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News Release



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LUCENT DIGITAL RADIO AND BROADCAST ELECTRONICS ANNOUNCE JOINT TESTING AGREEMENT FOR DIGITAL AUDIO BROADCAST SYSTEM

FOR RELEASE ON MONDAY, JULY 12, 1999

WARREN, N.J. -- Lucent Digital Radio, a wholly-owned subsidiary of Lucent Technologies (NYSE: LU), and Broadcast Electronics, a leader in the design and manufacture of radio broadcast equipment, today announced that they have agreed to jointly test transmitter technology that will facilitate Lucent Digital Radio's In-Band On-Channel (IBOC) Digital Audio Broadcasting (DAB) system.

The Lucent Digital Radio system recently became the first IBOC system to successfully pass a digital signal over the same transmitter and antenna infrastructure without affecting the analog host signal. These historic tests, conducted at NPR member station WBJB-FM in Lincroft, New Jersey, will be followed by further system tests at WBJB-FM and at station WPST-FM, the flagship station of Nassau Broadcasting Partners.

Lucent Digital Radio and Broadcast Electronics will perform a series of field tests of the Lucent IBOC system at commercial radio stations and will also conduct laboratory waveform tests at Broadcast Electronics' facilities. These efforts represent a reasoned, systematic, and open approach to validating LDR's IBOC technology and software.

"Together, Broadcast Electronics and Lucent Digital Radio will conduct testing that is critical for the further development of our IBOC system and for the broadcast industry's readiness for the coming of digital radio," said Suren Pai, president of Lucent Digital Radio. "We're designing a scientifically valid field and laboratory testing program. And this type of partnership is important to the overall success and acceptance of IBOC. Without this type of open validation of a proposed technical standard for IBOC, broadcasters and receiver manufacturers can only guess at the capabilities of our concepts – or anyone else's."

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Said Pai, "The radio industry is listening, and we will work side by side to deliver the answers that will assure all constituencies that IBOC is ready for the air. The combination of our software and the Broadcast Electronics hardware product line will offer formidable proof that IBOC is a reality, not a promise."

"We know that broadcasters are very interested in implementing a path to a digital future for the radio broadcasting industry," said John W. Pedlow, president and chief executive officer of Broadcast Electronics, Inc. "We expect to utilize the expertise of Broadcast Electronics' radio transmission systems and the proficiency of Lucent Digital Radio's digital system to develop a commercially viable transition path to IBOC for our broadcasting customers and their listeners."

Lucent Digital Radio's IBOC DAB system is an enhancement to current analog AM and FM radio broadcasting systems. It will provide greatly enhanced sound quality for AM radio and near-CD quality for FM radio, as well as interference-free reception and innovative new data services.

Lucent Digital Radio draws on several patented Lucent digital audio and channel coding techniques that provide robust digital signal delivery in an impaired broadcast channel, including Lucent's Perceptual Audio Coder (PAC™) technology, which delivers near-CD quality audio at 96 Kilobits per second; Unequal Error Protection, which prioritizes information based on its impact to audio quality; and Multi-Streaming, which provides for a more robust signal in an impaired channel.

The IBOC approach will allow broadcasters to introduce digital audio programming to listeners on their current dial positions using existing transmitters and antennas. IBOC DAB is both backward- and forward-compatible: current AM/FM receivers will still be able to receive the existing analog signals in the new system. When a station elects to turn off the analog signal in the future, IBOC DAB-compatible receivers will operate with the remaining all-digital signal.

Broadcast Electronics, Inc. (BE) designs, manufactures and markets leading products for the global radio broadcast industry. BE's offerings include the AudioVAULT® digital audio storage and control system, BE transmitters -- AM and FM transmission systems, and MARTI brand RPU's, STLs, and telephone codecs. This year BE celebrates its 40th Anniversary as a solutions provider exclusively to the radio broadcast industry.

For more information about Broadcast Electronics, please contact Rick Carpenter, Vice President, Engineering, on 217-224-9600 or rcarpent@bdcast.com. Information is also available on the Web site at www.bdcast.com.

Lucent Digital Radio is a Lucent Technologies venture with a mission to develop IBOC DAB technology for AM and FM broadcasting worldwide. LDR's IBOC system will be resistant to multipath and other forms of interference that impair current analog transmissions.

For more information about Lucent Digital Radio, please contact William Casey, Director, Marketing & Sales, on 908-580-7008 or williamcasey@lucent.com. Information is also available on the Web site at www.lucent.com/ldr.

