CRT® MEGAPRO

MOBILE CB TRANSCEIVER
AM- FM CITIZEN BAND
EUROPEAN MULTI-NORMS

12/ 24V

OWNER'S MANUAL

CE 0678 !

ISO9001
ISO14001

RoHS

SYMBOLS DESCRIPTION

Please carefully read the instructions	
Information on recycling, not throwing your material in the trash at the end of life, bring it to special aera to be recycling	
DC using	
Keep dry	
Shield symbol	
CE conformity symbol	
Alert symbol indicating an incomplete harmonization of the frequency band which will result in restrictions on the use of the equipment concerned.	
Warning	

STORAGE , TRANSPORT, USING

Storage : Classe 1 -30/85% (°humidity)

Transport :- 30/85% (°humidity)

Operating temperature 30 à + 50°

Using cycle TX 10%/RX 90%

Warned before use

This transceiver corresponds to the requirements of European directives R&TTE 1999/5/CE documents n° EN 301 489-13 / EN 62 311 / EN 300 433 / EN 60 950.

Thank you for choosing this CRT vehicle transceiver CRT always provides high quality products. Though friendly design for user, this transceiver is technically complicated and some features may be new to you. Consider this manual to be a personal tutorial from the designers, allow the manual to guide you through the learning process now, then act as a reference in the coming years.

Precautions

Please observe the following precautions to prevent fire, personal injury, or transceiver damage.

Do not attempt to configure your transceiver while driving it is dangerous

This transceiver is designed for a 13.8V or 24V DC power supply.

Do not place the transceiver in excessively dusty, humid or wet areas, nor unstable surfaces.

Do not connect the antenna while transmission, risk of burn or electric shock.

Please keep it away from interferential devices (such as TV, generator etc.) devices (such as TV, generator etc.)

For those fitted with pacemakers are advised to move away from the antenna during transmission, mainly in high power, and especially do not touch it.

Never allow metal objects or son electrical contact with the part or internal electrical connection to the risk of electric shock.

Avoid exposing the transceiver to temperatures below -30 ° C. and above +60 ° C, the temperature of the dashboard inside a vehicle can sometimes exceed 80 ° C, which can damage irreparable damage to your machine in case of prolonged exposure. Not exposed to prolonged direct sunlight or place it near heaters.

Do not place anything on top of the apparatus that would interfere with cooling.

Check that your battery is sufficiently charged to avoid rapidly exhausting its resources.

It is important to turn off your device before starting the vehicle to avoid damage caused by spikes in the ignition.

When replacing the fuse, you must use a fuse 2A 250V type F
In no case a higher value!, Otherwise a fire hazard.

If an abnormal odor or smoke is detected coming from the transceiver, turn OFF the power immediately.
Contact an CRT service station or your dealer.

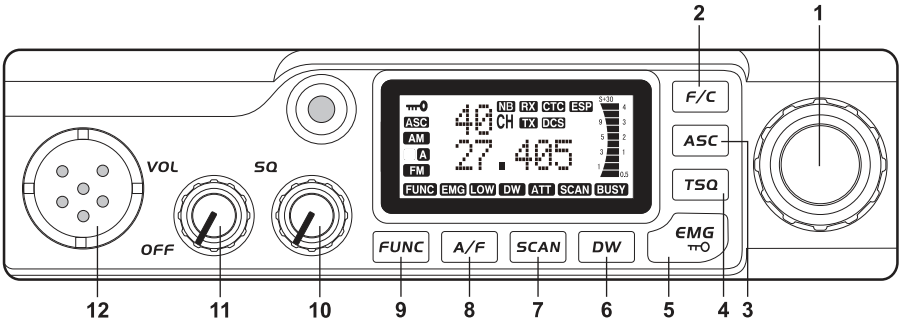
Do not transmit with high output power for extended periods; the transceiver may overheat.

Keep out from children.

Attention :

• Before using your transceiver please connect an antenna on the connector PL on back side then check the SWR before emitting. A too important SWR can entail the destruction of the transistors of power which are not flatware by the guarantee

Control elements and connections



1 Channel switch/SET button
Rotary switch for selecting the channel or – depending on the menu – for modifying the parameters or the corresponding values.

The channel switch also has a pushbutton function (**SET** button): By briefly pressing the button, the radio set switches to the next ten channels. If the button is pressed for more than 2 sec., the radio set switches into the *Settings* menu. If the **FUNC** key is pressed prior to pressing the **SET** button, the *Memory* menu is activated.

2 F/C key
Switching between the indication of **F**requency and **C**hannel on the display. In **F** mode, the activated channel (e.g. *80CH)* is displayed on top with the corresponding frequency (26,955) in MHz underneath. In C mode, the activated country code (e.g. D for Germany) and the activated channel (e.g. 17CH) are displayed.

3 ASC key
Switches the **a**utomatic **s**quelch **c**ontrol (ASC) on and off. The ASC controls the squelch depending on the field strength and the signal-to-noise ratio of a received transmission. A manual readjustment of the squelch at different receiving locations is not necessary. For this reason, the manual squelch is deactivated in this case.

4 TSQ key
Switches the selected tone squelch method on and off, the display shows *CTC* or *DCS* (the requested method is adjusted in the Settings menu under *S01* and *S02*). All TSQ methods can only be activated in FM. As long as they are active, manual squelch and ASC are deactivated.

5 EMG key
Direct access to channel 9/19 (emergency key). By pressing the **EMG** key once, the radio set switches over to channel 9, by pressing the key once again, channel 19 is activated (for this, the type of modulation is used which was activated last for the corresponding channel). By pressing the **EMG** key for the third time, the radio set returns to the initial channel.

