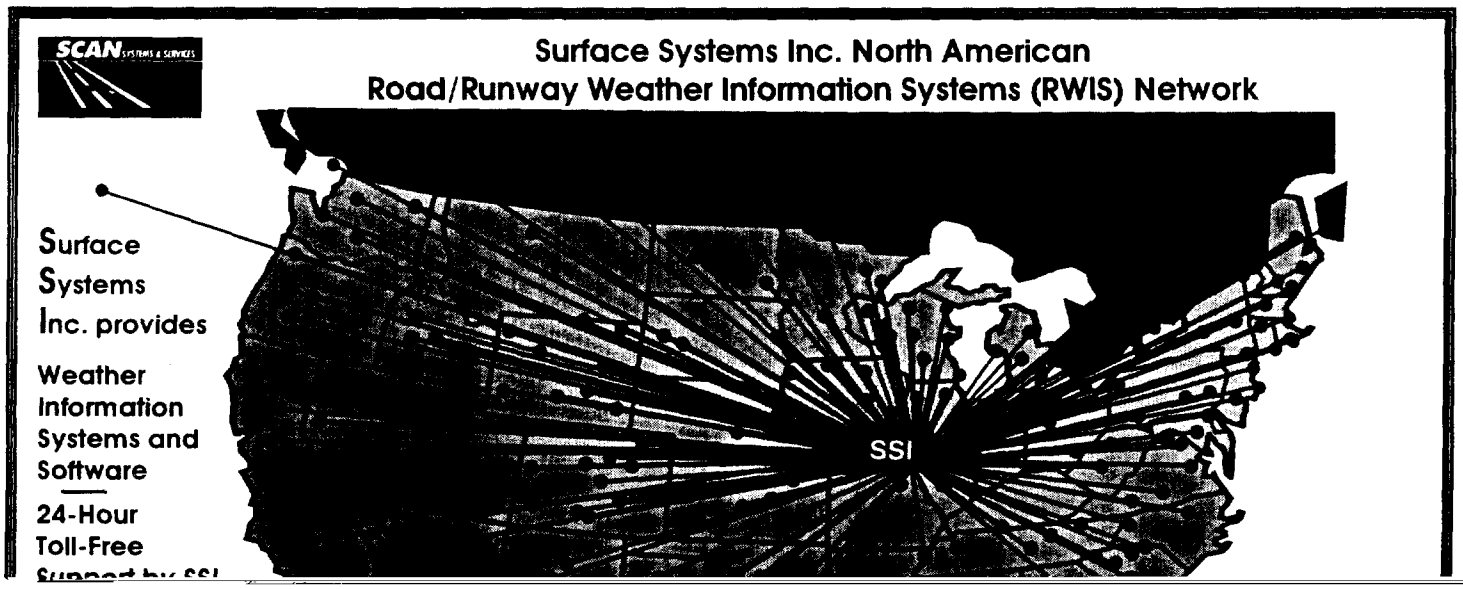
The company is avoiding the expense of dedicated phone links by using a dial-up connection to transmit probe data from the field. Data will be transmitted in near-real time, within 30 seconds of the time the system reads a probe, Dorrance says. If several transponders pass through while a call is in progress, they will all be reported, he says. If TxDOT eventually installs a fiber optic network, the system can be adapted easily to the new pipeline, he says. "But in the short term, this is a less expensive implementation."

Data from the readers will be transmitted to a TxDOT facility, where personnel provided by TTI will process it and present it to TxDOT in a form it can disseminate to the public, McCasland says. TxDOT has been faxing travel time data to commercial traffic information services and providing information directly to the public via variable message sings (VMS).

The use of AVI on both the regular and HOV lanes is interesting because the VMS will be able to display precise travel times for each, Dorrance says. This could help lure travelers into car pools or public transit. "You can easily see the 22 minute commute time on the regular [lanes] and 12 minutes on the HOV. It becomes instantly concrete and evident," he says.

The current contract calls for Amtech to install the system within six months, implementing one freeway at a time, Dorrance says. TxDOT will begin distributing transponders within 30 to 60 days, he says.

The $1.9 million for the current AVI implementation on the three freeways comes entirely from state funds. A phase 2 implementation will be supported mainly by Congestion Mitigation and Air Quality (CMAQ) funds (see *Inside IVHS*, Jan. 18, 1993). In Phase 2, Amtech will install equipment on the Eastex and South Freeways (both part of U.S. 59), the western portion of the I-610 Beltway, a small portion of the Gulf Freeway (I-45), part of the Hardy Toll Road and part of the I-8 Beltway (not including the Sam Houston Toll Road). The document that will open the bidding process for phase 2 is currently being processed, says Mark Conway, senior traffic engineer at TxDOT's District 12 office in Houston.



