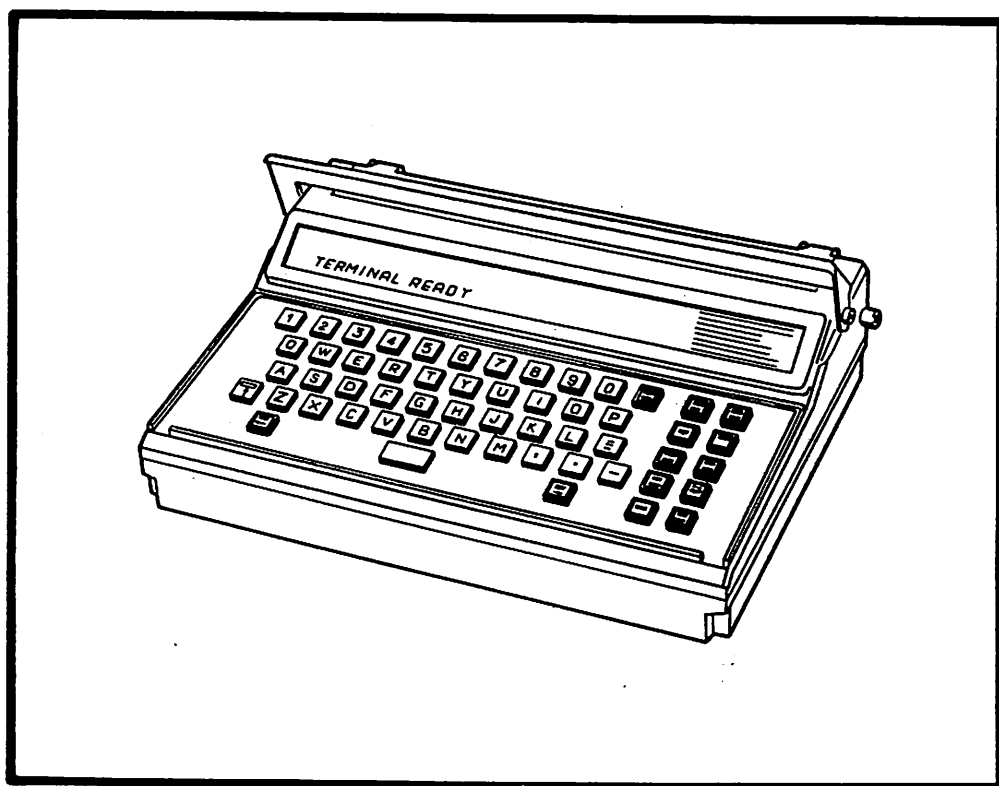


**PHILIPS USFA BV**

**User's manual**  
Preliminary

# **SHORT-BURST MESSAGE TERMINAL**

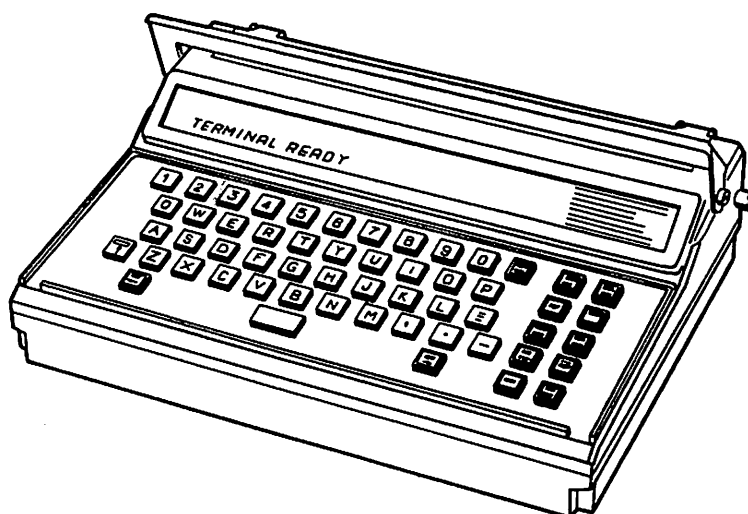
## **TYPE UA 8295/00**



**PHILIPS**

# **SHORT-BURST MESSAGE TERMINAL**

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Document No. 20.0057-E-0884

Printed in The Netherlands

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## Section 1

## GENERAL CHARACTERISTICS

### 1 UA 8295 DESCRIPTION

#### 1.1 General

The UA 8295 message transmission terminal offers a powerful means of transmitting and receiving data via radio and telephone lines. The message to be transmitted can be edited by means of the unit's keyboard or sent to the terminal from a computer or an external data terminal through a serial data port.

The received message can be shown on the unit's LED display or printed by an external printer or a computer.

A very powerful digital enciphering algorithm is implemented in software and can be tailored in accordance with customer's requirements.

The terminal can be used as a data transmission terminal and as an off-line ciphering unit which enciphers/deciphers five-character data groups.

The message can have either a free format or a fixed format. In the latter case only the ID number of the format and the variable data sections must be edited and transmitted.

The output signal level of the modem is adjustable by means of a resistor inside the radio interface connector.

The unit contains an AGC (Automatic Gain Control) circuit for adjusting the level of the input signal.

## 1.2 ECCM features

Because the messages transmitted by the terminal have very short "on air" time, it is difficult to jam and locate the associated transmitter. In addition the unit employs a very effective error-correction method and contains a data modem designed especially for HF transmission. Both of these features minimize transmission time by reducing the need to re-transmit messages.

## 1.3 Man/machine communication

Text can be typed in and edited from the unit's keyboard or can be supplied to the memory from a computer or an external data terminal.

The transmission buffer memory is divided into two parts with capacities of 2000 and 250 characters respectively. Either buffer can be used for message transmission.

In the off-line mode it is possible to encipher or decipher messages in the memory. The result can be read on the unit's display or sent to an external data terminal.

