



Hilberling

24768 Rendsburg, GERMANY

Proudly Introduces Its New

HF/VHF-Transceiver



PT-8000 A·B·C

Briefing

Technical Concept

HF/VHF-Transceiver PT-8000

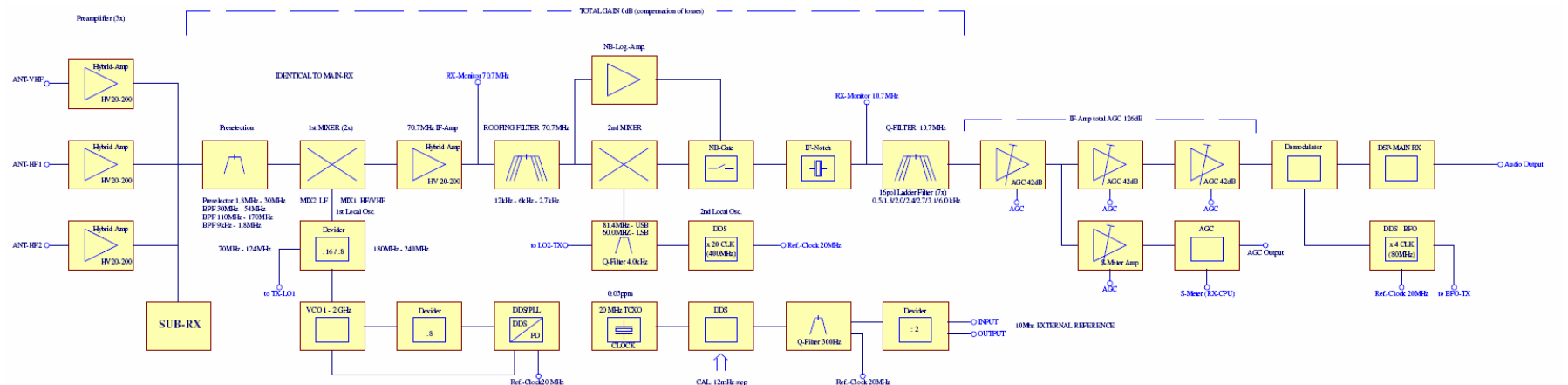
„... the pinnacle of German technology ...“



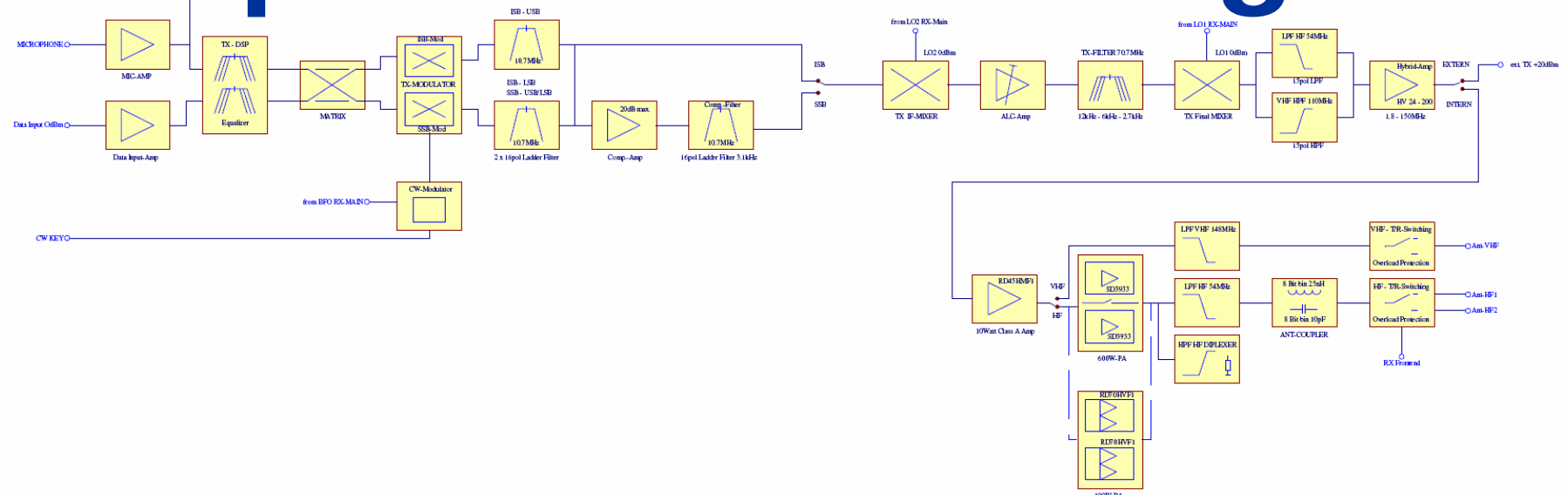
Design Requirements

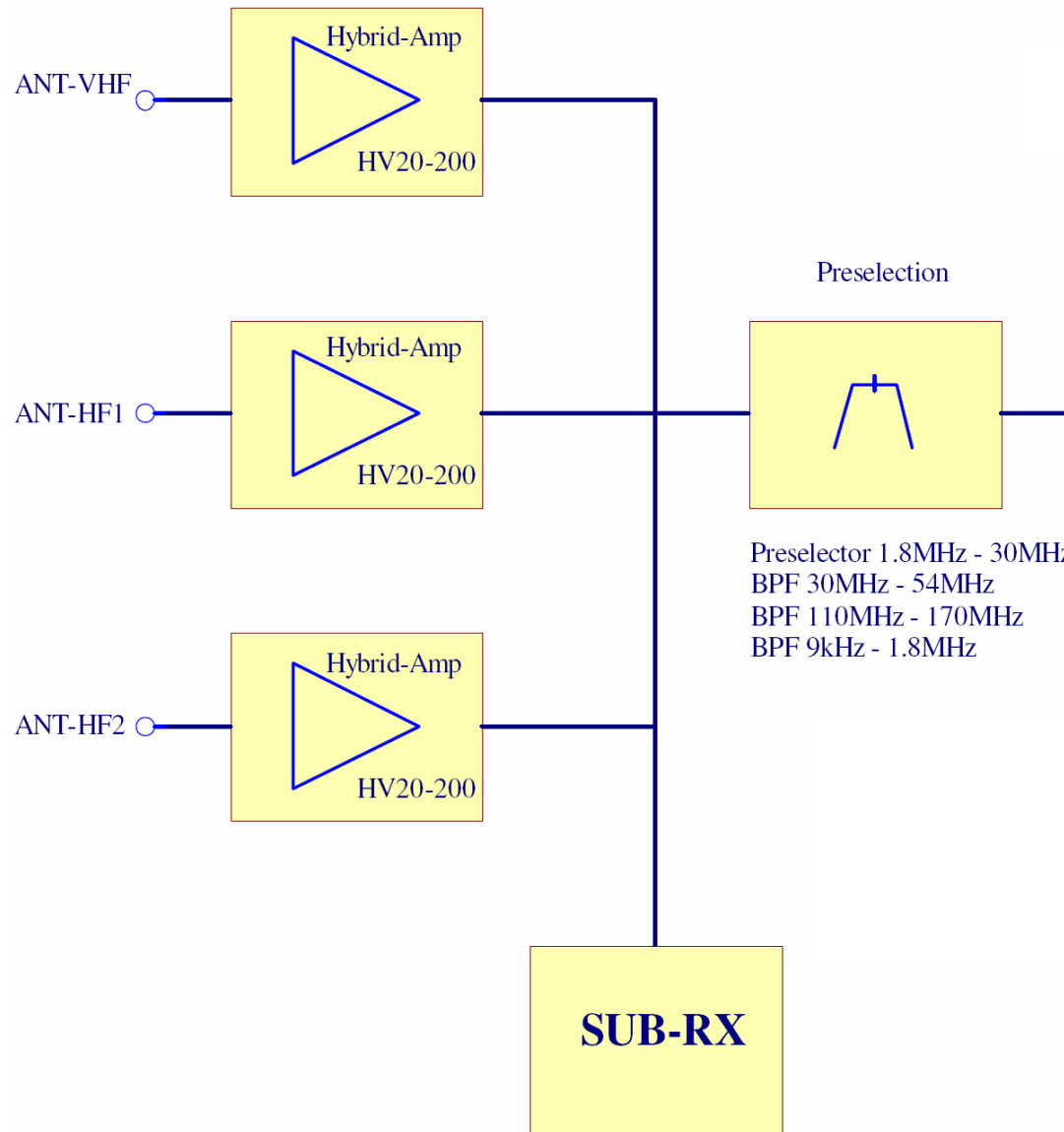
- TX and 2 independent, identical RX
- VHF integral part, same performance than HF – not an afterthought
- Frequency range expandable by TRANSVERTERS
- ISB-capability
- Analog and digital signal processing
- High output on 160 – 6m using efficient RF-MOSFETs @100 Volt





