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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

June 10, 1996



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Problem Solvers to the Telecommunications Industry

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William F. Caton, Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Room 222  
Washington, DC 20554

**Re: In the Matter of Petition to Amend Part 68 of the Commission's Rules to Include Terminal Equipment Connected To Basic Rate Access Service Provided via Integrated Services Digital Network Access Technology , CC Docket No. 93-268; and In the Matter of Petition to Amend Part 68 of the Commission's Rules to Include Terminal Equipment Connected to Public Switched Digital Service, RM 7815 and RM 6147, REPORT AND ORDER, Adopted: January 11, 1996, Released: March 7, 1996**

Dear Secretary Caton:

This letter is to acknowledge that Committee T1, sponsored by the Alliance For Telecommunications Industry Solutions ("ATIS"), Inc. is in receipt of and understands the Federal Communications Commission ("FCC" or "Commission") request as contained in paragraph 17 of the above-referenced proceeding. Specifically, that request asks that Committee T1 "edit the RJ48 and SJA series jack drawings that appear in the ATIS Committee T1 Report Number 5 of June 1990, and to include appropriate Facility Interface Codes for the ISDN PRA, ISDN BRA, and PSDS Types I, II and III services."

Technical Subcommittee T1E1- the Interfaces, Power and Protection of Networks Technical Subcommittee- of Committee T1, which has responsibility for work related to interfaces associated with user access to telecommunications networks among other things, has been referred this FCC request by Committee T1. We note that the FCC asks that the completed drawings be submitted to the FCC within ninety (90) days after adoption of the above-referenced Report And Order. This is to inform the Commission that Committee T1 expects that the work related to this request will be completed by the end of July. As the Commission may know, Committee T1 has certain procedures requiring publication of draft documents for review and comment by interested parties. It is this thorough review and comment

COMMITTEES



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Telecommunications



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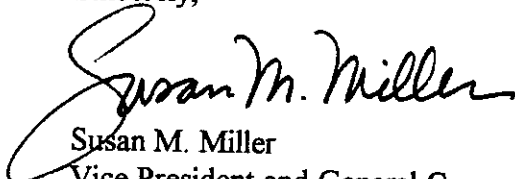
SONET interoperability  
Forum



process which dictates the availability of a completed report to send to the Commission. Committee T1 will submit its report to the Commission at that time, within the ninety (90) day window designated by the Report and Order.

If you have any further questions about this activity, please do not hesitate to contact me at (202) 434-8828 or Harold Daugherty, Director for Committee T1 at (202) 434-8830. Thank you.

Sincerely,



Susan M. Miller  
Vice President and General Counsel

cc: Reed E. Hunt, Chairman  
James H. Quello, Commissioner  
Rachelle B. Chong, Commissioner  
Susan Ness, Commissioner  
Marian R. Gordon, Special Counsel, CCB  
William von Alven, Public Utilities Specialist, CCB

Before the  
Federal Communications Commission  
Washington, D.C. 20554

FCC 96-1

In the Matter of )  
)  
Petition to Amend Part 68 )  
of the Commission's Rules )  
to Include Terminal Equipment ) CC Docket No. 93-268  
Connected to Basic Rate Access )  
Service Provided via )  
Integrated Services )  
Digital Network Access Technology )  
)  
and )  
)  
In the Matter of ) RM 7815  
)  
Petition to Amend Part 68 of the ) RM 6147  
Commission's Rules to Include )  
Terminal Equipment Connected to )  
Public Switched Digital Service )  
)

REPORT AND ORDER

Adopted: January 11, 1996

Released: March 7, 1996

By the Commission:

I. Introduction

1. In this Order, we adopt final rules to amend Part 68 of the Commission's rules which governs the terms and conditions under which customer-provided terminal equipment may be connected to the telephone network.<sup>1</sup> Part 68 is designed to ensure that customers and manufacturers can connect terminal equipment to the telephone network without causing harm to the network.<sup>2</sup>

<sup>1</sup> See 47 C.F.R. Part 68.

<sup>2</sup> For a history of Part 68, see Proposals for New or Revised Classes of Interstate and Foreign Message Toll Telephone Service (MTS) and Wide Area Telephone Service (WATS); Revision of Part 68 of the Commission's Rules to Specify Standard Plugs and Jacks for the Connection of Telephone Equipment to the Nationwide

2. We now amend Part 68 to include terminal equipment connected to the two-wire Basic Rate Access (BRA) interface and the four-wire Primary Rate Access (PRA) interface associated with the Integrated Services Digital Network (ISDN) access technology.<sup>3</sup> We further amend Part 68 to include terminal equipment for Public Switched Digital Service (PSDS) in the Commission's equipment registration program.<sup>4</sup> Finally, we adopt rules to govern revocation of Part 68 registration and clarify other aspects of our rules.<sup>5</sup>

## II. Background

3. In November 1993, in response to a petition filed by SWBT and Ameritech, the Commission issued a Notice of Proposed Rulemaking proposing to amend Part 68 to include ISDN and PSDS terminal equipment.<sup>6</sup> Such equipment will promote end-to-end digital connectivity for consumers, enabling them to move rapidly data, voice, or facsimile, either separately or simultaneously, over the same pair of copper wires.<sup>7</sup> It will further support a wide array of "intelligent" services including desktop conferencing (to allow users to communicate over a single

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Telephone Network; and Amendment of Part 68 of the Commission's Rules (Telephone Equipment Registration) to Specify Standards for and Means of Connection of Telephone Equipment to Lamp and/or Annunciator Functions of Systems, Memorandum Opinion and Order (CC Dockets 19528, 20774, 21182), 70 F.C.C. 2d 1800 (1979).

<sup>3</sup> For a technical description of these services, see infra para. 6.

<sup>4</sup> For a technical description of this service, see infra para. 6.

<sup>5</sup> Revocation of Part 68 registration means that equipment covered by that registration can no longer be connected to the public switched network. See Appendix B for specific rules and authority.

<sup>6</sup> Petition to Amend Part 68 of the Commission's Rules, CC Docket 93-268, Notice of Proposed Rulemaking, 9 FCC Rcd 1068 (1993); Errata 9 FCC Rcd 1078 (1994) (Notice). On February 10, 1994, twelve parties filed comments in response to the Notice. On February 25, 1994 two parties filed reply comments. A list of commenting parties is contained in Appendix A.

<sup>7</sup> For example, an ISDN channel can move data at a rate that is nearly seven times higher than an analog line. This means that a facsimile transmission, which can take about 15 seconds per page, could be sent at a rate about half a page a second at high quality levels.

transmission medium with voice and computer images simultaneously); on-line customer services (to direct callers automatically to their individual account representatives); and electronic data exchange (to simplify ordering, inventory control, delivery and billing between manufacturers and their suppliers).<sup>8</sup>

4. In the Notice, the Commission tentatively concluded that inclusion of such equipment in Part 68 would promote rapid development of ISDN and PSDS services by establishing the fundamental criteria for connection of related customer premises equipment (CPE) to the public switched network throughout the country. The Commission noted comments by IDCMA that the proposed rules "will eliminate the serious problem which manufacturers currently encounter, that is, the imposition of differing requirements for the connection of customer-provided equipment to ISDN services."<sup>9</sup> The Commission proposed technical standards for these services.

5. The Commission further proposed procedures to revoke equipment registration in cases where Part 68 authorization was obtained by fraud, or where continued use of terminal equipment posed a threat of harm to the network. We tentatively concluded that such procedures would strengthen our ability to enforce Part 68 and the Telecommunications Trade Act of 1988, which requires that telephone equipment imported into the United States meet FCC rules and regulations.<sup>10</sup>

### III. Policy Issues

#### A. Part 68 Standards for ISDN and PSDS

##### 1. Background

6. In the Notice, the Commission proposed to amend Part 68

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<sup>8</sup> See Report on ISDN Trial in New York State, submitted by ISDN Trial Steering Committee (NYNEX Service Company, Teleport Communications Group, AT&T Communications, Contel of NY, Inc., Rochester Telephone, MCI Telecommunications, ALLTEL New York, Inc., New York Telephone) on March 15, 1990 to the New York State Public Service Commission. As the potential of ISDN is recognized around the world, foreign governments are implementing the technology as part of their strategy for economic development of their telecommunications industries. Germany and Japan, for example, have launched significant nationwide ISDN deployment efforts. Id.

