



ALCATEL BUSINESS SYSTEMS
PROFESSIONAL & CONSUMER DIVISION

TD - IT BU - Illkirch

External Specifications of 2840 US Screenphone

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1 PRESENTATION

1.1 Overview

The ALCATEL 2840 US Internet screen phone is a high end screen phone allowing access to internet world

The main features are:

- full VGA display
- V34 modem up to 33.6kbits/s
- Touch Screen
- In addition to the "telephony" keyboard, a complete alphanumeric keyboard
- High end phone features like handfree, Caller identification, large directory...

1.2 External appearance



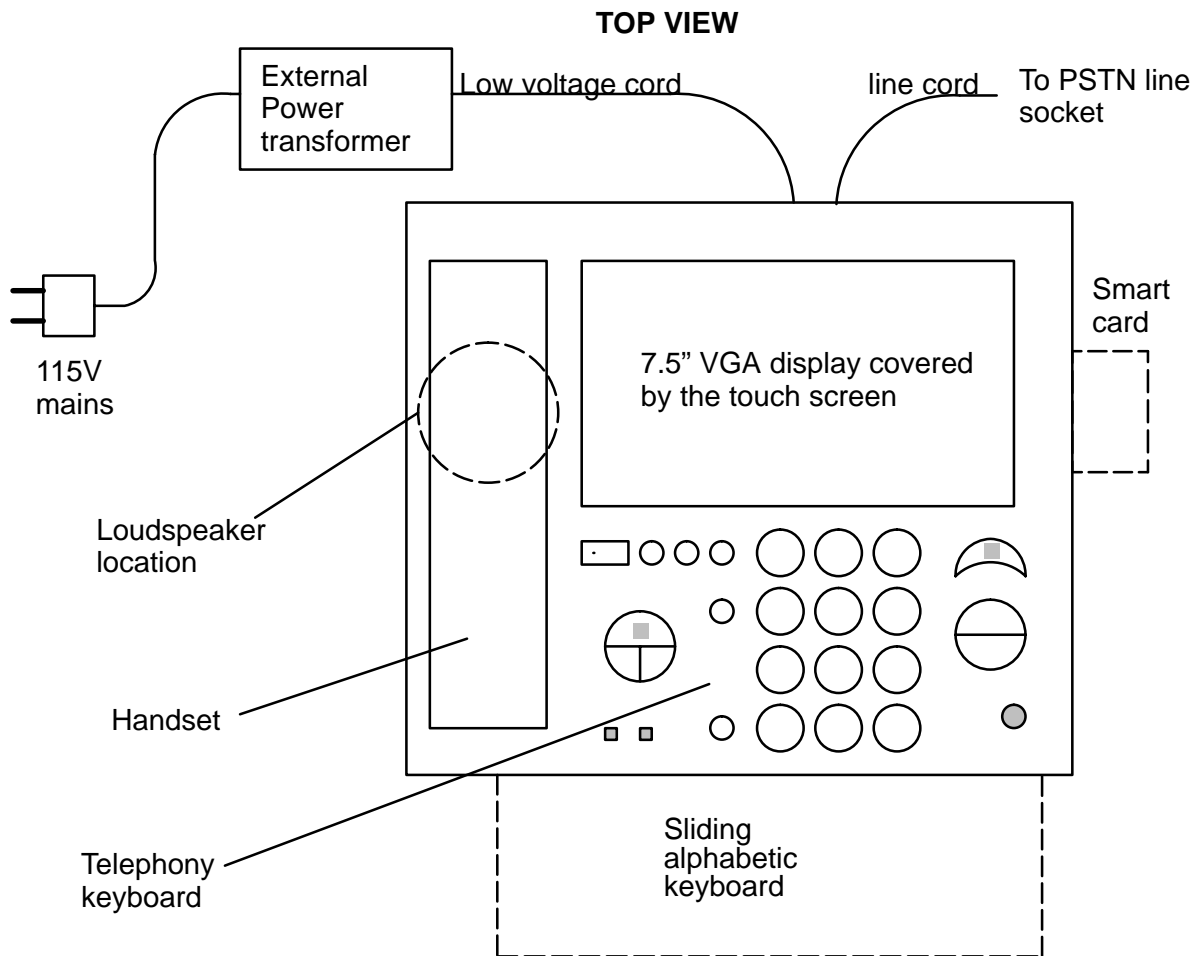
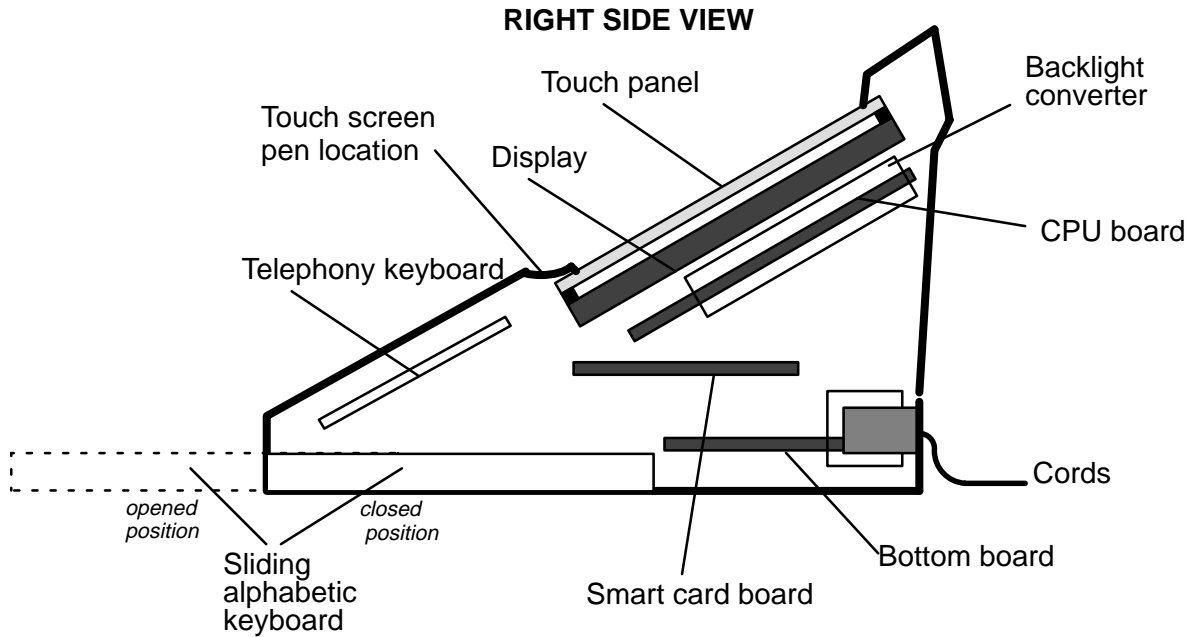
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2 MECHANICAL ARCHITECTURE