Simplified Block Diagram

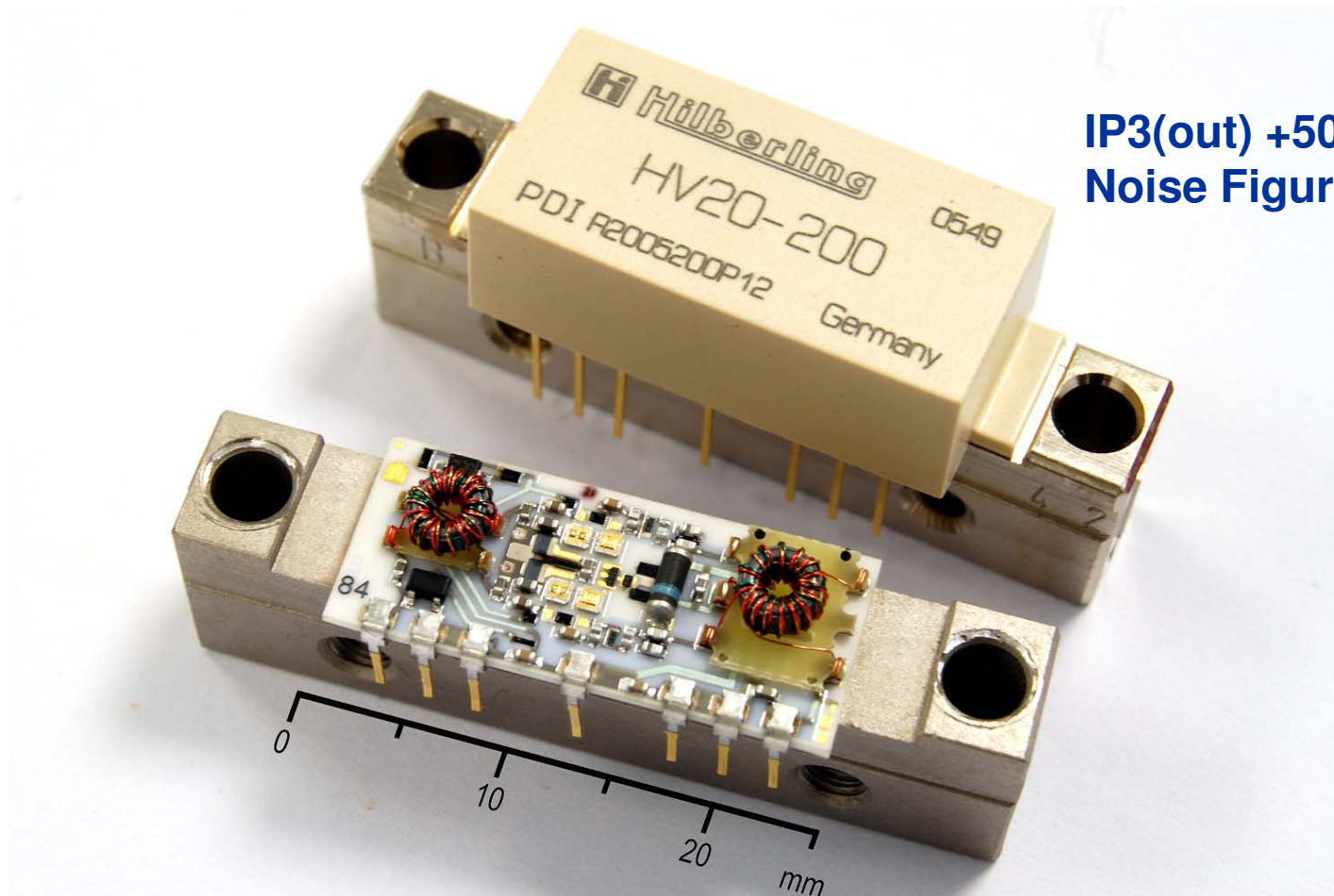




Front-End:

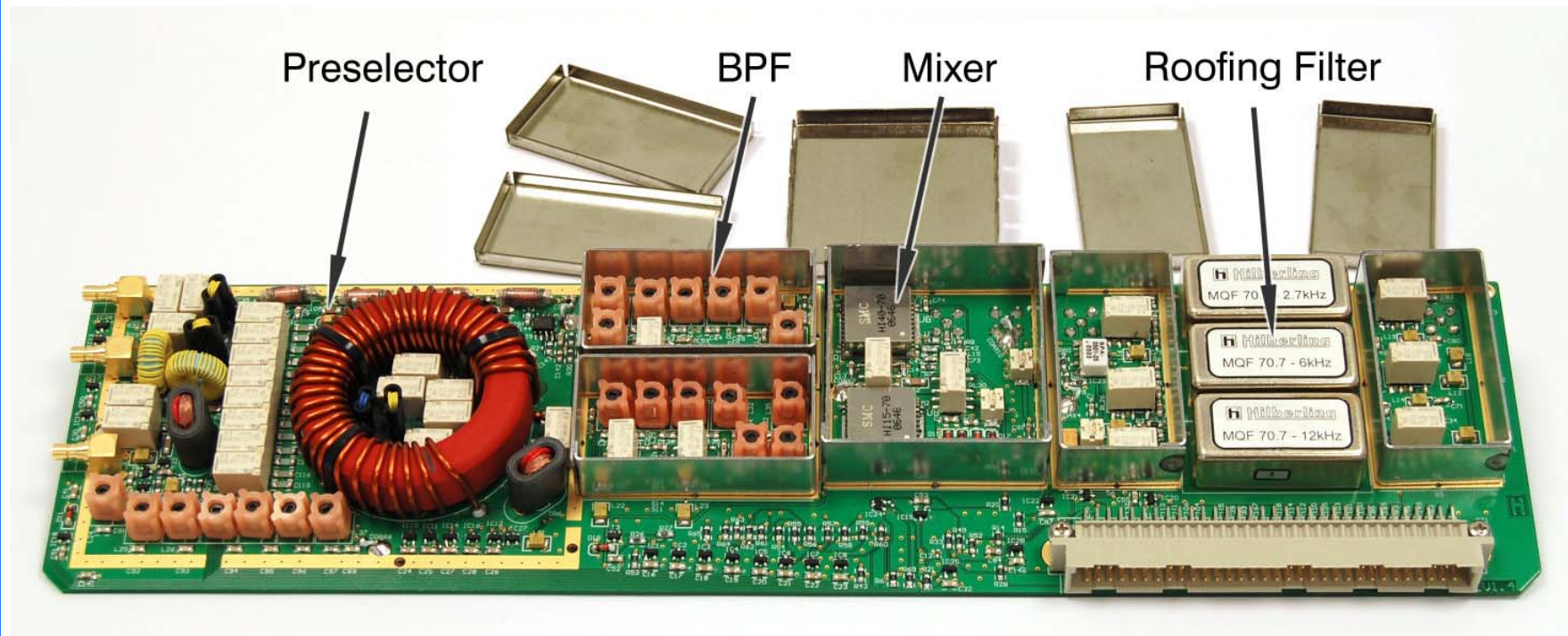
- Antenna distribution
- BPF 110 MHz ... 170 MHz
- BPF 30 MHz ... 54 MHz
- BPF 9 kHz ... 1.8 MHz
- *tracking* Preselector 1.8 MHz ... 30 MHz

