

## **VHF-Transceiver**

### **VHF-Ground-Transceiver GT6201**

## **Installation and Operation**

Manual     DV17001.03  
Issue 05    May 2016  
Article-No. 0640.093-071

## Preface

Dear Customer,

Thank you for purchasing a Becker Avionics 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.

## VHF-Transceiver



GT6201 (Single Block Transceiver)

## List of Effective Pages and Changes

Only technical relevant modifications are described in this table.

<b>Document: DV17001.03 / issue 05 Article Number 0640.093-071</b>			
Cover Page	05/2016		
Introduction	05/2016		
Chapter 1 – 4	05/2016		
Issue	Page No.:	Section / Chapter	Description
<b>05</b>	1...72	all	Changed: Editorial adjustments Added: Warning notes and safety instructions
	--	1.7.6	Changed: Dimensions-mounting depth
	--	1.8	Added: Technical data-Approvals
	--	1.9	Changed: Order Code- editorial adjustments
	--	2.3	Added: Description "Device Assignment", delivery, identification, ...
	--	2.4	Added: Description "Mounting Requirements" in general.
	--	2.9.2	Added: Description adjustments for better understanding ("Installation Setup Pages").
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## List of Abbreviations

### List of Abbreviations

AC	Advisory Circular
AF	Audio Frequency
ATT	Attenuation
AUX	Auxiliary
AWG	American Wire Gauge
BNC	Bayonet Neill Concelman
CBIT	Continuous Built-In Test
CFG	Configuration
CH	Channel
COM	Communication
DC	Direct Current

**List of Abbreviations**

EASA	European Aviation Safety Agency
EMI	Electro Magnetic Interference
ETSI	European Telecommunications Standards Institute
ETSO	European Transmission System Operators
GND	Ground (Vehicle Ground)
HMI	Human Machinery Interface
HIRF	High Intensity Radiated Fields
HW	Hardware
IC	Intercom (not in use for ground applications)
I&O	Installation & Operation
LCD	Liquid Crystal Display
M&R	Maintenance & Repair
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
N/A	Not Applicable
PBIT	Power-On Built In Test
PTT	Push To Talk
PWR	Power
RSSI	Received Signal Strength Indication
RX	Receive
SQL	Squelch
RSSI	Received Signal Strength Indicator
SN	Serial Number
SPKR	Speaker (Loudspeaker)
SRC	Source
SW	Software
TSO	Technical Standard Order
TX	Transmit
VOX	Voice Operated IC Threshold (not in use for ground applications)
VHF	Very High Frequency
VDC	Voltage Direct Current
VSWR	Voltage Standing Wave Ratio
VU	Volume Unit

## Units

### Units

A	Ampere
mA	Milliampere
°C	Degree Celsius
cm	Centimetre
dBm	Power Ratio In Decibel
dB	Decibel
g	Gram
Hz	Hertz
kg	Kilogram
kHz	Kilohertz
MHz	Megahertz
Mbps	Mega Bits Per Second
mm	Millimetre
Nm	Newton Metre
NM	Nautical Mile (1NM = 1852,0 m)
Ohm ( $\Omega$ )	Resistance
ppm	Parts per Million
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, lethal fumes may develop.

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

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

Dispose of the circuit boards:

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

## Warranty Conditions

User Conversions and Changes are Not Permitted

Any change made by the user excludes any liability on our part (excluding updates for the navigation data base).

- 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.

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

### **⚠ CAUTION**

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

### Additional Conditions of Utilization

Please refer to "Safety-Conscious Utilization", page 14.

## 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.



## 1. General Description

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This manual describes the operation and installation of the VHF-Ground-Transceiver. GT6201 The ID label on your device shows the part number for identification purposes (see "Type Plate", page 21).

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

### 1.1. Introduction

VHF-Ground-Transceivers GT6201 are a modern family of communication equipment that have comprehensive capabilities and significantly extend the typical aeronautical transceivers.

Designed for installation in desk-cabinets, 19 inch racks or cars VHF-Ground-Transceivers GT6201 are specified for operations on airports, airfields or airline operations stations.

Despite its small size and weight the device include inter alia:

- Sensitive receiver which meets the most recent requirements of ETSI EN 300 676.
- Receiver includes SCAN (dual watch) mode. This allows simultaneous monitoring of two different VHF frequency channels without interrupting communication on the active frequency.
- High efficiency transmitter, which delivers more than 10 W carrier output power at 28 V supply voltage, or 6 W at 12 V.  
Lower power consumption allows longer operation from battery.
- Non-volatile memory for storing:
  - 99 channels can be labelled manually for storage of VHF frequencies.
  - 9 recently selected VHF frequencies are automatically stored.
- Easy installation via four screws (rear panel installation). The dimensions correspond to the standard instrument diameter of 58 mm (2¼ inch).

For further descriptions we are using the term GT6201, instead writing the complete model number.

The manuals "Maintenance and Repair" (**M&R**), "Installation and Operation (**I&O**) contain the following sections:

Section		DV17001.04 M&R	DV17001.03 I&O
	General	X	X
	Installation	X	X
	Operation	X	X
	Theory of Operation	X	N/A
	Maintenance and Repair	X	N/A
	Illustrated Parts List	X	N/A
	Modification and Changes	X	N/A
	Circuit Diagrams	X	N/A
	Certifications	X	X
	Attachments	X	N/A

## 1.2. Purpose of Equipment

GT6201 is ground-based equipment. GT6201 enables voice communication between ground and airborne stations, using the very high frequency band between 118.000...136.9916 MHz respectively 136.9750 MHz with a selectable channel spacing of 8.33 kHz or 25 kHz.

The GT6201 transceiver can operate using ground power when installed in desk-cabinets or 19 inch racks, but is also dedicated to applications where low power consumption is required. GT6201 is capable to operate from standard 14 and 28 VDC installations and from 12 or 24 VDC batteries.

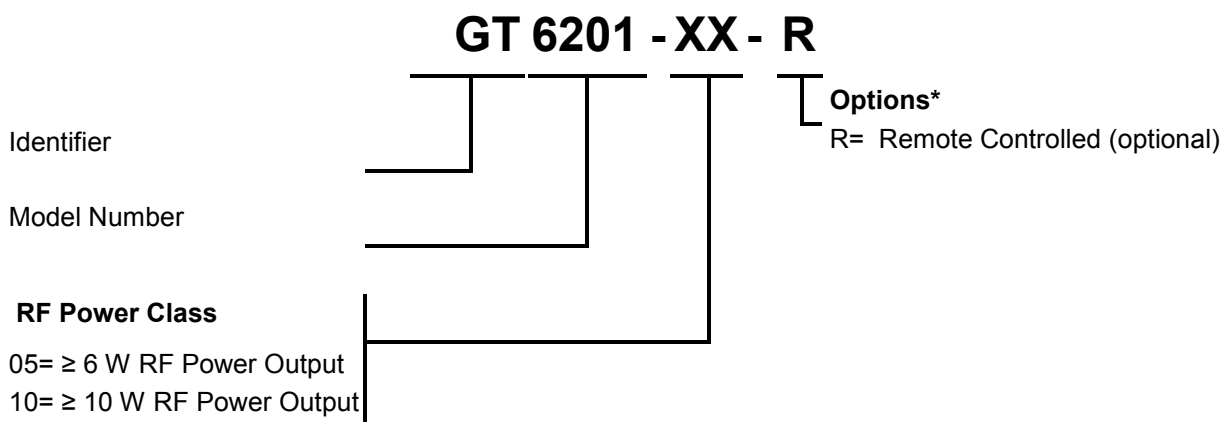
## 1.3. General Notes

The word "frequency" also used in the sense of "channel name", as defined in ICAO Annex 10, Volume II.

In this document the word "memory channel" or "channel" means a memory place identified by a channel number, where a frequency may be stored for later use.

## 1.4. Variants Overview

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



\* only available as component with TG660

### 1.4.1. Software Status

Description see "Software/Firmware Status – Functionality", page 21.

## 1.5. Scope of Functionality

### 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

## Audio Outputs

GT6201 includes four fully configurable outputs:

- Headphone 1 output, rated output power is 300 mW into 75  $\Omega$  (with floating transformer output).
- Headphone 2 output, rated output power is 200 mW into 75  $\Omega$ .
- Speaker output, rated output power is 4 W into 4  $\Omega$ .
- LINE-OUT output intended for ground station use only

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

## Mike Inputs

GT6201 has an input for dynamic microphone (DYN\_MIKE) and an input for standard microphone (STD\_MIKE).

GT6201 provides four microphone inputs:

- Standard microphone input 1 (STD\_MIKE1)
- Standard microphone input 2 (STD\_MIKE2)
- Standard microphone input 3 (STD\_MIKE3)
- Dynamic microphone input (DYN\_MIKE)

Each input is able to operate with one single microphone or with two microphones of the same type connected in parallel.

## AF Auxiliary Input

The AF auxiliary provides the interface to connect an external audio source (e.g. other radio services, music-player) to the transceiver. Interconnection of multiple external audio sources on this particular port requires additional external decoupling/isolation resistors. The external audio is audible only when the transceiver is in receiving mode.

The individual audio volume is set directly at the particular external equipment.

## Side Tone

The side tone is available on the headphone output during transmission. The side tone volume automatically adapts to the intercom volume setting.

## 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.

## 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.

## 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.

## Illumination

The illumination of LCD and push buttons can be controlled either directly from the front panel via the users menu or externally via the dimming input lines. If external dimming selected, the illumination curve (brightness to voltage relation) is adjustable in installation setup.

### **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.

### **Emergency Operation**

If the power supply voltage drops below 10.25 V, the transceiver continues operation with degraded performance. If power supply further drops below 9.0 Volt, the unit automatically switches off.

### **Built-in Tests PBIT and CBIT**

After power-up, the unit 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 unit. If detecting a problem during CBIT an error message become displayed.

### **Installation Setup**

Configuration of the installation parameters such as mike sensitivity, mike type selection, speaker enable/disable and several other parameters, via the installation setup is provided.

### **Service Mode**

The service mode is a special configuration mode accessible via RS422 interface with a proprietary serial data communication protocol. This mode is for use by authorized maintenance organizations only.

## 1.6. Safety-Conscious Utilization

For safe operation of the product the following notes have to be observed:

### NOTICE

- The installation may be carried out only by an authorized personnel. The country regulations always have to be observed.
- Use the product only within the specified conditions, see "Technical Data", page 14.

## 1.7. Technical Data

### 1.7.1. Power Supply Data

GT6201	Specifications
Nominal supply voltage range	11.0...30.3 VDC
Extended supply voltage range	10.25...32.2 VDC
Emergency operation	9.0...10.25 VDC
Dimming control	0...14 VDC or 0...28 VDC

### Typical Power Consumption

	GT6201-05 6 W	GT6201-10* 10 W
Power off state @ 12 VDC	≤ 0.10 mA	--
Power off state @ 24 VDC	≤ 0.10 mA	≤ 0.10 mA
Reception standby mode @ 12 VDC, panel backlight off	≤ 140 mA	≤ 140 mA
Reception standby mode @ 24 VDC, panel backlight off	≤ 80 mA	≤ 80 mA
Transmission mode @ 12 VDC, VSWR=1:1	2.0 A @ 85% 1.7 A @ 0%	--
Transmission mode @ 24 VDC, VSWR=1:1	--	1.5 A @ 85% 1.25 A @ 0%

\* 10 W @ 24 VDC and above, degraded TX power < 24 V

### 1.7.2. General Data

GT6201	Specifications
Frequency range	118.000...136.990 MHz
Channel spacing	8.33 / 25 kHz
Number of channels	
25 kHz channel spacing	760 (118.000...136.975)
8.33 kHz channel spacing	2280 (118.000...136.990)
Storage temperature range	-55...+85 °C
Operating temperature range	-20...+55 °C

### 1.7.3. Receiver Data

GT6201	
<b>Sensitivity</b> (measured with psophometric filter)	$\leq -101$ dBm for a SINAD of 12 dB (nominal)
	$\leq -95$ dBm for a SINAD of 12 dB (under extended and extreme environmental conditions)
<b>Effective bandwidth</b> (8.33 kHz channel spacing)	$\pm 2.8$ kHz
<b>Effective bandwidth</b> (25 kHz channel spacing)	$\pm 8.5$ kHz
<b>Squelch</b>	level adjustable
<b>AGC characteristic</b>	$\leq 6$ dB in range -101...-1 dBm
<b>Distortion</b> at 30%, 50% rated output power at 90%, 50% rated output power	$\leq 5\%$
	$\leq 10\%$
<b>Audio frequency response</b> 8.33 kHz channel spacing 25 kHz channel spacing	+2 dB / -4 dB 350...2500 Hz relative to 1000 Hz
	+2 dB / -4 dB 300...3400 Hz relative to 1000 Hz
<b>Audio Noise</b>	$\geq 40$ dB at 90%
<b>Rated output power for speaker</b>	$\geq 4$ W into 4 $\Omega$
<b>Rated output power for headphone 1</b>	$\geq 300$ mW into 75 $\Omega$
	$\geq 100$ mW into 600 $\Omega$
<b>Rated output power for headphone 2</b>	$\geq 200$ mW into 75 $\Omega$
	$\geq 100$ mW into 600 $\Omega$
<b>Audio auxiliary input</b>	50 mV...8 V (adjustable) across 600 $\Omega$
<b>Offset-carrier operation</b>	N/A

#### 1.7.4. Transmitter Data

GT6201	
Output power into 50 $\Omega$ (with and without modulation)	GT6201-05: $\geq 6$ W
	GT6201-10: $\geq 10$ W
Frequency tolerance	$\leq \pm 1$ ppm
Duty cycle	120 s (TX); 480 s (RX)
Type of modulation	6K80A3EJN 5K00A3EJN
Modulation capability	$\geq 85\%$
Distortion	$\leq 10\%$
Audio frequency response	
8.33 kHz channel spacing	-4 dB / +2 dB in band 350...2500 Hz relative to 1000 Hz $\leq -25$ dB above 3200 Hz
25 kHz channel spacing	-4 dB / +2 dB in band 300...3400 Hz relative to 1000 Hz $\leq -25$ dB above 5000 Hz
Dynamic microphone	1...20 mV compressor starting point, adjustable
(with compressor)	Input balanced, 200 $\Omega$ Input range up to 20 dB above compressor starting point.
Standard microphone(s)	10...1000 mV compressor starting point, adjustable
(with compressor)	Input unbalanced, 150 $\Omega$ Input range up to 20 dB above compressor starting point.
FM deviation with modulation	$\leq 3$ kHz ( $\leq 800$ Hz typ.)
Sidetone	adjustable
Automatic shutdown of transmit mode	120 s (Factory configurable 30...120 s)



### 1.7.5. Emergency Operation

Emergency Operation

9.0...10.25 VDC (degraded performance)

#### SAFETY INSTRUCTIONS

For power-supply voltages below 10.25 V, the speaker output of the transceiver will automatically switch "OFF" without further indication.

