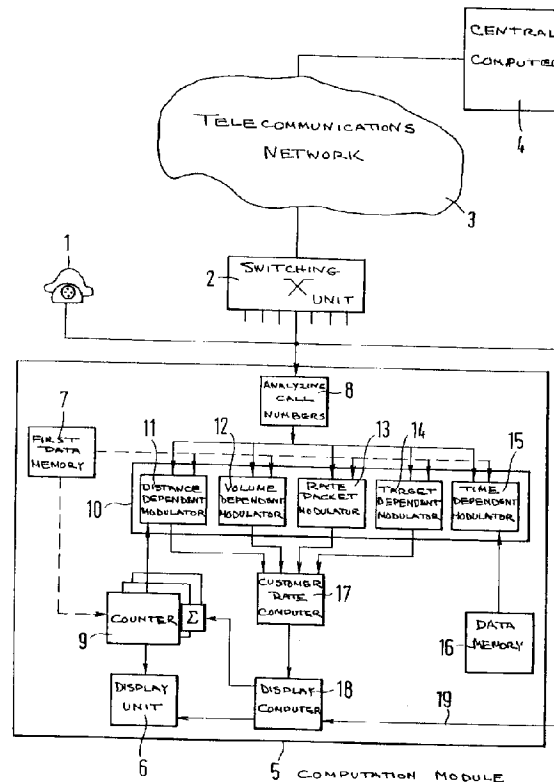




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(54) **METHODE ET DISPOSITIF PERMETTANT D'INDIQUER DES
FRAIS D'APPEL D'APRES DES DONNEES LOCALES
DISPONIBLES DANS UN TERMINAL**
(54) **METHOD AND APPARATUS FOR INDICATING CALL
CHARGES BASED ON LOCAL INFORMATION AVAILABLE
IN A TERMINAL**



(57) Dispositif pour l'affichage de frais sur un terminal (1) de télécommunications (TK). Comprend un ordinateur permettant de déterminer les frais et une unité d'affichage (6) pour afficher les frais établis. Le dispositif se caractérise par son module de calcul (5) pour le calcul de frais spécifiques-client, qui peut

(57) A device for displaying charges on a telecommunications (TK) terminal (1), with a computer for determining the charges and a display unit (6) for displaying the established charges, is characterized in that a computation module (5) for calculating a customer-specific rate is provided, which is able to call





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rechercher des données de paramètres spécifiques-client d'une première mémoire de données (7), ainsi que des algorithmes de tarification spécifiés d'une mémoire de programme (10), puis utiliser cette information pour calculer les frais applicables à une connexion TX particulière, et envoyer à l'unité d'affichage (6) les signaux d'information correspondants. Il est ainsi possible d'utiliser des moyens simples pour l'affichage de frais individuels sur le terminal TK.

up customer-specific parameter data from a first data memory (7), and specifiable rate algorithms from a program memory (10), and use this information to calculate a current charge for an individual TK connection, and route corresponding information signals to the display unit (6). This makes it possible to use simple means for displaying individual charges on the TK terminal.

Abstract

A device for displaying charges on a telecommunications (TK) terminal (1), with a computer for determining the charges and a display unit (6) for displaying the established charges, is characterized in that a computation module (5) for calculating a customer-specific rate is provided, which is able to call up customer-specific parameter data from a first data memory (7), and specifiable rate algorithms from a program memory (10), and use this information to calculate a current charge for an individual TK connection, and route corresponding information signals to the display unit (6). This makes it possible to use simple means for displaying individual charges on the TK terminal.

METHOD AND APPARATUS FOR INDICATING CALL CHARGES BASED
ON LOCAL INFORMATION AVAILABLE IN A TERMINAL

Field of the Invention

The invention concerns a device for displaying a charge on a telecommunications (TK) terminal, with a calculator for determining the charge and a display unit for displaying the established charges.

