



IBM

Small Business

Computer Telephony Solution

Administration Guide

Options
by IBM

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First Edition (June 1998)

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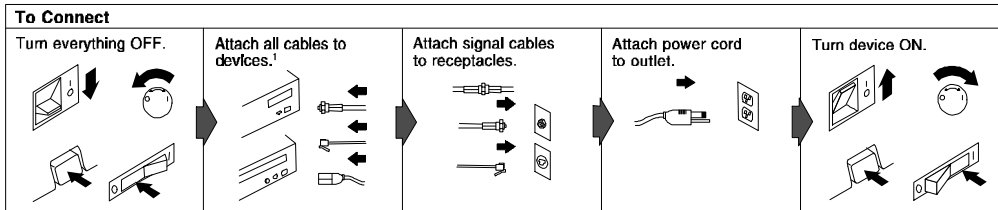
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1. Safety Information

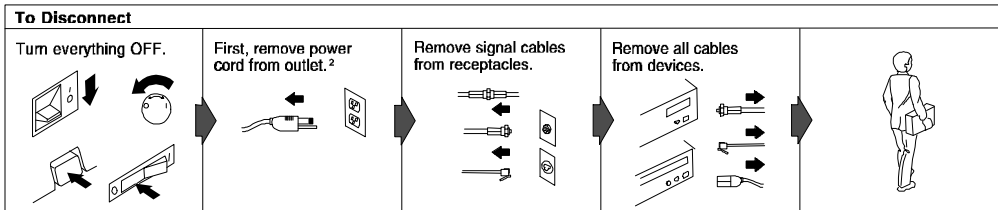


DANGER:

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving or opening the covers of this product or attached devices. The power cord must be used with a properly grounded outlet.



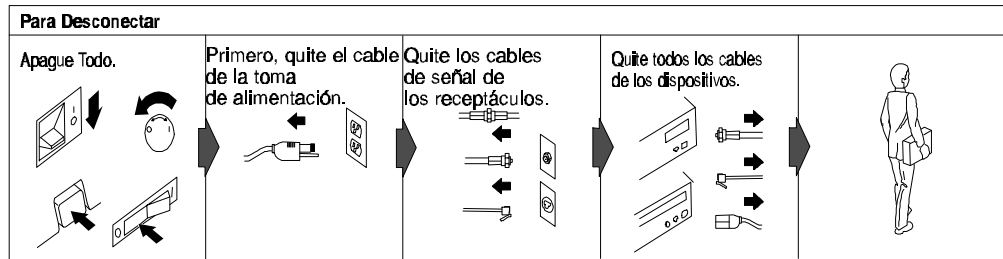
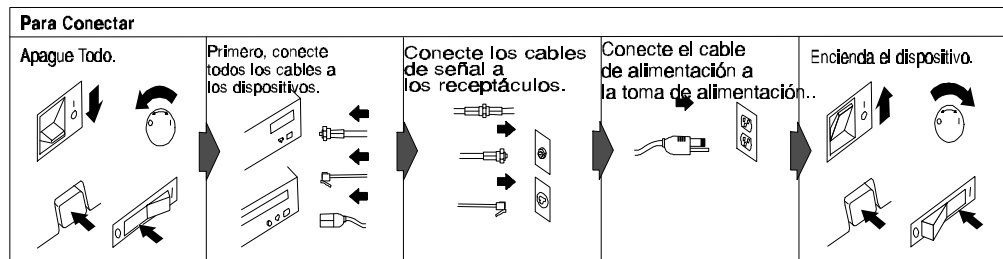
¹ In the U.K., by law, the telephone cable must be connected after the power cord.



² In the U.K., by law, the power cord must be disconnected after the telephone line cable.

 **PELIGRO:**

La corriente eléctrica de la alimentación, teléfono y cables de comunicación es **peligrosa**. Para evitar **peligro de descargas** cuando instale, mueva o abra las cubiertas de este producto o de un disp. conectado, conecte y desconecte los cables tal como se muestra a continuación.



To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

To avoid shock hazard:

- The power cord must be connected to a properly wired and earthed receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.

Pour éviter tout risque de choc électrique:

- Le cordon d'alimentation doit être branché sur une prise d'alimentation correctement câblée et mise à la terre.
- D'autre part, tout le matériel connecté à ce produit doit également être branché sur des prises d'alimentation correctement câblées et mises à la terre.

Para evitar peligro de descargas, no contacte o desconecte ningún cable, ni realice ninguna instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.

Para evitar peligro de descargas:

- El cable de alimentación debe estar conectado a una toma de alimentación adecuadamente cableada y con toma de tierra.
- Cualquier equipo al cual se conecte este producto debe estar también conectado a tomas de alimentación adecuadamente cableadas.
- Cuando sea posible, utilice una mano para conectar o desconectar los cables de señal para impedir que se produzcan posibles descargas eléctricas al tocar dos superficies con potencial eléctrico distinto.

DANGER

When using your telephone equipment basic safety precautions should always be followed to reduce the risk of fire, electrical shock, and injury to persons, including the following:

- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

2. Introduction

2.1 IBM Computer Telephony Solution (CTS) overview

The IBM CT-618 hardware and software comprise a complete Windows NT server-based PBX system. This system is flexible and extensible; simply add additional CT-618 boards as your needs increase.

- The IBM Telephony Administration software provides a graphical interface for administrative functions, including line configuration, database maintenance and translation table editing.
- Individual phone users can perform calling operations through the telephone handset, or use the IBM Call Manager software to manage calls through their PC.
- The IBM VoiceMaster software provides a complete set of voice mail functions, including integrated messaging to allow e-mail and pager notification.

2.2 About this book

This manual is intended for the IBM Computer Telephony system administrator, and assumes that you are familiar with Windows NT operations and server administration.

The following topics are covered in this manual:

- Creating/maintaining the company database
- Setting and maintaining line configuration information
- Modifying the CT-618 translation table
- Configuring voice mailboxes
- Setting up integrated messaging setup
- Using TAPI based applications with the IBM Computer Telephony Solution
- Collecting usage data with SMDR
- Troubleshooting
- Installing IBM Call Manager client software

This book is also available on the IBM Telephony CD as an Adobe Portable Document Format (PDF) file. This file is located in the CD's Documentation folder, and will also be installed on your system, along with the Adobe Acrobat Reader, during a typical installation (or by selecting the Install Documentation option) during the installation process.

3. IBM CT Functions

3.1.1 Incoming calls

An incoming call on a trunk rings the operator extension. After an adjustable number of rings the call is connected to the auto attendant message and permits the caller to dial an extension. After the message, the call is again sent to the operator extension. If the number of rings is set to 0, callers will immediately connect to the auto Attendant without the operator's extension ringing first.

3.1.2 Dialing calls

Dialing calls with IBM CT is similar to dialing with most Centrex or other business phone systems. The dialing instructions described below are the defaults supplied with the IBM CT system. You may find differences if your system has been reconfigured by your IBM CT Administrator.

Other Extensions

To call another extension, enter the digits of the extension number.

Operator

To place a call to the internal operator, press **0**.

Outside Calls

To dial an outside local call press **9**, then the seven digits of the phone number you wish to call. To dial an outside long distance call press **9 + 1**, then the ten digits of the phone number you wish to call (provided that your extension has privilege to dial 1+10 digit calls).

911 Emergency Services

To place a call to 911 emergency services, press **911**.

Directory Assistance

To place a call to phone company directory assistance, press **9** plus the appropriate directory assistance number.

3.2 Managing Calls

Picking up ringing calls on other extensions

You can pick up any ringing extension within your pickup group by pressing *5. A pickup group is any set of phone extensions forming part of a group, as assigned by the IBM CT Administrator, usually all extensions within one office or department. (See *Assigning pickup group* on page 18.)

Placing calls on hold

Depressing and quickly releasing the switch hook (in less than one second) is called a "Flash." Flashing places the current call on hold and gives an acknowledge dial tone. You can then transfer or conference the call. The IBM CT PBX also supports handsets that have a "flash" button for this function.

Picking up a held call

To pick up a call placed on hold, enter *4 (pickup Held), or flash to reconnect. If you have more than one held call, the last call placed on hold is picked up first.

3.2.1 Transferring calls

Announced transfers

1. Flash to place the call on hold.
2. Dial the transferee.
3. When connection is made, announce the caller to transferee.
4. If the transferee wants to speak with the caller, flash to place the transferee on hold.
5. Press *8 to transfer the call.

Unannounced (blind) transfers

1. Depress and quickly release the switch hook or use the flash button to place the call on hold.
2. Dial the transferee's number and hang up within five seconds. (If you do not complete the transfer within five seconds, you have hung up on the number you are transferring to, and the call will ring back on your extension.)

Conference calls

1. Place calls to be conferenced on hold
2. Press *2 (Conference). This will create a conference of all held calls plus yourself. Press *8 to create a conference of held calls, but not include your extension.

3.2.2 Forwarding calls

You can have your calls forward to other extensions if your line is busy, not answered, or you do not wish to be disturbed.

Forward if Busy

You can set your extension so that calls will forward to another extension if your line is busy.

To set *Forward if Busy* press *92 plus the extension calls will forward to. (Enter *88 in place of the extension number to forward calls to voice mail.) To cancel *Forward if Busy* press *92#.

Forward Immediately

To set your extension so that calls will *Forward Immediately* to another extension press *94 plus the extension calls will forward to. (Enter *88 in place of the extension number to forward calls to voice mail.) To cancel *Forward Immediately* press *94#.

Forward if No Answer

You can set your extension so that calls will forward if your extension does not answer.

To set your extension to Forward if No Answer press *96 plus the extension calls will forward to. (Enter *88 in place of the extension number to forward calls to voice mail.) To cancel *Forward if No Answer* press *96#.

4. IBM CT System Administration

The IBM CT administrator is responsible for the configuration and maintenance of the IBM CT system. Administration duties include:

- System Configuration - including setting trunk reservation and rotation, on-hold audio source, flash hook timing and digit play/quiet time.
- Line Configuration, including pickup group and class of service assignments.
- Creation and maintenance of the Company listing.
- Slave board configuration.
- Auto attendant message recording and maintenance.

4.1 Using the IBM CT Administration Utility

Most IBM CT administration functions are performed through the IBM CT administration utility. Certain commands may also be entered via the handset (that has a class of service with administrative privileges), and some functions can only be performed using a handset. Where applicable, both methods are included in this guide.

Starting the IBM CT Administration Utility

1. From the Start Menu, navigate to Programs/IBM Computer Telephony/Admin/IBM Telephony Administration Utility.
2. Enter the IBM CT Administrator password in the box provided (asterisks will appear in the box as you type), then click OK or press enter. Note that IBM CT passwords are case-sensitive.

Note: The default password supplied with the system is NETPHONE. It is strongly suggested that you change this password immediately.

The IBM CT Administration Utility offers options for the following system administration functions:

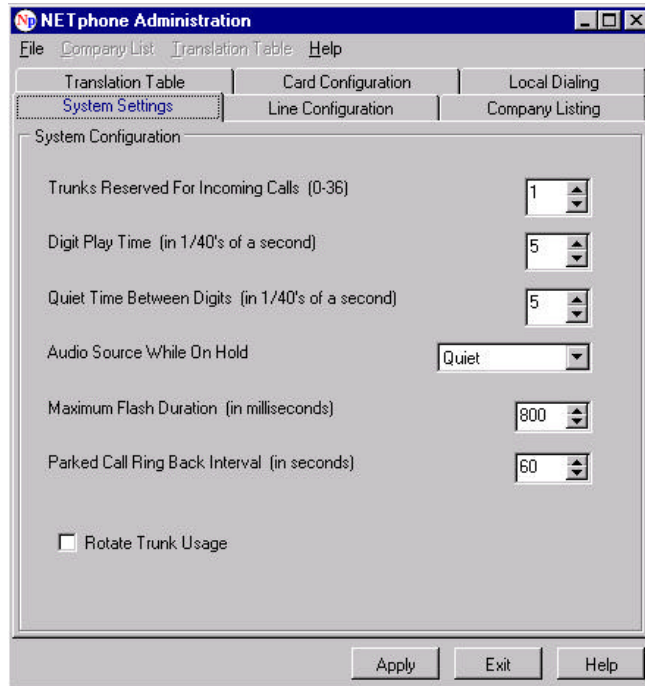
- System information
- Line Information
- Company Database
- Translation Table
- Slave board configuration

When making changes through this utility, you can click **Apply** to activate your changes, or click **Exit** to close without activating changes.

4.2 Changing the administrator password

1. Select **Set Admin Password** from the IBM CT Administration Utility **File** menu.
2. Enter the current password in the dialog box and click **OK**.
3. Enter a new password and click **OK**.
4. You will be prompted to re-enter the new password to confirm accuracy. Enter the new password and click **OK**.

If you forget the Administrator password, you will need to manually reset to the default in order to use the IBM Telephony Administration Utility. Removing the IS-TEST-MODE jumper on the CT-618 board after the system is running will allow IBM CT to accept the default password (it does not reset the password). You can enter the default password (NETPHONE), and then set a new password as described above. When the jumper is replaced, IBM CT resumes use of the old password unless you have reset the password while in test mode.



4.3 Setting system information

4.3.1 Setting number of trunks reserved for incoming calls

You can specify the number of trunks to be reserved for incoming calls. Outgoing calls will be disallowed unless sufficient trunks are currently idle and available to satisfy the number of open trunks reserved for incoming calls. To set the number of trunks reserved:

1. Access the IBM Telephony Administration Utility System Settings tab.
2. Enter a value (0 through 36) in the box provided (default is 0).
3. Click Apply.

