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**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY**

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.**

In the Matter of)
)
Revision of the Commission's Rules)
To Ensure Compatibility with)
Enhanced 911 Emergency)
Calling Systems)

CC Docket No. 94-102
RM-8143

To: Chief, Wireless Telecommunications Bureau

**PETITION FOR EXTENSION OF THE TIME IN WHICH TO COMPLY WITH SECTION 20.18(C)
OF THE COMMISSION'S RULES OR, IN THE ALTERNATIVE, A WAIVER**

Powertel, Inc., by itself and on behalf of its subsidiaries (together "Powertel"),¹ pursuant to 47 C.F.R. § 1.3 and the Commission's *Order*, DA 98-2323, released November 13, 1998 (the "*Order*"), hereby petitions for extension of time in which to comply with 47 C.F.R. § 20.18(c) or, in the alternative, a waiver of the rule. Such action is appropriate because the equipment necessary for the transmission of 911 calls made from TTY devices does not currently exist and, as such, compliance with Section 20.18(c) is not readily achievable. In support of this Petition, the following is respectfully shown:

I. Introduction

Powertel is a broadband PCS and cellular licensee operating digital wireless telecommunications networks. Digital wireless carriers, through their associations and in conjunction with manufacturer, have been working on the capabilities to comply with Section

¹ Powertel's subsidiaries include: InterCel Licenses, Inc., Powertel Atlanta Licenses, Inc., Powertel Birmingham Licenses, Inc., Powertel Jacksonville Licenses, Inc., Powertel Kentucky Licenses, Inc., Powertel Knoxville Licenses, Inc., Powertel Memphis Licenses, Inc., Powertel Nashville Licenses, Inc., Powertel/Atlanta, Inc., Powertel/Birmingham, Inc., Powertel/Jacksonville, Inc., Powertel/Kentucky, Inc. and Powertel/Memphis, Inc.

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20.18(c). Those capabilities do not yet exist.² As such, Powertel's ability to comply with the requirements of Section 20.18(c) by December 31, 1998, is not readily achievable.

II. Compliance With Section 20.18(c) Of The Commission's Rules Is Not Readily Achievable

Section 20.18(c) of the Commission's Rules requires that licensees "must be capable of transmitting 911 calls from individuals with speech or hearing disabilities through means other than mobile radio handsets, *e.g.*, through the use of Text Telephone Devices."³ Section 20.18(c) was promulgated under Section 255 of the Communications Act of 1934, as amended (the "Act"). Section 255 of the Act provides that:⁴

A provider of telecommunications service shall ensure that the service is accessible to and usable by individuals with disabilities, if, *readily achievable*.⁵

Powertel's compliance with Section 20.18(c) of the Commission's Rules is not *readily achievable* because its equipment suppliers have not yet developed such capabilities. In such circumstances, Powertel has no obligation under either Section 255 or, as a result, Section 2018(c).

² The wireless telecommunications industry, manufacturers of TTY equipment, emergency and relay providers, and consumer organizations that represent individuals who are deaf and hard-of-hearing have undertaken collaborative efforts through the Wireless TTY Forum to develop technically feasible solutions for TTY users regarding 911 access over digital wireless systems.

³ 47 C.F.R. § 20.18(c).

⁴ In *Enhanced 911 Emergency Calling Systems*, 3 CR 967 (1996), the order promulgating Section 20.18(c), the Commission made specific reference to Section 255 in the "Access To Text Telephone Devices" section of the order. *See* 3 CR 967 at ¶ 47 and fn. 68.

⁵ 47 U.S.C. § 255(c) (*emphasis added*).

For the purposes of Section 255, the term “readily achievable” means “easily accomplishable and able to be carried out without much difficulty or expense.”⁶ Because the equipment necessary to comply with Section 20.18(c) does not yet exist, compliance with Section 20.18(c) by Powertel is not readily achievable under the definition of that term. Additionally, when considered in light of the factors used to determine whether an action is readily achievable, particularly the “nature . . . of the action,” because the development of the equipment is a *prerequisite* to compliance with Section 20.18(c) -- there is no question that compliance with Section 20.18(c) is not readily achievable at this time. If Powertel’s suppliers and the industry as a whole have not developed the necessary equipment despite their effort to date, it is simply impossible to comply at this time. Powertel does not have the independent ability to develop the network capabilities that the Commission determined, through 20.18(c), are required by Section 255.

Pursuant to Section 255(c) of the Act, and in light of the foregoing, the Commission should extend the Section 20.18(c) compliance date as it applies to Powertel or provide some other form of appropriate relief until such time compliance is readily achievable.

⁶ See 47 U.S.C. § 255(a)(2) and 42 U.S.C. § 12181(9). In determining whether an action is readily achievable, Section 42 U.S.C. § 12181(9) provides the following factors for consideration:

- (a) the nature and cost of the action needed under this chapter;
- (b) the overall financial resources of the facility or facilities involved in the action; the number of persons employed at such facility; the effect on expenses and resources, or the impact otherwise of such action upon the operation of the facility;
- (c) the overall financial resources of the covered entity; the overall size of the business of a covered entity with respect to the number of its employees; the number, type, and location of its facilities; and
- (d) the type of operation or operations of the covered entity, including the composition, structure, and functions of the workforce of such entity; the geographic separateness, administrative or fiscal relationship of the facility or facilities in question to the covered entity.

II. In The Alternative, The Commission Should Waive Section 20.18(c)

If the Bureau determines not to grant an extension to Powertel based upon the readily achievable standard of Section 255 of the Act, by this Petition, Powertel alternatively seeks a waiver of Section 20.18(c) until such time as compliance is readily achievable. A waiver is appropriate because, until the equipment is available for Powertel to comply with Section 20.18(c), the rule as applied to Powertel is unjust.⁷ Additionally, a waiver is appropriate because this temporary deviation from Section 20.18(c) will allow the Wireless TTY Forum to finish its work regarding a standard for the wireless digital TTY device capability.