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Description of the Prior Art

Such devices are generally known. Their function is described for example in the "Textbook of Telecommunications" volume 1, fifth edition 19.., Technical Publishers Schiele & Schön GmbH, Berlin, pages 614 to 620.

With the known TK systems, a network subscriber usually receives charge information mainly via charge pulses, which are either totaled or processed further by the respective TK terminal. Today the number of pulses or the corresponding amounts that are charged depend on the duration and the distance of the chargeable TK connection. With a calculation that is accurate to the second, these pulses can no longer be used as a display for the subscriber.

20

In addition to different rates for different times of day, and different rates for working days and holidays, ever more complex and differentiated rate models are being introduced. Many other parameters must be considered as well, for example rebates for wholesale users and such, and rate models in the future must also be able to be diversified or even individualized. But to that end the applicable information, such as charge amounts, must be processed accordingly during or after a TK connection. Such current charge amounts, which are derived from complex calculations, cannot be displayed on present TK terminals during or shortly after a TK connection has ended. At best such information can be transmitted to the subscriber later via the respective TK network, or other communication media.

30

Summary of the Invention

In this regard the object of the present invention is to modify by mostly simple means a device for displaying charges on a TK terminal of the kind described in the beginning in such a way, that an individual charge can be displayed on the TK terminal.

The invention achieves this object by providing a computation module for calculating a customer-specific rate, which requests customer-specific parameter data from a first data memory, and specifiable rate algorithms from a program memory, and uses this information to calculate the current charge for an individual TK connection, and routes the corresponding information signals to the display unit.

The invention starts with the idea that information about the applicable rate model for the subscriber is not only kept in the TK network, but can be made available locally in the TK terminal, especially with standard rate models. This creates a very significant increase in the flexibility for introducing new rate structures, such as for example special individual rates for certain customers or groups of customers, timely limited advertising means at discount rates, and such.

In a particularly compact configuration of the device of the invention, the computation module is integrated in the TK terminal. This allows the device of the invention to be implemented in an especially space-saving and technically simple manner.

In alternative configurations, the computation module is located separately from the TK terminal. This has the special advantage that existing old TK terminals can continue to be used.

A particularly advantageous development of the configuration provides that a separate display unit for displaying the established charges is connected to the computation module, which is not integrated in the TK terminal. This avoids the need of special interfaces to potential display units in the TK terminal. In addition, the simplest TK terminals which contain no display unit can be utilized.

In another particularly preferred configuration, the first data memory with the customer-specific parameter data is integrated as a customer module in the computation module. This makes the device of the invention especially compact and the data are always immediately available.

5 In a further development of this configuration, the customer module is exchangeable. This has the advantage that in the event of rate changes, the old customer module can be replaced with a new one.

10 When the above-cited configuration of the device of the invention is developed further, the first data memory can be a read-only memory. This avoids a complicated downloading procedure between the TK network and the TK terminal, which makes simple handling possible for the user.

In alternative further developments, the first data memory can be overwritten with information signals from a TK network. In this way rate changes are easier, centralized and immediately downloadable without any time delay.

15 In a further development, the overwriteable first data memory can be in the form of a magnetic tape cassette (cartridge). Presently these have a particularly large memory volume, so that many technical options become available.

20 As an alternative, the overwriteable first data memory can also be in the form of a chip card, in which a processor for processing the rate-algorithms can be integrated at the same time.

In a particularly compact configuration, the customer module is in the form of a chip card which has an integrated customer rate calculator.

25 Especially preferred is a configuration of the device of the invention which is characterized in that the first data memory with the customer-specific parameter data, and/or the program memory with the specifiable rate-algorithms, is located separately from the computation module, and that the parameter data and/or the rate-algorithms can be transmitted to the TK computation module via a TK network. In this way information and updating can be sent simply and above
30 all centrally to the respective TK terminals, and loading processes without any

problems would be made possible from the TK network operator to all the connected users.

5 Especially preferred is a configuration in which a counting device is provided to determine the amount of the charges accumulated during an accounting time. This gives the user of the respective TK terminal the ability to inquire about the accumulated exchange charges and other services that are owed to the TK network operator.

