3. Enter the **bridge** IP Address and IP Netmask for the Model 195Ep. You will notice that for the 195Ep in AP Bridge mode only a single IP address in entered. Both the ethernet IP and wireless IP addresses will be the same in the bridge mode. Reference Figure 22.

Figure 22: Bridge IP Addresses

4. Enter the default route (Gateway) address for the network. For Ethernet devices on the wireless network (IP 172.16.X.X – See Figure 3), the AP Router 195Ep will be the gateway. Enter the **wireless** IP address for the AP Router 195Ep (configured in Example 1) and any DNS server information. If you are not connecting the Model 195Ep to the Internet, leave blank and press the *Next* button. Figure 23.

Figure 23: Default Route (Gateway) and DNS Configuration

5. Select *Yes* if you will be using security for your wireless network (recommened).

NOTE: The setting of this security level is ONLY for client access to the Model 195Ep. The security of the Bridge communication between the Model 195Ep's is separate and will be configured during the repeater configuration.

Enter the SSID for your network. The SSID is the unique identification for your wireless network and all 195Ep that share a wireless network MUST have the same SSID code. This identification code is case sensitive and must NOT contain spaces. Reference Figure 24.

Figure 24: Security and SSID Configuration

6. Select the encryption level for client access to the wireless network. For further information on the different levels of security, please refer to Appendix E – Security of this User's Manual. If you would like to hide the SSID from broadcasting from the Access Point select **Yes**. If Yes is selected the Model 195Ep will not send out periodic SSID radio. The users of the network will have to know the SSID to enter the network and security is increased, but if you want the SSID to be broadcast to the network for easy identification then select **No**. The 195Ep can also be configured to discard the probe requests from clients. If desired, set Discard Broadcast Probes to Yes. In our example, we will be using mobile clients with 128 bit WEP. Reference Figure 25.

Figure 25: Encryption Level Selection

7. Enter the WEP key values for your application that will be used by all devices on the wireless network. Reference Figure 26.

Figure 26: WEP Key Entry

8. Enter the values for the Access Control List (ACL). This is a configurable MAC filter that can be set to allow or deny specific wireless MAC address to the network. This feature is further explained in Appendix E – Security. In our example we will not use the ACL. Reference Figure 27.
9. Select the frequency channel of operation. All Access Points in the same Repeater Peer network need to be on the same radio

Figure 27: ACL Configuration

frequency channel. See Appendix D – Radio Configuration for help in selecting the frequency channel. Reference Figure 28.
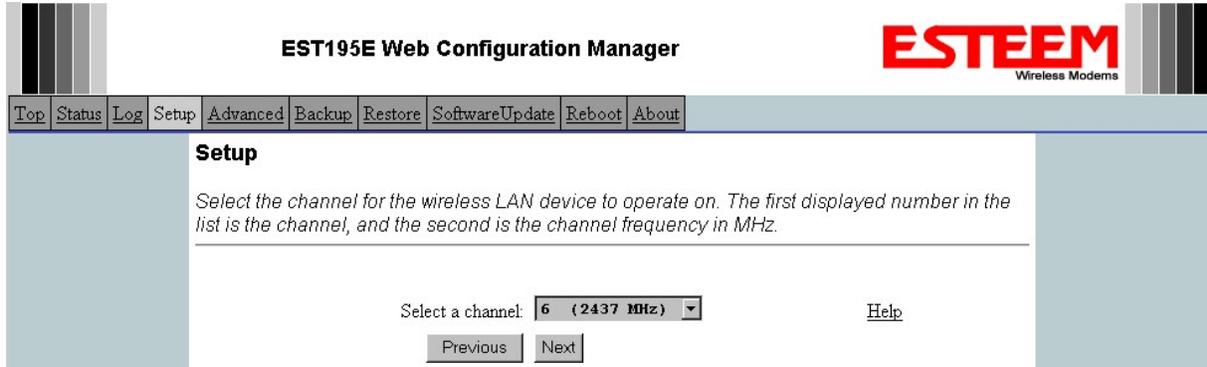

Figure 28: Channel Configuration

10. The Repeater Peer Table identifies which Model 195Ep's will bridge wireless Ethernet communication. Only other Access Point Repeaters need to be listed <u>not</u> the Model 195Ep's in client modes. Looking at the system layout in Figure 1 and what we discussed in Example 1, both the Plant Network's 195Ep and the Remote Building's 195Ep will be listed by their <u>wireless (WLAN) MAC</u> (Figure 29). There is only a single radio connection path to the other two 195Ep's in the network. The path cost only effects redundant links in the network (not applicable to the repeater) and will be left at default. Enter the WLAN MAC addresses for the other two Access Points and press the *Next* button to continue.

