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September 14, 1995

*Building The Wireless Future*™

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

**CTIA**
Cellular Telecommunications Industry Association
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Washington, D.C. 20036
202-785-0081 Telephone
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**Re:** *Ex Parte* Presentation
RM-8658

Dear Mr. Caton:

On Thursday, September 14, 1995, Mr. Thomas Wheeler, President and CEO of the Cellular Telecommunications Industry Association ("CTIA") sent the attached letter to Chairman Reed Hundt with copies to Commissioners James Quello, Andrew Barrett, Rachelle Chong and Susan Ness. The letter concerns issues raised in the Petition for Rule Making to amend Section 68.4 of the Commission's Rules: Hearing Aid Compatible Telephones.

Pursuant to Section 1.1206 of the Commission's Rules, an original and one copy of this letter and the attachments are being filed with your office. If you have any questions concerning this submission, please contact the undersigned.

Sincerely,

Andrea D. Williams

Andrea D. Williams
Staff Counsel

Attachments

**ENTREPRENEURS**

# THEY'RE BEARING THE GIFT OF SOUND

## Two Coloradans have a promising new hearing device

**LESS STATIC:** *Crouch and Waldron with HATIS*

When United Airlines Flight 427 crashed in Colorado Springs in September, 1991, it was less than a block from Jo Waldron's house. But because Waldron is profoundly deaf—she was born 44 years ago with a 97% hearing loss—she didn't know what the flashing lights outside meant. Had there been a gas-main explosion? Should she bustle her sons to safety or stay put? Her frantic phone calls to local newscasters and a hospital—which she was able to make thanks to a prototype of a new device for telephones that she had helped develop—were curtly rebuffed with admonitions to "turn on the TV" or "listen to the radio."

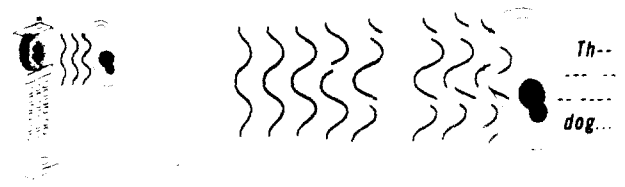
That was just one of a lifelong series of frustrations at being cut off from a world saturated with telecommunications. In fact, Waldron and Shirley A. Crouch, her business partner, had decided a year earlier that it was high time for the isolation of deaf people to end. The co-owners of Phoenix Management Inc.—founded to counsel people with disabilities and sponsor job fairs at large companies—launched the company on a new track: developing low-cost technology for the handicapped.

Their initial product is an $80 device dubbed HATIS, short for Hearing Aid Telephone Interconnect System. Waldron used it to call her mother and, for the first time ever, heard her mother's voice. Existing hearing-aid-compatible phones are fine for people with a slight-to-moderate hearing loss, says Waldron. But most of the 30 million hearing-impaired Americans can't understand what they hear on such phones, she insists. "I've met thousands of deaf people, but only three of them use a hearing-aid-compatible phone." The reason: Background noises also get amplified, and these unwanted sounds can drown out the words.

**MUSIC AND NEWS.** HATIS is different because it plugs directly into a headphone jack in electronic equipment—TV sets, multimedia computers, cellular telephones—or in a small adapter for regular phones. As a result, HATIS funnels electronic signals straight to a user's hearing aid, avoiding the corruption of sound waves that travel through the air. Says Waldron: "It's really that simple."

[illegible] quite. The signals actually [illegible] special earpiece, shaped like a [illegible] that sits atop the user's [illegible] is a so-called induction coil [illegible] the hearing aid via an

## CONVENTIONAL HEARING DEVICE




**1** Electronic signal first gets mechanically converted into sound waves by a speaker, which often distorts the sound

**2** Sound waves travel through the air, where they are further contaminated by background noise

**3** Hearing aid amplifies this hodgepodge, boosting the volume of not only the original signal but also the extraneous noises, often rendering everything unintelligible

## HATIS DEVICE


**1** The HATIS system plugs directly into a telephone or stereo, so the original electronic signals can travel straight to the HATIS device, which sits atop the user's ear

**2** An induction coil in the HATIS earpiece is close enough to the hearing aid to transmit the signals to the hearing aid electromagnetically without amplification

**3** The hearing aid amplifies signals that never passed through the air as sound waves, and HATIS produces distortion-free sound

electromagnetic field. And since the hearing aid amplifies an electromagnetic signal, not mechanical sound waves, its volume can be increased while retaining clarity. As a result, people who have never heard an intelligible sound can listen to music and TV news.