Lucent Technologies, headquartered in Murray Hill, N. J., designs, builds and delivers a wide range of public and private networks, communications systems and software, data networking systems, business telephone systems and microelectronic components. Bell Labs is the research and development arm for the company. For more information on Lucent Technologies, visit the company's web site at www.lucent.com.

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LUCENT DIGITAL RADIO AND ELECTRONICS RESEARCH INC. ANNOUNCE AGREEMENT TO DEVELOP DIGITAL RADIO BROADCAST EQUIPMENT

FOR RELEASE THURSDAY, JUNE 3

WARREN, NJ -- Lucent Digital Radio, a wholly-owned subsidiary of Lucent Technologies, and Electronics Research Inc., a leading radio equipment manufacturer, today announced that they have agreed to jointly develop combiner technology that can be used in Lucent's In-Band On-Channel (IBOC) Digital Audio Broadcast (DAB) system.

A combiner is a device used for adding together two radio signals -- an analog signal and a digital signal -- for transmission over the air using the same antenna. In the IBOC system, the device will combine the existing analog host signal and the new digital FM signal.

Lucent Digital Radio (LDR) is already utilizing a prototype IBOC combiner in tests of its IBOC system at National Public Radio (NPR) member station WBJB-FM in New Jersey. Previously, LDR had announced that it had successfully tested its IBOC system live and over the air at WBJB-FM with no degradation of the host FM analog channel during the transmission of the digital FM signal over the same FM band.

Suren Pai, president of Lucent Digital Radio stated, "ERI is the leader in antenna and combiner technology. Although there is science involved with developing new combiners, there is a lot of art in it as well. Tom Silliman and his team at ERI are world famous in this industry and we are honored to be working with them to solve this very difficult problem."

"We are pleased to have the opportunity to work with Lucent Digital Radio on developing IBOC combiners," said Tom Silliman, president of ERI. "Our strengths compliment each other and this will lead to a successful implementation of LDR's IBOC system."

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Lucent Digital Radio will be using ERI's IBOC combiners at other field test locations. The two companies will also be exploring alternatives to combining technologies, such as advanced antenna technologies. The advantage of these new technologies will be not only to implement IBOC, but also to lower the cost of IBOC deployment.

Lucent Digital Radio's IBOC DAB system is an enhancement to current analog AM and FM radio broadcasting systems. In addition to greatly enhanced sound quality for AM radio and near-CD quality for FM radio, it will provide interference-free reception and innovative new data services.

Lucent Digital Radio draws on several patented digital audio and channel coding techniques that provide robust digital signal delivery in an impaired broadcast channel, including Lucent's Perceptual Audio Coder (PAC™) technology, which delivers near-CD quality audio at 96 Kb/s; Unequal Error Protection, which prioritizes information based on its impact to audio quality; and Multi-Streaming, which provides for a more robust signal in an impaired channel.

The IBOC approach will allow broadcasters to introduce digital audio programming to listeners on their current dial positions using existing transmitters and antennas. IBOC DAB is both backward- and forward-compatible: current AM/FM receivers will still be able to receive the existing analog signals in the new system. When a station elects to turn off the analog signal in the future, IBOC DAB-compatible receivers will operate with the remaining all-digital signal.

ERI was established during World War II to assist the Department of Defense in avionics research. In 1945 ERI modified the new FM wireless technology for civilian use and constructed a transmitter, tower and antenna for one of the earliest experimental FM stations, W9XEV in Glenwood, Indiana. Through the next five decades ERI continued to lead the wireless development with innovative product designs and meticulous fabrication for both the public and private sectors. Many now common products including the circularly polarized, internally fed FM antenna; improved temperature compensation of RF filters; and electrically transparent antenna support structures originated at ERI.

For more information about ERI, please contact Beth Seaton, Sales Support, on 812-925-6000 Ext. 226. You can also visit the Web site at www.ERInc.com.

Lucent Digital Radio is a Lucent Technologies venture with a mission to develop IBOC DAB technology for AM and FM broadcasting worldwide. LDR's IBOC system will be resistant to multipath and other forms of interference that impair current analog transmissions.

For more information about Lucent Digital Radio, please contact William Casey, Director, Marketing & Sales, on 908-580-7008 or williamcasey@lucent.com. You can also visit the Web site at www.lucent.com/ldr.