Powertel requires a waiver of Section 20.18(c) because it will not be able to comply with the rule on December 31, 1998.⁸ No amount of effort on Powertel's behalf will cure this fact. The Commission must understand that, although it placed the obligation of compliance with Section 20.18(c) on the licensees, until the equipment necessary to implement Section 20.18(c) is commercially available, carriers such as Powertel cannot comply. Powertel is not in a position to develop the capability itself and believes its equipment suppliers have acted reasonably through the Wireless TTY Forum to bring about the capabilities necessary to comply with Section 20.18(c). As such, special and unique circumstances are present in the instant situation, *i.e.*, the capabilities necessary to comply with Section 20.18(c) have not yet been fully developed by the manufacturers, and it would be unjust to enforce Section 20.18(c) against Powertel.⁹

⁷ *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969) (“*WAIT Radio*”).

⁸ The Commission found in the *Order* that “despite the efforts of the Forum, users of TTY devices will not be able to operate such devices in conjunction with digital phones at any time in the near future.” *See Order* at ¶ 7.

⁹ *See Northeast Cellular*, 897 F.2d at 1166, citing *WAIT Radio v. FCC*, 418 F.2d 1153, and *Industrial Broadcasting Co. v FCC*, 437 F.2d 680 [20 RR 2d 2122] (DC Cir 1970).

Relief from the requirements of Section 20.18(c) at this time will better serve the public interest because it will allow manufacturers to develop standard digital capabilities for the use of TTY devices through the Wireless TTY Forum. Additionally, it will allow the manufacturers to develop and carriers to implement such capabilities and devices. If successful, those persons requiring TTY capability for use with digital wireless networks will have greater flexibility and a more dynamic wireless communications tool. As such, a waiver will assist in realizing the underlying policy of the rule and, in the long run, better serve the public interest.¹⁰

III. Information Requested by the *Order*

Powertel provides the following information as specified by Paragraph 11 of the *Order*. Powertel wishes to note, however, that as a carrier it does not have independent ability to develop network capabilities such as those required by Section 20.18(c). As the Commission is aware, carriers like Powertel are participating in the development of TTY capabilities through their associations. CTIA is involved with the Wireless TTY Forum on behalf of its members and Powertel expects the solutions with respect to the TTY capabilities to find their genesis at the Forum. Once solutions have been crafted and standards set, Powertel intends to implement the necessary TTY capabilities as soon as readily achievable, *e.g.*, available from the manufacturers. Powertel is also monitoring the process of its principal equipment supplier, Ericsson, who is a participating Wireless TTY Forum manufacturer.¹¹

¹⁰ *Northeast Cellular Tel. Co. v. FCC*, 897 F2d 1164, 1166 (D.C. Cir. 1990).

¹¹ *See* Attachment 1.

A. Steps Powertel Is Taking, Or Intends To Take, To Provide Users Of TTY Devices With The Capability To Operate Such Devices In Conjunction With Digital Wireless Phones

Powertel's equipment suppliers are developing wireless phones that are compatible to TTY devices that have a standard 2.5mm connector built into the TTY device. Most TTY devices today either have the rubber "hearing & voice" cups built into the machine allowing a Bell handset to be positioned into the cups for transmit/receive messages or have an RJ-11 connector built in the device providing a direct connection for hearing and voice. Through this standardized connector Powertel's suppliers intend to evaluate both voice-based solutions and data-based solutions for TTY compatibility. Powertel and its suppliers do not believe, however, that it is possible at this time through the use of a digital vocoder to transmit reliably the Baudot tones of a TTY device over digital wireless technology when making a 911 emergency call and continue to search for potential solutions.

B. When Does Powertel Intend To Make This Capability Available To TTY Users?

The development efforts of Powertel's suppliers continue to evolve in future products for individuals with disabilities. Powertel's primary equipment supplier, Ericsson, has developed processes to evaluate products including accessibility needs at the pre-study phase. At this point, the product is identified as a product that can be used by persons with disabilities. The list below are Ericsson products that are available, or will be available in the near term, to persons with disabilities, but not particularly for use with TTY:

<u>Product</u>	<u>Availability</u>
HATIS	commercially available
5 V Adapter	commercially available
HAC Cable	available before 1Q99

Silent Call Alert commercially available

Acoustic Coupling available before 2Q99

Powertel's suppliers intend to evaluate data-based solutions for TTY compatibility as defined in the September 1998 TTY Workplan submitted to the Commission in this docket and is hereby incorporated by reference. As noted in these reports, the proposed data-based solution has only been recently discussed in the TTY Forum meetings and has not been fully tested to acknowledge the advantages or disadvantages of this proposed solution. Therefore, at present, a detailed schedule for implementation of solutions for TTY compatibility is not available.¹²

C. Steps Powertel Will Take To Address The Consumer Concerns Raised In The Memo To The TTY Forum From Consumer Representatives Dated September 10, 1998

Powertel, through its suppliers and industry workgroups, is addressing the consumer concerns. These concerns address only functional characteristics of the proposed solutions and have been reviewed and documented by the TTY Forum committee with respect to each proposed TTY solution (*i.e.*, voice-based and data-based). The results of these initial inquiries are documented in the meeting minutes of the TTY Forum #9 meeting held November 4-5, 1998. *See Attachment 1 hereto.*

¹² Powertel intends, as applicable, to utilize the goals and milestone enumerated in the attached Wireless TTY Forum Workplan. *See Attachment 2.*

IV. Conclusion

Given the current lack of equipment necessary for the Section 20.18(c) TTY capabilities, complying with Section 20.18(c) is not readily achievable by December 31, 1998. For this reason, and for the other reasons stated in this petition, Powertel requests an extension of time to comply with Section 20.18(c) or, in the alternative, a waiver of Section 20.18(c) until compliance with Section 20.18(c) is readily achievable.

Respectfully submitted,

POWERTEL, INC.

By: 
Edward A. Yorkgitis, Jr.
Paul G. Madison
KELLEY DRYE & WARREN LLP
1200 19th Street, N.W., Suite 500
Washington, DC 20036
(202) 955-9600

Its Attorneys

Date: December 4, 1998



November 30, 1998

David Barkman
Manager, Switching Systems & Applications
Powertel Inc.
1239 O.G. Skinner Dr.
West Point, GA 37833

Re: Powertel Inc. letter dated November 20, 1998, addressing Disability Access Questions and Waiver Petitions, David Barkman, Manager, Switching Systems & Applications

Dear Mr. Barkman:

This letter is in response to the reference letter addressed to Mr. Daniel Ashitey, National Sales Manager of Ericsson Inc.