Developing HATIS was surprisingly easy. Waldron knew what it should do, and she and Crouch were familiar enough with electronic gadgets for the deaf to noodle up a list of parts. They handed it to a local engineer in 1991. "Thirty hours later, we had our first crude prototype," says Waldron.

What gobbled up two-thirds of their time and money was convincing telephone companies and phone makers that HATIS is important. Waldron and Crouch have raised—and spent—$700,000, selling their homes, cars, jewelry, and even some furniture. "We knew it would be rough," says Waldron. "So I sat my three sons down and told them what we'd be facing." They backed her up, because they understand what it means for their mom to be trapped in a soundless world. When she had a miscarriage 10 years ago, it was her youngest son, then age four, who called 911.

Determined to retain control of their invention so they can keep its price low, Waldron and Crouch are hoping HATIS will grab some limelight at the Cellular Telecommunications Industry Association's annual meeting in New Orleans, starting Feb. 1. Since Phoenix Management can't afford splashy advertising, the partners are lobbying cellular-phone makers to help promote HATIS. If that happens, Crouch says sales could top 200,000 systems this year, up from a total of 500 to date. AT&T, Ericsson, Nokia, Oki, and Motorola are among those offering cellular models with jacks suitable for HATIS. "It's terrific technology," says CTIA President Thomas E. Wheeler. "What it means is that all people get the opportunity to take part in the wireless revolution."

Waldron was "manually deaf"—restricted to sign language and lip-reading—until she began intensive speech therapy when she was 21. "It took me 15 painful years" to amass a respectable vocabulary, she says. "Just learning to say 'ethical pharmaceutical' took four months. But we had a manually deaf kid who put on HATIS and learned to say 17 words in five minutes," she says. "His speech therapist was amazed. That's not supposed to be possible."

**"THUMBS UP."** HATIS has its skeptics. Dr. Stephen Epstein, an ear specialist in Silver Spring, Md., wants scientific tests to see whether HATIS helps profoundly deaf persons learn new words rapidly under controlled conditions. He believes HATIS will mainly benefit a small segment of the deaf population. Epstein has a moderate-to-severe impairment himself, and he found HATIS no better than a hearing-aid-compatible phone.

Still, the hard-of-hearing people who used a HATIS-outfitted cellular phone in informal tests run by Paris Howat, technical support director at Nynex Mobile Communications Co., "gave it two thumbs up," he says. Mary G. Whalen, owner of Sound Waves, a New Rochelle (N.Y.) mail-order company that sells products for the deaf, says she always had difficulty with phones until she tried HATIS.

Motorola Inc. is providing a HATIS-equipped two-way radio to Shelley Beattie, the deaf crew member of the America's yacht, now competing in the America's Cup trials. "If it works there, we think it would benefit the hard of hearing in lots of other situations," says David S. Weisz, manager of sports marketing. One might be sounding the fire alarm in office buildings.

Finally, HATIS can enable deaf people to hold down jobs as telemarketers and help-desk operators. Plantronics Inc., a leading manufacturer of telephone headsets, has already built a plug-in socket that will accommodate HATIS. Michael W. Erbe, special-projects manager, expects that many companies will snap up the system to comply with the Americans with Disabilities Act, which requires large companies to employ a certain number of disabled workers.

> Waldron and Crouch have raised–and spent–$700,000, selling their homes, cars, jewelry, and even some furniture

Waldron and Crouch started their company in 1987, after President Ronald Reagan named Waldron that year's Outstanding Disabled American, in honor of her work with United Way and other charitable organizations, plus her longtime championing of the cause of the handicapped. In 1988, she was named to the President's Committee on the Employment of People with Disabilities.