If the device enters emergency operation, the speaker is switched "OFF" due to degraded performance. Depending on settings in installation setup "LOW BATT" may be indicated if supply voltage drops below a predefined threshold to indicate to the user, that he should connect his headset as the speaker may be switched "OFF" soon. In this case, a headset is required to continue operation of the transceiver.

GT6201 (Emergency Operation)	Specifications
Panel & Display Backlight	switched off (for saving BATT energy)
TX Output Power	≥ 2 W into 50 Ω (with modulation)
TX Modulation Depth	≥ 50%
RX Sensitivity	≤ -93 dBm for a (S+N)/N ratio of 6 dB

### 1.7.6. Dimensions & Weight

GT6201	Specifications
Front panel (W x H)	61 x 61 mm (2.4 x 2.4 inch)
Depth of unit	205.7 mm (8.98 inch)
Mounting depth	184.8 mm (7.28 inch)
Mounting	Back panel standard Ø58 mm (2¼ inch)
Material	AlMg/Plastic
Surface treatment	Control-head coated with black matt paint
Weight	645 g (1.42 lbs)

### 1.8. Approvals

#### SAFETY INSTRUCTIONS

Unauthorized changes or modifications to the GT6201 may void the compliance to the required regulatory agencies and authorization for continued equipment usage.

GT6201 meets 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
GT6201-10	0637.361-923	BAF - German Federal Supervisory Office for Air Navigation Services D-0030/2014

## 1.9. Order Code

### 1.9.1. GT6201

Qty	VHF-Transceiver	
1	GT6201-05, Single Block Unit, $\geq 6$ Watt RF Power Output	Article no. 0637.351-923
1	GT6201-10, Single Block Unit, $\geq 10$ Watt RF Power Output	Article no. 0637.361-923

### 1.9.2. Accessories

Qty	Mounting	
1	Vehicle Kit VK4201 <ul style="list-style-type: none"> <li>• 1PM012, Dynamic Microphone</li> <li>• 1PL011, Speaker with housing and cables</li> <li>• 1E024, Car mounting</li> <li>• 1K044, Cable harness</li> <li>• 1A002, Antenna</li> <li>• 1KA003, Antenna cable, length 2.5 m</li> </ul>	Article-No. 0892.424-923

Qty	Available Documentation	
1	GT6201 Installation and Operation Manual, English	Article no. 0640.093-071
1	GT6201 Maintenance and Repair Manual, English	Article no. 0640.107-071
1	Quick Start Guide English/German	Article no. 0646.921-071

## 2. Installation

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

The installation of the transceiver depends on the location and its equipment. Therefore, this section only provides general information.

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 own responsibility.

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## 2.1. Limitations

- GT6201 is designed been installed as ground based transceiver for management air and ground traffic operations..
- The equipment is not qualified for installation in areas where fluid contamination is quite likely.

### **SAFETY INSTRUCTIONS**

Unauthorized changes or modifications to the GT6201 may void the compliance to the required regulatory agencies and authorization for continued equipment usage.

## 2.2. Packaging, Transport, Storage

Visually inspect the package contents for signs of transport damage.

### 2.2.1. Packaging Material and Transport

#### **⚠ CAUTION**

The packaging material is inflammable, if it is disposed of improperly by burning, lethal 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 20).

#### **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.

## 2.3. Device Assignment

This manual is valid for the following devices:

- GT6201-05
  - GT6201-10
- from Software Version  
SCI1050S305 Version 3.08  
SCI1051S305 Version 1.56

### 2.3.1. Scope of Delivery

- Manuals
  - Installation and Operation
- Device in accordance with your order
- Documents of Certifications if available

### 2.3.2. Additional Required Equipment

- Antenna (VHF COM, with coaxial 50 Ω impedance cable and BNC connector)
- Mounting material
- Connector kits
- Cable harness
- Microphone
- Headphone or speaker

Details see "Accessories", page 18.

### 2.3.3. Type Plate

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

Example:

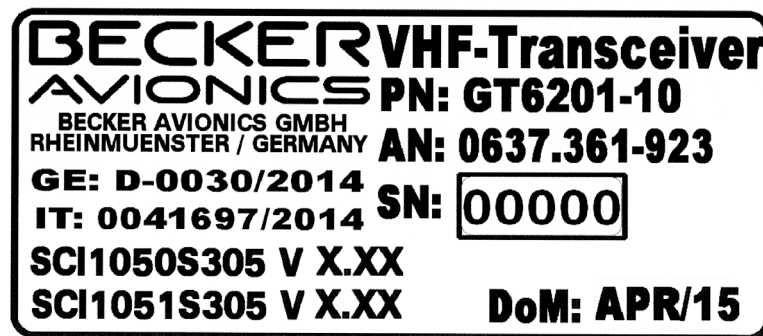


Figure 1: Type plate (example)

#### Explanation:

<b>PN:</b>	<b>Example Type designation: GT6201-10</b> <b>GT6201</b> = Single Block VHF-Ground-Transceiver 58 mm (2¼ inch)  <b>Options:</b> <b>-05</b> 6 Watt Transceiver <b>-10</b> 10 Watt Transceiver
<b>SN:</b>	Unique number of the particular device
<b>AN:</b>	Article number
<b>DoM:</b>	Date of Manufacturing
	<b>Software</b> Corresponding to the displayed version
	<b>Compliance and Certifications</b> Corresponding to the displayed text and logos

### 2.3.4. Software/Firmware Status – Functionality

The software version is displayed at the screen for a few seconds after power on.

Please contact our Customer Service for details about software modification updates.

## 2.4. Mounting Requirements

### SAFETY INSTRUCTIONS

The device must not be opened.

When installing the device, make sure the heat dissipators of the device receive sufficient air. 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.

- Leave a clearance between GT6201 and other equipment (min. 5 mm) to allow air circulation.
- Forced cooling is usually not required.

### 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.

### 2.4.1. Installation in a Vehicle

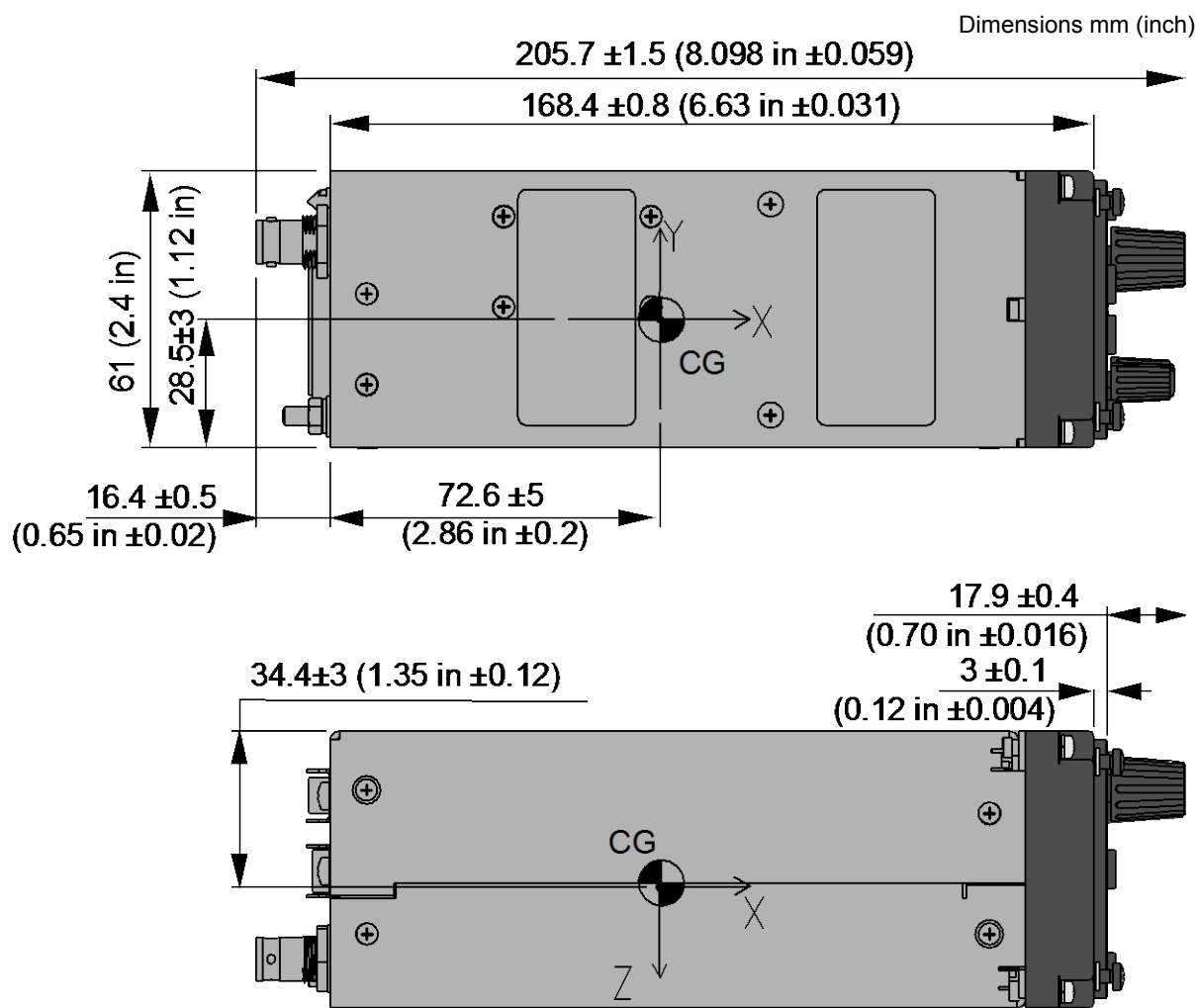
- Please use vehicle kit VK4201 for installation.
- Make sure to find a suitable spot to place the device.
- Please check easy access to the controls and indicators.
- Detailed information please see "Dimensions", page 23.

### 2.4.2. Installation Back Panel Mounting

- For installation via rear side of the panel, four screws already attach to the front of the unit.
- Circular cut out and the mounting holes please see "Dimensions", page 23.

## 2.5. Dimensions

### 2.5.1. GT6201



CENTER OF GRAVITY

Figure 2: Dimensions: GT6201 Single block transceiver

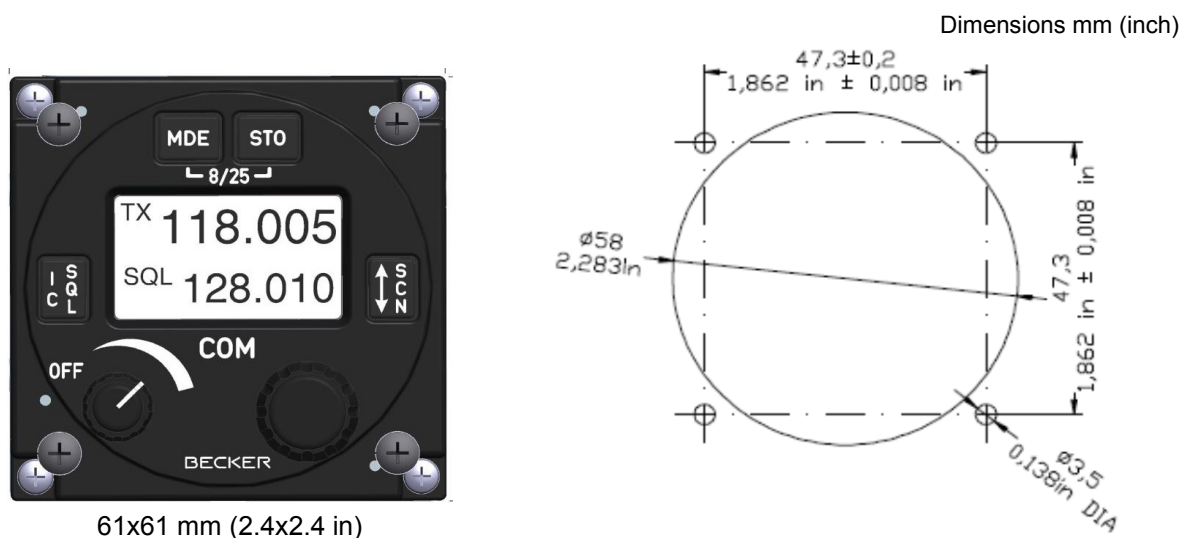


Figure 3: GT6201 front view

Figure 4: Drilling template (back-panel mounting)

## 2.6. Connector Pin Assignments

### 2.6.1. Antenna Connector (Position 1)

The antenna connector (Figure 5:, position 1) is a BNC type. The antenna port designed for operating with a nominal impedance of 50  $\Omega$ .

