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AT&T Wireless Services, Inc. ("AWS") supports the vast majority of its approximately 20 million customers on a nationwide network using the TDMA (ANSI-136) air interface. As specified below, AWS completed deployment of the infrastructure and software necessary for digital-TTY compatibility on the TDMA network prior to the June 30, 2002 deadline, and that feature is now available to consumers.

In addition, AWS is in the process of building a nationwide GSM network. That portion of the operational GSM network served by Ericsson also was TTY-compatible as of June 30, 2002. During field testing of necessary software, AWS and its second GSM vendor, Nokia, discovered critical errors that required AWS to seek a temporary waiver of the deadline for its Nokia GSM markets. On June 28, 2002, the FCC granted AWS's request for a limited waiver of the implementation deadline until September 30, 2002. As described below, AWS has worked aggressively with Nokia to resolve the software problems and remains confident that it will be able to fully deploy TTY-compatibility in its remaining operational GSM markets by the September 30 date approved by the Commission.

Deployment of TTY Capability in the TDMA Network

AT&T Wireless completed deployment of TTY compatible software on all three of its TDMA platforms in accordance with the June 30, 2002 deadline. AWS continues to participate in PSAP testing being overseen by ATIS.

Deployment of TTY Capability in the GSM Network

Ericsson GSM Status:

As noted above, timely compliance was achieved in commercially launched Ericsson GSM markets in accordance with the June 30, 2002 deadline.

Nokia GSM Status:

AWS and Nokia are on schedule with the milestones addressed on page 8 of AWS's Petition For Waiver and expect to achieve full compliance on or before September 30, 2002, as approved by the FCC. AWS will keep the Commission fully informed of any changes that could affect the ultimate compliance date.

Handset Testing and Availability

TDMA Handsets:

AT&T Wireless continues to offer the Panasonic TDMA TTY-capable handsets (models EB-TX310 and EB-TX320) in our retail stores. The Nokia 6360 TDMA TTY-capable handset also

was made available in our retail stores during Q2 of 2002. Throughout Q2, 2002, AWS continued to test additional handset models produced by Motorola, Nokia and Sony/Ericsson.

GSM Handsets:

AT&T Wireless now has a Sony/Ericsson TTY-capable GSM handset available. AWS is testing additional models from Nokia and Motorola, which we expect to be made widely available through AWS's retail stores during Q3 2002.

Progress of TTY-Digital Deployment Solutions
CC Docket No. 94-102
Final Quarterly Report
July 10, 2002

#1 Network infrastructure software development:

Caprock Cellular utilizes Nortel Networks equipment to provide TDMA digital services in Texas RSA 4. A report from Nortel Networks states that development of software is complete, and product tests have been completed as well. Testing was limited to Panasonic prototype handset, as other equipment was not available during the test.

#2 Handset development and testing plans

Caprock Cellular must rely on handset vendors to develop the required handsets. When handsets are available testing can be performed with area PSAPs to insure compatibility.

#3 Beta testing and lab testing

Caprock Cellular must rely on Nortel Networks and handset vendors for initial conformance testing.

#4 Release and general availability to carriers of network infrastructure software

The required software load, MTX10 was deployed March 6, 2002. The switch is in compliance.

#5 Availability to carriers to full acceptance test units

Nortel Networks plans to test and confirm the solution performance during the six-month extension allowed for this purpose.

**Caprock Cellular Limited Partnership
Progress of TTY-Digital Deployment Solutions
CC Docket No. 94-102 - Final Quarterly Report**

#6 Efforts toward achieving digital wireless solution capability with enhanced TTY devices.

The solution provided by the MTX10 software load addresses Baudot type messages only. Other capabilities may be included later, after standards are adopted.

#7 Carrier coordination of testing with PSAP

See response to item #2 above.

#8 Carrier testing activities, including field testing, consumer end-to-end testing, and other necessary tests.

Caprock Cellular will acquire compatible handset when available and test service.

#9 Retail availability of necessary consumer equipment

At this time it is unknown when handsets will be available.

#10 Geographic scope of network infrastructure deployment

The required software load for the cellular switch (MTX10) has been installed. See #4

North Carolina RSA 3 Cellular Telephone Company
d/b/a Carolina West Wireless
TTY Report
Second Quarter 2002

Background

Carolina West Wireless uses TDMA technology
Infrastructure vendor is Nortel
Phone manufactures include Nokia, Motorola and Ericcison

Status

There is no change on the infrastructure status from the last report.

Testing began in mid second quarter concerning the existing service provided to and from the PSAPs and using a Nokia 6360. A test script was sent to each PSAP. Testing results mirror the results that have been reported through ATIS in that PSAPs received only 70% to 75% accurate data from the mobile unit. This high error rate is the result of 20 to 25% character error and unintelligible data being received. Test summaries are as follows:

Surry County, NC No complete accurate data was received.
Conclusion: Possible incompatible equipment at PSAP

Wilkes County, NC No complete accurate data was received
Conclusion: Possible incompatible equipment at PSAP
New equipment at PSAP

Avery County, NC No complete accurate data was received, PSAP could not transmit
Data toward cellular equipment
PSAP expects to replace equipment in the near future.

Beech Mountain Police Dept. was unable to receive data. TDD device not functional

Alleghany County Test inconclusive, old TDD equipment
PSAP may replace equipment in the near future.