11. Select Commit Changes to write the programming to Flash memory and reboot the Model 195Ep. When the reboot process has completed (approximately 30 seconds) the modem will be ready to place in operation.
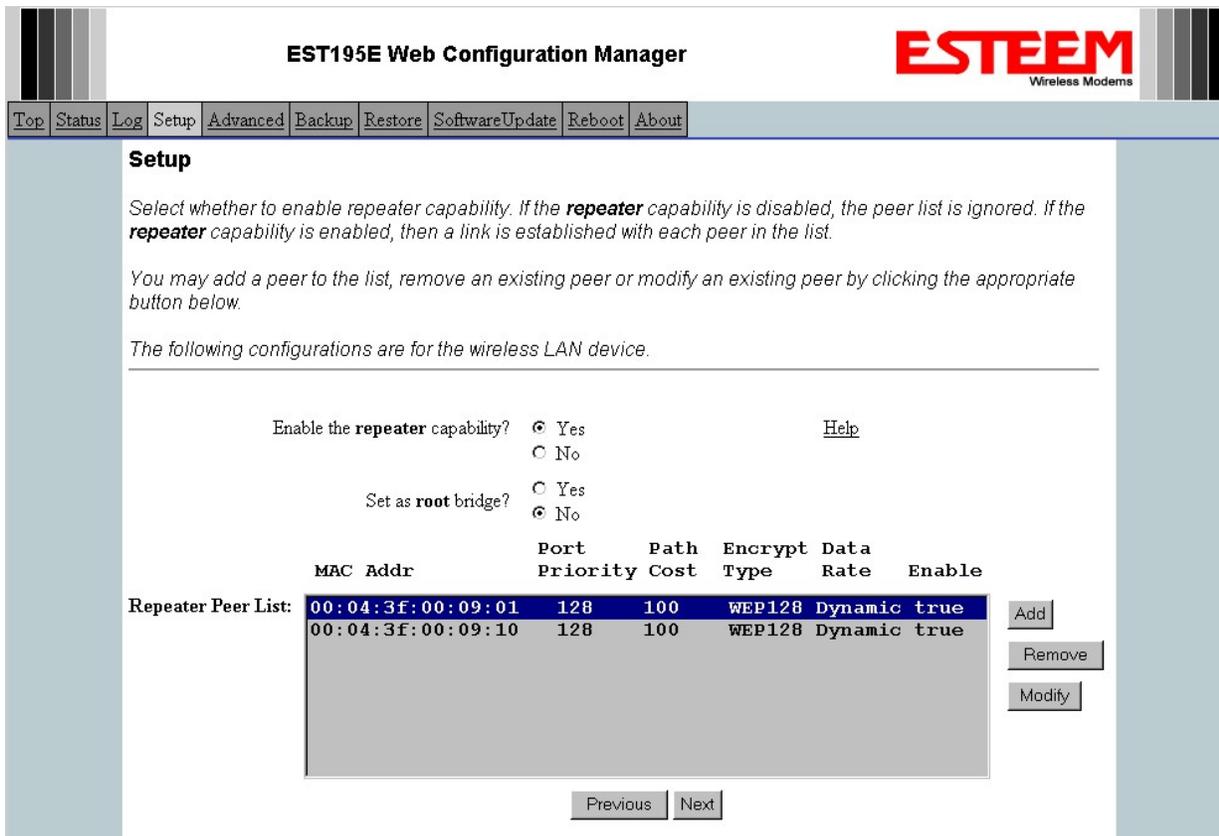

Figure 29: Repeater Configuration

Example 3 – Remote Building (Access Point Bridge with Repeater Enabled)

1. Review Example #1 diagram (Figure 1) and locate the 195Ep marked as Example 3. This ESTeem is connected to a Remote Building network that will be bridged to the Plant network through the Access Point Router (Example #1) via the repeater. This modem should be configured for Access Point Bridge mode and the configuration for this 195Ep will be identical to Example 2 except that the IP addressing and the Repeater Peer table. You would follow all steps 1-11 in Example 2 to configure this 195Ep also but Figures 31 & 32 will show the changes.

