

VHF Transceiver

AR6201, AR6203, RT6201, RCU6201

Software Versions:

upwards from Software Version

SCI1050S305 Version 4.06

SCI1051S305 Version 2.06



Operating Instructions

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Becker Avionics GmbH • Baden-Airpark B108

77836 Rheinmünster • Deutschland

☎ +49 (0) 7229 / 305-0 • Fax +49 (0) 7229 / 305-217

<http://www.becker-avionics.com> • E-mail: info@becker-avionics.com

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Abbreviations

AC	Alternating Current
AF	Audio Frequency
AR	Airborne Radio
ATT	Attenuation
AUX	Auxiliary
CH	Channel
CM	Chassis Module
COM	Communication
DC	Direct Current
IC	Intercom
LCD	Liquid Crystal Display
NAV	Navigation
PBIT	Power-On Built In Test
PTT	Push To Talk
RCU	Remote Control Unit
RSSI	Received Signal Strength Indication
RT	Remote Transceiver
RX	Receive
SQL	Squelch
SW	Software
TX	Transmit
UKW	Ultrakurzwellen
VOX	Voice Operated IC Threshold
VHF	Very High Frequency
VDC	Voltage Direct Current

Units

V	Volt
A	Ampere
mA	Milliampere
W	Watt
mW	Milliwatt
kHz	Kilohertz
MHz	Megahertz
s	Second
dBm	Power ratio in Decibel
dB	Decibel
Ohm (Ω)	Resistor
kg	Kilogram
°C	Degree Celsius
mm	Millimeter
cm	Centimeter

1. Introduction

Before use of the device it is recommended to study this instruction manual carefully because it contains safety as well as operating instructions.

Include this manual to the documentation carried on board the aircraft.

1.1. General Safety Definitions



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE

Is used to address practices not related to physical injury.



**SAFETY
INSTRUCTIONS**

Safety instructions (or equivalent) signs indicate specific safety-related instructions or procedures.

1.2. Packaging, Transport, Storage

Visually inspect the package contents for signs of transport damage.

The packaging material can be kept and reused in the case of a return shipment. Improper or faulty packaging may lead to transport damages.

Make sure to transport the device always in a safe manner and with the aid of suitable lifting equipment if necessary. Do never use the electric connections for lifting. Before the transport, a clean, level surface should be prepared to place the device on. The electric connections may not be damaged when placing the device.

First Device Checkup

- Check the device for signs of transport damages.
- Please verify if the indications on the type plate correspond to your purchase order.
- Check if the equipment is complete ("Scope of Delivery", page 34).

Storage

If you do not wish to mount and install the device immediately, make sure to store it in a dry and clean environment. Make sure that the device is not stored near strong heat sources and that no metal shavings can get into the device.

1.3. Disposal

⚠ CAUTION The packaging material is inflammable, if it is disposed of improperly by burning, toxic fumes may develop.

This product contains materials that fall under the special disposal regulation, which corresponds to the EC directive for dangerous disposal material. We recommend disposing of the respective materials in accordance with the respectively valid environmental laws. The following table states the materials suitable for recycling and the materials which have to be disposed of separately.

Material	Suitable for recycling	Disposal
Metal	yes	no
Plastics	yes	no
Circuit boards	no	yes

Dispose of the circuit boards:

- Disposal via a technical waste dump which is allowed to take on e.g. electrolytic aluminium capacitors. Do under no circumstances dump the circuit boards with normal waste dump.

1.4. Warranty Conditions

User Conversions and Changes are Not Permitted.

Any change made by the user excludes any liability on our part (excluding the work described in the manual).

- The device must not be opened.
- Do not make any modifications to the device, except for those described in the installation manual*.
- Make connections to the inputs, outputs and interfaces only in the manner described in the installation manual*.
- Fix the devices according to the mounting instructions (installation manual*). We cannot provide any guarantee for other mounting methods.

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

1.5. Conditions of Utilization

General introductory notes

With this device you bought a product which was manufactured and tested before delivery with the utmost care.

Please take your time to read the following notes which you ought to follow closely during operation.

Unless, all claims under the warranty will become void and a reduced service life or even damages must be expected.

⚠ CAUTION The user is responsible for protective covers and/or additional safety measures in order to prevent damages to persons and electric accidents.

1.5.1. Purpose of Equipment

The VHF transceiver enables voice communication in the very high frequency band between 118.000 to 136.975 MHz (radio communication part of air-band) with a selectable channel spacing of 25 or 8.33 kHz.

1.5.2. Additional Conditions of Utilization

Please refer to "Safety-Conscious Utilization", page 10.

1.6. Non Warranty Clause

We checked the contents of this publication for compliance with the associated hard and software. We can, however, not exclude discrepancies and do therefore not accept any liability for the exact compliance. The information in this publication is regularly checked, necessary corrections will be part of the subsequent publications.

2. Operating Instructions

This chapter contains general information and instructions to ensure safe operation of the VHF transceivers.

The 620X transceiver family enable voice communication between aircraft or between aircraft and ground using the very high frequency band between 118.000...136.9750 MHz with a selectable channel spacing of 25 kHz respectively 8.33 kHz.

