User Manual Specification

OTS Multimedia Remote Control RC197xx

PHILIPS CONFIDENTIAL

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Table of contents

1. Introduction

1.1 Purpose of this document

The purpose of this document is to define and describe the UI, function and feature requirements of the multimedia Remote Control RC197xx. The multimedia remote will control Windows Vista Media Center PC; it's a wireless speaker & microphone, floating mouse for browsing & navigation, and gesture control for game applications.

This document is to get a common understanding between the customer, Philips product management and development team about the functions and features of the product range.

1.2 Scope

The document covers the user interface or behaviour as well as command table of the multimedia remote control. For complete technical requirement in terms of electrical, mechanical and approbation topics, do refer to the Multimedia Remote Control RC197xx SRS document.

1.3 Product introduction

TBC

1.4 Edition history

Version	Status	Date	Author	Modification(s)
0.1	Draft	18-Jun-08	CMK / RSI	Initial version
0.1a	Draft	20-Jun-08	CMK / RSI	Add 1D game mode, vibration feedback
0.2	Draft	24-Jun-08	CMK / RSI	After internal 1st review
0.3	Draft	30-Jun-08	CMK / RSI	- After Lenovo review. - Delete 1D game mode & 1D LED: feature of up / down / left / right via gesture controls remain via new user interface. See section 3.2 - Rename 2D / 3D to 3D / Motion in the new passport.
0.4	Draft	03-Oct-08	CMK / RSI	Amend gaming UI and printing
0.5	Draft	24-Oct-08	CMK / RSI	Various UI updates

1.5 Definitions, acronyms and abbreviations

MCE	Windows Media Center
UI	User Interface
IR	Infra Red
OTP	One Time Programmable
ROM	Read Only Memory
EEPROM	Electrical Erasable Programmable ROM
RAM	Random Access Memory
MCU	Micro Controller Unit
LED	Light Emitting Diode
OTS	Off The Shelf
RC	Remote Control
SRS	Software Requirements Specification
OS	Operating System
OEM	Original Equipment Manufacturer
BT	Bluetooth®
RF	Radio Frequency
3D	Gesture motions translate to Gamepad HID profile (X,Y…. channel)
Motion	Gesture motions translate to Joystick HID profile (IaX, IaY...channel)

1.6 Reference documents

MCE HID Command	Title	VistaHIDRequirement June 2008 (Draft 1)
	Document ID	
	Author	Microsoft e-Home
	Publisher	Microsoft Corp.
	Version	Draft 1
	Date	June 2008
MCE IME	Title	TBA
	Document ID	
	Author	Microsoft e-Home

Publisher	Microsoft Corp.
Version	
Date	

Title	
Document ID	
Author	
Publisher	
Version	
Date	

1.7 Distribution list

Name	Organisation	Function
Jean Lim S.Y.	Home Control	Project Manager
Rick Siu / Che Mun Kiat	Home Control	Product Managers
Timothy Ho / Ford Chen	Home Control	Commercial
Lim Hong Chiang	Home Control	System Architect

1.8 Pending items

No	Items	Action by	Deadline

2. General product description comment

2.1 Product perspective

This multimedia Remote Control RC197xx controls MCE on a Vista PC.

