

ROHDE & SCHWARZ

Make ideas real



DE LA RECHERCHE SCIENTIFIQUE À UNE ENTREPRISE MONDIALE

- ▶ Fondée il y a plus de 90 ans en tant que “Laboratoire de développement physique et d’ingénierie” par Dr. Lothar Rohde et Dr. Hermann Schwarz, amis depuis l’université
- ▶ Détenue en totalité par les familles des fondateurs
- ▶ Indépendante des marchés boursiers et financiers
- ▶ Relations clients basées sur la confiance, la stabilité et le long terme
- ▶ Engagement et innovation pour un monde plus sûr et connecté depuis sa création



PROXIMITÉ AVEC LE MARCHÉ. PROCHE DE NOS CLIENTS.

- ▶ Implanté dans plus de 70 pays
- ▶ Plus de 60 filiales
- ▶ Centre de R&D, bureau de ventes et de services dans le monde entier



R&S France en quelques chiffres

1,6 M € Structure SAS au capital de...

61 M € de chiffre d'affaires*

90 salariés



Siège social basé à...

Meudon-La-Forêt



Arpège

La ciotat (13)
47 employés

NOS DOMAINES D'ACTIVITÉS

Test & mesure



Broadcast & media



Aérospatiale | Défense | Sécurité



Réseaux & cybersécurité



Service

Service

PORTEFOLIO PRODUITS



Analyseurs de spectres et de signaux



Oscilloscopes



Alimentations



Analyseurs de reseaux vectoriels

FOCUS CEM



Récepteurs de mesures EMI



Amplificateurs



Logiciel CEM



Générateurs analogiques et vectoriels



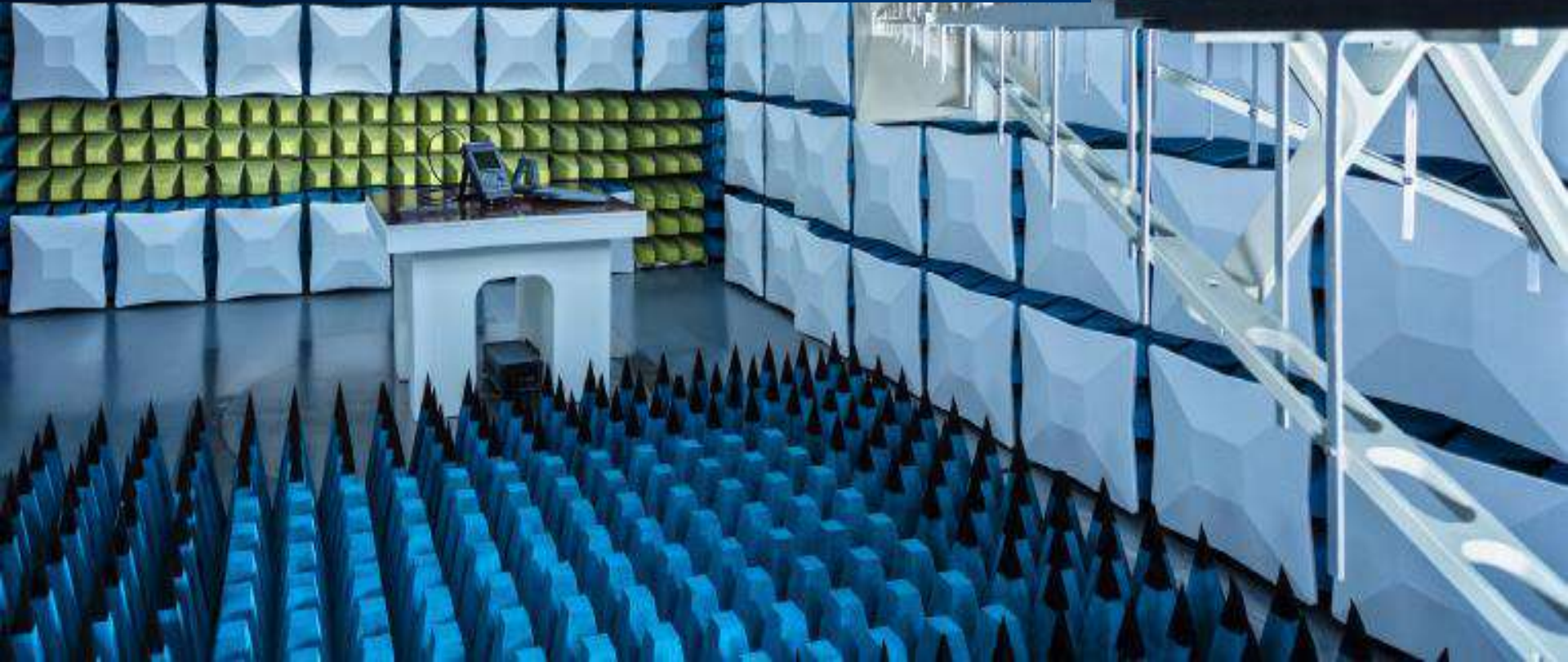
Matrices de commutation



Sondes de puissances

R&S solutions portfolio for EMI / RSE / EMS application

NEW WAYS FOR YOUR EMC WITH EXCLUSIVE R&S SOLUTIONS.



