



# WORLD

Technology News and Commentary for Deaf and Hard of Hearing People



## Captioning for the Big Leagues!

*Story begins on pg 10*

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*See page 14*

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*See page 16*



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## TDI'S MISSION

**"TDI provides leadership in achieving equal access to telecommunications, media, and information technologies for deaf and hard of hearing people."**

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## Board Views



BY DR. ROY MILLER  
*TDI President*

**Universal TV  
captioning! What  
a wonderful dream  
that was, but when  
I awoke I realized  
that it was  
only a dream.**

## Let's Go From Dream to Reality

**T**he other night I had a dream about how wonderful life would be for deaf and hard of hearing people if we had "universal captioning" on television. In my dream, all programs were captioned. All commercials were captioned. There were no exceptions and no exemptions. The hours from 2:00 to 6:00 AM were just like the hours from 2:00 to 6:00 PM. It did not matter if the network broadcasting the program was old or new. Use of the electronic newsroom (ENR) technology for generating captions from scripted teleprompts during local news broadcasts was no longer acceptable. In effect, if there was a single word spoken on TV, then it was accompanied by a textual display of it so that people with hearing loss could understand what was said.

Universal TV captioning! What a wonderful dream that was, but when I awoke I realized that it was only a dream. But after wiping the sleep from my eyes, brushing my teeth, and guzzling my regular morning glass of orange juice, I began to think seriously that the time had come to transform that dream into a reality. So I asked myself, "Why don't we have universal captioning? What are the arguments that are stopping that from happening?"

The loudest argument, of course, is that it would be too expensive. I have a very hard time accepting that argument any more in view of a few facts. First, the cost of producing an hour-long show for television depends upon many factors, such as the number of characters in the cast, the salary level of the actors, the nature of the shooting locations, and so forth. But the cost generally runs somewhere between the low hundreds of thousands (minimum of about \$500,000 to produce a pilot for a drama series) to the \$13 Million per episode NBC paid Warner Bros. to

produce the hit show ER. The network average is around \$1.5 to \$2 million per episode for a television series. Given that the cost of post-production offline captioning runs about \$7-\$15 per minute, there is little, if any, basis to the economic argument. If companies can afford to produce shows for television costing an average of \$1.5 to \$2 million per episode they can certainly afford to caption them for a total cost of around \$1,000.

But some might argue that the economic argument makes sense when looking at commercials. My response to that is "bull-feathers." According to the "Production Cost Survey: Report of 2004 Findings" published by the American Association of Advertising Agencies (November 2, 2005) the average 30-second TV commercial in 2004 cost \$372,000. And the cost of captioning a 30-second video has to be a mere pittance. Once again the economic argument makes no sense.

The next argument frequently heard is that we simply don't have enough caption writers to caption everything on television. The National Court Reporters Association (NCRA) estimates that in 2004 broadcast captioners earned \$45,000-\$75,000 and CART writers earned \$35,000-\$65,000. The Bureau of Labor Statistics of the U.S. Department of Labor indicates that "Wage and salary court reporters had median annual earnings of \$45,610 in May 2006." Those salary figures are certainly more than adequate to attract people to that profession. And if there aren't enough then certainly government could stimulate the growth of that industry by infusing millions of dollars in training grants. If the federal government can give billions to bail out the banking industry with millions going to bonuses for their top officers,

## BOARD VIEWS Continued from page 2

then it can certainly provide millions to stimulate an industry that provides a critical service to over 37 million Americans with hearing loss.

Furthermore, today we have an additional captioning tool that we did not have available several years ago, namely, voice writing. With voice writing a person speaks into a voice mask or isolated microphone and their voice is translated into text by a computer using Automatic Speech Recognition (ASR) software. Voice writers can be trained rather quickly and certainly could provide adequate captioning services for programs with little spoken dialogue or programs involving primarily simple language and grammatical structures. So any shortage of trained steno writers can be quickly made up with voice writers.

The next argument often heard is an argument about the geographical distribution of captioning resources. In particular, it is often argued that eliminating the use of ENR technology for captioning local news broadcasts and requiring real-time captioning would be impossible because caption writers are clustered in big cities, and there are few if any available to serve TV stations in small and medium sized towns. While that argument once made sense, it no longer has any validity. With the development of remote captioning, it doesn't matter where a caption writer is physically located. Rather, the writer can be located anywhere so long as they have an internet connection and a phone line available and the TV station broadcasting the local news that the writer is captioning has the same things available. So the geographical distribution of caption writers is now a moot issue.

While the arguments for limiting

captioning on TV no longer have any merit, the reasons for moving to "Universal" TV captioning are many and persuasive. First and foremost, universal captioning would erase the stigma of "second class" citizenship that currently is attached to all people who cannot hear and understand spoken English. As a deaf person I get figuratively "slapped in the face" every night when I watch the local news on television. I do not live in one of the "Top 25" market areas so I (and about 50% of the U.S. population) must accept use of the Electronic Newsroom technology (ENR) by my local television station. And with ENR I get no captions for the weather segment of the news, the sports segment, all anchor to anchor impromptu dialog, and all remote (off site) coverage of news stories. So every night I am told effectively "you are not important enough to know what the weatherman is saying" and "you don't need to know where the murder occurred in the 'breaking news' story, only hearing people need that information." In essence, you are a "second class" citizen and are not worthy of being completely informed. Only hearing people deserve that! Needless to say, use of ENR is an affront to the goals of the Americans with Disabilities Act (ADA), and needs eliminated.

Then there is the "arbitrary" nature of the "Top 25" rule. Why is it not the "Top 35" marketplaces that have to real-time caption the local news programs? Why not the "Top 50?" This rule that allows use of ENR based upon where one lives says in effect that a deaf person living in rural Nebraska is less worthy than a deaf person living in New York City. And that is a bunch of poppycock, and creates social classes among deaf and hard of hearing

people.

Another way that social classes are created among people with hearing loss is by means of the 2:00 AM to 6:00 AM exemption. This says in effect that a deaf person who works second shift on the assembly line at a John Deere plant making tractors and wants to relax watching television for a couple of hours after he gets home from a hard night's labor is less entitled to TV access than a deaf person who works either the first shift or the third shift and wants to relax watching TV after she gets home. The arbitrary nature of this distinction is again obvious and indefensible.

Currently only a very few TV commercials are captioned. Of course it makes no sense to suggest that people with hearing loss are entitled to know what the person selling Tide detergent is saying in a captioned commercial but are somehow less capable of understanding the sales pitch concerning why Cheer is the best laundry detergent in the world (and thus that commercial is not captioned). Companies spend millions of dollars every year advertising their products on television because they firmly believe that consumer behavior in the marketplace is really affected by television commercials. And if that is the case, they stand to gain immensely by requiring universal captioning of all television commercials.