The capacity of the buffer memory for received data is 2000 characters. The terminal can receive up to eight messages into the buffer memory.

Data from the input and output buffer memories can be sent to a computer or to an external printer.

## 1.4 Transmission and reception of messages

The UA 8295 can transmit messages from both input and output memories. The terminal adds the ID-codes of the transmitter and receiver to each message, together with the automatically generated additional keyword and the time of its clock; the time is used for detecting false messages possibly generated by the enemy.

The transmitting terminal enciphers the message text and adds error-correction information.

The receiving terminal detects and corrects errors, decipheres the message, checks the transmission time, and adds the relevant information to the beginning of the message.

Depending on the operator's choice the receiver terminal can automatically send acknowledgement to the transmitter terminal. Acknowledgement or rejection can also be sent manually.

## 1.5 Enciphering

The keyword required by the digital enciphering algorithm is entered via the keyboard and encoded by means of a custom-programmed ROM circuit. The terminal displays a four-character identification code generated from the keyword; the keyword itself is never displayed.

## 1.6 Error correction

The UA 8295 employs the 128.78.7 BCH (Bose-Chaudhuri-Hocquenghem) code for error correction and detection. The message is divided into blocks of 13 characters (78 bits) and each block is error-protected by 49 bits.

Using this method it is possible to correct seven bit errors within each 127-bit block.

To increase the probability that all errors will be corrected, the blocks are interleaved before transmission; thus, if error bursts occur during transmission, the erroneous bits will be distributed over several blocks.

## 2 EXTERNAL INTERFACES

External connections to radio, printer and computer are made via three 7-pin audio connectors. (see Fig. 2)

### 2.1 Communication equipment

The built-in modem uses the frequency band between 1100 Hz and 2300 Hz.

Input level can vary from 0.003 to 2.5 volts.  
Input impedance is 600 ohms.

Maximum output level is 0.775 V (0 dBm) into 600 ohms and can be reduced by a resistor fitted inside the cable connector. Additional attenuation of 9 dB can be obtained by selecting the "low output level" option during the configuration of the terminal (see Section 3, paragraph 2.4).

A PTT (Push To Talk) switch is rated for 100 VDC, 100 mA and is protected against transients.

The transmission rate is either 150 or 600 bits per second (selectable from keyboard). The receiver automatically selects the correct rate.

### 2.2 Printer port

Although primarily intended for use with a printer, the port can also be used for data entry (for

example from a paper tape reader in a teletype terminal).

With an external adapter (RS-232 to current loop), a standard telex terminal can also be operated via the printer port.

Characteristics in RS-232 mode:

- asynchronous
- 7 or 8 data bits without parity, or 7 data bits and an even or odd parity bit
- two stop bits at 110 Bd transmission rate, one stop bit otherwise
- transmission rates 110, 300, 600 and 1200 Bd
- the signals
  - TXD - data transmitted by the terminal
  - RXD - received data
  - CTS - clear to send

Characteristics in telex mode (with telex adapter):

- asynchronous
- 5 data bits, no parity
- transmission rate: 50 Bd
- TXD, RXD and CTS have the same definitions, levels and polarities as in the RS-232 mode.

## 2.3 Computer port

The levels and polarities of TXD and RXD signals are in accordance with the RS-422 standard.

Characteristics:

- asynchronous
- 7 or 8 data bits without parity, or 7 data bits and an even or odd parity bit
- transmission rates: 600 and 1200 Bd
- the signals
  - RXD - data received by the terminal
  - TXD - data transmitted by the terminal

## 2.4 Location of connectors

The connectors for the various interfaces are shown in Fig. 2.

## 2.5 Typical configurations

The terminal can be connected to HF and VHF/UHF radio equipment and through field telephones to wire lines. A typical configuration is shown in Fig. 3, while Fig. 4 shows a possible system arrangement using UA 8295 terminals, UA 8296 patrol message terminals and a message terminal centre.



### **3 POWER SUPPLY**

Power is supplied by four IEC R20 dry cells ("D-cells") or IEC KR35/62 nickel-cadmium rechargeable cells.

Fully charged nickel-cadmium cells will give at least 24 hours of normal operation.

The device can also be operated from an external power source of 10 to 30 V DC, which also supplies current to the built-in battery charger.

### **4 SPECIFICATION**

Technical data and environmental specifications are given in Appendices 1 and 2 respectively.

## Section 2

## CONTROLS AND INDICATORS

### 1. KEYBOARD

The UA 8295 keyboard (Fig.1) has 55 keys, namely:

- power ON/OFF switch
- numbers 0 to 9
- 26 alpha characters (capitals only)
- comma, point, dash and space
- carriage return/line feed ( $\equiv$ )
- four single-function control keys
- nine dual-function control keys, used in conjunction with the shift key ( $\square$ ), which is denoted in the text by the symbol  $\uparrow$ .

#### 1.1 Control keys

The functions of the control keys are summarised below:


##### Single-function keys

ON/OFF	Power switch
DISPL	Used in conjunction with keys 1 to 8 to display received messages (see Sect. 3, para. 2.10).
CONF	Initiates device-configuration procedure (see Sect. 3, para. 2.4).
SEND	Used in the message-transmission procedure (see Sect. 3, para. 2.8).

##### Dual-function keys

↑ACK	Sends affirmative acknowledgement (see Sect. 3, para. 2.9).
NAK	
↑TIME	Displays device time (see Sect. 3, para. 2.5).
BRIGHT	Sets display brightness (see Sect. 3, para. 2.3).