The partners have a long list of new products they want to develop, but they're short on cash. So, until HATIS catches on, Phoenix Management will probably survive on a shoestring. But Crouch, the duo's penny-pincher, is resigned to fat phone bills. "Now that Jo can use the phone, you can't shut her up," she says. Retorts Waldron: "Hey, I'm just making up for lost time."

*By Otis Port in New York*

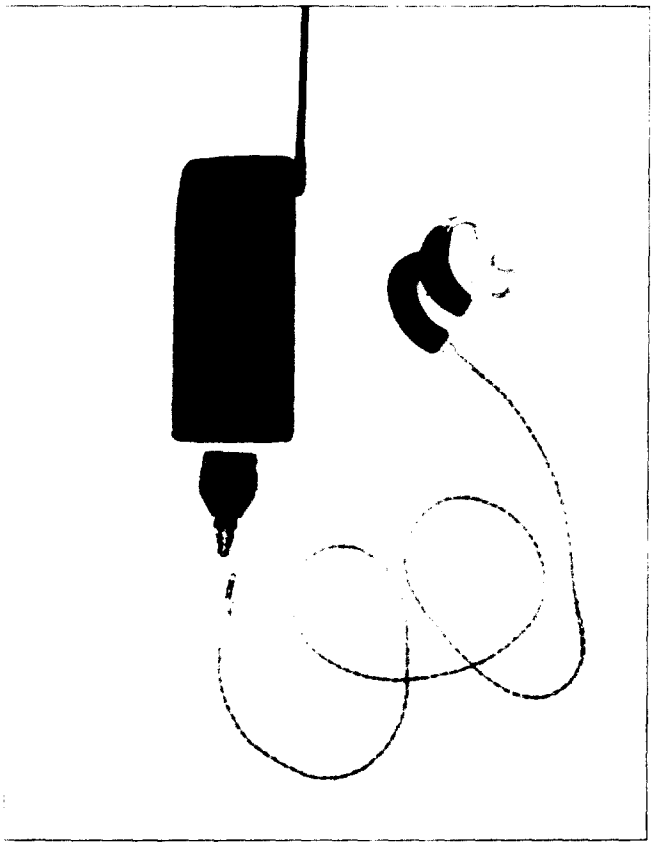
# PRODUCT REVIEW

## HATIS HEARING AID TELEPHONE INTERCONNECT SYSTEM

**By Faris Howat**

Just pick up a cellular phone or standard landline telephone, dial your party and, within seconds your call is on its way. Does this sound simple enough? Not for everyone.

There are approximately 110 million people worldwide, 30 million in the United States alone, who are hearing impaired. Sometimes we take for granted the convenience of simple things like picking up the cellular or landline phone and ordering a pizza, saying hello to family and friends, or using the phone to call police, fire or ambulance services.



You may not have been aware of the above statistics because the situation may not effect you directly. But more than likely, you know of at least one person who has impaired hearing. To some, the ability to call friends or family members and actually hear their voices is a luxury instead of a normal way of life.

Depending on the nature and severity of the impairment, many people with a hearing disability are unable to use a standard telephone without either some form of modification to the telephone set or some form of external device. Conversations with some people who are hearing impaired revealed that many of these devices do not provide enough volume amplification and that the clarity of the conversation was not up to par.

Jo Waldron, who has a 97% hearing loss and was unable to use existing phones, was frustrated by this communication gap, as were many others. So Waldron (Outstanding Disabled American for the United States, 1987) set out to do something about the problem. She and Shirley Crouch formed Phoenix Management Inc. (PMI) and teamed with inventor Jim Potter to develop the Hearing Aid Telephone Interconnect System (HATIS). PMI saw a need to help the deaf/hearing impaired community.

