



HC04CH-FM

USER MANUAL
VOLUME 1



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HC04CH-FM - User Manual
Version 1.0

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Declaration of Conformity

Hereby, R.V.R. Elettronica, declares that this FM transmitter is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.



Technical Specifications

			HC04CH-FM	
Parameters		U.M.	Value	Notes
GENERALS				
Frequency range		MHz	87.5 ÷ 108	
Rated output power		W	150	
Unbalanced Power Limit		W	150	
Ambient working temperature		°C	-5 to + 50	
Ambient Working Humidity		%	85 (Without condensing)	
INPUTS				
Power Coupler	Connector		N	
	Impedance	Ohm	50	
	Number of Way		4	
	Power	W	150	
	Insertion Loss	dB	6	
OUTPUTS				
Power Coupler	Connector		N	
	Impedance	Ohm	50	
POWER REQUIREMENTS				
AC Power Input	AC Supply Voltage	VAC	230 +10% -15%	
	AC Apparent Power Consumption	VA	48	
	Active Power Consumption	W	48	
	Power Factor		0,998	
	Connector		VDE IEC Standard	
DC Power Input	DC Supply Voltage	VDC	--	
	DC Current	ADC	--	
MECHANICAL DIMENSIONS				
Physical Dimensions	Front panel width	mm	483 (19")	19" EIA rack
	Front panel height	mm	132 (3HE)	
	Overall depth	mm	557	
	Chassis depth	mm	485	
Weight		kg	about 10	
VARIOUS				
Cooling			Forced, with internal fan	
Acoustic Noise		dBA	<75	
AUXILIARY CONNECTIONS				
Interlock 1	Connector		BNC	For remote power inhibition (short is RF off)
Interlock 2	Connector		BNC	For remote power inhibition (short is RF off)
R.F. Monitor 1	Connector		BNC	
R.F. Monitor 2	Connector		BNC	
FUSES				
On Mains			1x External F 3,15 - 5 x 20 mm	

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IMPORTANT



The lightning bolt symbol inside a triangle on the product draws attention to operations for which care must be taken to avoid the danger of electric shock.



The exclamation point symbol inside a triangle on the product informs the user of the presence of instructions in the manual accompanying the equipment, which are important for operation and maintenance (repairs).


1. Preliminary Instructions

• General Notices


The equipment in question is to be considered for use, installation and maintenance by "trained" or "qualified" personnel aware of the risks associated with working on electrical and electronic circuits.

The definition of "trained" means personnel with the technical knowledge required to use the device in a manner that ensures their own safety and that of other unqualified personnel under their direct supervision when working on the equipment.


The definition of "qualified" means personnel with the training and experience required to use the device in a manner that ensures their own safety and that of other unqualified personnel under their direct supervision when working on the equipment.

 **CAUTION:** The device may be equipped with an ON/OFF switch which may not completely remove voltage inside the device. It is necessary to disconnect the power cord, or turn off the power panel, before carrying out technical work, making sure that the safety earth connection is connected. Technical work that involves inspection of the device with live circuits must be carried out by trained and qualified personnel in the presence of a second trained person who is ready to intervene by disconnecting the power supply in case of need.


R.V.R. Elettronica assumes no responsibility for injury or damage caused by improper or incorrect use by personnel, whether trained and qualified or not.


 **CAUTION:** The device is not resistant to the ingress of water and infiltration could seriously compromise its correct performance. To prevent fire or electric shock, do not expose this equipment to rain, infiltration or moisture.

Please observe local regulations and fire regulations when installing and using this equipment.

 **CAUTION:** The device in question has internal parts that pose the risk of electric shock: always disconnect the power supply before removing the covers or any other part of the equipment.

Ventilation slots and holes are provided to ensure reliable operation of the product and to protect it from overheating. These slots must not be obstructed or covered. The slots must not be obstructed under any circumstances. The product should not be incorporated into a rack unless it is provided with adequate ventilation or the manufacturer's instructions have been followed.

 **CAUTION:** This equipment can radiate radio frequency energy, and if not installed in accordance with the instructions in the manual and the regulations in force it can interfere with radio communications.

 **CAUTION:** This equipment has an earth connection on both the power cord and the chassis. Make sure they are connected correctly.

Operating this appliance in a residential environment can cause radio disturbances; in this case, the user may be required to take appropriate measures.

The specifications and information given in this manual are provided for informational purposes only, and may therefore be subject to change at any time without notice and should not be seen as binding to R.V.R. Elettronica.

R.V.R. Elettronica assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual, including the products and software described in it; and reserves the right to make changes to the design and/or technical specifications of the equipment, as well as to this manual, without prior notice.

• Notice regarding the intended use and limitations on use of the product.

This product is a radio transmitter suitable for frequency modulated audio broadcasting service. It uses operating frequencies that are not harmonized in the designated user states.

The user of this product must obtain specific authorization for use of the radio spectrum from the spectrum management authority of the designated user state, before putting this equipment into operation.

The operating frequency, the power of the transmitter, as well as other characteristics of the transmission system, are subject to limitations and are set out in the authorization obtained.

2. Warranty

R.V.R. Elettronica guarantees the absence of manufacturing defects and the proper functioning of the products, within the terms and conditions provided.

Please read the terms carefully, because purchasing the product or accepting the order confirmation constitutes acceptance of the terms and conditions.

For the latest updates on the legal terms and conditions, please visit our website (WWW.RVR.IT) which can also be modified, removed or updated for any reason without notice.

The warranty will be void in the event of opening the equipment, physical damage, misuse, modification, repair by unauthorized persons, carelessness and use for purposes other than those intended.

In the event of a defect, proceed as described below:

- 1 Contact the retailer or distributor from whom the equipment was purchased; describe the issue or malfunction to verify if there is a simple solution.

Retailers and Distributors are able to provide all information relating to the most common issues; they can usually repair the equipment much faster than the manufacturer could. Installation errors can normally be identified directly by retailers.

- 2 if your retailer cannot help you, contact R.V.R. Elettronica and describe the issue; if the staff deems it necessary, the authorization to send the equipment will be sent to you with the appropriate instructions;

- 3 Once you have received authorization, you can return the unit. Pack it carefully for shipping, preferably using the original packaging and duly sealing the package.

The customer always assumes the risks of loss (i.e., R.V.R. is never liable for damage or loss), until the package reaches the R.V.R. facility. For this reason, we suggest that you insure the goods for their full value. The goods must be shipped, using C.I.F. values (PAID IN ADVANCE), to the address specified by the R.V.R. service manager on the authorization.



The equipment must not be returned without the authorization for sending as it may be returned to the sender.

- 4 Make sure to include a descriptive technical report mentioning any issues encountered and a copy of your original invoice indicating the date from which the warranty is valid.

Spare parts and parts under warranty can be ordered at the following address. Make sure to include the model and serial number of the equipment, as well as the description and number of spare parts.



R.V.R. Elettronica
Via del Fonditore, 2/2c
40138 BOLOGNA ITALY
Tel. +39 051 6010506

3. First aid

Personnel entrusted with installation, use, and maintenance of the equipment must be familiar with first aid theory and practices.

3.1 Treatment of electric shocks

3.1.1 If the victim has lost consciousness

Follow the first aid principles below.

- Place the victim lying on their back on a hard surface.
- Open the airway by lifting the neck and pushing the forehead back (**Figure 1**).

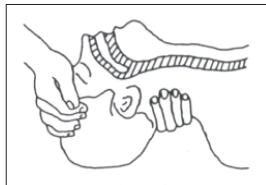


Figure 1

- If necessary, open their mouth and check their breathing.
- If the victim is not breathing, start artificial respiration immediately (**Figure 2**): tilt the head, close the nostrils, make your mouth adhere to that of the victim and perform 4 quick breaths.



Figure 2

- Check the heart rate (**Figure 3**); in the absence of a heartbeat, immediately begin heart massage (**Figure 4**) by compressing the sternum approximately in the centre of the chest (**Figure 5**).



Figure 3

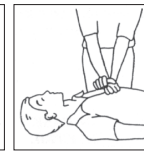


Figure 4

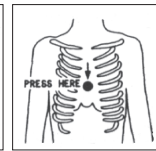


Figure 5

- In the case of only one rescuer, this person must maintain a rhythm of 15 compressions alternating with 2 quick breaths.
- In the case of two rescuers, the rhythm must be one breath every 5 compressions.
- Do not interrupt heart massage during artificial respiration.
- Call a doctor as soon as possible.

