# Errata on Vienna & Austria in the Book "Telephone Dials & Pushbuttons"

(*As well as some other obvious errors*)

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written by Herbert Schwarz, Vienna, Austria, European Union
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This is one of several works which I am making available in printable form, since it is intended to be used as reference material.

Herbert Schwarz
Vienna, Austria, European Union – January 2019

## Table of Contents

# Errata on Vienna & Austria in the Book "Telephone Dials & Pushbuttons"

(*As well as some other obvious errors*)

The following pages are not intended to discredit Mr. Swihart's work in any manner, but should rather be viewed as a means to increase the factual value of the book to future readers by identifying some of the more or less serious errors which crept into the work. Since Mr. Swihart is, sadly, no longer with us, and while the publisher is apparently pretty well fed-up with matters concerning the book and openly states that even the most-needed changes are *too time-consuming and costly to make* (when compared with the possible income generated by the book), the author has decided to write up and publish the following corrections independently.

The author wishes to make it perfectly clear that he held Mr. Swihart in high esteem for his exceptionally deep and widespread knowledge of telephony, as well as of telephone history in general, and anyone who followed Mr. Swihart's trials and tribulations knows just how difficult it was for him to finally get his book into print (if correctly remembered, version 1.00 was a mere 78 pages long). It's more than just a shame that Mr. Swihart's highly specialized library was disposed of in the manner in which this took place (in part, literally, packed off to the recycling center or just plain thrown away), because this makes it impossible to recheck information where this appears to be necessary …. The portion of Tacitus which Mr. Swihart quotes on page 3 of his book sums things up nicely – both as to his own fate and that of his book (refer to the author's post scriptum for more on this – was prophecy at work here?).

The author feels that it would be very desirable if others would, for the sake of propagating verified & correct information, undertake writing supplements and/or corrections in their own areas of expertise, similar to those presented here.

Having written what was to be written on this matter for the moment, onwards ….

## Volume I

### Page 3-64, "Offset-order dials, continued" – reference to Vienna in the right-hand column

In chapter 3.6.3., it's written that offset-order dials invariably caused problems when long distance calls were dialed from a country with an offset-order dial to any country not utilizing the same dial layout – purportedly, the same sort of problem was encountered when dialing from Vienna to anywhere else ("Vienna also had offset-order dials. There too a similar problem arose. Chapter 5.5.6 discusses the problems with this layout in Vienna").

Throughout the years, and as the book evolved, the book's editor had one pet misconception: that it was possible to dial out of Vienna (or into Vienna, for that matter) prior to the dial conversion of 1957 – this simply *wasn't* possible, except to and from a very limited number of locations situated near Vienna, and by unconventional ways and means. The reference on page 3-64 is misleading and should therefore be deleted for the sake of accuracy.

## Page 3-97, Exhibit 3-9H, "Dial with 12 holes"


Exhibit 3-9H — This dial with twelve holes was ~~used only in service handsets of Bundespost technicians, never in customer apparatus~~ the last one used on outward toll positions in Vienna, Austria.

The dial shown in the exhibit is attributed to the German Bundespost; however, this dial was used (until circa 1998) on outward toll positions by the Austrian PTT, for operator-assisted calls to Eastern Europe (from Vienna), in situations in which 'code 11' and 'code 12' dialing was required[1] in order to reach an English-speaking inward operator in the foreign country. This error was reported to the book's editor, but it was obviously never rectified. The scan to the right is from a draft version dated October 5, 2006, and shows the author's handwritten correction as submitted to the editor.

[1] Such as between Vienna and Belgrade, Yugoslavia, which was placed into operation in September, 1966; this toll line terminated in the toll tandem exchange in Vienna.

## Page 3-98, Excursus 3-9M, "Dial with two holes and one pushbutton"

As published in the book, several paragraphs of text were inadvertently printed out of sequence, and one small photograph was omitted, so that the excursus doesn't really make much sense and can therefore be deleted without replacement.

## Page 3-114, Exhibit 3-11-2D, "Model W64 Austrian PTT telephone"

While being correctly identified as belonging to the W64 generation, the telephone shown *isn't* a PBX telephone, as is stated in the exhibit. The phone shown was used for party-line service, in connection with a small subset, which isn't shown. Party-line service in Austria was, with few exceptions in rural areas, strictly "secret service" from 1905 onward, and the subscriber had to push the "ground" pushbutton on this telephone to seize the party-line (if the same wasn't already busy). Also, while it is correct that the pushbutton was also available in the color black, white was commonly used; the color wasn't a customer-orderable option anyway.

The electromagnetic indicator in the lower left-hand corner of the phone gave visual indication of whether the party-line was busy or not while the pushbutton was being depressed with the handset off-hook; such indicators are commonly known as "star" indicators in German-language Telco parlance.

## Page 3-119, Exhibit 3-11-4A, German Reichsbahn area code directory, August, 1939.

The last sentence of the second paragraph of text in the exhibit reads: "In this extract from late 1939, the Morse code was used only in four cities, all in Austria." This isn't quite true; one of the four cities using a Morse code city identifier was Oppeln – the historical capital city of the district of Upper Silesia, which belonged to Prussia between 1742 and 1945 and which fell to Poland after WWII.

## Page 3-124, Chapter 3.11, "Call progress tones, continued"

In the first full paragraph of text in the left-hand column, the first line of text reads: "In parts of Europe, this extra immediate ring may have had to do with PBXs." It isn't the case that the "… extra immediate ring 'may' have had to do with PBXs …" – it *did* and *still has* to do with PBXs, for the reason stated in the text.

## Page 3-128, Exhibit 3-15C, "Abbreviated dialing equipment"

The abbreviated dialing equipment shown in the exhibit is correctly identified as a "Telerapid" dialer, manufactured by the German firm of the same name. However, something got mixed up, because the author never stated that "An American telephone collector also has such a phone," but rather pointed out to the book's editor that "Telerapid" dialing equipment was also used by the Bell System in the U.S.A., which is proven by the existence of an appropriate BSP (Section C34.112.) The author happens to own a NOS Telerapid type 125 dialer from the late 1940s (but it isn't connected to a phone at all).

Readers may also wish to refer to the lead article in the January 2011 issue of "Singing Wires," which makes mention of the Telerapid type 125 & 350 electromechanical automatic dialers (further information may also be found in Part 2 of the same issue).

## Page 3-131, Chapter 3.16, "Dialing long-distance, continued" – Subscriber dialing in Europe

In the right-hand column of text, near the bottom of the page, it's stated that "Several other countries had made limited installations before the war – Italy from 1928, Austria, France and Belgium in the 1930s …."

Austria was virtually a sea of manual service at the time written of, with a few small, isolated islands of local dial service – it simply *wasn't* possible for people in Vienna to dial their own long-distance calls to other cities in Austria (let alone to anywhere *else* on the planet), and folks in other cities in Austria couldn't dial calls to each other, or to Vienna (or elsewhere), either.

It wasn't until the dial exchange network group in the town of Klosterneuburg and environs[2] (near Vienna) was installed and placed into service circa 1929 that *any* form of subscriber-dialed long-distance service was available – but even then, subscribers could only dial from Klosterneuburg *into* Vienna, but not the other way around[3].

