

Customer Information Letter

To: Whomever it may concern
Subject: AR/RT62 series
Reason: Becker Avionics shows herein the recommendations for installing the AR/RT62 in an environment where 2 communication radios are placed on 1 A/C.
Edition CIL AR/RT62 01-issue04

1. AR/RT62 Series

The AR/RT62 series family is depicted as short reference:



AR6201 (Single Block Transceiver)



AR6203 (Single Block Transceiver)



RT6201 (Remote Transceiver)

2. Purpose

With this information letter, Becker Avionics wishes to provide guidance to installers when performing installations with two AR/RT62 series VHF air band communication radios on-board the same aircraft.

In order to minimize the risk of cross talk issues, a special care has to be applied during the installation of the subsequent antennas on the fuselage, as described in chapter 3 of this document. Becker recommends to configure the muting functionality in the AR/RT62 series and to perform the related wiring as described in chapter 4 of this letter.

The herein mentioned recommendations will be inserted into the AR/RT62 series manuals at a later stage.

3. Antenna Installation

For antenna installation, refer always to the manufacturer's maintenance documentation for the aircraft. Carry out the antenna installation in accordance with AC 43.13-2B Chapter 3.

NOTICE

Penetration of the pressurized cabin on a pressurized aircraft requires additional data, which are not contained in this installation manual.

CAUTION

Radiation risk:

A safe distance to the installed antenna must be ensured by corresponding installation measures around human body damage (e.g. at the eyes) and/or avoid the inflammation of combustible materials by radiated energy.

3.1. Required Antenna Type

Vertical polarized 50 Ω broadband aircraft COM antenna.

The antenna must be able to radiate RF energy evenly and omnidirectional.

NOTICE

The aircraft's manual for antenna installation has to be observed.

3.2. Antenna Mounting Location

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

- The aircraft-certifying inspector could support you in questions on how to achieve best results in all directions (installation instructions must be fully complied with).
- For aircraft with metal fuselage, we recommend a rod antenna.
 - The antenna should be mounted vertically (as far as) on or under the fuselage.
 - The antenna location should be of an even surface and in a safe distance from horizontally screening metal parts (propeller, undercarriage, vertical metal fins etc.), for maximum radio range in all (horizontal) directions.

The picture shows a typical location for top and bottom antenna installation.

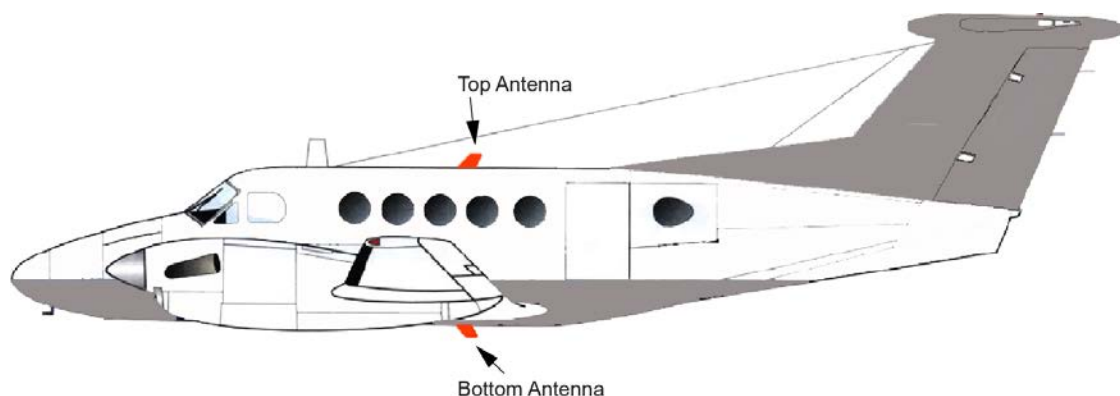


Figure 1: Antenna Installation

- VHF Com 1 and VHF Com 2 can also be mounted on the top with at least ½ wavelength (of the antenna operating frequency) distance available between antennas and provided an antenna separation of 45 dB.

- Distance to other aircraft antennas (COM, NAV antennas), should be at least 1.5 m/5 ft.
- The antenna mounting area should be as flat as possible.
- When two radios are used:
 - It is required to have an antenna separation of at least 45 dB. This needs to be guaranteed by the installer.
 - It could happen that operational degradations may apply, this needs to be documented from the installer and approved for airworthiness
- Make sure that the metallic contact between aircraft surface/structure and the antenna cable outer conductor (shield) is adequate/solid.
 - Never use a location on paint-coated surfaces!
 - The electrical contact shall remain continuously good safe against vibration.
- For wood and fiberglass (GRP) aircraft (reinforcing the mounting location):
 - 3 or 4 aluminum strips (each 60 cm/2 ft long/5 cm/2 in wide) are recommended.
 - The stripes shall be placed (mostly) horizontally with a shape as a star or cross.
 - These placed counter weights must be centrally screwed together with the antenna socket to ensure a continuous, electrically good contact.
- For aircraft with non-metallic surface structure inside the fuselage:
 - A metal foil (min. 60x60 cm/2x2ft) can be stuck in.
 - The antenna socket should be placed in the foil center, in addition with a metallic ground contact support plate.
- For aircraft with fuselage and/or tail-fin made of non-conductive material:
 - A vertical folded top antenna is suitable.
 - The installation should be made preferably during manufacturing the tail-fin.