Figure 31: Example 3 Bridge IP Address

Figure 32: Example 3 Repeater Routing Table

Example 4 – Mobile Vehicle with Single Ethernet Device (EtherStation Mode)

Review the Example Diagram #1 (Figure 1) and locate the 195Ep marked as Example 4. This ESTeem is connected to a single Ethernet device in a mobile application and will be configured for EtherStation mode. In this mode the 195Ep will gain access to the wireless Ethernet canopy created by the three Access Points (Examples 1-3), but will be emulating the MAC address for the connected Ethernet device and will no longer have an IP address in the network. To reprogram the 195Ep after configuration in EtherStation mode requires the ESTeem Discovery Utility or direct connection to the RS-232 port.

1. Access the ESTeem Web page using your computer's Web Browser as per instructions in Chapter 4. Select Setup from the menu items. From the Select Mode of Operation pull down box , select EtherStation (Figure 33) and push the *Next* button below the pull down box.
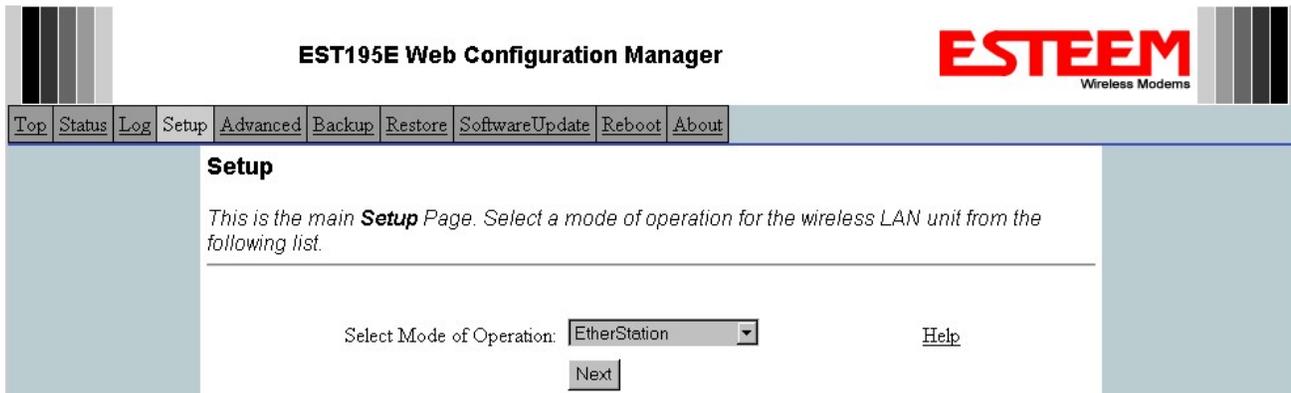