This situation changed somewhat during the years of WWII – toll calls to and from nearby towns which were of importance to the war effort (various factories had been located predominantly to the east and south of Vienna in order to protect them from possible Allied bombing raids) were placed by the subscriber in Vienna, dialing directly to an inward operator's position[4] in the town concerned – the inward operator then completed the call manually. Some of these operators could also dial directly into the Vienna telephone network (the less fortunate ones only had CB lines running to the Vienna toll exchange), but neither mode of operation could even remotely be considered to be direct distance dialing in the traditional sense.

[2] More information on the Klosterneuburg network group (and later additions) may be found in "A *Closer* Look at Telephone Levers, Dials and Pushbuttons in Vienna", written by the author, which is planned to be published separately and at some later date.

[3] Subscribers connected to the Klosterneuburg network group had to separately contract and pay for service which allowed direct distance dialing into the PSTN in Vienna; those who didn't enter into such a contract had to make do with traditional, operator-assisted connections to reach subscribers there.

[4] The dial telephone lines were hosted on various exchanges *within* Vienna in all cases and since Viennese exchanges were not equipped to meter or handle toll calls at the time, the inward operator at the far end of the line took care of toll ticketing.

Page 4-9, Chapter 4.5, "Austria, 1909-1930"

Although the author's name is listed under the heading "acknowledgements," he never saw so much as a draft of this chapter, and was thus unaware of the more or less serious errors which found their way into the text ….

There is erroneous information, possibly arising from a misinterpretation of German-language text, concerning the lever telephone system installed at the city of Graz in the province of Styria. The book states that, "initially this system apparently had about 2,000 residence lines and 1,200 business lines." The original German-language source writes of "… eine vollautomatische Zentrale für 2000 Einzel- und 1200 Gesellschaftsanschlüsse …." The German word "Gesellschaftsanschluss" *could* be construed as meaning "business line," since one of the common translations of the root word "Gesellschaft" is "business," but it also, *very literally*, translates as "party" in the sense of a group of people. "Gesellschaftsanschluss" refers to a *party-line* within the context of the original German-language source; hence the system at Graz was initially installed with 2,000 single-party (private) lines and 1,200 lines, each hosting a maximum of either two or four parties. Thus, the 3,200 lines the exchange was equipped with could support a maximum of 6,800 subscribers (under the condition that all party-lines had four parties connected).

It may also be of interest to note the fact that, since the subscriber's telephones were originally of the lever type (with 4 digit phone numbers), the number ring on the dials used later on were numbered 0-9 (the same as in Vienna, but sans letters).

Exhibit 4-5A on the same page contains some factual errors; there never was a specific "table model version" of the lever-type telephone and it wasn't intended to offer this type of telephone in a wall-mounted version. While it may, or may not, be true that Dietl, et al, developed the lever-type desk *telephone* (at the very least, blueprint number 10979 from the Imperial-Royal Administration of Posts and Telegraphs, dated April 1910, bears his signature), it *wasn't* Dietl who invented the Austrian version of the lever-type dialing mechanism.

The Austrian lever 'dialing' mechanism was designed and patented by Johann (Hans) Föderl (not "Förderl" – the author missed this, because he, like most other folks, constantly misspelled the name); the patent (number 77678) was granted on November 15th, 1919. Föderl was a contemporary of Hubert G. Dietl and was, as Dietl, a telephone engineer under State employment, although he wasn't directly supervised by the Chief Technical Department of the Imperial-Royal Administration of Posts and Telegraphs, of which Dietl was a high-ranking employee.

BTW – there is conflicting information throughout the German-language literature as to Dietl's first and middle names; some sources list him as Hubert Gottlieb Dietl, while others list him as Gottlieb Hubert Dietl. Among the former sources are official almanacs of the Imperial-Royal Administration of Posts and Telegraphs, so Hubert G. Dietl is deemed as being correct.

### Page 5-57ff., Chapter 5.5.6., – Vienna

For unknown reasons, an unrevised, ancient version of chapter 5.5.6. (from the year 2007) was published – the book's editor said it was the publisher's fault and vice versa, so who knows? The author hereby disassociates himself from the version published in Mr. Swihart's book – due to the *very* many factual errors and shortcomings it has.

### Page 6-19, Exhibit 6-3-5C, "Semi-automatic systems in Europe"

In the first line of data in the table belonging to the exhibit, the equipment *manufacturer* is listed as being "Dietl." H. G. Dietl *wasn't* the manufacturer of the switching equipment used for the semi-automatic system in Vienna. In reality, a consortium of the firms of Siemens & Halske (Vienna branch), Czeija, Nissl & Co and the Österreichische Telefon-Fabrik A.G., vormals J. Berliner (aka "ÖTAG"; Austrian Telephone Factory, Joint Stock Company, formerly J. Berliner) were responsible for manufacturing all of the equipment, including the telephones, with each firm being awarded exactly 1/3 of the contracts involved. However, the Viennese semi-automatic switching system (and its later transition to subscriber dial service) was commonly known as "System Dietl" in Austria; this designation may have been misinterpreted.

Hubert G. Dietl, and others within the Imperial-Royal Administration of Posts and Telegraphs, developed the switching equipment, modifying the original Strowger system to meet specific and uniquely Austrian design criteria in the process. As an interesting side note: practically no "off the shelf" telephone switching equipment was ever used in Vienna or Austria (the most notable exception being the 1905 trial Strowger exchange) – nearly every little bit and piece was modified to meet local design criteria; even the Nortel DMS and Siemens (Germany) EWSD digital switches in use today "required" modifications before being placed into service.

## Volume II

### Page 9-24, Excursus 9-4-4-A, "Flexible pushbutton pads"

The exhibit shown to the right was found in a draft version of chapter 9, concerning itself with modern pushbutton pads, which the author received on December 30th, 2005. As may be seen, the keypad was erroneously attributed as being of *Australian* origin ….

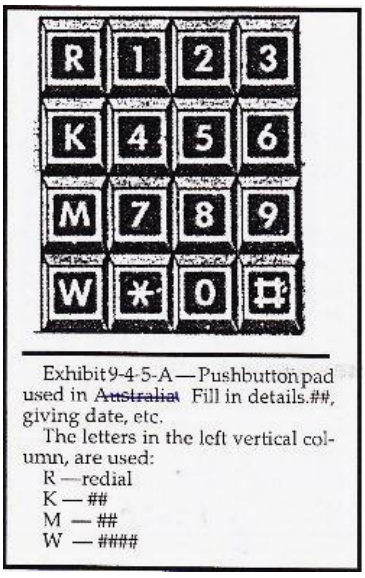



Exhibit 9-4-5-A — Pushbutton pad used in ~~Australia~~ Fill in details.##, giving date, etc.
The letters in the left vertical column, are used:
R — redial
K — ##
M — ##
W — ####

Since the author recognized the keypad as being of Austrian origin, he wrote a long note to the book's editor, explaining the function of the pushbuttons R, K, M & W. The information in the note was purely off the top of the author's head and *wasn't* intended for publication. Therefore, the author disassociates himself from excursus 9-4-4-A because the information is jumbled up and makes little sense the way it's presented.

