

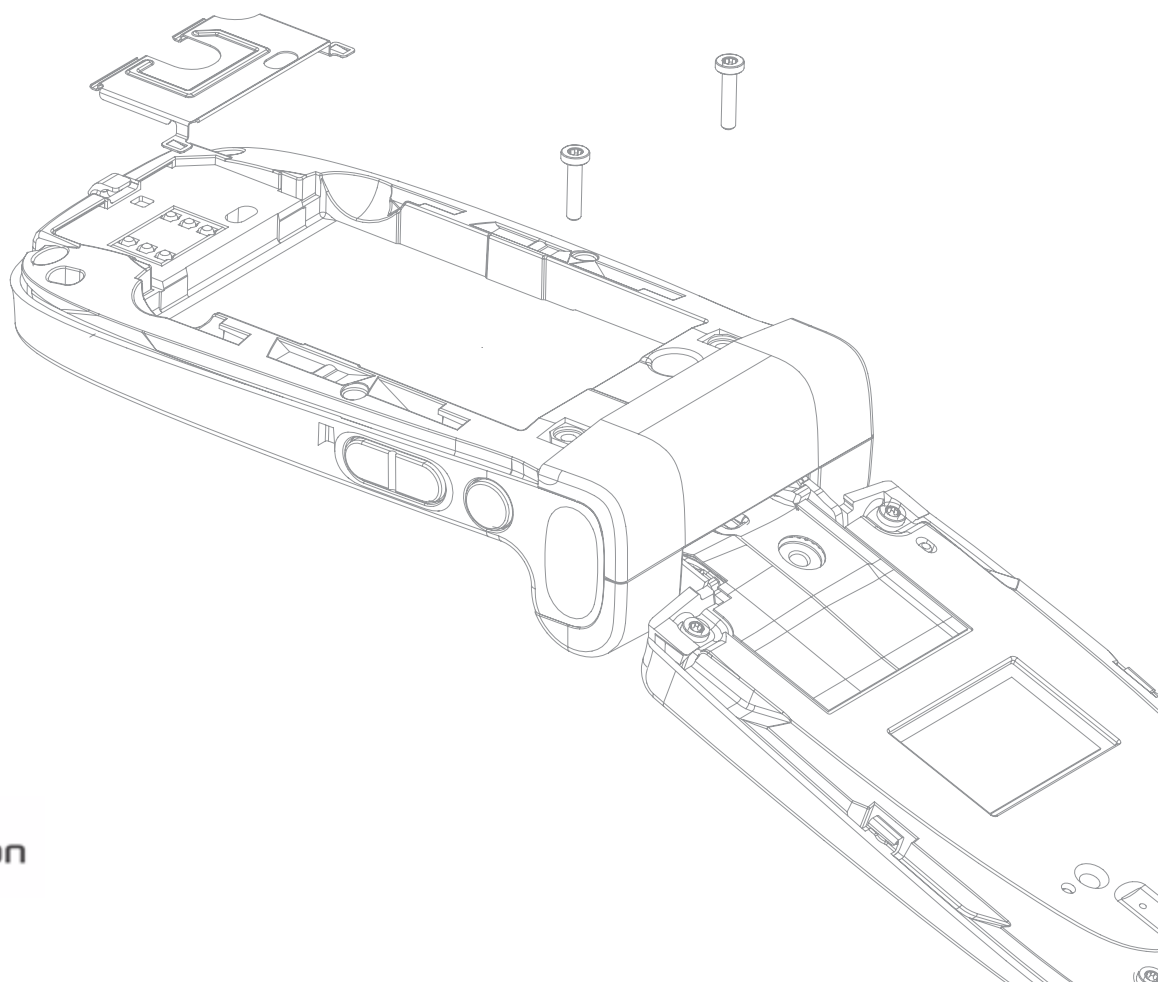
# Developers guidelines

**DEVELOPER**  
**WORLD THE FAST**  
**TRACK FROM**  
**MIND TO MARKET**

January 2008

## Macromedia™ Flash Lite™ 1.1

in Sony Ericsson feature phones



Sony Ericsson

# Preface

## Purpose of this document

---

This document is intended for Macromedia™ Flash Lite™ content developers who want insight in the Sony Ericsson phone implementation of Flash Lite.

People who can benefit from this document are:

- Software developers
- Operators and service providers
- Content providers

It is assumed that the reader is familiar with Flash™ 4 or Flash Lite development.

These Developers guidelines are published by:

Sony Ericsson Mobile Communications AB,  
SE-221 88 Lund, Sweden

Phone: +46 46 19 40 00  
Fax: +46 46 19 41 00  
[www.sonyericsson.com/](http://www.sonyericsson.com/)

© Sony Ericsson Mobile Communications AB,  
2007. All rights reserved. You are hereby granted  
a license to download and/or print a copy of this  
document.  
Any rights not expressly granted herein are  
reserved.

