New Type of Cordless C.B. Private Branch Exchanges

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A new line in the range of L M Ericsson's modern manual telephone switchboards has been brought out in the form of cordless C.B. private branch exchanges. These switchboards possess a number of advantageous features which make them simple to handle: they are easy to install and maintain, can be placed independently on a table and are of attractive appearance.

Fig. 1 X 4962
Cordless switchboard ADD 1311
for 3 extensions and 1 public exchange line

LM Ericsson's new cordless switchboards, type *ADD 13*, can operate in conjunction with all automatic or manual C. B. exchanges of any system.

Automatic holding of the public exchange line permits the operator to leave the connection before the call is answered by extension.

The ringing current required for calling extensions is generated by a pole changer controlled by the dial. The ringing signal is automatically interrupted if the call is answered while the signal is being sent.

The larger switchboards are equipped for individual through-connection on every external line, which permits an executive to have a direct external line on which calls can be answered by the operator in his absence.

Types

L M Ericsson's cordless switchboards, type *ADD 13*, are made in the following standard sizes:

ADD 1311 for 3 extensions and 1 public exchange line with 1 external and 1 internal call facility.

ADD 1321 for 6 extensions and 2 public exchange lines with 2 external and 1 internal call facility.

ADD 1331 for 9 extensions and 3 public exchange lines with 3 external and 2 internal call facilities.

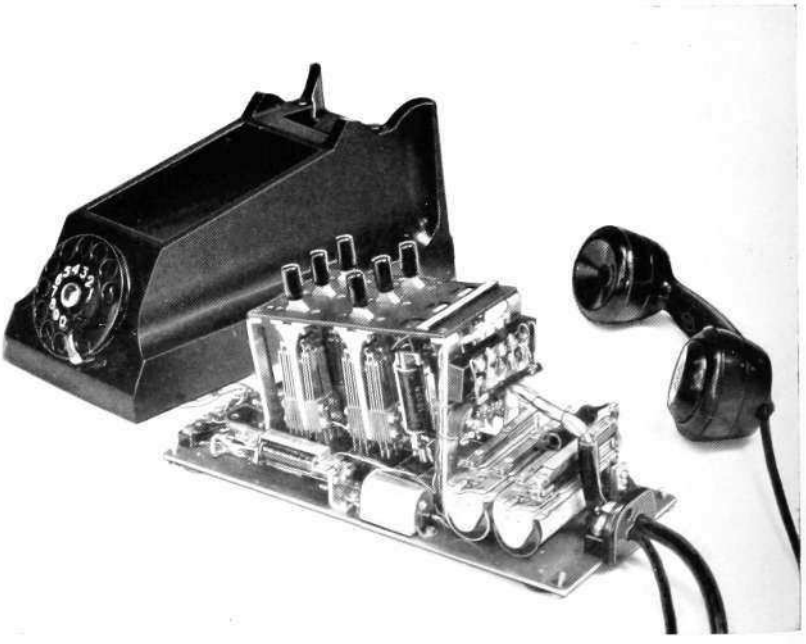


Fig. 2 X 6811
ADD 1311 with case removed

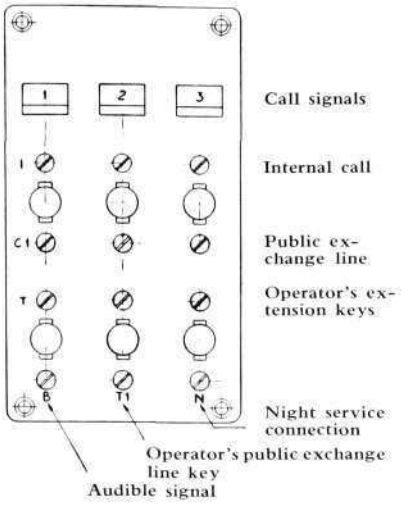


Fig. 3 X 4965

Front panel of ADD 1311

ADD 1311

As is seen in fig. 1, *ADD 1311* is designed in the form of a telephone instrument with extended front. The black phenolic case is secured to the base plate by four screws. With the exception of the dial all components are mounted on the base plate, as shown in fig. 2. The keys and indicators are mounted on the front panel, which is easily removed from the base to permit full accessibility of all units for inspection and adjustment.

