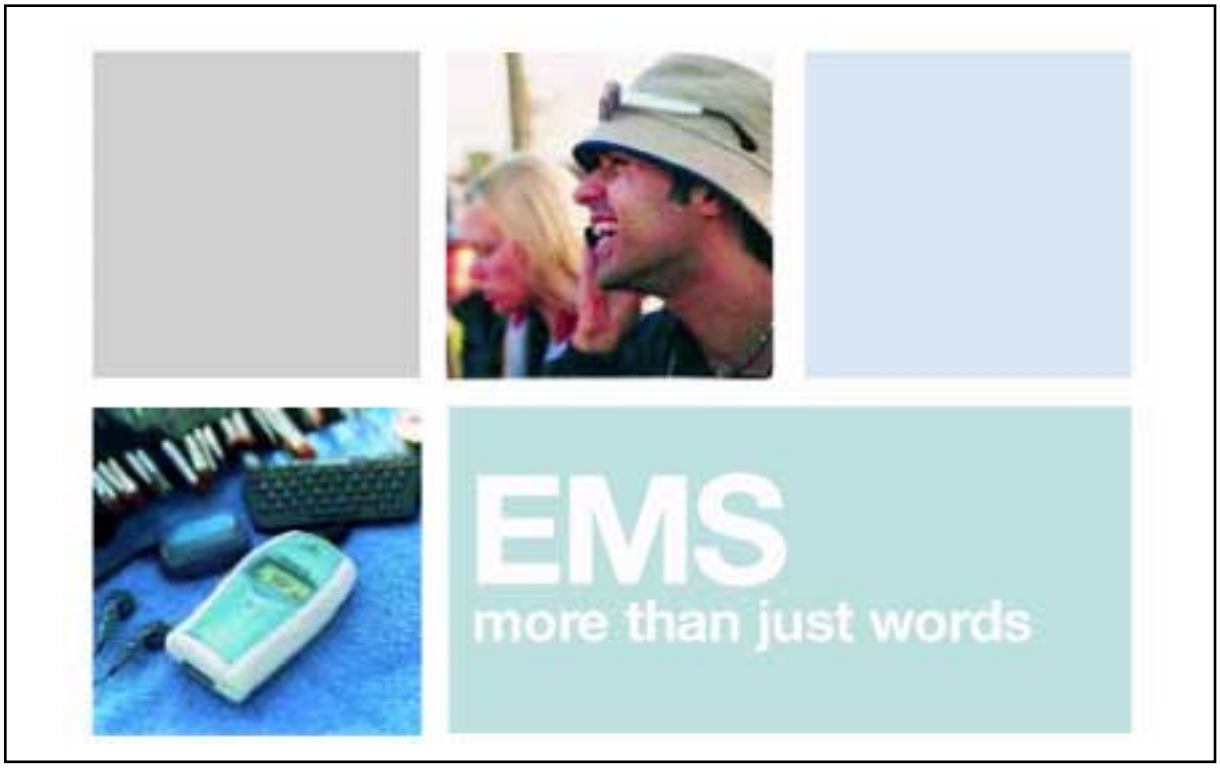
LZT 108 4854 R1C



Enhanced Messaging Service White Paper

ERICSSON

Ericsson is the leading provider in the new telecoms world, with communications solutions that combine telecom and datacom technologies with freedom of mobility for the user. With more than 100,000 employees in 140 countries, Ericsson simplifies communications for its customers - network operators, service providers, enterprises and consumers - the world over.

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PREFACE

Purpose Of This Document

The EMS White Paper is designed to give the reader an overview and a deeper understanding of Enhanced Messaging Service (EMS). Initiated by Ericsson, EMS is now incorporated by the 3rd Generation Partnership Project (3GPP) into the Short Messaging Service (SMS) standard. The SMS standard is supported by the major network operators and mobile phone manufacturers.

People who can benefit from this document include:

- Application providers
- Content providers
- Content aggregators
- Operators and service providers
- Software developers
- Business decision-makers

The EMS White Paper does not contain detailed information about how to develop contents and services. This is described in the EMS Developer's Guidelines, available on the Ericsson Mobility World. The site at http://www.ericsson.com/mobilityworld contains up-to-date information about technologies, products and tools.

