

Antwerp, the Belgian Telecom City for more than 100 years



See mini-exhibition “From Telephone to Smartphone” at MAS, Antwerp, Belgium.

Exhibition from October 19, 2014 until February 8, 2015

By:

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For

“The Friends of the ATEA-museum”

www.kulentuur.be/ateamuseum

In cooperation with MAS: Museum aan de Stroom (Museum At the Stream), Antwerp, Belgium, see

http://www.mas.be/Museum_MAS_EN

And

http://www.mas.be/Museum_MAS_EN/MAS_EN/On-Display/Antwerp-as-a-telecom-city.html



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1. Introduction

1.1 General

A mini-exhibition was setup in Antwerp, Belgium to give people an idea about telephony's history. The exhibition started at October 18, 2014 and will last until February 8, 2015.

1.2 History

Alexander Graham Bell, an American, invented the telephone in 1876. When companies founded around his invention were looking for expansion to Europe, they chose Antwerp, which at that point in time was the largest port in the world with many wealthy entrepreneurs and investors. First *Bell Telephone Manufacturing Company* (locally known as "the Bell") was established and then a few years later, the *Antwerp Telephone and Electric Works*, better known as ATEA, was founded.

For more than 100 years, both companies were leaders in cutting edge telephone technology. Telephones and telephone exchanges from both of these companies were successfully installed worldwide.

At its peak, about twenty thousand people were working in the telecom industry in Antwerp. Due to globalization and technological changes such as miniaturization, both companies had to scale down, and are now part of a bigger entity.

Most objects in this exhibition are part of the ATEA heritage, but are typical for the telecom industry.

Four time periods are considered, showing for each time period the appropriate technology, material and features typical for that period.

Initially we see wooden telephone boxes as small pieces of furniture in a "Belle Époque" interior, later on we see more industrial looking products.

We will see the evolution from a basic nostalgic telephone with a crank up to a sophisticated smartphone with many modern communications features.

Telephone usage (adoption) graphs demonstrate that in the beginning only very rich people could afford to have a telephone. By 2014 almost everyone has their own intelligent sophisticated wireless device in their pocket or purse.

1.3 Company history

- ATEA: *A History of ATEA 1892-1999*; see http://www.kulentuur.be/ateamuseum/vrienden_atea_museum/publicaties/atea_thg_spring_2012.pdf
- BTMC: *The Bell Telephone Manufacturing Company of Antwerp, Belgium*; article by Bob Estreich and Jan Verhelst at <http://www.vintagephones.com.au/Pages/BTMC/BTMCHistory.htm>



ATEA started in 1892 in Berchem, a suburb of Antwerp in the building at the right side, at the corner.

Handmade

Industrialization

Democratization

Wireless

1880-1930: Belle Epoque

1930-1960: Around WW II

1960-1990: Golden 60s

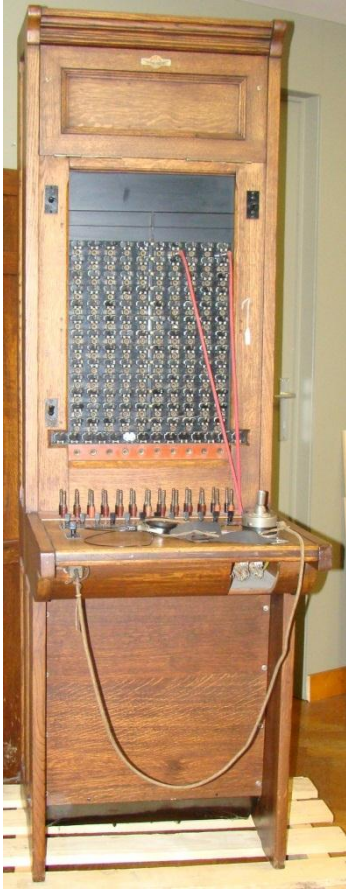
1990-2014: Current Time



Setup of the exhibition, mainly divided over 4 windows

2. Welcome

2.1 A manual exchange



This is a typical manual exchange. A user warned the operator by turning crank, and announced who he or she wanted to talk to. The connection was setup by means of cables and plugs.

Secrecy was not always guaranteed, and some attendants did like to tell gossips!

This ATEA system can service 140 subscribers. It has been re-stored by the Friends of the ATEA-museum.

Why were telephone operators mostly female?

In January 1878 the Boston Telephone Dispatch company had started hiring boys as telephone operators. Boys had been very successful as telegraphy operators, but their attitude (lack of patience) and behavior (pranks and cursing) was unacceptable for live phone contact, so the company began hiring women operators instead.

The companies observed that women were generally more courteous to callers. However, a contributing factor to women entering this workforce was because women's labor was cheap in comparison to men's. Specifically, women were paid from one half to one quarter of a man's salary.

So women held the chair for most of the next 50 years until (in the USA) laws against discrimination forced the Telco's to allow men in that job. Although the percentages were quiet small except during strikes when all available management man or women were called to "man" the boards!