Currently most television ads produced by political candidates are not required to be captioned, and thus are not captioned. This is another "slap in the face" for deaf and hard of hearing people. Given that television ads are the primary source of information about political candidates for the vast

## Capitol Commentary



BY CLAUDE STOUT  
*TDI Executive Director*

**All together,  
experts estimate  
that captioning  
benefits nearly  
everyone.**

## Can't Provide Captioning? You Cannot Afford Not to Caption!

**I**n these uncertain economic times, many people are looking to stretch their dollars and analyzing every penny they spend. From Wall Street to the nation's heartland, we have witnessed many large corporations fold and thousands of people lose their jobs. This downturn has affected non-profits like TDI as well.

In previous down times, captioning was one of the first casualties of a recession. In the old days, captioning was a charitable act. Non-profits were doing the captioning with funds donated from individuals and corporations. When they stopped giving, captioning was in danger of diminishing.

However, although the economy may be down today, captioning is stronger than ever. Not only do more people benefit from captioning, but also the demand is there. In the year 2000, 28 million people had a hearing loss of some degree. Now it has grown to 37 million people. Add to that number the growing ranks of baby boomers who are beginning to lose their hearing, and top it off with the bulging ranks of immigrants seeking to learn English as they aspire toward a new life in America. In addition, there are specific environmental situations where captioning can benefit those watching television, such as in noisy bars or quiet hospital rooms. Captioning is allows you to watch television even when others want a moment of silence. All together, experts estimate that captioning benefits nearly everyone.

If an advertiser spends just a few dollars more, about \$7-\$15 per minute of video, to add captions to their TV ad, their potential viewing

audience increases by more than 10 percent. True, like many other video post-production expenses, a variety of factors such as format, turnaround time, length of video and long-term commitments can influence the price one pays for captioning. But if you do not caption, the cost in lost viewership is much higher.

Hollywood knows that captioning draws more viewers to watch movies. Virtually all DVDs by major studios are captioned. Now, if B-movie producers can follow their lead, they can easily recoup their captioning investment through more DVD sales and a larger market share.

Advertisers that do not caption commercials lose a significant market share as viewers abandon them for wiser competitors whose audience is more inclusive. If a yellow laundry detergent company captions its commercials but not the blue laundry soap factory, consumers with hearing loss will naturally look into and likely buy something that they are able to understand, and ignore products from companies that do not recognize the value of captioning.

Educators know and understand the literacy value of captioning. When words appear on the screen simultaneously with the spoken dialogue, the dual audio/visual information reinforces each other.

Employers gain increased productivity when they show training and safety videos with captioning. By presenting the same information both audibly and visually, workers remember and retain the information better than if no captions were used.

*Continued on page 6*

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## CAPITOL COMMENTARY Continued from page 4

The benefits of captioning are long lasting. This post-production feature has another use that many of us do not realize. Future advocates will be able to research and “google” a certain keyword on the Internet such as “access”. Among the zillion results that pop up, most likely at the top would be a list of videos containing some form of the word “access” in the captioning data stream as a key topic of dialogue.

There are many more examples that illustrate why captioning makes better business sense. Cutting corners to “save” money can cause a bad effect when people are not able to comprehend the same information that others get. Captioning is more than just providing access; it’s the right thing to do.

## BOARD VIEWS Continued from page 3

majority of Americans, not captioning political ads in effect allows many millions of American citizens to be “less or ill informed” when they enter the ballot booth. This again makes persons with hearing loss who are dependent on captions “second class” citizens, and that is an unacceptable affront to the principles of “democracy.”

And to top it all off there is the “it’s about time” argument. We all know that it takes some time for the ethical principles embodied in a new law to be disseminated to and accepted by the general populace. Certainly the “Thou shalt not discriminate against people with disabilities” commandment of the Americans with Disabilities Act of 1990 (ADA) is no exception. It has been nearly two decades since the ADA was signed into law, but television producers, distributors and broadcasters, as well as the FCC, still

act as if it were OK to discriminate against deaf and hard of hearing people by not providing captions for much that appears on our TV screens. Certainly people with hearing loss have been patient long enough, and it is way past time that the ethical maxim of the ADA is fully implemented through “universal captioning.”

The bottom line is simple. There are no longer any good arguments for continuing to allow any exemptions or waivers concerning TV captioning. Rather there are many reasons to eliminate the rules that create “second class” citizens out of deaf and hard of hearing people. It is time to change the rules and require “universal” television captioning, that is captioning of every word spoken on TV, with absolutely no waivers and no exemptions. It is time to “go from dream to reality.” FCC, are you listening?

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## Accessible Tech



BY JAMES HOUSE  
TDI World Editor

**Universal captioning? Is it here, or is it a myth? Do you think it is possible for us to have captions everywhere?**

## Universal Captioning? When?

**S**ome days it seems that everywhere you go something is always captioned. Nevertheless, it may also seem that for some reason you are not seeing captions. Some bars show captions on their TV sets all the time, while others do not unless you ask. As I travel, most public service announcements are not captioned, and thus leave me behind. Universal captioning? Is it here, or is it a myth? Do you think it is possible for us to have captions everywhere?

First, we had silent movies. In order for patrons to understand the movie, it had to have sub-titles throughout the movie. Films had no spoken dialogue – you could only hear the piano that set the mood during some movies. When the first “talking” movie, “The Jazz Singer,” premiered in 1927 sub-titles disappeared, and deaf people were literally “left in the dark.” Today, very few movie theaters show open captioned or Rear Window movies, so few that the number of captioned screens is less than 1% of all screens nationwide. It is almost as if captioned films were just a tiny drop of butter in a big bucket of popcorn. The cinema industry is putting all of their hopes on some day in the future when movies will come encrypted via satellite delivery systems and decoded for every audience. We will have to wait and see if we can actually get captions on demand in theaters. If we can do it at home on our DVDs, why can’t the theaters?

Many years after silent films disappeared, television came into our homes. In the early years, TV programs were just like movies at that time – lots of noise but no captions. During the 1970’s many of us began to see the future by staying up half the night waiting for The Caption Center at WGBH to insert open captions in the ABC Evening News with Frank Reynolds and Matt Robinson. The

1980’s brought closed captioning and now it is almost everywhere on television. Today’s transition to digital television promised spectacular captions with consumer control over color, font size and location on the screen. But many of us have encountered glitches almost from the moment the new digital sets were brought home, and we still see digital versions of analog captions – white letters on a black background. Where is the advancement this time?

Home videos allowed us to watch movies on TV in our pajamas and slippers without the expense of going to a neighborhood theater. DVDs became popular for many reasons, including the fact that we no longer had to rewind our VHS tapes. Movie buffs were thrilled to be able to watch interviews and laugh at the outtakes and bloopers rescued from the cutting room floor – only if they were captioned or subtitled along with the main feature. As DVDs started adopting the crisp high-resolution Blu-Ray standard, the captioning technology took a step backwards and became “Subtitles for the Hearing-Impaired” (SDHI). SDHI is actually subtitles with captioning rules that include off screen sounds in addition to the dialogue. This is a disappointing development because out of the many strands of wire inside the HDMI cable, touted as the “best” way to experience high quality digital television, not one strand was designated to carry closed captioning. Unless the captions were decoded on a set-top box or DVD/Blu-Ray player, the HDMI cable cannot transmit the hidden closed-captioned data to be decoded on your television set, but will carry open captions.

