Zeitschrift: Technische Mitteilungen / Schweizerische Post-, Telefon- und Telegrafenbetriebe = Bulletin technique / Entreprise des postes, téléphones et télégraphes suisses = Bollettino tecnico / Azienda delle poste, dei telefoni e dei telegrafi svizzeri

Herausgeber: Schweizerische Post-, Telefon- und Telegrafenbetriebe

Band: 56 (1978)

Heft: 2

Artikel: The AZ44 coinbox telephone

Autor: Guyer, Peter

DOI: https://doi.org/10.5169/seals-875195

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Mehr erfahren

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. En savoir plus

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. Find out more

Download PDF: 05.08.2025

ETH-Bibliothek Zürich, E-Periodica, https://www.e-periodica.ch

The AZ44 Coinbox Telephone[1]

Peter GUYER, Berne

621.395.663.6

1 Introduction

Coinbox telephones have been in use in Switzerland since 1932. It would be unthinkable to be without them since they provide direct access to the telephone network for a large number of people. Since call charges and surcharges must be collected immediately, these telephones are necessarily more complex than a standard telephone. The structure and method of operation of the various coinbox models have accordingly been very dependent on the state of development of switching technology and it is particularly noticeable that the structural complexity has tended to shift from the exchange equipment to the telephone station. For example in the case of the M-type *(Fig. 1)* the amount of money inserted was still checked by the equipment in the telephone exchange. The new AZ 44 model *(Fig. 2)* on the other hand requires no exchange equipment and can be freely connected to any standard exchange line. In addition electronic controls largely replace the mechanised functions of the previous models. The standardisation of the surcharge at 20 centimes per call provided the incentive to replace the current common AZ 1 coinbox *(Fig. 3)*. Previously 10 centimes was charged for local and medium distance calls and 20 centimes for long distance calls. The ability of the coinbox to withstand break-ins also left something to be desired in recent times and also, since the introduction of customer trunk dialling, its security against fraud.

2 Requirements

The performance specification requires a station having the following most important features:

- Local, national, continental and intercontinental traffic. Intercontinental traffic (code digits 001, 002, 005...009) to be barred but access to be enabled in a simple manner.

In the case of service traffic (all dialled numbers beginning with 1) a code tone is to be sent to the exchange which is switched off by the first charge pulse, Normal calls to the coinbox are possible; checking of inserted money by the operator is suspended.

- The call charge unit is 10 centimes. For each chargeable call a surcharge of 20 centimes is made. Provision for altering the charge in 10 centimes steps up to 90 centimes is to be provided. Dialling is possible only when the money inserted corresponds to at least two call pulse units including surcharge (40 centimes at present).
- The polarity-independent coinbox is connected via a normal exchange line and conforms to the specification of a normal customer termination.
- The coinbox is supplied with 24 V a.c. or 24 V d.c.

In the event of a power supply failure it must not be possible to telephone free of charge. Money retained in the store must be directed into the cash compartment following restoration of operating power supply.

3 Design

31 Mechanical Part

The AZ 44 coinbox telephone is shown in Figure 2. Resistance to break-in is substantially improved as a result of its chrome steel housing with robust hinges and locks. Still greater ability to withstand break-in is provided by mounting the coinbox on a concrete pillar *(Fig. 4)*. The cash compartment is no longer located in the telephone station but is located instead in the pillar. The cash compartment is connected to the telephone instrument part by means of a channel provided with various chicanes. In this way access to the cash compartment is prevented when the telephone station is detached.

The lectern-shaped middle portion of the instrument containing the dial and credit display provides good visibility for the user.

Fig. 1
The M-type coinbox telephone in the form in which it is still encountered – in service since 1948

[1] Deutsche Originalfassung in den Techn. Mitt. PTT Nr. 3/1977, S. 120...126, erschienen.
Version française parue dans le Bull. techn. PTT No 3/1977, p. 120...126.

