A Different Kind of Manhattan Project

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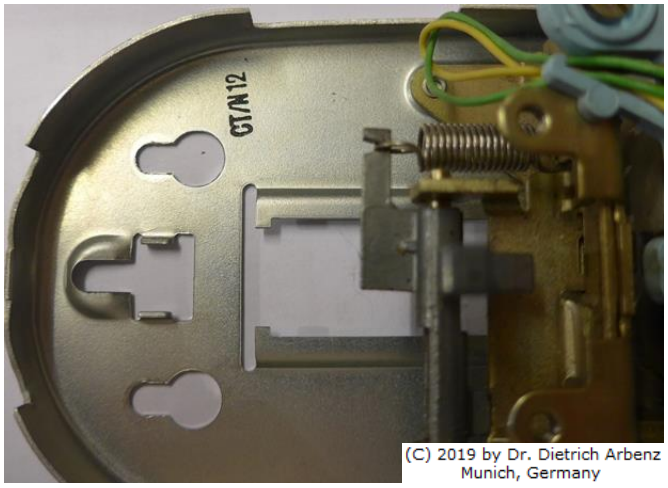
This is the story of how Western Electric got involved with Telecom Germany, and what came from that liaison ("Telecom Germany" is used in a generic manner here, instead of the proper term for the time: "German Federal Post [office]" because it's shorter).

It was back around 1980 that Telecom Germany decided that it was time to offer subscribers new designs of telephones other than the traditional ones manufactured by Siemens and other German telephone manufacturers. Telecom Germany apparently took a liking to Western Electric's Trimline®, but it had no experience in dealing with telephone manufacturers in other countries, so it requested Siemens of Germany to step in as an intermediary – especially since Siemens owned and operated some plants of its own in the USA, and was thus in a good position to deal with W.E.

Hence, Siemens contracted W.E. to manufacture and deliver approximately 130,000 Trimline® phones, manufactured to Telecom Germany's electrical specifications. These phones were then initially delivered to the Siemens plant in Bocholt (Nordrhein-Westfalen district), Germany, where they received their final modifications, such as adding a Siemens carbon microphone, line and handset cords, etc. The typical Siemens markings are usually found stamped on the inside of the base, as may be seen in the following photograph of a wall phone:



"CT" is the Siemens identifier code for the plant in Bocholt, Germany, while "N" denotes the year 1981 and "12" December of that year. Not all Siemens phones were marked in this manner. The phones were manufactured between 1980 and 1984.

As can be seen, the base of the wall-mounted version has the slot for a RJ plug, but Telecom Germany didn't use it, so it was omitted – wall phones were simply hardwired to the line.

Electrically, the Siemens version of the Trimline® is *completely* different from the W.E. version, and has no external markings identifying it as a Trimline® - as a matter of fact, Telecom Germany dubbed their version of the phone the "Manhattan®" (official codes "D Fe Ap 370-1*" for the desk version and "D Fe Ap 390-1*" for the wall version). Siemens itself also marketed this type of Trimline® for use with their own PABXs, dubbing it the "miniset 100®" (*sic!*).

*) "D" stands for "Deutschland" (Germany), "Fe Ap" for "**Fe**rnsprech**ap**parat" (telephone) and "-1" for the first version (apparently, there was no second version).

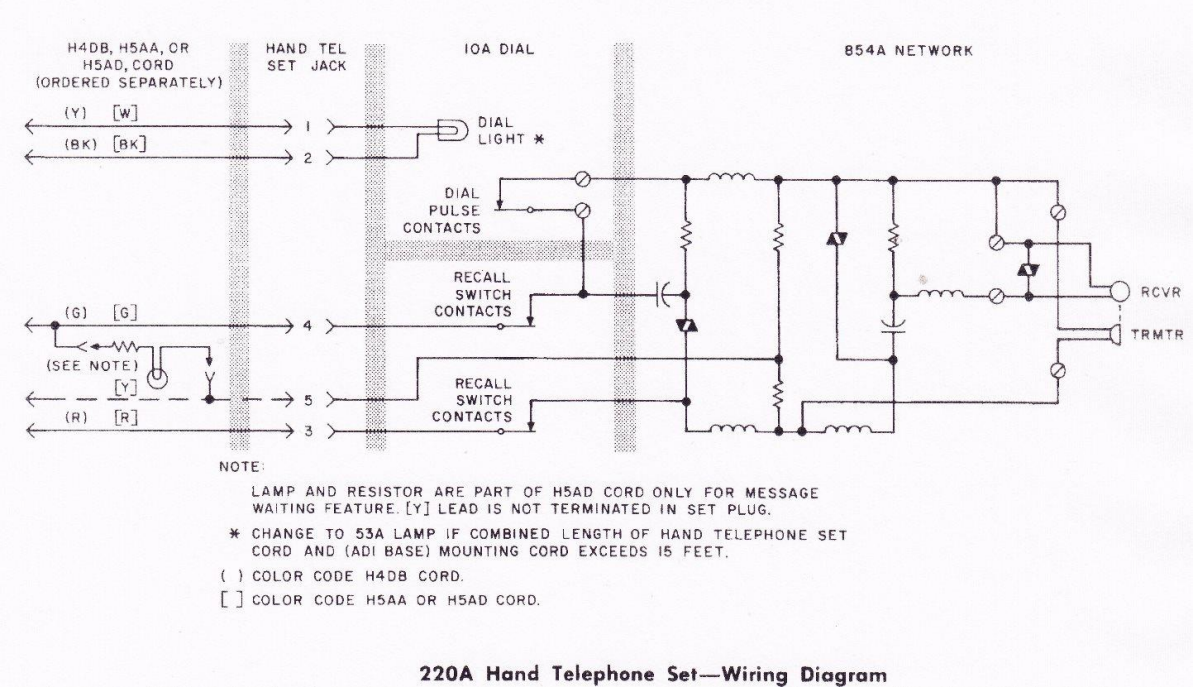
The Manhattan® was available with or without the green LED to illuminate the dial, the constraint being a line loop resistance of 800 Ohms; less than 800 Ohms with LED, more than 800 Ohms without. The miniset 100® was only available with the LED, since PABX lines were never so long as to have a loop resistance anywhere near 800 Ohms. Neither the Manhattan® nor the miniset 100® was built in a version with a light bulb to illuminate the dial.

Telecom Germany offered the desk Manhattan® *with* LED in the W.E. colors ivory (-50), cherry red (-53), muted blue (-76), white (-58), moss green (-51) and brown (-113); phones *without* the LED were only available in ivory, cherry red and muted blue (all colors approximate). Refer to the addendum on page 19 for further information.

