



SAMSUNG

MagicLAN SWL-2000E

User Manual (Ver. 1.0)

Notice 1

This manual cannot be reproduced in any form without the prior written permission of SAMSUNG Electro-Mechanics, Co., Ltd.

SAMSUNG Electro-Mechanics, Co., Ltd. reserves the right to change this manual and the specifications to improve products without prior notice. So you can get the most recent software and user documentation for all MagicLAN products on our web site.

- MagicLAN is the trademark of SAMSUNG wireless LAN.
- MS-DOS, Microsoft and Windows are registered trademarks of Microsoft Corporation.

All other brand and product names are trademarks of registered trademarks of their respective holders.

<http://www.MagicLAN.com>

Service Dept. +82-331-210-6805

Sales Dept. +82-331-210-6386

SAMSUNG – America Corporation

Western US Marketing Office

85 Tasman Drive

San Jose, CA 95134 USA

Tel: (408)544-5200 Fax: (408)544-4967

Eastern US Marketing Office

LanPAL AKOM Corporation

9 Parklawn Dr.

Bethel, CT 06801

Tel: (203)778-9500 Fax: (203)778-9525

Copyright © 1999 SAMSUNG Electro-Mechanics, Co., Ltd.

All rights reserved.

Notice 2

Samsung Electro-Mechanics
MagicLAN SWL-2000E



Tested to Comply

FOR HOME OR OFFICE USE

The SWL-2000E complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions;

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING

While installing and operating this transmitter and antenna combination the radio frequency exposure limit of $1\text{mW}/\text{cm}^2$ may be exceeded at distances close to the antennas installed. Therefore, the user must maintain a minimum distance of 20 cm from the antenna.

Note: The SWL-2000E has been tested and found to comply with the limits for a Class B digital device and a low power transmitter, according to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to resolve the problem by one or more of the following measures;

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an output on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important Safety Information

- Read these simple guidelines. Breaking the rules may be dangerous or illegal. SAMSUNG is not responsible for any damages caused by breaking the rules.
- Wireless LAN Card described in this document is approved for use in a wireless local area network.
- Remember to make backup copies of important data.
- When you are transferring data, keep your laptop computer stationary. Roaming between access points may break the connection.
- Only qualified service personnel must repair the equipment.
- All wireless devices may get interference, which could affect performance.
- Use approved accessories only. Do not connect incompatible products.
- Use only accessories approved by the wireless LAN Card manufacturer for use with this particular wireless LAN Card. The use of any other types will invalidate any approval or warranty applying to the wireless LAN Card, and may be dangerous,
- Use only the region setting appropriate for the area where the wireless LAN Card is used at the present time. Using the card in any other region or with an incorrect region setting is prohibited and may be illegal.
- Operation of any radio transmitting equipment, including a wireless LAN Card, may interfere with the functionality of inadequately protected medical devices.
- Do not use the wireless LAN Card on aircraft.
- Do not use the wireless LAN Card at a refueling point.
- Do not use the wireless LAN Card near fuel or chemicals.
- Do not use the wireless LAN Card where blasting is in progress.
- Do not use the wireless LAN Card when the use of wireless device may cause interference or danger.
- Do not use the wireless LAN Card where the use of cellular terminals is prohibited.

Table of Contents

1. MagicLAN Installation	7
1.1 Introduction	7
1.2 Technical Background	7
1.3 MagicLAN Overview	10
2. Before Installation	11
2.1 What's in your Package	11
2.2 System Requirement	11
3. MagicLAN Installation for Windows95/98	12
3.1 Installation Overview	12
3.2 Hardware Installation	13
3.2.1 Notebook PC Adapter Card (SWL-2000E)	14
3.3 Software Installation	15
3.3.1 Driver Setup	15
3.4 MagicLAN Wireless LAN Card Properties Setup	20
3.4.1 Before Wireless LAN Card Properties Setup	20
3.4.1.1 Basics regarding the Properties Setup	20
3.4.1.2 Meanings of the Properties Setup Options	20
3.4.2 Setting Network Properties for "Peer-to-Peer" mode	21
3.5 Network Configuration Setup	23
3.5.1 Network Configuration Setup Overview	23
3.5.2 Before TCP/IP Networking Configuration Setup	23
3.5.2.1 What you should know before Configuration	23
3.5.2.2 What you should have in your hands to proceed further	24
3.5.3 Setting Network Properties for "StructureNet" mode	25
3.5.4 Setting Network Properties for "Instawave" mode	26
3.5.5 TCP/IP Networking Configuration Setup	27
3.5.5.1 TCP/IP Installation	27
3.5.5.2 TCP/IP Properties Setup	30
4. MagicLAN Installation for Windows NT	34
4.1 Hardware Installation	34

4.2 Software Installation	34
4.2.1 When there is no Windows NT Networking installed yet	34
4.2.2 When there is Windows NT networking already installed	44
5. Packet Driver Installation for MS-DOS	52
5.1 Copy the Packet Driver	52
5.2 Setup AUTOEXEC.BAT	52
5.3 Setup MAGICWAV.CFG	52
6. Management Utilities(Web & Telnet)	63
6.1 About Management Utilities	63
6.2 TELNET Management Utility	70
6.2.1 Telnet Management Utility Overview	70
6.2.2 Various Commands and Usage	70
6.2.2.1 Usage of the command line	70
6.2.2.2 All Possible Commands	70
6.2.2.3 Explanation on various Commands	71
7. Miscellaneous Features	73
7.1 Connection Check	73
7.1.1 When successfully connected to Network through AP	73
7.1.2 When failed to connect to Network through AP	73
7.2 Performance & AP Information Check	73
7.3 Brief Troubleshooting	74
7.4 Specifications	75
7.4.1 Physical Specifications	75
7.4.2 Radio Characteristics	75
7.4.3 Network Characteristics	75

1. MagicLAN Introduction

1.1 Introduction

Thank you for your purchase of SAMSUNG MagicLAN (SWL-2000E) Wireless LAN Adapter.. Installing card allows the computer to join a wireless network based on the IEEE 802.11 wireless LAN standard. You will be surprised how easy for you to be a part of network with no bother of twisted cables.

1.2 Technical Background

- What is IEEE 802.11?

The IEEE 802.11 specification is a wireless LAN standard developed by the IEEE (Institute of Electrical and Electronic Engineering) committee in order to specify an “over an air” interface between a wireless client and a base station or Access Point, as well as among wireless clients.

Like other IEEE 802 families, IEEE 802.11 specification addresses both Physical (PHY) layer and Media Access Control (MAC) layer.

- IEEE 802.11 Physical (PHY) Layer

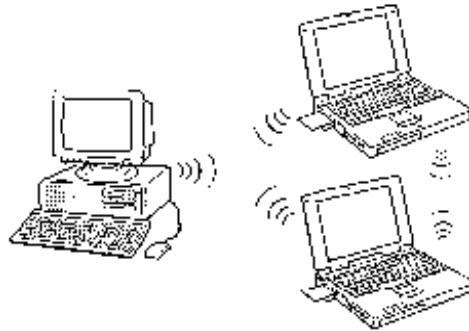
At the PHY layer, IEEE 802.11 defines three physical characteristics for LAN: diffused infrared, Direct Sequence Spread Spectrum (DSSS), and Frequency Hopping Spread Spectrum (FHSS). While the infrared PHY operates at the baseband, the other two PHYs operate at the 2.4GHz ISM (Industrial, Scientific, and Medical) band, which can be used for operating wireless LAN devices without the need for end-user licenses. In order for wireless devices to be interoperable, they have to be conform to the same PHY standard.

- IEEE 802.11 Media Access Control (MAC) Layer

The IEEE 802.11 MAC Layer is mainly concerned with rules for accessing the wireless medium. There are two network architectures defined: StructureNet Network and Peer-to-Peer Network.

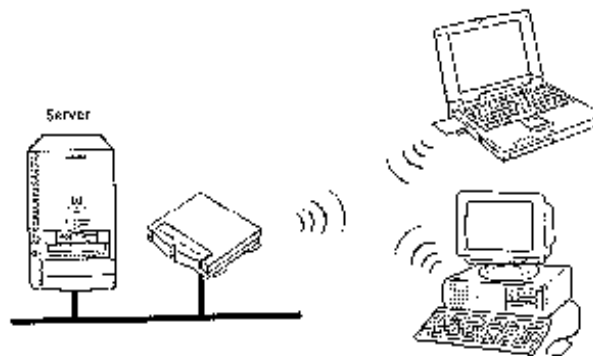
- Peer-to-Peer Network

Peer-to-Peer Network is an architecture that is used to support mutual communication among wireless clients only. Since Peer-to-Peer Network does not support access to wired networks, it does not need an Access Point to be a part of the network. You can use the network immediately after setting up the operating mode using the supplied network driver.



- StructureNet Network

StructureNet Network is architecture to provide communication between wireless clients and wired network resources. The transition of data is defined by an Access Point (AP) and the associated wireless clients. So a wireless client can access all the services that are available for a regular wired LAN by using Access Point (AP).

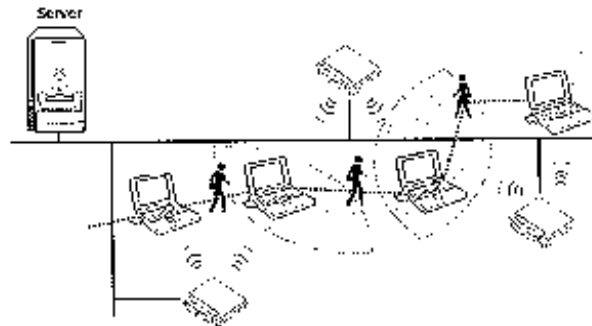


- Instawave Network

Instawave Network is architecture to provide both Peer-to-Peer Network features and StructureNet Network features at the same time. In other words, wireless clients on the network can directly communicate with each other while they can also access wired LAN clients through AP if they want. Instawave Network is a good choice for small networks that need maximum flexibility and simplicity.

- Roaming

Roaming is a service that allows wireless clients to use the network in motion by automatically moving the connection to an old Access Point into a new Access Point when the clients enter into a new cell.



- Scanning, Beacons & ESS ID

When a wireless client is initialized, it is necessary for it to find and communicate with the correct group for wireless devices, including Access Point (AP). At this point, it may search for all the frequency channels and this process is called “scanning.”

There may be multiple APs and network operating at the same time. It may be necessary to ensure that the station joins with the correct network during the scanning process. To achieve this, each AP is assigned to be part of a logical group called the Extended Service Set (ESS). The name of this logical group is the ESS ID. When roaming is operating, there may be several Access Points as part of the same ESS.

After powering up, the wireless client will listen on its default frequency channel. It will be listening for “beacons” sent by another wireless station or AP. Here, a beacon is a short message containing the ESS ID that will be broadcast roughly ten times a second.

When the wireless station hears a beacon, if the ESS ID in the beacon matches its own, the client knows that it is on the correct channel and can communicate with its group. If no beacons are seen, or if the ESS ID does not match, the wireless client may move to the next frequency channel and repeat this listening procedure. If all frequency channels have been searched with no matched ESS ID found, it will assume that it is the first client in the group to wake up and will return to its default channel and start to issue beacons itself.

In DSSS, this scanning process occurs at start up and may also occur when the client roams between APs.

1.3 MagicLAN Overview

- The SWL-2000E (for Notebook) is a wireless LAN adapter card that provides wireless connection between PCs.
- The MagicLAN is designed to operate with IEEE 802.11 (wireless LAN International Standard) wireless compliant radio cards and uses a CSMA/CA (Collision Sense Multiple Access with Collision Avoidance) algorithm as the media access scheme, which makes high speed communication with minimal collision possible.
- The MagicLAN supports DSSS (Direct Sequence Spread Spectrum). This is a radio technique, which scrambles the data prior to transmission and uses a correlation technique on receiving to improve the signal to noise ratio and makes it possible to communicate in the office having a wall and a compartment.
- The SWL-2000E for Notebook PC is small and portable as a roaming function is provided for users who need network services while maintaining mobility.
- The MagicLAN Adapter has three LED's (Light Emitting Diodes) on the part of the card: Power, Tx, and Rx. The red Power LED will illuminate when the power is applied. The orange Tx LED and green Rx LED will illuminate when the data is transmitted out and in respectively.
- The MagicLAN supports various network software. The network driver is provided to support most network software such as MS-DOS Packet, Windows 95/98, and Windows NT 3.51/4.0.

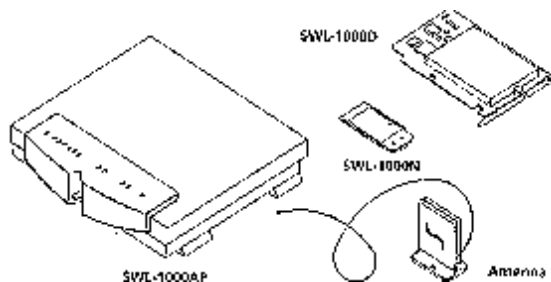
2. Before the Installation

The following section will assist you in successfully installing your wireless network adapter card. You will first install the hardware and software, then set network properties to accommodate resource sharing and to select the type of wireless network you wish to install. The MagicLAN can be easily installed and used, without bother to connect cables and maintain them to use network as a wired LAN requires.

2.1 What's in Your Package

Please check the contents of the box to make sure everything is included and ready for use. Here is the list of what you should have in your package:

- SWL-2000E (PCMCIA Card) Adapter
- SWL-2000E Installation Diskette (Driver Diskette)
- User's Manual
- External Antenna



2.2 System Requirement

- Operating System: MS Windows 95 / Windows 98 / Windows NT3.51/ Windows NT4.0
- Computer System with a 3¹/₂-inch floppy disk drive
- For Notebook PC Adapter Card (SWL-2000E):

The computer system should have PCMCIA Type II or Type III card slot.

3. MagicLAN Installation for Windows 95/98

3.1 Installation Overview

Here are some steps you will perform in establishing your wireless network connection:

- Install the adapter (SWL-2000E).
- Install the software using the included installation diskette.
- Install the network protocol(s) required to communicate on your network. Most likely you will need the TCP/IP protocol.

3.2 Hardware Installation

3.2.1 Notebook PC Adapter Card (SWL-2000E)

- You can install the card whether the power of the Notebook is on or off.
- Insert the SWL-2000E adapter card into the PCMCIA slot.
(A pleasant “cheep” sound indicates the regular operation. A low monotonous tone indicates a failure in recognition.)



- If you see red Power LED illuminating and green Rx LED is blinking, you are now ready to proceed to software setup.

3.3 Software Installation

3.3.1 Driver Setup

(The dialog box pictures used in this section is from Windows 98, and the ones from Windows 95 may be slightly different.)

