

Mobile Phone as PC-TV Remote Control

By

Mohd. Anas Bin Mohd. Anuar

Dissertation submitted in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION AND COMMUNICATION TECHNOLOGY)

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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
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Approved by,

(Mr. Anang Hudaya Muhammad Amin)

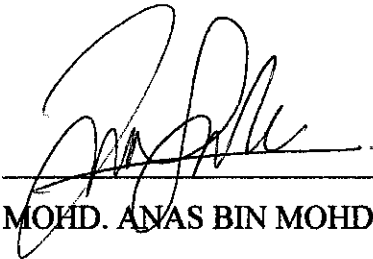
UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

June 2006

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except specified in the references and acknowledgements and that the original work contained herein have not been taken or done by unspecified sources or persons.



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ABSTRACT

Mobile Phone PC-TV Remote Control would provide the easiest way and better communication via Bluetooth communication on controlling PC-TV application installed inside a computer. Basically, Bluetooth Mobile Phone PC-TV Remote Control is replacing the usage of the infrared remote control because of the better connection by the Bluetooth connectivity instead of using infrared connectivity which requires line-of-sight approach. The scope of study is focuses on the development of the system on the Bluetooth mobile phone as the remote control on controlling the TV application in a computer. However, there are two main application needed and to be installed in the mobile phone side and also in the computer. These applications will be developed using NetBeans IDE 5.0 as Java 2 Micro Edition (J2ME) toolkit for mobile phone and Microsoft Visual Basic as Graphical User Interface (GUI) development tool for the personal computer.

ACKNOWLEDGEMENT

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CHAPTER 1

INTRODUCTION

1.1 Background of study

As entitled to final year project, the author chose "*Mobile Phone as PC-TV Remote Control*" as his topic for his final year project. Basically, Mobile Phone as PC-TV Remote Control is a remote control that able to control TV application installed inside a computer (PC). Fascinatingly, mobile phone will be use as a remote control in enabling the control of TV application. Based on his studies for this project, these are the important elements that he has covered for his background of study:

1. PC-TV Application
2. Bluetooth
3. Symbian OS
4. Mobile Phone as Remote Control using Bluetooth

1.1.1 PC-TV Application

Currently, there is capability to watch television (TV) through a computer. In fact, to make it happen, we need to install TV Tuner hardware inside the computer. This TV Tuner or also known as TV card comes with the TV application software where the user needs to interact with the application in order to configure the setting. The setting enable the application connect and retrieve the TV frequencies or terrestrial broadcast using connectable TV cable or antenna.

Nowadays, there are lots of brands for TV Tuner available in the current technology market such as InfoSmart PC-TV Tuner, Wayjet TV Tuner, PixelView TV Tuner and so on. In fact, PC-TV tuner comes with other external devices such as remote control, infrared receiver and so on.

1.1.2 Bluetooth

Basically, Bluetooth is wireless connection and has a number of interesting features that can simplify our daily lives. Nowadays, the art of connecting things is becoming more and more complex every day. There are lots of different ways that electronic devices can connect to one another. For example:

- Many desktop computer systems have a CPU unit connected to a mouse, a keyboard, a printer and so on.
- A personal digital assistant (PDA) will normally connect to the computer with a cable and a docking cradle.
- A TV will normally connect to a VCR and a cable box, with a remote control for all three components.
- A cordless phone connects to its base unit with radio waves, and it may have a headset that connects to the phone with a wire.
- In a stereo system, a CD player and other audio devices connect to the receiver, which connects to the speakers.

When we use computers, entertainment systems or telephones, the various pieces and parts of the systems make up a community of electronic devices. These devices communicate with each other using a variety of wires, cables, radio signals and infrared light beams, and an even greater variety of connectors, plugs and protocols.

Bluetooth is a standard developed by a group of electronics manufacturers that allows any sort of electronic equipments, for example from computers and cell phones to keyboards and headphones where it is to make its own connections without wires, cables or any direct action from a user. Bluetooth is intended to be a standard that works at two levels:

- It provides agreement at the physical level. In fact, Bluetooth is a radio-frequency standard.
- It also provides agreement at the next level up, where products have to agree on when bits are sent, how many will be sent at a time and how the parties in a conversation can be sure that the message received is the same as the message sent.

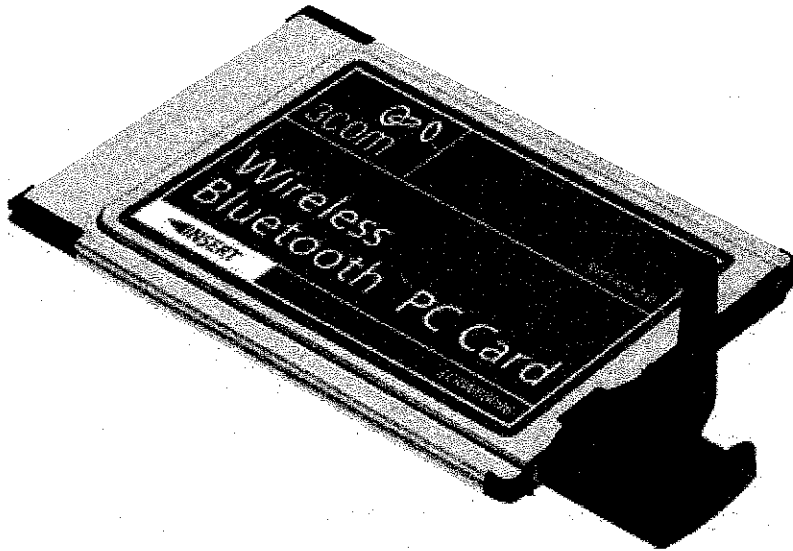


Figure 1: Bluetooth Wireless PC card

Figure 1 shows the Bluetooth Wireless PC card especially fit to the laptop or notebook. For the laptop or notebook, there will be PC card slot for the owner or the laptop to fit in any additional PC card such as network PC card, memory PC card and mostly for this project is Bluetooth Wireless PC card.

1.1.3 Symbian OS

Generally, Symbian OS is an operating system with associated libraries, user interface frameworks and reference implementations of common tools, produced by Symbian Ltd. However, Symbian is currently owned by Ericsson, Panasonic, Nokia, Samsung, Siemens AG and Sony Ericsson. There are multiple user interface flavours that use the Symbian OS such as UIQ and Nokia. The adaptability of the user interface enables the use of Symbian OS

on various form-factors of hand-held devices such as clam-shell or tablet, keyboard or pen, PDA or mobile phones, and others.

Symbian OS's major advantage is the fact that it was built for handheld devices, with limited resources, that may be running for months or years. There is a strong emphasis on conserving memory using Symbian-specific programming such as descriptors and a cleanup stack. Together with other techniques, these keep memory usage low and memory leaks rare. There are similar techniques for conserving disk space although the disks on Symbian devices are usually flash memory. Furthermore, all Symbian OS programming is event-oriented and the CPU is switched off when applications are not directly dealing with an event. This is achieved through a programming idiom called active objects. Without using these techniques properly, an application can wear down the battery of a phone in just a couple of hours. All of this makes Symbian OS's flavour of C++ very specialised with a steep learning curve. However, many Symbian OS devices can also be programmed in Visual Basic, Python, Simkin and Perl together with the J2ME and Personal Java flavours of Java.

Nowadays, Symbian OS competes with other mobile operating systems such as Windows Mobile, Palm OS and Linux. It also competes with the embedded operating systems used on lower-end phones such as NOS and OSE which tend to be maintained by the phone companies them. Symbian OS' major advantage over these embedded operating systems is its modularity where there is runtime linking between DLLs on the device and an emphasis on plug-in architectures. This makes complex phones quicker to develop although this is sometimes offset by the complexity of Symbian OS C++ and the awkwardness of going to another company for an OS instead of doing it in-house.