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2.1 Mechanical description

The internet phone is designed in a compact package. The dimensions are L x W x H (mm) :
284 mm x 218 mm x 121 mm with alphabetic keyboard closed
and

284 mmx 328 mm x 121 mm with alphabetic keyboard opened

There is an associated external power transformer with one cord on the 115V side and another low voltage cord on the other side.

The weight of the terminal itself is 2kg unpackaged and 3.1 kg when packaged with the power transformer and the cords.

The terminal must be used on an horizontal plan , it cannot be wall mounted.

The full VGA 7.5" LCD display is covered by a touch sensitive glass and has a fixed tilt angle.

A soft hole shape on the upper cabinet , just below the screen ,is dedicated to put the touch screen pen when not in use.

The line cord and the low voltage power cord are connected on the rear panel of the terminal.

The handset cord is plugged under the terminal and the cord is guided to the left side of the phone

The "telephony keyboard" is made of 25 keys and 5 leds. Three of these five leds are combined with :

- the internet call key
- the key for telephony mode selection
- the message key

The alphabetic keyboard which is not necessary for all operations, can be pushed in or pulled out of the terminal, allowing a nice design and a compact look. The alphabetic keyboard is directly issued from Portable PC world, offering a comfortable use

Most of the mechanical parts are screwed and the cabinet thickness is large enough. This leads to good robustness and comfortable acoustical characteristics.

