Portable
VHF Stations

GK615
GK616

Installation and Operation

Manual DV16800.03
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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 GmbH 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 observed.
  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 GmbH have to be observed.
- To the extent that Becker Avionics GmbH 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.

Preface

Dear Customer,

Thank you for purchasing this BECKER product.

We are pleased that you have chosen our product and we are confident that it will meet your expectations.

For development and manufacturing of our product, the guidelines for highest quality and reliability have been borne in mind, supplemented by selection of high quality material, responsible production and testing in accordance to the ISO 9001 and DIN EN 9100 standards.

Our competent customer support department will respond on any technical question you may have.

Please do not hesitate to contact us at any time.

Portable VHF Stations

GK61X without accessories

Example: GK61X with accessories

Example: GK61X with accessories

List of Effective Pages and Changes

Only technical relevant modifications are described in this table.

Document:	**DV 16800.03 / issue 04**	**Article Number 0633.496-071**
Cover Page	10/2017	
Introduction	10/2017	
Chapter 1 – 5	10/2017	

Issue	**Page No.:**	**Section / Chapter**	**Description**
04	1-56	all	Changed: Editorial adjustments.
	--	all	Updated: Technical information about GK615-10. Added: Technical information about GK616-E-1.
	--	1.5	Added: Scope of functionality.
	--	1.8.5	Added: Information about certification.
	--	3	Updated: Operating instructions.
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Table of Contents

List of Abbreviations

List of Abbreviations	
AC	Advisory Circular
FAA	Federal Aviation Administration
HW	Hardware
PBIT	Power-On Built In Test
PTT	Push To Talk
SW	Software
TX	Transmit
VHF	Very High Frequency

Units

Units	
A	Ampere
mA	Milliampere
°C	Degree Celsius
cm	Centimetre
dBm	Power Ratio in Decibel referenced to 1 mW
dB	Decibel
g	Gram
kg	Kilogram
kHz	Kilohertz
MHz	Megahertz
mm	Millimetre
Nm	Newton metre
Ohm (Ω)	Resistance
s	Second
V	Volt
mV	Millivolt
W	Watt
mW	Milliwatt
"	Inch

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.

Is used to address practices not related to physical injury.

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

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.

- Dispose circuit boards 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.

NOTICE

DO NOT throw the device(s) in municipal waste. This product has been designed to enable proper reuse of parts and recycling. Check local regulations for disposal of electronic products.

DO NOT throw the battery in municipal waste. The symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Information about where old batteries can be disposed free of charge is available at your local authorities.

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 this manual).

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

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 installation and operation.

Otherwise 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.

Additional Conditions of Utilization

Please refer to "Safety-Conscious Utilization", page 17.

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.

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1. General Description

In this chapter you can read about:

1.1. Introduction

This manual describes the operation and installation of GK615-XX and GK616-XX. The type plate on your device shows the part number for identification purposes (see "Type Plate", page 25).

Before starting operation of the device(s) please read this manual carefully, with particular attention to the description referring to your device(s).

For further descriptions we are using the term GK61X for the VHF Station instead writing the complete model number.

The manual "Installation and Operation" (I&O) contain the following sections:

	Section	DV 16800.03 I&O
	General	X
	Installation	X
	Operation	X
	Certifications	X

1.2. Purpose of Equipment

The easily-portable VHF stations GK61X can be used e.g. for mobile and fixed operations on airfields or landing strips. It can also be used in hot air balloons, for ferrying aircraft or recovery of gliders.

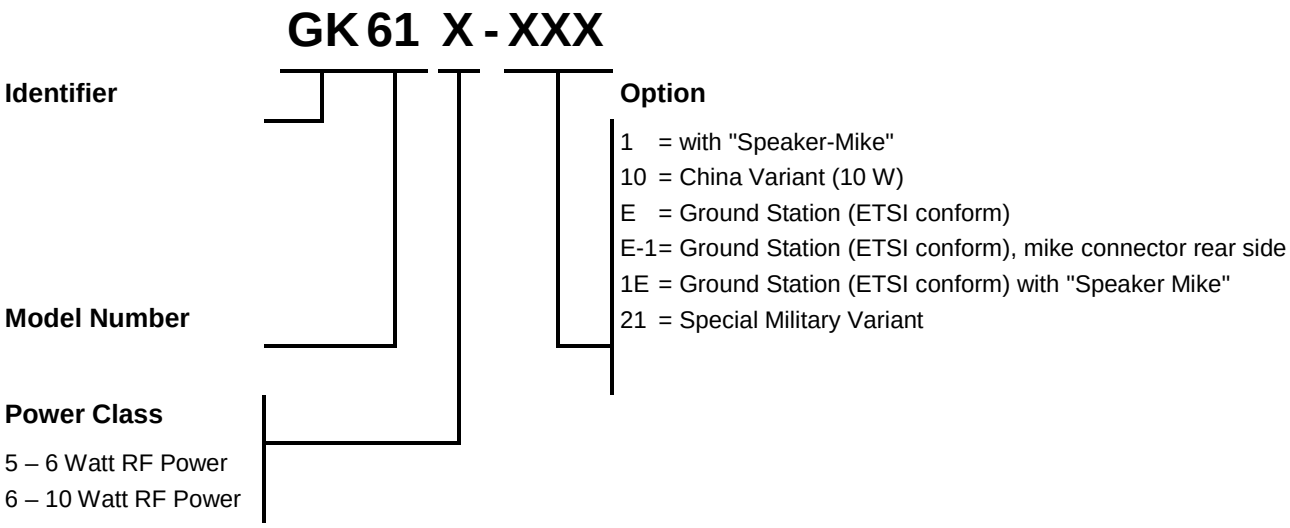
The carrying case contains the batteries, speaker, antenna socket, the socket for the microphone or microphone speaker and the voltage converter. Either a microphone, a headset or a helmet (ultralight) can be connected.

The portable VHF station is ready for operation after the antenna is connected and the microphone plugged in.

The portable VHF station consists of the carrying case and one of the available transceivers. Combinations please see "Combinations - Portable VHF Station" page 14.

1.3. Variants Overview

Within the part number, the meaning of "X-XXX " is:



1.3.1. Software Status

Descriptions see "Software/Firmware Status – Functionality", page 25.

1.4. Combinations - Portable VHF Station

Figure 1 GK61X with microphone 1PM415-1

Figure 2 GK61X with microphone 1PH01

Here the most commonly used combination:

	Application	Version	Transceiver	Microphone	Antenna	Remark
6 Watt Transceiver	Airborne	GK615 0622.834-923	AR6201-(022)	1PM415-1 0603.120-350	1A415 0884.294-952	whip antenna and dynamic microphone
		GK615-1 0622.842-923	AR6201-(022)	1PH012 0498.475-951	1A415 0884.294-952	whip antenna and speaker microphone
	Ground	GK615-E 0638.481-923	GT6201-05	1PM415-1 0603.120-350	1A415 0884.294-952	whip antenna and dynamic microphone
		GK615-1E 0638.498-923	GT6201-05	1PH012 0498.475-951	1A415 0884.294-952	whip antenna and speaker microphone
10 Watt Transceiver	Airborne	GK615-10 0638.625-923	AR6201-(012)	1PM415-1 0603.120-350	1A415 0884.294-952	whip antenna and dynamic microphone
	Airborne	GK616 0638.463-923	AR6201-(012)	1PM415-1 0603.120-350	1A415 0884.294-952	whip antenna and dynamic microphone
		GK616-1 0638.471-923	AR6201-(012)	1PH012 0498.475-951	1A415 0884.294-952	whip antenna and speaker microphone
	Ground	GK616-E 0638.501-923	GT6201-10	1PM415-1 0603.120-350	1A415 0884.294-952	whip antenna and dynamic microphone
		GK616-E-1 0649.163-923	equipment equal to GK616-E, but mike connector at the rear side			
		GK616-1E 0638.511-923	GT6201-10	1PH012 0498.475-951	1A415 0884.294-952	whip antenna and speaker microphone
	Special Mission	GK616-21 0637.289-923	AR6201-(021)	1PH012 0498.475-951	1A415-1 0586.137-375	Olive green housing, steel band antenna and speaker microphone

1.5. Scope of Functionality

1.5.1. Frequency Indication

A liquid crystal display (LCD) provides frequency indication. The required operating frequency is selectable by means of a "ROTARY ENCODER". The relation between the real operating frequency and the displayed frequency complies with the standards (ICAO Annex 10, Volume II). For an overview, refer to the table below.

Operating Frequency MHz	Channel Spacing kHz	Displayed Frequency	
		8.33 + 25 kHz mixed Mode	25 kHz Mode
118.0000	25	118.000	118.00
118.0000	8.33	118.005	N/A
118.0083	8.33	118.010	N/A
118.0166	8.33	118.015	N/A
118.0250	25	118.025	118.02
etc.	etc.	etc.	etc.
136.9750	25	136.975	136.97
136.9750	8.33	136.980	N/A
136.9833	8.33	136.985	N/A
136.9916	8.33	136.990	N/A

1.5.2. Audio In- & Outputs

- GK61X includes a recorder output on the rear panel connector.
- GK61X includes an input for dynamic microphone, phone and PTT at the front panel connector.
- GK61X includes a headphone 1 output, rated output power is 300 mW into 75 Ω (with floating transformer output).
- GK61X includes a headphone 2 output, rated output power is 200 mW into 75 Ω.
- GK61X includes a speaker with rated output power is 4 W into 4 Ω.

Note: Headphone 2 and speaker output cannot be active at the same time

1.5.3. Squelch Operation

When enabled the squelch (muting) circuit suppresses weak signals. There are two kinds of squelch methods implemented, carrier- and noise-squelch. Carrier-squelch depends on the received signal strength and is adjustable in installation setup; the noise-squelch depends on the detected noise level and is adjustable in the user setup.