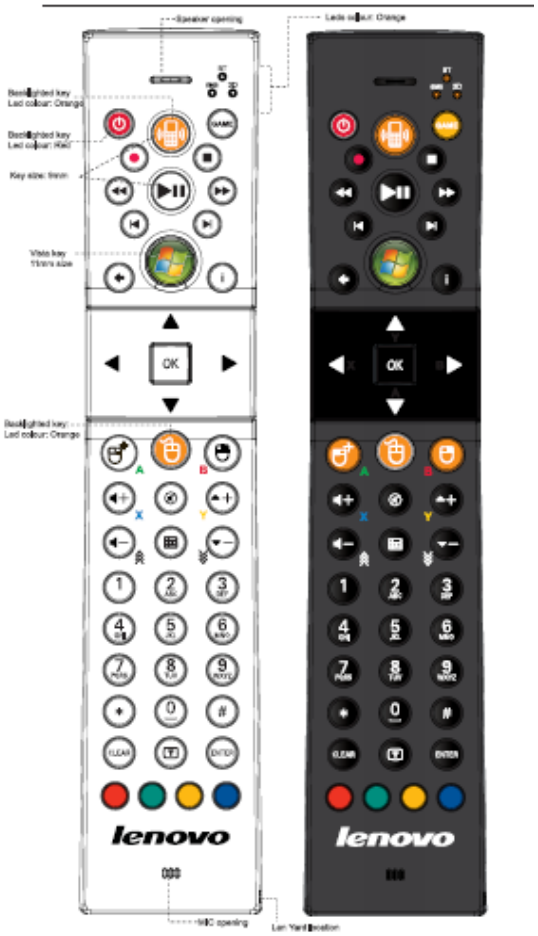
The wireless speaker & microphone, gesture control and floating mouse feature of this remote utilise the standard Headset/Handsfree profile and HID profile of Bluetooth 2.0, and it works in pair with a Bluetooth® (BT) host controller interface (HCI) device on the PC.

RC197xx has built in microphone and speaker comment for use as a wireless handset.

2.2 Product functions

RC197xx base version has English 46 or 41 keys. Various IME versions with different printings for different languages / countries text input purpose based on Microsoft MCE IME requirement will be a derived.

For the 41 (& 46) keys version; there are 36 (& 41 with teletext keys) MCE required keys, 1 Game Mode select key, 1 handset key, 1 Mouse on/off and 2 left-right Mouse select keys.



2.2.1 Windows Media Center control

RC197xx operates Windows Media Center as a standard Media Center remote control through BT with Vista HID commands. comment.

2.2.2 Wireless handset

RC197xx has built in speaker and microphone.

Press  *button to toggle between mute & un-mute both the speaker & microphone. comment*

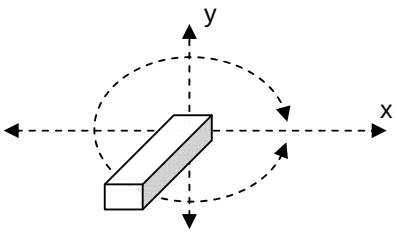
2.2.3 Game control input

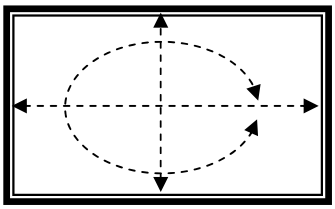
Provide X-Y-Z raw data input to special game application in the PC for interpretation into gesture control for gaming use. The hand-arm movements (while holding the remote control) will be captured and represented by 3 axes (X, Y, Z) data by on-board 3-axis accelerometer.

In the remote control there is also a motor that vibrates comment according to feedback from the game.

2.2.4 Floating mouse cursor control

Floating mouse cursor control is the control of mouse cursor by means of holding and moving RC197xx in the air. The relative movement of panning and lifting (or, yaw and pitch) will control the mouse cursor to move in the same relative direction on the PC screen.





The floating mouse cursor control is handled by on-board 2-axis gyroscope & the 3-axis accelerometer.

2.3 Power management

Due to higher power consumption nature of this remote control, rechargeable battery is highly recommended comment.

However, the used of 3xAAA alkaline batteries is possible if the customer accepts the inconvenience of user having to replace the batteries frequently. Simulation of the estimated lifespan of using 3xAAA alkaline batteries is to be provided separately.

Proper power management for battery energy conservation is needed, to achieve the indicated battery life.

2.3.1 Stuck key time out

Stuck key means a button has been pressed for a very long time in normal operating mode. To preserve battery power, the remote will stop sending and shut down at about **30** seconds after the last key transition to consume minimal power. After all keys are released, the remote resumes normal operation.