The advantages over other 'open' OS competitors such as Linux and Windows Mobile, the last one is not Open Source which are more debatable. Phone vendors and network operators like the customisability of Symbian OS relative to Windows. This customisability makes integrating a Symbian OS phone more difficult. It is possible that Linux goes too far in the other direction and is simply too hard to make a phone from at the moment. Symbian OS's ground-up design for mobile devices should make it more power and memory-efficient, as well as being flexible.

1.1.4 Mobile Phone as Remote Control using Bluetooth

Basically, Mobile Phone Remote Control is a remote controller for your PC. Currently, most of the advance mobile phone capable to enable the Bluetooth in the mobile phone into a universal PC remote controller. Most of the purpose is to use the Bluetooth Remote Control both for business and pleasure.

Bluetooth Remote Control is a true universal remote control. It allows the user to modify the current behavior as well as add support for new applications. We can add support by writing Java or VB scripts, defining key maps and file actions. With key maps the user can very easy and fast define application actions and link them to any buttons on the mobile phone.

1.2 Problem statement

The problem statement for this project is the weakness of the Infrared communication on remote control environment. By implementing the resulted product of this project, it will improve the better communication on remote controlling. Infrared remote control needs a direct line of sight while communicating with transmitter device and sometime it is difficult to get even a communication signal while directing the remote control to its transmitter. Therefore, it needs to have a better communication in remote controlling environment and the communication method propose is Bluetooth communication.

Nowadays, most of the students are interested and put the entertainment as their way for relaxing their mind from the stress of study. Furthermore, most of the students are intent and enjoy watching television as their major meal during the free and ample time. From the survey, most of the students owned a computer as their major medium of studying. Therefore, instead of using it for doing the assignments and projects, some of the students also owned TV tuner as their mass media device on gaining newest information locally and globally.

Furthermore, all of the students owned at least a mobile phone as the major communication device as to communicate with family, friends and other persons. In fact, mobile phone currently is a powerful device which is most of the people in over the world should own. From both devices, we could make good enhancement as to provide the easy way to replace infrared remote control with the Bluetooth Mobile Phone Remote Control. As stated before, Bluetooth is the advance connection than infrared where the infrared is basically needs the line-of-sight approach. Furthermore, the matter of replacing the remote control with mobile phone is to provide the easiest finding of the remote control whenever the user was misplaced it.

1.3 Objectives

The main objective of this project is to replace the infrared remote control with the advance Bluetooth Mobile Phone Remote Control. Basically, other objectives for this project are:

- To provide the better connection between remote control with the application by using Bluetooth remote control.
- To provide easiest way of controlling the TV application.
- To make the Bluetooth connection as a major approach on remote control.
- To avoid the communication losses instead of using Infrared communication.

- To implement and enable Bluetooth Mobile Phone to other functionality such as remote controlling.
- As alternative way being remote control.

1.4 Scope of study

The scope of study for this project is the implementation on the mobile phone Bluetooth enabled as the major communication or connection as a remote control which is focusing on developing an application for Bluetooth mobile phones. Nowadays, most of the mobile phone especially advanced mobile phone enables Bluetooth communication for connecting to other external device such as hand-free or ear-phone. Connection between a computer and Bluetooth mobile phone can also be enabled as it needs the receiver or adapter connected to the computer. Therefore, from there the connection between the computer and Bluetooth mobile phone could establish.

As the establishment of that connection, users could enable Bluetooth mobile phone to control their installed TV application. Instead of using mobile phone as their communication device, their also enabled their mobile phone as PC-TV remote control device. Therefore, the Bluetooth communication can usefully implement in the remote control communication and environment. As related category, mobile phone is an entertainment and communication device which is same as the PC-TV that is also an entertainment and communication application.

CHAPTER 2

LITERATURE REVIEW

2.1 Mobile Phone as Bluetooth Remote Control VS Mobile Phone as PC-TV Remote Control

Currently, most of mobile remote control especially mobile phone which has Bluetooth connectivity is able to remotely control desktop on the computer, PowerPoint presentation and see the actual slides in the phone and change songs that are currently being played on Media Player, browse for artists, albums, change volume and much more.

However there are lots more program and application currently support by the Bluetooth Remote Control. In fact it support for additional programs that can easily be added with simple keymaps, VB or Java scripts. Currently, the supported applications are:

- **ITunes**
 - Shows song name, artist & track time
 - Browse playlists, songs, artist, album, composers, genres
 - Search for song
 - Play/pause, rewind, fast forward, change volume, previous/next track

- **PowerPoint**
 - Shows next slide and slide notes
 - Shows actual slides on supported phones
 - Play/stop presentation, previous/next slide
 - Load recently used file

- **WinAMP**
 - Shows song name, artist & track time
 - Search for song and artists
 - Play/pause, rewind, fast forward, change volume, previous/next track

- Toggle shuffle mode
- Windows Media Player
 - Play/pause, rewind, fast forward, change volume, previous/next track
- Mouse mode
 - Full support for controlling the PC mouse
 - See the computer desktop on the phone
 - Zoom in and out of the desktop
- File Browser
 - Allows launching of files
- System
 - Change system volume
 - Start screensaver
 - Lock workstation
 - Shutdown Windows
 - Reboot Windows
 - Start screensaver
 - Sleep System
 - Hibernate System

Therefore, the additional application that plans to develop is a Symbian application which connects to TV application supported by Wayjet TV Tuner. However, the concept of application control is mostly similar to the WinAmp and Windows Media Player. But there is an additional feature to be added on controlling or changing the channel frequencies.

2.2 Piconet on Bluetooth

A Bluetooth device playing the role of the "master" can communicate with up to 7 devices playing the role of the "slave". At any given time, data can be transferred between the master and one slave; but the master switches rapidly from slave to slave in a round-robin fashion. Simultaneous transmission from the master to multiple slaves is possible, but not used much in practice. These groups of up to 8 devices (1 master and 7 slaves) are called piconets. Either device may switch the master/slave role at any time. The Bluetooth specification also allows connecting two or more piconets together to form a scatternet, with some devices acting as a bridge by simultaneously playing the master role in one piconet and the slave role in another piconet.

2.3 Bluetooth VS Infrared Data Association (IrDa)

For the clearer view, Bluetooth technology can operate in the globally available 2.4 to 2.5 GHz band. It facilitates the voice and data transfer. As stated before, Bluetooth consists of a piconet that includes up to eight devices which are one for the master and seven for the slaves. It provides also point-to-point and point-to-multipoint connections. In fact, Bluetooth uses ad hoc which is frequency hopping radio links to establish connections with devices. Bluetooth communicating devices need not see each other or fall in the line of sight (omni-directional) compared to infrared communicating devices. Bluetooth is also has a range of operation between 10 meters to 100 meters and it has an estimated rate of data at 721 kbps.

However, the main competing technology working on a low-cost interoperable wireless technique is Infrared Data Association (IrDA). IrDA is the main contender of the cable replacement market sector that uses the infrared interface standard. This technique for wireless data transmission is limited to point-to-point connections. As a result, only two devices can communicate with each other at a time. In addition, the devices are non-omni-directional which is requires to aim the IrDA beam directly at the antenna transceiver.

Currently, a new technology called Red Beamer from an Israeli company, Infra-Comm, has been able to overcome to non-omni-directional feature of IrDA. As a result, IrDA devices can now link without being in the line of sight of each other. However the initial transmission speed for the Red Beamer is rather slow at 56 kbps as compared to that of Bluetooth which is almost reach 1 mbps.