1.5.4. Memory Channels

The memory function allows storage of up to 99+9 frequencies. This memory may contain up to 99 frequencies stored manually. A user defined text label is assignable for each stored frequency. Additionally, the last recently used 9 (active) frequencies are stored automatically as "LAST" channels.

1.5.5. Scan Mode

Scan mode provides a dual watch function. The device is capable of monitoring frequencies on two different channels, active & preset simultaneously. The signal of the active frequency will always be audible, since it will have priority at all times.

1.5.6. Illumination

The illumination of LCD and push buttons can be controlled from the front panel via the user menu.

1.5.7. Power Supply

The built-in battery is a maintenance-free rechargeable dry lead acid battery 12 V/2 Ah (the number of the built-in batteries depends on the model). The transmitter power is approximately 5...7 W at 12 V and 10 W at 24 V supply voltage.

The battery can be charged via the external DC socket.

The charging time for a complete discharged battery is approximately 8 hours. The nominal operating time for the portable VHF station is approximately 6 hours at a keying ratio of 1:10 (normal radio traffic) and a transmit output power of 5 W.

Reception is still guaranteed for ca. two further hours. Afterwards the GK61X needs to be recharged.

NOTICE Please note:
During recharging the battery, the PTT shall **not** be being pressed.

The transceiver contains a monitoring stage for the battery voltage which is activated when the device is switched on. "LOW BATT" is indicated (appearance about every 5 seconds) if the supply voltage of the transceiver is below the threshold defined in the installation setup. The transceiver is still operable. Depending on the supply voltage the transceiver may have a reduced performance.

1.5.7.1. LOW BATT Indication

The transceiver monitors power supply voltage. If the supply voltage drops below the adjustable threshold, the display indicates the message "LOW BATT". If the power supply voltage drops further, emergency operation mode will be activated.

1.5.8. Built-in Tests PBIT and CBIT

After power-up, the device performs a self-test (power-up built-in test / PBIT). During PBIT, the transceiver displays "WAIT" and additionally the corresponding software versions of both, the control head and chassis module become visible.

If faults are detected during PBIT, the error message "FAILURE, press any key" is displayed. If no faults are detected the transceiver automatically activates the last active mode set at last power-off.

During normal operation, a continuous built-in test (CBIT) permanently verifies the correct operation of the device. If detecting a problem during CBIT an error message become displayed.

1.6. Safety-Conscious Utilization

NOTICE The following notes should always be taken in account to ensure a safe and normal operation of our product.

- Before first use, the built-in battery should be charged for approx. 8...10 hours. Man-carried GK61X can be charged via the included battery charger; for car installations the battery will be recharged automatically via the Car Battery Cable 1KA615 (accessory, to be ordered separately) as soon as the car power supply is available.
- To assure long battery life the GK61X should not be stored in a discharged state for a longer time.
- Speak loud into the microphone and keep it always close to the lips, otherwise ambient noise can be intrusive and make understanding difficult.
- Use only microphones or headsets, which are suitable for ground-stations. Radiation received from the equipment antenna can affect the integrated amplifier of the microphone (feedback). This is noticeable in the receiving station by whistling and/or heavy distortion. The described disturbances can occur in different ways on different transmit channels.
- Transmit buttons can stick, or TX line is short circuited thus causing continuous carrier signal on the active channel. Therefore, ensure that the display (sign "**TX**") disappeared when the "PTT" button was released.

⚠CAUTION Long term and very close exposure of a human body to VHF radiation may in individual cases cause health issues.

1.7. Restriction for Use

SAFETY INSTRUCTIONS The product is to be used inside the declared limits.
(see "Technical Data" page 18).

1.8. Technical Data

1.8.1. General Characteristics

GK61X	Specifications
DC Supply voltage	10...32 V
Nominal supply voltage	12 V / 24 V
Fuse	GK615: 2x T 2 A slow blow GK616: 1x T 2 A slow blow + 1x T 3 A slow blow
Fuse AR620X-XXX/GT6201-XX	7 A
Mike/Headphone connection Dyn. Mike	2...10 mV
Headphone	40 mW / 300 Ω
Recorder Output	symmetric, 0 dBm @600 Ω
Antenna impedance	50 Ω
Number of Batteries	1 (GK615), 2 (GK615-10, GK616)
Battery type	Dry Lead Acid Battery
Battery capacity	2 Ah / 12 V (GK615-XX) 2x 2 Ah / 12 V (GK615-10, GK616-XX)

1.8.2. Dimensions & Weight

GK61X	Specifications
Dimensions HxWxD	270 x 175 x 80 mm
Weight	4.4 kg (GK615-XX) 6.5 kg (GK615-10, GK616-XX)

Additional technical data see manuals AR6201 and GT6201.

AR620X I&O manual DV14307.03 Article no. 0617.857-071 (AR620X Family)

GT620X I&O manual DV17001.03 Article no. 0640.093-071

http://www.becker-avionics.com/downloads/

1.8.3. Software

The software for AR6201/GT6201 is as Level C in accordance with EUROCAE/RTCA document ED12B/DO-178B.

1.8.4. Complex Hardware

The AR6201/GT6201 devices do not contain complex hardware.

1.8.5. Certifications

SAFETY INSTRUCTIONS

Unauthorized changes or modifications to the 620X devices may void the compliance to the required regulatory agencies and authorization for continued equipment usage.

The AR6201 and the GT6201 are the built-in transceivers of the GK615 and GK616.

The type of the transceiver depends on the variant of the GK61X for details please see “Combinations - Portable VHF Station” page 14.

AR6201 Single Block Transceiver

Part Number	Article Number	EASA Approval	TSO Conformity	FCC Approval
AR6201-(012)	0631.418-910	EASA.21O.1249 ETSO-2C37e Class: D, E ETSO-2C38e Class: 4, 6	TSO-C169a Class: D, E, 4, 6	B54AR6201
AR6201-(022)	0636.339-910	EASA.21O.1249 ETSO-2C37e ETSO-2C38e Class: D, E, 4, 6	TSO-C169a Class: D, E, 4, 6	B54AR6201

GT6201 meet the requirements of ETSI EN 300 676 Regulations

Part Number	Article Number	Approval
GT6201-05	0637.351-923	BAF - German Federal Supervisory Office for Air Navigation Services D-0030/2014 Ministero Sviluppo Economico – Dipartimento per le Comunicazioni Registro ufficiale, Prot.n. 0041697-02/07/2014 Notification GZ: BMVIT-640.825/0301-III/BFT/2016
GT6201-10	0637.361-923	

GT6201 Notification

For further details about approvals/certification please see “Certifications” page 45.

1.9. Order Code

1.9.1. GK61X

Qty	GK615 (6 Watt Transceiver)	
1	GK615	Article-No. 0622.834-923
1	GK615-1	Article-No. 0622.842-923
1	GK615-E	Article-No. 0638.481-923
1	GK615-1E	Article-No. 0638.498-923

Qty	GK61X (10 Watt Transceiver)	
1	GK615-10	Article-No. 0638.625-923
1	GK616	Article-No. 0638.463-923
1	GK616-1	Article-No. 0638.471-923
1	GK616-E	Article-No. 0638.501-923
1	GK616-E-1	Article-No. 0649.163-923
1	GK616-1E	Article-No. 0638.511-923
1	GK616-21	Article-No. 0637.289-923

For details see "Variants Overview", page 13.

1.9.2. Accessories and Spare Parts


Antennas


Battery


Microphones


Power supply+cable


Handle


Bag


Car mounting bracket

Qty	Antenna	
1	Antenna 1A 415	Article-No. 0884.294-952
1	Steel band antenna 1A415-1	Article-No. 0586-137.375
1	Multiplex antenna1A415-2	Article-No. 0586-129.375

Qty	Battery	
1	Battery 12 V / 2 Ah	Article No. 0883.158-391

Qty	Microphone, Speaker	
1	Microphone 1PM 415	Article No. 0603.120-951
1	Speaker with Microphone 1PH012 (GK615-1 only)	Article No. 0498.475-951

Qty	Power supply + AC cable	Article-No. 0889.113-918
1	Power supply	Article-No. 0530.158-918
1	AC-connector cable	Article-No. 0295.728-276

Qty	Mounting, carry equipment	
1	Handle	Article-No. 0549.967-252
1	Car mounting bracket	Article-No. 0549.940-262
1	Microphone holder for 1PM415 Peiker HV5	Article-No. 0505.897-268
1	Car Battery Cable GK615 1KA615 (GK615 only)	Article-No. 0633.488-950
1	Carrying bag	Article-No. 0893.854-959

Qty	Available Documentation	
1	Manual Installation and Operation, English	Article No. 0633.496-071
1	Quick Start Guide / Kurzanleitung, English/Deutsch	Article No. 0646.921-071

Further accessories available please contact Becker Avionics.

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2. Installation

This manual must be available close to the device during the performance of all tasks.

Careful planning should be applied to achieve the desired performance and reliability from the product. Any deviations from the installation instructions prescribed in this document are under your own responsibility.

The installation of the VHF station depends on the type of vehicle and equipment design. It is therefore only possible to provide general guidelines in this section.

In this chapter you can read about:

2.1. Packaging, Transport, Storage

Visually inspect the package contents for signs of transport damage.

2.1.1. Packaging Material and Transport

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

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 24).

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 chippings can get into the device.

SAFETY INSTRUCTIONS The batteries have a self-discharging of approx. 1% per day. We recommend to recharge the batteries every 3 month of storage. Use delivered power supply+cable.