SAFETY INSTRUCTIONS

Several functions and settings are only available via the password-protected "Configuration Settings*".

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

For further descriptions we are using following terms for VHF transceivers instead writing their complete model number.

620X in general for the device family

AR620X for: AR6201, AR6203 (Single Block Transceiver).

RT for: RT6201 (Remote Transceiver).

RCU for: RCU6201 (Remote Control Unit).

2.1. Device Description

SAFETY INSTRUCTIONS

- The figures for illustrating display show transceivers working in 8.33/25 kHz mixed mode.
- Dedicated pictures for 25 kHz mode are not explicitly shown (they differ only in number of digits for frequency).
- The HMI actions described in this section can be performed on primary controller or on optional secondary controller RCU6201.
- The word "frequency" also used in the sense of "channel name", as defined in EUROCAE, document ED-23B chapter 1.3.2.
 - In this document the word "memory channel" or "channel" means a memory place identified by a channel number, where a frequency may be stored for later use.

2.1.1. Device Assignment

This manual is valid for the following devices:

- AR6201-(XX2)
- AR6203-(XX2)
- RT6201-(XX0) with RCU6201-(X12)

upwards from Software Version

SCI1050S305 Version 4.06

SCI1051S305 Version 2.06

2.1.2. Scope of Delivery

- Manuals
 - Operating Instructions
- Device in accordance with your order
- Device accessories
- Documents of Certifications

2.1.3. Additional Required Equipment

- Mounting kit MK6403-1 (for AR6203)
- Mounting kit MK6201-(10)
(for RT6201, to meet the conditions for certification)
- Connector kits
- Cable
- Antenna

For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.1.4. Type Plate

The device type is defined by the type plate (on the housing):



Figure 2-1: Type plate (example)

Explanation:

PN:	Type designation: AR6201 = Single Block VHF Transceiver 58 mm (2¼ inch) AR6203 = Single Block VHF Transceiver 160 mm (6.3 inch) RT6201 = Remote VHF Transceiver RCU6201 = Remote Control Unit 58 mm (2¼ inch) Options: 0XX: 8.33/25 kHz channel spacing capability 1XX: 25 kHz channel spacing capability only X1X: 10 W @ 28 V X2X: 6 W @ 12 V XX2: white illumination colour on black panel
SN:	Unique number of the particular device
AN:	Article number
DoM:	Date of Manufacturing
	Software: Corresponding to the displayed version (see device)
	Compliance and Certifications Corresponding to the displayed text and logos (see device)

2.1.5. Safety-Conscious Utilization

NOTICE

Excessive pulses on the DC bus of the aircraft may cause damage on electrical circuits of any installed instrument. Do not switch ON the device during engine start or shutdown.

SAFETY INSTRUCTIONS

A voice communication test shall be performed before starting the engine. It should be noted that, if the communication test is carried out close to a ground station, the results may be positive even if the antenna cable is broken or short-circuited. In such a case, at a distance of 5 to 10 km and above, communication might not be possible.

- Speak always loud, clear and not too fast for optimal voice communication.
- Keep the microphone always close to the lips otherwise a special suppressing circuit in the VHF COM will not be capable to suppress normal cabin noise.
- Use only microphones or headsets which are suitable for use in an aircraft.
 - In aircraft made of wood, synthetic materials or in gliders or helicopters, incoming radiation can affect the integrated amplifier of the microphone (feedback), noticeable in the ground station by whistling and/or heavy distortion.

If the power supply voltage drops below the "Low Battery Threshold" (default value is 10.5 V), the "LOW BATTERY" message will appear each 3 seconds in the lower part of the display.

SAFETY INSTRUCTIONS

If the power supply voltage drops below 10 V the system enters power saving mode:

- Speaker output of the transceiver is automatically switched "OFF"
- Speaker sign will no longer be presented on LCD display
- The pilot must use headphones to continue listening.

Channels store/change:

- The functions "LAST" and Store/Restore are only available if they are activated in "Configuration Settings*" - ("MEM OPTIONS").