We may as well call the year 2009 “The Year of Online Captioning.” To the delight of deaf, hard of hearing

## ACCESSIBLE TECH Continued from page 8

and other disability advocates everywhere, during the recent election year candidates for various state and national offices took advantage of online captioning in addition to captioning on TV. Since 1995, when “Live! With Derek McGinty” was captioned online, numerous online captioning experiments have been tried. Just within the past year, the amount of captioned content has jumped tremendously, along with captioned prime-time programs on television networks’ websites and the availability of do-it-yourself captioning tools on popular video sites such as YouTube.com.

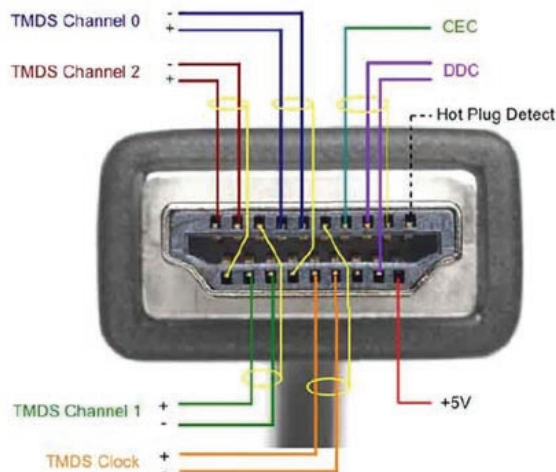
Live events are beginning to become accessible. For years, some indoor activities were captioned such as plays and operas. Due to improved and robust display technology, outdoor events are becoming more accessible. Jumbo screens are able to display

video content much more clearly night and day. Through advocacy, either the easy way (collaboration) or the hard way (lawsuits), many sports venues are becoming accessible to deaf and hard of hearing fans throughout the country.

There is a lot more work remaining. There are no final frontiers in captioning. We may have thought that we achieved a milestone with the introduction of digital captions like we did with closed captioning on analog television. But our glee was short-lived once we realized that current laws didn’t really apply to the Internet protocol and that new technology had thrown in a few monkey wrenches, such as the forgotten link in the HDMI cables. (See graphic below.) New video playing devices like portable DVD players and video iPods are coming out on the market, and they do not support captioning like we receive on television.

As you can see, there is no “universal captioning” yet today. That is why TDI is pushing for new legislation, “The 21<sup>st</sup> Century Communications and Video Accessibility Act” or H.R. 3101. Part of this bill focuses on video programming access, which requires decoder circuitry in all video programming (display) devices, including PDAs, computers, iPods, cell phones, DVD players, TiVo devices and battery-operated TVs. This bill also extends closed captioning obligations to television-type video programming distributed over the Internet, and would make using a remote easier for viewers who are blind or have low vision. Please contact your Congressional representative and ask him or her to support this bill today. Also, ask your Senator to support such a similar bill when it reaches their floor. Contact them as if our accessible future depends on it, because believe me, it does.

## The Anatomy of an HDMI Cable



*There are nineteen pins in an HDMI connector, as seen in the illustration:*

- Pins 1 through 9 carry the three TMDS data channels (Transition Minimized Differential Signaling – the technology that allows DVI and HDMI to send high-speed digital data), three pins per channel. TMDS data includes both video and audio information, and each channel has three separate lines for + values, - values, and a ground or data shield.
- Pins 10 through 12 carry data for the TMDS clock channel, which helps keep the signals in synchronization. As with the TMDS data channels, there are separate lines for + values, - values, and a data shield.
- Pin 13 carries the CEC (Consumer Electronics Control) channel, used for sending command and control data between connected devices.
- Pin 14 is reserved for future use. *(TDI Editor's note: How about transmitting captioning data through here?)*
- Pins 15 and 16 are dedicated to the DDC (Display Data Channel), used for communicating EDID (Extended Display Identification Channel) information between devices.
- Pin 17 is a data shield for the CEC and DDC channels.
- Pin 18 carries a low-voltage (+5V) power supply.
- Pin 19 is the Hot Plug Detect, dedicated to monitoring power up/down and plug/unplug events.

*from <http://www.hdmi.org/installers/insidehdmiacable.aspx>*





Jennifer captioning a live game from a booth behind home plate at the new Yankee Stadium

# Captioning for the Big Leagues

BY JENNIFER M. BONFILIO, RMR-CBC-CCP

**I** became a captioner for deaf and hard of hearing quite by accident. I was a court reporter for 16 years and enjoyed the freedom it offered me. I made a good living, and it enabled me to travel all over my home state of New Jersey as well as the country and even abroad a couple of times.

But then I got bored. I heard a young deaf man speak at a convention about CART in the classroom. CART stands for Communication Access Realtime Translation. A CART provider captures the spoken word via a stenograph machine, which is connected to a computer loaded with specialized software that translates the steno into English instantaneously. I decided that was what I wanted to do. It would take me a few years to break into CART, but finally, one day, an email landed in my inbox. A young deaf woman was seeking a CART provider for the fall semester at Princeton University. I jumped at the chance and landed the job. I provided CART for her for four years. As graduation neared, I wondered what I would do next. I loved providing CART but did not know where to find others who required my services. I decided to train to become a broadcast captioner to supplement my income

until I could build my CART business.

I moved to Pittsburgh and trained at one of the largest captioning companies in the country. I began captioning television programming such as "World News Tonight with Peter Jennings," CNN "Headline News," and "Jenny Jones." I loved it. All of a sudden, CART took a back seat to my new career. Eventually, I moved back to New Jersey and set up a captioning studio in my home, where I captioned for the next eight years – from local news to entertainment shows to sports. Working from home was awesome. Again, I made a good living and really enjoyed my work. The greatest satisfaction for me in doing this type of work is knowing I am providing people with hearing loss access to live television programming they otherwise would not have access to, but I missed the interaction with

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Continued from page 10

my end users. I began providing CART again last year for a number of clients, while continuing to cover my broadcast assignments.

One day last year while attending a convention, I was chatting with a colleague who was captioning on-site for an NFL football team. I was fascinated. I decided I would do that one day. Almost a year would pass, as I researched the opportunities of sports stadium captioning, before my dream job would become a reality. Again, through the wonders of email, I received an email that had been forwarded a few times to numerous people. The bottom line – the New York Yankees were seeking an on-site captioner for the upcoming season. Although I had contemplated the idea for nearly a year – and came up with reason after reason why it would not be a good idea, namely 72 reasons, the number of miles from my home to the Bronx – I was not going to let this

opportunity pass me by. I contacted the Yankees, submitted a bid proposal, and got the job.