<sup>9</sup> Notice, para. 2 as amended by Errata 9 FCC Rcd 1078.

<sup>10</sup> See 19 U.S.C. § 3109.

to include terminal equipment connected to the two-wire BRA interface and the four-wire PRA interface associated with ISDN access technology.<sup>11</sup> ISDN is a switched digital service that is capable of supporting a wide range of voice, data, and video services. BRA consists of one or two 64 Kilobits per second (Kbps) information channels, and a 16 Kbps channel for dialing and network access information.<sup>12</sup> PRA consists of 23 64 Kbps information channels, and a 64 Kbps dialing and network access channel. The Commission further proposed to amend Part 68 to include terminal equipment connected to the PSDS in the Commission's equipment registration program. PSDS is a switched digital service that provides the end user with the capability of establishing, through the public switched network, digital circuits capable of high speed data transfer and video conferencing.

## 2. Positions of the Parties

7. Most commenters support amending Part 68 to include interconnection standards for ISDN and PSDS.<sup>13</sup> Manufacturers of telecommunications equipment support inclusion of these standards to encourage development of a more competitive marketplace for CPE.<sup>14</sup> They contend that because Part 68 rules will allay any carrier concerns that independent supply of ISDN and PSDS equipment could "harm" the network, connection of their equipment to the network will be assured -- thereby stimulating the forces of competition. IDCMA, for instance, says that uniform specifications will encourage development of equipment, and lead to new and better products at lower cost, benefiting consumers, industry, and the economy.<sup>15</sup>

8. Carriers also support adding interconnection standards for ISDN and PSDS to Part 68.<sup>16</sup> Bell Atlantic, for example,

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<sup>11</sup> Notice, 9 FCC Rcd at 1068-1069, para. 2.

<sup>12</sup> An information channel is a channel that is provided for data transmission.

<sup>13</sup> AT&T Comments at 2; Ameritech Comments at 2; Bell Atlantic Comments at 1-2; IDCMA Comments at 2, 4-6; NATA Comments at 2-3; NYNEX Comments at 1-2; Pacific Comments at 1-2; SWBT Comments at 1-2; TIA Comments at 2-3.

<sup>14</sup> See, e.g., TIA Comments at 2; IDCMA Comments at 2-5, Reply at 2-3.

<sup>15</sup> IDCMA Comments at 3-5.

<sup>16</sup> See, e.g., Bell Atlantic Comments at 1-2; SWBT Comments at 1-2.

states that inclusion of interconnection standards for equipment used with ISDN under Part 68 will help ensure mass market deployment of ISDN and thus facilitate the Commission's goals of promoting development of ISDN terminal equipment, industry uniformity, and worldwide compatibility.<sup>17</sup> Only US West opposes extending Part 68 to include interconnection standards for ISDN and PSDS equipment.<sup>18</sup> It maintains that such extension is unnecessary because harm to the network can be prevented through other means such as industry standards, carrier rules, or tariffs.<sup>19</sup>

### 3. Discussion

9. We agree with the majority of commenters, who urge inclusion of equipment standards for ISDN and PSDS in Part 68. Such inclusion will establish a set of technical standards for connection of terminal equipment to ISDN or PSDS services throughout the country. Our initial view that establishing such technical standards will eliminate the problems that manufacturers now face from different requirements for connection of customer-provided equipment to these services is generally supported.<sup>20</sup>

10. We disagree with US West that standards for ISDN and PSDS should not be adopted because the lack of such standards has neither caused nor created a risk of harm to US West's network or its ISDN and PSDS services. As IDCMA correctly observes, the relevant point is that without registration, manufacturers and consumers have no assurance that they can connect their terminal equipment to the network. To establish such a right, parties must demonstrate that no harm to the network occurs as a result of attachment of their terminal ISDN and PSDS equipment to the network. The overarching principle underlying Part 68 is that the subscriber can reasonably use his or her customer premises equipment in ways that are privately beneficial without causing harm to the network.<sup>21</sup> The record supports our belief that the

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<sup>17</sup> Bell Atlantic Comments at 2.

<sup>18</sup> US West Comments at 3; compare BellSouth Comments at 2-3. Although BellSouth supports the proposed rules, it does so only on the basis of protecting the network from harm.

<sup>19</sup> US West Comments at 5.

<sup>20</sup> See Notice, 9 FCC Rcd at 1070, para. 2.

<sup>21</sup> See, e.g., Proposals for New or Revised Classes of Interstate and Foreign Message Toll Telephone Service (MTS) and Wide Area Telephone Service (WATS), First Report and Order (Docket No. 19528), 56 F.C.C. 2d 593, 598-99 (1975).

goals of the Part 68 program -- to enable consumers to enjoy the benefits of customer premises equipment competition -- are best served by adopting our proposal. We therefore adopt the proposed rules and amend Part 68 to include equipment connected to ISDN and PSDS services.<sup>22</sup>

## **B. Uniformity of Network Connectors**

### **1. Background**

11. In the Notice, the Commission solicited comment on proposals for ISDN BRA and PRA interface connectors, and for suitable connectors for the PSDS service.<sup>23</sup> Interface connectors are the means by which users can connect and disconnect their terminal equipment to the public switched network. The Commission further requested parties to comment on various proposals developed by standards bodies for network connectors for ISDN and PSDS, particularly those proposals to use an eight-position non-keyed jack.<sup>24</sup> The Commission noted that Ameritech urged the Commission to allow carriers to choose their own network connectors, and not mandate uniformity in this area.<sup>25</sup>

### **2. Positions of the Parties**

12. Several carriers claim that designation of a specific network connector for ISDN and PSDS service is unnecessary.<sup>26</sup> Ameritech, BellSouth, NYNEX and Bell Atlantic, for example, assert that the Commission's existing rules allow for sufficient flexibility in connector selection. They claim this flexibility avoids the need for subsequent rule changes and fosters

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<sup>22</sup> These rules are set forth in Appendix B.

<sup>23</sup> Notice, 9 FCC Rcd at 1071, para. 6.

<sup>24</sup> Notice, 9 FCC Rcd at 1068, 1071, n.7. "Jacks" (used in connection with their associated plugs) are used to make contact between a consumer's terminal equipment and the public switched network. An eight-position non-keyed jack is a device that uses an eight-position numbering scheme to permit identification of jack position to assure compatibility between the wiring system of the network and the consumer's terminal equipment. Standards bodies develop technical recommendations for telecommunications service providers and equipment manufacturers to support interconnection and interoperability of telecommunications networks.

<sup>25</sup> Notice, 9 FCC Rcd at 1071, para. 6.

<sup>26</sup> Ameritech Comments at 2-3; BellSouth Comments at 4; NYNEX Comments at 4-5; Bell Atlantic Comments at 4-5.



competition by decreasing the time frames for the introduction of services.<sup>27</sup>

13. Ameritech, in particular, argues that most ISDN compatible equipment can already accommodate a RJ11C jack and that manufacturers that wish to "build to" a different interface, the eight-position interface, can simply provide connection to the RJ11C jack through a six-position to eight-position double-male adapter.<sup>28</sup> Ameritech asserts that this flexibility avoids any need for Commission action and does not require use of an eight-position jack.<sup>29</sup> AT&T and NYNEX propose setting network connector requirements through the tariff process to avoid rulemaking proceedings every time a change is needed in a specification detail.<sup>30</sup>

14. Some manufacturers, on the other hand, oppose carrier discretion in this area. They maintain that the potential confusion and interconnection problems created by lack of a standard connector, or the selection by individual telephone companies of different connectors, will create constant connection problems.<sup>31</sup> IDCMA argues that if different jacks are used to any significant degree, manufacturers will be forced to include at least one adapter with each CPE shipment, thereby increasing the cost of equipment.<sup>32</sup> They argue that a uniform jack will eliminate the use of different jacks in different regions of the country and allow all equipment to connect to the network anywhere. SWBT argues that use of the RJ11C jack that Ameritech proposes will require the use of adapters, placing an unnecessary item of equipment in the circuitry that could lead to service disruption or other trouble.<sup>33</sup>

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<sup>27</sup> See, e.g., NYNEX Comments at 4-5; see also 47 C.F.R. Part 68, Subpart F and Section 68.104.

<sup>28</sup> Ameritech Comments at 3. "RJ-XX" (where XX are numbers) are telephone and data jacks registered with the FCC. The RJ11 is a specific kind of jack with a wiring configuration that requires connection to two "inner" connectors of a six connector modular jack.

