

**QPhone version 1.04**

**Reference Manual**

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# Chapter 1

## Introduction

QPhone is a software ISDN and IP phone. When used as IP phone, it uses the Picophone protocol and is therefore compatible with the Picophone program. A Windows compatible sound card is used for audio input and output, so a headphone/microphone pair can be used instead of a phone headset. QPhone has no special requirement for the ISDN adapter, so any CAPI 2.0 compliant ISDN adapter can be used.

QPhone has these advanced phone functions:

- phone book, with intelligent search;
- calls log, divided in incoming/outgoing/answered/unanswered;
- calls statistics, divided in incoming/outgoing/answered/unanswered; the data provided are, divided per number: total number of calls, number of calls in the last 30/7/1 days, last call date/time;
- black list; based on the caller id or on the called number, calls can be refused, deflected to another number, sent to the answering machine (into an arbitrary folder);
- conference mixing bridge; with a single basic ISDN access a four-party conference can be conducted;
- recorder: calls can be recorded into a standard WAV file in different qualities;

QPhone integrates these additional functions:

- advanced, programmable, folder based answering machine;
- IP/ISDN gateway; ISDN calls can be routed to another QPhone via IP or to a Picophone; IP calls from another QPhone or Picophone can be routed to ISDN;
- reminder: QPhone can remind to call a determined number at a determined time;
- list-dialer: QPhone can continuously call a list of numbers, with programmable timeout and retry times;
- interviewer: phone interviews can be programmed with a simple, specially formatted, text file containing the questions and the possible answers; these questions will be presented to the interviewer, who will enter the answers directly into QPhone; Qphone will then save the answers into an output file for further processing;

## Chapter 2

### Main panel

#### 2.1 Direct action buttons

The **TAKE/HOLD** buttons (F1-F8) take a waiting or a held call or put on hold an active call. They also pick up a call managed by the answering machine. The call state is signalled by a lamp on the button. The lamps can be:

- Off: no call on the associated line
- On, red, stable: the call is active
- Slow blinking, red, for the most of the time on: an outgoing call is proceeding
- Slow blinking, red, for the most of the time off: the call is held
- Fast blinking, red: an incoming call is present
- On, orange: active and connected to the answering machine
- On, light orange: active and linked to another line
- Fast blinking, light orange: an incoming call is present, but it will be linked to another line, when the other line will be answered

The **DISC** buttons (F1-F8) disconnect a call.

The **ECT** buttons (F9-F12) call the associated number (the number present in the cell near the buttons) and make an explicit call transfer of the active call to that number, when answered. If the text set in the cell begins with an asterisk (\* sign), the active call is simply sent to the answering machine, to the folder, whose name follows the asterisk sign (the root folder, if nothing follows). The **EDIT** buttons allow to edit those cells.

The **ECT** button calls the number present in the cell "NUMBER TO CALL" and then makes an explicit call transfer to that number. The **CALL** button calls the number present in the cell "NUMBER TO CALL". If nothing is present in that cell, the channel is taken and the dial tone is heard.

The **DISCONNECT** button disconnects the first active call. The button **TAKE** takes the first waiting call.

The **CD** button executes a **Call deflection** of the incoming call to another number. It can ask for a number where to deflect, if nothing is set in the settings and the incoming call number can be inserted in the black list automatically.

**SUSP** suspends (parks) an active call and **RESM** resumes a suspended call. A call identity can be asked, if set in the settings. A suspended call can be resumed by another phone connected to the same ISDN access.

**ECT-H** transfers the active call to a held call.

**3PTY** initiates a three-party conference between the active call and another held call. The lamp on the button switches on when a three-party conference is active. Pressing the button again, the three-party conference is split again into an active and a held call.

**REC** starts recording of the active call. The destination file name will be asked, if no destination is set in the settings. The lamp on the button switches on when recording is active.

**AMON** monitors the answering machine. The lamp is switched on, when monitoring is

turned on.

