

# Tab 4 Technical Standards



*(b) Technical standards.*

*(1) ASCII and Baudot. TRS shall be capable of communicating with ASCII and Baudot format, at any speed generally in use.*

Montana Relay is capable of receiving and transmitting using Voice, Turbo Code, ASCII or Baudot formats, at any speed generally in use. All equipment is compatible with industry-wide standards. The modems used by Montana Relay can auto-detect the difference between ASCII and Baudot signals within the same modem so that each call is connected correctly. Montana Relay furnishes all necessary telecommunications equipment and software to be capable of communicating with all voice, Baudot and ASCII calls at the correct Baud rate. The workstations and switching mechanisms used by Montana Relay are flexible enough to process other formats as they become available to relay users.

The Montana Relay provides Turbo Code, a proprietary alternate protocol developed by Ultratec which allows faster typing speeds and interrupt capability. This alternative protocol is discussed in detail in Appendix A.

*(2) Speed of answer.*

*(i) TRS providers shall ensure adequate TRS facility staffing to provide callers with efficient access under projected calling volumes, so that the probability of a busy response due to CA unavailability shall be functionally equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.*

*(ii) TRS facilities shall, except during network failure, answer 85% of all calls within 10 seconds by any method which results in the caller's call immediately being placed, not put in a queue or on hold. The ten seconds begins at the time the call is delivered to the TRS facility's network. A TRS facility shall ensure that adequate network facilities shall be used in conjunction with TRS so that under projected calling volume the probability of a busy response due to loop trunk congestion shall be functionally equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.*

*(A) The call is considered delivered when the TRS facility's equipment accepts the call from the local exchange carrier (LEC) and the public switched network actually delivers the call to the TRS facility.*

*(B) Abandoned calls shall be included in the speed-of-answer calculation.*

*(C) A TRS provider's compliance with this rule shall be measured on a daily basis.*

*(D) The system shall be designed to a P.01 standard.*

*(E) A LEC shall provide the call attempt rates and the rates of calls blocked between the LEC and the TRS facility to relay administrators and TRS providers upon request.*

Montana's Relay provides adequate staffing to provide callers with efficient access to the relay. The probability of a busy response due to Communication Assistant unavailability is functionally equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.

Except during network failure, Montana Relay **answers** ninety percent (90%) of all calls within 10 seconds, and the average answer speed is three and three-tenths (3.3) seconds or less. Abandoned calls are included in the speed-of-answer measurement. This results in the caller's call immediately being placed, not put in a queue or on hold on a daily basis for the State of Montana. Montana Relay begins measuring Average Answer time from the moment a relay call arrives at its relay switch (i.e. in the TRS center's network). As soon as the equipment used by Montana Relay accepts the call from the LEC and the public switched network delivers the call to the TRS center, Montana Relay starts its call detail record to capture answer time data.

### **Call Blockage**

The Montana Relay is designed to a P.01 standard. No more than one call in 100 will receive a busy signal when calling the relay center at the busiest hour. Montana Relay defines "blockage" as any call that arrives at the relay switch but is not answered due to the customer receiving a busy signal.

**There has been no blockage at our switch points because our incoming network capacity is well in excess of any peak load requirements.** Relay users never receive a busy signal from Montana Relay. If a relay user does reach a busy signal, there is a problem somewhere else in the network that is not under Montana Relay's control (i.e. local network, long distance network, equipment, etc.) Although very unlikely, in the event the switch used by Montana Relay is down, calls are automatically rerouted or intercept messages are used rather than busy signals.

The systems used by Montana Relay are designed to prevent blockage. The switch used by Montana Relay is a high-speed, stand-alone, **non-blocking** digital switching matrix. The system is fully redundant to insure quality and reliable performance, making blockage or any downtime nearly impossible. The system auto-detects any problems and moves to the secondary system immediately if necessary.

Another measure Montana Relay has taken to prevent blocking is to use networks that make use of SONET survivability technology. All of the networks controlled by Montana Relay - from the point a relay user picks up the phone in their home or business, through the relay and then back to the other phone being called - are redundant and can survive fiber cuts and other such outages. This allows Montana Relay to maintain its zero percent blockage rate.

Montana Relay measures, records and reports its answer performance and blockage rate information to the MTAP and abides by the FCC rules (i.e. a LEC shall provide the call attempt and the rates of calls blocked between the LEC and the relay center upon request).