Boone, NC Police Dept. No complete accurate data was received
Conclusion: Possible incompatible equipment at PSAP
PSAP expects to replace the equipment in the near future.

Watauga County No complete accurate data was received.
Conclusion: Possible incompatible equipment at PSAP.
PSAP expects to replace equipment in the near future.

Ashe County Test postponed at the request of the PSAP. Will be tested during the third Quarter of 2002.

Very little usage was experienced by any of the PSAPs. None of the PSAP equipment was known to be updated to be compatible with wireless TDD technology. PSAPs have been advised to contact their TDD suppliers and ascertain what modifications will be required.

Equipment testing for mobile to mobile using the Nokia 6360 was successful. Preliminary mobile to mobile test calls proved to be 95% accurate. Motorola has made the V60TI available to us. Ericsson has not yet provided a compatible handset for testing. Further testing both mobile to mobile and mobile to PSAP using both the Nokia 6360 and Motorola V60TI is scheduled for the third quarter of 2002.

Carolina West Wireless continues to actively work with vendors, PSAPs and the TTY Forum to ensure TTY availability as quickly as possible.

TTY Status Report: Second Quarter 2002 Cellular XL Associates, L.P.

July 10, 2002

Network Infrastructure Software Development

Cellular XL Associates, L.P. (Cellular XL) operates a Nortel Wireless 100 (W-100) hybrid wireless and wire line switch in its network. Nortel Networks has no TTY solution for the W-100 switch. To meet TTY requirements, Cellular XL and Nortel Networks have undertaken a project to split the wireless and wire line functionality into two separate switches – a DMS 100 wire line switch and a DMS-MTX wireless switch. Both switches must be in place before the DMS-MTX can be upgraded to the Nortel MTX10 software load required for proper TTY functionality.

Due to the extensive nature of this upgrade, Nortel Networks has informed Cellular XL that it will be unable to complete the upgrade until 4th quarter 2002. Although the software is generally available, Nortel has been focusing its installation efforts on large, nationwide carriers. Nortel has stated it will not complete the extensive software upgrade for Cellular XL before the fourth quarter of 2002. Therefore, Cellular XL has filed a one-year waiver with the FCC as it was unable to meet the compliance deadline of June 30, 2002.

Handset Development and Testing Plans

Cellular XL must rely on handset vendors to provide this solution. Cellular XL is gathering information from handset manufacturers and Nortel in its search for TTY-complaint handsets that Nortel deems compatible with its switch. Cellular XL has so far been unable to find such handsets, but is working with its vendors to acquire handsets as soon as possible.

Beta Testing and Lab Testing

Cellular XL is in contact with handset manufacturers and with Nortel Networks and will be gathering information on handsets Nortel deems compatible with its switch. Once Cellular XL has this information from Nortel, it will acquire handsets and test for compatibility and quality assurance in its own network.

Release and General Availability to Carriers of Network Infrastructure Software

Please see Nortel Networks' 2002 First Quarter Status Report for release and general availability information.

Availability to Carriers of Full Acceptance Test Unit

Cellular XL expects commitments from Nortel Networks to test the performance of their software solution prior to implementation

Efforts Toward Achieving Digital Wireless Solution Compatibility with Enhanced TTY Devices

Cellular XL has been working with Nortel to achieve compliance with several regulatory obligations, including TTY and E911 requirements. As stated above, it was determined that the wireless and wireline functionality of its hybrid switch had to be separated into two distinct switches: a DMS-100 wireline switch and a DMS-MTX wireless switch. Nortel originally told Cellular XL that the switch split would take place in January 2002. That date then slipped to June. Nortel now tells Cellular XL that the switch split will take place in August, at the earliest.

Testing and Deployment Activities

Once network TTY functionality is installed and Cellular XL has the handsets, Cellular XL will begin testing for compatibility and quality assurance within its own network. Presuming Nortel's completion of the switch split does not slip beyond August 2002 and its installation of the MTX10 software load takes place by the end of the fourth quarter, Cellular XL plans to test and deploy full TTY functionality throughout its entire 12-county service area by June 30, 2003.

Carrier Coordination of Testing with PSAP

Cellular XL has excellent relationships with the PSAP's in its service area and intends to utilize that relationship to assure complete communication functionality between handsets and PSAP's.

Carrier Testing Activities, Including Field Testing, Consumer End-To-End Testing, and other Necessary Tests

Cellular XL is a small carrier operating in two RSA's in South Mississippi. Once handsets have been acquired and network TTY functionality is installed, Cellular XL will begin testing. Testing will involve primarily three groups: Cellular XL engineers and technicians, PSAP representatives, and consumers. The University of Southern Mississippi has an active program assisting hearing-impaired people in this area and is one of many resources that will be utilized as a source of consumer test subjects.

Retail Availability of Necessary Consumer Equipment

Cellular XL intends to make consumer equipment available through all of its normal retail and direct sales outlets.

Geographic Scope of Network Infrastructure Deployment

Cellular XL operates its network in two relatively small RSA's in South Mississippi: MS 10 and MS 11. These two RSA's consist of 12 counties. Cellular XL will deploy the TTY solution over its entire network within this operating area.

