

Guide to the Chumby

<http://www.chumby.com>



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For the Rogers Communications Centre (Ryerson University)
September 1, 2010





Welcome to the **Chumby Classic**! This guide will help you with the basics of using the Chumby. The **Chumby Classic** has already be initialized and set up for Internet, so the guide will detail how to create and implement an application for the Chumby.

If you have any questions or concerns about the **Chumby Classic**, please do not hesitate to contact Jeremy Littler at 416 979 5000 ext. 2222 or via email at jlittler@ryerson.ca.

Additionally, the Chumby website is also very straightforward and helpful: http://www.chumby.com/pages/help_support, as is the Chumby chat room: <http://forum.chumby.com/index.php>.



1.0 What is The Chumby?

The Chumby is a Linux-based embedded computer, providing Internet & LAN via a Wi-Fi connection. It is through its connection to the Internet that it is able to run various software widgets. It has a touch screen and is AC powered. A 9-volt battery connector is supplied for backup power.

(www.wikipedia.org/wiki/Chumby)

2.0 Chumby Features

The Chumby is has two (2) USB ports, speakers, a headphone jack, power button and power jack. The Chumby may automatically power on upon plugging it in. However, if this does not occur, press the power button at the back of the unit. The button at the top of the Chumby acts as a reset button if the Chumby freezes/cannot connect to the Internet, but will also bring the user back to the Control Panel where the Chumby's internal settings can be managed.

The following is a list of the settings that can be viewed/modified under the **Settings:**

1. Chumby Info – Complete specifications for the Chumby.
2. Volume – Adjust the audio settings for the Chumby.
3. Brightness – Control the brightness of the screen.
4. Time/Date – This has already been set, but you can adjust the time and date to reflect your location.
5. Network – Allows you to ensure you're connected to the Internet.
6. Touchscreen – Allows you to confirm the touch screen is responding properly.

Other Modifiable Settings in the Control Panel:

1. Alarms – Set an alarm.
2. Music – Connect to any of the preinstalled music stations on the Chumby or connect your iPod (via USB) or your own music files.
3. Night – Changes your Chumby into Night Mode – darkening the screen and displaying the time.
4. Mute – Mute any audio from the Chumby.
5. Channel – Change your current Chumby channel – meaning changing the widgets that cycle on your Chumby. These can be modified on your PC and can be uploaded to your Chumby.
6. Stay – If you select **Stay**, the widget you've selected will cycle over and over again.
7. Send – Allows the user to connect to other Chumby users and send them widgets, messages, etc.
8. Rate – Allows the user to rate the widgets

3.0 Hardware Specifications

The Chumby is designed to be an open source consumer electronic. All schematics, PCB (printed circuit board) layouts and packaging/outerwear designs are available online. See the Chumby wiki for further details:

http://wiki.chumby.com/mediawiki/index.php/Main_Page.

Here are the specs for the Chumby Classic:

The Original Chumby

- 350 MHz ARM9-based Freescale [i.MX21](#) controller
- 64 MB of SDRAM
- 64 MB of NAND flash ROM
- 320×240 3.5 inch touchscreen [TFT LCD](#) running at 12 frames per second
- Stereo 2 W speakers, an audio output, an integrated microphone
- Two [USB 2.0](#) ports
- Integrated [Wi-Fi](#)
- A bend sensor for squeeze-based user interface features
- Motion sensor ([accelerometer](#)).

4.0 Operating System & Playback

The Chumby runs on a modified Linux kernel. It has a 350Mhz ARM9 processor - similar in performance to a low-end Pentium desktop. There is an embedded version of Adobe Flash Player on the unit allowing a small set of user customizable widgets to be played, viewed and interacted with on the Chumby. The Chumby automatically updates itself when something new becomes available. All updates are free and come from accessing the Chumby Network. A modified BitTorrent client is used to upgrade the open-source portions of the firmware.

(www.wikipedia.org/wiki/Chumby).

As of May 2007, all versions of the Chumby use Flash Lite (version 3) allowing [Sorenson](#), FLV, H.264, [VP6](#) and [On2](#) video playback.

5.0 Uploading Widgets to the Chumby

In order to upload new widgets/change/create new channels for the Chumby, log onto the Chumby account at www.chumby.com.

