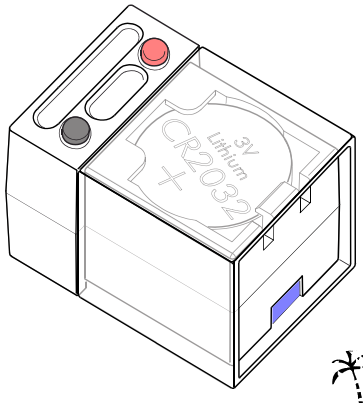
IR RECEIVER
INFRARED

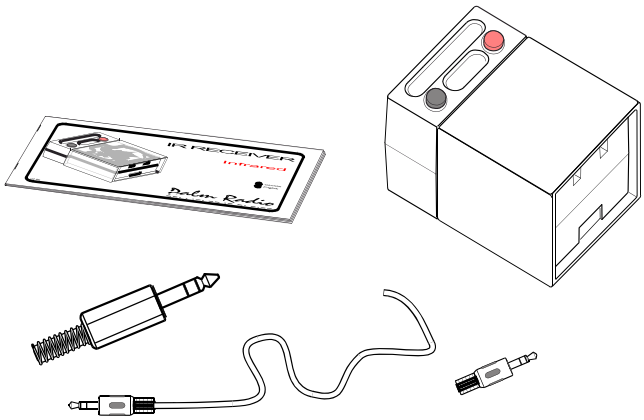


○ German
● English

Palm Radio

03.06

1. Packing list



2. General notes on the IR-RCVR

The infrared receiver (IR-RCVR) represents the data sink of the infrared **straight key** (IR-PPK) and the infrared **Code Cube** (IR-CC). These devices translate Morse code to infrared signals and optically transmit them over a distance of up to 5 meters (15') to the IR-RCVR.

The IR-RCVR converts this signal (to save current, only start and stop pulses are being transmitted) back to electrical signals, evaluates them withby a microcontroller and this recreated Morse code drives an output transistor. With this transistor, any modern transmitter can be keyed just as you would connect a straight key or electronic keyer.

An auto power-off function extends the life of the battery. The commercially available lithium cell can easily be changed after removing the aluminium housing.

3. Technical Data

Dimensions:	25 x 25 x 35 mm
Housing:	Aluminium, powder coated
Processor:	PIC10F2000T (firmware by DL4SDV)
IR-Module:	TSOP 34840 (f_o = 40 kHz)
Power supply:	Lithiumzelle, Typ CR2032 (3 Volt - 220 mAh)
Current load:	Off: - 0,1 µA - Standby: 1,5 mA
	Signal: 1,9 mA (Sidetone on)
	Signal: 2,4 mA (Sidetone 4 kHz on)
Battery Life:	≥ 100 h (equivals 600 QSOs of 10 min. each)
Keyer output:	N-FET, max. +25V / 0,2A - R_{on} typ. 5ý
Sidetone:	500 Hz to 4 kHz in 7 steps
	8th step = »Sidetone off«
	Sidetone-output (3 Volt via 10 nF)

4. Connecting a transceiver

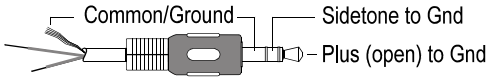
The IR-RCVR can be used with any transceiver that uses keying with positive voltage. (See also page 8)

The free end of the supplied cable has to be equipped with an plug that matches the transceiver. 3,5 mm stereo phone plugs are often used for small transceivers or portable radios. (Two plugs - 3,5 mm and 6,3 mm - are supplied with the IR-RCVR.)

To avoid problems with RF from the transmitter, keep the cable as short as possible.

For appropriate wiring please see the manual of your transceiver or use a multimeter to determine whether keying is from tip or ring (or either) to ground (shield).

The output of the IR-RCVR also provides an AF-signal (3 Volts square wave, Ri approx. 10 kOhms).



Please see supplementary sheet for colors of the wires.

5. Special notes on infrared links

Unlike data communication that uses an RF link (e.g. „Bluetooth"), optical rules must be kept in mind when using an infrared link.

That means that the transmitter and the receiver communicate via a straight line or reflected path - „line of site" or via reflections from bright surfaces.

The output power of the IR-LED can unfortunately not be expanded arbitrarily because this would shorten operation time dramatically, also the relatively high internal resistance of the battery doesn't allow current pulses over 100 mA.

That means that the range of operation is limited. Theoretically it would be 10 meters (30') with accurate orientation and clear line of site, but it has purposely been reduced to approx. 5 meters.

This reduces the possibility of interference and interrupts of the IR data transfer from direct sunlight for the IR-module TSOP 34840.

Despite this attenuation, direct sunlight on the blue cover should be avoided since it would at least reduce the operating range.

Unfortunately most infrared remote controls that are used in consumer electronics use the same range of infrared waves - you should avoid using them at the same time as your IR-RCVR.

This also applies to infrared computer mice, IR links used in laptops and transmitters for IR headphones.

One effect of interference deserves special mention because it can create a special transcription error:

Every element of a Morse code character is embedded between a start and a stop pulse - which saves 99 percent of current! If a character is started but for some reason the stop pulse is not detected, the output will be locked in „key-down" or continuous transmit.

To prevent this, a watchdog function deactivates the keying transistor after about one second if the stop pulse is missing.

6. Usage

Power up: Press the ON-key shortly. The LED will light and the Morse character „R" will be sent: The IR-RVCR is now turned on and ready-to-receive. Without an incoming signal, it will turn itself off within 4 to 5 minutes after the last transmitted signal.