Stuck key time out is not implemented on the corresponding A/B/X/Y keys at all time .

2.3.2 Remote idling Bluetooth® link time-out with connection

When detected no key press and none of the wireless speaker & microphone, Mouse & Game mode is Active, the remote control will enter STANDBY mode. During STANDBY mode, BT link is still maintained with host PC, moving or press any key will resume the remote control to ACTIVE mode almost immediately. Once the BT link has been established, the remote control will execute the **ANY** press.

When remote control wakes up from SLEEP, there will be re-connection latency of about **1~3** seconds for the BT link..

Once the BT link has been established, the remote control will execute the **ANY** press.

2.3.3 Bluetooth® broken link comment

When BT connection lost due to PC system sleep or system shutdown (S3, S4 or S5 state), remote will enter SLEEP mode immediately.

When BT connection lost due to out of range, remote will enter SLEEP mode after **10** min if it remains out of range.

2.3.4 Rechargeable battery

Not applicable for this version comment.

2.3.5 Battery low power handling & indication

When the remote control is in ACTIVE mode, and if the battery voltage level is **xV** + **yV** (system inoperable voltage) - the **red** LED under the “Power” key will blink **1 time** every **3** seconds to indicate battery low. All functions are usable. The remote control will continue to function for another **1** hour (based on highest consumption, i.e., speaker & microphone un-mute mode), before it reaches **yV**. The remote control shuts down.

When user press any key to the remote control to try waking it up, and if the battery voltage level =< **yV**, the **red** LED under the “Power” key will blink comment **3 times** every **1** second for **3** seconds, at the same time there is beeping added 3 times every 1 sec for 3 seconds as well. The remote control is inoperable, and new batteries are needed comment.

When new batteries are replaced, there will be no LED indication on the “Power” key.

3. Functional requirements

BT link of RC197xx should be paired with the PC. Pairing is via simultaneous pressing of **Play/Pause** & **numeric 1** key for **3** seconds. Once the BT is paired, under normal circumstance the user does not need to do it again. Once paired, the default is always in RC mode.

Depending on interaction of the remote control and the application on PC, availability of function sets is listed as below:

In general, Remote Control functions / keys are available in Mouse / speaker & microphone / Game mode. Mouse / speaker & microphone / Game modes however, are mutually exclusive.

Windows Media Center control:

Function sets	Status
Remote Control	Active
Mouse	Ready to activate by pressing the Mouse key
Speaker & Microphone	Ready to activate by pressing the  key
Game	Ready to activate by pressing the Game key

Floating mouse cursor control:

Function sets	Status
Remote Control	Active
Mouse	Active
Speaker & Microphone	Ready to activate by pressing the  key
Game	Ready to activate by pressing the Game key

Wireless handset:

Function sets	Status
Remote Control	Active
Mouse	Ready to activate by pressing the Mouse key
Speaker & Microphone	Active
Game	Ready to activate by pressing the Game key

Game control:

Function sets	Status
Remote Control	Ready to activate by pressing the MCE key or exit game mode right?
Mouse	Ready to activate by pressing the Mouse key
Speaker & Microphone	Ready to activate by pressing the  key
Game	Active

3.1 Bluetooth®

Except for Remote Control, standard BT profiles are used:

- Remote Control Vista HID
- Floating Mouse: Mouse HID profile
- Gesture control: Standard Joystick HID profile
  Philips custom control Joystick HID profile comment
- Wireless handset: Headset / Hands free profile

Support for these profiles should be available in driver distributed with most BT host controller interface (HCI) devices, or more commonly known as BT transceiver dongle/module.