Hybrid Amplifier 1.8 MHz ... 200 MHz

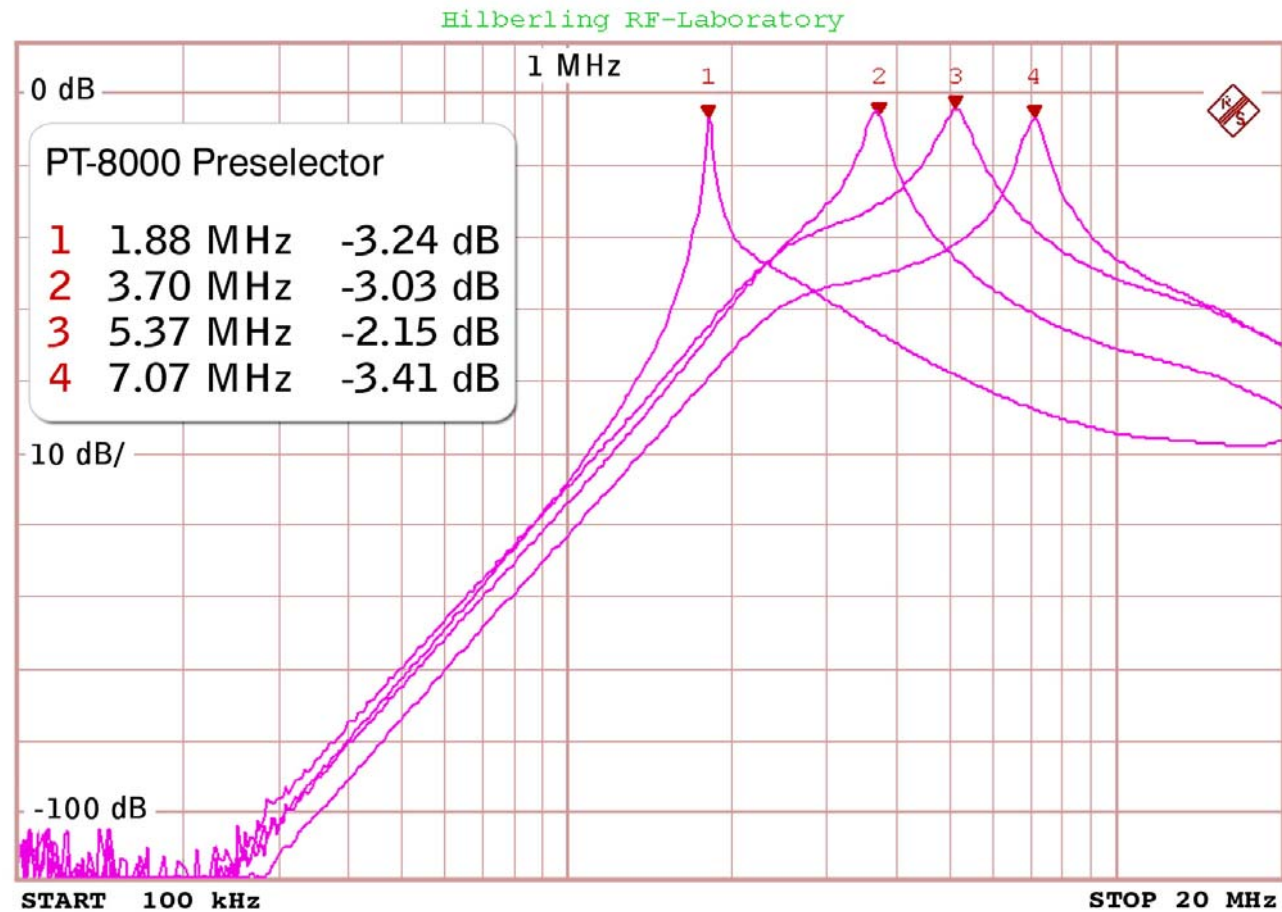


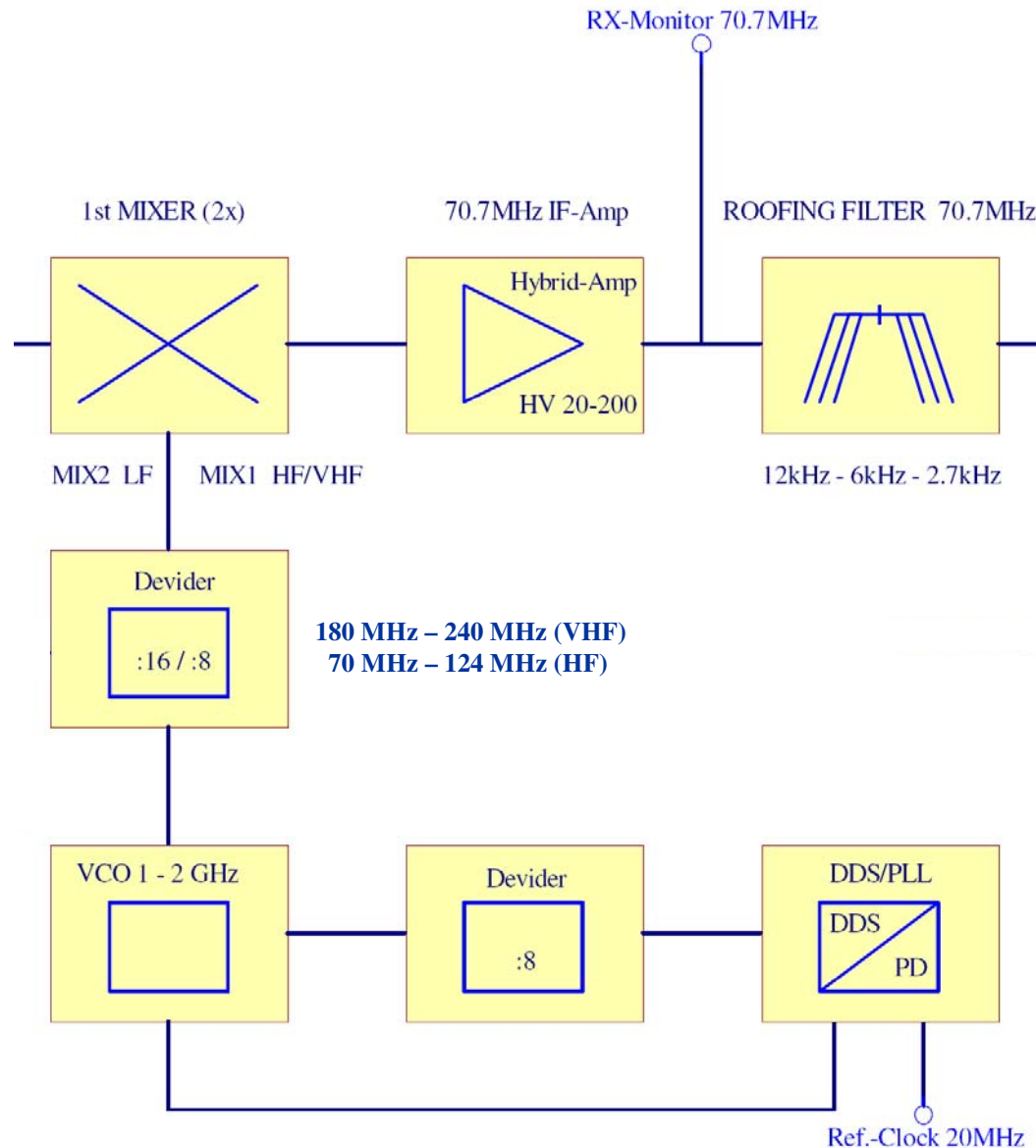
IP3(out) +50 dBm
Noise Figure 1.8 dB

Frontend – designed for +39dBm IP₃ from HF to VHF



Frequency Response Preselection



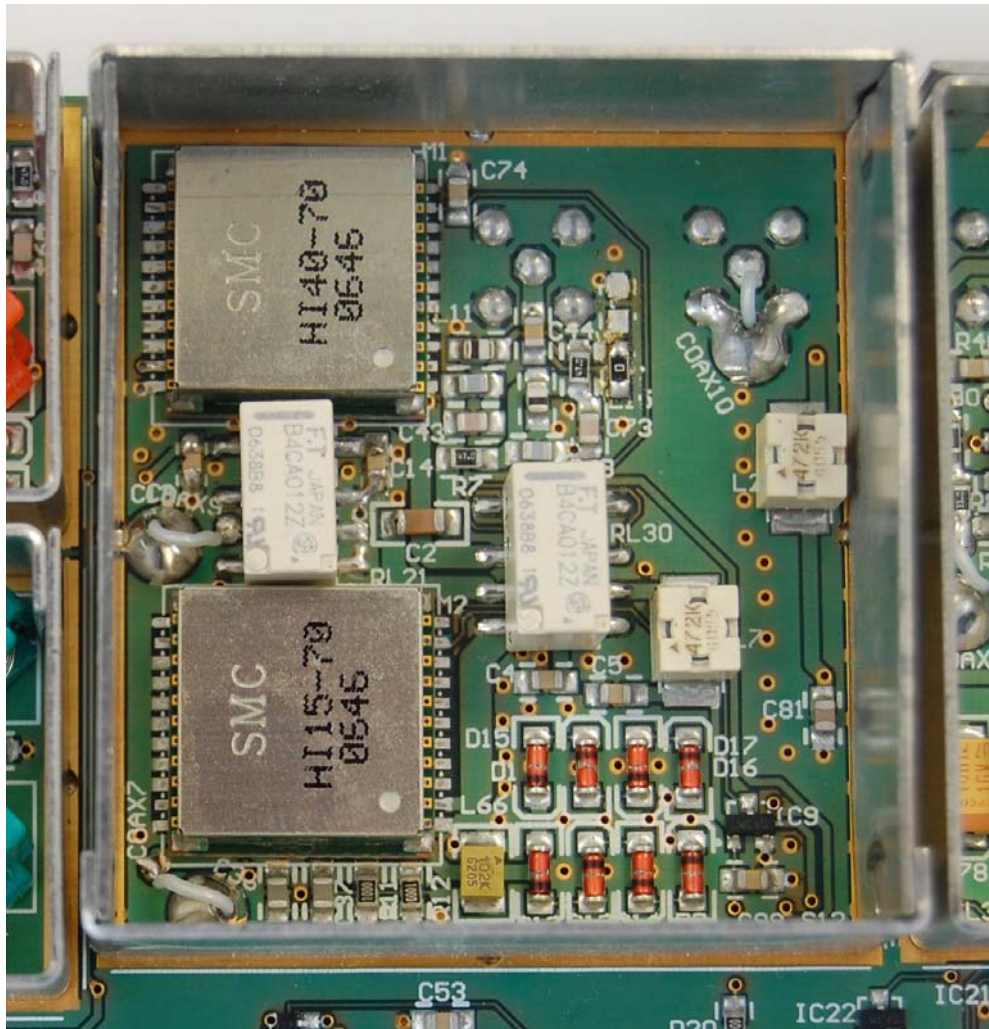


1st Mixer(s) from SMC
+40dBm IP3
7 dB Losses

6pol Roofing Filters

Low Noise
Quadruple VCOs

Noise Advantage
= $20\log(N)$