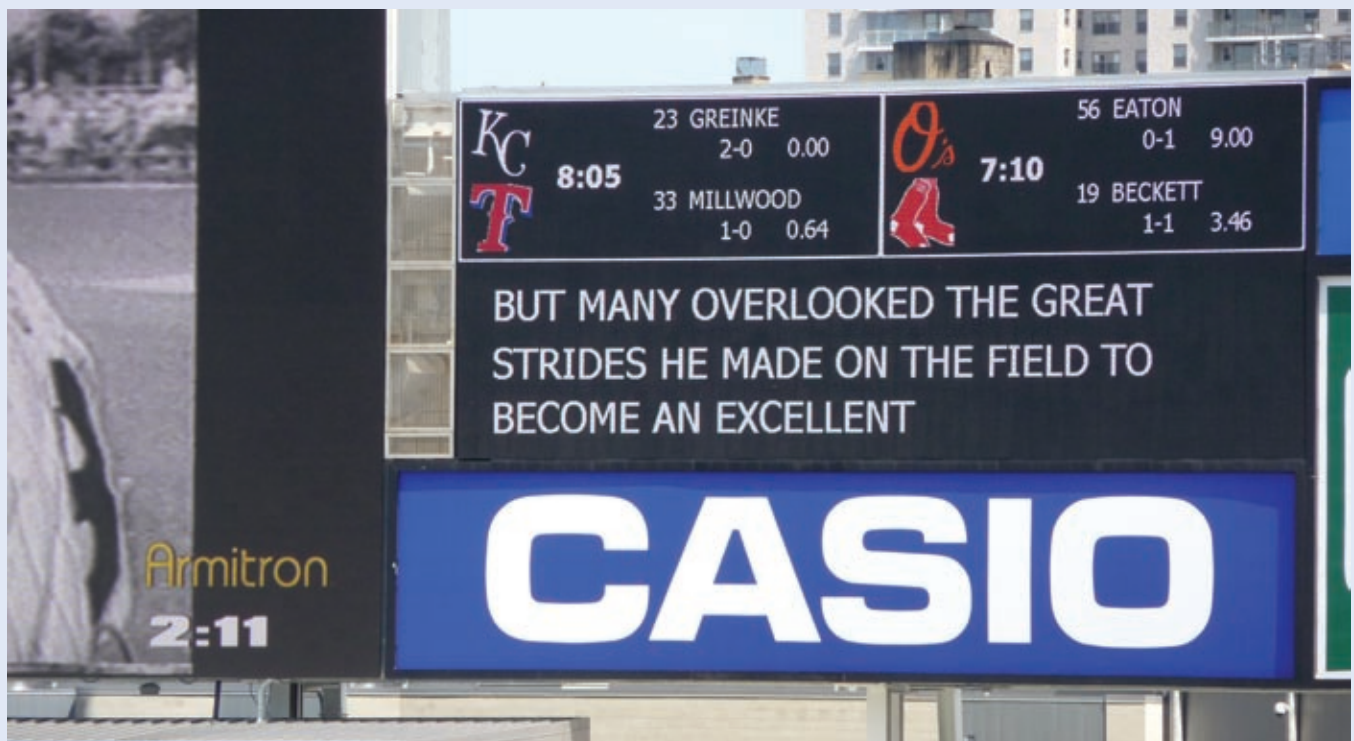
The adjustment of working from home to commuting nearly 150 miles a day has been challenging. The long hours at the stadium has left me exhausted. But it is well worth it. It is truly a dream job, the challenge and content of sports captioning coupled with the exhilaration and satisfaction of “performing” live in front of 50,000 people has rekindled a spark within me. On top of it all, I was honored to be a part of the Yankees’ goal of making the stadium completely accessible to all people with disabilities. My hope is all stadiums and arenas across the country will follow suit and come to the same realization the New York Yankees did – it is simply the right thing to do. Fans should contact their local stadiums and arenas and inquire whether captioning is available. If it is, be sure

to express your appreciation for their efforts and, if not, request that it be made available.

On April 2, 2009, The New York Yankees alongside the Department of Justice held a press conference to unveil the new stadium’s accessibility for people with disabilities. The full press release can be viewed at:

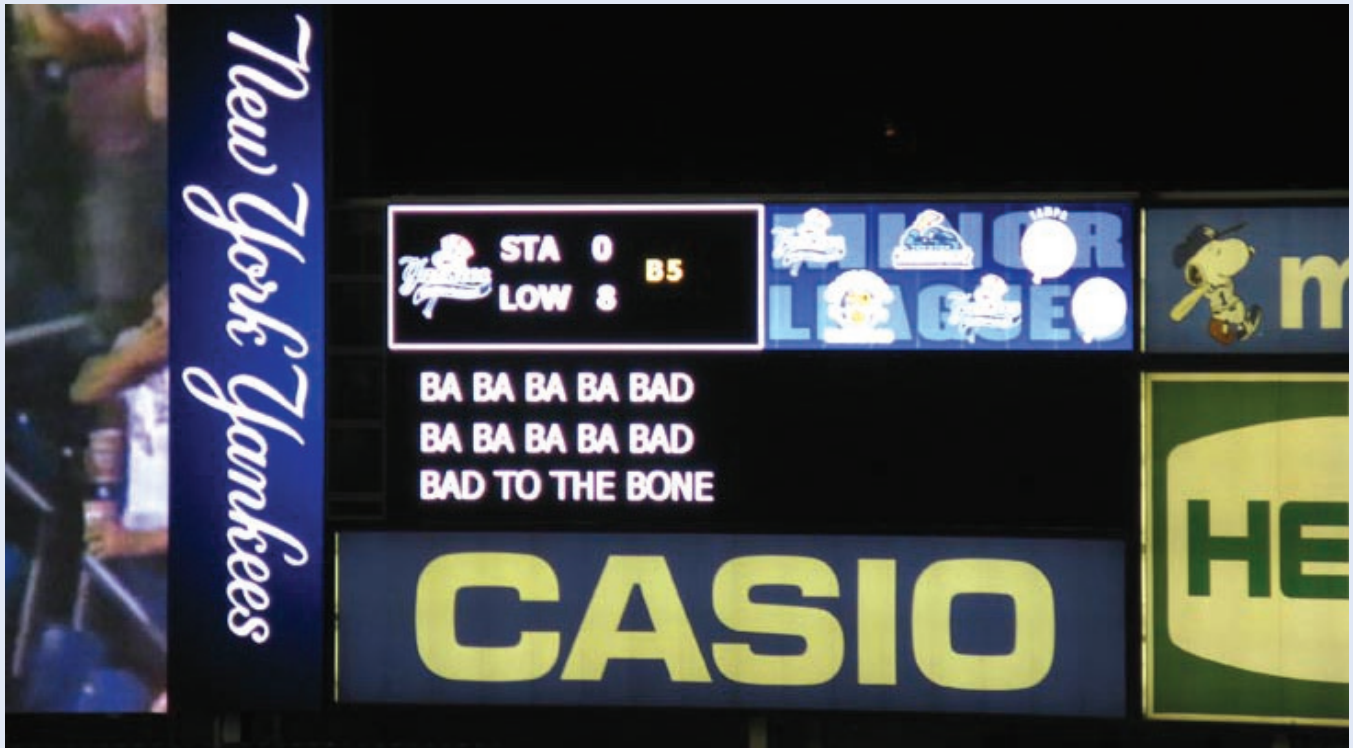
[http://newyork.yankees.mlb.com/news/press\\_releases/press\\_release.jsp?ymd=20090414&content\\_id=4266540&vkey=pr\\_nyy&fext=.jsp&c\\_id=nyy](http://newyork.yankees.mlb.com/news/press_releases/press_release.jsp?ymd=20090414&content_id=4266540&vkey=pr_nyy&fext=.jsp&c_id=nyy)

