

GOLDRF RPT-200 Analog Repeater Controller with Integrated Voice ID

(Version V2, with extended operating signal level range)

DD1US, rev. 5, 2026-10-12

! This paper is largely based on the documentation of “goldrf_partner” !

Source:

eBay: Repeater Controller HAM/GMRS, VOICE ID, CW ID, COR DETECTOR, GOLDRF RPT-200

eBay-Seller: “goldrf_partner” (based in Budapest / Hungary)

eBay-Price: 41 € + 9 € (shipping to Germany)

Technical specification

This is a versatile analogue repeater controller with an integrated voice ID feature. It allows you to easily **build** a compliant amateur or GMRS repeater that meets all identification requirements. You can also **add an identification function to your existing repeater**. The device does not need a computer for configuration.

Features

- **Plug-and-Play Repeater Controller:** This controller offers flexible connectivity, working with both negative and positive **COR (carrier operated Relay) / COS (carrier operated Squelch)** signals. What’s more, it also eliminates the need for a dedicated COR/COS output from your radio entirely. It uses sophisticated **sound level detection** to activate your repeater instantly upon receiving a signal, ensuring a fast uninterrupted connection and simplifying your entire setup.
- **Universal Compatibility:** Designed for use with both mobile and handheld radios.
- **Adjustable Hang Time:** Customizable from 0 to 4000ms.
- **Integrated Voice ID:** Built-in recorder/player for storing an identification message, which can be live voice or Morse code.
- **Internal Microphone:** For quick recording or modification of your ID message.
- **Line-In Input:** Record your voice/Morse ID from an external source like a computer sound card, smartphone, or media player.
- **Configurable ID Intervals:**
 - **15-minute interval** for GMRS applications.

- **10-minute interval** for amateur radio repeaters.
- **Selectable ID Modes:**
 - **Routine:** The controller automatically transmits the ID every 10 or 15 minutes.
 - **Traffic Only:** The controller only transmits the ID during periods of activity.
- **Excellent RF Immunity:** Heavily filtered and shielded against RF interference; highly stable even when operating close to transmitter antennas.

ID Transmission Process

1. Routine Mode:

- The device plays the recorded ID immediately after being powered on.
- It then repeats the ID every 10/15 minutes.

2. Traffic Only Mode:

- The device plays the ID immediately after being powered on, then every 10/15 minutes.
- If no traffic is detected for 20/30 minutes, the controller disables the ID transmission. However, the 10/15 minutes timer continues to run in the background.
- Once traffic is detected again, the controller re-enables the ID transmission, and the next scheduled ID will be broadcast.

The controller uses a **voice mixing** process for ID transmission.

Maximum ID length: 8 seconds.

Inputs and Outputs

- **RX AUDIO IN:** Main audio input. Connects to the audio output of the receiver: RX FLAT AUDIO OUT, AF OUT (or speaker output on handheld radios).
Maximum signal level: 5 V pp. Input impedance: 600 Ohm.
- **- COS:** Input for negative COR/COS signals. Features a built-in pull-up resistor to internal +5V.
- **+ COS:** Input for positive COR/COS signals. Activation voltage: +3.3V to +12V.
- **LINE IN:** Analog input with automatic gain control for recording the ID from external sources (PC sound card, smartphone, etc.).

Voltage level: 100 mV pp to 1 V pp. Input impedance: 2 kOhm. The GND of "LINE IN" and also of the microphone is independent of the main GND of the PCB.

- **PTT:** Digital output to control the transmitter radio's PTT. Open-collector output that closes to GND when active. Can be connected directly to most radio PTT lines.
- **TX AUDIO OUT:** Analog output. Connects to the audio input of the transmitter: TX FLAT AUDIO IN, AF IN or microphone input. When using a handheld radio, an external potentiometer may be required for adjustment to match the microphone input.
- **+12V:** Positive power supply input. Minimum 10 V, Maximum 18 V.
- **GND:** Common ground point for the controller board (except LINE IN & microphone).

Recorder/Player Specifications

- **Recording Input:** 14-bit ADC
- **Playback Output:** 14-bit DAC
- **Audio Format:** ADPCM
- **Sampling Rate:** 16 kHz

PCB Dimensions: 100 x 80 mm

User Manual

The RPT-200 is an analog repeater controller with voice ID function.