The handset has an ergonomic and aesthetic design. When on hook, it lies on the left side of the terminal.

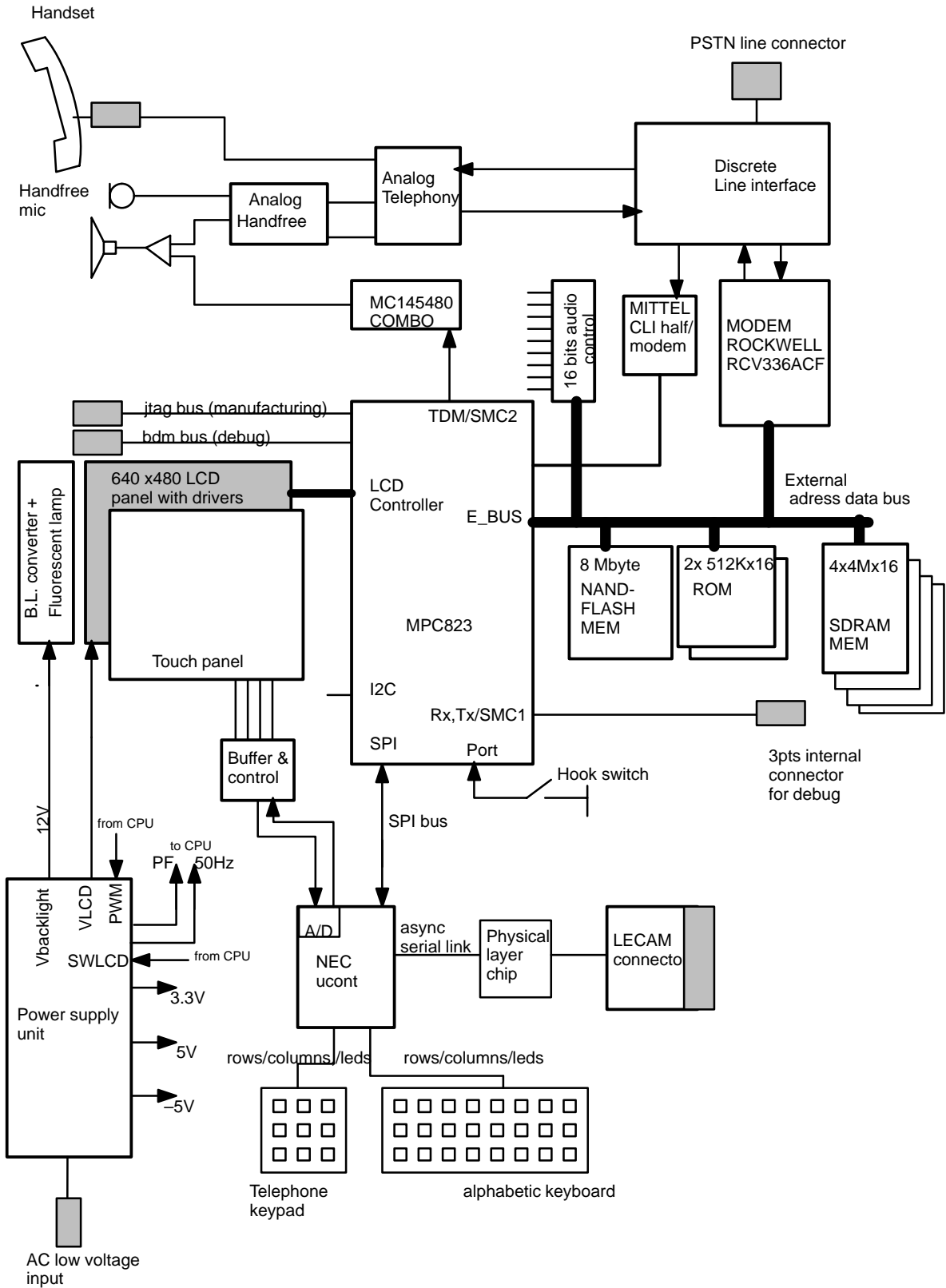
The hook switch mechanism is built to guarantee proper ON/OFF hook operation in any case of use.