Source:

- http://en.wikipedia.org/wiki/Emma_Nutt
- http://en.wikipedia.org/wiki/Switchboard_operator
- http://www.ieeeahn.org/wiki/index.php/Telephone_Operators
- <http://www.privateline.com/TelephoneHistory5/maleoperator.htm>

3. 1880-1930: “Belle Époque”

3.1 General introduction

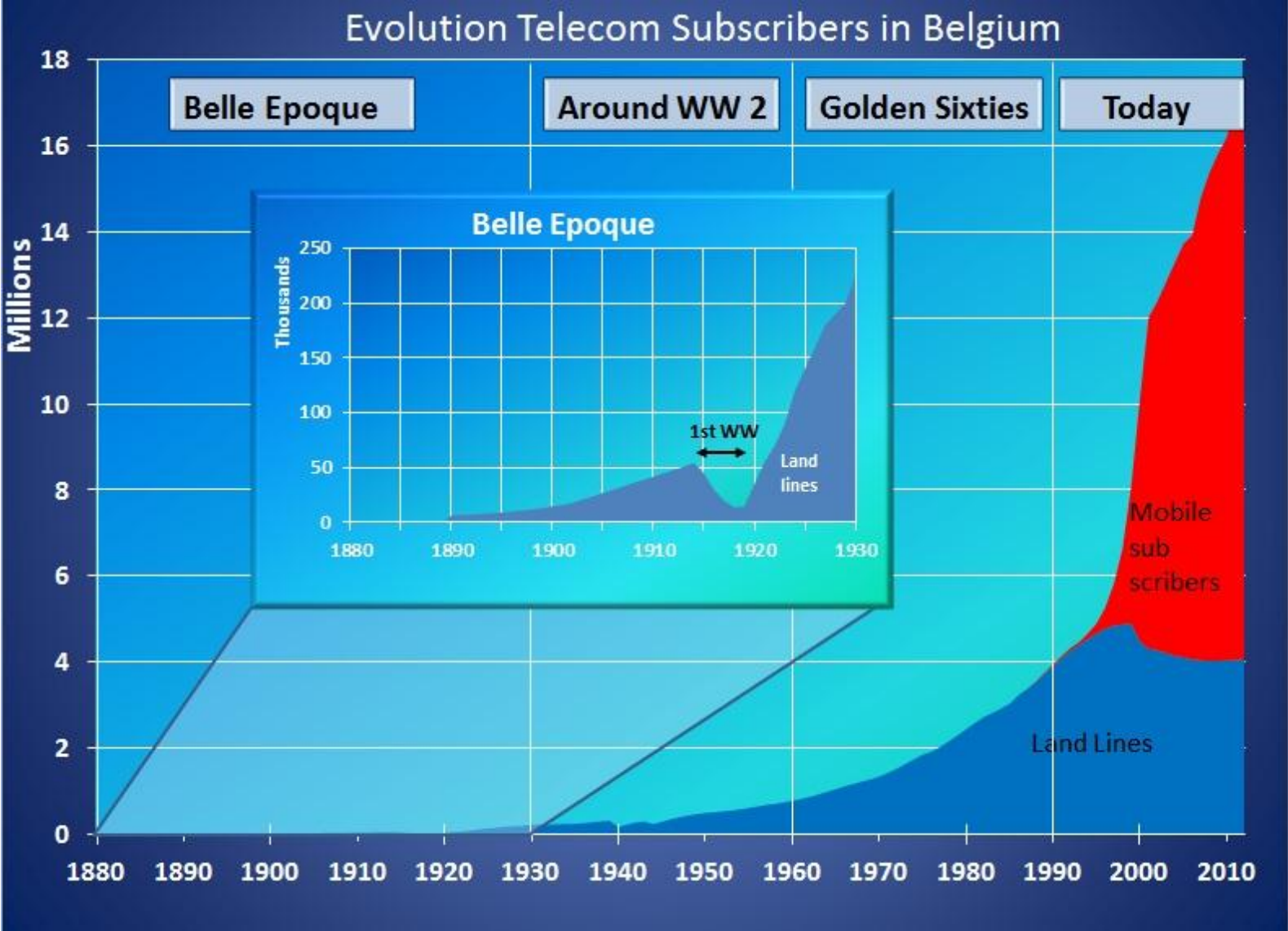
When the American Alexander Graham Bell invented the telephone in 1876, his invention was rapidly introduced throughout the Western world. In Antwerp, Bell and ATEA were founded, which manufactured telephones and telephone exchanges.

Only well-to-do citizens – such as the doctor, the notary and the mayor – had a telephone.

Conversations were set up manually. By turning the crank, contact was established with an operator, who was given the name of the called party. The operator then established the connection via cables and plugs.



3.2 How many people did have a telephone during the “Belle Époque”?



3.3 Company logo



3.4 Devices

3.4.1 Classic wooden telephones



In the early days of telephony, telephones were built using traditional methods and a few basic materials such as wood, copper, metal and ebonite.

The first telephones had a microphone that was separate from the receiver. The compartment at the bottom contained batteries. With the crank the operator could be called.