Table 1: Comparison of IrDA and Bluetooth Communication

Feature and Function	IrDA	Bluetooth Communication
<i>Connection type</i>	Infrared, narrow beam, line of sight	Spread spectrum, spherical
<i>Spectrum</i>	Optical 850-900 nm	RF 2.4 GHz
<i>Transmission power</i>	40-500 mW/Sr	10-100 mW
<i>Maximum data rate</i>	9600 bps-16 Mbps	1 Mbps
<i>Range</i>	1 m	10-100 m
<i>Supported devices</i>	2	8 (active), 200 (passive)
<i>Voice channels</i>	No support	3
<i>Addressing</i>	32-bit physical ID	48-bit MAC

Table 1 show the comparison between the IrDA and Bluetooth communication where it is shows that the Bluetooth communication has more advantages and pros on communication environment. The most crucial and important part is the connection type which very important and crucial for this project. As shown at the above table, the connection type for Bluetooth communication is spread spectrum or spherical which means it allows more and effective communication by enable the wall penetration compare to the Infrared (IrDA) connection which requires line of sight and unable to penetrate wall or blocking object.

CHAPTER 3

METHODOLOGY

3.1 Research and Planning Phase

At the early stage, research took place and the research is mostly regarding the latest mobile phone available in our country by surveying from shop to shop and also by surfing the Internet. Based on the survey, Nokia is the most preferable mobile phone in our country. He managed to gain a lot of information on mobile phone by casual interviewing the mobile phone sellers. Basically, most of the mobile phones are using Symbian OS.

During the research phase, lots of information regarding the Bluetooth communication, mobile phones, Symbian OS, J2ME and mobile development toolkits have been discovered. The resources for the research are books, Internet search, articles, journals, forum, e-books, doing experimentation, surveying, from friends and from lecturers.

3.2 Analyze and Planning Phase

Based on the analysis and survey, the most suitable mobile phone languages in order to develop the applications that will be installing and using inside mobile phone and also the computer are discovered. As the basic analysis, the NetBeans IDE 5.0 for Java 2 Micro Edition (J2ME) will be used as the application development for mobile phone Symbian OS which the complete product will be installed inside the mobile phone. Meanwhile for the computer side or interaction, the Visual Basic (VB) or GUI will be used as application medium.

3.3 Design and Developing Process

In the designing stage, designing and developing for one application for the mobile phone interaction and one application for computer interaction are very crucial. Therefore, as mentioned earlier that the programming tool that going to use for mobile phone interaction is Java 2 Micro Edition (J2ME) which is NetBeans IDE

5.0. Meanwhile for the personal desktop computer interaction is Microsoft Visual Studio as development toolkits. However, there is an existing program that going to use for this project in order integrating the Bluetooth enabled phone with the computer.

However for the project management development tools, these are the tool uses:

- Microsoft Word – for documentation and reports
- Microsoft Project – for project schedule (Gantt Chart)
- Microsoft Visio – for Data Flow Diagram (DFD)
- Adobe Photoshop – authoring tools (for graphic design)

As stated before, NetBeans IDE 5.0 is the main development on mobile application. The advantage on using this development tool is because it is easy to designing the interfaces and developing the source code for J2ME.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Result

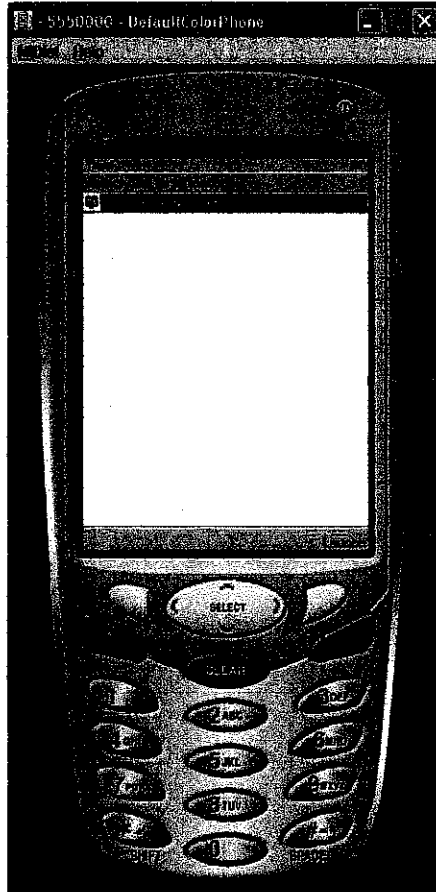


Figure 2: Menu on Mobile Phone interaction

Figure 2 shows the menu on the phone for mobile PC-TV Remote control. At this menu, user needs to select and open the application using the phone button functionality which is shown at Figure 2 where there is a word 'Launch' which means by pressing the upper right corner button, it will open or launch the application selected.

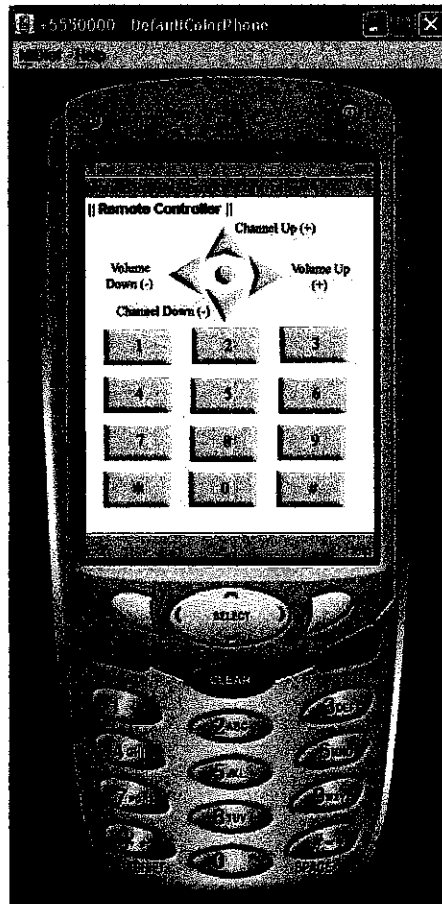


Figure 3: PC-TV Remote Control on Mobile Phone

Figure 3 shows the interface on the mobile phone for PC-TV Remote Control. At this interface, user is able to make use and take control over the PC-TV application in the computer. The interface was designed similar or almost similar to the usual remote control and fitted to the mobile phone buttons in order to avoid the conflict between the mobile phone keys usage with the remote control buttons usage. Furthermore, for this project, it is only applying and using the basic usage and functionality of a remote control which are include the number keys or buttons, channel control, and volume control.

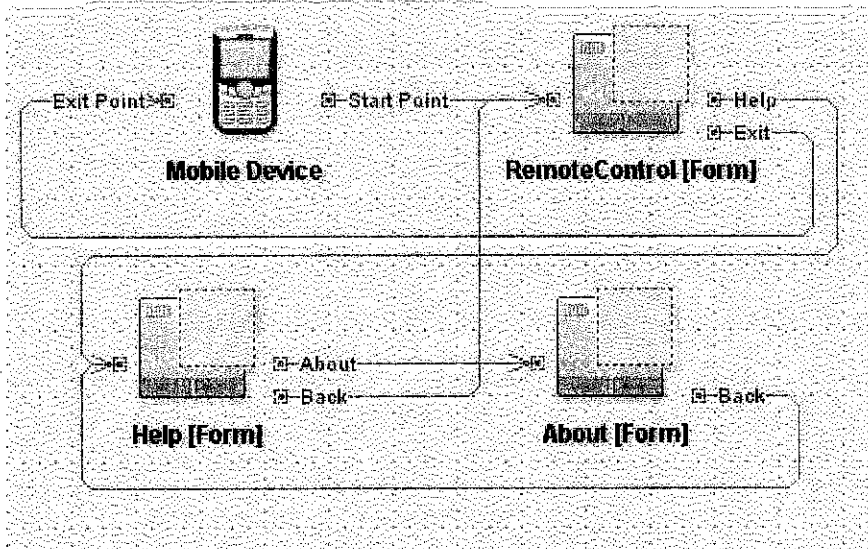


Figure 4: System Flow Diagram

Figure 4 shows the system flow of the mobile PC-TV remote control in mobile phone. The above diagram shows the flow of the system or the flow of the interfaces in the PC-TV mobile application. However, as shown in Figure 4, there is a Bluetooth device discovery implementation stage between the 'Mobile Device' phase and 'RemoteControl[Form]' phase. At the Bluetooth device discovery implementation stage, there will be the searching and detecting for other Bluetooth devices in order for the application to get connection with the other devices. However, for this mobile application, it only allows a single Bluetooth connection and also allows to a Bluetooth enabled computer which included with PC-TV application.