Figure 33: EtherStation Selection

2. Enter the SSID for your network. The SSID is the unique identification for your wireless network and all 195Ep that share a wireless network MUST have the same SSID code. This identification code is case sensitive and must NOT contain spaces. Select the encryption level for the wireless network to match the level of the Access Point canopy. Enter the MAC address of the connected Ethernet device. Reference Figure 34.
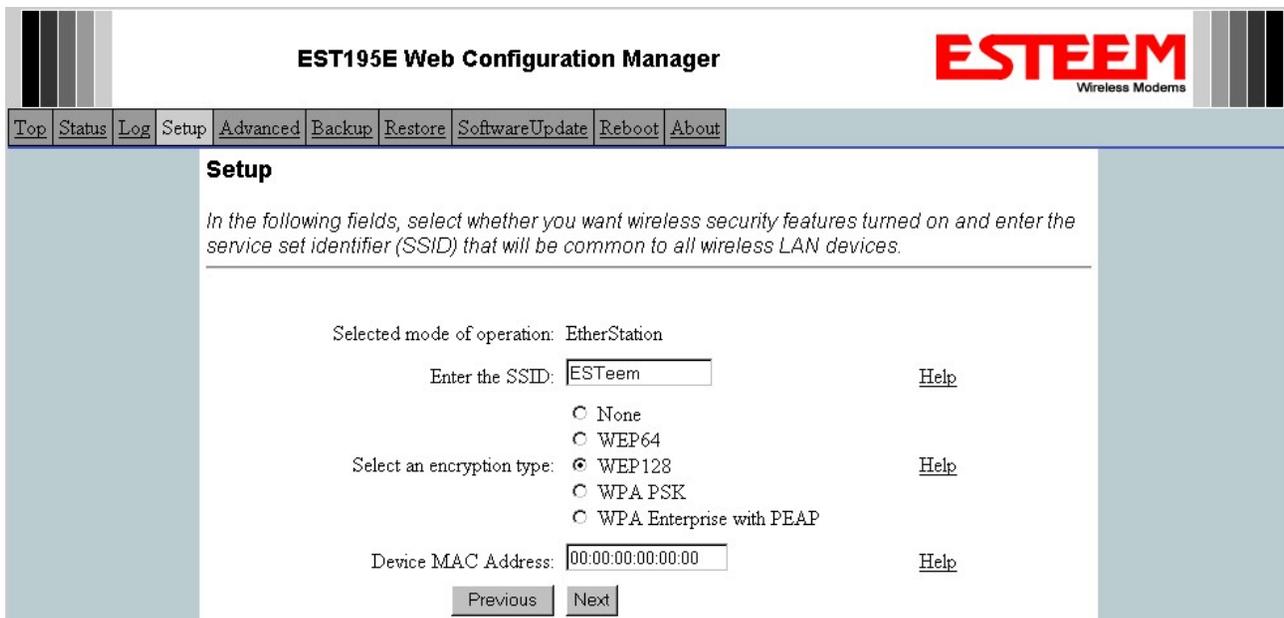

Figure 34: SSID and Device MAC Input

3. Enter the WEP key values for your application that will be used by all devices on the wireless network. Reference Figure 35.
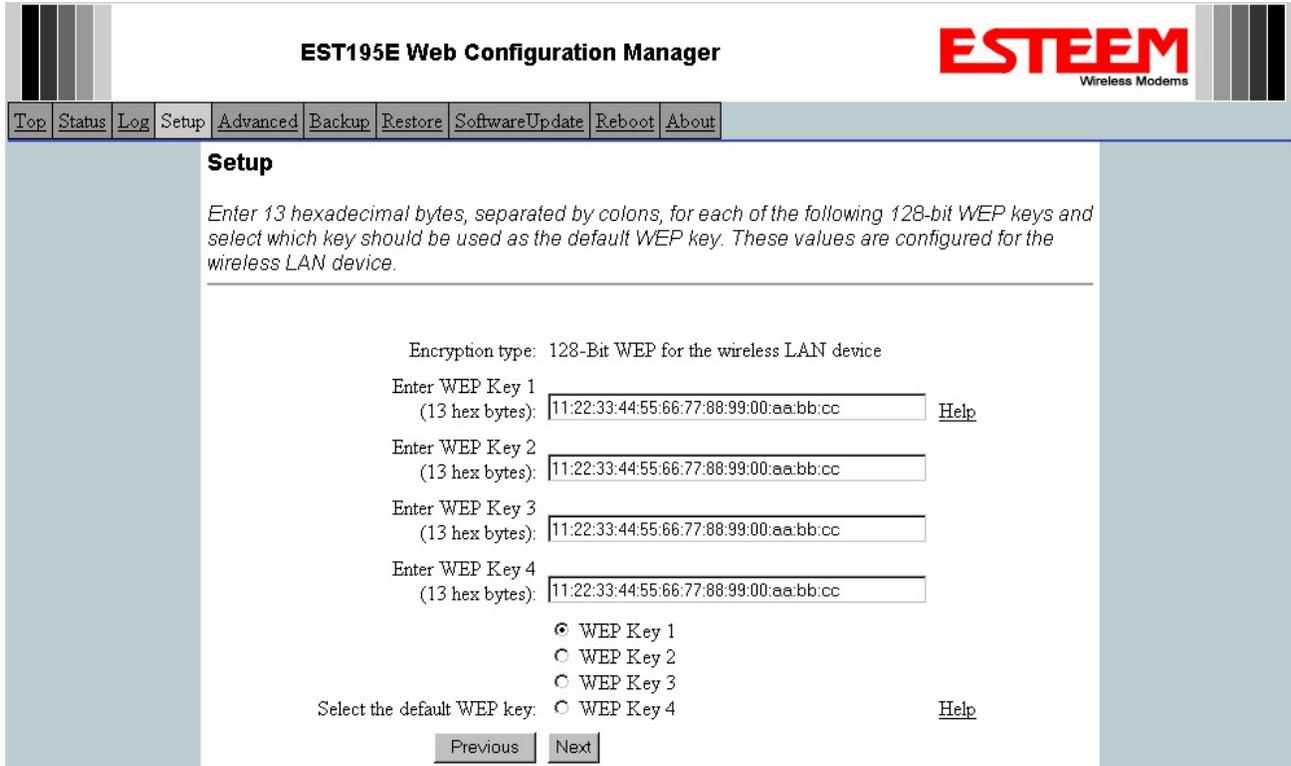