2.2. Device Assignment

This manual is valid for the following devices:

- GK615-XX + accessories
- GK616-XX + accessories

2.2.1. Scope of Delivery

- Manuals
  - Installation&Operation
- Device in accordance with your order
  - VHF transceiver (type depending on GK61X model),
  - Battery 12 V / 2 Ah (with GK615-10 and GK616 models two batteries),
  - Microphone or
  - Speaker, microphone, …
    (see “Combinations - Portable VHF Station” page 14)
  - Antenna 1A 415
  - Power supply and AC-connector cable
- Device accessories
  - Handle
  - Car mounting bracket
  - Carrying bag
- Documents: Declaration of Conformity

2.2.2. State of Delivery

- GK615, GK616 is ready for use
  - No programming procedures required

2.2.3. Additional Required Equipment

- Connector kits
- Cable harness

Details see "Order Code", page 20.

2.2.4. **Type Plate**

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

Figure 3 Type plate (example)

Explanation:

PN:	**Example Type designation: GK61X-XX** **GK615** = 6 Watt Transceiver **GK616** = 10 Watt Transceiver **Options:** **1** with "Speaker-Mike" **10** available for China only (10 W) **E** Ground Station (ETSI conform) **E-1** Ground Station (ETSI conform), mike connector on the rear side **1E** Ground Station (ETSI conform) with "Speaker Mike" **21** Special Military Variant
SN:	Unique number of the particular device
AN:	Article number
	Software: Corresponding to the displayed version
	Compliance and Certifications Corresponding to the displayed text and logos

2.2.5. **Software/Firmware Status – Functionality**

- The implemented firmware version can be checked in the display via the configuration menu.
- The software version is subject to change without notice.
- For detailed information about modifications you may contact our Customer Service Department.

2.3. Mounting Requirements

SAFETY INSTRUCTIONS

The device must not be opened.

When installing the device, make sure that the air circulation guaranteed heat dissipation of the device. Keep an efficient distance of the devices with integrated ventilator fans in order to ensure free circulation of the cooling air.

Make sure that the mounting plate is not exposed to external temperature influences.

Wiring:

The following general precautions are to be observed.

- All electrical systems in the vehicle shall be switched off and screened.
- No other leads should be included in the supply lead loop.
- All cable terminations to the equipment shall be marked.
- The cable harness must be able to move freely and thus prevent fracture of the wires. It should also be placed in a manner that the individual cables are not abraded on the cabinet or chassis.
- Twisted, screened cables should be used for symmetrical connections to minimise interference from electrical and magnetic fields.

2.3.1. Installation in a Vehicle

- Please use the car mounting bracket for installation.
- Make sure to find a suitable spot to place the three bolts.
- Please check easy access to the controls and indicators of the GK61X.
- Detailed information please see "Dimensions", page 27.

2.4. Dimensions

2.4.1. GK61X

Dimensions mm (inch)

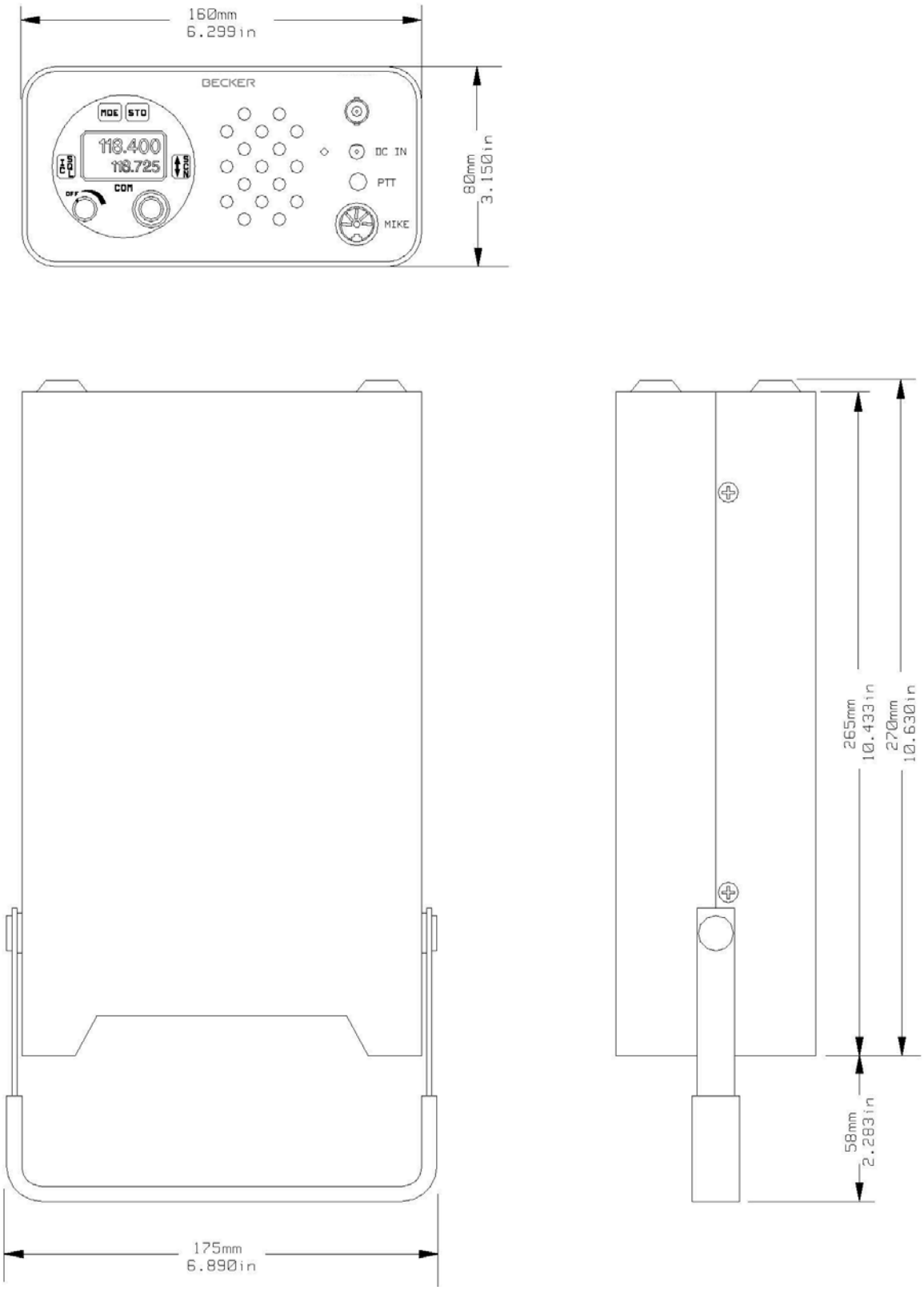


Figure 4 Dimensions GK61X

2.4.2. **Drilling Template for Vehicle Mounting**

Dimensions mm (inch)
No scale drawing

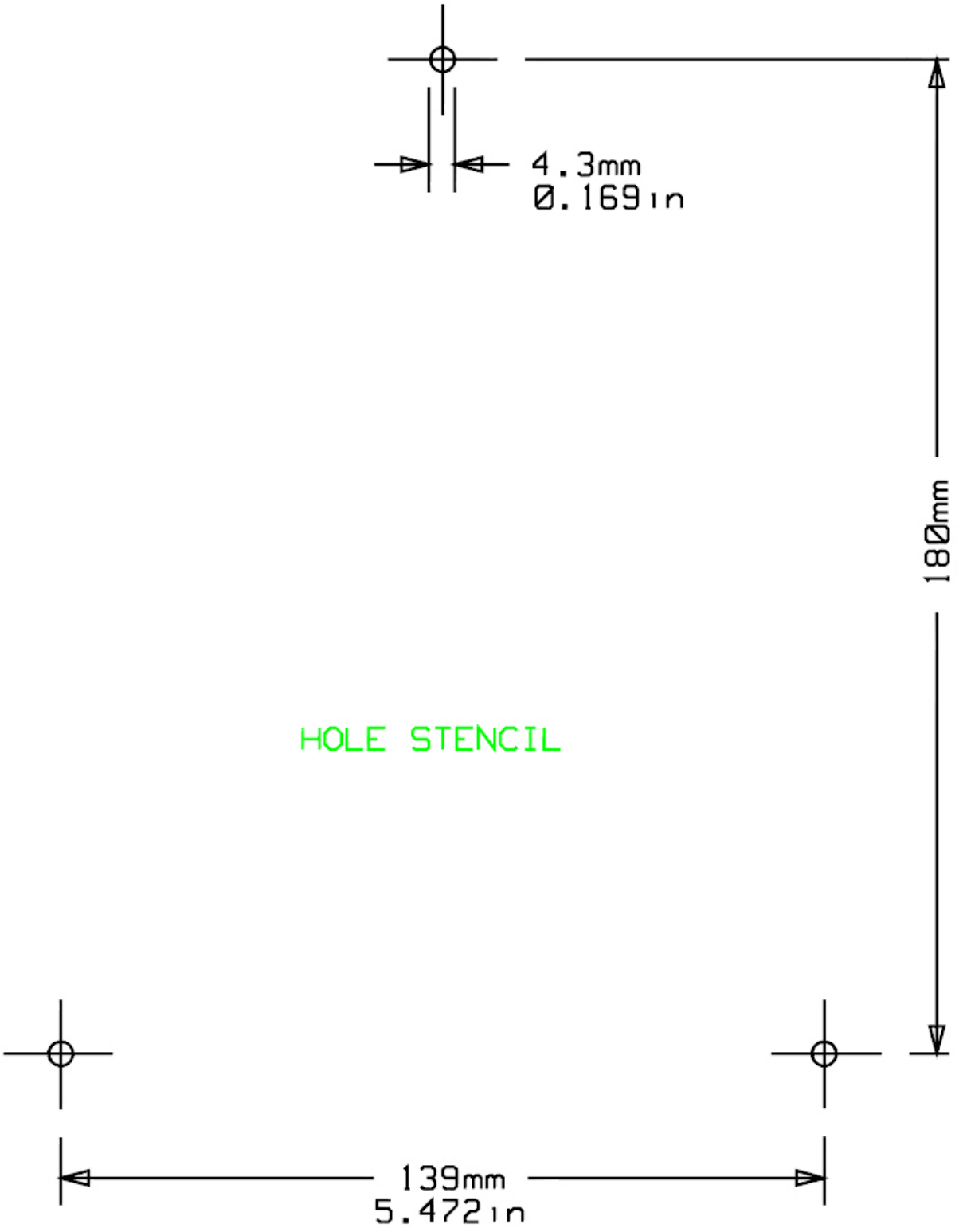


Figure 5 Drilling template GK61X for vehicle mounting bracket (no scale drawing)