TTY Contact:

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July 8, 2002

To: TTY Forum

From: Susan Palmer and Ken Evans

TTY Forum #22 Report
Cingular Wireless LLC

Overview

Cingular Wireless LLC (Cingular) is pleased to report that as of June 28, 2002, its' digital network supports TTY as per the FCC mandate. TTY call testing was conducted in each switch in our network. Results of these test calls indicate that Cingular Wireless service will be provided in a highly reliable fashion with acceptable total character error rates (TCER). TTY compatible handsets are available from three manufacturers in both GSM and TDMA markets. Cingular has provided training and general TTY information to our sales people and the National Center for Cingular Customers with Disabilities. The National Center for Cingular Customers with Disabilities provides customer support via a direct TTY phone number 1-866-241-6567. This number is listed on Cingular Wireless website and bills next to the general, voice-based, customer care number. Cingular Wireless has also strongly encouraged its handset vendors to continue to design, develop and manufacture handsets that provide TTY access.

Cingular completed 6 weeks of testing of the TTY solution with deaf and hard of hearing TTY users. This testing was conducted to identify usability issues and to confirm that the necessary network, handset and customer interfaces are in place. A number of interface issues were identified and corrected prior to June 30, 2002. Some TTY and handset usability issues were referred to specific manufacturers to address in future models.

Going forward, Cingular will continue to participate in ATIS sponsored interoperability testing to insure cross network compatibility. This will include TTY Forum work with NENA and others to address the difficulties some PSAPs have with TTY signals over digital wireless networks.

USER TESTING

Cingular worked with the Rehabilitation Engineering Research Center at Gallaudet University, a nationally recognized Deaf research organization specializing in Telecommunications access, to insure that the TTY solution is viable. The evaluations at Gallaudet involved deaf individuals using the TTY products on a commercial switch to evaluate the network performance; usability of the interface to the wireless handset and the TTY terminal; and the customer service interface

provided via TTY and TRS. As a result of having real users try the service, several issues with customer service interface, Telecommunications Relay Service, usability of portable TTYs and handsets were identified and corrected. Cingular Wireless is grateful to Dr. Judy Harkins and her staff at Gallaudet for the valuable assistance they provided.

Corr Wireless Communications, L.L.C.

Corr Wireless has completed installing the necessary software into its switch.

Corr Wireless completed successful TTY test calls to the 911 centers in Blount County, Alabama and Cullman County, Alabama using a NOKIA 6360 TDMA phone and digital Compact/C TTY from Ultratec, Inc. Corr has not tested the unit in all PSAPs served by its system but is planning tests in all of them.

Network Infrastructure TTY Status for Ericsson Inc.

Second Quarter 2002 Report

July 10, 2002

This report details the TTY Network Infrastructure status provided by Ericsson Inc. at the June 4th, 2002 TTY Forum 22. This report identifies that all development and testing has been completed for all technologies (CDMA, TDMA and GSM). All network infrastructure products have been released to our customers and have achieved General Availability status.

Ericsson has completed the development of TTY technology intended for integration within its products. These products have been built to the approved ballot standards from the industry. The development testing has been completed for all of the Ericsson products, and the products have been demonstrated to the carriers in a number of test events within the FCC required deadlines. As products completed the development testing, they have also completed carriers' acceptance testing. In general, the technical feasibility to transport TTY across the digital cellular systems has been proven by the product operability testing. Results have been published for TDMA, GSM and CDMA infrastructure demonstrations although isolated technical flaws and system integration issues continue to be identified in the product test and carrier test phases.

While handset to infrastructure compatibility testing has taken place between several manufacturers, there continues to be an incurred risk to interoperability testing for manufacturers that have missed the initial testing. Identifying and resolving any outstanding performance objectives will require continued involvement and cooperation among the manufacturers, carriers, 911 PSAP facilities, standards organizations, and governing bodies. Ericsson continues to test TTY compatible products as needed, participate and monitor the industry standards and test events, and work with the regulatory bodies and the ATIS Incubator.

1) Network Infrastructure Development:

TDMA Status:

TDMA network infrastructure has completed product development and testing and has released a Package B of the TTY TDMA solution which includes the Positron Express and Nokia handset interoperability fixes.

TDMA Plans:

The Ericsson TDMA infrastructure has been Generally Available since April 3rd, 2002 and the product is being deployed.

GSM Status:

GSM network infrastructure has completed product development and system verification and the CTM node solution is complete. The GSM infrastructure solution FOA'd with Cingular in December 2001 and January 2002 and the software General Availability was achieved on February 25, 2002.

GSM Plans:

The Ericsson GSM TTY solution has been Generally Available since February 25th, 2002 and the product is being deployed.

CDMA Status:

Software code development for the network infrastructure solution is complete. Lab and integration tests are complete.

CDMA Plans:

The CDMA TTY commercial solution has been Generally Available since May 28th, 2002 and the product is being deployed.

2) Handset Development and Testing Plans;

Reported by Sony Ericsson.

3) Beta Testing and Lab Testing;**TDMA Infrastructure Beta Testing and Lab Testing**

Testing of the Positron problem and TTY_Silence was completed on March 1st, 2002.

GSM Infrastructure Beta Testing and Lab Testing

Ericsson lab test is complete. Terminal and PSAP testing have completed successfully. Error rates of less than 1-% have been demonstrated.

To date, there are no outstanding technical issues.