<sup>29</sup> An eight-position jack, referred to as the ISDN interface connector, is an eight pin connector used for data transmission over a standard telephone wire.

<sup>30</sup> AT&T Comments at 3-4; NYNEX Comments at 4-5.

<sup>31</sup> See, e.g., IDCMA Reply at 4.

<sup>32</sup> Id. at 4-5 n.5.

<sup>33</sup> SWBT Comments at 4.

### 3. Discussion

15. Domestic and international standards organizations currently specify an eight-position non-keyed jack for ISDN. Domestically, industry consensus supporting the eight-position jack for ISDN BRA is reflected in American National Standards Institute (ANSI) specification T1.601-1992 and ISDN PRA in ANSI T1.408-1990. Consensus has further been reached on eight-position jack requirements for PSDS as set forth in ANSI/Telecommunications Industry Association (TIA)/Electronic Industry Association (EIA) specification 596-92. Internationally, eight-position jacks are specified in the interconnection standards of the International Standards Organization (ISO)/International Electrotechnical Commission (IEC) 8877 and Canadian standard (CS-03 Part III). Based on these standards, manufacturers today routinely build terminal equipment with eight-position jacks and are expected in the future to design and register their equipment to meet domestic and international "eight-position jack" standards.

16. While we recognize that some carriers want to choose connectors for ISDN and PSDS services that are inconsistent with these standards, we agree with IDCMA and SWBT that allowing carriers discretion to choose from a myriad of jacks with differing pin assignments and pin counts will unnecessarily increase the cost of manufacturing terminal equipment and create confusion for users. If different jacks are used to a significant degree, for example, manufacturers will be forced to include adapters with each CPE shipment. Such adapters introduce added costs and confuse users about the requirements for attachment. Moreover, they potentially lower the reliability of ISDN and PSDS service by creating an additional point of possible network failure in the attached equipment.<sup>35</sup> TIA points out that adapters are useful for non-standard applications, but are not the telecommunications industry's preferred method of interconnection.<sup>36</sup>

17. To avoid these difficulties, we will require use of eight-position connectors for ISDN and PSDS services under Part 68. This will ensure that users of ISDN and PSDS services are able to plug in their terminal equipment with minimal difficulty and training. We expect that the specification of the eight-position connector in Part 68 will foster the goals that we identified in the Notice of promoting development of ISDN terminal equipment, industry uniformity, and worldwide

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<sup>35</sup> Id.; IDCMA Reply at 4-5 n.5

<sup>36</sup> TIA Comments at 8.

compatibility.<sup>37</sup> Consistent with our action, and for the convenience of the public to ensure that they can obtain proper information about interconnection, we ask the T1 Committee of the Alliance for Telecommunications Solutions (ATIS) to edit the RJ48 and SJA series jack drawings that appear in the ATIS Committee T1 Report Number 5 of June 1990, and to include appropriate Facility Interface Codes for the ISDN PRA, ISDN BRA, and PSDS Types I, II and III services. Section 68.104(c) of the Commission's rules describes a procedure that allows connections to the telephone network to be made through standard plugs and standard telephone company-provided jacks or equivalent described in telephone company tariffs. In the past, ATIS's preparation of connector descriptions for inclusion in appropriate tariffs has greatly facilitated implementation of jack requirements, using this Section 68.104(c) procedure. We expect that any of the SJA series jacks that ATIS modifies to conform with our adopted rules will be added to the RJ48 series for the convenience of the public. We also ask that the completed drawings be submitted to us within 90 days after the adoption of this Order.

18. We do not intend that our eight-position jack requirement disrupt existing ISDN and PSDS equipment arrangements that do not use that jack to connect to the public switched network. Therefore, we will allow such arrangements that are in existence on January 1, 1996, to remain connected to the public switched network for the life of the equipment unless subsequently modified. Modification means changes to the equipment that affect Part 68 rules.

### C. Registration Revocation

19. In the Notice, the Commission proposed procedures to revoke Part 68 equipment registrations of parties that violate Commission rules. The Commission proposed that any registrant: (1) who has obtained an equipment registration by misrepresentation; (2) whose equipment is shown to cause harm to the network; (3) who has willfully or repeatedly failed to comply with the terms of a Part 68 registration; or (4) has willfully or repeatedly failed to comply with any of the provisions of the Communications Act of 1934, or of any rule, regulation or order issued by the Commission under that Act, may have the registration of its equipment revoked.<sup>38</sup>

20. Procedurally, the Commission further proposed that an apparently non-compliant registrant be served with a Notice of Intent to Revoke that closely tracked established Commission procedure for Notices of Apparent Liability for assessment of

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<sup>37</sup> Notice, 9 FCC Rcd at 1070, para. 3.

<sup>38</sup> Notice, 9 FCC Rcd at 1073, para. 10.

monetary penalty.<sup>39</sup> A Notice of Intent to Revoke, the Commission stated, would, inter alia: (1) identify the Commission rule or federal law with which the registrant apparently violated or failed to comply; (2) state the nature of the conduct at issue and date(s) of the occurrence(s); and (3) give notice to the registrant that a registrant whose registration is revoked may not apply for a registration of the same product for a period of six months from the date of the revocation.<sup>40</sup>

## 1. Positions of the Parties

21. Commenters broadly support the Commission's proposal to implement procedures to revoke Part 68 equipment registrations for parties that have violated the Commission's rules. Carriers favor the proposal as a means for swift Commission action against non-compliant registrants that still allows registrants a full and fair opportunity to be heard on the merits of their cases.<sup>41</sup>

22. For the same reason, manufacturers also support the Commission's revocation proposal. They urge, however, that the Commission narrow the scope of its proposed rules to ensure that revocation of equipment registration occurs only as a result of conduct that is related to the registered equipment or the relevant application.<sup>42</sup> NATA, in particular, is concerned that manufacturers not lose their registration when equipment that met applicable standards when manufactured later fails to comply with subsequent rule changes, or when third-parties in equipment "after-markets" alter the characteristics of the equipment without the manufacturer's consent.<sup>43</sup>

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<sup>39</sup> See 47 C.F.R. §§ 1.80 and 1.89.

<sup>40</sup> The Commission also stated that the prohibition on reapplication for a period of six months after revocation is intended to prevent registrants who violate the rules from simply obtaining a new registration immediately following a revocation. Currently, a Part 68 registration application can be processed and granted by the Commission in approximately 15 days. Notice, 9 FCC Rcd at 1073, para. 11.

<sup>41</sup> See, e.g., SWBT Comments at 6; BellSouth Comments at 2 n.2; NYNEX Comments at 6.

<sup>42</sup> See, e.g., IDCMA Reply at 5; NATA Comments at 4-7; see also US West Comments at 6.

<sup>43</sup> NATA Comments at 4-6. NATA does not define the meaning of the term "after-market." We interpret it to mean the market in which the original equipment manufacturers or registrants no longer exercise control over equipment they once manufactured or registered under their name.

## 2. Discussion

23. The record supports our conclusion that revocation of Part 68 registration should be among the Commission's remedies when entities misrepresent themselves, harm the network, or do not comply with Part 68 requirements. Accordingly, with the single modification we discuss below, we adopt the revocation rules that we proposed in the Notice.<sup>44</sup>

24. These rules are designed to allow the Commission to take remedial steps where misrepresentation or other improper conduct has occurred involving registered equipment. Accordingly, manufacturers will not be subject to invocation of punitive revocation procedures simply because newly discovered types of harm may require amendment of the Part 68 rules to strengthen the standards or add new requirements. The revocation rules outline circumstances where revocation may be imposed.

25. We did not intend that the proposed registration revocation provisions apply to original manufacturers or registrants after their equipment passes from their control and is registered to a different party. For the proposed procedure to be invoked, misrepresentation by the party who has obtained an equipment registration must have occurred. A manufacturer or equipment registrant cannot make misrepresentations with regard to equipment over which it no longer has control or holds registration. The proposed rule makes clear that the offending equipment must be registered to the party who is subject to revocation. For revocation to occur, the proposed rule requires willful or repeated failure to comply. A manufacturer or original registrant whose equipment has passed into the after market cannot be guilty of violating such prohibitions, because it no longer has control over the equipment. Moreover, we further intended that these rules provide for revocation only as a result of conduct that is related to registered equipment. To clarify our purpose, we modify the fourth part of our proposed revocation rule to allow the Commission to revoke the registration of any party "(4) [w]ho willfully or repeatedly fails to comply with any rule, regulation or order issued by the Commission under the Communications Act of 1934 relating to equipment registration." We adopt the proposed revocation procedures, as modified, and revise the authority citation of Part 68 to include 47 U.S.C. § 412, which, *inter alia*, makes documents filed with the Commission, such as Part 68 registration applications, *prima facie* evidence of what they purport to be for the purpose of investigations by the Commission. No party objected to this revision of the rules.

