BECKER AVIONICS

VHF Transceivers

AR6201, AR6203, RT6201, RCU6201
AR6211, AR6213, RT6211, RCU6211

<u>Software Versions:</u>
upwards from Software Version
SCI1050S305 Version 4.06
SCI1051S305 Version 2.06

Operating Instructions

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Approved Production and Maintenance Organization

Certificates see: http://www.becker-avionics.com/certification/ →Certificates

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⚠️   **WARNING - USER RESPONSIBILITY**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.
This document and other information from Becker Avionics provide product or system options for further investigation by users having technical knowledge.
The user is responsible for making the final selection of the system and components. The user has to assure that all performance, endurance, maintenance, safety requirements of the application are met and warnings be obeyed.
For this the user has to include all aspects of the application to be compliant with the applicable industry standards and the requirements of the responsible aviation authority. The product documentations from Becker Avionics have to be obeyed.
To the extent that Becker Avionics provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Term definition: User in the sense of user, installer, installation company.

Table of Contents

List of Figures

Some figures in this manual are for basic understanding and can be different to the design. Device design depends on variant.

List of Abbreviations

List of Abbreviations	
AC	Alternating Current
AF	Audio Frequency
AR	Airborne Radio
ATT	Attenuation
AUX	Auxiliary
CBIT	Continuous Built-In Test
CFG	Configuration
CH	Channel
CM	Chassis Module
COM	Communication
DC	Direct Current
IC	Intercom
LCD	Liquid Crystal Display
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
VOX	Voice Operated IC Threshold
VHF	Very High Frequency

Units

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

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1 Introduction

Before operation of the device(s) please read this manual carefully.

This manual must be available during performance of all tasks.

1.1   General Safety Definitions

⚠ **DANGER**   Indicates a hazardous situation which, if not prevented, will result in death or serious injury.

⚠ **WARNING**   Indicates a hazardous situation which, if not prevented, could result in death or serious injury.

⚠ **CAUTION**   Indicates a hazardous situation which, if not prevented, 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.

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

Keep the packaging material and use it in the case of a return shipment. Improper or faulty packaging can 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 put the device on. The electric connections may not be damaged when placing the device.

First Device Checkup

- Do a check for signs of transport damages.
- Please make sure that the indications on the type plate agree with your purchase order.
- Make sure that the equipment is complete ("Scope of Delivery", page 9).

Storage

If you do not 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 chippings can get into the device.

1.3   Disposal

⚠**CAUTION** | The packaging material is inflammable, by burning toxic fumes may develop.

This product contains materials that fall under the special disposal regulation. We recommend the disposal of such materials in accordance with the current environmental laws.

- Dispose circuit boards by a technical waste dump which is approved to take on e.g. electrolytic aluminum capacitors. Do under no circumstances dump the circuit boards with normal waste dump.

1.4   Warranty Conditions

⚠**CAUTION** | The device(s) may be installed on an aircraft only by an approved aeronautical company (e.g. Part 145) which shall also examine the installation.

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

1.5   Conditions of Utilization

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 instructions which you ought to follow closely during installation and operation.

Otherwise all claims under the warranty will become void and a decreased 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.

1.6   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 thus 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   Device Description

2.1   Purpose of Equipment

The devices of the 6200 VHF transceiver series are for 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.

2.2   Device Assignment

This manual is for devices upwards from software version:
SCI1050S305 Version 4.06
SCI1051S305 Version 2.06

Single block devices:	Remote-control devices:
• AR6201-(012)	• RT6201-(010)
• AR6201-(022)	• RT6201-(020)
• AR6201-(112)	• RT6201-(110)
• AR6201-(122)	• RT6201-(120)
• AR6211-(012)	• RT6211-(010)
• AR6211-(022)	• RT6211-(020)
• AR6211-(112)	
• AR6211-(122)	
• AR6203-(012)	• RCU6201-(012)
• AR6203-(022)	• RCU6201-(112)
• AR6203-(112)	• RCU6211-(012)
• AR6203-(122)	• RCU6211-(112)
• AR6213-(012)	
• AR6213-(022)	
• AR6213-(112)	
• AR6213-(122)	

2.3   Scope of Delivery

- Manuals
  - Operating Instructions
- The device(s) as ordered.
- Authorized Release Certificate (EASA Form 1)

2.4   State of Delivery

- The device(s) are ready for use with factory default adjustments.

2.5   Additional Required Equipment

- Mounting kit MK6403-1 (for AR62X3)
- Mounting kit MK6201-(10)
  (for RT62X1 to obey the conditions for certification)
- Connector kits
- Cable harness
- Antenna
- Microphone
- Headphone, speaker

For details please refer to related manual:
http://www.becker-avionics.com/manuals/   Communication → VHF Transceiver

2.6   Registration of the Device

Obey the national requirements for operation of radio equipment.