To set from phone keypad: Enter #30 (through #36) for 0 through 6 trunks, respectively.

4.3.2 Setting digit play and quiet time

Digit play time is the rate at which the dial input tones are transferred through the phone system when dialing on trunks. Digit quiet time is the time between these tones. You may need to adjust these times due to telephone equipment demands. Both of these rates can be set in 1/40 second increments (values of 0-127 permitted, default is 3). To set digit play and quiet time:

1. Access the IBM Telephony Administration Utility System Settings tab.
2. Enter values (0 through 127) in the boxes provided.
3. Click Apply.

4.3.3 Setting maximum flash interval

Handsets with “Flash” buttons may be used with IBM CT. The default flash interval used by IBM CT is 700 milliseconds. If your handset requires a different interval, you may change this setting (symptom would be flash button causes a hang up). Refer to the handset manufacturer’s documentation for appropriate flash interval.

To change the flash interval:

- Access the IBM Telephony Administration Utility System Settings tab.
- Select a value using the scroll box provided (500 to 1600 milliseconds, default is 700).
- Click Apply.

4.3.4 Choosing on-hold audio

Audio can be played to callers on hold from a source attached to the IBM CT board’s stereo jack, or you can choose to leave the line quiet. To choose the audio source:

1. Access the IBM Telephony Administration Utility System Settings tab.
2. Select either stereo jack or quiet from the scroll box (default is stereo jack).
3. Click Apply.

4.3.5 Rotating trunk usage

This option determines whether searches for an unused trunk should start with the trunk after the last trunk selected in round robin fashion, or always start with the first trunk. To set trunk rotation:

1. Access the IBM Telephony Administration Utility System Settings tab.
2. Click in the box to toggle on/off (default is OFF).
3. Click Apply.

4.3.6 Parked Call Ringback Interval

This setting specifies the number of seconds a call will remain parked before ringing back to the extension it was parked from. You can specify a number of seconds from 0-6500 (default is 120).

1. Access the IBM Telephony Administration Utility System Settings tab.
2. Enter the number of seconds (default is 120)
3. Click Apply.

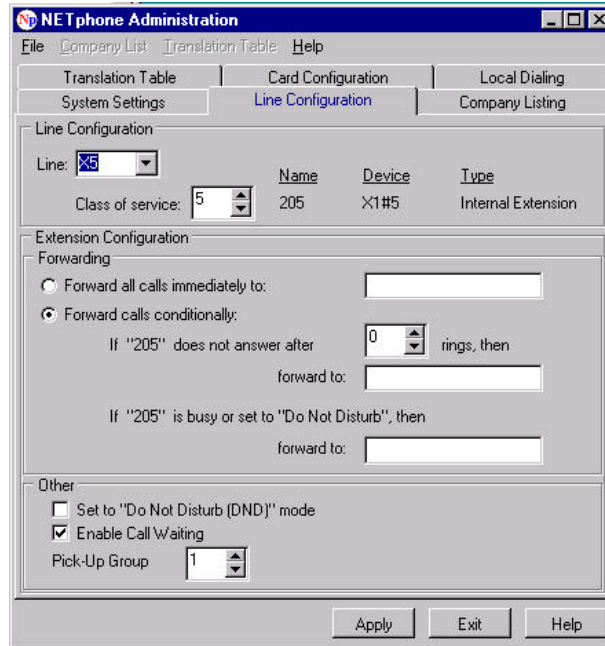
4.4 Setting line information

The IBM Telephony Administration Utility's **Line Configuration** tab allows you to set line information for trunks and extensions. Any changes you make to an extension will override the settings that may have been entered by that extension's user. However, for IBM Call Manager clients, the user-defined settings for non-privileged fields (all fields except class of service and pickup group) may be changed by the user.

4.4.1 Selecting lines and extensions

To select a line or extension number, enter the logical (extension number) or physical name in the line box, or scroll through the listing to display trunk lines and extensions by their physical device names. As you enter information in the box, a logical name display as soon as the characters in the box match the name of an existing device. A label for the line type and logical name displays next to the selection box.

- If you select an extension, the line type label will be “internal extension,” and available options are: set forwarding, do not disturb, class of service and pickup group. (Note that changes made to extensions by the administrator while the IBM Call Manager client fort that extension is active will not take effect until IBM Call Manager is restarted.)
- If you select a trunk, the line type label will be “outside line,” and the available options are: set the number of rings before auto attendant and class



of service.

4.5 Setting Forwarding for Extensions

To set forwarding for an extension:

1. Access the IBM Telephony Administration Utility Line Configuration tab.
2. Select the extension number. The current forwarding settings will be displayed. You can change the settings, making appropriate entries in the boxes provided.

- a) Forward immediately - Phone calls will be forwarded to this number (enter *88 for voice mail) without the phone ringing.
 - b) Forward if no answer - Phone calls will be forwarded to this number (enter *88 for voice mail) if the phone is not answered within the number of rings specified.
 - c) Rings before forwarding - Number of times phone will ring before calls are forwarded.
 - d) Forward on busy - Phone calls will be forwarded to this number (enter *88 for voice mail) when the phone is busy and call waiting is not active. (If a call waiting call is not picked up within this number of rings, it will be forwarded according to settings for “forward on no answer”)
 - e) Do not disturb - Callers will hear busy signal and forwarding will take place according to the Forward on busy setting for that extension.
 - f) Call waiting - Check box to enable/disable call waiting for an extension.
3. Click Apply when finished.

4.5.1 Setting the number of rings before auto attendant

To set the number of times the phone rings before the auto attendant message plays:

1. Access the IBM Telephony Administration Utility's Line Configuration tab.
2. select an outside line number.
3. Enter a value (0-99) in the box provided (default is 3). To have callers reach the auto attendant without the operator extension ringing first, set the number of rings to 0.
4. Click Apply.

To set from phone keypad: Enter #20 (through #26) to set the number of rings from 0 to 6, respectively.

4.5.2 Assigning class of service

The class of service number designates the selection of features and privileges available to a particular phone line. Classes of service are used to set calling restrictions on trunk lines and extensions; all lines and extensions with the same class of service number have the same privileges available to them. The privileges assigned to the different classes are defined through the translation table, and can be customized to meet your requirements.

Default classes of service are

Class 1 Internal calls only

Class 2 Free calls only (dial 9 plus seven digits)

Class 3 Free calls plus selected area codes

Class 4 Any North American dialing plan (1 plus 10 digits)

Class 5 Unrestricted (North American dialing plan and international dialing)

Class 6 Administration (unrestricted, plus able to enter test function codes)

To set the class of service:

1. Access the IBM Telephony Administration Utility's Line Configuration tab.
2. Select an extension or line number.
3. Enter a class of service number in the box provided (default is 5 - unrestricted).
4. Click Apply.

4.5.3 Assigning pickup groups

A pickup group is a group of phone extensions (usually all extensions in an office or workgroup). Members of the group can pick up ringing calls on other extensions in the group by entering *5 on their phone keypad. Groups are created by entering the same pickup group number for each extension included in the group. As delivered, all extensions are set as members of pickup group "1" (any extension can pick up any call).

In a small office you may want to assign all extensions to the same pickup group allowing any call to be picked up. However, generally only phones physically nearby would be members of the pickup group.

1. Access the IBM Telephony Administration Utility's Line Configuration tab.
2. Select an extension or line number.
3. Enter a pickup group number in the box provided.
4. Click Apply.

Note: A pickup group is not the same as the cover group set through IBM Call Manager Desktop Call Control. Members of the pickup group can pick up each other's ringing calls using the handset. The two groups do not necessarily have the same members.

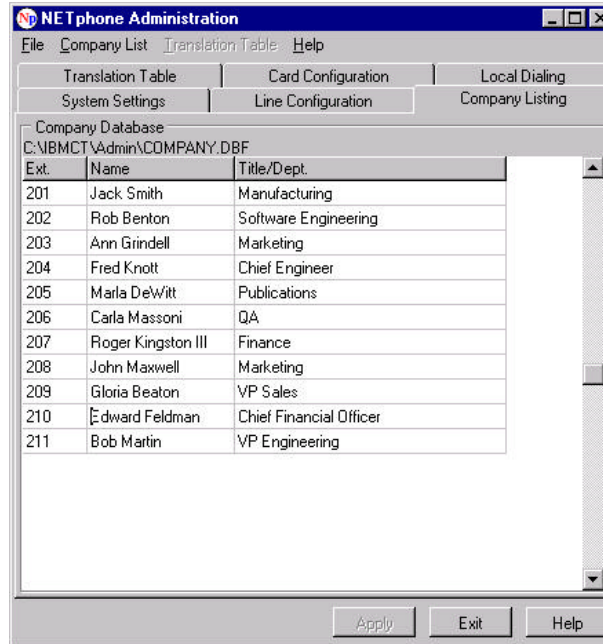
4.6 Company listing maintenance

The Company listing is used by IBM Call Manager clients as a resource for dialing and transferring calls. The Company listing file used by IBM Call Manager is named COMPANY.DBF, and must be stored on the server so that IBM Call Manager users will be able to copy it to their PCs.

Note: The COMPANY.DBF file is copied to the local client. The master copy should not actually be in use by a IBM Call Manager client (for example IBM Call Manager installed on the server), or other clients will not be able to access the file.

4.6.1 Editing the Company listing:

1. Access the IBM Telephony Administration Utility's Company Listing tab. If the Company listing displayed is not the one you wish to edit, select **Open** from the Company List menu and select the appropriate file.
2. Edit the listing by entering information in the fields. Use Ctrl+Delete to delete a line, Insert to add a line.



3. When you are finished, select **Save** from the Company List menu to save your file. (Choose **Save As** and choose a different directory if you want to maintain multiple COMPANY.DBF files.)

Notes: The Company listing is changed as you edit, even though you have not explicitly saved the file. If you are making major edits to the database, it is suggested that you save a copy of COMPANY.DBF in another directory so that you can revert to the previous file if necessary.

While the Company listing is open for editing, IBM Call Manager users will not be able to Refresh their copy. It is suggested that you do not keep this window open for excessive periods of time.

While working with the Company listing, note that the sort order IBM Call Manager will use for text fields (name, dept., etc.) is:

1. All entries beginning with an upper case character.
2. All entries beginning with a lower case character.

- Entries beginning with non-alpha characters, such as punctuation symbols.

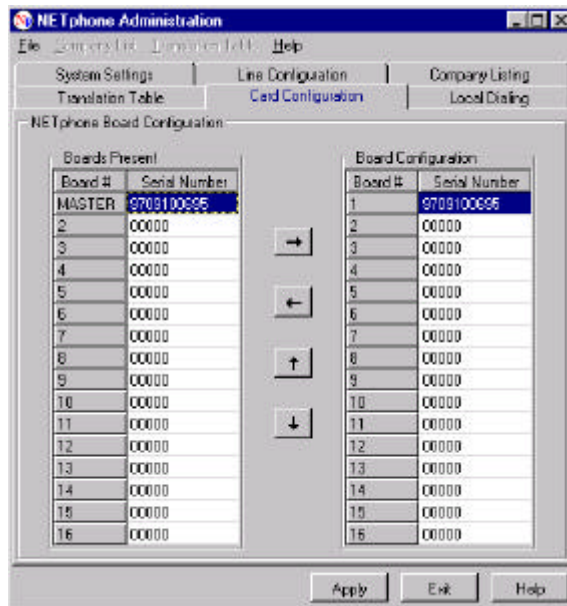
4.6.2 Creating a Company listing with other applications

The Company listing can also be created using a comma delimited text file, or imported from another file (such as dBASE or FoxPro), however, we suggest that it be entered using the IBM Telephony Administration Utility.

If you are using a database file as your Company listing, make sure that you edit it with the appropriate application, and that you keep a current copy named COMPANY.DBF on a network drive accessible by IBM Call Manager users.

4.7 Slave board configuration

When multiple boards are installed in an IBM CT system, the first board is the



Master board, and all other boards are slaves. Extensions and trunks are assigned sequentially across multiple boards.

If boards are added one at a time and the server is power cycled after each addition, the system will automatically configure them to have extensions assigned

sequentially. If the boards were not added in this fashion, you can use the IBM Telephony Administration Utility's Slave Configuration tab to set the order for the boards.

The IBM Telephony Administration Utility's **Slave Configuration** tab shows the CT-618 boards installed in the server. The **Boards Present** list shows the serial numbers of installed boards. The **Board Configuration** list shows the board sequence (the order in which extensions and trunks area assigned across boards). You can use this utility to logically change the slave board sequence. (Master board status is determined by jumper setting, and can not be changed with this utility.)

If you cannot dial a particular extension, or the one you get is different from what you dial, boards may be out of order.

To change the slave board sequence:

1. Access the Slave Configuration tab.
2. Click on an entry in the Board Configuration list to select.
3. Click on the up arrow or down arrow buttons to change the board's position in the list.
4. Click apply when done.

If you remove one (and only one) board, and add one (and only one) board, this is considered a swap, and is automatically configured. If you add more than one board or remove more than one board, you may need to add or remove them logically as well, or you if you have more boards installed than you need, you can logically remove them until needed.

To remove or add a slave board:

1. Access the Slave Configuration tab.
2. Click on an entry in the Board Configuration list to select, and click the left arrow button to remove the board .
3. Click on an entry in the Boards Present list to select, and click the right arrow button to add the board to the Board Configuration list.
4. Click apply when done.

4.8 Auto attendant message

The auto attendant message is played to incoming calls, and usually contains a greeting and instructions for the caller, for example, to enter additional digits to reach an extension or get additional information. The auto attendant message file used is ATTEND.MU, located on the server in the AUDIO directory (i.e., C:\IBMCT\AUDIO).