CDMA Infrastructure Beta Testing and Lab Testing

The TTY development Beta Testing and Lab Testing are completed and ready for commercial roll out. One final software load is kept in the Qwest ITC Lab for additional non-TTY related integration tests.

4) Release and General Availability to Carriers of Network Infrastructure Software;

The initial TDMA network software was declared General Availability (GA) on December 5, 2001. The new TDMA network software was declared GA on April 3, 2002.

The GSM System solution was declared General Availability (GA) with GSM R9.0, on February 25, 2002. Rollouts started in April 2002.

The CDMA TTY solution has been rolled out for Cricket market and ready to be rollout for other North American customers. The BSS Release 8.6 is scheduled to declare GA on July 12 for non-TTY related capabilities.

5) Availability to Carriers of Full Acceptance Test Units;

- *TDMA Network Infrastructure October 22, 2001*

- *New TDMA Network Infrastructure, March 4, 2002*
- *GSM Network Infrastructure November 30, 2001*
- CDMA Network Infrastructure was available on February 8, and completed on May 10, 2002.

6) Efforts Toward Achieving Digital Wireless Solution Compatibility with Enhanced TTY Devices.

Ericsson Inc. continues to support all other manufacturers and carriers on the TTY compatibility mandate.

7) Testing and Deployment Activities

Ericsson Inc. works with the operators/carriers in the test and deployment of network infrastructure systems. In addition, Ericsson Inc. works with the ATIS Incubator (TTSI) and participates in TTSI test events as scheduled.

Infrastructures for TDMA, GSM and CDMA have all attained General Availability and are now supported as released Ericsson products.

Ericsson Inc. would again like to express our appreciation for all of the test efforts and support we have received regarding TTY capability. Testing with operators, carriers, TTSI, Lucent, AWS, Cingular, DSPG, HITEC, Positron, and others contributed significantly to achieving the successes and results we have obtained so far.

8) Risks

The issue of continuing concern remains the issue of PSAP interoperability problems. The reality that these problems still have not been completely resolved poses an obstacle to the ability to provide 911 service over the wireless network. The wireless industry is interested in the commitment of both NENA and emergency services to assist with the resolution of this issue.

Outstanding issues are being circulated within the TTSI through the defined maintenance rollout effort.

Please feel free to contact Stephen Hayes if you have any questions regarding this report, or wish to contact test or product interfaces. Please contact your local customer interface for product sales and marketing information.

Midwest Wireless Holdings L.L.C
TTY Status Report
July 2, 2002

Background

Midwest Wireless Holdings L.L.C. is a rural carrier that operates TDMA digital Cellular service in its Minnesota, Iowa, and Wisconsin markets. Due to the complexity of this issue, Midwest Wireless is reliant on its switching vendor, Nortel Networks, for the necessary switch software, and the capabilities of products from our two major handset providers, Nokia and Motorola, in order for our company to be compliant.

Status

The TTY compliant Nortel switch software (MTX10) was purchased and installed in Midwest Wireless switching systems during May 2002. A limited quantity of compliant Nokia handsets are on hand, and the testing results to date have been positive. We believe that Midwest Wireless is currently compliant, and has met the June 30, 2002 deployment date.

Respectfully submitted
Gary Christopherson
Midwest Wireless Holding L.L.C.

July 8, 2002

Via Electronic Mail and Federal Express

Ed Hall
The Alliance for Telecommunications Industry Solutions
1200 G Street, NW
Suite 500
Washington, DC 20005

Dear Mr. Hall:

Motorola is pleased to submit our final status report related to implementation of TTY compatibility in our digital phones and infrastructure. Motorola is a domestic supplier of cellular handsets in TDMA, CDMA, GSM, and iDEN technologies. We also provide infrastructure equipment in CDMA and iDEN technologies.

We have worked closely with our carrier customers to provide them with the equipment necessary to meet the Federal Communications Commission's June 30, 2002 TTY deployment deadline. As of this report, Motorola has completed its efforts to enable these carriers to meet their obligations.

The attached report is provided to the TTY Forum for its report to the Commission for the second quarter of 2002. This will be our final report unless otherwise instructed by the Federal Communications Commission. Please contact me at the number below if you have any questions.

Regards

Rex Ellington
Senior Operations Manager
Product Safety & Compliance
Motorola – Personal Communications Sector
Voice: (815) 884-4315

Enclosure

MOTOROLA
TTY COMPATIBILITY DEVELOPMENT STATUS REPORT
2nd Quarter 2002

Product	Standard	Status	Milestones	Progress
CDMA Handset	IS 127-3 IS 733-2	Carrier deployment	IOT: June 2001 UI: October 2001 ROM: December 2001 SA: May 2002	Handset development work complete. V60i and V120c CDMA phones have been approved for shipment.
GSM Handset	TS 26.226 TS 26.230 TR 26.231	Carrier deployment	UI: October 2001 IOT: October 2001 ROM: January 2002 SA: July 2002	Handset development work complete. V60i GSM phone has been approved for shipment. P280i expected to be approved for shipment in July
iDEN Handset		Carrier deployment	Production handsets available to carriers.	Handset work complete.
TDMA Handset	IS 823-A IS 840-A	Carrier deployment	IOT: September 2001 UI: September 2001 ROM: October 2001 SA: April 2002	Handset development work complete. V60i and V120t TDMA phone has been approved for shipment.
CDMA Infrastructure	IS 127-3 IS 733-2	Carrier deployment	FOA Jan 02 Software release available	Carrier testing complete.
iDEN Infrastructure		Carrier deployment	Production software available to carriers	Infrastructure software available for carrier deployment.