BTW – *there are* no *kangaroos in Austria* – it is, rather, the 1,000+ year old country of Mozart and the Alps.

Page 9-27, Exhibit 9-6-1B, "Pay phone in Austria"

The photograph of the pay phone in the exhibit is cropped so that only a portion of the right-hand side (which is important in conjunction with the operating instructions) is shown, while the lower edge of the instrument (which is important in order to understand the rather unusual mode of operation) is completely cut off.

Although the pay phone shown to the left below is somewhat younger than the one in the book (the one shown here accepted a single Austrian coin of 1 Schilling for operation instead of two ten Groschen coins [= 0.20 Schilling]), the basic mode of operation and the text of the operating instructions are the same. The translated operating instructions read:

"1) Insert coin
2) Lift handset from hook
3) Depress pushbutton
4) Dial & then speak

Calling time extension: When calling time expires, depress the lever [on the right side of the instrument] completely [downward] and then let go; afterwards, insert new coin. Do ***not*** hang up the handset, [because] otherwise the connection will be lost and the call must [then] be repeated.

If busy tone is heard, or the call isn't answered, remain standing in the booth and try calling again.

After every call, and upon hearing busy tone, hang the handset up."

The pay phone depicted in the exhibit (as well as the one shown here) doesn't have a coin return chute … the reason is because pay phones in Austria were operated as an *entirely private enterprise* between 1903 and 1941, and the operating company was apparently of the opinion that pay phones were costly to operate and maintain and that, therefore, *any* use was reason enough to require payment – even if the call attempt was unsuccessful.

The operating instructions for the pay phone state that the subscriber was to remain standing in the booth upon receiving busy tone, or if the call wasn't answered, and to repeat the call; the following instruction, namely to *hang up* the handset upon hearing busy tone, is quite misleading. Why? Because these old pay phones operated upon a very unusual principle, intended to prevent what the operating company considered to be fraudulent use.

If the caller finished the conversation before the allotted time (5 minutes) expired, depressing the pushbutton per 3) of the operating instructions would bring back dial tone (a fact that isn't mentioned in the operating instructions) and a second call could be placed. It was possible to talk until the timer expired *without* having to deposit a new coin for this second call … it was quite imaginable that this (free) second call might be placed by a different person.

Naturally, this *wasn't* what the operating company wanted, so the phone booth floor was mounted on two sturdy, flat springs so as to float with respect to the rest of the structure, and was mechanically linked to the pay phone. Leaving the phone booth with the handset off-hook (in order to allow someone else to enter and use up the remaining speaking time, or in order to allow a second person to share the call) would cause the pay phone to reset, just as if the caller had hung up the handset. The handset cord was short enough to prevent anyone standing inside the booth from handing the handset to anyone standing outside.

The phone booth was pretty narrow, so as to prevent, as far as possible, two people from standing inside at the same time, which would circumvent the function of the anti-fraud floor; from what the author can recall, it took roughly 80 lbs. of pressure on the floor of the booth to allow the pay phone to operate correctly – practically anyone tall enough to operate the pay phone was also heavy enough for the floor to function properly. Two slim teenagers might fit into the booth at the same time, but two adults of even normal stature wouldn't. The technique of linking the booth floor with the pay phone was self-defeating, though, because the floor oftentimes jammed (especially in the winter months), leaving the pay phone inoperative.

Page 9-28, Exhibit 9-6-1C, "Instrument in Austria, for local calls only"

The first portion of the text belonging to the exhibit reads "Instrument in Austria equipped for local dialing only. Early versions of the phone had a sticker saying (in German) 'For local calls only.' The first payphone for international calls went into service in 1972."

The pay phone shown in the exhibit is the 1952 model, which is electrically and mechanically more or less equivalent to the model 1958 pay phone shown at the bottom of the next page. The major differences were that the 1958 model was physically hardened somewhat, making it more difficult to steal the coin box and in that the coin return chute was replaced with an "anti-stuffing" type. A rather minor change was moving from black, crinkle paint to gray "hammer-tone" paint (the dry, painted surface looks as if it has been repeatedly struck with the ball end of a ball peen hammer). The new paint was easier to clean because it gave a smooth finish.

Writing that the pay phone referred to was "equipped for local dialing only" is misleading in the sense that, up until 1962, *all* pay phones in Austria (with the exception of phones located within a post or telegraph office[5]) were physically designed to accept one or two low denomination coins as payment, and call duration was timed within the pay phone itself; there was *no* technical method available in Austrian exchanges for keeping track of payment for toll calls placed from pay phones until the early 1960s.


[5] Interestingly enough, using a phone within a post or telegraph office in the Austro-Hungarian Empire usually involved buying a pre-paid voucher for the call.

The fee of 1 Austrian Guilder (the Guilder was in use between 1857 & 1892 and equated to roughly US$ 8.55 purchasing power in 1992) was sufficient for a 5 minute long toll call between Vienna and Prague circa 1889. Such vouchers were in use until December 31st, 1916, after which the calling fee was paid in cash.

The text in the left-hand portion of the voucher literally translates to: "Imperial-Royal Administration of Posts and Telegraphs; card for telephonic speaking in interurban traffic," while the text in the right-hand portion reads: "Used on 5/3 (5th of March at) 7 O'clock, 13 Minutes a.m. at the Imperial-Royal telephone location Vienna 1 (1st District, i.e. inner Vienna) Telegraph Building. Number 1673 (the number was used for accounting purposes).

Until the advent of subscriber-dialed toll calls within portions of Austria (from pay phones circa 1962), there was no need for a caller to know whether or not toll calls could be placed from a pay phone. Hence, it's erroneous to write that "early" versions of this pay phone had the sticker stating "For local calls only" – this sticker was only added *after* pay phones suitable for toll calls were placed into service. The author had *mistakenly* informed the book's editor that no pay phone suitable for toll dialing was available until 1972 because he was under the impression that the model 1961/62 pay phone he had once seen in Vienna's Technical Museum was a prototype which never entered into public service (mea culpa).


The 1952/58 model pay phones did away with the mechanical phone booth floor linkage which some previous pay phones had, and the operating instructions specifically told the user that a subsequent call was possible if there was still time left on the clock.

Older pay phones, such as the one depicted in exhibit 9-6-1B, always collected the coin(s) inserted, whether the call went through or not, while the 1952/58 models only collected the coin when the caller depressed the payment button ("Zahlknopf" in German). Since it was necessary for the caller to hear whether or not someone answered, these models of pay phone always had the receiver portion of the speech circuit in operation, but short-circuited the microphone until the payment button was depressed.

This mode of operation could have led to a new form of telephone fraud because, at the time, there were many 4-digit customer service phone numbers (in the 15xx range) in Vienna, which, among other things, allowed callers to listen to a "Song of the Day," obtain the latest lottery results, the "Recipe of the Week," whatever [6] – in their heyday, there were almost 90 such services available. How so, fraud? Well, listening to a song for five minutes free of charge (until the clock in the pay phone timed out) certainly wasn't what the Austrian PTT had in mind when thinking about customer service … so the electromechanical clock in the pay phone was redesigned.