Operation: The LED flashes in the rhythm of the transmitted Morse code elements and the sidetone is audible.

Changing and turning off sidetone: A short press on the button will turn the tone off on the first press. Subsequent button presses will step through the following frequencies:

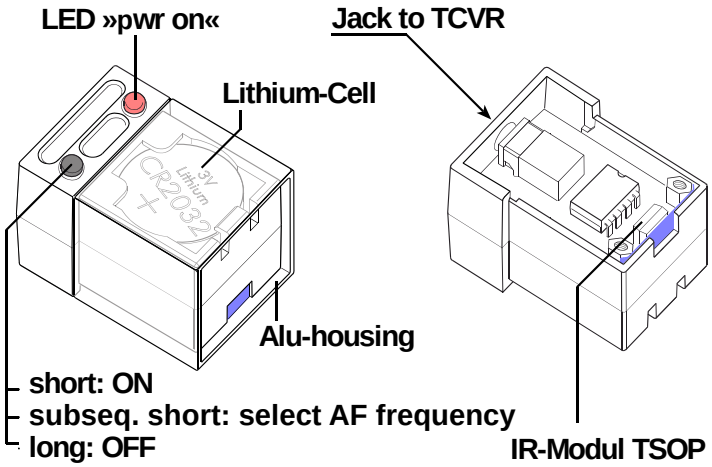
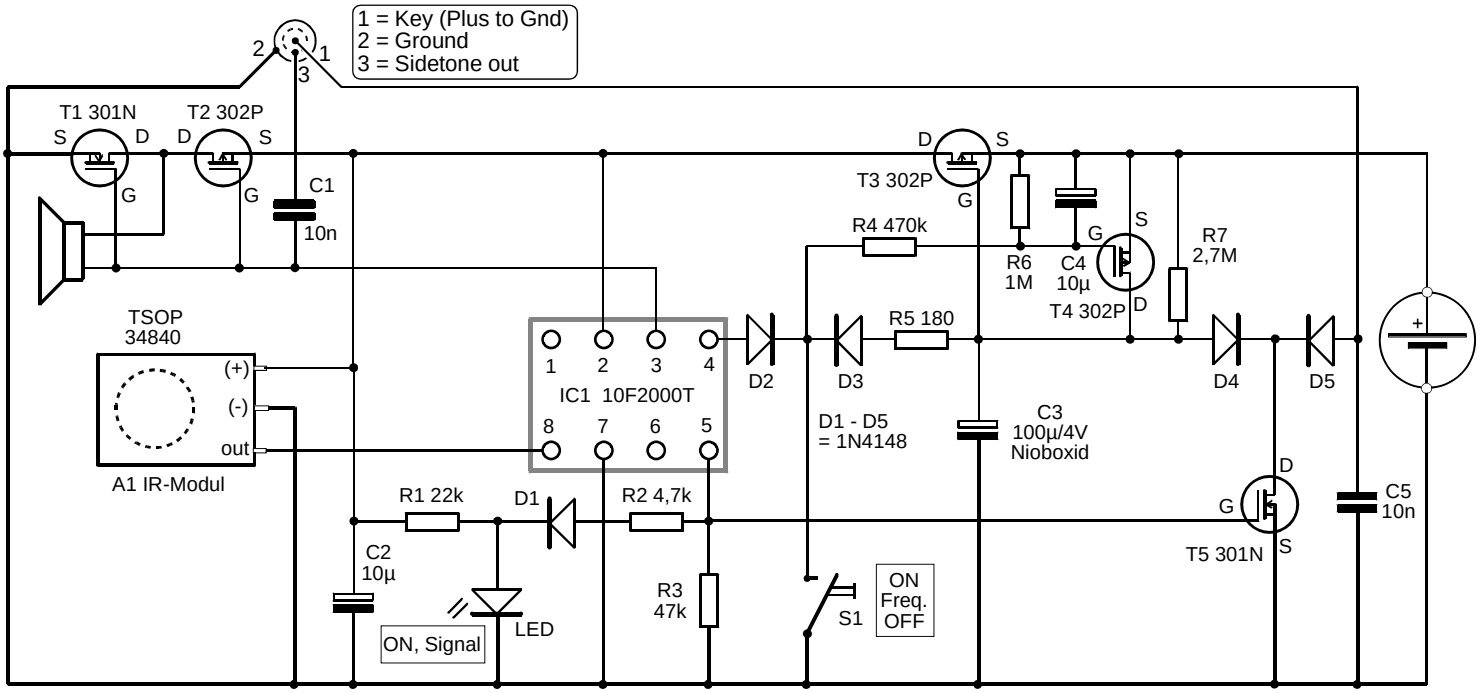
500 - 600 - 800 Hz; 1 - 1,5 - 2 - 4 kHz - OFF

Note: The 4 kHz tone is at the resonant frequency of the piezo, so it consumes a relatively large amount of power and should be avoided as much as possible.

Manual power down: Press and hold the key until the LED switches off (might be useful if two IR-RCVRs are used with two different radios, but only one at a time should be active).

7. Important Notes

- The IR Receiver is designed to switch a maximum of +24 V DC to ground. Continuous current must not exceed 200 mA, otherwise the switching transistor will overheat.
- Do not attempt to key either grid-block or cathode keyed tube transmitters! For these types of keying you must use a suitable outboard circuit adaptor.
- In case of high SWR, block common mode waves using a balun.
- The lithium cell may not be shorted or put into fire. Empty cells have to be disposed off properly.



8. Circuit diagram
Stromlaufplan