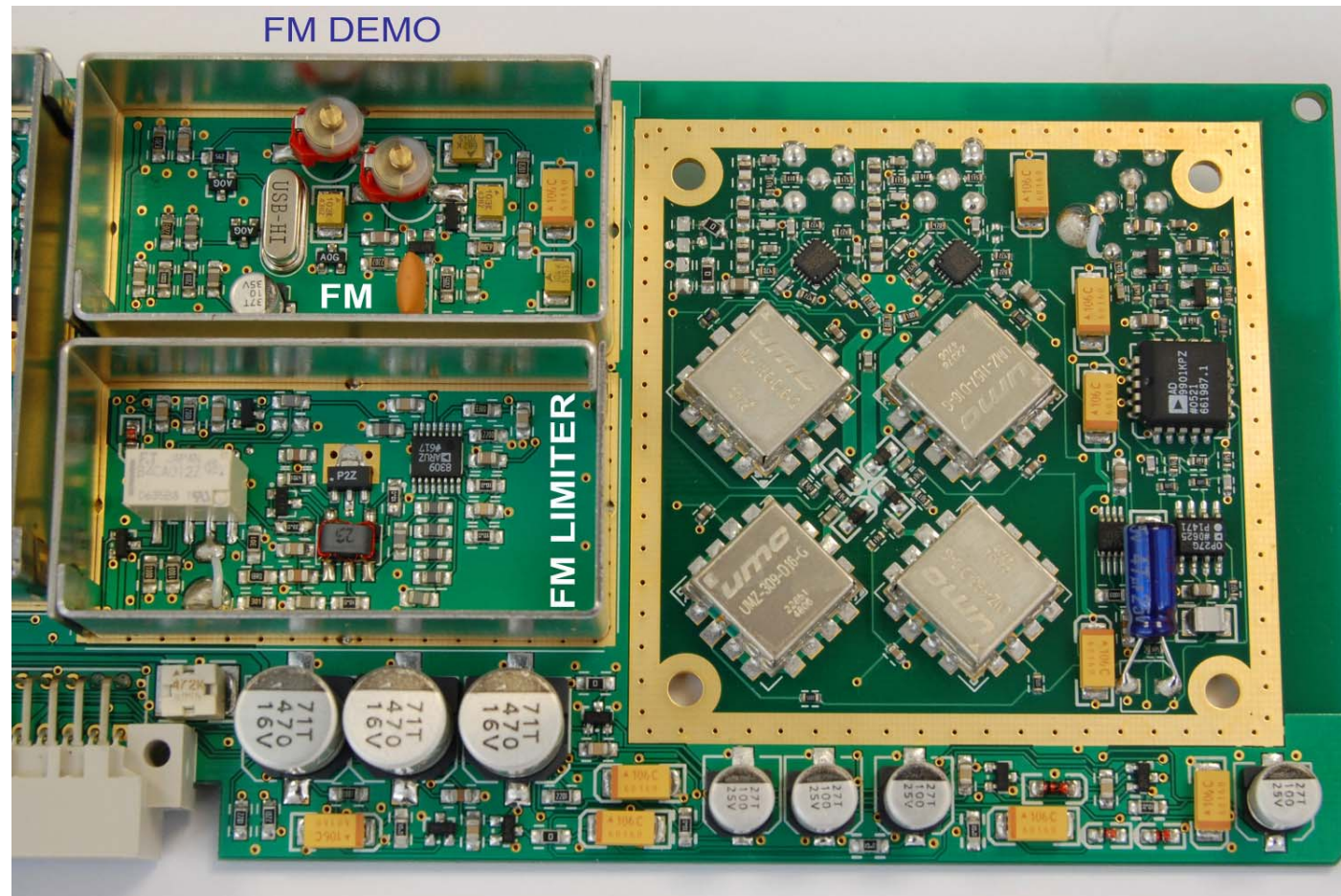
1st Mixers => 70.7 MHz 1st IF

**9 kHz ... 1.8 MHz (VLF/HF)
1.8 MHz ... 170 MHz (HF/VHF)**

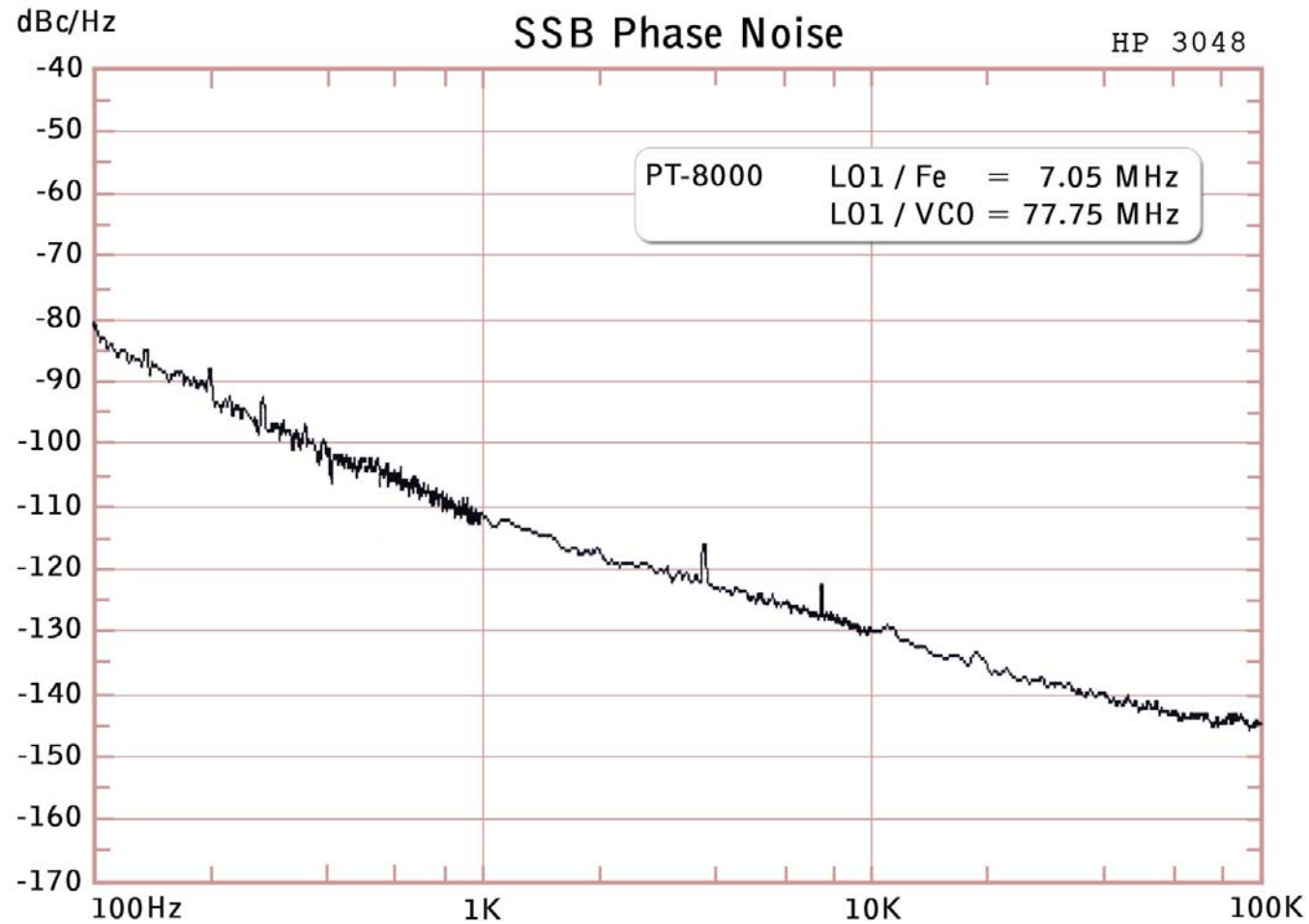
from

**Synergy
Microwave
Corporation**

Quadruple Microwave VCOs 1.0 – 2.0 GHz



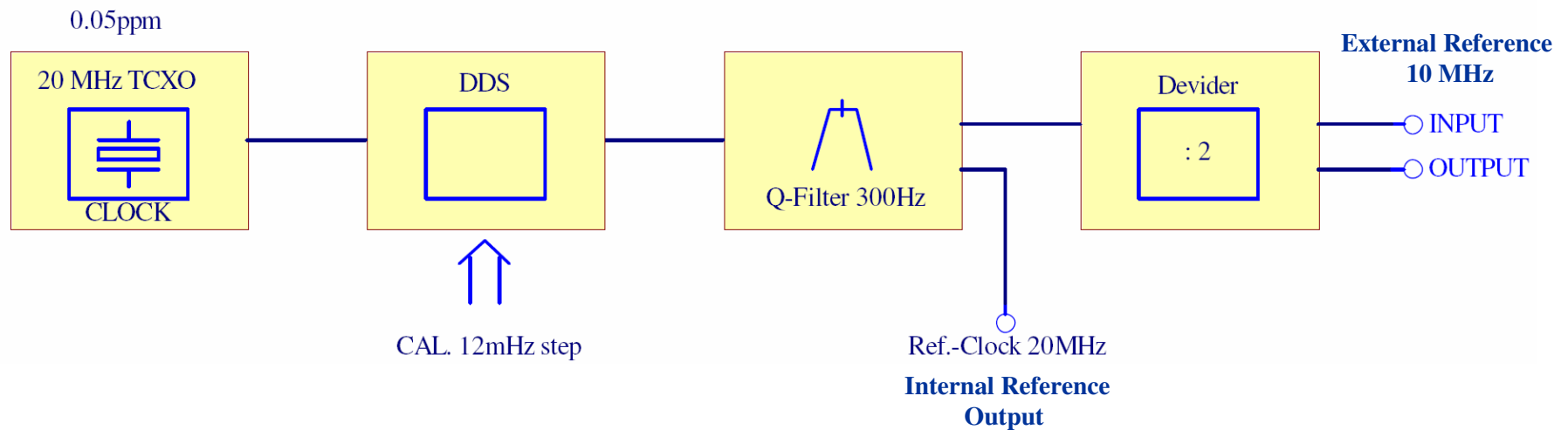
Phase Noise 1st Local Oscillator



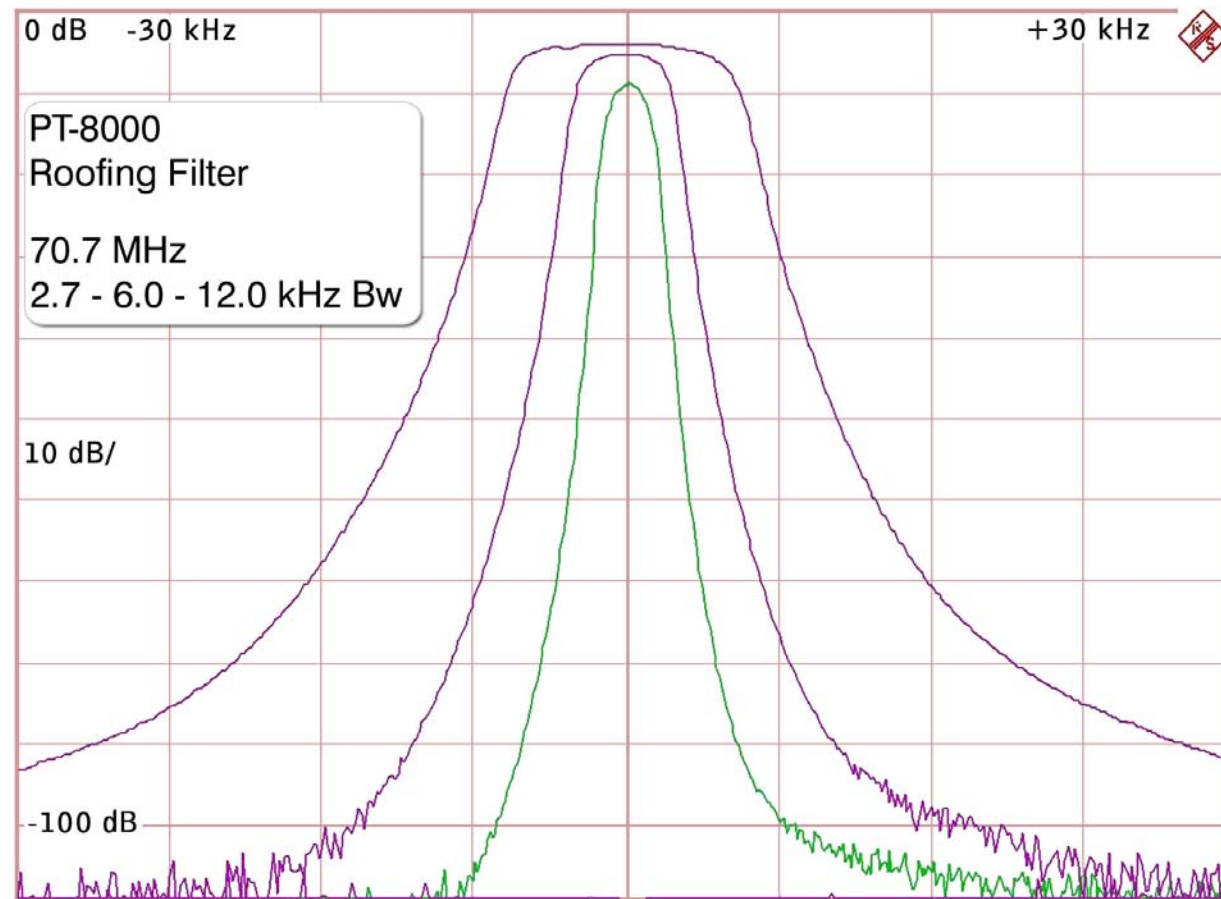
20 MHz reference oscillator on Stratum 3