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.2. Controls and Indicators

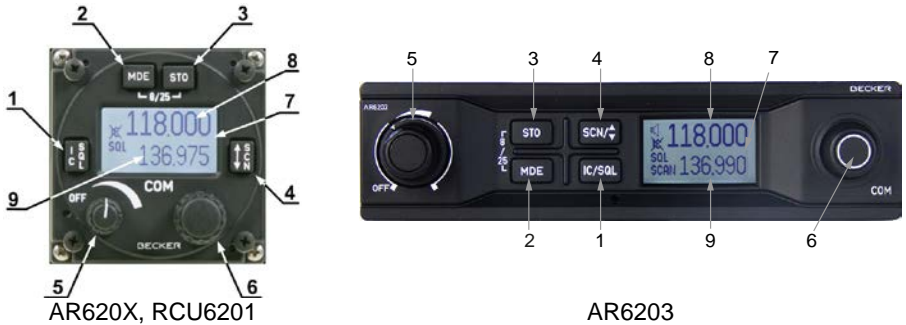


Figure 2-2: Controls and Indicators

	Symbol	Description	Function
1		IC/SQL (Intercom/ Squelch)	<ul style="list-style-type: none"> "Short press" during normal operation toggles the RX -SQL ON/OFF. "Long press" during normal operation activates Intercom Menu.
2		MDE (Mode)	<ul style="list-style-type: none"> "Short press" during normal operation changes the frequency selection mode. "Long press" during normal operation activates the user menu.
3		STO (Store)	<ul style="list-style-type: none"> "Short press" during normal operation activates storage procedure.
4		↑/SCN (Exchange/SCAN)	<ul style="list-style-type: none"> "Short press" during standard mode, or scan mode toggles between preset and active frequency. "Long press" activates scan mode.
5		Power ON/OFF + Volume	<ul style="list-style-type: none"> Switches the transceiver ON/OFF and adjusts volume level of received signal.
6		Rotary encoder	<ul style="list-style-type: none"> Turning "ROTARY ENCODER" changes the settings of several parameters (frequency, IC-volume, VOX, ...). Pushing the "ROTARY ENCODER" toggles between the digits and acts as an enter key.
7	-8/25-	Change of Channel Spacing	<ul style="list-style-type: none"> Keeping the MDE and STO button pressed simultaneously longer than 2 seconds changes 8.33 to 25 kHz channel spacing and vice versa.
7		Display	LCD: Liquid Crystal Display

8		Active frequency	Only on the active frequency, transmitting is possible and receiving has priority, even in scan mode. Frequency tuning is not possible in standard mode.
9		Preset frequency	Frequency tuning is possible in standard mode. In scan mode both frequencies, active and preset are in listening watch. If no receive signal is detected on the active frequency, receiving signals on the preset frequency will be audible, but will be muted as soon as a signal on the active frequency is detected.




The device detects a:

"Long press": when pressing and holding down a key for at least 2 seconds ($\geq 2s$).

"Short press": any pressing below 2 seconds ($< 2 s$).

If any action by the user is invalid, the whole display inverting for a short time.

Symbols shown on the display

Symbol	Function
IC	Intercom operation is active (triggered by VOX or external IC key).
	Intercom operation via VOX is disabled.
TX	Transceiver is in transmit operation.
SQL	Squelch function is active, weak RX signals suppressed.
SCAN	Transceiver operates in scan mode.
STO	Transceiver performs a storage operation.
LOW BATT	Battery below predefined low threshold.
	Inverted figures or letters on display ready to edit
	Speaker on

2.3. Start-Up

NOTICE

Excessive pulses on the DC bus of the aircraft may cause damage on electrical circuits of any installed instrument.
Do not switch ON the device during engine start or shutdown.

- Turn "ON" the device by turning the volume knob clockwise.
 - Power-On Built In Test is started.
- During PBIT (Power-On Built In Test) the display indicate the messages:
 - "WAIT".
 - The software version of "Control Head" (CH).
 - The software version of "Core Module" (CM).
- If the PBIT has detected error(s), "FAILURE" appears on the display. Details see "Warning and Failure Indications", page 32.

2.4. Receive and Transmit Mode

2.4.1. Receive Mode

If PTT (Push To Talk) inputs are inactive, the transceiver remains in receive mode.

In receive mode the headphone(s) outputs (if enabled) provide a mixed signal consisting of:

- Received signal from antenna.
- Intercom signal from intercom circuit 1 and 2.
- Signal from auxiliary input.

In receive mode the speaker output (if enabled) provides a mixed signal consisting of:

- Received signal from antenna.
- Signal from auxiliary input.

The signal from the auxiliary input been muted under certain conditions, for details refer to "Auxiliary Audio Input (AUX)", page 25.

The signal from intercom can be attenuated or muted, under certain conditions, for details refer to "Intercom Operation", page 26.

2.4.2. Transmit Mode

TX **118.005**
127.000

- If PTT input is active (PTT=Push To Talk key is pressed) the transceiver switches to transmit mode.
 - Microphone(s) signals can modulate the transmitter.
 - PTT 1 input activates transmission from microphone path 1.
 - PTT 2 input activates transmission from microphone path 2.
 - If "BOTH MIKES" are active/enabled in the "Configuration Settings*", each input (PTT 1 or 2) activates the transmission from both microphone paths simultaneously.
- The "TX" symbol indicates the device is in transmit mode.
- The sidetone (demodulated audio of the emitted signal) is available on the headphone output.
- The transmit mode automatically deactivates the speaker.

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

SAFETY INSTRUCTIONS

- In transmit mode several user actions such as changing frequency selection mode or channel spacing mode, which are normally allowed in receive mode, are blocked. (As an exception in standard mode the "Preset" frequency may still be changeable, even during transmission).
- In transmit mode no intercom operation is possible.
- Transmit mode is automatically terminated (return to receive mode) after 120 s of continuous transmitting. "STUCK PTT" is indicated, see "Warning and Failure Indications", page 32.

2.5. Frequency Selection Modes

Following frequency selection modes are available on AR620X and RCU6201:

- Standard Mode
- Direct Tune Mode
- Channel Mode
- SCAN Mode

**SAFETY
INSTRUCTIONS**

The availability of the modes depends on enabling or disabling in the "Configuration Settings*".