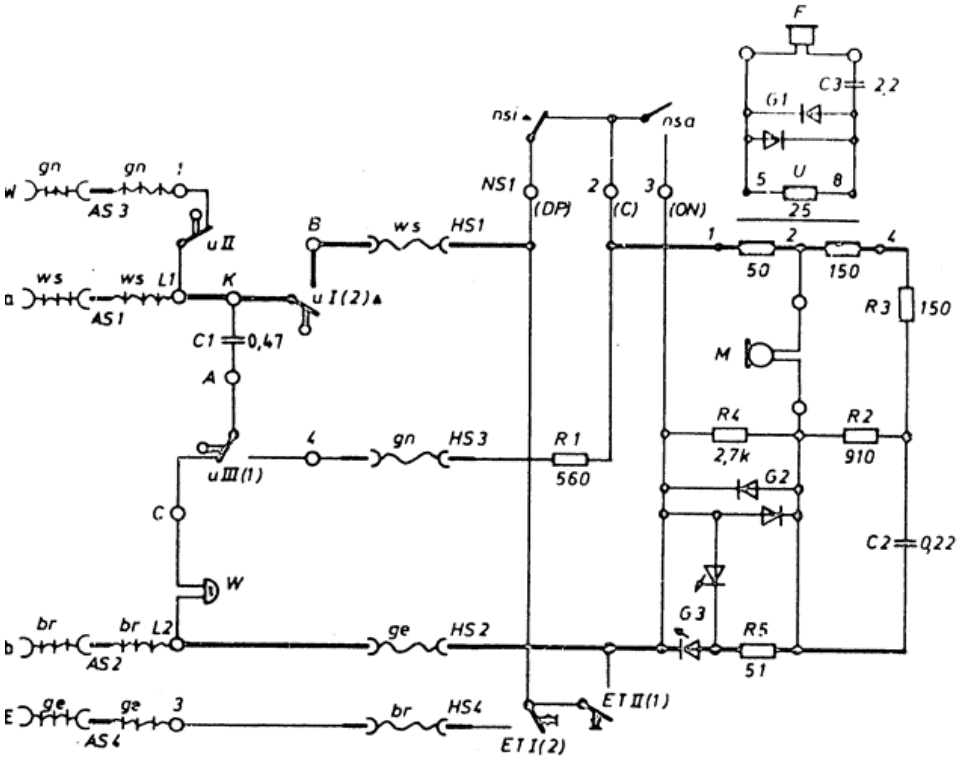
Siemens miniset 100® desk phones were *officially* only available in -58 (white), -105 (dark green) and -113 (brown), wall phones only in brown – however, I own a miniset 100® in cherry red (-53), complete with its original sticker from Siemens. It is in pristine condition and apparently rare.

The only true indication that these telephones were manufactured by W.E. is that some of the plastics are marked "WE," and that the ringer condenser is marked as having been manufactured at Hawthorne, Illinois.

As already stated, the Manhattan® and miniset 100® are completely different electrically from the Trimline®. Shown below are the schematics for a Trimline® type 220 handset and the Manhattan®.



220A Hand Telephone Set—Wiring Diagram



W.E. didn't assign new numbers to the components of the Manhattan®, but rather only prefixed them with a large "X." This was probably done so that it was easier to identify them, so that W.E. employees wouldn't confuse them with those for "regular" Trimline® phones. Another difference between phones was that the Siemens versions had a standard AD1 base, but the handset plastics were for the later type with an RJ plug, since the handset cord used was a standard Siemens type (photographs will be shown later on in the article).

Aside from a completely different flexible printed-circuit in the Manhattan® phones, the following differences are noted:

Ringer condenser:

The Manhattan® has a type 575E 0.464 microfarad capacitor (+/- 10%) from Hawthorne – the schematic calls for 0.47 microfarad; on phones *without* the dial LED, this value was raised to 1.0 microfarad. The W.E. AD1 base has a 575E of 0.460 microfarad (+/- 13%), also manufactured at Hawthorne.

Dial:

Manhattan® = X-10D, standard WE = 10D; for line loop resistances of less than 800 Ohms, the Manhattan® X-10D dials have a bipolar green LED, as do the W.E. 10D dials. The finger stop on the 10D dial will move to *slightly before* the digit 9, while than of the X-10D comes to rest *exactly over* the digit 9 – this allows for a forced 100 millisecond inter-digit pause. The X-10D also has an "off/normal" contact which the 10D doesn't have.

Ringer:

The Manhattan® has a ringer marked „XP1B" with a D.C. coil resistance of 1700 Ohms, with two leads (red and black), while the standard P1B ringer has a D.C. coil resistance of 6000 Ohms (red and black leads), the second coil is not in use (slate and red-slate leads). Both ringers have a type 65A gong and the same size and type of resonance chamber.

Receiver capsule:

Early type 220 handset capsules (circa 1969-1970) have a D.C. coil resistance of 35 Ohms in sum, with a varistor bridging the coils to provide hearing protection (type "LA2"), a later handset (circa 1993) has a type "LB1" capsule with a D.C. coil resistance of 45 Ohms total; the type LB1 capsule coils are also bridged by a varistor. The capsules in the Manhattan® have a total D.C. coil resistance of 95 Ohms (type "XLB2") and the coils are *not* bridged with a varistor – this is replaced by two anti-parallel diodes on the flexible printed-circuit.

Further technical differences on the Manhattan® phones:

With the handset resting on the cradle (on-hook condition), wire "a" (tip; white wire in line cord – "ws") is looped thru to wire "W" (green wire in line cord – "gn"), so that an external ringer can be bridged between wire "b" (ring; brown wire in line cord – "br") and "W." The classic "recall" button on W.E. Trimlines® has a different function on the Siemens types, namely to ground the tip and ring wires to wire "E" (ground; yellow wire in line cord – "ge") for PABX use. All phones of the Siemens versions have this function, although it is not needed for use on the Telecom Germany PSTN.

The microphone capsule type "T1" is replaced by a classic Siemens carbon microphone with the part number V30050-B5003-B; it is not known whether or not the phones delivered to Siemens were supplied with a T1 microphone which was then replaced in Germany, or whether they were delivered without a microphone capsule. Informed conjecture has it that the handsets were delivered with T1's, because they were necessary for testing purposes at the W.E. plant.