### Dual-function keys (continued)

$\uparrow$ INPUT PRINT	Inputs text from printer terminal Prints out displayed messages	(see Sect. 3, para. 2.15.).
$\uparrow$ NEW KEY KEY	Used in changing the key Displays the current key	(see Sect. 3, para. 2.14).
$\uparrow$ ENCR DECR	Used in off-line encryption Used in off-line decryption	(see Sect. 3, para. 2.11).
$\uparrow$ SHORT TERM	Selects small Tx memory Ends current operating sequence and prompts next.	(see Sect. 3, para. 2.8).
$\uparrow$ BEGIN —	Displays message header Character scroll left	
$\uparrow$ END —	Displays end of message Character scroll right	
$\uparrow$ DELETE 	Erases message from memory Erases last displayed character	(see NOTE below)

#### NOTE

The  $\uparrow$ DELETE key does NOT provide complete erasure of the memory contents. To clear the memory completely, use the procedure described in Sect. 3, para. 2.12.

### 1.2 Additional functions

Additional functions can be selected by using the shift key in conjunction with the alpha keys listed below:

$\uparrow$ T and $\uparrow$ Y	Used in the erasure of memory contents (see Sect. 3, para. 2.12).
$\uparrow$ C	Initiates battery-charging procedure (see Sect. 3, para. 2.2).
$\uparrow$ H	Displays operating instructions
	Each of the remaining alpha keys can be programmed to provide an additional function or special character.

### 1.3 Numerical keys

Keys 0 to 9 are also used in selecting the desired message format, as follows:

0(zero)	Selects free format for message composition (see Sect. 3, para. 2.6A).
$\uparrow$ 1 to $\uparrow$ 9 & $\uparrow$ 0 to $\uparrow$ 9	Used for selecting one of 19(max) fixed formats (see Sect. 3, para. 2.6B).

## 2. DISPLAY AND INDICATORS

The UA 8295 display comprises 32 LED characters. The brightness of the display can be adjusted to one of three pre-set levels, and a protective metal cover can be positioned to shield the display from incident light. The display is automatically turned off 30 seconds after the last keystroke and can be turned on again by striking any key.

Four separate LEDs on the right of the display indicate:

- LOW BATTERY VOLTAGE
- BATTERY CHARGE
- RECEIVE MESSAGE
- TRANSMISSION IN PROGRESS

## Section 3

## OPERATION

### 1 GENERAL

The main functions of the terminal are described in the paragraphs listed below:

Switching on (2.1)

Charging the batteries (2.2)

Adjusting the display brightness (2.3)

Configuring the terminal (2.4)

Setting the time (2.5)

Message composition (2.6)

Editing instructions (2.7)

Message transmission (2.8)

Message reception (2.9)

Display of messages (2.10)

Off-line encryption/decryption (2.11)

Deletion of memory contents (2.12)

Manual acknowledgement (2.13)

Changing the key (2.14)

Use of printer (2.15)

Use of external computer (2.16)

## 2 FUNCTIONS

The UA 8295 always displays the "FUNCTION?" prompt when it is ready to accept new commands.

### 2.1 Switching on

Press the ON/OFF key until the four indicating LEDs are lit. Then release the key.

Within about one second, one of the following messages appears on the display:

- TERMINAL OK Vxxxx FUNCTION ?  
(where Vxxxx is the current program version)
- ERROR: xxxxx.....  
(where xxxxx is an error code (see paragraph 3 of this Section))

#### NOTE

If the LOW BATTERY VOLTAGE indicator is lit, the batteries should be recharged or replaced (see 2.2)


### 2.2 Battery charging

The NiCd batteries of the UA 8295 can be charged from an external power source of between 10 and 30VDC.

Three different charging modes are available:

- a) normal charging
- b) quick charging
- c) fast charging

#### Procedure

Press the  C key.

Select the desired mode by answering yes (Y) or no (N) to the alternatives displayed.

#### NOTES

1. The BATTERY CHARGE indicator is lit while charging is in progress.
2. In modes b) and c) charging is automatically terminated after a predetermined time; in mode a) charging continues until terminated by repeating the above sequence.
3. To prevent excessive temperature rise, the external voltage applied during fast charging should not exceed 15V.

### 2.3 Display brightness

When the terminal is first switched on, the display brightness is at the lowest of three available levels.

Select the preferred brightness level by pressing the BRIGHT key repeatedly as required.

If the UA 8295 is not used within 30 seconds, the display is switched off; it can be turned on again by pressing any key.

**2.4 Terminal configuration** First press the CONF key. The desired configuration can then be set up from the features and options listed in the table on page.12 of this Section.

To accept the option displayed, press the = key. the following feature is then displayed automatically.

To select the default features, press CONF.

When the default features are selected, the address of the receiving terminal is set to 00; this means that the messages are transmitted to all terminals.

During the selection of a printer interface option, repeated operation of the T key alternately displays and suppresses the text TELEX MODE. To select telex-mode operation, press = while the text is displayed.

**2.5 Setting the time** Press the <sup>↑</sup>TIME key to display the time.

If the time needs to be changed, type in the new time and press the = key.

If the time does not need to be changed, press the TERM key.

The given hours and minutes are used as the reset time while the seconds are set to zero. The time is not updated on the display.

## 2.6 Message composition

- 2.6A. Free-format messages**
1. Press 0 (zero).
  2. If there is a fixed-format message in the transmission memory, the terminal will ask whether it should be deleted. If the answer is "YES", proceed to step 4. If the answer is "NO", check whether the message requires any specific action. The message can then be erased by pressing <sup>↑</sup>DELETE, or alternatively the message can be composed in the small memory.