There is no battery neither in the terminal, nor outside in the power transformer module.

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3 ELECTRONIC ARCHITECTURE

3.1 General bloc diagram



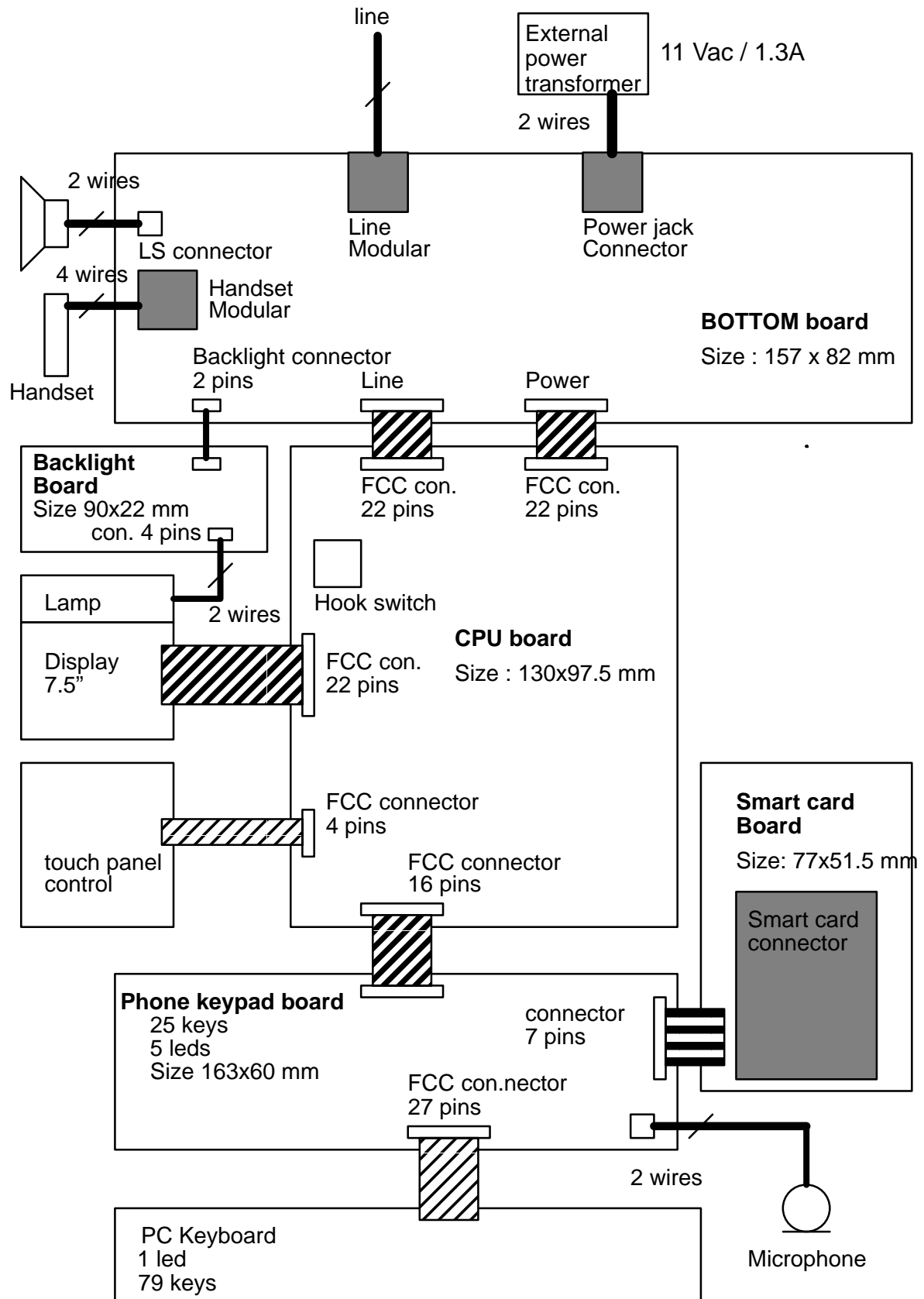
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3.2 Boards interconnections



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3.3 CPU board description

The CPU board is the heart of the terminal. It is a 4 layer PCB with reflow soldering on both sides.