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

The modes "Standard Mode", "Direct Tune Mode" and "Channel Mode" provide different user interfaces for the selection of the operating frequency.

- The modes are selectable by consecutive short pressing of "MDE" key.
- One by one appear: "Standard Mode", "Direct Tune Mode" "Channel Mode" and again "Standard Mode", etc.
- When toggling between the three modes the active frequency always remains the same and active.

The mode SCAN is a sub-mode of standard mode and is used for monitoring two frequencies at the same time.

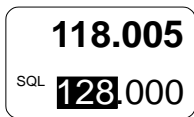
- Press "↓/SCN" key (2 seconds) to activate/deactivate the scan function.

2.5.1. Standard Mode

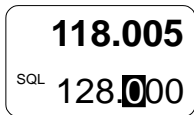


- Press the "MDE" key until the standard mode page appears.
 - The active frequency is displayed in the top line and preset frequency in the bottom line.
- Changing the active frequency is not possible in standard mode (only available in direct tune mode).
- Changing the preset frequency is possible.

Changing the preset frequency in standard mode:



- Make a "short press" on the "ROTARY ENCODER" for modification of the MHz digits.
 - The editable digits are shown inverted.
- Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 MHz steps.



- Make another "short press" on the "ROTARY ENCODER" for modification of the 100 kHz digits.
 - The editable digits are shown inverted.
- Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 kHz steps.



- Make another "short press" on the "ROTARY ENCODER" for modification of the 25/8.33 kHz digits.
 - The editable digits are shown inverted.
- Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 25/8.33 kHz steps.

SAFETY INSTRUCTIONS

- A short press of the "↕/SCN" key, exchanges active frequency to preset frequency and vice versa.
 - While the transceiver operates in transmit mode, the toggle function is disabled.
- Press the "STO" key to store the active frequency into the next vacant memory place of the user channel database (see "Frequency Storage Functions", page 20).

2.5.2. Direct Tune Mode



- Press the "MDE" key until the direct tune mode page appears.
 - The active frequency is displayed in the top line.
- The battery information is displayed.

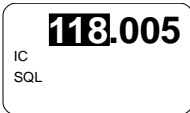
SAFETY INSTRUCTIONS

The battery information is only displayed if BATTERY VOLTAGE in the "Configuration Settings*" is selected.

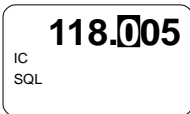
* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

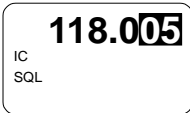
Changing the active frequency in direct tune mode:



- Make a "short press" on the "ROTARY ENCODER" for modification of the MHz digits.
- The editable digits are shown inverted.
- Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 MHz steps.



- Make another "short press" on the "ROTARY ENCODER" for modification of the 100 kHz digits.
- The editable digits are shown inverted.
- Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 kHz steps.



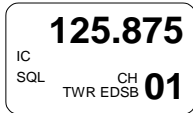
- Make another "short press" on the "ROTARY ENCODER" for modification of the 25/8.33 kHz digits.
- The editable digits are shown inverted.
- Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 25/8.33 kHz steps.

SAFETY INSTRUCTIONS

- The changes become active immediately.
- Changing the active frequency is possible only when the transceiver is not transmitting.
- Press the "STO" key to store the active frequency into the next vacant memory place of the user channel database (see "Frequency Storage Functions", page 20).

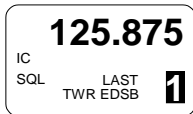
2.5.3. Channel Mode

The channel mode shows data from "User channel database" (indicated by "CH"), or "Last Channel Database" (indicated by "LAST") and shows if applied a customized label (identifier) for the frequency (max. 10 characters).



The channel database provides storage of:

- CH01...CH99 and
- LAST 1...LAST 9.



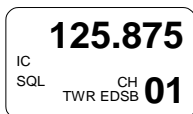
SAFETY INSTRUCTIONS

- The functions "LAST" and Store/Restore are only available if they are activated in "Configuration Settings*" - ("MEM OPTIONS").

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

- If the device is operating in the 25 kHz mode a selection of stored 8.33 kHz channels is not possible.
For selection of 8.33 kHz channels, the device must operate in 8.33 + 25 kHz mixed mode.

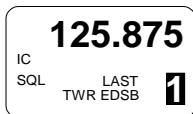
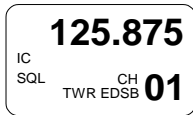


- Press the "MDE" key until the channel mode page appears.
- By means of channel number stored frequencies can be selected.
 - The top line shows the corresponding frequency and the bottom line the customized label (identifier) assigned to the frequency number.
 - If the active frequency has no assigned channel number the indication is "CH--".

2.5.3.1. Select Channels

Example: With CH01 user channel shown on display:

In order to select the channel number:



- The first turn clockwise in channel mode provides navigation up to the user channels CH01...CH99.
 - Make a short press of the "ROTARY ENCODER", or:
 - Make one clockwise turn of the "ROTARY ENCODER".
- The channel number is now highlighted and the channel can be changed turning the "ROTARY ENCODER".