### 2.6.2. Grounding Bolt (Position 2)

The transceiver has a M4 threaded grounding bolt (Figure 5: position 2) allowing a low impedance grounding of the unit, which is essential to avoid damage or malfunction in the case of indirect lightning, EMI and HIRF conditions.

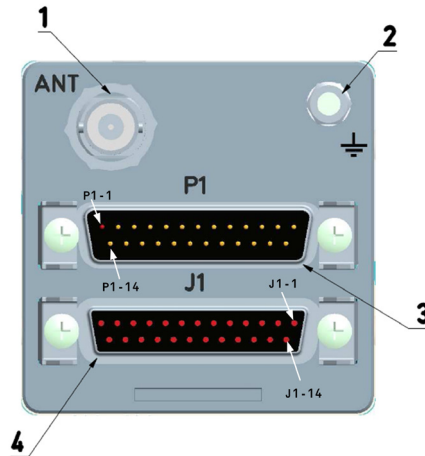


Figure 5: GT6201 – connector layout

### 2.6.3. P1 Connector

D-SUB male connector with 25 pins and slide-in fastener.

Pin No.	Pin Name	Direction	Function
P1-1	SPK_HI	OUT	Speaker output signal (hot)
P1-2	HDPH1_A	OUT	Balanced output for headphone(s)1
P1-3	HDPH1_B	OUT	Balanced output for headphone(s)1
P1-4	AF_AUX_IN_HI	IN	Auxiliary audio input (hot)
P1-5	MIKE_DYN_HI	IN	Balanced input for dynamic microphone(s)
P1-6	MIKE_DYN_LO	IN	Balanced input for dynamic microphone(s)
P1-7	/IC	IN	Intercom key input; ACTIVE state - closed contact to GND
P1-8	MIKE_STD_LO	-	Standard microphone(s) low (ground/return) used for STD1, STD2 and STD3
P1-9	MIKE_STD2_HI	IN	Standard microphone 2 High (hot)
P1-10	ILL_LO	IN	Illumination low input
P1-11	P_SUPP	IN	Power supply Hot (positive)
P1-12	P_SUPP	IN	Power supply Hot (positive)
P1-13	P_SUPP_GND	-	Power supply ground (return)
P1-14	SPK_LO	-	Speaker ground (return)
P1-15	LINE_OUT	OUT	Linear audio output, unbalanced
P1-16	AGC_OUT	OUT	Receiver AGC output
P1-17	/PTT1	IN	Press To Talk key input1 ACTIVE state - closed contact to GND



P1-18	MIKE_STD1_HI	IN	Standard Microphone 1 High (hot)
P1-19	MIKE_STD3_HI	IN	Standard Microphone 3 High (hot)
P1-20	HDPH2_A	OUT	Balanced Output for headphone(s)2
P1-21	AF_AUX_IN_LO	IN	Auxiliary audio input low (return)
P1-22	HDPH2_B	OUT	Balanced output for headphone(s)2
P1-23	ILL_HI	IN	Illumination high
P1-24	/PWR_EVAL	OUT	Power on monitor output
P1-25	P_SUPP_GND	-	Power supply ground (return)

#### 2.6.4. J1 Connector

D-SUB female connector with 25 sockets and slide-in fastener.

Pin No.	Pin Name	Direction	Function
J1-1	CPIN	-	Reserved coding pin
J1-2	TX2+	OUT	Auxiliary control interface
J1-3	RX2+	IN	Auxiliary Control Interface
J1-4	/SQL_EVAL	OUT	Squelch monitor output ACTIVE state - closed contact to GND
J1-5	/PTT2	IN	Press-To-Talk key input 2 ACTIVE state - closed contact to GND
J1-6	SHIELD_1	-	Secondary control & service interface SHIELD
J1-7	TX1+	OUT	Secondary control & service interface
J1-8	RX1+	IN	Secondary control & service interface
J1-9	TX2-	OUT	Auxiliary control interface
J1-10	RX2-	IN	Auxiliary control interface
J1-11	SHIELD_2	-	Auxiliary control interface SHIELD
J1-12	/EXT_SO	IN	External "Exchange" key Falling edge will activate frequency exchange
J1-13	/SRV_EN	IN	Service enable pin ACTIVE state - closed contact to GND
J1-14	TX1-	OUT	Secondary control & service interface
J1-15	RX1-	IN	Secondary control & service interface
J1-16	NC		not connected
J1-17	/SQL_SW	IN	"Squelch Force-OFF" input ACTIVE state - closed contact to GND
J1-18	NC		not connected
J1-19	NC		not connected
J1-20	/ISOL	IN	"ISOL" input ACTIVE state - closed contact to GND
J1-21	D_GND	-	Discrete lines ground
J1-22	D_GND	-	Discrete lines ground
J1-23	D_GND	-	Discrete lines ground

J1-24	/MIKE_SW	IN	Configuration selector CFG1 and CFG2
J1-25	/EXT_ON	IN	External Power ON input ACTIVE state - closed contact to GND

## 2.6.5. Inputs / Outputs

### Microphone Connection – Standard Microphones

Pin No.	Pin Name	Direction	Function
P1-8	MIKE_STD_LO	-	Standard microphone(s) low (ground/return) used for STD1, STD2 and STD3
P1-9	MIKE_STD2_HI	IN	Standard microphone 2 high (hot)
P1-18	MIKE_STD1_HI	IN	Standard microphone 1 high (hot)
P1-19	MIKE_STD3_HI	IN	Standard microphone 3 high (hot)

The transceiver has three unbalanced inputs STD1, STD2 and STD3. Each input has an input impedance of 110  $\Omega$  and a nominal sensitivity of 110 mV.

This sensitivity level is adjustable in the installation setup from 9...1500 mV independently for each of the microphones. The power supply delivered from pins P1-9, P1-18 and P1-19 for supply of the connected microphone(s) is > 8 VDC (8.3 V nominal) open circuit with an output impedance of 120  $\Omega$ .

#### Note:

- For common aviation microphones the power supply is able to support two microphones in parallel. It is recommended to combine only microphones of the same type / impedance.
- In installations where high interferences were detected, we recommend the use of sensitivity levels between 27...1500 mV.
- We also recommend mounting the jacks generally isolated from car frame in order to avoid ground loops.

### Microphone Connection - Dynamic Microphone

Pin No.	Pin Name	Direction	Function
P1-5	MIKE_DYN_HI	IN	Balanced input for dynamic microphone(s)
P1-6	MIKE_DYN_LO	IN	Balanced input for dynamic microphone(s)

Interfacing with dynamic microphones, the transceiver provides balanced inputs with an impedance of 140  $\Omega$  and a nominal sensitivity of 1.6 mV. This sensitivity level is adjustable in the installation setup from 1...20 mV. Two dynamic microphones in parallel may be connected (identical technical characteristics of the microphones are preferable).

#### Note:

- In installations where high interferences are detected we recommend the use of sensitivity levels between 2...20 mV.
- We also recommend mounting the jacks generally isolated from car frame in order to avoid ground loops.
- Use microphone cables with shielded microphone wires.

### Speaker Connection

Pin No.	Pin Name	Direction	Function
P1-1	SPK_HI	OUT	Speaker output signal
P1-14	SPK_LO	-	Speaker ground (return)

The speaker output provides nominal 4 W into 4  $\Omega$ .

### Headphone(s) Connection

Pin No.	Pin Name	Direction	Function
P1-2	HDPH1_A	OUT	Balanced output for headphone(s) 1
P1-3	HDPH1_B	OUT	Balanced output for headphone(s) 1
P1-20	HDPH2_A	OUT	Balanced output for headphone(s) 2
P1-22	HDPH2_B	OUT	Balanced output for headphone(s) 2

The headphone 1 output is a balanced, transformer-coupled output providing nominal 300 mW into 75  $\Omega$ . Using a shielded single wire for headphones requires an unbalanced output configuration. To achieve this, ground P1-3 (connect pin P1-13 with P1-25).

The headphone 2 output is a balanced output providing nominal 200 mW into 75  $\Omega$ .

Up to two headphones with phone-impedance of 300  $\Omega$  (or higher) may be connected in parallel on each circuit, therefore up to four headphones can be connected at the same time.

**CAUTION:** The headphone 2 output shall be always floating (cannot be connected in unbalance configuration as headphone 1).

### Panel Illumination

Pin No.	Pin Name	Direction	Function
P1-10	ILL_LO	IN	Illumination low input
P1-23	ILL_HI	IN	Illumination high input

The VHF transceiver provides illumination for pushbuttons and LCD display. In the installation setup it can be configured if this illumination is controlled via front panel or externally.

Connect ILL\_LO (pin P1-10) to car ground. Connect ILL\_HI (pin P1-23) to dimming bus.

### "Auxiliary" Audio Input

Pin No.	Pin Name	Direction	Function
P1-4	AF_AUX_IN_HI	IN	Auxiliary audio input hot
P1-21	AF_AUX_IN_LO	-	Auxiliary audio input low ground/return

### "LINE\_OUT" Audio Output

Pin No.	Pin Name	Direction	Function
P1-14	SPK_LO	-	Speaker ground (return)
P1-15	LINE_OUT_HI	OUT	Linear audio output, unbalanced

The LINE OUT enables to connect e.g. an external voice recorder to the transceiver when used in ground-based installations. The LINE OUT output provides nominal 1 V<sub>RMS</sub> into 1000  $\Omega$ .

### External Power ON

Pin No.	Pin Name	Direction	Function
J1-25	/EXT_ON	IN	External Power ON input ACTIVE state - closed contact to GND

External Power ON input provides possibility to power "ON" the system by connecting this pin to ground.

### Push-To-Talk (/PTT)

Pin No.	Pin Name	Direction	Function
P1-17	/PTT1	IN	Push-To-Talk key input 1 ACTIVE state - closed contact to GND
J1-5	/PTT2	IN	Push-To-Talk key input 2 ACTIVE state - closed contact to GND

There are two Push-to-Talk inputs available /PTT1 and /PTT2.

Each input has an internal pull up. While the input is connected to ground a current of less than 1 mA will flow. The transceiver enters transmit operation, if either one or both inputs are connected to ground.

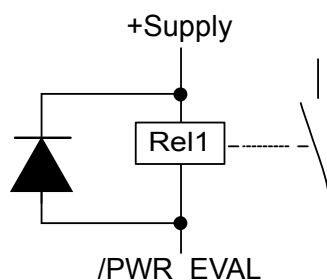
According to microphone(s) configuration, signal from particular inputs can or cannot modulate transmissions.

### Power Indication (/PWR\_EVAL)

Pin No.	Pin Name	Direction	Function
P1-24	/PWR_EVAL	OUT	Power on Monitor output: GT6201 "OFF" - open circuit GT6201 on - closed circuit to GND (max. 100 mA)

This output indicates whether the transceiver is in "ON" or "OFF" status by means of an open collector function. The output internally connects to ground when the unit is "ON" and allow a current of maximum 100 mA to drive an external relay for example. The output shows high impedance when the transceiver is "OFF".

**Note:** In order to avoid damage of this output a protection diode in parallel to the external relay shall connected.



### VHF Channel Signal Indication (/SQL\_EVAL)

Pin No.	Pin Name	Direction	Function
J1-4	/SQL_EVAL	OUT	Indicates presence of the VHF channel's signal on the audio outputs.

This output indicates presence of the VHF channel's signal on the audio outputs. It is an open collector output type. The output internally connects to ground when the unit receives signal on the selected VHF channel and this audio signal is available on audio outputs. In this case a current of maximum 100 mA can flow into the transceiver to drive an external relay for example. The output has high impedance if the unit is switched off.

### External Mike Switch (/MIKE\_SW)

Pin No.	Pin Name	Direction	Function
J1-24	/MIKE_SW	IN	Configuration selector CFG1 and CFG2. ACTIVE state - closed contact to GND

The external Mike switch provides selection between the two available audio in/out configurations: CFG1 and CFG2. Configurations can also be changed during flight in installation setup.

- When /MIKE\_SW is active then configuration CFG1 is in use.
- When /MIKE\_SW is inactive then CFG2 is in use.

Each configuration CFG1 and CFG2 stores several parameters that can be set in installation setup pages (For details, refer to chapter "Installation Setup", page 31).