The CPU board support the Motorola POWER PC microcontroller MPC823 and the its associated memories.

It also supports the V34 modem chip and the audio telephony fonctionnalités.

A D/A converter enables playing audio files.

3.3.1 MPC823 System microprocessor

The MPC823 is a 32 bits Power PC core plus a 32 bits RISC dedicated to communication.

The MPC823 has its own integrated PLL and is clocked at 66 MHz based on a 32Khz crystal.

The MPC823 has its on chip LCD controller which allows direct connection of the passive LCD panel. This on chip controller uses the main SDRAM memory plan for display memory.

3.3.2 ROM memory

The MPC823 Power PC boots on 2Mbyte ROM which contains the minimum application able to upgrade or to download a complete new software from the line.

The ROM memory is organized sa 512Kx32

3.3.3 SDRAM memory

The SDRAM is the code and data working memory. Code is loaded in SDRAM either from the Non Volatile NANDFLASH or from the ROM.

The 32 Mbytes SDRAM is directly managed by the MPC823 which contains a versatile memory controller.

The SDRAM plan is on 32bits wide for maximum throughput.

The SDRAM memory capacity cannot be upgraded.

3.3.4 NANDFLASH memory.

The NANDFLASH memory is today, for the considered capacity range, the lowest cost solution for non volatile writable memory.

The memory plan is seen by the MPC823 as a "hard disk" and is managed by a Flash file system..The capacity is 8 Mbyte. The NANDFLASH memory capacity cannot be upgraded after manufacturing.

The NANDFLASH memory contains the code to be loaded in SDRAM memory in a compressed format .

It contains also non volatile user data like directory or settings

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3.3.5 MODEM chip

The modem chip is a ROCKWELL RCV 336ACFchip with a V34+ . It has associated external RAM and ROM . The modem chip is connected on the parallel main bus and is seen as an I/O by the MPC823. The firmware allows connection up to 33.6kbits/s.

The modem firmware is stored in a ROM and cannot be upgraded to V90 for example

3.3.6 Caller ID function

The caller ID function is done by the Rockwell Modem chip when off-line (type 1)
The caller ID on call waiting function is done by an analog standard chip MITTEL 8843AS (type 2). Parallel telephon equipment detection is not supported.

An digital temporal filtering mechanism impemented in the Power PC improves the CAS detection features of the MITTEL chip.

3.3.7 Telephony electronic

This electronic consist of the analog half duplex handsfree component, the audio amplifiers and switches. This electronic allows handset, handfree or group listening modes.(group listening = handset + loudspeaker associated to a simplified antihowling mechanism)

3.3.8 Audio file converter

The audio file conversion is done by the D/A part of a standard G711 CODEC.

3.3.9 Miscellaneous

The time and date function is based on mains 60Hz AC information counting. The time and date is automatically updated with caller ID function.

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3.4 Bottom board description

The bottom board supports the DC line interface , the power converters and the handset connector.

It is a two layer board with wave soldering on one side and reflow soldering on the other side.

3.4.1 DC line interface

The line interface is a completely discrete solution. It is common for telephony and modem operation. The only power drawn from the line is to achieve the DC impedance. All the electronic on the other side of the line transformer is powered by the main.

The benefit is that the voltage supply for all the Op amps and switches is large enough to avoid distortion. The Op amps are high quality components to achieve the require S/N ratio for proper MODEM operation.

One consequence of this powering method is that the terminal is no more fonctionnal, even in telephony mode, in case of mains power failure.