### D. Part 68 Rulemaking Process

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<sup>44</sup> See Appendix B at 27-29.

26. Most parties support adding ISDN and PSDS to the Commission's Part 68 registration program. One party, however, argues that the length of time it has taken to prepare rules to include these services in Part 68 demonstrates a deficiency in the Commission's current rulemaking processes. It suggests an alternative method for more timely rule changes that we consider below.

### 1. Positions of the Parties

27. TIA asserts that while technology is changing in a matter of a few years or months (or even faster), the regulatory rulemaking process to add new services to Part 68 lags behind.<sup>45</sup> It suggests that instead of conducting lengthy rulemakings to change Part 68, the Commission should rely on consensus industry positions achieved through standards bodies.<sup>46</sup> IDCMA disagrees that the Commission should defer to "industry consensus" because it can be incorrect or contrary to the established policies of the Commission.<sup>47</sup>

### 2. Discussion

28. We recognize that it is desirable to expedite our rulemaking process. We agree with TIA that any future effort to harmonize our terminal equipment attachment rules with those of other countries will be frustrated if, after technical requirements are initially harmonized, the regulatory process fails to keep pace with technological changes. For this reason, we believe that it is advantageous for the Commission and the nation to rely, whenever possible, on standards bodies composed of industry experts to resolve complex technical matters.

29. We cannot agree, however, that the Commission should rely completely on industry consensus as a substitute for its Part 68 rulemaking function. Reliance on industry consensus, as IDCMA correctly observes, will not always be consistent with our

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<sup>45</sup> TIA Comments at 6.

<sup>46</sup> Timely rule changes, it says, are becoming ever more important as the Commission moves to harmonize its terminal equipment attachment rules with those of other countries. TIA notes that the U.S. Government, along with Mexico and Canada, have agreed in the North American Free Trade Agreement (NAFTA) to seek harmonization of terminal equipment attachment rules. *Id.* at 3.

<sup>47</sup> IDCMA Reply at 6.

mandate to promote the public interest.<sup>48</sup> While standards bodies often may most expeditiously resolve complex technical matters, when consensus cannot be achieved, these bodies lack the Commission's authority to ensure that fair rules supporting safe and direct electrical connection of subscribers' telephone terminal equipment to the public switched network are developed. Thus, while industry consensus can and should play a crucial and vital role in assuring interoperability and connectivity, the Commission must retain the ultimate responsibility, which it exercises in its Part 68 rulemakings, to ensure subscribers' continued ability to make beneficial use of interconnected devices and communications systems. Finally, if the industry believes it can reach a consensus on such matters, it may submit a negotiated rulemaking proposal to us.

#### **IV. Technical and Administrative Issues**

30. Parties raise a number of technical and administrative issues concerning our proposed amendments to Part 68 to include ISDN and PSDS equipment standards. We address them below.

##### **A. Part 68 for Terminal Equipment Connected to the Two-Wire BRA and Four-Wire PRA Interface Provided by ISDN**

##### **1. Section 68.308**

##### **a. Positions of the Parties**

31. NYNEX asks whether the encoded analog content protection requirements of Section 68.308 should be extended to ISDN terminal equipment. NYNEX also proposes that standards bodies determine specific signaling interference requirements for ISDN.<sup>49</sup> IDCMA replies that ISDN signal interference requirements are unnecessary.<sup>50</sup>

32. TIA and IDCMA request that the title of Section 68.308(h)(2) be amended to incorporate a reference to ISDN PRA service, as these subparagraphs apply equally to 1.544 Mbps and to ISDN PRA services.<sup>51</sup> TIA also asks that the pulse template specified in Table III of this subsection be modified: (1) to allow a maximum pulse height of 3.6 volts; and (2) to allow the Option A pulse to fall within the template indicated in Figure 68.308(e) Ref. EIA/TIA 547-1989. These changes, TIA says, will

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<sup>48</sup> Id.

<sup>49</sup> NYNEX Comments at 3.

<sup>50</sup> IDCMA Reply at 8.

<sup>51</sup> TIA Comments at 5; IDCMA Comments at 5.

make the rule consistent with industry-adopted standards in the United States and Canada.<sup>52</sup>

33. NYNEX and IDCMA request that the proposed "Through Gain Limitations" of Section 68.308(b)(5) be deferred until the TR-41.9.4 Committee finalizes its recommendations and makes them available to the public.<sup>53</sup> IDCMA and TIA further request that the term "subrate" rather than "DDS" be used in the section to be consistent with the text of Part 68. TIA asks the Commission to define the term "HCC" used in the section. Finally, TIA asks that the "Zero Level Decoder" definition be amended to comply with the (mu) 255 Pulse Code Modulation law specified in ITU-T Recommendation G.711.<sup>54</sup>

#### **b. Discussion**

34. We agree with NYNEX that the encoded analog content protection requirements of Section 68.308 should be extended to ISDN equipment. While encoded analog services are not provided through ISDN because ISDN is digital, we are concerned that when digital signals are converted to analog and retransmitted on public switched networks they may carry certain analog signals that pose network harm. For example, if a signal with excessive amplitude is passed from a digital network to an analog public switched network, it could damage the public network because its high amplitude exceeds that network's normal operating levels. We therefore extend the encoded analog protection of Part 68 to ISDN terminal equipment. As signal interference requirements are only technically applicable to the analog network, not ISDN, we deny NYNEX's second request and take no action to incorporate them into our rules.

35. We also agree with TIA and IDCMA that the title of Section 68.308(h)(2) should be amended to incorporate a reference to ISDN PRA service, because these subparagraphs apply equally to 1.544 Mbps and to ISDN PRA services. Accordingly, we will make that change. We will also modify the pulse template specified in Table III in our current rules to update it with current industry standards. Our current template is based on an earlier industry standard. In keeping with TIA's suggestion, we also modify our Zero Level Decoder definition to state that it complies with the (mu) 255 Pulse Code Modulation encoding standard that is specific to digital applications in North America.<sup>55</sup>

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<sup>52</sup> TIA Comments at 5.

<sup>53</sup> NYNEX Comments at 3; IDCMA Reply at 8.

<sup>54</sup> TIA Comments at 5; IDCMA Reply at 9.

<sup>55</sup> A different encoding scheme is used in Europe.



36. We further agree to defer action on our proposed Through Gain Limitations to Section 68.308(b)(5) and instead to address the matter in a forthcoming rulemaking to amend Part 68 to harmonize it with Canada's network protection standards.<sup>56</sup> We clarify that "HCC" is an abbreviation for "High Capacity Circuits" used in early tariffs for T.1 (1.544 Mbps) service.

37. Finally, we clarify in Section 68.308(b)(2)(iii) by inserting the words "when averaged" after -12 dBm, and replace the word "a" with "any" before "3-second". This will eliminate inconsistencies in the text of our amended rules.

## **2. Section 68.310(1)**

### **a. Positions of the Parties**

38. Many parties support our proposal to include a metallic to longitudinal (M-L) balance requirement in Part 68.<sup>57</sup> Bell Atlantic, for example, says this balance requirement should be adopted because it addresses crosstalk interference, a potential source of harm to the network. NYNEX also supports the proposal, and requests that a longitudinal to metallic (L-M) balance requirement be included as well. It says that the L-M balance measures susceptibility to noise induced on the wire pair connected to unbalanced terminal equipment.

### **b. Discussion**

39. As the Commission stated in the Notice, Part 68 is directed to the prevention of network harm, not to establishing performance measures. Accordingly, as an L-M methodology is a performance measure (measuring susceptibility to noise), and not an interference measure, we reject its inclusion into Part 68. Only M-L balance requirements for ISDN and PSDS that address the potential network harm of cross-talk interference will be included in our rules.<sup>58</sup>

## **B. Part 68 Changes for Terminal Equipment Connected to PSDS**

### **1. Section 68.308**

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<sup>56</sup> On March 9, 1995, TIA filed its Petition for Rulemaking to amend Part 68 to harmonize it with Canada's certification regulations CS-03.