You can play the current auto attendant message by entering *13 on the phone keypad.

To create an auto attendant message

1. Enter *11 on your phone keypad.
2. Speak into the phone, then hang up. You will have created a message file RECORD.MU, located on the server.
3. Enter *12 on your phone keypad to play the message you have recorded.
4. To install this message as your auto attendant message, copy or rename the file to ATTEND.MU.

You can keep different message files for use at different times. As you record each message, rename the RECORD.MU file to ensure that each file has a unique name. Copy or rename the desired file you want to ATTEND.MU when you want to use it as your auto attendant message.

Customizing voice files

IBM CT provides a professionally rendered simple default auto attendant message produced by Worldly Voices, Inc.

The volume of the auto attendant (ATTEND.MU) file must be carefully controlled. If the volume is too loud, the auto attendant may not operate properly: DTMF digits may not be detected, DTMF digits may be detected twice, or the voice recording may be interpreted as a DTMF tone (talk off). This should not be a problem if you record the ATTEND.MU file with the handset record function (*11).

For editing voice files, IBM CT recommends using the VFEEdit[®] software offered by Voice Information Systems, Inc. This software tool is useful for removing silent periods, speeding up audio, and changing volume levels. You will need a sound card to operate this software. To set a proper volume level with VFEEdit we

recommend that the audio peaks be less than 40% on the displayed VFEedit volume scale.

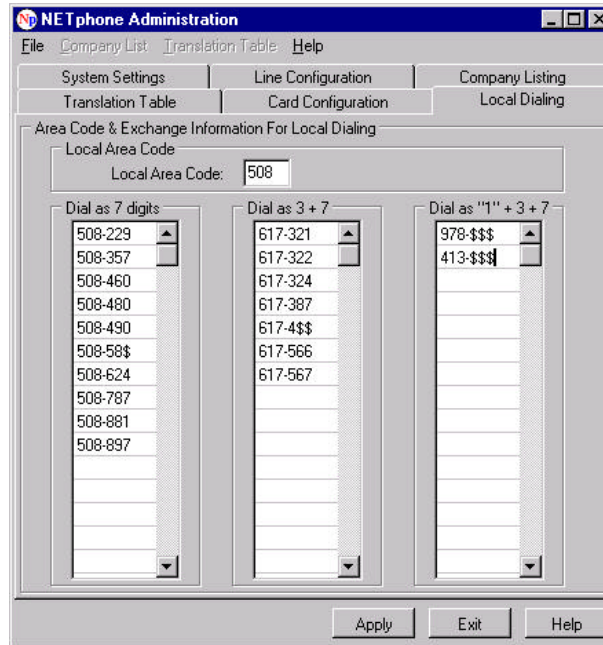
4.9 Local Dialing Wizard

In most areas of the United States, local calls are dialed with seven digits. However, it is becoming common for some local calls to be dialed with the area code plus phone number (10 digit dialing). A non-local (toll) call requires dialing 1+area code+number (11 digit dialing).

The IBM Telephony Administration Utility provides a “Local Dialing Wizard” which allows you to enter area code/exchange number pairs according to the local dialing requirements. Once this information is entered, IBM CT will make the appropriate entries to the translation table to that calls are dialed correctly, even when users do not know whether the call is local.

To enter the local dialing information

1. Determine dialing requirements for the exchanges in your area. Your local phone company can provide this information.



2. Access IBM Telephony Administration's Local Dialing tab.
3. Enter your local area code in the field provided.
4. In the column labeled "Dial as 7 digits", enter the area code and 3-digit exchange numbers for calls that are dialed with 7 digits. Press enter after each entry to post the entry.
5. In the column labeled "Dial as 3+7 digits", enter the area code and 3-digit exchange number for calls that are dialed with 10 digits (area code+number).
If

all exchanges in an area code are dialed with 10 digits, you can enter the area code and wild card the exchange portion (\$\$\$). Press enter after each entry to post the entry.

6. In the column labeled "Dial as 1+3+7 digits", enter the area code and 3-digit exchange number for calls that are dialed with 11 digits (1+area code+number). Note: entries in this column should only be for exceptions to a wild card entry in the Dial as 3+7 column. Press enter after each entry to post the entry.
7. When entries are complete, click Apply. You will be asked to confirm that you wish to modify the translation table. If you click Yes, the appropriate changes will be made to the translation table, and the updated table information will be read to the CT-618.
8. Two new translation table (.trn) files will be created automatically, one for the current table, and one for the new table that includes your local dialing changes.

Notes:

- You can use the dollar sign wild card (\$) in place of a digit in any position of the exchange. For example, if entering 508-76\$ will include exchanges 760 through 769 for area code 508.
- If you over populate the translation table, you will receive an error message, and none of your entries will be written to the table.
- Entries in the translation table are made according to the default classes of service (see page 46 for defaults).
- You can delete an entry by placing the insertion point within the entry and pressing ctrl+delete.
- Press enter after each entry to post the entry.

5. The IBM CT Translation Table

The IBM CT translation table is the mechanism that:

- Takes the digits dialed (by a user's handset or with IBM Call Manager Desktop Call Control), determines when dialing is complete and then directs the call.
- Implements the dialing patterns seen by the user, for example, dialing 9 for an outside line, toll restrictions, and other special dialing services.
- Defines names (extension numbers) for the physical lines of a IBM CT system to be used in both dialing and TSAPI messaging.

You will need to edit the translation table when you make changes to your phone system, such as when:

- You change extension numbers.
- People change offices and you want to reassign the extension number to the physical line of the new office.
- You change calling privileges for a particular class of service.
- You define a number that callers enter to reach a department or service, for example: "Press 3 for customer service."

All entries in the translation table include two parts you can edit, the Pattern String (on the left-hand side of the table), and the Translation String (on the right-hand side). In order to make changes to the IBM CT translation table, you will need to understand these entries, their components, and how they interact.

5.1 Line mappings and TSAPI *DeviceID*

Line mappings are translation table entries that show logical names on the left hand side that map to the physical lines on the right hand side. In the example below, dialing 201 will reach line X1, and line X1 reports "201" in TSAPI messaging.

Pattern String	Translation String
201	X1

It is important to note that the translation table defines **names** for the physical lines, and that while it is possible to add and remove these names (extension numbers), what is really being changed is a logical name for the physical line. In a TSAPI message it is always possible to refer to an extension by its physical name, for example X1#3, which refers to physical line 3 on the first IBM CT server in a multi-server system. When there is no extension number defined in the translation table this physical name will be used. An extension can make outbound calls even if it has no name defined in the translation table. A trunk usually has no name defined in the translation table.

When the IBM CT system gets a TSAPI message it searches the translation table, looking at the right hand side to find the physical line number. The string in the pattern is then used as the *DeviceID* in the TSAPI message. Only the first entry found is used.

For trunks, the IBM CT system tries to use the outside telephone number as the TSAPI *DeviceID*. When the outside telephone number is not available, the translation table is searched for the physical line just as is done for extensions.

When a TSAPI request is made of the IBM CT system, the *DeviceID* is looked up in the translation table by searching the patterns in the left hand side of the translation table. If a match is found **and** the right hand side is a physical line description (Xnn or Lnn) then the *DeviceID* matches that physical line. The *DeviceID* can also be translated to a physical line by matching the outside telephone number or by matching a physical *DeviceID*.

To create a translation table entry for use in TSAPI messaging that may not be dialed, append the tilde character (~) to the end of the entry's pattern string as shown below. (When reporting a *DeviceID* for TSAPI applications, any trailing tilde is discarded.) In this example, trunk L1 can be monitored for TSAPI purposes, but not dialed.

Pattern String	Translation String
901~	L1

Note: For performance reasons and to eliminate confusion in the translation table, it is important that all line mapping entries appear before the remaining dialing patterns in the translation table, and that all extensions have at least one mapping.

5.2 Dialing patterns

All entries in the translation table are used as **Dialing Patterns**.

When digits are dialed, the translation table is searched from beginning to end for a dialing pattern that matches the digit string. If a matching pattern is found, the **Translation String** is evaluated to produce a result string, and the call is directed to this result. If the result is an error or blank, the call will be directed to reorder (fast busy signal). If no match is found the system waits for more digits until there is a time out.

Dialing patterns can contain wild card characters that allow recognition and translation of complex sequences of dialed characters. For example, the translation table can be modified so that when a long distance call is dialed using the conventional sequence (1+Area code+number), the call is dialed with access codes to send it through a specific long-distance carrier.

Dialing patterns can also contain restrictions based on the class of service for each type of line. For example, a particular class of service may be permitted to dial internal extensions only, local calls only, etc. This allows you to set an extension's dialing privileges by the class of service you assign to that extension.

5.2.1 The pattern match process

When a digit string is presented to the IBM CT system, either by dialing or from a TSAPI CSTAMakeCall request, it is evaluated against the translation table in a three step process.

The translation table is searched for a pattern that matches the dialed digits. If no match is found the system waits for more digits.

1. Once a matching pattern is found dialing is complete. No further digits will be accepted and the second step, evaluating the translation string, occurs.
2. The call is then directed by the result of the translation string evaluation.
3. If no match occurs and no more digits are presented there is an eventual time out and the call will be directed to reorder.

When dialing from the phone, individually dialed digits are matched against the translation table as they are dialed. This can give different results from CTI dialing (for example, dialing with IBM Call Manager), which never attempts pattern matching on the initial digits, but presents complete strings for matching.

Pattern matching

The first character of the dialed string is compared with the first character of the pattern string. If they match (either explicitly or through the use of a matching wild card character in the pattern string, the next character of the dialed string is tested. This process continues, character by character until either a mismatch is encountered or the last character of the dialed string successfully matches the last character (or wild card representation) of the pattern string. The result of the pattern match step is either a success or a failure. When the match succeeds the characters in the dialed string that matched wild card characters in the pattern are retained for use in the evaluation step.

Entry placement

When searching for a pattern match the translation table is searched from the top down after each dialed digit. Each entry is checked for a match until a matching pattern is found or there are no more patterns to check.

If you have explicit as well as wild card entries, make sure that your explicit entries are listed before the wild card entries, and short strings are listed before long strings.

Examining how some of these rules are used in the sample translation table on page 45 will help you understand their significance.

5.2.2 Characters used in patterns and in translation strings

The following are used when building translation table entries. Refer to the examples and the sample translation table to see how these are applied.

- 0-9 The digits 0 through 9 match the DTMF digits 0 through 9.
- *, # The star (*) and pound (#) match the corresponding DTMF digits
- A,B,C,D These match the DTMF digits A through D (case sensitive). DTMF specifies 16 digits, although most phones in the USA only provide 12 of the possible digits; IBM CT handles all 16 DTMF tones.

- E-Za-z** These match themselves (case sensitive). Alphabetic characters and spaces are permitted in patterns; they cannot be dialed by phones but can be dialed by CTI applications.
- '0'** The character with an ASCII value of 0 terminates strings and can not be embedded within them. Matching terminates when a null byte is found in either string. To successfully match, the null byte in the pattern string must match the first null in the test string.
- ** The backslash character (\) quotes (escapes) the subsequent one or two character sequence, forcing it to be matched literally, without interpretation. Valid forms are:
- \<hex digit><hex digit>
 \<hex digit>
 \<char>
- \00 is not permitted. The form where '\ ' is followed by only one hex digit is supported, but its use is discouraged.
- |** The vertical bar character matches all characters until the end of the digit string. When any characters are matched they are wild card characters. In the example below, setup for international calling, dialing 9011 plus any digits accesses a trunk, and dials 011 plus whatever string was entered.
- | Pattern String | Translation String |
|----------------|--------------------|
| 9011 | L=011@(1:) |
- !** An exclamation point inverts sense of a test or pattern match. The character(s) following the '!' must be interpreted by all of the usual rules (for example, !<char>, !#, !*, !\07). Any matching character is considered a wild card.
- [...]** This matches if the single character is one of those in the brackets. Used in pattern matching (left side) entries only, this is always considered a wild card, even with one character inside. Any characters can be inside the brackets. All characters therein except '\ ' are taken literally. '\ ' is a quote character (see above).

^ The caret, used in pattern matching (left side) entries only, modifies the [] operator so that it will match none or one of any of the characters included within []. In the example below, dialing 10 digits (area code+ number) will be processed in the same way if preceded by a 1, a 9, or neither.

Pattern String	Translation String
[^19]\$\$\$\$\$\$\$\$\$	L@(1:10)

% This operator excludes a matched character from the wild card string. Used in pattern matching (left side) entries only.

\$ This matches any digit ('0' - '9'). This is a wild card, used in pattern matching (left side) entries only.

& This matches any digit 0-9 * # A B C D (the DTMF 16 digit set). This is a wild card. Used in pattern matching (left side) entries only.

? This matches any non-null character. This is a wild card, used in pattern matching (left side) entries only.

`\t` A space or tab in the pattern string matches one or more (but not zero) spaces and/or tabs in the test string. This is used in pattern matching (left side) entries only.

< > A character within angle brackets is used as a terminator. In cases where the input is not a set number of digits, a terminator (usually #) is used to signify the end of input.

@ This is a placeholder for a wild card substitution, Used in pattern matching (right side) entries only. '@' will be followed by (x) or (x:y), where x and y are decimal numbers. When @(x) is encountered in the string, the result string gets the x'th wild card match.

When @(x:y) is encountered, the result string gets the characters matched by the x'th through the y'th (inclusive) wild cards. In the example below, the result string gets the first through second matches, to dial an extension number.

Pattern String	Translation String
2&&	X@(1:2)

~ When found in a pattern string (left side entry) the tilde character forces a pattern mismatch. The matching process resumes with the next table entry. This will generally be used within conditionals. For example, {L}{~} will fail to match if the calling line is a trunk. (See additional information about conditionals below.)