According to the PMI fact sheet, a telephone switch (T-switch) is all that HATIS requires of a hearing aid. The device works on inductive coupling and may be applied to both behind- and in-the-ear types of aids, as well as cochlea implants. HATIS works directly with the person's prescribed hearing aid, thus the hearing aid can amplify up to 144dB. There is no liability or risk with using HATIS, as the system does not amplify — the individual's hearing aid does. The hearing aid actually becomes the receiver. This method ensures both volume and clarity. HATIS enables people with up to 97% hearing loss to benefit from telecommunications.

Waldron sent me a HATIS system, which was compatible with the Ericsson AH97/GE model CT 400 portable cellular phone, for evaluation. The kit contains a T-coupler, cellular phone plug adapter and lightweight interconnect cord. Also included is a simple 2-page instruction sheet.

One end of the cord contains a stan-

Howat is director of technical support for NYNEX Mobile Communications, Hoppauge, NY.

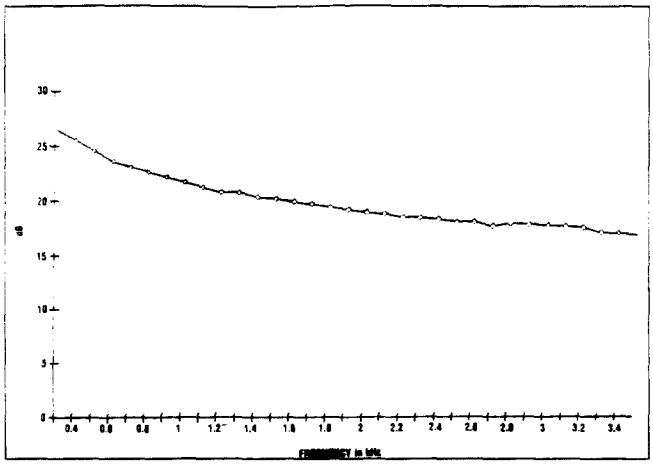


***Figure 1.*** *Coupling loss of the HATIS.*

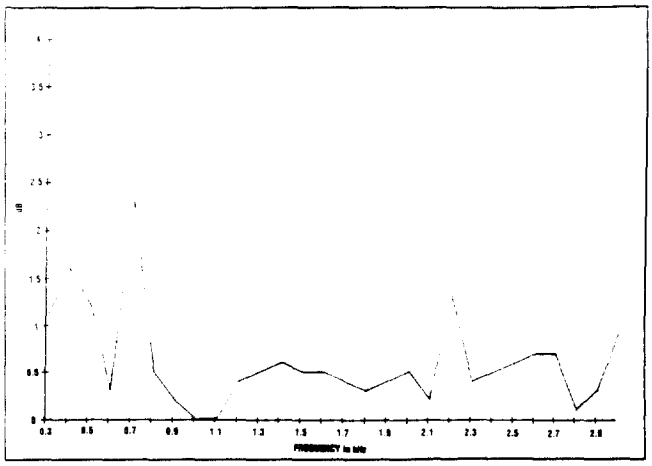


***Figure 2.*** *T-coupler audio response delta (compared to normal audio response).*

dard male 1/8-inch mono (earphone type) plug that may also be plugged into any standard radio or tape player.

I decided to give Ingrid Chopping of Ericsson GE a call to obtain a loaner Ericsson portable cellular phone to test with the HATIS. She was very familiar with the system, and was more than happy to send a cellular phone for as long as I needed the unit. Within a day or so, I received an Ericsson cellular portable. Now that's true customer focus and service.

## Installation

Installation of HATIS takes less than a minute. It's as easy as 1, 2, 3.

1. Simply insert the 2-pin plug into the receptacle on the end of the T-coupler (ear hook), then position the T-coupler behind the ear with the hook over the top of the ear to hold it in place. This is the case whether the hearing aid is a behind-the-ear or an in-the-ear type.

2. Connect the plug of the other end of the cable into the cellular phone adapter.

3. Connect the phone adapter into the cellular phone (in the case of the Ericsson, it is on the bottom of the phone).

The user then speaks into the mouthpiece of the phone, and the hearing aid becomes the receiver. The user does not put the phone's receiver to his or her ear.