3.1.1 Bluetooth® pairing

User action	System action
Start BT Device Wizard on PC	BT LED blinks **3** times per **1** second for **3** seconds. (Whenever any key is pressed and the BT is not paired.)
Press & hold **Play/Pause** & numeric key **"1"** for **3** seconds on RC.	Once RC enter pairing mode, there is a beep tone and RC BT LED blinks **2** times per 1 second, for **60** sec** (time-out countdown)
Start BT device search on PC Wizard	PC Wizard found RC197xx BT Device
Select RC197xx to pair on PC Wizard	PC Wizard prompt for pairing passkey
Enter "0000" as passkey on PC Wizard	Passkey accepted and BT paired**. PC Setup BT profile: HID and headset. RC BT LED stays **ON**
** If BT pairing unsuccessful after **60**sec, BT LED turns OFF.	

3.1.2 Bluetooth® ACTIVE / STANDBY / SLEEP

Set BT Active: (when it is in SLEEP mode)

User action	→	System action
Press ANY key on the Remote Control.		BT wakes up.
		BT LED blinks **1** time per **1** second* to **ON** once it is active comment.
		Execute ANY key command.
* As there will be a BT connection time of 1 ~ 3 seconds.		

Set BT Active: (when it is in STANDBY mode)

User action	→	System action
Press ANY key on the Remote Control.		BT resumes almost immediately.
		BT LED stays ON. At STANDBY LED STAYS ON.
		Execute ANY key command.

3.1.3 Bluetooth® auto connection

When the BT wakes up or resumes from SLEEP/STANDBY or come back within range of a power on paired PC, BT link will be re-connected automatically. No BT re-pairing is needed.

3.1.4 Bluetooth® out of range

When the BT is out of range, the BT LED blinks **1** time per **1** second, and go to SLEEP in **10** min comment if it remains out of range.

3.2 Windows Media Center

For HID specification detail, please refer to [VistaHIDRequirement June 2008 Draft 1]. Except for Speaker & Microphone, Game, Mouse & Left / Right altogether 5 keys, the rest are available for Windows Media Center control.

None of the MCE remote control keys is back lighted.

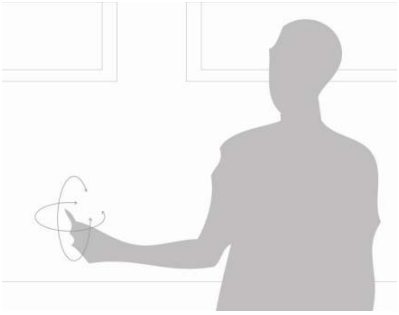
When no key press is detected, the remote control goes on STANDBY, the BT LED stays ON comment, and after **10** min the remote control goes to SLEEP if the PC is ON but the BT LED goes OFF. If the PC is in S3, S4 or S5 state, the RC immediately goes into SLEEP, the BT LED goes OFF.

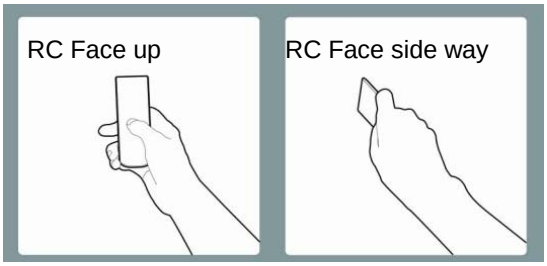
When the RC is not in Mouse, Game or Speaker & Microphone mode, the RC can send up / down / left / right via gesturing. These are done via press & hold the Left mouse button and swing the RC, with a predefined speed & acceleration parameters that trigger sending of the commands.

3.3 Floating Mouse

The floating mouse cursor is by means of relative pointing, as such even the user do not face the screen of PC – the relative panning and lifting (or, yaw and pitch) movement will cause the mouse cursor move in the same relative direction of the remote control. Floating mouse is making use of HID Mouse profile comment.

Floating mouse cursor control is possible independent if the remote is facing up or facing side way. However, this feature is NOT implemented.