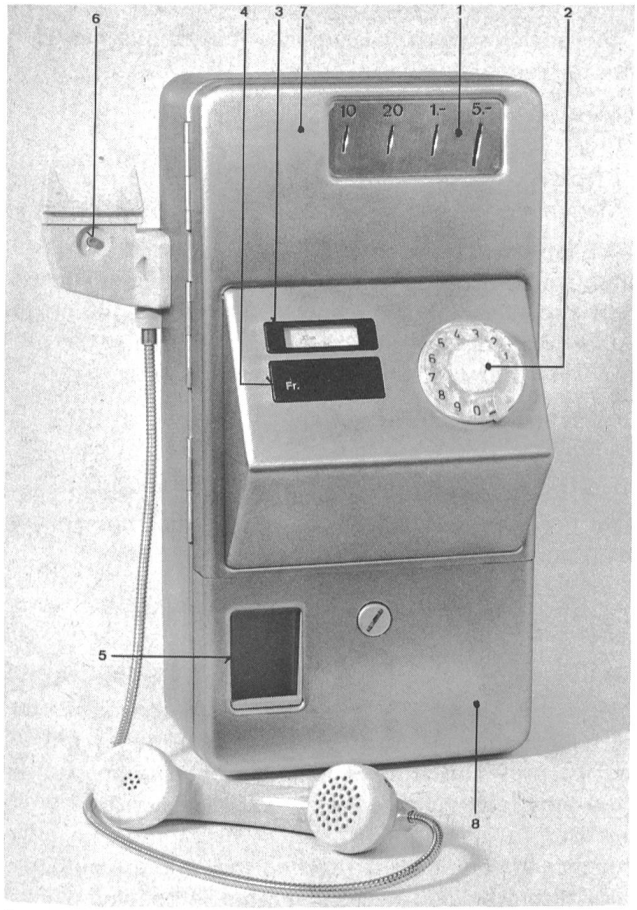

Fig. 2
The AZ 44 coinbox telephone – in service since 1977
1 Coin insertion slots for 4 coins (10, 20 centimes, 1, 5 francs)
2 Dial
3 Window with telephone number and description of location
4 Credit display
5 Refund chute
6 Redial key
7 Instrument portion
8 Cash compartment

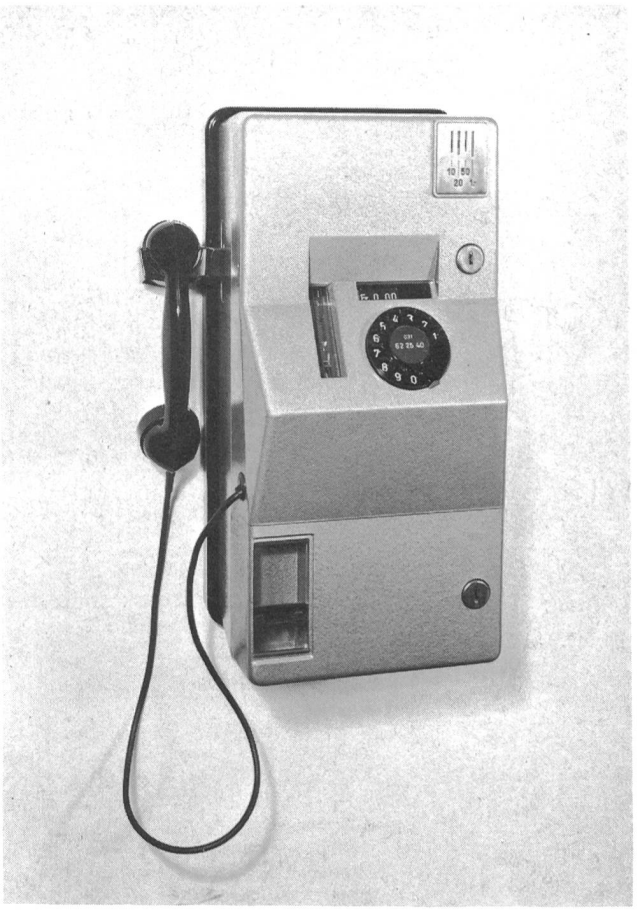

Fig. 3
The AZ 1 coinbox telephone, in service since 1966

32 Electronic Circuits

321 Control

A microprocessor is used to control the equipment. This solution offers several advantages over logical circuits used hitherto such as a small number of integrated circuits (IC), great flexibility, increased reliability, sim-

Figure 5 shows the coinbox with the instrument part open. A coin test unit and a storage unit for each coin value as well as the credit display are mounted in the lid. Within the case two printed circuit boards containing the speech circuit, interface and control are located on a frame which can be swung out. The power supply unit is housed in the lower part of the case in the form of a sealed unit. These are plug-in units and facilitate maintenance operations or various alterations.