Figure 35: WEP Key Input

4. Select Commit Changes to write the programming to Flash memory and reboot the Model 195Ep. When the reboot process has completed (approximately 30 seconds) the modem will be ready to place in operation. Reference Figure 36.
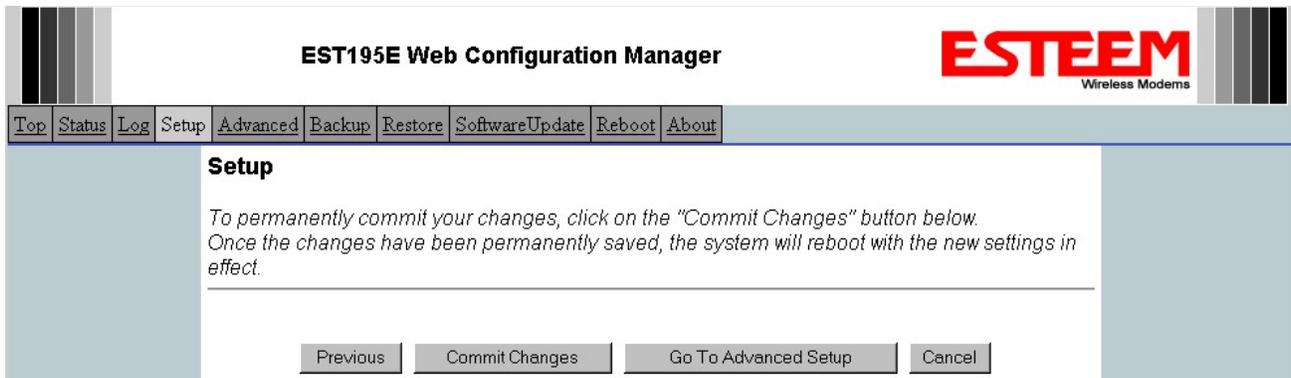

Figure 36: EtherStation Selection

Example 5 – Mobile Vehicle #1 (Station Router)