3.1.2 If the victim is conscious

- Cover the victim with a blanket.
- Try to keep the victim calm.
- Loosen the clothes and place the victim in a lying position.
- Call a doctor as soon as possible.

3.2 Treatment of electrical burns

3.2.1 Extensive burns and cuts to the skin

- Cover the affected area with a clean sheet or cloth.
- Don't break blisters; remove fabric and items of clothing adhering to the skin; apply a suitable ointment.
- Treat the victim as required for the type of injury.
- Transport the victim to the hospital as quickly as possible.
- If the arms and legs have been affected, keep them elevated.

If medical help is unavailable for an hour and the victim is conscious and not retching, administer a liquid solution of salt and baking soda: 1 teaspoon of salt and half a teaspoon of baking soda for every 250ml of water.

Slowly drink about half a glass of solution four times over a period of 15 minutes. Discontinue if retching occurs.

Do not give alcohol.

3.2.2 Less serious burns

- Apply cold (not icy) gauze compresses using as clean a cloth as possible.
- Don't break blisters; remove fabric and items of clothing adhering to the skin; apply a suitable ointment.
- If necessary, put on clean and dry clothes.
- Treat the victim as required for the type of injury.
- Transport the victim to the hospital as quickly as possible.
- If the arms and legs have been affected, keep them elevated.

4. Descrizione Generale

The **HC04CH-FM**, manufactured by R.V.R. Elettronica, is a hybrid coupler made with new concept technology. Its function is to take the RF signal coming from a maximum of four external sources and combine its outputs to a single antenna output (or two outputs if the option is present) or to slotted cables. The **HC04CH-FM** combines up to four sources of 150 W max power (150 W total).

The **HC04CH-FM** is designed to be contained in a 2HE 19" rack box.

4.1 Unpacking

The package contains the following:

- 1 **HC04CH-FM**
- 1 Compliance Documentation
- 1 Power connector

You can also obtain the following accessories for the equipment from your R.V.R. retailer:

- **Options for the equipment:** \OUT2-HCCH
- **Spare parts**
- **Cables**

4.2 Features

The nominal operation of a transmitter based on a hybrid combiner scheme such as the **HC04CH-FM** requires the sources to deliver the same power. Any power differences (or phase shifts) between the amplifiers produce so-called "imbalance power", which is partly dissipated inside the combiner; the loss is equal to 6dB maximum in the final combination. The **HC04CH-FM** guarantees operation of the transmitter even if one of the amplifiers is completely out of service. In which case, the power coming from the surviving amplifier is transmitted to the antenna, except for a fraction of it (about 1/4) which is dissipated inside the combiner.

The status of the equipment is indicated by a LED on the front panel: **ON/OFF**.

The **HC04CH-FM** can be connected in cascade to the exciters via an interlock cable, so as to be able to deactivate the power delivery of the exciter in the event of malfunctions in the transmission system.

4.3 Description of the Front Panel

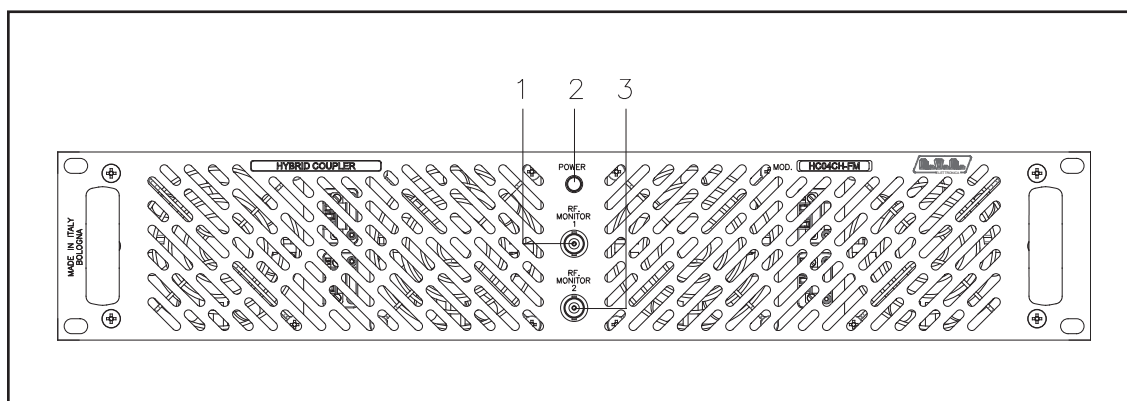


Figure 4.1

- | | |
|------------------|--|
| [1] RF MONITOR 1 | BNC connector for RF monitor 1 output before the pass band filter. The output level is -60dB referred to the power output in 87.5 - 108 MHz range. |
| [2] POWER | Red LED, turns on when amplifier is switched on. |
| [3] RF MONITOR 2 | BNC connector for RF monitor 1 output after the pass band filter. The output level is -60dB referred to the power output in 87.5 - 108 MHz range. |

4.4 Description of the Rear Panel

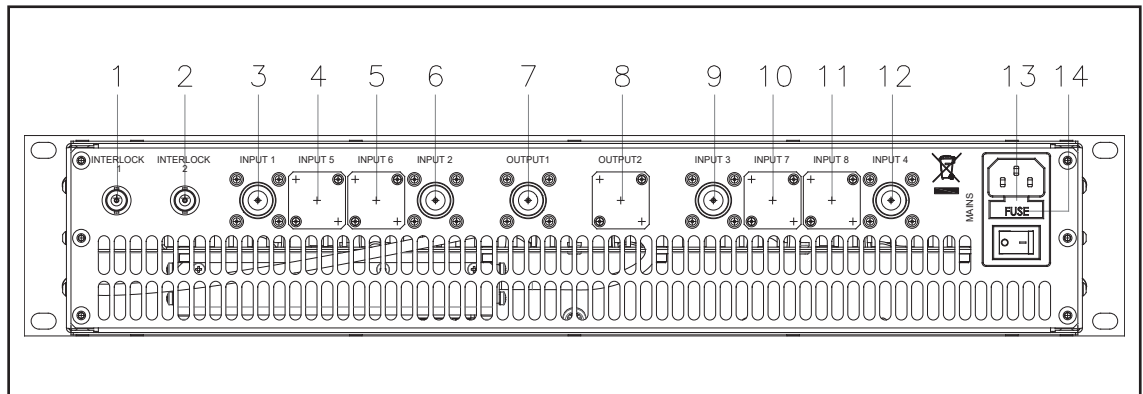


Figure 4.2

- | | |
|-----------------|--|
| [1] INTERLOCK 1 | BNC connector 1 to disable an external device, such as an exciter. In case of faults, the central conductor is grounded. |
| [2] INTERLOCK 2 | BNC connector 2 to disable an external device, such as an exciter. In case of faults, the central conductor is grounded. |
| [3] INPUT 1 | Input 1 of the combiner circuit (N-Type Connector) coming from source A. |
| [4] INPUT 5 | Not used. |
| [5] INPUT 6 | Not used. |
| [6] INPUT 2 | Input 2 of the combiner circuit (N-Type Connector) coming from source B. |
| [7] OUTPUT 1 | Output 1 of the divider circuit (type N connector) to drive antenna 1. |
| [8] OUTPUT 2 | Output 2 of the divider circuit (type N connector) to drive antenna 2 (optional). |
| [9] INPUT 3 | Input 3 of the combiner circuit (N-Type Connector) coming from source C. |
| [10] INPUT 7 | Not used. |
| [11] INPUT 8 | Not used. |
| [12] INPUT 4 | Input 4 of the combiner circuit (N-Type Connector) coming from source D. |
| [13] PLUG | VDE socket for mains supply and power switch. |
| [14] MAIN FUSE | Fuse holder. Use a screwdriver to access the fuse. |

5. Installation and Configuration Procedure

Instructions are given in this chapter on installation and configuration of the equipment. Carefully perform all the steps described in this chapter both upon initial start-up and every time the main configuration is changed, for example when moving to a new transmission station or when replacing the equipment.