[6] These 15xx phone numbers operated as endless tape recording loops, some shorter, some longer. Some, such as skiing condition reports during the winter months, were very long indeed.

In older pay phones with similar clocks, speaking time was simply limited to five minutes and the complete speech circuit (listening *and* talking) was always active, while the clock in the 1952/58 pay phones automatically disconnected the line if the payment button wasn't depressed within 30 seconds after removing the handset from its hook … the reasoning being that, if the called party didn't answer by the sixth ring, then there was probably no one at home anyway.

Despite the efforts to make stealing the coin box more difficult, redesigning the clock mechanism in order to prevent fraud and replacing the coin return chute with an "anti-stuffing" type, the model 1958 pay phone was *highly* prone to another form of fraud, namely placing local calls of practically unlimited duration for the cost of a single, 5 minute call. The method was simple, highly effective and anyone with two hands was capable of doing it … one simply tore a 1" wide by 5" long strip off of the stiff paper cover of the phone book in the booth, folded the top 1½" over to form a flap, smoothed the crease of the flap with a coin and slipped the strip, creased end up and short end underneath, between the glass plate covering the clock face and the housing, until the flap sprang open.

One then gently pulled the strip back until the crease was resting on the top edge of the glass plate, and pushed the strip over until it was wedged into the right-hand corner. When the clock pointer hit the flap, it jammed and the clock didn't time out; this left the connection intact for as long as one pleased. It was naturally also possible to place several consecutive local calls, simply by depressing the payment button and dialing a new number.


Why was something like this possible? Well, the glass plate which covers the clock face was designed to be movable. The upper half was clear glass, while the lower half was painted white, with the German-language text "GESTÖRT" (literally: "disturbed", out of order) printed in black, in an arc to match the curvature of the window on the housing. If the pay phone was out of order and not immediately repairable, the repairman unhooked a spring latch on the slide which held the glass plate in place and pushed the glass up – there was no need for a separate "out of order" sign (which some wag might steal).

This was one *very* expensive lesson for the Austrian PTT, because the next pay phone type to be placed in service, the 1961/62 toll-capable pay phone, was far too complex (and much too expensive) to be used as a replacement for the 1,000s of model 1952/58 pay phones in service at the time. The major phase-out of the 1952/58 pay phones didn't happen until the advent of the *next* generation of toll-capable pay phones around 1971/72 … the author recalls at least one model 1958 pay phone which was still in daily use in Vienna circa 1984; it was located in the hallway of the au-pair dormitory at the U.S. Embassy personnel compound in Vienna, where a former girlfriend of his lived for a time.

Page 9-28, Exhibit 9-6-1D, "Trial Pay Phone"

The version of the smart card pay phone shown in the exhibit is, indeed, the trial version installed at Vienna (and other select places in Austria) around 1979 (*not* 1981, which was the year in which the Austrian PTT decided to accept this type of pay phone for general public service). The version shown to the left is the one which was common throughout Austria as of circa 1983. This type was designed and manufactured by a division of the Swiss firm of Landis & Gyr and is supported by the Kapsch Group of Austria.

Landis & Gyr dubbed this pay phone the "PHONOCARD®;" the prepaid card used with this type of pay phone is neither of the chip, nor of the magnetic strip type … the country code, the number of calling units available and the unit denomination are optically encoded as a series of holograms on a metalized strip hidden beneath a layer of white ink. A heated die defaces one unit at a time during the call; the heat of the die is sufficient to deform the holograms. The cards are prone to damage if left in a hot place, such as in a car on a hot summer's day. The cards are also susceptible to damage from scratches … so they were physically upgraded over time. Two major differences are protective ridges above and below the holographic reading zone, to help prevent scratches in that area and the addition of a roller-pin detent to hold the card in the proper position during read/write operations.

The Austrian PTT originally offered a rebate to users of these pay phones – one only paid for 48 units of speaking time when buying a 50-unit card, and for 95 units when buying a 100-unit card. This was an attempt to migrate pay phone users from costly coin-operated pay phones to the "less expensive" prepaid card pay phones, but it turned out that the holographic, infrared card reader inside the pay phone was everything but easily and cheaply maintainable. The PHONOCARD® pay phone wasn't placed into as widespread service as originally planned, and it never replaced coin-operated pay phones in the manner in which the Austrian PTT had intended.

Page 9-36, Exhibit 9-7-2C, "An Austrian standard telephone for dial PBX use."


The first line of text, as quoted above, is inaccurate. The phone depicted in the exhibit is simply one of three basic models of the W80 generation telephones which were placed in service from around 1981 onward; the phone in question could equally well have been used as a single (private) line telephone, a party-line telephone *or* as a PBX telephone, because the W80 phones were designed to be very flexible. This flexibility allowed the PTT to carry less phone types in stock without sacrificing options required to fulfill a specific role.

The last two lines of text in the exhibit state that "The pound (#) button is square, not with four crossed lines" – sorry, it just isn't so. The keypad shown to the left is of the exact same type as that on the phone shown in the exhibit.

The author was unaware of the existence of this exhibit until he had received (and read thru) the book; he wasn't the source of the photo used in the exhibit. The author was very surprised that he wasn't asked anything about the phone or its keypad – from the foreshortened view in the original photograph it was apparently *assumed* that the "pound" sign was a square ….

Errata not directly relating to Vienna or Austria

Volume I

Page 3-43, Exhibit 3-6-1-T, "Dual purpose Reihenanlage"

The English-language translation of the German-language telephony term "Reihenanlage" is given as "row key type," which is a non-sequitur. Although the German root word "Reihe" is most commonly translated as "row," the word "Reihenanlage" simply has *nothing* to do with the pushbuttons (or keys) being arranged in a horizontal or vertical row on the telephone.

The "Reihenanlage" and the "Parallelanlage" were among the smallest types of private branch exchanges used in Germany and Austria. The Reihenanlage was named so because the CO line(s) were looped through all telephone in *series*, while the Parallelanlage was named for the fact that the phones were all wired in parallel with the exchange line(s). The distinction between parallel and series types was more common in Austria, while both types were commonly called "series equipment" in Germany.

Both types supported intercom functions between phones and connection to 1 (or more) exchange lines – the most common types in Austria either had 1 outside line and intercom between a maximum of 6 phones or 2 outside lines and intercom between a maximum of 11 phones (both required a separate subset to supply local talking battery, intercom buzzer power and to support optional functions).

The English-language translation of the German telephony term "Sternschauzeichen" is simply given as "visual display" in the exhibit. The term is better translated as "star indicator."

Such electromagnetic star indicators were commonly used to show whether the exchange line the indicator was assigned to was in use or not (black = not in use, white = in use). In Austria, such indicators were also used on some party-line telephones to indicate whether or not the party-line was busy. These indicators are low-current devices, operating on 6 to 10 milliamps at 3 volts D.C.