2.7   Type Plate

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

Example:

Figure 1: Type plate (example)

Explanation:

PN:	**Type designation:** **AR6201, AR6211** = Single Block VHF Transceiver 58 mm (2¼ inch) **AR6203, AR6213** = Single Block VHF Transceiver 160 mm (3.6 inch) **RT6201, RT6211** = Remote-Controlled VHF Transceiver **RCU6201, RCU6211** = Remote Control Unit 58 mm (2¼ inch) **Options:** 0XX: 8.33/25 kHz channel spacing 1XX: 25 kHz channel spacing only X1X: 6 W @ 14 V, 10 W @ 28 V X2X: 6 W @ 14 V XX2: white illumination color on black panel
SN:	Unique number of the device
AN:	Article number
DoM:	Date of Manufacturing
	Software: Refer to the version on the device type plate
	Compliance and Certifications: Refer to the text and logos on the device type plate

2.8   Software/Firmware Status – Functionality

- The software version is shown at the screen for a few seconds after power on. The software version is also available with the configuration setup → DEVICE INFO.

- The software versions are subject to change without notice.

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3 Operation

This chapter contains information and instructions for safe operation of the devices.

The devices of the 6200 VHF transceiver series are for 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.

- All control and display elements are on the front side.

For further description we use also short forms.

- 6200 series   in general for the device family.
- AR62X1   for: AR6201, AR6211, (Single Block Transceiver).
- AR62X3   for: AR6203, AR6213 (Single Block Transceiver).
- RT62X1   for: RT6201, RT6211 (Remote-Controlled Transceiver).
- RCU62X1   for: RCU6201, RCU6211 (Remote Control Unit).
- If a description refers to only one of the product variants is it specified.

NOTICE	• The figures for display content mainly show the transceiver in 8.33/25 kHz mixed mode (pictures for 25 kHz differ only in number of digits for frequency). • The user can do the HMI operation on the primary controller or on optional secondary controller RCU62X1. • The word "frequency" is also used in the sense of "channel name", as defined in EUROCAE, document ED 23C chapter 1.3.2, Volume II. • In this document the word "memory channel" or "channel" is also used in the sense of a memory position identified by a channel number, where a frequency may be stored for later use.

NOTICE	• Some functions and adjustments are only available through the password-protected configuration setup*.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/   Communication → VHF Transceiver

3.1 Registration of the Device

Obey the national requirements for operation of radio equipment.

3.2   Safety-Conscious Utilization

NOTICE
- Excessive pulses on the DC bus of the aircraft can cause damage on electrical circuits of any installed instrument.
- Do not turn on the device during engine start or shutdown.

SAFETY INSTRUCTIONS

First make a voice communication test before starting any operation.
- Please notice that, if the communication test is done close to a ground station, the results may be positive even if the antenna cable is broken or short-circuited.
  Caution! Then a communication could be not possible at a distance of 5...10 km and above.
- 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 noise.
- Use only microphones or headsets which are suitable for specific installations.
  - In aircraft made of wood, synthetic materials or in gliders or helicopters, incoming radiation can affect the integrated amplifier of the microphone (feedback), then the ground station receives a whistling and/or heavy distortion.

SAFETY INSTRUCTIONS

- If the power supply voltage is less than the adjusted threshold, the display shows the message "LOW BATT".
- If the power supply voltage is < 10.25 V, the device continues operation with decreased performance.
  - The speaker output of the transceiver is automatically turned "OFF"
  - The speaker symbol is no longer shown.
  - The user must use headphones to continue listening.
- If power supply voltage is < 9.0 Volt, the device turns off automatically.

3.3   Controls and Indications
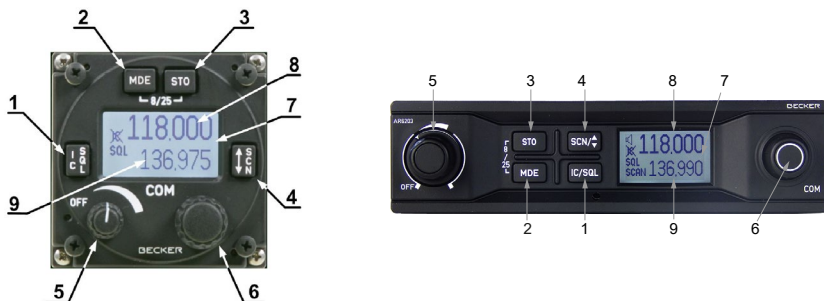
AR6201, AR6211, RCU6201, RCU6211   AR6203, AR6213