## Bench test

I was curious to determine the frequency response and coupling loss of the HATIS. I placed two HATIS T-couplers together, side by side, and connected them to a Hewlett Packard 8903B audio analyzer. I connected one coupler to the audio generator port and the other to the input measurement port. Figure 1 displays the frequency spectrum from 300Hz (0.3kHz) to 3,500Hz (3.5kHz). I divided the loss measurement in half to determine the loss of a single HATIS T-coupler. As you can see, the loss is relatively flat.

I then connected a standard AMPS-compatible cellular phone with a standard direct test interface to a Hewlett Packard 8953DT and performed a receiver audio response test. This measures the received audio output level difference based against the standard 1kHz tone. I then ran a second test. This time, I connected the T-coupler via the handset receiver. The measured delta average is shown in Figure 2. Quite impressive, I'd say.

## Field test

I've had the opportunity to test and evaluate many cellular phones, antennas, gizmos and gadgets over the years. In this case, I must admit, I wasn't truly qualified to fully evaluate the HATIS product. Because I did not know an audiologist, what better evaluation process could there be than to recruit a few hearing impaired people who use standard T-switch hearing aids. After a little research, I realized it wouldn't be much of a task to find a few people for the test.

During a weekend visit to the local shopping mall, I decided to take along the Ericsson portable and the HATIS. I couldn't help but notice how many people were wearing some form of hearing aid device. By no means am I a saleperson, but I really wanted to get a wide sampling for the evaluation. Within a short time, I had the opportunity to test the HATIS unit with four people.

At first, I felt slightly awkward approaching strangers, but believe it or not, they were delighted to help. They all agreed that the clarity and comfort of the HATIS was excellent. After calling friends and family, I noticed their smiling faces. Perhaps they'll be cellular users some day.

Within the next few weeks, another three people assisted in the evaluation. Everyone mentioned that the HATIS T-coupler was comfortable and that the audio quality was very good. All of the comments I received were very positive.

Although many people were denied quality in such a simple form of communication, HATIS now allows the hearing impaired to use the same phones that are used by everyone else.

HATIS helps the hearing impaired communicate. The system provides an economical means and opens the door to a large number of new cellular users. HATIS helps reach an untapped market, and more importantly, provides a much-needed public service as well as life saving benefits of cellular to potentially millions of people.

Many thanks to Ingrid Chopping of Ericsson GE for supplying the phone. In addition, HATIS may also be used with Ericsson GE's new digital/dual-mode cellular portables.

I would also like to thank all of the people who assisted in the HATIS trial. They all gave the product two thumbs up.

HATIS meets or exceeds the criteria and mandate requirements under all three federal acts on telecommunications: the Hearing Aid Compatibility Act of 1988, the Telecommunications Act of 1982 and the Americans with Disabilities Act of 1990. HATIS is registered with the FCC, under part 68.

"One simply cannot understand the value of telecommunications, unless you can't use it," Waldron said. Need I say more?

The following cellular phones are presently adaptable to the HATIS:

Ericsson AH-97, GE CT400, Ericsson DH 198, OKI 1150 and Panasonic HH 900/HH 600. PMI is also working with Motorola, Fujitsu, Nokia, Technophone, Sony and others. In addition, HATIS is adaptable to standard landline phone sets. ■

**For Immediate Release**
**September 13, 1995**

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# Miss America Heather Whitestone Talks With First Lady Hillary Rodham Clinton Via Cellular Phone Demonstrates New Technology That Helps Hearing Impaired

*Wireless Industry Deploys New Device That Gives Hearing Impaired Access To Communications*

WASHINGTON, D.C. – In her farewell news conference, Miss America 1995 Heather Whitestone used a cellular phone to talk with First Lady Hillary Rodham Clinton at the White House to thank her and the President for their support of her efforts on behalf of people who are deaf and others with disabilities.