NOTICE

Carbon fiber is conducting and may shield the antenna!

- Careful sealing of all holes/openings of the outer skin is mandatory.
 - Make sure, that electrical contacts remain continuously good, even under bad environmental conditions.
 - Use only high quality 50 Ω coax cable type **RG400 or higher quality**.
 - Avoid any sharp cable bend (radius > 50 mm), and any excessive coax cable length.
 - Place all wiring including antenna cable away from other wiring which carries heavy AC currents and away from any aircraft controls.
- Any operating kinematics, trimming and all control handles must be absolutely free in all directions.
- Ensure the BNC antenna plug is not shortened between inner and outer connector (ohmmeter).
 - A measured resistance of 0.0 Ω indicates a short inside antenna connector (0.6...1 Ω indicates the antenna cable resistance), while an internally (static) protected antenna is used.
 - A simple rod antenna is tested for low resistive contact between inner cable conductor and radiator, and outer conductor to counter weight.
- Check the antenna matching:
 - Using 50 Ω SWR meter over the whole frequency range for SWR < 3:1.
 - It may be helpful or necessary to change slightly the length of the middle radiator, or counter weight length for optimized antenna efficiency and matching.

4. Radio Settings and Wiring for Mute Function

To use the RT/AR62 series in a dual com context, a muting function can be performed using the following procedure.

The radio provides two input and output configurations which are editable by the installer via the configuration menu. The selection of either configuration 1 or configuration 2 is done by an external input called external mike switch.

Therefore the wiring needs to be adapted with a cross link wire from the "Push-To-Talk" input of the first transceiver to the "External Mike Switch" of the other transceiver.

For general details please refer to manual:

<http://www.becker-avionics.com/downloads/> → AR620X Family (AR620X I&O...).

External Mike Switch (/MIKE_SW)

Pin No.	Pin Name	I/O	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 configuration setup.

- When /MIKE_SW is active then configuration CFG2 is in use.
- When /MIKE_SW is inactive then CFG1 is in use.

Each configuration CFG1 and CFG2 stores several parameters that can be set in configuration setup pages. (For details, refer to chapter "Configuration" in AR620X I&O manual).

Push-To-Talk (/PTT)

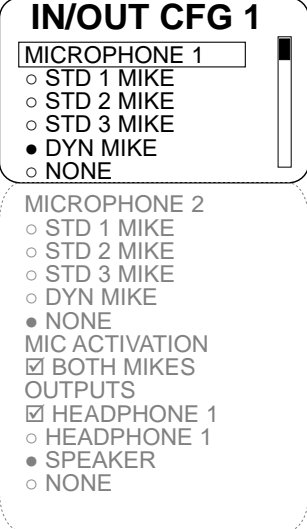
Pin No.	Pin Name	I/O	Function
P1-17	/PTT1	IN	Push-To-Talk key input 1 ACTIVE state - closed contact to GND
J1-5	/PTT2	IN	Push-To-Talk key input 2 ACTIVE state - closed contact to GND

There are two Push-to-Talk inputs available /PTT1 and /PTT2, e.g. one for the pilot and the other for the co-pilot.

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.

The in/out CFG1 can be set as preferred from the user.

Display Contents	Description
 <p>IN/OUT CFG 1</p> <p>MICROPHONE 1</p> <ul style="list-style-type: none"> <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 <p>MICROPHONE 2</p> <ul style="list-style-type: none"> <input type="radio"/> STD 1 MIKE <input type="radio"/> STD 2 MIKE <input type="radio"/> STD 3 MIKE <input type="radio"/> DYN MIKE <input checked="" type="radio"/> NONE <p>MIC ACTIVATION</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> BOTH MIKES <p>OUTPUTS</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> HEADPHONE 1 <input type="radio"/> HEADPHONE 1 <input checked="" type="radio"/> SPEAKER <input type="radio"/> NONE 	<p>"IN/OUT CFG1":</p> <p>On "IN/OUT CFG1" page the microphone inputs and headphone outputs for configuration CFG1 can be configured. To scroll the page turn the "ROTARY ENCODER".</p> <p>"MICROPHONE 1" (at one time only one option can be selected):</p> <p>STD1 MIKE Standard microphone input 1 (Pins P1-18/ P1-8) is selected.</p> <p>STD2 MIKE Standard microphone input 2 (Pins P1-9/ P1-8) is selected.</p> <p>STD3 MIKE Standard microphone input 3 (Pins P1-19/ P1-8) is selected.</p> <p>DYN MIKE Dynamic microphone input (Pins P1-6/ P1-5) is selected.</p> <p>NONE No microphone is used in microphone path 1.</p> <p>"MICROPHONE 2" (at one time only one option can be selected):</p> <p>STD1 MIKE Standard microphone input 1 (Pins P1-18/ P1-8) is selected.</p> <p>STD2 MIKE Standard microphone input 2 (Pins P1-9/ P1-8) is selected.</p> <p>STD3 MIKE Standard microphone input 3 (Pins P1-19/ P1-8) is selected.</p> <p>DYN MIKE Dynamic microphone input (Pins P1-6/ P1-5) is selected.</p> <p>NONE No microphone is used in microphone path 2.</p> <p>"MIC ACTIVATION"</p> <p>BOTH MIKES ENABLED:</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 path 1.</p> <p>Input /IC (Pin P1-7) activates intercom from microphone path 1 and 2.</p> <p>BOTH MIKES DISABLED:</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>