Note: Motorola works with its carrier customers to provide them specific information related to their respective products.

Note: IOT is Inter Op Testing with RAM based parts for Character Error Rate testing
 UI is User Interface testing with HCO / VCO support
 ROM is the availability of ROM based phones. These should be functionally identical to a RAM phone.
 SA is Ship Acceptance of production volume quantities

Rex Ellington
 Product Safety & Compliance
 Motorola – Personal Communications Sector
 Phone: 815-884-4315



Nextel Communications, Inc.
2001 Edmund Halley Drive, Reston, VA 20191

July 10, 2002

Via Electronic Mail and Federal Express

Megan Hayes
The Alliance for Telecommunications Industry Solutions
1200 G Street, NW
Suite 500
Washington, D.C. 20005

Re: Nextel Communications, Inc. Second Quarter 2002 Report to the TTY Forum

Dear Ms. Hayes:

Pursuant to the Fourth Report and Order ("Fourth R&O") of the Federal Communications Commission ("Commission") in CC Docket No. 94-102,³ Nextel Communications, Inc. ("Nextel") hereby submits this final report on the status of its efforts to attain TTY accessibility on its iDEN handsets and national digital network. For several years, Nextel has worked closely with its vendor, Motorola, Inc. ("Motorola"), to research, develop and deploy TTY accessibility capabilities in the iDEN platform. Nextel is pleased to report that, as of June 30, 2002, six TTY-compatible iDEN handsets were available for use anywhere on Nextel's nationwide network.

Specifically, Nextel's i85s, i50sx, i55sr, i80s, i90c or i95cl are TTY compatible, and with the rollout of new software throughout Nextel's network, this TTY accessibility is available on these particular handsets in every Nextel market. To ensure that Nextel's customer base is aware of this new TTY capability, Nextel included a message in its July billing cycle announcing the launch of this new capability and specifying the handsets with which TTYs can be used.

Finally, although Nextel has successfully and timely launched the TTY capability in its network and handsets, Nextel continues to work with the Alliance for Telecommunications Industry Solutions ("ATIS") to find solutions to compatibility issues ATIS recently discovered in Public Safety Answering Point ("PSAP") TTY equipment. Due to the large number of TTY vendors, and their differing technologies and standards, ATIS discovered that some PSAP TTY equipment may have trouble receiving error-free calls from digital wireless handsets using TTY devices. Therefore, Nextel is working with ATIS to assist it in addressing this PSAP issue.

³ *In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Calling Systems*, Fourth Report and Order, CC Docket No. 94-102, FCC 00-436, released December 14, 2000 ("Fourth R&O").

Nextel appreciates the opportunity to provide this final report to the TTY Forum and is pleased to announce that its deployment of TTY capabilities in the iDEN network were completed prior to the Commission's June 30, 2002 deadline. If you have any questions about this report, please do not hesitate to contact me at 703-433-8315.

Sincerely,

Robert D. Montgomery
Senior Manager – Regulatory Technology Development

Enclosed is information regarding Nortel Networks plans to deliver a TTY solution in support of TDMA service providers' ability to meet the FCC TTY milestone objective.

- What is the status of TTY/TDD network infrastructure **software/hardware development and testing**?

Nortel response: Nortel Networks has completed development and testing activities regarding TDMA TTY/TDD functionality. End-to-end system validation within operator networks has also been completed. This TDMA TTY/TDD solution was tested to be compliant to IS-823A (TTY/TDD Extension to TIA/EIA 136-410 Enhanced Full Rate Speech Codec) for the EFRC Codec, and to IS-840. Nortel Networks has tested this feature with alpha/beta handsets from a few major vendors, which have all shown positive results*. We have also received TTY capable mobile handsets containing commercial TTY software from major vendors, which have shown excellent interoperability test results. Nortel Networks has also performed tests with a leading manufacturer of TTY/TDD (Teletypewriter /Terminal for Deaf Device) PSAP (Public Service Answering Point) equipment to ensure interoperability. Results of that specific testing were found to be positive.

Nortel Networks plans to support new and evolved standards in this year's next software releases. A more robust version of the TTY/TDD functionality is to be delivered within the MTX11 software release. MTX11/NBSS11 is scheduled to be generally available (GA) Q4 2002. This new TTY/TDD version has completed internal testing and has shown greatly improved robustness* when used with certain widely used, but older versions of PSAP equipment that may have issues fully meeting TTY standards.

Operators will be able to deploy Nortel Networks current TTY solution i.e. MTX10, which is based on the IS-823A and IS-840 standards, to meet the FCC deadline for implementation.

- For TTY/TDD what are the plans to work with any wireless carrier to perform **end-to-end customer tests**, and when will this occur?

Nortel response: The verification process with Nortel Networks lead customers for the MTX10 software version of the TTY/TDD functionality has completed as of January 2002. The Nortel Networks TTY/TDD solution showed TCER (Total Character Error Rate) of less than 1% in most cases and marginally exceeded 1% TCER in only the most strenuous RF and TTY/TDD test conditions. Nortel Networks used several different TTY mobile terminals during these test activities*. Please note the 1% TCER is not part of the FCC mandate.

