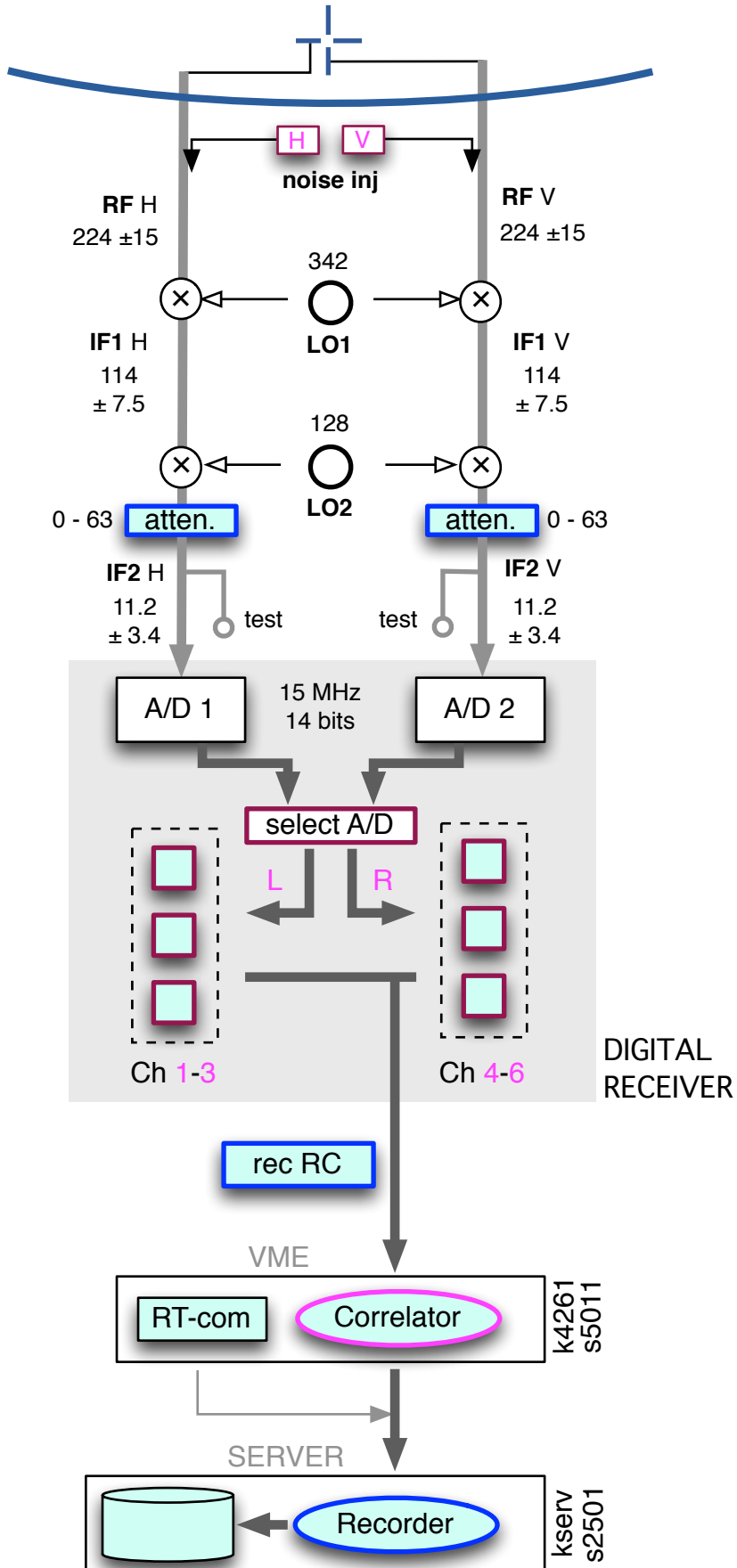


DIGIRECEIVER

Tunable, multichannel sampler/detector

SODANKYLÄ and KIRUNA VHF RECEIVER



SPECTRUM of a REAL-valued analog signal has positive freq. part and negative freq. part