10 A particularly advantageous development of this configuration provides the possibility for threshold values for the customer-specific usage to be called up from the first data memory; after these are exceeded, more favorable customer-specific rates are used to calculate the current charge. This allows adapting a rebate to the individual usage in a simple manner, which serves as an incentive for higher usage of the respective TK service, and thereby for better utilization of the respective service provider system, and to increased sales for the service offerer.

15 Especially advantageous is also a configuration of the device of the invention wherein a device for call number analysis is provided. This allows for example to automatically determine different rate zones which are then used to calculate the charges.

20 A particularly preferred development of this configuration provides that customer-specific target call numbers can be called up from the first data memory which, when dialed by the TK terminal, result in a more favorable customer-specific rate than all the other target call numbers. This can further increase the incentive for usage by the customer with a view toward an increased usage of the offered TK service.

25 Finally, a preferred configuration of the device of the invention provides another data memory from which parameter data that are valid for all subscribers of the TK network can be called up, for example distance of the connections, rate packets, time of day, date, etc. This makes available a complete, generally applicable rate model for computing the current charge.

30 A method for operating the above-described device also falls within the framework of the invention, which is characterized in that during the establishment

of a TK connection, customer-specific parameter data are downloaded from the first data memory to the computation module; a rate algorithm is then called up from a program memory to calculate the current charge for the TK connection, which is displayed on the display unit.

5 A particularly preferred variation of the method of the invention provides for changed customer-specific parameter data to be automatically downloaded from a central computer to the customer module via the TK network. This allows rate changes to be defined and immediately converted, but also to be entered into the TK network in a time-controlled manner. Another possibility of
10 applying this variation of the method is that during the next use of a TK terminal, a rate change can be entered into the corresponding parameter memory or program memory for the rate algorithms. For certain customers, the planned change can be made earlier and out of sequence, or at any other time, and can then be activated at a predetermined time.

15 In conjunction with the granting of more favorable customer-specific rates when certain usage threshold values have been exceeded, it is advantageous if these threshold values are determined from statistics of the usage by the respective customer during a preceding accounting period. In that way a usage by the respective final user, which is particularly desirable for the service offerer, can
20 be specially rewarded.

 Other advantages of the invention can be found in the description and the drawing. According to the invention, the previously cited features and those described later can be utilized individually or in any combination thereof. The indicated and described configurations should not be taken as a final listing, they
25 rather have an exemplary character for the depiction of the invention.

Description of the Drawing

 The invention is illustrated by the drawing and is explained in greater detail by means of an embodiment. The figure represents an operating schematic diagram for the display of current charges in accordance with the invention, based
30 on information which is locally available in the terminal.

Detailed Description of the Preferred Embodiment

The basic idea of the system according to the invention is that, not only can a general rate model which is stored in the network apply to a subscriber of a TK network, but that especially with different standard rate models as well, an individual rate can also be made locally available in the TK terminal. As soon as the distance between the respective TK terminals plays a role during the calculation of usage fees, such stored information must be individually adapted to the respective location of the TK terminal.

The following offers two possibilities that fall within the framework of the present invention, which locally store the necessary information about a rate model in the TK terminal:

1. The rate information is directly entered into the TK terminal via a plug-in module, which can be obtained from a TK network operator. The network operator can already consider the future location while this plug-in module is being loaded. In addition to such a plug-in module, a separate device similar to the separate charge counter known today can also be envisioned. In that case a new terminal would not be required .

2. In the establishment phase of user connections, the information about the rate model is downloaded from the TK network to the TK terminal, or by means of load connections which are independent of the user connections. This method has two advantages with respect to the first. On the one hand the TK network informs the TK terminal where the TK terminal is located in the TK network, while the TK terminal remains portable without any modification; on the other hand rate models can be centrally changed in the TK network, and then become immediately available.