■ ***Minimal electronics knowledge is recommended for the installation of the panel!***

First, a receiver and a transmitter radio must be connected, then the voice ID can be set.

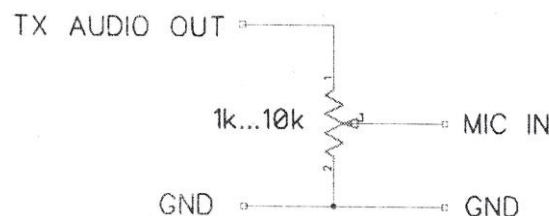
Connecting the receiver radio:

- The audio wire of the receiver radio to the "RX AUDIO IN" connector.
- The common, GND point of the receiver radio to the "GND" connector.
- If the receiver radio has a COR/COS signal, it is connected to the "-COS" or "+COS" connector, depending on the polarity of the signal used by the receiver.
- In the case of a negative COR/COS signal, no external pull-up resistor is required, the input is factory-wired to the controller's internal 5 V voltage.

- In the case of a positive COR/COS signal, the active voltage level is:
min. 3.3 V ... max. 12 V.
- Set the microswitch to "AUDIO CONT.", if you do not use COR/COS signal. In this setting the controller generates the switching signal required to start transmission from the incoming audio signal. In this setting always use CTCSS or DCS signal on the receiver radio.

Connecting the transmitter radio:

- The transmitter radio audio input to the "TX AUDIO OUT" output. If you are using a handheld radio with a microphone input, you will need to reduce the signal with an external potentiometer, as shown in the picture:



- The transmitter common, GND point to the "GND" connector.
- The transmitter PTT control to the "PTT" output. This is an open collector output, when active, it closes to GND.
If the transmitter radio uses a different transmission start solution, a relay can also be used, with a protective diode. Maximum current: 50 mA.

After connecting the receiver and transmitter radio, connect the 12 V power supply (10 V ... 18 V) to the controller. After switching on, the blue "PWR ON" LED will be constantly lit, the yellow "TIMER" LED will flash.

When the receiver radio is receiving, the green LED is on, and the repeater switches the transmitter radio to transmit, the red LED also lights up. When reception is complete, the green LED goes out, then the red one goes out too when the set hold time has elapsed, which you can adjust with the HOLDING TIME potentiometer.

■ ***You need to set the appropriate signal levels with the TX AUDIO LEVEL potentiometer (or in the case of a handheld radio, also with the receiver's volume control).***

■ ***Proper adjustment of signal levels is very important.***

Recording and adjusting the voice ID:

1. Recording the ID with the built-in microphone:

Set the switch under the microphone to "MIC". With the controller turned on, in a quiet environment, record an ID by pressing and holding the "ID REC" button. When the button is

pressed, the orange "REC" LED lights up. You have 8 seconds to record the ID, when this time is up, the "REC" LED goes out. If the ID is shorter than the available time, release the "ID REC" button at the end of the ID.

2. Testing the ID

Press the "ID TEST" button once briefly. The controller will now play the recorded sound and the transmitter will switch to transmission. When the ID is played, both the "RX" and "TX" LEDs will light up. You can check on a radio receiver whether the recorded ID is correct. The "VOICE ID LEVEL" potentiometer can be used to fine-tune the ID level.

■ ***Correct level adjustment is important, with the correct coordination of the level adjusters ("VOICE ID LEVEL" + "TX AUDIO LEVEL"), the repeater identification will work perfectly.***

3. Recording an ID from an external signal source:

Set the switch to "LINE IN". Connect a signal source to the "LINE IN" - "GND" connector pair. Press and hold the "ID REC" button and immediately start playing the audio, which can also be a recorded Morse code. At the end of the audio, you want to record, release the "ID REC" button. The recorded audio can be played back by pressing the "ID TEST" button once.