6 DW key
Switches the dual watch function on and off. When the dual watch function is activated, the radio set is ready-to-receive on two channels and automatically checks whether a signal is present on one of both channels.

7 SCAN key
Switches the scanning function on and off. (The scanning type and delay time can be modified in the memory menu under *SCN* and *SCT*).

8 A/F key
Switches over the type of modulation (AM/FM). When switching over to another channel, the type of modulation last used is stored (Thus, channel 9 can e.g. be operated in AM, while all other channels are operated in FM).

Switches between *UK* and *CEPT* in U mode.

9 FUNC key
In combination with the **SET** button for selecting the memory menu.

10 SQ control
Rotary knob for adjusting the squelch.

11 VOL/OFF control
Rotary knob to switch the radio set on and off and to adjust the volume.

12 Microphone jack (6-pin)
Jack for the supplied microphone (Make sure that the recess on the plug is oriented upwards). A packet radio modem (TNC) can also be connected to this jack.

Key pad of the microphone

Lock switch Key lock: When the switch is in *Lock* position, the entire microphone keypad except for the PTT key is locked, the lighting is switched off.

DTMF switch When the switch is in *DTMF* position, the numbers 0 to 9, the letters A to D, and the symbols * and # are used to generate the DTMF tones. When the switch is in *OFF* position, the number keys can be used to directly select the channel, the letter and symbol keys are used for the following device functions:

Key *F/C* [A] Switches the display over to indicate either the **f**requency or the **c**hannel (as F/C key on the radio set).

Key *CALL* [B] Activates the Call function (A programmed DTMF tone sequence is transmitted when pressing the PTT key). When pressing the key **CALL**, the display shows *CAL* and the assigned memory location (*M01* to *M16*) with the corresponding DTMF tone sequence (programming in settings menu). If you wish to transmit a different DTMF tones sequence, another sequence can be selected using the up/down keys.

Key *SET* [C] Provides access to the settings menu (apart from this, as **SET** key on the radio set).

Key *H/L* [D] Switches the transmitting power over between *h* (high) and *l* (low).

Key *FUNC* [#] In combination with the **SET** button for selecting the memory menu.

Key *MONI* [*] The *MONI*tor function deactivates the squelch function as long as the key is pressed. Thus, this function is used for “fast listening”. The *MONI* key works with normal squelch, ASC, and the tone squelch methods CTCSS, DCSN, and DCSI.

PTT button (1) Push-to-talk button

Up/down keys (2) For selecting the channel and stepping forward within both menus.

Product description

Welcome to the fascinating world of CB radio and congratulations on having purchased the CB radio set CRT MEGAPRO. You have made a decision in favor of a comfortable high-end radio set which can either be used for mobile operation in your car or as stationary radio set at home – a radio set which provides numerous extra functions.

Features

6 frequency bands, selectable
Especially equipped for gateway operation by CTCSS, DCS, and DTMF
Storage of individual channel settings (AM/FM, NB, CTCSS/DCS) for every single channel
Entry of different codes (CTCSS, DCS, DCSi) for RX and TX possible
Integrated DTMF encoder (e.g. for Internet gateway control)
16 channel memories for often used DTMF codes
Backlit microphone key pad for controlling and entry of DTMF codes
Backlit LCD indicating channel, frequency and operating modes like AM/FM,CTCSS, DCS, ASC, NB, EMG, DW
S meter in the display (TX: indicating relative power output)
Scan function
Direct access to channel 9/19 (EMG key)
Dual watch
ASC Automatic Squelch Control
Integrated compander system for noise reduction
RF attenuator, switchable
ANL automatic noise limiter
Noise Blanker, switchable
Hi-Cut Filter, switchable
Roger Beep, switchable

Scope of delivery

CB radio set CRT MEGAPRO
Mounting bracket
DTMF hand microphone (Elektret)
Microphone attachment
Operating instructions

Important information

Safety warnings

- Persons with cardiac pacemakers are strongly advised to ask a doctor whether he has basically concerns against the use of a radio set and/or which rules of conduct are to be observed.
- Never touch the antenna during the transmission!
- Prior to using the radio set in a vehicle, make yourself in any case familiar with its functions and their operation! Never allow yourself to be distracted by operating the radio set or by radio communications from the current traffic situation!
- Never transmit without having an antenna connected!
- Never open the housing of a radio set or its accessories and do not carry out any modification. Ensure that any repair is carried out exclusively by qualified personnel. Modifications of or interventions in the radio set automatically lead to an expiry of the type approval, moreover it voids all warranty claims!
- Prevent children from playing with the radio set, accessories, batteries or the packing material.
- Do not operate the radio set, if you detect any damage of the housing or the antenna. Contact a qualified workshop.
- Protect your radio set and the accessories against moistness, heat, dust and strong vibrations. Avoid operating temperatures below -10°C or above +50°C.

Legal requirements

Operating CB radio sets:

Prior to using the radio set abroad, find out more about the current national provisions! Be sure to observe the relevant provisions as well as any possible obligation to register – otherwise, you may be risking significant fines or even the confiscation of your radio set!

Installing a radio set in a vehicle:

The manufacturer has specified instructions for the installation of radio sets and antennas in nearly all types of vehicle: Thus, contact your automobile dealer for the corresponding manufacturer specifications belonging to your car model. In any case, you should observe these specifications when installing the radio set, since the type approval of your vehicle can expire otherwise!

Using voice radio in a vehicle:

While the driver of a vehicle is allowed to use mobile phones only using a hands-free kit or when the vehicle engine is switched off, an express exception to this rule is provided for radio sets in the German Motor Vehicle Traffic Regulations (Prior to making trips abroad, find out more about different provisions which may apply!). However, you should only use your radio set, if the traffic situation permits (please refer also to the safety instructions)!