(continued on page 13)

FEATURE	TO CHANGE	DEFAULT
1. Individual address	Type new address	00 (see Note 1)
2. Group address: i, ii or iii	Type new address	00 (see Note 1)
3. Key: Fixed key or day's key	<input type="checkbox"/>	Fixed key
4. Automatic acknowledgement: ON or OFF	<input type="checkbox"/>	ON
5. Sound alarm: ON or OFF	<input type="checkbox"/>	ON
6. Transmission speed: 150 or 600 Bd	<input type="checkbox"/>	150 Bd
7. Output level: HIGH or LOW	<input type="checkbox"/>	HIGH
8. Automatic printout: NO AUTOMATIC PRINTING REC (= print received messages) XMT (= print transmitted messages) XMT + REC (= print both) REC (DELETE REC) (= print & delete received messages) XMT + REC (DELETE REC) (= print both, delete received messages)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	NO AUTOMATIC PRINTING
9. Printer interface (see Notes 2 and 3): Speed: 110, 300, 600 or 1200 Bd Parity: even, odd; level 0 or 1	<input type="checkbox"/> P	300 Bd, no parity, 8 bits
10. Computer interface (see Note 3): Speed: 110, 300, 600 or 1200 Bd Parity: even, odd; level 0 or 1	<input type="checkbox"/> P	1200 Bd, no parity, 8 bits
<p style="text-align: center;"><b>NOTES</b></p> <p>1. Receive address 00 = messages are transmitted to all terminals.</p> <p>2. The text TELEX MODE can be displayed by pressing 'T' during configuration of printer interface and is cancelled by pressing 'T' again. To select telex mode, press "accept" key (≡) while text is displayed.</p> <p>3. The character frame is: 1 start bit, 7 data bits, 1 parity bit, 1 stop bit (2 stop bits at 110 Bd).</p>		



3. A free-format message in the memory can be edited (or deleted by pressing **↑DELETE**) before proceeding to step 4.

4. Type in the message.

5. Press the TERM key.

## 2.6B. Fixed-format messages


1. Select the required format by pressing one of the keys from 1 to 9 or from **↑10** to **↑9**.
2. If the transmission memory contains a message in a format other than that selected, the terminal asks whether or not it should be deleted. If the answer is "YES", proceed to step 3. If the answer is "NO", check whether the message requires any specific action. The message can then be deleted by pressing **↑DELETE**, or alternatively the small transmission memory can be used.

After pressing the TERM key and the fixed-format number again, proceed to step 3.

3. Type in the fixed parts of the message according to the automatically displayed prompts.
4. After "\*" is shown on the display, an additional part may be typed in free format if desired.
5. Press the TERM key.

## 2.7 Editing

### 2.7A. Free-format messages

The "character erase" key  deletes the character preceding the cursor.

To move text to the left press the **←** key.

To move text to the right press the **→** key.

If either of these keys is kept depressed for more than 0.4 seconds, the text moves in the respective direction (maximum 16 characters) as long as the key is kept depressed.

**↑BEGIN** moves the beginning of the text into the display.

**↑END** moves the end of the text into the display.

Pressing the  $\equiv$  key displays the "/" character; in printer output this appears as carriage return and line feed.

2.7B. Fixed-format messages For fixed-format messages only the  $\uparrow$ DELETE and  $\uparrow$ BEGIN keys are needed for editing.

## 2.8 Message transmission

### Sequence

1. Select the message to be transmitted

As a default the message is transmitted from the large transmission memory. To select the small transmission memory press  $\uparrow$ SHORT.

If a received message is being displayed, it can be transmitted.

2. Press the SEND key.

3. UA 8295 displays the old address. If necessary, type in the new address.

4. Press the  $\equiv$  key to terminate the sequence.

### Response

When transmission starts, the TRANSMISSION IN PROGRESS indicator is lit and the display is deleted.

If the feature "automatic printout of transmitted messages" has been selected, the message is printed.

After transmission, the indicator is extinguished and the text TRANSMITTED is displayed.

If the message is acknowledged the text ACKNOWLEDGED is displayed.

## 2.9 Message reception

If a message with an appropriate address is transmitted from another device, the RECEIVE MESSAGE indicator is lit, the display is deleted and reception begins. If the address does not match, or if the receiving memory is full, the UA 8295 resumes its previous function.

If the message has been properly received and the time-check gives a positive result, the receiving unit sends an automatic acknowledgement to the transmitting unit provided that this feature was selected during configuration.

If the feature "automatic sound alarm" was selected, an audible alarm is triggered; it can be terminated by pressing any key.

If the RECEIVE MESSAGE indicator is lit, the receiving memory contains one or more messages.

If eight messages have been received, or if an incoming message is too long for the receiving buffer, RECEIVING MEMORY FULL is displayed instead of the normal FUNCTION? prompt.

## 2.10 Display of messages

Press the DISP key

The prompt MESSAGE 1...N ? is displayed (where N is the total number of messages in the receiving memory, message N being the latest).

To display a message, type its number. The header information of the message is displayed first. This includes the address of the transmitting unit, the time, and possible error messages.

DE (Data Error) indicates that the received message contains errors that UA 8295 has not been able to correct.

CE (Clock Error) indicates that there is a discrepancy of more than 5 minutes between transmission and reception times.

If the "automatic printout" feature was selected, a hard copy of the message is printed out.

The beginning of the message can be displayed by pressing the → key.

The next message is displayed by pressing the DISPL key again. When all the received messages have been displayed (at least once) the RECEIVE MESSAGE indicator is extinguished.

The message currently being displayed can be deleted from the receiver memory by pressing ↑DELETE.

Pressing the TERM key terminates the display of the received messages.

A free-format message can be read by using the ←, →, ↑BEGIN and ↑END keys. To display the header information, press ↑BEGIN.

To display a fixed-format message, only the  $\equiv$  key is needed. An additional free-format part, if any, can be read as described earlier.

## 2.11 Off-line encryption/decryption

### Encryption

Plain-language text is typed into the transmission memory (or is already stored in the receiver memory). The message being displayed is encrypted by pressing  $\uparrow$ ENCR.

UA 8295 asks whether the encrypted text is to be printed. If "printer output" was not selected, the entire cipher text can be displayed by repeated use of the  $\leftarrow$  key. If "printer output" was selected, the entire cipher text is printed out.