A trailing tilde in the left side causes the pattern to mismatch. This is commonly used to specify a pattern that is only used to define a name for a device. In the example below, the second trunk is named 902, but does not allow users to reach the trunk by dialing 902.

Pattern String	Translation String
902~	L2

~~ A double tilde is an explicit stop matching operator. When this operator is encountered, it stops the current search and waits for additional digits to be entered. In the example below, the matching is stopped when the initial digit (2) is entered, since additional digits are expected (for three digit extension numbers).

Pattern String	Translation String
2{E}{~~}	
201	X1
202	X2

> The recursion operator is used to send the result string from the matching process through the table again, using the result of the first search as the subsequent search's input. The table will be searched up to three times (this recursion limit is placed to prevent infinite looping). If there is still no match after the recursions, the call is sent to the operator (if one is defined), or to reorder.

In the example below, dialing 201 would match at the first entry, and the result (202) would be processed again, matching at the second entry, dialing X2.

The recursion operator is used in right side entries only.

Pattern String	Translation String
201	>202
202	X2

// The double slash is used as a comment delimiter. Any characters to the right of this operator will be ignored (leading white space is allowed). Comments are allowed in both sides of translation table entries.

Pattern String	Translation String
902~	L2//this trunk is for our fax

,

The comma is used as a delay operator (each comma equals one second). This allows delays to be inserted between digits dialed to a trunk, with each comma equal to one second. This is used in right side entries only. In the example below, if the dialed string matches the pattern string, it will dial the number of trunk 1, wait three seconds then dial 244 (an extension number).

Pattern String	Translation String
97871000	L1=18007871000,,,244

Conditionals

{ } [] Conditional, used to perform a test. If the test contained within { } results in TRUE, read and interpret the character string contained within []. If the test results in FALSE, skip over the entire { } [] sequence. Test specifications can be preceded by '!', indicating that the results should be negated before testing.

The { } [] sequence must occur with no intervening blanks. Currently supported tests are:

{A} True if dialing line is an analog line (as opposed to a digital line)

- {L}** True if dialing line is a trunk
- {Lxx}** True if dialing line is physical trunk xx
- {X}** True if dialing line is an extension
- {Xxx}** True if dialing line is physical extension xx
- {Cxx}** True if dialing line has class of service equal to xx (where xx is a decimal number from 0 to 255)
- {Wx}** True if x = number of wild card characters matched to date.
- {Tx}** True if a specified amount of time has expired since the last dialed digit(wher x = number of tenths of seconds).
- {I}** True if string being processed was sent from CSTAMakeCall or other CTI service (rather than from handset).
- {D}** True always. As a side effect dial tone will be added to the call.. Entry No. 49 uses this to insert dial tone after the first 9 when dialing 9 to access an outside line.
- {E}** True if at end of input.

Examples:

Pattern String	Translation String	
{L}[5]	X5	A match will occur if the dialed digit string is a 5 and the line dialing is a trunk. The call will be directed to physical extension 5
{!L}[5]	X7	A match will occur if dialed digit string is a 5 and the line dialing "5" is NOT a trunk. The call will be directed to physical extension 7

9011{!T15}{[-]	{C5}[L=011@(1: #]	If class 5, dial 9011 plus digits for international dialing from handset is allowed; dialing 9011 with no additional input within 1.5 seconds will match and result in a reorder.
9{E}{{D}}{[]~		Dialing 9 provides a dial tone (dial 9 for outside line), but does not stop looking for additional digits.

5.3 Working with the translation table

The translation table is edited using the IBM Telephony Administration Utility.

To avoid problems when working with the IBM CT translation table:

- Always save the current table before making edits.
- Test your edits as you go, saving to file so that you can revert if necessary.
- Schedule translation table changes during normal phone “down time” so that users are not inconvenienced.
- Place entries concerning extension/trunk numbers (line mappings) towards the beginning of the table with similar entries.
- Do not edit or remove an entry from the default table unless you understand the purpose of the entry.
- Use the comment delimiter to place notes about an entry’s purpose.

5.3.1 Opening the translation table

To open the translation table window for editing:

- 1) Access the IBM Telephony Administration Utility’s **Translation Table** tab. A blank translation table will be displayed.
- 2) Select one of the following options from the Translation Table menu:
 - **Read from NetPhone** - Reads in the table data currently in use directly from the IBM CT board. (Note that this reads the table currently in use, not necessarily the factory default table.)

- **Read from File** - Reads in the table data from a translation table file. Enter a file name or browse to select a file and click OK.

3) The table is now open for editing.

5.3.2 Editing the translation table

Note: Before editing the translation table it is strongly suggested that you take the precaution of saving the current table as a file, so that you can always "backup" if you encounter difficulty. The IBM Computer Telephony installation CD also contains a default translation table file (Default24.trn).

While the translation table window is open, you can use the following **Edit** menu commands to update the translation table, clicking within a row of the table to select the line.

- **Insert Above** - Insert a blank line above selected line
- **Insert Below** - Insert a blank line below selected line
- **Move up** - Move selected line up
- **Move Down**- Move selected line down
- **Delete Line** - Delete selected line

The table entry numbers will adjust automatically as you edit the table.

5.3.3 Saving and implementing your changes

Writing the translation table to the CT-618 board

When your translation table edits are complete, you must write it to the IBM CT board in order to have your changes take effect.

- Select **Write to NetPhone** from the Translation Table menu.
- IBM CT board will request confirmation before overwriting the table currently in use.
- Click OK to overwrite the current table.
- Revised table is now in use.

Saving the translation table as a file

1. Select **Write to File** from the Translation Table menu. The Save As dialog box will display.
2. Enter a file name and location.
3. Click OK

5.4 Examples of translation table modification

Examples are provided to show common modifications of the translation table. Before making complex edits, it is suggested that you read the entire IBM CT Translation Table section, so that you have a greater understanding of table entries.

Pay particular attention to how the modification of one entry may affect other entries in the table. You must remember that the translation table is searched from the top down after each dialed digit and stops when a match is made. Therefore, the order in which entries are placed in the table is very important.

Note: Changes to the translation table affecting definition of extensions will not be apparent to IBM Call Manager clients until the next login. You may wish to broadcast a message to the affected users.

5.4.1 Extension number definition

To define (change) an extension number:

The simplest type of entry in the translation table serves as both a name for a physical line and a dialing pattern. These mappings have a physical line number (Xnn or Lnn) on the right hand side.

1. To define or change an extension number, find the entry with the name of the physical line in the right hand column of the translation table. (An extension begins with "X" followed by the physical line number and a trunk begins with "L" followed by the physical line number. There is no special designation for which board the line is on, the IBM CT system resolves this internally.) Trunks can be named in a similar way but the pattern string should have a suffix of a tilde "~" which will prohibit dialing the trunk using the digit string.
2. Edit the left hand column to reflect the logical name (extension or trunk number) you wish to use. This logical name is also the digit pattern that can be dialed to reach this extension. It is important that the name appear only

once in the pattern column.

Multiple names for the same physical line are permitted. The first name in the translation table is considered the primary name and will be used in all TSAPI messages generated by the IBM CT system. TSAPI requests can use any of the names for the line.

3. Update the Company listing to reflect the new extension numbers.

Example: If the person with extension number 211 changes offices with the person who has 210, they can keep their extension numbers by editing the table as shown below:

Pattern String	Translation String
211	X10
210	X11

To remove the name for an extension:

1. Click within the entry to select the line.
2. Use the Edit menu's Delete Line command to remove the entry.

If your extension numbers are not in the 2xx series:

If you add or change to an extension number series different from the default provided, you will need to make sure that other entries in the table do not conflict. For example, if you add a logical extension number of 310, you will need to:

1. Create/edit entry to add extension number and its map to a physical line, such as the entry mapping 310 to X10 in the example below.
2. Make an entry (after the line mappings entries) so that outside calls entering any three digit number beginning with "3" will match and be directed to the operator extension (X1). Entering a valid extension number would match before reaching this entry, and connect with the extension.
3. Edit entries that would be a match if an outside caller enters "3" as a first digit, and would connect to the operator extension (X1).

Make sure that you do not have any other entries that would restrict the use of “3” as a first digit.

Pattern String	Translation String
310	X10
3&&	{L}[X1]
{!L}[-][1456789#ABCD]	X1
[456]	

Note: If you have “overlapping” extension numbers (for example, 21 and 213), you will need to use a “time out” so that dialing 213 would not match first at the entry for 21, and connect to that extension.

To have two or more extension numbers share the same line:

You can also have more than one extension number mapped to the same physical extension (for example, two users sharing a phone could have separate extension numbers). This would allow you to have a separate voice mailbox for each user.

Create/modify entries so that the physical line for the extension (X11) is mapped to each logical extension number sharing the phone (211 and 212).

Note however, that IBM Call Manager will show all calls as going to the primary extension (the first translation found for that particular physical extension).

Pattern String	Translation String
211	X11
212	X11

5.4.2 Directing improperly dialed extensions

If an outside caller enters an invalid number, the default translation table directs the call to the internal operator extension (X1). An internal caller entering an invalid number will get a reorder.

To have internal callers also reach the operator, find the table entries that cause a reorder on improperly dialed internal calls, such as those in the example below. The blank translation string fields for these entries cause the reorders.

Pattern String	Translation String
1[01*#ABCD]	
[3456]	
7[01*#ABCD]	
9&&	

Enter the operator extension (X1) in the translation string field for these entries, and callers will reach the operator extension rather than a reorder.

Pattern String	Translation String
1[01*#ABCD]	X1
[3456]	X1
7[01*#ABCD]	X1
9&&	X1

5.4.3 Defining virtual extensions and hunt groups

To define a number callers will use to reach a department:

You can define a virtual extension, such as a number callers enter to reach a department or service (other than a specific extension number). In the example below, dialing “3” will connect the caller with physical line X9. You may also wish to include a “hunt group” so that callers will get first available extension in that department.

Add an entry that maps the requested input to a physical line. When using this type of input, it cannot be the same as first digit(s) of a valid extension (unless you use a time out conditional), and it must be placed before any entries that cause a reorder if a “3” is dialed.

Pattern String	Translation String
3	X9
{!L}[~][13456789#ABCD]	X1

If you choose to use a multiple digit entry to reach the department (for example, “33”), you should have an entry that will direct any two-digit entry with 3 as a first digit to reorder.

s	Translation String
33	X9
{!L}[~][1456789#ABCD]	X1
3&	

Creating a hunt group

You can also create a hunt group, so that a call destined for a department will be connected with the first available extension in the hunt group. Make the translation table entries as described above, adding the additional extensions for the hunt group as shown in the examples below.

A **Linear** hunt group has the extensions separated by commas. In the example below, dialing 3 would hunt for the first free extension, trying each extension in the following sequence: X9, X12, X15.

A **Circular** hunt group has the extensions separated by semicolons. In the example below, dialing 4 would hunt for the first free extension on a rotating basis, to distribute calls evenly.

Pattern String	Translation String
3	X9,X12,X15
4	X9;X12;X15

You can also use an extension number as the lead into a hunt group. In the example below, dialing extension 209 would hunt for the first free extension in the following sequence: X9, X12, X15.

Pattern String	Translation String
209	X9,X12,X15

5.5 Creating virtual mailboxes

You can create a virtual mailbox, that is, a mailbox not associated with an actual extension. This is useful if you want to make a voice mailbox available for communication with someone who does not need an extension in the office. Callers to this extension will be sent directly to voice mail. (If you have created a virtual extension (see above), you can create an associated mailbox through the IBM VoiceMaster Mailbox Administrator to create the appropriate mailbox (see page 59).

To create a virtual mailbox:

1. Add an entry for the virtual mailbox, directing the call to voice mail (*88)
2. Use IBM VoiceMaster Mailbox Administrator to create the appropriate mailbox (see page 59). You add, de-activate, and delete virtual mailboxes in the same manner as regular voice mailboxes.

Pattern String	Translation String
249	*88

5.5.1 Connecting a fax machine

In the example below, the fax trunk line is L12 (trunk 6 on the second board), and the fax machine is connected to X36. Note: You should also configure for the fax line (L1#12) to ring 30 times before auto attendant will answer. This will prevent intrusion by the auto attendant message in the event the fax is slow to connect. See *Setting the number of rings before auto attendant* on page 17.

Pattern String	Translation String
{!L12}[~]0	X36
0	X1

5.5.2 Dialing patterns for your organization

Adding a specific carrier code when a long distance call is dialed

Long distance carriers that offer special rate plans may require you to dial a special access code when making a long distance call. The translation table can be edited to do this automatically. For example, if your long distance carrier requires you to dial the sequence 10562+1+Area Code+Number, you would make an entry similar to the one below.

Pattern String	Translation String
1\$\$\$\$\$\$\$\$	{!C1}{!C2}{!C3}[L=105621@(1:10)]]]

Permitting a class of service to dial selected area codes:

The example below allows classes of service other than 1 or 2 to dial to area code 617 (this essentially allows class of service 3 to dial this area code, since classes 4-6 are not restricted to local calling).

1. Change the area code shown in the pattern and translation strings to reflect the area code desired.
2. To provide access to additional area codes, create equivalent entries for each area code.

Pattern String	Translation String
1617\$\$\$\$\$\$	{!C1}{!C2}[L=1617@(1:7)]

Allowing delayed digit dialing

There may be a requirement to allow delayed digit dialing when forwarding to another phone number. Users of IBM Call Manager 2.4 can enter a forwarding number that includes a delay period, then another sequence, for example, to access a pager service or dial an extension. Delays are indicated by commas (each comma representing a one second delay).