3.4.2 View on the Belle Époque technology: open phone



This is the oldest phone in the ATEA collection of MAS. This phone has been fully restored by Carlos Bekaert.

It dates definitely from the 1890s

- "dry stamp" with the company name on the door
- Non – isolated wires
- Hinges used as electrical conductor

Open phone – Belle Époque period

3.4.3 Upstairs-downstairs



In the houses and mansions of the bourgeoisie, residents could call their servants with a push of a button. The servants could see on a panel in which room they were needed.



At a later stage it also became possible to call the servants directly and give them instructions via the internal telephone. This device was also used for communication within small companies.

3.4.4 The candlestick

Telephones became more elegant and user-friendly. In the design of the 'candlestick' the bell and the handle were hidden inside a 'bell box'.



Notice the bilingual (French-Dutch) user instructions near the mouth-piece.

This BTMC phone dates from the beginning of the 20th century; it is part of the collection of Filip Van Steenkiste.

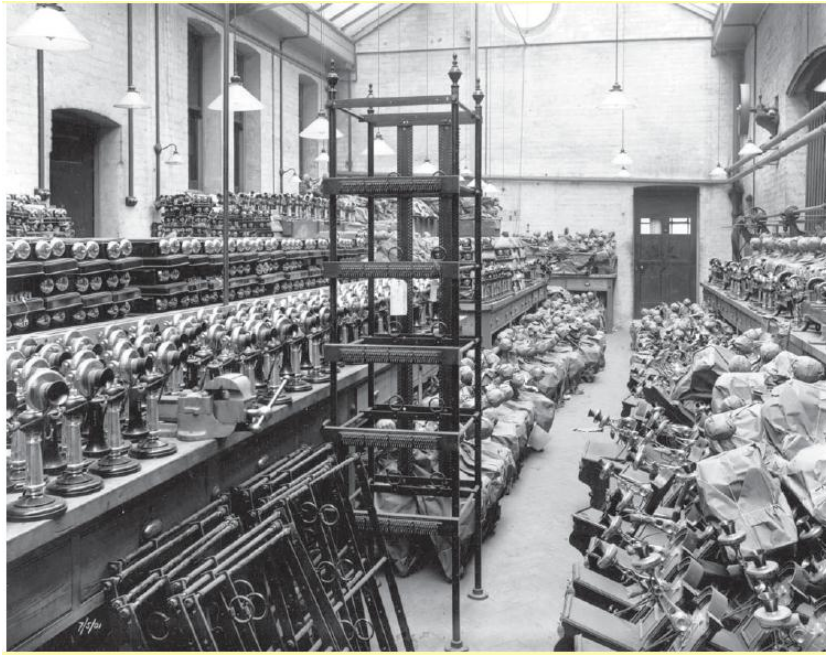
Laurence Rudolf wrote an extensive article about the so called "golf ball

candlestick", see <http://www.britishtelephones.com/t002.htm>



Also ATEA manufactured candlesticks

Candlestick manufacturing at ATEA



Candlestick manufacturing at BTMC Antwerp.

Source: Laurence Rudolf (UK)

3.4.1 The Ericsson Eifel tower or skeleton phone



The Swedish company Ericsson designed the first integrated telephone receiver in the 1880s. This device was also built under license by ATEA and Bell.

This object is part of the Carlos Bekaert collection.

3.4.1 The first Office telephone



Originally mostly wall phones were delivered. Since companies and people such as doctors and lawyers preferred to have some kind of desk phone, this styling appeared after World War I. It looks as part of the furniture.

3.4.2 The manually operated telephone exchange



When a subscriber turned the handle of his telephone, a bell started ringing in the exchange. The operator then inserted a plug into this line to learn who the subscriber wished to be connected to. The operator then called the recipient and connected him/her to the caller.

This object is part of the Jan Verhelst collection.

3.5 Multimedia on 1880-1930

Powerpoint presentation: "ATEA telephones and the 'Belle Époque' "

3.6 Earliest text messages: telegrams

Text messages could be sent by telegram. In the business world, for instance, orders were placed in coded form. In common life, luxury telegrams could be used, for example, to congratulate someone.



4. 1930-1960 around World War II: Industrialization

C A P

CENTRAUX AUTOMATIQUES PRIVES

CENTRAUX DE 10, 22, 40, 50 ET 100 LIGNES AUX PRIX LES PLUS REDUITS EN EUROPE, TOUT EN MAINTENANT UNE QUALITE DE MATERIEL IRREPROCHABLE