### Decryption

The encrypted message is fed to the transmission memory of the UA 8295 (or it may exist in the receiver memory). The message shown on the display is decrypted by pressing the DECR key. The device asks whether the text is to be printed out. If "printer output" was not selected, the plain text can be displayed by repeated use of the  $\leftarrow$  key. If "printer output" was selected, the decrypted message is printed out.

## 2.12 Deletion of memory contents

### Sequence

Press  $\uparrow$ T.

UA 8295 prompts "GIVE  $\uparrow$ Y TO DELETE THE MEMORY".

To delete the memory contents, press  $\uparrow$ Y.

### Response

All messages, configuration parameter values and the key are erased and all memory locations are filled with zeros.

## 2.13 Manual acknowledgement

If the "automatic acknowledgement" feature was not selected during configuration, the operator of the receiving unit can send a manual acknowledgement by pressing  $\uparrow$ ACK.

If he does not accept the message, he can send a "not acknowledged" signal by pressing NAK.

After pressing  $\uparrow$ ACK or NAK, proceed according to steps 2, 3 and 4 in paragraph 2.8 of this Section.

#### 2.14 Changing the key

The four-character identification code generated from the original keyword is displayed by pressing KEY.

To change the key, press  $\uparrow$ NEW KEY, type in the new keyword and press  $\equiv$ .

#### 2.15 Use of the printer

A printer can be used for the following purposes:

1. Automatic printout (see paragraphs 2.4, 2.8 and 2.10).
2. Off-line encryption/decryption (see paragraph 2.11).
3. Printout of any message is obtained by first displaying it and then pressing the PRINT key.
4. A printer terminal can be used to feed a message into the transmission memory. First set up the transmission memory for composition of free-format messages as described in paragraph 2.6. Then press the  $\uparrow$ INPUT key. The input operation is terminated upon receiving a CNTRL-C character from the printer terminal.

Echoing of the characters back to the printer terminal starts on receipt of a CNTRL-O character and is terminated on receipt of the CTRL-N character.

"Character erase" is available for deleting the previous character.

#### 2.16 Use of an external computer

An external computer connected to the UA 8295 can be used, for example, to move calculation results into a message to be transmitted.

In this mode of operation the computer gives all instructions to the UA 8295 and the message terminal acts as an encrypting/decrypting modem. Part of the interactive communication (e.g. editing) is disregarded.

### 3 ERROR CONDITIONS

The following error conditions are described in paragraphs 3.1 to 3.8, as listed below:

- UA 8295 does not respond when switched on (3.1).
- Error during initial check-out (3.2).
- UA 8295 does not respond to an incoming message (3.3).
- UA 8295 synchronises properly with a message but reception does not succeed (3.4).
- Message transmission does not succeed (3.5).
- Automatic acknowledgement not functioning properly (3.6).
- UA 8295 remains in reception mode even though transmission has been completed (3.7).
- UA 8295 enters an undefined operating mode (3.8).

#### 3.1 UA 8295 does not respond when switched on

Check that the batteries are adequately charged (by substituting other batteries or by using an external power source).

If the batteries are in order, return the UA 8295 for repair.

#### 3.2 Error during initial check-out

During the initial check-out, an error condition in UA 8295 causes the word ERROR to be displayed, together with an error code:

Error code	Explanation
PR1, PR2, PR3	fault in the main CPU program memory
RAM	fault in the data memory
CLOCK	fault in the timer circuits
MOD	modem processor not functioning
PRM	fault in the modem CPU program memory

If modem or clock errors are indicated, the situation may be remedied by switching off and on again.

After an error display the terminal will resume its normal operation upon any keystroke.

**3.3 UA 8295 does not respond to an incoming message**

Possible corrective measures:

- check the cable connectors
- check that the UA 8295 and the communication equipment are powered
- check that the message has free access from the communication equipment to the UA 8295 (e.g. the telephone handset must be lifted and the PTT switch of the radio must be off)
- increase the signal level.

**3.4 UA 8295 synchronizes with the message but reception does not succeed**

In this case the display turns off briefly but turns on again, and reception of the message is not started.

Possible causes and corrective measures:

**1. Incorrect station address**

- define the address correctly
- change the address of the receiving device
- change the address of the message
- transmit the message to the "broadcast" address 00 (automatic acknowledgement is not issued in this case)

**2. Incorrect key**

- the keys of both stations must be the same (see paragraph 2.4 of this Section)
- use the fixed key

**3. Receiving memory is full**

- confirm by pressing the TERM key, whereupon the appropriate error message is displayed

- delete unwanted messages from the receiving memory as described in paragraph 2.10 of this Section.

**3.5 Message transmission does not succeed**

Corrective measures:

- check the cable connectors
- check that the message has free access to the communication equipment
- if the correctness of the employed key is in doubt, retransmit using the fixed key
- if the correctness of the receiving station address is in doubt, retransmit using the "broadcast" address 00.

**3.6 Automatic acknowledgement not functioning properly**

Corrective measures:

- reconfigure the UA 8295 with the "automatic acknowledgement" feature
- check that the UA 8295 has the correct time. If necessary, feed in the correct time as described in paragraph 2.5 of this Section
- check whether a group address was used. If so, retransmit the message using the correct individual address.
- if the problem appears to be at the receiving terminal, refer to paragraphs 3.3 and 3.4 of this Section.

**3.7 UA 8295 remains in reception mode even though transmission has been completed**

Possibly caused by a bad communication line or by the UA 8295 misinterpreting the length of the message. Wait 60 seconds (max) or switch the power off and on again.

**3.8 UA 8295 enters an undefined operating mode**

Switch the power off and on again.



## Section 4

### MAINTENANCE

Although the UA 8295 does not require any specific regular maintenance, simple checks on the cleanliness of the battery compartment and the cable connector are recommended.