<sup>57</sup> See, e.g., Bell Atlantic Comments at 3; NYNEX Comments at 2-3.

<sup>58</sup> M-L balance is also known as "transverse balance."

**a. Positions of the Parties**

40. AT&T argues that the pulse heights proposed in Tables IV(A) and (B) of Section 68.308(h) (i) are much too narrow to accommodate normal operation.<sup>59</sup> It urges that broader ranges of at least plus or minus fifteen percent be created around the Commission's selected mid-points.

41. Ameritech asserts that the scrambling algorithm for PSDS Types II and III proposed in 68.308(h) (3) (ii) is necessary to prevent network harm.<sup>60</sup> PSDS Type II is a two-wire switched 56 Kbps service that has a digital data channel and an analog signaling channel. PSDS Type III is a four-wire digital service that provides two full duplex channels on one pair of wires and an 8 Kbps network address signalling channel and a 64 Kbps data channel on the second pair of wires. Ameritech claims that the "scrambling of the digital signals prevents the generation of discrete frequency components, thus ensuring the sufficient density of pulses needed for timing recovery and to prevent crosstalk interference in adjacent systems."<sup>61</sup> Others, however, question whether exact scrambling algorithms need to be contained in Part 68 to prevent network harm.<sup>62</sup>

42. Several parties raise the issue of whether PSDS Type I should be included in proposed Sections 68.308(b) (1) (viii) and (b) (2) (iii).<sup>63</sup> PSDS Type I service is a four-wire switched 56 Kbps service. Parties also question whether PSDS tolerances proposed in 68.308(h) (3) should be eliminated.<sup>64</sup>

**b. Discussion**

43. AT&T does not provide sufficient data to justify creating at this time a broader pulse height range around selected mid-points than the Commission had proposed in the Notice. It merely claims that the proposed ranges are too narrow to accommodate normal operation. Without a more rigorous demonstration to show that broader ranges are necessary, we decline to make the changes it suggests.

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<sup>59</sup> AT&T Comments at 2.

<sup>60</sup> Ameritech Petition for Rulemaking, Appendix at 13.

<sup>61</sup> Id.

<sup>62</sup> See, e.g., TIA Comments at 9.

<sup>63</sup> See, e.g., BellSouth Comments at 5; TIA Reply at 9.

<sup>64</sup> See, e.g., TIA Comments at 11.

44. The scrambling algorithm Ameritech proposes is not supported by the record before us.<sup>65</sup> For example, it may be possible, as TIA suggests, to substitute a lower pulse density for the exact scrambling algorithms that Ameritech proposes to avoid any potential network harm created by cross-talk. As the justification for including the proposed scrambling requirements is not established, we do not include it in our Part 68 rules at this time.

45. In the Notice, the Commission did not propose to include PSDS Type I in our proposed rules because equipment connected to PSDS Type I is substantially the same as the lease-line versions already in the rules, and can be used or readily adapted for use for PSDS services.<sup>66</sup> Leased line versions of PSDS Type I equipment are four-wire leased line equipment to which network address signaling functionality has been added. To close any potential loophole in the rules we adopt today, however, we will specifically include PSDS Type I in rules 68.308(b)(1)(viii) and (b)(2)(iii). This will help ensure that later designed equipment that may not be "substantially the same" as that in use today will be included in Section 68.308(b)(1)(viii).

46. Finally, we eliminate PSDS tolerances proposed in 68.308(h)(3). We agree with TIA that as PSDS services receive their referencing "clock" from the serving central office, the tolerances of the "clock" for the terminal equipment does not raise a concern about potential network harm.<sup>67</sup>

## **2. Section 68.314(a)(3)**

### **a. Positions of the Parties**

47. Some parties recommend that the proposed two-second billing protection delay for PSDS Types I, II, and III in 68.314(a)(3) be deleted because the need for the delay has not been established.<sup>68</sup> AT&T, for example, says that the delay is unnecessary at least for PSDS Types I and III because there is no risk that calls of less than two seconds, such as very brief bursts of data, will be subject to the billing problems that

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<sup>65</sup> See, e.g., BellSouth Comments at 5.

<sup>66</sup> See Notice, 9 FCC Rcd 1068, 1072 at paras. 7-8.

<sup>67</sup> See TIA Comments at 11. A "clock" provides signals in a transmission system to control timing of certain functions. "Clock tolerance" is the permissible difference of a clock from a designated time reference supplied by the telephone company.

<sup>68</sup> See, e.g., AT&T Comments at 3; IDCMA Reply at 9.

prompted the rules.

## **b. Discussion**

48. The record in this proceeding does not establish the need for a billing delay for PSDS. Originally, the time delay was developed to prevent certain types of toll fraud. It appears, however, that the type of equipment that was susceptible to this problem, which prompted the proposed rule, will not be used in central offices providing digital switched service. Moreover, as IDCMA suggests, advances in deployment of nationwide Signalling System 7 and other technologies have increased the ability of billing systems to register, and bill for, calls of brief duration.<sup>69</sup> As it appears there is little risk of billing problems associated with calls of less than two seconds, such as very brief bursts of data, we do not amend our rules to allow a billing protection delay at this time.

## **C. Test Equipment Exemption**

### **1. Positions of the Parties**

49. TIA suggests that the Part 68 test equipment exemption used by telephone companies for network installation and maintenance be expanded to include usage by interexchange carriers, competitive access providers, and other service providers.<sup>70</sup> IDCMA agrees that the exemption for test equipment should not be limited to use by telephone companies.<sup>71</sup>

### **2. Discussion**

50. TIA's proposal was not among those included in the Notice, and its proponents have not analyzed the proposal in terms of potential risks of harm to the public switched network. We therefore cannot include it among the final rules adopted herein. We invite proponents, however, to submit a specific proposal for notice and comment rulemaking analysis. Any such proposal should include an analysis of the benefits to users and the potential risks of harm to the network.

## **D. Inverse Multiplexers for ISDN Equipment**

51. In the Notice, the Commission asked parties to address whether a new technology known as "inverse multiplexing" or

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<sup>69</sup> IDCMA Comments at 5 n.5.

<sup>70</sup> TIA Comments at 11.

<sup>71</sup> IDCMA Reply at 7.

"bandwidth on demand" should be included in Part 68.<sup>72</sup> Inverse multiplexing permits customers to use PSDS and ISDN BRA technologies to order wider bandwidths in multiples of 56 or 64 Kbps.

### 1. Positions of the Parties

52. NYNEX argues that inverse multiplexers have applications that go beyond ISDN and PSDS, so that standards for such equipment go beyond the scope of the Notice.<sup>73</sup> IDCMA claims that because inverse multiplexers are CPE that use 56 and 64 Kbps ISDN service and the proposed rules contain requirements for interconnection of CPE with 56 and 64 Kbps ISDN services, no additional notice is necessary.<sup>74</sup>

### 2. Discussion

53. We agree with IDCMA that the Part 68 rules that we now adopt in this Order, specifying the characteristics necessary for connection to a 56 or 64 Kbps service, apply to a device capable of connecting to separate multiple 56-or 64 Kbps services. Our Part 68 rules apply to either service arrangement. Accordingly, we take no further action to amend our rules at this time.

## E. Part 68 Administrative Issues

### 1. Positions of the Parties

54. In the Notice, the Commission proposed that the Common Carrier Bureau publish a Registration Guide "with a list of acceptable test procedures" to show compliance with Part 68 requirements.<sup>75</sup> TIA claims that this language could be interpreted to mean that the FCC will determine and publish its own test procedures. TIA urges the Commission to clarify its intent by replacing the words "with a list of" by the word "referencing."<sup>76</sup> TIA further urges the Commission to clarify in its final rules that only one copy of the Part 68 application form (Form 730) is required.<sup>77</sup>

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<sup>72</sup> Notice, 9 FCC Rcd at 1072, para. 7.

<sup>73</sup> NYNEX Comments at 5-6.

<sup>74</sup> IDCMA Reply at 7.

<sup>75</sup> Notice, 9 FCC Rcd at 1080.

<sup>76</sup> TIA Comments at 10; see also IDCMA Reply at 9.

<sup>77</sup> TIA Comments at 10.