EMS OVERVIEW

Enhanced Messaging Service (EMS) adds new powerful functionality to the well-known SMS standard. With it, mobile phone users can add life to SMS text messaging in the form of pictures, animations, sound and formatted text. This gives the users new ways to express feelings, moods and personality in SMS messages. As well as messaging, users will enjoy collecting and swapping pictures and ring signals and other melodies, downloading them from the Internet or editing them directly on the phone.

The beauty with EMS is that it uses existing SMS infrastructure and industry standards, keeping investments to a minimum for operators and providing a familiar user interface and compatibility with existing phones and with other manufacturers. EMS will be a standard feature in Ericsson mobile phones in the future.

In the future, messaging can be even further enhanced by new standards and technologies supported by Ericsson, such as Multimedia Messaging Service (MMS).

EMS More Than Just Words

Sounds And Melodies

EMS gives the user the ability to send and receive sounds. These can be pre-defined sounds, such as “Chime high” and “Notify”, or melodies (ring signals in the phone), downloaded from the Internet, received in SMS messages or composed by the user on the phone keypad or a PC. Several sounds and melodies can be inserted in one message, and they can be combined with pictures.

Pictures, Animations And Styled Text

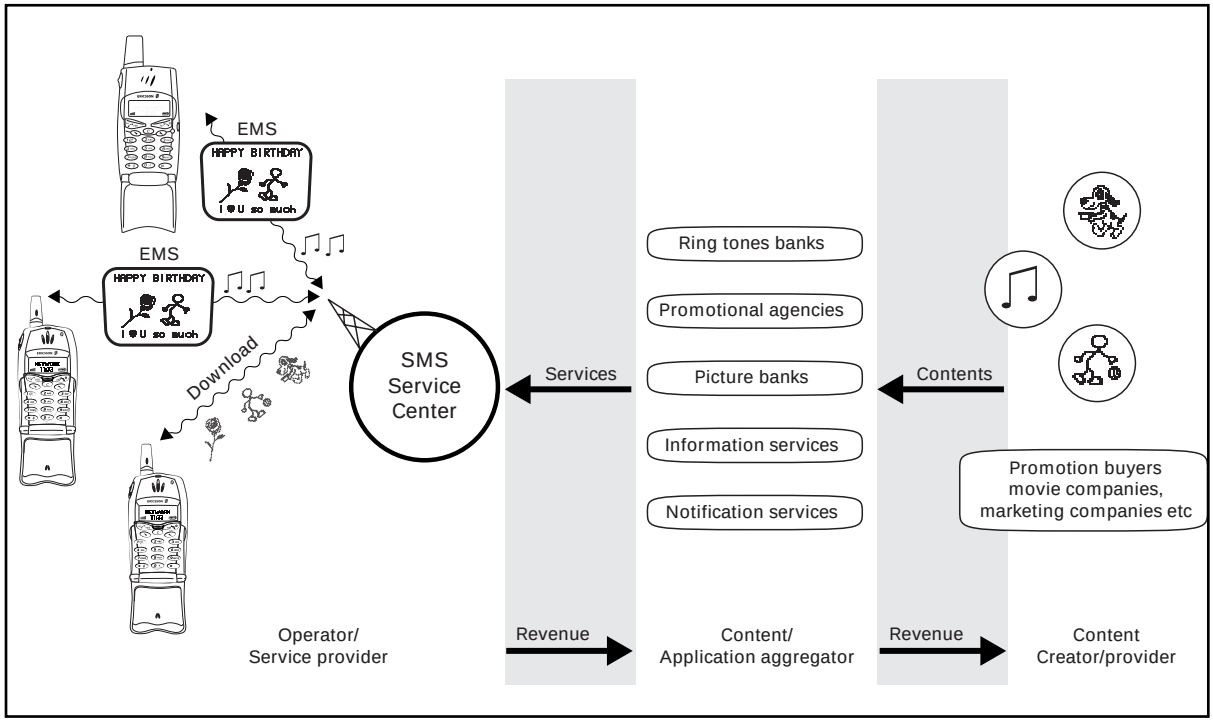
Phones supporting EMS include a set of pre-defined pictures for inserting in SMS messages. New pictures and animations are downloaded from the Internet or received in SMS messages. Pictures can be created and edited in the phone using a built-in Picture Editor. The users can format text in messages with different styles and sizes. Several pictures can be inserted in one message, and they can be combined with sounds and melodies.