The mode of operation of the coin test unit and storage unit is shown in *Figure 6*. The insertion slot (1) tests the maximal dimensions of the coin. The insertion check unit (2) reports the presence of a coin and causes the control to close the open barrier flap. The clamp point (3) arrests bent coins until the measurement cycle (about 1.5 s) is over. They then proceed directly to the refund chute (8). In this way, blockages in the coin feed channel are prevented. At measurement point (4) the minimal dimensions of the coin and the coin alloy are tested. Fake coins roll into the refund chute (8), genuine coins roll into the store (6). From the store (6) coins are transported either to the cash compartment (7) by the charging lever or to the refund chute (8) by the refund lever. Money inserted when the storage unit is full drops into the refund chute.

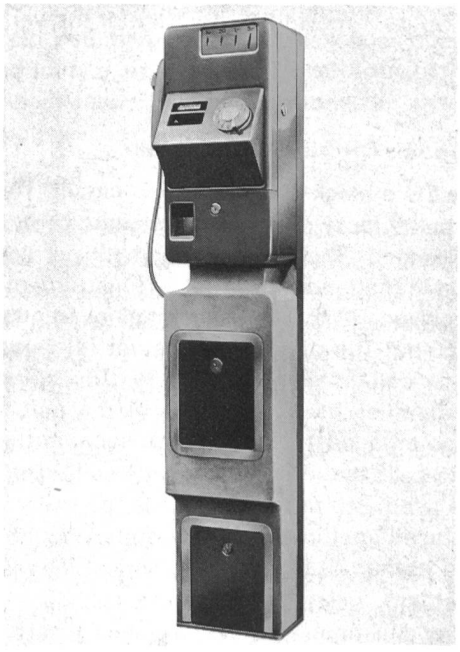

Fig. 4
Coinbox telephone on a concrete pillar

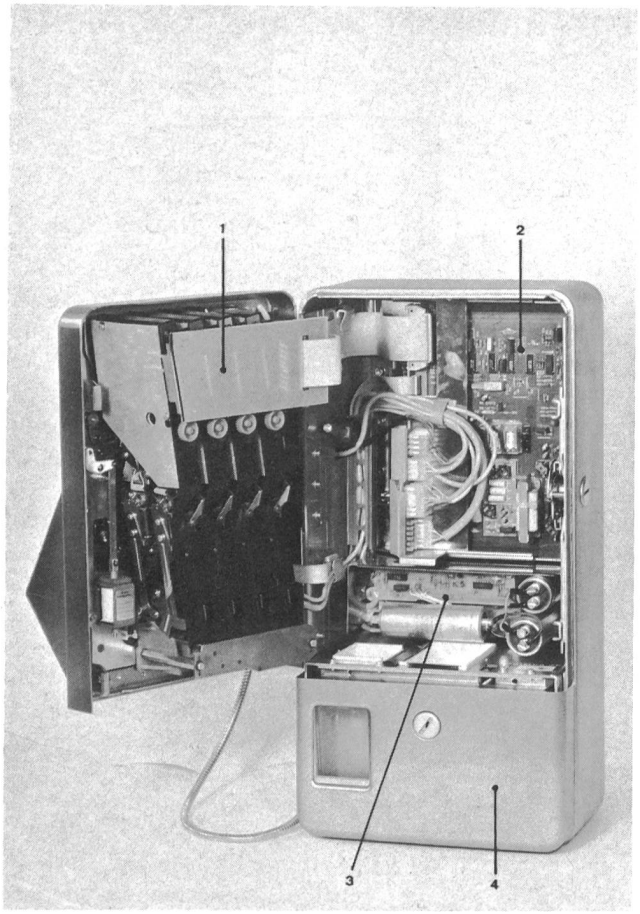

Fig. 5
Internal view of the coinbox telephone
1 Coin test and storage units
2 Speech circuit, interface, control
3 Power supply unit
4 Cash compartment

pler servicing (test programs) and lower costs for various subsequent alterations. The task of the microprocessor is to process all information presented at its inputs in accordance with the programs specifically written for this application and present in the program store (ROM). *Figure 7* shows the structure of the various programs.