>**BLK** puts the active call number into the black list. >**BOOK** puts the active call number into the phone book.

**ANS. MACHINE** activates the answering machine mode. It will be signalled on the main display with the string "Answering machine active and waiting".

**INTVI** starts an interview procedure and asks for two text files: one with the instructions for the interview, and the other for the answers. See the chapter on the interviews.

**INTV+** shows a series of dialog boxes with the questions for the interview. The data entered will be saved into a text file along with the current time and the number of the currently connected user, if any.

**CLOSE** closes the program window. The program will stay minimized in the icon tray.

If more than one line is eligible for a function (like suspend or three party convergence), the function will not be executed immediately, but the relative button will stay depressed. The user has then to select the appropriate line by clicking on the **TAKE/HOLD** button of the desired line.

## 2.2 Mode buttons

**CONFERENCE** activates the conference mode. When a call is currently active and another one has to become active, the currently active call won't be put on hold, but both of them will be mixed into a conference.

**DIAL TONES** enables the hearing of the tones from the central switch office, before the call becomes active.

**ECHO CANC** activates the echo cancellation or echo suppression function of QPhone. Echo is produced by remote analog phones, which reflect back the signal transmitted by QPhone. The echo cancellation algorithm deletes this echo. The effect will be heard locally, it has no impact on the remote user. ISDN phones and GSM phones don't produce echo, so if the user on the remote side has an ISDN or GSM phone, the echo cancellation is not necessary.

**WITHHOLD NO.** disables the transmission of the local number to the called or connected user. The called or connected user won't see the number of the calling or connected QPhone.

**SEND DTMF** sends DTMF tones when digits are pressed on the PC keyboard. DTMF tones don't need to be sent in order to make ISDN calls, but they can be required by other equipment listening at the other side.

## 2.3 Functions buttons

**BOOK** opens the phone book dialog box. **LOG** opens the calls log dialog box. **STATS** opens the statistics dialog box. **BLACK** opens the black list/ISDN-IP gateway dialog box. **LIST** shows/hides the call list buttons. **PREF** opens the preferences (settings) dialog box.

## 2.4 Call list buttons

Call lists are used to automatically call a list of numbers. The numbers will be called in a circular fashion, until all the numbers in the list will answer. Unanswered/busy numbers

will be delayed by a programmable amount of time definable in the settings. **NEW** creates a new list, **OPEN** opens a list, **EDIT** shows the list currently in memory for editing, **RUN** starts calling the numbers in the list. When automatic calling is active, the lamp on this buttons is switched on.

**REMIND** opens the reminder dialog box. The reminder is another function, which reminds to call a list of numbers, but does not actually call those numbers automatically.

## 2.5 Displays

The main display shows various data, such as the status of a call, some statistics and also display data sent by the central switch office.

At the left of every TAKE/HOLD button there are three displays: the first shows the name or the number of the called/calling user, the second shows the date and time of the last call to or from that number, the last line shows the total number of calls for that number and the number of calls for that number in the last 30, 7 and 1 days. In this case, only incoming calls are considered, if the current call is incoming, and only outgoing calls are considered, if the current call is outgoing.

In the MISSED CALLS display the list of the last unanswered numbers is present.

If the call list buttons are shown, also a status line for the auto-dialer is shown.

Two vu-meters show the level of the signal being sent (MIC) and the level of the signal being received (SPK).

## Chapter 3

### Books, lists, logs

#### 3.1 Phone book

The phone book is used everywhere in QPhone and almost everywhere, data from the phone book is shown instead of phone numbers. Also, everywhere when the user has to enter a phone number, entries from the phone book can be entered, instead, as they will be automatically converted to phone numbers.

The phone book can be accessed by pressing the **BOOK** button. New entries can be added to the phonebook with the **New** button, edited by clicking on the entry, when **Edit mode** is checked, and deleted with the **Delete** button. Entries can be searched with the **Find** button, and the complete list is shown again by pressing the **All** button. The currently selected number is called by pressing the **Call** button. **Save** saves the modifications closing the windows; closing the window by clicking on the upper right corner of the window, undoes the modifications made reloading the phone book from disk.