On W.E. Trimline® 220 handsets, the flexible printed-circuit is designated as "854D NET," while that on the Manhattan® is designated as an "X854D NET."

The number of holes, and their arrangement in the plastic for the microphone, is the same for both versions, whereas the number of holes for the receiver is six for W.E. and seven for the Manhattan®, with those of the Manhattan® being larger in diameter than those of the W.E. product and in a slightly different arrangement. The dial on the Manhattan® only has digits, while the W.E. version also has the traditional lettering.

The number of Siemens miniset 100®'s in actual use was rather small, so that one is *much* more likely to find a Manhattan® than a miniset 100® at eBay in Germany.

As an aside: Siemens actually sold the miniset 100®'s as a stopgap measure until they were through with designing their in-house miniset 200®, which was named the "Dallas®" by Telecom Germany. I must explain here that practically all telephones which Siemens intended for use with their PABXs were designed in such a manner as to also be acceptable to Telecom Germany for use on the PSTN, thus killing two birds with one stone and ensuring healthy sales.

The phone on the left is a discolored and beat-up Manhattan® (D Fe Ap 370-1) which I dumped after having taken the photographs shown further on. For comparison, the phone on the right is a "marriage" of a W.E. AD1 base with a late model type 220 dial handset from a Trimline® sold by AT&T in the 1990s.

A comparison of the underside of the bases, the AD1 is on the right.

The important thing here is that the Manhattan® doesn't have plugs and jacks for the line and handset cords – both are hard-wired to the base.

What looks like a line cord plug is nothing more than a strain relief block inserted into the empty jack opening. The handset cord is held in place by a similar piece of plastic.

The base of the Manhattan® lacks all the typical W.E. markings – blanks were inserted into the casting dies for these bases.

All screws and rivets on are in the exact same position on both bases.

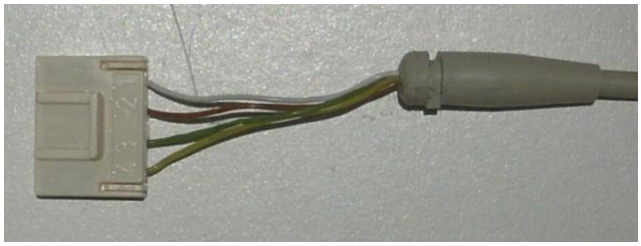
Since the Manhattan® is a legal copy of the Trimline®, the innards are virtually the same in the bases, right down to the resonance chamber for the ringer.

It is not known why the Manhattan® had the terminal block, the resonance chamber and the plastic on the ringer in blue instead of in classic W.E. colors, but it is possible that this was the simplest means for W.E. employees to differentiate the open bases from one another, seeing as how the Manhattan® base was delivered with sockets for the original cords, just as Trimlines® were at that time. As already mentioned, the modifications were done by Siemens in Germany, but W.E. had to have some way of interfacing the bases and handsets to test equipment; thus the original jacks were mounted to the Manhattan® bases during manufacture.

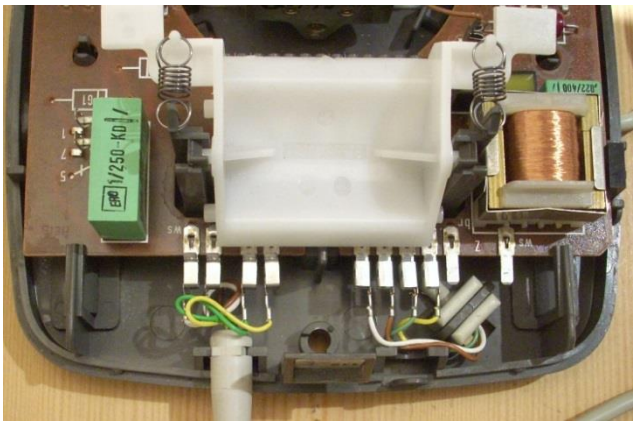
In this photo, one can see that the ringer is designated as an "XP1B," which denotes it as belonging to a Manhattan® base.

One may also see the 0.464 microfarad ringer condenser and, at the bottom of the photo, the terminals for the handset cord.

These terminals are quite different from the spade lugs commonly used in the States – they are more akin to the flat tongue and socket style most commonly found in automotive electrical systems. In this case, the female portions have a double spring-clip and were originally intended to be mounted within a small jack housing (known as a "postage stamp" plug in Germany – used for PABX telephones) as shown below.



The following photograph (left) shows such loose spring-clip wire terminals pushed onto contact tongues soldered directly to a printed-circuit board.



The photograph on the lower right compares the cradle switch contact piles; it also gives a good view of the cradle switch lever on both phones. One also has a good view of the black plastic block on the Manhattan® which secures the line cord and provides for strain relief.

There is one big difference between the jack holder on the Trimline® and the line cable entrance on the Manhattan®: it was physically redesigned for the latter and thus cast in a different manner, being lower than in the original.

The handset on the left belongs to the Manhattan® - one can easily read the part number as being "X854D NET." The printed-circuit board is also marked "W.E." As can be seen, the two circuit boards are very different, especially as to the handset cord, the number of screws for the dial and general layout.

The termination of the Manhattan® handset cord is quite different from that on the Trimline®, using the ubiquitous German spring-clip terminals. The black terminal block is soldered directly to the circuit board and provides strain relief for the handset cord, as may be seen in the detail to the left below.

If one looks closely, it is just possible to see the semicircular notch in the terminal block which mates with a circular notch on the handset cord strain relief boot.

In a typical German phone **line** cord, white is tip, brown is ring, yellow is ground and green is the wire for a second ringer; in this case, the handset cord takes the place of a line cord, which only requires two wires on the Trimline®.

Here, however, white is tip with *yellow* equaling ring, brown being connected to the "ground" pushbutton. Green is connected to a single-pole, double-throw contact on the cradle switch and connects the ringer condenser (with a series resistor) in parallel to the dial pulse contact, to suppress sparks across it.

The frame for the handset components is exactly the same for both the Trimline® and the Manhattan®; while the receiver capsule for both has the same dimensions and general construction, the coils in the one belonging to the latter have a higher resistance and it lacks the varistor.

As can be seen, the microphone capsule and its plastic ring are different for the Manhattan®, seeing that they are from Siemens. Some components are in different locations on the circuit boards, or are missing all together, or are additional ones for the Manhattan®.

As already mentioned, the dial for the Manhattan® has one terminal more than the one for the Trimline®, because the former has an extra "off/normal" contact to short-circuit the entire speech circuit during dialing, as is standard for most European telephones.