$$\cos 2\pi f_0 t = 0.5e^{i2\pi(-f_0)t} + 0.5e^{i2\pi(f_0)t}$$

negative frequency component

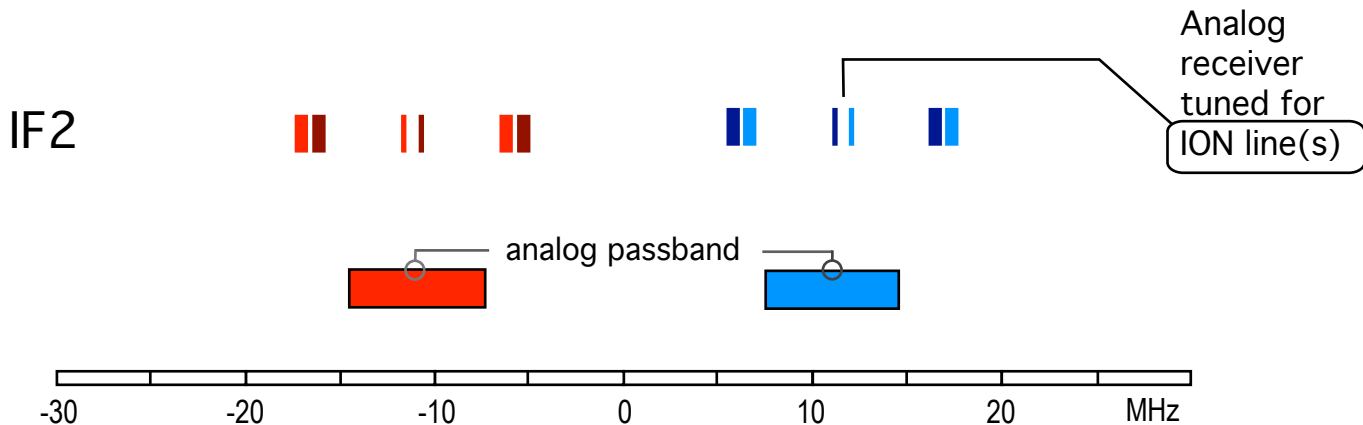
positive frequency component

SPECTRUM of a DIGITAL (sampled) signal is PERIODIC by the sampling frequency

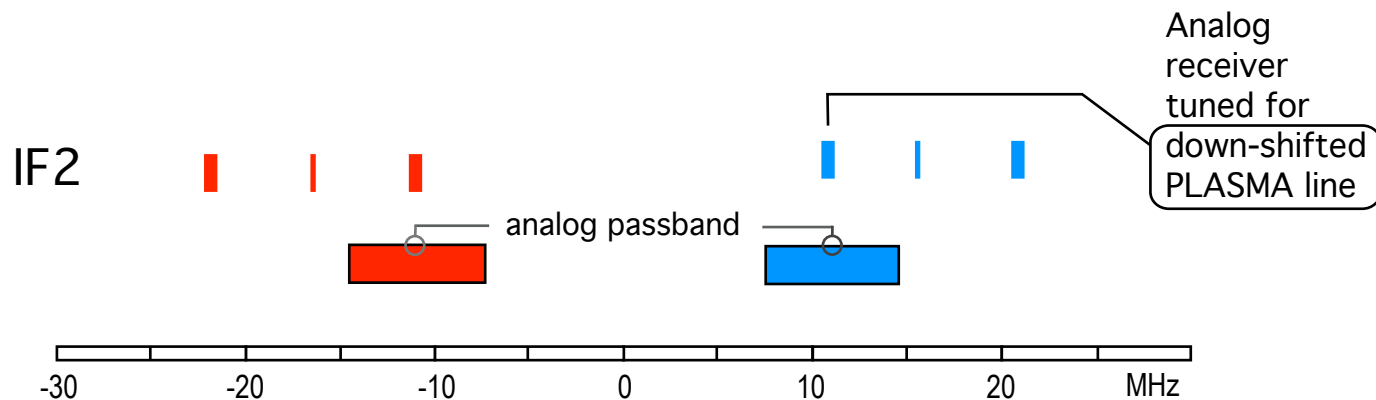
$$Z(f) = \left| \sum_n z_n e^{-i2\pi(f/f_s)n} \right|^2$$