Figure 2: Controls and Indicators

	Symbol	Description	Function
1	I S Q C L	IC/SQL (Intercom/ Squelch)	• "Short push" during normal operation = RX - SQL ON/OFF. • "Long push" during normal operation starts the intercom menu.
2	MDE	MDE (Mode)	• "Short push" during normal operation changes to the frequency selection mode. • "Long push" during normal operation starts the user menu.
3	STO	STO (Store)	• "Short push" during normal operation stores the new value.
4	↕ S C N	↕/SCN (Exchange/SCAN)	• "Short push" during standard mode or scan mode changes between preset and active frequency. • "Long push" starts the scan mode.
5	OFF	Power ON/OFF + volume	• Turns the transceiver ON/OFF and is used to adjust the volume level of received signals.
6	●	Rotary encoder	• Turn the rotary encoder to change the selected parameters (frequency, IC-volume, VOX, …). • Push the rotary encoder to select the digits. • Push the rotary encoder to confirm the adjustment.
	-8/25-	Change of channel spacing	• Push and hold the MOD and STO key at the same time for > 2 s to change 8.33 to 25 kHz channel spacing and vice versa.

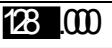|	Symbol	Description	Function
7		Display	LCD: Liquid Crystal Display
8		Active frequency	Only on the active frequency: • Transmission is possible and the reception has priority, even in scan mode. • Frequency tuning is not possible in standard mode.
9		Preset frequency	• Frequency tuning is possible 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 identifies a:
"Long push": when you push and hold a key for > 2 seconds.
"Short push": when you push and hold a key for < 2 seconds.
If any action by the user is invalid, the whole display is inverted for a short time.

3.3.1   Symbols on the Display

Symbol	Function
IC	The intercom operation is started (triggered by VOX or external IC key).
✕	The intercom operation with VOX is disabled.
TX	The transceiver is in transmit operation.
SQL	The squelch function is started.
SCAN	The transceiver operates in scan mode.
STO	The transceiver is in a storage procedure.
LOW BATT	The battery voltage is less than the predefined threshold.
123.000	Inverted figures or letters on the display are selected to change.
	The speaker is on.

3.4 Start-Up

NOTICE	• Excessive pulses on the DC bus of the aircraft can cause damage on electrical circuits of any installed instrument.
	• Do not turn on the device during engine start or shutdown.

- Turn the volume knob clockwise to turn on the device.
- After power-on, the device starts a self-test (PBIT).
    o The display shows the message "WAIT".
    o The display shows the software versions of the control head and the chassis module.
- If there is an error the display shows the message "FAILURE, push any key" (for details see "Warning and Failure Indications", page 36).
- If there is no error the transceiver changes to the last active mode before power off.
- During normal operation, a self-test (CBIT) permanently examines the correct operation of the device.
    o If there is an error the display shows an error message.

3.5 Receive Mode

- If PTT (Push To Talk) inputs are inactive, the transceiver stays in receive mode.
- A mixed signal is supplied on the headphone(s) outputs (if enabled), it is mixed of the:
    o Received signal from antenna.
    o Intercom signal from intercom circuit one and two.
    o Signal from auxiliary input.
- A mixed signal is supplied on the speaker output (if enabled), it is mixed of the:
    o Received signal from antenna.
    o Signal from auxiliary input.
- The signal from the auxiliary input is muted under certain conditions (for details refer to "Auxiliary Audio Input (AUX INPUT)", page 30).
- The signal from intercom is muted under certain conditions (for details refer to "Intercom Operation", page 30).

3.6   Transmit Mode

^{TX} **118.005**

127.000

- If PTT input is active (PTT=Push To Talk key is pushed) the transceiver is set to transmit mode.
  - o   Microphone(s) signals can modulate the transmitter.
  - o   PTT 1 input starts transmission from microphone path 1.
  - o   PTT 2 input starts transmission from microphone path 2.
  - o   If "BOTH MIKES" are enabled in the configuration setup*, each input (PTT 1 or 2) can start the transmission from both microphone paths at the same time.
- The "TX" symbol shows that 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 related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

NOTICE

- In transmit mode some user actions are blocked e.g. change the frequency selection mode or channel spacing mode, which are normally permitted in receive mode.
- Changes in standard mode e.g. the "Preset" frequency are possible even during transmission.
- In transmit mode is no intercom operation possible.
- Transmit mode is automatically terminated (return to receive mode) after 120 s of continuous transmitting.
  - o   The display shows "STUCK PTT", see "Warning and Failure Indications", page 36.
  - o   For the start of a new transmission first it is necessary to set the /PTT line inactive.

3.7   Frequency Selection Modes

Available modes:

- Standard mode
- Direct tune mode
- Channel mode
- Scan mode

Standard mode	Direct tune mode	Channel mode	Scan mode
118.005 SQL 127.000	**118.005** SQL BAT 13.5V	**125.875** SQL TWR EDSB CH **01**	**118.005** SQL ▶ 127.000 SCAN

NOTICE
- The availability of the modes depends on the adjustments in the configuration setup*.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

The modes "Standard Mode", "Direct Tune Mode" and "Channel Mode" have different layouts for the selection of the operating frequency.