LA METHODE DE COMMUNICATION INTERDEPARTEMENTALE LA PLUS ECONOMIQUE AU MONDE

GAGNEZ DU TEMPS ET DE L'ARGENT

Précision *Rapidité* *Secret* *Silence*

DIRECTION GÉNÉRALE
SERV. RECHERCHES
SECRETARIAT
SERV. COMMERCIAL
VENTE
SECRET

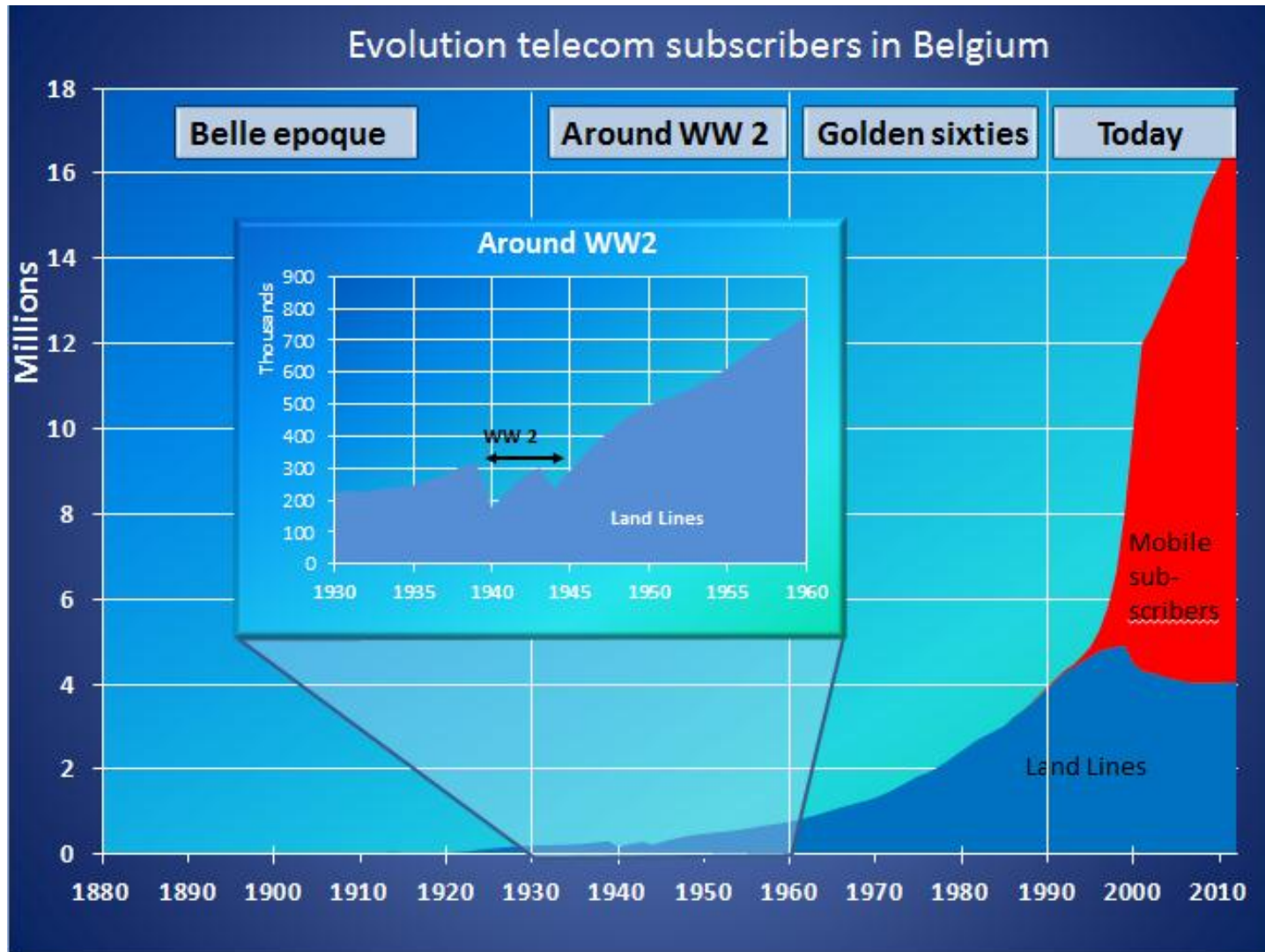
UNE INSTALLATION DE TELEPHONE PRIVE EST UNE NECESSITE DANS TOUTE ORGANISATION COMMERCIALE OU INDUSTRIELLE MODERNE.

DES INFORMATIONS IMMEDIATES SONT A VOTRE DISPOSITION • EVITEZ L'EMPLOI D'OPERATRICE • FONCTIONNE NUIT ET JOUR • FRAIS D'ENTRETIEN REDUITS • ANNEES DE SERVICE • RELIEZ VOS DEPARTEMENTS • TELEPHONEZ VOS INSTRUCTIONS • CONTROLEZ VOTRE PERSONNEL • CONFEREZ AVEC VOS CHEFS DE SERVICES • DONNEZ DES RENSEIGNEMENTS IMMEDIATS A VOS CLIENTS QUI VOUS TELEPHONENT •

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4.1 How many people did have a telephone around World War II?



4.2 Introduction

From the end of the 1920s onwards, the production and functioning of telephone exchanges was automated. The introduction of **metal alloys**, such as zamac, and synthetics, such as **Bakelite**, left its mark on both the production and the design of telephones.