#### 3.2 Calls log

To see the calls log, the **LOG** button should be pressed. Logs are sorted chronologically and different days are accessed by clicking on the respective date. **Only incoming** shows only the incoming calls, **Only outgoing** shows only the outgoing calls, **Only answered** shows only the answered calls and **Only unanswered** shows only the unanswered calls. **Play** plays the call, if it has been recorded. Recorded calls are shown with an icon near the call time. These fields are shown in the log: time of the call, length of the call (the length of the period while the call has been in the waiting state, for unanswered calls, but only the length of the period while the call has been in the active or held state, for answered calls – the waiting state is not considered in this case), the name associated to the number, if present in the phone book, the number, and the type of call (like incoming or outgoing, answered, unreachable, etc.).

#### 3.3 Statistics

To see the statistics, the **STAT** button should be pressed. Stats show, for every number, the total number of calls, the number of calls in the last 30/7/1 days and the date and time of the last call. As in the log view, only outgoing, only incoming, only answered and only unanswered calls can be considered while showing the statistics. The names associated to the numbers are also shown, if found in the phone book. **Regenerate** recalculates the statistics from the logs. Otherwise, the statistics are kept in a different file for performance reasons.

#### 3.4 Black list and IP/ISDN gateway

This function is accessible by pressing the **BLACK** button. Numbers present in the black

list are treated differently from others. Incoming calls from these numbers can be automatically refused or deflected to another number. The desired incoming number should be entered in the field **Number** and the destination number into the **Deflect to** field. If the **Deflect to** field is empty, the call is refused, instead. A number can be deflected to the answering machine, too. In this case, the **Deflect to** field must contain an answering machine folder name preceded by an asterisk (\* symbol); if there is only an asterisk without a subsequent name, the root folder of the answering machine will be taken.

If the **Number** field starts with the "equal to" symbol (=), the number that follows represents the called number and not the calling party number. In this case all the calls directed to that number can be deflected or sent to the answering machine. Each entry can have an expiration date and time.

Since QPhone makes no distinction between ISDN and IP calls, as regarding the user, calls can be deflected also to a destination different from the source. ISDN calls can be deflected to IP destinations and viceversa. In this case, Picophone addresses or subaddresses can be entered in the relevant fields. IP source addresses are always Picophone **identities** or **subaddresses** (the name preceding the '@' symbol), while IP destination addresses are usually IP addresses (with optional port numbers and/or picophone subaddresses). When a call is deflected in this way, it is actually **linked** to another call made by QPhone, which will act as a router for audio data.

## 3.5 Call lists

Call lists are used to automatically call a list of numbers. The **LIST** button shows the additional buttons needed to operate the call lists. New numbers can be added to a call list directly with the **New** button and then edited. Otherwise they can be inserted from the phonebook with a double click on a phone book entry. The phone book should be opened in the Call list editor and not by pressing the **BOOK** button. The Call at field can be filled with a date and time, but it is usually filled automatically, when a recall should be performed.

The reminder is a function similar to the call list, but the numbers aren't called automatically. The user is alerted that a call should be made and then the call is performed, if desired.

# Chapter 4

## Preferences

### 4.1 General

**Take button (SPACEBAR) puts on hold the active call instead of disconnecting** changes the behaviour of the **TAKE** button, when **CONFERENCE** mode isn't enabled and both an active call and a waiting call are present.

**Disconnect button (BACKSPACE) disconnects active call instead of refusing incoming** changes the behaviour of the **DISC** button in the same situation.

**Disconnect buttons deflect call to default deflection number instead of refusing** changes the behaviour of the eight **DISC** button. A default number for deflection should be set in the settings in order for this to be useful.