## 2.7. Wiring

### 2.7.1. Car Cable Harness 1K044

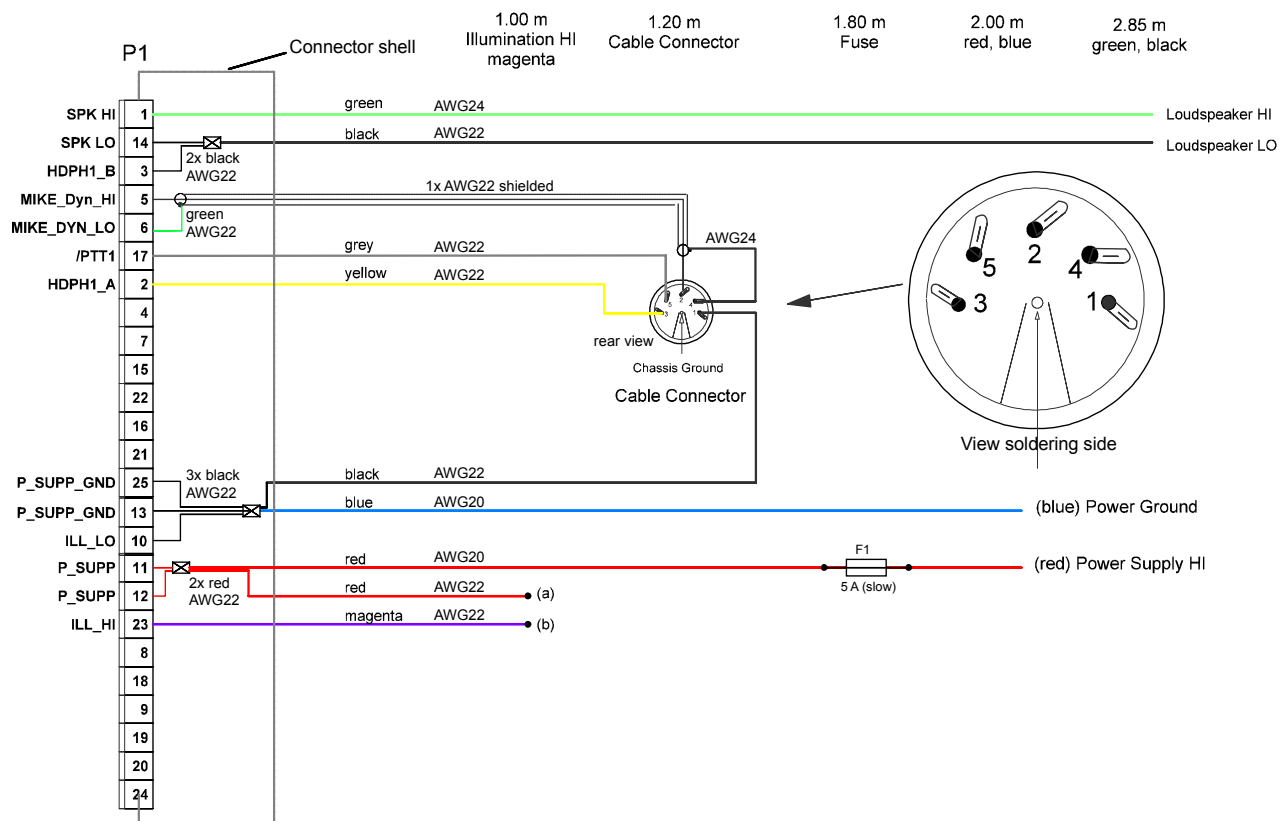


Figure 6: Car Cable Harness 1K044

**Notes:**

### 1. GT6201 panel illumination with fix illumination voltage

Connecting (a) with (b) provides vehicle power supply (14 or 28 VDC) on pin 23 "ILL HI".

Detailed information for illumination supply voltage and brightness see chapter "Installation Setup", page 31.

## 2. GT6201 panel illumination controlled by vehicle DIM--bus

Connect (b) "ILL\_HI" with the vehicle DIM-bus 0...14 VDC or 0...28 VDC for panel illumination adaption with vehicle instrument panel.

**If connected this way check if all open cable ends are correct insulated!!**

Detailed information for illumination supply voltage see chapter "Installation Setup", page 31.

## 2.8. Installation and Configuration

Connection to the following equipment is required as minimum for GT6201 transceivers:

- Power supply
- Antenna
- Microphone (direct or via external audio panel)
- Headphone or speaker (direct or via external audio panel)
- Push-To-Talk (PTT) switch

### SAFETY INSTRUCTIONS

- Use only cables which are qualified (e.g. self-extinguishing).
- Use AWG 20 for power supply and AWG 22/24 for other cables.
- Fit sleeves over the solder joints on the equipment connector. Crimp connectors are also available from Becker.
- Protect the power supply with a 7.5 A fuse.
- GT62010 is protected internally by a 7 A SMD not resettable fuse.
- Type-specific cable harnesses are also available for the vehicle's wiring (see "Accessories", page 18 and "Car Cable Harness 1K044", page 29).
- No RF antenna cables or HF cables should be included in the cable harnesses of the system. Avoid routing of the cable loom along with other wiring, which carry audio power or pulses.
- Check the wiring carefully before powering up the unit and check particularly that power supply lines have not been reversed.

### 2.8.1. Antenna Installation

The transceiver requires a standard 50  $\Omega$  vertically polarized VHF antenna. Follow manufacturer's instructions for antenna installation. In addition, consider the following recommendations:

- The COM antenna shall be on an electrical conductive surface or, on a ground plane with sufficient area of approximately 60 x 60 cm installed. (VSWR  $\leq$  3:1)

## 2.9. Installation Setup

The installation setup enables the technician to set up the equipment configuration.

### 2.9.1. Start Installation Setup

Hold down the "MDE" key during power up to access the installation setup menu. The "PASSWORD DIALOG" screen will appear.



Figure 7: "PASSWORD DIALOG"

Insert the 4-digit numerical code password "6435" by turning and pushing the "ROTARY ENCODER". Confirm by pressing the "STO" key. Now the first page of installation setup shows the "DEVICE INFO" screen.

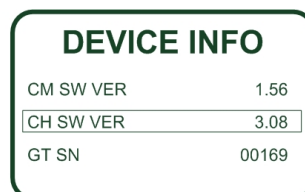


Figure 8: "DECIVE INFO"

#### 2.9.1.1. Navigate between Pages

The installation setup consists of several pages. Navigation within main pages:

Page Down (next page): press "↓/SCN" or the "ROTARY ENCODER".

Page Up (previous page): press "IC/SQL" key.

For navigation within the sub-pages of the installation setup, use the "ROTARY ENCODER".

#### 2.9.1.2. Store Setup Data

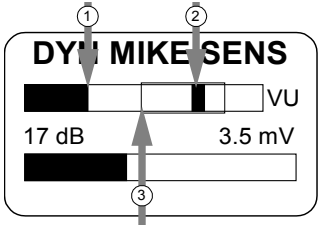
The setting of any parameter is stored immediately after changing the parameter.

#### 2.9.1.3. Leave Installation Setup

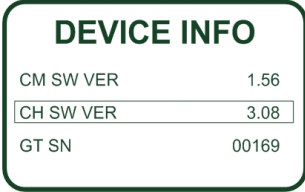
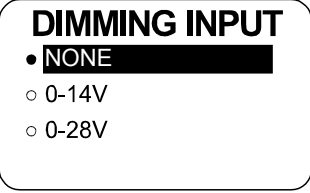
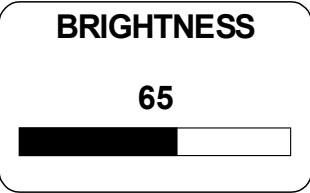
Switch "OFF" the GT6201 to terminate the setup. All changes made up to this time will be stored automatically. No special action is required before leaving setup page.

#### 2.9.1.4. Adjust Volume Settings (VU Meter)

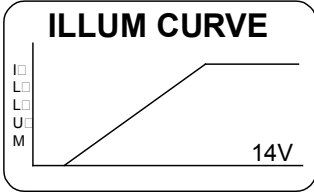
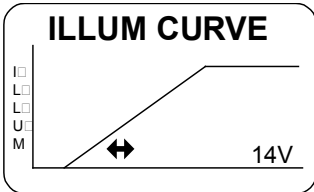
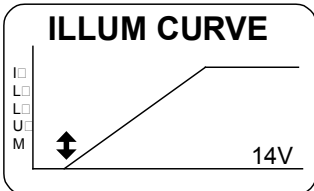
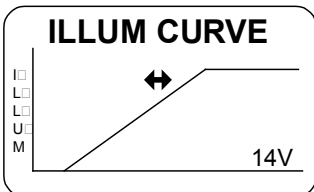
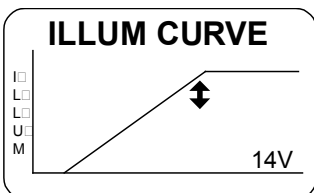

The VU Meter allows correct adjustment of audio input sensitivity. It is displayed on all sensitivity setting menus.

Display Contents	Description
<p>Example:</p>  <p>1: Current audio level 2: Hold max. level 3: Recommended range (inside frame)</p>	<p>VU Meter, it is located in the middle below the menu name and above the dedicated sensitivity setting bar.</p> <p>It displays the current audio level value on selected audio input ("Current audio level") and holds the highest value of active audio level recorded during last 3 seconds (displayed as "Hold max level" bar).</p> <p>Correct sensitivity is achieved if most of the time, while you are speaking normally into the microphone, the "Hold max level" bar remains in the "Recommended range".</p>

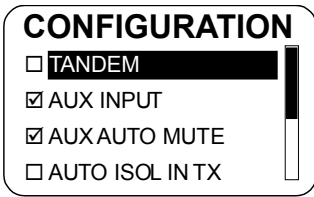
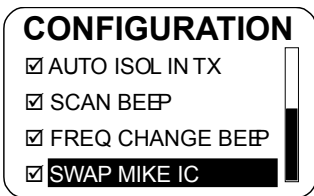
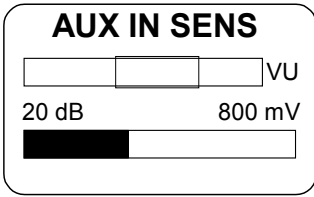
## 2.9.2. Installation Setup Pages


Display Contents	Description
	<p><b>"DEVICE INFO":</b></p> <p>After entering the "Installation Setup" the first page "DEVICE INFO" is displayed. This page shows information about the SW version and the serial number of the transceiver.</p> <p><b>For GT6201 "DEVICE INFO" displays information about;</b></p> <ul style="list-style-type: none"> <li>• Transceiver SW version (CM SW VER).</li> <li>• Controller SW version (CH SW VER).</li> <li>• GT620X serial number (GT SN).</li> </ul>
	<p><b>"DIMMING INPUT":</b></p> <p>One of three options can be selected by turning the "ROTARY ENCODER" to dim illumination for the display and push-button. Finalize the selection by pressing "STO" push-button.</p> <p><b>NONE:</b></p> <p>The illumination for LCD and push-buttons is controlled via the "ROTARY ENCODER" on the transceiver itself. The user can adjust the brightness in the user menu.</p> <p><b>0...14 V or 0...28 V:</b></p> <p>The background lighting for LCD and push-buttons is controlled (via pin P1-10/P1-23) by the dimming bus. The dimming curve is adjustable within the range from 0...14 VDC respectively 0...28 VDC. Adjusting the brightness via the "ROTARY ENCODER" is no longer possible after selecting this option.</p>
	<p><b>"BRIGHTNESS":</b></p> <p>The brightness of the LCD and push-button illumination can be adjusted between 0% (off) and 100%. Select your brightness by turning "ROTARY ENCODER". The BRIGHTNESS settings can also be adjusted in the user setup menu. Users can change the parameter at any time.</p> <p>BRIGHTNESS settings are separate for each controller therefore this menu is available on both controllers.</p> <p><b>Note: This page is displayed only if dimming input is set to</b></p>



Display Contents	Description
	<p><b>"ILLUM CURVE":</b></p> <p>The page "ILLUM CURVE" is displayed only if the DIMMING input is either selected for "14 V or 28 V" dim-bus voltage. The illumination curve shows the relation between dimming bus voltage and brightness of the LCD and push-button illumination.</p> <p>Two adjustable points V1 and V2 define the illumination curve.</p> <p>Select the respective parameter by pushing the "STO" button and then adjust the value in horizontal (left/right) respectively vertical (up/down) direction using the "ROTARY ENCODER".</p>
	<p>(1) This parameter defines the horizontal parameter V1x (minimum values: 1.5 V for 14 V dimming bus and 4 V for 28 V dimming bus). Up to this value the brightness is zero. When reaching V1x the brightness is immediately adjusted to V1y.</p>
	<p>(2) This parameter defines the vertical parameter V1y which is the level of brightness that is set when trigger point V1x is reached.</p>
	<p>(3) This parameter defines the horizontal parameter V2x (maximum values: 14 V or 28 V depending on selected dimming input) where the illumination curve reaches the maximum brightness level.</p>
	<p>(4) This parameter defines the vertical parameter V2y which is the maximum brightness.</p>
	<p><b>"MEM OPTIONS":</b></p> <p>Two options can be selected on "MEMORY OPTIONS" page. By means of the "ROTARY ENCODER" one option can be highlighted and enabled/ disabled by pushing the "STO" button.</p> <p><b>CHANNEL STORE:</b></p> <p>If this option is enabled frequencies can be stored in any of the 99 available channels.</p> <p>Even if the "CHANNEL STORE" option is disabled the user has access to previously stored "User Channels"</p> <p><b>STORE LAST CHANNEL</b></p> <p>If this option is enabled, the device automatically stores the last used VHF frequency in "Last Channel" database and user has a read access to this database.</p> <p>If this option is disabled the stored data in the "LAST CHANNEL" database is not accessible.</p>