A more robust version of the TTY/TDD functionality is to be delivered within the MTX11 software release, which begins end-to-end lead customer validation testing later this summer.

Operators are encouraged to request their handset vendors to test their commercial-grade TDMA TTY capable handsets in Nortel Networks Wireless Interoperability Test Lab.

***Nortel Networks acknowledges that the positive results of the TTY/TDD software feature is a direct function of the TTY/TDD equipment available to Nortel Networks and their lead customer verification partners at the time of TTY/TDD development, testing, and full network verification. Also note that some of the commercially deployed PSAP equipment, consumer TTY/TDD devices, and TTY/TDD capable digital mobile terminals will not comply with the same published standards from which Nortel Networks TTY/TDD solution was developed and tested. This reality will impact wireless operators who strive to deliver the best quality solution. Some operator effort will be required to procure the proper permutation of TTY/TDD equipment to inter-work with Nortel Networks TTY/TDD infrastructure software.**

Nortel Networks

- What is the Network infrastructure software/hardware **planned general availability dates** that support the deployment of this regulatory feature?

Nortel response: In order that wireless network operators may comply with the FCC's June 30, 2002 requirement for TTY/TDD implementation, Nortel Networks has made TTY/TDD enabling software available as follows:

Software load	TDMA SW general availability
MTX10 TDMA (incl. EDSPM)	Now Available (January 2002)

- What are the **hardware baseline and software baseline** to support TDMA TTY/TDD functionality?

Nortel response:

Regulatory solution required	TDMA HW/SW baseline
TTY/TDD	EDSPM SW for the ICP; MTX10 SW for the DMS-MTX** TTY capable handsets (3 rd party)

**Please note that the MSC itself must meet certain hardware requirements in order to upgrade to the MTX10 version of software e.g. processor speeds, memory size. These requirements were communicated to customers in the year 2000. Nortel Networks customer account team personnel churn related to Nortel Networks 2001 downsizing activities impacted some smaller customers. In these instances communication did not occur until Q2 2001.

- What is the **schedule for deployment** of the software/hardware in the network?

Nortel Networks response: The minimum baseline software requirements for this functionality are given above. For questions related to scheduling its deployment into an operator's network, please contact Nortel Networks Product Deployment. Most of Nortel Networks U.S. TDMA customers (>50%) have already upgraded to MTX10 and are therefore TTY/TDD ready. Most of the *remaining* TDMA customers operate smaller networks and are currently showing plans to order and/or schedule a full network MTX10 upgrade after June 30, 2002. Many of these smaller customers that have yet to upgrade have significant hardware prerequisites to procure prior to being able to upgrade their MTX software baseline release. Many of these same operators have scheduled MTX10 for later this year, which is when these mitigating baseline issues delaying switch readiness are closed. Other operators may choose to migrate their networks to improved digital technologies e.g. CDMA or GSM. There is relatively small portion of rural cellular customers that from whom Nortel Networks has not received confirmation of upgrade plans.

Nortel Networks recommends that all customers who have not yet ordered and scheduled upgrade MTX10 to please contact Nortel Networks to ensure the most expeditious MSC upgrade.

Nortel Networks

- What are Nortel Network's plans to **test their own or other vendor handsets** with your switch solution?

Nortel Networks response: Nortel Networks provides only infrastructure for wireless networks. Nortel Networks does not provide mobile handsets. Nortel Networks recommends that the operator engage its handset vendor(s) in order to respond to the FCC regarding handset availability and interoperability test results with Nortel Networks infrastructure.

Operators are encouraged to request their handset vendors to test their commercial grade TDMA TTY capable handsets in Nortel Networks Wireless Interoperability Test Lab.

Please contact Gerry Chaparro for scheduling TTY testing in the Nortel Networks Wireless Interoperability Test Lab, where testing is based on current published standards (Phone: 972-684-4622; Fax: 972-684-3881; <mailto:chaparro@nortelnetworks.com>)

- **Contacts:**

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Product Management	TDMA TTY/TDD	Doug Kinnaird	(403) 769-8461
Regulatory	TTY/TDD	Charles Spann	(903) 852-6798
Product Deployment	MTX/NBSS SW	Mark Schwarzer	(972) 685-5851

Enclosed is information regarding Nortel Networks status to deliver TTY solutions to market in support of CDMA service providers' ability to meet FCC TTY milestone objectives.

- What is the status of TTY/TDD network infrastructure **software/hardware development and testing**?

Nortel Networks response: Regarding the MTX10/NBSS10.x release, Nortel Networks has completed development, product test and verification. Nortel Networks has completed internal testing using prototype and more recently using commercial mobile handsets with TTY capabilities from a few vendors, which have all shown positive results. Nortel Networks does not anticipate performance issues with any other vendor's handsets once they become available provided they are based on published standards. Nortel Networks has also performed tests with a leading manufacturer of TTY/TDD (Teletypewriter /Terminal for Deaf Device) PSAP (Public Service Answering Point) equipment to ensure interoperability. Results of that specific testing were found to be positive*. This completed TTY/TDD solution is based on standards: IS-127-2 (EVRC) & IS 733-1 (13K Vocoder). Operators will be able to deploy the Nortel Networks TTY solution based on these original standards IS-733-1, IS127-2 to meet the FCC deadline for implementation.