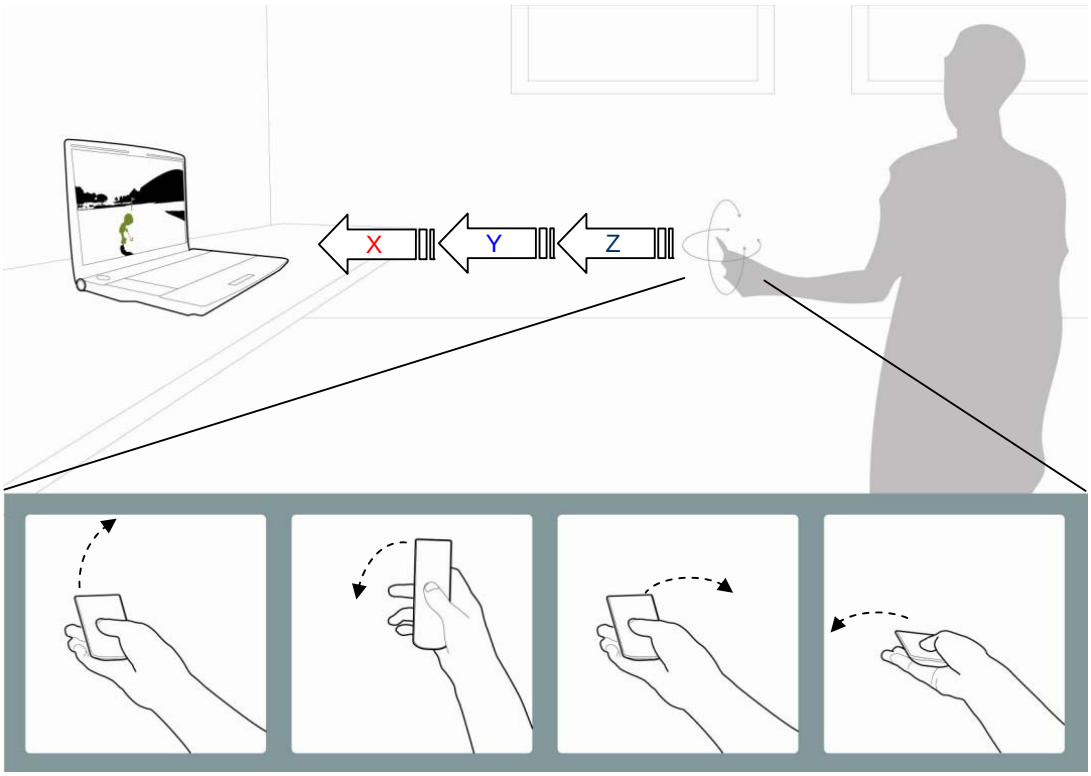
Mouse Left button and Mouse Right button will function at mouse mode only, except when gamepad mode, it is to be defined as part of game keys.

The floating mouse can be toggle ON and OFF by press and hold for 1 sec on the Mouse key. This is to avoid accidental / unintentional turning on/off the mouse during Game mode. When floating mouse is OFF mouse cursor on screen will not be moved by RC movement, until it is toggled ON again.

There is an **Orange** LED under the Mouse key. LED is ON / OFF when the Mouse is ON / OFF.

When the Mouse is ON, and there is no motion senses after comment after **15** seconds, the Mouse & the Mouse LED turns OFF. The remote control goes on STANDBY, the BT LED stays ON. Within 10 min if the remote is lifted up the Mouse mode and Mouse LED resume. If no motion senses after **10** min the remote control goes to SLEEP if the PC is on but the LED goes off. The RC goes into SLEEP immediately if the PC goes to S3, S4 or S5 state, and the BT LED turns OFF.

3.4 Game control



There are 2 game modes, 3D mode & Motion mode. Press the Game once each time will toggle between 3D mode > Motion mode > Game OFF.

In the remote control there is also a motor that vibrates according to feedback from the game. The feedback is through / according to Bluetooth standard profile.

In 3D Mode:

Game 3D **Orange** LED turns ON.