**Suspend and Resume ask for call identity** enables the asking for a call identity when suspending or resuming a call. If this is not checked, the default value from settings will be used, which can be also empty (empty call identity). A call identity is a short string identifying a suspended call.

**Call Deflection asks for destination number** enables the asking of a destination number, when the **CD** button is pressed to deflect an incoming call. If this isn't checked, the default number present in settings will be used. If the default number is not inserted, a number will be always asked.

**Save new incoming call numbers to phone book** inserts automatically all new incoming numbers to the phone book and prompts the user to insert the relevant data.

**Log all incoming calls** enables the logging of all the type of calls and not only voice calls. This is useful to use QPhone as a logger of all ISDN incoming calls, like data calls, which won't be managed by QPhone.

**Give precedence to calls in waiting and calling state on main display** shows these types of calls on the main display instead of the active call, when both type of calls are present.

**No hotkeys** disables keyboard shortcuts. This can be useful, when the user makes other things with the computer and doesn't want to accidentally answer or refuse a call, when an incoming call brings QPhone in the foreground.

**Call transfer via link** makes all the call transfers (**ECT** and **ECT-H** buttons) internally, with the internal voice router, instead of using the ECT ISDN supplementary service, which is not always available. Call transfers between ISDN and IP are always made in this way.

**Call deflection via link** makes all the call deflections internally, with the internal voice router, instead of using the CD ISDN supplementary service, which is not always available. Call deflections from ISDN to IP and from IP to ISDN are always made in this way.

**Lock mode keys** locks the **mode keys**, so that the user cannot modify their status.

**Send keypad** enables the sending of keypad data (digits and the # and \* sign are sent as keypad data, when typed).

**Own number** is the called number, on which QPhone will react.

**User identity** is sent as the subaddress when making IP calls and as UUS (User-to-user signalling) data when making ISDN calls.

**Operator preselector** is always put in front of a dialled number.

**Charging unit** and **currency** are used when displaying call charge information.

**Call list timeout (s)** is the timeout period, after which an outgoing call is considered unanswered in the call list dialer.

**Call list retry (minutes)** is the time, in minutes, added to the current time for the next call schedule to the same number, which is now unreachable or unanswered.

**Reminder retry (minutes)** is the time, in minutes, added to the current time, for the next reminding of the current call, for which the user has now chosen not to dial.

**Ring** is an optional audio file used to alert the user of an incoming call. If not set, no audio signal is produced on an incoming call.

## 4.2 Audio

**Playing device** is the audio device used to output the voice of the far end speaker.

**Recording device** is the audio device used to input the voice of the near end speaker, which will be transmitted to the far end speaker.

**Recording source** is the input of the sound card used for recording.

**Mute recording source** disables the sending of the input of the sound card (microphone) to the output (speakers or headphones). It should be checked, normally.

**Sampling frequency** is the frequency used to sample audio data. ISDN sampling occurs always at 8 kHz, so 8 kHz is the normal choice. If conversations should be recorded in an audio file, a higher sampling frequency saves the near end speaker with a higher quality. The far end speaker will be converted from 8 kHz sampling to the higher value, but the quality will remain the same. Picophone allows to use 16 kHz sampling, so this sampling frequency should be used when speaking with a Picophone user with the HQ option, but ISDN/IP gateway works only at 8 kHz sampling.

**MIC** and **SPK** are used to set the recording and playing level of the sound card.

**Use echo suppression instead of echo cancellation** enables the use of a simpler algorithm for echo suppression, which doesn't try to cancel the echo in double-talk situations. It should be enabled, when the normal echo cancellation algorithm performs badly.

**Long buffer** highers the length of the buffers used for sound card management. This options should be checked, if the audio is choppy. This usually occurs under overheded systems or on systems with bad multitasking (such as Windows 95/98/Me).

**Save files without echo cancellation** saves the conversations before the echo cancellation algorithm has cancelled the echo out. The files saved are exact copies of what sent/received to/from ISDN.