At each step the receiver tunes immediately to the displayed frequency.

- The first turn counter-clockwise will enter to the channel "LAST 1".
 - The channel number is now highlighted and one of the nine last used channels is selectable by turning the "ROTARY ENCODER" either counter clockwise or clockwise.

SAFETY INSTRUCTIONS

- The "LAST" mode is left automatically after a 5 second timeout or can be deselected by a press of the "ROTARY ENCODER".
- When leaving the "LAST" channel database and the last shown frequency is not stored in the user channel database, "CH__" appear on the display.
- Press the "STO" key to store the frequency into the next free memory place of the user channel database.

Leave Channel Mode:

- Press the "MDE" key.
 - The channel mode will be closed.
 - The standard mode page appears.

2.5.3.2. Frequency Storage Functions

Start store function:



- Press "STO" key.
(in "Standard", Direct Tune" or "SCAN Mode").
 - The symbol "STO" appears.

2.5.3.3. Store

Note

The functions "LAST" and Store/Restore are only available if they are activated in "Configuration Settings*" ("MEM OPTIONS").

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

Two databases are provided:

- User channel database - provides 99 channels CH01...CH99 to store frequencies with the possibility to apply a customized label (identifier) with max. 10 alphanumeric characters.
- Last channel database - automatically stores last used frequencies.
Named and callable as LAST 1...LAST 9, the customized identifier will be displayed (if applied).
- Any frequency (within the range 118.000...136.9916 MHz) can be assigned to any channel by simply pressing the "STO" button.
- All 99 channels are editable.

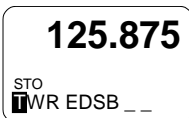
By entering the storage procedure, the device will first propose the next free channel.



- The label "FREE" appears together with the channel number, if the selected channel is vacant.



- A selected channel with an already stored frequency has the label "USED".



- If the same frequency is stored a second time, then the existing data (frequency, label/identifier data) is offered to store.

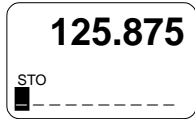


- If the frequency has no label attached, ten underscore digits allows to insert a label.
- The cursor automatically appears on the first position.

Overview - The data can be stored to:

- Next free channel (offered from system).
- A selected free channel.
- A selected used channel (the existing data will be overwritten).

Label (Identifier) Data:



- By turning the "ROTARY ENCODER" characters can be selected.
- Selection works in both directions (example: blank → A → ...Z → 0 → 9 → — → / → blank → A by turning clockwise or counter clockwise).
- A short press on the "ROTARY ENCODER", the cursor is passed to the next position.
- A short press of the "STO" key stores the label.
- A long press of the "STO" key clears the currently edited label.
- After storing the transceiver returns back to the previous selection mode.
- If no action occurs in label editing mode within 7 seconds, the transceiver returns to the previous selection mode without storing the frequency and label information.
- Stored frequencies are callable in channel mode (see "Channel Mode", page 18).

2.5.3.4. Automatic Storage Function

The transceiver stores recently selected frequencies. Named and callable as LAST 1...LAST 9 (see "Channel Mode", page 18).

- When changing to a new active frequency, the previous active frequency is stored in memory as LAST 1.
- The frequencies previously located in LAST 1...LAST 8 are shifted to memory channels LAST 2...LAST 9.

Note **The functions "LAST" and Store/Restore are only available if they are activated in "Configuration Settings*" ("MEM OPTIONS").**

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.5.3.5. Delete data:

The stored content in user channel database can only be deleted in "Configuration Settings*". Please note, all stored data in channel database will be reset.

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.5.4. SCAN Mode



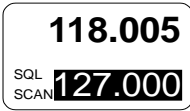
- In scan mode the display shows both frequencies.
 - The active frequency is shown on the top line and the preset frequency on the bottom line.
- The SCAN sign in the display indicates that scan function is active.

In all frequency selection modes:

- A long press (>2 s) of "↑/SCN" key activates the scan function and changes to standard mode, if activated from channel or direct tune mode.
- A short press on the "MDE" key or a long press (>2 s) on "↑/SCN" key terminates scan function. The device will remain in standard mode.
- The arrow sign "▶" in front of the frequency indicates that this frequency is audible.



If both the active and preset frequency simultaneously detect a signal, the active frequency (top) has priority.



- The preset frequency is shown inverted and blinks.
- An audio notification "beep" tone becomes audible in addition to the blinking preset frequency to indicate the presence of an RX signal on the preset frequency (if activated in the "Configuration Settings*").

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

Reception on Preset Frequency in Scan Mode:



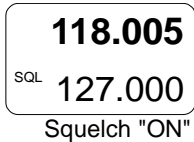
- If the preset frequency detects a signal while no signal is present on the active frequency, the transceiver automatically switches over to the preset frequency.
- The arrow sign "▶" in front of the frequency indicates that this frequency is audible.

Note: **Transmission always uses the active frequency, even if the monitored frequency is currently audible. If transmission on the preset frequency is required, push the "↑/SCN" key to swap active and preset frequency.**

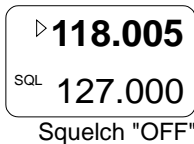
2.6. SQUELCH

This function is independent of the selected operation menu.