In addition to standard minimal features, the DC line interface provides

- Pulse dialling
- CLIP impedance switching

3.4.2 Power converter

The Power conversion from the low voltage AC input is mainly done by serial regulation. A first stage of pre-regulation switching converter limits the power dissipation inherent to serial regulation.

This serial power regulation has the advantage of noiseless conversion and of lowcost. This power conversion section generates 3.3V, 5V, -5V, 12V for backlight converter and adjustable voltage between 32V and 40V for LCD contrast control

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3.5 Telephony keypad board description

This board supports physically the contact matrix for the telephony keyboard and manages the contacts and leds of the alphabetic sliding keyboard.

This board is controlled by an integrated 8 bit NEC microcontroller with onchip ROM and RAM. It communicates with the MPC 823 on the CPU board through a high speed serial link. The 8 bit microcontroller has an integrated A/D converter.

It handles :

- The telephony keyboard and alphanumeric keyboard management
- The ISO7816 protocol for the smart card reader in association with a physical layer chip.
- The touch screen polling mechanism and associated A/D conversion
- The A/D conversion for display temperature sense.
- The 5 leds located on the phone cabinet.
- The led on the alphabetic keyboard

3.6 Smart card board

The smart card board is in fact only a mechanical support of the ISO 7816 compliant smart card connector . It is connected to the keypad board.

3.7 Backlight converter

This board supports the step up converter which generates the high voltage required by the cold cathode fluorescent lamp used for the backlight.

This board is linked on one side to the bottom board and on the other side on the backlight lamp located on the top of the display module

The backlight converter is automatically cut-off when the terminal is in iddle state to save power and to compensate the limited live duration of inherent to fluorescent lamp.

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4 DETAILED CHARACTERISTICS

4.1 PC like keypad

The sliding keyboard is a PC like keyboard. It is located under the phone with push pull mechanism to draw it out or to hide it . The key mapping is QWERTY. There is a locking mechanism on the alphabetic keyboard which locks it under the terminal. when the user wants to pull out the keyboard , he has to push first and then pull to unlock. The alphabetic keyboard is directly issued from the portable PC keyboard market, thus offering a convenient usage.

4.2 Full VGA display

The Display has a fixed tilt angle of 27 degrees. It is a custom component for ALCATEL. The characteristics below are related to the display + the touch sensitive screen.

- Full VGA resolution 640 x 480 pixels (1920 dots x 480)
- Stripe organization
- Size : 7,5 "
- 256 colours
- passive matrix
- single scan
- 8 bits interface
- Contrast minimal value is 15 perpendicular to the display
- Viewing angle in the front rear direction is +/- 20 degrees
- Viewing angle in the right left direction is +/- 45 degrees

The CFL backlight technology built in the display module features 90cd/m2 brightness for the screen

A temperature compensation algorithm implemented in the power PC modifies automatically the contrast voltage by measuring the LCD module temperature. This avoids contrast variation due to temperature conditions.

4.3 Touch panel

The Touch panel allows direct access to objects proposed on the screen. For small object selection like those existing on internet pages, there is a pen delivered with the terminal with an ergonomic shape. When not used, this pen lies in a dedicated location under the

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display.

The touch screen polling is done by the microcontroller of the telephony keypad board.

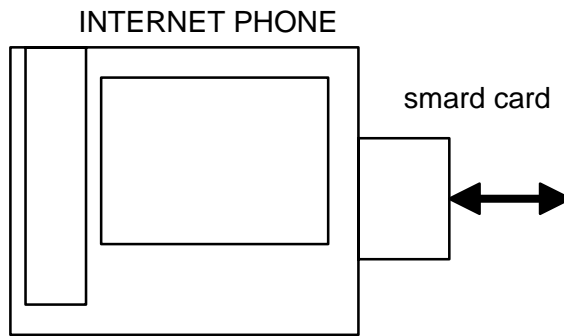
A calibration function which associates precisely the touch screen coordinates to the display coordinates is offered to the user .

4.3.1 Characteristics

- resistive touch panel (4 wires)
- Size : 7,5 ”
- Technology : Flex on glass

4.4 Smart card reader

The Smart Card is located on the right side of the terminal. When the smart card is engaged, around 25mm are available outside to be able to handle the card with no difficulties.