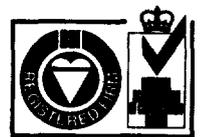
As a major manufacturer of telecommunications equipment, representing digital technologies of TDMA, and GSM, Ericsson Inc. is committed to ensure that their equipment is capable of transmitting 911 calls from individuals with speech or hearing disabilities, through the means of digital technology using a Text Telephone Device (TTY) per the FCC Order CC Docket No. 94-102, DA 98-2323.

Ericsson actively participates in the discussions of the TTY/E911 Forum meetings established to address industry digital technologies supporting TTY transmission over digital wireless devices for 911 calls.

Ericsson also participates in the development of the Hearing Aid Compatible Standard, ANSI C63.19, by performing tests and measurements on various manufacturers hearing aids used in conjunction with the Ericsson mobile phones. Results of these tests have been presented to various Interest groups and Forums defined.

Within these industry group forums, meeting minutes and agreements have been documented and published to the FCC for Quarterly Status Reports as required. These reports have Industry positions, manufacturers test data, along with recommendations of CTIA, test procedures and proposed solutions to the TTY requirements. As a recommendation, I would encourage you obtain a copy of these reports to provide the detail and back-up to the responses supplied.

Classification:



Certificate No. FM 11374

Ericsson Inc.
Radio Systems
1239 O.G. Skinner Drive
West Point, GA 31833

Telephone: (706) 634-1613
Fax: (706) 634-1610



David Barkman
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November 30, 1998

I am managing the disability access efforts for Ericsson's American Standard Business Group (ASBG) located in RTP, NC. Please direct any additional questions or follow-up pertaining to this matter to my attention. I can be reached by phone at (919) 472-7527, or the address specified below.

Steven G. Coston
Mgr., Regulatory Services
Ericsson Inc.
7001 Development Drive
Research Triangle Park, NC 27709
steve.coston@ericsson.com

If I can be of any further assistance to you, please don't hesitate to contact me.

Sincerely,

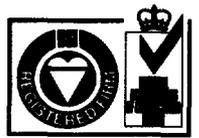
 (For Steve Coston)

Steven G. Coston
Manager, Regulatory & Standards
Ericsson - Business Group American Standards
7001 Development Drive
Research Triangle Park, NC 27709
Phone: 919-472-7527

cc. Bjorn Krylander, Ericsson, Vice President & General Manager
Dave Korb, Ericsson, Vice President, Sales & Marketing - North America
Daniel Ashitey, Ericsson, National Sales Manager

Enclosure

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Compatibility and Disability Access Questions

- A. Is the infrastructure equipment which you provided to Powertel and Powertel is presently operating, capable in its present form or with presently commercially available upgrades, of providing full support and access to TTY devices to ensure reliable access to 911 services by persons utilizing such TTY devices sufficient to enable Powertel to fully comply with the requirements of Section 20.18 of the FCC rules? If so, please provide a formal quote and pricing information in accordance with the terms and conditions of our Equipment Supply Agreement. If not, please answer to the remaining questions.**

Evaluation of Ericsson's infrastructure equipment is currently being evaluated for full support and access to TTY devices to ensure reliable access to 911 emergency service calls by individuals utilizing TTY devices. A follow up to this information will be forwarded to Powertel.

- B. What steps is Ericsson taking or intending to take to provide carriers utilizing its infrastructure equipment with the ability to provide users of TTY devices with the capability to operate such devices in conjunction with digital wireless systems in compliance with Section 20.18 of the rules?**

Along with other carriers and manufacturers, Ericsson has been actively involved in the TTY forum investigating and testing numerous voice and data solutions to solve the issue of reliably operating TTY devices in conjunction with digital wireless phones.

- C. When do you intend to make this capability available to your infrastructure users to enable them to provide full Section 20.18 compliant service to TTY users? This information should include well-documented timetables and milestones regarding the implementation of this capability.**

Scheduled milestones for infrastructure checks are being documented and will be forwarded to Powertel.

Ericsson would also like to provide Powertel with the following terminal status and information regarding the compatibility of the digital wireless phone and the TTY devices.

- D. Are the digital wireless phones manufactured by Ericsson currently compatible to TTY devices?**

Ericsson's wireless phones are compatible to TTY devices that have a standard 2.5mm connector built into the TTY device. Most TTY devices today either have the rubber "hearing & voice" cups built into the machine allowing a Bell handset to be positioned into the cups for transmit/receive messages, or have an RJ-11 connector built in the device providing a direct connection for hearing and voice. Nonetheless, Ericsson does not believe it is possible, through the use of a digital vocoder, to transmit reliably the Baudot tones of a TTY device over digital wireless technology when making a 911 emergency call.

E. If not, what steps is Ericsson taking or intends to take to provide users of TTY devices with the capabilities to operate TTY devices in conjunction with digital wireless phones manufactured by Ericsson?

Ericsson understands that future TTY devices will be developed and deployed with an external 2.5mm connector to provide a direct connection to the wireless phone. Since Ericsson has the HAC cable providing the interface to the system connector of the phone, we believe we have positioned ourselves for future compatibility. As for the current TTY devices that are being used in the field, Ericsson is developing an acoustic coupling device designed to provide an interface between an Ericsson wireless phone and the TTY device rubber cups. Along with other carriers and manufacturers, Ericsson has been actively involved in the TTY forum investigating and testing numerous voice and data solutions to solve the issue of reliably operating TTY devices in conjunction with digital wireless phones.

F. When does Ericsson intend to make this capability available to TTY users? Please include well-documented timetables and milestones regarding implementation of this capability.