- By a short press on "SQL/IC" key squelch can be toggled "ON" or "OFF".



- If the squelch function is active ("ON") the receivers noise is muted.



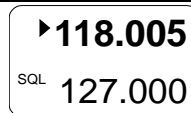
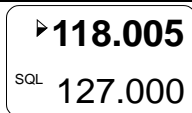
- If the squelch is "OFF" the arrow sign "▶" in front of the active frequency stay visible all the time and receiver noise will be audible as long as signal is receiving.

The squelch threshold is adjustable to a convenient trigger level. See "User Menu", page 30.

2.7. RX Field Strength Indication

The field strength indicator is represented by triangle on the left upper corner of the corresponding frequency (in all frequency selection modes). The field strength of an incoming signal relates to the measured RSSI level ("Received Signal Strength Indication"):

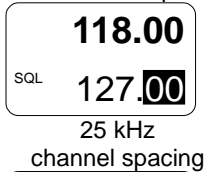
Weak Signal Strength	Good Signal Strength	Excellent Signal Strength
RSSI passing squelch levels (empty triangle)	-88 > RSSI > -80 dBm (half-filled triangle)	RSSI > -80 dBm (fully filled triangle)



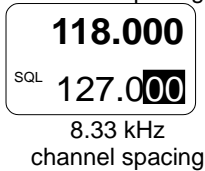
2.8. Channel Spacing Mode

The transceiver provides 8.33 kHz and 25 kHz frequency channel spacing.

- Press "STO" and "MDE" keys simultaneously for ≥ 2 s to select channel spacing.



- In 25 kHz mode, 5 frequency digits are shown.
 - Only operating frequencies with a channel spacing of 25 kHz are selectable. This mode provides the advantage of faster tuning since skipping the 8.33 kHz frequency steps.



- In 8.33 /25 kHz mixed mode 6 frequency digits are shown.
 - The transceiver tunes to all possible frequencies within the aviation VHF frequency band. The channel spacing and operating frequency is derived automatically from the selected and displayed frequency.

The 620X-(0XX) variants provide toggling between 8.33 /25 kHz channel spacing modes.

The 620X-(1XX) variants provide only operation in 25 kHz mode.

2.9. Auxiliary Audio Input (AUX)

The transceiver has a dedicated auxiliary audio input e.g. for MP3 player connection. This function can be enabled in the "Configuration Settings".

With auxiliary input enabled, the auxiliary audio input signal will be mixed with the received signal from antenna (passing squelch) and the intercom signal (when activated).

When intercom operates in ISOLATION mode, auxiliary audio input signal is audible on headphone 2 output, even if radio communication (transmission/receiving) is active.

AUX AUTO MUTE function depends on the AUX INPUT, selectable via the "Configuration Settings". This function automatically mutes the audio signal from the auxiliary audio input as long as the device detects (based on squelch evaluation) a RX signal or the user deactivates the squelch manually. If this function is disabled the signal from the auxiliary audio input is permanently audible on the audio output, independently of the received signal or the squelch status.

Automatic AUX attenuation functionality controls the auxiliary audio input. The level of the auxiliary input signal attenuates if intercom is activated by VOX or by IC discrete input. The auxiliary input signal reverts to its previous value after intercom deactivation.

The attenuation value can be adjusted within the range from 0...40 dB.

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.10. Intercom Operation

Intercom operation may be triggered automatically via VOX (with adjustable threshold) or externally via intercom switch.



- If intercom operation is active, the "IC" sign appears in the display.

The setting of VOX-threshold and intercom volume is accessible in the intercom menu. In tandem configuration (application with additional controller) it is only possible on primary controller.

- For the AR620X single block devices, the primary controller is the one directly connected to the device.
- For the RT6201 remote device the primary controller is the one connected to primary control interface.

VOX-threshold and intercom volume for the second intercom circuit are adjustable from secondary controller RCU6201 (secondary controller is the one connected to secondary control interface).

The transceiver has two internal built in intercom circuits. Therefore, up to four headsets are connectable.

- Pilot and co-pilot connect to the first intercom circuit.
 - When intercom is active, both microphone signals are mixed and amplified and will be audible on both headphone outputs. This enables internal communication via headsets between both pilots.
- Passenger headsets are connecting to the second intercom circuit.

ALL-mode - Everyone connected to the intercom will hear all communications (pilots hear passengers and passengers hear pilots).

ISOL-mode - Provides separate intercoms for the pilots (intercom circuit 1) and the passengers (intercom circuit 2).

This allows pilots to communicate with each other and air traffic, while the passengers are isolated. The passengers on the intercom circuit 2 can hear auxiliary audio (for example from MP3 player) and can communicate with each other.

An external "ISOL" input provides possibility to switch between ALL mode and ISOL mode. If the PTT1 input is active and ISOL is active the passenger intercom operation on second intercom circuit is still possible.

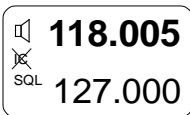
Intercom Operation via VOX

Via VOX the intercom operation is automatically activated (threshold adjustable in the intercom menu).

