



## Description

The CPRC-26 is a small battery operated transceiver, for ground-ground or ground-air communication. It operates on 6 crystal controlled channels in the VHF frequency range of 47 to 55.4 MHz usually in a 200kHz grid. The power output is 300mW with FM (Frequency Modulation) deviation of plus and minus 15kHz. It has a range of about 1 mile (1.6km), is fully sealed and weights about 10 pounds (5kg). Power was provided by a dry battery providing a useful life of 20 hours. It was designed in Canada and used by many armed services, including the Canadian Army and Navy, the US Army, NATO, and the Australian Army. There were about 4500 built by Philips and Canadian Rogers.

Frequency channels and modulation type are compatible with the airborne comm units as the ARC-44, ARC-54 and ARC-131. No squelch is included at receive, and no 150Hz tone at transmit.

**The power source** is a dry battery type BA-439 or BA289/U (+1.5, -3, +45, +90 V),

**Size** 5.5 x 3.5 x 11 inch , weight 10 lb with the battery.

**Antenna** : 135 cm stylus or 50 ohm loop.

**Receive/Transmit switching:** NO relay is used, but filament groups are switched directly with the push-to-talk switch to preserve battery power. So, the set is inoperative the first second in transmit or receive mode, and operators were trained to handle this.

## Specification

The CPRC-26 was used in the Dutch army from 1958 to 1968 . The range was about 2km on the ground, or 5km from ground to a helicopter.

**Frequency** 6 channels on a 200kHz grid, in the range of 47 to 55.4 MHz.  
50.0-50.2-50.4-50.6-50.8-51.0 MHz was used in Holland.

The performance with a new battery should be :

### Receiver:

Sensitivity 2 $\mu$ V for 20dB signal + noise to noise ratio

Selectivity: 6dB down at 65-85 kHz bandwidth

60dB down at 250 kHz bandwidth

Image rejection > 34 dB

Spurious frequencies > 60 dB

IF frequency rejection > 90 dB (4.3MHz)

Audio output 6 mW at 15kHz FM deviation

### Transmitter:

RF output > 275mW ( 24.2 dBm , new battery )

Deviation + 5 to + 11kHz for an AF input of

250mV in NORMAL or

25mV in WHISPER.

## Battery

The BA270 block battery has 60 cells in series for 90V output with a tap at 45V, a large cell for the 1.5V heater voltage, and two tiny cells for the -3V bias.

The consumption with new batteries is :

CPRC26	90 V	45 V	1.5 V	-3 V
Receive	3 mA	12 mA	550 mA	2 uA
Transmit	30 mA	8 mA	850 mA	2 uA

The end-of-discharge voltages under load are resp. 72V, 34V, 1.1V and -2V. Battery life should be 20 hours with a 18 minutes receive, 2 minutes transmit cycle.

## Receiver

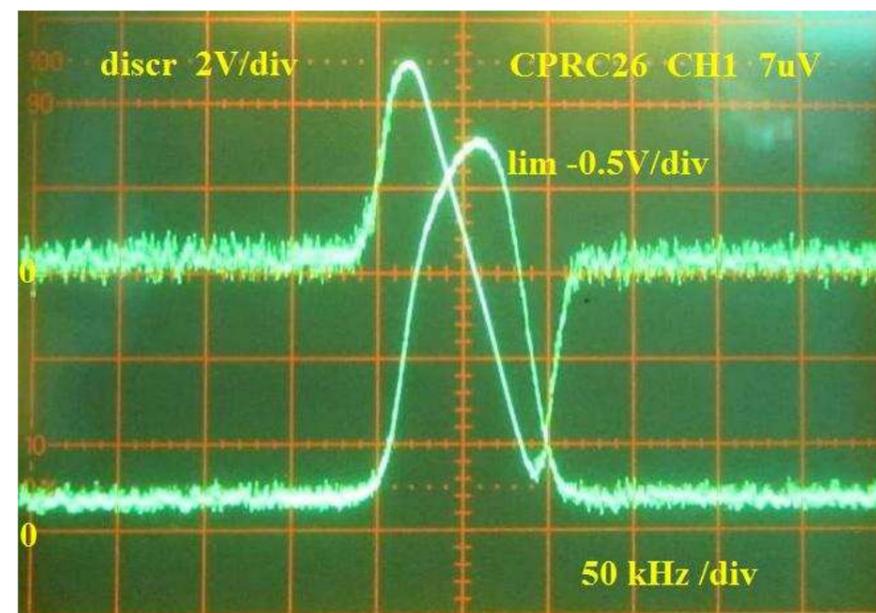
The receiver has one RF stage, a mixer with a crystal oscillator (XLO)

The XLO operates 4.6 MHz below the channel frequency. The IF amplifier has 5 stages at 4.6 MHz. With less than 2uV RF input, there is no clipping, and the bandwidth is 80 kHz with sharp skirts.

At increasing RF input signal, these stages start to clip the IF signal, beginning with the last stage, the "limiter". Clipping occurs due to grid detection, and associated gain reduction of the 5678 variable mu pentodes in each stage.

The voltage at testpoint 3 (loaded with 1M) is less than -1V at 2uV RF input, and rises to -2.5V at 7uV or more. A simple squelch circuit could be made with a JFet based on this voltage to mute the audio signal.

The Foster Seeley discriminator output and the voltage at TP3 versus frequency are shown here:



**The audio** amplifier has a single stage, and functions not only in receive mode, but also in transmit mode, to allow checking the modulator and transmitter stages perform correctly.

## Transmitter

The transmitter has only 2 stages, a master oscillator and a power amplifier. A part of the inductor of the MO can be saturated by a signal from the modulator, and changes the oscillator frequency with 250kHz per volt input of the modulator.

The input to the modulator has two parts:

- a dc component from the automatic frequency controller to keep the MO 4.6MHz above the crystal frequency, and
- an ac component from the microphone.