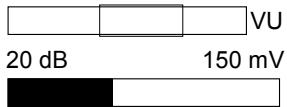
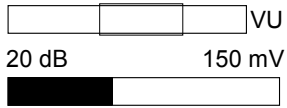
Display Contents	Description
<div style="border: 1px solid black; padding: 10px; margin: 10px;"> <p style="text-align: center;"><b>MDE PAGES</b></p> <p><input checked="" type="checkbox"/> <b>STANDBY FREQUENCY</b></p> <p><input checked="" type="checkbox"/> BATTERY VOLTAGE</p> <p><input checked="" type="checkbox"/> CHANNEL MEMORY</p> </div>	<p><b>"MDE PAGES":</b> On "MDE PAGES" page three options are selectable by means of the "ROTARY ENCODER". The three frequency selection modes provide different user interfaces for operating frequency selection. Enabling/Disabling can be toggled by pushing the "STO" button.</p> <p><b>STANDBY FREQUENCY</b> Enables/disables "Standard Mode"</p> <p><b>BATTERY VOLTAGE</b> Enables/disables "Direct Tune Mode".</p> <p><b>CHANNEL MEMORY</b> Enables/disables "Channel Mode".</p> <p>After deselecting "BATTERY VOLTAGE" the "DIRECT TUNE MODE" page is no longer available in the normal operation. Storing a frequency in a specific channel will be possible even if only "BATTERY VOLTAGE" or "STANDBY FREQUENCY" remain selected. At least one page will remain active, deselecting all options from the "MDE PAGES" is not possible</p>
<div style="border: 1px solid black; padding: 10px; margin: 10px;"> <p style="text-align: center;"><b>LOW BATT THR</b></p> <p style="text-align: center; font-size: 1.2em;"><b>10.5</b></p> <div style="border: 1px solid black; height: 15px; width: 100%; margin-top: 5px;"> <div style="background-color: black; width: 10%;"></div> </div> </div>	<p><b>"LOW BATT THR":</b> On "LOW BATT THR" page the threshold for indication of the "LOW BATT" warning page can be adjusted (default setting is 10.5 V). The low battery threshold depends on battery type in use and should be adjusted within 10...33 V by the installer turning the "ROTARY ENCODER". "LOW BATT" warning page is displayed if the supply voltage drops below the "LOW BATT THR" value.</p> <p>Recommended vales:</p> <p>"LOW BATT THR" = 11 V for 12 V battery "LOW BATT THR" = 24 V for 24 V battery</p>

Display Contents	Description
 <p>Options 1...4</p>	<p><b>"CONFIGURATION":</b></p> <p>On "CONFIGURATION" page 6 or 7 options can be selected. (refer to the note under <b>AUX AUTO MUTE</b> in the column on the right side). Use the "ROTARY ENCODER" to scroll up and down, then and push the "STO" button for selection.</p> <p><b>Tandem</b></p> <p>Not relevant for ground operations.</p> <p><b>AUX INPUT</b></p> <p>If selected, the auxiliary audio signal applied to pins P1-4 / pin P1-21 is audible on headphone / speaker.</p> <p><b>Note: If the auxiliary audio input is not used, it is recommended to deselect "AUX INPUT".</b></p> <p><b>AUX AUTO MUTE</b></p> <p>If selected the auxiliary audio input will be muted. The auxiliary audio input is also muted if the receiver detects (based on squelch evaluation) a signal.</p> <p>When deselected the auxiliary audio input signal and the receiver signal will intermix continuously.</p> <p><b>Note: "AUX AUTO MUTE" is only displayed when "AUX INPUT" is enabled.</b></p> <p><b>AUTO ISOL IN TX</b></p> <p>Not relevant for ground operations.</p>
 <p>Options 4...7</p>	<p><b>SCAN BEEP</b></p> <p>If selected the transceiver generates (only in scan function) a short beep tone to notify a signal presence on the "PRESET FREQUENCY".</p> <p>During signal reception on the "ACTIVE FREQUENCY" switch over to the "PRESET FREQUENCY" is not possible. The audio remains on "ACTIVE FREQUENCY" and a short beep tone is audible. Additionally the "PRESET FREQUENCY" will appear contrast inverted in a sequence of approximately one second.</p> <p><b>FREQ CHANGE BEEP</b></p> <p>If selected the transceiver generates a short beep on each change of the "ACTIVE FREQUENCY".</p> <p><b>SWAP MIKE IC</b></p> <p>If selected the /IC input functions as /MIKE_SW input and /MIKE_SW input operates as /IC input.</p>
	<p><b>"AUX IN SENS":</b></p> <p>On "AUX IN SENS" page the sensitivity adjustment of the auxiliary audio input (Pin P1-4 / Pin P1-21), in the range 50...8000 mV, can be set by turning the "ROTARY ENCODER".</p> <p>This page is displayed only if ENABLE_AUX_IN is activated.</p> <p>The VU meter shows the current signal level of the aux audio input and always displays the highest detected signal value from the last 3 seconds.</p>

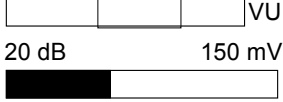

Display Contents	Description
<div> <b>AUTO AUX ATT</b>   <b>20</b>   </div>	<p><b>"AUTO AUX ATT":</b></p> <p>On "AUTO AUX ATT" page the attenuation for the auxiliary audio input can be adjusted between 0...40 dB by turning the "ROTARY ENCODER"</p> <p>When intercommunication is initiated (regardless of the intercom activation: "VOX", or "/IC" discrete input) the signal from auxiliary audio input will be attenuated. After intercommunication is finished the auxiliary audio will revert to its previous level.</p>
<div> <b>IN/OUT CFG 1</b>  <div> MICROPHONE 1 <ul style="list-style-type: none"> <li>○ STD 1 MIKE</li> <li>○ STD 2 MIKE</li> <li>○ STD 3 MIKE</li> <li>● DYN MIKE</li> <li>○ NONE</li> </ul> </div> <div> MICROPHONE 2 <ul style="list-style-type: none"> <li>○ STD 1 MIKE</li> <li>○ STD 2 MIKE</li> <li>○ STD 3 MIKE</li> <li>○ DYN MIKE</li> <li>● NONE</li> </ul> </div> <div> MIC ACTIVATION <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> BOTH MIKES</li> </ul> </div> <div> OUTPUTS <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> HEADPHONE 1</li> <li>○ HEADPHONE 1</li> <li>● SPEAKER</li> <li>○ NONE</li> </ul> </div> </div>	<p><b>"IN/OUT CFG 1":</b></p> <p>On "IN/OUT CFG 1" page the microphone inputs and headphone outputs for configuration CFG1 can be configured. To scroll the page turn the "ROTARY ENCODER".</p> <p><b>"MICROPHONE 1" (at one time only one option can be selected):</b></p> <p><b>STD1 MIKE</b> Standard microphone input 1 (Pins P1-18/ P1-8) is selected.</p> <p><b>STD2 MIKE</b> Standard microphone input 2 (Pins P1-9/ P1-8) is selected.</p> <p><b>STD3 MIKE</b> Standard microphone input 3 (Pins P1-19/ P1-8) is selected.</p> <p><b>DYN MIKE</b> Dynamic microphone input (Pins P1-6/ P1-5) is selected.</p> <p><b>NONE</b> No microphone is used in microphone path 1.</p> <p><b>"MICROPHONE 2" (at one time only one option can be selected):</b></p> <p><b>STD1 MIKE</b> Standard microphone input 1 (Pins P1-18/ P1-8) is selected.</p> <p><b>STD2 MIKE</b> Standard microphone input 2 (Pins P1-9/ P1-8) is selected.</p> <p><b>STD3 MIKE</b> Standard microphone input 3 (Pins P1-19/ P1-8) is selected.</p> <p><b>DYN MIKE</b> Dynamic microphone input (Pins P1-6/ P1-5) is selected.</p> <p><b>NONE</b> No microphone is used in microphone path 2.</p> <p><b>"MIC ACTIVATION"</b></p> <p><b>BOTH MIKES ENABLED:</b> Input /PTT1 (Pin P1-17) activates transmission from microphone path 1 and 2. Input /PTT2 (Pin J1-5) activates transmission from microphone path 2 and path 1. Input /IC (Pin P1-7) activates intercom from microphone path 1 and 2.</p> <p><b>BOTH MIKES DISABLED:</b> Input /PTT1 (Pin P1-17) activates transmission only from microphone path 1 Input /PTT2 (Pin J1-5) activates transmission only from microphone path 2</p>

Display Contents	Description
	<p>Input /IC (Pin P1-7) activates intercom only from microphone path 1</p> <p>"OUTPUTS"</p> <p><b>HDPH 1 ENABLED</b> Audio available on headphone 1 output (Pins P1-2/P1-3)</p> <p><b>HDPH 1 DISABLED</b> No audio available on headphone 1 output.</p> <p><b>HDPH 2 ENABLED</b> Audio is available on headphone 2 output (Pins P1-20/P1-22), speaker not available.</p> <p><b>HDPH 2 DISABLED</b> No audio available on headphone 2 output, speaker not available.</p> <p><b>SPEAKER ENABLED</b> Audio is available on speaker (Pins P1-1/P1-14), headphone 2 not available</p> <p><b>NONE</b> No audio on headphone 2 output or speaker output.</p> <p><b>Note: Displayed only if MIKE_SW input (Pin J1-24) has inactive state.</b></p>
<p><b>IN/OUT CFG 2</b></p> <p>MICROPHONE 1</p> <ul style="list-style-type: none"> <li>○ STD 1 MIKE</li> <li>○ STD 2 MIKE</li> <li>○ STD 3 MIKE</li> <li>● DYN MIKE</li> <li>○ NONE</li> </ul> <p>MICROPHONE 2</p> <ul style="list-style-type: none"> <li>○ STD 1 MIKE</li> <li>○ STD 2 MIKE</li> <li>○ STD 3 MIKE</li> <li>○ DYN MIKE</li> <li>● NONE</li> </ul> <p>MIC ACTIVATION</p> <p><input checked="" type="checkbox"/> BOTH MIKES</p> <p>OUTPUTS</p> <p><input checked="" type="checkbox"/> HEADPHONE 1</p> <ul style="list-style-type: none"> <li>○ HEADPHONE 1</li> <li>● SPEAKER</li> <li>○ NONE</li> </ul>	<p><b>"IN/OUT CFG 2":</b> On "IN/OUT CFG 2" page the microphone inputs and headphone outputs for configuration CFG2 can be configured. This page is displayed only if MIKE_SW input (Pin J1-24) has active state. Please note when MIKE_SW connected in installation both configurations for IN/OUT CFG1 and IN/OUT CFG2 shall be configured. To scroll the page turn the "ROTARY ENCODER".</p> <p><b>"MICROPHONE 1"</b> (at one time only one option can be selected):</p> <p><b>STD1 MIKE</b> Standard microphone input 1 (Pins P1-18/ P1-8) is selected</p> <p><b>STD2 MIKE</b> Standard microphone input 2 (Pins P1-9/ P1-8) is selected</p> <p><b>STD3 MIKE</b> Standard microphone input 3 (Pins P1-19/ P1-8) is selected</p> <p><b>DYN MIKE</b> Dynamic microphone input (Pins P1-6/ P1-5) is selected</p> <p><b>NONE</b> No microphones is used in microphone path 1</p> <p><b>"MICROPHONE 2"</b> (at one time only one option can be selected):</p> <p><b>STD1 MIKE</b> Standard microphone input 1 (Pins P1-18/ P1-8) is selected</p> <p><b>STD2 MIKE</b> Standard microphone input 2 (Pins P1-9/ P1-8) is selected</p> <p><b>STD3 MIKE</b> Standard microphone input 3 (Pins P1-19/ P1-8) is selected</p> <p><b>DYN MIKE</b></p>

Display Contents	Description
	<p>Dynamic microphone input (Pins P1-6/ P1-5) is selected</p> <p><b>NONE</b></p> <p>No microphones is used in microphone path 2</p> <p>"MIC ACTIVATION"</p> <p><b>BOTH MIKES ENABLED:</b></p> <p>Input /PTT1 (Pin P1-17) activates transmission from microphone path 1 and 2</p> <p>Input /PTT2 (Pin J1-5) activates transmission from microphone path 2 and 1</p> <p>Input /IC (Pin P1-7) activates intercom from microphone path 1 and 2</p> <p><b>BOTH MIKES DISABLED:</b></p> <p>Input /PTT1 (Pin P1-17) activates transmission only from microphone path 1</p> <p>Input /PTT2 (Pin J1-5) activates transmission only from microphone path 2</p> <p>Input /IC (Pin P1-7) activates intercom only from microphone path 1</p> <p>"OUTPUTS"</p> <p><b>HDPH 1 ENABLED</b></p> <p>Audio available on headphone 1 output (Pins P1-2/P1-3)</p> <p><b>HDPH 1 DISABLED</b></p> <p>No audio is available on headphone 1 output.</p> <p><b>HDPH 2 ENABLED</b></p> <p>Audio is available on headphone 2 output (Pins P1-20/P1-22), speaker not available.</p> <p><b>HDPH 2 DISABLED</b></p> <p>No audio available on headphone 2 output, speaker not available.</p> <p><b>SPEAKER ENABLED</b></p> <p>Audio is available on speaker (Pins P1-1/P1-14), headphone 2 not available</p> <p><b>NONE</b></p> <p>No audio on headphone 2 output or speaker output.</p> <p><b>Note: Displayed only if MIKE_SW input (Pin J1-24) has inactive state.</b></p>