- With additional RCU6201, VOX threshold for the first intercom circuit is adjustable from primary controller (AR620X or RCU6201).
- For the second intercom circuit it is adjustable from second controller (RCU6201).

Intercom activation via VOX is not possible if:

- Speaker is enabled (see "VOX & Speaker Operation", page 27).
- User switched VOX off.



- In both cases, VOX is disabled and the display shows the sign ~~🔊~~.

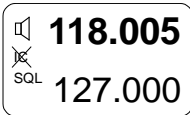
Intercom Operation via external Intercom Switch

Via external intercom switch the intercom operation can be activated, independent of VOX or speaker status (enabled/disabled).

- The external intercom switch has priority.
- During intercom operation the speaker output is disabled.

2.11. VOX & Speaker Operation

Depending on wiring and "Configuration Settings*", the speaker may always been enabled, or the speaker can be enabled/disabled by switching configurations using external switch (/MIKE_SW).



- When speaker enabled and not muted, the display will show the loudspeaker sign.



With active speaker in audio configuration, VOX always forced "OFF" and intercom via VOX is not possible (to avoid oscillation of VOX due to acoustical feedback).

In transmission mode the speaker output is muted (switched "OFF") even if speaker is enabled in current audio configuration* in the following cases:

- Intercom is activated by external intercom switch (/IC input).
- Power supply voltage is < 10 V.

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.12. Menus

During normal operation in one of the frequency selection modes the following menus are available:

- Intercom menu (IC) - allows adjustment of intercom volume and VOX threshold.
- User menu - allows adjustment of panel brightness and squelch threshold.

2.12.1. Intercom Menu

- A long press (>2 s) on "IC/SQL" key activates the intercom menu.
- A short press on "IC/SQL" key provides toggling between the pages.

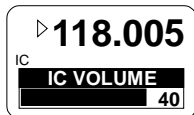
The intercom menu consists of two pages:

- IC VOLUME.
- IC VOX.

Leave the menu:

- Automatically after 5 seconds timeout.
- Another long press (>2 s) on "MDE" key.

IC VOLUME



- The active frequency is indicated in the top line of the display and below appears the indication "IC VOLUME".
- The adjustable value is displayed as bar graph and as numerical indicator in the bottom line.
- The intercom volume is adjustable from 0...46 ("ROTARY ENCODER").
- The intercom volume setting affects the intercom audio and sidetone signal routed to the headphone.
- The changes become active immediately.

Intercom VOX

Note:

Access to the VOX threshold level is not possible if VOX forced to be "OFF" (due to enabled speaker in current "Audio Configuration Settings*").

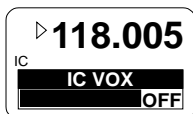
- Intercom via VOX is not possible.
- VOX threshold level state is "OFF".

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.



- The active frequency is indicated in the top line of the display and below appears the indication "IC VOX".
- The adjustable value is displayed as bar graph and as numerical indicator in the bottom line.
- The VOX threshold is adjustable from -30...+10 ("ROTARY ENCODER").
 - -30, most sensitive, even a very low microphone signal already triggers the VOX threshold for Intercom operation.
 - +10, VOX is less sensitive and only high microphone signals trigger the VOX threshold for intercom operation.
- The changes become active immediately.



IC VOX is disabled:

- With the adjustment of VOX threshold level to >+10.
 - VOX operation is disabled
 - In this case "OFF" replaces the numerical value indication.
- With VOX switched "OFF", activation of intercom operation using an external intercom switch is still possible at any time.
- VOX threshold level is not adjustable if VOX forced to be "OFF" (due to enabled speaker in current audio setup configuration*).
- In tandem installation the "first" controller adjusts VOX threshold for first intercom circuit.
- In tandem installation the second controller RCU6201 adjusts VOX threshold for second intercom circuit.

Note: **At a setting for VOX threshold of -15 a convenient behaviour of the VOX should be achieved in most aircraft. This requires that mike sensitivity had been correct adjusted (Configuration Settings*). If the mike sensitivity is not correct adjusted, VOX may not work satisfying.**

* For details please refer to manual:
<http://www.becker-avionics.com/downloads/> → AR620X Family.

2.12.2. User Menu

- A long press (>2 s) on "MDE" key starts the user menu.
- A short press on "MDE" key provides toggling between the pages (or a short press on the "ROTARY ENCODER").

The intercom menu consists of two pages:

- BRIGHTNESS.
- SQUELCH TRH.

Leave the menu:

- Automatically after 5 seconds timeout.
- Another long press (>2 s) on "MDE" key.
- A short press on the "ROTARY ENCODER" when the "SQUELCH" page is visible.

BRIGHTNESS

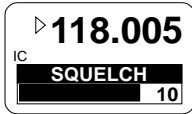


- The active frequency is indicated in the top line of the display and below appears the indication "BRIGHTNESS".
- The adjustable value is displayed as bar graph and as numerical indicator in the bottom line.
- The brightness is adjustable from 0...100 ("ROTARY ENCODER").
 - 0, illumination is off.
 - 100, maximum brightness is reached.