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LUCENT DIGITAL RADIO ANNOUNCES SUCCESSFUL OVER-THE-AIR TEST OF DIGITAL AUDIO BROADCAST SYSTEM WITH 90.5 WBJB-FM

FOR RELEASE ON WEDNESDAY, JUNE 2, 1999

WARREN, N.J. -- Lucent Digital Radio, a wholly-owned subsidiary of Lucent Technologies (NYSE: LU), today announced that it has successfully tested its In-Band On-Channel (IBOC) Digital Audio Broadcast (DAB) system, live and over the air, with National Public Radio (NPR®) member station WBJB-FM. The tests showed that there was no degradation of the host FM analog channel during the transmission of the digital FM signal over the same band.

Lucent began field-testing with WBJB-FM in April, 1999 to evaluate a range of technical issues associated with digital FM radio. WBJB-FM, in Lincroft, New Jersey, is the first NPR member station to test the current generation of IBOC DAB systems.

"This successful test of an IBOC signal during a live broadcast is an important milestone on the road to providing digital capabilities for enabling new radio features that consumers want," said Suren Pai, president of Lucent Digital Radio. "We are on target and on time with our system testing. Working with WBJB-FM allows us to test our system with an organization that is in the technical vanguard of radio."

Lucent Digital Radio expects to have complete results from its IBOC testing by the end of 1999. It expects to complete its IBOC system by 2000.

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IBOC, which is the leading candidate for the U.S. standard for DAB, uses existing radio spectrum allocations – no new allocations or auctions are required. IBOC DAB will provide AM radio with interference-free FM audio quality, and FM with near-CD audio quality. It will be able to accommodate up to 100 Kb/s of data transport for innovative new data services. The system will also provide broadcasters with a low-cost transition path to digital technology, creating the potential for new revenue opportunities.

IBOC DAB is both backward- and forward-compatible: current AM/FM receivers will still be able to receive the existing analog signals in the new system. When a station elects to turn off the analog signal in the future, IBOC DAB-compatible receivers will operate with the remaining all-digital signal.

Lucent Technologies and its research and development unit, Bell Laboratories, have been leaders in the digital encoding of information used in communications systems, and have been at the forefront of digital audio broadcasting (DAB) technology for the past decade.

In January, Lucent Digital Radio announced a significant technical advance, called Multi-Streaming, that solves the problem of providing high-quality digital audio reception over a coverage area equal to that of current analog FM stations.

Lucent Digital Radio draws on several patented digital audio and channel coding techniques that provide robust digital signal delivery in an impaired broadcast channel, including Lucent's Perceptual Audio Coder (PAC) technology, which delivers near-CD quality audio at 96 Kb/s; Unequal Error Protection, which prioritizes information based on its impact to audio quality; and Multi-Streaming, which provides for a more robust signal in an impaired channel.

For more information about Lucent Digital Radio, please contact William Casey, Director, Marketing & Sales, on 908-508-7008 or williamcasey@lucent.com. The Lucent Digital Radio Web site is www.lucent.com.ldr.

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LUCENT DIGITAL RADIO AND NAUTEL LIMITED WILL JOINTLY TEST LUCENT'S IN-BAND ON-CHANNEL DIGITAL AM BROADCASTING SYSTEM

FOR RELEASE ON TUESDAY, JUNE 1, 1999

WARREN, N.J. -- Lucent Digital Radio, a wholly-owned subsidiary of Lucent Technologies, and Nautel Limited, a leading transmission equipment manufacturer specializing in high power solid-state RF equipment, today announced that they have agreed to jointly test transmitter technology that will facilitate In Band On-Channel (IBOC) AM-band Digital Audio Broadcasting (DAB).

The two companies will perform laboratory waveform testing at Nautel's facilities using Lucent Digital Radio's prototype waveform generator. The agreement also includes field testing at commercially operating radio stations in the United States.

Suren Pai, president of Lucent Digital Radio stated, "This agreement will help us to bring Lucent Digital Radio's IBOC technology to the market. Nautel is a premier transmission equipment manufacturer and we are pleased to be working with them on testing our IBOC system".

"This is an exciting agreement for us," said David Grace, president and chief executive officer of Nautel Limited. "Nautel brings years of experience in transmission equipment to the table and Lucent Digital Radio brings the digital system expertise. The combination is extraordinary and will help drive IBOC to a viable market implementation".

Lucent Digital Radio's IBOC DAB system is an enhancement to current analog AM and FM radio broadcasting systems. It will provide greatly enhanced sound quality for AM radio, near-CD quality for FM radio, as well as interference-free reception and innovative new data services.