Whitestone, who is profoundly deaf, was able to talk with Mrs. Clinton via a cellular phone thanks to a new communications technology, the Hearing Aid Telephone Interconnect System (HATIS™).

"Recent technological innovations are enabling the hearing impaired to experience the security, personal convenience and access to emergency communications as other mobile phone users," said Elizabeth Maxfield, Senior Vice President for Industry Affairs at the Cellular Telecommunications Industry Association (CTIA). "One such device, the Hearing Aid Telephone Interconnect System (HATIS™) enables those people with up to 99 percent hearing loss to use the same communications devices that others take for granted. "

HATIS works directly with a doctor's prescribed hearing aid and plugs directly into a headphone jack in adapted wireless and other telephones, as well as other electronic equipment, such as TV sets, multimedia computers and stereos. The hearing aid literally becomes the receiver, creating a volume and clarity that enables people who have never heard an intelligible sound to hear conversations, listen to music, etc.

- more -

"Existing hearing-aid compatible phones are fine for people with a slight-to-moderate hearing loss," explained Phoenix Management Inc. President and Co-Inventor of HATIS Jo Waldron, who has a 97 percent hearing loss herself. "But most of the 30 million hearing-impaired Americans can't understand what they hear on such phones, because the background noise gets amplified as well."

HATIS plugs directly into a telephone or stereo, so the original electronic signals travel straight to a special small earpiece that rests atop the user's ear. Inside of the earpiece is an induction coil that activates the hearing aid via an electronic signal. Because the hearing aid is amplifying magnetic signals that have never passed through the air as sound waves, it produces distortion-free sound.

"Wireless telecommunications service providers and manufacturers, have renewed their commitment to ensuring that all people have access to communications wherever and whenever they want," said CTIA's Maxfield. "We intend to do this by offering such products as HATIS to consumers and by working toward making all wireless phones compatible with hearing aids."

Maxfield added that AT&T, Audiovox, Ericsson, Nokia, Nortel, Oki and Motorola already offer cellular models with jacks suitable for HATIS.

CTIA, formed in 1984, is the national organization of the wireless communications industry, both wireless carriers and manufacturers. The membership of the association has been expanded to cover all Commercial Mobile Radio Service providers, including cellular, personal communications services, enhanced specialized mobile radio, and mobile satellite services.

###

NEWS MEDIA CONTACT: Mike Houghton (202) 736-3207

***Wireless Technology:***
***Helping the Hearing Impaired***

***Building The Wireless Future™***

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# Key Points

- The wireless telecommunications industry is committed to ensuring that all people have access to communications wherever and whenever they want. This includes the more than 30 million hearing impaired Americans -- the great majority of whom are unable to use the telephone today.

- Recent technological innovations make both landline and wireless telecommunications more accessible to the hearing impaired, so now they too can experience the security, personal convenience and access to emergency communications as other mobile phone users.

- One such device, the Hearing Aid Telephone Interconnect System (HATIS™) enables those people with up to 99 percent hearing loss to use the same communications devices that others take for granted. Not only does HATIS™ allow total compatibility to communications previously denied to 11 percent of Americans, it serves as a major tool in speech therapy for the deaf.

###

**News Media Contact: Mike Houghton (202) 736-3207**

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# Questions & Answers

**What is HATIS?**

The Hearing Aid Telephone Interconnect System (HATIS™) is a device that works directly with a doctor's prescribed hearing aid and plugs directly into a headphone jack in adapted wireless and other telephones, as well as other electronic equipment, such as TV sets, multimedia computers and stereos. The hearing aid literally becomes the receiver, creating a volume and clarity that enables people who have never heard an intelligible sound to hear conversations, listen to music, etc.

**How does HATIS ™ work?**

The HATIS system plugs directly into a telephone or stereo, so the original electronic signals travel straight to a special small earpiece that rests atop the user's ear. Inside of the earpiece is an induction coil that activates the hearing aid via an electronic signal. Because the hearing aid is amplifying magnetic signals that have never passed through the air as sound waves, it produces distortion-free sound.