Concatenated Messages

A part of the EMS standard is the support for concatenated messages, which means that the phone is able to automatically combine several messages both when creating and receiving EMS. This is useful to be able to build, and display, messages with rich content, since the amount of information in each SMS is limited by the SMS standards.

New Possibilities With Messaging

The EMS standard is now a part of the SMS standard and supported by the major network operators and mobile phone manufacturers. This universal approach enables a fast penetration and development of new services and applications within messaging.



The diagram shows a model over the possibilities with Enhanced Messaging Service:

- When the Operator/Service provider enables EMS in the network, users will enjoy adding life to messages with sounds, melodies, pictures and styled text
- New ranges of Content/Application aggregators on the operator network or the Internet can provide EMS contents and services to the users over SMS
- Content Creators/providers can see a new demand for creative contents. Also, promotional activities from movie companies, record labels etc can provide ring tones, movie snapshots etc

The added value in SMS messaging will create new revenue which can be shared between the network operators, the application aggregators and the content providers

Creativity Explosion

Users will be inspired to create and swap their own melodies and pictures. But more importantly, professional content creators and providers are already preparing to offer imaginative and creative contents for use with EMS. Based on subscriptions, fees or ads, network operators will be able to provide wide ranges of ringing tones, operator logos and corporate icons, as well as personal and mood-related pictures and melodies. Movie, music and game companies can promote new products and events with designer melodies, animations and pictures.

Huge Business Potential

Network operators can now enhance their services and attract more customers by offering pictures, animations, ring signals and melodies for download at their portals. Operators can charge more per EMS message since it contains more data. Thereby EMS adds more value to the operators and to the end users.

Increase SMS Revenue

EMS uses the same basic network support as ordinary SMS, and with the same familiar user interface. From an operator's point of view, SMS is low tech because minimal investment is needed to provide an effective SMS service to subscribers and little maintenance is required. EMS will create additional revenue for service providers and network operators by increasing SMS traffic.

Compatible With SMS Standards

Users will find EMS as easy to use as SMS. At the moment 15 billion SMS messages, are sent every month worldwide. Roughly 80% of this traffic is user-to-user i.e. mobile phone users sending short messages to each other using the keypad of the phone to enter text. The remaining 20 % is shared by downloads and notifications of different kinds.

The Enhanced Messaging Service (EMS) was first submitted to the standards committees by Ericsson. Ericsson presented the outline structure of EMS to the relevant ETSI/ 3GPP committees. The major mobile phone manufacturers and most operators are actively contributing to the 3GPP standards. Hence the EMS standards have evolved and are now stable and complete as part of the 3rd Generation Partnership Project (3GPP) technical specification, see “Documents” on page 20.

An EMS message can be sent to a mobile phone that does not support EMS, or only supports part of EMS. All the EMS elements i.e. text formatting, pictures, animations and sounds are located in the message header. The EMS contents will be ignored by a receiving phone that does not support the standard. Only the text message will be displayed to the receiver. This is true consumer-friendly standardization. EMS is compatible to SMS across most of the range of mobile phones from the oldest to the newest.

Some companies in the mobile phone industry have developed their own messaging technologies, which only work with their own phone models. Network operators are in favour of EMS because it is universal – many of the major mobile phone manufacturers are constructively improving and developing the EMS standards even further for implementation in their products.

Examples Of EMS Contents And Applications

A wide range of contents, applications and services may be developed and examples exist already today, see “Links” on page 20. Below is a list of examples and areas where messaging can be enhanced with EMS.

