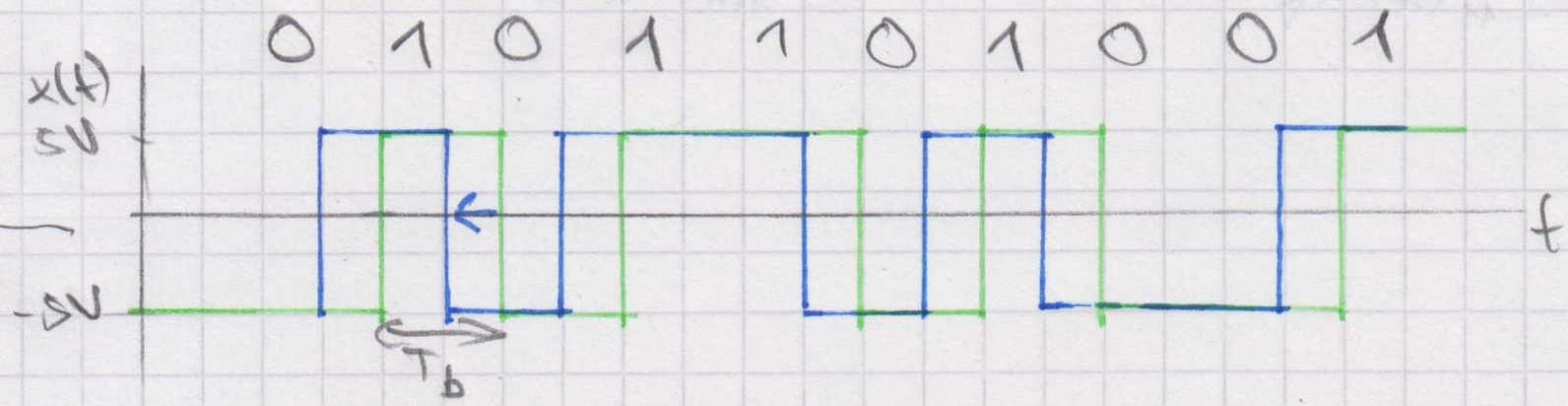
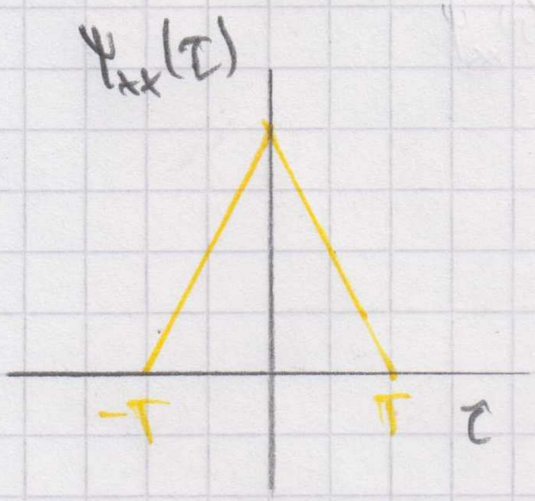