2.4.3. Car Mounting Bracket and Handle GK61X

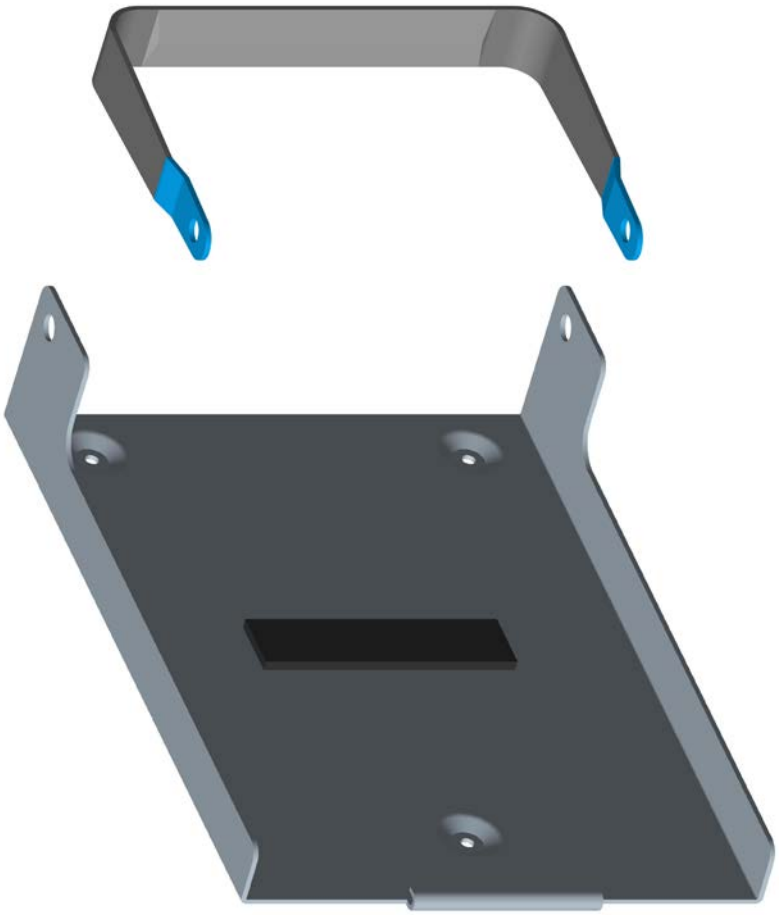


Figure 6 Car mounting bracket and handle GK61X

2.5. Connector Pin Assignments

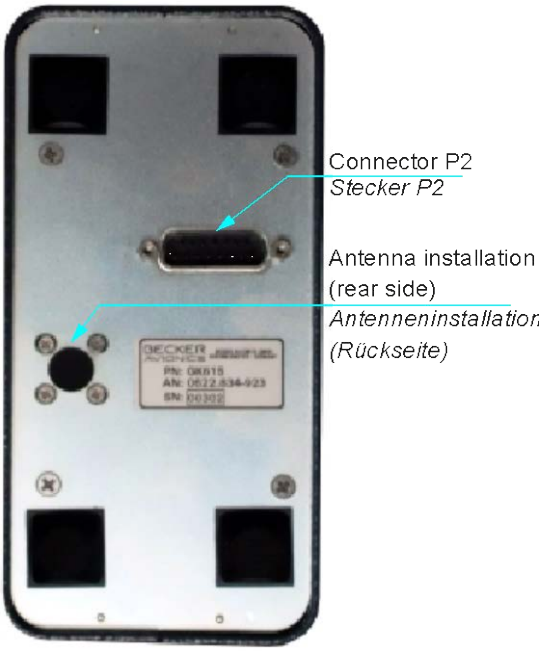


Figure 7 GK61X rear side

2.5.1. Connector P2

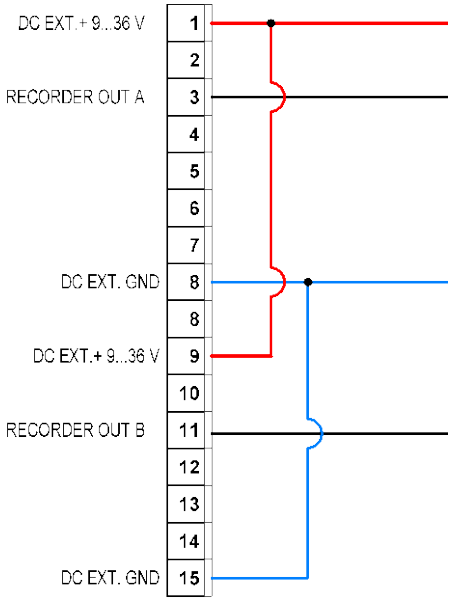


Figure 8 Wiring diagram Connector P2

2.5.2. Antenna Connection for Installation in a Vehicle

The antenna connection is fitted at the front panel as standard.

- It is recommended to move the antenna socket from the front panel to the rear panel for vehicle installations.
- To do this, remove both half shells of the carrying case and the cover plate of the front panel.
- Remove the bolts attaching the antenna socket.
- Take off the small cover plate on the back where the antenna socket has to be fixed and attach it to the front panel.
- Reassemble the carrying case.

2.5.3. Connect an External PTT or Foot PTT Switch

A PTT switch can be connected to the microphone socket at front panel pin5 (PTT) and pin1 (ground).

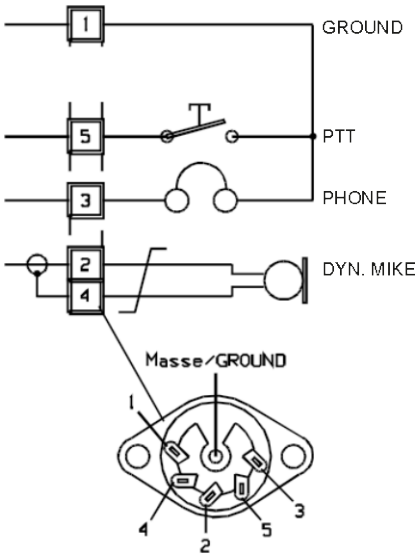


Figure 9 Wiring diagram 5 way DIN socket J4

3. Operating Instructions

In this chapter you can read about:

3.1. Device Description

The chapter "Operating Instructions" in this manual contains general information and instructions to ensure safe operation of the VHF station.

NOTICE

In this section the figures for illustrating display content mainly 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).

3.1.1. Device Assignment

This manual is valid for the following devices:

- See page 24

3.1.2. Packing, Transport, Storage

- See page 23

3.1.3. Scope of Delivery

- See page 24

3.1.4. Type Plate

- See page 25

3.1.5. Controls and Indications

Figure 10 Controls GK61X

Figure 11 Controls and indicators AR6201/GT6201

	Symbol	Description	Main Function
1		IC/SQL (Intercom/Squelch)	"Short press" during normal operation toggles the RX -SQL ON/OFF. "Long press" during normal operation activates Intercom Menu.
2		MDE (Mode)	"Short press" during normal operation changes the frequency selection mode. "Long press" during normal operation activates the pilots menu.
3		STO (Store)	"Short press" during normal operation activates storage procedure.
4		↕/SCN (Exchange/SCAN)	"Short press" during standard mode, or scan mode toggles between preset and active frequency. "Long press" activates scan mode.
5		Power ON/OFF, Volume Knob	Switches the transceiver ON/OFF and adjusts volume level of received signal.
6		Rotary encoder	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.
	-8/25-	Change of Channel Spacing	Keeping the MOD 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.

"Short press": any pressing below 2 seconds.

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	The transceiver is in transmit operation
SQL	The squelch function is active, weak RX signals suppressed.
SCAN	Transceiver operates in scan mode
STO	The transceiver performs a storage operation.
LOW BATT	Battery below predefined low threshold
128.225	Inverted figures or letters on display ready to edit
	Speaker on

3.2. Start-Up

- Connect the antenna and the mike/speaker to the corresponding jacks
- Turn "ON" the device by turning the volume knob clockwise.
- During PBIT (Power-On Built In Test) the display indicates the message "WAIT", the software version of "Control Head" (CH) and the software version of "Chassis Module" (CM).
- If the PBIT has detected error(s),"FAILURE" appears on the display (for details see "Warning and Failure Indications", chapter 3.9).

3.3. Receive and Transmit Mode

3.3.1. Receive Mode

If PTT (Push To Talk) input is 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 one and two,
- Signal from auxiliary input.

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

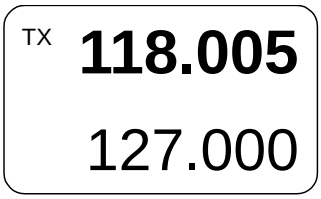
- Received signal from antenna
- Signal from auxiliary input

.

3.3.2. Transmit Mode

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.

The "TX" symbol in the left upper corner of the display indicates the device is in transmit mode.



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).