1. Start your PC and allow Windows95/98 to fully load. Since you must already have installed the MagicLAN Adapter in the previous step, an “**Add New Hardware Wizard**” box will appear.
2. If you use PCMCIA-compatible notebook and have not installed the SWL-2000E adapter yet, insert the adapter to the slot now, and you will see an “**Add New Hardware Wizard**” box.
3. In “**Add New Hardware Wizard**” box, be sure SAMSUNG-WirelessLAN appears as a new device name as the following box shows.



4. Insert the MagicLAN (SWL-2000E) Installation Diskette into your floppy drive. Click on “**Next**”.

5. Windows 95/98 will present a list of drivers and optionally allow you to specify a location where it can find the appropriate driver software for the device. The following dialog box will appear if you use Windows98. Be sure the MagicLAN (SWL-2000E) Installation Diskette is in floppy drive and “**Search for the... (Recommended)**” option is selected. Click on “**Next**”. (Windows95 has a slightly different display, and you should select a “**Have Disk**” option instead.)



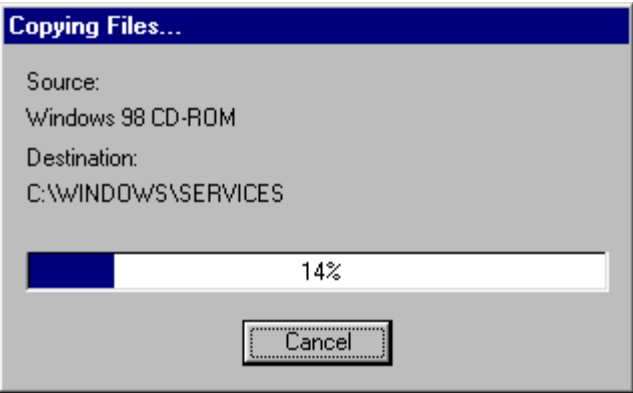
6. Next, “**Add New Hardware Wizard**” box may appear as follows. Be sure the MagicLAN (SWL-2000E) Installation Diskette is in floppy drive and **Floppy disk drives** option is checked as follows. Click on “**Next**”.



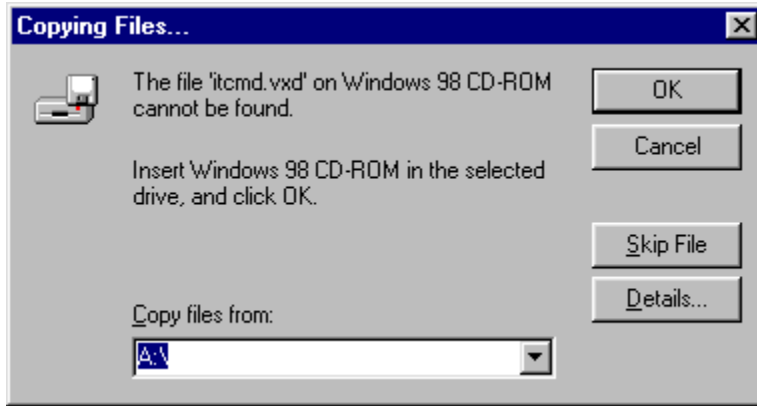
7. If the proper driver was successfully found on the floppy disk, “**Add New Hardware Wizard**” box may appear as follows. Click on “**Next**”.



8. Windows95/98 will now copy files from the floppy disk and may prompt you for the location for the Windows95/98 installation CD or files. Depending on how your computer was configured by the manufacturer, you may need to insert the Windows CD into your CD-ROM drive at this step. While files are being copied, you will see “**Copying Files...**” box similar to the one below.



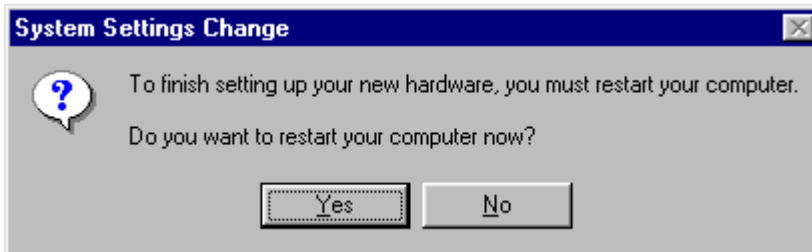
9. While copying files, the following box may appear requesting you to specify where the some files are located. In the drop-down choice box below, select “A:” where the MagicLAN (SWL-2000E) Installation Diskette is located. Click on “OK”.



10. When the driver and all the required Windows95/98 software components are loaded, you will see the box similar to the one below, which indicates that the driver for “SAMSUNG Wireless LAN Card” has been successfully installed. Click on “Finish”.



11. Finally, “**System Settings Change**” box will appear, asking if you wish to restart your computer now. Remove the MagicLAN (SWL-2000E) Installation Diskette from your floppy drive. Since you are done with the Installation Diskette, place it in a safe place for later use. Now, Click on “**No**” to proceed to MagicLAN Wireless LAN Card Properties Setup before you restart your computer.



3.4 MagicLAN Wireless LAN Card Properties Setup

3.4.1 Before MagicLAN Wireless LAN Card Properties Setup

3.4.1.1 Basics regarding the Properties Setup

- Peer-to-Peer Operating Mode:
Multiple wireless clients can directly communicate with each other without AP.
- StructureNet Operating Mode:
Wireless clients can communicate with each other or with clients on another wired network always through AP.
- Instawave Operating Mode:
Multiple wireless clients using the same channel can directly communicate with each other, And they also can communicate with clients on another wired network through AP. In the second case, it is automatically set up which AP will be used for it.
- Roaming:
One feature of StructureNet operating mode that effortlessly moves between APs that are on different channels but have the same ESS ID.
- From your network administrator, you should find out ESS ID of the AP and channel number that you are supposed to use.

3.4.1.2 Meanings of the Properties Setup Options

- Default Scanning / Start Channel: Option in StructureNet and Peer-to-Peer Network)
StructureNet operating mode enables clients to automatically search for new Access Point. In **Default Scanning** mode, the wireless client begins the search with Channel 1. The client then searches all consecutive channels until it finds a new AP with the same ESS ID. If you want to start the search from a specific channel other than channel 1, you can deselect the **Default Scanning** check box and enter the desired channel number in a blank for **Start Channel**. This **Start Channel** entry will be helpful when multiple APs are within range of each other and you desire to connect to a specific AP among them.
- Enable Power Saving: Option in StructureNet Network
Power save mode will keep the wireless LAN adapter in a low power standby state when there is no data transfer. This **Enable Power Saving** option is mainly to extend the operating time of portable battery operated device such as laptop computers, even sacrificing the effective throughput of the wireless connection. So you should test both with and without power saving enabled to see if this option satisfies your needs.

- Case sensitive ESS ID: Option in StructureNet and Peer-to-Peer Network

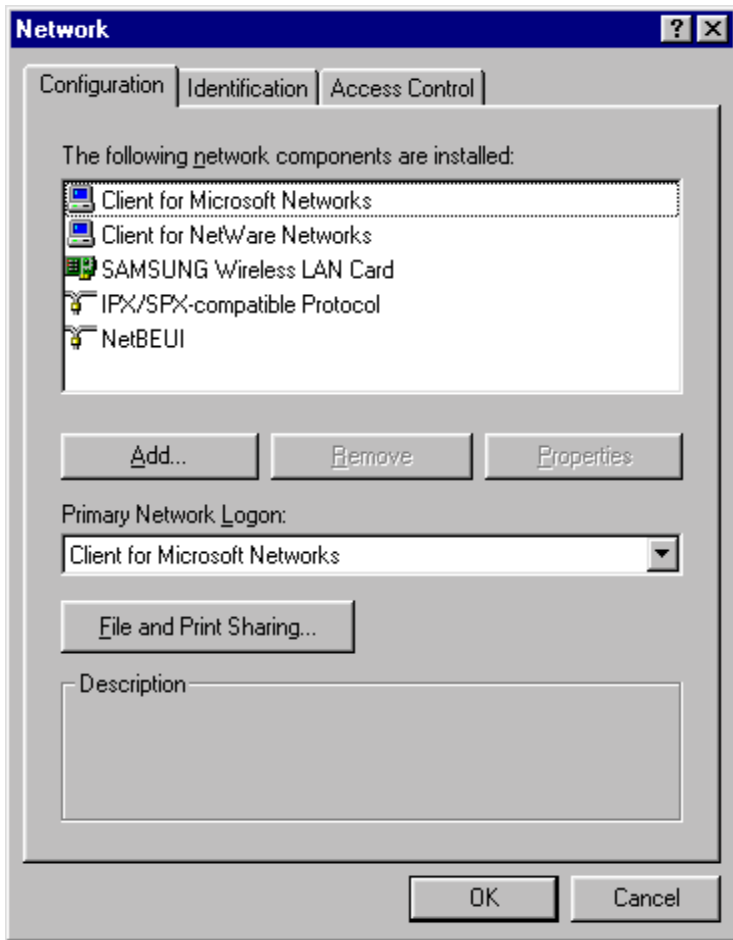
When entering ESS ID, you can make it case sensitive by checking **Case sensitive ESS ID** check box.

- Auto join: Option in StructureNet and Peer-to-Peer Network

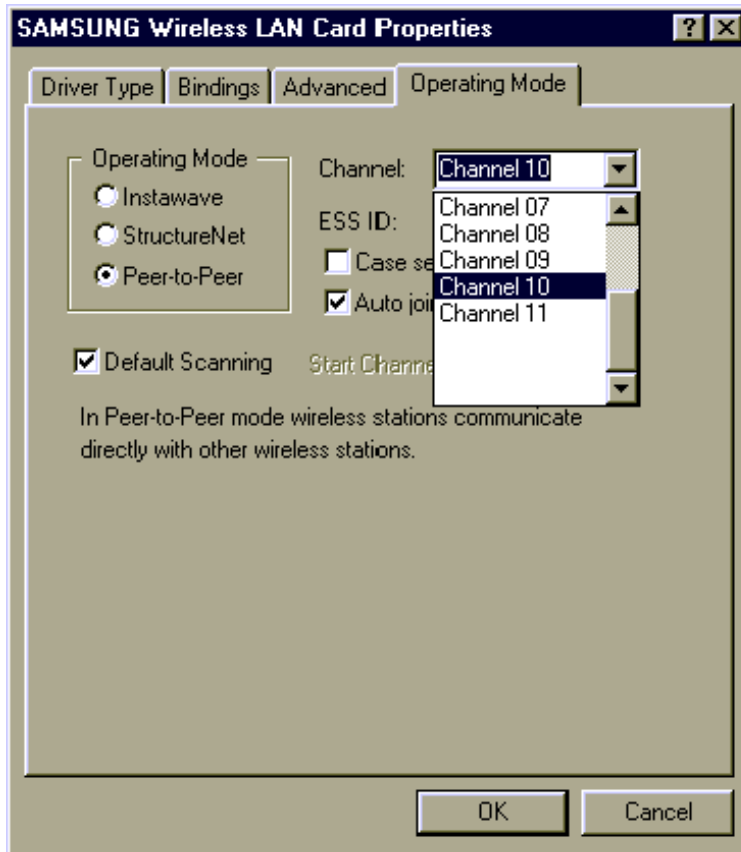
When **Auto join** option is selected, the wireless client will associate with whatever access point is within range and has the best signal independent of the ESS ID setting. Since you may not use the same AP as described in the “**Access Point Client Properties**” box, you can check which AP and ESS ID you are actually using by double clicking the task bar status icon to display the wireless client status box.

3.4.2 Setting Network Properties for “Peer-to-Peer” mode

1. Right click on your “**Network Neighborhood**” icon and click on “**Properties**”.
2. “**Network**” box will appear with **Configuration** tab selected as follows. In the list in the box, click on “**SAMSUNG Wireless LAN Card**” and “**Properties**” button in the middle sequentially.



3. “Access Point Client Properties” box will appear as follow.



4. Check the **Peer-to-Peer** radio button in **Operating Mode** list.

5. Enter the desired **ESS ID** you are authorized to use.

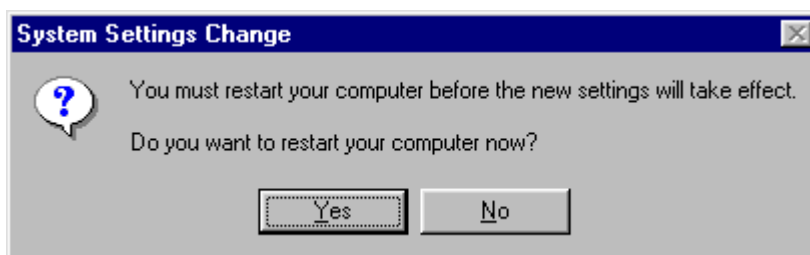
(ESS ID is set to “MagicLAN” as default, but you can change it to another.)

6. Select the desired **Channel** you are authorized to use.

7. Change some options if you want.

8. Click on “OK” to finish up the setup.

9. “**System Setting Change**” box will appear as follows. Click on “**No**” to proceed to Network Configuration Setup before you restart your computer.



3.5 Network Configuration Setup

3.5.1 Network Configuration Setup Overview

- After you finish up the hardware and software driver setup, you will need to install and configure Microsoft Networking components.
- If you only need to access the Internet, installation of the TCP/IP networking component should be sufficient.
- If you want some functions to share files and printers in small LAN environment, some installations may use an alternative networking protocol called NetBEUI protocol.
- Both TCP/IP and NetBEUI protocols can be used to share files and printers between wired and wireless computers.

3.5.2 Before TCP/IP Networking Configuration Setup

3.5.2.1 What you should know before Configuration

- **TCP/IP** protocol is a protocol used to connect to a Wide Area Network (WAN), such as the Internet or hard-wired Ethernet networks.
- Every computer connecting to WAN has a **unique** number called **IP address**, which consists of two parts, network part and host part. For example, consider the IP address 150.205.30.9. Assuming this is part of a Class B network, the first two numbers (150.205) represent the network address and the second two numbers (30.9) represent the host address.
- Network administrator can divide the host part of IP address into two or more subnets for more effective use. In that case, **subnet mask** is used to determine what kind of subnet the IP address belongs to.
- You should consult your network administrator or Internet Service Provider (ISP) to find out your **IP address and subnet mask**.
- There are two ways of obtaining an IP address. Some networks use **Dynamic Host Configuration Protocol (DHCP)** to dynamically assign an IP address every time you log on to the network. Others use static IP that is uniquely assigned to your computer and you use the same IP address whenever you log on to the network.

- You should consult your network administrator or Internet Service Provider (ISP) to find out if you would use **DHCP or static IP.**

- **Windows Internet Name Service (WINS)** is a network service that resolves a computer NETBIOS name to an IP address. It is similar in concept to the Domain Name Service (DNS) except WINS resolves NETBIOS names while DNS resolves host names.

- If you use a static IP and want to enable WINS, You should consult your network administrator or Internet Service Provider (ISP) to find out the **WINS server IP Address and Scope ID.**

- **Gateway** is a hardware or software set-up that translates between two dissimilar protocols. More easily, it can also be called a specific point to access another system. So if you want to reach out to Internet from your PC, you should set up a gateway to pass through.