TravelAid Inches Toward Starting Line; Partners Near Pact

Washington state project serves as example of the complexity of coordinating needs of state, federal and private partners in IVHS projects. WSDOT to begin collecting "before" data next winter. Westinghouse considers using Trafficscope for in-vehicle display.

A year after it was announced, participants in Washington state's TravelAid operational test are just on the verge of signing the agreements that will allow work to start on the project. "We think we're close," says Peter Briglia, an engineer with the Washington Department of Transportation (WSDOT), one of the partners in the project.

WSDOT is working with the Federal Highway Administration (FHWA), the National Highway Transportation Safety Administration (NHTSA), Farradyne Systems and Westinghouse Electric on a system that will monitor traffic and roadway conditions on a hazardous road east of Seattle. The 40 mile stretch of Interstate 90 runs through the Snoqualmie Pass in the Cascade Mountains, an area that sees a good deal of snow and ice between October and May (see *Inside IVHS*, June 8, 1992).

Using data collected by traffic surveillance and environmental sensors, TravelAid will determine when there are hazards and display appropriate warnings on variable message signs (VMS). The system will also change the speed limit on the road as conditions warrant, and display that figure on the signs. In addition, TravelAid will transmit the hazard and speed limit information to on-board devices supplied by Westinghouse and installed in 200 vehicles.

It's taken this long to sign agreements for TravelAid largely because the negotiating parties had to overcome a sort of language barrier. Much of the financial information that came from Westinghouse "was not in a form that our people are used to looking at," Briglia says. Bridging the culture gap between a state DOT and a company that has dealt largely with the U.S. Department of Defense took some doing, he says.

Based on what Briglia hears from colleagues in other states, problems of that sort aren't uncommon in negotiating IVHS contracts. "Everyone seems to be having trouble with companies that have done defense work and are fairly comfortable working with defense-related agencies," he says. "All of a sudden, they have to work with both Federal Highways and state DOTs, and things are different."

The contracts have been delayed partly because it took WSDOT a long time to come to an agreement with the federal government about funding—which is not an uncommon situation, says Bill Jones, general manager at Westinghouse Electric's transportation management systems division in Baltimore. Also, WSDOT wanted to look at certain financial data that Westinghouse generally provides to the federal government as part of its defense activities. It took time to coordinate with the necessary audit agencies to get that data. "In most of the other contracts I have with municipalities and state governments, I didn't get into that," he says.

Westinghouse hasn't seen such long delays in other IVHS projects it's involved in, but TravelAid "has been a little unique," Jones says. It was one of the first IVHS contracts involving a public-private partnership, and "neither we nor the federal government nor the state government is really used to doing that," he says.

TravelAid will cost approximately $4.5 million. The FHWA's IVHS Operational Test Program is providing $1.4 million. NHTSA is providing $238,000 for evaluating the safety benefits of the system. Farradyne, in Rockville, Md., and Westinghouse, in Baltimore, are contributing $760,000. The balance will come from Interstate highway funds supplied by the FHWA.

> *"All of a sudden, they have to work with both Federal Highways and state DOTs, and things are different."*

This summer, the project will advertise a contract to install devices in the roadway to collect information on traffic volumes and speeds at the test site during the winter, before warning signs are installed. This baseline data will allow participants to compare driver behavior before and after the system goes into operation.

In-pavement loops will be installed at all three data stations on the test roadway. In addition, two of the sites will have "dual-mode detectors," using radar and sonar technology, provided by Westinghouse. These will allow the project to collect information not only on lane occupancy and traffic volume, but also on speed and vehicle classification, Briglia says. They will also permit the system to detect when drivers "are straying all over the roadway" when snow and ice hide the pavement markings and "all lane discipline goes out the window," he says.

Westinghouse is combining radar and sonar in one detector in order to be able to detect a wide variety of factors about traffic. "Each of those [technolo-

gies] adds a dimension to the data that we want out of that system," Jones says.

WSDOT hopes to collect the baseline data during the winter of 1993-94 and then do most of the construction for the operational test in the summer of 1994, Briglia says. The system would begin operating in the winter of 1994-95.

Data from the roadway will probably be transmitted to computers in a WSDOT maintenance facility in Hyak, Wash., which handles snow removal in the Snoqualmie pass, Briglia says. Messages for the VMS and in-vehicle displays will be transmitted from the Hyak facility.