■ ***"LINE IN" is a sensitive input.***

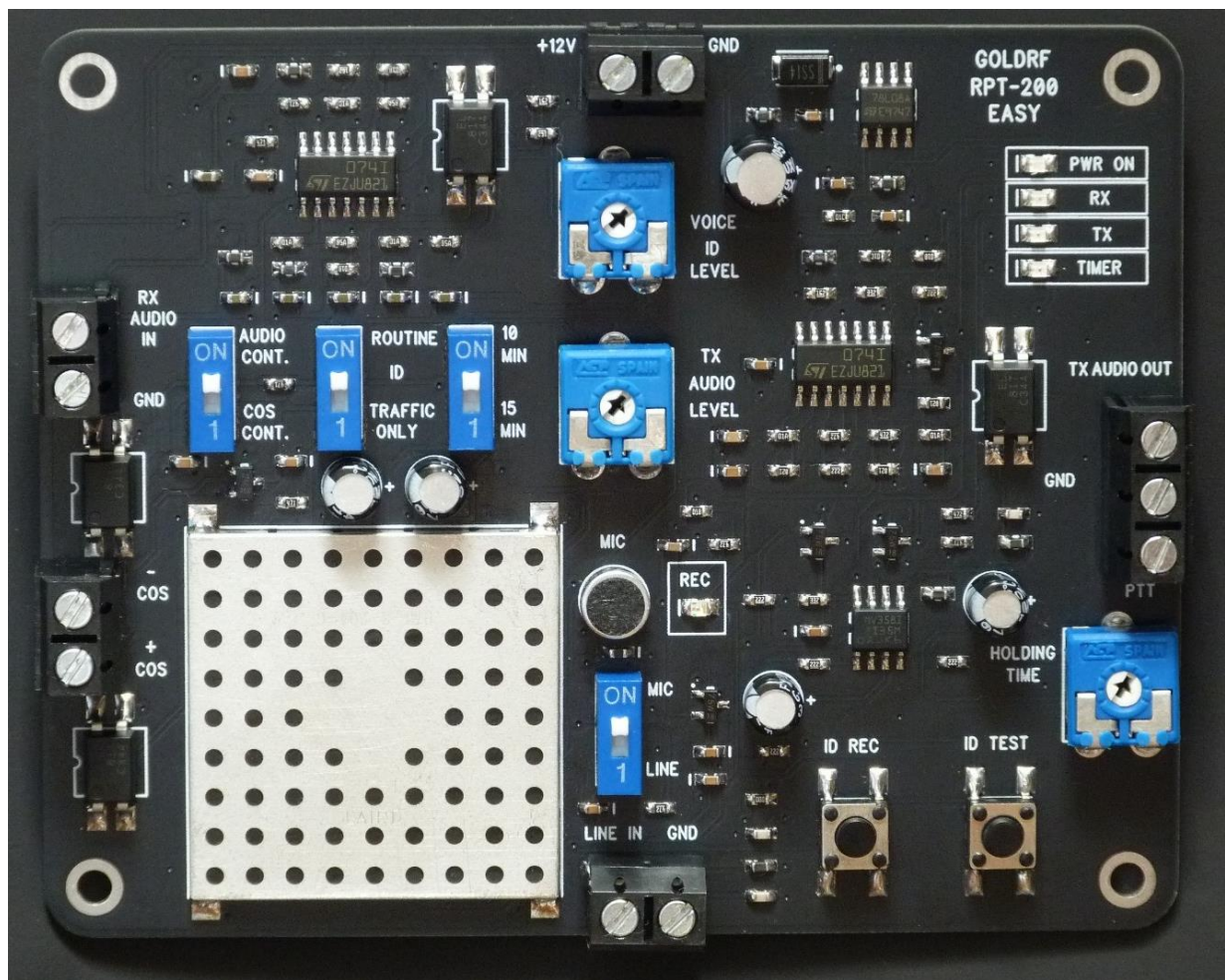
When using it, it is best to use a device that is independent of the mains voltage (battery powered laptop, smartphone). Alternatively disconnect the receiver and transmitter radio wires for the duration of the recording, if they are also mains-powered. Otherwise, unwanted noise may appear in the recording. It may also be necessary to disconnect the wires of the external audio source when testing the recorded audio.

Repeat the recording of the voice ID if necessary until you hear a clear, and noise-free ID, and adjust the two level-adjustment potentiometers accordingly.