- The modes are selectable with short push of the of the "MDE" key, one after the other.
  - o The display shows one by one: "Standard Mode", "Direct Tune Mode" "Channel Mode", "Standard Mode", and so on.
- During the changes between the modes the active frequency is always the same and active.

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

- Push "↕/SCN" key (2 s) to start/stop the scan function.

3.7.1   **Standard Mode**
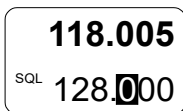
118.005
✉
SQL 127.000
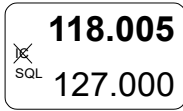
- Push the "MDE" key to change to the standard mode page.
  - o The active frequency is shown in the top line and preset frequency in the bottom line.
- The change of the active frequency is not possible in standard mode (only available in direct tune mode).
- The change of the preset frequency is possible.

Change the preset frequency in standard mode:
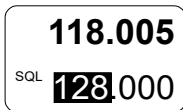
118.005
SQL **128**.000

- Make a "short push" on the rotary encoder to change the MHz digits.
  - o The changeable digits are shown inverted.
- Turn the rotary encoder clockwise/counter clockwise to change the frequency in 1 MHz steps.
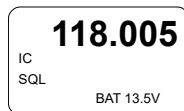
118.005
SQL 128.**0**00

- Make another "short push" on the rotary encoder to change the 100 kHz digits.
  - o The changeable digits are shown inverted.
- Turn the rotary encoder clockwise/counter clockwise to change the frequency in 100 kHz steps.

118.005
SQL 128.0**00**

- Make another "short push" on the rotary encoder to change the 25/8.33 kHz digits.
  - o The changeable digits are shown inverted.
- Turn the rotary encoder clockwise/counter clockwise to change the frequency in 25/8.33 kHz steps.

NOTICE

- A short push of the "↕/SCN" key, exchanges active frequency to preset frequency and vice versa.
  - o While the transceiver operates in transmit mode, the exchange function is disabled.
- Push the "STO" key to store the active frequency into the next vacant memory position of the user channel database (see "Frequency Storage Functions", page 24).

3.7.2 **Direct Tune Mode**

118.005
IC
SQL
BAT 13.5V

- Push the "MDE" key to change to the direct tune mode page.
  - o The active frequency is shown in the top line.
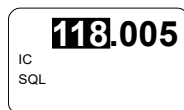- The battery information is shown.

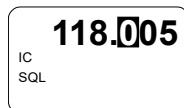| NOTICE | The battery information is only displayed if BATTERY VOLTAGE in the "Configuration Setup*" is selected. |

* For details please refer to related manual:
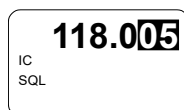http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

Change the active frequency in direct tune mode:

118.005
IC
SQL

- Make a "short push" on the rotary encoder to change the MHz digits.
  - o The changeable digits are shown inverted.
- Turn the rotary encoder clockwise/counter clockwise to change the frequency in 1 MHz steps.

118.005
IC
SQL

- Make another "short push" on the rotary encoder to change the 100 kHz digits.
  - o The changeable digits are shown inverted.
- Turn the rotary encoder clockwise/counter clockwise to change the frequency in 100 kHz steps.

118.005
IC
SQL

- Make another "short push" on the rotary encoder to change the 25/8.33 kHz digits.
  - o The changeable digits are shown inverted.
- Turn the rotary encoder clockwise/counter clockwise to change the frequency in 25/8.33 kHz steps.

| NOTICE | - The changes are active immediately.
  - o While the transceiver transmits, the change of the active frequency is not possible.
- Push the "STO" key to store the active frequency into the next vacant memory place of the user channel database (see "Frequency Storage Functions", page 24). |

3.7.3   Channel Mode

- The channel mode shows data from the user channels database ("CH"), or last channels database ("LAST").
- The entry shows a customized label (identifier, max. 10 characters), if applied, for the frequency.
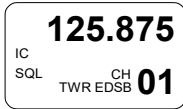
125.875 IC SQL TWR EDSB CH **01**	**The channel database can store frequencies in channels:** - CH01…CH99 and - LAST 1…LAST 9
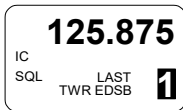
125.875
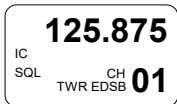IC
SQL
TWR EDSB   LAST **1**

NOTICE	- The functions "LAST" and Store/Restore are only available if they are enabled in the configuration setup* - ("MEM OPTIONS"). - If the device operates 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.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

125.875
IC
SQL
TWR EDSB   CH **01**
	- Push the "MDE" key to change to the channel mode page.
	- Use the rotary encoder to select the channel number/frequency.
	    o The top line shows the related frequency and the bottom line the customized label (identifier) and the channel number/frequency.
	    o If the active frequency is not yet stored, then shows the display "CH--".