Note: **Transmit mode is automatically terminated (return to receive mode) after 120 seconds of continuous transmitting even if PTT is still pressed. In this case "STUCK PTT" is indicated (refer to page 43). For initiation of a new transmission, /PTT line needs first to become inactive.**

3.4. Frequency Selection Modes

Following frequency selection modes are available on AR620X and RCU6201:

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

The "Standard Mode", "Direct Tune Mode" and "Channel Mode" provide different user interfaces for convenient selection of the operating frequency. These three frequency selection modes are selectable by consecutive short pressing of "MDE" key. They appear in the following order: "Standard Mode", "Direct Tune Mode" "Channel Mode", "Standard Mode", and so on. When toggling between the three modes the active frequency always remains the same and active.

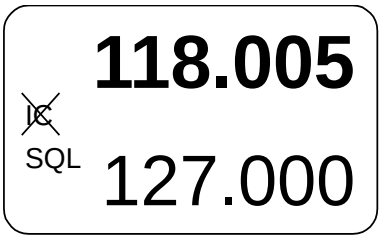
"SCAN Mode" is a sub-mode of standard mode and used for monitoring two frequencies at the same time. A 2 seconds press on "↕/SCN" key activates/deactivates the scan function.

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

3.4.1. Standard Mode

Press the "MDE" key until the standard mode page appears.

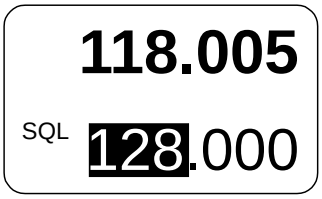
The standard mode page displays the active frequency in the top line and preset frequency in the bottom line.



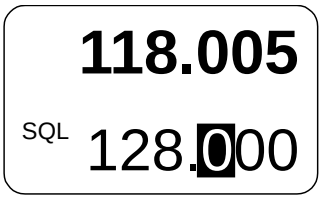
Changing the active frequency is not possible in standard mode (only available in direct tune mode) but changing the preset frequency is possible.

Changing the preset frequency in standard mode:

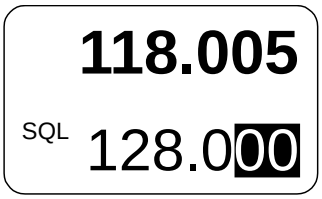
- Make a "short press" on the "ROTARY ENCODER" for modification of the 100 MHz digits. Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 MHz steps.



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



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

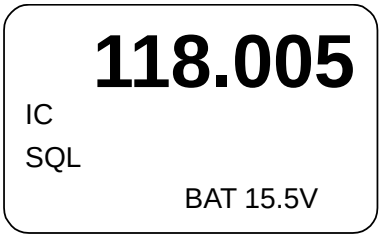


A short press of the "↕/SCN" key, exchanges active frequency to preset frequency and vice versa.
If wanted, please press now the "STO" key to store the active frequency into the next vacant memory place of the user channels database.

Note: **While the transceiver operates in transmit mode, the toggle function is disabled.**

3.4.2. Direct Tune Mode

Press the "MDE" key until the direct tune mode page appears.

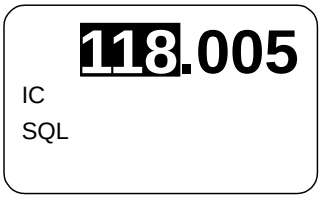


Note: **The battery information is only displayed if BATTERY VOLTAGE in the installation setup is selected.**

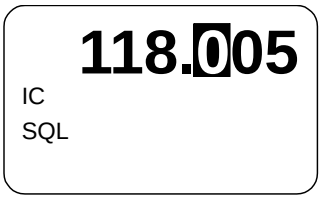
In direct tune mode, the active frequency appears in the top line. It can be edited by means of the "ROTARY ENCODER" following the procedure.

Changing the active frequency when in direct tune mode:

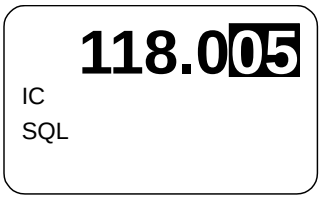
- Make a "short press" on the "ROTARY ENCODER" for modification of the 100 MHz digits.
  Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 MHz steps.



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



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



Notes:

The changes become active immediately

Changing the active frequency is possible only when the transceiver is not transmitting.

If wanted, please press now the "STO" key to store the active frequency into the next vacant memory place of the user channels database.

3.4.3. Channel Mode

The channel mode shows data from User Channels Database (indicated by "CH"), or Last Channels 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 to CH99 and
- LAST 1 to LAST 9.

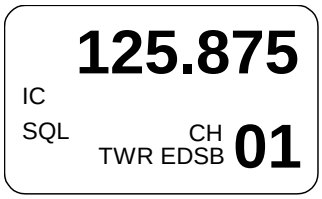
Note **The functions "LAST" and Store/Restore are only available if this options are activated in "Configuration Settings" - "MEM OPTIONS".**

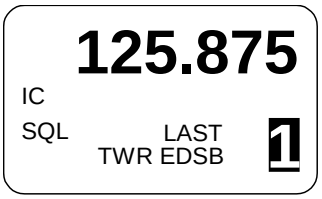
Note: **If the device is operating in the 25 kHz mode a selection of an earlier stored 8.33 kHz channel is not possible. For selection of 8.33 kHz channels, the device must operate in 8.33 + 25 kHz mixed mode.**

Press the "MDE" key 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--".





3.4.3.1. 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 user channels CH01 to 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.

The "LAST" mode is left automatically after a 5 second timeout or can be deselected by repeated pressing 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 "STO" to start the storage process.

Leave Channel Mode:

Press the "MDE" key the standard page appears.

3.4.4. Frequency Storage Functions

Start store function by pressing:

- "STO" key in "Standard Mode", "Direct Tune Mode" and "SCAN Mode".
  During this procedure, the display looks similar to the channel mode with one difference that "STO" appears on the left side of the display.

3.4.4.1. Store

The transceiver provides two databases:

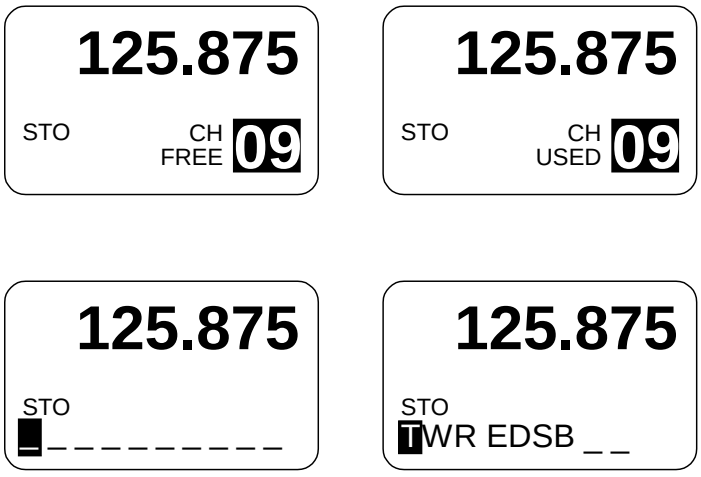
- User channels database - provides 99 channels CH01 to CH99 to store frequencies with the possibility to apply a customized label (identifier) with max. 10 alphanumeric characters.
- Last channels database - automatically stores 9 last used frequencies with customized identifier if applied, easy to recall as LAST 1 to LAST 9.

Any frequency can be assigned to any channel within the range from 118.000...136.9916 MHz 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 for storing the active frequency. 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.

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 replaced).



Label (Identifier) Data:

By turning the "ROTARY ENCODER" characters can be selected. Selection works in both directions (example: A→...→Z→0→...→9→—→/→blank→A" by turning clockwise and vice versa by turning counter clockwise).

Each "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 frequency selection mode.

If no action occurs in label editing mode within 7 seconds, the transceiver returns to the previous frequency selection mode without storing the frequency and label information.

Stored frequencies are recallable in Channel Mode (see "Channel Mode" page 38).

3.4.5. Automatic Storage Function

The transceiver stores 9 recently selected frequencies and updates the last channels database during operation in "Standard Mode", "Direct Tune Mode" and "Scan Mode".

When changing to a new active frequency, the previous active frequency is stored "LAST" in memory LAST 1. The frequencies previously located in LAST 1…LAST 8 are shifted to memory channels LAST 2…LAST 9. This algorithm ensures the last 9 used active frequencies are available. Last used frequencies "LAST" can be recalled in channel mode (see "Channel Mode" page 38).

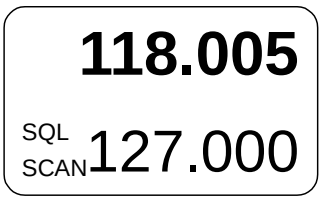
Note The functions "LAST" and Store/Restore to channels are only available if this options are activated in "Configuration Settings" - "MEM OPTIONS".

3.4.5.1. Delete data:

The stored content in User Channel Database can only be deleted in "Configuration Settings". Please note the whole channel database will be reset.

3.4.6. Scan Mode

In Scan Mode the display shows both the active frequency on the top line and the preset frequency on the bottom line. The SCAN sign in the display indicates that scan function is active.

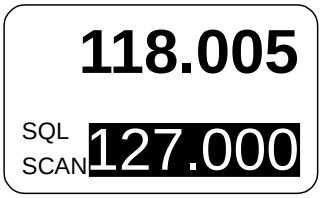


In all frequency selection modes;

- A long press 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 on "SCN" key terminates scan function. After leaving scan function, the device will remain in standard mode.

The arrow sign "►" in front of the active frequency indicates that this frequency is audible.

If both the active frequency and preset frequency simultaneously detect a signal, the active frequency (top) takes priority. The preset frequency then inverts and blinks.