Setting the repeater identification mode and time:

- Set the switch to the desired identification time: "15 MIN / 10 MIN". The voice ID is emitted in the last third of the set minute of the set interval.
- Set the desired identification process: "ROUTINE / TRAFFIC ONLY".
- Interpretation of the blue "TIMER" LED:
 - Slow flashing: Identification every 15 minutes.
 - Faster flashing: Identification every 10 minutes.
 - The LED is dark, identification is disabled (in TRAFFIC ONLY mode, if the traffic free period has exceeded 20/30 minutes).
 - The LED starts flashing again: in TRAFFIC ONLY mode, traffic is detected, ID is enabled again.

Pictures of the PCB (source: "goldrf partner")

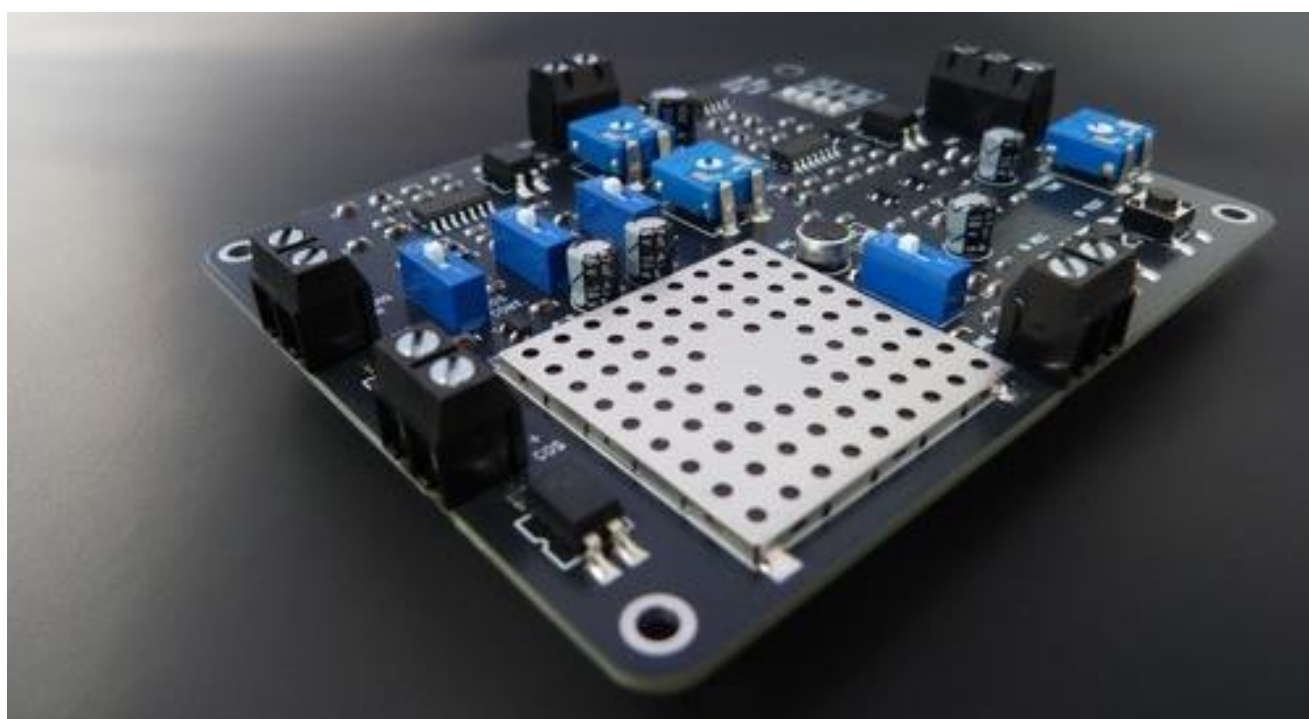
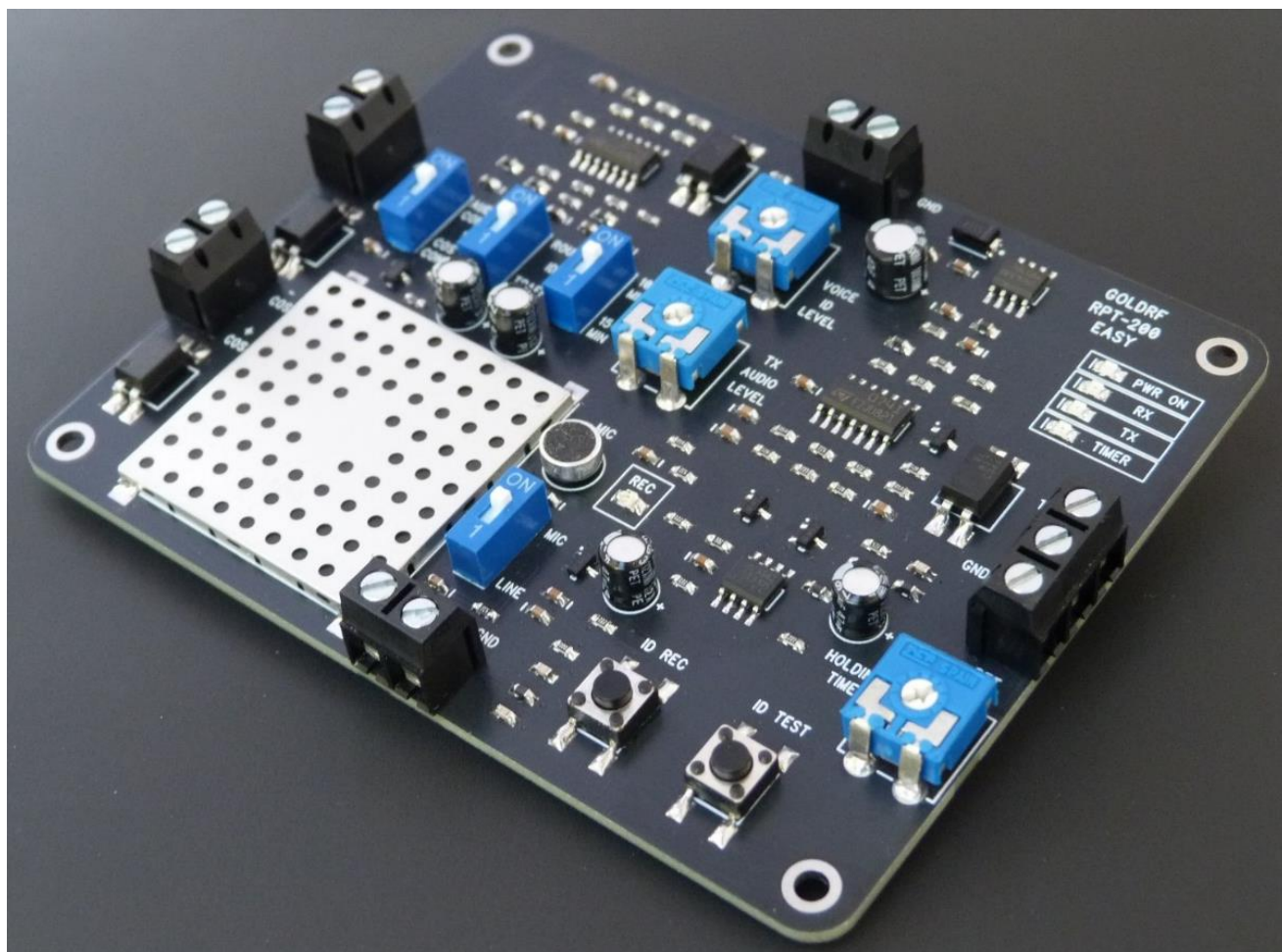