User-to-user message Messages usually originating from the keypad of a mobile phone can include pictures, melodies, styled text with EMS

Voice and e-mail notifications Notifying mobile phone users that they have new voice or fax mail messages waiting - including icons or melodies with EMS

Unified messaging The user typically receives a short message notifying them that they have a new message in their unified messaging box, with icons or styled text further enhancing the message

Internet e-mail alerts An Internet e-mail alert is provided in the form of a short message that typically details the sender of the email, the subject field and first few words of the email message, and in this case styled text is excellent to identify mesage elements

Ring signals Downloading ring tones from the Internet

News & commercials World news illustrated, sports scores and news headlines, finance and stock market news with diagrams and tickers, commercial product promotions, weather reports with maps, tunes from TV commercials as

	ring tones,
Info & entertainment	Ring tones, e-greetings, football club logo, joke-of-the-day illustrated by pictures or sound, horoscopes, movie related animation or theme song, TV show promotions, music artist promotions, lottery results, food and drinks pictures and recepies, mood-related pictures
Corporate	Flight schedules, preinstalled corporate logos, map snippets and travel info, company branded icons and ring signals, corporate e-mail notifications, affinity programmes where companies notify customers of product updates etc, banks notifying customers about new services and interest rates, call centres providing answers to questions about a product, vehicle positioning combining EMS with Global Positioning System (GPS) position information, job dispatch with delivery addresses for sales or courier package delivery, using EMS in a retail environment for credit card authorization, remote monitoring of machines for service and maintenance purposes

Using Web, WAP And SMS For Download

Already today services exist on the Internet where users can create melodies, and view icons and pictures, subscribe to entertainment and informations services. These may develop further in the future to support access via PC over the Internet, from the phone using WAP and even with and SMS request interface.

SOUNDS AND MELODIES

EMS gives the user the ability to send and receive melodies and to insert pre-defined sounds in messages. The melodies can be ring signals stored in the phone, downloaded from the Internet or composed by the user on the phone keypad or a PC. Already, there are dozens of Web/WAP sites where users can choose from hundreds of ring signals for download to their mobile phone – a very popular application. EMS users can exchange ring signals and melodies between phones. This is done using SMS as a carrier.

Multiple sounds and melodies can be inserted in one message, and also in combination with pictures and animations. The sound or melody is played when the user selects its icon in the display; this is referred to as putting it into focus.

There are two different types of sounds that are supported by EMS:

Sounds	Pre-defined sounds in the phone; these are referred to as “sounds”
Melodies	Ring tones and user-defined melodies; these are are referred to as “melodies”

Pre-Defined Sounds

There are today 10 different sounds supported by the EMS standard:

- Chimes – low
- Chimes – high
- Chords – low
- Chords – high
- Ding
- TaDa
- Clap
- Drum
- Notify
- Fanfare

The sounds can be included in messages both originated on a mobile phone and originated by an operator service or application provider.

Since the sounds are specified in the EMS standard the actual message sent will only include a reference to the sound and not the entire sound itself. This makes the transmission more efficient.

The actual sound produced by the phone is manufacturer-dependent. This means that each manufacturer can implement the sounds different from others.

Most phones without support for the EMS standard will simply ignore the sound information when the message is received, and will just display the text in the message. This prevents the phone from displaying unreadable contents to the user

Melodies

Melodies and ring tones can be a very powerful personalization tool for mobile phone users, and melodies can be used to provide attractive services and applications for use with EMS. Users can access and create melodies in several ways.

- All phones have pre-installed ring tones which can be included in EMS messages
- Users can edit and create melodies using the phone keypad
- Exchanging melodies with other phone users receiving and sending them in EMS messages
- Using services on Web/WAP portals
- Requesting melodies from the Internet; this is referred to as downloading
- Receiving melodies in EMS messages originated by service providers, such as movie theme songs, commercial tunes, music hits etc

All melodies that are received can be stored by the user in the phone in one of the MyMelodies positions. The number of positions is dependent on the phone model. Tools for creating and downloading melodies on the Internet are available from Ericsson, see “Links” on page 20.