3.7.3.1   **Select Channels**
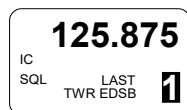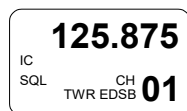
NOTICE	• The functions "LAST" and Store/Restore are only available if they are enabled in the configuration setup* - ("MEM OPTIONS").

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

Example: With CH01 user channel on the display:

In order to select the channel number:

125.875
IC
SQL   CH
    TWR EDSB **01**

• The first turn clockwise in channel mode starts access to the user channels CH01…CH99.
   o   Make a short push on the rotary encoder or:
   o   Make one clockwise turn with the rotary encoder.

⤓ …

125.875
STO   CH
        FREE **09**

• The channel number is now highlighted.
• Turn the rotary encoder to select a channel.
• With each step the device tunes immediately to the shown frequency.
   o   The first turn counter-clockwise starts access to the channel "LAST 1".
      o   The channel number is now highlighted.
      o   One of the nine last used channels is selectable.
      o   Turn the rotary encoder to select a channel.

125.875
IC
SQL   LAST
    TWR EDSB **1**

NOTICE	• The "LAST" mode is left automatically after a 5 second timeout or stopped by the user with a push on the rotary encoder. • When leaving the "LAST" channel database and the last shown frequency is not stored in the user channel database, the display shows "CH__". • Push "STO" to start the storage process.

Cancel channel mode:
• Push the "MDE" key.
   o   The channel mode will be closed.
   o   The standard mode page is shown.

3.7.4   **Frequency Storage Functions**

Start store function:

125.875
STO   CH **09** FREE

- Push "STO" key.
  (in "Standard", Direct Tune" or "SCAN Mode").
  - o   The symbol "STO" is shown.

3.7.4.1   **Store**

NOTICE	• The functions "LAST" and Store/Restore are only available if they are enabled in the configuration setup* - ("MEM OPTIONS").

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

The transceiver has two databases:

- The user channel database - it has 99 channels CH01…CH99 to store frequencies with the possibility to apply a customized label (identifier) with max. 10 alphanumeric characters.
- The last channel database - automatically stores last used frequencies.
  Named and callable as LAST 1…LAST 9, the customized identifier will be shown (if applied).

- You can store frequencies (in the range 118.000...136.9916 MHz) to any channel with a push the "STO" key.
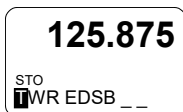- All 99 channels are changeable.

With the start of the storage procedure, the device proposes the next free channel first.

125.875
STO CH
FREE **09**

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

125.875
STO CH
USED **09**
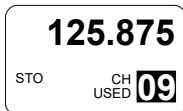
- A selected channel with a stored frequency has the label "USED".

125.875
STO
■WR EDSB _ _

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

125.875
STO
■ _ _ _ _ _ _ _ _ _

- If the frequency has no label attached, ten underscore digits are shown to give in a label.
- The cursor automatically starts on the first position.

Overview - The user can store data to:
- Next free channel (offered from system).
- A selected free channel.
- A selected used channel (the existing data will be overwritten).

Label (Identifier) Data:

125.875

STO
■ _ _ _ _ _ _ _ _
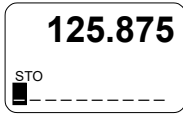
- Turn the rotary encoder to select the characters.
- The selection works in both directions
  (example: blank → A →…Z → 0 → 9 → — → / → blank
  →A with a turn clockwise or counter clockwise).
- A short push on the rotary encoder and the cursor is on the next position.
- A short push of the "STO" key stores the label.
- A long push of the "STO" key clears the label.
- When the change is stored the transceiver changes to the before selected mode.
- If no action occurs in label editing mode in 7 seconds, the transceiver changes to the before selected mode without storage the frequency and label information.
- Stored frequencies are callable in channel mode (see "Channel Mode", page 22).

3.7.4.2   Automatic Storage Function

The transceiver stores recently selected frequencies. Named and callable as LAST 1…LAST 9 (see "Channel Mode", page 22).

- With the change to a new active frequency, the before selected active frequency is stored in memory as LAST 1.
- The frequencies stored in LAST 1...LAST 8 are shifted to memory channels LAST 2...LAST 9.

Notice   **The functions "LAST" and Store/Restore are only available if they are enabled in the configuration setup* ("MEM OPTIONS").**

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

3.7.4.3   Delete data:

The stored data in user channel database can only be deleted in the configuration setup*. Please notice, the whole channel database will be reset.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

3.7.5   SCAN Mode

118.005

SQL
SCAN **127.000**

- 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 symbol in the display shows that scan function is started.

In all frequency selection modes:
- A long push (>2 s) of "↕/SCN" key starts the scan function and changes to standard mode, if started from channel or direct tune mode.
- A short push on the "MDE" key or a long push (>2 s) on "↕/SCN" key stops the scan function.
The device stays in standard mode.