In order to support this feature, generic entries must be made to the IBM CT translation table (by modifying the default dialing entries, as shown below). Some or all of the following entry types must be used:

Pattern String	Translation String
{C1}[~]1800\$\$\$\$\$\$E!&]	L=1800@(1:)
{!}[~]{C1}[~]800\$\$\$\$\$\$E!&]	L=1800@(1:)
{C1}[~]1888\$\$\$\$\$\$E!&]	L=1888@(1:)
{!}[~]{C1}[~]888\$\$\$\$\$\$E!&]	L=1888@(1:)
{!}[~][23456789]\$\$\$\$\$\$E!&]	>91@(1:)
1[23456789]\$\$\$\$\$\$E!&]	>91@(1:)
{!}[~][23456789]\$\$\$\$E!&]	>9@(1:)
7[23456789]\$\$\$\$E!&]	>9@(1:)
{C1}[~]91800\$\$\$\$\$\$E!&]	L=1800@(1:)
{C1}[~]91888\$\$\$\$\$\$E!&]	L=1888@(1:)
90[234567890]\$\$\$\$\$\$E!&]	L=0@(1:)
91[23456789]\$\$\$\$\$\$E!&]	{!C1}[!C2][!C3][L=1@(1:)]
9[23456789]\$\$\$\$E!&]	{!C1}[L=@(1:)]

5.6 Sample Translation Table

The annotated sample translation table below shows how table entries for common calling requirements are composed and sequenced. Although it is based on the default table supplied with IBM CT, the sample table is provided for illustration purposes, and is not identical to the default table.

The default translation table supplied with IBM CT implements the following dialing patterns:

Handset Dialing	CTI Dialing	Dials:
Ext. number	Ext. number	Extensions
9 + 7 digits	9 + 7 digits	Local calls
1 + 10 digits	10 digits	Non-local calls
9 + 1 + 10 digits		Non-local calls
1011+ number	011+ number	International calls
9011+ number	9011+ number	International calls

Notes:

The IBM CT translation table allows 256 entries, and contains default mappings for extensions 201 through 308. There is no harm done if there are not enough IBM CT boards installed to have this many extensions, however, performance is enhanced if there are not extraneous extension mappings.

The default IBM CT configuration has X1 mapped as the operator extension.

The default table assumes that external calls failing to provide valid input will be directed to (X1), and that incorrect internal dialing will result in a reorder (failure).

The default translation table implements six classes of service (See page 18 for additional information about assigning class of service):

Class 1 Internal calls only

Class 2 Free calls only (dial 9 plus seven digits)

Class 3 Free calls plus selected area codes

Class 4 Any North American dialing plan (1 plus 10 digits)

Class 5 Unrestricted (North American dialing plan and international dialing)

Class 6 Administration (unrestricted, plus able to enter test function codes)

Sample Translation Table

Entry No.	Pattern String	Translation String	Comments
1	2{E}[--]		These two entries are used to wait for all digits when dialing an extension number in the 2xx series. This enhances system performance.
2	2\${E}[--]		
3	201	X1	Entries 3-101: Any valid 2xx series extension number dialed (201-299) is directed to the physical line.
4	202	X2	
5	203	X3	
6	204	X4	
7	205	X5	
8	206	X6	
102	3{E}[--]		
103	3\${E}[--]		
104	300	X100	Entries 104-112: Any valid 3xx series extension number dialed (300-308) is directed to the physical line.
105	301	X101	
106	302	X102	

IBM CT Translation Table

113	[23]&&	{L}[X1]	Any three digit sequence (with 2 or 3 as a first digit) from a trunk (other than a valid extension listed above) matches, and call is directed to the physical extension X1. From an extension, it results in a reorder.
114	L1#1~	L1	This provides the deviceID for trunk 1 (for use by TSAPI applications). Note: No entries other than extension mappings should be placed above this entry.
115	//Entries for T1 boards only		Comment
116	{!S1}[~]&&&&	>2@[3:4]	These entries are for use with T1 boards.
117	{!S2}[~]&&&&&&	>2@[6:7]	
118	{!S3}[~]&&&&&&	>2@[6:7]	
119	//Inbound trunk dialing entries		Comment
120	{!L}[~][1456789#ABCD]	X1	Any first digit from a trunk other than 2 or 3 matches and call is directed to physical extension (X1). Since all valid extensions in this table begin with 2 or 3, any other first digit would be an error. (This entry must be modified if inputs beginning with other than 2 or 3 are valid, for example, if there was an extension number 401.) If dialed from an extension, it matches and results in a reorder.

IBM CT Translation Table

121	{!L}[~]*[67]	*8@(1)	If dialed from a trunk, *6 or *7 match and translate to *86 and *87 which are used for voice mail access.
122	{!L}[~]*&	X1	Dialing * plus any DTMF sequence (other than those covered above) from a trunk matches and is directed to the operator extension (X1).
123	0	X1	Dialing 0 connects to internal operator extension (X1).
124	0(!T15)[~]	X1	Dialing 0 with no additional input within 1.5 seconds connects to internal operator extension (X1). This entry is only required if there are dialing patterns that start with 0.
125	011(!T15)[~]	{C5}[L=011@(1:)]# {C6}[L=011@(1:)]#	Dial 011 for an international call for class 5 and 6, 1.5 seconds after dialing stops.
126	{!I}[~]1011	{C5}[L=011@(1:)]# {C6}[L=011@(1:)]#	If dialed with CTI, class 5 and 6 have the leading 1 stripped and international number is dialed.
127	{!I}[~]011	{C5}[L=011@(1:)]# {C6}[L=011@(1:)]#	If dialed with CTI, class 5 and 6 can dial 011 plus any number of digits to make international calls.
128	{C1}[~]1800\$\$\$\$\$\$	L=1800@(1:7)	Dial 800 numbers (if not class 1).
129	{!I}[~]{C1}[~]800\$\$\$\$ \$\$\$	L=1800@(1:7)	Dial 800 numbers with CTI (if not class 1).
130	{C1}[~]1888\$\$\$\$\$\$	L=1888@(1:7)	Dial 888 numbers (if not class 1).
131	{!I}[~]{C1}[~]888\$\$\$\$ \$\$\$	L=1888@(1:7)	Dial 888 numbers with CTI (if not class 1).

IBM CT Translation Table

132	{!}[~][23456789]\$\$\$\$ \$\$\$\$	>91@(1:10)	The recursion operator is used to send this result string through the again for matching. (This and similar entries are provided to facilitate the local dialing wizard function.)
133	1[23456789]\$\$\$\$\$\$ \$\$	>91@(1:10)	The recursion operator is used to send this result string through the again for matching.
134	1[1*#ABCD]		Dialing 1, followed by 1,*,#,A,B,C or D results in a reorder.
135	1011{!T15}[~]	>9011@(1)	The recursion operator is used to send this result string through the again for matching.
136	1011<#>	>9011@(1:<#>)	The recursion operator is used to send this result string through the again for matching.
137	10[023456789*#ABCD]		Dialing 10 followed by anything other than 1 matches and results in a reorder.
138	[456]		Any of these entered as a first or only digit matches and results in a reorder. (If extension numbers beginning with one of these digits are added, this entry must be modified by deleting the appropriate digit from the pattern string.
139	{!}[~][23456789]\$\$\$\$ \$\$	>9@(1:7)]	The recursion operator is used to send this result string through the again for matching.

IBM CT Translation Table

140	7[23456789]\$\$\$\$\$\$	>9@(1:7)]	The recursion operator is used to send this result string through the again for matching.
141	7[01*#ABCD]		Dialing 7, followed by 0,1,*,#,A,B,C or D will result in a reorder.
142	8	{C6}[L]	If class of service is 6, dialing 8 connects to a trunk. (Used for maintenance only).
143	9{E}{{D}}~		Dialing 9 provides a dial tone (dial 9 for outside line), but does not stop looking for additional digits.
144	9411	{!C1}[L=411]	If not class 1, dialing 9+411 for outside directory assistance is permitted.
145	911{!T30}[-]	L1,L2,L3,L4,L5,L6,L7,L8,L9,L10,L11,L12,L=911	Dialing 911 (emergency services) will search through trunks in this sequence and dial 911 on first open trunk it finds (regardless of trunk rotations or trunks reserved for incoming).
146	9911{!T30}[-]	L1,L2,L3,L4,L5,L6,L7,L8,L9,L10,L11,L12,L=911	Dialing 9+911 will search through trunks in this sequence and dial 911 on first open trunk it finds (regardless of trunk rotations or restrictions).
147	{C}[-]91800\$\$\$\$\$\$	L=1800@(1:7)	If not class 1, dialing 9-1-800 plus seven digit number is permitted..
148	{C}[-]91888\$\$\$\$\$\$	L=1888@(1:7)	If not class 1, dialing 9-1-888 plus seven digit number is permitted.
149	90[234567890]\$\$\$\$\$ \$\$\$\$	L=0@(1:10)	Dial 90 + 10 digits (first digit cannot be 0 or 1) on trunk is permitted(credit card calls).

IBM CT Translation Table

150	9011<#>	{C5}[L=011@(1:<#>)] {C6}[L=011@(1:<#>)]	If class 5 or 6, dialing 9011 plus digits for international dialing is permitted..
151	{}[~]9011	{C5}[L=011@(1:)#] {C6}[L=011@(1:)#]	If class 5 or 6, dialing 9011 plus digits for international CTI dialing is permitted.
152	9011{T15}{~}	{C5}[L=011@(1:)#] {C6}[L=011@(1:)#]	If class 5 or 6, dialing 9011 plus digits for international dialing is permitted from handset. (Dialing 9011 with no additional input within 1.5 seconds results in a reorder.)
153	901[023456789]		Dialing 901 followed by any digit other than 1 matches and results in a reorder.
154	~AreaCodeControlStart		These two entries mark the section of the table used for entries created by the Local Dialing Wizard. For information about the local dialing wizard, see page 24. (Do not modify these entries.)
155	~AreaCodeControlEnd		
156	91[23456789]\$\$\$\$\$ \$\$\$	{!C1}{!C2}{!C3}[L=1@(1:10)]	If not class 1, 2 or 3, dialing 91+ any digit 2-9 + any nine digits is permitted.
157	91[*#ABCD]		Dialing 91 followed by any non-digit matches and results in a reorder.
158	9[0*#ABCD]		Dialing 9 followed by any non-digit matches and results in a reorder
159	9[23456789]\$\$\$\$\$	{!C1}[L=@(1:7)]	If not class 1, dialing 9+seven digit number (first digit cannot be 0 or 1) is permitted.
160	//Standard services		Comment

IBM CT Translation Table

161	*2	*82	Maps *2 (make held calls a conference) to *82 (hardwired on board).
162	*30\$\$	*P@(1:2)	(Don't modify this entry; call parking will be affected.)
163	*31\$\$	*R@(1:2)	(Don't modify this entry; call parking will be affected.)
164	*4	*44	Dial *4 to pick up held call.
165	*5	*47	Dial *5 to pick up ringing call in pickup group.
167	*6	*86	Dial *6 to check voice mail.
168	*7	*87	Dial *7 to leave voice mail message.
169	*8	*84	Dial *8 to make held calls a conference, not including your extension.
170	*88	*88	Dial *88 for voice mail (forwarding destination).
171	*9[246][#ABCD]	*7@(1:2)	Dial *92#, *94# or *96# to cancel forwarding.
172	*9[246][02345689*]\$\$	*7@(1:4)	Dial *92, *94 or *96 plus extension number to set forwarding.
173	*9[246]7\$\$\$\$\$\$	*7@(1)7@(2:8)	Dial *92, *94 or *96 plus digits to set forwarding to local number.
174	*9[246]1\$\$\$\$\$\$\$\$	*7@(1)1@(2:11)	Dial *92, *94 or *96 plus 11 digits to set forward to non-local number.
175	*9[0135789*#ABCD]	*7@(1)	Maps *9 commands to *7 series. (IBM CT-618 boards are hardwired to use a series of *7x commands for some functions.)
176	*{!T30}[~]	**	Dialing * accesses audio help dialog. Note the use of the 3 second time out.
177	**	**	Dialing ** accesses audio help dialog.

IBM CT Translation Table

178	*[013#ABCD]&	*@(1:2)	Dialing *, followed by 0,1,3,#,A,B,C,D plus one more character is expanded to * plus the two characters. (Allows additional phone keypad commands to be created)
179	#4\$	#4@(1)	Enter #4x - #50 series commands (Set I/O port).
180	#50	#50	
181	#&&	{C6}[#@(1:2)]	Class of service 6 (Administrator) is permitted to enter any command consisting of # plus 2 digits (system test and codes).
182	[ABCD]		Dialing any of these results in a reorder.
183	VOICEMAIL	*88	Allows applications to use mnemonic.

6. IBM VoiceMaster Administration

6.1 IBM VoiceMaster features

IBM's VoiceMaster product provides full-function voice mail system for IBM CT PBX systems. IBM VoiceMaster features include:

- Graphical interface for administrative functions
- Server-resident voice mail message storage
- Password protection for user privacy and security
- Visual voice mail support through IBM Call Manager Desktop Call Control software
- Message forwarding and annotation
- Professionally recorded dialog files
- Automatic volume control providing consistent playback volume without the need for user volume controls

6.2 Starting and stopping IBM VoiceMaster

The voice mail manager service on a Windows NT server should be configured during installation to start automatically. If you do stop IBM VoiceMaster manually, make sure that there is no current voice mail activity, or callers will be disconnected.