The sound data of a melody is transmitted in a subset of the iMelody format, as specified by the Infrared Data Association, see “Documents” on page 20. The maximum size of one melody is 128 bytes, including header and footer information. The iMelody format is a minimal set of tones that can be used to transfer melodies between devices. The definition can be extended by defining new formats for MIDI/WAV, DTMF, polyphonic etc. The iMelody format also specifies duration of each individual tone.

The actual tones in the melody produced by the phone is manufacturer-dependent. This means that each manufacturer can implement the tones different from others, and that different phone models can have a different frequency range and tone quality. It is therefore important to verify the playback quality of the melody on the actual target devices.

Most phones without support for the EMS standard will simply ignore the melody information when the message is received, and will just display the text in the message. This prevents the phone from displaying unreadable contents to the user.

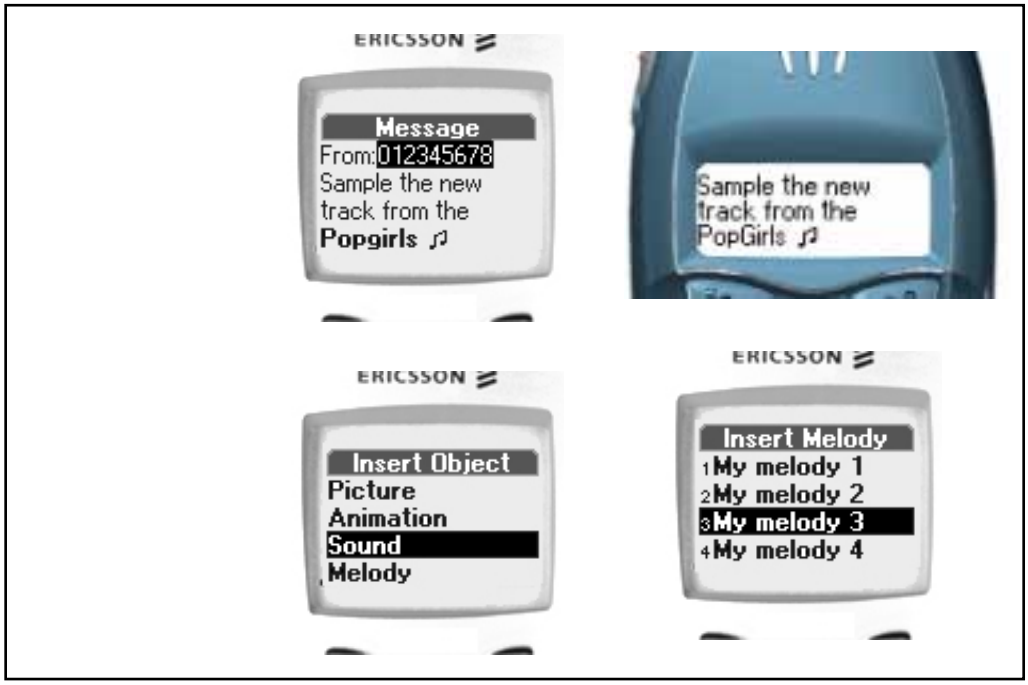
iMelody Example

Without any detailed explanations, this is an example of how the data for a Class1.0 iMelody object is composed, taken from Beethoven’s 9th Symphony:

iMelody example object	Description
BEGIN:IMELODY VERSION:1.0 FORMAT:CLASS1.0	Required header information
MELODY: *3f3f3f3#c1#d3#d3#d3c1r3f3f3f3#c3#f3#f3#f3f3*4#c3#c3 #c3*3#a1	Required iMelody *)
END:IMELODY	Required footer information

**) Note: This melody is an example without guarantee that it can be played on all phones.*

These are some examples on how sounds and melodies can be used in EMS messages:



PICTURES AND ANIMATIONS

EMS gives the user the ability to send and receive pictures and animations. The pictures can be stored in the phone, downloaded from the Internet or edited by the user on the phone keypad or a PC. Users will be able to choose from hundreds of pictures and animations on Web/WAP sites for download to their mobile phone.