- You should consult your network administrator or Internet Service Provider (ISP) to find out your **Gateway Address.**

- Domain Name Service (**DNS**) is the service that performs a mapping between domain names – more English-like names - and their corresponding IP address.

- DNS can be either enabled or disabled. If you want to enable it, you should also consult your network administrator or Internet Service Provider (ISP) to find out your **Host ID, Domain, DNS Server IP Address, and Domain suffix.**

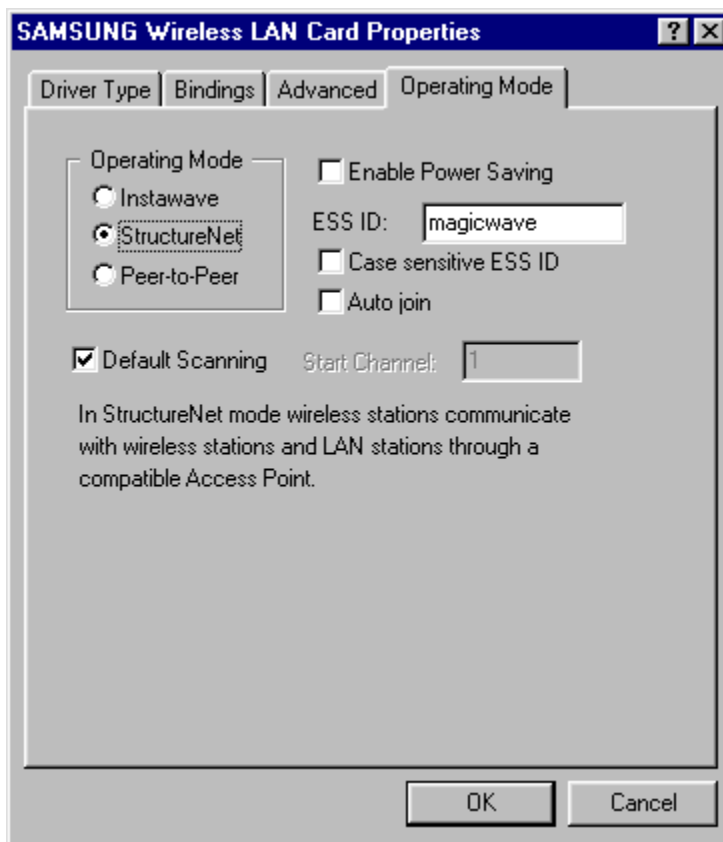
3.5.2.2 What you should have in your hands to proceed further

- Whether you would use **DHCP or static IP** (Required)
- Your **Gateway Address** (Required)
- Your **IP address** and **subnet mask**. (If you want to use static IP)
- **WINS server IP Address** and **Scope ID** (If you want to enable WINS using static IP)
- Your **Host ID, Domain, DNS Server IP Address, and Domain suffix**
(If you want to use DNS)

(Consult your network administrator or ISP if you are not sure any of the above, and make sure you are ready with all the information necessary to proceed more.)

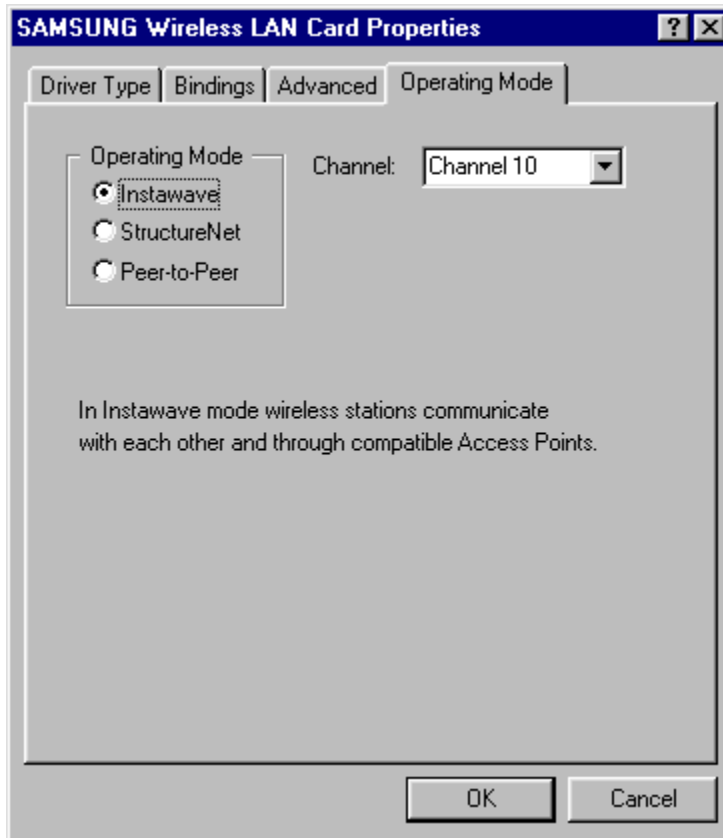
3.5.3 Setting Network Properties for “StructureNet” mode

1. Do the step 1 and 2 mentioned in the previous section. (Section 3.4.2)
2. In “**Access Point Client Properties**” box, check the **StructureNet** radio button in **Operating Mode** list.
3. Enter the desired **ESS ID** for the Access Point you are authorized to use.
(ESS ID is set to “magicwave” as default, but you can change it to another.)
4. Change some options if you want.
5. Click on “**OK**” to finish up the setup.
6. Do the step 9 mentioned in the previous section (Section 3.4.2) to make the change effective.



3.5.4. Setting Network Properties for “Instawave” mode

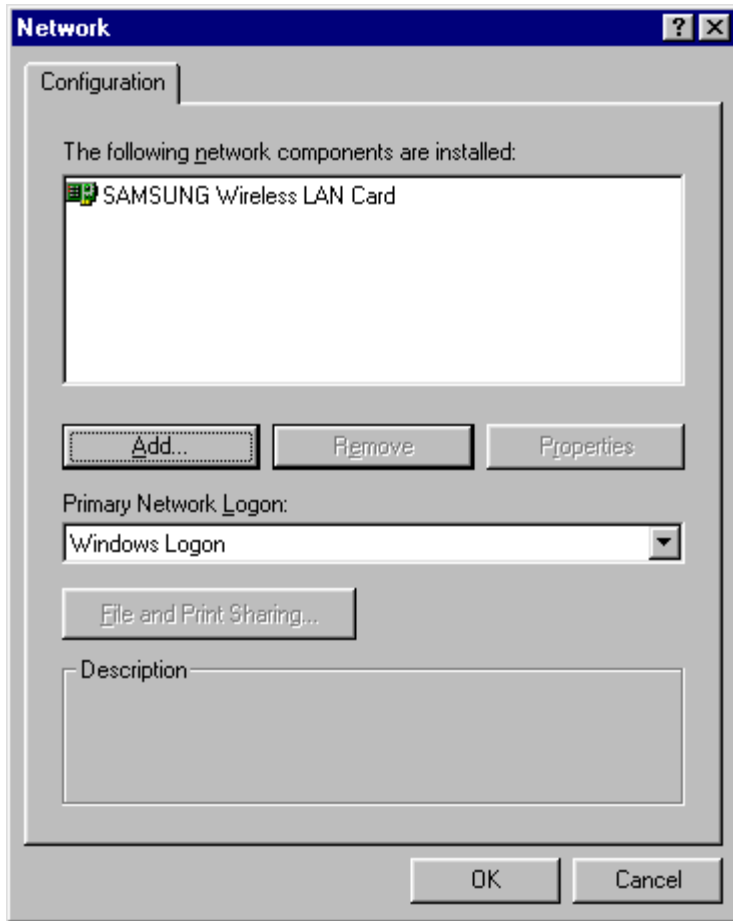
1. Do the step 1 and 2 mentioned in the section 3.4.2.
2. In “**Access Point Client Properties**” box, check the **Instawave** radio button in **Operating Mode** list.
3. Select the desired **Channel** you are authorized to use.
4. Click on “**OK**” to finish up the setup.
5. Do the step 9 mentioned in the section 3.4.2 to make the change effective.



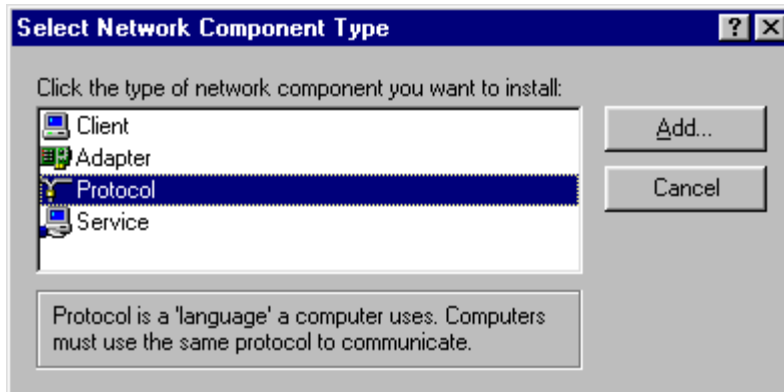
3.5.5 TCP/IP Networking Configuration Setup

3.5.5.1 TCP/IP Installation

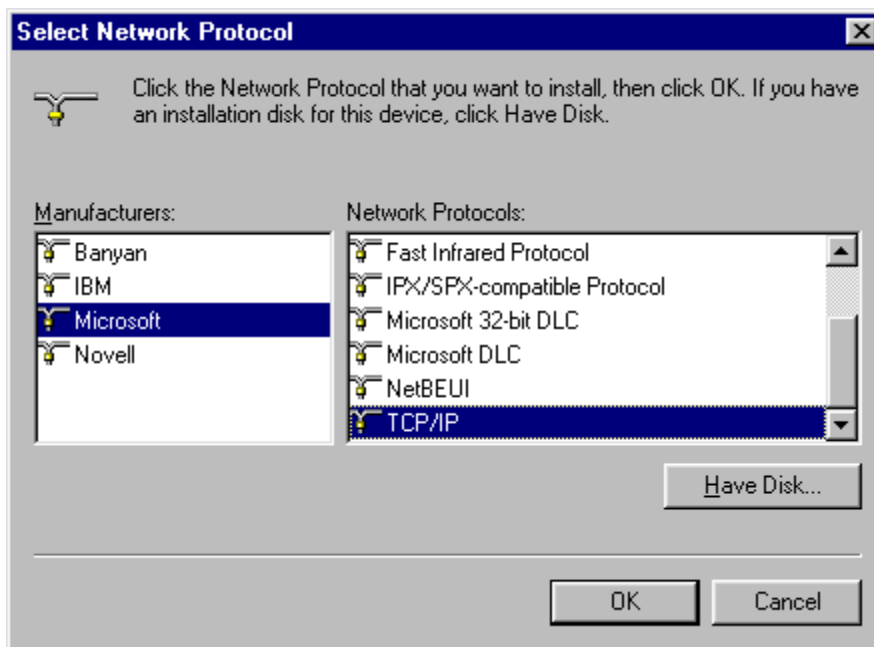
1. **Right click** on the **Network Neighborhood** icon and select **“Properties”** at the bottom **“Network”** box may appear as follows. If you find **TCP/IP** in the list of **Configuration** tab, skip to 3.5.5.2 (TCP/IP Properties Setup). To add TCP/IP, Click on **“Add”**.



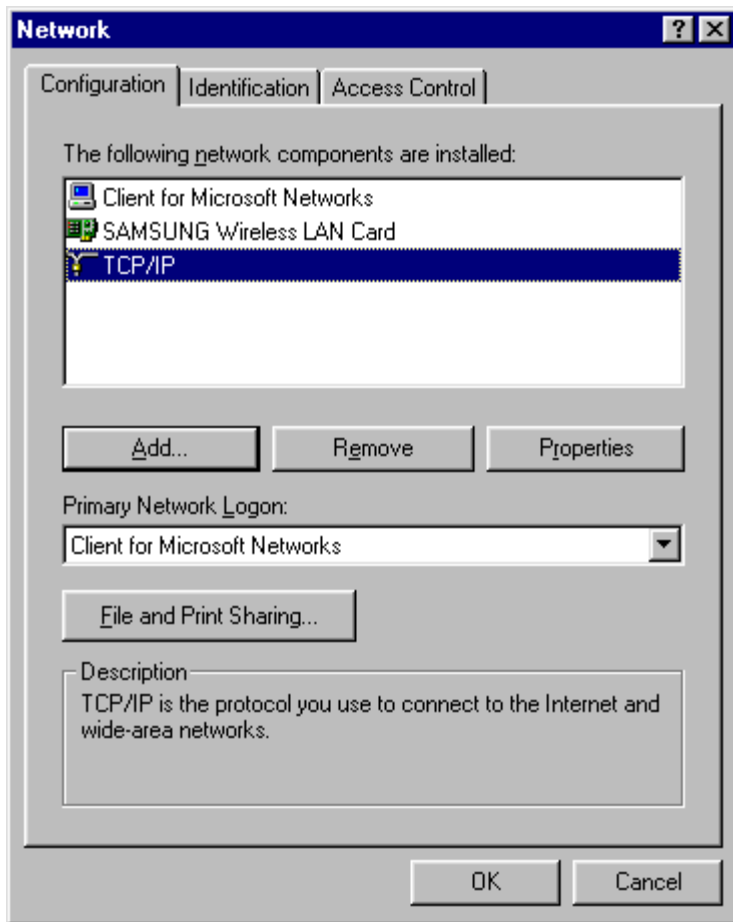
2. When “**Select Network Component Type**” box appears, select “**Protocol**” since TCP/IP that we want to install is a Protocol. Click on “**Add**”.



3. "Select Network Protocol" box will appear. From the list of Manufacturers, select "Microsoft". From the list of Network Protocols list, select "TCP/IP". Click on "OK".



4. In “**Network**” box, you will see “**TCP/IP**”, which means that TCP/IP is successfully installed in your system now.