**How is the wireless telecommunications industry using the HATIS technology?**

AT&T, Audiovox, Ericsson, Nokia, Nortel, Oki and Motorola already offer cellular models with jacks suitable for HATIS. In addition, the wireless service providers and manufacturers have renewed their commitment to ensuring that all people have access to communications wherever and whenever they want. They intend to do this by offering such products to consumers and by working toward making all wireless phones compatible with hearing aids.

- more -

**What about reports that new digital wireless phones interfere with hearing aids?**

To varying degrees, all digital wireless technologies have the potential to interfere, as can fluorescent lights, computers, and other electronic devices. The way to eliminate such interaction always involves lowering power, increasing distance and providing shielding, or some combination of the three . In the United States, the wireless industry is already working cooperatively with hearing aid manufacturers to ensure that all Americans enjoy the benefits of both wireless phones and hearing aids. People with hearing aids that have a t-coil/switch will be able to use interconnect systems, like HATIS, to gain compatible access to analog and digital cellular phones.

**Is there any research being done to resolve any interaction problems?**

In 1994, the wireless industry supported the establishment of an independent laboratory, the *Center for the Study of Wireless Electromagnetic Compatibility* at the University of Oklahoma. The Center is conducting a program of research and development with the manufacturers and users of these devices, and has access to a multi-million dollar electromagnetic testing facility -- the finest in the world.

**Does CTIA endorse the HATIS device?**

CTIA does not endorse specific products or services. However, CTIA supports the technological advances made by companies like HATIS' manufacturer, Phoenix Management Inc.(PMI). This company was formed by Shirley Crouch and the 1987 Disabled American for the Nation Jo Waldron, who is a member of the President's Committee on the Employment of People with Disabilities. Their efforts certainly help provide the opportunity for all people to take part in the wireless revolution.

###

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# Background

- More than 30 million hearing impaired Americans (according to the 1991 U.S. Census) are unable to use the standard telephone. Use of the amplified handsets found on some public phones can not be used by many of these hearing-impaired individuals.

- The HATIS system will enable individuals with up to a 99 percent hearing loss, through their hearing aids, to directly benefit from telecommunications. Most for the very first time. Hearing aids with HATIS devices can increase the hearing volume up to 133 decibels, compared with the 18 to 32 decibel increase with amplified phones.

- The Telecommunications for the Disabled Act of 1982 requires that if a hearing-impaired individual needs to make an emergency phone call, and his or her place of business or government facility does not have an accessible telecommunications system, the violation results in a $10,000 a day fine, up to $75,000, and the requirement for corrective impact.

- The Hearing Aid Compatibility Act of 1988 required all employers with more than 25 employees to make their telecommunications systems hearing aid compatible by May 1, 1993. However, the FCC waived enforcement of this Act because hearing aid compatible phones only worked for those individuals with slight or mild hearing loss. With conventional hearing devices, the electronic signal of a phone is converted into sound waves by a speaker, which often distorts the sound. The sound waves travel through the air, picking up background noise, on its way to the hearing aid, where it is amplified. This system not only boosts the original signal but also the extraneous noises, often making the conversation unintelligible.

- In addition to provisions prohibiting discrimination in the workplace of individuals with disabilities, The Americans with Disabilities Act of 1990 (ADA), requires that all public facilities, private, state or Federal be communicatively accessible.

- Wireless telecommunications offers an economical way to meet these requirements. By making wireless phones accessible to systems like HATIS, the hearing disabled can communicate wherever and whenever they want.

###

**News Media Contact: Mike Houghton (202) 736-3207**

RM-8658

Attachment A

DOCUMENT OFF-LINE

This page has been substituted for one of the following:

o An oversize page or document (such as a map) which was too large to be scanned into the RIPS system.

✓ o Microfilm, microform, certain photographs or videotape.

o Other materials which, for one reason or another, could not be scanned into the RIPS system.

The actual document, page(s) or materials may be reviewed by contacting an Information Technician. Please note the applicable docket or rulemaking number, document type and any other relevant information about the document in order to ensure speedy retrieval by the Information Technician.