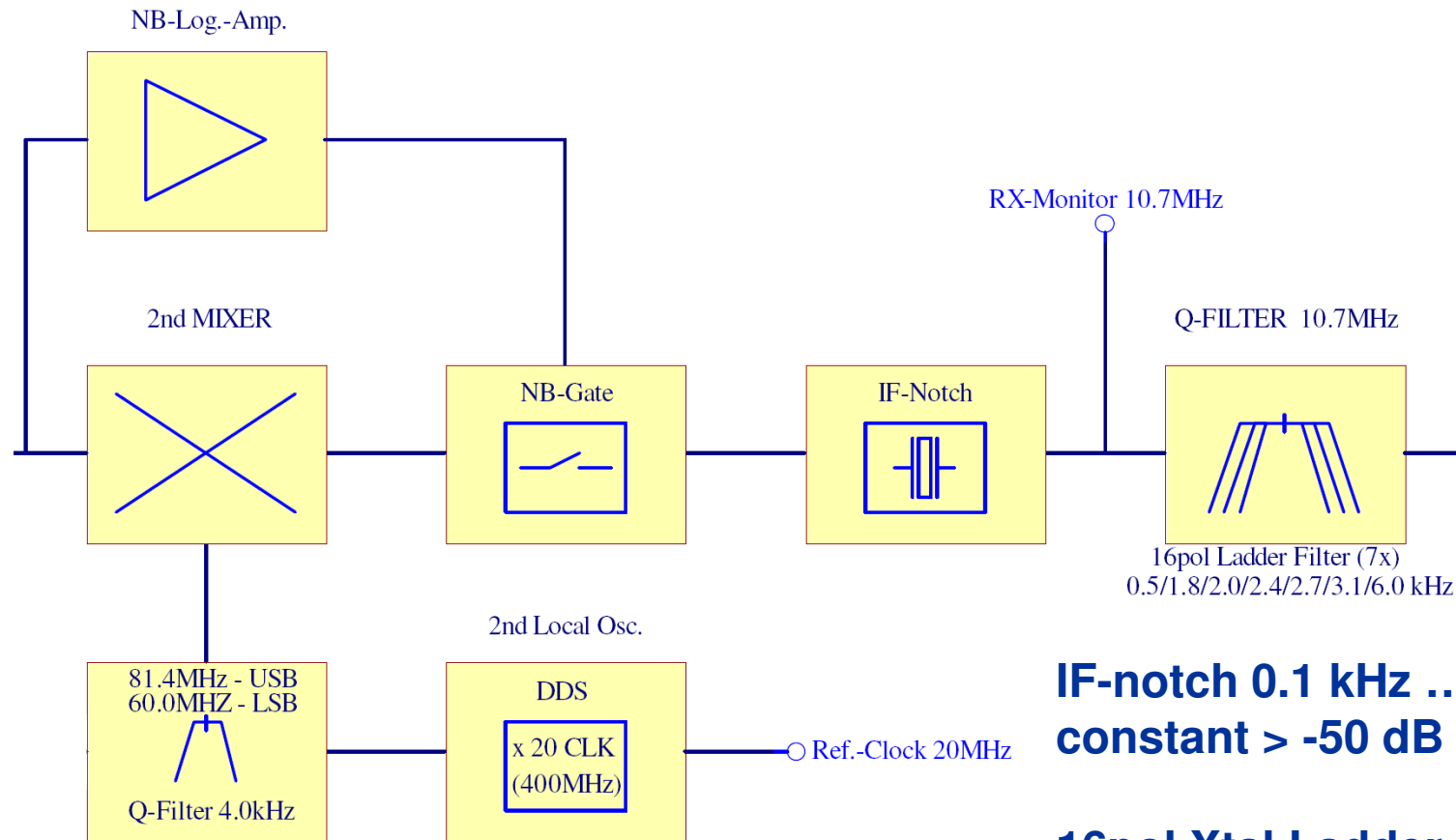
DDS allows tuning in 12mHz step
(even ext. reference)

Xtal filter improve
noise sidebands
by 20 ... 50 dB



6-pol Xtal Ladder Filter





Noise Blanker -65 dB

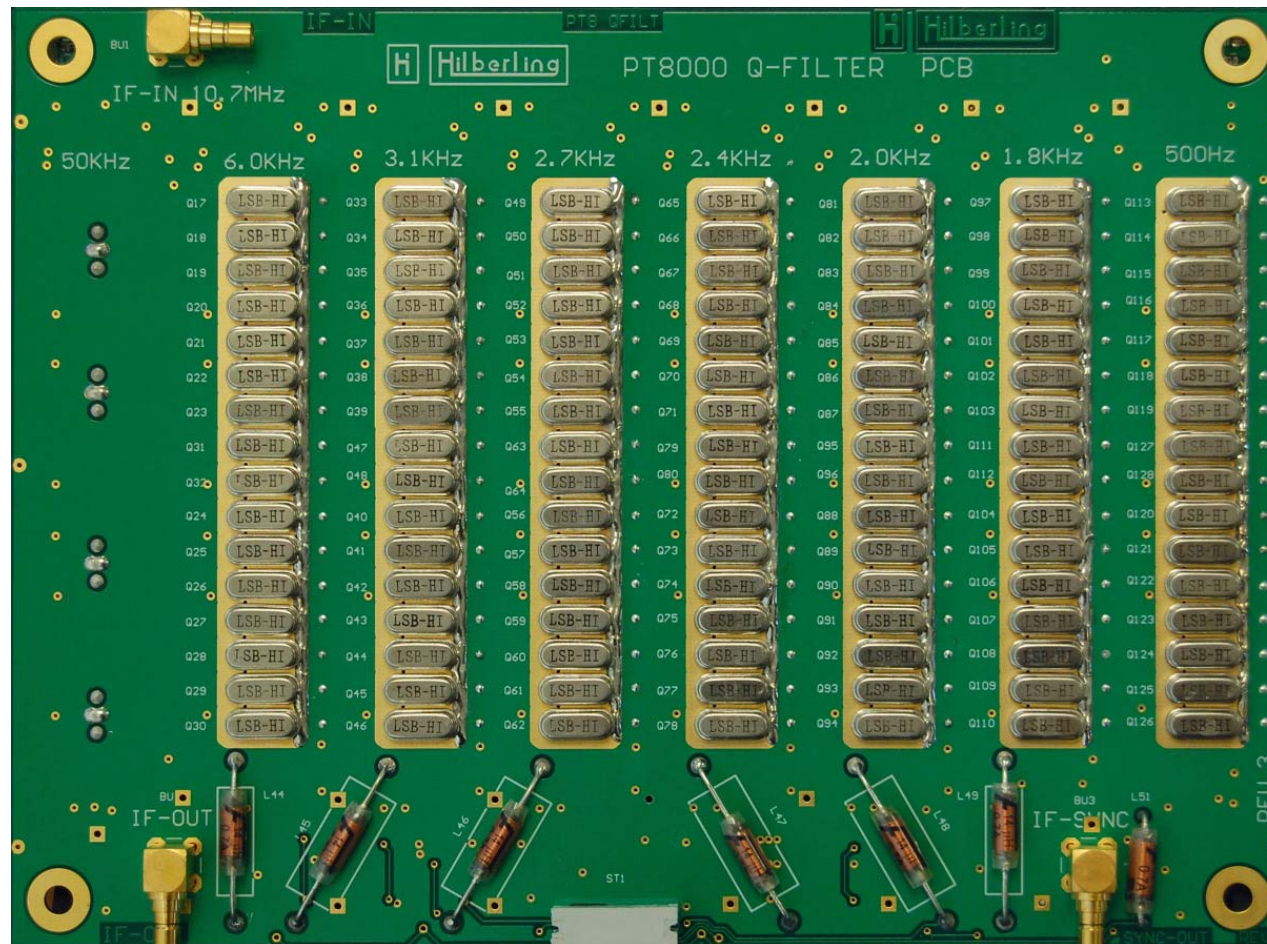
**Low Noise 2nd LO
4.0 kHz Xtal filter**