Hamilton's transmission circuits meet or exceed industry interexchange performance standards for circuit loss and noise. Hamilton has no busies at its center because of a lack of facilities. Hamilton's system is currently provisioned in such a manner that call blockage or busies never

happen. This meets the FCC requirements. **In the last 12 months Hamilton has experienced absolutely no call blockage.**

*(3) Equal access to interexchange carriers. TRS users shall have access to their chosen interexchange carrier through the TRS, and to all other operator services, to the same extent that such access is provided to voice users.*

Montana Relay provides relay users with access to the interexchange carrier of their choice through the TRS, and to all other operator services, to the same extent that such access is provided to voice users. Interlata and intralata long distance toll charges are recorded and billed by the relay user's carrier of choice in the same manner as the carrier bills that customer for long distance calls made without the relay. On each interlata and intralata call, Montana Relay forwards the appropriate information digits (identifying the call as a relay call), calling number and called number as part of the call information so that the long distance company can bill the customer at correct functionally equivalent rate through their normal billing mechanisms. Calling card or credit card billing is handled in the same manner. Montana Relay has provisioned the necessary trunks at each of its relay switching tandems for all long distance companies participating in equal access so that they can receive Montana Relay traffic. Montana Relay offers equal access to all carriers who choose to participate.

When a call has been defined as a long distance call, Montana Relay sends this call to its relay switching tandem. The correct carrier code is sent with each call so that the tandem sends the call to the customer's carrier. Each call is identified as a relay call. If a relay user has signed up with his/her carrier of choice for a "relay" discount, the carrier will bill the call as a relay call and pass on any discounts. Relay users will receive one bill from their carrier of choice just like they do for all of their direct calls. Montana Relay explains this type of billing arrangement through all Outreach and Customer Service activities, in newsletters, relay materials, etc. so that relay users understand how to select a carrier and find the best long distance rates.

Montana Relay provides relay users with access to all other Operator Services to the same extent that such access is provided to voice users. Operator services are handled in the same manner as explained above. All operator assisted calls are sent to the customers' carrier of choice for processing and billing.

The type of arrangement explained above gives the control to the relay user. The relay user can pick their carrier of choice, receive one bill for all of their calls, and the relay user can shop for the best rates, just like they do today for calls not made through the relay. The relay user can continue to work with one carrier and the relay remains invisible.

The customer profile program used by Montana Relay is based on the relay users' ANI that provides automatic connection to the carrier of choice for both interlata and intralata calls made by the relay user. Relay users complete a customer profile with their carrier information and Montana Relay adds this information to its database. On each subsequent relay call relay users are automatically connected to their carrier of choice. Relay users can also notify the Communication Assistant of their carrier of choice when making a long distance relay call. In the event a relay user elects to change his/her carrier of choice, the Communication Assistant is

able to do so. The Communication Assistant will also explain carrier of choice to a relay user when asked.

Montana Relay offers 1010 dialing through the relay. This service is functionally equivalent to using 1010 services when not placing calls through the relay. In addition to 1010 dial-around, Montana Relay has 34 interexchange carriers available on its platform.

In order to obtain new carriers on its platform, Montana Relay contacts all carriers that are requested by its users to see if they will participate in relay equal access. Montana Relay then works diligently through ordering and testing phases with that carrier to ensure that the carrier becomes available to Montana relay users. Hamilton maintains a list of participating long distance carriers for the Montana Relay and makes this information available to relay users.

#### *(4) TRS facilities.*

*(i) TRS shall operate every day, 24 hours a day. Relay services that are not mandated by this Commission need not be provided every day, 24 hours a day, except VRS.*

The Montana Relay provides telecommunications relay service 24 hours a day, 7 days a week.

*(ii) TRS shall have redundancy features functionally equivalent to the equipment in normal central offices, including uninterruptible power for emergency use.*

The facility used by Montana Relay has the needed redundancy in switching mechanisms and telecommunication facilities to ensure operation 24 hours a day. Montana Relay is operated from Hamilton's Relay facility located in Aurora, Nebraska. Montana Relay calls automatically overflow during peak volume times and during any failure of switching or telecommunications facilities to other centers operated by Montana Relays provider. This ensures continuous operation of the Montana Relay.

### **Switching System**

Montana Relay makes use of an Excel telecommunications switch. The GS-2000 is a programmable, non-blocking switching system that supports a wide range of digital telephony services. Its open, modular architecture and programmable interfaces allow for simplified and cost-effective application development. The GS-2000 supports up to 2,048 ports in a single high-density system. Its components include a matrix CPU, network interface cards, Digital Signal Processing service cards and SS7 packet engine cards. The GS-2000 adapts to all standard network and line interfaces, including T1, E1, J1, and ISDN PRI.

The InterCall Switch Operating System (ISOS) was developed in response to the need to quickly develop applications on the Excel Inc. programmable switching platforms.

The ISOS can simply be loaded on a UNIX host, and plugged into the switch to offer basic tandem type switching capabilities including routing and call detail records. The ISOS is a fully operational basic switch and has great flexibility.

The workstation application was developed to take advantage of the power and flexibility of the ISOS operating system. It provides a high level of Communication Assistant control processing with complete flexibility to connect any type of call protocol to any other type of call protocol. A database was developed to maintain a profile of each caller to speed up call connections and to provide information for tailored call processing.

**The switching system used by Montana Relay contains a fully redundant central processing unit on hot standby with automatic failover.** This is to ensure that no calls are dropped due to technical failure. It also has a redundant power supply on hot standby. Backup control and database servers are also on hot standby with automatic failover. Montana Relay maintains an inventory of spare critical components for the switching system onsite to ensure that the required levels of service are met (listed below).