Display Contents	Description
<p><b>STD1 MIKE SENS</b></p>  <p><b>Note: This page is only displayed if :</b> Standard Mike 2 input is selected in IN/OUT CFG1 and MIKE_SW input pin status is [Inactive] or Standard Mike 2 input is selected in IN/OUT CFG2 and MIKE_SW input pin status is [Active].</p>	<p><b>"STD1 MIKE SENS":</b> The sensitivity of standard microphone 1, "STD 1 MIKE SENS", input is adjustable within the range 9...1500 mV by turning the "ROTARY ENCODER".</p> <p>The factory setting is 110 mV.</p> <p>The VU meter displays the current signal level on the audio input and also displays the highest signal value for the last 3 seconds.</p> <p>When speaking normally into the microphone the bar graph should remain within the recommended predefined range</p> <p><b>Note: Adjust the microphone sensitivity by keeping the cockpit noise suppression as high as possible, this will ensure correct modulation.</b></p> <p>If the sensitivity is adjusted to a smaller value (e.g. 10 mV) the cockpit noises may become louder than for a higher adjustment (e.g. 100 mV). Otherwise, adjusting the sensitivity to a very high value (e.g. 1000 mV), the cockpit noise is very much reduced, but the modulation of the transmitter might be not sufficient.</p> <p>The installer shall perform a communication check after modification of this parameter.</p> <p><b>Note: For installations with high interferences it is recommended to use sensitivity level 27...1500 mV.</b></p>
<p><b>STD2 MIKE SENS</b></p>  <p><b>Note: This page is only displayed if :</b> Standard Mike 2 input is selected in IN/OUT CFG1 and MIKE_SW input pin status is [Inactive] or Standard Mike 2 input is selected in IN/OUT CFG2 and MIKE_SW input pin status is [Active].</p>	<p><b>"STD2 MIKE SENS":</b> The sensitivity of standard microphone 2 input can be adjusted in range from 9...1500 mV by turning the "ROTARY ENCODER".</p> <p>The default setting is 110 mV.</p> <p>VU meter displays current value of audio level from standard microphone input 2 and displays the highest value of active audio level recorded during last 3 seconds.</p> <p>Correct sensitivity is achieved when you are speaking normally into the microphone, this is confirmed by the "Hold max level bar" remaining in "Recommended Range".</p> <p><b>Note: The microphone sensitivity shall be adjusted to achieve a correct modulation by keeping the cockpit noise suppression as high as possible.</b></p> <p>If the sensitivity value is very small (e.g. 10 mV) more cockpit noise will be heard than if the sensitivity value is set to a higher level (e.g. 100 mV).</p> <p>Alternatively if the sensitivity value is very high (e.g. 1000 mV) the cockpit noise will significantly be reduced but the modulation of the transmitter may not be sufficient.</p> <p>After modifying this parameter a communication check shall be done by the installer. It is recommended to perform this communication check with and without engine running.</p> <p><b>Note: For installations with high interference it is recommended to use sensitivity level 27...1500 mV.</b></p>

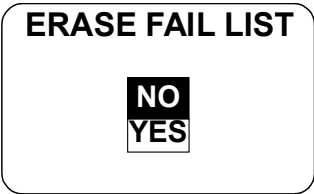
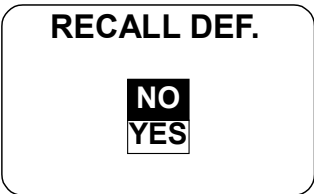


Display Contents	Description
<div data-bbox="156 432 472 622"> <p><b>STD3 MIKE SENS</b></p>  <p>20 dB 150 mV</p> </div> <p><b>Note:</b> This page is only displayed if :</p> <p>Standard Mike 3 input is selected in IN/OUT CFG1 and MIKE_SW input pin status is [Inactive]</p> <p>or</p> <p>Standard Mike 3 input is selected in IN/OUT CFG2 and MIKE_SW input pin status is [Active].</p>	<p><b>"STD3 MIKE SENS":</b></p> <p>The sensitivity of standard microphone 3 Input can be adjusted in range from 9...1500 mV by turning the "ROTARY ENCODER".</p> <p>The default setting is 110 mV.</p> <p>VU meter displays current value of audio level from standard microphone input 3 and displays the highest value of active audio level recorded during last 3 seconds.</p> <p>Correct sensitivity is achieved when you are speaking normally into the microphone, this is confirmed by the "Hold max level bar" remaining in "Recommended Range".</p> <p><b>Note: The microphone sensitivity shall be adjusted to achieve a correct modulation by keeping the cockpit noise suppression as high as possible.</b></p> <p>If the sensitivity value is very small (e.g. 10 mV) more cockpit noise will be heard than if the sensitivity value is set to a higher level (e.g. 100 mV).</p> <p>Alternatively if the sensitivity value is very high (e.g. 1000 mV) the cockpit noise will significantly be reduced but the modulation of the transmitter may not be sufficient.</p> <p>After modifying this parameter a communication check shall be done by the installer. It is recommended to perform this communication check with and without engine running.</p> <p><b>Note: For installations with high interferences it is recommended to use sensitivity level 27...1500 mV.</b></p>
<div data-bbox="156 1305 472 1496"> <p><b>DYN MIKE SENS</b></p>  <p>17 dB 3.5 mV</p> </div> <p><b>Note: This page is only displayed if :</b></p> <p>Dynamic input is selected in IN/OUT CFG1 and MIKE_SW input pin status is [Inactive]</p> <p>or</p> <p>Dynamic Mike input is selected in IN/OUT CFG2 and MIKE_SW input pin status is [Active].</p>	<p><b>"DYN MIKE SENS":</b></p> <p>The sensitivity of the Dynamic Mike, "DYN MIKE SENS", input is adjustable within a range of 0.5...25 mV by turning the "ROTARY ENCODER".</p> <p>The factory setting is 3.5 mV.</p> <p>When speaking normally into the microphone the bar graph should remain within the recommended predefined range</p> <p><b>Note: The microphone sensitivity shall be adjusted to achieve a correct modulation by keeping the cockpit noise suppression as high as possible.</b></p> <p>If the sensitivity is adjusted to a smaller value (e.g. 1 mV) the cockpit noises may become louder than for a higher adjustment (e.g. 25 mV). Otherwise, adjusting the sensitivity to a very high value (e.g. 25 mV), the cockpit noise is significantly reduced but the modulation of the transmitter may not be sufficient.</p> <p>The installer shall perform a communication check after modification of this parameter.</p> <p><b>Note: For installations with high interferences it is recommended to use sensitivity level 2...25 mV.</b></p>



Display Contents	Description
<div> <b>SPKR VOL SRC</b> <ul style="list-style-type: none"> <li>○ PRIMARY CH</li> <li>○ SECONDARY CH</li> <li>● BOTH</li> </ul> </div>	<p><b>"SPKR VOL SRC":</b></p> <p>One of the three following options may be selected for speaker volume source, "SPKR VOL SRC", by pressing the "STO" button:</p> <p><b>PRIMARY CH</b></p> <p>If "PRIMARY CH" is selected the speaker volume will be adjustable by GT6201.</p>
<div> <b>SQUELCH THR</b> <div>6</div> <div></div> </div>	<p><b>"SQUELCH THR":</b></p> <p>The noise squelch threshold "SQUELCH THR" is adjustable within a range of 6...26 by turning the "ROTARY ENCODER".</p> <p>Minimum Adjustment of 6 means: Weak RF signals can trigger the Squelch threshold and the voice signal might be low combined with a noisy background.</p> <p>Maximum adjustment of 26 means: Only strong RF signals will trigger the Squelch threshold. The voice signal will be audible very clear with very low background noise.</p> <p>Weak RF signals may not trigger the Squelch threshold and therefore the audio may not be heard by the users.</p> <p>Note: Adjustment of the "SQUELCH THR" is available via the "MENU" at any time.</p>
<div> <b>SCAN HOLD TIME</b> <div>1</div> <div></div> </div>	<p><b>"SCAN HOLD TIME":</b></p> <p>The "SCAN HOLD_TIME" is adjustable within the range of 1...60 seconds by turning the "ROTARY ENCODER".</p> <p>The default factory setting is 1.</p> <p><b>For normal operation it is recommended to leave the setting at 1.</b></p>
<div> <b>SIDETONE ATT</b> <div>6</div> <div></div> </div>	<p><b>"SIDETONE ATT":</b></p> <p>The sidetone attenuation "SIDETONE ATT" is adjustable within the range 0...12 dB by turning the "ROTARY ENCODER".</p> <p>The attenuation relates to the intercom volume.</p> <p>0dB = sidetone as loud as intercom signal.</p> <p>12dB = sidetone signal 12 dB less than the intercom signal.</p> <p>Example: If the intercom volume is set to a very low value, then the sidetone volume will be reduced in relation to the intercom volume, irrespective of the sidetone value.</p> <p>The "SIDETONE ATT" parameter is an additional attenuation of the sidetone signal in transmit mode.</p>

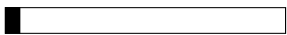


Display Contents	Description																														
<div> <b>ERASE CHN MEM</b>  </div>	<p><b>"ERASE CHN MEM":</b></p> <p>The GT6201 transceiver provide two databases to store up to 99 VHF frequencies identified by channel numbers (CH01 to CH99).</p> <p>Both data bases, the "User Channels Database" and "Last Channels Database" can be erased.</p> <p>To erase the data bases;</p> <ol style="list-style-type: none"> <li>1. Select "YES" via the "ROTARY ENCODER"</li> <li>2. Press the "STO" push-button to confirm the selection.</li> </ol>																														
<div> <b>ERASE FRQ LAB</b>  </div>	<p><b>"ERASE FRQ LAB":</b></p> <p>The GT6201 transceiver provides a third database, "FRQUENCY LABELS DATABASE", containing 99 text labels of max 10 characters each. Text labels can be assigned to any of the frequencies (CH01 to CH99), the labels are stored manually.</p> <p>The "LABELS DATABASE" can be erased.</p> <p>To erase the data base;</p> <ol style="list-style-type: none"> <li>1. Select "YES" via the "ROTARY ENCODER"</li> <li>2. Press the "STO" push-button to confirm the selection.</li> </ol>																														
<div> <b>FAIL LIST</b> <table border="1"> <tbody> <tr><td>P_NVRAM TEST</td><td>0</td></tr> <tr><td>P_INTERNAL IC</td><td>0</td></tr> <tr><td>P_RXS LOCK</td><td>0</td></tr> <tr><td>P_RECEIVER</td><td>0</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>P_SUPP BLOCK</td><td>0</td></tr> <tr><td>P_OVER TEMP</td><td>0</td></tr> <tr><td>C_INTERNAL IC</td><td>0</td></tr> <tr><td>C_RXS LOCK</td><td>0</td></tr> <tr><td>C_TXS LOCK</td><td>0</td></tr> <tr><td>C_TX POWER</td><td>0</td></tr> <tr><td>C_SUPP BLOCK</td><td>0</td></tr> <tr><td>C_TX OVERLOAD</td><td>0</td></tr> <tr><td>C_OVER TEMP</td><td>0</td></tr> <tr><td>C_STUCK PTT</td><td>0</td></tr> </tbody> </table>  </div>	P_NVRAM TEST	0	P_INTERNAL IC	0	P_RXS LOCK	0	P_RECEIVER	0			P_SUPP BLOCK	0	P_OVER TEMP	0	C_INTERNAL IC	0	C_RXS LOCK	0	C_TXS LOCK	0	C_TX POWER	0	C_SUPP BLOCK	0	C_TX OVERLOAD	0	C_OVER TEMP	0	C_STUCK PTT	0	<p><b>"FAIL LIST":</b></p> <p>This page automatically stores and displays information from all failures that occur during operation.</p> <p>Used for trouble shooting and failure isolation.</p> <ol style="list-style-type: none"> <li>1. The display can only show 4 monitored failures types (more are available).</li> <li>2. Move the slide bar via the "ROTARY ENCODER" To view additional failures.</li> <li>3. "0" means no failure were detected and stored.</li> <li>4. "1" means that a failure was detected once or several times and stored.</li> </ol>
P_NVRAM TEST	0																														
P_INTERNAL IC	0																														
P_RXS LOCK	0																														
P_RECEIVER	0																														
P_SUPP BLOCK	0																														
P_OVER TEMP	0																														
C_INTERNAL IC	0																														
C_RXS LOCK	0																														
C_TXS LOCK	0																														
C_TX POWER	0																														
C_SUPP BLOCK	0																														
C_TX OVERLOAD	0																														
C_OVER TEMP	0																														
C_STUCK PTT	0																														

Display Contents	Description
<p><b>ERASE FAIL LIST</b></p> 	<p><b>"ERASE FAIL LIST":</b> To erase all stored failures.</p> <ol style="list-style-type: none"> <li>1. Selecting "YES" via the "ROTARY ENCODER".</li> <li>2. Press the "STO" push-button to confirm.</li> </ol> <p>Erasing the failure list should not be undertaken by the installer. The failure list will normally be deleted by factory or maintenance shop after a repair is completed.</p>
<p><b>RECALL DEF.</b></p> 	<p><b>"RECALL DEF.":</b> The factory default settings are the settings of the device when it left the factory after production.</p> <p>To restore the factory settings;</p> <ol style="list-style-type: none"> <li>1. Select "YES" via the "ROTARY ENCODER".</li> <li>2. PRESS the "STO" push-button to confirm.</li> </ol> <p><b>Restoring the factory default settings will overwrite all previous and customized installation settings!</b></p>