Ericsson's development efforts continue to evolve in future products for individuals with disabilities. Our processes are set up to evaluate the product ideas including accessibility needs at the Pre-Study phase. At this point, the product is identified as a product that can be used by persons with disabilities. Please refer to the list below for selected product availability:

<u>Product</u>	<u>Commercial Availability</u>
HATIS	commercially available
5 V Adapter	commercially available
HAC Cable	available before 1Q99
Silent Call Alert	commercially available
Acoustic Coupling	available before 2Q99

G. What reasonable steps is Ericsson taking to address the consumer concerns raised in the attached memo for the TTY Forum from Consumer Representatives dated September 10, 1998?

Our participation in interest groups focused on individuals with disabilities will continue to increase. Outreach efforts are underway to facilitate consumer testing of wireless products and accessories in coordination with area carriers.

Within the TTY Forum, a special Task Force has been created to address the consumer criteria previously submitted to the FCC. This Task Force has been empowered to research, evaluate, and provide input to complete the SOLUTIONS MATRIX AND WORKPLAN table, evaluating the Proposed Solutions.

Under the proposed Voice-Based Solutions are the following:

Direct Audio Connection

RJ-11 Modular Connection

*Acoustic Solution
True RJ-11 Connection
Vocoder Modifications*

Under the proposed Data-Based Solutions (Circuit-Switched) are the following:

Inter-Working Function (IWF)

*Including: V.18 (Baudot)
Proprietary TTY Modem*

3rd Party Gateway

Responses to these proposed solutions and how each support the Consumer Requirements recommendations are documented in the TTY Forum # 9 Meeting Minutes, Appendix C. See attachments.

APPENDIX C

SOLUTIONS MATRIX AND WORKPLAN

Task Force Members to Complete the Data Base Solutions Matrix:

- **Todd Lantor**
- **Norm Williams**
- **Judy Harkins**
- **Ron Schultz**
- **Nikolai Leung**
- **Mohamed El-Rayes**
- **UWCC member**
- **Steve Coston**
- **John Suprock**
- **Brye Bonner**

Group is empowered to complete matrix below on behalf of the TTY Forum.

PROPOSED VOICE-BASED SOLUTIONS
(Passing Baudot signal through the VOCODER)

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
<p><i>Direct Audio Connection</i> (2.5 mm Jack – Preferred Method)</p>	<ol style="list-style-type: none"> 1. Finalize Technical Information Document, 2. SRD, 3. Develop Standard, SDO 4. Notify TTY Phone Manufacturers 	<p>Advantages:</p> <ul style="list-style-type: none"> • Cost effective • Small in size • Rapid to implement • High Immunity to interference • Recognized industry connector • Does not require additional power supply • May allow connection to other devices <p>Disadvantages:</p> <ul style="list-style-type: none"> • Requires modification/ adapter to TTY • Yields no inherent improvement to CER • Supports only limited features 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	<ol style="list-style-type: none"> 1. Nov 1998 2. Submit to TR45.1 – (Ericsson liaison) date TBD 3. Ericsson to identify timetable with TR45.1 – actual date to be posted on listserve 4. TBD by #3

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
RJ11-type Modular Connection/ Jack (Analog Solution)	5. Develop Technical Information Document, 6. SRD, 7. Develop Standard 8. Notify TTY Phone Manufacturers	Advantages: <ul style="list-style-type: none"> • Could support full functionality • Could support some of the embedded base of TTYs Disadvantages: <ul style="list-style-type: none"> • Physical size • Cannot use handset for VCO functions (may require separate device for HCO/VCO) 	1. Preferred over acoustic 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A	This option is not considered a short-term solution by the Forum and therefore is not being pursued by this Forum at this time.

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
Acoustic solution – use of external landline handset	1. No Standardization required	Advantages: <ul style="list-style-type: none"> • No standardization required • Supports most embedded base of TTYs • Very Low interface cost • Short development cycle • Easily accessible to standardized landline handsets Disadvantages: <ul style="list-style-type: none"> • Highly susceptible to background noise • Bulky – requires a landline handset and cable 	1. Could negatively impact CER 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A	TBD by manufacturer
Proprietary <ul style="list-style-type: none"> • Phone Products • Terminals 	Unknown	Unknown	Unknown	Unknown FCC can meet with stakeholders

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<p><i>True RJ-11 Connection</i></p>	<ol style="list-style-type: none"> 1. Develop Technical Information Document, 2. SRD, 3. Develop Standard 4. Notify TTY Phone Manufacturers 	<p>Advantages:</p> <ul style="list-style-type: none"> • Supports full functionality • Support some of the embedded base of TTYs <p>Disadvantages:</p> <ul style="list-style-type: none"> • Physical size • Cannot use handset for VCO functions (may require separate device for HCO/VCO) • Requires additional power supply • Expensive • Bulky 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Not Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	<p>This option is not considered a short-term solution by the Forum and therefore is not being pursued by this Forum at this time.</p>

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
<p><i>Vocoder Modifications</i></p>		<p>Not cost effective</p> <p>No modification to TTY</p> <p>Using Full rate</p> <p>Extensive international standards development and implementation process.</p> <p>Could provide more reliable CER</p> <p>Potential to degrade voice quality.</p> <p>Error detection and correction would be lower for a data tone call compared to data services.</p>	<ol style="list-style-type: none"> 1. TBD 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. TBD 10. Supported 11. Supported 12. TBD 13. TBD 	<ul style="list-style-type: none"> • Develop new standard. • Test new standard for baudot and voice.

PROPOSED DATA-BASED SOLUTIONS – Circuit-Switched

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
<p>Inter-Working Function (IWF):</p> <ul style="list-style-type: none"> • V.18 (Baudot) • Proprietary TTY Modem 	<ul style="list-style-type: none"> • Complete Data SRD • CDMA existing IS-707 • TDMA existing IS-135 • Standards Modifications TBD based on SRD. • Test with existing TTYs for both inbound and outbound calls. • Test with PSAP, existing TTY using existing standards 	<p>Advantages:</p> <ul style="list-style-type: none"> • Reliable Communications, as good as wireline. • World-wide Standard • Requires little or no modifications to existing TTY • Could support more platforms, TTYs, PDAs, and Laptops. <p>Disadvantages:</p> <ul style="list-style-type: none"> • Not all Carriers may choose to implement data services. • Compatible with all current Baudot standards, except Ultratec's Turbocode. • Require mobile connection interface to existing TTYs. • IWF do not support VCO • IWF with Baudot not commercially available 	<ol style="list-style-type: none"> 1. Supported 2. TBD 3. TBD 4. N/A 5. TBD 6. Supported 7. Supported 8. Supported 9. Not Supported 10. Supported 11. TBD 12. Supported 13. Supported 	<ul style="list-style-type: none"> • Est. Timetable 12-18 months • Implement Baudot/V.18 in the IWF • Widespread deployment of the IWF • Update handsets to support data service.