Lucent Digital Radio draws on several patented Lucent digital audio and channel coding techniques that provide robust digital signal delivery in an impaired broadcast channel, including Lucent's Perceptual Audio Coder (PAC™) technology, which delivers near-CD quality audio at 96 Kilobits per second; Unequal Error Protection, which prioritizes information based on its impact to audio quality; and Multi-Streaming, which provides for a more robust signal in an impaired channel.

The IBOC approach will allow broadcasters to introduce digital audio programming to listeners on their current dial positions using existing transmitters and antennas. IBOC DAB is both backward- and forward-compatible: current AM/FM receivers will still be able to receive the existing analog signals in the new system. When a station elects to turn off the analog signal in the future, IBOC DAB-compatible receivers will operate with the remaining all-digital signal.

Nautel specializes in high power, totally solid-state RF equipment operating in LF through VHF frequency bands. Nautel's product range includes: broadcast transmitters, AM and FM; aeronautical non-directional beacons; MF telegraph transmitters for operator telegraphy and NAVTEX; differential GSP transmitters; LF/MF transmitting antennas and antenna tuning units; and high power FR amplifiers for dielectric heating. Since 1969, customers have put in the field over 4,500 of Nautel's totally solid-state transmitters in more than 160 countries with environments ranging from arctic to desert to tropical jungle in every continent of the world.

For more information about Nautel Limited, please visit the Web site at www.nautel.com or call 207-947-8200.

Lucent Digital Radio is a Lucent Technologies venture with a mission to develop IBOC DAB technology for AM and FM broadcasting worldwide. LDR's IBOC system will be resistant to multipath and other forms of interference that impair current analog transmissions.

For more information about Lucent Digital Radio, please contact William Casey, Director, Marketing & Sales, on 908-580-7008 or williamcasey@lucent.com. Information is also available on the Web site at www.lucent.com/ldr.

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LUCENT DIGITAL RADIO ANNOUNCES NEW PRODUCT LINE BASED ON THE LUCENT PERCEPTUAL AUDIO CODER (PAC™)

FOR RELEASE MONDAY, APRIL 12, 1999

WARREN, N.J. – Lucent Digital Radio, a wholly owned subsidiary of Lucent Technologies (NYSE: LU), today announced the availability of new audio coders, based on the Lucent Perceptual Audio Coder™ (PAC™), the industry's highest-quality audio coder. The new PAC coders, which offer transparent CD quality at 128 kilobits per second (Kb/s) and CD-like quality at 96 Kb/s, are available at a wide range of bit rates, from 16 Kb/s to 128 Kb/s. The PAC coders will be available to customers developing applications for transmission of digital audio over a variety of wireless and wireline channels.

The new PAC coders include PAC Version 1.0, which delivers digital audio transport on unimpaired channels and PAC Version 2.0, which incorporates Lucent Digital Radio's patented Multi-Streaming technology for broadcast applications over impaired channels.

"The new PAC product line allows us to deliver the most comprehensive set of digital audio coders ever available on the market," said Suren Pai, president of Lucent Digital Radio. "PAC is a building-block for the next generation of digital audio. This new generation of PAC coders presents a high-quality and flexible product line for the audio industry and broadcast equipment providers."

One application that is already using PAC is the studio link, where Audio Video Communications (AVC) has implemented PAC, operating at variable bit rates within their newest broadcasting product, the TieLine. The AVC TieLine is a bi-directional audio codec, which allows high-quality remote broadcasting over analog phone lines. Another application is within Lucent Digital Radio's In-Band On-Channel (IBOC) Digital Audio Broadcast (DAB) system.

The PAC product line will take advantage of the coder's variable bit rates and superior audio quality. This means that PAC adapts, in real time, to free bandwidth for other applications. PAC is also modular and can deliver audio in 16 Kb/s increments.

"As processor speeds increase, and acceptance of new forms of audio delivery grow, PAC will become the de facto standard for perceptual audio coding," said Deepen Sinha, principal engineer for Lucent Digital Radio. "This new PAC product line is several generations beyond our nearest competition and employs a number of key Bell Labs patented technologies. Bell Labs is the birthplace of perceptual audio coding, having perfected this class of audio coders over the past two decades. Now, the floodgates of the market are opening for new applications that maximize the potential of this powerful technology. Lucent Digital Radio is uniquely poised to deliver this technology to market."