Installation of the radio set

Usage as stationary radio set

If you want to use the CRT MEGAPRO as stationary radio set, you are in need of a particular power supply unit for radio sets (optional) with an output voltage of 13.8 V, a continuous current of 3 A and an electronically stabilized voltage control. Your approved dealer will be happy to advise you when selecting an appropriate power supply unit.

Usage in a vehicle

If you want to use the CRT MEGAPRO as mobile radio, make sure to observe the given specifications of the vehicle manufacturer when installing the radio set! Position the radio set such that neither the movement nor the field of view of the driver/front-seat passenger is restricted. Make sure to provide a rigid, reliable and almost vibrationless mounting of the radio set. (Even in the event of a possible accident) it must not present any risk for injury for the vehicle occupants.

Before you fix the mounting bracket using the tapping screws, make sure not to damage any lines in the vehicle! Furthermore, make sure not to bend any cables or connecting lines and not to install them on sharp edges or along vehicle components which get hot.

Choose a place for the microphone attachment such that the microphone is always within reach. Remember that its microphone cord must not interfere with the control elements of the vehicle.

If the space for installing the radio set is so very restricted that the loudspeaker radiation at the bottom of the radio set is impaired, we recommend you to install an external mobile speaker (optional). This speaker is connected to the EXT.SP jack (C) situated at the back side of the radio set. When connecting the external speaker, the internal loudspeaker is automatically deactivated.

Power supply

Your radio set is supplied with a nominal voltage of 13.2 V to 24V. By all means, make sure that the used polarity is correct, since a reverse polarity could damage your radio set (in spite of the integrated reverse polarity protection)!

The negative pole is connected to ground (= chassis) as for almost all modern vehicles.

Prior to connecting the radio set, check polarity and voltage: If the vehicle is older, the positive pole can e.g. also be connected to ground. If in doubt, please check with a specialist workshop!

Connection to the vehicle's battery

Your radio set is provided with a power supply cable (A) into which a 2 A fuse is connected. Unless otherwise provided in the manufacturer's specifications, connect the radio set using the red cable to terminal 30 (permanent plus) or terminal 15r (radio connection). Connect the black cable (negative pole) to ground using the shortest possible route.

Lay the power supply cable in the car such that the interferences resulting from the ignition system are as small as possible.

Notes:

With a burnt-out fuse: First determine and eliminate the cause and insert a new 2 A fuse afterwards!
Always switch the radio set off before leaving the vehicle for optimizing the battery life!

Connection of an external loudspeaker (optional)

At the back side, the radio set is equipped with a jack (**C**) for connecting an external loudspeaker with an 8 ohms impedance. For improving the fidelity of reproduction, a loudspeaker can be connected using a 3.5 mm mono jack plug. Make sure to provide a rigid, reliable and almost vibrationless mounting of the loudspeaker, too. Even in the event of a possible accident, it must not present any risk for injury for the vehicle occupants.

Choosing and connecting an antenna

Attention: Transmitting without having an antenna connected would result in a destruction of your radio set!

The antenna is an important component of the radio equipment and has a major impact on the reach of the radio set. Depending on the intended usage of the radio set, different antenna types are available – your specialist dealer will be happy to advise you!

Antennas for stationary radio sets

When using a stationary antenna, the maximum range of your radio set is achieved. However when installing outside antennas, various provisions (lightning protection, German VDE) have to be observed: We recommend you to have the antenna system installed by an expert!

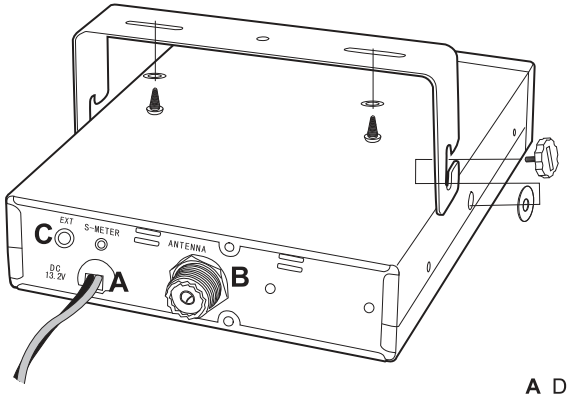
Mobile antennas

A distinction is made between tuned and tunable mobile antennas.

Tuned antennas should only be mounted on a great metallic surface (e.g. on the roof of the vehicle or the trunk lid) assuring a short connection to ground. For an antenna which must be fixed by drilling a hole into the car body, the body sheet must be thoroughly smoothed until metallically bright for assuring a good ground connection. Furthermore, make sure not to bend any cables or connecting lines and not to install them on sharp edges or along vehicle components which get hot. Connect the antenna cable to jack (B).

Tunable antennas are to be adjusted to the output resistance of the transmitter (50 ohms). The actual characteristic antenna impedance depends on its length and on its environment of installation. For this reason, the manufacturer can only provide you with a roughly tuned antenna. Normally it is designed such that there is always enough scope left for adjusting it to the given conditions. In practical operation, this means that a new antenna is usually too long.

For adjusting the antenna, connect a VSWR resistance bridge (e.g. President TOS-1, article no. 50004) into the circuit between the radio set and the antenna. Set the radio set to FM modulation to work always with a constant transmitting power when measuring. Adapt the antenna according to the manufacturer's information such that the VSWR on your preferred channel or one of the median channels approximates to 1: A value of 1.5 is still acceptable. (For mobile operation, it does not make much sense to adjust a value of 1:1 by all means, since this value is modified again due to different environments, cable modifications etc.) Regularly check the antenna adjustment: An unfavorable value points to connector and cable problems!