Note: This page is not available if in the "Configuration Settings*" the dimming input is set to 14 V or 28 V.

* For details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family.

SQUELCH

- The active frequency is indicated in the top line of the display and below appears the indication "SQUELCH".
- The adjustable value is displayed as bar graph and as numerical indicator in the bottom line.
- The squelch threshold is adjustable ("ROTARY ENCODER").
 - 6, very weak signals are audible with high noise content; squelch opens at about -105 dBm.
 - 26, only quite strong signals are audible with low noise content; squelch opens at about -87 dBm. The receiver sensitivity is significant reduced.

2.13. Warning and Failure Indications

Display	Description
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;"> <p>118.005</p> <p>IC LOW BATTERY</p> </div> <p>appears in 3-second cycle</p>	<p>"LOW BATT": the supply voltage of the transceiver is below the defined threshold.</p> <p>The transceiver is still operable but may have a reduced performance depending on supply voltage.</p> <p>Possible reasons for indication:</p> <ul style="list-style-type: none"> • Accumulator capacity problems (gliders). • Power interrupts. • General power supply problems. • Setting for low battery threshold too high.
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;"> <p>118.005</p> <p>IC STUCK PTT</p> </div> <p>appears in 3-second cycle</p>	<p>"STUCK PTT": is indicated after 120 seconds of continued transmission. The transceiver goes back to receive mode even if the PTT line is still active (GND).</p> <p>For initiating a new transmission, the PTT line needs first to become inactive (open).</p> <p>Possible reasons for indication:</p> <ul style="list-style-type: none"> • Transmission lasts more than 120 seconds. • PTT-key is stuck. • PTT line permanently grounded (short circuit in installation).
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;"> <p>118.005</p> <p>IC TX HOT</p> </div> <p>appears in 3 second cycle</p>	<p>"TX HOT": is indicated if the internal device temperature exceeds +90 °C.</p> <p>Transceiver is still operable. Performance of transmitter is reduced.</p> <p>Possible reasons for indication:</p> <ul style="list-style-type: none"> • Very hot environmental temperature, long transmission times and insufficient airflow conditions
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center;"> <p>118.005</p> <p>IC FAILURE</p> </div> <p>appears in 3 second cycle</p>	<p>The transceiver has detected an internal failure during normal operation.</p> <p>Depending on failure reason, the device may still be operable with degraded performance or not operable at all.</p> <p>Possible reasons for indication:</p> <ul style="list-style-type: none"> • Specified environmental conditions • HW or SW failure inside the transceiver. <p>Contact maintenance shop for assistance.</p>

Display	Description
<div style="border: 1px solid black; border-radius: 10px; padding: 10px; text-align: center;"> <p>FAILURE PRESS ANY KEY</p> </div>	<p>The transceiver has detected an internal failure during start up. Depending on failure reason, the device may be still operable with degraded performance or not operable at all.</p> <p>Possible reasons for indication:</p> <ul style="list-style-type: none"> • Outside specified environmental conditions • HW or SW failure inside the transceiver. <p>Contact maintenance shop for assistance.</p>
<div style="border: 1px solid black; border-radius: 10px; padding: 10px; text-align: center;"> <p>FAILURE</p> </div>	<p>The transceiver has no communication with the controller. Depending on failure reason, the device may be still operable with degraded performance or not operable at all.</p> <p>Possible reasons for indication:</p> <ul style="list-style-type: none"> • Problem with inter-wiring <p>Contact maintenance shop for assistance.</p>

3. Technical Data

620X	Specification
Supply voltage (nominal)	11.0...30.3 V
Supply voltage (extended)	10.25...32.2 V
Emergency operation	9.0...10.25 V
Dimming control	0...14 V or 0...28 V
Frequency range	118.000...136.975 MHz (variante -1XX) 118.000...136.9916 MHz (variante -0XX)
Channel spacing	25 kHz (variants -1XX) 8.33/25 kHz (variants -0XX)
Output power into 50 Ω (with and without modulation)	≥ 6 W AR620X-(X2X), RT6201-(X2X) ≥ 10 W AR620X-(X1X), RT6201-(X1X)
Rated output power for speaker operation	≥ 4 W @ 4 Ω
Operating temperature	-20...+55 °C (AR620X, RCU6201)
	-40...+55 °C (RT6201)
	short-term +70 °C
Storage temperature	-55...+85 °C
Protection of the application	7.5 A (AR620X, RT6201) 3 A (RCU6201)
More detailed data see manual:	http://www.becker-avionics.com/downloads/ → AR620X Family.
Notes:	

In case of additional questions contact your local Becker Avionics dealer or forward your request direct to Becker Avionics "Customer Service".

In the event of damage or a defect, the entire device must be returned for repair. The repair must be made by trained Becker Avionics personnel.

Becker Avionics GmbH • Baden-Airpark B108 • 77836 Rheinmünster • Germany

☎ +49 (0) 7229 / 305-0 • Fax +49 (0) 7229 / 305-217

Customer Service:

Sales

Email: sales@becker-avionics.com

Support in German or English

Email: support@becker-avionics.com

Support in French

Email: FR-sales@becker-avionics.com

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