Review the Example Diagram #2 (Figure 2) and locate the 195Ep marked as Example 5. This ESTeem is connected to multiple Ethernet devices in a mobile application and will be configured Station Router mode. In this mode the 195Ep's will gain access to the wireless Ethernet canopy created by the Access Point and act as the router between the devices connected to the Ethernet port and wireless network. Each of these networks will require a unique subnet to operate. If Ethernet devices on the wired LAN network want to access Ethenet devices on the Station Router 195Ep, a network router is required on the wired LAN to resolve the IP conflict created by having the wired and wireless networks on separate subnets (Figure 37).
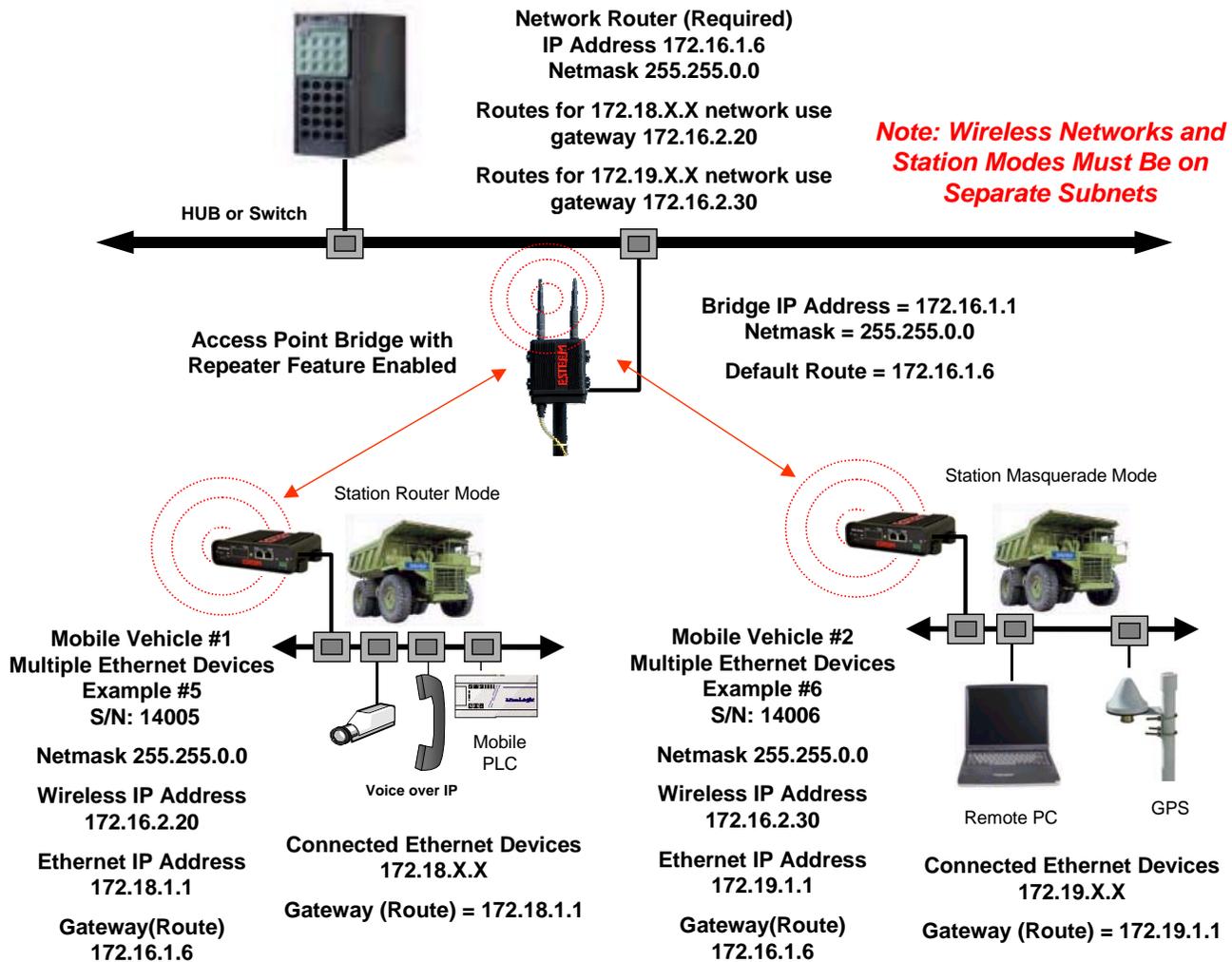
Figure 37: Station Router IP Addressing Diagram

1. Access the ESTeem Web page using your computer's Web Browser as per instructions in Chapter 4. Select Setup from the menu items. From the Select Mode of Operation pull down box , select Station Router (Figure 38) and push the *Next* button below the pull down box.

Figure 38:Station Router Selection

2. Select *Yes* if you would like to use DHCP services on either the **wireless** or **ethernet** connections. Enter the SSID for your network. The SSID is the unique identification for your wireless network and all 195Ep that share a wireless network MUST have the same SSID code. This identification code is case sensitive and must NOT contain spaces. Select the encryption level for the wireless network to match the level of the Access Point canopy. Reference Figure 39.

Figure 39:DHCP, SSID and Encryption Settings

3. Enter the WEP key values for your application that will be used by all devices on the wireless network. Reference Figure 40.