**IF-notch 0.1 kHz ... 4 kHz
constant > -50 dB**

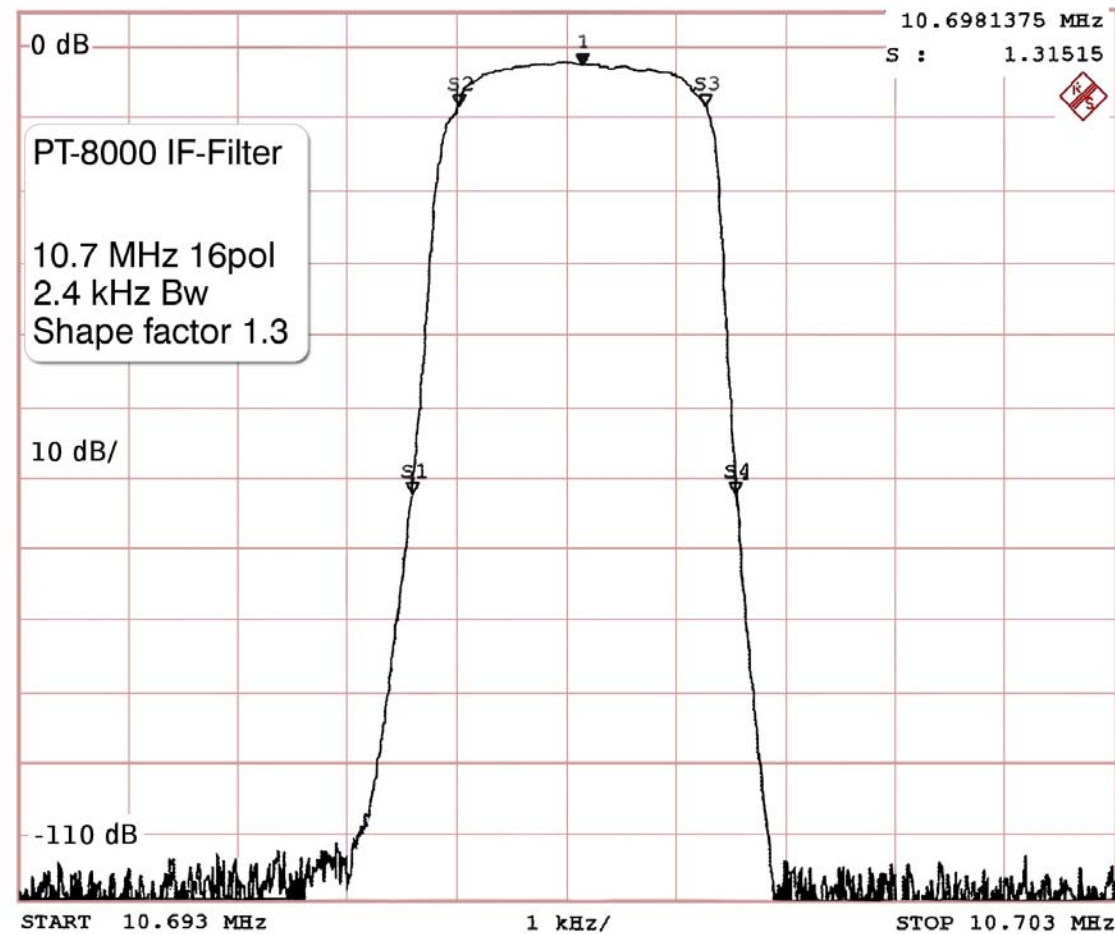
16pol Xtal Ladder Filter

Enhancement by DSP

Channel Filters 2nd IF - 16pol Xtal Ladder Filter



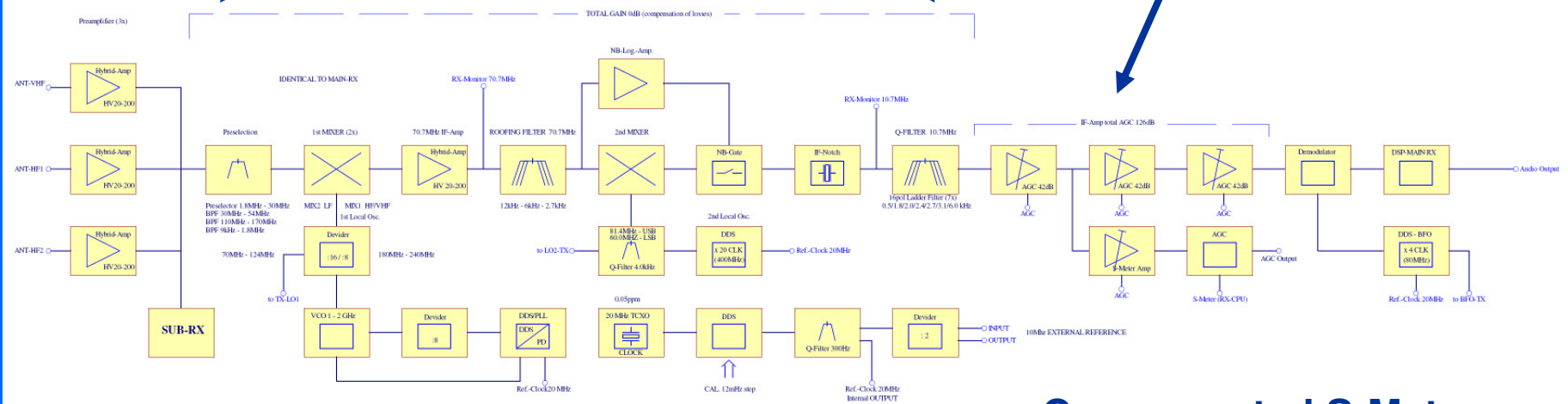
Channel Filters 2nd IF



Gain Distribution:

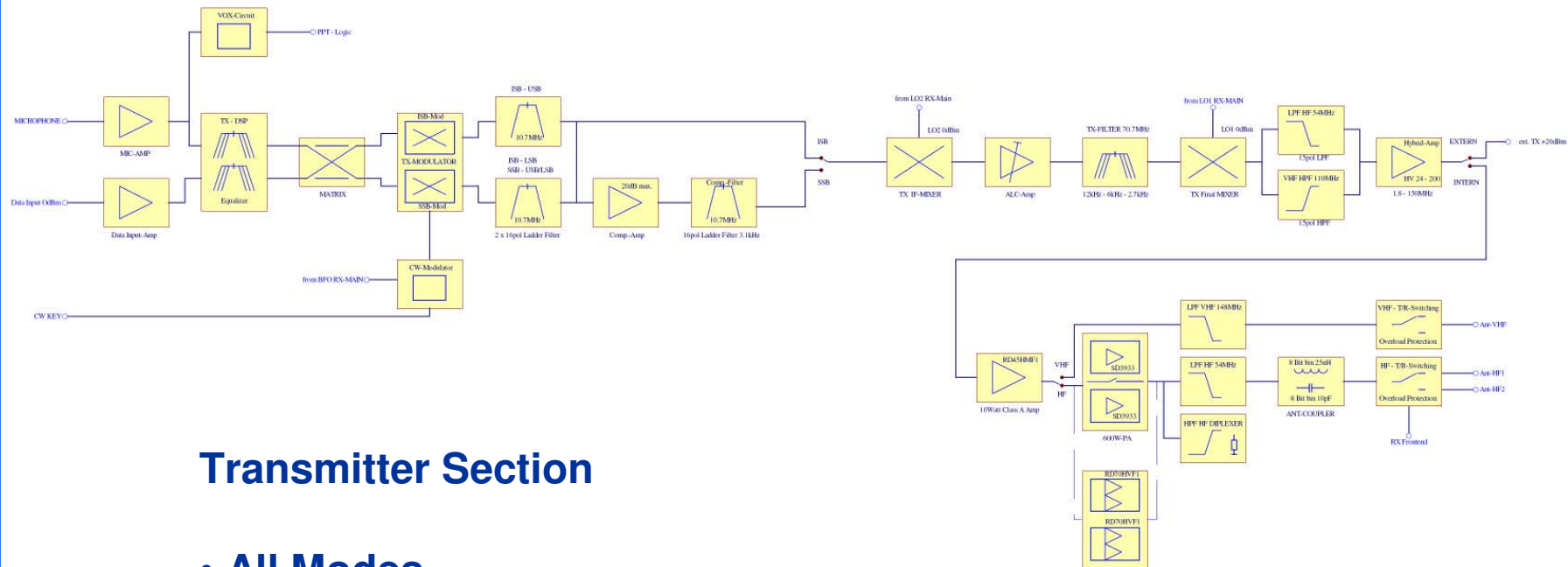
... from antenna input (preamp off) to 2nd IF amplifiers 0 dB: compensation for losses only. No AGC until that point!