322 Speech Circuit and Interface

Figure 8 is a block diagram of this circuit. The plug-in charge pulse receiver can be exchanged for 12 kHz or 50 kHz working. The speech circuit (2) corresponds to that used in the model 70 telephone instrument. The ringing receiver is actuated by ringing frequencies of 16 2/3...50 Hz. The dial pulse detector (4) serves to bar access to certain dialled numbers. The coinbox telephone identifies itself by means of the unit (5) which generates an acoustic and optical signal in the case of incoming calls and outgoing service calls. The acoustic signal is used also to request further payment when the credit is used up. Circuits (6, 7, 9) supervise the coin test unit; the flasher (8) actuates the optical request for further payment. Relay WGF enables dialling to proceed when the minimum amount has been inserted. When the credit has been used up or in the event of power supply failure relay BLR forces interruption of the circuit.

323 Power Supply and Credit Display

The power supply unit supplies the various modules with the required voltage, namely

– Microprocessor	15 V
– C-MOS-Logic	12 V
– Display	5 V
– Magnets	24 V

The input voltage amounts to 24 V a.c. or 24 V d.c. All outputs other than the 24 V output are protected against short-circuit conditions. Supply voltage outages up to 1 s are bridged. Power dissipation, measured at the primary side (220 V) of the supply transformer is:

Quiescent	16 VA (mean values)
Operational	25 VA (mean values)

The four-digit credit display consists of seven-segment gallium phosphide display elements. They ensure good legibility and have a long operational life.

4 Use

By comparison with earlier models the new AZ 44 coinbox telephone is a great deal more convenient for the user mainly by virtue of its optimal money refund and the provision of a redial key. When the handset is lifted the credit indicator starts to flash as a request to the user to insert money. As soon as the minimum amount (40 centimes) is reached the credit is continuously displayed and number dialling is enabled. Coins may be inserted in arbitrary sequence. The credit is decremented by the surcharge and call charge pulses. If it is exhausted during conversation a short warning tone is heard in the telephone receiver and the credit display starts to flash as a request for further payment. If no

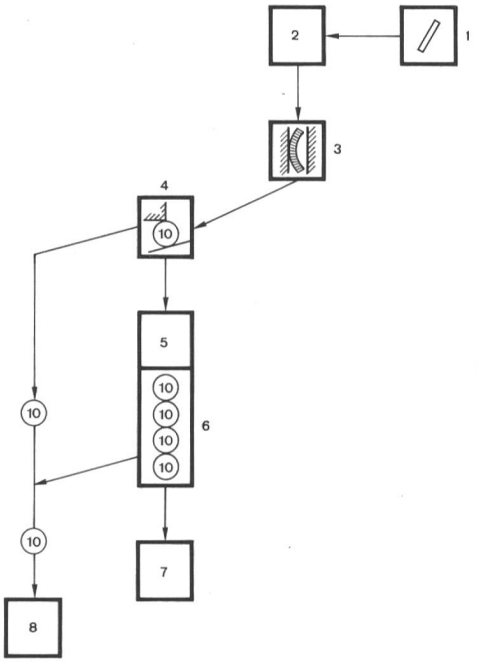

Fig. 6
Method of operation of the coin test and storage units
1 Insertion slot with insertion blocking flap
2 Insertion check
3 Clamp point for bent coins
4 Test point for minimum mass and alloy composition
5 Supervisory unit for storage channel
6 Cash store
7 Cash compartment
8 Refund