- number of contacts: 2x8
- Related Standard:
ISO 7816-1
ISO 7816-2
ISO 7816-3
- PTS and warm reset.
- Single card voltage: 5V,
- Single card clock: 3.58 Mhz,
- T=0 and T=1 protocol ,
- Card transmission speeds: 9600 and 19200,
- Support of all asynchronous standard card as Bull CP8, SIM, EMV,

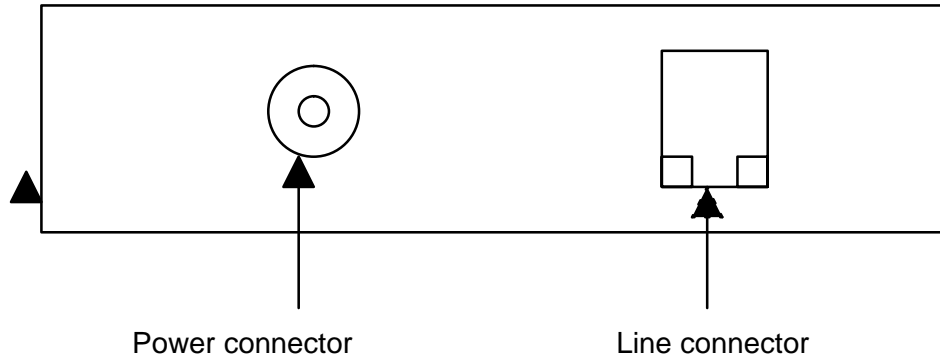
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4.5 External connectors

The handset cord is plugged under the terminal and the cord is guided to come out on the left side of the terminal.

The line cord and the power supply cord are connected on the rear panel of the internet phone.

CONNECTOR AREA VIEW (rear side)



4.5.1 Handset connector

- Female modular 4 contacts RJ11

4.5.1.1 Line connector

- Female modular 6 contacts RJ11

4.5.1.2 External power connector

- Female 5mm JACK

4.6 Line and handset cords

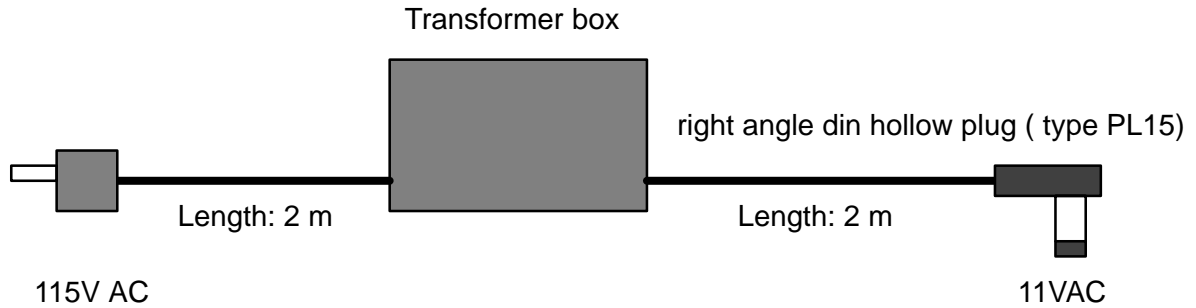
- The handset is linked to the base by a four leads partly coiled cord.
Length : 600mm +/- 20 mm coiled
- The terminal is supplied with a 3 meters flat cord with a RJ11 male connector on both ends.

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4.7 External power transformer

The Internet Screen Phone gets power from an external power transformer.