118.005

SQL ►**127.000**
SCAN

- The arrow symbol "►" in front of the frequency shows that this frequency is audible.

118.005

SQL **127.000**
SCAN
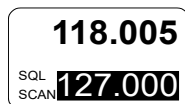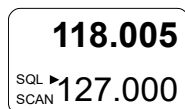
If both the active and preset frequency find a signal at the same time, the active frequency (top) has priority.
- The preset frequency is shown inverted and blinks.
- An audio notification "beep" tone is audible and the preset frequency blinks to show that there is a RX signal on the preset frequency (if enabled in the configuration setup*).

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

Reception on preset frequency in scan mode:

118.005

SQL ►**127.000**
SCAN
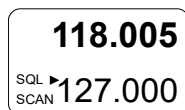
- If the preset frequency finds a signal and no signal is on the active frequency, the transceiver automatically changes to the preset frequency.
- The arrow sign "►" in front of the frequency shows that this frequency is audible.

Notice: **For transmission is always the active frequency used, also if the monitored frequency is currently audible.
If TX on the preset frequency is required, push the "↕/SCN" key to change active and preset frequency.**

3.8   SQUELCH

- This function operates independently of the selected operation menu.
- A short push on "SQL/IC" key changes the function to "ON" or "OFF".

118.005

SQL 127.000

Squelch "ON"

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

▷**118.005**

SQL 127.000

Squelch "OFF"
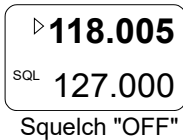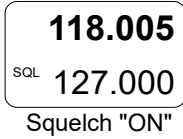
- If the squelch is "OFF" the arrow symbol "►" in front of the active frequency stay into view all the time.
- Audio noise is audible as long as the signal is received.

- The squelch threshold is adjustable see "" page 35.

3.9   RX Field Strength Indication

- The field strength is shown with triangle symbol in front of the related frequency (in all frequency selection modes).
- The field strength of a received signal relates to the measured RSSI level ("Received Signal Strength Indication").
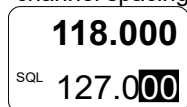
Weak Signal Strength	Good Signal Strength	Excellent Signal Strength
RSSI passing squelch levels (empty triangle)	-88 > RSSI > -80 dBm (half-filled triangle)	RSSI > -80 dBm (fully filled triangle)
▷**118.005** SQL 127.000	▸**118.005** SQL 127.000	▶**118.005** SQL 127.000
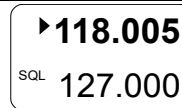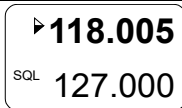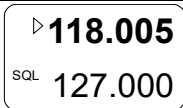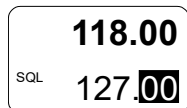
3.10   Channel Spacing

- The transceiver can operate in 8.33 kHz and 25 kHz frequency channel spacing.
- Push and hold the MOD and STO key at the same time for > 2 s to change 8.33 to 25 kHz channel spacing and vice versa.
- In 25 kHz mode, 5 frequency digits are shown.
  - o Only operating frequencies with a channel spacing of 25 kHz are selectable.
  - o This mode has a faster tuning, because it does not show the 8.33 kHz frequency steps.

118.00
SQL 127.**00**
25 kHz
channel spacing

118.000
SQL 127.0**00**
8.33 kHz
channel spacing

- In 8.33 /25 kHz mixed mode 6 frequency digits are shown.
  - o The transceiver tunes to all possible frequencies in the aviation VHF frequency band.

Notice:

The 62XX-(0XX) variants can operate in 8.33 /25 kHz channel spacing modes.

The 62XX-(1XX) variants can operate in 25 kHz mode only.

## 3.11   Auxiliary Audio Input (AUX INPUT)

- The auxiliary audio input is used for e.g. MP3 player connection.
  - o This function can be enabled/disabled in the configuration setup*.
- With AUX INPUT enabled:
  - o The auxiliary audio input signal will be mixed with the received signals from antenna (passing squelch) and the intercom signal (when started).
  - o When the intercom operates in isolation mode, the auxiliary audio input signal is audible on headphone 2 output, also if radio communication (transmission/receiving) is started.
- The AUX AUTO MUTE function depends on the AUX INPUT.
  - o This function can be enabled/disabled in the configuration setup*.
  - o 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 stops the squelch manually.
- With auxiliary input disabled:
  - o 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.
  - o The level of the auxiliary input signal attenuates if intercom is started by VOX or by /IC discrete input.
  - o After intercom deactivation, the auxiliary input signal changes to its value before.
  - o The attenuation value can be adjusted.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

3.12   Intercom Operation

The intercom operation can be started automatically with VOX (with adjustable threshold) or externally with an intercom switch.
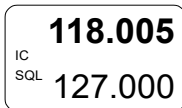
|	
118.005 IC SQL 127.000	• If intercom operation is started, the "IC" symbol appears in the display.
NOTICE	• The intercom volume and the VOX threshold is adjustable in the intercom menu. o In tandem configuration (application with additional controller) on primary controller only.