A DC-power connector (13,2 V or 24V)
B antenna connector (SO-239)
C external speaker jack (8 Ω, Ø 3.5 mm)

Operation/functions

At first, a description of the **basic functions** of your radio set is provided, these functions are operated using the front keyboard of the device.

All further functions/individual settings which are controlled via the two menus **(memory and settings menu)** are presented in tabular form.

Finally, we provide you with explanations on the individual functions or **supplemental information** on how to operate the radio set in a gateway.

Basic functions

Switching on

After having established all connections (incl. microphone and antenna!) switch your radio set on using the **VOL/OFF** control (if the display is not lit, check the power supply and fuse). Adjust the **SQ** control such that the background noise from the loudspeaker just disappears.

Frequency tables/channel configurations

CRT MEGAPRO is equipped with six switchable frequency tables: Select the corresponding channel configuration depending on the country in which your radio set shall be operated (factory setting: E). In Germany, this radio set is free of charge and can be operated with each channel configuration without any registration.

Important notes: Prior to using the radio set abroad, find out more about the current national provisions: Be sure to observe the relevant provisions as well as any possible obligation to register!

E	40 channels FM (4 W), 40 channels AM (4 W)	
D	80 channels FM (4 W), 40 channels AM (4 W)	*free of licence and charges in Germany*
EU	40 channels FM (4 W), 40 channels AM (1 W)	*free of licence and charges in D, B, F, NL, P* *individual licence required in CH*
EC	40 channels FM (4 W) CEPT	*free use in all CEPT-countries* *in some countries individual licence is required*
PL	40 channels FM (4 W), 40 channels AM (4 W) carrier offset -5 KHz	*only allowed in Poland*
U	40 channels FM (4 W) UK 40 channels FM (4 W) CEPT	*only allowed in UK*

This radio is not allowed to be used in A!

Changing the frequency table/channel configuration

1. Switch the radio set off.
2. Hold the **FUNC** key pressed and switch on the radio set again: When the country code is displayed, release the **FUNC** key again.
3. Use the channel switch to select the requested channel configuration.
4. Switch the radio set off and on again: The new channel configuration is now activated.

Channel selection

Use the channel switch to adjust the channel you wish to use for receiving/transmitting.

Choosing the type of modulation (AM/FM)

Using the adjustments 40/40 and 80/40 you can either operate your radio set in FM or in AM modulation. Frequency-modulated signals (FM) are less sensitive to interferences resulting from the ignition system etc. than amplitude-modulated signals (AM). The decision, which type of modulation is your preferred one, depends on your radio contact partners and on your and/or the legal requirements.

If your loudspeaker emits an unintelligible, distorted signal, you should try receiving the signal using a different type of modulation. You can change the type of modulation by pressing the **A/F** key.

Transmitting

Attention: Never transmit without having an antenna connected!

Before starting the transmission, listen to make sure that the channel is free and that there is no “doubling” with a different radio station! Please note that the radio station needs a certain time to carry out its start-up sequency: Thus, you should wait for a second before speaking.

For transmitting, you just have to press the **PTT** button (push-to talk button) on the left side of your microphone and to speak with normal voice level into the microphone while holding the key pressed. Don’t speak too loud such that the sound of your voice is natural for your radio contact partner. (Simply give it a try and ask for a modulation report afterwards.)

Squelch

Each radio set features a function for noise suppression (squelch) suppressing the reproduction, if the signal is lacking or too weak. Use the **SQ** control to adjust the signal level at which the function is activated. By turning the knob to the left, the signal level is reduced, by turning the knob to the right, the signal level is increased. With constantly varying conditions of reception (e.g. during mobile operation) a frequent adjustment of this level can be necessary.

ASC (Automatic Squelch Control)

ASC is activated by pressing the **ASC** key; in this case, the SQ control has no function.

Signal strength indication

On the right side of the channel or frequency indication, a bargraph is displayed which shows the signal strength in S-grades when receiving. The S-grades 1, 3, 5, and 9 are indicated. Values above S9 are indicated as S9+30. In this case, the received signals are very intensive and are transmitted by an adjacent radio station.

Power display

When pressing the “push-to-talk” button on your microphone, the bar display shows the relative transmitting power instead of the S-value.

Dual Watch

The dual watch function enables you to be ready-to-receive on two channels: The radio set automatically changes from the current channel to an arbitrary second one and checks whether a signal is present on this channel.

Switch to the first channel to be monitored and press the **DW** key: *DW* flashes on the display. Switch over to the second channel to be monitored now and press the **DW** key again: DW stops flashing on the display. If the squelch is adjusted correctly, the display switches between both selected channels. If a signal is received on one of both channels, the dual watch function stops. After having finished the call, dual watch is activated again.

Direct access to channel 9/19 (EMG)

By pressing the **EMG** key once, the radio set switches over to channel 9, by pressing the key once again, channel 19 is activated (for this, the type of modulation is used which was activated last for the corresponding channel). By pressing the **EMG** key for the third time, the radio set returns to the initial channel.

Channel scanning/SCAN

For using the channel scan function ASC and TSQ must be switched off. Adjust the **SQ** control such that the background noise just disappears. Activate channel scanning by pressing the **SCAN** key: Scanning will stop as soon as a signal which is worth being received is available on a channel.