The two terminals for the dial LED are in the same position on both dials, as are the two for the dial pulse contact. The LEDs are not polarity-dependent.

The terminal to the far left on the left-hand dial is for the "off/normal" contact of the Manhattan® dial.

Mechanically, both dials are built the same.

The peg for the finger stop is exactly opposite the digit eight on the Manhattan® dial, while it is almost in line with the digit nine on the Trimline® dial.

The tangs for mounting the dials are in the same position on both.

Since both the Manhattan® and the miniset 100® are first cousins to the W.E. Trimline® phone, they naturally have the same exterior plastics as the Trimline® does.


While researching and photographing the Manhattan® and miniset 100®, I stumbled across what at first appeared to be a cheap copy of the W.E. Trimline®, namely a phone named "Gondola®" from Spain.

Further research into the matter revealed that the Gondola® was an IT&T style Trimline®, manufactured by the Spanish IT&T associate company "CITESA" (La **C**ompañía **I**nternacional de **T**elecomunicación y **E**lectrónica, **SA**), located in the city of Malaga.

The following information was gleaned from an automated German translation of a Spanish document pertaining to strikes and social unrest in Malaga, Spain during the 1970's – I cannot vouch for either the correctness of the translation, nor for the content. It is most unfortunate that TCI's IT&T expert, Mr. Roger Conklin, is no longer alive and able to provide further insights into CITESA.

"CITESA was founded in 1961, and a factory built in Malaga, Spain, which appears to have taken up production on 2 December 1964 with the goal of an annual output of 750,000 phones. The firm started with 20 directors, 162 technicians and 499 regular employees, of which 383 were direct employees of CITESA. Most of the telephones to be manufactured were intended for export. In the 1970's, CITESA had over 2,000 employees.

Two Gondola® telephones were bought, and as luck would have it, one had the dial illuminated with a lightbulb, the other with an LED … both were bought at eBay® in Germany, the former from a German seller, the latter from someone in Spain.

They were originally bought out of sheer curiosity, because they were look-alike products without *apparent* connections to any known telephone manufacturers – who had ever heard of CITESA or a Gondola® telephone?

The Gondola® with a dial lightbulb was the first to arrive, and it was cleaned and examined in depth. The base (of both phones) is similar to the early W.E. type AD1 with a sliding retainer for the line cord (readers may wish to refer to the article "THE TRIMLINE® BASE" by Richard Gerber and Paul Fassbender, to be found in Volume 27, number 5 of "Singing Wires", dated 15 May 2013, for further information).

The handset cord has 5 conductors in red, green, yellow, black and white – red and green are for the speech circuit, white and black carry 6 volts A.C. for the lightbulb, with yellow being reserved for a field change in wiring in connection with a call transfer function (nothing further is known of this feature). Contrary to W.E. handset cords, which only had a tapered end on one of the plugs, the cords on the Gondola® have a taper end on both plugs (refer to the article "The Western Electric Trimline Cord" by Richard Gerber, to be found in Volume 21, number 3 of "Singing Wires", dated 15 March 2007, for further information).

The *line* cords vary between the two types of Gondola®, the early version has the standard colors red, green, yellow, black and white – with yellow being connected to one side of the ringer, requiring a strap in the wall jack to connect the yellow and green wires together, just the same as on W.E. Trimlines®, while the type with LED has a four conductor line cord with wire colors red, white, black and yellow. White and red (tip and ring) are for the phone line, black isn't connected to anything and yellow is connected to yellow of the handset cord.

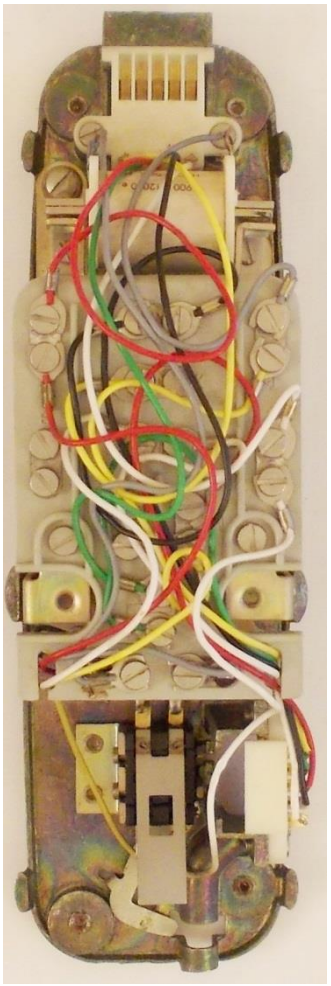
However, in this case, yellow isn't intended for call transferring, but rather the wire terminates on one of the dial pulse contacts inside the handset – there is no information available as to what this wire might have been used for.

The two photographs at the bottom of the previous page give general views of the Gondola® equipped with a lightbulb for the dial. The logo is easy to see in the lower picture, but it is not discernable what is written at the right side; the text reads as "Fabricado en CITESA-Malaga" (manufactured by CITESA Malaga). The white knob is for adjusting the ringer volume.

As stated before, the Gondola® looks just like a Trimline® from the outside, right down to the number and position of the holes for the receiver.

The peg for the finger stop on the dial is in the same position as on Trimline® dials, and in the standard version(s) of the phone, the push-button disconnects the handset from the line when depressed.

While the handset cord looks rather ratty as received, I was able to clean and unkink it without having to resort to strong cleaning agents or heat.

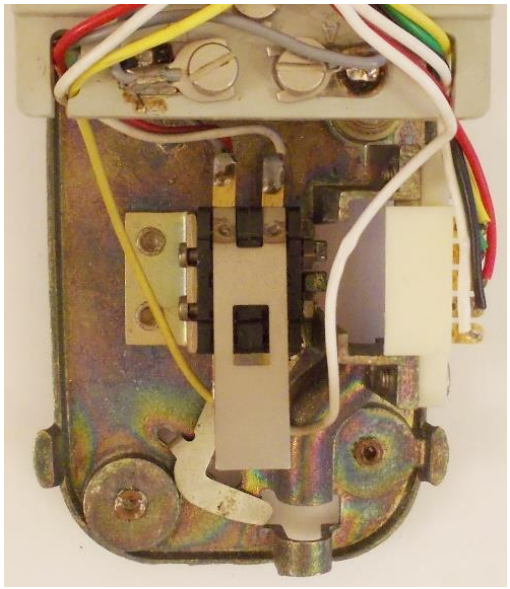


The electrical components inside the base are radically different from those of a Trimline®. The first thing one notices is the absence of a visible capacitor for the ringer; it is soldered to the *underside* of the terminal board, on the end nearest the cradle "leaf microswitch" at the bottom of the photo. Also visible is the sliding line cord retainer.