Both methods have their justification. The first method provides lower cost for the TK network, and is above all suitable for TK terminals which are not used for basic portability. The second method increases the flexibility for subsequent modifications performed by the network operator.

A third imaginable method is a hybrid of the two described above: as in 2., the information is downloaded from the TK network to the TK terminal, whereby full flexibility is preserved for the network operator. However, this downloading of the rate does not take place with every establishment of a connection, but only with rate model changes. During the time between such changes the rate information is stored in a module, which can be designed as a plug-in module as described in 1., and is called up by the TK terminal for every establishment of a connection. In this way the advantages described for the first method can also be utilized.

But a display unit is conveniently provided with all the methods, whereby the respective calculated charge is displayed on the TK terminal or in its immediate vicinity, in this way providing the user with the opportunity to act on the currently accumulating charge for the TK connection.

The figure illustrates a possible realization of the device of the invention for displaying the individual charge: a switching unit 2 connects a telecommunications (TK) terminal 1 to a TK network 3, which is operated and serviced by a central computer 4. A computation module 5 is connected to the TK terminal 1, to calculate the charge and display each individual TK connection of the TK terminal 1.

The computation module 5 of the illustrated embodiment contains a first data memory 7, which can be designed as an insertable customer module for example. The customer module includes customer-specific data for calculating the connection charges. Such data are e.g. the location in the network (if the rating is dependent on the distance), or special rates etc. granted by the network. This information is either locally stored, locally entered (chip card), or is downloaded from the network 3. Combinations of these mechanisms can also be envisioned.

A program memory 10 stores specifiable rate algorithms from which a customer rate computer 17, in conjunction with the customer-specific parameter data called up from the first data memory 7, calculates a current charge for each individual TK connection. The result is routed to a display computer 18, which on the one hand routes it further in suitable form to a display unit 6 where it can

be made visible to the user of the TK terminal, and on the other hand enters it into a counter 9 that stores the amount of the charges accumulated during a predetermined period, which can also be made visible by the display unit 6.

5 The customer rate computer 17 as well as the data memory 7 can also be integrated on a chip card.

10 The customer rate itself is determined by a series of factors which are taken into consideration by the different modulators. The derived rate, together with other information (the time above all) is converted into a charge and is displayed. A distance-dependent modulator 11, a volume-dependent modulator 12, a rate packet modulator 13, a target-dependent modulator 14 and a time-dependent modulator 15 are provided in the present example. In addition, parameter data that are valid for all subscribers of the TK network 3, such as for example date, time, clock pulse, rate packets, distance from connections etc., can be loaded from a further data memory 16 into the program memories 10 and taken into
15 consideration for the current computation of the charges.

For example, in order to provide more favorable customer-specific rates for a predetermined number of target call numbers, the computation module 5 also includes a device 8 for analyzing call numbers. The respective target call number with the favorable rates can be routed from the first data memory 7 to the program
20 memory 10.

Numerous additional features, such as forming the total amount of the charges, storing the totals of the last n accounting periods, resetting the current summation meter as a function of the accounting period, storing individual fees etc., are possible depending on the desired added feature, and are indicated by the
25 corresponding connection arrows in the figure.

In some configurations of the invention, a corresponding distance-dependent basic rate can also be stored for example in the device 8 for call number analysis.

30 A line 19 is also provided for direct access to the display computer 18 for the purpose of through-connections, release or similar operations from the TK terminal 1 or from the central computer 4.

What is claimed is:

- 1 1. A device for displaying fees on a telecommunications (TK) terminal,
2 with a computer for determining the charges and a display unit for displaying the
3 established charges, characterized in that a computation module (5) for calculating
4 a customer-specific rate is provided, which calls up customer-specific parameter
5 data from a first data memory (7), and specifiable rate algorithms from a program
6 memory (10), and uses these parameter data and rate algorithms to calculate a
7 current charge for an individual TK connection, and routes the corresponding
8 information signals to the display unit (6).

- 1 2. A device as claimed in claim 1, characterized in that the computation
2 module is integrated in the TK terminal.