Sand and other dirt must be removed from the connector before the plug is inserted. Loose dirt is best removed by using water and thereafter by blowing with pressurized air.

The UA 8295 is fully immersible and can therefore be washed with soap and water.

In case of battery leakage the compartment should be washed and dried.

**Appendix 1**  
**TECHNICAL DATA**

**Display**            32-character LED display

**Keyboard**           55-key silicone rubber keyboard

**Memory capacity**

Transmit            2000 characters  
                      250 characters

Receive            8 messages or 2000 characters

**Interfaces**

Communications    Voice-grade, 150 and 600 Bd.

Optional eqpt.    RS-422, 110-1200 Bd.  
                      RS-232, 50-1200 Bd.

**Power supply**

Battery            4 x D-size dry cells

Battery life       24 hours in normal use

External           10 to 30 VDC

**Dimensions**       30 x 22 x 70 cm

**Weight**            3kg

**Accessories**       A protective bag for use during transportation is  
                      supplied with each terminal.

## Appendix 2 ENVIRONMENTAL SPECIFICATIONS

Operating temperature	IEC 68-2-1 IEC 68-2-2	Test Aa, -40°C, 16h Test Ba, +55°C, 16h
Storage temperature	IEC 68-2-1 IEC 68-2-2	Test Aa, -55°C, 72h Test Ba, +75°C, 16h (without battery)
Rapid change of temp.	IEC 68-2-14	Test Na, 30 min, 5 cycles, +20/-40°C (two-chamber method)
Vibration	IEC 68-2-6	10/60Hz: 0.35mm constant amplitude 60/500Hz: 49m/s <sup>2</sup> constant accel. 90 minutes
Shock	IEC 68-2-27	490m/s <sup>2</sup> , half-sine, 11ms, 3 shocks in 3 perpendicular directions
Bump	IEC 68-2-29	245m/s <sup>2</sup> , half-sine, 6ms, 1000 bumps in 3 perpendicular directions
Humidity	IEC 68-2-30	Test Db, 95%: 55°C(12h) & 25°C(12h) 2 cycles
Free fall	IEC 68-2-32	750mm, dropping on to each side, edge and corner
Protection against ingress of liquid	IEC 144	Test IP67
EM emission and susceptibility	MIL-STD 461B	Class A3