Page 3-63, Chapter 3.6.3, "Offset-order dials"

In the first five paragraphs of chapter 3.6.3., it is inferred that using offset-order dials offered certain benefits in conjunction with dialing the head numbers of large PABXs, which oftentimes ended in zeros. While this may, or may not, have held true for Norway and Sweden (*if* these countries truly and strictly adhered to the Bell System practice of ending PABX numbers in zeros), this wasn't the case at Vienna, Austria, because the Viennese switching system didn't support direct inward dialing to PBX extensions during the semi-automatic phase (because only 5, later 6, digit numbers could be keyed in on the operator's keypad). Because of this it was wholly immaterial where the numeral zero was located on the dial (or on the levers).

The lever-type telephones in general and the 1928-1957 Viennese dial wound up having an offset configuration because of an unusual definition in the original Viennese switching system specifications, and not because it made direct inward dialing to PBXs any easier, nor for any other reason. This offset dial configuration was also used with dial phones in the city of Graz (in the province of Styria), but sans the Viennese lettering. The dials at Graz were changed to the international 1-0 numbering scheme in 1949, 8 years ahead of Vienna.

Page 3-127, Excursus 3-14B, "Telephony moving backward in time."

Paragraphs 4 and 5 of the text in the left-hand column of the excursus read as: "To fill this gap, in the absence of working equipment, several district exchanges in Cologne were partially or totally equipped for some years with no-longer needed former Army field switchboards, type Fk16, somewhat modified for use in civilian city telephone service, until replacement dial equipment could be manufactured and installed.

It was impossible to obtain a picture of these field switchboards for this book. The picture [in the book] is a different type of interim switchboard, developed quickly and roughly so some kind of basic telephone service could be restored as rapidly as possible."

While it may be correct that a photograph of a *modified* German WWII magneto field switchboard was 'impossible to be obtained' for inclusion in the book, it would've been nice if the book's editor had at least included a photograph of an *unmodified* switchboard. The author owns enough such equipment to handle 400+ magneto lines, and if asked (or if he had at least known that anything was going to be written concerning these switchboards) he would've been more than happy to supply a photograph, such as the one shown on the left (which shows part of a German field switchboard setup the author had standing around in his kitchen – of all places).

To designate a German WWII magneto field switchboard as being an "Army" switchboard is misleading, since all branches of the German Wehrmacht (Army, Navy and Air Force) used the same equipment.

Writing that this type of field switchboard is "type Fk 16" isn't quite proper, since the original FK16 switchboard was designed and placed into military service by the Germans in 1916. The switchboards used by the German Wehrmacht in WWII were an updated version which included several new components not found in the original design. The proper German-language designation for the WWII field switchboard shown above is "großer Feldklappenschrank" – large magneto field switchboard, as opposed to the small field switchboards, which handled a maximum of 10 or 20 magneto lines[7], which were not modular or expandable. Many European collectors of German field telephone equipment are in the bad habit of using the term "FK16" to designate both the WWI and WWII versions of these large field switchboards.

[7] Information concerning these switchboards can be found in the tale "The Smaller WWII German Field Switchboards" in the "Collection of Telephone Tales."

## Pages 6-17 & 6-18, Exhibits 6-3-5A and 6-3-5B

The lower, semi-automatic console in Exhibit 6-3-5A is erroneously listed as being located in Germany; in actuality, it was in use in the Netherlands. It's the same console shown in exhibit 6-3-5B, but with operators seated in front of it. A portion of the text belonging to the latter exhibit states: "There is some conflict in identification of this console. One description with this picture in one collection indicates that this console was in service in 1911. If that date is correct, the console would be in Amsterdam, in the Netherlands. Another description has the console at Dresden, Germany, from January 1912."

Although the author wasn't the original source of the scans, he was able to verify the true source in 2017. The photo of the lower semi-automatic console in exhibit 6-3-5A and the photo in exhibit 6-3-5B were published by Siemens & Halske, in conjunction with a lecture entitled "On Automatic Telephony," held on November 26th 1910 before the German Society of Electrotechnicians.

The photographs appeared as figures 26 and 27 in the Siemens & Halske reprint of this lecture. The relevant portions of the lecture specifically state that this console was intended for installation at Amsterdam. The conflicting information may have arisen because Siemens & Halske may have reused the two photographs in a later publication, and that this semi-automatic console was then incorrectly identified as being installed at Dresden, Germany.

## Volume II

### Page 7-64, Excursus 7-3-4AG, "Getting dials to big-city panel suburbs"

In the second full paragraph of text in the right-hand column, reference is made to "The ZZZ call-metering methodology introduced in Germany by Siemens in 1923 …" Some readers may be wondering what text or other information it was intended to replace the supposed placeholder "ZZZ" with, but there really *was* such a thing as the "ZZZ call-metering" scheme. The "ZZZ" is the German-language abbreviation for "**Z**eit-**Z**onen-**Z**ählung," which roughly translates to metering (or counting; "**Z**ählung" in German) calls by duration (**Z**eit = time) and distance (the German word "**Z**one" has the same meaning as the English word, although it's pronounced differently) at the same time. In theory, the ZZZ system allowed for a vast number of zones, each of which could be metered at a different rate, but actual day to day use was limited to a certain number of zones and timing rates. If the author recalls correctly, it *is* eventually explained what "ZZZ" refers to, but only much further on in the book.

A similar system was in use in Austria when subscriber toll dialing finally became a reality, and was implemented in the so-called zoning registers ("Registerverzoner" in German); there were four toll tariff zones for subscriber dialable long distance calls to points outside of Austria in 1989. The fourth zone set the subscriber back 28 Austrian Schillings – roughly US$ 2.55 at the time – per minute.

### Page 7-142, Chapter 7.3.9., "Dialing Q and Z, continued" – "The Letter Z in Vienna"

The book states that "This subject is discussed in the chapter on Vienna, 5.5.6."

Well, yes and no – but more *no* than yes, actually, because the letter Z on the 1928-57 Viennese dial face led a rather dull and boring life. It was never used as a letter prefix to subscriber phone numbers, and only came into its own when it began to be used as a party-line *suffix* letter between 1934 and 1957, and it's only in this capacity that the dial letter Z is mentioned at all.

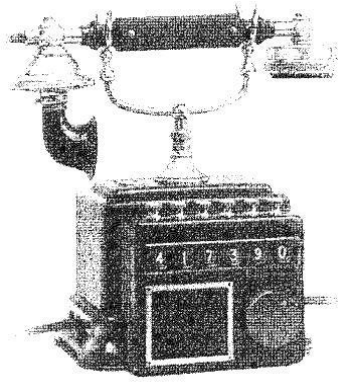
A while before the author was requested to co-author chapter 5.5.6. circa 2005, the book's editor had begun work on an analysis of the evolution of subscriber telephone numbers in Vienna (it was intended to publish this in a future issue of Telecom History, but it wasn't to be so). The task of compiling and analyzing the numbers was passed on to the author, and the final version surpassed 100 pages in length – even in this lengthy analysis, only the following facts came to light: circa 1946, the phone number Z-0-11 was used to call the fire department, Z-0-22 to call the police & Z-0-44 to call an ambulance; Z-0-7 was dialed by subscribers who wished to set up a conference call. Dialing Z all alone was akin to dialing zero to reach a telephone operator in the USA, but at Vienna one was connected to an outward operator in the toll exchange instead of to a *local* operator; Z-0-5 was dialed in order to reach an information operator.