**126 dB max. gain
for 2nd IF and AGC**



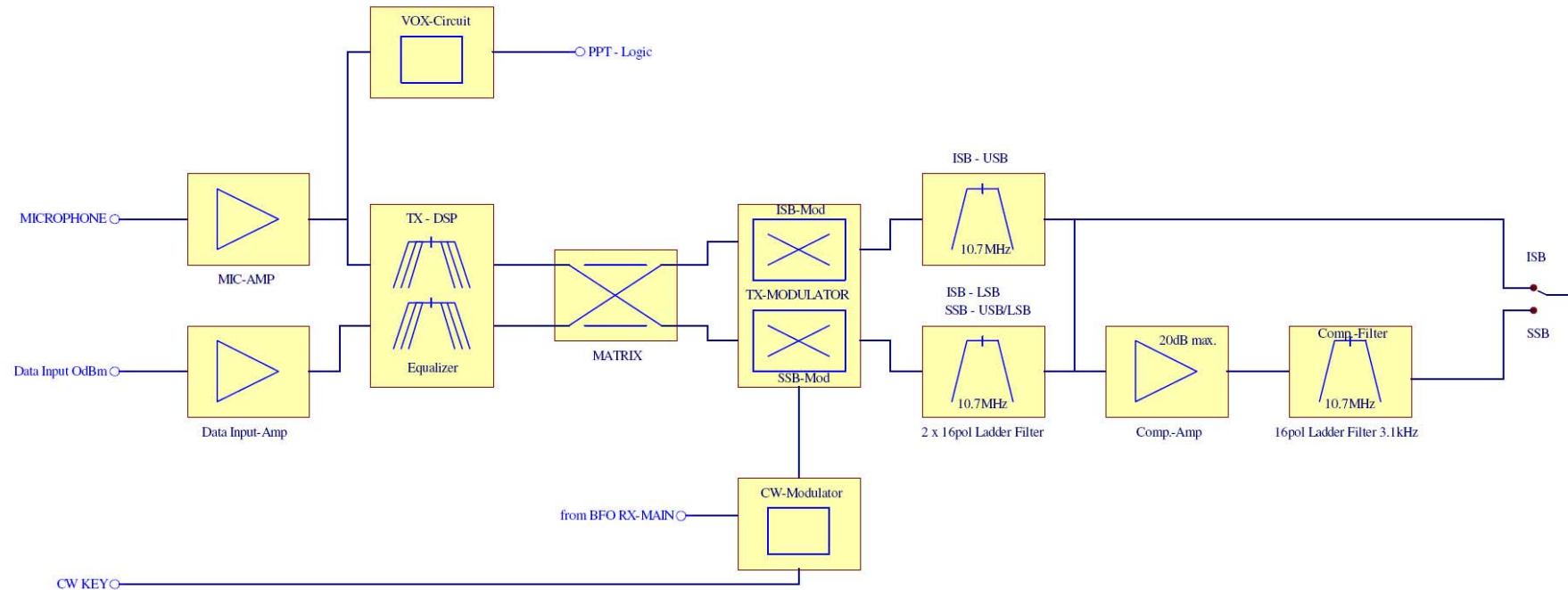
Compensated S-Meter

S-Units; dBμV; dBm



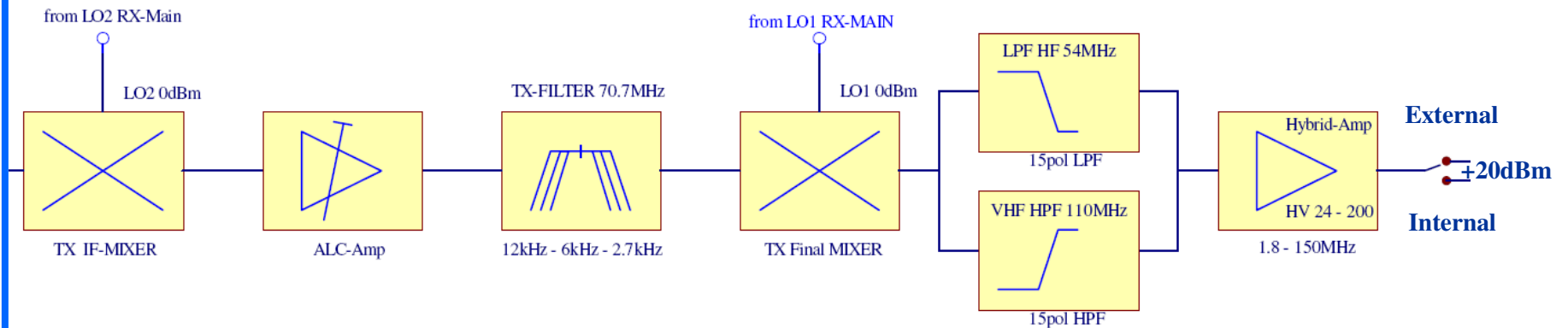
Transmitter Section

- All Modes
- 0dBm Data Input
- RS232 CAT Interface
- Wide PA Power Spectrum



Modulator / 10.7 MHz section

- ISB - Independent Sideband;
AM/AME; FM; SSB; CW
- MIC-Amp with Leveler
- 3 x 16pol Xtal filters

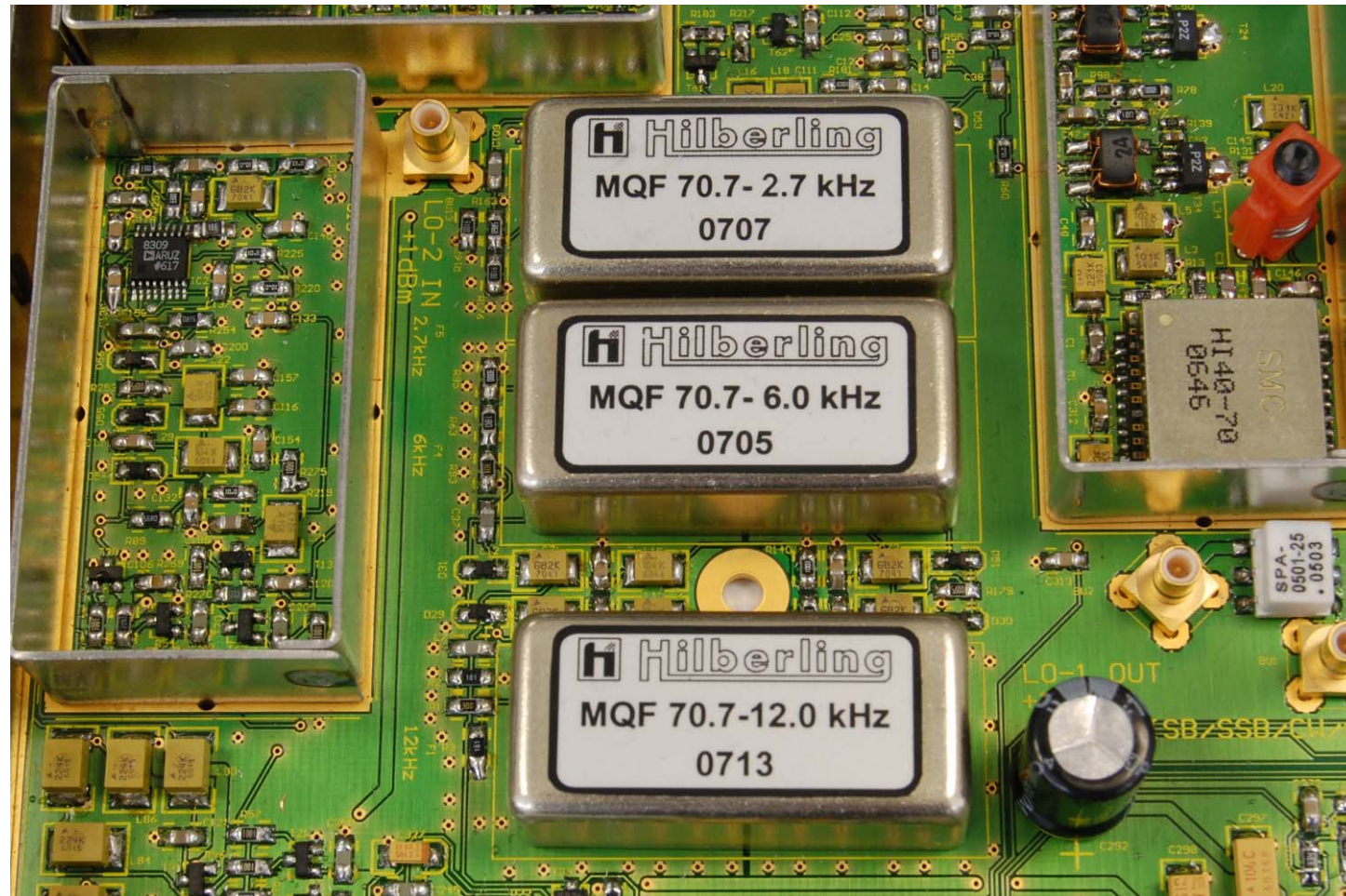


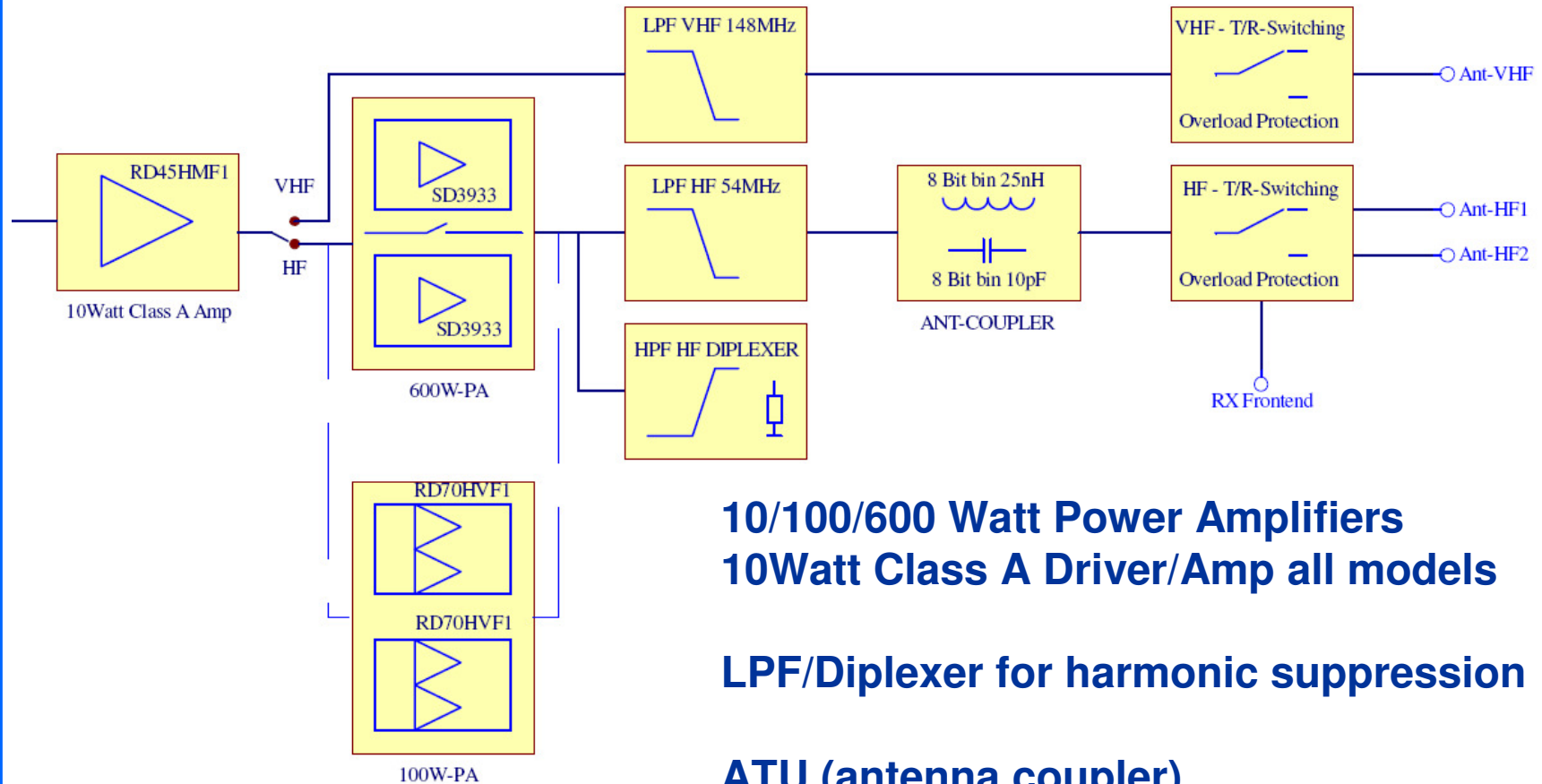
TX with 70.7 MHz „roofing filters“

Hybrid-Amp 1.8 ... 150 MHz

+20dBm TX out (external)