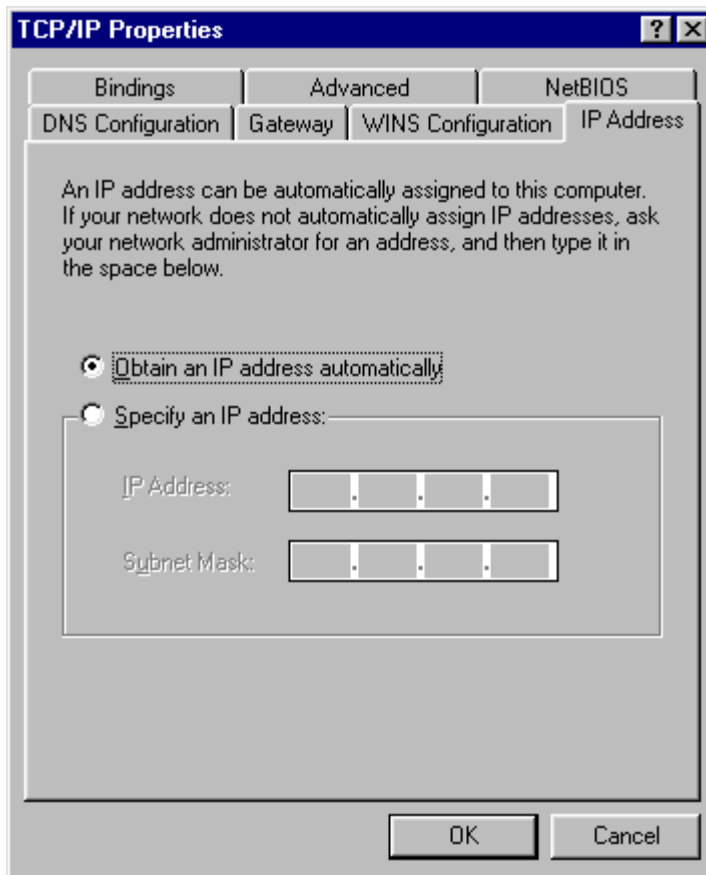


5. While TCP/IP is selected, click on “**Properties**” to proceed for TCP/IP Properties Setup.

3.5.5.2 TCP/IP Properties Setup

1. Continuing from the last step, “**TCP/IP Properties**” box will appear. If not already selected, select **IP Address** tab on top of the box to display the IP configuration setting. If you find from your network administrator or ISP that you would use DHCP so that you can get a dynamic IP every time you log on the network, select “**Obtain an IP address automatically**” and proceed to step 2a. If you use a static IP address, select “**Specify an IP address**” and type in your **IP Address** and **Subnet Mask** in the blank below, and proceed to step 2b.

Go to **WINS Configuration** tab on top of the box to proceed.



2. **WINS Configuration** box will appear as follows.

2a. If you use DHCP so that you would get a dynamic IP address every time you log on:

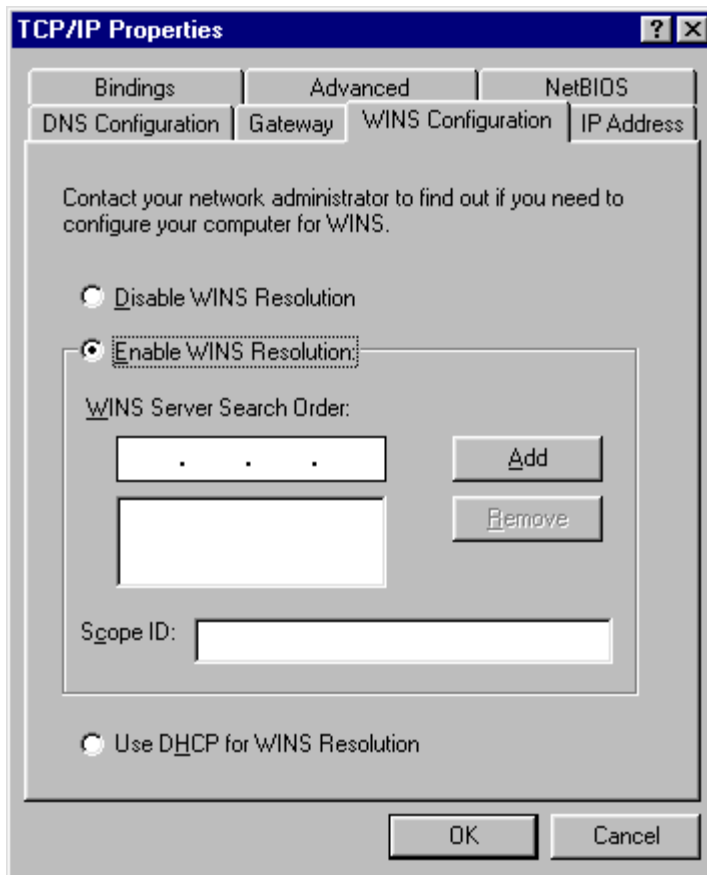
Select “**Use DHCP for WINS Resolution**” at the bottom.

2b. If you use a static IP address and want to:

a. Disable WINS Resolution: Select “**Disable WINS Resolution**” in the middle.

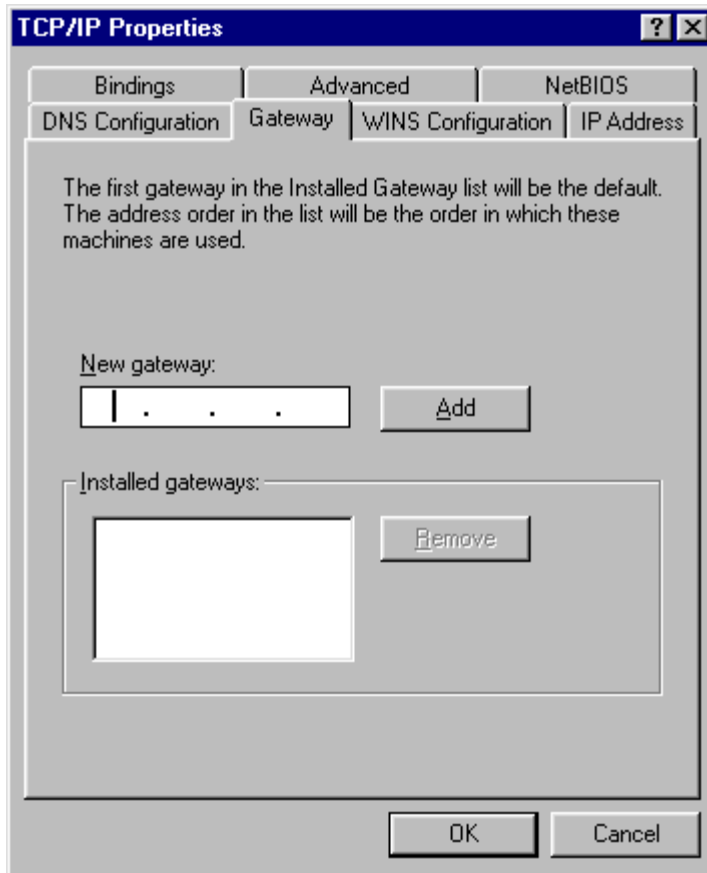
b. Enable WINS Resolution: Select “**Enable WINS Resolution**” and fill out the blanks for **WINS Server Search Order** and **Scope ID** using the information from your network administrator or ISP.

Go to **Gateway** tab on top of the box to proceed.

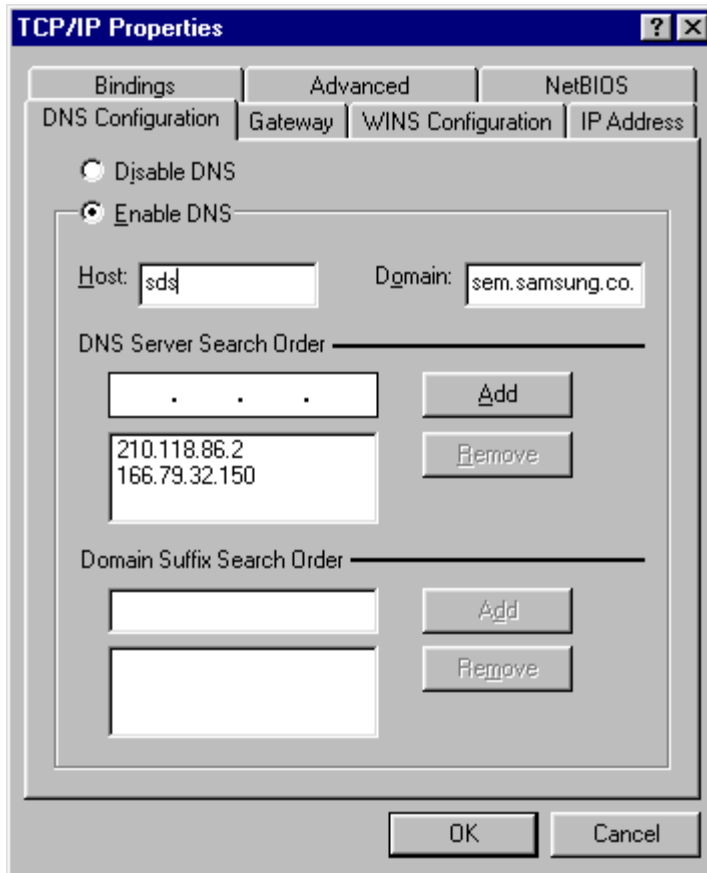


3. **Gateway** box will appear on your screen as follows. If your network administrator or ISP provided you with a Gateway IP address, type that address into the “**New Gateway**” field and click on “**Add**”. If more than one IP addresses were provided to you, repeat the procedure until you type in all those numbers.

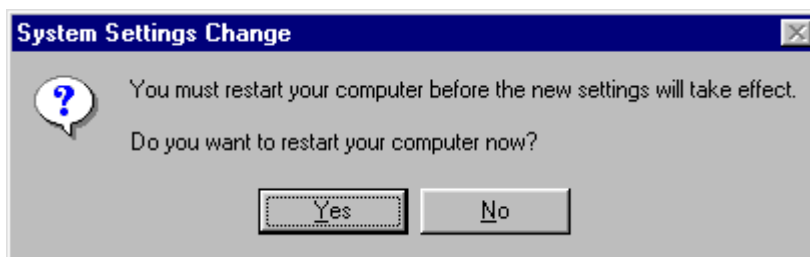
Go to **DNS Configuration** tab of top of the box to proceed.



4. **DNS Configuration** box will appear as follows. If you want to disable DNS, check on the radio button for “**Disable DNS**”. Otherwise, check on the radio button for “**Enable DNS**” and type **Host** and **Domain** in the proper field. After that, type IP Address of DNS server in “**DNS Server Search Order**” box and click on “**Add**”. Repeat this procedures if multiple IP address of the DNS server were provided. If applicable, fill out the “**Domain Suffix Search Order**” field. Click on “**OK**” at the bottom of “**TCP/IP Properties**” box.



5. “**System Setting Change**” box will appear as follows. Click on “**Yes**” to restart your computer so that the whole installation procedures take effects.



4. MagicLAN Installation for Windows NT

4.1 Hardware Installation

Hardware installation procedure for Windows NT is exactly same as the one for Windows 95/98.

Please make a reference of the Windows 95/98 hardware installation section. (Section 3.1)

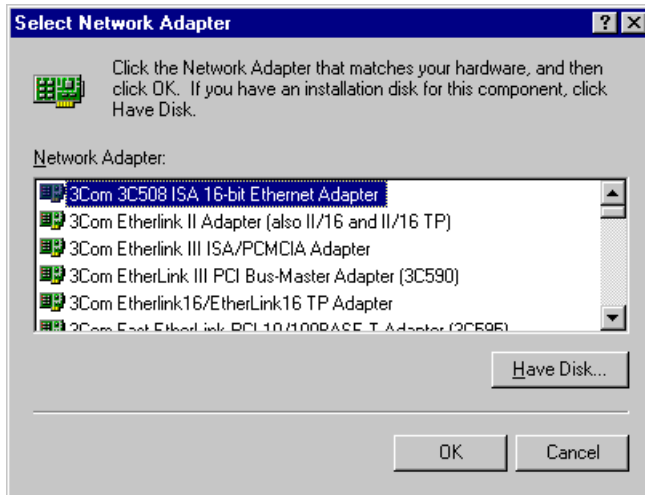
4.2 Software Installation

4.2.1 When there is no Windows NT Networking installed yet

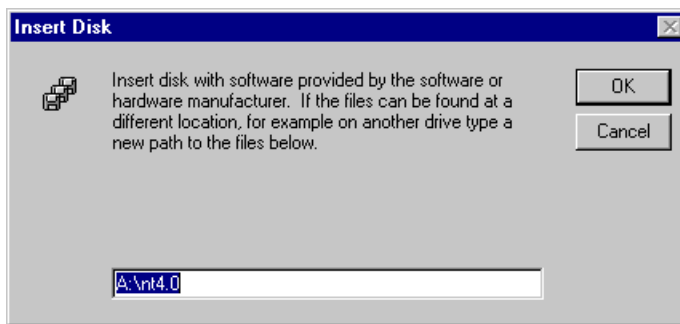
1. Unlike Windows 95/98, since Windows NT does not support Plug and Play (PnP), you should add your driver manually. To do so, click on “**start**” in task bar, go to “**Settings**”, and go to “**Control Panel**”.
2. Under “**Control Panel**”, double click on **Network** icon.
3. Since there is no NT networking installed in your system, you may be asked if you want to install NT networking first. Click on “**Yes**” button. Next, you may be asked to specify how you access to the network: modem or LAN. Check the proper selection and click on “**Next**”. In “**Network Setup Wizard**” box, click on “**Select from list**” button.



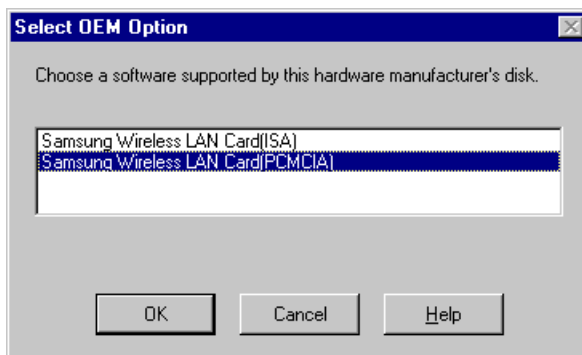
4. In “Select Network Adapter” box, click on “Have Disk” button.



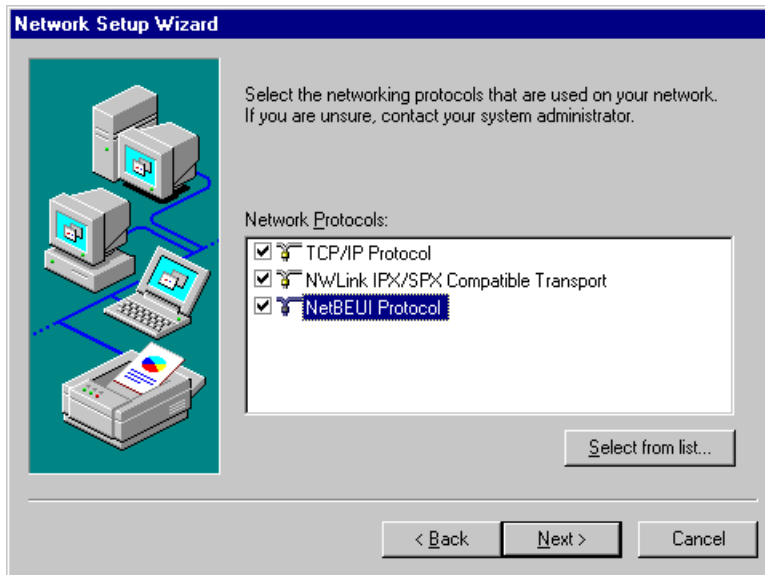
5. In “Insert Disk” box, you may be asked to specify the necessary software directory. Insert the MagicLAN installation disk into the floppy disk drive, type in “A:\nt4.0” in the blank and click on “OK” button. (In this example, we assume we are installing Windows NT version 4.0.)