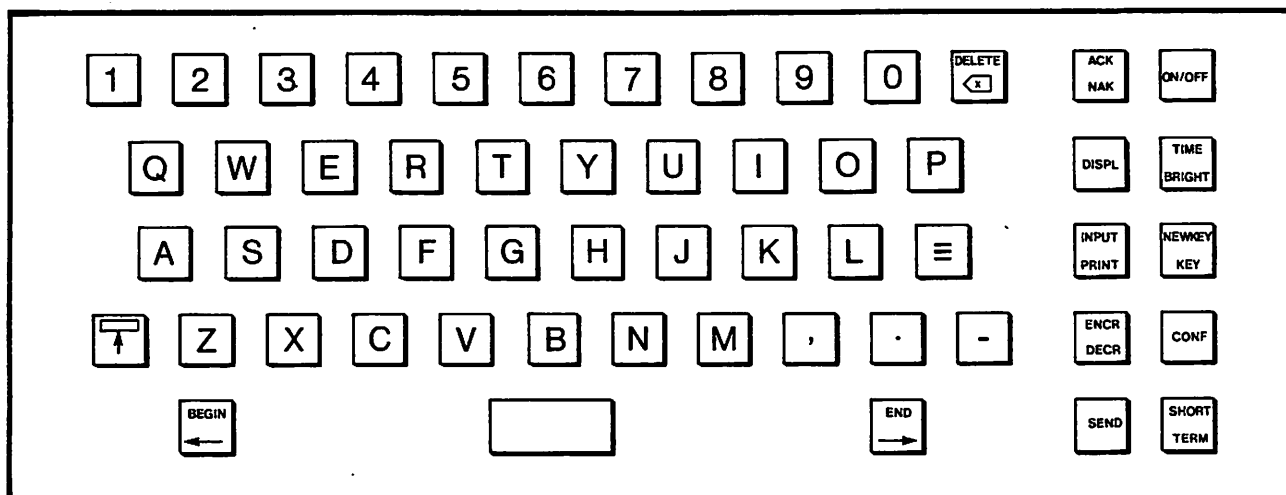


Figure 1. UA 8295 keyboard

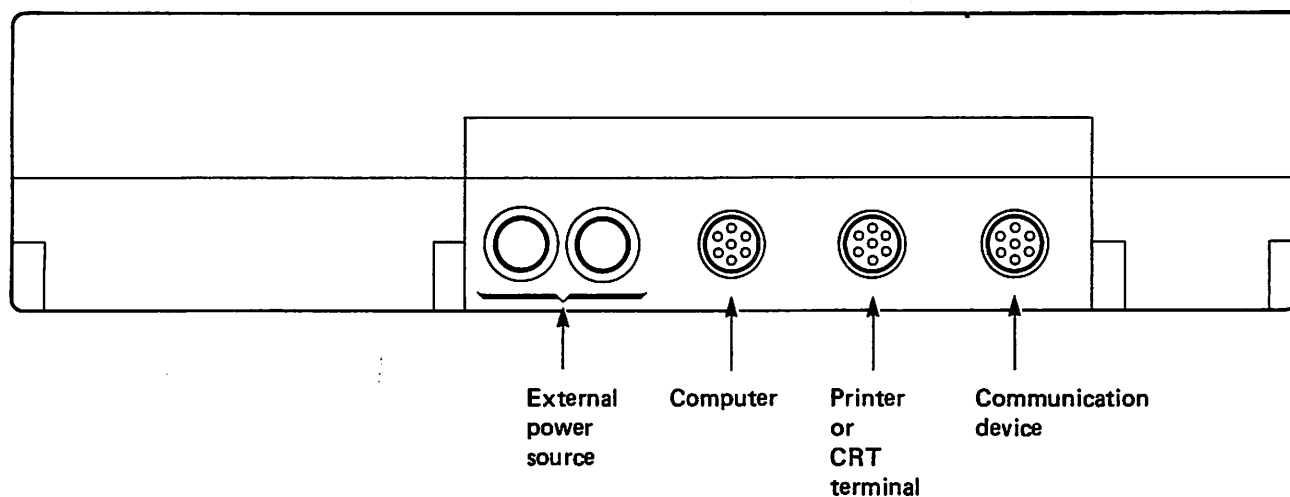


Figure 2. UA 8295 interface connectors

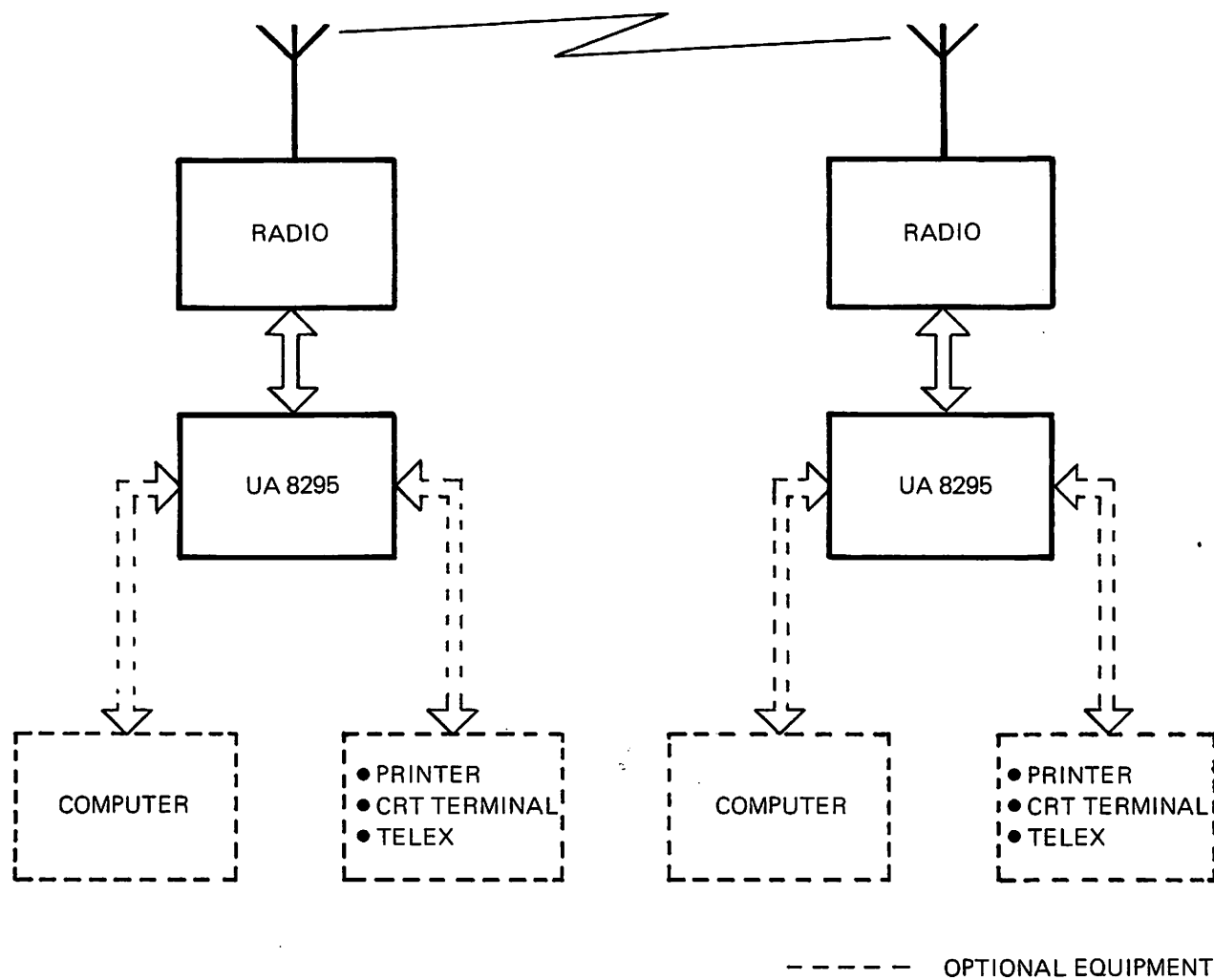