Ninth edition (January 2008)  
Publication number: EN/LZT 108 9300 R9A

This document is published by Sony Ericsson  
Mobile Communications AB, without any  
warranty\*. Improvements and changes to this text  
necessitated by typographical errors, inaccuracies  
of current information or improvements to  
programs and/or equipment, may be made by  
Sony Ericsson Mobile Communications AB at any  
time and without notice. Such changes will,  
however, be incorporated into new editions of this  
document. Printed versions are to be regarded as  
temporary reference copies only.

\*All implied warranties, including without limitation  
the implied warranties of merchantability or fitness  
for a particular purpose, are excluded. In no event  
shall Sony Ericsson or its licensors be liable for  
incidental or consequential damages of any  
nature, including but not limited to lost profits or  
commercial loss, arising out of the use of the  
information in this document.

# Sony Ericsson Developer World

---

On [www.sonyericsson.com/developer](http://www.sonyericsson.com/developer), developers find documentation and tools such as phone White papers, Developers guidelines for different technologies, SDKs (Software Development Kits) and relevant APIs (Application Programming Interfaces). The Web site also contains discussion forums monitored by the Sony Ericsson Developer Support team, an extensive Knowledge base, Tips and tricks, example code and news.

Sony Ericsson also offers technical support services to professional developers. For more information about these professional services, visit the Sony Ericsson Developer World Web site.

## Document conventions

---

### Products

---

The following Sony Ericsson phones are referred to in this document by generic names:

<b>Generic names</b> Series	<b>Sony Ericsson mobile phones</b>
K530	K530i
K770	K770i
S500	S500i, S500c
T650	T650i, T658c
W200	W200i, W200c
W300	W300i, W300c
W350	W350i, W350c
W380	W380i, W380c
W550	W550i, W550c
W580	W580i, W580c
W600	W600i
W610	W610i, W610c
W660	W660i
W710	W710i, W710c
W810	W810i, W810c
W830	W830i, W830c

Generic names Series	Sony Ericsson mobile phones
W850	W850i, W850c
W880	W880i, W888c
W900	W900i
Z555	Z555i, Z555a

## Trademarks and acknowledgements

Adobe, Macromedia, Flash Lite and Flash are trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

i-mode is a trademark or registered trademark of NTT DoCoMo, Inc.

NetFront is Internet browsing software of ACCESS Co., Ltd.

NetFront is a trademark or registered trademark of ACCESS Co., Ltd.

Other product and company names mentioned herein may be the trademarks of their respective owners.

## Document history

Change history		
2007-01-08	Version R1A	Document published on Developer World
2007-02-06	Version R2A	Second edition. W880, W610 and K550im added
2007-03-13	Version R3A	Third edition. W660 added
2007-03-27	Version R4A	Fourth edition. W580 added
2007-05-08	Version R5A	Fifth edition. S500 and T650 added
2007-06-14	Version R6A	Sixth edition. K530 added
2007-08-21	Version R7A	Seventh edition. K770 added
2007-11-06	Version R8A	Eighth edition. W380 added
2008-01-06	Version R9A	Ninth edition. W350 and Z555 added

# Contents

<b>Overview .....</b>	<b>6</b>
Flash Lite in Sony Ericsson phones .....	6
<b>Specifications .....</b>	<b>7</b>
Compliance .....	7
Phone features .....	7
Links and references .....	8
<b>Appendix .....</b>	<b>9</b>
General design considerations .....	10
Programming issues .....	11
Audio support in the Sony Ericsson Flash player .....	11
Delay when trapping Keypress events .....	11

# Overview

Flash Lite was originally developed by Macromedia™ (now part of Adobe™ Systems Inc.) to run Flash™ based content on the latest generation of mobile phones and other small devices. It first appeared as Macromedia Flash Lite 1.0 in 2003, and was at that time aimed at the Japanese NTT DoCoMo i-mode™ services. Flash Lite 1.1 followed in 2004, and contained a number of major improvements. Both Flash Lite 1.0 and 1.1 are based on a Flash 4 structure, helping to minimize the footprint and processor demands of the player.

## Flash Lite in Sony Ericsson phones

---

There are two main implementations in Flash Lite enabled Sony Ericsson phones:

- The “stand alone” model. Flash Lite exists as a separate media application in the phone. In some Sony Ericsson phones, this model is used for wallpaper or screensaver applications.
- The “browser based” model. Flash Lite essentially runs as a plugin within the resident browser of the phone. This model allows a user to access Flash Lite content via an Internet connection without needing to open a separate application for viewing. It is also the default way of viewing Flash content via the phone file manager. This model is implemented in all Flash-enabled Sony Ericsson phones.

# Specifications

## Compliance

All Sony Ericsson phones in this document are fully compliant with Flash Lite 1.1 standards.