**Calls are saved to stereo files instead of mixed mono files** saves the sent voice in one channel and the received voice in the other channel. Normally they are mixed together in a mono file.

**Automatically save calls** saves automatically all the calls without asking. **Files detination** should be set in this case.

**Directory for date** creates an additional directory with the call date as its name, where audio files are saved.

**Ask at the end for confirmation** asks for confirmation for saving at the end of every call.

**Files destination** is the directory name, where calls are saved.

## 4.3 Answer

**Monitor** enables answering machine monitoring automatically. Monitoring can be always disabled and enabled again manually with the **AMON** key.

**Disable black list when answering machine active** disables the black list processing, when the answering machine mode has been enabled with the **ANS. MACHINE** button.

**Seconds to wait** is the time after which the answering machine will answer an unanswered call.

**Directory for date** creates an additional directory with the call date as its name, where audio files are saved.

**Pre-recorded messages root** is the directory name, where all the prerecorded messages and instructions are present.

**Messages are stored in** is the directory name, where all the calls managed by the answering machine will be saved. **Open messages** shows this directory.

The window below is used to program the tree structure of the Answering machine. These commands are available with a right click on the mouse:

**Add folder** – a folder is created inside the currently selected folder. The folder name can be any string, but if the folder name is a digit, the # or the \* sign, the phone user will enter that folder by pressing the respective key.

**Add command** – four commands are available now:

**Record** starts recording after having played the **Message.wav** file and a beep. The recording will stop when the phone user will press a key, which is also present as a folder inside the current folder.

**Alert** alerts the local user that the remote user wants to speak with it. The lamp on the respective line changes to fast blinking. Then the **Alert.wav** file will start playing.

**Loop** plays continuously the **Message.wav** file until the user presses a key.

**Disconnect** disconnects the user after having played the **Message.wav** file.

**Goto** moves to another folder. If no path is given, the root folder is taken. Folder names in the path should be separated by a slash or a back-slash.

**Transfer** makes another call and connects the user to the other call.

If no command is present in a folder, QPhone will wait after having played the file **Message.wav**. If that file isn't present, QPhone will wait without playing anything.

**Record message.wav** opens the Windows recorder for recording (or playing, if already recorded) the file **Message.wav**.

**Record alert.wav** opens the Windows recorder for recording (or playing, if already recorded) the file **Alert.wav**.

**Edit Goto command** has the same effect of **Add command/Goto** and allows to change the destination folder.

**Delete folder/command/audio file** deletes the respective item from the tree.

## 4.4 Pico

**Identity** is the identity of the picophone user.

**Codec** is the used codec. Three choices are available: **GSM**, **Truespeech** and **MS G.723.1**.

**HQ audio** enables 16 kHz sampling for higher quality audio.

**Picoserver** is the address of a picoserver used for user identity to IP address

resolving.

**Picoserver password** is used together with **Identity** for authentication on the picoserver.

**Port number** is the UDP port number on which QPhone will receive incoming Picophone packets. The default Picophone port is 11676. Use another port number if a Picophone is already installed on the system.

**On incoming call** should be always left on **Ask**. Set it to **Refuse** or **Ignore** to disable receiving of Picophone calls.

**Input threshold (dB), THR** is the input level in dB necessary to trigger transmission. It is used to disable transmission when the speaker is silent. Set to **-infinite** to transmit always.

**Frames per packet, PKT** is the number of audio frames put in every transmitted packet. Lower numbers lower the delay after which the remote party will hear the local party, but it increases the used network bandwidth.

**Min delay, MIN** is the time that QPhone will wait, before reproducing the first packets coming from the remote party. It has to be higher than zero in order to compensate the variable packet transmission times present in the network (jitter) and to avoid a choppy audio.

**Max delay, MAX** is the maximum buffering performed by QPhone for incoming packets. The buffer is necessary to compensate network jitter and higher values are necessary, when this jitter is very high.

## 4.5 About

The version of the program is presented here.