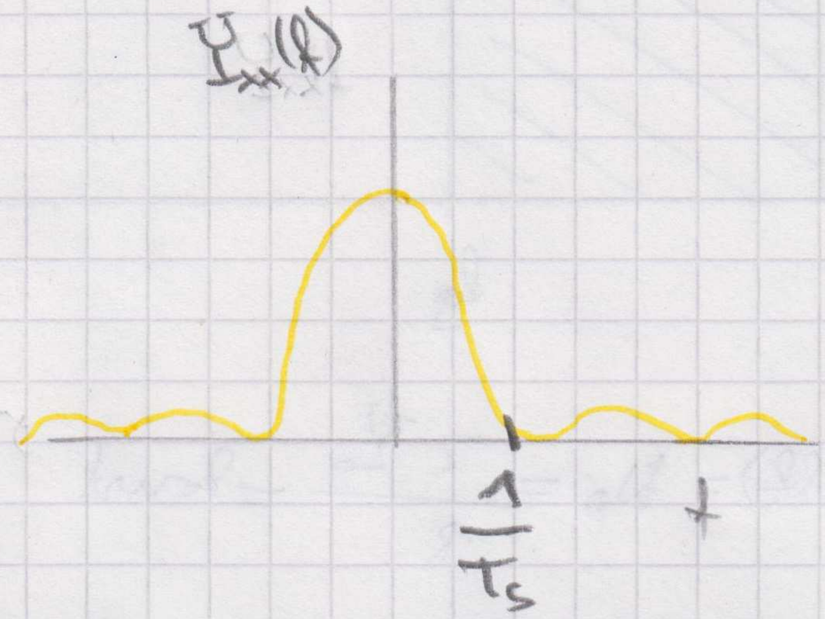
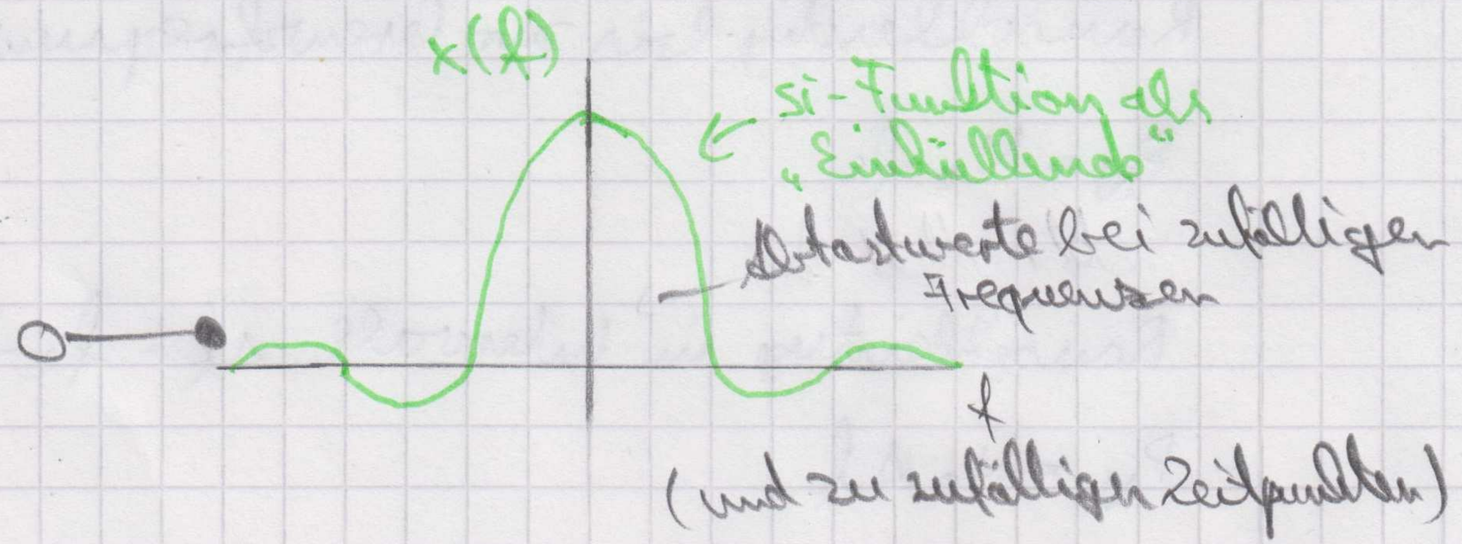
Bipolares NRZ-Signal