Figure 40:WEP Key Input

4. Refer to the IP address in Table 1 and enter the **wireless** IP Address and IP Netmask for the Station Router. Reference Figure 41.

Figure 41:Wireless IP Address

5. Refer to the IP address in Table 1 and enter the **ethernet** IP address and IP netmask. Reference Figure 42.

*Note: When configuring the Ethernet devices connected to the Station Router 195Ep, the ethernet IP address will be **their** Gateway address (Figure 37).*

Figure 42:Wired Ethernet IP Address

6. All IP requests for the Ethernet devices connected to the 195Ep Station Router (Example #5) will need to be resolved by the Network Router (Figure 37). Enter the default route (Gateway) IP address for the Network Router in the 195Ep. Enter any DNS server information and press the *Next* button. Figure 43.

Figure 43:Default Route (Gateway) Address and DNS Input

7. Select *Commit Changes* to write the programming to Flash memory and reboot the Model 195Ep. When the reboot process has completed (approximately 30 seconds) the modem will be ready to place in operation.

Example 6 – Mobile Vehicle #2 (Station Masquerade)

Review the Example Diagram #2 (Figure 2) and locate the 195Ep marked as Example 6. This ESTeem is connected to multiple Ethernet devices in a mobile application and will be configured Station Masquerade mode. In this mode the 195Ep's will gain access to the wireless Ethernet canopy created by the Access Point and act as a firewall between the devices connected to the Ethernet port and wireless network. Each of these networks will require a unique subnet to operate. In this configuration the Ethernet devices connected to the Station Masquerade 195Ep can access the wired LAN network, but not the other way around. This mode could be used if the Remote PC connected to the Station Masquerade needed to access the Internet (connected to the wired LAN), but did not want to be seen by other Ethernet devices on the network.
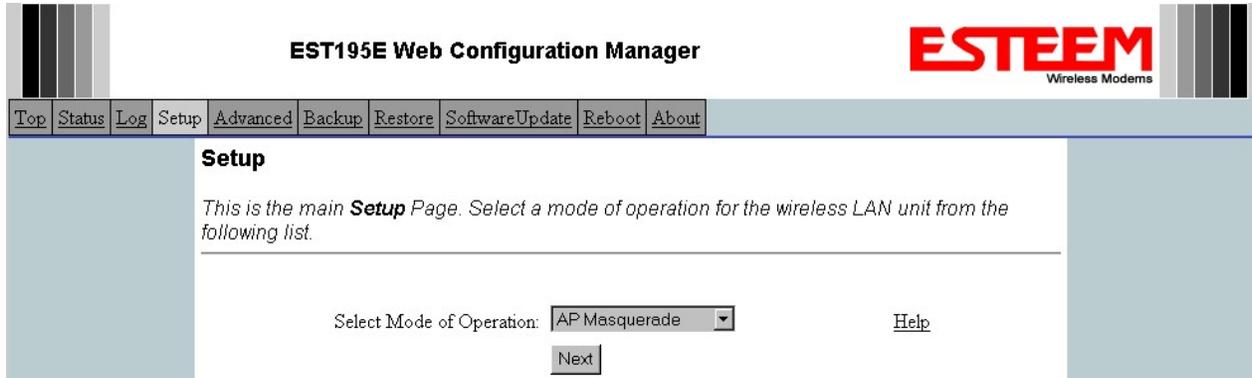