Menu functions

Functions/settings of the memory menu

Function	Menu item	Description/possible settings
Transmit time limit	**M01 TOT**	OFF, 15 to 600 sec.
Display lighting	**M02 LED**	ON/AUTO (lighting is switched off after 10 sec. without user interaction)/OFF
Display color	**M03 COR**	Seven colors are available for the display lighting. When the LOOP function is activated, the color changes every second.
DTMF memory locations	**M04 DTMF**	Sixteen memory locations for DTMF tone sequences (M01 to M16)
Channel scanning	**M05 SCN**	**SQ:** The scan function depends on the squelch. When the squelch function is deactivated and the delay time (M06 SCT) has elapsed, the radio set starts scanning again. **TI:** Scanning is interrupted by opening the squelch function and is activated again when the delay time (M06 SCT) has elapsed.
Delay time scan	**M06 SCT**	Adjustment of the delay time for the scan functions SQ and TI (5 to 60 sec.)
Roger beep	**M07 BEP**	ON/OFF, roger beep on/off.
Parameter transfer to other channels	**M08 PD**	ON/OFF: When the function is activated, a just modified parameter is not only applied to the adjusted channel, but to all other channels as well. When PD is deactivated, the settings previously stored for the respective channels are again applied to the parameter.
DTMF tone length	**M09 DSU**	Specifies the duration of a DTMF tone (30 to 500 millisec.). For each DTMF system, 100 ms should be enough for evaluation.

Input/modification of the settings in the memory menu

Note: After 10 seconds without user interaction, the radio set automatically exits the menu, all modifications will be stored!

Press **FUNC** key: *FUNC* is displayed.

↓

Press **SET** key (channel switch): *M01* is displayed.
The memory menu is activated.

↓

Select the requested menu item using the channel switch
(refer to menu table: M01 – M09).

↓

After having selected the requested menu item,
press **SET** key again: The corresponding parameter flashes.

↓

By turning the channel switch, the settings can be modified.
(With *M04 DTMF*, a DTMF code can be entered after having selected the memory location (M01 to M16) and after having pressed the **SET** key once again.)

↓

Confirm by pressing the **SET** key: The selected parameter flashes again.

↓

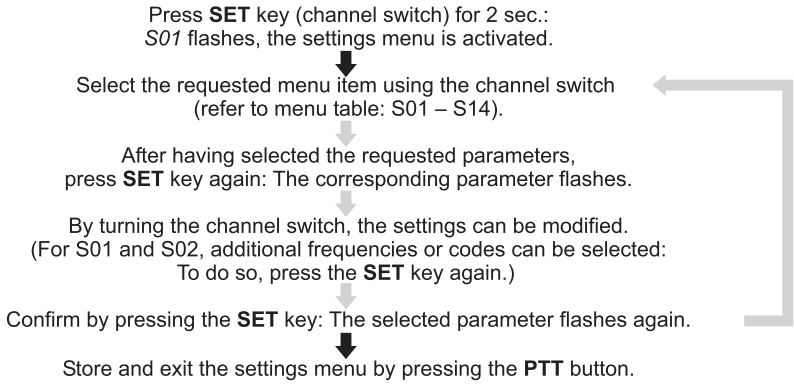
Store and exit the memory menu by pressing the **PTT** button.

Functions/settings of the settings menu

Function	Menu item	Description/possible settings
Receive codes (CTCSS/DCS)	**S01 RXC**	None CTC: 50 CTCSS frequencies from 67,0 to 254,1 Hz DCSN: 107 codes from 017N to 754N DCSI: 107 inverse codes from 017i to 754i
Transmit codes (CTCSS/DCS)	**S02 TXC**	None CTC, DCSN, DCSI like under receive codes
AF expander	**S03 EXP**	ON/OFF, a 2:1 expander is switched on or off during reception.
Compressor	**S04 COM**	ON/OFF, a 1:2 compressor is switched on or off during transmission.
Noise blanker/ANL	**S05 NB**	ON/OFF, Noise blanker and automatic noise limiter are switched on/off during reception.
RF attenuator	**S06 ATT**	ON/OFF, a 20 dB attenuator is switched on/off during reception.
Hi-Cut	**S07 HIC**	ON/OFF, attenuates high tones thus reducing the high-frequency noise
Busy lockout	**S08 BSY**	OFF: Transmission is always possible. SQ: While squelch is opened, transmission is not possible (pressing the key intermediately is not possible). C/D: During CTCSS or DCS operation, transmission is possible as long as the code squelch is opened.
Roger beep	**S09 RB**	OFF/1 to 8 (choose among eight different melodies).
DTMF transmission when transmission starts	**S10 BOT**	OFF/M01 to M16 (choose among one of 16 DTMF memory location: The corresponding DTMF tone sequence is transmitted at the beginning of each broadcasting).
DTMF transmission when transmission ends	**S11 EOT**	OFF/M01 to M16 (choose among one of 16 DTMF memory location: The corresponding DTMF tone sequence is transmitted at the end of each transmission).
DTMF call	**S12 CAL**	OFF/M01 to M16 (choose among one of 16 DTMF memory location: The corresponding DTMF tone sequence is transmitted at the beginning of the next transmission when pressing the Call key on the microphone.
Transmitting power AM	**S13 PAM**	High/low (transmitting power in AM 1 W or 4 W)
Transmitting power FM	**S14 PFM**	High/low (transmitting power in FM 1 W or 4 W)

Input/modification of the settings in the settings menu

Note: After 10 seconds without user interaction, the radio set automatically exits the menu, all modifications will be stored!



Explanations/supplemental information

Busy lockout (settings menu: S08 BSY)
Transmit lockout when the channel is busy: For reducing interferences during radio communication, a transmit lockout can be activated which blocks the transmission when the channel is busy. With this function activated, transmission is also impossible when pressing the push-to-talk button.