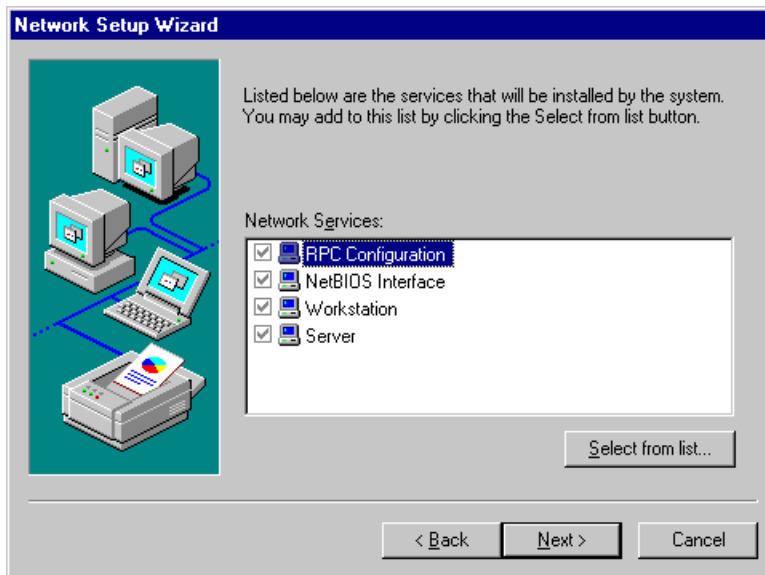
6. In “Select OEM Option” box, two adapters found may appear in the list. Select the proper adapter and click on “OK” button. Usually you can select PCMCIA for laptop. In the next box, make sure that SAMSUNG Wireless LAN Card is checked and click on “Next”.



7. In the next box to choose protocols to use, make sure that all the protocols you want to use are checked and click on “Next”.



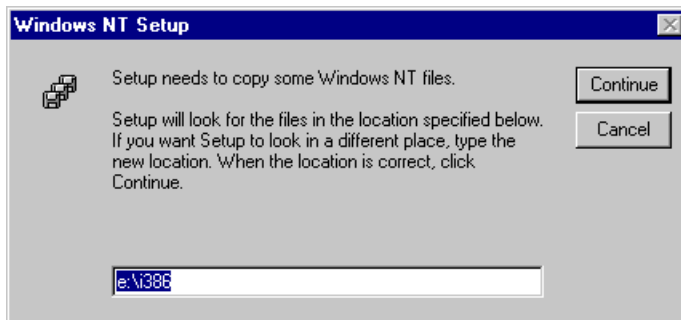
8. In the next box to choose network services to use, make sure that all the services you want to use are checked and click on “Next”.



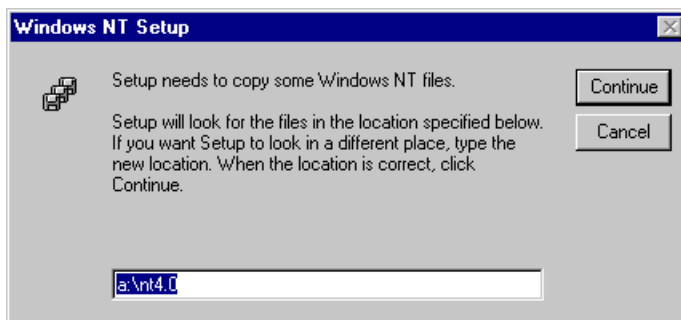
9. In the next box, it is confirmed that necessary NT networking components are selected. Click on “Next”.



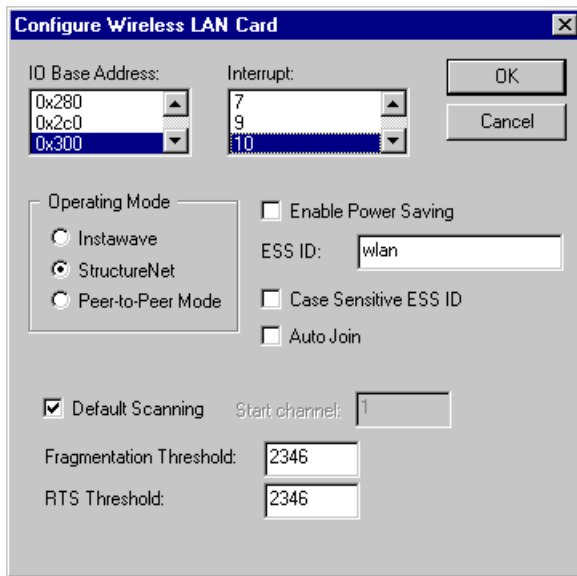
10. When you are asked to specify the directory that the necessary NT files are copied from, insert your Windows NT CD and type in “**e:\i386**” in the location blank. (Here it is assumed that the CD-ROM drive is e drive)



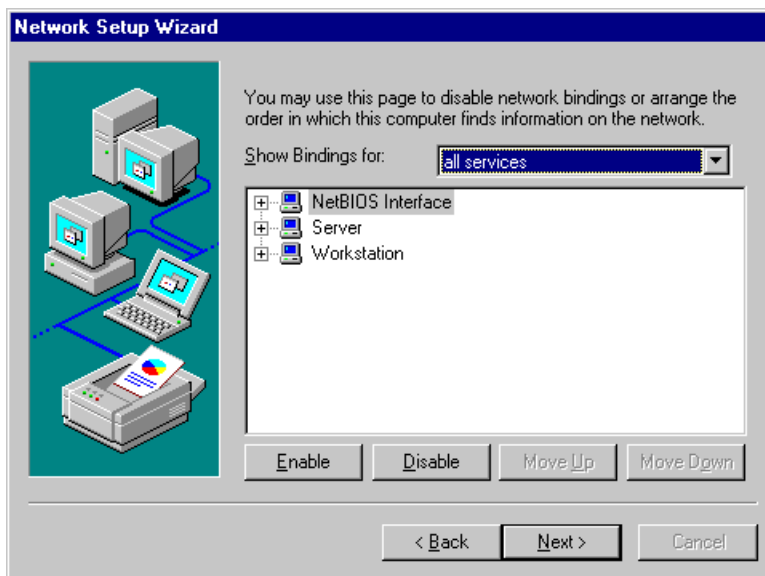
11. Some files from the “**e:\i386**” directory are copied and you may be prompted the same box to ask you to specify where the NT files are once more. Since it is looking for some files from the installation diskette this time, insert your installation disk into floppy disk drive and type in “**a:\nt4.0**” in the location blank. Windows NT networking is successfully installed now



12. “**Configure Wireless LAN Card**” box may appear as follows. Set each some parameters (I/O Base, Interrupt, Fragmentation Threshold, RTS Threshold) for the proper system configuration setup and other parameters (Operating Mode, ESS ID, etc.) for the proper LAN Card configuration setup. For the information on LAN Card-related parameters, you can refer to the explanation on the previous section (3.4 SAMSUNG Wireless LAN Card Properties Setup). If you are not sure any of system configuration-related parameters, please refer to your network administrator. After you set all the parameters necessary, click on “**OK**” to proceed.

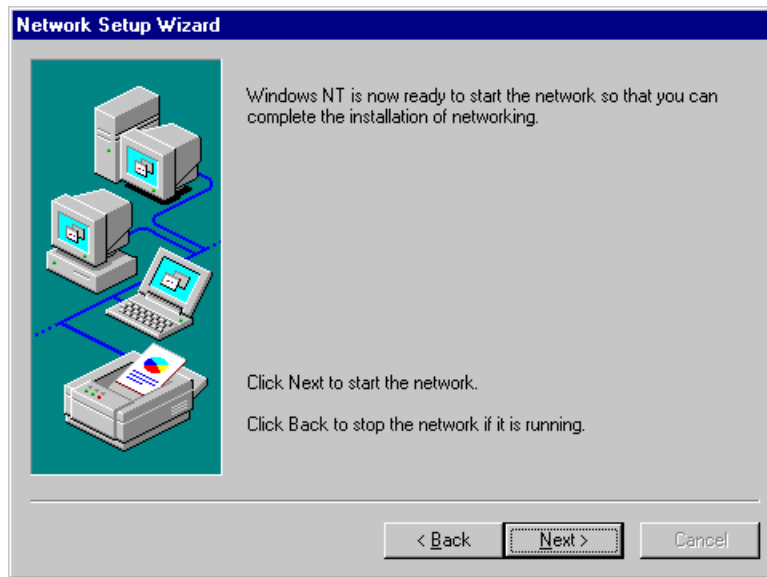


13. Network binding related box may appear next. Click on “**Next**” to proceed.

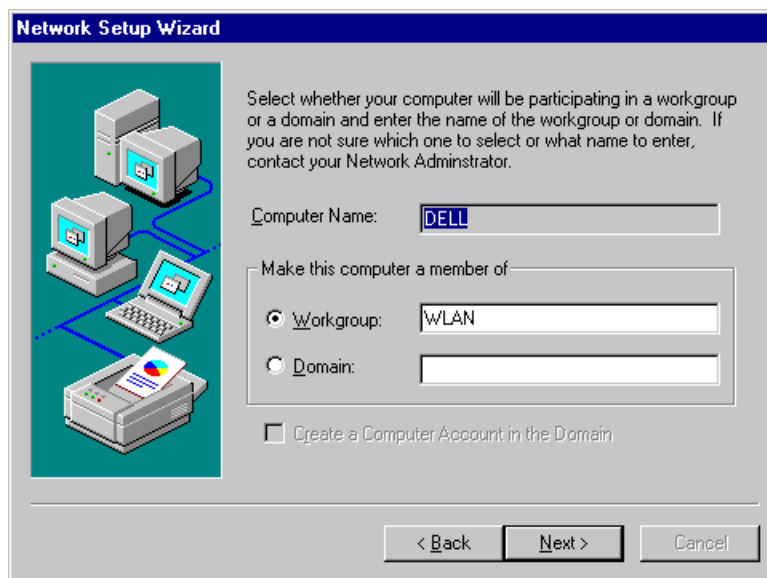


14. Next box will say network installation is done and network is ready to start. Click on “**Next**” in that

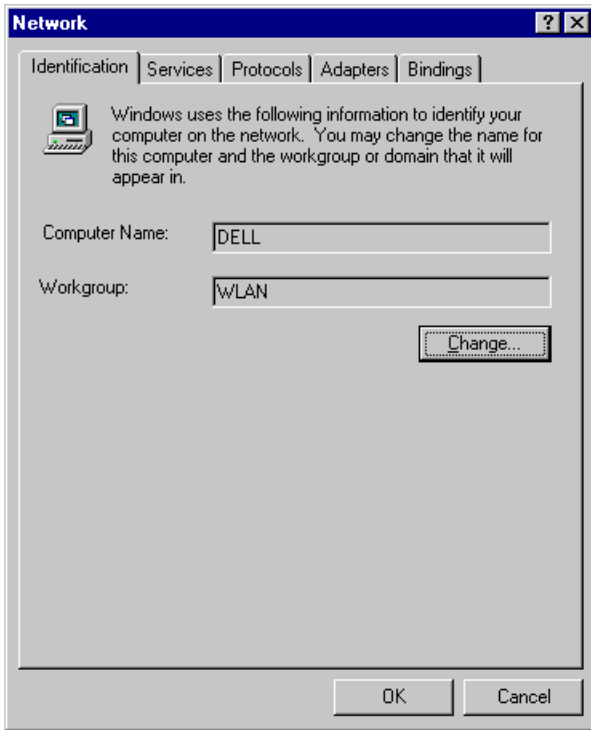
box and “**Finish**” on the next box to start network.



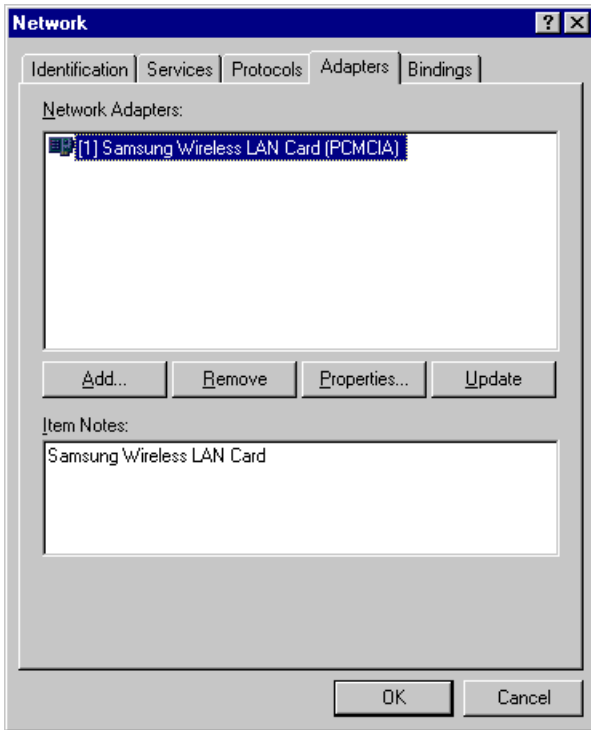
15. You will be prompted to enter the name of the Workgroup or Domain in the next box. Type in a desired name of it and click on “**Next**” to proceed.



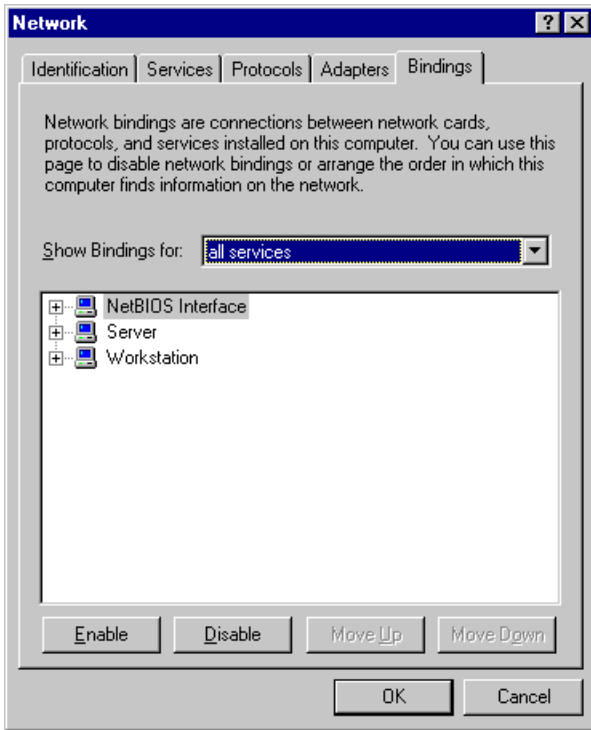
16. “**Network**” box with **Identification** tab selected will appear as follows. You can change the Computer Name and Workgroup after clicking on “**Change**” in the middle of the box.