IMPORTANT: *always disconnect the mains power before carrying out any type of installation and/or maintenance. It is imperative to cut off the power supply to avoid electric shock hazards that could cause damage to property and physical harm, serious injuries or even death.*

The equipment must only be installed by qualified personnel. Qualified personnel are personnel who comply with all the safety directives, laws and standards that apply to the installation and operation of this device.

The choice of qualified and duly trained personnel is always the responsibility of the employer, since the employer is always the one in the best position to judge whether a worker is suitable for a particular job and therefore capable of ensuring their safety while respecting the applicable law on occupational safety.

Employers must provide their personnel with adequate training in electrical devices, and ensure that they are familiar with the content of this manual.

Compliance with the safety instructions set out in this manual or with the legislation indicated does not relieve the personnel from the duty to also comply with other specific standards relating to the installation, place, country or other circumstances concerning the equipment.



IMPORTANT: *there is a danger of possible electric shocks and it is therefore mandatory to comply with the applicable safety law regarding electrical aspects.*

Once configured, the equipment is ready for normal operation and no further intervention is required since all the parameters are saved automatically for when the equipment is switched off and on again either intentionally or unintentionally.

The performance and functions of the hardware and firmware of the equipment are described in more detail in the following chapters: please refer to the relevant sections of the manual for further information on what is covered in this chapter.



IMPORTANT: *during all phases of configuration and testing of the transmitter of which this equipment forms part, always keep to hand the test table ("Final Test Table") accompanying the equipment: this document covers all the operating parameters of the equipment set and checked at the time of testing after production.*

5.1 Installation

5.1.1 General Requirements

The ventilation of the equipment and workplace must be suitable for maintenance according to the directive in force in the country in which this equipment is installed.

To ensure correct operation of the appliance, there must be a clearance of at least 50 cm at the front and back of the device to facilitate the circulation of air through the ventilation grids.

In any case, the clearances must be in accordance with the safety directive in force in the country where this equipment is installed.

This device has been designed to operate at temperatures between -10 °C and 45 °C without loss of performance. The ambient air must be dust-free and not condensed; the maximum humidity must never exceed 95%.

In particular environmental conditions it should be remembered that temperature fluctuations can cause condensation. If the place where this device is located should be subject to these physical events, it is advisable to monitor the device once it is put into service, in addition to trying to protect the device itself as best as possible.



IMPORTANT: *never power up the equipment in the presence of condensation. This problem can occur more frequently in the case of equipment stored for a long time or used as active backup.*

The RF antenna, power supply and connection cables must have a section suitable for the maximum current intensity.

5.1.2 Preliminary checks

Unpack the appliance by removing the wrapping and, before any other operation, check for any damage due to transport. Carefully check that all connectors are in perfect condition and verify the absence of moisture. Otherwise, wait until it is completely dry.

If any issues occur during this first phase, contact the after-sales service immediately.

The main fuse is accessible from the outside on the rear panel. Remove the fuse block with a screwdriver to check its condition and replace it if necessary. The fuses to be used are:

	HC04CH-FM @ 230 Vac
Main fuse	(1x) F 3.15A type 5x20

Table 5.1: **Fuses**

5.1.3 Placement of the device

Useful tips for correct installation:

- Avoid the presence of external elements near the ventilation inlets and outlets, as they could prevent proper ventilation of the device.
- Avoid proximity to a source of heat or flammable gas.
- Limit places subject to accumulation of humidity, dust, sand or salt or environments that could compromise correct operation of the equipment.
- Avoid installing the equipment in inhabited places due to possible noise pollution, or on lightweight supports. The device may hum during operation due to forced ventilation. The mounting surface must be able to withstand the weight of the device and must be solid.



Note: below we will refer to a complete station of which the device can form a part. The same procedures also apply if the device is used as a standalone one.

The device is generally connected inside a 19" rack and fixed with M5 screws in the designated holes.

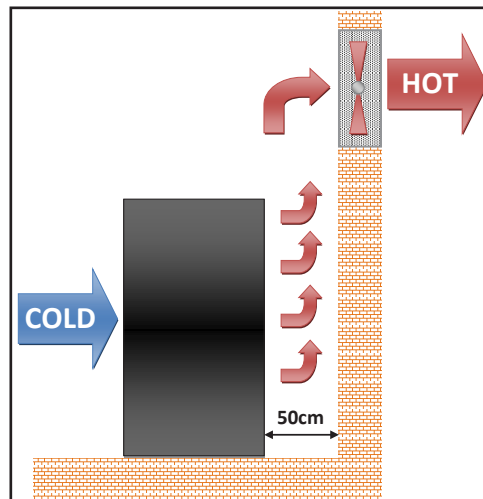
The device must be installed at least 1 metre from the ground.

Install the rack where the transmitter will be operated. The rack is mounted on wheels for ease of movement: once it is put into position it is advisable, therefore, to use the four screws at the base of the rack to stabilize it perpendicular to the ground.

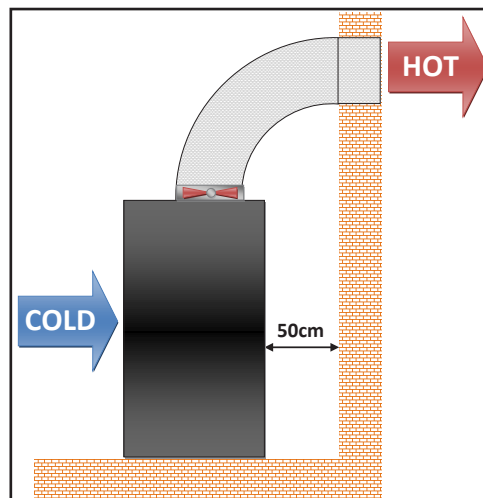
The environment where the rack is installed should be air conditioned at about 25 °C and equipped with a filter for the elimination of dust and salt.



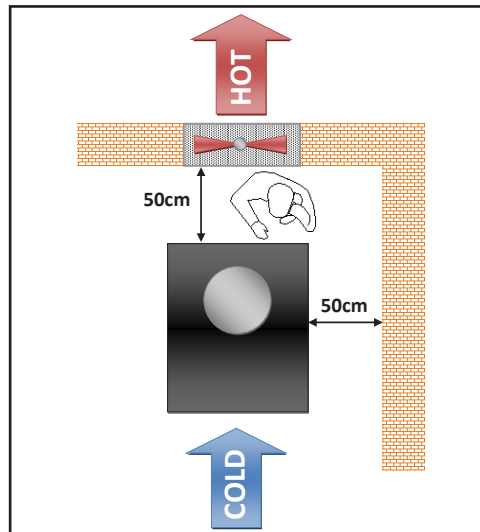
The station normally has an air outlet at the rear of the equipment: in which case, ensure adequate ventilation of the room.



Alternatively it is cooled by forced ventilation and the air intake is located on the roof of the equipment. A hose approximately 1.5 metres in length is recommended.



It is strongly recommended to install the rack at least 50 cm from the rear and side walls in order to allow optimal air flow and ease of maintenance.



5.1.4 Power supply connections of the device

Prepare the following connection (valid for both functional tests and final commissioning):

- ✓ Single-phase mains power connector, 230 (-15% / + 10%) Vac.
A conductor section of at least 1.5 mm² is recommended.



Note: to ensure the safety of the operators, prepare the wiring according to the laws and regulations in the country where this equipment is installed.

Connect the mains cable to the MAINS socket on the rear panel.



Caution: To avoid the **risk of damaging the equipment**, it is essential that this is properly earthed. It is mandatory, therefore, to check the efficiency of the earth connection of your system.



Note: to ensure both the safety of the operators and correct operation of the equipment, it is essential that the mains system is earthed and properly connected to the equipment.

Useful tips for a correct connection:

- Prepare suitable earthing of the electrical system. This offers both direct protection, as it prevents shocks when direct contact is made with the metal casings of the equipment, and indirect protection, as it cuts off the supply of energy when dispersion occurs due to poor insulation. This can be done independently also with an earthing rod and inspection pit

installed by the qualified personnel of a specialised company.