The technical components of the new PAC coder line include:

- FilterBank - signal adaptive MDCT/wavelet transform
- Psychoacoustic Model
- Quantization – non-uniform vector quantization
- Noiseless coding – adaptive Huffman coding with codebooks based on signal level and statistics
- Efficient stereo coding – low bit-rate parametric stereo coding

PAC VERSION 1.0

PAC Version 1.0 is optimized for low bit-rate transmission of voice and music with up to 8.0 kHz audio bandwidth. The output bit rates available are between 16 Kb/s and 32 Kb/s, targeting products that transmit and receive audio over analog phone lines and other bandwidth-constrained channels.

PAC VERSION 2.0

PAC Version 2.0 is designed specifically for broadcast applications with impaired channels. Multi-Streaming technology enables high-quality reception even if audio packets are missing from the broadcast stream. PAC's Multi-Streaming technology maintains performance even under conditions of 10% Frame Error Rate (FER), ideal for digital wireless broadcast products.

Lucent Technologies and its research and development unit, Bell Laboratories, have been leaders in the digital encoding of information used in communications systems, and have been at the forefront of digital audio broadcasting (DAB) technology for the past decade.

For more information on Lucent Digital Radio, visit the Web Site at <http://www.lucent.com/ldr> or contact William Casey, Director, Marketing & Sales, at 908-580-7008 or email at williamcasey@lucent.com.

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LUCENT DIGITAL RADIO ANNOUNCES DIGITAL AUDIO BROADCAST SYSTEM TESTING WITH NASSAU BROADCASTING PARTNERS

FOR RELEASE: MONDAY, MARCH 22, 1999

WARREN, NJ -- The future of digital radio has just gotten a little clearer.

Lucent Digital Radio, a wholly-owned venture of Lucent Technologies, today announced an agreement to test its In-Band On-Channel (IBOC) Digital Audio Broadcast (DAB) system with Nassau Broadcasting Partners, L.P.

These are the first tests of Lucent Digital Radio's IBOC DAB system with commercial radio stations. The tests will be conducted in Nassau Broadcasting Partners' radio facilities. Nassau Broadcasting Partners L.P., who have conceived and implemented the first and only statewide radio network in the country, owns and/or operates 15 AM and FM stations in New Jersey. It also owns and/or operates two stations in New York and two in Pennsylvania.

Lucent Digital Radio is developing its IBOC DAB system for consideration as a potential digital radio standard in the United States. The Lucent Digital Radio tests will evaluate several technical issues associated with digital radio, including interference, range of signal, and audio quality.

In the tests with Nassau's stations, Lucent Digital Radio will evaluate its Multi-Streaming technology, which is expected to provide high-quality digital audio reception over a coverage area equal to that of current analog FM stations.

Lucent Digital Radio's IBOC DAB system is an enhancement to current analog AM and FM radio broadcasting systems. It will provide greatly enhanced sound quality for AM radio, near-CD quality for FM radio, as well as interference-free reception and innovative new data services.

The IBOC approach will allow broadcasters to rapidly introduce digital audio programming to listeners on their current dial positions using existing transmitters and antennas. In addition, the system will support datacasting using the existing radio broadcasting infrastructure to deliver information -- such as song titles, weather and traffic reports, financial reports and news -- to consumers with new digital receivers.

"IBOC DAB offers a strong value proposition for us. It enhances our programming, maximizes our signals and increases our revenue streams. With Lucent Digital Radio, we can see a future where we will increase our channels and deliver a new product that goes far beyond the delivery of high-quality audio," said Anthony Gervasi, Jr., senior vice president of engineering and technology for Nassau Broadcasting Partners. "We have not seen evidence from other IBOC proponents that they understand the full scope of this paradigm shift in the way that Lucent Digital Radio does."

Lucent Digital Radio will supply the hardware and software for the field-testing. Nassau Broadcasting Partners will provide the radio sites and also support the test evaluation.

"The opportunity to work with Lucent Digital Radio on what is, in effect, the future of radio broadcasting is tremendously important to us," said Louis F. Mercatanti, Jr., president and chairman of Nassau Broadcasting Partners, L.P. "The results of our tests will enable both our stations' listeners as well as listeners throughout the industry to benefit from these efforts."