55. TIA also asks the Commission to clarify some typographical errors. In Section 68.3, it says that in the definition for ISDN PRA, "ring-2" should be "ring-1".<sup>78</sup> It adds that in Section 68.310(1), the proposed rule twice uses the term ohms but capitalizes it only once.<sup>79</sup>

## **2. Discussion**

56. To avoid confusion, we will use the word "referencing" in place of "with a list of" in Section 68.200(d). We will also make the typographical corrections that TIA suggests and some typographical corrections to Section 68.312(h). We clarify that only one copy of Form 730 is required for a Part 68 application. Although no commenters addressed the issue, under Section 68.300 we will allow Part 68 registrants of small devices for which it is impractical to place labelling information, to place such information in a prominent place in user's instructions.

## **V. Paperwork Reduction Act**

### **1. Initial Paperwork Reduction Act of 1995 Analysis**

57. This Report and Order contains either a proposed or modified information collection. As part of its continuing effort to reduce paperwork burdens, we invite the general public to comment on the information collections contained in this order, as required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13. Public and agency comments are due 60 days from publication of the notice in the Federal Register. Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

## **VI. Ordering Clauses**

58. Accordingly, IT IS ORDERED that pursuant to authority contained in Sections 1, 4(i), 4(j), 201-205 and 403 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154(i), 154(j), 201-205, 225 and 403, Part 2 and Part 68 of the Commission's rules ARE AMENDED as set forth in Appendix B.

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<sup>78</sup> Id. at 12.

<sup>79</sup> Id.

59. IT IS FURTHER ORDERED that the rules and requirements set forth herein to include terminal equipment for ISDN and PSDS into Part 68, and the rules for Part 68 registration revocation ARE ADOPTED.

60. IT IS FURTHER ORDERED that the rules adopted herein SHALL BE EFFECTIVE ninety days after publication of this Report and Order in the Federal Register.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton  
Acting Secretary





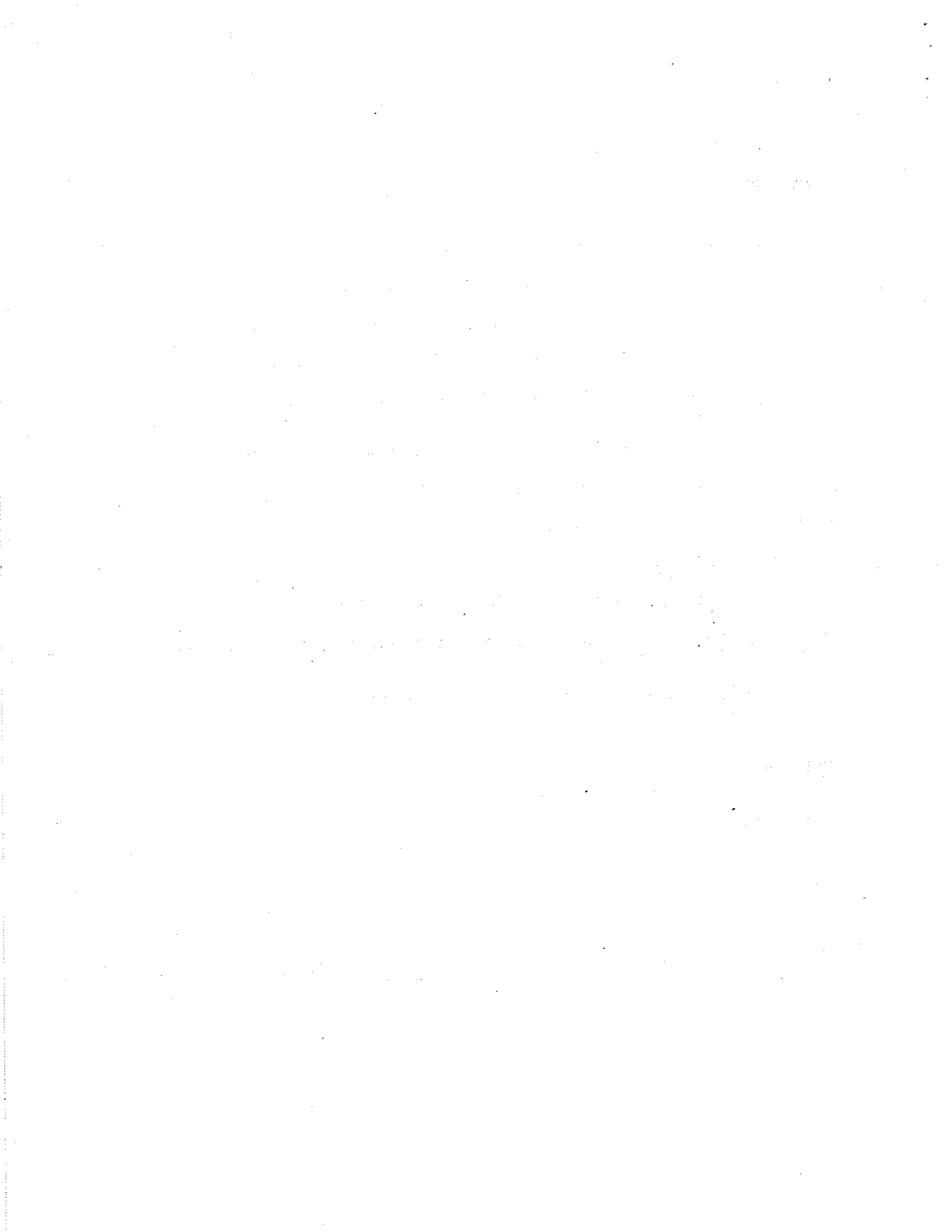
## APPENDIX A

### COMMENTS:

1. American Telephone and Telegraph Company (AT&T)
2. Ameritech Operating Companies (Ameritech)
3. Bell Atlantic Telephone Companies (Bell Atlantic)
4. BellSouth Telecommunications, Inc. (BellSouth)
5. Independent Data Communications Manufacturers Association, Inc. (IDCMA)
6. North American Telecommunications Association (NATA)
7. NYNEX Telephone Companies (NYNEX)
8. Pacific Bell and Nevada Bell (Pacific)
9. RICOH Corporation
10. Southwestern Bell Telephone Company (SWBT)
11. Telecommunications Industry Association, User Premises Equipment Division (TIA)
12. US West Communications, Inc. (US West)

### REPLIES:

1. IDCMA
2. NYNEX



**APPENDIX B**

Part 2 and part 68 (Chapter 1 of Title 47 of the Code of Federal Regulations) are amended as follows:

**PART 2 - FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS**

1. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 202, 203, 204, 205, 208, 215, 218, 313, 314, 404, 410, 602 unless otherwise noted.

2. Section 2.1302 is amended by removing the words "two copies" and adding in their place the words "one copy."

**PART 68 - CONNECTION OF TERMINAL EQUIPMENT TO THE TELEPHONE NETWORK**

1. The authority citation for part 68 is revised to read as follows:

Authority: 47 U.S.C. 151, 154, 155, 201-205, 208, 215, 218, 220, 226, 227, 303, 313, 314, 403, 404, 410, 412, 522.

2. Section 68.2 is amended by revising paragraph (a) introductory text, and adding paragraphs (a)(9), (a)(10), (j) and (k) to read as follows:

**§ 68.2 Scope.**

(a) General. Except as provided for in paragraphs (b), (c), (d), (e), (f), (g), (h), (i), (j) and (k), the rules and regulations in this part apply to direct connection:

\* \* \* \* \*

(9) Of all terminal equipment to Public Switched Digital Service (PSDS) Type I, II or III.

(10) Of all terminal equipment to the Integrated Services Digital Network (ISDN) Basic Rate Access (BRA) or Primary Rate Access (PRA).

\* \* \* \* \*

(j) Grandfathered equipment for connection to PSDS (Type I, II

or III)

(1) Terminal equipment, including its premises wiring directly connected to PSDS (Type I, II or III) on or before January 1, 1996, may remain for service life without registration, unless subsequently modified. Service life means the life of the equipment until retired from service. Modification means changes to the equipment that affect compliance with part 68 rules.

(2) New installation of terminal equipment, including its premises wiring, may occur until July 1, 1997, without registration of any terminal equipment involved, provided that the terminal equipment is of a type directly connected to PSDS (Type I, II or III) as of January 1, 1996. This terminal equipment may remain connected and be reconnected to PSDS (Type I, II or III) for service life without registration unless subsequently modified.