The switch used by Montana Relay is a high-speed, stand-alone, non-blocking digital switching matrix. The system is fully redundant to insure quality, reliable performance. The system utilizes a standard T1 interface that enables it to be linked to other digital switches. All cards and power supplies within the system are redundant which gives us the flexibility to switch from one side of the switch to the other to perform updates or to troubleshoot without interrupting call processing. The system is set up to automatically access the secondary operating system on the switch with no human intervention. The system auto-detects any problems and moves to the secondary system immediately if necessary.

The on-sight switching system spare equipment includes:

- D4 channel bank
- All required channel bank cards
- T1 CSU packs
- Switch T-1 card
- Switch conference card

If one of the switching systems used by Montana Relay cannot be returned to service by transferring control to redundant equipment, the calls automatically will overflow to another switching system. Switching systems used by Montana Relay are designed to provide a very high level of operational security with two fully redundant processors and power supplies in each switch. Each fully redundant control system, which includes keyboard, monitor and printer capabilities, are used to control and monitor each of the switching systems. **The control systems provide online system monitoring and real-time programming capabilities that will not take the system off-line and the ability to perform preventative maintenance or repair while the system is online.** Remote capabilities are also provided so the system can be remotely monitored, reconfigured or controlled as necessary. All of this is provided to insure the required levels of service are always met.

## **Backup Power**

The backup power supply system fully complies with and exceeds the requirements for uninterruptible power. An uninterruptible power source with full battery backup is available to operate the Montana Relay at full capacity for extended periods of time. **Montana Relay also**

**has automatically activated generator back-up capabilities allowing it to provide relay service for days and weeks at a time during power outages.**

This power system supports the switch system and its peripherals, switch room and CA work site emergency lights and system alarms, CA consoles/terminals, Call Detail Recording, Supervisory and traffic monitoring consoles, Customer Service and administrative phone and voice mail systems, and building security systems.

Montana Relay's provider maintains auxiliary power sources for nine central offices in addition to all its relay centers. All of Hamilton's back-up power systems are comparable to central office auxiliary power sources in terms of time and capacity. Please Appendix C for Hamilton's Disaster Recovery Plan.

*(5) Technology. No regulation set forth in this subpart is intended to discourage or impair the development of improved technology that fosters the availability of telecommunications to person with disabilities. TRS facilities are permitted to use SS7 technology or any other type of similar technology to enhance the functional equivalency and quality of TRS. TRS facilities that utilize SS7 technology shall be subject to the Calling Party Telephone Number rules set forth at 47 CFR 64.1600 et seq.*

Using flexible software and hardware (i.e. common equipment frames, standard T1 interfaces, windows NT servers, UNIX operating System, etc.) where components can easily be modified in order to accommodate new technology, **the platform used by Montana Relay is ideal for today's rapidly changing technologically advanced environment.** Montana Relay's provider can quickly add new features and make changes based on the input from relay users and from our internal evaluations. Montana Relay's provider takes advantage of innovations and technological improvements to enhance the State of Montana's relay service.

As a telecommunications company, Montana Relay's provider is on the leading edge of new technology. Hamilton is an Internet provider, cable television provider, computer supplier and a general telecommunications provider. There are new advances in these areas every day. Hamilton is constantly watching for opportunities to use the technological advances in these areas in relay. Hamilton keeps the MTAP informed about any new types of technology that become available.

Montana Relay relies on user feedback a great deal to set its technological development priorities. Montana Relay is also involved in several industry groups to stay abreast of the latest FCC activities, user needs, and developing technology.

### **Signaling System Seven (SS7)**

**The relay platform used by Montana Relay has made use of SS7 signaling since February 2002.** The Relay platforms have been retrofitted to deliver Caller ID in the same manner that these services are delivered today in the public switched network (i.e. Montana Relay provides true Caller ID service where the actual information of the calling party (not the relay center number) appears on the called party's Caller ID box).

Please see Tab 6 for listing of the current technology provided by Hamilton that exceeds the above minimum standards.

*(6) Caller ID. When a TRS facility is able to transmit any calling party identifying information to the public network, the TRS facility must pass through, to the called party, at least one of the following: the number of the TRS facility, 711, or the 10-digit number of the calling party.*

### **True Caller ID**

**Through the use of SS7 signaling Montana Relay provides true Caller ID service where the actual information of the calling party (not the relay center number) appears on the called party's Caller ID box. Montana Relay provides this information on all call types and on all carriers. Montana Relay brings true functional equivalence to Montana Caller ID relay users.**

Montana Relay receives and passes calling line identification information, **including blocking information** from all users calling through the relay service. If the Caller ID block indicator is enabled on the call when Montana Relay receives it, the relay caller's number is not passed on to the called party. The call blocking information passes through automatically to the called party with no relay intervention. The relay user has complete control over blocking information with their local phone company. Please see Appendix A for more information.