Page 7-200, Exhibit 7-5B, "Dialing international calls"

If the CCITT country code for Germany is given as 0049, and the country code for Switzerland is given as 0041 in the exhibit, then the CCITT country code for Luxembourg is 00352, and not simply 352.

Page 9-4, Exhibit 9-2E, "Two early Ericsson pushbutton pads"

The lower of the two "pushbutton pads" shown in the exhibit isn't a pushbutton pad. In the exhibit, the mode of operation is described as: "The subscriber set up the number to be 'dialed' by pressing the buttons at the top, the correct number of times for each digit. The digits were transmitted when the subscriber 'released' the call by turning the knob just below the indicators on the right."



As may be see in the scan on the left, the dialing mechanism doesn't have any buttons to depress on top; it has knobs instead, which are to be rotated until the appropriate digits are shown behind the display windows (at least, that is what LME says). When the entire number has been "dialed" by the subscriber, he was to lift the handset, listen for dial tone and then give the knob in the lower right-hand corner of the phone one full turn – to wind up and release the dialing mechanism.

The last paragraph in the exhibit states that, "… at the time of the invention, Stockholm didn't yet have any dial telephones (until 1924) nor any 6-digit numbers, but Stockholm changed to 6-digit numbers in 1928. No other Ericsson customer, with dial systems, had 6-digit numbers at the time."

The phone shown above was produced by LME in – guess when? – 1924. It's a rather obvious fact in manufacturing that one can't design a new telephone (or an oddball dialing mechanism) at the wink of an eye, so at least having a prototype by 1924 is just enough lead time to get all the kinks out of the mechanism before going and trying to sell it to anyone – the phone *could* have been perfect for Stockholm in 1928, but by then a more or less standard type rotary dial was available, which was much simpler to operate and which had fewer moving parts. Just what the doctor ordered to prevent maintenance headaches ….

The photo to the right shows part of another telephone prototype from 1924 – this phone has six rotary knobs as well (the knob to wind up and release the dialing mechanism can just be seen in the lower right-hand corner of the photo). This phone was considered for use at Vienna, Austria, and was thought to be more ergonomic than the lever telephone … in the end, though, a "plain Jane" dial mechanism won the day.

Exhibit 9-3G on page 9-10 and exhibit 9-3Z on page 9-15 convey the same information – the book's editor repeatedly stated that everything had been proof-read more than once before going into print; how duplicate exhibits managed to get overlooked is a bit of a mystery – or, if they *were* noticed, why weren't such duplications rectified? The author pointed out the one mentioned here back in 2006 … and was very surprised to find it still alive and kicking in the finished product.

Page 9-34, Exhibit 9-7-2A, "Autovon Telephones"

There is a serious error in the designation of the keys "P," "I," "F" and "FO" on the AUTOVON keypads shown; "I" doesn't stand for "interrupt," but rather for "immediate," as any collector of AUTOVON telephones knows.

The same error crops up in the text on page 9-35, in the middle column, where it's written that "The precedence levels, in ascending order of priority are Routine (which every telephone in the system has and for which there is no special priority button), Priority, *Interrupt*, Flash, and the highest level, Flash Override." This is another error which the author pointed out in 2006, and which still persists.

Page A-12, "Appendix C", "Early automatic telephone systems, continued"

The data under the heading "Europe, Austria-Hungary, Vienna" in the left-hand column of text is incorrect insofar as here, again, H. G. Dietl is incorrectly listed as being the *manufacturer* of the semi-automatic equipment used.

Page A-15, "Appendix D"

Yes, the author **is** well aware that there are *quite* a number of other errors, fluffs, typos, etc. contained in the two volumes of "Telephone Dials & Pushbuttons" – a really bad one is that the book's editor equates the Danish monetary unit "Crown" with U.S. dollars *throughout* both volumes, despite the fact that the two currencies never were at parity. Personally, though, he finds exhibit 7-3-1-1C on page 7-35 in volume 2 to be one of the *quite* serious errors the book contains; one that *really* hurts.

The text begins "The first full alphabet dial, used in the first telephone system to dial the first letters of the exchange name. This was at Minneapolis and St. Paul, Minnesota, beginning in June 1920." The author would've liked to see the dial face referred to very much, and it's an awful shame that the picture in the exhibit is a scan of an AT&T advertisement; it appears that the *dial* referred to is "lost in space" forever … this specific error is so painful because the relevant subchapter, *complete with the AT&T ad*, had been previously published in the July, 2008, bonus section of Singing Wires – nearly two years before the book was finally printed and published.

P.S. Lest there be any misunderstandings concerning copyright(s), intellectual property and the current (& future) fate of the book "Telephone Dials and Pushbuttons:"

In an email dated March 27, 2011, Mr. Steve Swihart wrote the author the following: "Stan did send myself and my sisters a letter about a year ago stating many things, among which was that he gave the intellectual property, physical property, etc., to Lyle for everything related to telephone history[8]."

[8] The author personally regards it as a colossal error for the book's father and editor to have left everything related to telephony and telephone history in the hands of the one man who hasn't the *slightest* idea of the historical value of those goods and properties, or of the ins and outs of telephony in general. Truly: "…*can more easily be* ***crushed****, than brought to life again*."

In an email dated February 22, 2011, the publisher wrote the author: "You mentioned taking things up with Stan's son as well. For the record, the family has no interest in the book and Stan made me the heir to "all things telephone-related," the publisher further wrote that, "With regard to your own book or publishing, feel free to do whatever you want and use whatever you want … the target market for these highly specialized materials is so small that it is really a non-issue anyway …."

Concerning the current & future fate of the book, the author once more quotes from the publisher's email: "I am like you in that I don't want a knowingly erroneous product to be out there, but you have to understand that this has not been a money-making venture at all since sales haven't even covered production costs, let alone any of my time …." The publisher isn't willing to make any changes to the book, no matter how important they may be for the sake of accuracy.

P.P.S. Yes, the author *is* well aware of the all-encompassing disclaimer in the book, but he feels that the disclaimer can't be viewed as giving license to knowingly publish erroneous information and for not having errors, which were pointed out in due time, corrected.

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## Addendum

This document has been "in the works" on and off for a number of years, and as time went on, I found that I could take better photos of two of the dials shown in the book, so I decided to add them here.

I am also going to give an overview of telephone dials and pushbuttons of a country that no longer exists, namely Eastern Germany (a.k.a. German Democratic Republic, GDR), since the book doesn't cover this subject at all ….

### Volume I

#### Page 3-65, Exhibits 3-6-4A & 3-6-4B

The above exhibits show one version of the Siemens "pull-down dial," with the digits printed on the non-movable portion of the drum, with the Berlin lettering on the finger-hole arc of the drum.