Display Contents	Description
	<p>"OUTPUTS"</p> <p>HDPH 1 ENABLED Audio available on headphone 1 output (Pins P1-2/P1-3)</p> <p>HDPH 1 DISABLED No audio available on headphone 1 output.</p> <p>HDPH 2 ENABLED Audio is available on headphone 2 output (Pins P1-20/P1-22), speaker not available.</p> <p>HDPH 2 DISABLED No audio available on headphone 2 output, speaker not available.</p> <p>SPEAKER ENABLED Audio is available on speaker (Pins P1-1/P1-14), headphone 2 not available</p> <p>NONE No audio on headphone 2 output or speaker output.</p> <p>Note: Menu available on primary controller. Displayed only if MIKE_SW input (Pin J1-24) has inactive state.</p>

The in/out CFG2 contains the Muting in the way that the "OUTPUTS" are to be selected to NONE (marked in yellow)

Display Contents	Description
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>IN/OUT CFG 2</p> <p>MICROPHONE 1</p> <ul style="list-style-type: none"> <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 </div> <div style="border: 1px dashed black; padding: 5px;"> <p>MICROPHONE 2</p> <ul style="list-style-type: none"> <input type="radio"/> STD 1 MIKE <input type="radio"/> STD 2 MIKE <input type="radio"/> STD 3 MIKE <input type="radio"/> DYN MIKE <input checked="" type="radio"/> NONE <p>MIC ACTIVATION</p> <p><input checked="" type="checkbox"/> BOTH MIKES</p> <p>OUTPUTS</p> <p><input type="checkbox"/> HEADPHONE 1</p> <p><input type="checkbox"/> HEADPHONE 2</p> <p><input type="checkbox"/> SPEAKER</p> <p><input checked="" type="radio"/> NONE</p> </div>	<p>"IN/OUT CFG2":</p> <p>On "IN/OUT CFG2" 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>"MICROPHONE 1" (at one time only one option can be selected):</p> <p>STD1 MIKE Standard microphone input 1 (Pins P1-18/ P1-8) is selected</p> <p>STD2 MIKE Standard microphone input 2 (Pins P1-9/ P1-8) is selected</p> <p>STD3 MIKE Standard microphone input 3 (Pins P1-19/ P1-8) is selected</p> <p>DYN MIKE Dynamic microphone input (Pins P1-6/ P1-5) is selected</p> <p>NONE No microphones is used in microphone path 1</p> <p>"MICROPHONE 2" (at one time only one option can be selected):</p> <p>STD1 MIKE Standard microphone input 1 (Pins P1-18/ P1-8) is selected</p> <p>STD2 MIKE Standard microphone input 2 (Pins P1-9/ P1-8) is selected</p> <p>STD3 MIKE Standard microphone input 3 (Pins P1-19/ P1-8) is selected</p> <p>DYN MIKE Dynamic microphone input (Pins P1-6/ P1-5) is selected</p> <p>NONE No microphones is used in microphone path 2</p> <p>"MIC ACTIVATION"</p> <p>BOTH MIKES ENABLED:</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>BOTH MIKES DISABLED:</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>

Display Contents	Description
	<p>"OUTPUTS"</p> <p>HDPH 1 ENABLED Audio available on headphone 1 output (Pins P1-2/P1-3)</p> <p>HDPH 1 DISABLED No audio is available on headphone 1 output.</p> <p>HDPH 2 ENABLED Audio is available on headphone 2 output (Pins P1-20/P1-22), speaker not available.</p> <p>HDPH 2 DISABLED No audio available on headphone 2 output, speaker not available.</p> <p>SPEAKER ENABLED Audio is available on speaker (Pins P1-1/P1-14), headphone 2 not available</p> <p>NONE No audio on headphone 2 output or speaker output.</p> <p>Note: Menu available on primary controller. Displayed only if MIKE_SW input (Pin J1-24) has inactive state.</p>

That means during transmission of a radio, the other radio with this cross link feature will have all outputs muted (no audio signal at all). **Voice transmission is still available but with no Sidetone on Audio outputs.**

We reserve the right to make technical changes.
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