The telephone network was operated by the government owned “Regie van Telefonie en Telegrafie” (RTT), the predecessor of the present-day Belgacom.

Telephony finally gained success in the business world as well. People with higher incomes also had a telephone at home, but this was not within the reach of the common man.

4.3 Company logo



4.4 Objects

4.4.1 Internal telephony expands to intercom systems



The high-rise buildings which appeared from the 1930s onwards were equipped with intercom systems. Via a microphone and a speaker at the front entrance, one could talk to visitors before letting them in.

This bakelite receiver and metal door speaker are typical of the 1940s.



4.4.2 Typical phone



At the request of RTT, Bell and ATEA designed and produced one standard telephone together.

At the end of the 1920s the first automatic exchanges were installed. Subscribers could instruct these themselves by means of the dial on their telephone. In areas where the changeover was in full swing, both telephones with dials and telephones with cranks were supplied.

4.4.3 View on the technology around WW 2: open phone



- "RTT-56 A" on the bottom indicates the phone has been assembled by ATEA
- "RTT-56 B" is the indication for a BTMC assembly

4.4.4 Telephone on a mixed network



These phones were used in business environments as a so called “intermediate phone”. Jack Ryan: “An intermediate telephone system consists of a main telephone and an extension. The main (or a control box next to it) has a switch to select “Exchange”, so that the main telephone can make calls as usual via the local exchange (central office), “Extension”. So that the main telephone can call the extension, and “Exchange to Extension” so that the extension telephone can be connected to the exchange. There are facilities so that the main user knows if the extension is connected to the exchange”.

4.4.1 An “art déco” phone

Postes Muraux

Poste régulier N° 2725-A.



Poste mural No 2725-A

Poste mixte N° 2725-B.

Ce poste est semblable au poste N° 2725-A, mais est muni d’un bouton monté sur le boîtier et donnant les mêmes facilités que celles du poste N° 2724-B.

Poste N° 2725-E.

Ce poste est semblable au poste N° 2725-A mais peut être utilisé comme poste ordinaire ou comme poste à ligne collective pour 2 abonnés en modifiant son circuit.

Service automatique. — Tous les postes sont munis d’un cadran d’appel N° 7019-A comportant le disque numéroté 7002-A et la carte d’instruction 7003-D.

Service manuel. — Les postes sont munis d’un faux-disque ou bouchon 2047-C.

Circuits. — Les circuits des postes type 2725 sont les mêmes que ceux des postes type 2724.

Ces postes sont généralement utilisés avec les commutateurs automatiques privés (type 7006 - 7011 - 7025 - 7035).

Boîtier en bakélite, venu d’une seule pièce avec le socle et le berceau, plaque de base amovible, en acier, et sur laquelle sont montés tous les éléments du poste (condensateur, bobine d’induction, sonnerie polarisée, timbres, crochet-commutateur).

Talons d’écartement en bois dur.

Plongeur en bakélite.

Cadran d’appel monté sur le boîtier.

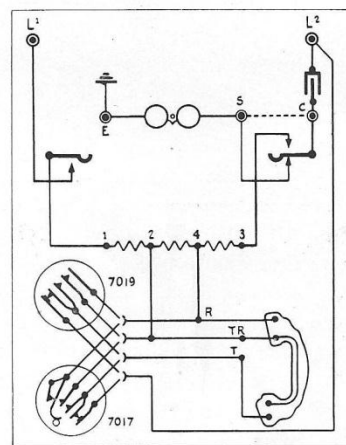


Schéma du poste No 2724-E

BTMC 1936 catalogue



This Bakelite phone from the 1930s is a BTMC design, with definitely an “**art déco**” look, such as seen also on radios etc. built in that timeframe.

This phone is very well appreciated by phone collectors.

4.4.2 The office telephone: ‘system 600’



For use in small and medium enterprises the so-called ‘key systems’ were designed: with one push of a button, one could reach a colleague or get an outside line. With the dial an external number could be formed.

4.4.3 The pay phone



Those who did not have a telephone at home, or wanted to call someone while they were on their way somewhere, had to use a pay phone in a phone booth or a pub. This device was manufactured by Bell and is typical of the 1950s.

4.4.4 The small electromechanical exchange



Automatic exchanges were built by combining ingenious electromechanical parts, such as relays and step by step switches. The connection was established mechanically without the intervention of an operator.

Call me!

This type of exchange was used in companies and could operate a maximum of 22 telephone lines. This device was manufactured by ATEA around 1960.

The exchange still works perfectly. Take up the left device, dial the number of the right device, and the device on the right will start ringing. Now pick up, and you can talk to each other!