Lucent Digital Radio draws on a number of patented Lucent digital audio and channel coding techniques that provide robust digital signal delivery in an impaired broadcast channel, including:

- Lucent's Perceptual Audio Coder (PAC™) technology
- Unequal Error Protection, which prioritizes information based on its impact on audio quality
- Multi-Streaming, a combination of techniques that extends the coverage of digital signals by allowing for graceful degradation of audio quality

"We are on target with our IBOC DAB system design and testing plans. Nassau Broadcasting provides an ideal base of stations that enable our iterative design and system testing to proceed with simultaneous tests of several technical issues," said Suren Pai, president of Lucent Digital Radio. "The team at Nassau is very eager to work with us on our IBOC DAB system."

IBOC, which is being considered as the U.S. standard for DAB, uses existing radio spectrum allocations -- no new allocations or auctions are required. IBOC DAB is both backward- and forward-compatible, meaning that current AM/FM receivers will still be able to receive the existing analog signals in the new system. And when a station elects to turn off the analog signal in the future, IBOC DAB-compatible receivers will operate with the remaining all-digital signal.

"We can see a future where our stations' AM signals will deliver FM quality sound and we will be able to transmit data," said Gervasi. "The radio station of the future will deliver much more than audio, and we want to explore that future with Lucent Digital Radio."

Lucent Technologies and its research and development unit, Bell Laboratories, have been leaders in the digital encoding of information used in communications systems, and have been at the forefront of digital audio broadcasting technology for the past decade.

For more information on Lucent Digital Radio, visit the Web Site at <http://www.lucent.com/ldr> or contact William Casey, Director, Marketing & Sales, at 908-580-7008 or email at williamcasey@lucent.com.

Nassau Broadcasting Partners, LP, is based in Princeton, New Jersey and operates radio stations in New Jersey, New York, and Pennsylvania, including WADB-AM, WJLK-FM, WOBN-AM/FM, WBBO-FM in Monmouth-Ocean counties, New Jersey; WNNJ-AM/FM, WHCY-FM and WSUS-FM in Warren and Sussex counties, New Jersey; WHWH-AM, WTTM-AM, WJHR-AM, WCHR-FM, WNJO-FM and WPST-FM in central New Jersey; WVPO-AM and WSBG-FM in Pennsylvania and WDLC-AM, WTSX-FM in Port Jervis, New York.

For more information on Nassau Broadcasting Partners, contact Joan Gerberding, at 609-419-0240 or email at Radiojoan@aol.com.

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LUCENT DIGITAL RADIO ANNOUNCES TESTS OF ITS DIGITAL AUDIO BROADCAST SYSTEM WITH 90.5, WBJB-FM, AN NPR® MEMBER STATION

FOR RELEASE ON MONDAY, MARCH 8, 1999

WARREN, N.J. -- Lucent Digital Radio, a wholly-owned subsidiary of Lucent Technologies, today announced that it is testing its In-Band On-Channel (IBOC) Digital Audio Broadcast (DAB) system with National Public Radio (NPR®) member station WBJB-FM.

The field tests, which will commence immediately, will evaluate a range of technical issues associated with digital FM radio. WBJB-FM, licensed to Brookdale Community College in Lincroft, New Jersey, is the first NPR member station to test the current generation of IBOC DAB systems.

In January, Lucent Digital Radio announced a significant technical advance, called Multi-Streaming, that solves the problem of providing high-quality digital audio reception over a coverage area equal to that of current analog FM stations.

"We are on target and on time with our IBOC DAB system testing. We believe the full evaluation of capabilities for new radio features that consumers want is vital to the future commercial success of any digital broadcast system," said Suren Pai, president of Lucent Digital Radio. "Working with WBJB-FM, central New Jersey's local NPR member station, allows us to test our system with an organization that is in the technical vanguard of radio."

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Lucent Digital Radio, which announced its testing plans in October, 1998, will test its AM IBOC system in mid-year 1999, and will conclude all field tests on its system by the end of year. It expects to have product-ready systems available in 2000.

IBOC, which is being considered as the U.S. standard for DAB, uses existing radio spectrum allocations -- no new allocations or auctions are required. IBOC DAB is both backward- and forward-compatible, meaning that current AM/FM receivers will still be able to receive the existing analog signals in the new system. And when a station elects to turn off the analog signal in the future, IBOC DAB-compatible receivers will operate with the remaining all-digital signal.

"The transformation of radio for the 21st century is an industry-changing issue that we're prepared for, both on a technical and programming side," said Cheryl Cummings, station manager with WBJB-FM. "Working with Lucent Digital Radio will enable us to test the next generation of radio today."