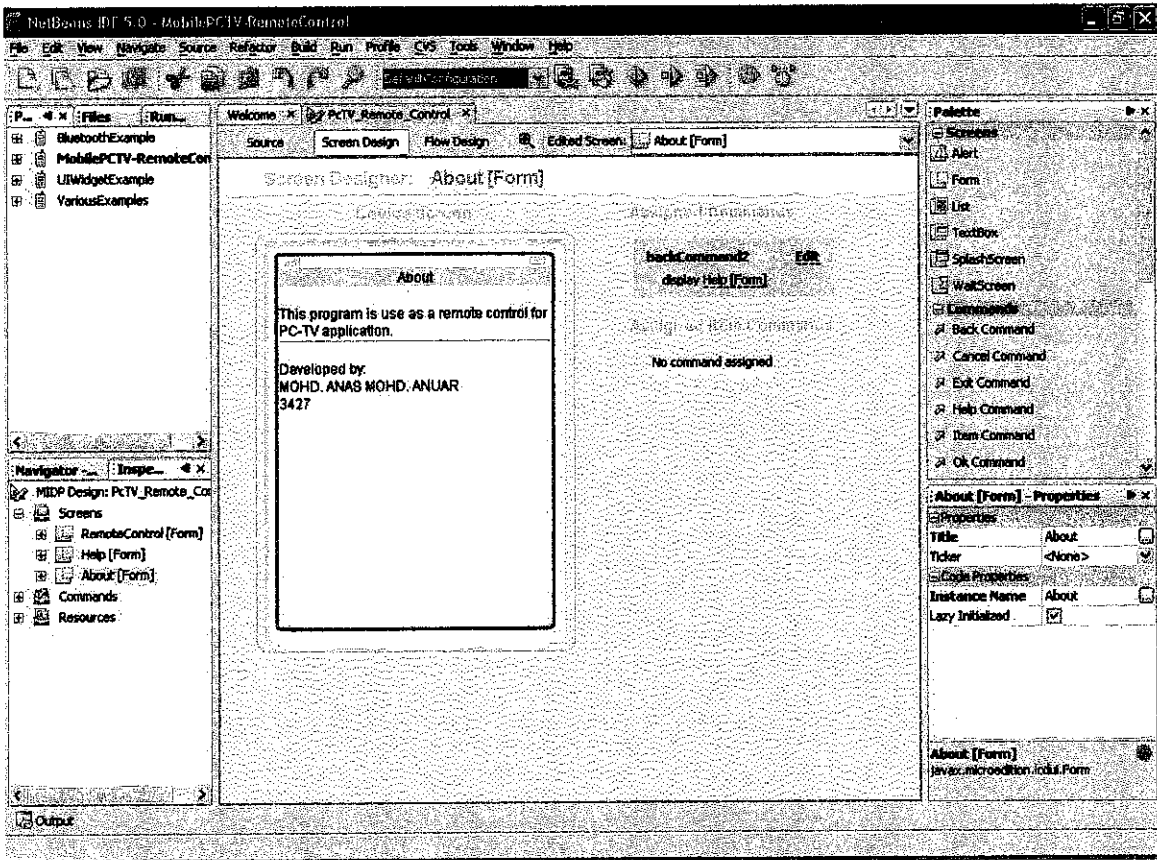


Figure 5: Screen Display

Figure 5 shows the screen display on NetBeans IDE 5.0. In NetBeans, designer or developer is able to form and design any screen display or interface for the mobile application. Designer or developer can use the basic features or criteria available in creating and developing a mobile application interface or form. The basic features in creating interface or form are such as command button, text item, label or string, ticker, image insert and list item.

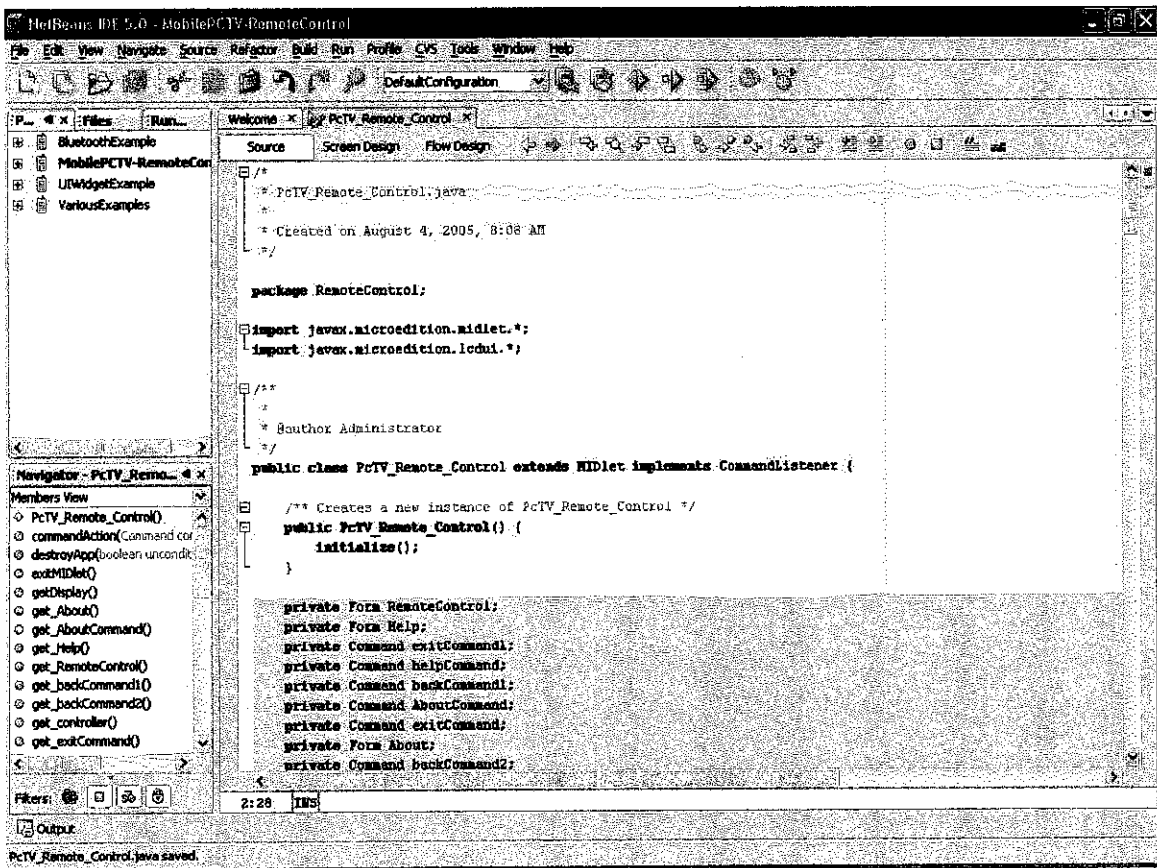


Figure 6: Screenshot of J2ME Source Code

Figure 6 shows the screenshot of J2ME source code on NetBeans IDE 5.0. At this view, user or developer can program and establish the codes for the J2ME program. J2ME is extended version of Java language. Therefore, in creating and developing the codes for the J2ME program, it needs the knowledge, the concept, and the logical of Java programming or language.