On game day, I arrive at the stadium five hours before game time. Yankee Stadium opens its doors three hours before game time and begins running announcements and video clips shortly after the gates open up until the first pitch. This gives me about two hours to prepare for the day. I am positioned in a booth behind home plate which I share with the P.A. announcer and one



Jennifer's captions on the Daktronics board adjacent to the video board in center field on Opening Day, April 16, 2009





Song lyrics for “Bad to the Bone” are displayed along with the commentary as captions during Opening Day at the new Yankee Stadium in New York City.

other person. When the game is in play, I usually do not have to caption anything. All player introductions are accompanied by video graphics. All of my captioning takes place between innings and in the middle of each inning as the teams change sides. I caption pre-taped video clips, live music, audience participation spots, reports from within stadium restaurants and concession areas. Baseball can be unpredictable with rain delays and extra innings, but I will be there until the last out is made to caption the traditional closing music – what else? – Frank Sinatra’s “New York, New York,” which runs on a loop until the stadium is cleared out.

The New York Post ran an article in the April 19, 2009, issue referencing the captions as they related to the booing of a former Yankee, Carl Pavano, who now plays for the Cleveland Indians.

To view the article and accompanying picture of the captions, go to the following link:

[http://www.nypost.com/seven/04192009/news/regionalnews/even\\_deaf\\_hear\\_this\\_bronx\\_cheer\\_165122.htm](http://www.nypost.com/seven/04192009/news/regionalnews/even_deaf_hear_this_bronx_cheer_165122.htm)

*Jennifer M. Bonfilio, RMR-CBC-CCP, is the president of NJCaptions, located in Hamilton Twp., NJ, and can be reached via email at [jen@njcaptions.com](mailto:jen@njcaptions.com). For more information on services offered by NJCaptions, visit its web site at [www.njcaptions.com](http://www.njcaptions.com).*

*For additional information about accessibility at Yankee Stadium or if you have any questions or comments, please contact Yankees Disabled Services at 718-579-4510 (voice) or 718-579-4595 (TTY). Fans can also email [disabledservices@yankees.com](mailto:disabledservices@yankees.com).*

The greatest satisfaction in doing this type of work is knowing I am providing people with hearing loss access to live television programming they otherwise would not have.

## Realtime Captioning Free to Fans, Patrons

**C**aption Colorado, LLC offers live captioning at arenas, event centers and stadiums around the nation. This revolutionary service offers deaf and hard-of-hearing people full communication access in event centers, by delivering realtime captioning of everything said on the Public Address (PA) system to a hand-held device (pager), *Blackberry, Smartphone or any other (Windows enabled device) and/or jumbotron.* Caption Colorado, LLC is also dedicated to making all event centers fully accessible for deaf and hard-of-hearing attendees, by providing stadiums with phones for patrons to borrow, in case a fan may not have their own personal device. Deaf and hard-of-hearing attendees will also have **complete access** to everything being said on the PA system from anywhere in the stadium, including all emergency announcements, thus ensuring the safety and enjoyment of all patrons!

This service is powered by mobileCAP™, Caption Colorado's proprietary MobileCAP technology that offers visitors even greater accessibility and convenience than ever before! The service is free to patrons and fans can order tickets anywhere in the venue with full communication access.

### How It Works

It begins with a captioner, who is listening to a live event at the same time as the



mobileCAP user. The captioner writes the audio portion (everything they hear) of the event using captioning technology. This technology and the skills and training of the captioner allows them to reach speeds of up to 250 words per minute. This is the same technology that is used for captioning live TV. Using Caption Colorado's advanced technology, the captioned text produced by the captioner is streamed to the mobileCAP system allowing the text of the event to be displayed on a handheld mobile device and/or jumbotron.

### Ordering the Service

A deaf or hard-of-hearing fan can contact their local venue to request the service. If a patron needs a device the venue will give them a device with an event ID to sign in and the fan will receive live streaming of the game plus pre and post game announcements. If a patron has their own device they can go

to [www.mobilecap.net](http://www.mobilecap.net) to download the application and get the event number from the venue.

- Caption Colorado now offers realtime captioning at the following stadiums and event centers:
- Heinz Field (Pittsburgh Steelers) [LittleC@STEELERS.NFL.com](mailto:LittleC@STEELERS.NFL.com)
- Bank of America (Charlotte Panthers) [pauls@panthers.nfl.com](mailto:pauls@panthers.nfl.com)
- Pepsi Center (Denver) [guestrelations@pepsicenter.com](mailto:guestrelations@pepsicenter.com)
- Invesco Field at Mile Hi (Denver Broncos) [guestservices@broncos.nfl.com](mailto:guestservices@broncos.nfl.com)
- Lincoln Field Financial (Philadelphia Eagles) [contact@lincolnfinancialfield.com](mailto:contact@lincolnfinancialfield.com)
- M&T Bank Stadium (Baltimore Ravens) [contactus@ravens.nfl.net](mailto:contactus@ravens.nfl.net)

Please go to: [www.captioncolorado.com/eventcenters](http://www.captioncolorado.com/eventcenters) for a video description of the service. You will find how to contact your local event center at the end of this video or email us at [mobilecap@captioncolorado.com](mailto:mobilecap@captioncolorado.com)

**Deaf and hard-of-hearing attendees  
will have complete access to everything being  
said on the PA system anywhere in the stadium**





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### For Sprint VRS:

- Go to [www.sprintvrs.com](http://www.sprintvrs.com)
- View instructions online:  
[www.sprintrelaynews.com/callnow/sprintvrs/](http://www.sprintrelaynews.com/callnow/sprintvrs/)