The positions of the keys on the front panel, and their functions, are shown in fig. 3.

ADD 1321 and ADD 1331

Figs. 4 and 5 show the two cordless switchboards *ADD 1321* and *ADD 1331*. The components of each switchboard are assembled on an oak base and a green-enamelled aluminium front panel. The front panel is hinged and can be folded forwards (see fig. 6), whereby all parts become readily accessible for checking and adjustment. The equipment is enclosed in a light oak case which is secured to the base by two screws. The switchboard handset hangs on the left wall.

The placing of the keys on the front panel, and their functions, are shown in figs. 7 and 8.

Components

The components used in the new series of switchboards are all well-known and tested in different kinds of equipment under operating conditions. The following facts alone are of interest in this connection.

The *signalling devices* consist of visual indicators for the extension lines and drop indicators for the public exchange lines. (The smallest switchboard ADD 1311 has only one audible signalling device—a buzzer—on the public exchange line). The visual and drop indicators are fairly similar, being incorporated in the same electromagnetic circuit and having recessed shutters. The public exchange line drop indicators are automatically restored when the operator answers the call. Both visual and drop indicators have alarm contacts for audible signal circuits.

The *keys*, which have twin contacts, are of the previously known type *RMA 11*.

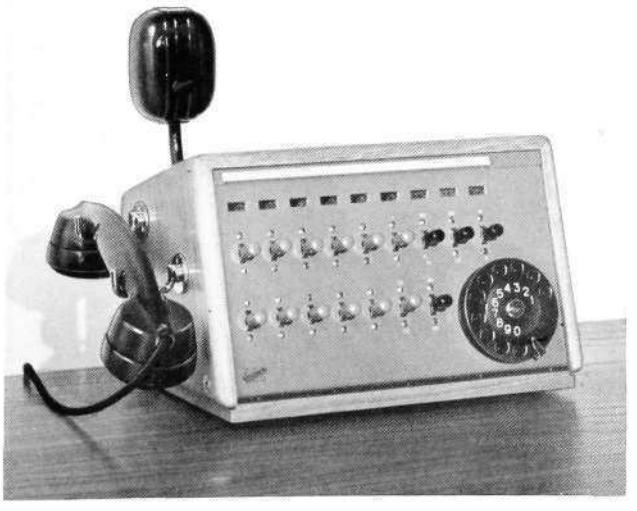


Fig. 4 X 6809 X 6810

Cordless switchboards ADD 1321 and (right) ADD 1331

for 6 extensions and 2 public exchange lines (ADD 1321) and 9 extensions and 3 public exchange lines (ADD 1331)