$$\Psi_{xx}(\tau) = \lim_{T\to\infty} \frac{1}{T} \int_T x(t)\, x(t+\tau)\, dt$$





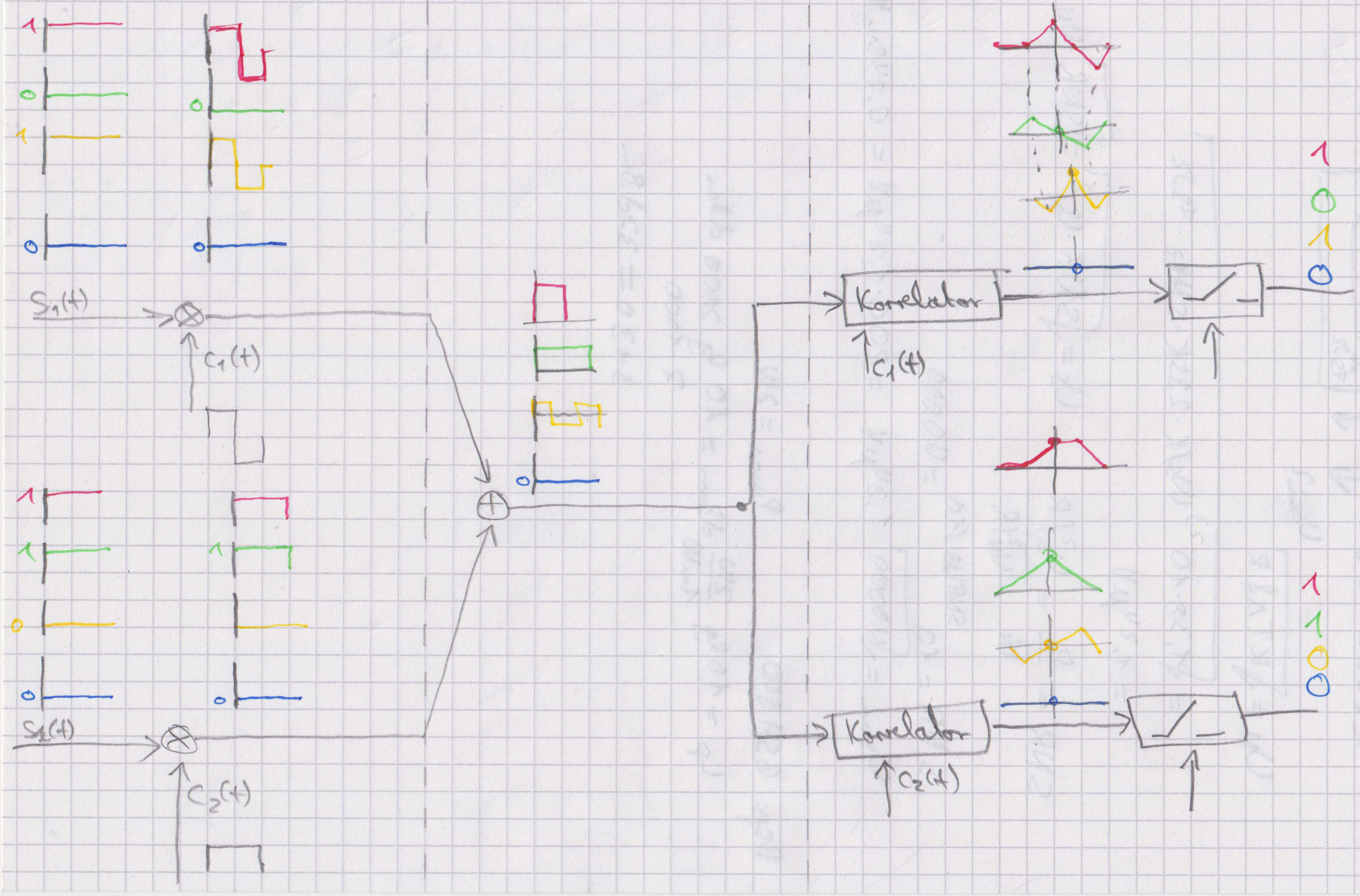


(und zu zufälligen Zeitpunkten)

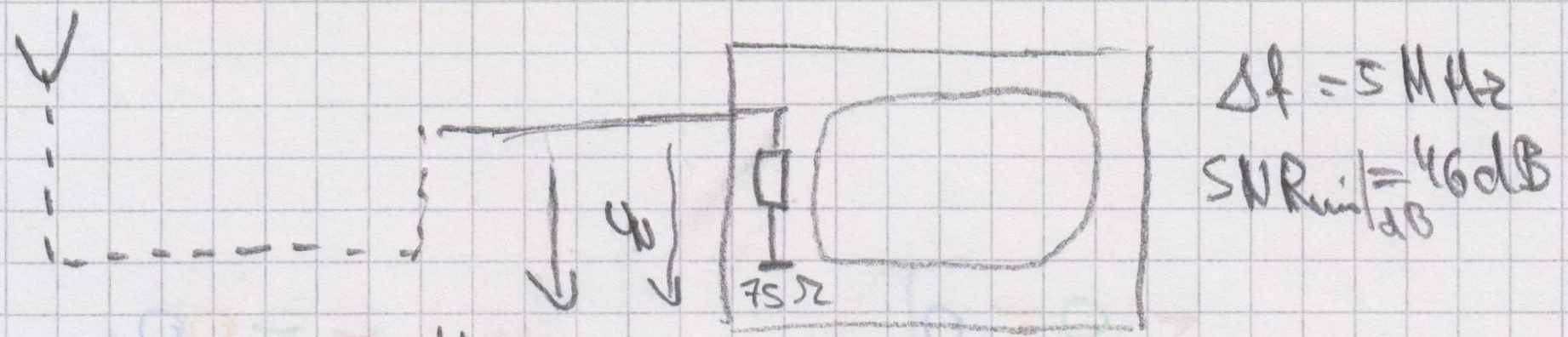
Sender

Kanal

Empfänger



Bsp. Antenneneingang (BB 3-56)



$$U_N = \sqrt{kT\Delta f R}$$

$$= \sqrt{1{,}38 \cdot 10^{-23}\,Ws/K \cdot 295K \cdot 5MHz \cdot 75\Omega}$$

$$= 1{,}24\,\mu V$$

$$SNR = \frac{P_S}{P_N} = \frac{U_S^2/R}{U_N^2/R} \qquad U_S = \sqrt{SNR \cdot U_N^2} = \sqrt{SNR}\cdot U_N$$

$$SNR = 10^{SNR|_{dB}/10} = 40000$$

$$U_{Smin} = \sqrt{40000}\ 1{,}24\,\mu V = 200 \cdot 1{,}24\,\mu V = 0{,}248\,mV$$

Bsp: GSM 900 $\qquad P_{max} = 2W$

$$L_P = 10\lg \frac{2W}{1mW}\,dBm = 10\lg 2000\,dBm$$

$$2 \cdot 1000$$

$$3 + 30 = 33\,dBm$$