User Name: MRLChumby

Password: chumbymrl

Once you've logged in, you can upload any existing widgets from other users to your Chumby, or you can upload your own. Users are free to create their own widgets and share them with the Chumby community. Under the Apps tab at the top of the homepage, you have the option to browse, subscribe, submit & send applications to any of your friends on the Chumby Network.

6.0 Developing for the Chumby

Widgets can be created using any version of Adobe Flash, however, they should be created in Action Script 2.0 and published in Flash 8 or earlier. Widgets can also be created in Flash Lite 3.0. Widgets can also be created using a PC freeware known as [FlashDevelop](#).

Features supported on the Flash Lite Player 3.1.5 are:

- Flash video (FLV) encoded with ON2 and Sorenson Spark codecs
- Video, NetStream and NetConnection classes
- Internal PNG Transparent (PNG-24)
- Internal GIF Transparent
- External MP3 files
- External PNG, GIF, non-progressive JPEGs

Not supported:

- Bitmap caching, bitmap effects or enhancements
- Filters
- Blend modes
- Style Sheets
- Non-default code pages
- Focal gradients
- Progressive JPEGs
- External GIF Transparent
- Non-round line caps and joins

The Chumby is a touch screen device, therefore it's important to note that mouseMove events will only occur while the mouseDown position. For example, buttons should not be designed to have a separate 'over' state, since the Flash player can't determine when to switch in and out of that state. Instead, button over states should be the same as their "up" state.

(http://wiki.chumby.com/mediawiki/index.php/Developing_widgets_for_chumby#Performance_and_Optimizations)

7.0 Creating a Chumby Application

First and foremost, keep it **simple**. The Chumby wiki suggests developers compress all images and audio; change dynamic text/property values when necessary; simplify vector graphics and avoid gradients, full frame animation, lots of text, processing a lot of data in a single frame & layered translucent areas. Lastly, use tweening sparingly – keep the tweening to one or two small objects at a time. For more tips and tricks on creating Chumby apps, check out their wiki: (http://wiki.chumby.com/mediawiki/index.php/Developing_widgets_for_chumby)

Now, creating a Chumby app is quite simple. It is very important to follow the specifications for the application or it will not upload to your Chumby.

7.1 Chumby Application Specifications:

1. Open up a project in Action Script 2.0 or Flash Lite 3.0
2. Go to Modify>Document and set the stage: (w*h) 320x240 pixels &12fps (frames per second)
3. Ensure your project is less than 15 minutes or 999 frames and <100k (kilobytes) in size
4. Publish in Flash Player 7 or Flash 8 if you are not supporting On2 Video
5. Upload application to www.chumby.com using the user/pass specified in this guide booklet
6. Create a thumbnail picture 60x80 pixels to represent your application (<http://www.slideshare.net/guest5343cb/chumby-flash-lite>)

7.2 Accelerometer Function

If you create an application that requires the user to tilt or shake the Chumby, you can code an accelerometer function that will have an object(s) move when/if the Chumby is tilted, shaken, or otherwise moved. Below are a few articles to better describe the coding involved with the accelerometer. The basic coding deals with

variables – this being the most basic form of the code:

```
var getAccelerometer:Function = ["ASnative"](5, 60);
```

1. http://www.adobe.com/devnet/devices/articles/chumby_development_06.html
2. <http://www.youtube.com/watch?v=QIhKRzZ05Mk>
3. <http://www.wonderhowto.com/how-to-collect-and-use-accelerometer-data-adobe-flash-cs5-390758/>
4. http://poster66.com/devnet/devices/articles/chumby_development_print.html
5. <http://www.nineteenfortyone.com/2010/03/accessing-the-chumby-accelerometer/>

7.3 Security

Another aspect of creating a Chumby widget is to ensure that you've implemented a *crossdomain.xml* file on any other servers that may have files connecting to your widget. For example, if your widget contains XML, LoadsVar or another SWF file, it's important that you disable the security block that will pop up on your widget if access has not been granted to these other servers. For details, visit these sites:

1. http://kb2.adobe.com/cps/142/tn_14213.html
2. http://wiki.chumby.com/mediawiki/index.php/Developing_widgets_for_chumby#Security

7.4 Common Widget Problems

- The movie is the wrong version - Flash Lite 3 will not play Flash 9 movies.
- The movie does not have sufficient security privileges – cross domain files may not exist on the external content servers
- The movie has the wrong dimensions - the widgets should be 320x240 (http://wiki.chumby.com/mediawiki/index.php/Developing_widgets_for_chumby)