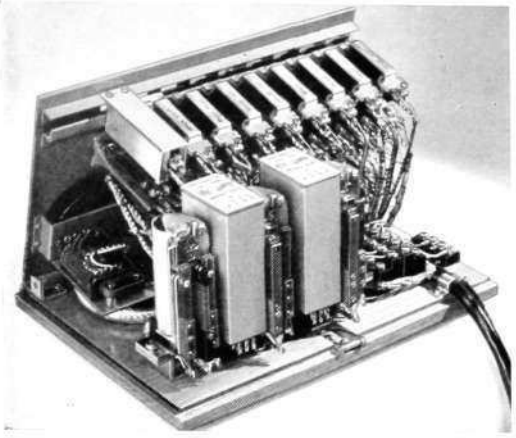


Fig. 5 X 4963

ADD 1321, case removed

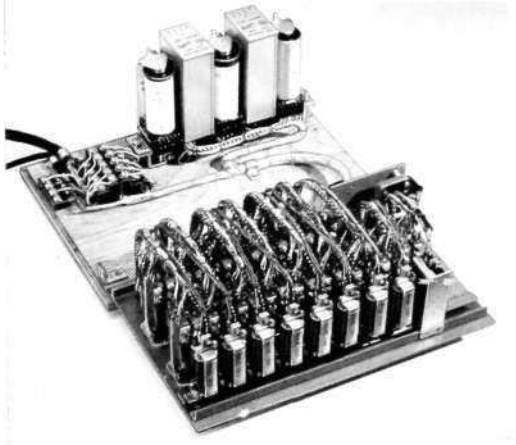


Fig. 6 X 4964

ADD 1321, case removed and front panel down

Fig. 7 X 6812

Front panel of ADD 1321

H 1 Holding of external line 1
H 2 " " " " 2
N Night service
N 1 Individual through connection of external line 1
N 2 Individual through connection of external line 2
B Audible signal

Relays and capacitors are of normal telephone type. All relays have twin contacts.

Of particular interest is the pole changer relay. Apart from its function of generating ringing current, it has three other functions, viz. as ringing trip relay, operator's transmitter feed relay and audible signalling device (buzzer).

Operation

Internal Call

The switchboard is called by lifting the handset, which operates a visual indicator. The operator answers by throwing the corresponding key to *T*, so restoring the indicator. If an internal call is required, the operator throws the caller's key to *I* and thereafter the called party's key to *T*. The operator rings the called party by dialling one digit, a ringing signal being transmitted until the dial has returned to rest. The called party's key is then thrown to *I* and the connection is established.

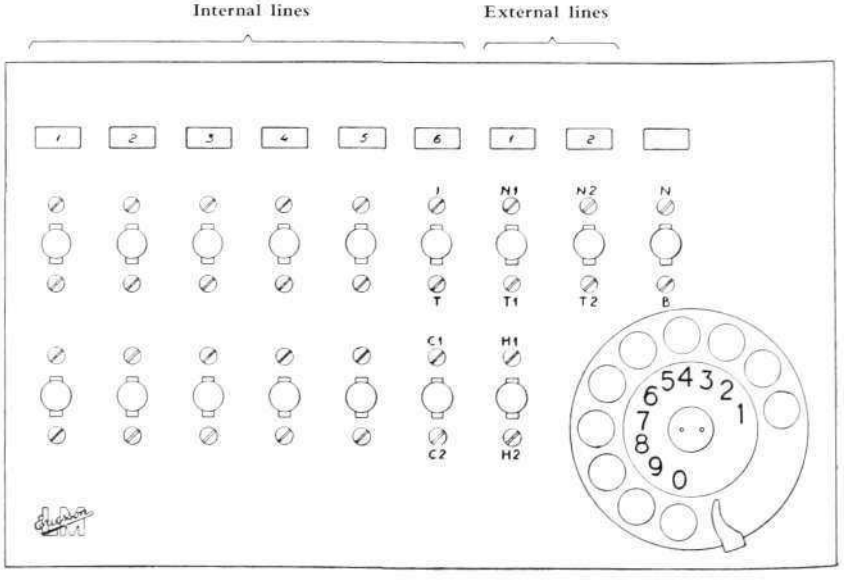
If the extension replies during the ringing signal, the signal immediately ceases. Thus the extension can never be irritated by a ringing signal when the handset is raised.

The replacing of both handsets on completion of a call is signalled on the respective visual indicators, whereupon the operator restores both keys.

Incoming Calls from Public Exchange

An incoming call on, for example, external line *1* is answered by the operator throwing the key to *T1*. After receiving the order, she throws the external line key of the wanted extension to *C1*, which actuates the visual indicator of that extension. The upper key of the extension is then thrown to *T* and the external line key is restored from *T1*. The operator next rings the extension as described above. After ringing she restores the upper key and, when the extension replies, the indicator returns to rest. The connection is now through.

From the time the lower key is thrown to *C1* until the called extension answers, the external line is held over a holding circuit in the switchboard.