### For Sprint Relay IP and IM:

- Go to [www.mysprintrelay.com](http://www.mysprintrelay.com)
- View instructions online:  
[www.sprintrelaynews.com/callnow/sprintip/](http://www.sprintrelaynews.com/callnow/sprintip/)

For more information on Sprint Relay  
Call Now 10-Digit Local Numbers,  
go to [www.sprintrelay.com/callnow](http://www.sprintrelay.com/callnow)

Although Sprint IP, Sprint IP using AIM, Sprint VRS, Sprint WebCapTel, Fed IP, and Fed VRS can be used for emergency calling, such emergency calling may not function the same as traditional 911/ E911 services. By using Sprint IP, Sprint IP using AIM, Sprint VRS, Sprint WebCapTel, Fed IP, and Fed VRS for emergency calling you agree that Sprint including Sprints suppliers of emergency services are not responsible for any damages resulting from errors, defects, malfunctions, interruptions or failures in accessing or attempting to access emergency services through Sprint IP, Sprint IP using AIM, Sprint VRS, Sprint WebCapTel, Fed IP, and Fed VRS whether caused by the negligence of Sprint or otherwise. ©2009 Sprint. Sprint and the logo are trademarks of Sprint. Other marks are the property of their respective owners.

# Sports Stadium Captioning Has Gone Real-Time with Intelligent Access™

## Wireless Personal Captioning System

Intelligent Access™ is Landmarc's wireless personal captioning system. This mobile system integrates smartphones, electronic eyewear, and WiFi connectivity to bring captions and multiple languages to people at a variety of venues.

This project was funded by the National Institute on Disability and Rehabilitation Research through the Wireless Rehabilitation Engineering Research Center.



The Intelligent Access™ system follows the “one device, many venues” design philosophy.

## One Device, Many Venues

The Intelligent Access™ system follows the “one device, many venues” design philosophy.

This approach benefits both the caption end user and the location providing the service. The end-user can receive captions from any Intelligent Access installation on his or her own compatible mobile device, with a software application download.

The current client system utilizes WiFi technology to deliver personal captions to an individual on an iPod Touch, iPhone, or Windows mobile system. The user has the choice of viewing the captions on the handheld screen or optional electronic eyewear.

The current server system has a simple user interface that allows the venue or presenter to select from one of three input choices: pre-recorded text, input from speech recognition software, and input that is typed in real time with CART (Computer-Assisted Real-time Translation) or a computer keyboard.

Intelligent Access™ mobile captioning system provides real-time captions to deaf and hard of hearing patrons in a variety of venues, such as sports stadiums, movie theaters or classrooms, or anywhere there are large group settings. Using the venue's existing WiFi network patrons receive captioned text of the event on their personal Windows Mobile smartphone/PDA, iPod Touch, or iPhone. Plans are to make devices running other OS's compatible with the system. Below are some of the Stadium System features:

- Captioning is generated in real-time through CART (Communication Access Real-Time Translation)

captioning or typed from keyboard, or any other external serial or network source.

- Song lyrics can be stored and easily selected line-by-line from files to send on demand.
- Text is simultaneously sent to PDAs and other sources such as big stadium screen, or sideline screen.
- Multiple languages can be sent simultaneously.
- Emergency Mode notifies patrons by a custom message in red text that the following message is an emergency notification. The patron is also notified when the emergency is past.
- Captions appear in a scrolling fashion.
- The system has been tested in various baseball and football stadiums.

## Stadiums and Other Sports Venues

Intelligent Access™ enhances the sporting experience by transmitting color commentary and public address announcements to the deaf or hard-of-hearing fan. Input from text that is typed in real time with a CART system has been tested at the Georgia Tech Russ Chandler Stadium, and a football



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Complies with HIPAA regulations

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1-877-735-5151

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## Intelligent Access™

Continued from page 16

stadium. The color commentary from the baseball and football games was generated via CART and sent wirelessly to patrons at the baseball game.

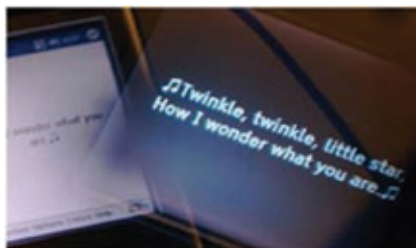
Intelligent Access™ also includes copyright protection for the rights-holders of the transmitted content, such as color commentary. The “Save” option is automatically blocked.



### Movie Theatres

Intelligent Access™ uses pre-recorded text input in a movie theater-type setting, where the audio content does not vary from one performance to the next. Text is generated ahead of time, and the server receives time code from the digital cinema server or digital media player to synchronize the captions with the video content.

The heads-up display works particularly well in this setting, enabling viewers to read the captions without taking their eyes off the film in action. This input method works with various types of movie theater equipment and adheres to the Society



of Motion Picture and Television Engineers (SMPTE) closed captioning standards for digital cinema. (These standards are under development.)

The Intelligent Access™ system has undergone a formative evaluation in both actual theaters and mock theater settings. Deaf and hard of hearing users were involved in the evaluations, and Landmarc incorporated their end-user suggestions as part of their iterative design process.

### Aquariums, Museums and Theme Parks



Landmarc's wireless captioning enhances visitor experience in other leisure venues. Intelligent Access™ can assist deaf and hard-of-hearing patrons through personalized wayfinding, realtime captioning of performances, and interactive exhibit interpretations. These location-based features function in realtime, providing a richer and more memorable encounter that encourages repeat visits.

The Mystic Aquarium launched Landmarc's system in January 2009. Running on smartphones and other mobile devices like the iPod, the system includes video captions. Future versions will include exhibit-specific



The speech recognition input is currently under test at the Rochester Institute of Technology National Technical Institute for the Deaf through an NSF grant “Speech to Text Systems: Comparative Analysis of Text Generation and Display Methods.”

information (including text, images and audio), and automated tracking in support of wayfinding and gallery interpretation.

### Schools, Professional Instruction and Conferences

Captioning has been shown to improve learning performance in a variety of teaching settings. The Intelligent Access™ system can enhance the appeal and usability of professional training and conferences for adults as well as performance in classrooms and traditional teaching situations.