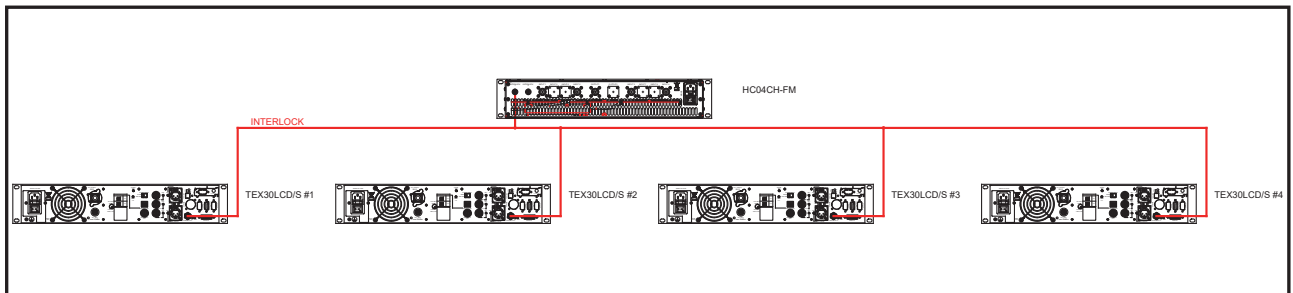
- Provide internal lightning protection such as a surge arrester (internal SPD) or a circuit breaker, to be installed by qualified personnel in the distribution panel. This solution allows to protect from violent atmospheric electric discharges that hit the surrounding ground up to several kilometres.
- Provide internal protection against disturbances on the distribution line such as EMI filters or line voltage stabilizers, to be installed by qualified personnel in the distribution panel, which can filter disturbances caused by electrical equipment and sudden surges on the line, as well as permit voltage control.

5.1.5 Signal and RF connections

Prepare the following connection (valid for both functional tests and final commissioning):

✓ For functional tests only:

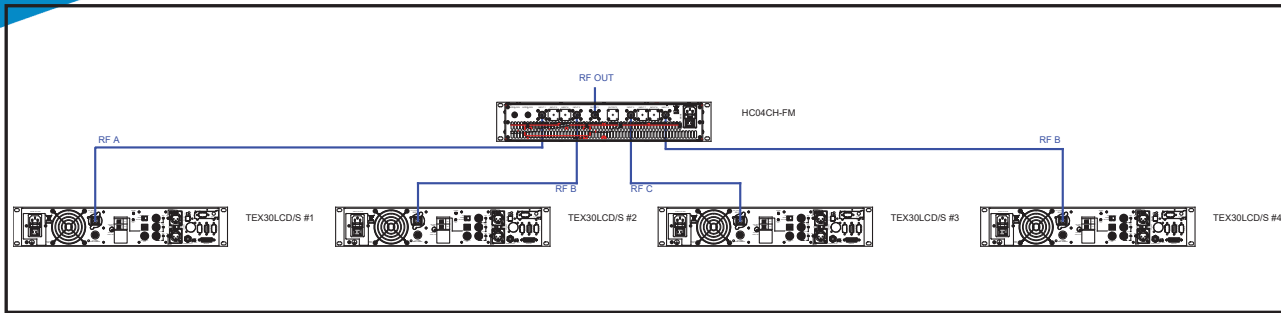
- a dummy load with 50 Ohm impedance and of appropriate power (minimum 150W for **HC04CH-FM**).
- Coaxial cable with BNC connectors for connecting the **INTERLOCK** signal to the load protection.



INTERLOCK signal connection

✓ Connection cable kit including:

- RF cable for the output towards the load / antenna (50 Ohm coaxial cable with standard N-type connector).
- RF cables for sources input (4x 50 Ohm coaxial cables with standard N-type connector).



RF signal connection



CAUTION: risk of burns due to RF. Before connecting the antenna cable, make sure that the equipment cannot emit RF at the output.



CAUTION: For reasons of electromagnetic compatibility, only double shielded

Connect the N-type output connector of the combiner section to the antenna or to a dummy load capable of dissipating the power involved. Connect with a coaxial cable one of the BNC **INTERLOCK** connectors to the **INTERLOCK** connector of the transmitters (see the diagram included with each station for reference).

The hybrid combiner must be installed in a rack that includes an anti-tear device to prevent the possibility of accidentally disconnecting the power leads.



CAUTION: To avoid electric shocks and electrocution, never touch the RF output connector when the equipment is powered up and with no load connected.



Note: to ensure both the safety of the operators and correct operation of the equipment, it is essential that the mains system is earthed and properly connected to the equipment.

5.1.6 Initial start-up and setting of operation

For initial start-up, follow the procedure below.

Due to its function, an **HC04CH-FM** is always used inside a transmitter. The description given in this section therefore refers to these devices in general.

When the **HC04CH-FM** is powered up, check that the POWER lamp lights up.

Activate the exciter at minimum power and wait for it to lock onto the working frequency. Once the exciter has locked on, gradually increase its output power, checking the exciter instruments, the amplifiers and the combiner display. Increase the power of the exciter until the combiner output reaches the desired value, that is, the full power of the station at the very most.

Normally, the device does not require supervision for its operation.

6. Identification and Access to the Modules

6.1 Identification of the Modules

The **HC04CH-FM** is composed of several modules which are interconnected with connectors to facilitate maintenance and replacement of the modules.

6.1.1 HC04CH-FM Top view

The figure below shows the top view of the device, indicating the various components.

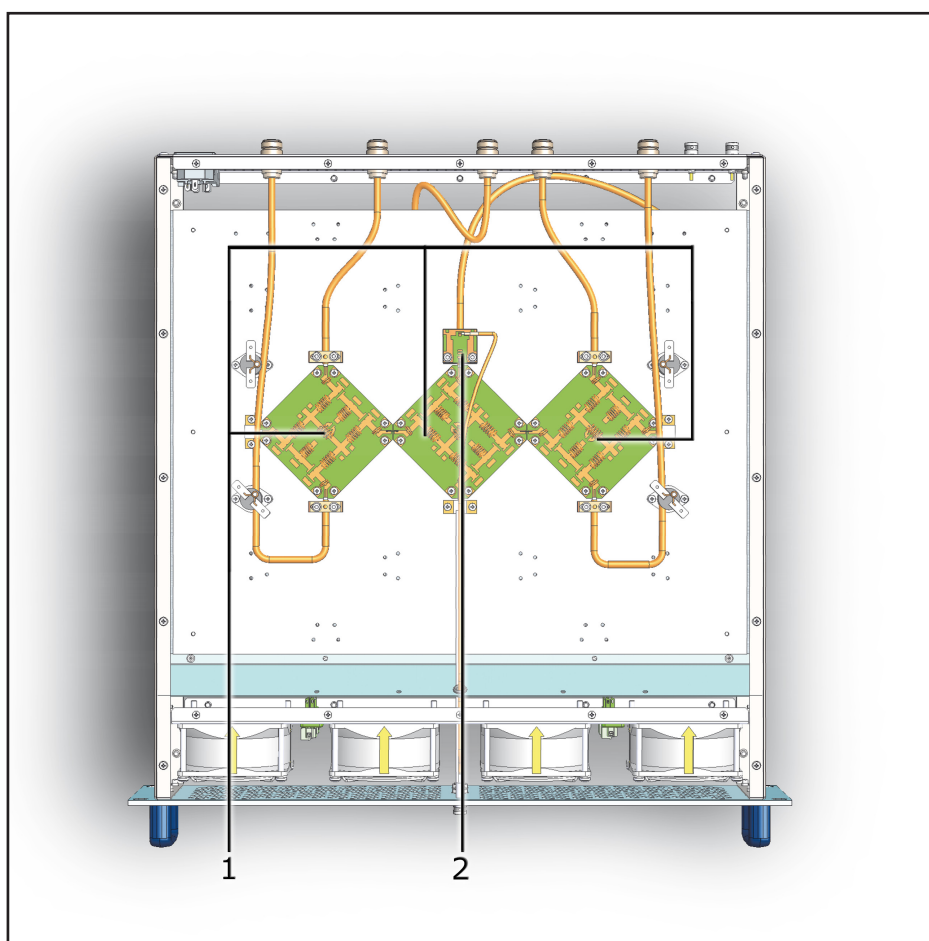


Figure 6.1

- [1] Hybrid Combiner Board
- [2] RF Measure Card

6.1.2 HC04CH-FM Bottom view

The figure below shows the bottom view of the device, indicating the various components.