Early plans called for Westinghouse to develop an on-board display device specifically for TravelAid. That's still an option, but Westinghouse is also looking into the possible use of Trafficscope—its name for the Trafficmaster system it's licensing from General Logistics in Luton, England. The license allows Westinghouse to provide a commercial traffic information service, using the Trafficmaster technology, in four areas of the U.S. Washington state is one of those areas, although it's not yet determined whether Westinghouse will develop a commercial service in the Seattle area, Jones says. Plans to use Trafficscope as a display device for the TravelAid test would not have to be tied to any plans to offer a commercial service.

Westinghouse is still weighing the advantages of the off-the-shelf Trafficscope unit vs. a custom unit for the operational test, Jones says. A determination won't be made until the participants actually begin work on the project, he says.

Exhibit 3

ANDREWS OFFICE PRODUCTS CAPITOL HEIGHTS, MD (K)

United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION

EXPERIMENTAL
(Nature of Service)

K S 2 X A R
(Call Sign)

XD MO
(Class of station)

S-1082-EX-93
(File number)

NAME SALT LAKE CITY AIRPORT AUTHORITY

Vicinity Salt Lake City International Airport, UT
(Location of station)

Special Temporary Authority is hereby granted to operate the radio transmitting apparatus described below:

Frequency MHz	Authorized Power (watts)	Emission Designator
902-928	32 (ERP)	20K0N0N

This special temporary authorization is granted upon the express condition that it may be terminated by the Commission at any time without advance notice or hearing if in its discretion the need for such action arises. Nothing contained herein shall be construed as a finding by the Commission that the authority herein granted is or will be in the public interest beyond the express terms hereof.

This special temporary authorization shall not vest in the grantee any right to operate the station nor any right in the use of the frequencies designated in the authorization beyond the term hereof, nor in any other manner than authorized herein. Neither the authorization nor the right granted hereunder shall be assigned or otherwise transferred in violation [illegible] Communications Act of 1934. This authorization is subject to the [illegible] use of control by the Government of the United States conferred by [illegible] 706 of the Communications Act of 1934.

[illegible]ization effective May 28, 1993 and
[illegible] 3:00 A.M. EST. November 28, 1993

FEDERAL COMMUNICATIONS COMMISSION

Exhibit 4

Federal Communications Commission

1270 Fairfield Road
Gettysburg, PA 17325-7245

In Reply Refer To:
7110-22

March 1, 1993

Vulcan Chemicals
Div. of Vulcan Materials Co.

Exhibit 5

Federal Communications Commission
Gettysburg, PA 17325-7245

RADIO STATION LICENSE

Licensee Name: SALT LAKE CITY AIRPORT AUTHORITY

Radio Service: RS RADIOLOCATION — License Issue Date: 930406

Call Sign: WPBZ381 — File Number: 9210344498 — License Expiration Date: 980406

Frequency Advisory No:

Number of Mobiles by Category: Vehicular - ****** Portable -******Aircraft - ******Marine - ******Pagers*******

930406N 621 1 1Z

SALT LAKE CITY AIRPORT AUTHORITY
KEN IMBER
AMF BOX 22084
SALT LAKE CITY UT 84122

Station Technical Specifications

FCC I.D.	Frequencies (MHz)	Station Class	No. of Units	Emission Designator	Output Power (Watts)	E.R.P. (Watts)	Ground Eleva	Ant. Hgt. To Tip	Antenna Latitude	Antenna Longitude
1:	918.01000	LR	12	20K00N0N	2.000	32.000	4200	18	40-47-13	111-58-05
	919.00000	LR	12	20K00N0N	2.000	32.000				
	920.00000	LR	12	20K00N0N	2.000	32.000				
	921.00000	LR	12	20K00N0N	2.000	32.000				
	923.00000	LR	12	20K00N0N	2.000	32.000				
	924.00000	LR	12	20K00N0N	2.000	32.000				
	925.99000	LR	12	20K00N0N	2.000	32.000				

	TRANSMITTER STREET ADDRESS	CITY	COUNTY	STATE
1:	SALT LAKE CITY AIRPORT AUTHORITY 776 N TERMINAL DR	SALT LAKE CITY	SALT LAKE	UT

CONTROL POINTS:AMF BOX 22084 SALT LAKE CITY UT
CONTROL POINT PHONE: 801-575-2490

SPECIAL COND: SEE ATTACHED #39

NOTE: FREQUENCY 922.00 MHZ WAS MISTAKENLY LEFT OFF THIS LICENSE AND IS TO BE ADDED IN A MODIFICATION.

EMISSION DESIGNATOR(S) CONVERTED TO CONFORM TO DESIGNATOR(S) SET OUT IN PART 2 OF THE COMMISSION'S RULES.

FEDERAL COMMUNICATIONS COMMISSION

This authorization becomes invalid and must be returned to the Commission if the stations are not placed in operation within eight months, unless an extension of time has been granted. EXCEPTION: 800 MHz trunked and certain 900 MHz station licenses cancel automatically if not constructed within one year.