To start IBM VoiceMaster manually

1. From the Start menu, navigate to Programs/IBM Telephony/IBM VoiceMaster/Register IBM VoiceMaster Service.
2. The IBM VoiceMaster Initialization window will display. The server location will be displayed, and must be edited if not correct.
3. Click verify to ensure that this is a valid server.
4. You will be prompted to start the IBM VoiceMaster service. Click Yes.

To stop IBM VoiceMaster manually

From the Start menu, navigate to Programs/IBM Telephony/IBM VoiceMaster/Unregister IBM VoiceMaster Service.

6.3 Initializing IBM VoiceMaster

The first time you run IBM VoiceMaster, the initialization window is displayed. You will verify file server and enter telephony server login information.

1. From the Start menu, navigate to Programs/IBM Computer Telephony/VoiceMaster/Register VoiceMaster Service. The IBM VoiceMaster Initialization window will display.
2. Edit the Mapped Drive:/Root Directory information if it is not correct. Click Verify to make sure this is a valid location.
3. You may enter a user name and password (it must be the same as that for the IBM Telephony server).
4. Click OK. You will be prompted to start the IBM VoiceMaster service. Click Yes.

The screenshot shows the 'VoiceMaster Initialization' dialog box. It is divided into three main sections:

- NetPhone Telephony Server:** Contains a 'Server Name' dropdown menu with 'IBMSERVERNAME' selected.
- File Server:** Contains a 'Mapped Drive:/Root Directory' text box with 'D:\IBMCT' entered. To the right of this text box is a 'Verify' button. Further to the right are 'OK' and 'Cancel' buttons.
- NetPhone Telephony Service:** Contains three text boxes: 'Login Name' with 'Administrator', 'Password' (empty), and 'Log Files In' with 'D:\IBMCT'.

6.4 IBM VoiceMaster Voice Mail Manager interface

The Voice Mail Manager window appears when you start IBM VoiceMaster, indicating that IBM VoiceMaster is running. The Voice Mail Manager window displays status information.

Objects Served

Active Boxes - The number of boxes currently in service, that is, capable of receiving messages.

Device Monitors - The number of trunks and extensions being monitored by IBM VoiceMaster.

Active Calls - The number of calls currently being controlled by IBM VoiceMaster.

Logging Information

Error Count - The number of errors generated since last startup.

View Error Log - Allows you to see a report of voice mail errors. This option is not available if there are no errors.

Trace Log on/off - Used to gather diagnostic information when you experience problems with voice mail. Normally, this is only used under the direction of the IBM CT Customer Support.

Server Information

Telephony Server - Name of the server presented by the IBM CTS to clients on the network.

Link Status - Shows the status (either OK or Down) of the connection between the IBM VoiceMaster application and the telephony server.

6.5 VMMGR.INI

IBM VoiceMaster installation creates the file VMMGR.INI in the server's IBM Telephony directory. This file contains configuration information, including:

- Error and information log locations
- Maximum length and number of messages.

- Server information

6.6 IBM VoiceMaster Troubleshooting

IBM VoiceMaster maintains an Error Log and a Trace Log. These log files provide useful information for system troubleshooting. Error logging is always on. To enable trace logging click the Trace Log On button.

The Status Report section of VMMGR.INI specifies the directory and file where you want to store the voice mail error logs.

Each time voice mail is started, a new Trace Log file is created by replacing the last character of the file name with a digit beginning with “1” and incrementing with each start. After reaching “9” it will begin again with “1”.

This file is renamed when:

- IBM VoiceMaster is started.
- The file exceeds 50K bytes (this keeps files small enough to read with Notepad).
- The Trace Log buttons are switched from “Off” to “On.”

You can investigate problems by refreshing the log file. Immediately after experiencing a problem, click the Trace Log buttons Off button, and then click the Trace Log On button. This will isolate the error information in the previous Trace Log file.

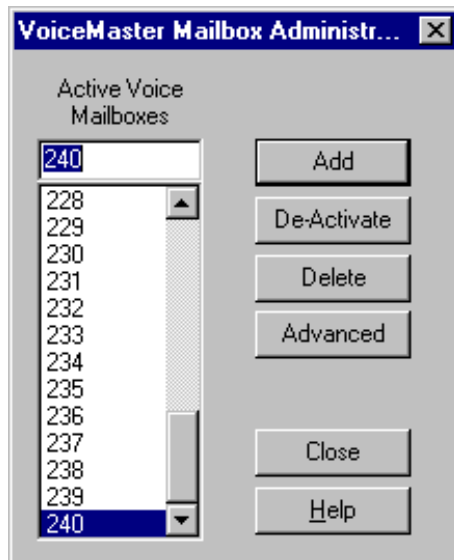
6.7 Mailbox Management

The IBM VoiceMaster Mailbox Administrator manages voice mailbox assignments.

- **Add** creates a new mailbox for an extension, or a “virtual mailbox,” that is, a mailbox not associated with a specific extension.
- **De-activate** turns off a mailbox without deleting its messages.
- **Delete** removes both the mailbox and its messages. A warning message appears before deletion takes place.

<p>Note: When a mailbox is added, a folder is created on the server under the IBMCT\VM folder. The mailbox folders are named by mailbox number, and contain folders for annotations, greetings and messages.</p>

6.8 Adding a voice mailbox



1. Click **Edit Mailbox List** to open the IBM VoiceMaster Mailbox Administrator.
2. Enter a mailbox (extension) number in the box, or select one from the list.
3. The maximum length for mailbox names is 5 digits.
4. When the box number you want appears, click **Add**.
5. You will receive a confirmation message, or an error message if you have entered an invalid mailbox ID.
6. To acknowledge the confirmation, click **OK**.
7. Another mailbox number appears in the box. This number is the previous box number incremented by one. This is helpful during initial installation or when setting up a new range of boxes.
8. Continue to add mailboxes as desired. When finished, click **Close**.

6.9 Removing a voice mailbox

1. Click **Edit Mailbox List** to open the Voice Mailbox Administrator.
2. Enter a mailbox number in the box, or select one from the list.
3. When the box number you want appears, click **Delete**.
4. When you are finished, click **Close**.

6.10 De-activating a voice mailbox

1. Click **Edit Mailbox List** to open the Voice Mailbox Administrator.
2. Enter a mailbox number in the box, or select one from the list.
3. When the box number you want appears, click **De-Activate**.
4. When you are finished, click **Close**.

6.11 Specifying the maximum number of messages

You can specify the maximum number of messages allowed in the voice mailboxes. This setting is for all voice mailboxes, and is not configurable on a per-mailbox basis. The default maximum number of messages is 99. You change by editing the following line in the VmParams section of the VMMGR.INI file:

```
MaxNumMessages=99
```

You can change this number at any time. The change takes effect immediately. Any mailbox with more than the new maximum number of messages will not be able to accept new messages until a sufficient number of messages are deleted.

6.12 Specifying maximum message length

You set the default maximum message length for new mailboxes in the file VMMGR.INI. If you want to set a maximum message length different from the default of 300 seconds, modify VMMGR.INI file **before** creating mailboxes. If you have already created mailboxes, you will need to delete and re-add them in order for them to have the new maximum message length. When you create a new mailbox, it uses the number defined in the file VMMGR.INI, but existing voice mailboxes have the maximum length set when they were created.

6.13 Customizing IBM VoiceMaster Dialog Files

You can customize the default voice mail dialogs by creating your own voice files and using them in place of the default files supplied with IBM Telephony.

These files belong to the default voice which resides on the file server

A text file (dialog.txt) is installed in the server's VM folder during the VoiceMaster installation. This file provides the text for all voice mail dialogs (prompts) and the file names and locations.

7. Integrated Messaging

IBM VoiceMaster's integrated messaging allows you to have your voice mail messages delivered to an e-mail address, with .WAV file attachments so that you can play them through your PC. You can also have pager notification whenever you have a new voice mail message.

IBM VoiceMaster's E-mail Link application uses MAPI (Messaging Application Program Interface) to allow IBM VoiceMaster to send messages to a user's e-mail account. These messages will include audio (.WAV) files that can be played through the user's PC.

7.1 Enabling Integrated Messaging

To enable messaging you will need configure the IBM VoiceMaster e-mail link, then configure the individual mailboxes that will be using this option.

Configuring the IBM VoiceMaster E-mail Link

1. Navigate to Programs/IBM Computer Telephony/IBM VoiceMaster/VoiceMaster E-mail Link.
2. When you first run this application it will try unsuccessfully to start up MAPI, and will display an error dialog box because the registry hasn't been set up for it.
3. Click OK on the "cannot run" message box, then click the Configure button to display the MAPI Link Configuration window and enter the following configuration information:
4. Check "Enable E-mail Link". IBM VoiceMaster will not send any e-mail messages unless this box is checked.
 - a) Enter the MAPI profile name. You can find available MAPI profile names in the control panel's "Mail" or "Mail and Fax" application. If no profiles are available, click Add and use the wizard to build a profile.
 - b) Enter Originator Transport protocol to be used (SMTP is the only transport currently supported).
 - c) Enter an originator name and address. This information will be used as a return address for the e-mail messages.

- d) You may specify a value (in seconds) in the "Block attachments larger than" field. If a value is specified, IBM VoiceMaster will not send attachments if they are larger than the number entered. (E-mails are still sent, but with "Attachment Omitted" in place of the attachment). Leave this field blank to allow all attachments, no matter how large. (Note: this is subject to the limitations on voice mail message size set in the vmmgr.ini file.)
5. Click OK to apply changes and close the MAPI Link Configuration window.
6. Click Start on the IBM VoiceMaster E-mail Link dialog box to start messaging. (The IBM VoiceMaster E-mail Link Start button will change to "Stop" when IBM VoiceMaster e-mail delivery is in operation.)

Note: The IBM VoiceMaster E-mail Link application must be left running in order to have e-mail and pager notification.

Configuring Voice Mailboxes for e-mail and pager messaging

To configure notification for a voice mailbox:

1. Navigate to Programs/IBM Telephony/IBM VoiceMaster/IBM VoiceMaster Mailbox Administrator.
2. Select a mailbox from the IBM VoiceMaster Mailbox Administration window
3. Click **Advanced** to display the IBM VoiceMaster Advanced Features window. The mailbox being modified will display in the title bar of the window.

To set up e-mail notification:

1. Enter a name in the Display Name Field (optional).
2. Enter the address in the E-mail Address field (example: yourname@company.com)
3. Click Add.

You can add additional addresses if you want the mail or notification to be sent to multiple addresses.

To set up pager notification:

1. Enter a pager address in the Pager Address field.
2. Click Add.
3. You can add additional addresses if you want the notification sent to multiple pagers.
4. Click Close when finished.

To remove an e-mail or pager notification:

Select the address in the appropriate window and click Delete.

8. SMDR Call Logging

Your IBM Telephony Solutions package provides SMDR (station message detail reporting) by creating log files or by sending data directly to phone data collection and reporting software (IBM recommends using SDT's Call View).

Note: Data collection software is installed on a client machine connected to the server communication port via a null modem cable (RS232 data cable).

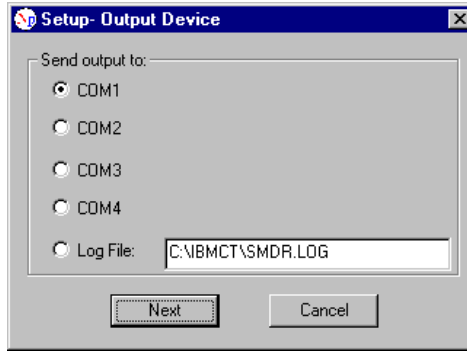
8.1 SMDR Installation

SMDR call logging is installed and run as a service on the NT server or NT client. If you did not already install SMDR as part of a IBM Telephony Utilities installation, install it now.

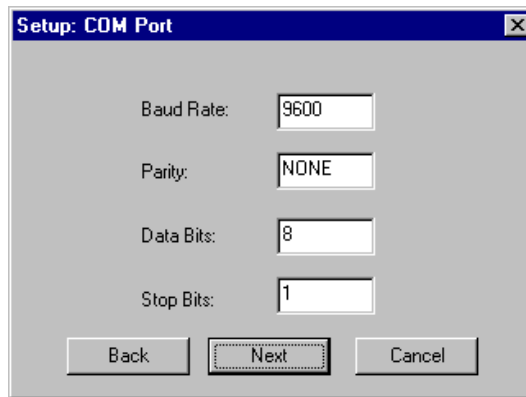
1. Insert the IBM Computer Telephony installation CD to auto-run the installation wizard. Click Next on each display screen to continue.
2. When the Select Components screen displays, click the plus sign in front of IBM Telephony Utilities to display components.
3. Select SMDR Call Logging and Telephony Services Client, Then click Next.
4. When installation is complete, close the IBM CT installation window.
5. If you are planning to use Call View and have not installed it, do so now, following the product documentation. During setup, choose the following Panasonic format: Panasonic DBS (CPC-B Rel 3.1+).
6. Copy the file MSTUNV.INI from the IBM Computer Telephony CD's Utilities folder to the Call View folder on your PC. This will replace the .INI file installed by Call View, and provide NetPhone and Panasonic data formats used with IBM CT.

8.2 Configuring SMDR

1. From the Start menu, navigate to Programs/IBM Computer Telephony/Utilities/SetupSMDR.



2. The Setup Output Device window will appear. If you are using data collection software, select a communications port. If not, select Log to file and enter the file name you want to use, or accept the default. When information is complete, click Next.
3. If you have selected a communications port, the Setup COM Port window will appear, displaying current settings. Note: NPSMDR communications port settings must match those for the collection software. Click Next.