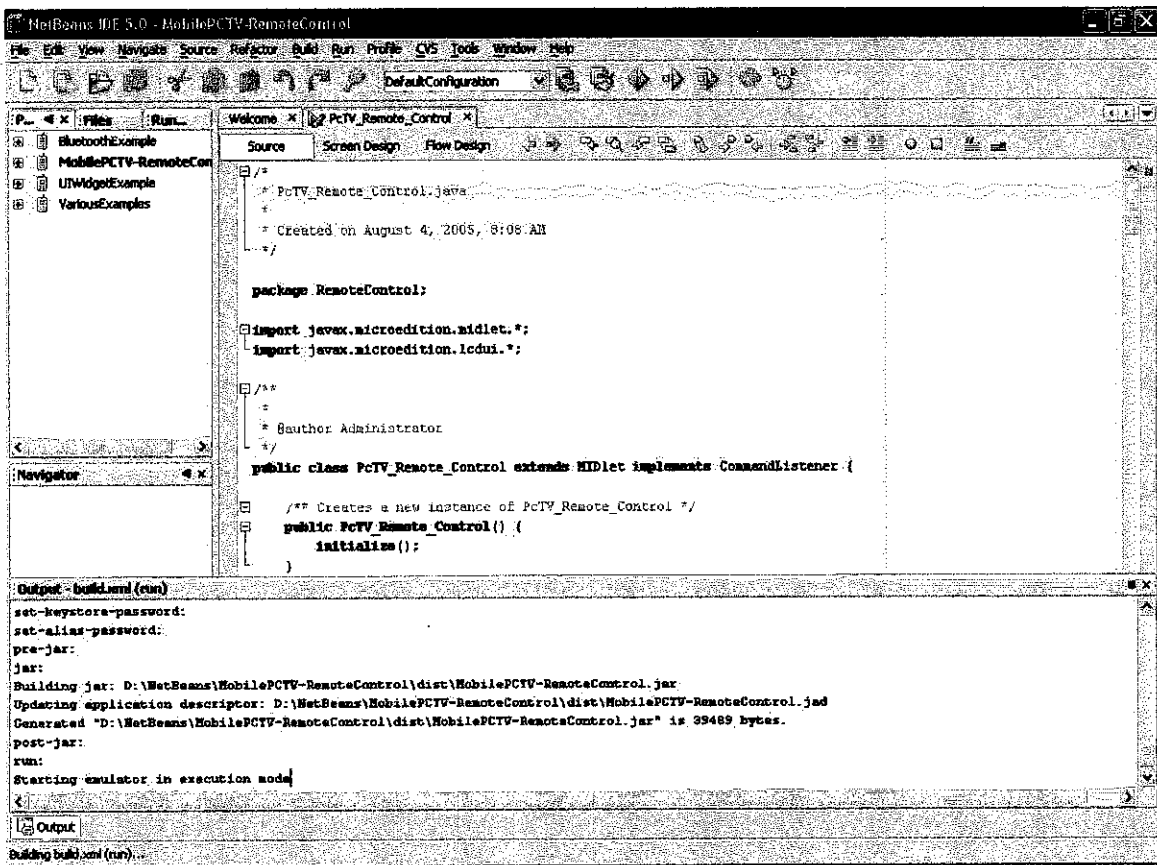


Figure 7: Screenshot for compiling source code

Figure 7 shows the screenshot on compiling the J2ME source code using NetBeans IDE 5.0. At this view, Figure 7 shows the compiler log of compiling the J2ME source codes in order to create a program or application. Therefore, the output of the compilation of source codes will generate and establish an application as shows at Figure 2 and Figure 3.



Figure 8: Screenshot for WAYJET PC-TV Application on computer

Figure 8 shows the screenshot for the WAYJET PC-TV Application that going to use and install inside the computer. This PC-TV application is use as a medium or player for the PC-TV.

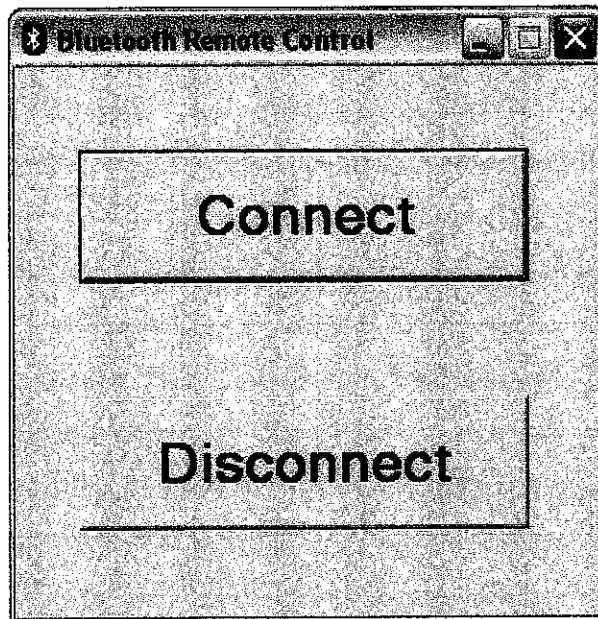


Figure 9: Interface on the computer interaction

Figure 9 shows the screenshot of the interface on the computer side for the connection integration medium between mobile phone and computer. This simple program will integrate with the mobile application in order to allow the Bluetooth connection with between the computer and mobile phone.

4.2 Discussion

The above figures show that the expected results of interfaces that will be develop and any enhancement would be better than the above views. As explained earlier, there will be two kind of application that will be use and develop in this project, which are one from the computer interaction and the other is from the mobile phone interaction. The Figure 2 shows one of the interfaces that will be use for the computer (PC) interaction. Meanwhile, the Figure 3 and 4 show the interfaces or screen that will be use as a Bluetooth remote control for PC-TV controlling.

4.2.1 NetBeans IDE 5.0 and Mobility Pack

NetBeans IDE 5.0 is the latest version of the NetBeans IDE application on developing the IDE modules and rich client applications based on the NetBeans platform. In fact, NetBeans IDE is a modular and standards-based integrated development environment (IDE) written in the Java™ programming language. Basically, the NetBeans project consists of:

- An open source IDE written in the Java programming language.
- An application platform, which can be used as a generic framework to build any kind of application.