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Container Requirements Supported	Milestones
<i>3rd Party Gateway</i>		<p>Advantages:</p> <ul style="list-style-type: none"> • Landlines TTY do not need to be modified. <p>Disadvantages</p> <ul style="list-style-type: none"> • Expensive to operate and maintain. 	<ol style="list-style-type: none"> 1. TBD 2. Not Supported 3. Not Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. TBD 10. N/A 11. Not Supported 12. Supported 13. TBD 	<p>This option has not been fully explored by any members of the TTY Forum.</p>
<i>Proprietary</i>	Unknown	Unknown	Unknown	<p>Unknown</p> <p>FCC can meet with stakeholders</p>

***V.18 Letter to modem manufacturers will be drafted by Dick Brandt under the TTY Forum letterhead requesting support for TTY issue.**

**WIRELESS TTY FORUM WORKPLAN: TTY ACCESS OVER DIGITAL
WIRELESS SYSTEMS**

Since September 1997, the wireless telecommunications industry (wireless carriers and phone manufacturers), manufacturers of TTY equipment, emergency and relay service provider (9-1-1 and TRS), and consumer organizations that represent individuals who are deaf and hard-of-hearing ("Stakeholders") have undertaken intensive collaborative efforts through the Wireless TTY Forum to develop technically feasible solutions for TTY users to access 9-1-1 over digital wireless systems. To date, the TTY Forum's primary focus has been voice-based solutions in an effort to find an acceptable short-term solution and to meet the FCC's compliance date. The TTY Forum has also proposed several data-based solutions for TTY access to digital wireless systems.

The wireless industry is committed to continuing intensive collaborative efforts to provide viable and practical solutions for TTY access over digital wireless systems not only for 9-1-1 purposes but also to meet the industry's obligations under Sections 225 and 255 of the Communications Act of 1934, as amended. The wireless industry acknowledges that it cannot resolve this issue in a technical vacuum, and that the wireless industry must continue to work cooperatively with TTY manufacturers, the appropriate consumer organizations and organizations representing public safety answering points ("PSAPs") to resolve this issue. Accordingly, the Wireless TTY Forum proposes the following Workplan with scheduled milestones for developing and implementing technical solutions for TTY users to access 9-1-1 over digital wireless systems.

PROPOSED WORKPLAN

I. Assessment of Test Results and Finalization of Test Plan

The TTY Forum has provided preliminary test results and demonstrations on several potential methods for addressing incompatibility between TTYs and the different wireless digital technologies. The TTY Forum developed a uniform test script that manufacturers representing various digital technologies and at least one TTY manufacturer have used in their testing. Test results, however, indicate a wide variance in the character error rate. Furthermore, trying to isolate the cause of the problem within a short time period has been a Herculean yet circumspect task with no conclusive results to date. While the goal is to minimize the character error rate, particularly in 9-1-1 situations, a certain character error rate is inherent with wireline and wireless, both analog and digital technology, and TTY devices.

The co-chairs of the TTY Forum have acknowledged the need for the development of a consistent test methodology, a uniform method of evaluating the test results ("test plan") and TTY performance standards to determine the minimal level of character error rate that TTY users can expect with certain digital technologies used with certain TTY devices.¹

A. Independent review and assessment of tests conducted to date.

The TTY Forum has requested Dr. Dale Hatfield, Chief of the FCC's Office of Engineering and Technology ("OET") to review and assess the tests conducted to date. It is anticipated that Mr. Hatfield will provide guidance to the TTY Forum on the soundness of the research conducted to date and identify any discontinuity or gaps in such research that should be explored in the development of a standardized test procedure.

¹ Since the September 1998 TTY Forum, the wireless industry has reviewed the initial test results and has concluded that additional testing would not yield new or significant information on character error rates. The wireless industry has acknowledged that there does not appear to be a voice-based solution in the near future which will allow the Baudot signal of a TTY device to pass through the vocoder of a digital air interface and achieve a character error rate comparable to the character error rate achieved with analog air interface, *i.e.*, less than 1%. Nevertheless, the wireless industry has agreed to conduct further testing to assess character error rates and in accordance with the standardized Test Procedure.

Target Date

Review and assess tests conducted to date -**Task Completed**

B. Finalization of a Standard Test Procedure

The TTY Forum with the assistance of the wireless digital technology groups² shall develop a uniform test process designed to limit and control test variables and establish a test methodology yielding better consistency in determining and comparing character error rates ("CER") across the various digital wireless technologies (CDMA, TDMA, GSM 1900, iDEN). Each wireless digital technology group has assumed responsibility for modifying the test process to accommodate testing variances of that technology.

- ◇ Draft Test Procedure – **Task Completed**
- ◇ Submit Test Process to Wireless Digital Technology Groups – **Task Completed**
- ◇ Responses due from wireless digital technology groups regarding modifications, locations of test facilities and test schedules – **10/28/98**
- ◇ Review responses from wireless digital technology groups (Test Plan Sub-task Group) – **10/28/98 – 10/29/98**
- ◇ Submit Test Procedure to FCC and distribute to wireless manufacturers and carriers – **10/30/98**
- ◇ Status Report to TTY Forum – **11/4/98**
- ◇ Review and Feedback on Test Procedures – **TBD by FCC**

C. Conduct additional tests using Test Procedures and compare new results

Each wireless digital technology group shall identify at least one test facility and advise the TTY Forum as to the availability of the test facility in order to commence testing prior to April 1999.³

² For purposes of the Workplan, wireless digital technology groups refers to the CDMA Development Group ("CDG"), GSM North America, and Universal Wireless Communications Consortium ("UWC Consortium").