## 2.10. Factory Default Settings

☒ Enabled
 ☐ Disabled
 ☒ Selected
 ☐ De-Selected

Setting name	Value
DEVICE INFO	
DIMMING INPUT	NONE
BRIGHTNESS	50%
MEMORY OPTIONS	<input checked="" type="checkbox"/> CHANNEL STORE <input checked="" type="checkbox"/> STORE LAST CHANNEL
MDE PAGES	<input checked="" type="checkbox"/> STANDBY FREQUENCY <input checked="" type="checkbox"/> BATTERY VOLTAGE <input checked="" type="checkbox"/> CHANNEL MEMORY
LOW BATT THR	10.5 V GT6201-05 21.0 V GT6201-10
CONFIG	<input type="checkbox"/> TANDEM <input type="checkbox"/> AUX_IN <input checked="" type="checkbox"/> AUTO ISOL IN TX <input type="checkbox"/> SCAN BEEP <input type="checkbox"/> FREQ CHANGE BEEP <input type="checkbox"/> SWAP MIKE IC
IN/OUT CFG1	MICROPHONE 1 <input checked="" type="radio"/> STD 1 MIKE <input type="radio"/> STD 2 MIKE <input type="radio"/> STD 3 MIKE <input type="radio"/> DYN MIKE <input type="radio"/> NONE MICROPHONE 2 <input type="radio"/> STD 1 MIKE <input type="radio"/> STD 2 MIKE <input type="radio"/> STD 3 MIKE <input checked="" type="radio"/> DYN MIKE <input type="radio"/> NONE MIC ACTIVATION <input checked="" type="checkbox"/> BOTH MIKES OUTPUTS <input checked="" type="checkbox"/> HEADPHONE 1 <input type="radio"/> HEADPHONE 2 <input checked="" type="radio"/> SPEAKER <input type="radio"/> NONE

Setting name	Value
IN/OUT CFG2	<p>MICROPHONE 1</p> <p> <input checked="" type="radio"/> STD 1 MIKE  <input type="radio"/> STD 2 MIKE  <input type="radio"/> STD 3 MIKE  <input type="radio"/> DYN MIKE  <input type="radio"/> NONE         </p> <p>MICROPHONE 2</p> <p> <input type="radio"/> STD 1 MIKE  <input checked="" type="radio"/> STD 2 MIKE  <input type="radio"/> STD 3 MIKE  <input type="radio"/> DYN MIKE  <input type="radio"/> NONE         </p> <p>MIC ACTIVATION</p> <p> <input checked="" type="checkbox"/> BOTH MIKES         </p> <p>OUTPUTS</p> <p> <input checked="" type="checkbox"/> HEADPHONE 1  <input checked="" type="radio"/> HEADPHONE 2  <input type="radio"/> SPEAKER  <input type="radio"/> NONE         </p>
STD1 MIKE SENS	119 mV
STD2 MIKE SENS	119 mV
DYN MIKE SENS	3.5 mV
SPKR VOL SRC	<p> <input checked="" type="radio"/> PRIMARY CH  <input type="radio"/> SECONDARY CH  <input type="radio"/> BOTH         </p>
SQUELCH THR	<p><b>12</b></p> 
SCAN HOLD TIME	<p><b>1</b></p> 
SIDETONE ATT	<p><b>6</b></p> 
EREASE CHANNEL MEM	<p><b>NO</b></p> <p><b>YES</b></p>
EREASE FREQUENCY LABELS	<p><b>NO</b></p> <p><b>YES</b></p>
FAIL LIST	
EREASE FAIL LIST	<p><b>NO</b></p> <p><b>YES</b></p>
RECALL DEF.	<p><b>NO</b></p> <p><b>YES</b></p>

visible depending on MIKE configuration of external MIKE Switch


## 2.11. Wiring Diagrams and Settings

### SAFETY INSTRUCTIONS

Installation of the unit varies according to installation area and equipment design. It is therefore only possible to provide general guidelines in this section.

### 2.11.1. Single Seat Glider

#### 2.11.1.1. Installation Setup

Sub-Menu	Function: / Selection
"SPKR VOLUME SOURCE"	PRIMARY CH
"IN/OUT CFG1":	<p>"MICROPHONE 1": NONE            "MICROPHONE 2": DYN_MIKE            "BOTH MIKES": Enabled            "HEADPHONE 1": Enabled            "SPEAKER": Enabled</p> <p>With /MIKE_SW not connected (/MIKE_SW input is set to Inactive state) it is only necessary to configure IN/OUT CFG1.            If only headphone(s) are used, SPEAKER can be disabled by selecting NONE.            If only speaker is used, disable HDPH 1.</p>
<p><b>DYN MIKE SENS</b></p> 	Adjust DYN MIKE SENS to proper level
<p><b>CONFIGURATION</b></p> <p><input type="checkbox"/> TANDEM</p> <p><input checked="" type="checkbox"/> AUX INPUT</p> <p><input checked="" type="checkbox"/> AUX AUTO MUTE</p> <p><input type="checkbox"/> AUTO ISOL IN TX</p>	<p>If you want to use an auxiliary input we recommend to configure AUX AUTO MUTE in CONFIG menu set:</p> <p>AUX IN – ENABLE            AUX AUTO MUTE - ENABLE</p>
"IN/OUT FG2"	N/A
Remarks	<p>Permanent speaker sign is visible on LCD screen.            VOX operation suppressed.</p>

## 2.12. Post Installation Check

Note: It is assumed that the "Installation Setup" has been done before the Post Installation Tests will be carried out.

Once the unit is installed completely a test procedure to verify system functionality. Ensure compliance with authority required procedures. Refer to the installation order of the minor change document or use an own approved test protocol for VHF units. The following chapter below provides guidance for such tests.

### 2.12.1. Mechanical Installation and Wiring Check

- Verify all cables are fixed securely and shields connected properly to signal ground.
- Check the movement of controls to verify there is no interference.
- Verify all screws are tight and the connectors on the rear side of the unit are secured.

### 2.12.2. Power Supply

- Check the power supply lines and confirm correct polarity.
- Confirm that the power supply is within the specified limits.

### 2.12.3. Receiver / Transmitter Operation

- Power up the 620X and tune it to a local station for a communication test.
- Verify that the receiver output produces a clear and readable audio and ask the local station for proper readability for the transmit signal of the 620X.
- Repeat this communication test with an airborne station within  $\approx 20\text{-}40$  NM (Nautical Miles).

### 2.12.4. Antenna Check

- Check the VSWR (voltage standing wave ratio) over the complete frequency band (e.g. by using a VHF Reflection-Coefficient Meter).  
The VSWR ratio should be less than 2:1 and is not acceptable when exceeding 3:1.

## 2.13. Trouble Shooting

Problem	Possible Reason	Proposed Solution
VOX threshold is not adjustable. VOX is always off.	VOX is inoperative, because speaker is on.	Switch speaker to "OFF". Refer to "Installation Setup", page 31).
Too high "cabin" noise during intercom / transmit operation.	The sensitivity of the microphone input is too sensitive.	Adjust the microphone sensitivity to a higher value to ensure the cabin noise relatively reduces. Recheck transmit operation and/or Intercom function. Refer to "Installation Setup", page 31).
No Speaker output.	Speaker is switched off	Switch Speaker "ON". Refer to "Installation Setup", page 31).
The noise suppression function of the squelch is not working.  (Receiver noise is always present).	Other equipment, installed near to GT6201 can produce quite high electromagnetic interference, which is receiving by the GT6201.	Reduce the interference emitted by the avionic around by improving shielding, distance or grounding. The interference may also been suppressed by adjusting the squelch to a higher value. Refer to "Installation Setup", page 31). Note, that a higher value will cause a reduced sensitivity.
Display shows Warning/Failure message. (LOW BATT, STUCK PTT, TX HOT, FAILURE)		Refer to "Warning and Failure Indications", page 62).
Antenna VSWR exceeds 3:1.	Possibly caused by a defective, or insufficient counterpoise for the antenna.	Check for sufficient size of the counterpoise and make sure there is no mechanical defect on the antenna.
	The impedance of the antenna cable deviates significantly from 50 $\Omega$ .	Make sure the used antenna cable has 50 $\Omega$ impedance and the cable is not bend or kinked on its way from the radio to the antenna
	Defective BNC connectors on the antenna cable.	Check for proper crimp/solder work on the BNC connectors and rectify as far as necessary.



### 3. Operating Instructions

#### In this chapter you can read about:

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

#### 3.1. Device Description

##### 3.1.1. Device Assignment

This manual is valid for the following devices:

- See page 20

##### 3.1.2. Packing, Transport, Storage

- See page 20

##### 3.1.3. Scope of Delivery

- See page 20

##### 3.1.4. Type Plate

- See page 21

**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).

The HMI actions described in this section can be performed on primary controller or on optional secondary controller RCU6201.

The following graphics of the display content show the 8.33 kHz channel spacing for all possible operation modes.

**SAFETY  
INSTRUCTIONS**

A voice communication test shall be performed before starting any operation.

- 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.

**SAFETY  
INSTRUCTIONS**

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

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







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

### 3.1.5. Controls and Indications

#### 3.1.5.1. User Interface



Figure 9: GT6201: Controls and Indications

	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 users 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

- 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 chapter 3.10).

## 3.3. Receive and Transmit Mode

### 3.3.1. Receive Mode

If /PTT1 and /PTT2 (Push To Talk) inputs are inactive, the transceiver remains in receive mode.

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

- Received signal from antenna,
- Intercom signal from intercom circuit 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

The signal from the auxiliary input been muted under certain conditions (For details refer to "Auxiliary Audio Input", page 60).

### 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.

- PTT 1 input activates transmission from microphone path 1
- PTT 2 input activates transmission from microphone path 2
- If BOTH MIKES are active / enabled in the installation setup, each input (PTT 1 or 2) activates the transmission from both microphone paths simultaneously.

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).

No intercom operation is possible in transmit mode.

The sidetone (demodulated audio of the emitted signal) is available on the headphone output. The transmit mode automatically deactivates the speaker.

**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 62). 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 GT6201:

- 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.

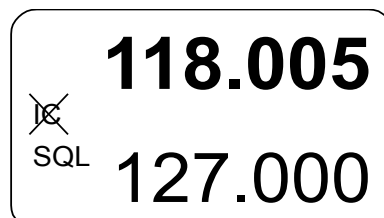
"SCAN Mode" is a sub-mode of standard mode and used for monitoring two frequencies at the same time. A 2 seconds press on "↓/SCN" key activates/deactivates the scan function.

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.

**118.005**  
SQL **128.000**

- 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.

**118.005**  
SQL 128.**0**00

- 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.

**118.005**  
SQL 128.0**00**

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.

**118.005**  
IC  
SQL  
BAT 13.5V

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

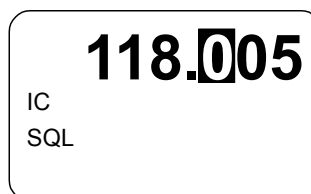
In direct tune mode, the active frequency appears in the top line. It can be edited by means of the "ROTARY ENCODER" following the procedure.

### Changing the active frequency when in direct tune mode:

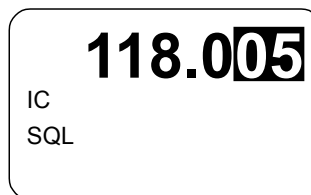
- Make a "short press" on the "ROTARY ENCODER" for modification of the 100 MHz digits. Rotate the "ROTARY ENCODER" clockwise/counter clockwise to change the frequency in 1 MHz steps.



- 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.

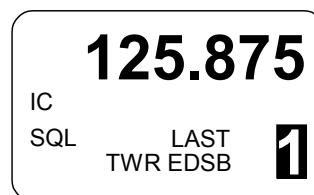
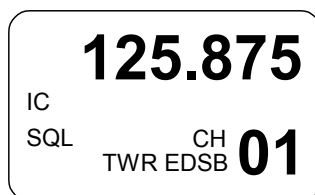
**Note**                **The functions "LAST" and Store/Restore are only available if this options are activated in "Configuration Settings" - "MEM OPTIONS".**

**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:

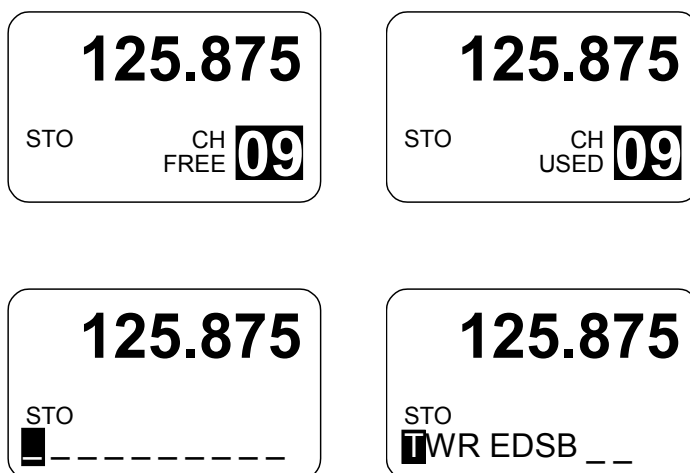
- User channels database - provides 99 channels CH01 to CH99 to store frequencies with the possibility to apply a customized label (identifier) with max. 10 alphanumeric characters.
- Last channels database - automatically stores 9 last used frequencies with customized identifier if applied, easy to 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 56).

### 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 56).

**Note** The function "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.

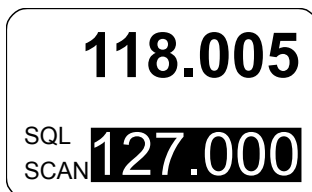


In all frequency selection modes;

- 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.