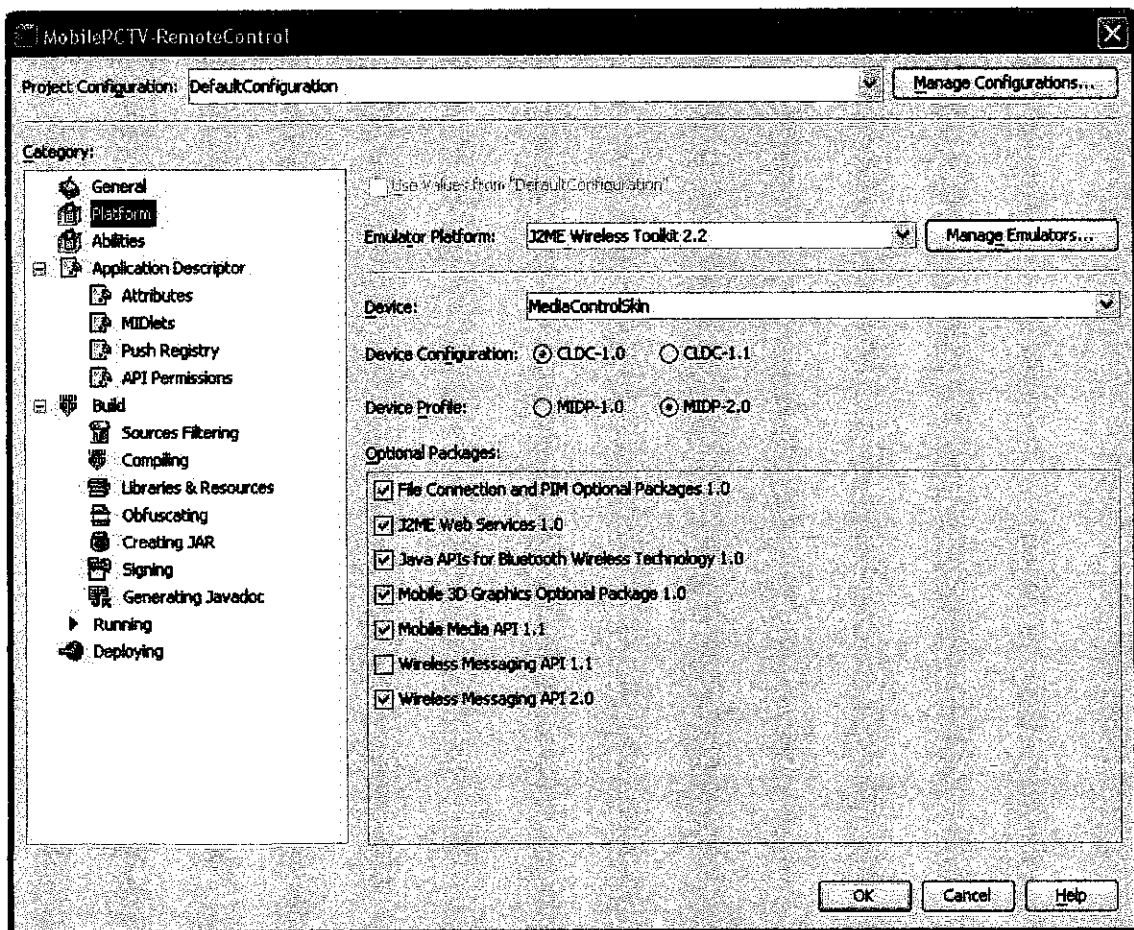


Figure 10: Screenshot for configuration on the project platform

Figure 10 shows the screenshot of the configuration for the project platform. For this mobile application of the project, the most important configuration for the mobile application are shown in Figure 10 where the emulator platform is using the J2ME Wireless Toolkit 2.2, the device configuration is CLDC-1.0, and the device profile is MIDP-2.0.

4.2.2 Series 60 Developer Platform

The Series 60 Developer Platform is a complete smartphone software package that provides a mandatory base of technology implementations. The Series 60 Developer Platform enables application and service developers to produce smartphone products for the Series 60 Platform. While the term "Series 60 Platform" encompasses the technologies of the relevant version of the Series 60 Developer Platform on which it is based, it also provides an optional range of lead software that licensees may wish to support. Devices based on the Platform therefore provide the developer with a guaranteed set of technologies while allowing the manufacturer to differentiate between devices by choosing the lead software options best tailored to the target consumer segment. By providing a standardized platform while maintaining a high degree of flexibility, the Series 60 Developer Platform is well positioned to maintain its market leader status in the smartphone sector.

4.3 Finding

The findings for this project are the understanding of the Java Bluetooth API and Bluetooth with J2ME MDIP. Basically, these findings are focus on the mobile phone application development and programming. Generally, Java Bluetooth API is use to create a wireless application. In creating a wireless application, codes or scripts is the major element of application development. Therefore, writing the scripts is the obligation aspect to have and know. Briefly, the basic components of a Bluetooth application consists stack initialization, device management, device discovery, service discovery, service registration and communication.

Stack initialization can consist of a number of things, but its main purpose is to get the Bluetooth device ready to start wireless communication. Stack initialization sequences can vary, and it's heavily dependent upon the underlying OS and Bluetooth radio. *LocalDevice*, *RemoteDevice* and *DeviceClass* are the classes in the Java Bluetooth specification that form the Generic Access Profile and allow user to perform device management. Device discovery is the method of finding the other Bluetooth devices such as laptop, printer, fax and so on. Service discovery includes the finding of the services available in the connected Bluetooth devices. Service registration is the process of internal registration the services of the devices before a Bluetooth client device can use service discovery on a Bluetooth server device. In fact, Bluetooth is a communication protocol and the official Java Bluetooth API gives three ways to send and receive data.

Generally, Java 2 Micro Edition (J2ME) and Mobile Information Device Profile (MIDP) are use to create the Java Bluetooth application by developing MIDlets. A *MIDlet* is a Java application that runs on a mobile device and uses the Mobile Information Device Profile. MIDlets can be created by extending the *javax.microedition.midlet.MIDlet* class. A MIDlet has three states in its life cycle which are active, paused, and destroyed. Those three states correspond to three methods that are consist of *startApp()*, *pauseApp()*, and *destroyApp()*. One or more MIDlets packaged together in a JAR file constitute a *MIDlet suite*. Software on the mobile device called the *application manager* and it is responsible for loading, running, and destroying the MIDlet.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

As conclusion, *Mobile Phone as PC-TV Remote Control* would provide better performance on controlling the PC-TV application using the mobile phone. Bluetooth is the effective wireless connection for the remote control. In fact, Bluetooth technology is fast emerging as a solution toward replacing infrared and wired connections with a more economical, simple and low power consuming technique. Therefore, with the Bluetooth enhancement on *Mobile Phone as PC-TV Remote Control* could give the fastest control especially on the TV application installed in a computer. The advent of Bluetooth will further increase and unlock the potential of mobile communication especially mobile phone. With the broad market support from the PC and mobile phone industries, it wouldn't be wrong to predict that the future of PC-TV and Bluetooth seem to be very bright as its provide the better entertainment and connection.

5.2 Recommendation

The project is considered successful as compare to with its stated objectives and aim. However, there are lots of spaces for the future work since the technology is relatively new and still at the alpha and beta stage. Some of recommendations that can be done as continuation of this project are stated in the below paragraphs.

The project topic is only focused on developing the Bluetooth mobile phone application in beta version. The project can be done to extend to the more functions and features capability which has more controls on the PC-TV application.

Further, it is can be focused on mobile phone application as a TV application where the mobile phone will be use as a viewer to see a TV inside a mobile phone. This enhancement would need the Bluetooth communication implementation as it will be more useful and save.

CHAPTER 6

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CHAPTER 7

APPENDICES

7.1 HOW TO USE MOBILE PHONES AS A REMOTE CONTROL TO PC

If you have a GPRS and Bluetooth-enabled cellphone then you can do a lot of things with it other than just make calls and send SMSs. There are two different usages of such phone, one is synchronizing the cellphone and the PC by that you can control some of the PC's applications from the phone.

These can be done by using the phone to control the volume of your PC, navigate the mouse cursor and control a PowerPoint presentation. On the other hand, you can make calls from your PC and even send SMSs with the ease of a keyboard and send them over Bluetooth. You can even take backups of your phone data to our PC. To do these, we need software such as FMA (FloAt's Mobile Agent). The software is available for Sony Ericsson models and those using other phone models can do a search in websites.

The other thing that we will talk about in this article is using any standard WAP/GPRS-enabled phone to read our local mail from our office PC, access files and even run commands on it through the phone and get the output back, no matter wherever we are. We just need to have GPRS connectivity in that area.

Controlling PowerPoint

To remotely control PowerPoint presentations we need: a Sony Ericsson phone, a Bluetooth dongle for your PC/notebook (if you don't have a Bluetooth-enabled PC) and FMA installed on your PC. (Win XP has enhanced its Bluetooth support with Service Pack 2; therefore, you don't need to install the drivers for the USB-Bluetooth dongle. XP automatically recognizes its presence and configures it for you.) First download the FMA software from www.fma.sourceforge.net and install it on your PC.

Then set the connectivity options from the Tools Options menu. Now to use your phone as a remote control, go to the Connectivity Accessories option of the phone. Here you will find a new menu called FMA. Selecting it will open a list of Windows applications. Each of these applications has different options to remote control it. For example, if you want to remote control a PowerPoint presentation, select the PowerPoint menu. Here you will see four new menus (Start Show, Next Slide, Prev Slide and End Show), which means you can perform all these actions from your phone. You can even control your mouse from here

(Mouse Control menu). Besides Bluetooth, the software can work over IR or even a data cable. Since it doesn't depend upon line of sight like IR, Bluetooth works the best for it. Moreover, you can use the Bluetooth proximity option to automatically logoff your PC, when your mobile phone is out of the Bluetooth range.