Multiple pictures and animations can be inserted in one message, and also in combination with sounds and melodies and styled text. A picture is displayed as part of the message, and an animation is played in loop as long as the user selects its icon in the display; this is referred to as putting it into focus.

Pictures	Black and white pictures, such as icons, logos and simple illustrations
Animations	Sequences of black and white pictures that are animated in the display to create a short animation clip

Pictures

With pictures, users will be able to enhance their messages to express personality and mood. New Ericsson phones can make it possible to edit pictures in the phone. Subscription-based or fee-based services on the Internet can provide huge banks of pictures for download. In addition, commercial applications such as promotional campaigns can make use of this feature.

Ericsson phones will have pre-installed pictures for inclusion in EMS messages.

- Users can edit and create pictures using the phone keypad
- Exchanging pictures with other phone users receiving and sending them in EMS messages
- Using services on Web/WAP portals
- Requesting pictures from the Internet; this is referred to as downloading
- Receiving pictures in EMS messages originated by service providers, such as corporate logos, movie promotions, commercials, news and information services etc

All pictures that are received can be stored by the user in the phone in one of the MyPictures positions. The number of positions is dependent on the phone model.

The dimensions of one picture is 1024 pixels in 1 bit colour (black and white), which translates to 128 bytes. This means it is possible to use pictures with a size of 1 x 1024 pixels. The practically available picture formats are as follows

Variable picture formats for pictures received to the phone	
Width:	In multiples of 8 pixels up to the screen width (ie. 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96) The max screen width currently is 101, so 96 is the nearest to this, any larger and the width will be truncated.
Height:	From 1 to 1024 pixels. **Note:** The total product of Width and Height must never exceed 1024 pixels.

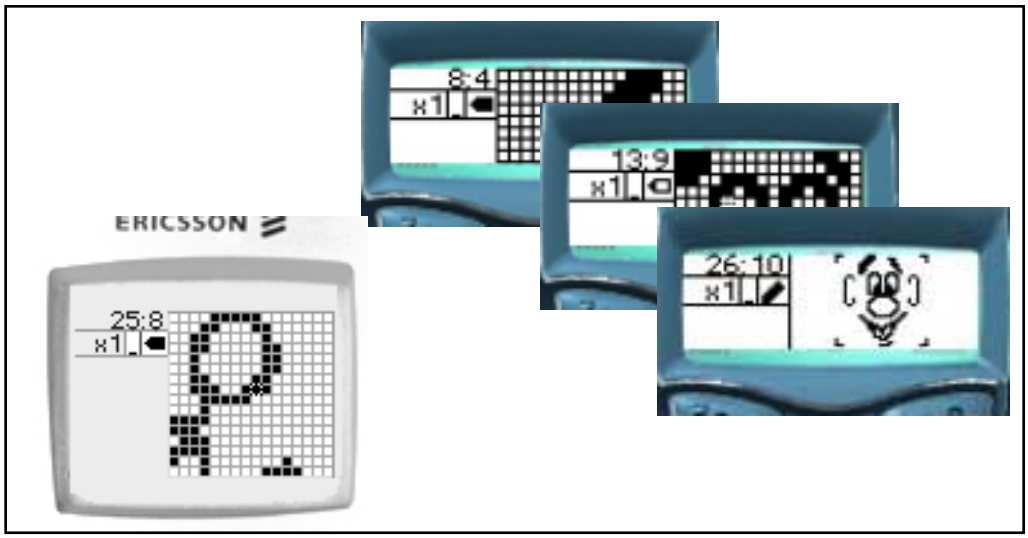
Fixed picture formats for pictures originated on the phone
Small – 16 x 16 pixels Large – 32 x 32 pixels

How the picture is displayed on the phone obviously depends on the size of the display. It is therefore important to verify the visual appearance of the picture on the actual target devices. If a picture is wider than the display, it will be truncated. If it is higher than the display, the user can scroll up and down to view it. There will be possibilities to build messages conatining pictures and melodies that are larger than 128 bytes. This could be useful for larger scrollable images, such as city maps or house plans.