³ GSM NA has indicated that it plans to commence testing as soon as possible with a target date of January 1999 to provide test results to the TTY Forum and the FCC, provided that the following are true: 1) the test specification with modifications suggested by the GSM NA is approved and released by October 30, 1998; 2) lab based testing with real world conditions is accepted; 3) the test specification does not change dramatically; 4) manufacturers can assist the test facilities to set up the test; and 5) no unforeseen restrictions are placed on the testing.

Wireless manufacturers and carriers will conduct tests in accordance with the test schedules submitted and return results to the TTY Forum and the FCC as soon as available. TTY Forum members shall concurrently continue to research acceptable error rates, voice-based and data-based solutions during the test schedule.

The TTY Forum will provide advance notice to all interested parties of the test dates, location of the test laboratories, and contact person. Technical representatives of TTY manufacturers, Gallaudet University, PSAPs and the FCC are encouraged to participate in the testing and should contact the appropriate manufacturer or carrier conducting the test to discuss participation.

Goals and Target Dates

Refer to Test Procedure for list and availability of test labs and scheduled target dates for conducting the additional tests.

D. Analysis of test results and recommendations

The TTY Forum will appoint a sub-group comprised of representatives from each of the Stakeholder groups. The sub-group will review and analyze the test results and provide specific comments and recommendations to the TTY Forum and the FCC based on the test results.

Goals and Target Date

January 1999

II. User Requirements

Consumer representatives of the TTY Forum have provided the TTY Forum with two documents outlining their criteria with respect to solutions: *Consumer Approved Criteria for Acceptance of 'One Phone Model Per Service Provider as of October 1' Proposal* ("Consumer Criteria Document") and *September 10, 1998 Memorandum from Consumer Representatives to TTY Forum* ("September 1998 Consumer Memo").

A. Consumer Criteria Document

The purpose of the document was to stimulate discussion and solicit the views of the wireless carriers and manufacturers participating in the TTY Forum. At the September 1998 TTY Forum Meeting, CTIA, on behalf of its members, submitted its comments to the criteria set forth in the Consumer Criteria Document.⁴ CTIA's senior staff and the drafters of the Consumer

Criteria Document shall meet at a mutually agreeable time to address the criteria in the context of CTIA's inter-disciplinary approach to accessibility under Section 255.

Goals and Target Date

Meeting to be held on a mutually agreeable date but no later than December 15, 1998.

B. September 1998 Consumer Memo

On September 10, 1998, representatives of the consumer groups circulated a document to members of the TTY Forum outlining a new set of criteria to address only functional characteristics of any proposed solution for TTY access to digital wireless systems.⁵ In accordance with the FCC's Extension Order, the TTY Forum shall consider whether the criteria set forth in the September 1998 Consumer Memo is supported in the proposed voice-based and data-based solutions set forth in this Workplan. Consideration of the criteria shall be documented in a matrix of proposed technical solutions.

Goals and Target Date

- ◇ Develop matrix of proposed technical solutions - **Task completed**
- ◇ Finalize matrix (Task Force Members) - **Task Completed**
- ◇ Submit matrix with Workplan to FCC - **10/30/98**
- ◇ Submit September 30th Consumer Memo to standards-setting organizations – **early December 1998**

III. Performance Standards for TTY Devices

Over the past several months, there has been significant discussion

⁴ Letter from Andrea Williams, Assistant General Counsel, Cellular Telecommunications Industry Association, to Ed Hall and Mary Madigan, Co-Chairs, Wireless TTY Forum, Sept. 8, 1998. Attached to October Quarterly Status Report as Appendix Q.

⁵ Memorandum from Consumer Representatives to TTY Forum, Sept. 10, 1998. Attached to October Quarterly Status Report as Appendix R.

The FCC's Wireless Telecommunications Bureau has elevated the new list of criteria by attaching it to the Extension Order as an appendix and holding it out as an example of what consumer groups would like to have incorporated into any solution implemented by the Forum, and therefore the workplan. See Extension Order at 4.

concerning the lack of uniform performance standards among TTY devices. Manufacturers of wireless handsets have indicated that such standards are critical in trying to address the technical challenges of voice-based solutions, including passing the Baudot signal of a TTY device over a digital air interface without any modification to the handset or the TTY device. The TTY Forum also discussed the need for a list of "most often used" TTY devices and specifications for each device if TTY manufacturers are not using the EIA Draft Standard.⁶ Two TTY manufacturers (Ultratec and Ameriphone) have agreed to identify the typical operating characteristics of the majority of existing TTYs and submit this information as a contribution to the TTY Forum. The TTY Forum will also compile a list of the TTY devices used in the tests. A letter will be sent to a third TTY manufacturer (Krown) again requesting their participation in the TTY Forum, specifically providing typical operating characteristics of its existing TTYs.

Goals and Target Dates

Discussion of TTY manufacturers' willingness to incorporate EIA Draft Standard - **TTY Forum - 9 (11/4/98-11/5/98)**

Submission of document listing typical operating characteristics of the majority of existing TTYs – **Week of 11/9/98**

Letter to third TTY manufacturer – **Week of 11/9/98**

IV. Proposed Technical Solutions

To provide TTY users with a variety of solutions and to allow manufacturers and service providers maximum flexibility to develop innovative technology and services for TTY users, the TTY Forum has posed several voice-based and data-based solutions. The TTY Forum presently does not support any one solution over others. The TTY Forum has developed a matrix of proposed voice-based and data-based solutions. The matrix sets forth the implementation stages, the advantages and disadvantages of each solution, whether the consumer requirements set forth in the September 1998 Consumer Memo are supported, and the corresponding milestones scheduled for each phase of implementation. Please refer to Appendix C: Solutions Matrix and WorkPlan for target dates where applicable.

A. Proposed Voice-Based Solutions

The TTY Forum defines voice-based solutions as those solutions whereby the Baudot signal passes through the Vocoder. Proposed

⁶ See Electronic Industries Association, Memorandum to Parties Interested in EIA Standards Project PN 1663, Telecommunications Devices for the Deaf, May 16, 1988, 1. Attached to October Quarterly Status Report as Appendix J.

voice-based solutions include connection method solutions such as:

- ◆ Direct Audio Connection
- ◆ RJ-11-type Modular Connection/Jack (Analog Solution)
- ◆ True RJ-11 Connection
- ◆ Acoustic Solution
- ◆ Proprietary Solutions

Other proposed voice-based solutions include solutions that may require modification of the Vocoder.