4.5 Multimedia 1930-1960

- Powerpoint presentation: ATEA telephones around WW II
- Movie "How to dial " A 1954 AT&T instruction movie
<https://www.youtube.com/watch?v=PuYPOC-gCGA>
- Electromechanical ATEA system working

4.6 Text messages by telex

The telex was a message service for which the RTT operated a separate telex network. People could 'call' another telex and then type a message via a terminal.

```
16.34 #
33695 ateagt b
gte aeinc nlke

no 1 3-11-77
d clays gte atea

your paper for icc 77 was reviewed in stamford and they have
the following comments. if you can incorporate them in your
paper and still meet icc 77 publication deadline, suggest
you do. otherwise, retain paper as is, make deadline, and
make clarifying comments in presentation.

comments:
the abstract
-----
the author may wish to indicate the concept is limited, at this
time, to international application as the concept has not been
reviewed or approved for use in the domestic north american
network as yet.

introduction
-----
references made to the no. 2 eax as having the capability for
calss 4/5 operation, suggest that the author indicate this as
a future probability, rather than one which exists at the
moment.

major characteristics
-----
f. suggests that the word concentrator be changed to perhaps
line units, since concentrators seem to have undesirable
connotations in some engineer,s minds.
g. i assume that reference to international dialing capability
does not include billing capability at the no. 2 eax, and that
it means it will merely accept international dialing codes.

the operation
-----
suggest the author provide some description of the survivability
of the ru,s as many people will consider this an inherent
weakness of the system.

cuening delays on data links for remote switching units
-----
figures 1-8 seem to be missing from the text. i have no other
comments on this paper

e j glenner gte automatic nlake tlx 728477
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5. 1960-1990 Golden sixties: Democratization

5.1 Introduction

From the 1960s onwards, the telephone became accessible to all. Besides companies, nearly all private persons now had a land line.

Materials such as plastic were used for the mass production of streamlined telephones. From the 1970s onwards, electronics offered more possibilities for exchanges and telephones, and this resulted in more compact telephone exchanges. The dial was replaced by the keypad, which allowed for digits to be transmitted faster. After 1986 telephones became fully electronic and new possibilities became available, such as a number memory, hands-free calling, etc.

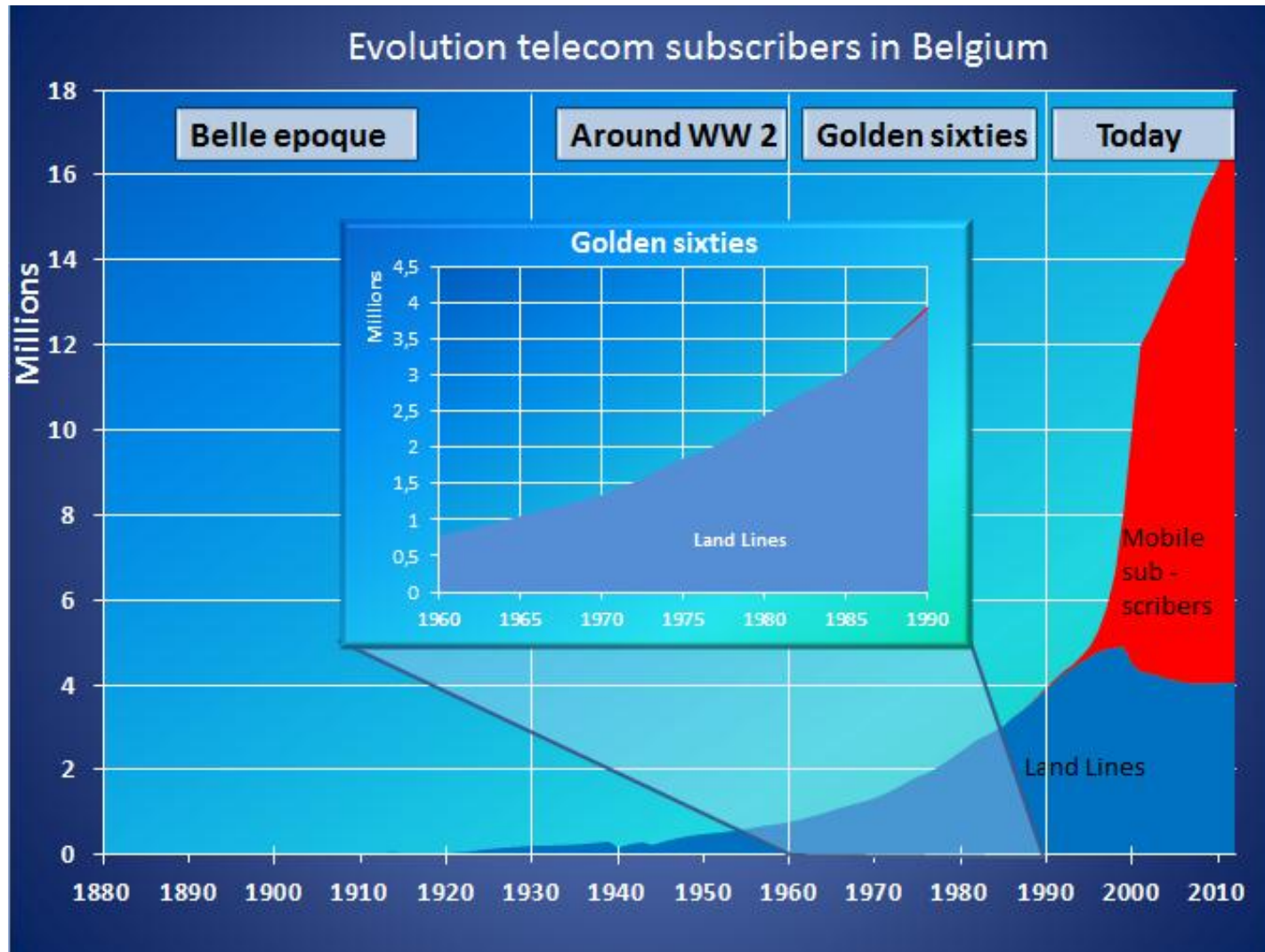
Finally, everything was controlled by software, and the integration with data communication was gradually prepared.



5.2 Company logo



5.3 How many people did have a telephone in the “Golden Sixties”?



5.4 Objects

5.4.1 Internal telephony