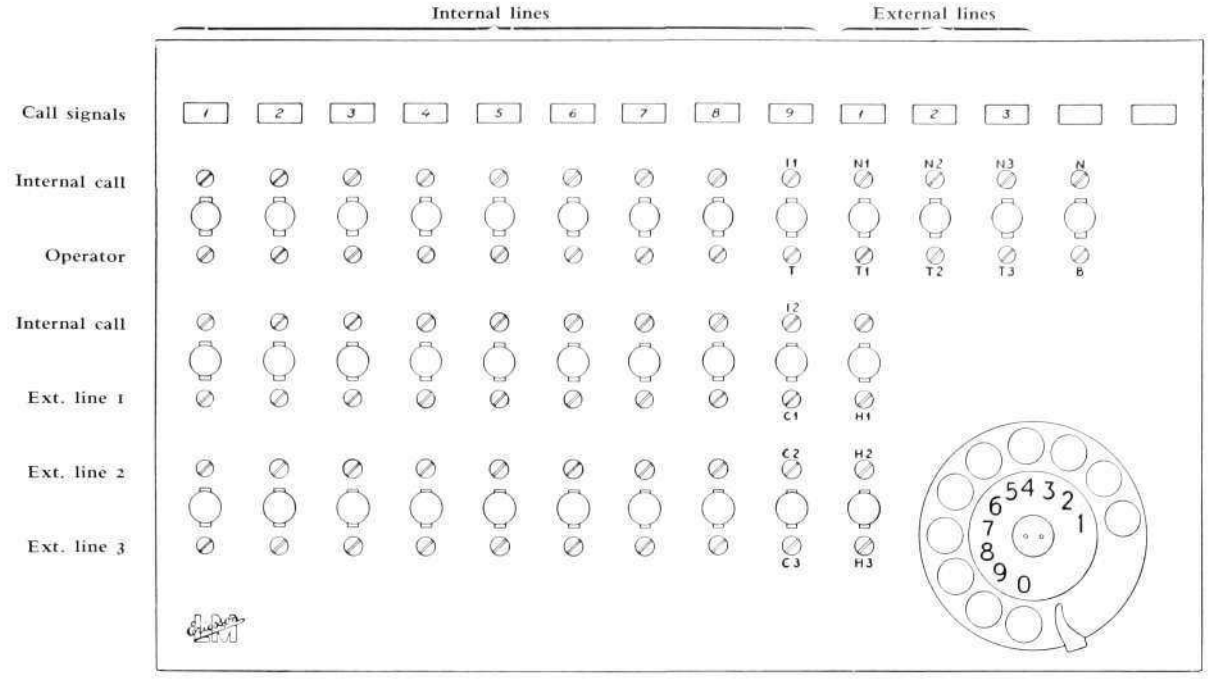


Fig. 8 X 6826

Front panel of ADD 1331

H 1 Holding of external line 1
H 2 " " " " 2
H 3 " " " " 3
N Night service
N 1 Individual through connection of external line 1
N 2 Individual through connection of external line 2
N 3 Individual through connection of external line 3
B Audible signal

The replacing of the extension's handset is signalled on the visual indicator and the external line is released. The operator restores the external line key from *C1* and the indicator signal disappears. If a new call comes in on the external line before the operator has restored the above-mentioned key, the calling device of the external line is actuated nevertheless.

Outgoing Calls to Public Exchange

The extension calls the switchboard and the operator answers as described above. The connection is extended to the public exchange by the operator throwing a free public exchange line key to *C*, after which the extension's upper key is restored. The extension can then dial the required number.

The end of a call is signalled on the extension's visual indicator, and the operator disconnects the call by restoring the key from *C*.

The operator can also establish an outgoing call by means of her dial.

Audible Signal

If the operator is unable to keep the visual signals under observation, she throws an audible alarm key to *B*, whereupon a subdued tone is heard both on call and clearing signals.

Night Service

Night service connection is obtained by throwing the night service key to *N* and the public exchange line keys to *C1*, *C2* and *C3* respectively for the extensions who wish the night service connection. When key *N* is thrown, the current supply to the switchboard is cut off.