3.12.1 **Pilot Circuit and Passenger Circuit**

- The transceiver has two internal intercom circuits.
- Up to four headsets are connectable.
- The pilot and co-pilot are connected to the first intercom circuit.
  - o When intercom is active, both microphone signals are mixed and amplified.
  - o The signal is audible on both headphone outputs.
  - o The internal communication with headsets between both pilots is possible.
- The passenger headsets are connected to the second intercom circuit.

- ALL mode - Everyone connected to the intercom hear all communications.
  - o Pilots hear passengers and passengers hear pilots.
- ISOL mode - Isolated intercoms for the pilots (intercom circuit 1) and the passengers (intercom circuit 2).
  - o This lets pilots communicate with each other and air traffic, while the passengers are isolated.
  - o The passengers on the intercom circuit 2 can hear auxiliary audio (e.g. from MP3 player) and can communicate with each other.
- An external ISOL input gives the possibility to change between ALL mode and ISOL mode.
- If the PTT1 input is started and ISOL is active the passenger intercom operation on second intercom circuit is still possible.

3.12.2 **Intercom Operation started with VOX**

| 118.005 |
| IC |
| SQL 127.000 |

- The intercom operation can be started automatically with VOX.
- The VOX threshold is adjustable in the intercom menu.
  - o In tandem installations (application with additional controller) make the adjustments on the primary controller.
  - o In tandem installations with a second intercom circuit make the adjustments for the second circuit on the secondary controller.

| 118.005 |
| SQL 127.000 |
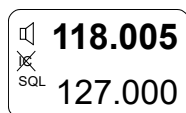
- The intercom operation cannot be started if:
  - o The speaker is enabled (see "VOX & Speaker Operation" page 32).
  - o The user turned VOX off.
- The display shows the symbol ✕ if:
  - o VOX is off.
  - o The speaker is enabled.

3.12.3 Intercom Operation started with an Intercom Switch

- The intercom operation can be started externally with an intercom switch.
  - o The external intercom switch has priority.
  - o During intercom operation the speaker output is disabled.

3.13

3.13   VOX & Speaker Operation

NOTICE

- The speaker always enabled (depends on wiring and configuration).
- To enable/disable the speaker it is necessary to change to the configuration (CFG1, CFG2*) with the related adjustment for the speaker.
  - o An external mike switch is necessary to change between the configurations CFG1 and CFG2.
- When the speaker is enabled and not muted, the display will show the loudspeaker symbol.

⌐◁ **118.005**
◁̸
SQL 127.000

- When the speaker is enabled and not muted.
  - o VOX is forced "OFF".
  - o Start of the intercom with VOX is not possible.
- In transmission mode the speaker output is muted ("OFF"), if:
  - o The intercom is started with the external intercom switch.
  - o The power supply voltage is < 10 V.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

3.14   Menus

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

- The user menu,
  it is for adjustments of panel brightness and squelch threshold.

- The intercom menu,
  it is for adjustments of intercom volume and VOX threshold.

3.14.1 **User Menu**

- A long push (>2 s) on "MDE" key starts the user menu.
- The menu has two pages:
    o BRIGHTNESS
    o SQUELCH TRH
- A short push on "MDE" key or the rotary encoder changes the pages.

118.005
IC
BRIGHTNESS
                    96
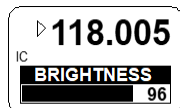
BRIGHTNESS:
- The display shows the active frequency in the top line.
- The adjustable value is shown as bar graph and as numerical indicator in the bottom line.
- The brightness is adjustable from 0…100 (rotary encoder).
    o 0, illumination is off.
    o 100, maximum brightness.

Notice:

This page is not available if the dimming input is set to 14 V or 28 V in the configuration setup*.

For this adjustment, the dimming circuit controls the brightness parameters.

118.005
IC
SQUELCH THR
                    10
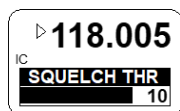
SQUELCH TRH:
- The display shows the active frequency in the top line.
- The adjustable value is shown as bar graph and as numerical indicator in the bottom line.
- The squelch threshold is adjustable from 6…26 (rotary encoder).
    o 6, very weak signals are audible with high noise content; squelch opens at about -105 dBm.
    o 26, only quite strong signals are audible with low noise content; squelch opens at about -87 dBm. The receiver sensitivity is very decreased.

Cancel the menu:
- Automatically after 5 seconds timeout.
- Another long push (>2 s) on "MDE" key.
- A short push on the rotary encoder when the "SQUELCH TRH" page is started.