# Chapter 5

## Interviews

Interviews are started from an instruction file, which is simply a text file containing the questions and the possible answers. The actual answers will be written in the destination file, which is also a simple text file.

### 5.1 Instructions file structure

Questions start with a number followed by a close parenthesis. The question must stay in one line and is then presented to the interviewer in the same form. After the question, the possible answers must be present. Answers can be typed in one of these forms:

- Number, dot, answer
- Number, dot, answer, asterisk
- Number, colon, answer
- Number, colon, answer, asterisk
- Asterisk

When using the first and the second form, the answers exclude each other, where the third and the fourth form allow to choose more than one answer. The asterisk gives the interviewer the faculty to enter a text near the answer.

The last form must be present alone (no other answers are possible) and asks the interviewer to answer the question with a text.

An example of an interview file can be:

```
1) How old are you?  
1. Less than 18 years  
2. From 18 to 35 years  
3. From 36 to 50 years  
4. From 51 to 65 years  
6. Over 65 years  
2) Where did you know of us?  
1: From newspapers  
2: From TV  
3: From radio  
4: From Internet  
5: From friends  
6: Other *  
3) Where are you born?  
*
```

### 5.2 Results file structure

Every interview starts in the result file with a line containing the # sign, the date and time of the interview, and the number of the interviewed party, if available. After that the answers to the questions follow. One line is present for every question. Every line will start with the question number followed by the close parenthesis. After that the number corresponding to the answered answer follows, possibly followed by the text

entered closed in quotation marks. Multiple answers are separated by commas.

An example of a result file can be:

```
# 23/10/2002 15:23:03 3473041292
```

```
1) 2
```

```
2) 3, 6 "a colleague"
```

```
3) "Trieste"
```

## Chapter 6

### Shortcut keys

F1-F8	Take a waiting or a held call, hold an active call
CTRL+F1-F8	Disconnect a call
SHIFT+F1-F8	Initiate a three-party conference between the active call and a held call
F9-F12	Explicit call transfer to another already set number or to an answering machine folder
CTRL+F9-F12	Edit an entry for explicit call transfer
RETURN	Call
SPACE	Take the first waiting call
BACKSPACE	Refuse incoming call or disconnect active call
INSERT	Insert the number of the current call into the phone book
DOWN ARROW	Put the number of the active call in the black list
LEFT/RIGHT/UP ARROWS	Deflect a call to a number

## Chapter 7

### Numbers and addresses format

#### 7.1 ISDN numbers format

ISDN numbers are formatted in this way  
phone number [. subaddress] [: keypad data]

#### 7.2 Picophone addresses format

##### 7.2.1 Outgoing calls addresses

Always, when calling a Picophone party, one of these formats should be used:

[subaddress] @ IP address [: port number]  
[subaddress] @ DNS host name [: port number]  
[subaddress] @ Picophone identity

The last syntax can be used only in conjunction with a Picoserver.

##### 7.2.2 Incoming calls addresses

Incoming calls addresses are always represented in this way:

subaddress @ Picophone identity

The subaddress can be empty.

##### 7.2.3 Incoming calls called subaddresses

This syntax is used in the **Number** field in the black list, when a call made to a QPhone subaddress should be deflected somewhere.

= called subaddress

# Appendix

## Specifications

### General

8 waiting, held or active calls handled

### Standards

ISDN CAPI 2.0, A-law G.711 coding

Picophone protocol, GSM, Truespeech and G.723.1 coding

### Supported ISDN supplementary services

- Calling Line Identification Presentation
- Calling Line Identification Restriction
- Connected Line Identification Presentation
- Direct Dial In
- Subaddressing
- User to user signalling
- Advice of charge
- Call waiting
- Call hold
- Call deflection
- Three party conference
- Terminal portability
- Explicit call transfer

### Audio format

16 bit linear WAV files, sampled at 8, 16, 32 or 48 kHz

Mixed mono files or stereo files (far end and local end in different channels)