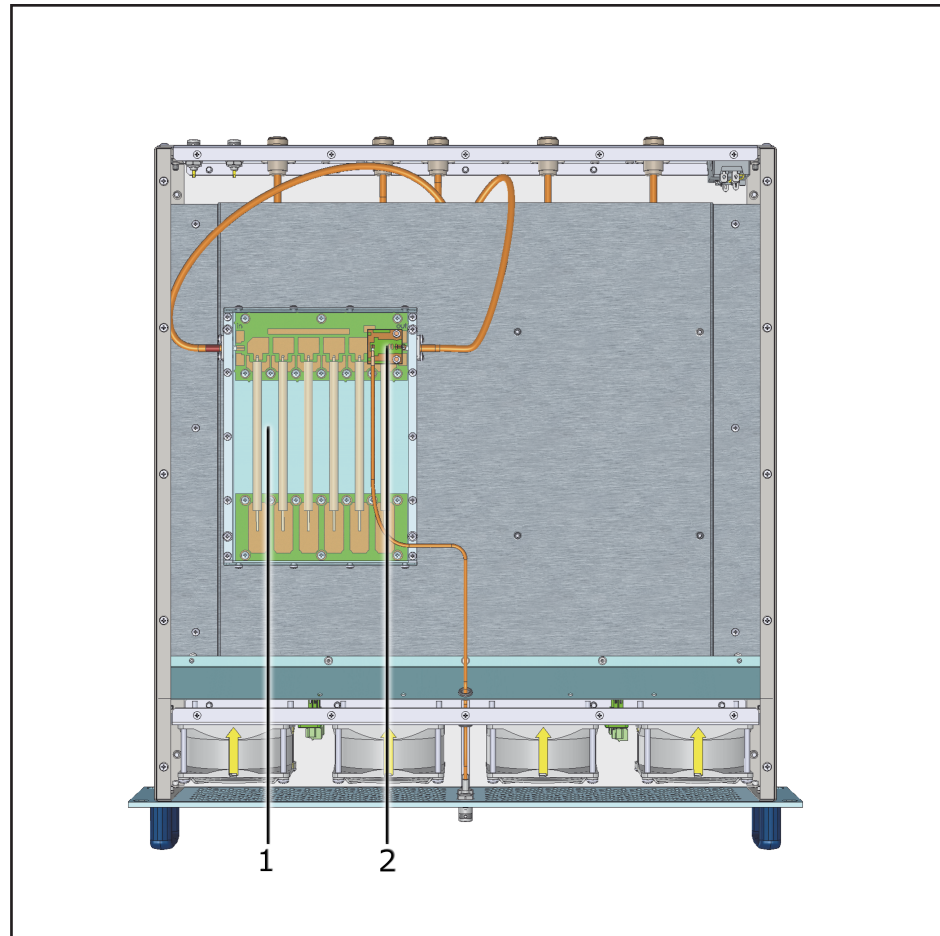


Figure 6.2

- [1] Band Pass Filter Card
- [2] RF Measure Card

7. Principles of Operation

There is a schematic view of the modules and connections that make up the **HC04CH-FM** in figure 7.1.

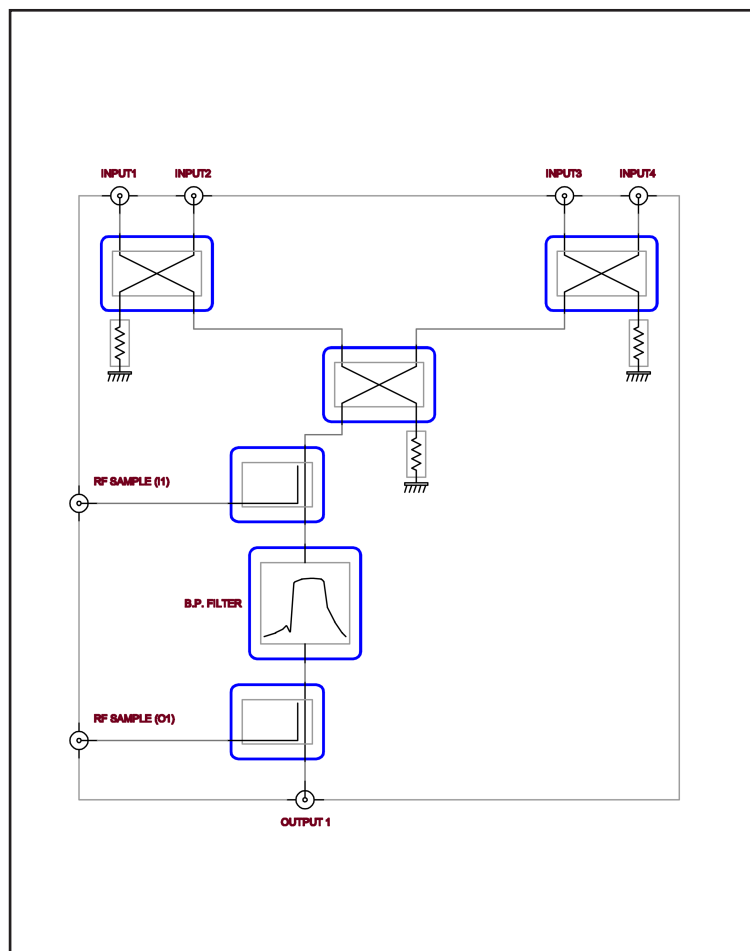


Figure 7.1

A brief description of the functions of each module is given below, and the complete diagrams and layouts of the boards can be found in the “Technical Appendix” Vol.2.

7.1 Description of the modules

7.1.1 Hybrid Combiner Board

The combiner circuit has the function of adding the RF power delivered by the two sources and delivering it to the antenna output.

The circuit is made with concentrated constants with an impedance of 50 Ohm.

The combiner contains special resistive terminations mounted on the main heat sink to absorb any imbalance power in case of bad adjustments, differences in performance between the amplifiers or malfunctions.

7.1.2 RF Measure Card

The task of this card is to take a part of the RF signal, with attenuation at -60dBc, and subsequently sends it to the RF MONITOR output connector.

7.1.3 Band Pass Filter Card

The main function of this card is the passage of frequencies within a given range (the so-called pass band) and attenuates the frequencies outside it.

8. Maintenance and Repair Procedures

8.1 Introduction

This section gives general information on maintenance and electrical adjustments for the **HC2-5GRL** exciter.

Maintenance is divided into two sections depending on the complexity of the procedure and the test equipment required to complete the maintenance.

8.2 Safety Considerations

When the amplifier is operational, dangerous voltages, high currents, and strong RF signals are present inside.



CAUTION: Do not remove any covers without first turning off the device and make sure you have closed them all before restarting the device. Be sure to disconnect the amplifier from the mains before proceeding with any maintenance on the system.

8.3 Ordinary maintenance

The only regular maintenance required for the **HC2-5GRL** is periodic replacement of the fans and cleaning to remove dust in the air filter and any traces inside the amplifier.

The frequency of these operations depends on the operating conditions of the device: ambient temperature, level of dust in the air, humidity, etc...

It is advisable to carry out a preventive check every 6 months, and to replace the fans that make abnormal noises.

The fans should be replaced in case of problems as soon as possible and in any case at least every 24 months.

9. Options

This section shows views on the variants with respect to the basic version to be requested when ordering.

For more information about the options, refer to the respective instruction manuals.