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

3.14.2 **Intercom Menu**

- A long push (>2 s) on "IC/SQL" key starts the intercom menu.
- The menu has two pages:
  - IC VOLUME.
  - IC VOX.
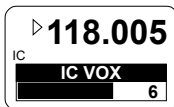- A short push on " IC/SQL" key changes the pages.
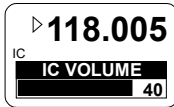
IC VOLUME:

- The display shows the active frequency in the top line.
- The adjustable value is shown as bar graph and as numerical indicator in the bottom line.
- The intercom volume is adjustable from 0…46 (rotary encoder).
  - The intercom volume affects the intercom audio and sidetone.
- The changes are active immediately.

Notice:

Access to the VOX threshold level is not possible if VOX is forced "OFF".

Access to the VOX threshold level is not possible if the speaker is enabled.

IC VOX (threshold):

- The display shows the active frequency in the top line.
- The adjustable value is shown as bar graph and as numerical indicator in the bottom line.
- The VOX threshold is adjustable from -30…+10 (rotary encoder).
  - -30, most sensitive, a very low microphone signal starts the intercom operation.
  - +10, less sensitive, only a high microphone signal starts the intercom operation.
- The changes are active immediately.

- With an adjustment of >+10 is the VOX operation disabled.
  - The word "OFF" replaces the numerical value indication.
  - The activation of intercom operation with an external intercom switch is still possible at any time.
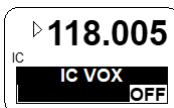
NOTICE
- In tandem installation:
  - The primary controller adjusts VOX threshold for first intercom circuit.
  - The second controller (RCU62X1) adjusts VOX threshold for second intercom circuit.

Cancel the menu:
- Automatically after 5 seconds timeout.
- Another long push (>2 s) on "MDE" key.

NOTICE	• The adjustment of -15 for VOX threshold is a convenient behavior in most aircraft.
	o This made a correct adjustment for the mike sensitivity necessary (see configuration*).

3.15   Read Out and Reset Error/Failure Flags

NOTICE	**The fail list (fail history) is only available in the password-protected configuration setup*.**

* For details please refer to related manual:
http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

3.16   Warning and Failure Indications

Display Contents	Description
118.005 IC **LOW BATTERY** at intervals of 3 s	**"LOW BATTERY":** • The supply voltage of the transceiver is less than the threshold adjusted in the configuration setup. • The device is operable but it can have a decreased performance depending on supply voltage. **Possible cause:** • Accumulator capacity problems • Power interrupts. • General power supply problems. • Adjustment for low battery threshold too high.
118.005 IC **STUCK PTT** at intervals of 3 s	**"STUCK PTT":** • The transmit mode is automatically terminated (return to receive mode) after 120 s of continuous transmitting. • The transceiver goes back to receive mode also if the PTT line is still active (GND). **Possible cause:** • Transmission continues more than 120 seconds. Frequent overriding can decrease the MTBF. • PTT-key is stuck. • PTT line permanently grounded (short circuit in installation). Notice: For the start of a new transmission it is necessary to set the /PTT line inactive (open).
118.005 IC **TX HOT** at intervals of 3 s	**"TX HOT":** • "TX HOT" is shown if the internal device temperature is > +90 °C. • Transceiver is still operable. The performance of transmitter is decreased. **Possible cause:** • Very high environmental temperature, long transmissions times and airflow conditions are not sufficient.

Display Contents	Description
118.005 IC **FAILURE** at intervals of 3 s	• The transceiver has found an internal failure during normal operation. • Depending on failure cause, the device is operable with decreased performance, or not operable at all. **Possible cause:** • Specified environmental conditions. • HW or SW failure inside the transceiver.
FAILURE PRESS ANY KEY	• The transceiver has detected an internal failure during start up. • Depending on failure cause, the device is operable with decreased performance or not operable at all. **Possible cause:** • Outside specified environmental conditions. • HW or SW failure inside the transceiver.
FAILURE	• The transceiver has no communication with the controller. • Depending on failure cause, the device is operable with decreased performance or not operable at all. **Possible cause:** • Problem with the interwiring.

Contact maintenance shop for assistance, if you cannot find the failure.

4 **Technical Data**

	Specifications
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 (variant -1XX) 118.000...136.9916 MHz (variant -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, AR621X, RCU6201, RCU6211)
	-40...+55 °C (RT6201, RT6211)
	short-term +70 °C
Storage temperature	-55...+85 °C
Detailed data see related manual:	http://www.becker-avionics.com/manuals/ Communication → VHF Transceiver

5   Contact Data

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 done by trained Becker Avionics personnel.

For relevant department and addresses, please see contact info page 2.

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

6 **Index**

We reserve the right to make technical changes.
The data match to the current status at the time of printing.

*** End of the Document ***