The Down/Right/Up/Left remote control keys are switched to standard joystick “hat” control commands (4 directions only) The Mouse L/R keys are switched to standard joystick A & B commands. Other keys are switched to X, Y, throttle up & down functions as in the key layout

The remote control senses the 3 axes raw data, and sends to the PC via HID gamepad profile.

In 3D game mode, the Mouse button / function can only be enabled by press & hold for **1** second, and the handset switch to Mouse mode.

When there is no motion senses after **15** seconds, the 3D LED turns OFF. The remote control goes on STANDBY, the BT LED stays ON. Within 10 min if the remote is lifted up the 3D game mode and the 3D LED resumes. If no motion senses after **10** min the remote control goes to SLEEP if the PC is on but the BT LED goes off. The RC goes into SLEEP immediately if the PC goes to S3, S4 or S5 state, and the BT LED turns OFF.

In Motion Mode:

Game Motion **Orange** LED turns ON.

The Up/Down/Left/Right remote control keys switched to the format that supports the motion game application of Up/Down/Left/Right control.

The Mouse L/R keys are switched to A, B controls.

The remote control senses 3 axes raw data, and sends to the PC via Philips defined protocol.

In Motion game mode, the Mouse button / function can only be enabled by press & hold for **1** second, and the handset switch to Mouse mode.

When there is no motion senses after **15** seconds, the Motion LED turns OFF. The remote control goes on STANDBY, the BT LED stays ON. Within 10 min if the remote is lifted up the Motion game mode and the Motion LED resumes. If no motion senses after **10** min the remote control goes to SLEEP if the PC is on but the BT LED goes off. The RC goes into SLEEP immediately if the PC goes to S3, S4 or S5 state, and the BT LED turns OFF.

When there is no motion senses after **15** seconds, the remote control exits Game mode and the 3D LED turns OFF. The remote control goes on STANDBY, the BT LED blinks **1** time per **1** second, and after **10** min the remote control stays on STANDBY if the PC is on but the LED goes off. The RC goes into SLEEP immediately if the PC goes to S3, S4 or S5 state, and the BT LED turns OFF.

3.5 Wireless Handset

Wireless handset function is provided by BT headset profile, the onboard microphone is mapped to audio-in of audio device of the PC, whereas onboard speaker is mapped to audio-out device.

There is an **Orange** LED under the  key, LED is ON / OFF when the speaker & microphone is ON / OFF.

The remote control will have NO power management / time out in speaker & microphone mode.

3.6 Indicator light behaviour

Indicator		**Status description**
Bluetooth® status indication		
BT LED	Blinks **2** times per **1** second for **3** seconds.	Whenever any key is pressed and BT is NOT paired with the PC.

BT LED	Blinks **2** times per **1** second for **60** seconds	BT has entered into pairing mode. The BT LED stays ON once pairing is successful.
BT LED	Blinks **1** time per **1** second	RC is out of range
BT LED	ON	BT is ACTIVE or STANDBY
BT LED	OFF	BT is SLEEP
3D LED	ON / OFF	Game 3D Mode ON / OFF
Motion LED	ON / OFF	Game Motion Mode ON / OFF
Mouse LED	ON / OFF	Mouse mode is ON / OFF
“icon” LED	ON / OFF	Speaker & microphone ON / OFF
Power status indication		
Power LED	Blinks **1** time per **3** second	Whenever the RC is ACTIVE and the Battery is low, RC is still operable.
Power LED	Blinks **3** times per **1** second for **3** seconds	Whenever any key is pressed and the Battery is flat, RC is inoperable.
Power LED	OFF	Battery is within normal operating range.

4. Non functional requirement

4.1 Hardware reset

no

4.2 Soft reset

no

COMPLIANCE WITH FCC RULES AND REGULATIONS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase or decrease the separation between the equipment and receiver.
- Consult the dealer or an experienced remote control/ technician for help.

This equipment has been verified to comply with the limits for a Class B computing device, pursuant to FCC Rules. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

FCC Authorization Label

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

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