New revisions of these standards namely IS-127-3 (EVRC TTY) & IS-733-2 (13K TTY) have been published as of September 2001. Nortel Networks plans to support this new addendum to the standards in our next scheduled software release, MTX11/NBSS11, which is scheduled to be generally available (GA) Q4 2002. Product testing for this newer, more robust TTY/TDD software based on the revised CDMA standards is currently underway. The latest test results have shown, under a variety of test conditions, that the TCER (Total Character Error Rate) is less than a percent. These positive results have been repeatable when interoperating with mobile terminals with TTY capabilities from a variety of different vendors who could make their test phones available to Nortel Networks during the testing of this TTY enhancement. Nortel Networks did conclude during interoperability that a few mobile terminals were attributing to a higher than usual TCER due to TTY algorithms internal to those handsets being less than the most current version at the time of testing. These vendors have taken steps to update their mobiles to the latest code; therefore Nortel Networks foresees no issues with interoperability with those mobile terminals in the future.

- For TTY/TDD what are the plans to work with any wireless carrier to perform **end-to-end customer tests**, and when will this occur?

Nortel Networks response: The verification process for MTX10/NBSS 10.1.2 version of the TTY/TDD functionality with Nortel Networks lead customers was completed as of January 2002. The Nortel Networks TTY/TDD solution showed TCER of less than 1% in most cases and marginally exceeded 1% TCER in only the most strenuous RF and TTY/TDD test conditions*. Nortel Networks used several different TTY mobile terminals during these test activities. Please note the 1% TCER is not part of the FCC mandate.

A more robust version of the TTY/TDD functionality based on the revised CDMA standards is to be delivered within the MTX11/NBSS11.0 software release, which begins end-to-end lead customer validation testing later this summer.

Operators are encouraged to request their handset vendors to test their commercial-grade CDMA TTY capable handsets in Nortel Networks Wireless Interoperability Test Lab.

*Nortel Networks acknowledges that the positive results of the TTY/TDD software feature is a direct function of the TTY/TDD equipment available to Nortel Networks and their lead customer verification partners at the time of TTY/TDD development, testing, and full network verification. Also note that some of the commercially deployed PSAP equipment, consumer TTY/TDD devices, and TTY/TDD capable digital mobile terminals will not comply with the same published standards from which Nortel Networks TTY/TDD solution was developed and tested. This reality will impact wireless operators who strive to deliver the best quality solution. Some operator effort will be required to procure the proper permutation of TTY/TDD equipment to inter-work with Nortel Networks TTY/TDD infrastructure software.

- What is the Network infrastructure software/hardware **planned general availability dates** that support the deployment of this regulatory feature?

Nortel response: In order that wireless network operators may comply with the FCC's June 30, 2002 requirement for TTY/TDD implementation, Nortel Networks has made TTY/TDD enabling software available as follows:

Software load	CDMA SW general availability
MTX10/ NBSS10.x	Now Available (January 2002)

- What are the **hardware baseline and software baseline** to support CDMA TTY/TDD functionality?

Nortel Networks response:

Regulatory solution required	CDMA HW/SW baseline
TTY/TDD	NBSS10.x SW (BSS)** TTY capable handsets (3 rd party)

****Note:** NBSS10.x will operate with MTX09 software, however this configuration will only be supported for 30 days. NBSS software is only fully supported on the previous MTX software version as a step to upgrading to the most current MTX version. I.E. All customers require MTX10 software to not only maintain a supported NBSS10.x load, but to also enable the regulatory feature set contained in MTX10 e.g. CALEA, LNP, E911 phase 2.

Please also note that the MSC itself must meet certain hardware requirements in order to upgrade to the MTX10 version of software e.g. processor speeds, memory size. These requirements were communicated to customers in the year 2000. Nortel Networks customer account team personnel churn related to Nortel Networks 2001 downsizing activities impacted some smaller customers. In these instances communication did not occur until Q2 2001.

- What is the **schedule for deployment** of the software/hardware in the network?

Nortel Networks response: The minimum baseline software requirements for this functionality are given above. For questions related to scheduling its deployment into an operator's network, please contact Nortel Networks Product Deployment. The majority of Nortel Networks U.S. CDMA customers (>75%) has already upgraded to MTX10/NBSS10.x software and is therefore TTY/TDD ready. Most of the *remaining* CDMA customers are currently showing plans for MTX10/NBSS10 upgrade after June 30, 2002. Many of these smaller customers that have yet to upgrade have significant hardware prerequisites to procure prior to being able to upgrade their MTX and BSC baseline software version. Many of these same operators have scheduled MTX10/NBSS10.x release for later this year, which is when these mitigating baseline issues delaying switch readiness are closed. There are a relatively small number of rural cellular customers that from whom Nortel Networks has not received confirmation of their upgrade plans.

Nortel Networks recommends that all customers who have not yet ordered and scheduled upgrade MTX10/NBSS10.x to please contact Nortel Networks to ensure the most expeditious network upgrade.

- What are Nortel Networks **plans to test their own or other vendor handsets** with your switch solution?