The public exchange lines in ADD 1321 and 1331 have been supplied with individual through connection facility, allowing direct connection of the respective public exchange line to the desired extension. This means that an

executive can have a directly connected exchange line on which calls can be answered by the operator in the executive's absence. The individual through connection can also be utilized when an extension desires a number of outgoing calls in succession. Thus the operator is not troubled by any signals.

Current Supply

When the operator or an extension is speaking on an external line, the current to the transmitter is obtained from the public exchange. Only on internal calls between extensions or between an extension and the operator is a local current supply required. The switchboard is designed for 24 V, but variations between 15 and 30 V may be tolerated. The current consumption at 24 V is

for external calls: 0 mA

for internal calls: abt 40 mA

for calls between operator and extension and ringing to extension: abt 170 mA.

Dry cells, storage batteries or battery eliminators may be used for the power requirements of the switchboards.

Dimensions and Weights

The dimensions and weights of the switchboards are tabulated below. The width measurements of ADD 1321 and ADD 1331 do not include the handset hooks which project about 50 mm.

Designation	Length mm	Height mm	Depth mm	Net weight kg
ADD 1311	126	154	293	3.9
ADD 1321	303	200	216	8.2
ADD 1331	388	249	226	12.2

New Cordless P.M.B.X. for C.B. Operation

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An earlier article in Ericsson Review No. 2, 1954, contained a detailed description of L M Ericsson's cordless C.B. switchboards types ADD 1311, ADD 1321 and ADD 1331.

Thanks to their simplicity of management, low maintenance cost and exclusive design, these switchboards have been in great demand. The need soon arose for a larger switchboard of this type. L M Ericsson is now able to offer such a switchboard, likewise designed for offices in which the operator's services are combined with other work.

The attractive appearance and small dimensions of these switchboards harmonize well with most modern office furnishings.

The new switchboard, coded *ADD 1342*, has a capacity of 16 extensions and 4 exchange lines with 3 internal and 4 external connecting circuits and 1 connecting circuit for the operator.

The switchboard features the same technical finesses as those described earlier, viz.

automatic holding of exchange line on incoming call,
ringing current generated by pole changer under control of dial,
ringing automatically interrupted when extension answers,
individual through-connection for every exchange line.

This switchboard, like the remainder in the series, can naturally be connected to any type of public exchange, and the same C.B. telephones can be used as in the remainder of the network.

Every exchange line is equipped with a key for manual holding under queuing conditions. It is also possible to connect an extra bell for audible calling and clearing signals. The operating voltage is as usual 24 V. The construction and operation are largely similar to switchboards ADD 1321 and ADD 1331.

The dimensions and weight of the new switchboard are: length 571 mm, height 304 mm, depth 230 mm, weight 20.5 kg. The length dimension does not include the handset hooks which project about 50 mm.

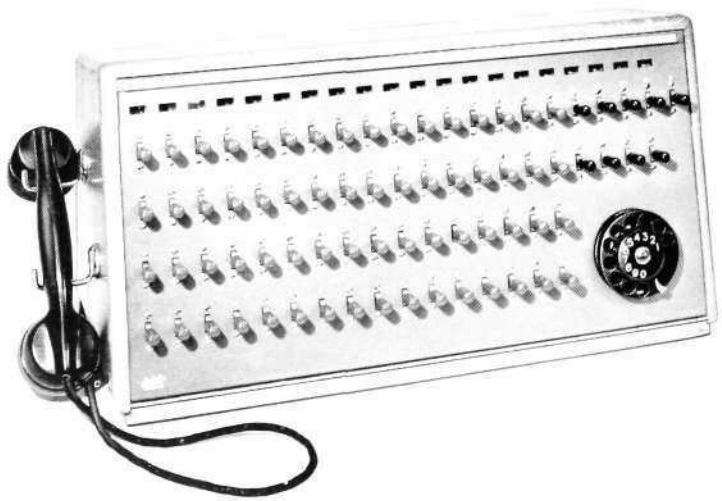

Fig. 1 X 8049
Cordless switchboard ADD 1342