Located in Lincroft, New Jersey, WBJB-FM offers an ideal test-bed for Lucent's IBOC system. It is located in the heart of the only area in the United States that can sample radio signals from two major markets -- New York and Philadelphia.

"The adoption of a DAB standard will require a concentrated effort on the part of Lucent and other proponents to deliver a system that provides robust digital audio quality and significant scalable data capacity," said Don Lockett, Vice President, Chief Technology Officer. "In this regard, Lucent's testing is a solid step in this direction and NPR's member stations will carefully follow WBJB's work with Lucent Digital Radio in order to make informed decisions about IBOC DAB."

Lucent's IBOC system will greatly enhance sound quality for AM radio and near-CD quality for FM radio and provide interference-free reception and innovative new data services (e.g., song titles shown on a radio display). The system will also provide broadcasters with a low-cost transition path to digital technology, creating the potential for new revenue opportunities.

Lucent Digital Radio draws on several patented Lucent digital audio and channel coding techniques that provide robust digital signal delivery in an impaired broadcast channel, including:

- Lucent's Perceptual Audio Coder (PAC™) technology, which delivers near-CD quality audio at 96 kilobits per second (kbps)
- Unequal Error Protection, which prioritizes information based on its impact to audio quality
- Multi-Streaming, which allows for multiple digital streams

Lucent Technologies and its research and development unit, Bell Laboratories, have been leaders in the digital encoding of information used in communications systems, and have been at the forefront of digital audio broadcasting (DAB) technology for the past decade.

For more information about Lucent Digital Radio, please contact William Casey, Director, Marketing & Sales, on 908-580-7008 or williamcasey@lucent.com. You can also visit the Web site at www.lucent.com/ldr.

National Public Radio®, a membership organization of 607 public radio stations across America, is radio's leading provider of high-quality news, information and cultural programming. NPR is the producer and distributor of such noted programs as Morning Edition®, All Things Considered®, Jazz Profiles®, and CarTalk®.

Lucent Technologies, headquartered in Murray Hill, N. J., designs, builds and delivers a wide range of public and private networks, communications systems and software, data networking systems, business telephone systems and microelectronic components. Bell Labs is the research and development arm for the company. For more information on Lucent Technologies, visit the company's web site at www.lucent.com.

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LUCENT DIGITAL RADIO ANNOUNCES SIGNIFICANT TECHNICAL ADVANCE; REAFFIRMS ROYALTY-FREE LICENSE OFFER TO RADIO BROADCASTERS

FOR RELEASE ON THURSDAY, JANUARY 14, 1999

WARREN, N.J. -- Lucent Digital Radio, a wholly-owned venture of Lucent Technologies, today announced a significant technical advance in its In-Band On-Channel (IBOC) Digital Audio Broadcast (DAB) system that solves the problem of providing high-quality digital audio reception over a coverage area equal to that of current analog FM stations. Lucent Digital Radio also announced that it will offer digital radio broadcasters royalty-free licenses for its IBOC DAB system, which will be field-tested this year.

Lucent Digital Radio's advancement, called Multi-Streaming, is based on state-of-the-art capabilities in audio and wireless channel coding technologies from Lucent's Bell Labs, and allows for the best-quality FM audio to be delivered over a wide coverage area, even under impaired channel conditions.

"This new advancement with Multi-Streaming now makes possible a fully digital solution to IBOC even in the hybrid mode, eliminating the need for receivers to fall back on the analog signal," said Suren Pai, president of Lucent Digital Radio. "This solution to the hybrid system is consistent with our objective of generating maximum economic benefit to broadcasters. As we extend the development of IBOC from technology feasibility towards commercial reality, it is important for us to reiterate our position that broadcasters will have royalty-free licenses and easy access to our IBOC technology so we can drive its rapid adoption by the industry."

This innovation, developed recently by Lucent Digital Radio's technical team, will allow new IBOC receivers to transparently reconstruct the digital signal to deliver the best quality sound possible at a given geographic location of the receiver. Until now, digital broadcast systems designed to operate during a multi-year transition period from analog to digital could be received in just a portion of the analog service area. With the Lucent Digital Radio development, the digital signal will be receivable throughout the analog service area, ensuring high-quality audio to all listeners in a broadcaster's current service area.

As a result of this innovation, the digital signal emulates the graceful degradation characteristics of analog signals, instead of the annoying "cliff effects," or "digital drop-outs" experienced by earlier digital systems. This allows for high-quality digital audio even at the edge of analog coverage. No other proposed digital broadcast system offers this unique capability.