(k) Grandfathered equipment for connection to ISDN BRA or PRA:

(1) Terminal equipment, including premises wiring directly connected to ISDN BRA or PRA on January 1, 1996, may remain connected to ISDN BRA or PRA for service life without registration, unless subsequently modified.

(2) New installation of terminal equipment, including premises wiring, may occur until July 1, 1997, without registration of any terminal equipment involved, provided that the terminal equipment is of a type directly connected to ISDN BRA or PRA as of January 1, 1996. This terminal equipment may remain connected and be reconnected to ISDN BRA or PRA for service life without registration unless subsequently modified.

3. Section 68.3 is amended by adding the following definitions in alphabetical order as they should appear; by revising the definition of "Test equipment"; by removing in the definition of Zero level decoder the words "See Figure 68.3(j)" and adding in their place "See Figure 68.3(1)"; by adding to the renamed Figure 68.3(1) the caption "Note: Zero Level Decoder complies with the (mu) 255 Pulse Code Modulation encoding law specified in ITU-T Recommendation G.711"; by revising in Figure 68.3(a) (in the schematic titled "LOOP SIMULATOR CIRCUITS") the maximum voltage value in the table for Condition 1 from "Max 52.5" to read "Max 56.5"; by revising Figure 68.3(g) (the schematic titled "AIOD DATA CHANNEL SIMULATOR CIRCUIT") by removing the second sentence from Note 4 and substituting in its place the following: "4. \*\*\* Thus, if the registered terminal equipment provides -42.5 to -56.5 volts, the overall circuit (simulator and PBX AIOD) shall be tested over the range of -39.5 to -59.5 volts."; and by adding new Figure 68.3(m) (reproduced herein) as it should appear.

**§ 68.3 Definitions.**

As used in this part:

\* \* \* \* \*

ISDN Basic Rate Interface: A two-wire interface between the terminal equipment and ISDN BRA. The tip and ring leads shall be treated as telephone connections for the purpose of fulfilling registration conditions.

ISDN Primary Rate Interface: A four-wire interface between the terminal equipment and 1.544 Mbps ISDN PRA. The tip, ring, tip-1, and ring-1 leads shall be treated as telephone connections for the purpose of fulfilling registration conditions.

PSDS Type II Analog Mode Loop Simulator Circuit: A circuit simulating the network side of the two-wire telephone connection that is used for testing terminal equipment to be connected to the PSDS Type II loops. Figure 68.3(m) shows the type of circuit required. Other test circuit configurations may be used provided they operate at the same DC voltage and current characteristics and AC impedance characteristics presented in the illustrated circuit. When utilized, the simulator should be operated over the entire range of loop resistances, and with the indicated voltage limits and polarities. Whenever the loop current is changed, sufficient time shall be allowed for the current to reach a steady-state condition before continuing testing.

Public Switched Digital Service Type I (PSDS Type I): This service functions only in a digital mode. It employs a transmission rate of 56 Kbps on both the transmit and receive pairs to provide a four-wire full duplex digital channel. Signaling is accomplished using bipolar patterns which include bipolar violations.

Public Switched Digital Service Type II (PSDS Type II): This service functions in two modes, analog and digital. Analog signaling procedures are used to perform supervisory and address signaling over the network. After an end-to-end connection is established, the Switched Circuit Data Service Unit (SCDSU) is switched to the digital mode. The time compression multiplexing (TCM) transmission operates at a digital transmission speed of 144 Kbps to provide full-duplex 56 Kbps on the two-wire access line.

Public Switched Digital Service Type III (PSDS Type III): This service functions only in a digital mode. It uses a time compression multiplexing (TCM) rate of 160 Kbps, over one pair, to provide two full-duplex channels -- an 8 Kbps signaling channel for supervisory and address signaling, and a 64 Kbps user data channel on a two-wire access line.

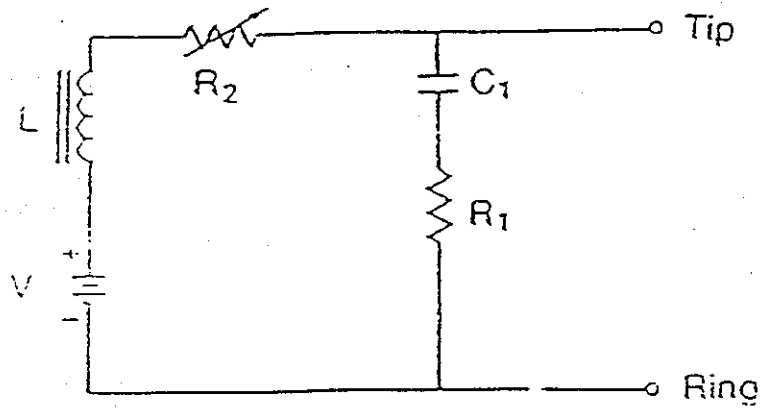
Switched Circuit Data Service Unit (SCDSU): A CPE device, with

PSDS functionality, located between the Network Interface and the data terminal equipment. (It also is sometimes referred to as Network Channel Terminating Equipment).

\* \* \*

Test Equipment: Equipment connected at the customer's premises that is used on the customer's side of the network interfaces: (a) to measure characteristics of the telephone network; or (b) to detect and isolate a communications fault between a terminal equipment entity and the telephone network. Registration is required for test equipment capable of functioning as portable traffic recorders or equipment capable of transmitting or receiving test tones; except registration is not required for devices used by telephone companies solely for network installation and maintenance activities such as hand-held data terminals, linesmen's handsets, and subscriber line diagnostic devices.

\* \* \* \* \*



$L \geq 10H$  (Resistance= $R_L$ )

$R_1 = 600 \Omega \pm 1\%$

$C_1 = 500 \mu F, -10\%, +50\%$

### TEST CONDITIONS FOR ANALOG MODE

V (Volts)		$R_2 + R_L$ (Ohms)
Min	Max	Continuously Variable
36	46	610 To 1510

Fig. 68.3 (H)

### SIMULATOR CIRCUIT FOR PSDS IN ANALOG MODE

4. In Section 68.104(b), the designation "§ 68.308(a)(4)(i) or (ii)" is removed, and the designation "§ 68.308(b)(4)(i) or (ii)" is added in its place.

5. In Section 68.112(b)(2), the word "policy" is removed, and the word "police" is added in its place.

6. In the first sentence of the introductory text of Section 68.200, the words "two copies" are removed, and the words "one copy" are added in their place; and Section 68.200(d) is revised to read as follows:

**Subpart C -- Registration Procedures**

**§ 68.200 Application for equipment registration.**

An original and one copy \* \* \*

\* \* \* \* \*

(d) A statement that the terminal equipment or protective circuitry complies with and will continue to comply with the rules and regulations in Subpart D of this part, accompanied by such test results, description of test procedures, analyses, evaluations, quality control standards and quality assurance standards as are necessary to demonstrate that such terminal equipment or protective circuitry complies with and will continue to comply with all the applicable rules and regulations in Subpart D of this part. The Common Carrier Bureau will publish a Registration Application Guide referencing acceptable test procedures; but other test methods may be employed provided they are fully described in the application and are found acceptable by the Commission.

\* \* \* \* \*

7. In the third line of Section 68.208(a), the phrase "of this part of which" is removed, and the phrase "of this part or which" is added in its place.

8. Section 68.211 is added to read as follows:

**§ 68.211 Registration revocation procedures.**

(a) Cause for revocation. The Commission may revoke the part 68 registration of a registrant:

(1) Who has obtained the equipment registration by misrepresentation; or



(2) Whose registered equipment is shown to cause harm to the network; or

(3) Who willfully or repeatedly fails to comply with the terms and conditions of its part 68 registration; or

(4) Who willfully or repeatedly fails to comply with any rule, regulation or order issued by the Commission under the Communications Act of 1934 relating to equipment registration.

(b) Notice of Intent to Revoke Part 68 Registration. Before revoking a part 68 registration under the provisions of this section, the Commission, or the Common Carrier Bureau under delegated authority, will issue a written Notice of Intent to Revoke part 68 Registration, or Joint Notice of Apparent Liability for Forfeiture and Intent to Revoke part 68 Registration pursuant to sections 1.80 and 1.89 of the rules.