Periodic by the sampling frequency f_s

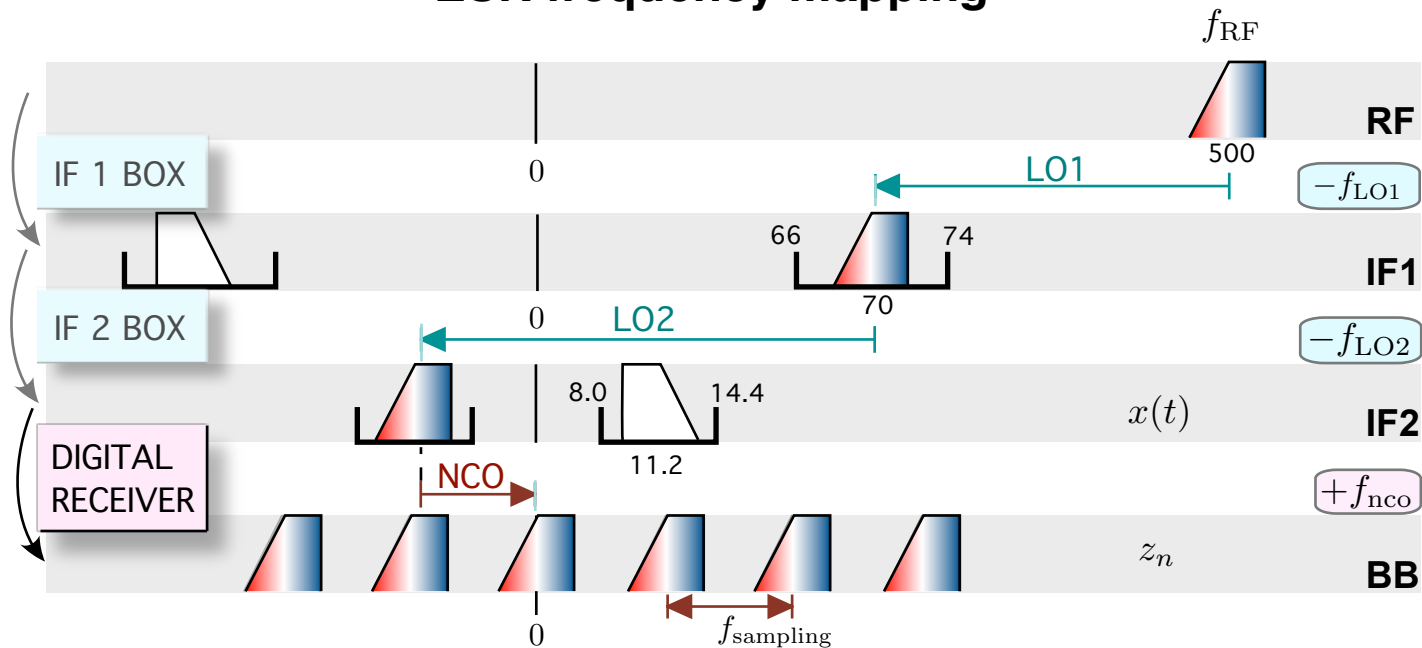
IS spectrum at IF2 when using two TX frequencies