Direct Audio Connection

It appears that coupling via a direct audio connection between the TTY device and a digital wireless handset, *i.e.*, a 2.5 mm audio interface, is a preferred voice-based solution for some wireless carriers. A proposal for a wireless phone 2.5mm audio interface to TTY devices has been submitted to the TTY Forum.⁷ The proposal noted that audio output and input levels are different for each make and model phone. Thus, manufacturers of wireless phones would need to provide a special adapter with standard levels. Moreover, audio output and input levels of TTY devices have yet to be defined. The proposal recommended a "common interface" to resolve the variance in output and input levels.⁸ While the TTY Forum has reviewed a draft Technical Information Document ("TID"), the TID will be finalized at TTY Forum-9 and will be distributed to manufacturers and carriers shortly thereafter. Members of the TTY Forum will also prepare a Standards Requirements Document ("SRD") for submission to TIA TR45 in early December 1998.

Acoustic Solution

Ericsson has indicated that it plans to pursue this option. Due to the confidential nature of Ericsson's marketing plans for this option, the TTY Forum recommends that the FCC meet with the manufacturer under confidentiality to discuss specific implementation plans and scheduled milestones.

RJ-11-type Modular Connection/Jack (Analog Solution)

⁷ See Proposed - Wireless Phone 2.5mm Audio Interface to TTY/TDD ("2.5mm Audio Interface Proposal"). Attached to October Quarterly Status Report as Appendix K.

⁸ See 2.5mm Audio Interface Proposal at 3-4. Attached to October Quarterly Status Report as Appendix K.

The TTY Forum has discussed this option and does not consider it to be a viable short-term solution. Thus, the Forum has not pursued development or implementation of this option.

True RJ-11 Connection

The TTY Forum has discussed this option and does not consider it to be a viable short-term solution. Thus, the Forum has not pursued development or implementation of this option.

Proprietary Solutions

Several proprietary solutions such as the Mobility™ TTY, an enhanced TTY device developed by Lober & Walsh Engineering, the AxCell Interface Device developed by Sendele Wireless Communications and the RangeStar™ Technology developed by RangeStar International, have been presented to the TTY Forum for consideration as solutions. Due to the proprietary nature of these solutions, the TTY Forum has not been privy to how soon these products will be made commercially available. The TTY Forum recommends that the FCC meets with each company separately and under confidentiality to discuss specific implementation plans and scheduled milestones.

B. Proposed Data-Based Solutions (Circuit-Switched)

The proposed data-based solutions include Inter-Working Function solutions, Third Party Gateway and Proprietary Data-based solutions. The TTY Forum has adopted a SRD for Circuit-Switched Data, which will be submitted to TR45 in early December 1998.

Inter-Working Function Solutions

These solutions rely on the development and installation of the appropriate inter-working function (IWF) software into a wireless carrier's network infrastructure. There are at least two proposed IWF solutions: the V.18 standard and proprietary TTY modems. While the standards for GSM, TDMA, iDEN and CDMA support the IWF functionality, minor modifications are necessary for TTY applications. Implementation of IWF solutions requires completion of product development and deployment, including billing capabilities for data, installation of TTY software in the subscriber terminal, installation of the IWF infrastructure which may be installed per switch or shared among a carrier's switches. In addition, V.18 capable modems need to be manufactured for use in the United States. The estimated timeframes set forth in the Matrix are contingent upon several factors: availability of modems incorporating V.18 standard or other enhanced protocols; timely resolution of any unanticipated technical glitches in product development and deployment as well as installation of the IWF

infrastructure; and the availability of the appropriate engineering staff.

The TTY Forum will send a letter to IWF and modem manufacturers notifying them about the TTY Forum's work and the demonstrations of an IWF (V.18) as one type of viable data-based solutions. The letter will also request information and the projected time period concerning the incorporation of V.18 standard.

Letter to IWF and modem manufacturers: **Week of 11/9/98**

Third-Party Gateway Solution

Another proposed data-based solution is a Third Party Gateway Solution, which is a solution, using the Inter-working function (IWF) but it need not be installed in every carrier's network. A third party vendor would supply a number for a TTY user to call into and then complete the call to a landline TTY using the IWF.

The TTY Forum discussed this option at the November 1998 Forum. The Forum and does not consider it to be a viable solution. Thus, the Forum will not pursue development or implementation of this option.

Proprietary Data-based Solutions

To be reviewed at future TTY Forums.

- V. Notification to Subscribers and Potential Subscribers who use TTYs**
In compliance with the FCC's rules, wireless carriers have notified subscribers and potential subscribers that they may not be able to use TTYs to access 9-1-1 over digital wireless systems. Wireless carriers, with the support of the wireless trade associations, the consumer advocacy groups, TTY manufacturers and wireless handset manufacturers, will continue to notify subscribers and potential subscribers at appropriate intervals until a product is commercially available.

Goals and Target Date

On-going until product is commercially available.

APPENDIX C

SOLUTIONS MATRIX AND WORKPLAN

Task Force Members to Complete the Data Base Solutions Matrix:

- Todd Lantor
- Norm Williams
- Judy Harkins
- Ron Schultz
- Nikolai Leung
- Mohamed El-Rayes
- UWCC member
- Steve Coston
- John Suprock
- Brye Bonner

Group is empowered to complete matrix below on behalf of the TTY Forum.