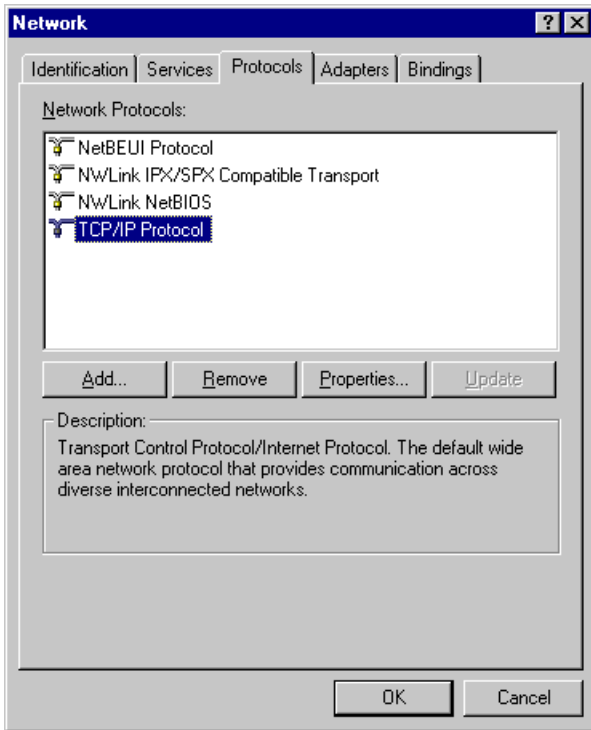
17. Go to **Adapters** tab of the “**Network**” box, and make sure that “**SAMSUNG Wireless LAN Card**” are installed and currently selected.



18. Go to **Binding** tab of the “**Network**” box and check if all the necessary services are binded.

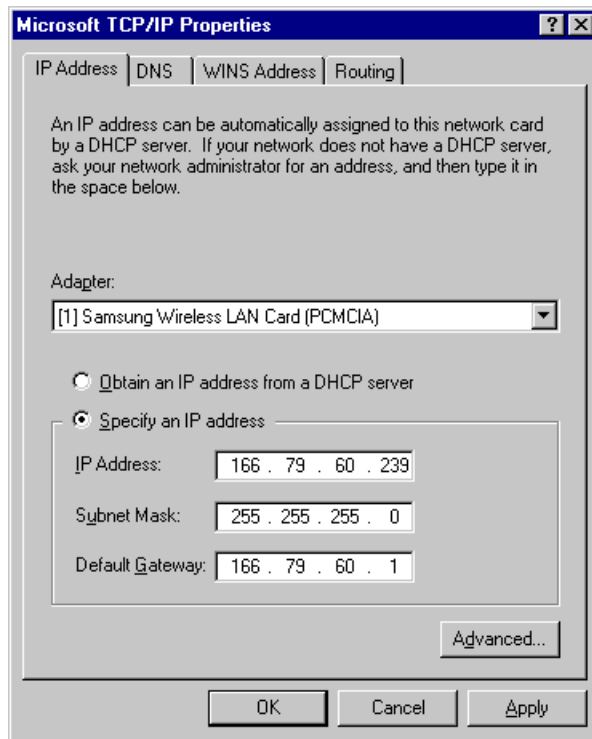


19. Go to **Protocols** tab of the “**Network**” box. Select “**TCP/IP Protocol**” in the list and click on “**Properties**” button.

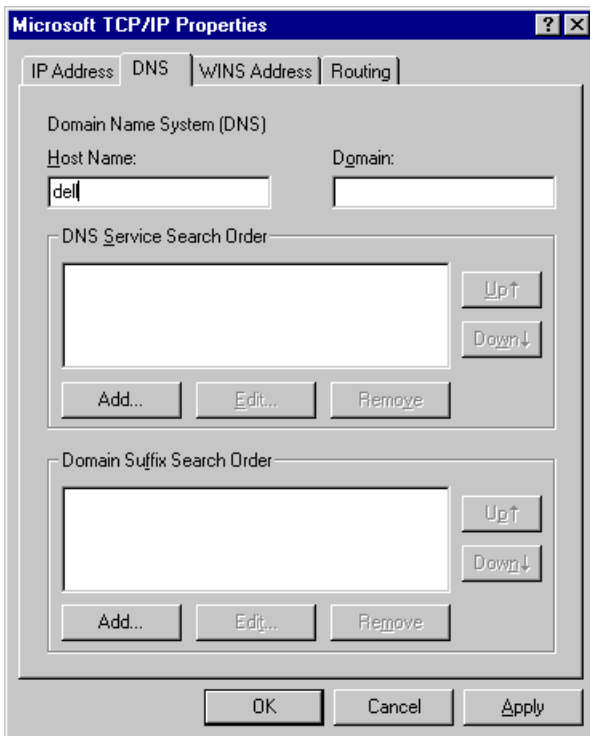


20. “**Microsoft TCP/IP Properties**” box with **IP Address** tab selected will appear as follows. Select “**SAMSUNG Wireless LAN Card**” in the Adapter section, and fill out the rest sections with proper

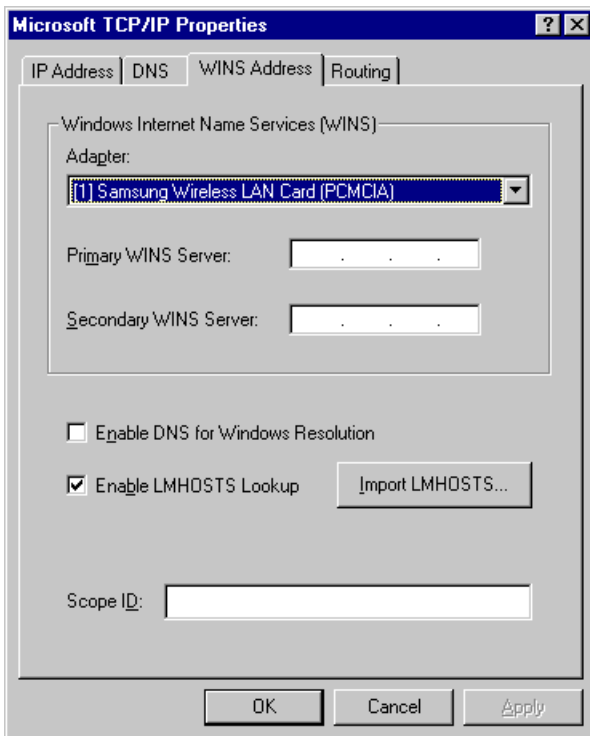
information. About the parameters and meaning, you can refer to the explanation in the previous section. (3.5 Network Configuration Setup). If you are not sure about any of the required information in this section, please consult to your network administrator. Go to **DNS** tab.



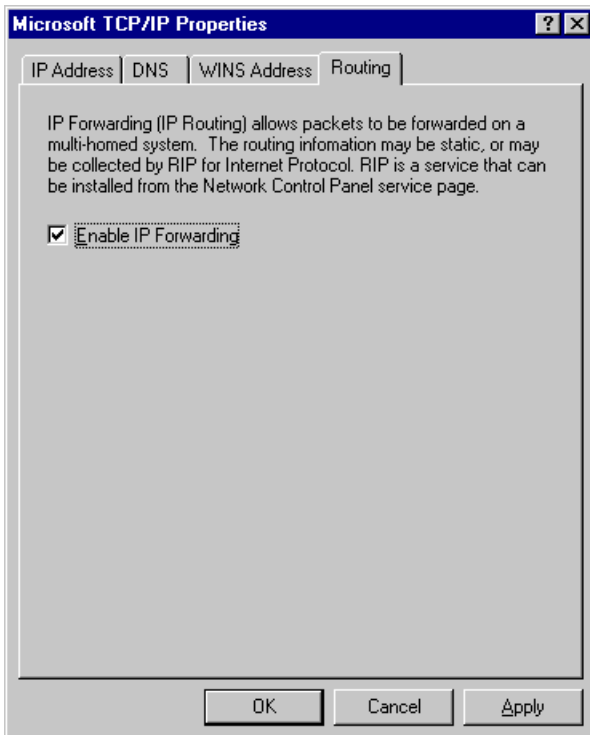
21. In "**Microsoft TCP/IP Properties**" box with **DNS** tab selected, enter the proper information for the blanks. About the parameters and meaning, you can refer to the explanation in the previous section. (3.5 Network Configuration Setup). If you are not sure about any of the required information in this section, please consult to your network administrator. Go to **WINS Address** tab.



22. In “**Microsoft TCP/IP Properties**” box with **WINS Address** tab selected, select SAMSUNG Wireless LAN Card (PCMCIA) and fill the rest of the blanks with the proper information. About the parameters and meaning, you can refer to the explanation in the previous section. (3.5 Network Configuration Setup). If you are not sure about any of the required information in this section, please consult to your network administrator. Go to **Routing** tab.

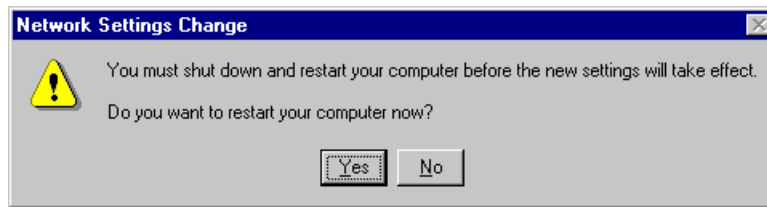


23. In “**Microsoft TCP/IP Properties**” box with **Routing** tab selected, make sure if “**Use IP Routing**” is checked only if you want NT to play a role of router in your network. Click on “**OK**”.



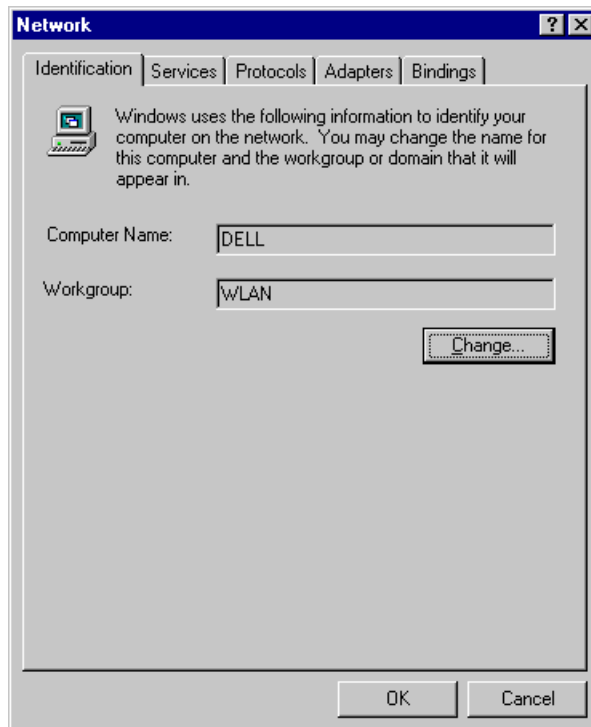
24. When TCP/IP properties are set, click on “**Close**”. Then “**System Setting Change**” box will appear

as follows. Click on “**Yes**” to restart your computer so that the whole installation procedures take effects.

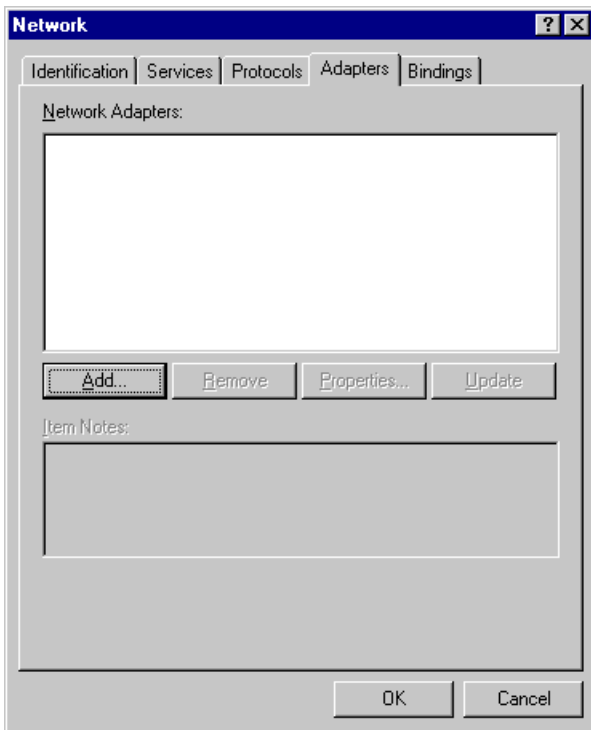


4.2.2 When There is Windows NT networking already installed

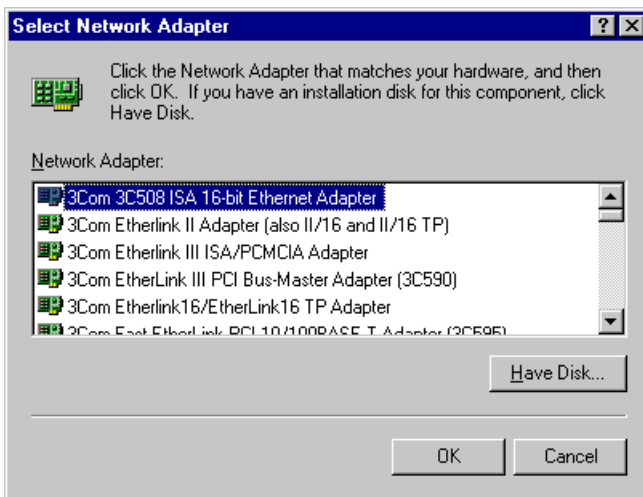
1. Unlike Windows 95/98, since Windows NT does not support Plug and Play (PnP), you should add your driver manually. To do so, click on “**start**” in task bar, go to “**Settings**”, and go to “**Control Panel**”.
2. Under “**Control Panel**”, double click on **Network** icon.
3. “**Network**” box with **Identification** tab selected may appear as follows. You can change the Computer Name and Workgroup after clicking on “**Change**” in the middle of the box.



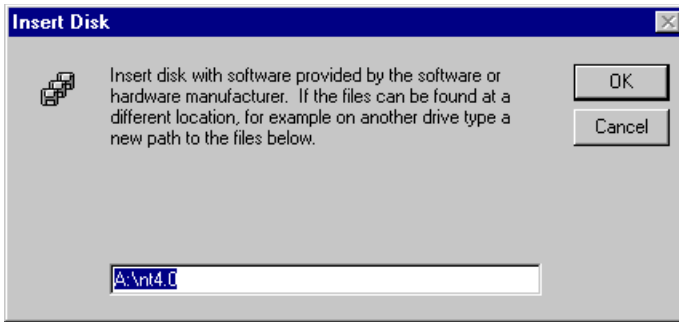
4. Go to **Adapters** tab of the “**Network**” box, and click on “**Add**” button in the middle.