9.1 Option \OUT2-HCCH

9.1.2 Description of the Front Panel

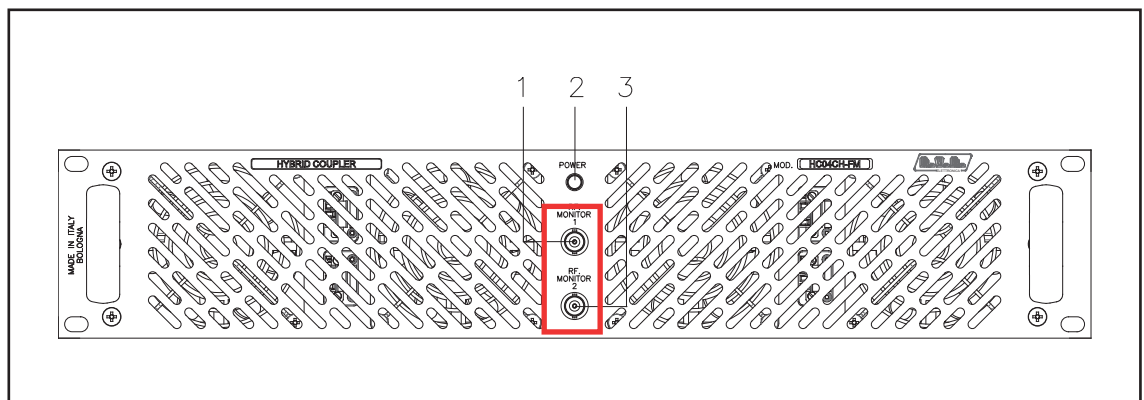


Figure 9.1

- | | |
|------------------|---|
| [1] RF MONITOR 1 | BNC connector for RF monitor 1 output after the pass band filter 1. The output level is -60dB referred to the power output in 87.5 - 108 MHz range. |
| [2] POWER | Red LED, turns on when amplifier is switched on. |
| [3] RF MONITOR 2 | BNC connector for RF monitor 2 output after the pass band filter 2. The output level is -60dB referred to the power output in 87.5 - 108 MHz range. |

9.1.3 Description of the Rear Panel

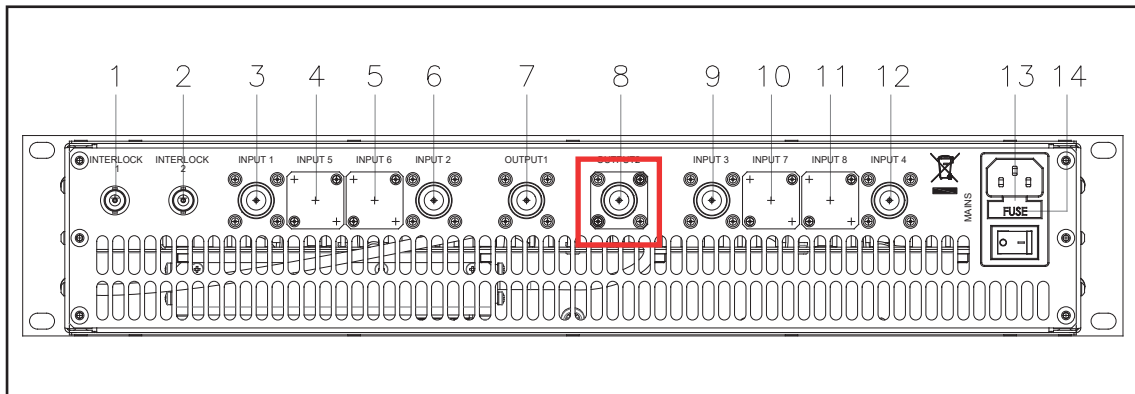


Figure 9.2

- | | |
|-----------------|--|
| [1] INTERLOCK 1 | BNC connector 1 to disable an external device, such as an exciter. In case of faults, the central conductor is grounded. |
| [2] INTERLOCK 2 | BNC connector 2 to disable an external device, such as an exciter. In case of faults, the central conductor is grounded. |
| [3] INPUT 1 | Input 1 of the combiner circuit (N-Type Connector) coming from source A. |
| [4] INPUT 5 | Input 5 of the combiner circuit (N-Type Connector) coming from source E. |
| [5] INPUT 6 | Input 6 of the combiner circuit (N-Type Connector) coming from source F. |
| [6] INPUT 2 | Input 2 of the combiner circuit (N-Type Connector) coming from source B. |
| [7] OUTPUT 1 | Output 1 of the divider circuit (type N connector) to drive antenna 1. |
| [8] OUTPUT 2 | Output 2 of the divider circuit (type N connector) to drive antenna 2. |
| [9] INPUT 3 | Input 3 of the combiner circuit (N-Type Connector) coming from source C. |
| [10] INPUT 7 | Input 7 of the combiner circuit (N-Type Connector) coming from source G. |
| [11] INPUT 8 | Input 8 of the combiner circuit (N-Type Connector) coming from source H. |
| [12] INPUT 4 | Input 4 of the combiner circuit (N-Type Connector) coming from source D. |
| [13] PLUG | VDE socket for mains supply and power switch. |
| [14] MAIN FUSE | Fuse holder. Use a screwdriver to access the fuse. |

9.1.4 HC04CH-FM\OUT2-HCCH Top View

The figure below shows the top view of the device, indicating the various components..

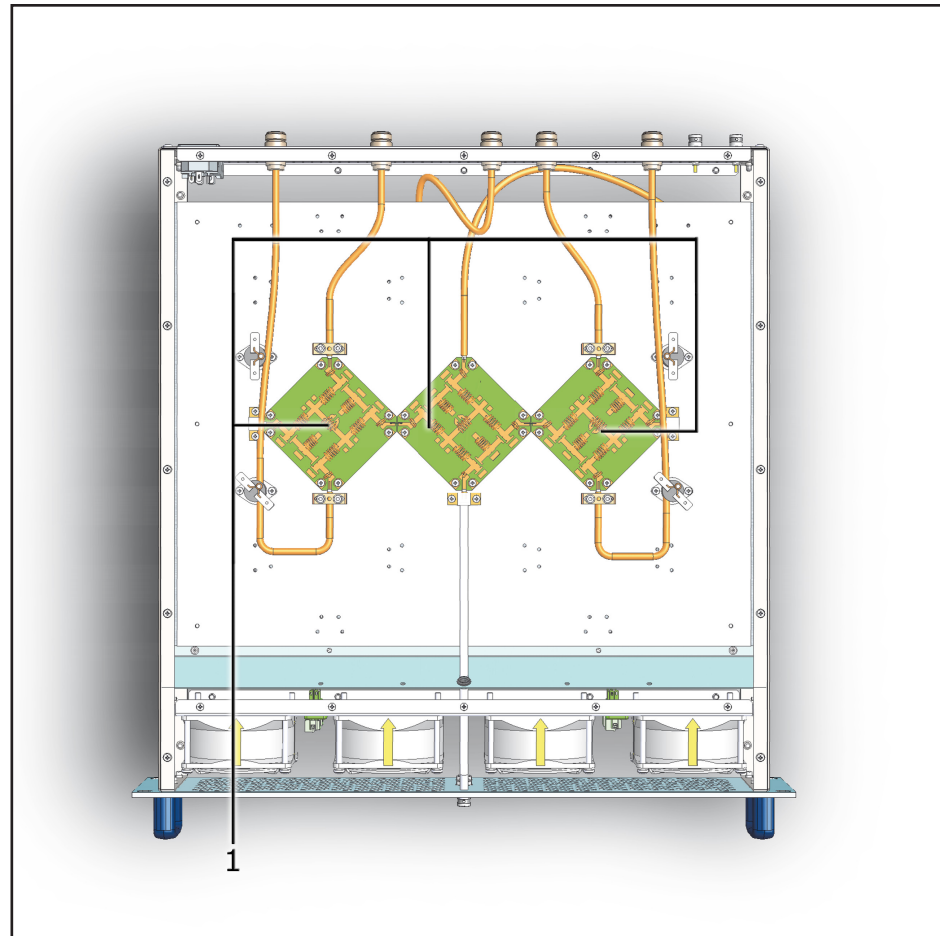


Figure 9.3

[1] Hybrid Combiner Board

9.1.5 HC04CH-FM\OUT2-HCCH Bottom view

The figure below shows the bottom view of the device, indicating the various components.