FCC 574-L

SENT BY:SLCAA : 6- 4-93 : 13:31 : DIRECTORS OFFICE-

Exhibit 6

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Part 90	)	
of the Commission's Rules	)	**PR DOCKET 93-61**
to Adopt Regulations	)	**RM 8013**
for Automatic Vehicle	)	
Monitoring Systems	)	
	)	

To: The Commission

REPLY AFFIDAVIT OF DR. CHARLES L. JACKSON

CHARLES L. JACKSON, being duly sworn, deposes and says:

1. I have reviewed the Opposition of Pinpoint Communications, Inc. to Teletrac's Application for Freeze in this proceeding, and the Affidavit of Louis Jandrell filed in support of that Opposition ("Jandrell aff.") Mr. Jandrell makes a number of erroneous and misleading observations concerning an affidavit I prepared which was submitted in support of Teletrac's Application ("Jackson aff.") I offer this reply affidavit to respond briefly to some of Mr. Jandrell's major errors.

have shared spectrum, either some form of a carrier-sense protocol was used, or the licensees actually shared the ownership and operation of a single system. I am not aware of any other system for such sharing which has been shown to be feasible and workable in practice. Mr. Jandrell's affidavit provides no description of Pinpoint's alternative method for addressing this problem; nor is there any basis on which to conclude from the general and hypothetical discussion in his affidavit that Pinpoint's system is capable of addressing the problems I have outlined.

3. Mr. Jandrell grossly mischaracterizes my position as being that two systems must "be the same in all significant particulars" or "get the same amount of airtime" to share spectrum. (Jandrell aff. ¶¶ 8, 13). I stated, rather, that sharing requires "common knowledge and shared technology" and that the systems must "mesh," that is, that they must be able to operate together. (Jackson aff. ¶¶ 12, 17). Such a result is extremely difficult to attain in an open entry environment which is always subject to the burden of new systems with new characteristics. I note that Mr. Jandrell does concede the need for systems to be synchronized and for agreements among system providers on controlling access to the spectrum and access to air time. (Jandrell aff. ¶¶ 9, 14). I note further that his hypothetical "common standard" synchronization scheme (¶ 24) would require at least a common subsystem to receive, demodulate, and process this common timing standard, a requirement for very significant commonality between systems.

4. Mr. Jandrell argues that asynchronous transmissions are irrelevant and inefficient (Id. ¶ 21). Such transmissions are an important safeguard for the reliability of stolen vehicle services. The capability for asynchronous transmissions is thus in the public interest, even if it is not in Pinpoint's interest because Pinpoint is apparently not concerned with this market.

5. Mr. Jandrell states that "asynchronous operations are monumentally inefficient," and goes on to draw an uncomplimentary parallel between true asynchronous systems and citizens band (CB) radio. (Id. ¶ 22). This discussion contains two errors. First, the proper measure of efficiency is economic benefit to the public. Asynchronous transmissions may consume more spectrum than alternatives, but if they do a valuable job that the alternative cannot do, asynchronous transmissions are the more efficient. Second, citizen's band radio is not an asynchronous data service -- nor an asynchronous service of any kind. Rather, it is a voice

policy is some form of exclusive right that could be sold or exchanged with another. Such exclusivity is, however, the antithesis of the open-entry sharing he supports.

7. In Paragraph 17, Mr. Jandrell advocates a platonic "arbitrator" who would pass out time-division rights in a fair fashion. He discusses neither the funding for this enterprise, the mechanism for appeal of its decisions, nor any problems of rights definitions. I believe that such a system would have substantial incentive problems. For example, if Able Enterprises has only 5,000 customers and Baker Communications has 10,000 customers, can Able use as much channel time as Baker -- thereby allowing Able to provide location updates twice as frequently? Does the equity change if most of Able's customers are ambulances and physicians while Baker serves pizza delivery vans and plumbers?

8. Mr. Jandrell offers the totally unsupported assertion that the proportion of the spectrum taken up with "overhead transmissions" will not increase appreciably as additional participants enter. (Id. ¶ 25). As common sense would indicate, unless their systems are virtually identical, additional participants will require additional overhead transmissions. My affidavit offered a mathematical demonstration of this fundamental problem. Moreover, such overhead can include more than synchronization, so Mr. Jandrell's focus on only synchronization (see ¶¶ 19, 20, 24) misstates my original comments.

I hereby declare and aver under penalty of perjury that the foregoing is true and correct.

Charles L. Jackson

DISTRICT OF COLUMBIA: ss

Subscribed and sworn to before me
this 16th day of June, 1993.

Notary Public

My commission expires: My Commission Expires July 14, 1997