Modernization also took place in internal telephony and intercom systems. Both the devices inside the house and the door speaker were made of plastic, and ATEA, as a leading manufacturer, maintained an important market share.

5.4.2 The national telephone

		
1972	1977	1986

At the request of the RTT, ATEA and Bell regularly produced a new design for a 'national' telephone.

5.4.3 The office telephone 'system 800'



These telephones were used by SMEs and allowed for smooth internal and external business communication.

5.4.4 The data phone 'DATEA 2000'



In the 1980s data communication gained increasing importance, especially for payments with debit and credit cards. In order to be able to carry out those payments in a safe way, a software-controlled telephone was built, which communicated with computers of the banks via the telephone network. The 'DATEA' was the first data phone in the world.

See also : http://www.kulentuur.be/ateamuseum/vrienden_atea_museum/publicaties/micro-fone.pdf

5.4.5 The orange telephone



The pay phone persisted, and was manufactured in the typical bright colors of the time. Coins were replaced by 'tokens', which could be bought from the pub owner or from the landlord.

5.4.6 Electronic exchange



Exchanges are now controlled electronically and via software. As a result, they have become smaller, the cost per line is lower, and adjustments for a customer can be made more easily.

The 'type 8800' exchange is a first software-controlled exchange for 6 internal lines and 2 external lines, and was used a lot by SMEs and independent professionals.

5.5 Multimedia "Golden sixties"

Powerpoint ATEA telephones and exchanges typical for 1960-1990.

5.6 Text messages by fax



With a fax machine one could scan a document, send it to a similar machine over a telephone line and have it printed there. This way, one could send not only text, but graphic information as well.

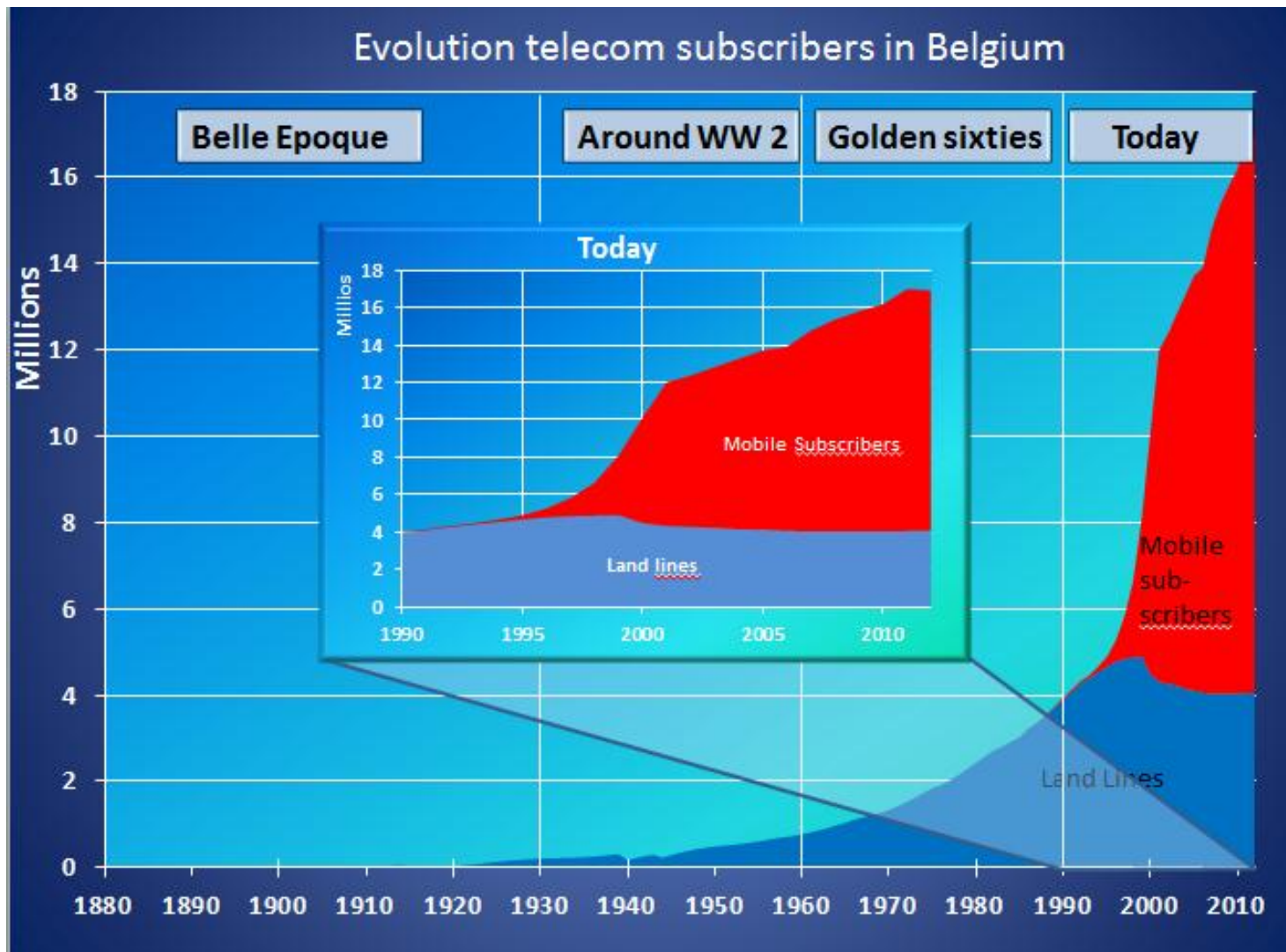
6. Today communications



6.1 Introduction

In 2014 all communication is integrated into 'the cloud', and all possible means of communication are available anytime, anywhere. The evolution of traditional telephony over 100 years has repeated itself with wireless communication in less than 20 years. In 1994 Proximus provided the first Belgian cellular phone network.

6.2 How many people do have a telephone today?



6.3 Objects

6.3.1 Cellular phones

			
+/-1985	+/-1994	+/-2003	+/-2009

Before the introduction of the cellular phone network, there were already 'radiotelephones', which were usually installed in cars. From 1994 onwards, compact mobile phones have evolved at an incredible speed. Initially, they were only equipped with basic functions and had a visible antenna. The evolution of smartphones with endless possibilities is still going on today.

6.3.2 Internal mobile communication