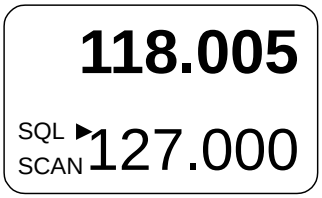


If selected in the installation setup an audio notification "beep" tone becomes audible in addition to the blinking preset frequency to indicate the presence of an RX signal on the preset frequency.

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 now appears in front of the preset frequency and the signal is audible.

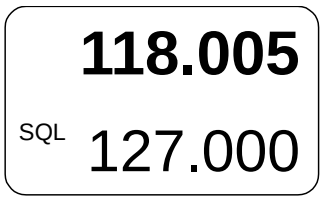


Note: Transmission always uses the active frequency, even if the monitored frequency is currently audible.
If TX on the preset frequency is required, push the "↕/SCN" key to swap active and preset frequency.

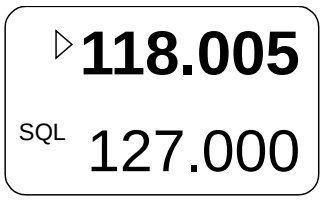
3.5. SQUELCH

Independent of the selected operation menu, squelch can be toggled "ON" or "OFF" by a short press on "SQL/IC" key.

- 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.



Squelch "ON"



Squelch "OFF"

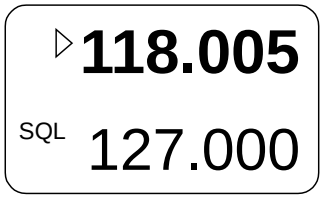
In the pilots menu, the squelch threshold is adjustable to a convenient trigger level. See "Pilots Menu" page 42.

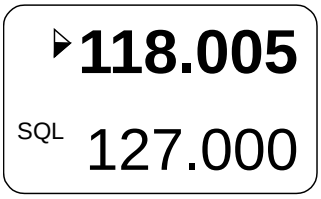
3.6. RX Field Strength Indication

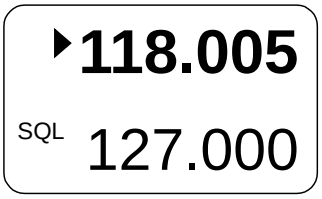
The field strength indicator, represented by triangle on the left upper corner of the corresponding frequency, will appear next to the active or preset frequency in all frequency selection modes.

The field strength of an incoming signal relates to the measured RSSI level. The three levels displayed are:

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)





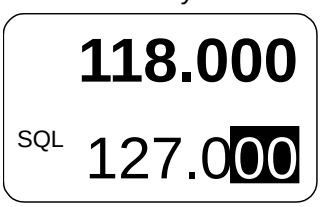


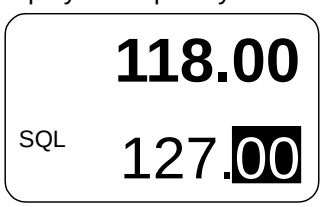
3.7. Channel Spacing Mode

The transceiver provides two operation modes of frequency channel spacing, (8.33 and 25 kHz), selectable by means of pressing "STO" and "MDE" keys simultaneously for at least 2 seconds.

In 25 kHz mode, 5 frequency digits are shown. Only operating frequencies with a channel spacing of 25 kHz are selectable. If 8.33 kHz channels are not in use, this mode provides the advantage of faster tuning since skipping the 8.33 kHz frequency steps.

In 8.33 kHz and 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.





8.33 kHz channel spacing (left) / 25 kHz channel spacing (right)

Toggling between the frequency channel spacing modes is only available for AR-, RCU620X-(0XX) variants. The AR-, RCU620X-(1XX) variants provide operation in 25 kHz Mode only.

3.8. Menus

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

- The Pilots menu allows adjustment of panel brightness and squelch threshold.

3.8.1. Pilots Menu

Press the "MDE" key for 2 seconds to start the pilots menu. Toggling between the pages by a short press of the "MDE" key, or by a short press of the "ROTARY ENCODER".

The pilots menu consists of two pages:

- BRIGHTNESS
- SQUELCH TRH

To exit the pilots menu either

- Wait 5 seconds without any switch selections.
- Press the "MDE" key again for 2 second,
- Press the "ROTARY ENCODER" when the SQUELCH setting page is visible,

BRIGHTNESS

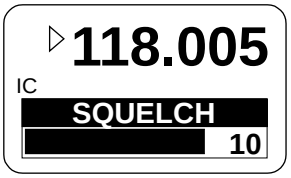
The active frequency appears in the top line of the display "BRIGHTNESS" label appears in combination with a bar graph and the selected value.

The panel brightness for display illumination and push buttons can be changed from 0 (illumination off) to 100 (maximum brightness) by turning the "ROTARY ENCODER".

Note: **This page is not available if in installation setup the dimming input is set to 14 V or 28 V. For this setting, the aircraft dimming circuit controls the brightness parameters.**

SQUELCH

A short press on the "ROTARY ENCODER" provides "SQUELCH" trigger level adjustment. The active frequency appears in the top line of the display. On the bottom line "SQUELCH" with bar graph and value is indicated.



By means of the "ROTARY ENCODER", the squelch threshold is adjustable:

- At a setting to 6 (very weak signals are audible with high noise content; squelch opens at about -105 dBm).
- At a setting to 26 (only quite strong signals are audible with low noise content; squelch opens at about -87 dBm). With this adjustment the receiver sensitivity is significant reduced.

3.9. **Warning and Failure Indications**

Display Contents	Description
IC 118.005 **LOW BATTERY** Appears in 3-second cycle	"LOW BATT" is indicated if the supply voltage of the transceiver is below the threshold defined in the installation setup. The transceiver is still operable but may have a reduced performance depending on supply voltage. **Possible reasons for indication:** Accumulator capacity problems (gliders), Power interrupts, General power supply problems, Setting for low battery threshold too high
IC 118.005 **STUCK PTT** Appears in 3-second cycle	"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). For initiating a new transmission, the PTT line needs first to become inactive (open). **Possible reasons for indication:** Transmission lasts more than 120 seconds. PTT-key is stuck. PTT line permanently grounded (short circuit in installation).
IC 118.005 **TX HOT** Appears in 3-second cycle	"TX HOT" is indicated if the internal device temperature exceeds +90 °C. Transceiver is still operable. Performance of transmitter is reduced. **Possible reasons for indication:** Very hot environmental temperature, long transmissions times and insufficient airflow conditions.
IC 118.005 **FAILURE** Appears in 3-second cycle	The transceiver has detected an internal failure during normal operation. Depending on failure reason, the device may still be operable with degraded performance, or not operable at all. **Possible reasons for indication:** Specified environmental conditions HW or SW failure inside the transceiver. **Contact maintenance shop for assistance.**
FAILURE PRESS ANY KEY	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. **Possible reasons for indication:** Outside specified environmental conditions HW or SW failure inside the transceiver. **Contact maintenance shop for assistance.**
FAILURE	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. **Possible reasons for indication:** Problem with inter-wiring **Contact maintenance shop for assistance.**

3.10. 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 performed by trained Becker Avionics personnel.

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

User Conversions and Changes are Not Permitted

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

4. Certifications

In this chapter you can read about:

4.1. BAF Approval - GT6201

Bundesaufsichtsamt
für Flugsicherung

Urkunde

Ein(e)	**VHF-Sprechfunkgerät für Bodenfunkstellen des Flugfunkdienstes**
Typ	**GT6201 in den im Anhang zur Zulassungsurkunde aufgeführten Modellvarianten und zugehörigen Hard- / Softwarekonfigurations-ständen**
Frequenzbereich	**118 – 136,975 MHz**
Kanalraster	**8,33 kHz / 25 kHz**
der Firma	**Becker Avionics GmbH Baden Airpark B108 77836 Rheinmünster**
bestehend aus	**Sende-/Empfangseinheit (6 W oder 10 W) in Single Block oder Remote Version ohne Control Head**
für die Betriebsart	**6K80A3EJN (25 kHz) / 5K00A3EJN (8,33 kHz)**

ist auf Einhaltung der Anforderungen an Anlagen und Geräte für Zwecke der Flugsicherung gemäß § 4 Flugsicherungs-Anlagen- und Geräte-Musterzulassungs-Verordnung (FSMusterzulV) geprüft worden.

Die Anlage oder das Gerät entspricht damit den Festlegungen des Bundesministeriums für Verkehr und digitale Infrastruktur hinsichtlich Art, Umfang und Beschaffenheit von flugsicherungstechnischen Einrichtungen gemäß § 32 Abs. 4 des Luftverkehrsgesetzes sowie der Richtlinien und Empfehlungen der Internationalen Zivilluftfahrt-Organisation (ICAO).

Es wird daher als Muster mit den umseitig aufgeführten Auflagen in der Bundesrepublik Deutschland zugelassen.

Der Gerätetyp hat die Zulassungsnummer **D-0030/2014** erhalten.

Bundesaufsichtsamt für Flugsicherung
Langen, den 04.06.2014

Im Auftrag

Bodo Heinzl

Bundesaufsichtsamt
für Flugsicherung

Anhang zur Zulassungsurkunde

D-0030/2014

Konfigurationsstand

Ausgabestand 11.05.2017

VHF-Sprechfunkgerät GT6201

Modellvariante	Artikelnummer	Softwareversion
GT6201-05 (6 W, Single Block Version)	**0637.351-923**	**SCI1050S305 (Control Head)** **SCI1051S305 (Chassis Module)**
GT6201-05-R (6 W, ohne Control Head)	**0641.073-923**	**SCI1051S305 (Chassis Module)**
GT6201-10 (10 W, Single Block Version)	**0637.361-923**	**SCI1050S305 (Control Head)** **SCI1051S305 (Chassis Module)**
GT6201-10-R (10 W, ohne Control Head)	**0641.081-923**	**SCI1051S305 (Chassis Module)**

Für die Nutzung als tragbare VHF-Sprechfunkanlage können die VHF-Sprechfunkgeräte **GT6201-05** und **GT6201-10** in den in **Tabelle 1 aufgeführten Geräteträgern** eingesetzt werden.