Most phones without support for the EMS standard will simply ignore the picture information when the message is received, and will just display the text in the message. This prevents the phone from displaying unreadable contents to the user.

Picture Editor

The Ericsson Phones contain a Picture Editor, by which the users can create and edit their own pictures using familiar editing tools. This shows the picture editor on small and a large display.



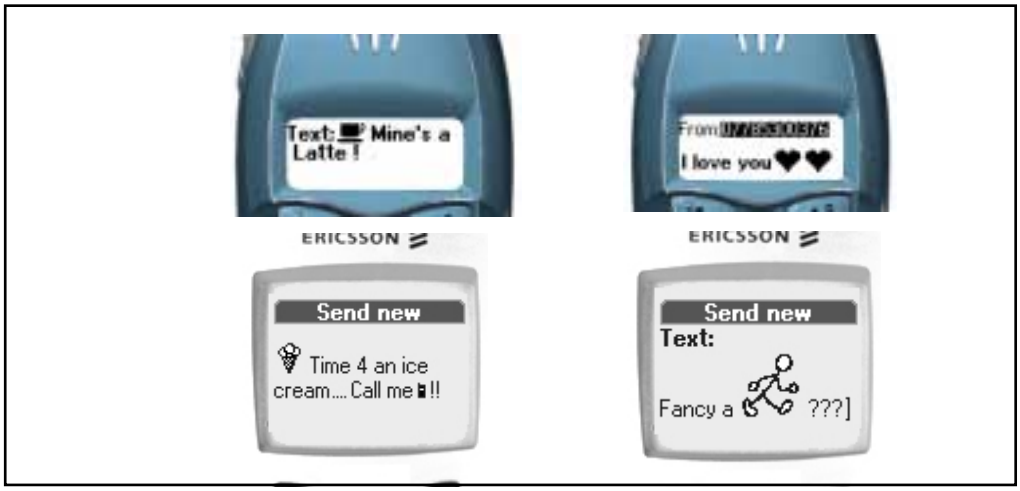
Picture Examples

These are examples of pictures in the format 8 x 8 pixels that can be pre-installed in phones:

These are examples of pictures in the format 16 x 16 pixels that can be pre-installed in phones:

These are examples of pictures in the format 32 x 32 pixels that can be pre-installed in phones:

These are some samples of how pictures and styled text will appear in the display, both when editing and when receiving messages.



Animations

With animations, the user experience of pictures will take a step further, and so will the commercial possibilities in messaging. Animations can be transmitted in two ways:

Pre-defined Only a reference to the animation is transmitted in the EMS message, which is very much like the procedure for transmitting a pre-defined sound. Therefore there is no theoretical limit to its size, other than the phones memory. Samples of the pre-defined animations are shown below.

User defined These are animations transmitted in EMS messages, and must be limited in size.

The user can access animation in many ways.

- Exchanging animations with other phone users receiving and sending them in EMS messages
- Using services on Web/WAP portals
- Requesting animations from the Internet; this is referred to as downloading
- Receiving animations in EMS messages originated by service providers, such as movie promotion animations, commercial banners, e-greetings, news and weather services etc

All animations that are received can be stored by the user in the phone in one of the MyAnimations positions. The number of positions is dependent on the phone model.

The available animation formats are as follows.

Fixed animation formats
Small – 8 x 8 pixels, Medium – 16 x 16 pixels

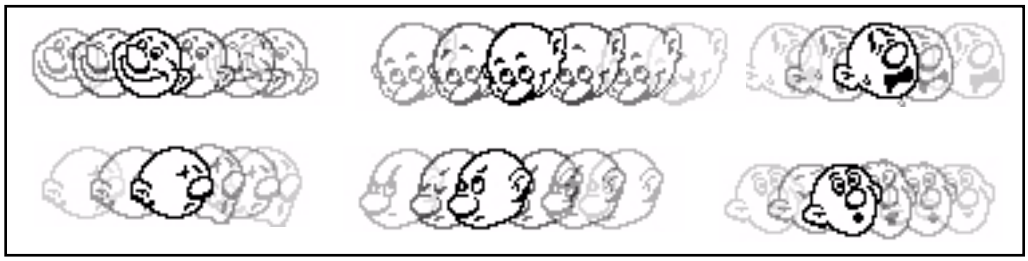
Number of frames and size	
Pre-defined	6 frames of suitable size, pre-installed in the phone. Only a reference is transmitted
User defined	4 frames of 16 x 16 pixels