The technology uses familiar technology to deliver classroom lecture captions individually to the students in real time. The learning process benefits from other features in development, including chat, student-to-student, and student-to-teacher interactions. The system provides real-time captions in the classroom individually to the student using a CART system to generate the text. In the near future however, speech recognition products such as Dragon Naturally Speaking

Continued on page 23



# TDI In Action

January - March 2009

## Telecommunications Access

- TDI and other national organizations jointly filed comments to the Federal Communications Commission (FCC) requesting that it reconsider its decision not to authorize individuals without a hearing disability to obtain ten-digit numbers from VRS providers for purpose of telecommunication using videophones with people who are deaf or hard of hearing.
- TDI attended a number of *ex parte* meetings with Consumer and Government Affairs Bureau, Wireline Competition Bureau and Commissioners staff on TRS numbering, E911 and VRS equipment porting interoperability issues.
- TDI joined other national and state level organizations in filing a request for intervention and modification with the California Public Utilities Commission (CPUC). The CPUC inserted a provision in its Request for Proposal for California Relay Services that would require a captioned telephone relay service provider to inform all parties to a CTS call, by text and voice messages, about the "participation" of a CTS communications assistant on that call. We do not support this new provision and have asked CPUC to delete it.
- TDI and the California Coalition of Agencies Serving the Deaf and Hard of Hearing (CCASDHH) took part in meetings at the FCC with officials of both the Wireline Competition, and Consumer and Government Affairs Bureaus to discuss implementation progress of Internet-based Telecommunications Relay Service numbering.
- TDI met with FCC staff and



reviewed the report from members of the House Energy and Commerce Committee on TRS activity at FCC and provided advice to DHHCAN on VRS rate issues.

- TDI commended Hamilton Relay, Purple and CSDVRS on their recent VRS promotional and educational outreach efforts, including videos and educational webinars on the ten-digit numbering system.

## Media Access

- TDI drafted an opposition to petitions filed with the FCC seeking reconsideration of certain closed captioning requirements including rules that require broadcasters to:
  1. Use the Standardized Form 355 for closed captioning information collection and reporting;
  2. Provide public inspection files on their websites; and
  3. Provide their public inspection files in an accessible format.
- TDI under DHHCAN was represented at the FCC's Consumer Advisory Committee meeting. Topics covered at the meeting were: the DTV Converter Box Coupon program and DTV outreach efforts. This marked the first debut of Commissioner Michael Copps to speak before the Advisory Committee as Acting Chairman of the FCC.
- TDI sent an email to Acting FCC Chairman Michael Copps, supporting a task force with representatives from broadcasters, captioning providers and consumer groups to work on digital television closed captioning technical issues.



- TDI drafted reply comments encouraging the Commission to incorporate HD Radio functionality into satellite radio receivers, which would enable captioning of local radio programs. Currently, satellite and over-the-air analog AM and FM radios do not support captioning.
- TDI met with officials at the U.S. Department of Education to discuss the possible nationwide distribution of accessible instructional material to public schools, colleges and universities, and other educational institutions to benefit students who are deaf or hard of hearing.
- TDI and other organizations filed eleven oppositions to closed captioning undue burden waiver requests in this quarter.
- TDI prepared comments and reply comments to the FCC Declaratory Ruling, Order and Final Notice of Proposed Rulemaking (FNPRM) regarding supporting closed captioning for all multicast programming.
- TDI issued an eNote commending the Internal Revenue Service for production of its accessible online video clips sharing tax tips in American Sign Language, and with captioning and voiceover.





# TDI In Action

January – March 2009

Continued from page 20

## Emergency Access

- TDI and CCASDHH attended the Summit on Deployment and Operational Guidelines for Next Generation IP-Enabled 911 (NG911) and Enhanced 911 (E911) services. TDI also took part in meetings at the FCC with officials of both the Public Safety and Homeland Security, and Consumer and Government Affairs Bureaus to discuss access issues regarding traditional, E911 and NG911 services by those who are deaf or hard of hearing. One area of focus was the review and analysis of the recent FCC order that extended the waiver of the requirement to connect automatically 911 emergency calls using VoIP to PSAP. TDI also participated in several conference calls about NG911 sponsored by the U.S. Department of Transportation (DOT)
- TDI issued an eNote announcing the new CEPIN project, the second grant from Federal Emergency Management Agency to develop and launch a unique, Web-based training for special needs populations and emergency managers. A second eNote proclaimed a special collaboration between TDI and American Association of People with Disabilities (AAPD) to assist CEPIN in fulfilling the requirements within the entire special needs population as it develops and implements the online-based training in emergency preparedness for this population and emergency management.

## Public Policy Development

- TDI signed on to letters by the Deaf and Hard of Hearing Alliance (DHHA) to Speaker of the House Nancy Pelosi, D-CA and Senate

Majority Leader Harry Reid, D-NV to thank them for the successful passage of the American Recovery and Reinvestment Act. We outlined eight areas where \$52 billion from this Act would benefit deaf and hard of hearing Americans in education, broadband technology and other topics.

- TDI and other national consumer groups met with key officials at the U.S. Department of Transportation (DOT). We reviewed issues related to the forthcoming DOT airline accessibility implementation guidelines, DOT's current airline training manual and the forthcoming Supplemental Notice of Proposed Rulemaking (SNPRM).
- TDI also signed onto letters by DHHCAN to the two key architects of the State Model Plan for Rehabilitation of Persons who are Deaf, Deaf-Blind, Hard of Hearing or Late Deafened, Dr. Douglas Watson, and Mr. H. S. McMillan. In the letter, we outlined some strengths with the Plan, and recommended some minor improvements in other areas of the Plan, such as demographics, diversity, consumer involvement, interpreter training, income disparity, and outreach.
- TDI and other national groups met with Acting FCC Chairman Copps' staff to provide the recommendations and expectations of the role, major responsibilities, scope of work,



Acting FCC Chairman, Commissioner Michael J. Copps

and short/long term goals of the Disability Rights Office in the Obama administration.

- TDI met with two members of U.S. Senator Richard Durbin's staff to discuss:
  1. Seeking passage of the "21<sup>st</sup> Century Communications and Video Accessibility Act;"
  2. Finding a sponsor willing to insert new language in the Individuals with Disabilities Education Act that would require all educational videos shown in public schools to be either open or closed captioned; and
  3. Asking the FCC to revise its current rules and eliminate those provisions that allow television stations that are not in the "Top 25 Markets" in the U.S. to use electronic newsroom technology (ENR) to comply with their captioning requirements, and instead mandate that all news broadcasts on all television stations in the U.S. must be captioned in real-time.



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## Intelligent Access™

Continued from page 19

could provide the text translation without having to rely on CART or equivalent personnel.

### Project Timeline

Landmarc's wireless personal captioning technology is currently undergoing commercialization. The technology has resulted in six invention disclosures. User testing was conducted in the following stages. In addition to these more formal tests, patrons have used the Intelligent Access™ system in a variety of theatres and sports venues.

#### Winter 2008 - Spring 2009

The speech recognition input is currently under test at the Rochester Institute of Technology National Technical Institute for the Deaf through an NSF grant "Speech to Text Systems: Comparative Analysis of Text Generation and Display Methods." Handheld (PDA screen) and electronic eyewear display methods have been compared to desktop and common screen display methods for captions in

the college classroom setting.

#### June 2003

The second stage of user testing occurred at the Self-help for Hard of Hearing People (now Hearing Loss Association of America) conference in 2003. This group consisted of 52 volunteers, from 15 to over 75. The individuals came from diverse auditory backgrounds, including hearing, hard of hearing, deaf from birth, and late deafened.