Modellvariante	Artikelnummer	Bemerkung
GK615-E	0638.481-923	Für die Nutzung mit GT6201-05. Ausgestattet mit: Microphone 1PM415-1 (0603.120-350), Antenne 1A415 (0884.294-952)
GK615-1E	0638.498-923	Für die Nutzung mit GT6201-05. Ausgestattet mit: Lautsprecher/Microphone 1PH012 (0498.475-951) Antenne 1A415 (0884.294-952)
GK616-E	0638.501-923	Für die Nutzung mit GT6201-10. Ausgestattet mit: Microphone 1PM415-1 (0603.120-350), Antenne 1A415 (0884.294-952)
GK616-1E	0638.511-923	Für die Nutzung mit GT6201-10. Ausgestattet mit: Lautsprecher/Microphone 1PH012 (0498.475-951) Antenne 1A415 (0884.294-952)

Bundesaufsichtsamt für Flugsicherung
Langen, den 11.05.2017

Im Auftrag

Bodo Heinzl

4.2. EC Declaration of Conformity – GT6201-05

EC Declaration of Conformity /
EC Declaration of Suitability for Use

EC Declaration of Conformity / EC Declaration of Suitability for Use for Constituents	
Name and address of manufacturer :	**Constituent / application area**
Becker Avionics GmbH Baden Airpark, Building B108 77836 Rheinmünster Germany	*GT6201-05* *VHF-Transceiver, communication system for ground-to-air communication*
System classification:	*Communication system for ground-to-air communication*

Part 1:General information about the constituent in accordance with Regulation (EC) 552/2004, Annex III

1.1 Regulation Reference Number

Basic requirements in accordance with

- *Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.*
- *Implementing Regulation (EC) No. 1079/2012*
- *Directive 2014/53/EU*

1.2 Manufacturer information

Becker Avionics GmbH, Baden Airpark, Building B108, 77836 Rheinmünster, Germany.

1.3 Description of the constituents

The Transceiver Becker GT6201-05 is a mobile VHF-Transceiver station for air traffic management.

Frequency Range :	*118.000 – 136.9916 MHz*	*Channel spacing :*	*8.33 kHz/25 kHz*
Transm. Power Output :	*≥ 6 W*	*Frequency stability :*	*≤ 1 ppm*
Supply Voltage. :	*11 VDC – 30.3 VDC*	*Weight :*	*645 g*
Temperature Range:	*-20 °C - +55 °C*	*Dimensions W x D x H :*	*61.2 x 168.4 x 61.2 mm³* (Front plate till end of antenna connector)

More detailed technical data about the transceiver itself and his physical interfaces as well as the limits of operation are given by the Installation and Operation Manual.

1.4 Description of the procedure followed in order to declare the system´s conformity or suitabiity for use

Conformity is stated and has been verified in accordance with decision 768/2008/EC Annex II, Module A1.

1.5 Relevant regulations

- ***ETSI EN300 676-1 V1.5.2*** : Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation Part 1: Technical characteristics and methods of measurement
- ***ETSI EN300 676-2 V1.5.1*** : Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation
- ***EN 62311:2008*** : Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)
- ***DIN EN 60950-1* :2006 +A11:2009 + A12:2011 + A1:2010**: Information Technology Equipment – Safety
- ***EN 301 489-1 V1.9.2*** : Electromagnetic compatibility and radio spectrum matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1 : Common technical requirements

Issue 6 Page 1 of 2

EC Declaration of Conformity /
EC Declaration of Suitability for Use

- ***EN 301 489-22 V1.3.1*** : Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 22 : Specific conditions for ground based VHF aeronautical mobile and fixed radio equipment
- ***SSB FL 024*** : Schnittstellenbeschreibung für Bodenfunkstellen des mobilen Flugfunkdienstes
- ***ICAO Annex 10*** *to the Convention on International Civil Aviation, Volume III and Volume IV*

1.6 Notified body

CETECOM ICT Services GmbH, Untertürkheimer Strasse 6 – 10, 66117 Saarbrücken, Deutschland

1.7 References to the community specifications

The device complies with the regulations and directives :

- ***Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.***
  Regulation on the interoperability of the European Air Traffic Management network.
- ***Implementing Regulation (EC) No. 1079/2012***
  Laying down requirements for voice channels spacing for the single European sky.
- ***Directive 2014/53/EU***
  Radio Equipment Directive
- ***Regulation (EC) No. 550/2004***
  Regulation on the provision of air navigation services in the single European sky.

1.8 Information about the authorized signatures

1.) *Dipl.-Ing. Jürgen Schiller, QA-Manager*
Address :
Becker Avionics GmbH
Baden Airpark, Building B108
77836 Rheinmünster, Germany
Tel.: 07229/305-202
e-mail : juergen.schiller@becker-avionics.de

2.) *Dr. Ingo Pletschen, Product Manager*
Address :
Becker Avionics GmbH
Baden Airpark, Building B108
77836 Rheinmünster, Germany
Tel.: 07229/305-104
e-mail : ingo.pletschen@becker-avionics.de

Part 2: Declaration:

Becker Avionics GmbH, 77836 Rheinmünster declares herewith that above mentioned constituents

- *have been assessed in terms of compliance with the above mentioned standards and the compliance has been ascertained;*
- *have been considered in terms of its suitability within the environment of air traffic management and have been classified as suitable.*

Place of issue, Date	1st Signature On behalf :	2nd Signature : On behalf (in representation Peter Fritz)
Rheinmünster *September 18th, 2017*	*Dipl.- Ing. Jürgen Schiller*	*Dr. Ing. Ingo Pletschen*

Issue 6

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4.3. EC Declaration of Conformity – GT6201-10

EC Declaration of Conformity /
EC Declaration of Suitability for Use

EC Declaration of Conformity / EC Declaration of Suitability for Use for Constituents

Name and address of manufacturer :	Constituent / application area
Becker Avionics GmbH Baden Airpark, Building B108 77836 Rheinmünster Germany	*GT6201-10* *VHF-Transceiver, communication system for ground-to-air communication*
System classification:	*Communication system for ground-to-air communication*

Part 1:General information about the constituent in accordance with Regulation (EC) 552/2004, Annex III

1.1 Regulation Reference Number

Basic requirements in accordance with

- *Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.*
- *Implementing Regulation (EC) No. 1079/2012*
- *Directive 2014/53/EU*

1.2 Manufacturer information

Becker Avionics GmbH, Baden Airpark, Building B108, 77836 Rheinmünster, Germany.

1.3 Description of the constituents

The Transceiver Becker GT6201-10 is a mobile VHF-Transceiver station for air traffic management.

Frequency Range :	*118.000 – 136.9916 MHz*	*Channel spacing :*	*8.33 kHz/25 kHz*
Transm. Power Output :	*≥ 10 W @ ≥ 24 VDC*	*Frequency stability :*	*≤ 1 ppm*
Supply Voltage. :	*11 VDC – 30.3 VDC*	*Weight :*	*645 g*
Temperature Range:	*-20 °C - +55 °C*	*Dimensions W x D x H :*	*61.2 x 168.4 x 61.2 mm³* (Front plate till end of antenna connector)

More detailed technical data about the transceiver itself and his physical interfaces as well as the limits of operation are given by the Installation and Operation Manual.

1.4 Description of the procedure followed in order to declare the system´s conformity or suitabiity for use

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1.5 Relevant regulations

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- ***EN 62311:2008*** : Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)
- ***DIN EN 60950-1:2006 + A11:2009 + A12:2011 + A1:2010*** : Information Technology Equipment – Safety
- ***EN 301 489-1 V1.9.2*** : Electromagnetic compatibility and radio spectrum matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1 : Common technical requirements

Issue 6 Page 1 of 2

EC Declaration of Conformity /
EC Declaration of Suitability for Use

- ***EN 301 489-22 V1.3.1*** : Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 22 : Specific conditions for ground based VHF aeronautical mobile and fixed radio equipment
- ***SSB FL 024*** : Schnittstellenbeschreibung für Bodenfunkstellen des mobilen Flugfunkdienstes
- ***ICAO Annex 10*** *to the Convention on International Civil Aviation, Volume III and Volume IV*

1.6 Notified body

CETECOM ICT Services GmbH, Untertürkheimer Strasse 6 – 10, 66117 Saarbrücken, Deutschland

1.7 References to the community specifications

The device complies with the regulations and directives:

- ***Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.***
  Regulation on the interoperability of the European Air Traffic Management network.
- ***Implementing Regulation (EC) No. 1079/2012***
  Laying down requirements for voice channels spacing for the single European sky.
- ***Directive 2014/53/EU***
  Radio Equipment Directive (RED)
- ***Regulation (EC) No. 550/2004***
  Regulation on the provision of air navigation services in the single European sky

1.8 Information about the authorized signatures

1.) *Dipl.- Ing. Jürgen Schiller, QA-Manager*
Address :
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77836 Rheinmünster, Germany
Tel.: 07229/305-202
e-mail : juergen.schiller@becker-avionics.de

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- *have been assessed in terms of compliance with the above mentioned standards and the compliance has been ascertained;*
- *have been considered in terms of its suitability within the environment of air traffic management and have been classified as suitable.*

Place of issue, Date	1st Signature On behalf :	2nd Signature : On behalf (in representation Peter Fritz)
Rheinmünster September 18th, 2017	*Dipl.- Ing. Jürgen Schiller*	*Dr. Ing. Ingo Pletschen*