The sockets for the cords are not pressed into place, but rather attached with screws, and the ringer is completely different – the coil and part of the armature can be seen just below the handset cord jack at the top of the base.

As may be seen in the lower photo on the previous page, the base only has riveted components, the same as on W.E. AD1 style Trimline® bases.

From left to right: line cord jack, terminal board with ringer capacitor at the left (black rectangle), ringer gong, armature and coil mounted on a common base (which is attached to the phone's base with screws), and the handset cord jack. An interesting feature is that the cord jack contacts (as well as the contacts on the cord plugs) are at least gold-plated, if not of solid gold.

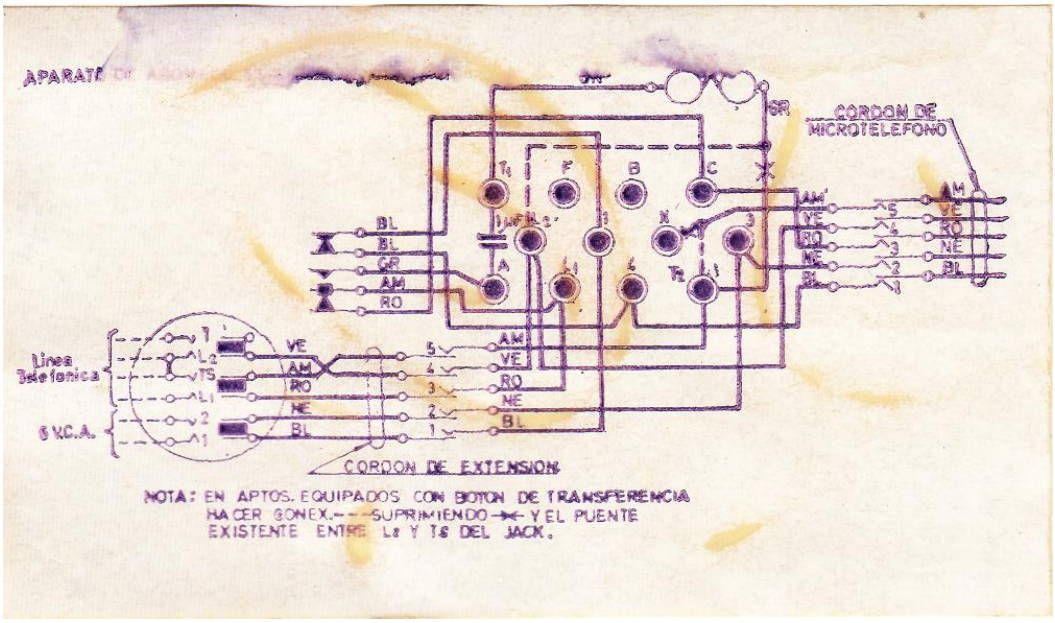


The spring-leaf cradle microswitch includes a single pole, single throw normally open contact and a single pole, double throw contact.

The former turns on the dial lightbulb when the handset is removed from the cradle, the latter switches the "tip" side of the line between the ringer (handset on cradle) and the speech circuit in the handset when the handset is taken up.

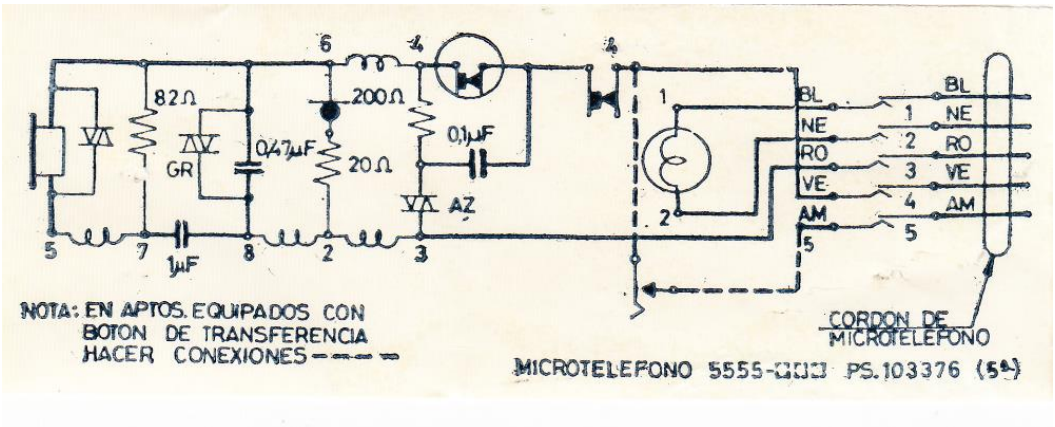
If one looks closely to the left and right of the two terminal board screws visible, it is possible to see the soldered wires of the ringer capacitor.

The flexible printed-circuit board inside the handset is completely different from that in a Trimline®, and there is no separate frame to which the individual components are attached to.



This is the schematic for the base of the Gondola® with dial light; the wire colors are abbreviated in Spanish – "BL" ("Blanco" = white), "NE" ("Negro" = black), "RO" ("Rojo" = red), "AM" ("Amarillo" = yellow), "VE" ("Verde" = green), "AZ" ("Azul" = blue) and "GR" ("Griz" = slate). As can be seen, the green ("VE") and yellow ("AM") line cord wires are connected together in the wall terminal.

An important point when reading the above schematic is that, contrary to usage in many European countries, the handset cradle switch contacts are shown in the off-hook position.



A quick primer in reading European phone schematics: the item immediately above and to the left of the lightbulb is the handset disconnect switch, the circle with a closed contact is the dial-pulse contact. In conjunction with the 0.1 microfarad capacitor, the 200 Ohm resistor forms a spark quencher to suppress radio interference; the varistor labeled "AZ" (blue) and the 200 Ohm resistor regulate the line voltage. The coils of the induction coil are drawn separately and are to be found between the numbered points 6-4, 8-2-3 and 5-7. The carbon microphone capsule is connected between induction coil points 6 and 2, with a 20 Ohm resistor in series to limit the current flowing thru the microphone. The unit at the far left, one end of which is connected to induction coil terminal 5, is the receiver capsule, which is bridged by a separate varistor, which is supposed to limit the volume in the receiver to levels safe for the ear.