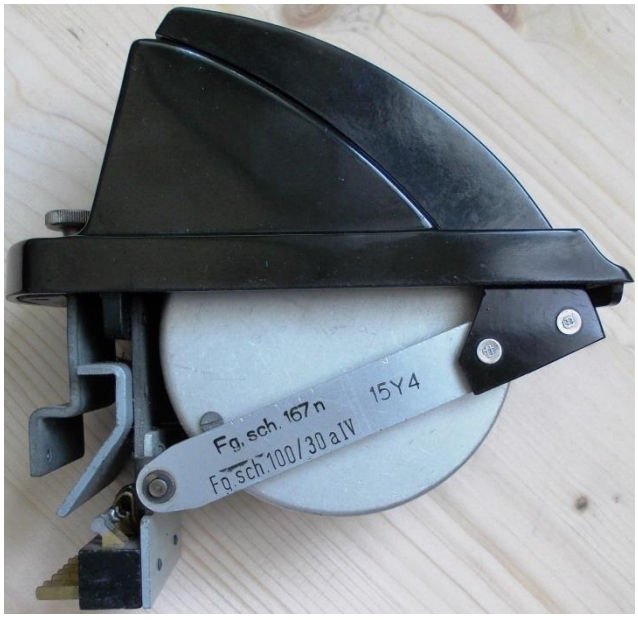
At some later date, Siemens redesigned this dial type, so that the digits (and eventual letters) were all on the finger-hole arc. The following photographs show such a revised "pull-down dial," manufactured by Siemens at Vienna, Austria, during April of the year 1943.

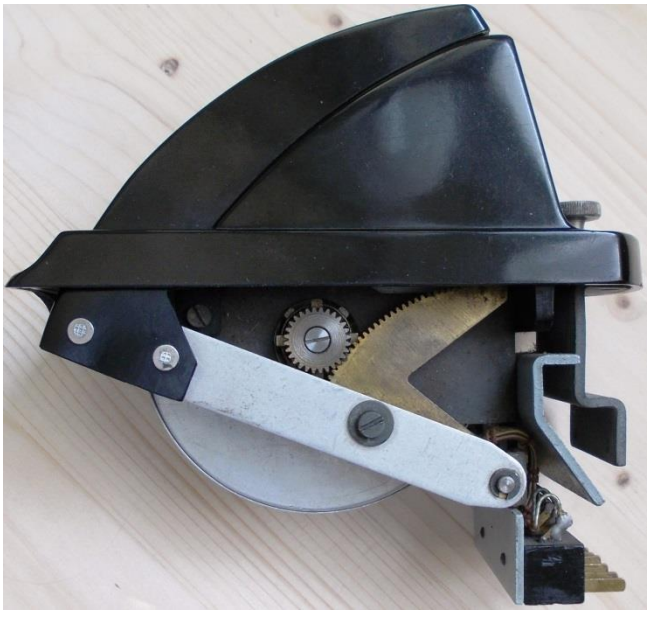

As can be seen, the non-movable portion of the drum no longer carries the digits, which are now on strips of electrically oxidized aluminum, riveted along the outside edges of the finger-hole arc.

This had the advantage that the digits were no longer subject to the everyday wear & tear of dial use, and thus could not be scratched off over time.

If it were necessary to add lettering to this style of dial, then the middle strip of blackened aluminum would have been replaced with one bearing the requisite letters.

As I previously wrote, this particular dial was manufactured at Vienna, Austria, but it was certainly used somewhere else, because (back then) Viennese dials began with the digit zero and the numerals 0-9 were associated with the letters "iFABRUMLYZ."



Part of the text belonging to exhibit 3-6-4B states that "… the insides [are] partially uncovered, so as to reveal some of the operating mechanism inside." This is incorrect, in that, since these dials were installed on switchboards, only the portion up to, and including, the finger stop, was visible. The rest of the dial was below the surface of the switchboard keyshelf, and required no further (dust) protection other than a round, aluminum case for the dial mechanism itself ….

Page 5-56, Exhibit 5-5-5A

The exhibit referred to above shows two different versions of the style of dial used at the city of Prague (the former capitol of Czechoslovakia, now the capitol of the Czech Republic). The dial shown below belongs to a PBX telephone, manufactured by Standard Electric (ITT) Prague circa September, 1946. The enameled ring with the digits and letters is interesting, in that it was hand-painted. (I have intentionally left the photograph so large, so that it is easier to see the ring.)


One may easily see the ends of the strokes in the red enamel paint, since these are darker than the rest – proof positive that the letters and numerals were **not** printed.

Page 5-80, Exhibits 5-8-A, 5-8-1B thru 1D

All of the above exhibits are of poor quality, especially exhibit 5-8-1C (very poorly cropped, if not to say chopped-up). I happen to own a NOS Soviet telephone, manufactured by the company "VEF," in Riga, Latvia, from 1953, and the large photograph below shows the dial clearly.


The most unusual thing about the telephone with the above dial is that it incorporates design features from several different phones from different eras. The body is a two-part design like the German W28 (lower portion of stamped metal, the upper portion formed of Bakelite), the handset cradle has the classic "wings" of Ericsson PBX telephones from the 1930s, and the finger-wheel of the dial (including the screw which holds the central aluminum disk) are wholly interchangeable with those of the Siemens W48 telephone.

Chapter 5.5.3.1 – The German Democratic Republic

Early dial (desk) telephones of the German Democratic Republic (GDR) were made of Bakelite and had dial bodies and finger-wheels of the same material. In appearance, these early desk phones can easily be confused with the West German W48 desk set … even their Model 38.

Yes, I am well aware that the digits refer to the year the phone was designed or first went into service, and that the GDR didn't exist in 1938 – but, the GDR W38 telephone was manufactured in the 1950s!


This dial is from a GDR W38 desk set from 1952; physically, it is a carbon copy of the standard German Reichspost style "N30" dial, which was in use as of circa 1930.

The inner disk shows the emergency numbers ("Notrufe") for the fire department ("Feuer," 112), the police ("Polizei," 110) and the Red Cross of the GDR ("DRK" – Deutsches Rotes Kreuz, 115; ambulance service).

The finger-wheel is made of Bakelite, while the inner disk is of electrically oxidized aluminum. The numeral ring is enameled iron.


This dial belongs to the GDR Bakelite desk set model W 63a.

The finger-wheel is made of a transparent plastic, while the numeral ring and the central disk are made of electrically oxidized aluminum.

The lettering "RFT" refers to the GDR umbrella corporation which manufactured and sold *all* manner of telecommunications equipment, such as telephones, teletypes, personal computers, commercial and other types of radio transmitters and receivers, as well as electrical and electronic components.

RFT stands for the German expression "Rundfunk- und Fernmeldetechnik," which literally translates to "broadcast and telecommunications technology." The RFT itself was called a "Volkseigener Betrieb" (a company owned by the people) – this being the German communist designation for all factories (large and small), according to the tenant that the means of production must be placed in the hands of (communist) society, so that only such products are manufactured as are planned by the number of units to be sold, and their usefulness to the society at large.


This was the GDRs first attempt at a telephone keypad (from the early 1980s), based on a 40 pin soviet microcontroller … it is believed that this keypad was only produced in small numbers and was intended to be the prototype for following keypads.