Figure 3. Typical configuration

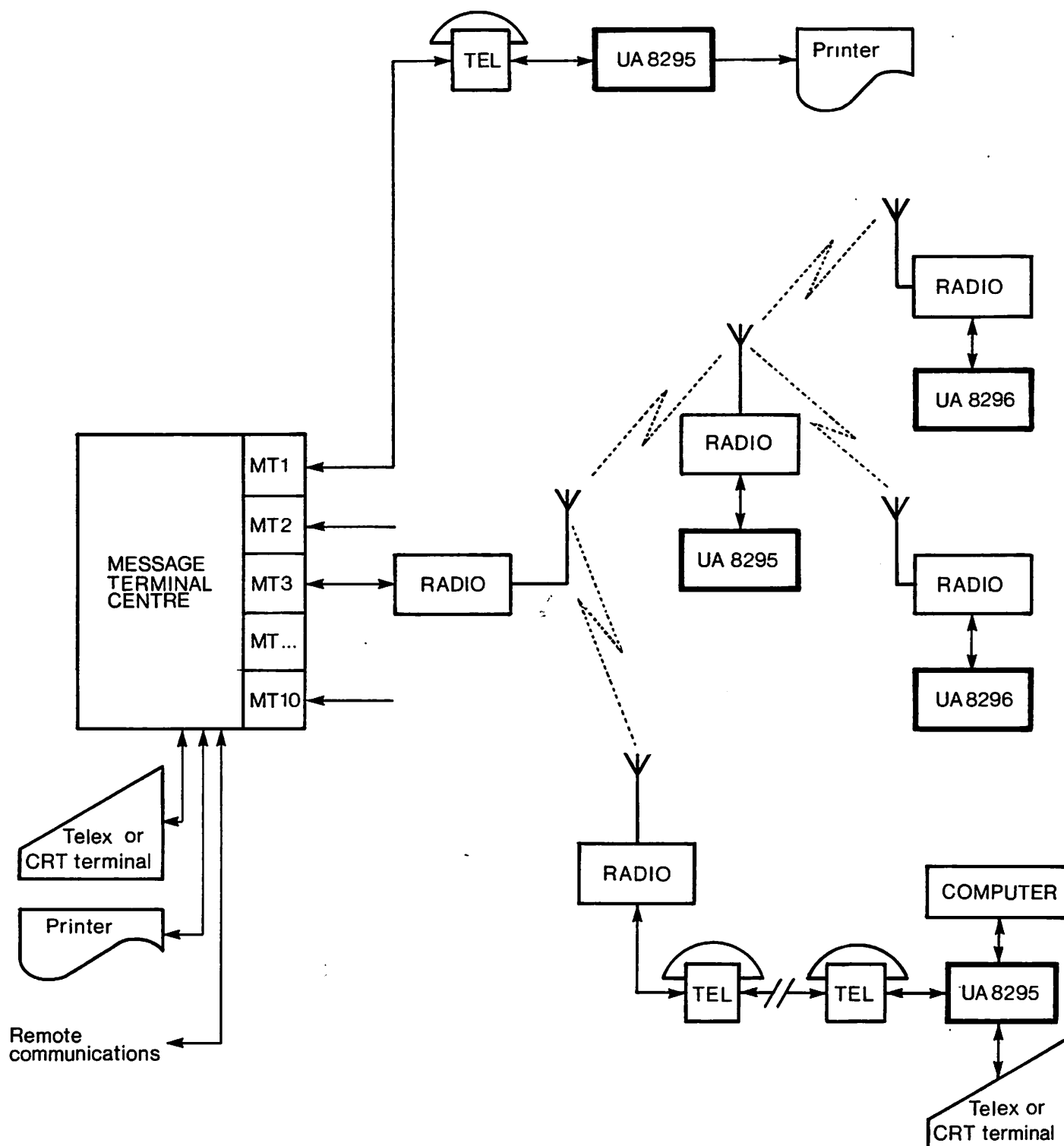


Figure 4. Typical system arrangement

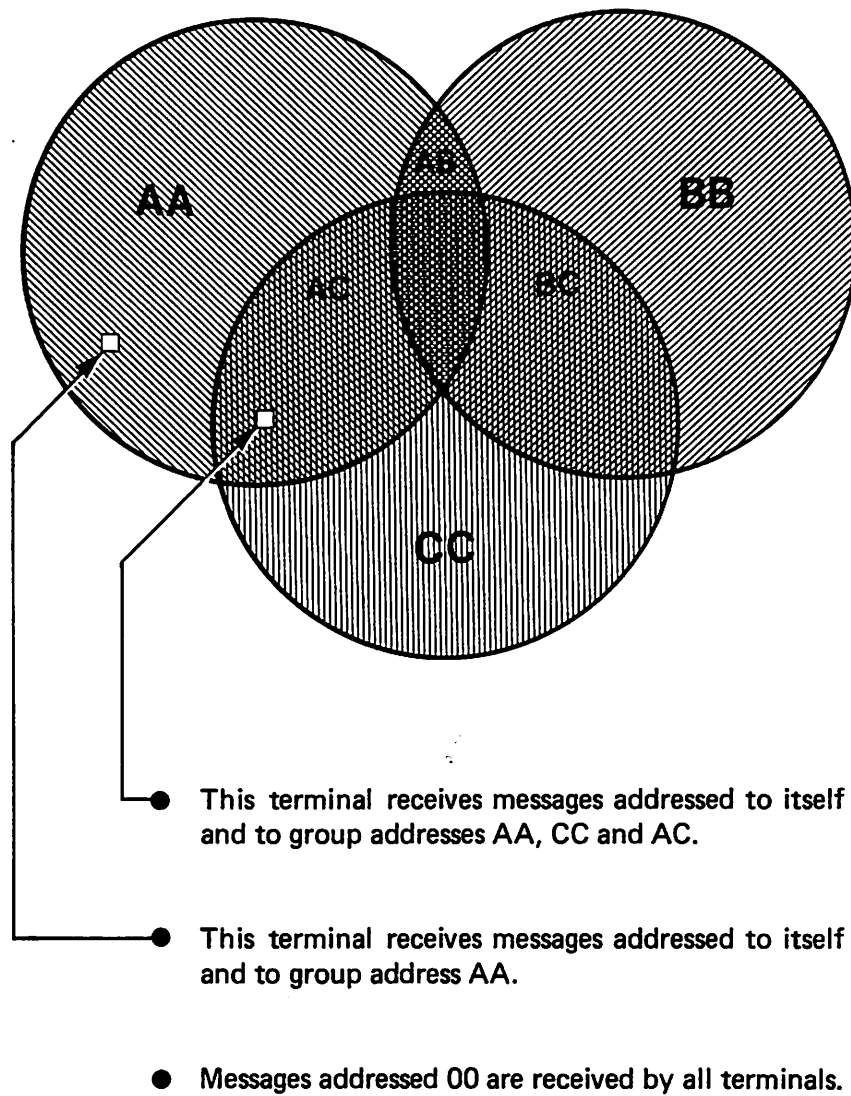


Figure 5. Group and individual addresses