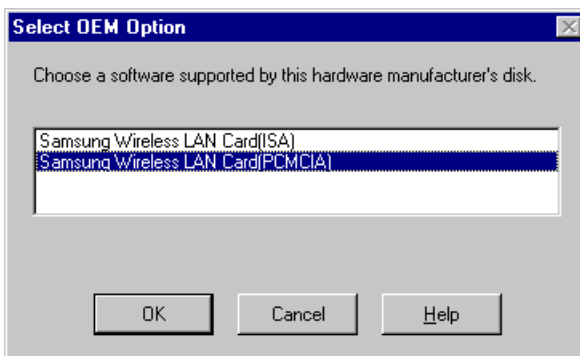
5. “Select Network Adapter” box may appear as follows. Click on “Have Disk”.



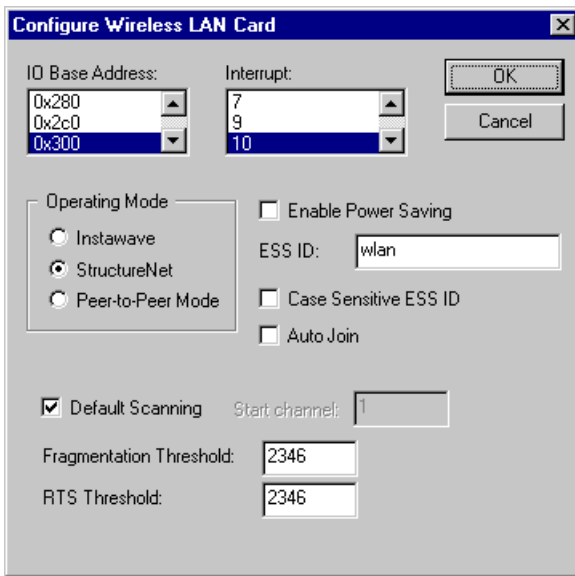
6. “Insert Disk” box may appear as follows. Insert the Installation Diskette into your floppy drive and specify the path “A:\nt4.0” in blank field. Click on “OK”. (In this example, we assume we are installing Windows NT version 4.0.)



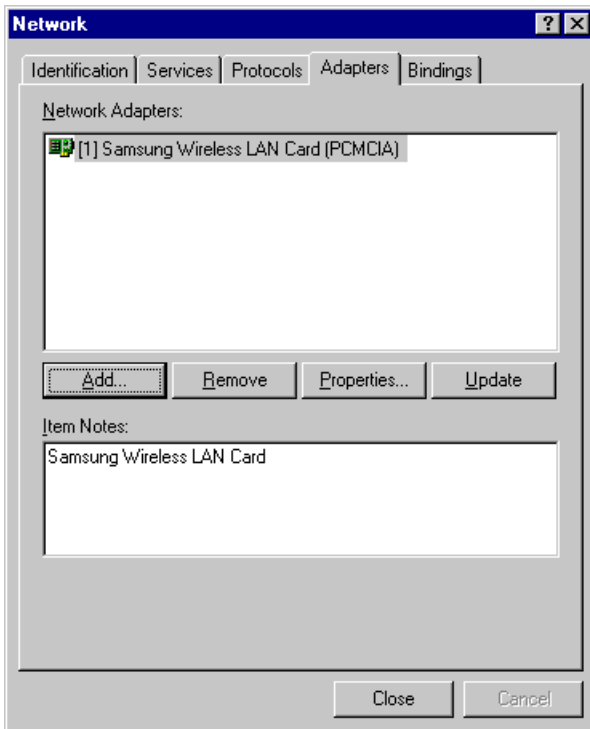
7. If the Driver is successfully set up, “**Select OEM Option**” box may appear. Select the card type. Usually you can select PCMCIA for laptop. Click on “**OK**”.



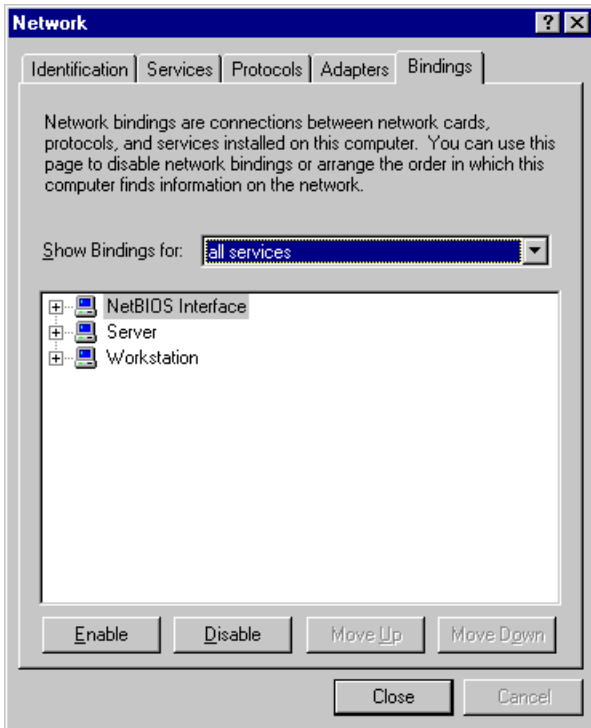
8. “**Configure Wireless LAN Card**” box may appear as follows. Set each some parameters (I/O Base, Interrupt, Fragmentation Threshold, RTS Threshold) for the proper system configuration setup and other parameters (Operating Mode, ESS ID, etc.) for the proper LAN Card configuration setup. For the information on LAN Card-related parameters, you can refer to the explanation on the previous section (3.4 SAMSUNG Wireless LAN Card Properties Setup). If you are not sure any of system configuration-related parameters, please refer to your network administrator. After you set all the parameters necessary, click on “**OK**” to proceed.



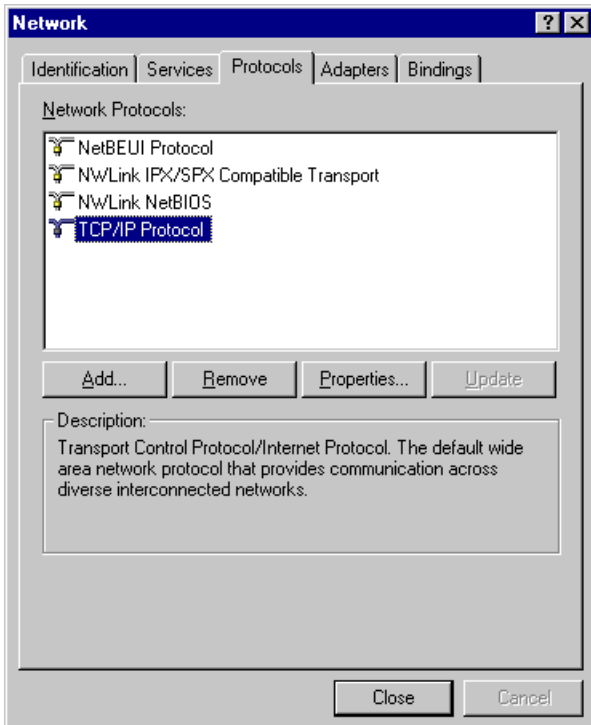
9. “**Network**” box with **Adapters** tab selected may appear as follows. Make sure “**SAMSUNG Wireless LAN Card**” is installed and currently selected.



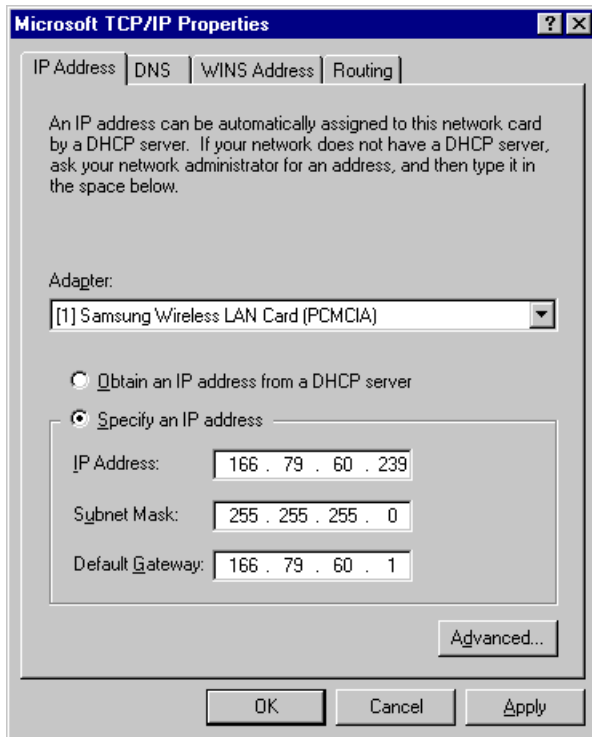
10. Go to **Binding** tab of the “**Network**” box. Make sure that all the necessary services are binded.



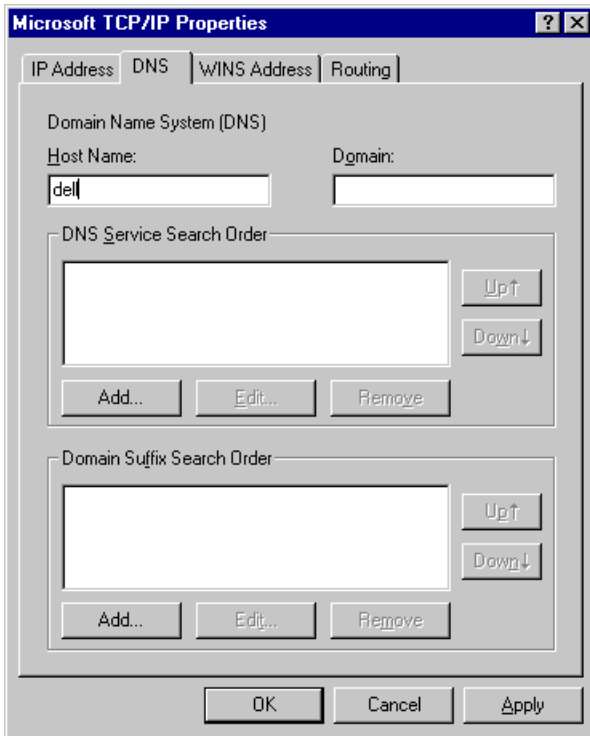
11. Go to **Protocols** tab in the “**Network**” box. If you have TCP/IP protocol already installed in your system, select “**TCP/IP Protocol**” and click on “**Properties**”. If you do not have TCP/IP protocol installed yet, you will have to add it by clicking on “**Add**” button, selecting “**TCP/IP Protocol**”, and clicking on “**OK**”. Once you add it, click on “**Properties**”.



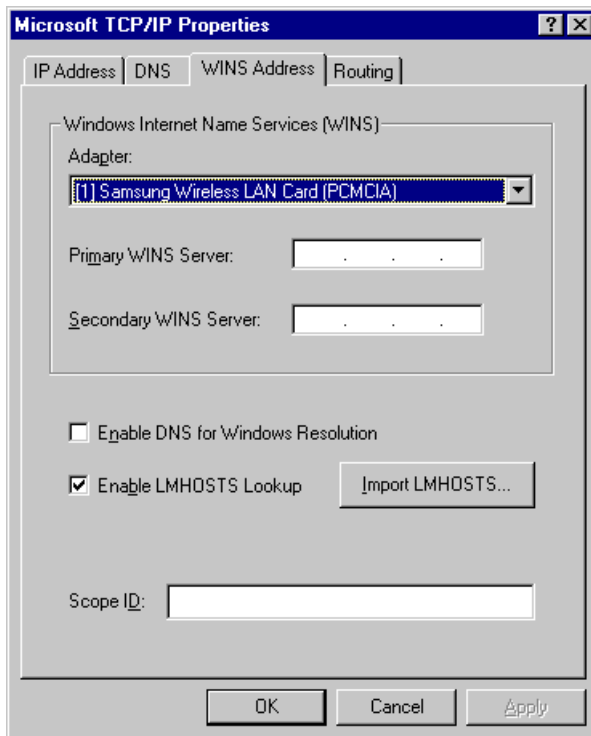
12. “**Microsoft TCP/IP Properties**” box with **IP Address** tab selected will appear as follows. Select “**SAMSUNG Wireless LAN Card**” in the Adapters section, and fill out the rest sections with proper information. About the parameters and meaning, you can refer to the explanation in the previous section. (3.5 Network Configuration Setup). If you are not sure about any of the required information in this section, please consult to your network administrator. Go to **DNS** tab.



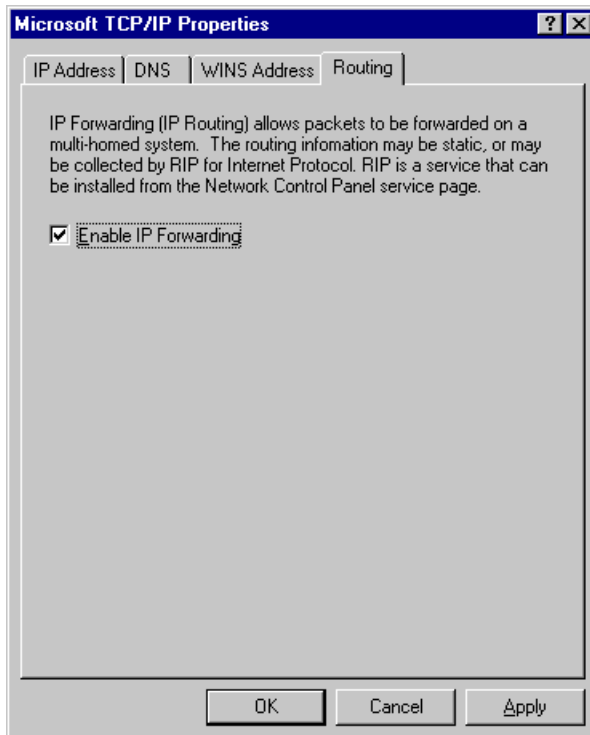
13. In “**Microsoft TCP/IP Properties**” box with **DNS** tab selected, enter the proper information for the blanks. About the parameters and meaning, you can refer to the explanation in the previous section. (3.5 Network Configuration Setup). If you are not sure about any of the required information in this section, please consult to your network administrator. Go to **WINS Address** tab.



14. In “**Microsoft TCP/IP Properties**” box with **WINS Address** tab selected, select “**SAMSUNG Wireless LAN Card**” and fill the rest of the blanks with the proper information. About the parameters and meaning, you can refer to the explanation in the previous section. (3.5 Network Configuration Setup). If you are not sure about any of the required information in this section, please consult to your network administrator. Go to **Routing** tab.