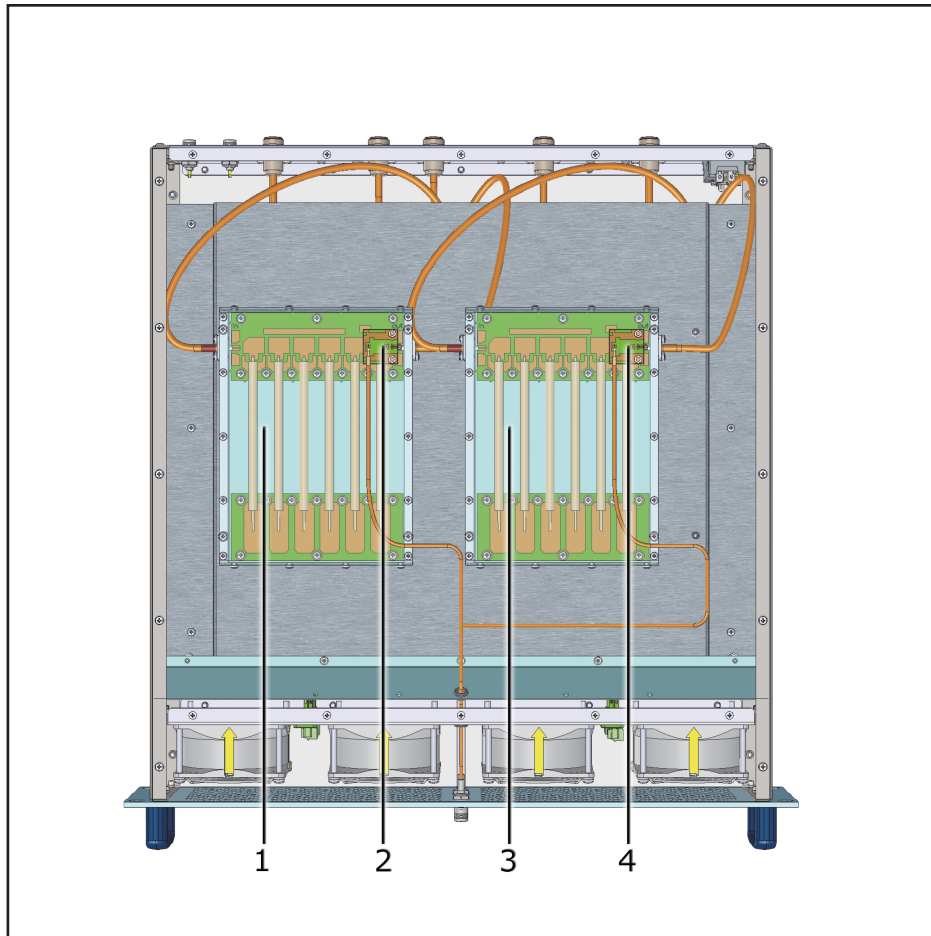


Figure 9.4

- [1] Band Pass Filter Card 1
- [2] RF Measure Card 1
- [3] Band Pass Filter Card 2
- [4] RF Measure Card 2

9.1.6 Principles of Operation

There is a schematic view of the modules and connections that make up the **HC04CH-FM\OUT2-HCCH** in figure 9.5.