Figure 44:Station Masquerade Selection

1. Access the ESTeem Web page using your computer's Web Browser as per instructions in Chapter 4. Select Setup from the menu items. From the Select Mode of Operation pull down box , select Station Masquerade (Figure 44) and push the *Next* button below the pull down box.
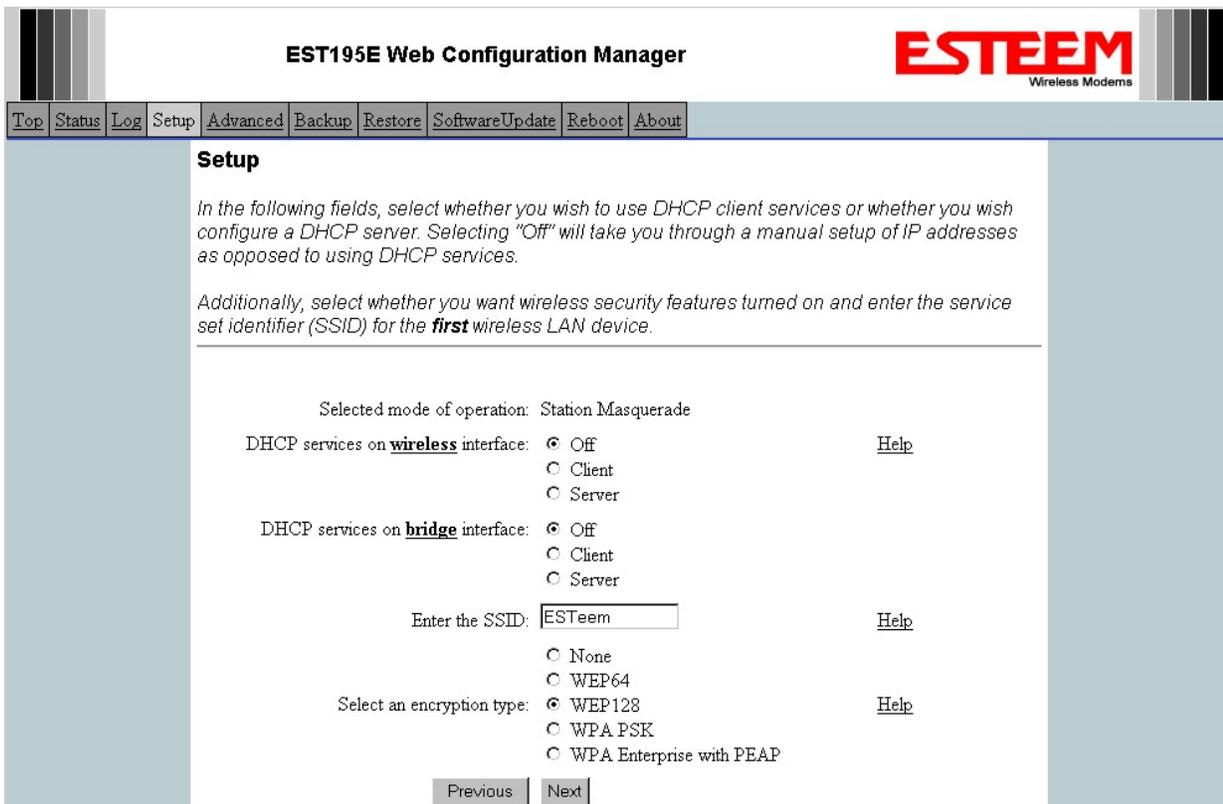

Figure 45:DHCP, SSID and Encryption Settings

2. Select *Yes* if you would like to use DHCP services on either the **wireless** or **ethernet** connections. Enter the SSID for your network. The SSID is the unique identification for your wireless network and all 195Ep that share a wireless network MUST have the same SSID code. This identification code is case sensitive and must NOT contain spaces. Select the encryption level for the wireless network to match the level of the Access Point canopy. Reference Figure 45.

Figure 46:WEP Key Entry

3. Enter the WEP key values for your application that will be used by all devices on the wireless network. Reference Figure 46.

4. Refer to the IP address in Table 1 and enter the **wireless** IP Address and IP Netmask for the Station Router. Reference Figure 47.

Figure 47:Wireless IP Settings

5. Refer to the IP address in Table 1 and enter the **ethernet** IP address and IP netmask. Reference Figure 48.

Note: When configuring the Ethernet devices connected to the Station Router 195Ep, the ethernet IP address will be their Gateway address (Figure 37).

Figure 48:Wired Ethernet Interface

6. All IP requests for the Ethernet devices connected to the 195Ep Station Router (Example #5) will need to be resolved by the Network Router (Figure 37). Enter the default route (Gateway) IP address for the Network Router in the 195Ep. Enter any DNS server information and press the *Next* button. Figure 49.

Figure 49:Default Route (Gateway) and DNS Input

7. Select *Commit Changes* to write the programming to Flash memory and reboot the Model 195Ep. When the reboot process has completed (approximately 30 seconds) the modem will be ready to place in operation.