DTMF (memory menu: M04 DTMF)
In CB radio, DTMF is used for controlling parrots and Internet gateways (depending on the features of the used gateway software, DTMF can be used to switch e.g. into different virtual spaces) or for applying a selective call procedure. Since the xm 4006e only features a DTMF encoder but no DTMF receiver, the usage for selective calling is not possible with this radio set!

DTMF transmits the numbers 0 to 9, the letters A to D as well as the symbols * and # as tones (known from tone dialing for telephone communications).

16 DTMF tone sequences can be stored in the **CRT MEGAPRO**. Common control commands are already assigned ex works to all memory locations. However, the stored codes can be modified as required (in memory menu under *M04 DTMF: M01 to M16)*. Each memory location can be used for storing a DTMF tone sequence with up to 16 digits.

Note: An already stored code can be overwritten. But if the new code is shorter than the previous one, the previous tone sequence must be deleted before!

In the settings menu, one of the 16 DTMF memory locations can be assigned to the parameters *S10 BOT* and *S11 EOT* (BOT = **B**eginning **o**f **T**ransmission, EOT = **E**nd **o**f **T**ransmission). When a DTMF tone sequence is assigned to S10 *BOT*, this tone sequence is transmitted at the beginning of each transmission, a DTMF tone sequence stored on S11 *EOT* is correspondingly transmitted at the end of the transmission. The parameters *CAL*, *BOT,* and *EOT* can be separately stored for each channel.

Storing a DTMF tone sequence
In the memory menu, select a memory location under parameter *M04 DTMF* by pressing the **SET** key on the radio set/the ***SET***button on the microphone.

Use the channel switch/the up/down key on the microphone to select the requested memory location. Press the ***SET*** key once again: The required code can be entered now.

Store the entered code by briefly pressing the **PTT** button.

Deleting a DTMF tone sequence
In the memory menu, select the memory location to be deleted under parameter *M04 DTMF* by pressing the **SET** key on the radio set/the ***SET***button on the microphone. The first digit of the code flashes.

Repeatedly press the **A/F** key on the radio set, until you reach the last digit of the code.

Repeatedly switch the channel switch, until a minus sign flashes on this position.

Use the **FUNC** key to move one digit to the right and repeat the procedure until you reach the first digit.

Confirm deleting the memory content by pressing the **PTT** button.

A new value can now be stored to the memory location.

Transmitting a stored DTMF tone sequence
Set the **DTMF/OFF** switch on the microphone to *OFF* and press the **B/CALL** button: The display shows *CAL* and one of the 16 DTMF memory locations flashes. Use the channel switch or the up/down key to select the requested memory location. Press the **PTT** button: The selected tone sequence briefly scrolls over the display while being transmitted simultaneously. In this way, stored DTMF tone sequences can quickly be transmitted as control commands.

Manual transmission of DTMF tones
Set the **DTMF/OFF** switch on the microphone to *DTMF:* During transmission, the DTMF tones

can be emitted by pressing the corresponding keys. They can also be entered during reception and emitted when the next transmission begins.

Compander (compressor/expander)(settings menu: S03 EXP, S04 COM*).*
Compander is an invented word consisting of com(pressor) and (ex)pander.

With each radio communication, undesired background noise is transmitted along with the voice. For reducing this noise to a minimum, a compander system is used: The voice signal is compressed in the transmitter, i.e. quiet voice is intensified, loud voice is attenuated. In this way, the original dynamic range, i.e. the difference between loud and quiet passages of the voice transmission, is reduced. For the **CRT MEGAPRO**, the compressor functions with a fixed compression ratio of 2:1. The compressed signal can be transmitted a bit louder without being distorted. Thus, the so called signal-to-noise ratio is increased. In the receiver, the voice signal is again expanded with a ratio of 1:2 to its original dynamic range. Although the voice signal has again the original dynamic range during reception, the signal-to-noise ratio has been increased.

Generally, the compander system should only be used, if all radio sets in a speech circuit are equipped with this function. Sometimes it's expedient to use the compressor only, e.g. in case of very weak radio contacts in AM, when the voice signal can hardly be understood. For this reason, the compressor and expander can be switched separately in the **CRT MEGAPRO** radio set.

Note: If you wish to transmit data with this device (e.g. packet radio), the compander system must be switched off!

Roger beep (settings menu: S09 RB)
Tone signal at the end of a transmission: Signals to your radio partner that the message is finished and the channel is free to transmit an answer.

Transmit time limit (memory menu: M01 TOT)
On one hand, a permanent transmission on one channel can lead to damages on the radio set. On the other hand, messages shall be as short as possible to give other radio partners the opportunity to participate in the discussion. The **t**ime-**o**ut **t**imer prevents the permanent transmission: If the duration of a transmission exceeds a specified time, it is automatically interrupted.

Tone squelch methods CTCSS and DCS (settings menu: S01 RXC, S02 TXC)
CRT MEGAPRO features three tone squelch methods. The most well-known method is CTCSS (**C**ontinuous **T**one **C**oded **S**quelch **S**ystem), the two other ones are DCS methods (**D**igital **C**oded **S**quelch): DCSN (n for normal) and DCSI (i for inverse). All three methods have one thing in common: They replace the manual squelch and simultaneously function similar to a selective call system. Squelch function often depend on the field strength or are controlled via the signal-to-noise ratio. This means that they always depend on the varying conditions or reception: Each transmission on the selected channel and each interference carrier as well will open the squelch. This is particularly disturbing if the radio set is used in an Internet gateway: Each interference/overshoot opens the squelch and the interference is transmitted to all other gateways in the network. Nothing but permanent monitoring through the SysOp (system operator) and switching off the concerned gateway can resolve this problem.