Remote control to your PC

This function could be useful for power users or network administrators who want to control their PCs remotely using their cellphone. This is done using the WAP browser on your GPRS phone and you can check your mail, access files and even run some commands from it. The DataLocker Desktop Agent software (download from www.mydatalocker.com) converts your PC into a WAP server. The basic functionality of the software, called Basic Plan, is free and has a session limitation of 5 minutes. After downloading and installing the software, you have to first create a new login at the datalocker's website. Do this and get yourself a username and password. Now start the software, which will ask you for the username and password that you registered with. Then go to the service tab and click on the Start button to start the WAP server on your machine.

To access this machine from your phone, just open the WAP browser on it and enter the URL www.mydatalocker.com/mobile.aspx. It will open a page that asks you for the same username and password. Provide these to login. You'll get four links, namely 'My documents', 'My Mail', 'Command Prompt' and 'Flight Info'. Select the first one to see all

documents in the corresponding folder on your machine. Use the second option to read MS Outlook mails, and the third option will open a new page where you can type any Windows command that will be executed on your machine and the output sent to your mobile phone.

Datalocker is a very beneficial tool. If you have a dial-up DSL connection at home, then it will give a dynamic IP address to your machine every time you connect. So when you are away from home and want to connect to your home PC, using WinXP Remote Desktop Sharing, then you can use datalocker to determine the dynamically assigned IP. For this, you can use your phone to connect to datalocker and run the 'ipconfig' command, which will give you your machine's IP. This way, you can remotely access your desktop.

7.2 Bluetooth Mobile Remote Control for WinAmp by Branimir Lambov barnie@dir.bg Version 0.1b

This is a general purpose plug-in for WinAmp that lets you use your bluetooth-capable mobile phone as a remote control. It uses accessory menus to give you full control over your multimedia center from anywhere within the bluetooth range. For details about the requirements and setup, please read the plugin's readme file.

This remote control engine also accepts custom menus provided by other plugins (API is available on request). The current version of the Winamp TV plugin makes use of this. Hopefully the support for this API will grow and we'll be able to see other plugins offering their custom menus as well as other remote control systems that can use them e.g. in on-screen displays.

- Download gen_btcr version 0.1b.
- Readme file.
- Planned improvements (todo file).

The plugin is shareware. You can try it for 30 days after which you have to register by donating EUR 10.

If you are looking for a more general application for using your mobile phone as a remote control, you should also look at the following options:

- uICE with Bluetooth device driver can natively use devices without support for accessory menus (e.g. Siemens S55) and is highly customizable and scriptable.
- Jeyo remote can control Winamp as well as other functions in your computer with somewhat more restricted functionality.
- For Macintosh computers Salling Clicker and Romeo offer full control with completely customizable menus and scripts.

Links

- Winamp TV plugin, TV-tuner support for Winamp.

- Bluetooth mobile phone device driver for uICE.

What's this for?

This is a general purpose plugin for WinAmp that lets you use the accessory menus of a (Sony) Ericsson phone to control WinAmp. Use it to change the current song, to see what is playing, to change the volume or the full-screen state of the video window. More functions are coming.

The plugin has an API using which other WinAmp plugins can offer their own menus (under development, available to developers on request). Currently only the WinAmp TV plugin makes use of this to offer a menu which is more suitable for watching TV if one of its files is being played.

Requirements

A bluetooth-capable (Sony) Ericsson mobile phone with accessory menus. Supported models include T39, T68, T610, and T630. Alternatively, the devices supported by Veta Universal should also work (Nokia, Palm, Symbian).

On the computer side, you need a bluetooth device and a working serial port (RFCOMM) connection to the mobile phone.

Setup

Make sure you have a working serial port connection with your mobile phone. If your bluetooth device uses WIDCOMM drivers, right-click on the bluetooth icon in the tray, select "Quick Connect", "Bluetooth Serial Port" and select your mobile phone. When the connection is established, the drivers will display the communication port the connection uses.

Open the configuration menu of the "Bluetooth Remote Control v0.1" general purpose plugin. Select the communication port the bluetooth drivers use to communicate with the

mobile phone and press apply. In a few seconds the status line should read something like: "Ready and connected to SONY ERICSSON".

In your mobile phone, go to the Connectivity submenu and select Accessories and Winamp. You have entered the Winamp remote control.

Status

This plugin is shareware and is distributed according to the license in "gen_btcr_License.txt". It is free for testing purposes up to 30 days, after which you are expected to register by making a donation using the plugin's site. The sum for the donation is EUR 10.

The driver has only been tested with a SonyEricsson T610. If you have anything else and have tried the driver, please drop a line to let me know.

This is the first version of this plugin. Comments, suggestions, bug reports are welcome.

Send mail to barnie@dir.bg.

The plugin's main page is <http://wabtrc.zapto.org>

Welcome to the Winamp TV plugin for WinAmp page.

Winamp TV is a plugin for Winamp that lets you control your TV tuner card from within the multimedia player. TV and FM radio channels are saved as small files which can be enqueued in a playlist, added to the music library or just played one by one. To change a channel, you only have to change the track in Winamp: so you can arrange the channels any way you like, you can have Winamp or a general purpose plugin randomize them for you, or make different playlists with e.g. preferred selections of channels for the morning or evening. Every channel has its own settings for the video adjustments, the TV system used, stereo/SAP audio and volume.

The plugin lets you run the sound of the TV or radio stations through Winamp's equalizer, DSP and output plugin. You can use this to get better sound, or to correct

problems with a channel (using the automatic equalizer settings). The video can be output in a separate window with captioned or thin frame, or just attached to Winamp's video window. The plugin can also use the Video Mixing Renderers which avoids the problems associated with overlays (i.e. problems in multi-monitor setups and multiple applications trying to display video), and lets you select different de-interlace options, or use the comprehensive on-screen menus.

Version 1.9, which is in beta stage now, offers recording and initial support for digital cards. Some features are not working yet, see the readme file for details. Version 1.9beta7 has new OSD configuration in addition to the new audio code and configuration from 1.9beta6, which also lets you record without the requirement to capture and route the audio through Winamp. The configuration dialogs have tool tips explaining the various options in 1.9beta8, and 1.9beta9 supports satellite tuners with BDA drivers.

The lite versions are stripped-down versions of the betas that only support the stable features. They do not support digital tuners, recording, and sending the audio to Winamp.

- Download Winamp TV version 1.9lite9 (May 2, 2005)
- Latest beta version: 1.9beta9 (May 2, 2005)
- Readme file
- Compatibility information (please contribute)

If you want to contribute to the continued development of this project, and help me believe that I have not wasted my time and efforts doing it in the first place, please use the button below. There is a list of improvements in the todo file that depend entirely on your support.

If you have any suggestions, comments, or problems about the plugin that you want to share with me, send mail to barnie@dir.bg.

Translated versions

- Bulgarian: 1.9lite9/1.9beta9

- French: 1.7 (translated by winampfr.com)
- German: 1.7 (translated by Maximilian Kramer)
- Spanish: 1.9lite9/1.9beta9 (translated by Fer Morfer)

Version archive

- version 1.9beta8b (Apr 25, 2005)
- version 1.9lite8a (Apr 21, 2005)
- version 1.9beta6 (Mar 30, 2005)
- version 1.9lite6 (Mar 30, 2005)
- version 1.9beta5 (Feb 14, 2005)
- version 1.9beta4 (Nov 22, 2004)
- version 1.9beta3 (Sep 10, 2004)
- version 1.7d (Apr 28, 2004)
- version 1.7 (Apr 8, 2004)
- version 1.6a (Mar 26, 2004)
- version 1.6 (2000/XP only) (Mar 23, 2004)
- version 1.5b (2000/XP only) (Feb 26, 2004)
- version 1.5 (Feb 15, 2004)
- version 1.5 in German
- version 1.4a (Dec 7, 2003)
- version 1.3 (Aug 26, 2003)
- version 1.2 (May 25, 2003)
- version 1.1 (May 17, 2003)
- version 1.01 (End 2001)
- version 1.0 (July 20, 2001)

Links

- the Bluetooth mobile phone remote control plugin for Winamp
- the Bluetooth mobile phone device driver for uICE

Bluetooth mobile phone device driver for uICE by Branimir Lambov barnie@dir.bg
version 1.1

What's this for?