TX – 70.7 MHz Xtal Filters





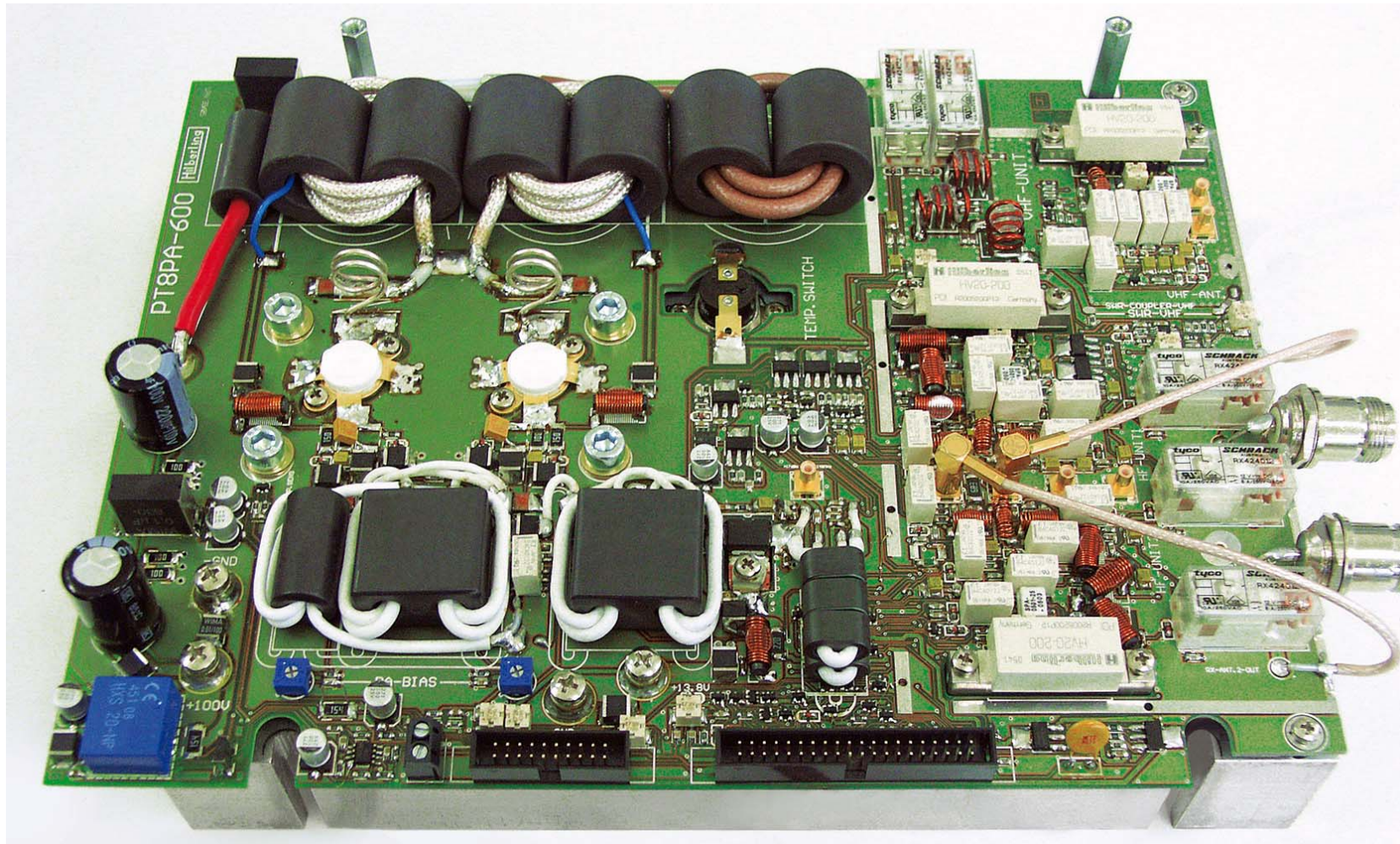
10/100/600 Watt Power Amplifiers
10Watt Class A Driver/Amp all models

LPF/Diplexer for harmonic suppression

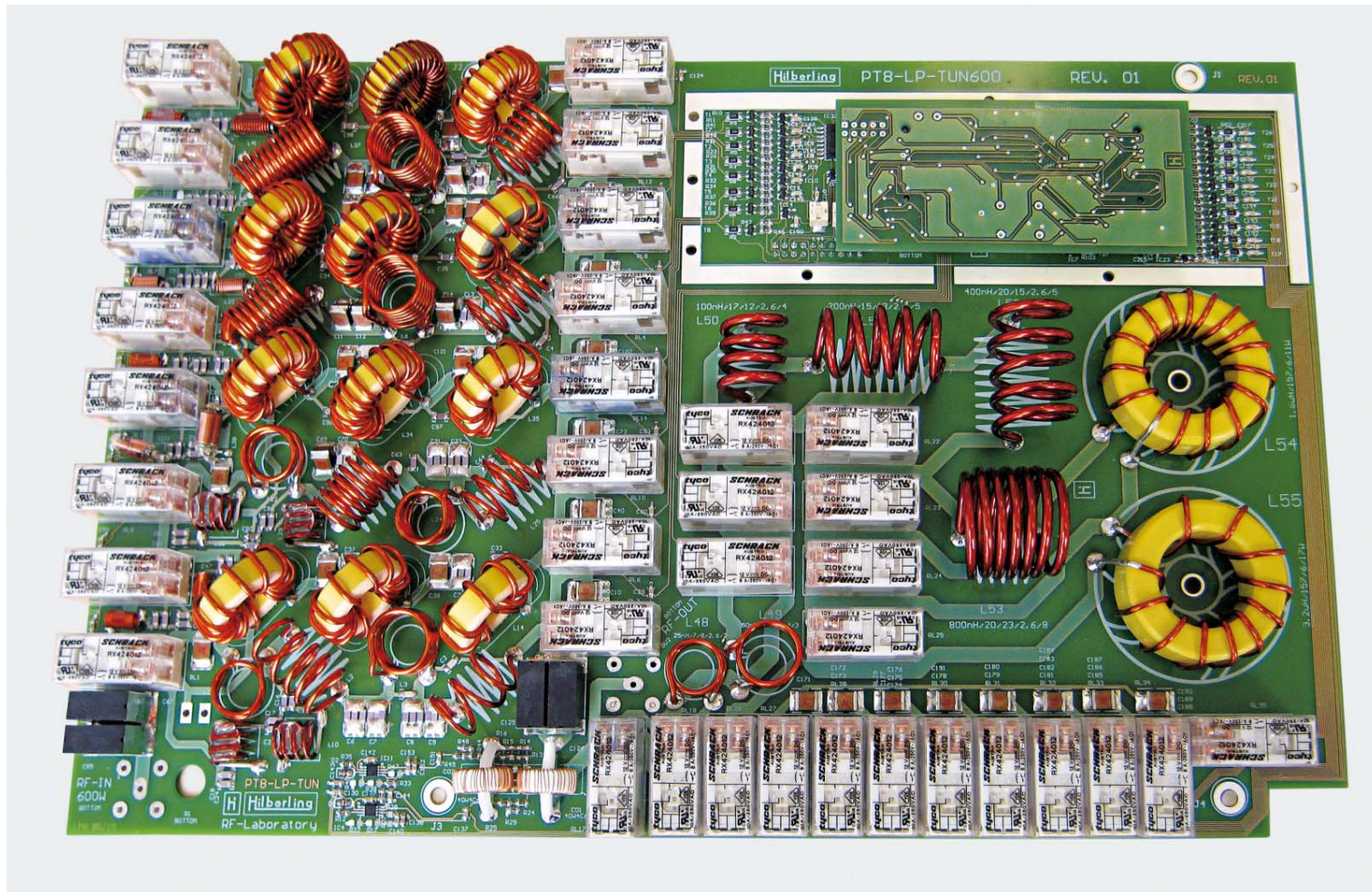
ATU (antenna coupler)

PIN-diodes T/R-switching

600 Watt Power Amplifier



LPF – Diplexer - ATU





PT-8000 A/B/C may be customized in color and features (through software/hardware mods) for commercial applications such as communication for

- **Government (civil / military)**
- **NGOs**
- **MARS**

RF-Laboratories

24768 Rendsburg, Germany
www.hilberling-usa.com



Who is Hilberling GmbH?

Established 1988 In Rendsburg, Germany
35 Employees, 7 Engineers

Founded By
Hans Hilberling, DK7LG
RF Engineer And
Veteran Amateur Radio Operator



HAMVENTION Dayton, Ohio – 2007



Core Competence

- Professional RF Communication Equipment
- RF Power Generators For LASER Applications
- RF Microwave Measurements Of All Kinds
- RF Data Transmission And Process Control
- AC Pulsed Power Supplies

www.hilberling.de

**PT-8000, HN-8000 and T9
are
developed and manufactured in the EU**

by

Hilberling GmbH

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Germany**