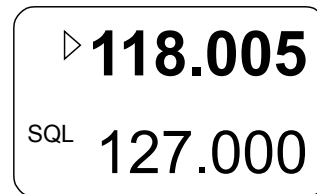
### 3.5. SQUELCH

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"

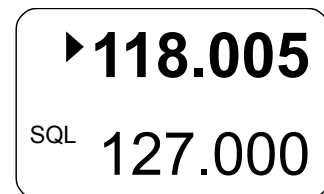
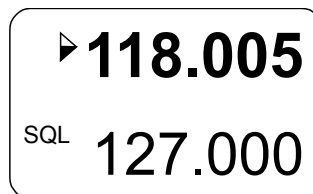
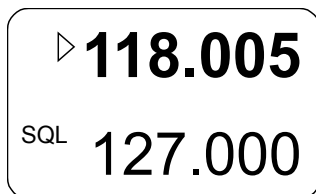
In the user menu, the squelch threshold is adjustable to a convenient trigger level. See "User Menu" page 60.

### 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)

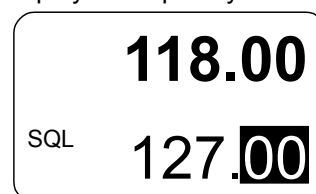
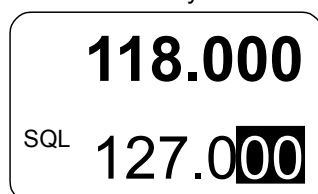


### 3.7. Channel Spacing Mode

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)

### 3.8. Auxiliary Audio Input

The transceiver has a dedicated auxiliary audio input e.g. for MP3 player connection.

With auxiliary input enabled in installation setup, the auxiliary audio input signal mixing with the received signal from antenna (passing squelch) and the intercom signal (when activated).

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

AUX AUTO MUTE function depends on the AUX INPUT, selectable via the CONFIGURATION page in the installation setup. This function automatically mutes the audio signal from the auxiliary audio input as long as the GT620X detects (based on squelch evaluation) a RX signal or the user deactivates the squelch manually. If this function is disabled the signal from the auxiliary audio input is permanently audible on the audio output, independently of the received signal or the squelch status.

Automatic aux attenuation functionality controls the auxiliary audio input. The level of the auxiliary input signal attenuates if intercom is activated by VOX or by /IC discrete input. The auxiliary input signal reverts to its previous value after intercom deactivation. The attenuation value can be adjusted within the range from 0...40 dB.

### 3.9. Menus

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

- The Intercom menu allows adjustment of intercom volume and VOX threshold.
- The users menu allows adjustment of panel brightness and squelch threshold.

#### 3.9.1. User Menu

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

The users menu consists of two pages:

- BRIGHTNESS
- SQUELCH TRH

To exit the users 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.

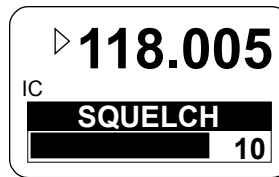


The panel brightness for display illumination and push buttons can be changed from 0 (illumination off) to 100 (maximum brightness) by turning the "ROTARY ENCODER".

**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 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.

### 3.10. Warning and Failure Indications

Display Contents	Description
<div> <div>IC</div> <div>118.005</div> <div>LOW BATTERY</div> </div> <p>Appear in 3-second cycle</p>	<p>"LOW BATT" is indicated if the supply voltage of the transceiver is below the threshold defined in the installation setup.</p> <p>The transceiver is still operable but may have a reduced performance depending on supply voltage.</p> <p><b>Possible reasons for indication:</b></p> <p>Accumulator capacity problems (gliders), Power interrupts, General power supply problems, Setting for low battery threshold too high</p>
<div> <div>IC</div> <div>118.005</div> <div>STUCK PTT</div> </div> <p>Appear in 3-second cycle</p>	<p>"STUCK PTT" is indicated after 120 seconds of continued transmission. The transceiver goes back to receive mode even if the PTT line is still active (GND).</p> <p>For initiating a new transmission, the PTT line needs first to become inactive (open).</p> <p><b>Possible reasons for indication:</b></p> <p>Transmission lasts more than 120 seconds. PTT-key is stuck. PTT line permanently grounded (short circuit in installation).</p>
<div> <div>IC</div> <div>118.005</div> <div>TX HOT</div> </div> <p>Appear in 3-second cycle</p>	<p>"TX HOT" is indicated if the internal device temperature exceeds +90 °C.</p> <p>Transceiver is still operable. Performance of transmitter is reduced.</p> <p><b>Possible reasons for indication:</b></p> <p>Very hot environmental temperature, long transmissions times and insufficient airflow conditions.</p>
<div> <div>IC</div> <div>118.005</div> <div>FAILURE</div> </div> <p>Appear in 3-second cycle</p>	<p>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.</p> <p><b>Possible reasons for indication:</b></p> <p>Specified environmental conditions HW or SW failure inside the transceiver.</p> <p><b>Contact maintenance shop for assistance.</b></p>
<div> <div>FAILURE</div> <div>PRESS ANY KEY</div> </div>	<p>The transceiver has detected an internal failure during start up. Depending on failure reason, the device may be still operable with degraded performance or not operable at all.</p> <p><b>Possible reasons for indication:</b></p> <p>Outside specified environmental conditions HW or SW failure inside the transceiver.</p> <p><b>Contact maintenance shop for assistance.</b></p>
<div> <div>FAILURE</div> </div>	<p>The transceiver has no communication with the controller. Depending on failure reason, the device may be still operable with degraded performance or not operable at all.</p> <p><b>Possible reasons for indication:</b></p> <p>Problem with inter-wiring</p> <p><b>Contact maintenance shop for assistance.</b></p>

## 4. Certificates

### In this chapter you can read about:

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### 4.1. Certificate-Info

For detailed information about approvals and certification please see Technical Data, page 14.

## 4.2. BAF Approval - GT6201



### Urkunde

Ein(e)	VHF-Sprechfunkgerät für Bodenfunkstellen des Flugfunkdienstes
Typ	GT6201 in den im Anhang zur Zulassungsurkunde aufgeführten Modellvarianten und zugehörigen Hard- / Softwarekonfigurationsständen
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 04.06.2014

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)

Bundesaufsichtsamt für Flugsicherung  
 Langen, den 04.06.2014

Im Auftrag

Bodo Heinzl

### 4.3. 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
<b>Part 1: General information about the constituent in accordance with Regulation (EC) 552/2004, Annex III</b>	
<b>1.1 Regulation Reference Number</b>	
Basic requirements in accordance with <ul style="list-style-type: none"> <li>Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.</li> <li>Implementing Regulation (EC) No. 1079/2012</li> <li>Directive 1999/5/EC</li> </ul>	
<b>1.2 Manufacturer information</b>	
Becker Avionics GmbH, Baden Airpark, Building B108, 77836 Rheinmünster, Germany.	
<b>1.3 Description of the constituents</b>	
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 mm <sup>3</sup> (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.	
<b>1.4 Description of the procedure followed in order to declare the system's conformity or suitability for use</b>	
Conformity is stated and has been verified in accordance with decision 768/2008/EC Annex II, Module A1.	
<b>1.5 Relevant regulations</b>	
<ul style="list-style-type: none"> <li><b>ETSI EN300 676-1 V1.5.2</b> : 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</li> <li><b>ETSI EN300 676-2 V1.5.1</b> : Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation Part 2 : Harmonized EN covering essential requirements of article 3.2 of the R&amp;TTE Directive</li> <li><b>EN 62311</b> : Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)</li> <li><b>DIN EN 60950-1</b> : Information Technology Equipment – Safety</li> <li><b>EN 301 489-1</b> : Electromagnetic compatibility and radio spectrum matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1 : Common technical requirements</li> </ul>	

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



<ul style="list-style-type: none"> <li>• <b>EN 301 489-22</b> : 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</li> <li>• <b>SSB FL 004</b> : Schnittstellenbeschreibung für Bodenfunkstellen des mobilen Flugfunkdienstes</li> <li>• <b>ICAO Annex 10</b> to the Convention on International Civil Aviation, Volume III and Volume IV</li> </ul>
<b>1.6 Notified body</b> <i>CETECOM ICT Services GmbH, Untertürkheimer Strasse 6 – 10, 66117 Saarbrücken, Deutschland</i>
<b>1.7 References to the community specifications</b> <i>The device complies with the standards :</i> <ul style="list-style-type: none"> <li>• <b>Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.</b> <i>Regulation on the interoperability of the European Air Traffic Management network.</i></li> <li>• <b>Implementing Regulation (EC) No. 1079/2012</b> <i>Laying down requirements for voice channels spacing for the single European sky.</i></li> <li>• <b>Directive 1999/5/EC</b> <i>Directive on radio equipment and telecommunicationsterminal equipment and the mutual recognition of their conformity.</i></li> </ul>

<b>1.8 Information about the authorized signatures</b>		
1.) Jürgen Schiller, QA-Manager <u>Address :</u> Becker Avionics GmbH Baden Airpark, Building B108 77836 Rheinmünster, Germany Tel.: 07229/305-202 e-mail : juergen.schiller@becker-avionics.de	2.) Sakhr Naal, General Manager <u>Address :</u> Becker Avionics GmbH Baden Airpark, Building B108 77836 Rheinmünster, Germany Tel.: 07229/305-225 e-mail : sakhr.naal@becker-avionics.de	
<b>Part 2: Declaration:</b>		
Becker Avionics GmbH, 77836 Rheinmünster declares herewith that above mentioned constituents <ul style="list-style-type: none"> <li>• have been assessed in terms of compliance with the above mentioned standards and the compliance has been ascertained;</li> <li>• have been considered in terms of its suitability within the environment of air traffic management and have been classified as suitable.</li> </ul>		
<b>Place of issue, Date</b>  Rheinmünster June 11 <sup>th</sup> , 2014	1 <sup>st</sup> Signature On behalf :  Jürgen Schiller	2 <sup>nd</sup> Signature :  Sakhr Naal



#### 4.4. 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	
<b>Name and address of manufacturer :</b>	<b>Constituent / application area</b>
Becker Avionics GmbH Baden Airpark, Building B108 77836 Rheinmünster Germany	GT6201-10 VHF-Transceiver, communication system for ground-to-air communication
<b>System classification:</b>	Communication system for ground-to-air communication
<b>Part 1: General information about the constituent in accordance with Regulation (EC) 552/2004, Annex III</b>	
<b>1.1 Regulation Reference Number</b>	
Basic requirements in accordance with <ul style="list-style-type: none"> <li>Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.</li> <li>Implementing Regulation (EC) No. 1079/2012</li> <li>Directive 1999/5/EC</li> </ul>	
<b>1.2 Manufacturer information</b>	
Becker Avionics GmbH, Baden Airpark, Building B108, 77836 Rheinmünster, Germany.	
<b>1.3 Description of the constituents</b>	
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 mm <sup>3</sup> (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.	
<b>1.4 Description of the procedure followed in order to declare the system's conformity or suitability for use</b>	
Conformity is stated and has been verified in accordance with decision 768/2008/EC Annex II, Module A1.	
<b>1.5 Relevant regulations</b>	
<ul style="list-style-type: none"> <li><b>ETSI EN300 676-1 V1.5.2</b> : 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</li> <li><b>ETSI EN300 676-2 V1.5.1</b> : Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation Part 2 : Harmonized EN covering essential requirements of article 3.2 of the R&amp;TTE Directive</li> <li><b>EN 62311</b> : Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)</li> <li><b>DIN EN 60950-1</b> : Information Technology Equipment – Safety</li> <li><b>EN 301 489-1</b> : Electromagnetic compatibility and radio spectrum matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1 : Common technical requirements</li> </ul>	

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



<ul style="list-style-type: none"> <li>• <b>EN 301 489-22</b> : 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</li> <li>• <b>SSB FL 004</b> : Schnittstellenbeschreibung für Bodenfunkstellen des mobilen Flugfunkdienstes</li> <li>• <b>ICAO Annex 10</b> to the Convention on International Civil Aviation, Volume III and Volume IV</li> </ul>
<b>1.6 Notified body</b> <i>CETECOM ICT Services GmbH, Untertürkheimer Strasse 6 – 10, 66117 Saarbrücken, Deutschland</i>
<b>1.7 References to the community specifications</b> <i>The device complies with the standards :</i> <ul style="list-style-type: none"> <li>• <b>Regulation (EC) No. 552/2004 Part A and Part B, subchapter 1 and 4.</b> Regulation on the interoperability of the European Air Traffic Management network.</li> <li>• <b>Implementing Regulation (EC) No. 1079/2012</b> Laying down requirements for voice channels spacing for the single European sky.</li> <li>• <b>Directive 1999/5/EC</b> Directive on radio equipment and telecommunicationsterminal equipment and the mutual recognition of their conformity.</li> </ul>

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<b>Part 2: Declaration:</b>		
Becker Avionics GmbH, 77836 Rheinmünster declares herewith that above mentioned constituents <ul style="list-style-type: none"> <li>• have been assessed in terms of compliance with the above mentioned standards and the compliance has been ascertained;</li> <li>• have been considered in terms of its suitability within the environment of air traffic management and have been classified as suitable.</li> </ul>		
<b>Place of issue, Date</b>  Rheinmünster June 12 <sup>th</sup> , 2014	1 <sup>st</sup> Signature On behalf :  Jürgen Schiller	2 <sup>nd</sup> Signature :  Sakhr Naal

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We reserve the right to make technical changes.  
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