As long as the reach is not exceeded, the CTCSS and DCS functions are much more reliable and comfortable: All radio sets belonging to a certain speech circuit have to be operated using the same CTCSS frequency or the same DCS code. The squelch of the receiving radio set only opens when a signal featuring the corresponding CTCSS frequency/the corresponding DCS code is received. The manual squelch and ASC are switched off. CTCSS and DCS still function when the signal is already very weak and has a considerable background noise. The xm 4006e provides you with 50 different CTCSS tones. For DCSN, 107 codes are available, for DCSI another 107 codes. In the settings menu, the method (CTCSS, DCSN, DCSI) and the frequency or the code for reception are entered under S01 RXC and the same is entered for transmission under S02 TXC. Using the **TSQ** key on the radio set, the selected method is switched on or off. A different method and a different frequency or code can be stored for each channel.

An Internet gateway operated with CTCSS or DCS functions more reliably and provides a better reach for reception thanks to the good evaluation sensitivity. Overshoots and interference carriers are not transmitted anymore to the other gateways through the Internet.

Delay time scan (memory menu: M06 SCT)
If a signal is present on a channel, scanning briefly stops. If you wish to hear the transmission on this channel or to participate in the radio communication, you need to stop scanning manually or to define a certain delay time before scanning start again.

Disposal instruction

Electric and electronic devices are not to be thrown into the domestic waste.

Deliver devices that are out of order/used with a corresponding collecting point for electronic scrap. For further information please contact your municipal waste disposal company or your local authorities.

Technical data

General

Channels:	40
Operation modes:	AM/FM
Frequency range:	26.965 MHz to 27.405 MHz
Antenna impedance:	50 ohms
Supply voltage:	13.2 V DC
Dimensions (W/H/D):	139 x 37 x 184 mm
Weight:	approx. 0.85 kg

Transmitter

Stability of frequency:	+/- 200 Hz
Transmitting power:	4 W AM/4 W FM, each reducible to 1 W
Spurious resonances:	< -54 dBm)
Frequency response:	350 – 2500 Hz
Adjacent channel power:	< -17 dBm)
Microphone sensitivity:	10 mV
Power consumption:	1.5 A max.
Distortion factor:	1.5 %

Receiver

Sensitivity (20 dB SINAD):	-110 dBm (AM); -116 dBm (FM)
Frequency response:	350 – 2500 Hz
Adjacent channel selection:	60 dB
AF output power:	3 W
Sqelch sensitivity:	-119 dBm minimum -27 dBm maximum
Image frequency rejection:	60 dB
IF rejection:	70 dB
Power consumption:	500 mA nominal

Assignment of the 6-pin microphone socket

1 Modulation
2 RX
3 TX
4 Data
5 Ground
6 Power supply

Troubleshooting

Your CB radio set does not transmit at all or transmission power is poor:
With the push-to-talk button activated, TX should be lit and your radio set should start transmission. By releasing the button once again, the indicator should go out and your radio set should again switch over to reception mode.

Check the standing wave ratio of your antenna as well as the cable with regard to possible interruptions or loose contacts!

Your radio set does not receive any response to your transmission or reception is poor:

Correctly adjust the **SQ** control!

Adjust the **VOL** control to an appropriate playback volume.

Check the standing wave ratio of your antenna as well as the cable with regard to possible interruptions or loose contacts!

Make sure that you are using the same modulation mode (AM or FM) as your contact partner!

The displays do not light up:
Check whether your power supply unit is switched on.

Check the connections for proper wiring: plus pole (= RED) and negative pole (= BLACK)! Exchange the connections if they are mixed up.

Tips on radio communication

After switching on the radio set, always listen first whether the set channel is free (To do so, deactivate the squelch function such that you are also able to hear weaker radio stations.)! Start your own call only if the channel is absolutely free.

Transmit nothing but short calls! After each call carefully listen to a station possibly answering your call. Repeat your call only after having carefully listened.

After each transmission of your contact partner wait for several seconds before answering in order to give further radio stations the chance to participate in the radio communication (“change-over delay”).

International phonetic alphabet

When the radio contact is weak or intense interferences occur, it is quite often difficult to understand everything perfectly, as e.g. proper names or geographical names.

In this case, you can fall back on the international alphabet which is also applied in air traffic (ICAO) and NATO communications:

A Alpha	F Foxtrott	K Kilo	P Papa	U Uniform	Z Zulu
B Bravo	G Golf	L Lima	Q Quebec	V Victor	
C Charlie	H Hotel	M Mike	R Romeo	W Whiskey	
D Delta	I India	N November	S Sierra	X X-ray	
E Echo	J Juliett	O Oscar	T Tango	Y Yankee	

Evaluating the reception quality

For informing the respective contact partner clearly on the strength and quality of reception, the numbers of the R/S code are used. The R-value is used for comprehensibility (readability) and the S-value (signal strength) for signal strength and/or volume of the contact partner.

R = readability

1 not readable, incomprehensible
2 temporarily or partially readable
3 difficult to read
4 readable, comprehensible
5 easy to read

S = signal strength

The S-value (= signal strength) can be read on the S-meter.