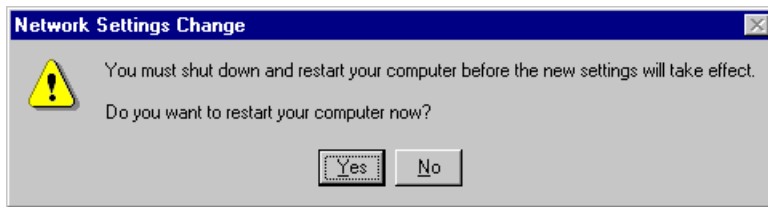


15. In "Microsoft TCP/IP Properties" box with **Routing** tab selected, make sure that "Enable IP Forwarding" is checked only if you want NT to play a role of router in your network. Click on "OK".



16. When TCP/IP properties are set, click on "Close". Then "System Setting Change" box will appear

as follows. Click on “**Yes**” to restart your computer so that the whole installation procedures take effects.



5. Packet Driver Installation for MS-DOS

5.1 Copy the Packet Driver

1. Create a new directory where you want to store a Packet Driver software on your hard disk.

```
Ex> c:\>md packet
```

(From this point, directory “Packet” right under root directory will be used for packet driver software directory for clearer explanation.)

2. Insert the installation diskette in drive A.
3. Copy all files in 'a:\dos>' to the 'c:\Packet>' directory which you created in the step 1.

```
Ex> a:\dos>copy *.* c:\packet
```

5.2 Setup AUTOEXEC.BAT

1. Change current directory to c:\
2. Open 'AUTOEXEC.BAT' with any text editor such as edit.exe

```
Ex> c:\>edit autoexec.bat
```
3. Add the following line at the last line of 'AUTOEXEC.BAT' file.

```
Ex> c:\packet\magicwav.exe
```
4. Save 'AUTOEXEC.BAT' and exit the editor program.

5.3 Setup MAGICWAV.CFG

1. Change current directory to “Packet” directory right under root(C:\) directory.
2. Open 'MAGICWAV.CFG' using a text editor such as edit.exe.

```
Ex> edit MagicWave.cfg
```

3. The structure of the 'MAGICWAV.CFG' is as follows.

- a. Basic Parameters that should be set:

```
ESSID: MAGICWAVE (default)
```

```
NETWORKMODE: 1 (default)
```

```
CHANNEL: 3 (default)
```

```
INTEROP: 1 (default)
```

- b. Parameters for Users that the driver will ignore:

(If you do not want to use PNP, set these parameters.)

```
IRQ: 9 (default)
```

```
IO: 240 (default)
```


MEM: D800 (default)

4. To set a parameter value, type in parameter name and a value within the range as specified in Table A.
5. Save 'MAGICWAV.CFG' and exit editor program.
6. If you want to use TCP/IP protocol, you should load TCP/IP driver after loading packet driver.
To do this, you must refer to the TCP/IP driver manual.

Table A. MagicLAN Packet Driver Parameter Values

<i>Parameter</i>	<i>Description</i>
ESSID	Alphanumeric string with a maximum of 10 ASCII characters that identifies the network to which you would like to connect your computer. Note that this string is NOT case-sensitive.
NETWORKMODE	MagicLAN can be used in 'Ad-Hoc' mode where Access Point (AP) is not required or in 'Infrastructure' mode where all communication will be made through an AP. Available values are as follows: 0 : Ad-Hoc mode 1 : Infrastructure mode
CHANNEL	This parameter is used as an operating channel. The domain and its available channel are shown in Table B.
INTEROP	Interoperability Flag. If this parameter set to '1', MAGICLAN can be used with other wireless LAN cards that based on IEEE 802.11 specification and support interoperability. Otherwise MAGICLAN can communicate only with MAGICLAN LAN card.
IRQ	Interrupt Request Number. If you use PnP (Plug and Play) bios, you can leave this parameter unspecified. Available values are as follows: PCMCIA cards : 2 to F
IO	This parameter is used as an I/O base port for MAGICLAN. If you use PnP (Plug and Play) bios, you can leave this parameter unspecified. Available values are as follows: 200, 240, 280, 2C0, 300, 340, 380
MEM	This parameter is used as a memory base address segment for MAGICLAN. If you use PnP (Plug and Play) bios, you can leave this parameter unspecified. Available values are as follows: C800, D000, D800

Table B. Number of operation channels

	Frequency	FCC	USA				
1	2412 MHz	O	O				
2	2417 MHz	O	O				
3	2422 MHz	O	O				
4	2427 MHz	O	O				
5	2432 MHz	O	O				
6	2437 MHz	O	O				
7	2442 MHz	O	O				
8	2447 MHz	O	O				
9	2452 MHz	O	O				
10	2457 MHz	O	O				
11	2462 MHz	O	O				
12	2467 MHz						

For each supported country, all channels in Table B marked with 'O' shall be supported.

6. Management Utilities (Web & Telnet)

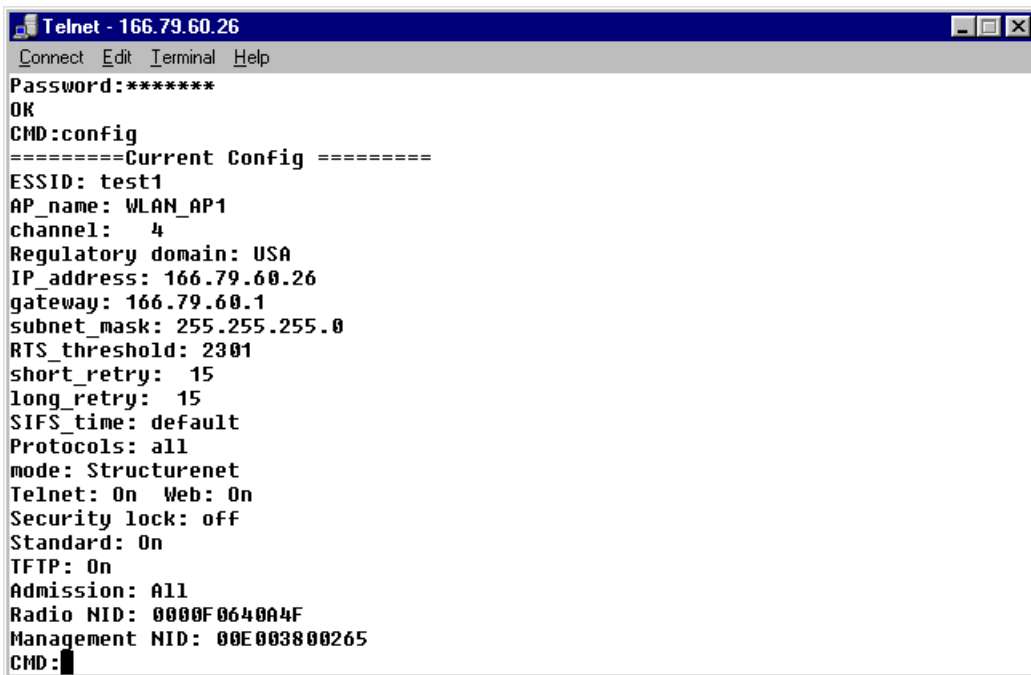
6.1 About Management Utilities

SAMSUNG MagicLAN has three ways of managing the configuration setup for SWL-2000AP: through Hyper Terminal, Web and Telnet service. Using one of those three, you can change the initial setup for AP that you were supposed to do at the previous chapter. (6. Access Point Installation)

6.2 TELNET Management Utility

6.2.1 Telnet Management Utility Overview

In order to browse Telnet management setup, type the command “telnet xxx.xxx.xxx.xxx” in DOS windows and the TELNET screen will appear as follows. Here, “xxx.xxx.xxx.xxx” represents the IP address of your destination AP. When you are prompted to type in the password, enter “default” which is preset as a default password.



```
Telnet - 166.79.60.26
Connect Edit Terminal Help
Password:*****
OK
CMD:config
=====Current Config =====
ESSID: test1
AP_name: WLAN_AP1
channel: 4
Regulatory domain: USA
IP_address: 166.79.60.26
gateway: 166.79.60.1
subnet_mask: 255.255.255.0
RTS_threshold: 2301
short_retry: 15
long_retry: 15
SIFS_time: default
Protocols: all
mode: Structurenet
Telnet: On Web: On
Security lock: off
Standard: On
TFTP: On
Admission: All
Radio NID: 0000F0640A4F
Management NID: 00E003800265
CMD:
```

6.2.2 Various Commands and Usage

6.2.2.1 Usage of the command line

The user can enter commands in the following form:

Command parameter1 parameter2

6.2.2.2 All possible Commands

show	arp	config	stats
set	nid	bridge	restart
time	settime	setdate	ping
logout	ver	log	help
trace	tracemon	tracemon	tracelp
traceclr	broadcast	disable	

6.2.2.3 Explanation on various Commands

- **help:** Displays list of all the commands.
Usage: help [command]
- **show:** Displays the number of attached clients in both wireless and wired LAN.
Similar to the “Bridge Table Report” screen of the Web Management Utility.
 - a. Usage: show [A | G | S]
 - A: List of all known clients attached via wireless LAN.
 - G: List of all known clients attached via wired LAN.
 - S: List of all wireless stations.
 - b. The result of the command is list providing the following information.
 - Net ID: IEEE network address of the client.
 - State: Current relationship of client with AP
(Associated, Disconnected, Detected, is bridging, bridged, Local AP, Unknown).
 - Channel: Radio channel.
 - Power: Whether the power of the client is on or off. (On, Off)
 - Current AP: The Access Point with which the unit is associated.
 - IP address: IP address of the client.
- **time:** Displays the current date and time and those of last restarted time.
- **settime:** Sets the system time.
Usage: “settime HH(hours):MM(minutes):SS(seconds)”
- **setdate:** Sets the system date.
Usage: “setdate MM(month):DD(date):YY(year)”
- **config:** Displays the current system settings for configuration. Note that if a configuration change has been made which requires a system restart to take effect, both the old and the new values will be shown.
- **stats:** Displays traffic statistics. Statistics are displayed for the last 10 second interval. To view the cumulative total, use the command line of “stats c”.
- **logout:** After this command has been issued the user must re-enter the password before any more commands can be issued.
- **ver:** Displays version information about the Access Point software.
- **restart:** Reinitializes the SWL-2000AP.
- **ping:** Issues an ICMP Echo request (PING) to the specified IP address.
Usage: “ping xxx.xxx.xxx.xxx [yy]”
(Here, “xxx.xxx.xxx.xxx” is the destination IP address and yy option will make this ping command executed indefinitely.)
- **nid:** nid is the unique number of wireless LAN card, which is also called “MAC Address”.
Usage: “nid [add | delete] 123456789abc NAME” / “nid list”

(Here, “123456789abc” is the new NID value and “NAME” is a text string up to 9 characters with no space in between.)

- trace: Displays the contents of the trace buffer. This command does NOT clear the trace buffer so that issuing the command twice will produce the same result.
- traceclr: Clears the entries which have been read by the trace command.
- tracelp: Displays a continuously updated log to the screen. To exit, press <Ctrl+C>.

Usage: “tracelp” : Updates the display every 5 seconds.

“tracelp Q” : Updates the display every second.

“tracelp S” : Updates the display every minute.

- traceon: Activates tracing for certain events. (Refer to “traceoff”)
- traceoff: Deactivates tracing for certain events.

Usage: “traceoff <specifier> <specifier>”

Here, specifier is of the following strings:

- “br+” : Traces new entries in the bridge table.
- “br-” : Traces bridge table entries which age out.
- “IP+” : Traces new TCP/IP address.
- “sys” : Traces authenticate, associate, WIN/LOSE negotiations (roaming).
- “all” : Turns off or on tracing of all events.

Default specifier Combinations are like the following:

- “traceon sys”

- “traceoff br+ br- IP+”

7. Miscellaneous Features

7.1 Connection Check

7.1.1 When successfully connected to Network through AP

On task bar at the bottom of window, you will see a monitor-like SWL-2000E icon, which is colored blue. The icon looks like the following. (The rightmost one)



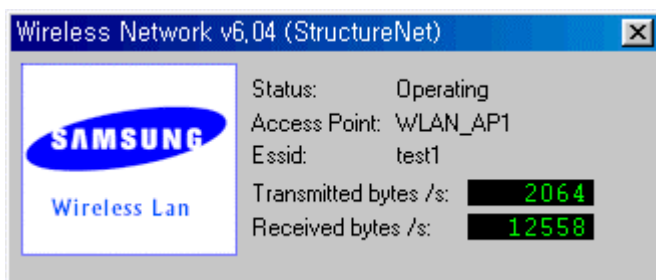
7.1.2 When failed to connect to Network through AP

On task bar at the bottom of window, you will see a monitor-like SWL-2000E icon with “red X” through it. The icon looks like the following. (The rightmost one)



7.2 Performance & AP Information Check

After you make sure if the connection is successfully made, double click on the icon and the following box will appear to display the AP’s current performance regarding transmitting and receiving and some basic AP information including ESS ID, AP name, and its status. This is also used to check which AP the client is currently using when the auto join option is selected.



7.3 Brief Troubleshooting

If you encounter some problems while installation, please try one or more of the followings.

- Check the driver configuration if the driver you are using is the correct one for your networking environment.
- Reboot with the Adapter inserted.
- Completely remove and reinstall the Adapter and driver.
- A common problem is a driver/firmware version mismatch. If the driver fails to find the card, this is often the case. Inform this to your retailer and try to install with different combination of driver and firmware.
- Check the resources used by the card to make sure no resource is being used by another device in your system.

(To see your resources setup, right click on My Computer icon, click on Properties, go to Device Manager tab, and click on Properties. The windows will display I/O Address, IRQ, DMA Channel and Memory ranges occupied on your system.)

7.4 Specifications

7.4.1 Physical Specifications

	SWL-2000E
PC Interface	PCMCIA
Dimensions(L*W*H)	106*54*5mm
Weight	37g
Temperature:	
- Operating	0 to 50 °C (maximum humidity 95%)
- Storage	-10 to 60 °C
Power Characteristics:	
- Receive Mode	320mA
- Transmit Mode	710mA
- Power Supply	5V

7.4.2 Radio Characteristics

Frequency	2412 to 2462 MHz
Modulation Method	Direct Sequence Spread Spectrum - QPSK
Tx/Rx Switching Speed	2 μ s
Output Power	+20.5dBm
Operating Range:	
- Open Space	Max. 400m(1330ft)
- Semi Open Space	Max. 80m(260ft)
- Closed Space	Max. 35m(110ft)

7.4.3 Network Characteristics

Compatibility	IEEE 802.11 Standard for Wireless LAN
Media Access Protocol	CSMA/CA
Supported OS	MS-DOS, MS Windows95/98, Window NT 3.51 and 4.0