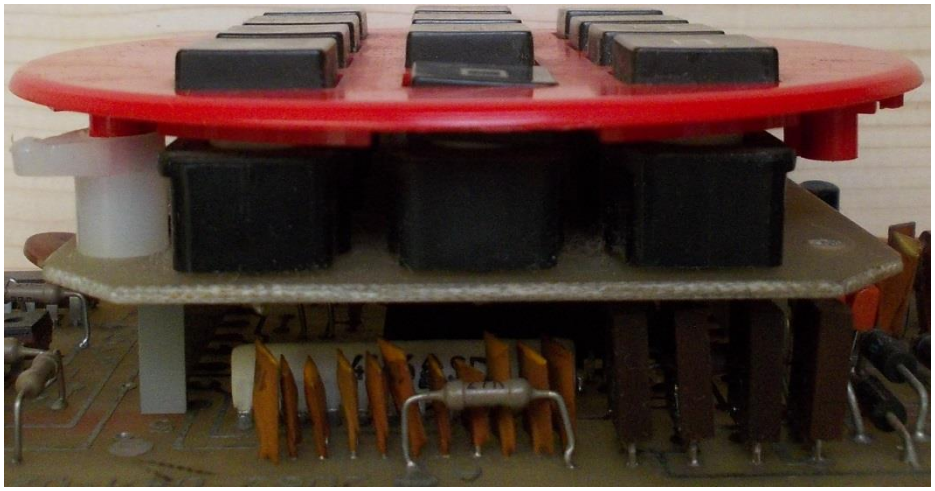
For all its complicated circuitry, this keypad could do no more than out-pulse keyed-in phone numbers. The "star" key inserted a pause in between dialed digits, while the "pound" key redialed the last phone number entered.

The "pause" key was necessary when a number was redialed from the keypad memory, in cases where the phone was a PBX extension and a one (or more) digit access code was required to access an outside line … in normally dialing from an extension, one would first enter the access code, press the "star" key and then enter the number of the subscriber called. To wit: since the GDR only had analog PBXs, it could take a second or two until an outside line was accessed.

In redialing the number, the keypad would dial the access code and then pause until the subscriber pressed the "star" key, upon which it would out-pulse the rest of the number. The keypad was only capable of storing a single phone number, namely the one last dialed.

It had five wires to connect it to the rest of the phone; two were directly connected to tip and ring of the line, while the three others were a combination of the dial pulse and "off-normal" contacts. Since the keypad was permanently connected across tip and ring, this style of keypad would retain the last number dialed for as long as the line was powered.

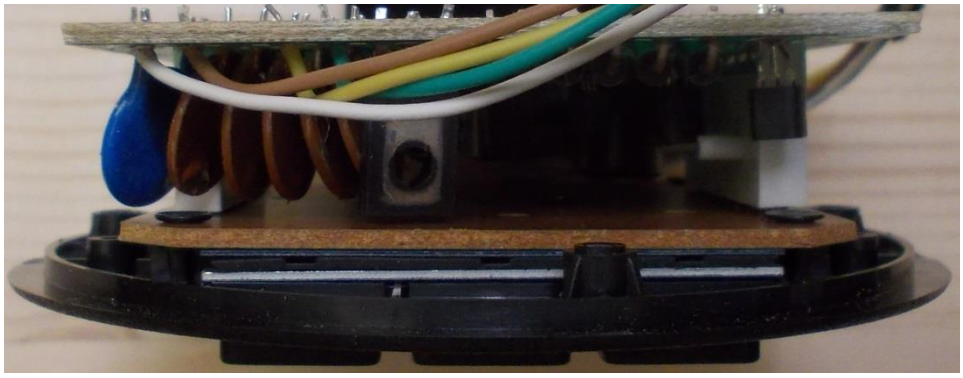
This style of keypad had three columns of four pushbuttons each, and they were true pushbuttons – which caused mechanical trouble in the form of stuck keycaps, as can be seen in the photograph shown below.




This is the final version of the GDR dial-pulse keypad; the one shown here is a drop-in replacement for rotary dials.

The "features" of the "star" and "pound" keys remained the same, with the exception that the last number redial feature only worked for circa ½ hour after hanging up – after that, the number was simply lost.

This keypad no longer uses mechanical pushbuttons and keycaps, but rather employs an elastomer-based pad with short-travel keys. The photograph below shows a side view of this keypad; one can see that it is much thinner than the prototype was.




This is the mechanical dial of a GDR desk set ("Alpha Ferro") from the mid-1980s, approximately the same time the drop-in keypad was placed into service.

The phone numbers on the central disk are the same as on the dial from the GDR W38 telephone, but the exact designations have changed … "Polizei" became "Volkspolizei" (people's police), "Feuer" became "Feuerwehr" (fire brigade) and "Deutsches Rotes Kreuz" simply became "Rotes Kreuz" (Red Cross).

Note the modern "RFT" logo in the middle of the central disk.


This integral keypad design was used on the GDR "Alpha" series of desk phones, namely on the "Alpha Ferro Quick" and the "Alpha Tast."

The former of the two "Alpha" phones was one with a dial-pulse keypad – which makes one wonder why they named it "quick," since one could key in the number as fast as possible, but then had to wait forever for the keypad to finish out-pulsing the number.

There was no real operational advantage for subscribers using dial-pulse keypads. In the dial-pulse version, the "star" and "pound" keys had the same functions as the drop-in keypad. The "Ferro" portion of the name stems from the fact that the 2-4 wire hybrid used an induction coil, instead of a discrete, electronic hybrid.

An operational advantage was first achieved in the late 1980s, when DTMF keypads became available in the GDR … however, most of these DTMF phones were intended for export, since the phone exchanges in the GDR were mostly of the Strowger type, model 1922.

The DTMF keypad had a *serious* drawback: although not sensitive to line polarity, it was *very* sensitive as to the off-hook line voltage. If it dropped even slightly below 12 VDC, the frequencies began to "wander," resulting in wrong connections or even no connection at all. I wonder why the GDR technicians, who designed the DTMF keypad, didn't opt for a lower operating voltage and a voltage regulator to keep the frequencies stable.

On the DTMF keypad, the "star" and "pound" keys generated the standard frequency pairs assigned to them; the "extra" key in the lower right-hand corner is an "earth" or "ground" key, required if the phone were a PBX extension ….

The East Germans even produced a telephone with a concept similar to that of the U.S. "Princess®" – it had an electronic 2-4 wire hybrid (and a hearing amplifier) integrated into the handset, while the keypad and the electronic ringer were mounted in the base of the telephone. This desk set was called the "Apart 2001" (my German-English dictionary defines the German word "apart" as: uncommon, singular, odd, remarkable or cute). This type of phone completely stops working if the line voltage drops below 8 VDC.


This is the keypad of the "Apart 2001;" it is of the GDR standard dial-pulse type, but its operation is slightly different: the "star" key is dead (there is no redial function), and the "E" key is an "earth" or "ground" key.

I haven't connected one of these to my local PSTN yet (only to a power supply), so I can't really tell what the yellow light-emitting diode (LED) is for … one thing I *do* know is that it doesn't flicker when a number is being out-pulsed – which would have been handy, since the handset is completely dead during dialing (absolutely no sidetone and no dialing clicks).