The note in the lower left-hand corner states that in phones using call transfer, the dotted connections must be made.

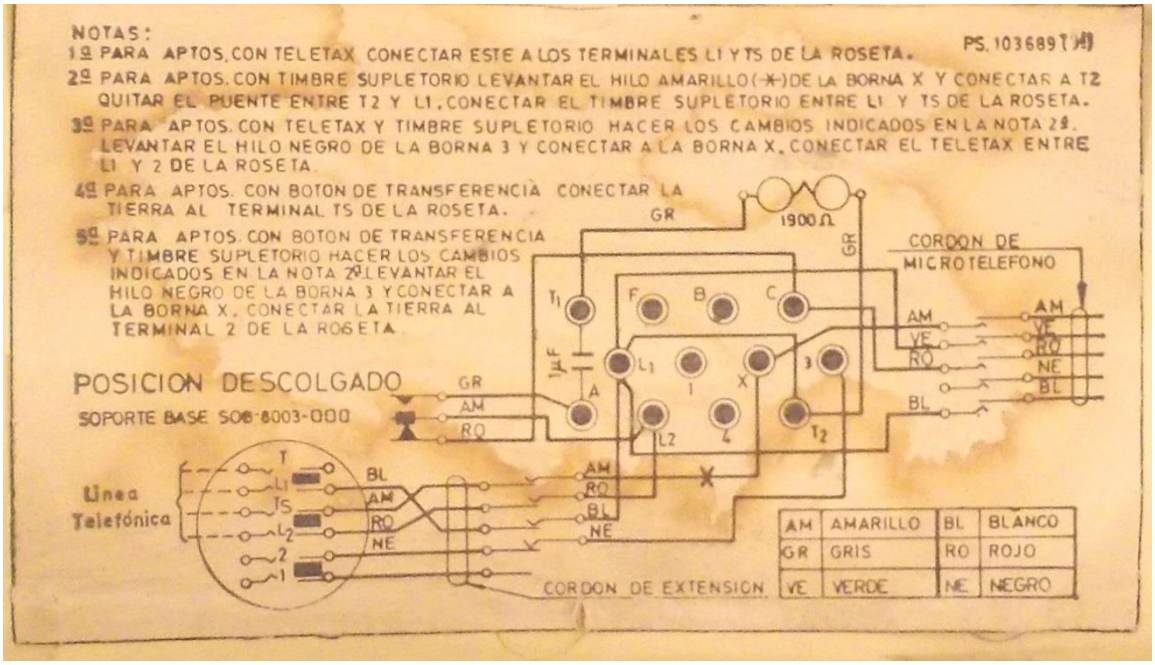
In the Gondola®, the circuitry of the handset completely matches that of a standard W.E. 425B type network, while there is one capacitor missing in that of a standard W.E. type 220 handset.

An interesting feature of the Gondola® circuit board is that the dial is not connected to it with screws; it is connected to the circuit via two flat lugs which are an integral part of the line disconnect pushbutton, located on top of the miniature induction coil.

As can be seen, there is a separate varistor for hearing protection connected to the receiver cup (green rectangle at the top).

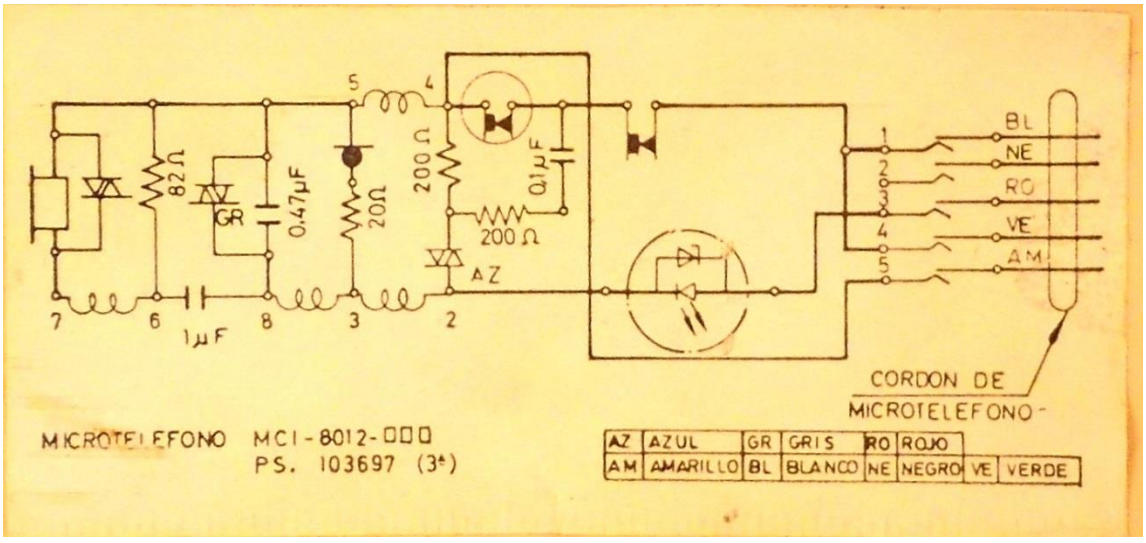
The two varistors for line voltage regulation and line balancing are located in the middle of the circuit board. As can be seen, one is blue, the other one gray. They are called out with their colors in the handset schematic, so it is possible to tell which is which: the blue one regulates the line voltage.

This is the general interior makeup of the handset, showing all components mounted in the lower handset shell, with the receiver capsule cup on the left. As can be seen, the microphone cup is held in place with two metal fingers of cadmium-plated iron. One of the dial wire connections can be seen immediately below the top right-hand dial mounting screw.



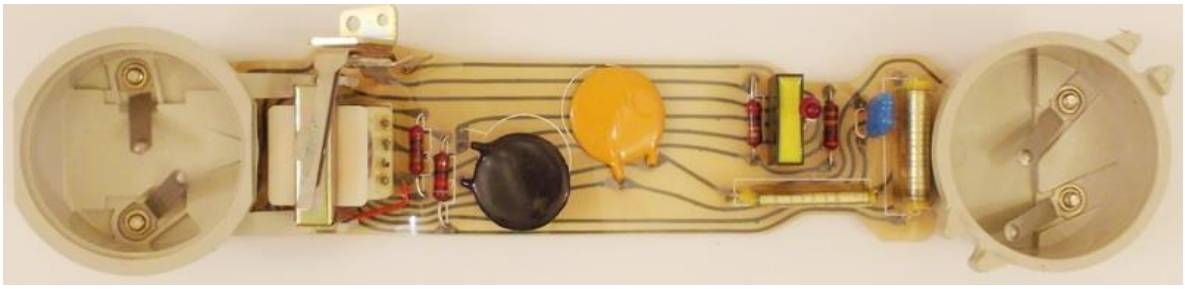
The schematic for the base of the LED version of the Gondola® has one contact less on the cradle switch, since there is no lightbulb to switch on and off. The line cord only has four wires, and can get away with two (red and white) for operation.