(1) Contents of the Notice. The Notice will:

(i) Identify the registration date(s) and registration number(s) of the equipment, and the rule or federal law apparently violated;

(ii) Set forth the nature of the act or omission charged against the registrant, and the facts upon which such charge is based;

(iii) Specify that in the event of revocation, the registrant may not reapply for registration of the same product for a period of six months; and

(iv) Specify that revocation of the registration may be in addition to, or in lieu of, an amount in forfeiture levied pursuant to Section 1.80 of the rules.

(c) Delivery. The Notice will be sent via certified mail to the registrant at the address certified in the part 68 application associated with the registration at issue.

(d) Response. The registrant will be given a reasonable period of time (usually 30 days from the date of the Notice) to show, in writing, why its part 68 registration should not be revoked or why the forfeiture penalty should not be imposed or should be reduced.

(e) Reapplication. A registrant whose registration has been revoked may not apply for registration of the same product for a period of six months from the date of revocation of the registration.

(f) Reconsideration or appeal. A registrant who is issued a revocation of equipment registration and/or forfeiture assessment may request reconsideration or make administrative appeal of the decision pursuant to part 1 of the Commission's rules -- Practice and Procedure, 47 C.F.R. part 1.

9. Section 68.300(c) is added to read as follows:

**Subpart D -- Conditions for Registration**

\* \* \* \* \*

**§ 68.300 Labelling requirements.**

\* \* \* \* \*

(c) When the device is so small or for such use that it is not practical to place the labelling information specified in paragraphs (a) and (b), the information required by these paragraphs shall be placed in a prominent place in user instructions. The FCC Registration Number and the device Model Number, however, must be displayed on the device. All lettering on the label must be discernible without magnification.

10. Section 68.308 is amended by revising paragraph (a); adding paragraphs (b)(1)(viii) and (b)(2)(iii); adding a table of conditions to paragraph (b)(7)(ii)(C); removing from the table in paragraph (f)(2)(ii) the words "20 kHz" and inserting in their place the words "120-kHz"; revising the first sentence of paragraph (h)(2)(v); and adding paragraphs (h)(3), (h)(3)(i), and (h)(4) to read as follows:

**§ 68.308 Signal power limitations.**

(a) General. Limitation on signal power shall be met at the interface for all 2-wire network ports, tip and ring conductors to PSDS Types II and III, and, where applicable to services, both transmit and receive pairs of all 4-wire network ports. Signal power measurements will be made using terminations as specified in each of the following limitations. The transmit and receive pairs of 4-wire network ports shall be measured with the pair not under test connected to a termination equivalent to that specified for the pair under test. Through-gain limitations apply only in the direction of transmission to the network.

(b) \* \* \*

(1) \* \* \*

(viii) For PSDS (Types I, II and III) terminal equipment when in the digital mode of transmission, the maximum equivalent power of any encoded analog signal (other than live voice) shall

not exceed -12dBm when averaged over any 3-second interval. The equivalent analog power shall be derived by a zero-level decoder located at the network interface to PSDS (Type II or III) facilities.

(2) \* \* \*

(iii) For PSDS (Types I, II and III) terminal equipment, when in the digital mode of transmission, the maximum equivalent power of any encoded analog signal shall not exceed -3dBm when averaged over any 3-second time interval. The equivalent analog signal shall be derived by a zero-level decoder located at the network interface to PSDS (Types II or III) facilities.

\* \* \* \* \*

(7) \* \* \*

(i) \* \* \*

(ii) \* \* \*

(C) Except for ... for the following conditions (see Fig. 68.3(f)):

-----

: R2 + RL :

CONDITION	CLASS B	CLASS C
1	600	1300
2	1800	2500

\* \* \* \* \*

(h) \* \* \*

(1) \* \* \*

(2) Limitations on Terminal Equipment Connecting to 1.544 Mbps Digital Services and ISDN PRA Services --

\* \* \* \* \*

TABLE III

Pulse Height (volts).....	2.4 to 3.6
Pulse Width (half amplitude) (nsec).....	324 +/- 45
Maximum rise or fall time: from 10% to 90% points (nsec).....	100

\* \* \*

(v) Encoded analog content. If registered terminal equipment connected to 1.544 Mbps digital service or to ISDN PRA service contains an analog-to-digital converter, or generates signals in digital form which are intended for eventual conversion to voiceband analog signals, the encoded analog content of the subrate channels of the ISDN information bearing channels within the 1.544 Mbps signal must be limited.

\* \* \*

(3) Pulse Repetition Rate. For PSDS (Type II) the pulse repetition rate shall be a maximum of 144,000 pulses per second +/-5 pulses per second; for PSDS (Type III) the pulse repetition rate shall be a maximum of 160,000 pulses per second +/-5 pulses per second.

(i) Template for maximum output pulse. When applied to a 135 ohm resistor the instantaneous amplitude of the largest isolated output pulse obtainable from the registered terminal equipment shall fall within the template of Table IV(A) for PSDS Type II or Table IV(B) for PSDS Type III. The limiting pulse template shall be defined by passing an ideal 50% duty cycle rectangular pulse within the amplitude/pulse rate characteristics of Table IV(A) or Table IV(B) through a 1-pole low-pass filter with a 3dB frequency of 260 kHz.

PULSE CHARACTERISTICS	TABLE IV(A)	TABLE IV(B)
Pulse Height	2.6 volts +/-5%	2.4 volts +/-5%
Pulse Width	3472.2 +/-150ns	3125 +/-100ns
Max Rise or Fall Time (from 10% to 90% points)	100ns	1.2 microsecond +/- 0.2 microsecond

\* \* \* \* \*

11. Section 68.310 is amended by revising the table in paragraph (a), revising the introductory text of paragraph (i), and revising (l) to read as follows:

**§68.310 Longitudinal balance limitations.**

(a) \* \* \*

Paragraph	Equipment State	Minimum Balance Requirement, dB	Frequency Range, Hz
(b)	On-hook	60	200 - 1000
	On-hook	40	1000 - 4000
	Off-hook	40	200 - 4000
(c)	On-hook	60	200 - 1000
	On-hook	40	1000 - 4000
	Off-hook	40	200 - 4000
(d)	Off-hook	40	200 - 4000
(e) Voice Equipment	On-hook	60	200 - 1000
	On-hook	40	1000 - 4000
	Off-hook	40	200 - 4000
(e) Data Equipment	On-hook	60	200 - 1000
	On-hook	40	1000 - 4000
	Off-hook	40	200 - 4000
(f)	Off-hook	40	200 - 4000
(g)	On-hook	60	200 - 1000
	On-hook	40	1000 - 4000
	Off-hook	40	200 - 4000
(h)	Off-hook	40	200 - 1000
(i)	On-hook	60	200 - 1000
	On-hook	40	1000 - 4000
	Off-hook	40	200 - 4000
(j)	Off-hook	40	200 - 4000

(i) Registered terminal equipment and registered protective circuitry for 4-wire network ports. The pair under ... impedance. The pair not under test shall be terminated in a metallic impedance of 600-ohms.

\* \* \* \* \*

(1) The maximum ... 1.544 Mbps shall be 100 ohms plus or minus one percent. The metallic termination used for the longitudinal balance measurements (M-L balance) for subrate, ISDN (BRA) and PSDS shall be 135 ohms +/- 1% and for 1.544 Mbps and ISDN (PRA) shall be 100 ohms +/- 1%. The longitudinal termination for these measurements (L-M balance) shall be 90 ohms in all cases.

\* \* \* \* \*

12. Section 68.312 is amended by revising the introductory sentences of paragraph (b); revising paragraph (b)(2); removing from paragraph (c)(2) the words "paragraph (a)(2)" and adding in their place the words "paragraph (b)(2)"; and by amending the second sentence of paragraph (h) to read as follows:

**§ 68.312 On-hook impedance limitations.**

(a) \* \* \*

(b) Limitations on individual equipment intended for operation on loop-start telephone facilities, including PSDS Type II in the analog mode:

\* \* \* \* \*

(2) Registered terminal equipment and registered protective circuitry intended for use on facilities which will always have ringing detection circuitry in use at the same time such registered terminal equipment and registered protective circuitry is connected need not comply with the 40 kilohms maximum impedance specification of paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(h) Limitations ... (DID).

PBX ringing supplies whose output appears on the off-premises interface leads shall not trip when connected to the following tip-to-ring impedance which terminates the off-premises station loop: ...

\* \* \* \* \*