## Phone features

Features	Phones					
	W200, W300	W550, W600, W810	W900	K530, W350, W380, W610, W660, W710, Z555	K770, S500, T650, W580, W830, W850, W880	K550im, K610im
General						
Screen size	128x160	176x220	240x320	176x220	240x320	176x220
Colour depth	18-bit (262,144 colours)					
Web browser	Access Netfront version 3.3					
Browser screen, normal mode	128x128	176x176	240x266	176x176	240x266	176x176
Browser, full screen mode	128x160	176x220	240x320	176x220	240x320	176x220
Flash features						
Flash Lite version	1.1+					
Flash in browser	Yes					
Flash in Wallpaper				Yes	Yes	Yes
Flash in Screensaver				Yes	Yes	
Flash colour depth	16-bit (65,536 colours)					
Heap size for Flash, per content type (MB)	3	3	3	1	1	1

Features	Phones					
	W200, W300	W550, W600, W810	W900	K530, W350, W380, W610, W660, W710, Z555	K770, S500, T650, W580, W830, W850, W880	K550im, K610im
Enabled sound formats for Flash	Midi					Midi, Mfi
Language support for device fonts and input	Latin-1 based			According to i-mode specifications		

## Links and references

- Adobe Flash Lite product page  
<http://www.adobe.com/products/flashlite/>
- Adobe Mobile and Devices Developer Center  
<http://www.adobe.com/devnet/devices/flashlite.html>
- NTT DoCoMo (i-mode) information  
<http://www.nttdocomo.co.jp/english/service/imode/make/content/flash/index.html>
- Sony Ericsson Developer World  
<http://developer.sonyericsson.com>
- Sony Ericsson Tutorial: “Getting started with Macromedia Flash Lite 1.1”  
<http://developer.sonyericsson.com/getDocument.do?docId=86555>



# Appendix

This appendix contains general advice on application design, and programming issues of interest for developers of Flash Lite applications for Sony Ericsson phones.

# General design considerations

---

Designing Flash applications for phones presents several challenges compared to designing for more “competent” platforms:

- **Screen size.** The small dimensions (128x160, 176x220 or 240x320 pixels – smaller when the browser is in normal mode) of phone screens should not limit application capabilities, but is a key consideration in application design, particularly when it comes to selecting fonts and images.
- **Navigation.** In most phones, navigation has to be done using keypad controls as opposed to mouse/keyboard navigation in, for example, a computer. On Sony Ericsson phones, some keys are assigned for a specific use, for example, “Back” and “Select”. This may need to be considered when designing Flash Lite applications, to avoid usability problems.
- **Menus.** To improve usability, Flash applications should adapt to MMI conventions established in targeted phone models.
- **Image formats and sizes.** The limited processor power in a phone requires optimization of images before using them in Flash Lite applications. In general, phones also have limited colour range compared to computers.
- **Fonts.** Flash Lite offers the possibility to let the device render text, by using so called device fonts. This is to avoid embedding bitmaps in the .swf file, making the file size smaller. However, this is a bit slow on Sony Ericsson phones due to a gap between the two font rendering techniques used by the Sony Ericsson internal font engine and the Flash Lite font engine. If speed is of great importance, device fonts should be avoided, particularly with wrapped text.
- **Network access** from Flash Lite is only permitted for Flash files running in the browser plugin.
- **Scaling.** Flash Lite is a vector based format and scales very well to different sizes. However, different viewers in the phone scale them differently.
  - The browser scales a stand alone .swf file to fit its drawing area. For example, a browser drawing area of 176x176 pixels shows all Flash Lite content in that size, even if the original size is 128x128.
  - Flash files within an HTML document adapt to HTML “Size” attribute values if specified.
  - Screensaver or wallpaper viewers present Flash content in its original size if it is smaller or equal to the screen size. If it is larger it is scaled down to the fit the screen size.

The documentation provided by Adobe gives examples of existing Flash based content, and provides information on how to design Flash Lite applications for phones. Testing applications on actual phones to verify application behaviour on the targeted platform, is also highly recommended.

# Programming issues

---

## Audio support in the Sony Ericsson Flash player

---

The generic Adobe Flash player supports playing of three types of sound:

- Device Event Sound. Sound data is stored in the phone's native sound format and the Flash Lite player does not interpret the data. The host application plays the sound, which therefore is not synchronized with animations.
- Cached Device Event Sound. A variant of the first type, commonly used in mobile phones where sound data must be stored or registered locally before being played.
- Flash Native Sound. This type supports event sound and synchronized sound playback which is also referred to as Stream Sound or Streaming Sound. Sound data is stored as MP3 compressed, ADPCM compressed or uncompressed PCM data. This is the only type of sound that can be synchronized with animations.

The Flash player in Sony Ericsson phones only supports the Cached Device Event Sound type, and only MIDI files can be played.

The actionscript `_capStreamSound` property can be queried to find out if the Flash Native Sound type is supported. It is a numeric variable which indicates whether the device can play streaming (synchronized) sound. If so, the variable is defined and has a value of 1; if not, the variable is undefined.

## Delay when trapping Keypress events

---

Under certain conditions, the Flash Lite player implemented in Sony Ericsson phones generates a pause (~100 ms) when a keypress event, for example, `on(release, keyPress "<right>") {<code>}` is captured within a frame. This issue is present in the Flash player regardless on platform, but the length and the impact of this pause is more significant on mobile phones with their limited processor capacity than, for example, on the PC platform.