- Electrical characteristics

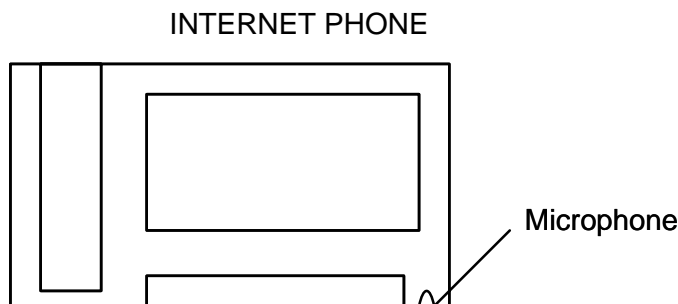
AC INPUT			AC OUTPUT	
VOLTAGE	CURRENT	FREQ.	VOLTAGE	CURRENT
115 VAC	0.2 A	60 Hz	11 VAC	1.3A

- Weight: 600 g

4.8 Other elements

4.8.1 Handfree microphone

The handfree microphone is located in the front right side of the terminal.



4.8.2 Loudspeaker

The loudspeaker is located on the left side of the upper part of the cabinet, under the handset. A close volume behind the loudspeaker, inside the terminal gives a morte "flat" frequency response for the loudspeaker and reduces the internal acoustical coupling between loudspeaker

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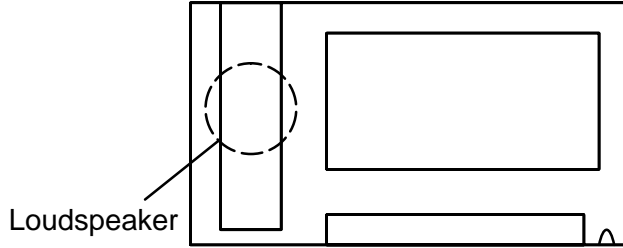
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and microphone.

The handsfree microphone and the loudspeaker are separated by the maximum distance possible taking into account mechanical and aesthetic constraints, to decrease the external acoustical coupling between the two transducers.

INTERNET PHONE



The loudspeaker is a high quality component with plastic membrane much more stable over the time and with better dispersion characteristics.

The loudspeaker is used for the following function:

- Ringing
- Group listening
- Handsfree
- Internet audio files
- MMI related sounds (beep, click...)

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5 TERMINAL CHARACTERISTICS

5.1 Reliability

The whole terminal has been designed for a 8 years MTBF. This is based on the major assumptions below:

- General conditions :average use 3 hours per day and 15 calls/connections per day.
- Cold fluorescent lamp : 10 000 hours before reaching half initial brightness
Hypothesis : 5 hours per day with 200 days per years.
- Touch screen reliability : 1 million touch .
Hypothesis: 500 touches per day with 200 days per years.

5.2 User guide

The format is A5 with 40 to 45 monochromic pages

5.3 Manufacturing options

See customization guide line.

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6 HARDWARE RELATED STANDARDS

6.1 Approval

- EMC, conform to CE approval requirement
 - ☞ PART 15
- SAFETY, conform to CE approval requirement
 - ☞ UL 1950
- telephony, line interface approval standards
 - ☞ Accoustic specification : EIA 470A (guide line, not mandatory)
 - ☞ Electric specification : EIA 470A (guide line, not mandatory)
PART 68

6.2 Other standards

6.2.1 Caller Identification (guide line, not mandatory)

Type 1 & 2 only supported in 2840 application

Bellcore GR-30-CORE issue 1, LSSGR

Voiceand data transmission interface generic requirements, section 6.6

Bellcore SR-TSV-002476

Customer permises equipement compatibility considerations for the voiceband data transmission interface

Bellcore SR 3853 Issue 1, February 1996

Type 1, 2 and 3 CPE Certification

Bellcore SR-3004 issue 2, January 1995

Testing Guidelines for analog type 1, 2 and 3 CPE

For design consideration regarding this specification, see chapter 3.3.6.

6.2.2 Modem

ITU V34+ , V42 and V42 bis

6.2.3 Mechanical

The mechanical hardness target is based on IEC 721-3 standard with IEC 721-3-1 Storage : 1M2

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IEC 721-3-2 Transport : 2M2
IEC 721-3-3 Use : 3M1

6.2.4 Climatic

The mechanical hardness target is based on IEC 721-3 standard with

IEC 721-3-1 Storage : 1K4
IEC 721-3-2 Transport : 2K2
IEC 721-3-3 Use : 3K3

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