How the animation is displayed on the phone obviously depends on the size of the display and the type of phone. It is therefore important to verify the visual appearance of the animation on the actual target devices. There will be possibilities to build messages conatining animations, pictures and melodies that are larger than 128 bytes.

Most phones without support for the EMS standard will simply ignore the anmation information when the message is received, and will just display the text in the message. This prevents the phone from displaying unreadable contents to the user.

Animation Examples

These are some examples of pre-defined animations that can be used in EMS messages, on the themes flirting, sad, happy, skepticism, crying, wow. In the case of the pre-defined animations, the actual animation is not transmitted in the message, only a reference to the animation.



STYLED TEXT AND FORMATTING

The EMS standard allows formatting of the text in messages, to give a more pleasant design to messages. This gives the users some of the possibilities available when creating greetings or invitations on a desktop PC. Styled text can be used in messages in combination with pictures, animations, sounds and melodies and.

- Users can format the message text using the phone keypad
- The styled text messages are sent to and received from with other phone users
- Styled text can be used in EMS messages originated by service providers, such as news headlines, e-greetings, commercials etc

The procedure for formatting the text is dependent on the phone model. The possibilities for styled text are as follows (note that some of these styles are not releveant to all languages).

Styled text formats
Align left
Align right
Align centre
Small font size
Normal font size
Large font size
Bold
Italic
Underlined
Strikethrough

The representation of the styled text on the phone is manufacturer-dependent. It is therefore important to verify the visual appearance of the text on the actual target devices.

Most phones without support for the EMS standard will simply ignore the styled text information when the message is received, and will just display the text in standard style. This prevents the phone from displaying unreadable contents to the user.

Styled Text Example

An example of a user styling a text in an outgoing messge:

TERMINOLOGY AND ABBREVIATIONS

3GPP	3rd Generation Partnership Project.
EMS	Enhanced Messaging Service, an enhancement of the SMS standard. This makes it possible to include pictures,melodies,sounds and animations in messages, and also to receive and edit new pictures and melodies on the phone.
ETSI	European Telecommunications Standards Institute.
GSM	Global System for Mobile Communications. GSM is the world's most widely-used digital mobile phone system, now operating in over 100 countries around the world, particularly in Europe and Asia-Pacific.
iMelody	The iMelody format, specified by IrDA, is a minimal set of tones that can be used in EMS applications to transfer melodies, such as ring tones, between devices.
IrDA	Infrared Data Association.
Service Provider	A company that provides services, for example subscriptions to mobile phone users.
SMS	Short Message Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to your mobile phone. Messages are stored if the phone is off or out of reach ensuring that they reach you. To use this service, it must be supported by your network.
WAP	Wireless Application Protocol.Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user. A collection of cards is called a deck, which usually constitutes a service.

RELATED INFORMATION

Documents

- EMS specifications are found in “Technical Specification 3GPP;Technical realization of the Short Message Service (SMS)” ((3G TS 23.040 V4.0.0 (2000-07))
- iMelody standard issued by Infrared Data Association. (Note that only a subset of this standard is supported)
- EMS Developer’s Guidelines
- Ericsson T20e White Paper
- Ericsson T29 White Paper

Links

- http://mobileinternet.ericsson.com - a site for the mobile phone user
- http://www.ericsson.com/mobilityworld - information, tools, white papers and software updates on Ericsson products and technologies; check frequently!
- http://www.gprsworld.com - home of the Mobile Applications Initiative created by Ericsson
- http://www.3gpp.org - home of the 3rd Generation Partnership Project
- http://www.irda.com - home of the Infrared Data Association
- http://www.etsi.org - home of the European Telecommunications Standards Institute

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