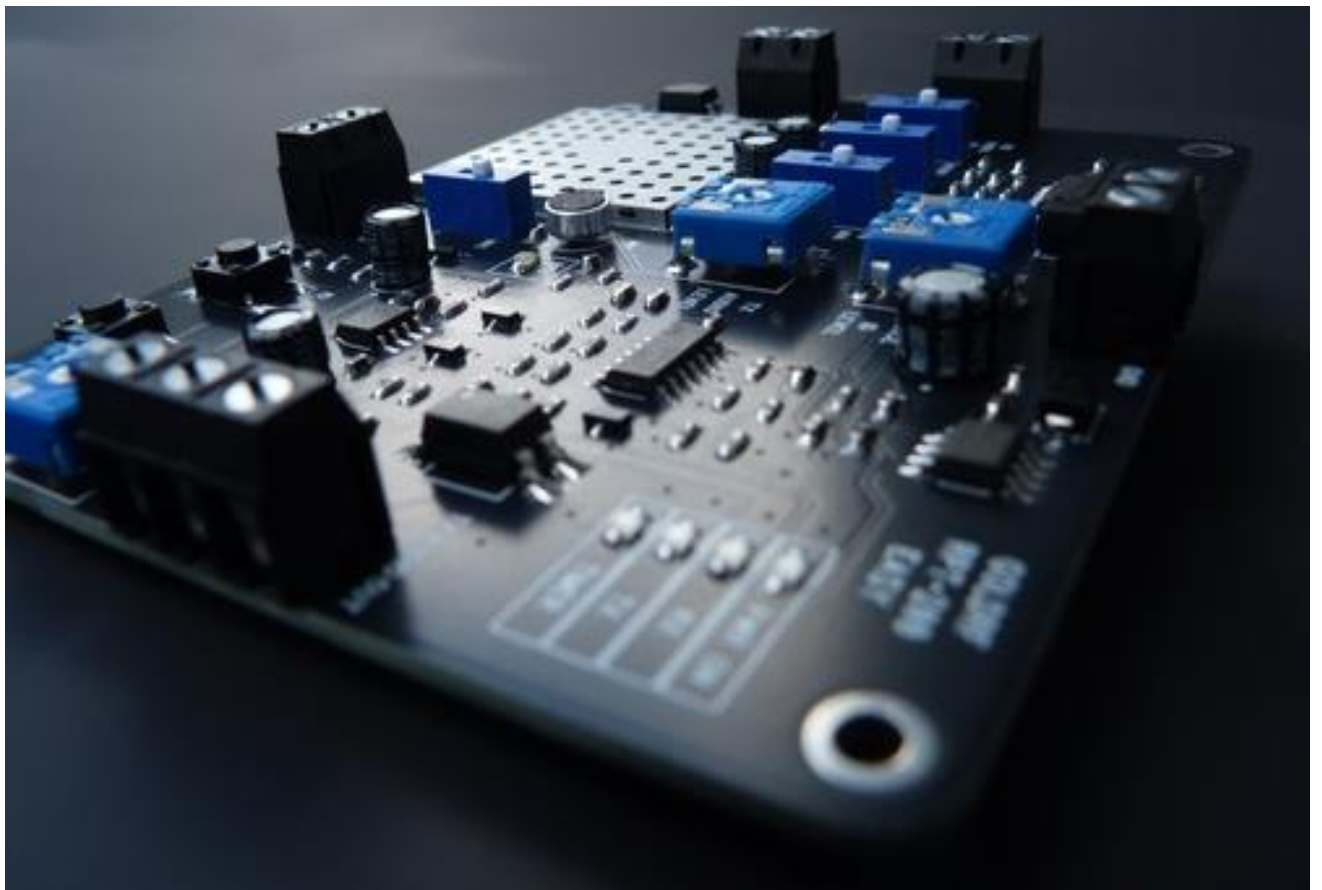
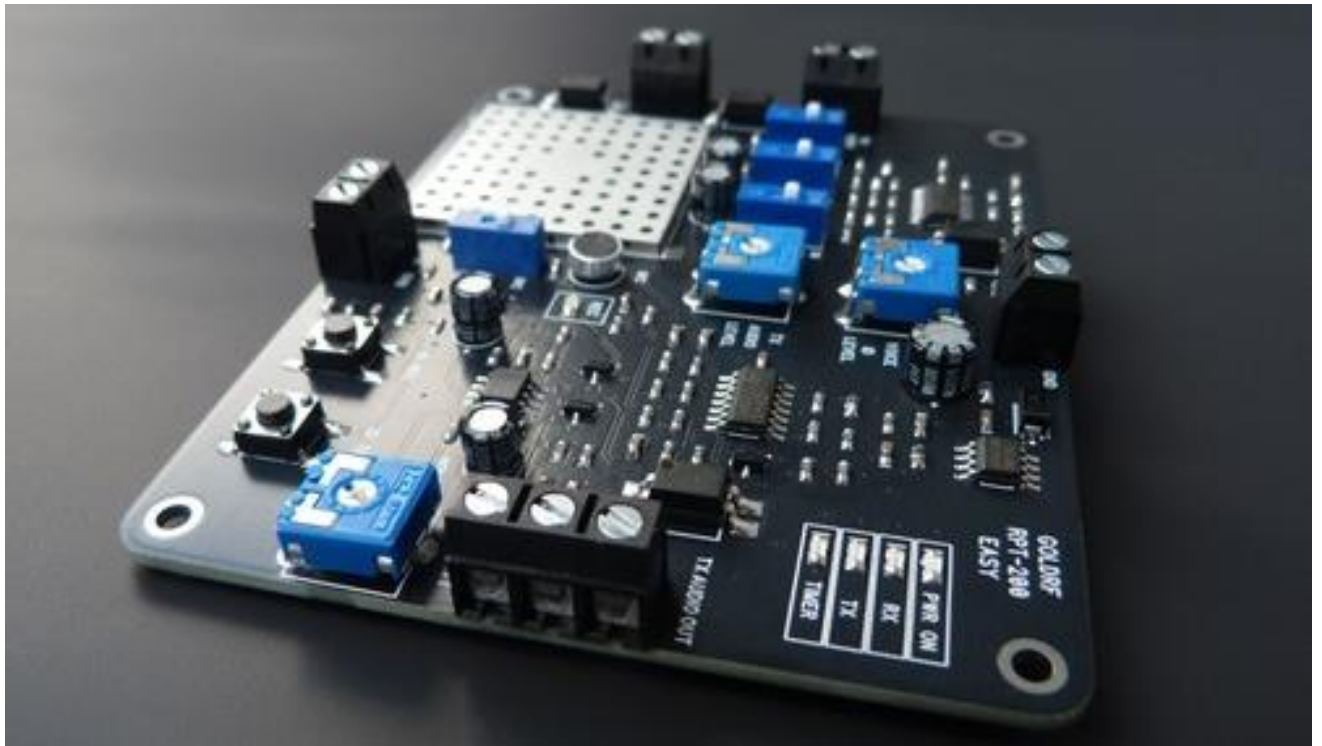
DIP-Switches:

- AUDIO CONT. / COS CONT.
- Identification process: ROUTINE ID / TRAFFIC ONLY
- Timer: 10 MIN / 15 MIN
- Recording source: MIC (internal microphone) / LINE IN

LEDs:

- PWR on: blue
- RX on: green
- TX on: red
- TIMER: yellow
- REC: orange





Integrated in a surplus encasing (source: DD1US)

Front panel:



Buttons (the buttons on the PCB have been removed and replaced with button in the front panel):

- Record (ID REC)
- Replay (ID TEST)

LEDs (the LEDs on the PCB have been removed and replaced with different colours mounted in the front panel):

- Record: white (~~orange~~)
- Timer: blue (~~yellow~~)
- TX on: red
- RX on: yellow (~~green~~)
- PWR on: green (~~blue~~)



Back panel:



Items on the back panel:

- tbd: to be defined - 8 pin jack possibly to used to connect a transmitter or receiver
- Line input: Isolated 3.5 mm jack for external input to record the voice ID



- RX audio input: 3.5 mm jack for audio input from the receiver



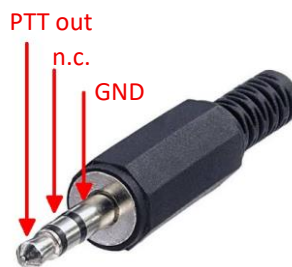
- TX audio output: 3.5 mm jack for audio and PTT outputs to the transmitter



- -COS/+COS input: 3.5 mm jack for COR (carrier operated Relay) / COS (carrier operated Squelch) inputs, both active low and active high



- PTT output: 3.5 mm jack for PTT output to the transmitter



- Speaker: internal speaker with 24 Ohm impedance parallel to the TX audio output
- Power on / off: power switch
- DC input: supply input jack, center pin positive, $V_s = 10 \dots 18 \text{ V}$, $I_s = 100 \text{ mA max.}$