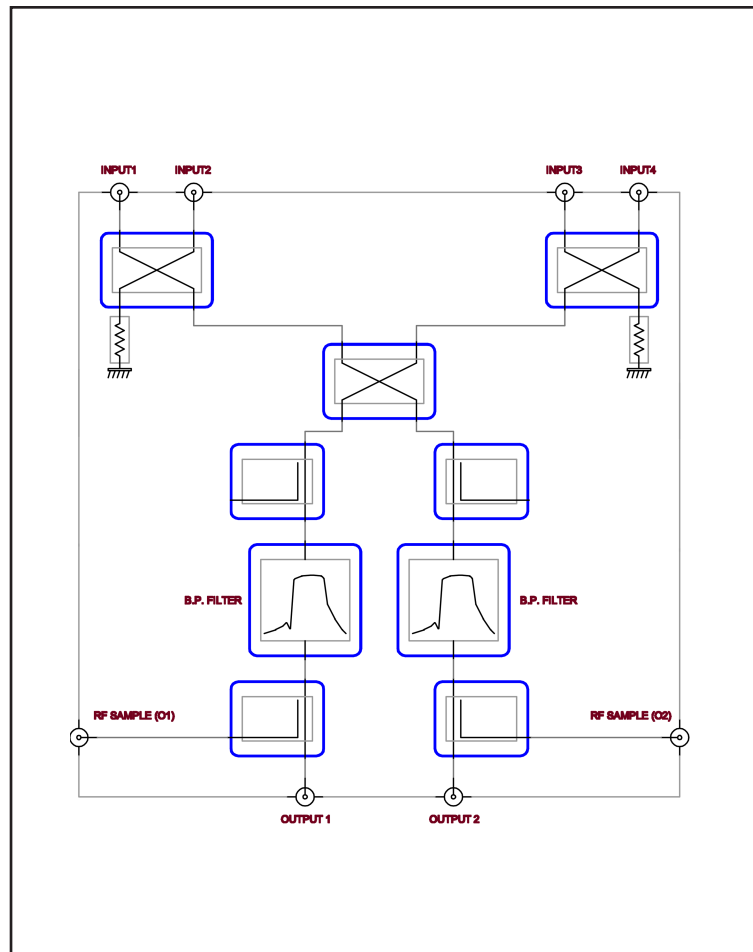
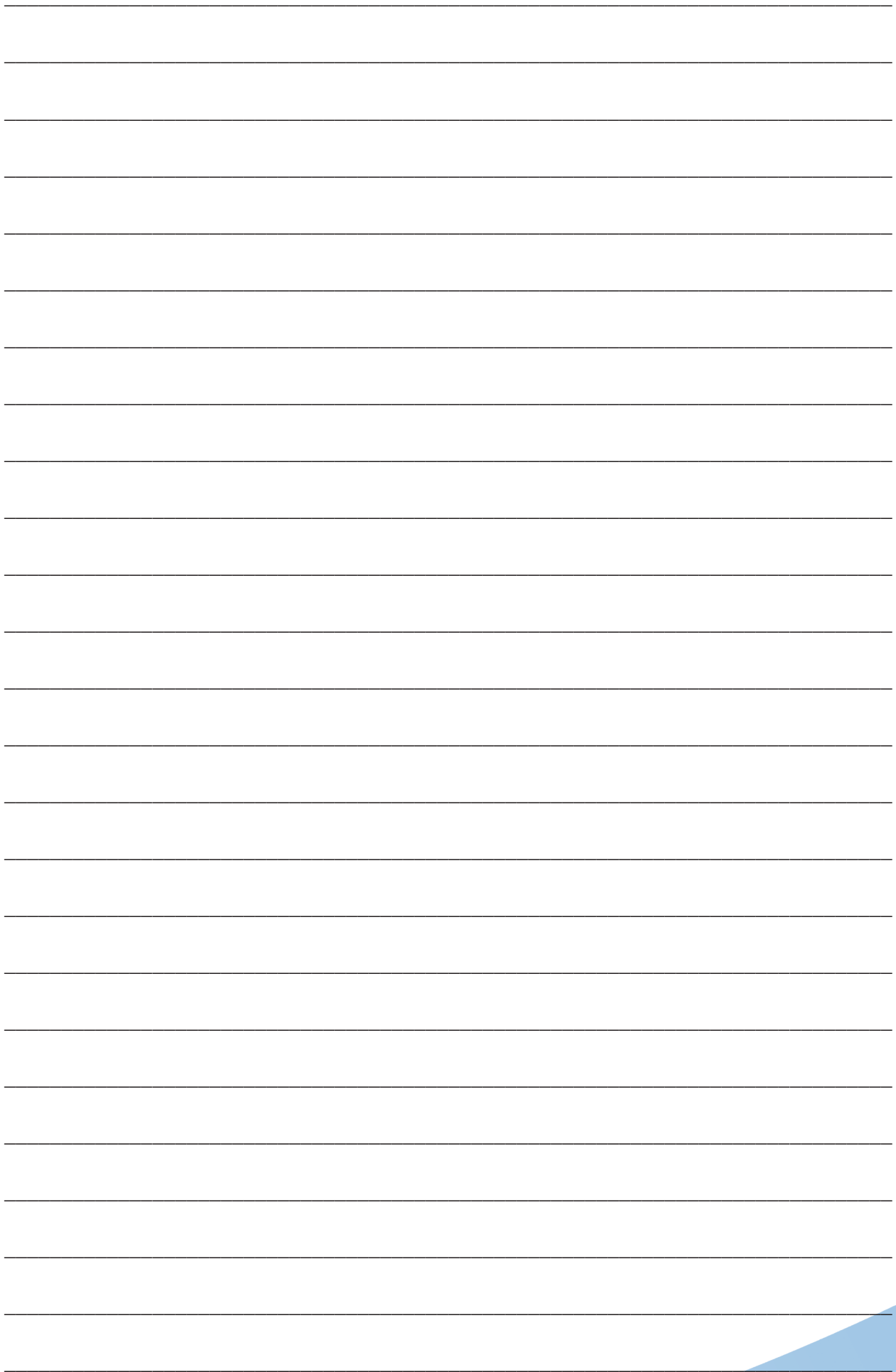
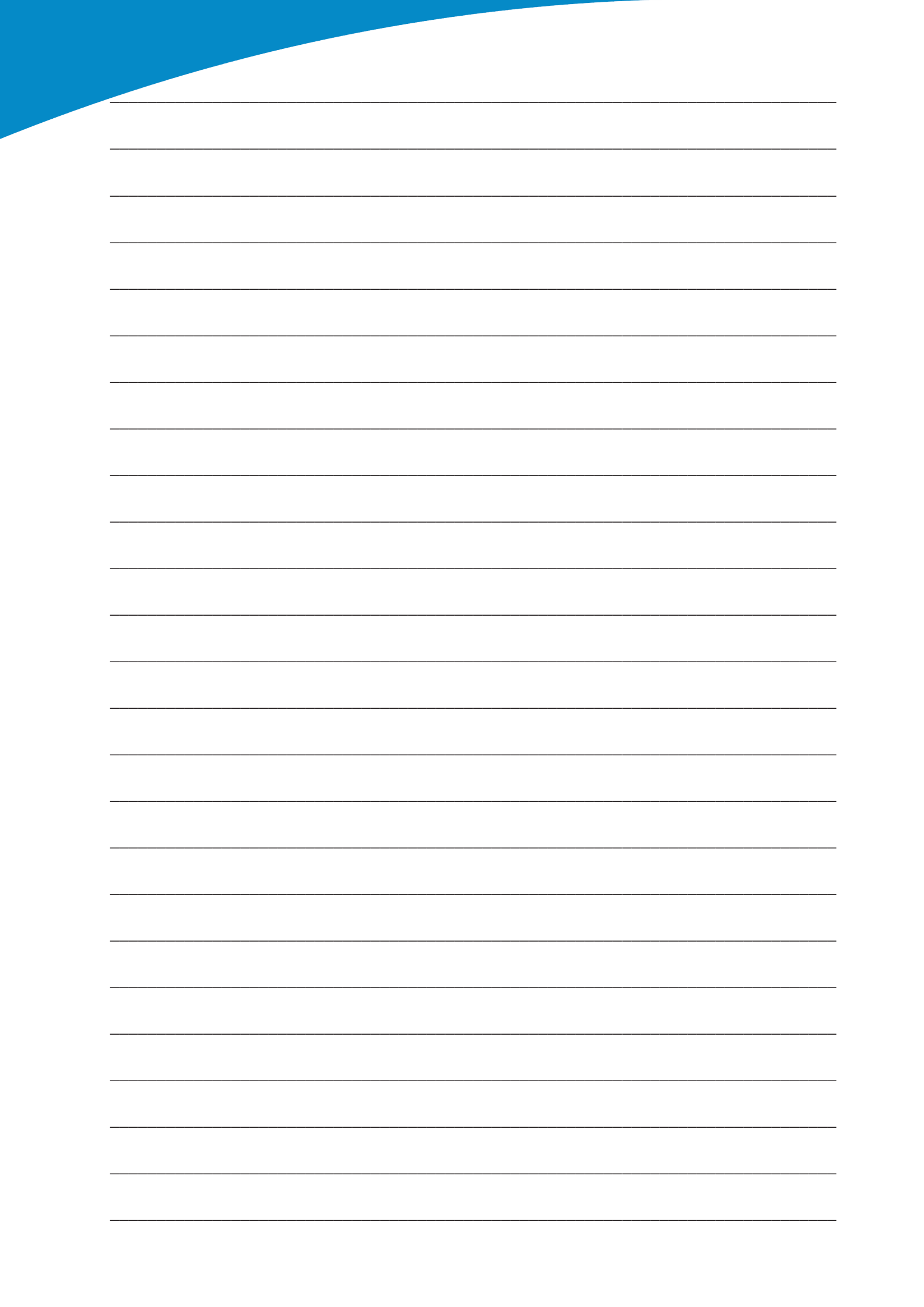
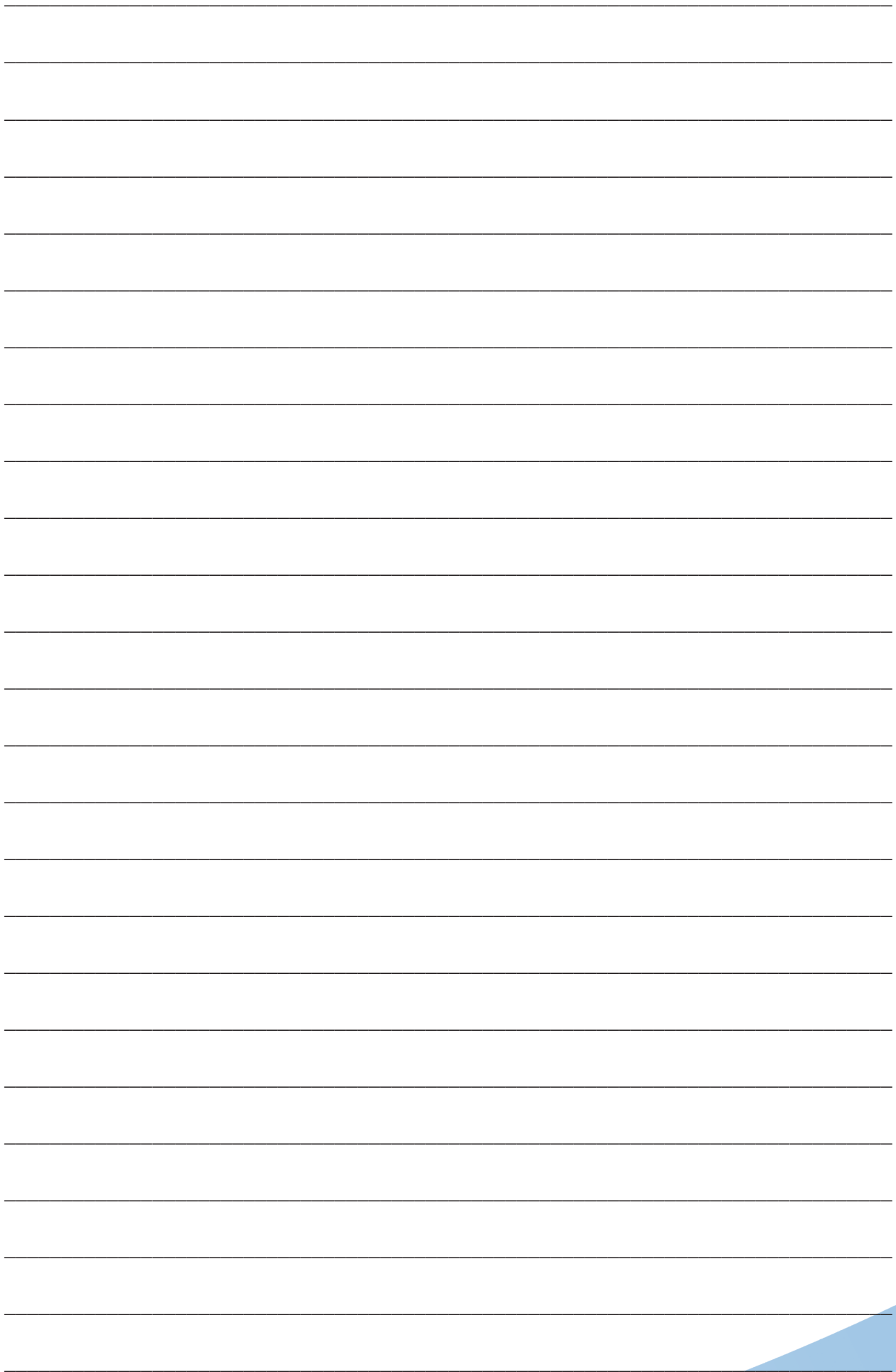


Figure 9.5

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