#### January - February 2003

Landmarc conducted the first stage of user testing in conjunction with the Georgia Council for the Hearing Impaired. 25 volunteers participated in this study.

### Project Follow-on and Continuing Development

Landmarc is building on its expertise in wireless personal captioning technology to include realtime informational systems for wayfinding, particularly for supporting people with disabilities. Continuing development

recognizes that the information and delivery vary depending on the user's context. At sporting events and theatres, for example, all patrons share in the same experience, at the same time; these settings require systems that deliver synchronous, uniform information. In transportation and healthcare settings, however, each patron requires unique information that must function dynamically according to location and status. For these settings, a system must be capable of delivering different information to each patron, as he or she needs it throughout the space.

These systems are being deployed in transportation, cultural, entertainment, and healthcare venues. The Intelligent Access™ technology is being developed for airport applications for Delta's Disability Working Group and the Transportation RERC. Museum and aquarium installations are being developed for Mystic Aquarium in Mystic, CT and the Creation Museum in Petersburg, KY. The Intelligent Access™ team is also developing systems for hospitals in cooperation with Shepherd Center in Atlanta, GA.

### Learn More

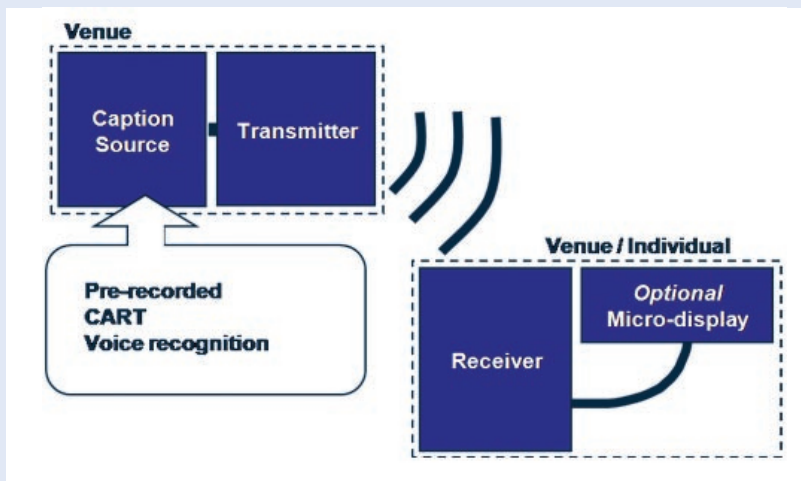
Landmarc's wireless personal captioning technology has appeared in the following press articles:

■ <http://www.gtresearchnews.gatech.edu/reshor/rh-w07/lerc.html>

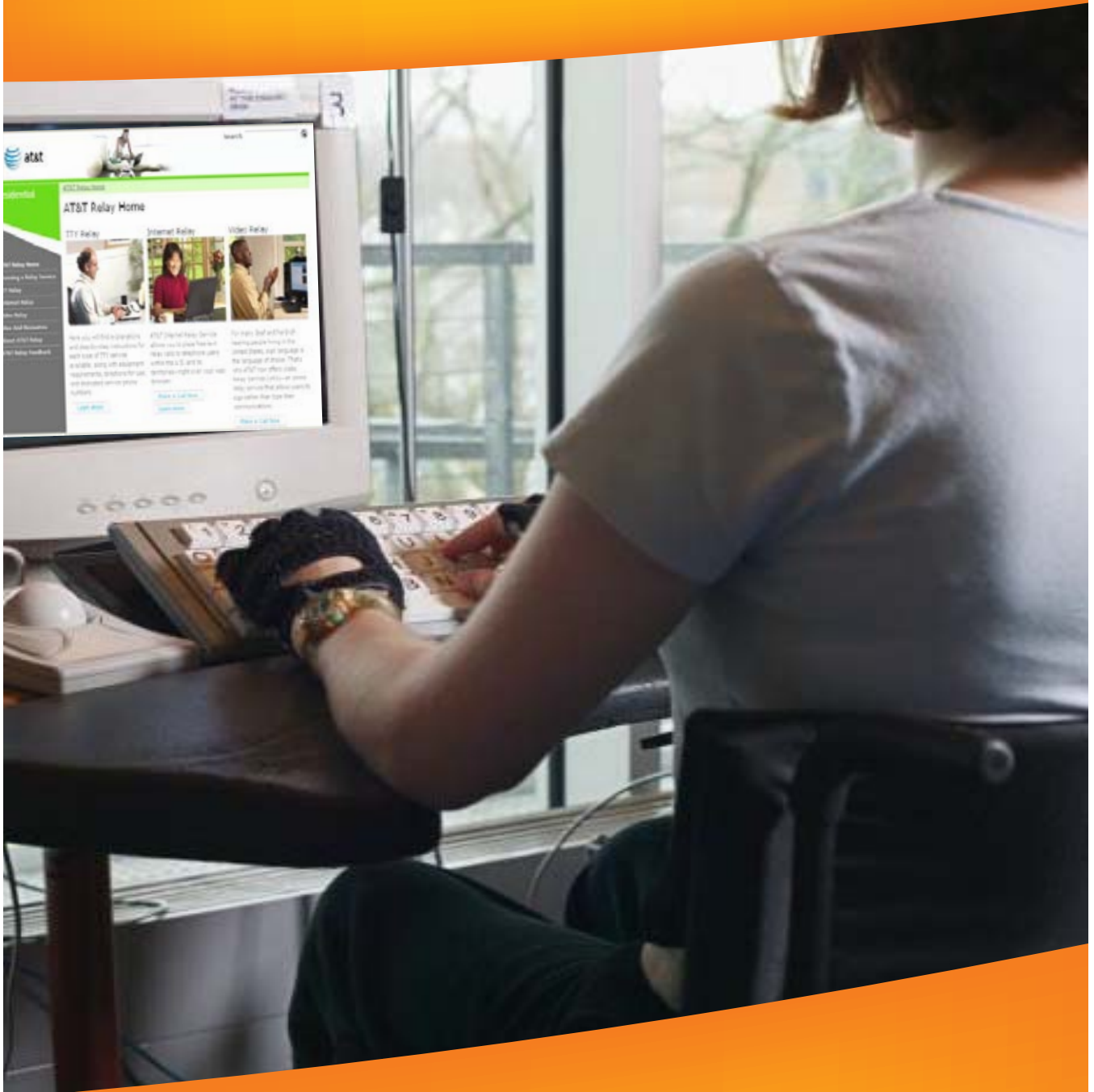
■ <http://gtresearchnews.gatech.edu/reshor/rh-w05/captioning.html>

Contact Landmarc if you are interested in becoming a partner or to discuss opportunities involving our technology.

## Technical Approach



[www.consumer.att.com/relay/](http://www.consumer.att.com/relay/)  
[www.att.com/disabilityresources](http://www.att.com/disabilityresources)



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