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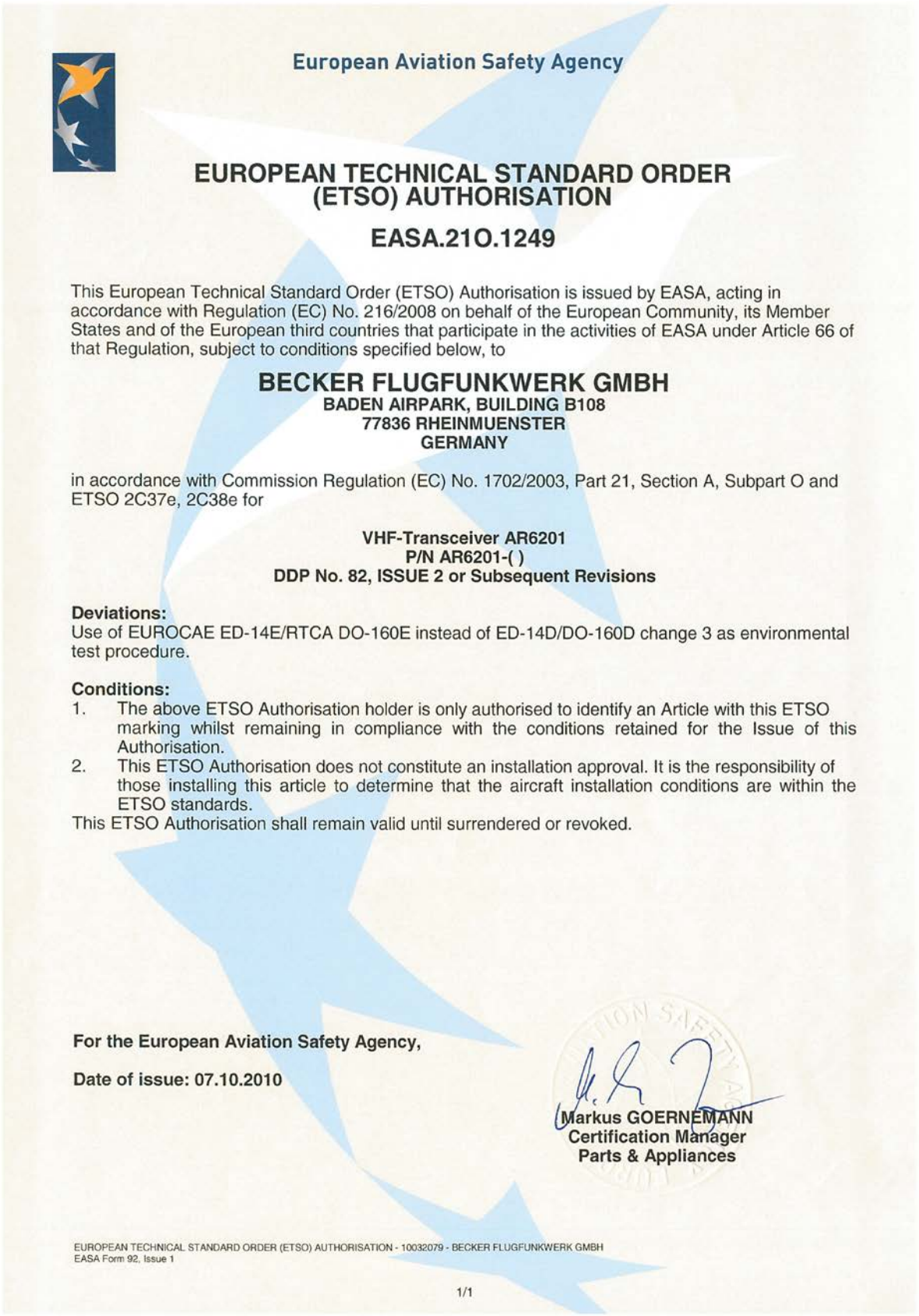
4.4. European Technical Standard Order (ETSO) Authorisation



European Aviation Safety Agency

EUROPEAN TECHNICAL STANDARD ORDER (ETSO) AUTHORISATION

EASA.21O.1249

This European Technical Standard Order (ETSO) Authorisation is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation, subject to conditions specified below, to

BECKER FLUGFUNKWERK GMBH
BADEN AIRPARK, BUILDING B108
77836 RHEINMUENSTER
GERMANY

in accordance with Commission Regulation (EC) No. 1702/2003, Part 21, Section A, Subpart O and ETSO 2C37e, 2C38e for

VHF-Transceiver AR6201
P/N AR6201-( )
DDP No. 82, ISSUE 2 or Subsequent Revisions

Deviations:
Use of EUROCAE ED-14E/RTCA DO-160E instead of ED-14D/DO-160D change 3 as environmental test procedure.

Conditions:
1. The above ETSO Authorisation holder is only authorised to identify an Article with this ETSO marking whilst remaining in compliance with the conditions retained for the Issue of this Authorisation.
2. This ETSO Authorisation does not constitute an installation approval. It is the responsibility of those installing this article to determine that the aircraft installation conditions are within the ETSO standards.

This ETSO Authorisation shall remain valid until surrendered or revoked.

For the European Aviation Safety Agency,

Date of issue: 07.10.2010

Markus GOERNEMANN
Certification Manager
Parts & Appliances

EUROPEAN TECHNICAL STANDARD ORDER (ETSO) AUTHORISATION - 10032079 - BECKER FLUGFUNKWERK GMBH
EASA Form 92, Issue 1

1/1

4.5. Approval - Telecommunication Office Italy

Ministero dello Sviluppo Economico

DIREZIONE GENERALE PER LA PIANIFICAZIONE E LA GESTIONE DELLO SPETTRO RADIOELETTRICO
ex Divisione II

Ministero Sviluppo Economico
Dipartimento per le Comunicazioni
REGISTRO UFFICIALE
Prot. n **0041697 - 02/07/2014** - USCITA

Becker Avionics GmbH
Baden-Airpark B, 108
77836 Rheinmunster GERMANIA
e-mail: info@becker-avionics.de

per conoscenza

D.G.P.G.S.R.-Ufficio IV Sede

D.G.A.T
email: dgat.segreteria@mise.gov.it

Fasc. 349022

Ispettorati Territoriali Repubblica Loro Sede

OGGETTO: Notifica di immissione sul mercato ai sensi dell'art.6.4 del decreto legislativo 9 maggio 2001 n. 269, degli apparati marca Becker Avionics modelli GT6201-05, GT6201-05R, GT6201-10 e GT6201-10R destinati al servizio aeronautico di terra.

Si prende atto della notifica pervenute a questa Direzione Generale, in data 23/6/14 e al riguardo si comunica che gli apparati in oggetto, se conformi a tutti i requisiti ed obblighi derivanti dall'applicazione del d.lgs 9.5.01 n.269 possono essere immessi sul mercato e possono essere utilizzati sul territorio nazionale **limitatamente** nella banda di frequenze prevista dal Piano nazionale di Ripartizione delle Frequenze di cui al decreto 13 novembre 2008 come ricetrasmettitori VHF destinati al servizio aeronautico di terra.

Le caratteristiche tecniche dichiarate sono le seguenti:

- Banda di frequenza: 118,0000-136,9916 MHz;
- Spaziatura tra canali: 8,33kHz e 25kHz;
- Modulazione: AM;
- Potenza di uscita: 6W/10W;
- Standard armonizzato di cui all'art.3.2 del d.lgs 9 maggio 2001, n.269: EN 300676-2 V1.5.1;

Ai sensi dell'art. 6.3 del d.lgs citato in oggetto, il costruttore o la persona responsabile dell'immissione sul mercato degli apparati deve fornire all'utente le seguenti informazioni:

1) come stabilito dal decreto legislativo 1° agosto 2003 n. 259 (Codice delle comunicazioni elettroniche), ai sensi degli artt. 104 parag. a), numero 1) e 126 comma 1, l'esercizio degli apparati in questione è subordinato rispettivamente al possesso dell' "autorizzazione generale" e del relativo "diritto individuale di uso";

2) gli apparati sono destinati al servizio aeronautico di terra.

Il Direttore Generale
(dott.ssa Eva Spina)

1

Viale America 201 – 00144 Roma
tel. +39 06 5444 2230
benedetto.attili@mise.gov.it

4.6. Approval SSRC for China – GK615

无线电发射设备
Radio Transmission Equipment
型号核准证
Type Approval Certificate

德国 Becker Flugfunkwerk GmbH:

根据《中华人民共和国无线电管理
In accordance with the provisions on the Radio

条例》，经审查，下列无线电发射设备
Regulations of the People's Republic of China , the following

符合中华人民共和国无线电管理规定和
radio transmission equipment , after examination , conforms

技术标准，其核准代码为：CMIIT ID: 2012HJ7993
to the provisions with its CMIIT ID:

中华人民共和国工业和信息化部
(发证机关)
Sealed by Issuing Authority

有效期：
Validity 2020-12-14

2017年11 月21 日
Year Month Date

编号：2017-7022
Number

设备名称：调幅电台
Equipment Name

设备型号：GK615
Equipment Type

主要功能：话音导航通信
Main Functions

调制方式：AM
Modulation Mode

主要技术参数及其指标值：
Main Technical Parameters

频率范围：118-136.975 MHz
Frequency Range

频率容限：≤5ppm
Frequency Tolerance

发射功率：6W±1.5dB
Transmitting Power

占用带宽：≤6.8kHz
Occupied Bandwidth

杂散发射限值：≤-30dBm
Spurious Emission Limits

（核发单位章）
Sealed by issuing authority

2017 年 11月 21日
Year Month Date

5. Index

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

***** End of the Document *****