

# High-Speed Dial-Up Configuration Using PPP Multilink

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The following instructions demonstrate how to achieve high-speed (greater than 56kbps) connections using PPP multilink. Multilink is a technology that allows separate physical dial-up connections to be used together as if they are one connection. Thus, the speeds of all connections are pooled together.

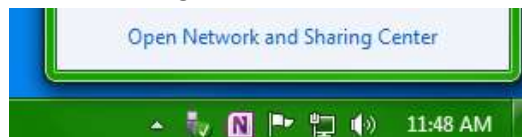
For the highest speeds, it is highly recommended to use a POTS (plain old telephone service) landline. Other connections are less stable and will likely not provide high speeds. However, speeds around 40kbps for one line and 80kbps for two lines have been observed with VoIP.

Your Internet Service Provider must support multilink. Not all service providers support multilink.

## Setting up a Dial-Up Connection

Multilink connections are just enhanced ordinary dial-up connections. Thus, you will need to first create a dial-up connection. To do so:

1. Open Network Sharing and Center through the Network  icon on the taskbar:



2. Click “Set up a new connection or network”:

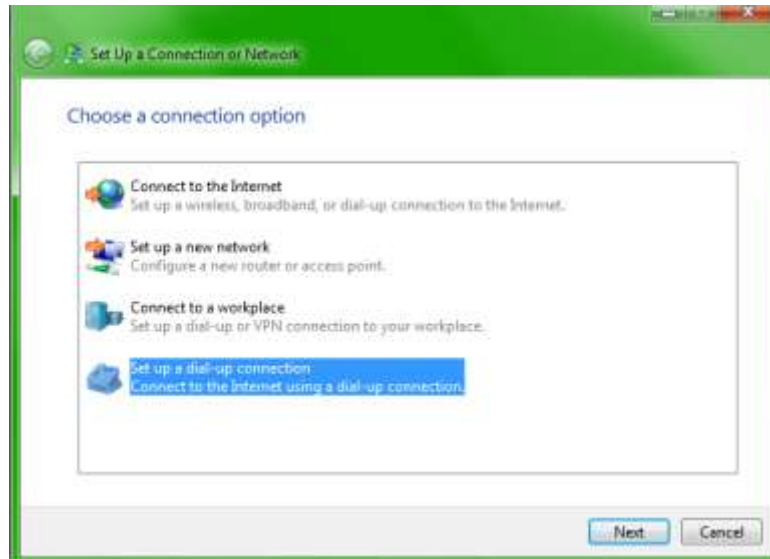
Change your networking settings



Set up a new connection or network

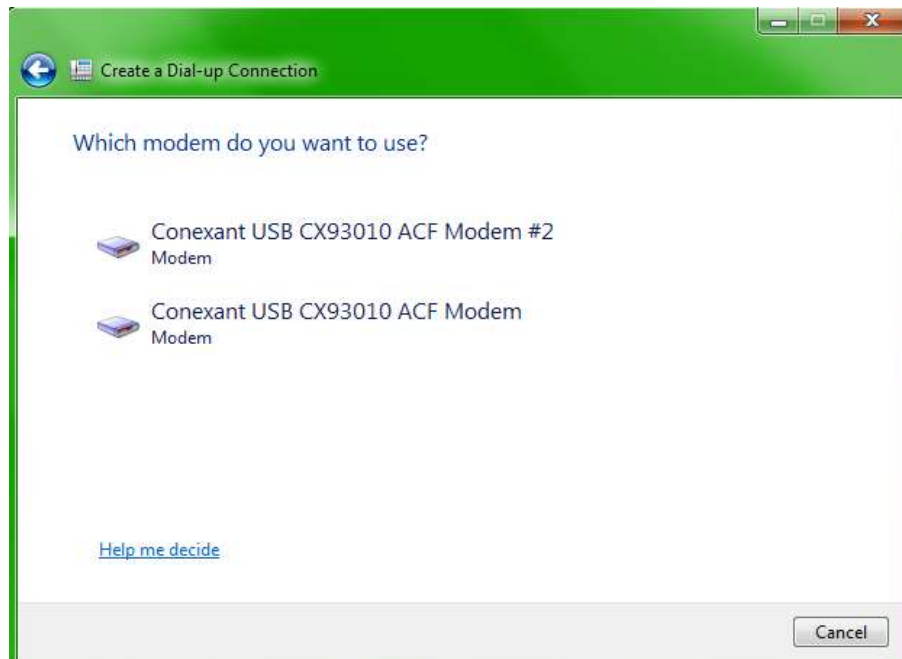
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

3. Click “Set up a dial-up connection”:



Astute users may notice that three of the four options have “dial-up” in the description. It is possible other options may also achieve the same end result.