CB Language

Typically a special slang is used in CB radio. Some special terms originate, for instance, from amateur radio or the professional radio communication, other expressions stand for periphrases or abbreviations:

Advertising	Flashing lights of police car
Back off	Slow down
Basement	Channel 1
Base station	A CB set in fixed location
Bear	Policeman
Bear bite	Speeding fine
Bear cage	Police station
Big slab	Motorway
Big 10-4	Absolutely
Bleeding	Signal from an adjacent channel interfering with the transmission
Blocking the channel	Pressing the PTT switch without talking
Blue boys	Police
Break	Used to ask permission to join a conversation
Breaker	A CBer wishing to join a channel
Clean and green	Clear of police
Cleaner channel	Channel with less interference
Coming in loud and proud	Good reception
Doughnut	Tyre
Down and gone	Turning CB off
Down one	Go to a lower channel
Do you copy?	Understand?
DX	Long distance
Eighty eights	Love and kisses
Eye ball	CBers meeting together
Good buddy	Fellow CBer
Hammer	Accelerator
Handle	CBer's nickname
Harvey wall banger	Dangerous driver
How am I hitting you?	How are you receiving me?
Keying the mike	Pressing the PTT switch without talking
Kojac with a kodak	Police radar
Land line	Telephone
Lunch box	CB set
Man with a gun	Police radar
Mayday	SOS
Meat wagon	Ambulance

Midnight shopper	Thief
Modulation	Conversation
Negative copy	No reply
Over your shoulder	Right behind you
Part your hair	Behave yourself - police ahead
Pull your hammer back	Slow down
Rat race	Congested traffic
Rubberbander	New CBer
Sail boat fuel	Wind
Smokey dozing	Parked police car
Smokey with a camera	Police radar
Spaghetti bowl	Interchange
Stinger	Antenna
Turkey	Dumb CBer
Up one	Go up one channel
Wall to wall	All over/everywhere
What am I putting to you?	Please give me an S-meter reading

Q groups

Quite often, abbreviations from the internationally binding Q code are used which is also applied in naval or amateur radio. Thanks to these three-letter acronyms, information can be submitted very fast:

QRA:	The name of my vessel (or station) is ...
QRG:	Your exact frequency (or that of ...) is ... kHz (or MHz).
QRL:	I am busy (or I am busy with ...). Please do not interfere.
QRM:	Your transmission is being interfered with ... *or* I am being interfered with
QRN:	I am troubled by static
QRP:	Decrease transmitter power
QRT:	Stop sending
QRU:	I have nothing for you
QRV:	I am ready
QRX:	I will call you again at ... hours (on ... kHz (or MHz))
QRZ:	You are being called by ... (on ... kHz (or MHz))
QSB:	Your signals are fading
QSL:	I am acknowledging receipt
QSO:	can communicate with ... direct (or by relay through ...)
QSP:	I will relay to ... free of charge
QST:	General call to all stations
QSY:	Change to transmission on another frequency (or on ... kHz (or MHz))
QTH:	My position is ... latitude, ... longitude (or according to any other indication)

CEPT channels
for FM, AM und SSB

Kanal CH	Frequenz (MHz)	Kanal CH	Frequenz (MHz)
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

UK frequency table

Kanal CH	Frequenz (MHz)	Kanal CH	Frequenz (MHz)
1	27.60125	21	27.80125
2	27.61125	22	27.81125
3	27.62125	23	27.82125
4	27.63125	24	27.83125
5	27.64125	25	27.84125
6	27.65125	26	27.85125
7	27.66125	27	27.86125
8	27.67125	28	27.87125
9	27.68125	29	27.88125
10	27.68125	30	27.89125
11	27.70125	31	27.90125
12	27.71125	32	27.91125
13	27.72125	33	27.92125
14	27.73125	34	27.93125
15	27.74125	35	27.94125
16	27.75125	36	27.95125
17	27.76125	37	27.96125
18	27.77125	38	27.97125
19	27.78125	39	27.98125
20	27.79125	40	27.99125

CTCSS frequencies
(Hz)

67,0	94,8	131,8	171,3	203,5
69,3	97,4	136,5	173,8	206,5
71,9	100,0	141,3	177,3	210,7
74,4	103,5	146,2	179,9	218,1
77,0	107,2	151,4	183,5	225,7
79,7	110,9	156,7	186,2	229,1
82,5	114,8	159,8	189,9	233,6
85,4	118,8	162,2	192,8	241,8
88,5	123,0	165,5	196,6	250,3
91,5	127,3	167,9	199,5	254,1

DCSN and DCSI codes

017	125	251	411	565
023	131	252	412	606
025	132	255	413	612
026	134	261	423	624
031	143	263	431	627
032	145	265	432	631
036	152	266	445	632
043	155	271	446	645
047	156	274	452	654
050	162	306	454	662
051	165	311	455	664
053	172	315	462	703
054	174	325	464	712
065	205	331	465	723
071	212	332	466	731
072	223	343	503	732
073	225	346	506	734
074	226	351	516	743
114	243	356	523	754
115	244	364	526	
116	245	365	532	
122	246	371	546	

DECLARATION OF CONFORMITY

CE 0678 ⓘ

We hereby declare under our responsability that the product :

BRAND : CRT
Model : MEGAPRO
Description : Mobile transceiver

Satisfies all the technical regulations applicable to the product within the scope of directive R .TTE 1999/5/CE european standarts

EN 60950-1 +A1+A11 +A12+A2
EN 301 489-1
EN 301 489-13
EN 300 433-1
EN 300 433-2
EN 300 135-1
EN 300 135-2
EMF : EN 62311

The object of the declaration described above is in conformity with the relevant Union harmonization legislation: Directive 2004/108 / EC (until April 2016) Directive and 2014/30 / EU (from 20 April 2016)

Notified Body : EMCC DR Rasek Gmbh Germany

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Mr CELESTRANO PHILIPPE
GERANT
Le 11/01/2016

RECYCLABLE

ISO9001
ISO14001

RoHS
compliant

A1.160201

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