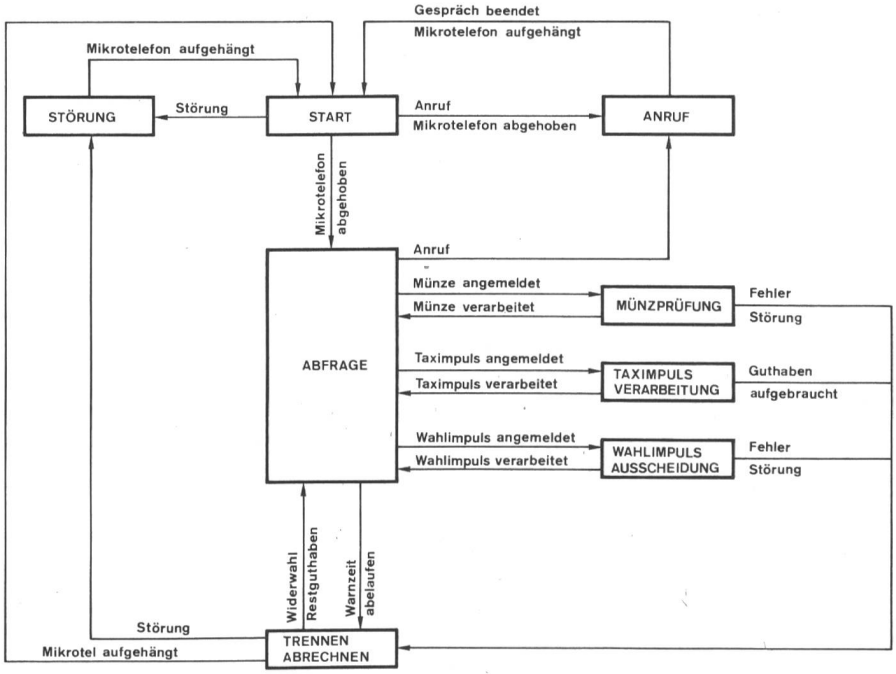

Fig. 7
Structure of the programs
Mikrotelefon aufgehängt – Handset restored
Start – Start
Störung – Fault
Anruf – Call
Gespräch beendet – Conversation ended
Mikrotelefon abgehoben – Handset lifted
Abfrage – Scan
Wiederwahl – Redial
Restguthaben – Residual credit
Trennen, abrechnen – Interrupt, bill
Warnzeit abgelaufen – Warning period expired
Münze angemeldet – Coin detected
Münzprüfung – Coin test
Münze verarbeitet – Coin processed
Fehler – False
Taximpuls angemeldet – Charge pulse detected
Taximpuls verarbeitet – Charge pulse processed
Guthaben aufgebraucht – Credit used up
Wahlimpuls angemeldet – Dial pulse detected
Wahlimpuls verarbeitet – Dial pulse processed
Wahlimpulsausscheidung – Dial pulse discrimination

money is inserted the call is interrupted after 10 s. If on the other hand a credit remains after the conversation has ended (at least 40 centimes) this can be used for one or more subsequent calls by pressing the redial key. If a wrong digit is selected during dialling it is possible to start dialling again by pressing this key without the need for the money to be refunded and reinserted. The redial key interrupts the circuit without affecting the cash collection process as happens when the handset is replaced. If a credit still remains after the handset is replaced this is returned optimally i.e. the unused amount is refunded insofar as the coins inserted allow. The instrument is not provided with a coin changer on grounds of cost and security.

Instructions are displayed in each kiosk to give the user a rapid summary of the sequence of operations. These instructions include a symbolic representation of the essential manual operations alongside the text in four languages.

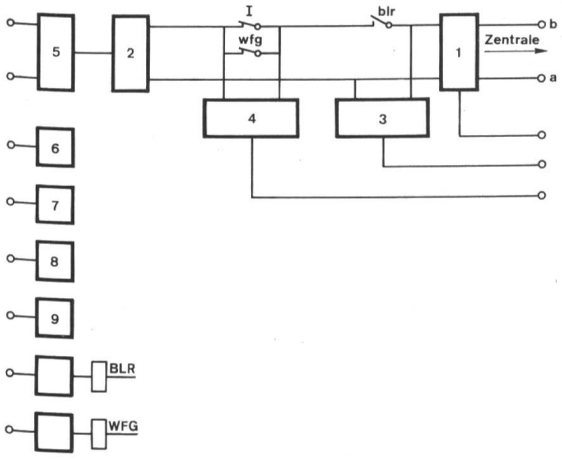

Fig. 8
Block diagram of speech circuit and interface
1 Charge pulse receiver
2 Speech circuit
3 Ringing receiver
4 Dial pulse counter
5 Acoustic and optical warning signal generator
6 Supervision of credit flap
7 Supervision of insertion flap
8 Flascher
9 Clock pulse generator for photoelectric sampling
BLR Belegungsrelais – Circuit seizure relay
WFG Wahlfreigaberelais – Proceed to dial relay
I Impulskontakt – Pulse contact
Zentrale – Exchange

5 Installation

The AZ 44 coinbox telephone can be mounted in the wall frames used previously for the AZ 1 instruments. The connections remain the same, the a.c. terminals (~) serving to supply the instrument. The station can be supplied with 24 V a.c. or 24 V d.c. as required. In most cases this will be supplied from the dimming switch or a transformer from 220/24 V a.c.

Special mounting instructions apply if the concrete pillar is used.

6 Conclusions

The AZ 44 coinbox telephone offers new and advantageous performance features to the user and to the PTT. Its design, the application of new technology and materials and its great flexibility for modifications make it a future-oriented instrument.