4. The PBX Type window will appear. Select NetPhone or Panasonic format. (Most third party applications read the Panasonic format; however, you can use the NetPhone format if your software allows you to customize your data source format. If you elect to log errors to a file, specify the name and location of the file. Select Monitor all Extensions if you wish to capture data for extensions as well as trunks. When information is complete, click Next.

5. The Telephony Server window will appear. Select the server name and enter a user name (must be a user on client as well as server, and have administrator privileges) and password. Click Next.
6. A summary of all setup information will be displayed. If any information is incorrect, click Back to return to the dialog boxes which need correction.
7. When setup is complete, a dialog box will display asking if you want to start IBM CT SMDR Log Service now. Click the desired option.

Starting and stopping the SMDR service

The SMDR service may be started and stopped through the Control Panel's Services folder. You can also set the SMDR service to start automatically.

8.3 Data Collection and Reporting

If you have elected to write call information to a log file, a text file will be created. You can read this file with the WordPad accessory (you will need to stop the NPSMDR service or copy the file, since WordPad is not able to open a file that is already in use). The information in the file will be arranged according to the format selected (NetPhone or Panasonic) during setup.

NetPhone format data fields (left to right):

- Call category (C = regular call, X = transferred call, F = conference call, M = voicemail)
- Date of call (MM/DD/YYYY)
- Time of call (HH:MM:SS)
- Time ringing before pickup (MM:SS)
- Call type (E = external or incoming, O = outbound, I = internal)
- Trunk number (NN)
- Call duration (HH:MM:SS)
- Extension involved (calling extension if internal)
- Dialed number or caller ID (extension if internal)
- Caller name from CallerID (if available)

SMDR Call Logging

- Extension that answered the call
- Original caller number (if transferred call)
- Number call was transferred to (if transferred call)
- Note: The NetPhone format does not support extension numbers with more than three digits.

Panasonic format data fields (left to right):

- Call type (O= outbound, I = inbound, T = transferred)
- Date of call (MM/DD)
- Time of call (HH:MM:SS)
- Call duration (HH:MM:SS)
- Extension involved
- Dialed number or caller ID
- Trunk number (NN)

Note: If you are using data collection software, refer to the product documentation for information on using and customizing raw SMDR data reports.

9. Using TAPI Applications

IBM CT supports call management functions for selected TAPI based PIM (personal information manager) applications. These are supported on Windows 95 and NT only, and require installation of Microsoft TAPI 2.1.

The following applications have been tested with IBM CT:

- Symantec's ACT! (V3.0)
- GoldMine
- TeleMagic
- Microsoft Outlook

To use one of these applications, perform the following installation on each client using the application:

1. Install TCP/IP using the Control Panel's Network application. Consult your system administrator for site-specific information required for this setup.
2. Install TAPI 2.1 client software from the IBM Telephony installation CD. (This is installed as part of the complete IBM CT client for Windows 95 or NT 4.0.)
3. Insert CD and run the IBM Telephony installation utility.
4. Click Install IBM Telephony Client for Windows 95 or NT 4.0.
5. Windows NT clients can use TAPI 2.0 or 2.1. Windows 95 clients must have TAPI 2.1. (included in the TAPI 2.1 SDK upgrade available for download from the Microsoft web site. To install TAPI 2.1:
 - a) Download the TAPI 2.1 SDK from www.microsoft.com.
 - b) Run TAPI21.exe to decompress the TAPI 2.1 files.
 - c) Consult the README.TXT file for client installation instructions. Install the appropriate TAPI 2.1 telephony client application on your computer.
6. Configure Telephony Services for your computer.

- a) Open the Control Panel, then open the Telephony folder.
 - b) Click the Telephony Drivers tab to display.
 - c) Click Add, then click on IBM CT PBX access via TSAPI/CSTA to select. Click Add.
 - d) The Select TSAPI Service dialog box will display. Scroll through the Server list to select a IBM CT server. (If no IBM CT servers display, either CSTA32 is not installed or the server is down/disconnected.)
 - e) If your server requires passwords, enter your user name and password on the appropriate lines.
 - f) Enter your extension number in the Extension box. Click OK and close windows.
7. If your PIM application has not been installed, do so now according the manufacturer's instructions. You can also test your installation by using the Phone Dialer accessory to make a call.

10. Security

10.1 Enabling NT Level 2 (LOGON) Security

Windows NT logon security requires users to enter a user name and password in order to access the system. To enable NT Level 2 security for users, the NT administrator will need to add user names to Telephony Services database, configure logon access for NetPhone Utility and IBM VoiceMaster services, and change security level in the registry using the Set Security Level Utility as described below.

Add user names to the Telephony Services database

1. From the Windows NT Start menu, navigate to Programs/TS Win32 Client/Telephony Services Admin.
2. In the Open Tserver window, select the default Tserver and Login (administrator). Click OK.
3. In the Telephony Services Administrator 32-bit window, click on Users in the SDB tree.
4. Click Create User from the Admin menu.
5. In the Information tab, enter the Login, Name, and Worktop name (if applicable) of each IBM Telephony user. (Note: Telephony Services user names must match NT Server user names). Click Apply to add each user.
6. Click OK when done and close the Telephony Services Administrator 32-bit window(s)

Configure logon access for NetPhone Utility and IBM VoiceMaster services

1. From the Start menu, navigate to Settings/Control Panel.
2. Open the Services folder.
3. Select NetPhone Utility and double-click to open.
4. Under Log On As, click button for This Account.

5. For user name, enter Administrator (other names will not work, even if they have administrator privileges).

If IBM VoiceMaster is installed, repeat the above procedure for the IBM VoiceMaster service.

Set security level

1. From the Start menu, navigate to Programs/IBM Computer Telephony/Utilities/Set Security Level.
2. When the SetLevel window displays, click Logon (level 2).
3. Click Apply, then Exit.
4. Reboot the IBM CTS NT Server or do the following:
 - a) Stop all Telephony services Clients.
 - b) Stop Service NetPhone Utility
 - c) Stop Service TSAPI Telephony Services
 - d) Start Service TSAPI Telephony Services
 - e) Start Service NetPhone Utility

10.2 Voice Mail Security

10.2.1 Changing a voice mail password

When you create a voice mailbox, it has a default password of 0 digits. You should encourage users to change this password immediately.

1. Access the voice mailbox through the handset.
2. Press 3 for personal options, and then press 2 to select the “Change password option” from IBM VoiceMaster’s main menu.
3. After the prompt, enter a new password that is between 0 and 9 characters in length, followed by the pound (#) key.

4. After entering the new password, IBM VoiceMaster asks you to verify the password by re-entering it. Re-type the new password. If it matches, your new password is installed.

10.2.2 Password storage

An extension's voice mail password is encrypted and stored in the file VMBOX.CFG. There is a VMBOX.CFG file for each extension, located in the mailbox ID folder on the voice mail server.

If a user forgets his or her password, edit the VMBOX.CFG file for the extension so that no password is required. To do so, delete the password. Do *not* delete the entire line where the password is found. The user can then access voice mail through the telephone handset and change the password.

In addition, you should make sure that adequate security is provided on the server so that users cannot access other voice mailboxes without authorization.

10.2.3 Mailbox access privileges

Note: IBM VoiceMaster allows access to mailboxes other than the one associated with the user's extension. In order to restrict this access, you must set the permission level of the voice mailbox folder.

For Windows NT servers, the administrator must create a share that allows the user to access the voice mailbox folder for their extension, and prohibits access by other users.

1. Navigate to a voice mail folder (for example \IBMCT\VM\201).
2. Right click on the voice mail folder and click Sharing to open the Sharing Properties page.
3. Click Shared As. Once selected, the default share name becomes the name of the folder.
4. Click Permissions, then click Add.
5. Click Show Users and add the user name (and any additional users or groups that need to access this voice mailbox).
6. Change type of access to Full, then click OK.
7. Click Everyone to select, then click Remove, so that members of the group "Everyone" will not be allowed to access this folder.

8. Click OK or Apply.

If the IBM Telephony directory itself has been included in a share, you should remove it from the share. (Open the Control Panel, double-click Server, then click Shares to list the shares that are currently defined.)

Note: Make sure that the directory the IBM Call Manager user maps their voice mailbox to is the same as that entered for Share Name above.

11. Troubleshooting

If you encounter a problem, check the following symptoms and suggestions:

No Dial Tone on an Extension

Check that the cable is securely plugged into the CT-618 board.

- Check that your telephone is set to tone and not pulse generation.
- Try a different telephone that is known to work.
- Dial tone but no DTMF tones on an extension
- Check that the telephone is set to tone and not pulse generation.
- Try a different telephone that is known to work.
- Try swapping the tip and rings wires, as some old style phones will not produce DTMF tones if tip and ring are reversed.

Cannot access an outside line (fast busy)

- Check that you have not inadvertently reserved all trunks for incoming calls. You can free all trunks by entering *30 at the operator extension or through the IBM Telephony Administration Utility.
- Check that the RJ-21X cable is securely plugged into the CT-618 board.
- Check that the trunk is active and that the wiring is correct by connecting a telephone directly to the telephone company Network Interface.
- Remove the RJ-21X cable and measure the voltage between the tip and ring. If the voltage difference is less than 40 volts, contact the telephone company to have them correct the problem.
- When IBM Telephony server is powered down, line X1 and trunk 1 will still be available. If they are not, your phone wiring may be at fault.

No audio while on hold

- Connect headphones to the audio cable to make sure that there is audio playing
- Make sure that you have selected audio in your system configuration.

Your new auto attendant recording doesn't play

- ATTEND.MU is the correct file name for the auto attendant message.
- If you recorded a new message, make sure that you have copied the file RECORD.MU to ATTEND.MU in IBMCT/AUDIO.

Unexpected results from calling operations

- Verify which translation table information has been written to the IBM CT-618 board.
- Make sure that the translation table entries are correct. The system does not validate the information entered in the translation table.

Using Flash button to place call on hold hangs up call

- Flash interval may need to be increased for your model of handset. See page 14 for information.

Speaker phone not functioning

- Some speakerphones do not operate properly with IBM CT PBX if used without batteries or an external power source, since they draw more current than the CT-618 can supply.

12. Help and Service Information

Before calling, please prepare for your call by following these steps.

12.1 Step 1: Troubleshooting

Please read the items in the troubleshooting section of this manual to see if you can resolve the problem.

12.2 Step 2: Preparing for the Call

To assist the technical support representative, have available as much of the following information as possible:

- Computer manufacturer and computer model.
- Option number.
- Option name.
- Serial number (if available).
- Proof of purchase (including date and place).
- Exact wording of the error message (if any)
- Description of the problem
- Hardware and software configuration information for your system

If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

12.3 Step 3: Placing the Call to IBM

Technical support is available during the warranty period to answer any questions about your new IBM option. Support response time will vary depending on the number and nature of calls received.

Marketing, installation, and configuration support will be withdrawn from the PC Company HelpCenter 90 days after the option has been withdrawn from marketing.

If you call 90 days after the date of withdrawal or after your warranty has expired, you might be charged a fee. Additional support is available through the IBM PC Company automated Fax system, the PC Company Web Page, the PC Company Electronic Bulletin Board System and HelpWare offerings.

- The IBM web site at "<http://www.pc.ibm.com>
- The IBM Fax system at (800) 426-3395 or (919) 517-0011
- The IBM BBS system at (919) 517-0001

For the support telephone and support hours by country, refer to the following table or to an optional enclosed technical support insert. If the number is not provided in the table or insert, contact your IBM reseller or IBM marketing representative.

Support 24 hours a day, 7 days a week	
---------------------------------------	--

Canada	1-800-565-3344
United States / Puerto Rico	1-800-772-2227

13. Product Warranty

The following warranty information applies to products purchased in the United States, Canada, and Puerto Rico. For warranty terms and conditions for products purchased in other countries, see the enclosed Warranty insert, or contact your IBM reseller or IBM marketing representative.

International Business Machines Corporation
Armonk, New York, 10504

Statement of Limited Warranty

The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them.

Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. If you have any questions, contact IBM or your reseller.

Machine: IBM CT-618 Adapter

Warranty Period*: Three (3) years

**Contact your place of purchase for warranty service information.*

Production Status

Each Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications.

The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if authorized by IBM, will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

For IBM or your reseller to provide warranty service for a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade.

Many of these transactions involve the removal of parts and their return to IBM.

You represent that all removed parts are genuine and unaltered. A part that replaces a removed part will assume the warranty service status of the replaced part.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair it or replace it with one that is at least functionally equivalent, without charge. The replacement may not be new, but will be in good working order. If IBM or your reseller is unable to repair or replace the Machine, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user. However, for Machines which have a life-time warranty, this warranty is not transferable.

Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM.

In the United States, call IBM at **1-800-772-2227**.

In Canada, call IBM at **1-800-565-3344**.

You may be required to present proof of purchase.

IBM or your reseller will provide certain types of repair and exchange service, either at your location or at IBM's or your reseller's service center, to restore a Machine to good working order.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours.

You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item. Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service. You also agree to ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange.

Product Warranty

You agree to:

1. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
2. where applicable, before service is provided --
 - a) follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
 - b) secure all programs, data, and funds contained in a Machine, and
 - c) inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Extent of Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

The warranties may be voided by misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, removal or alteration of Machine or parts identification labels, or failure caused by a product for which IBM is not responsible.

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Circumstances may arise where, because of a default on IBM's part or other liability you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable only for:

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages or loss, up to the greater of U.S. \$100,000 or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING:

1. THIRD-PARTY CLAIMS AGAINST YOU FOR LOSSES OR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE);
2. LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR
3. SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU.