Contrary to the Trimline® and the Manhattan®/miniset 100®, the LED version of the Gondola® has a small (3 millimeter) **red** LED to illuminate the dial, and the LED is very dark at typical off-hook line voltages. The LED in the Gondola® is polarity-sensitive, and the red line-cord wire must be connected to the positive side of the line for it to light up.

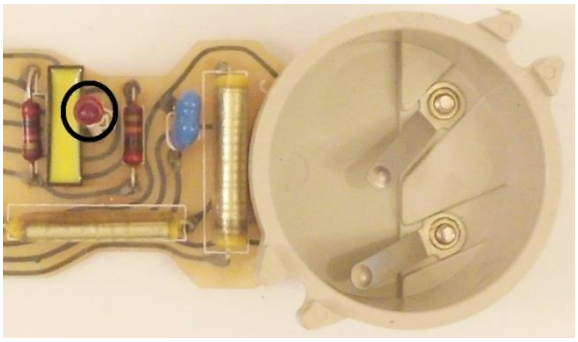


Aside from the LED, the schematic has one other additional component, namely an extra resistor of 200 Ohms in series with the 0.1 microfarad capacitor across the dial pulse contact. While the Trimline® and the Manhattan®/miniset 100® have the LED as an integral part of the dial, it is mounted on the flexible printed-circuit board of the Gondola®, which causes less light to reach the dial.

The yellow wire of the handset cord is connected to one side of the dial, but is apparently used in connection with a call transfer function similar to that of the lightbulb version.

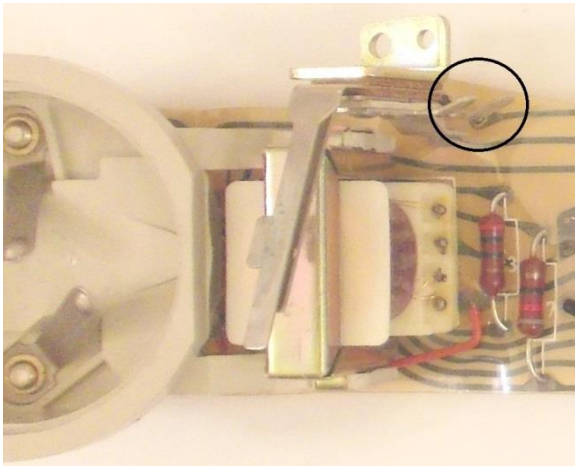


The handset circuit board is slightly different in the LED version of the Gondola®; the varistors have different colors (although they are still called out as blue and slate in the schematic), the reset pushbutton contact is a single contact (mounted on top of the induction coil). The LED is barely visible in this photo.



The red LED can be seen within the black circle in this photo.

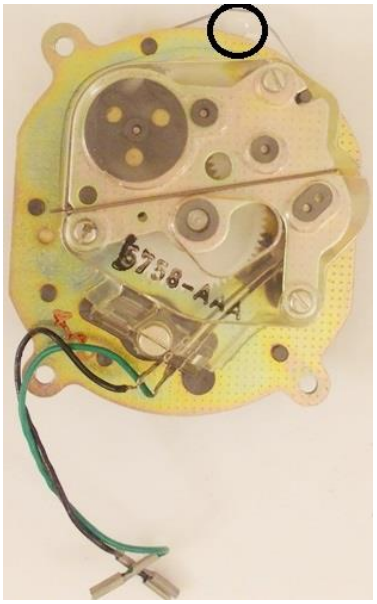
The PVC "spaghetti" insulation of the LED terminals is cut to a specific length, so that the LED will remain at the proper height during soldering.



In both versions of the Gondola®, the dial wires are connected to the circuit via push-on terminals and contact tongues.

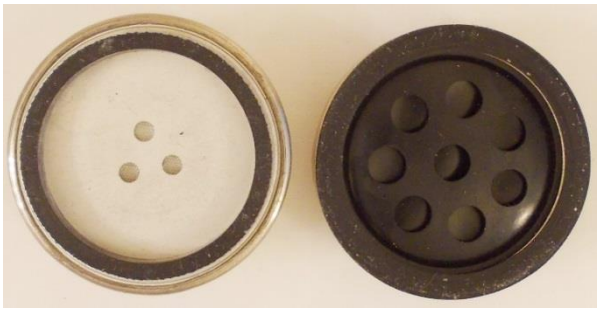
Although it looks as if the dial were bridged across the reset pushbutton, this is not the case.

The uninsulated contacts of the reset push-button touch the induction coil core frame when depressed, but this is no problem since the core is electrically insulated from the handset circuit.



The dial mechanism is of the same construction as in the Trimline® and the Manhattan®/miniset 100® telephones. One can see the push-on terminals crimped onto the end of the dial pulse contact wires.

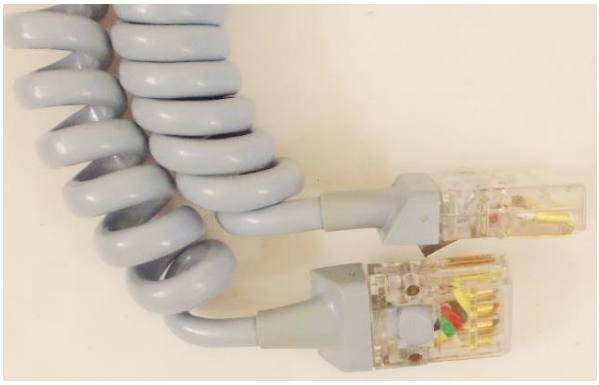
The black circle shows the hole thru which the LED is inserted. Since the LED is an off-the-shelf product, most of its light is emitted towards the front of its translucent housing, and not towards the side, as would be necessary for efficient illumination of the dial.



While the microphone capsule looks like a standard W.E. type "T1," the receiver capsule is of an unknown ITT design.