This is a device driver that allows you to use your bluetooth mobile phone as a remote control. It lets you use all the keys on the phone's keyboard plus a few events such as a received SMS.

The generic functionality, taking commands from a keyboard-locked phone, is available on all bluetooth phones. Additionally, accessory menus and more understandable setup are only available on phones that accept accessory menus, i.e. products of Ericsson or Sony Ericsson.

Configuration is easy, provided you have a working Bluetooth setup and a serial port mapping to your phone. Select the "Bluetooth mobile phone" device in uICE, in the hardware configuration is sure to select the serial port that maps to the Bluetooth connection to the phone.

(Sony) Ericsson Bluetooth phones

These phones accept accessory menus. Select "Setup" mode and when the phone connects (the status line should read "Ready and connected to <phone manufacturer and model>") you should be able to start learning the keys. On your phone, find "uICE remote" under Accessories in Connect. Select it to enter the setup menu which allows you to send keys and also simulate the events that the driver supports. Use them to teach uICE.

When you're done with the setup, switch to either "Accessory" or "Keylocked" mode. In the first, commands are only sent to uICE if you're in the "uICE remote" accessory menu of the phone. In the latter, keys will also be sent when the phone's keyboard is locked. In keylocked mode you can also use the key "C", but beware that this command will also be

sent when you unlock the phone, so it's best to assign to it some informative operation. Be careful with sequences such as 112, Yes!

Other Bluetooth phones

The initial setup here is a bit more complicated. You can teach uICE the special commands first: select "Setup" mode and when the phone connects (the status line reads "Ready and connected to <phone manufacturer and model>. Menus not available.") you will be able to send the special commands using the number keys (see the codes below). After that you will have to teach uICE the normal keys, and this you can do by entering

"Keylocked" mode

When you're done with the setup, make sure you're in "Keylocked" mode. Keys will be sent when the phone's keyboard is locked. The key that unlocks your phone will also be available for a command, but beware that it will be sent when you unlock the phone, so it's best to assign to it some informative operation. Be careful with emergency numbers and sequences that may dial them!

Accessory mode is not useful with these phones. Selecting it will result in only receiving the additional events.

Additional events

In addition to the keyboard, four events are supported. These are

- Phone is ringing (code 1)
- received an SMS (code 2)
- established connection with the phone (code 3)
- lost connection with the phone (code 4)

You can make some nice automatic actions with these, e.g. you can mute the PC's sound when the phone rings and alert with a message on the screen, and you can use the "established connection" event to make the computer launch your favorite internet site when you come home, or just tell you girlfriend or wife.

7.3 Java 2 Platform, Micro Edition

From Wikipedia, the free encyclopedia.

Java Micro Edition (Java ME or as it used to be referred to **J2ME**), is a runtime and collection of Java APIs for the development of software for resource constrained devices such as PDAs, cell phones and other consumer appliances.

Java ME was designed by Sun Microsystems and is a replacement for a similar technology PersonalJava.

Java ME has become a popular option for creating games for cell phones, as they can be emulated on a PC during the development stage and easily uploaded to the phone. This contrasts with the difficulty of developing, testing, and loading games for other special gaming platforms such as those made by Nintendo, Sony, and others, as expensive system-specific hardware and kits are required.

Sun Microsystems has tended not to provide free binary implementations of its Java ME runtime environment for mobile devices, rather relying on third parties to provide their own, in stark contrast to the numerous binary implementations it provides for the full Java platform standard on server and workstation machines. One of the notable omissions is for Microsoft Windows Mobile (Pocket PC) based devices, despite an open letter campaign to Sun to release a rumoured complete project "Captain America" which is such an implementation.

Configurations and Profiles

Java ME devices implement a *profile*. The most common of these are the Mobile Information Device Profile aimed at mobile devices, such as cell phones, and the Personal Profile aimed at consumer products and embedded devices like Set-top boxes and PDAs.

A profile is a superset of a *configuration*, of which there are currently two: Connected Limited Device Configuration and Connected Device Configuration.

Connected Limited Device Configuration

The CLDC contains a strict subset of the Java class libraries, and is the minimal needed for a Java virtual machine to operate. CLDC is basically used to classify the myriad of devices into a fixed configuration.

Mobile Information Device Profile

Designed for cell phones, MIDP boasts an LCD-oriented GUI API, and MIDP 2.0 includes a basic 2D gaming API. Applications written for this profile are called MIDlets. Almost all new cell phones come with a MIDP implementation, and it is now the de facto standard for downloadable cell phone games.

Information Module Profile

The Information Module Profile (IMP) is a Java ME profile for embedded, "headless" devices such as vending machines, industrial embedded applications, security systems, and similar devices with either simple or no display and with some limited network connectivity.

Originally introduced by Siemens Mobile and Nokia as JSR-195, IMP 1.0 is a strict subset of MIDP 1.0 except that it doesn't include user interface APIs — in other words, it doesn't include support for the Java package `javax.microedition.lcdui`. JSR-228, also known as IMP-NG, is IMP's next generation that is based on MIDP 2.0, leveraging MIDP 2.0's new security and networking types and APIs, and other APIs such as `PushRegistry` and `platformRequest()`, but again it doesn't include UI APIs, nor the game API.

IMP applications are called *IMlets*, but in reality they are MIDlets. They subclass `MIDlet`, and follow the same packaging, deployment, security and life-cycle as MIDlets.

Connected Device Configuration

CDC is a smaller subset of J2SE, containing almost all the libraries that are not GUI related.

Foundation Profile

A headless version of J2SE.

Personal Basis Profile

Extends the Foundation Profile to include lightweight GUI support in the form of an AWT subset.

Personal Profile

This extension of Personal Basis Profile includes a more comprehensive AWT subset and adds applet support.

External links



Wikibooks Programming has more about this subject:

J2ME

- [The Source for Java ME Developers \(Java ME Homepage\)](#)
- [J2ME.org Forum](#)
- [SprintDevelopers.com](#) Java ME Programming for SprintPCS (Operator)
- [developer.nextel.com](#) Java ME Programming for Nextel (Operator)
- [www.motocoder.com](#) Java ME Programming for Motorola phones
- [forum.nokia.com](#) Java ME Programming for Nokia phones
- [www.vipera.com](#) Java ME Programming for Vipera mobile network
- [developer.samsungmobile.com](#) Java ME Programming for Samsung phones
- [www.sony-ericsson.com/developer](#) Java ME Programming for Sony-Ericsson phones
- [Micro Developer Network](#) Resource site for Java ME Developers with more industry related info.
- [J2ME Polish](#) Open Source Development Tool for Java ME
- [mBooster](#) A J2ME optimization suite with integrated J2ME optimizing compiler
- [ngphone.com/j2me/opensource/](#) Java ME Open Source Software Directory
- [JavaMEDeveloper.com](#) Resources for Java ME Developers
- [openwap.org](#) Open Source Midlets News and Software
- [SophiaCompress\(Java\)](#) A compression tool that instantly minimizes the size of a J2ME application in JAR format, with graphical user interface for easier use.
- [Java Tech Talk](#) All about Java Technology. Every thing between try {} catch.
- [An Example Midlet \(MIDP1.0+\)](#). Thousands of Midlets are now available. This is an example of an established free one.