"This is the kind of breakthrough that you would expect from Lucent's Bell Labs," said Rick Doherty of Envisioneering, a leading digital media research firm. "Building on Lucent's strength in digital wireless networking, it's consistent with the kind of system architecture that will be required by broadcasters as they move into the IBOC era."

The Multi-Streaming solution works in both AM and FM IBOC systems and is integrated with Lucent's Perceptual Audio Coder™ (PAC™). Lucent Digital Radio uses PAC in its IBOC DAB system, which will allow radio broadcasters to transmit higher quality sound over AM and FM, and support the introduction of innovative, low-cost data broadcast services. The PAC encoder converts analog audio signals into a digital signal, then compresses the data by at least 15 to one, so that music, for example, can be represented accurately with only about one-fifteenth the number of bits per second as are used on a compact disc. The PAC encoder enables new capabilities, such as CD-like audio quality at bit rates lower than 96 kilobits per second (Kbps).

Lucent Technologies and its research and development unit, Bell Laboratories, have been leaders in the digital encoding of information used in communications systems, and have been at the forefront of digital audio broadcasting (DAB) technology for the past decade.

Lucent Digital Radio is the second Lucent venture in the digital broadcast market. Lucent Digital Video, announced in January, 1998, markets its industry-leading MPEG-2 encoders to the broadcast, cable, wireless cable, fiber optic and satellite markets. For more information about Lucent Digital Radio, visit the Web site at www.lucent.com/ldr.

Lucent Technologies, headquartered in Murray Hill, N. J., designs, builds and delivers a wide range of public and private networks, communications systems and software, data networking systems, business telephone systems and microelectronic components. Bell Labs is the research and development arm for the company. For more information on Lucent Technologies, visit the company's web site at www.lucent.com.

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LUCENT DIGITAL RADIO ANNOUNCES LICENSING AGREEMENT WITH AUDIO VIDEO COMMUNICATIONS IN AUSTRALIA

FOR RELEASE THURSDAY, JANUARY 7, 1999

LAS VEGAS -- Lucent Digital Radio, a venture of Lucent Technologies, today announced it is licensing its Perceptual Audio Coder (PAC) technology to Audio Video Communications (AVC), a supplier of radio broadcasting equipment in Australia.

Audio Visual Communications (www.avcom.com.au) will use the technology in its newest broadcasting products, including its TieLine bi-directional audio codec, which allows high quality remote broadcasting over phone lines.

TieLine is intended for applications such as remote broadcast links to the production studio, studio-to-studio program links, and news gathering to live-to-air reporting. When completed, TieLine is expected to enable up to 15 kHz of broadcast quality digital sound to be sent over a 3 kHz telephone line in real time, anywhere in the world. It may also be used for the audio portion of a remote TV broadcast.

"We are pleased to extend our Bell Labs-developed PAC technology to a wider customer base," said Suren Pai, president of Lucent Digital Radio. "PAC will help make digital broadcasting possible, and Lucent wants to provide the largest possible community of developers with an essential building block for this emerging industry."

Lucent Digital Radio uses PAC in its In-Band On Channel (IBOC) DAB system, which will allow radio broadcasters to transmit higher quality sound over AM and FM, and support the introduction of innovative, low-cost data broadcast services.

- more -

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LDR will begin testing its systems over conventional FM stations in the first quarter of 1999, and over AM stations in the second half of the year.

Other product developers interested in working with Lucent Digital Radio on PAC licensing may contact William Casey, Director, Marketing & Sales at 908-580-7008 or williamcasey@lucent.com.

Lucent Technologies and its research and development unit, Bell Laboratories, have been leaders in the digital encoding of information used in communications systems, and have been at the forefront of digital audio broadcasting (DAB) technology for the past decade.

DAB systems are expected to be commercially available starting in 2000. This migration to digital radio presents a sizable opportunity for the consumer electronics industry and will enable radio broadcasters to provide improved services to listeners.

Lucent Digital Radio is the second Lucent venture in the digital broadcast market. Lucent Digital Video, announced in January, 1998, markets its industry-leading MPEG-2 encoders to the broadcast, cable, wireless cable, fiber optic and satellite markets. For more information about Lucent Digital Radio, visit the Web site at www.lucent.com/ldr

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For more information on the TieLine Digital Audio Codec, contact Darren Levy, Marketing Manager on +61 8 9249 6688, or fax +61 8 9249 6858, or email levy@avcom.com.au