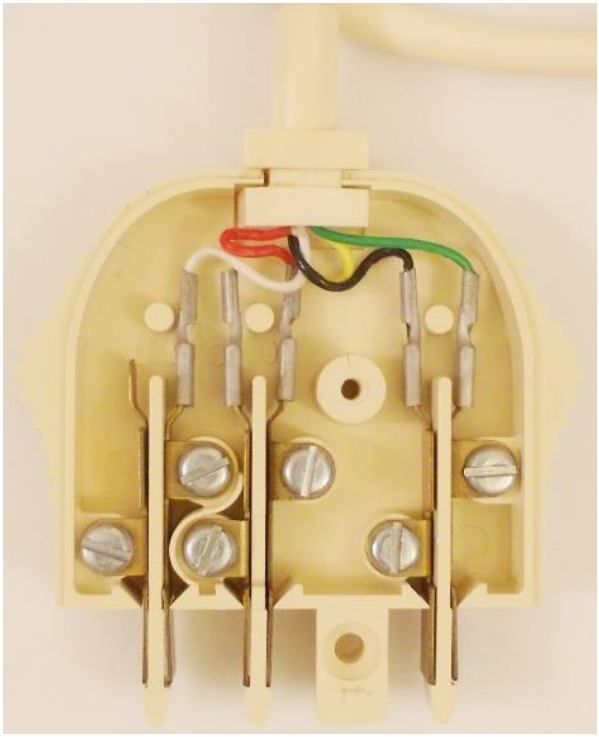
As can be seen, both have a flat grommet to physically and acoustically couple them to the handset molding.

The microphone capsule is unmarked, while the receiver capsule carries what appears to be a date code, but it is more likely the number assigned to this capsule design, since there is not date 33-3-67.



Contrary to Trimline® handset cords, where only one plug has a tapered (two would be a manufacturing error), the Gondola® handset cord plugs both have a tapered end.

As can also be seen, the contacts are (at a minimum) gold plated, if not solid gold, as on early Trimline® cords.



Unfortunately, the lightbulb version of the Gondola® bought did not have its original line cord plug, but the LED version did.

The plug is a bit unusual in two respects; first of all, one can terminate line cords with spade lugs *or* push-on contacts, and secondly, it can be used either as one half of a wall terminal for permanent installation (by physically locking plug and jack to each other by inserting a screw into the tongue with the hole), or as a plug in an arrangement with several wall jacks.

As can be seen, the plug has a total of six possibly contacts, of which five are in use here.

Although the components are attached with rivets to the bases of both versions of the Gondola®, there are a few threaded inserts pressed into the base, as can be seen in the lower middle of the above photo.

One can also easily read the Gondola® logo in this photograph, and the sliding line cord retaining clip is also visible in its open position.

As to the age of the phones, the version with the lightbulb has no markings which would give the date of manufacture, but some of the components do: the ringer condenser and the microphone capsule are marked with "0169," while the dial is dated "4-69," so it is safe to say that it was manufactured around April-May of 1969. The LED version carries a legible date on the exterior of the base: "AK-9-74."

Although CITESA built phones primarily for export, the Gondola® was extensively used by the Spanish national telephone company "CTNE" (Compañía Telefónica Nacional de España), which is simply known as "Telefónica" today.

In the meantime, I have discovered yet *another* Trimline® made in Europe, this one from Italy, also manufactured by a local ITT company. There will be a separate article on this phone shortly.

I wish to express my thanks to TCI member Dr. Dietrich Arbenz of Munich, Germany, whose doctorate thesis on Siemens PABX telephones ("Vom Trommelwähler zu Optiset E – Die Geschichte der drahtgebundenen Telefone für die Wählnebenstellenanlagen von Siemens (1950-2000)" – From the Drum-Dial Telephone to the Optiset E – The History of wire-line Telephones for Siemens Dial PBX's (1950-2000)) was the starting point of my research into the miniset 100® and the Manhattan®. I also wish to thank him for his time and effort in corroborating information not included in his thesis.

Addendum

The Siemens miniset100® was officially available in the three colors white, brown and moss green (Siemens documentation, as far as available today, does not reflect whether or not both the desk and the wall-mounted versions were available in all three colors or whether or not the wall version was available in different colors).

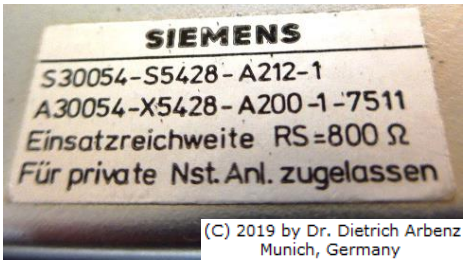
The wall-mounted version of the Manhattan® was available in moss green with LED (line loop resistance < 800 Ohms) or without LED (line loop resistance > 800 Ohms). These two phones were "dead enders" in that no further phone could be connected "downstream" (in many European countries, it is not legal to connect phones in parallel; they must be wired so that picking up the handset of any phone will automatically cut off those "downstream").

The brown version was only available with LED, but the circuitry allowed for its use in a multi-phone residential environment (with "downstream" phones), because the subscriber line was looped through the cradle switch contacts.

Granted: the same sort of multi-phone circuit was available in the desk-set version, whereby the "W" lead of the line cord (green) could be used to loop the "tip" of the subscriber line through to further phones (although this wire was actually intended to be connected to an external ringer – refer to the schematic on page 2).

I have included the Manhattan® and miniset100® labels below for collector's reference.

The German word "Post" (as well as the abbreviation "BP") refer to the (west) German "Bundespost" (Federal Administration of Posts) and indicate ownership. Siemens is given as the manufacturer, the small "a" being the BP-internal code letter for Siemens. The last line reads as "operational [loop] range = 800 Ohms," meaning that the phones in question have the dial illumination LED.



This label belongs to a miniset100®; the long designations beginning with "S" and "A" are Siemens-internal code numbers. "S" indicates a "Sammelkarte," which is a list of all the components of the phone; the portion "A212" tells whether the phone has a mechanical dial, a pulse or DTMF keypad (in the past, this would have also included the little-known dialing system DEV, which was only used in PABXs), as well as the color of the phone. "A" stands for "Allgemeine Angaben" (general information); for telephones, this is the schematic number. The portion "7511" denotes that the designations in the schematic are listed in German, French, English and Spanish (such codes were once common on all Siemens products). The lowest line reads as "approved for use on private branch exchanges."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For further INFORMATION please contact the Commercial Department of the **Compañía Internacional de Telecomunicación y Electrónica, S. A.** Antonio López, 234. Madrid 19. Spain

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