- 1 3. A device as claimed in claim 1, characterized in that the computation
2 module (5) is located separately from the TK terminal (1).

- 1 4. A device as claimed in claim 3, characterized in that a separate display
2 unit (6), which is not integrated in the TK terminal (1), is connected to the
3 computation module (5) for displaying the established charges.

- 1 5. A device as claimed in claim 1, characterized in that the first data
2 memory (7) with the customer-specific parameter data is integrated as a customer
3 module in the computation module (5).

- 1 6. A device as claimed in claim 5, characterized in that the customer
2 module is exchangeable.

- 1 7. A device as claimed in claim 6, characterized in that the first data
2 memory (7) is a read-only memory.

1 8. A device as claimed in claim 6, characterized in that the first data
2 memory (7) can be overwritten with information signals from a TK network (3).

1 9. A device as claimed in claim 8, characterized in that the first data
2 memory (7) is provided in the form of a magnetic tape cassette (cartridge).

1 10. A device as claimed in claim 8, characterized in that the first data
2 memory (7) is provided in the form of a chip card.

1 11. A device as claimed in one of claim 10, characterized in that the
2 customer module is provided in the form of a chip card, in which a customer rate
3 computer (17) in particular is integrated.

1 12. A device as claimed in one of claim 4, characterized in that the first
2 data memory (7) with the customer-specific parameter data, and/or the program
3 memory (10) with the specifiable rate algorithms, is located separately from the
4 computation module (5), and that the parameter data and/or the rate algorithms can
5 be transmitted to the computation module (5) via a TK network (3).

1 13. A device as claimed in claim 1, characterized in that a counter (9) is
2 provided to determine the total charges accumulated by the TK terminal (1) during
3 an accounting period.

1 14. A device as claimed in claim 13, characterized in that customer-specific
2 usage threshold values can be called up from the first data memory (7), which
3 when exceeded allow more favorable customer-specific rates to be used for
4 computing the current charges.

1 15. A device as claimed in claim 1, characterized in that a device (8) for
2 analyzing call numbers is provided.

1 16. A device as claimed in claim 15, characterized in that customer-specific
2 target call numbers can be called up from the first data memory (7), which when
3 dialed by the TK terminal (1) allow using a more favorable customer-specific rate
4 than other target call numbers.

1 17. A device as claimed in claim 1, characterized in that another data
2 memory (16) is provided, from which parameter data that are valid for all
3 subscribers of the TK network (3) can be called up, for example distance of the
4 connections, rate packets, time of day, date, etc.

1 18. A method for operating a device for displaying fees on a
2 telecommunications (TK) terminal, the device having a computer for determining
3 the charges and a display unit for displaying the established charges, and further
4 having a computation module (5) for calculating a customer-specific rate, which
5 calls up customer-specific parameter data from a first data memory (7), and
6 specifiable rate algorithms from a program memory (10), and uses these parameter
7 data and rate algorithms to calculate a current charge for an individual TK
8 connection, and routes the corresponding information signals to the display unit
9 (6), the method characterized in that during the establishment of a TK connection,
10 customer-specific parameter data can be downloaded from the first data memory
11 (7) to the computation module (5), a rate algorithm called up from a program
12 memory (10) is used to calculate the current charge for the TK connection, which
13 is displayed on the display unit (6).

1 19. A method as claimed in claim 18 for operating a device where the first
2 data memory (7) can be overwritten with information signals from a TK network
3 (3), the method characterized in that the changed customer-specific parameter data
4 are automatically downloaded from a central computer (4) to the customer module
5 via the TK network (3).

1 20. A method as claimed in claim 19 for operating a device where the
2 customer-specific usage threshold values can be called up from the first data
3 memory (7), which when exceeded allow more favorable customer-specific rates to
4 be used for computing the current charges, the method characterized in that the
5 customer-specific usage threshold values are determined from statistics of the
6 usage by the respective customer during a preceding accounting period.

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