14. Appendix A: Notices

14.1 Electronic Emission Notices

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

14.1.1 Telecommunication Notices

Federal Communications Commission (FCC) and Telephone Company Requirements

1. This adapter complies with Part 68 of the FCC rules. A label is affixed to the adapter that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, provide this information to your telephone company.
2. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.
3. If the adapter causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance; if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.
4. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice to give you an opportunity to maintain uninterrupted service.
5. If you experience trouble with this product, contact your Authorized Reseller, or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.
6. The telephone company may ask you to disconnect the adapter from the network until the problem has been corrected, or until you are sure the adapter is not malfunctioning.
7. No customer repairs are possible to the adapter. If you experience trouble with the adapter, contact your Authorized Reseller or see Help and Service section of this manual for information.
8. This adapter may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.
9. When ordering network interface (NI) service from the local Exchange Carrier, specify service arrangement USOC RJ11C.

Canadian Department of Communications Certification Label

NOTICE: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The LOAD NUMBER (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the sum of the LOAD NUMBERS of all the devices does not exceed 100.

Étiquette d'homologation du ministère des Communications du Canada

AVIS : L'étiquette du ministère des Communications du Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause d'un mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: l'utilisateur ne doit pas tenter de faire ces raccordements lui-même, il doit avoir recours à un service d'inspection des installations électriques ou à un électricien, selon le cas.

AVIS: L'INDICE DE CHARGE (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordé à un circuit téléphonique bouclé utilisé par ce dispositif. L'extrémité du circuit bouclé peut consister en n'importe quelle combinaison de dispositifs pourvu que la somme des INDICES DE CHARGE de l'ensemble des dispositifs ne dépasse pas 100.

14.2 Patent Notices

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IBM Director of Licensing
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FoxPro and Microsoft are registered trademarks of Microsoft Corporation.

PassageWay is a registered trademark of Lucent Technologies.

Other company, product, and service names, which may be denoted by a double asterisk (**), may be trademarks or service marks of others.

15. Appendix B: Software License and Warranty Information

15.1 NetPhone, Inc. Limited Software Warranty And License Agreement

IMPORTANT: READ THE FOLLOWING TERMS AND CONDITIONS CAREFULLY BEFORE OPENING THIS SEALED SOFTWARE PACKAGE. THESE TERMS AND CONDITIONS CONSTITUTE THE ENTIRE AGREEMENT BETWEEN YOU AND NETPHONE, INC. ("NETPHONE") CONCERNING THE PROGRAM, SUPPLIED ON MEDIA ("THE PROGRAM") AND THE USER DOCUMENTATION (THE "DOCUMENTATION").

BY OPENING THIS PACKAGE YOU INDICATE YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THEM, PROMPTLY RETURN THIS PACKAGE UNOPENED, ALONG WITH THE DOCUMENTATION, AND YOUR MONEY WILL BE REFUNDED. NO REFUNDS WILL BE GIVEN FOR RETURNED PACKAGES MISSING ANY ITEMS.

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LIMITED WARRANTY. NetPhone warrants that the media on which the Program is furnished shall be free from defects in material and workmanship for a period of 90 days, beginning from date of installation or 30 days after purchase, whichever comes first. If a defect in the media appears during that period, you may return the Program and Documentation to NetPhone or its authorized reseller for either replacement or, if so elected by the NetPhone distributor or reseller, refund of your purchase price. The foregoing constitutes your sole remedy for breach by NetPhone of any warranties (express or implied) made under this Agreement. EXCEPT FOR THE WARRANTIES SET FORTH ABOVE, THE PROGRAM AND THE DOCUMENTATION ARE LICENSE "AS IS," AND NETPHONE DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty may last, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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EXPORT ASSURANCES. You agree that the Program will not be shipped, transferred, or re-exported, directly or indirectly, into any country prohibited by the United States Export Administration Act and the regulations thereunder or used for any purpose prohibited by such Act.

This Agreement is governed by the laws of the Commonwealth of Massachusetts.

16. Appendix C: Specifications

16.1 PC Host Requirements

PC CPU Requirements	586-133 MHz (Pentium) with 64Mb RAM for minimum configuration
Bus Interface	ISA 16 bit
Cable Interface	50 Pin Telco (RJ-21X)
Power Required	+5V 1.6A, +12V 1.0A, -5V 0.1 A
Operating Temperature	10 Deg C Min / 40 Deg C Max
Storage Temperature	0 Deg C Min / 65 Deg C Max
Operating Humidity	20 to 80% relative, non-condensing

16.2 CT-618 Specifications

Number of Ports	6 Trunks / 18 Extensions
Switching	Digital Type Non-Blocking
Station Compatibility	Analog 2500 Series (Loop Start)
Station Interface Loop Limit	1200 Ohms Max
Station Impedance	600 Ohms
Trunk Impedance	600 Ohms
CO Min Leak Resistance	30,000 Ohms
System Crosstalk	>75 dB down
System Longitudinal Balance	>58 dB (200 to 3,000 Hz) on/off-hook
System Return Loss	>18 dB ERL
System Idle Circuit Noise	<20 dBmC
Insertion Loss Station to Station	1 dB
Insertion Loss Station to Trunk	2 dB

16.3 RJ21X Telco connector pinout

Color	Function	Pin	Pin	Function	Color
BLU-WHT	Trunk 1 - Tip	1	26	Trunk 1 - Ring	WHT-BLU
ORN-WHT	Trunk 2 - Tip	2	27	Trunk 2 - Ring	WHT-ORN
GRN-WHT	Trunk 3 - Tip	3	28	Trunk 3 - Ring	WHT-GRN
BRN-WHT	Trunk 4 - Tip	4	29	Trunk 4 - Ring	WHT-BRN
SLT-WHT	Trunk 5 - Tip	5	30	Trunk 5 - Ring	WHT-SLT
BLU-RED	Trunk 6 - Tip	6	31	Trunk 6 - Ring	RED-BLU
ORN-RED	Ext 1 - Tip	7	32	Ext 1 - Ring	RED-ORN
GRN-RED	Ext 2 - Tip	8	33	Ext 2 - Ring	RED-GRN
BRN-RED	Ext 3 - Tip	9	34	Ext 3 - Ring	RED-BRN
SLT-RED	Ext 4 - Tip	10	35	Ext 4 - Ring	RED-SLT
BLU-BLK	Ext 5 - Tip	11	36	Ext 5 - Ring	BLK-BLU
ORN-BLK	Ext 6 - Tip	12	37	Ext 6 - Ring	BLK-ORN
GRN-BLK	Ext 7 - Tip	13	38	Ext 7 - Ring	BLK-GRN
BRN-BLK	Ext 8 - Tip	14	39	Ext 8 - Ring	BLK-BRN
SLT-BLK	Ext 9 - Tip	15	40	Ext 9 - Ring	BLK-SLT
BLU-YEL	Ext 10 - Tip	16	41	Ext 10 - Ring	YEL-BLU
ORN-YEL	Ext 11 - Tip	17	42	Ext 11 - Ring	YEL-ORN
GRN-YEL	Ext 12 - Tip	18	43	Ext 12 - Ring	YEL-GRN
BRN-YEL	Ext 13 - Tip	19	44	Ext 13 - Ring	YEL-BRN
SLT-YEL	Ext 14 - Tip	20	45	Ext 14 - Ring	YEL-SLT
BLU-VIO	Ext 15 - Tip	21	46	Ext 15 - Ring	VIO-BLU
ORN-VIO	Ext 16 - Tip	22	47	Ext 16 - Ring	VIO-ORN
GRN-VIO	Ext 17 - Tip	23	48	Ext 17 - Ring	VIO-GRN
BRN-VIO	Ext 18 - Tip	24	49	Ext 18 - Ring	VIO-BRN
SLT-VIO	n/c	25	50	n/c	VIO-SLT

Notes:

1. SLT (Slate) is sometimes referred to as GRY (Gray).
2. The Ext xx numbers correspond to the default extension numbering scheme, so that Ext 1 is extension 201 on the first CT-618 board, 219 on the second CT-618 board, etc.
3. The power down fail-safe mode of the CT-618 board connects Trunk 1 (Tip and Ring) to Ext 1 (Tip and Ring). For this reason, we recommend that Ext 1 be used for the Operator extension (201) in normal usage.

16.4 CT-618 Functions

When first installed, the following IBM Telephony default keypad commands are in effect. Note that these defaults may change with subsequent versions of the IBM Telephony software.

Normal extension handset dialing

201-299	Place a call to extension 201 through 299.
9+7 digits	Connect to a trunk and dial a local call.
1+10 digits	Connect to a trunk and dial a non-local call.
9+11 digits	Connect to a trunk, wait for a dial tone, and dial all digits
911	Connect to a trunk, wait for dial tone and dial 911.
0	Place a call to the Operator (default is extension 201).
**	Listen to recorded IBM CT Help.
*2	Make all held calls a conference, joining the conference yourself (*2=*C - C onference).
*30+two digit parking station	Park a call.
*31+two digit parking station	Pick up parked call.
*4	Pick up a held call (*4=*G - G et Held).
*5	Pick up a ringing call from your pickup group .
*8	Make all held calls a conference and hang-up on the conference (*8=*T - T ransfer Hang-up).
*6	Check voice mail messages (requires optional IBM VoiceMaster voice mail software).
*7	Leave voice mail message (requires optional IBM VoiceMaster voice mail software).

*92+digits of forward extension	Set call forward on busy (*92# to cancel).
*94+digits of forward extension	Set call forward immediately (*94# to cancel).
*96+digits of forward extension	Set call forward on no answer (*96# to cancel).
*11	Record a message (file RECORD.MU).
*12	Play a message (file RECORD.MU).
*13	Play the auto attendant message (file ATTEND.MU). See Auto attendant message on Page 23 for more information.

Administration and Test Functions

Administration and test functions are performed from the Operator extension or an extension with administrator privileges (class of service 6).

8	Connect to a trunk and permit dialing an outside call.
*11	Record auto attendant message (RECORD.MU).
*12	Play RECORD.MU.
*13	Play current auto attendant message.
#20-#26	Set number of rings before Auto-Attendant (0-6 respectively).
#30-#36	Reserve trunks for incoming calls (0 through 6 trunks, respectively).
#40-#50	Set the I/O port to one of the following respectively: 0x260, 0x280, 0x290, 0x2A0, 0x2b0, 0x2e0, 0x2f0, 0x300, 0x310, 0x390, 0x3e0. Used only for initial configuration when there is an I/O conflict. After the system is powered up and the green light is on, enable this feature by removing jumper J0 and installing jumper J1. Replace the jumpers immediately before trying to run the setup software.

Appendix C: Specifications

- #71 Connect call to on hold audio.
- #83 Recalculate the number of trunks (when trunks have been added/removed).
- #85 Count number of trunks (will produce a beep tone for each trunk).
- #99 Set factory defaults (requires jumpers as above).

17. Appendix D: Installing IBM Call Manager

IBM Call Manager Desktop Call Control will generally be installed on all PC clients, as well as the server. The client must have mapped drives to the IBM Telephony server and IBM VoiceMaster (if using IBM VoiceMaster voice mail).

17.1 Prerequisite Hardware and Software

Clients:

486 (or higher) or Pentium with at least 16MB RAM, running Windows 95 or Windows NT.

- IBM Call Manager clients must have a server user account.
- The client must have mapped drives to the IBM Telephony server and IBM VoiceMaster (if using IBM VoiceMaster voice mail).
- Sound capability is required to play voice mail messages delivered by e-mail.

17.2 Installing Client Software

Note: Client accounts must be established on the server before IBM Call Manager is installed on client PCs.
--

1. Insert IBM Telephony CD in the client PC to autorun the installation utility (or run or double-click Setup.exe).
2. The Welcome screen will display. After reading, click Next.
3. The License Agreement will display. If you agree with the license terms, click Next. If you do not agree, click Cancel to stop the installation.
4. Click the checkbox for IBM Call Manager Client for Windows 95 or NT4.0, then click Next.

5. You will be prompted through the installation process. The windows displayed will prompt you for locations and names of the IBM CT Software Folder, Server System folder, and Program Icons folder. You may accept the defaults (recommended) or modify these entries.
6. When complete, click Exit and remove the IBM Telephony CD.

Note: IBM Call Manager clients can be installed over the network if the IBM Telephony CD is mounted in a drive accessible to the client PC, or if the installation CD contents have been copied to an accessible directory (you may not use long directory names or spaces in the directory name).

IBM Call Manager Setup

The first time you run IBM Call Manager you will need to enter login information and setup directories.

1. From the Start menu, navigate to Programs/IBM Computer Telephony/IBM Call Manager.
2. When the login window displays, enter your user name, password and extension number. You can check the box to save this information, and you will not need to enter it the next time you log in. Click OK when done.
3. The Voice Mail Path window will display. If you are using IBM VoiceMaster voice mail, make sure the path information is correct. If you are not using IBM VoiceMaster, check "Do not use NetPhone voice mail". Click OK when done.

Refer to the IBM Call Manager on-line help and for additional information.

If you have more than one IBM Computer Telephony server:

To allow a IBM Call Manager client to access multiple servers, the client's TSLIB.INI file must be edited to add the additional server names, as in the example below:

```
[Telephony Servers]

; This is a list of the servers offering
Telephony Services via TCP/IP.
; Either domain name or IP address may be used;
default port number is 450
; The form is: host_name=port_number    For
example:
;
; tserver.mydomain.com=450
; 127.0.0.1=450
;
myservr=450
serv2=450
serv3=450

[Shared Admin]

; Instead of each workstation maintaining its
own list of servers, a shared
; tslib.ini file may be placed on a network file
system, for example:
;
; tslib.ini=n:\csta\tslib.ini
;
; This entry overrides the [Telephony Servers]
section, if any.
```


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