Even within companies or homes, we communicate using wireless telephones: the so-called 'DECT' systems. These are linked to the land line via a base station.

6.3.3 Wireless communication



A central element of present-day communication is wireless Internet access in the entire home and also in public places: 'Wi-Fi'.

6.4 Text messages by E-mail, SMS..

Today text communication is via SMS, E-mail and social media such as twitter, whatsapp, etc.

7. Multimedia

7.1 On a PC

Several movies and presentations are shown on a PC

https://www.youtube.com/watch?v=A_cwXDK-L6c Our movie about a Strowger exchange, with English subtitles

Funny stuff with telephones;

http://www.dailymotion.com/video/x27nn4i_funny-laurel-hardy-telephone_fun

We had some others, but they are in French, Dutch etc.

7.2 ATEA in the city

Most people knew ATEA as a manufacturer of front door intercom systems and traffic lights . The company was market leader for these products. Although manufacturing of these products has been discontinued in the early 1990s, there are still many of these devices in service in the Antwerp area. We took pictures and they are shown on a city map.



8. Some technical information

Overview of a call setup in the different periods:

Period	Description	Who	How to setup a connection	Tool	Connection	Technology	Materials
1880-1930	Belle Époque	Wealthy citizens	Turn the crank, ask the operator	Crank	Wired	Electrical	Wood, Ebonite, Copper
1930-1960	around WW II	Industry	Go off hook, dial tone, dial the number	Dial	Wired	Electrical	Metal, Bakelite, Copper
1960-1990	Golden sixties	Most families	Go off hook, dial tone, tap the number on the keypad	Touch Tone	Wired	Electronic	Metal, Plastics
1990-2014	Today	Almost everybody	Send preprogrammed number from Cellular phone	Messages (1)	Wireless	Software	High quality plastics

(1) A phone sends digit after digit when using a Dial or keypad. The advanced computer controlled systems a message is sent from the phone to the exchange, containing a wealth of information, i.e.:

- Telephone number calling party
- Telephone number called party
- Data for extra features

9. The Friends of the ATEA-Museum

ATEA became part of Siemens in 1986. Around the beginning of the 21st century, the telecom underwent a series of transformations that resulted in the restructuring of the telecom industry. These endangered the continuing existence of the ATEA heritage (phones, exchanges and documentation). A group of former ATEA employees founded a non-profit organization, "The Friends of the ATEA-Museum". Their objective was to keep the ATEA heritage intact.



The newly erected museum MAS (Museum aan de Stroom / Museum at the Stream) in Antwerp was willing to accept objects related to the ATEA heritage, and in the autumn of 2014, we will have our first exhibition.

Members:

- Carlos Bekaert
- Luc Bruglemans
- Erik De Cooman
- Louis De Raedt
- Alex Sauwens
- Hubert Vanooteghem
- Jan Verhelst
- Karel Verhelst