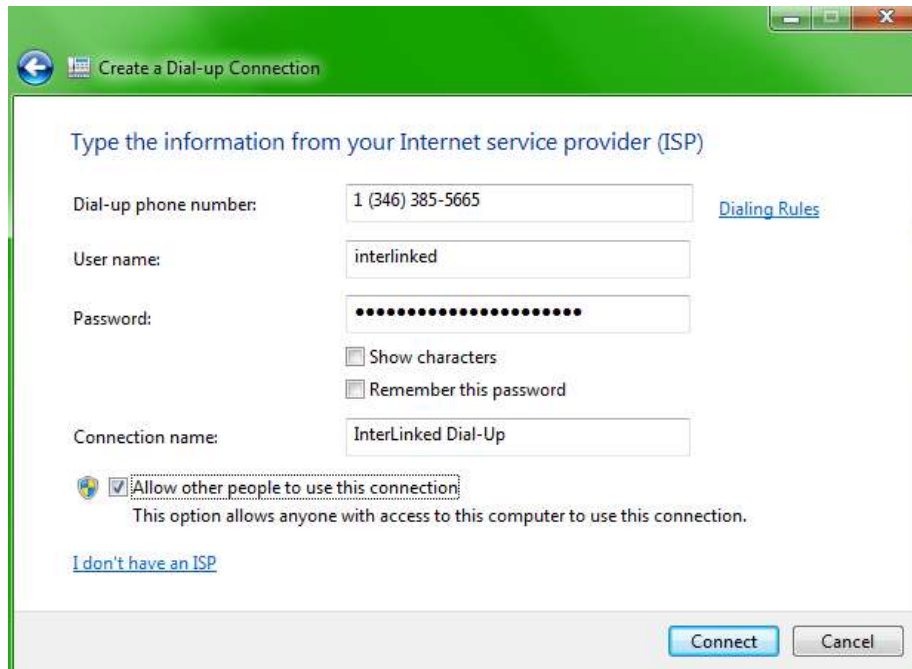
4. If you have multiple modems connected to your computer, you will be asked to choose which modem to use:



For multilink, you will use all modems connected to your PC, but for now, just choose any modem.


5. Enter the dial-up number, your username, and your password, and give the connection a name. To save on toll charges, choose the closest dial-up number available to you. InterLinked dial-up numbers are available at <https://bbs.interlinked.us>. For convenience, a list of numbers as of this printing is provided in the appendix.

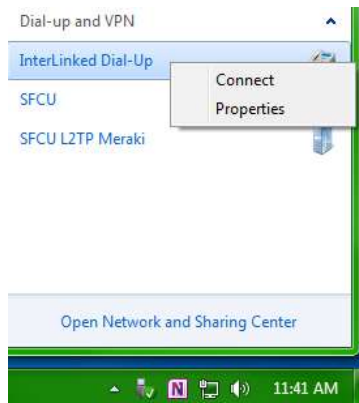
If you have flat-rate long-distance, you may choose any convenient number.



If you would like other people to be able to use the connection, check the box at the bottom. Note that this is not the same as “Internet Connection Sharing”, which allows sharing a PC’s dial-up connection with a Local Area Network to provide Internet access.

6. Follow the prompts to finalize the connection.

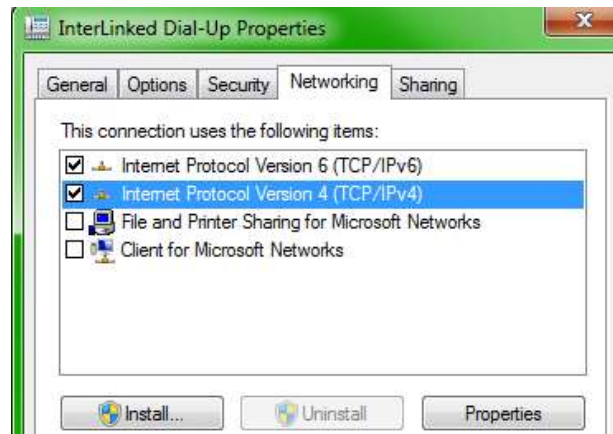
To use your connection, check the status, or change its properties, click the “Network”  icon in the taskbar:



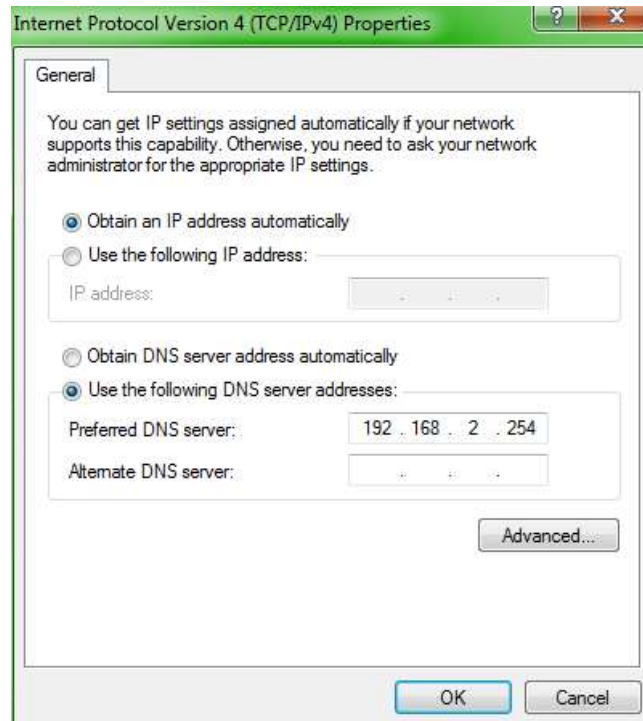
## Setting the Default Gateway

Your service provider may not set the default gateway for you. In this case, you can manually specify the default gateway. You will need to obtain this information from your Internet Service Provider.

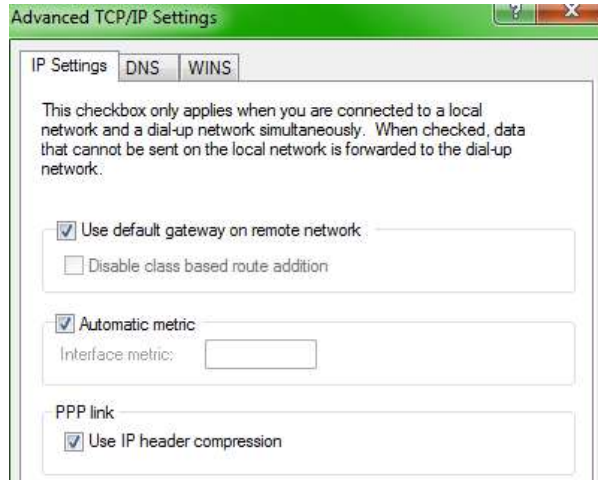
To set the default gateway, go to the Networking tab, choose Internet Protocol Version 4 (IPv4) and choose Properties:



Change "Obtain DNS server address automatically" to "Use the following DNS server addresses". Then specify the IP address of the default gateway.



If you click Advanced, make sure that “Use default gateway on remote network” is checked. This will forward traffic outside of your network to the dial-up connection:



## Enabling Multilink

Multilink allows for high-speed dial-up speeds. Both your equipment and your service provider must support multilink for PPP multilink to work.

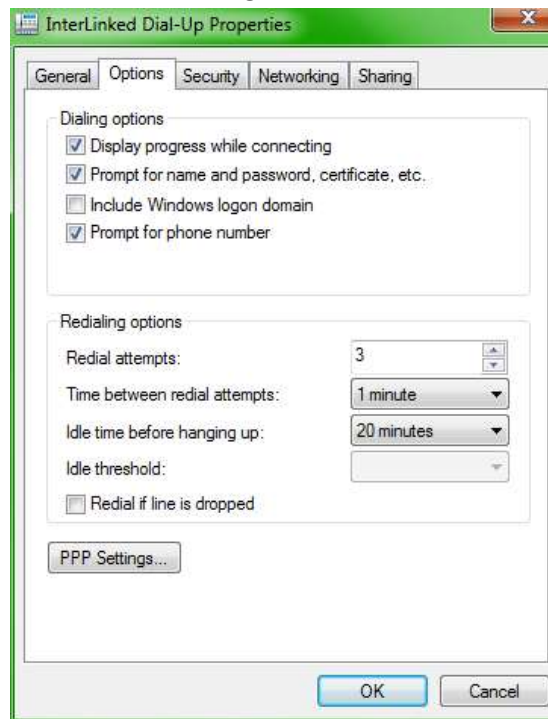
There are three additional things required to use PPP multilink to bundle the speeds of multiple dial-up connections together. To change these, right-click on the connection and choose “Properties”, as in the screenshot above.