IS spectrum at IF2 when using a single TX frequency



ESR frequency mapping

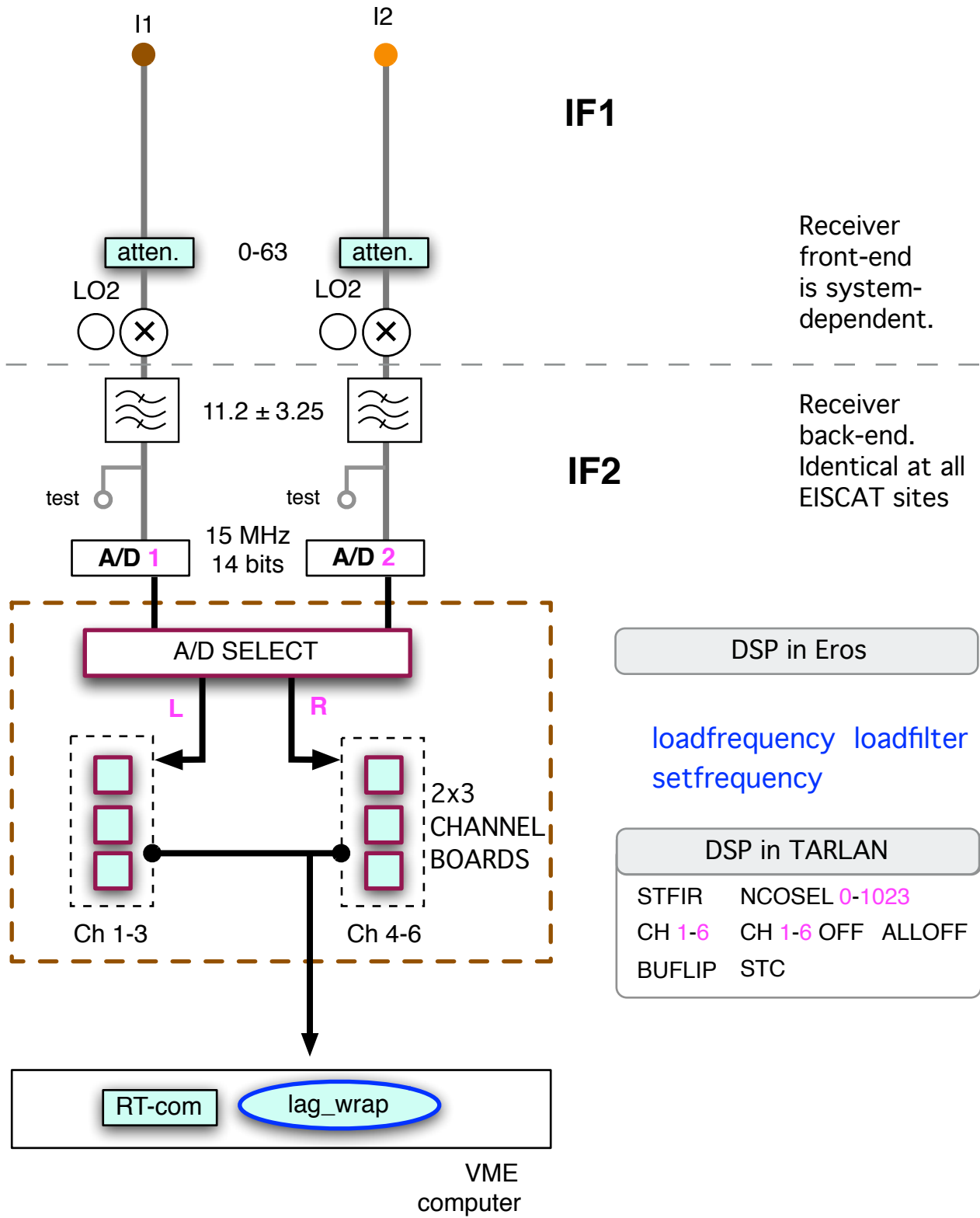


$$f_{\text{BB}} = f_{\text{RF}} - f_{\text{LO1}} - f_{\text{LO2}} + f_{\text{nco}}$$

$$f_{\text{LO1}} = 441.0|435.5 \text{ (PL U)} \quad f_{\text{LO1}} = 419.0|424.5 \text{ (PL D)} \quad f_{\text{LO1}} = 430 \text{ (IL)}$$

$$f_{\text{LO2}} = 81.25$$

EISCAT RECEIVER BACK-END



Receiver front-end is system-dependent.

Receiver back-end. Identical at all EISCAT sites

DSP in Eros

loadfrequency loadfilter
setfrequency

DSP in TARLAN

STFIR NCOSEL 0-1023
CH 1-6 CH 1-6 OFF ALLOFF
BUFLIP STC

VME computer

CHANNEL BOARD in the EISCAT system