Nortel Networks response: Nortel Networks provides only infrastructure for wireless networks. Nortel Networks does not provide mobile handsets. Nortel Networks recommends that the operator engage its handset vendor(s) in order to respond to the FCC regarding handset availability and interoperability test results with Nortel Networks infrastructure.

Operators are encouraged to request their handset vendors to test their commercial grade CDMA TTY capable handsets in Nortel Networks Wireless Interoperability Test Lab.

Please contact Cher Bruce for scheduling TTY testing in the Nortel Networks Wireless Interoperability Test Lab, where testing is based on current published standards (Phone: 972-684-2299; Fax: 972-684-3881; csbruce@nortelnetworks.com)

- **Contacts:**

Product Marketing	MTX10/NBSS10.x SW	Kurt Raaflaub	(972) 685-2971
Product Management	CDMA TTY/TDD	Maniam P	(972) 685-7203
Regulatory	E911Ph2&TTY/TDD	Charles Spann	(903) 852-6798
Product Deployment	CDMA NBSS SW	Mark Schwarzer	(972) 685-5851

Customer Response Template TTY/911 for GSM Systems
Date: 07-10-02 Version: TTYGSM002

Nortel Networks Solution Status- July 10th, 2002

Overview

Nortel Networks TTY Solution for GSM network consists of software for the BSS (applied on the Transcoding Unit (TCU)) and the Mobile Switching Center (MSC).

The TTY software for the BSS has been validated at a customer site and is commercially available since the end of May 2002 in the BSS V14.2d software release.

The TTY Software for the MSC has been validated at a customer site and is commercially available since March 2002 in the MSC NSS13 software load.

Baseline Software

MSC: NSS13, commercial availability date; Wk12 2002

BSS: V12.4d, commercial availability date; Wk 21 2002

Baseline Hardware:

MSC: SR70EM or XA-Core(3+1)

BSC: BSC/TCU12000

BTS: All BTS products

Summary of Inter-Operability Testing and Results

Nortel Networks has completed inter-operability testing with the following TTY terminals and device vendors.

- Motorola (TTY devices used: Q90 Ameriphone, Compact Ultratech, Ezcom Pro Ultratech)
- Ericsson (TTY devices used: Q90 Ameriphone, Compact Ultratech)
- Nokia (TTY devices used: Q90 Ameriphone, Compact Ultratech)

Nortel Networks demonstrated character error rates in compliance with the FCC target of less than 1%. These results were achieved with the devices mentioned above.

Verification results

Nortel Networks has completed development and testing activities regarding GSM TTY functionality. End-to-end system validation within operator networks has been completed May 2002, as part of the software verification. The GSM TTY solution was tested to be compliant with FCC requirements, and demonstrated character error rates in compliance with the target 1% error rate and in all cases lower than the 1% error rate.

Nortel Networks acknowledges that the positive results of the TTY software feature is a direct function of the TTY equipment available to Nortel Networks and their lead customer verification partners at the time of TTY development, testing, and full network verification.

Please direct all queries to-

GSM Americas PLM	Bruno Villa	(972)-684-0762
Regulatory	Charles Spann	(903)-852-6798

***Pine Belt Cellular, Inc.
3984 County Road 32
P. O. Box 279
Arlington, Alabama 36722***

TTY Report – July 10, 2002

Pine Belt Cellular, Inc. is completely reliant upon its vendors to implement the TTY solutions in its handsets and network. Pine Belt does not have the ability to independently verify the release dates of the solutions that will be provided by the vendors.

1.) Network infrastructure software development:

Lucent Technologies, our switch and infrastructure manufacturer is aware of the TTY requirements. Our understanding is that Lucent is currently working on software solutions at this time. Pine Belt is dependent upon Lucent providing these solutions.

2) Handset development and testing plans:

Pine Belt Cellular uses handsets made by a number of manufacturers. The manufacturers most predominantly used by Pine Belt are Motorola, Nokia, and Kyrocera. Pine Belt will stay abreast of the developments by these manufacturers so when TTY solutions are made available, we will be able to provide these units to our customers as soon as possible.

3) Beta testing and lab testing:

Pine Belt Cellular will begin testing TTY compatible equipment as soon as both our handset and infrastructure manufacturers provide solutions to us.

4) Release and general availability to carriers of network infrastructure software

Pine Belt Cellular is awaiting updated reports of software availability from switching and infrastructure vendors.

5) Availability to carriers of full acceptance test units:

Pine Belt Cellular is awaiting software and hardware availability from switching, infrastructure, and handset vendors.

6) Efforts toward achieving digital wireless solution compatibility with enhanced TTY devices:

Pine Belt Cellular remains dependent upon the availability of vendor provided solutions to meet the FCC's tentatively mandated timeline (12-31-01) to provide E911 TTY access to our networks.

7) Carrier coordination of testing with PSAP:

This testing target date is dependent upon solutions provided by network infrastructure vendors and handset vendors.

8) Carrier testing activities, including field testing, consumer end-to-end testing, and other necessary tests:

Testing will begin immediately upon receipt of software and hardware. Pine Belt Cellular is dependent upon network infrastructure vendor solutions.

9) Retail availability of necessary consumer equipment:

Pine Belt Cellular is dependent upon the availability of handsets from vendors. No firm commitment has been received at this time from handset vendors.

10) Geographic scope of network infrastructure deployment:

Pine Belt Cellular service area: Alabama RSA3B2 & BTA415