**PROPOSED VOICE-BASED SOLUTIONS
(Passing Baudot signal through the VOCODER)**

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
<p><i>Direct Audio Connection</i> (2.5 mm Jack – Preferred Method)</p>	<ol style="list-style-type: none"> 1. Finalize Technical Information Document, 2. SRD, 3. Develop Standard, SDO 4. Notify TTY Phone Manufacturers 	<p>Advantages:</p> <ul style="list-style-type: none"> • Cost effective • Small in size • Rapid to implement • High Immunity to interference • Recognized industry connector • Does not require additional power supply • May allow connection to other devices <p>Disadvantages:</p> <ul style="list-style-type: none"> • Requires modification/adapter to TTY • Yields no inherent improvement to CER • Supports only limited features 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	<ol style="list-style-type: none"> 1. Nov 1998 2. Submit to TR45– Dec 1998 3. Ericsson to identify timetable with TR45 actual date to be posted on listserve 4. TBD by #3

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<i>RJ11-type Modular Connection/ Jack</i> (Analog Solution)	<ol style="list-style-type: none"> 1. Develop Technical Information Document, 2. SRD, 3. Develop Standard 4. Notify TTY Phone Manufacturers 	Advantages: <ul style="list-style-type: none"> • Could support full functionality • Could support some of the embedded base of TTYs Disadvantages: <ul style="list-style-type: none"> • Physical size • Cannot use handset for VCO functions (may require separate device for HCO/VCO) 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	This option is not considered a short-term solution by the Forum and therefore is not being pursued by this Forum at this time.

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<p><i>Acoustic solution</i> – use of external landline handset</p>	<p>1. No Standardization required</p>	<p>Advantages:</p> <ul style="list-style-type: none"> • No standardization required • Supports most embedded base of TTYs • Very Low interface cost • Short development cycle • Easily accessible to standardized landline handsets <p>Disadvantages:</p> <ul style="list-style-type: none"> • Highly susceptible to background noise • Bulky – requires a landline handset and cable 	<p>1. Could negatively impact CER</p> <p>2. Supported</p> <p>3. Supported</p> <p>4. Supported</p> <p>5. TBD</p> <p>6. Supported</p> <p>7. Supported</p> <p>8. Supported</p> <p>9. Supported</p> <p>10. N/A</p> <p>11. N/A</p> <p>12. N/A</p> <p>13. N/A</p>	<p>TBD by manufacturer</p>
<p><i>Proprietary</i></p> <ul style="list-style-type: none"> • Phone Products • Terminal 	<p>Unknown</p>	<p>Unknown</p>	<p>Unknown</p>	<p>Unknown</p> <p>FCC can meet with stakeholders</p>

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
s				
<i>True RJ-11 Connection</i>	<ol style="list-style-type: none"> 1. Develop Technical Information Document, 2. SRD, 3. Develop Standard 4. Notify TTY Phone Manufacturers 	<p>Advantages:</p> <ul style="list-style-type: none"> • Supports full functionality • Support some of the embedded base of TTYs <p>Disadvantages:</p> <ul style="list-style-type: none"> • Physical size • Cannot use handset for VCO functions (may require separate device for HCO/VCO) • Requires additional power supply • Expensive • Bulky 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Not Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	<p>This option is not considered a short-term solution by the Forum and therefore is not being pursued by this Forum at this time.</p>

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
Vocoder Modifications		<p>Not cost effective</p> <p>No modification to TTY</p> <p>Using Full rate</p> <p>Extensive international standards development and implementation process.</p> <p>Could provide more reliable CER</p> <p>Potential to degrade voice quality.</p> <p>Error detection and correction would be lower for a data tone call compared to data services.</p>	<ol style="list-style-type: none"> 1. TBD 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. TBD 10. Supported 11. Supported 12. TBD 13. TBD 	<ul style="list-style-type: none"> • Develop new standard. • Test new standard for Baudot and voice.

PROPOSED DATA-BASED SOLUTIONS – Circuit-Switched

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
<p>Inter-Working Function (IWF):</p> <ul style="list-style-type: none"> • V.18 (Baudot) • Proprietary TTY Modem 	<ul style="list-style-type: none"> • Complete Data SRD • CDMA existing IS-707 • TDMA existing IS-135 • Standards Modifications TBD based on SRD. • Test with existing TTYs for both inbound and outbound calls. • Test with PSAP, existing TTY using existing standards 	<p>Advantages:</p> <ul style="list-style-type: none"> • Reliable Communications, as good as wireline. • World-wide Standard • Requires little or no modifications to existing TTY • Could support more platforms, TTYs, PDAs, and Laptops. <p>Disadvantages:</p> <ul style="list-style-type: none"> • Not all Carriers may choose to implement data services. • Compatible with all current Baudot standards, except Ultratec's Turbocode. • Require mobile connection interface to existing TTYs. • IWF do not support VCO • IWF with Baudot not commercially available 	<ol style="list-style-type: none"> 1. Supported 2. TBD 3. TBD 4. N/A 5. TBD 6. Supported 7. Supported 8. Supported 9. Not Supported 10. Supported 11. TBD 12. Supported 13. Supported 	<ul style="list-style-type: none"> • Est. Timetable 12-18 months • Implement Baudot/V.18 in the IWF • Widespread deployment of the IWF • Update handsets to support data service.

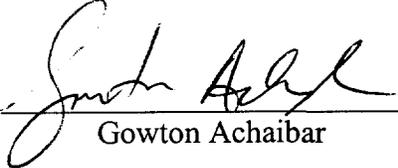
Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
<i>3rd Party Gateway</i>		Advantages: <ul style="list-style-type: none"> • Landlines TTY do not need to be modified. Disadvantages <ul style="list-style-type: none"> • Expensive to operate and maintain. 	1. TBD 2. Not Supported 3. Not Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. TBD 10. N/A 11. Not Supported 12. Supported 13. TBD	This option is not considered a viable solution by the Forum and therefore is not being pursued by this Forum at this time.
<i>Proprietary</i>	Unknown	Unknown	Unknown	Unknown FCC can meet with stakeholders

*V.18 Letter to modem manufacturers will be drafted by Dick Brandt under the TTY Forum letterhead requesting support for TTY issue.

DECLARATION

I, Gowton Achaibar, hereby declare under penalty of perjury that the foregoing is true and correct:

1. I am an officer of Powertel, Inc. My office address is 1233 O.G. Skinner Drive, West Point, GA 31833.
2. I have reviewed the foregoing Petition for Waiver and, except for those facts of which official notice may be taken by the Commission, it is true and correct to the best of my personal knowledge.


Gowton Achaibar

Date: Dec. 4, 1998