1. On the **General** tab, you will see all of the modems plugged in and active on your computer. By default, they may not all be checked. Check ALL the modems you want to pool for use for the multilink connection:

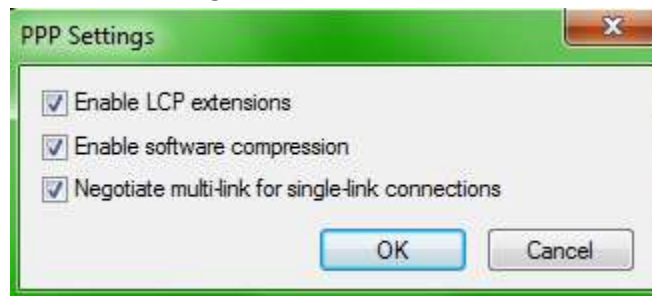


2. As shown in the above screenshot, make sure that “Dial only first available device” is unchecked.

3. Go to the “Options” tab and click “PPP Settings” at the bottom:

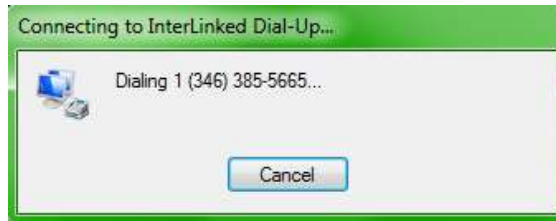


You will need to make sure that the last checkbox, “Negotiate multi-link for single-link connections” is checked. Otherwise, multilink will not be used and the separate physical connections cannot be used as one logical connection.



## Using Multilink

A multilink connection is dialed the same way as an ordinary connection. Simply click “Connect” as usual to dial the connection:



Both modems will go off-hook at once and dial the programmed number. Do not pick up any phones on the same line or you will interrupt the data negotiation and transmission.

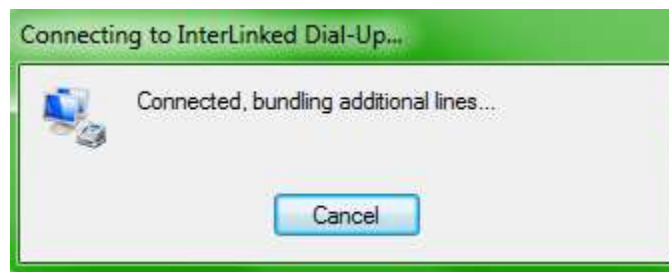
If the connection is properly dialed and modems negotiate, the server will attempt to authenticate you using the connections provided in the connection details:



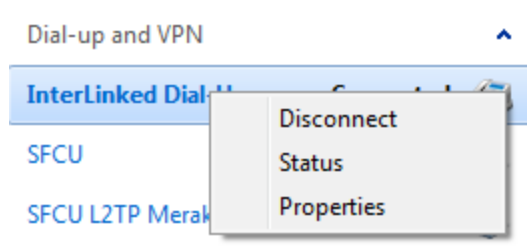
If your credentials are accepted, your computer will then be registered on the network:



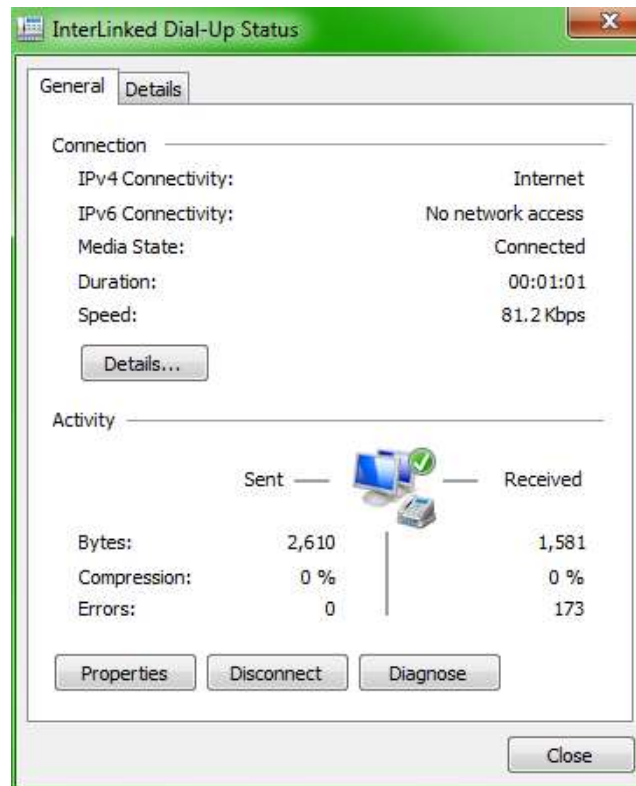
If multilink is used, you will also see an additional window at the end that tells you that it is bundling your connections together:



To check the speed of your connection, choose "Status" instead of "Properties":



You will be able to tell how fast the connection is by checking the “Speed” indicator. This speed adds all speeds used by all lines for the connection together, giving you your true logical speed:



The window above indicates a connection speed of 81.2 kilobits per second.

## Sharing Your Connection

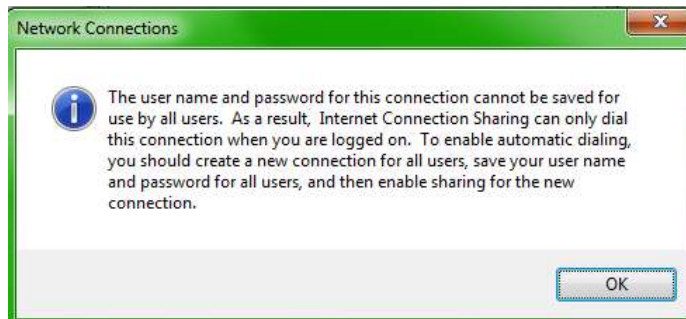
If you would like to use your dial-up connection to provide Internet access to a Local Area Network (LAN), you can use Internet Connection Sharing to achieve this. Your PC will need a network card. Since ICS acts as a router (including providing DHCP), you can connect the PC to an Ethernet switch using a standard twisted-pair Ethernet cable.

To enable sharing, go to the properties of the connection and go to the “Sharing” tab:





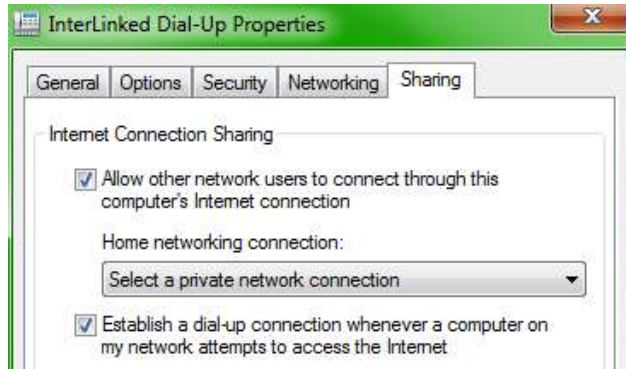
The first checkbox, “Allow other network users to connect through this computer’s Internet connection” will need to be checked. You may get a warning like this if other people are allowed to use this connection:



Now, choose the network to share the connection with:



It is also recommended to check the second checkbox:

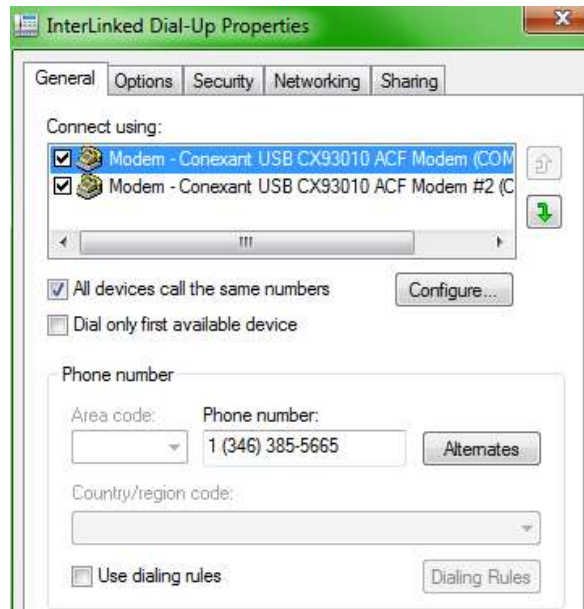


This will automatically dial the connection for you if a computer on your LAN attempts to access the Internet. This will save you from needing to manually initiate the connection on the modem-connected PC each time.

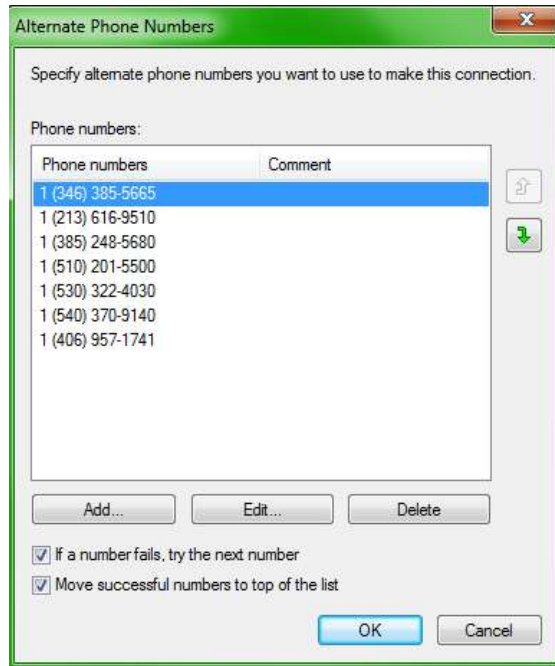
## Configuring Alternate Access Numbers

Occasionally, facilities may be congested and you may receive a busy signal when trying to dial up. To reduce the chances of being unable to automatically successfully establish a connection, you can configure alternate numbers as part of the dial-up connection.

On the General properties tab, click “Alternates”:



Now, you can provide alternate access numbers to use if the primary is unavailable. Consult your list of access numbers. Long-distance charges may apply for access numbers outside of your local calling area.



Make sure that the two checkboxes at the bottom are checked. This will ensure that Windows<sup>®</sup> automatically tries different numbers to establish a connection for you.

## Appendix: InterLinked Dial-Up Numbers

This list of access numbers is provided AS IS, WITHOUT WARRANTY and contains numbers working as of APRIL 2021. It is not guaranteed to be accurate in the future. For the latest list of access numbers, refer to <https://bbs.interlinked.us> or call your service provider for information.

To save on toll charges, you should pick the number located closest to you. Note that some cities may have zoned local calling areas and numbers may not be local even if they are in the same city as you. Consult the information pages in the front of your local telephone directory or call your operator if you are unsure if a number is within your local calling area. We disclaim all responsibility for any long-distance charges incurred for the use of its services.

- (213) 616-9510 - West Los Angeles, CA
- (215) 798-5050 - Philadelphia, PA
- (216) 260-2250 - Cleveland, OH
- (234) 702-5300 - Akron, OH
- (305) 749-5008 - Miami, FL
- (332) 206-0864 - New York Metro, NY
- (346) 385-5665 - Houston, TX
- (385) 248-5680 - Salt Lake City, UT

(407) 476-1277 - Orlando, FL  
(469) 501-5890 - Dallas, TX  
(470) 298-3070 - Atlanta, GA  
(505) 208-6370 - Albuquerque, NM  
(510) 201-5500 - Oakland, CA  
(514) 446-9726 - Toronto, ON  
(530) 322-4030 - Portola, CA  
(540) 370-9140 - Fredericksburg, VA  
(604) 210-4802 - Vancouver, BC  
(617) 993-0512 - Cambridge, MA  
(629) 262-5701 - Nashville, TN  
(647) 846-3165 - Montreal, QC  
(702) 620-5120 - Las Vegas, NV  
(737) 825-9124 - Austin, TX  
(775) 209-7120 - Reno, NV  
(909) 990-1230 - East Los Angeles (Rialto), CA  
(971) 256-3870 - Portland, OR