ROHDE & SCHWARZ, YOUR RELIABLE EMC TEST SOLUTION PARTNER



EMI test receivers



**EMC test software
ELEKTRA, AdvISE**



**Broadband
amplifiers**



EMC test systems



EMC accessories



**Signal and
spectrum analyzers**



Oscilloscopes



TEMPEST receiver

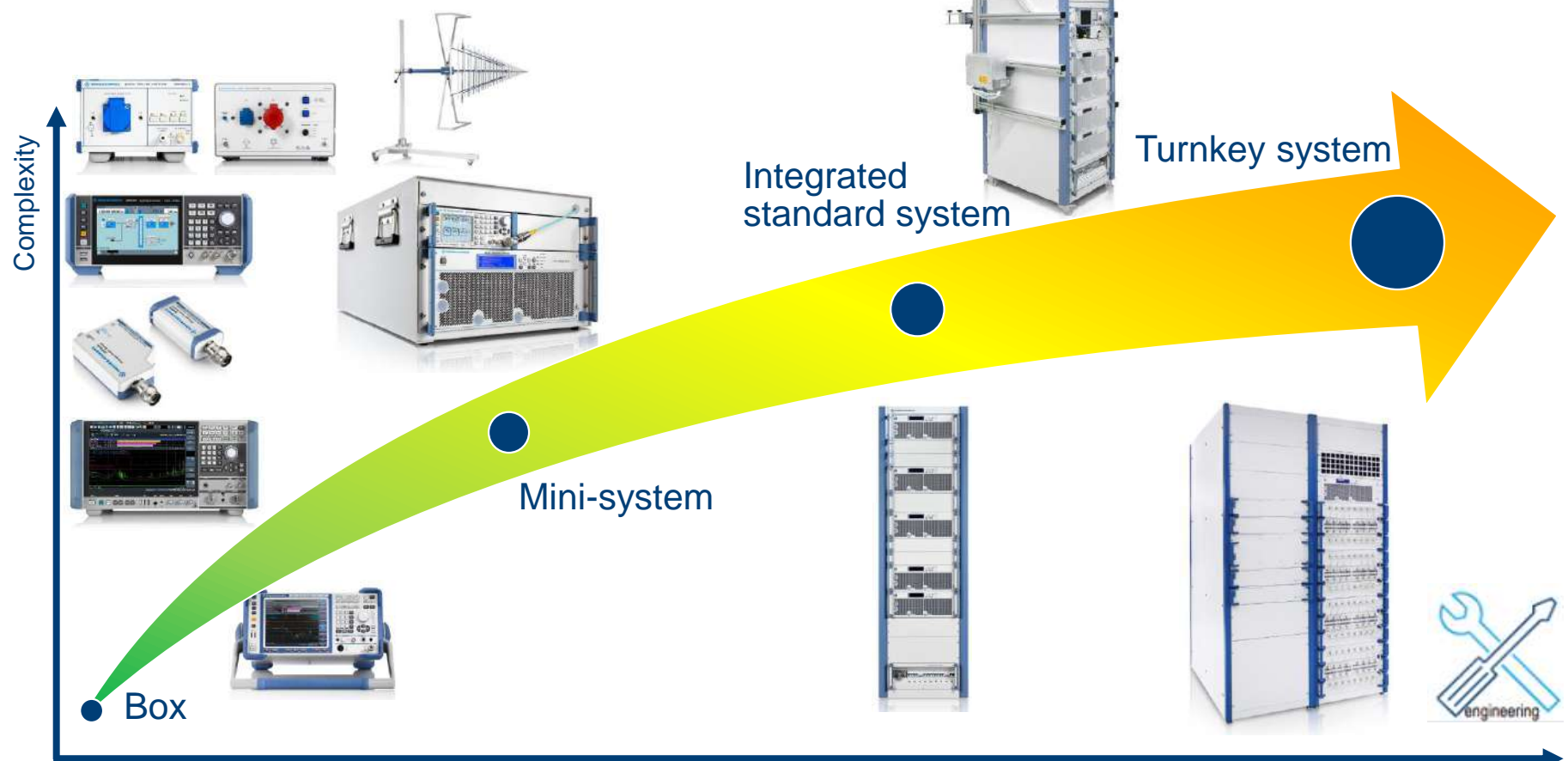


ROHDE & SCHWARZ OFFERS A COMPLETE PORTFOLIO FOR EMC TEST

- ▶ EMC is the DNA of Rohde & Schwarz
- ▶ In-house development of powerful test-equipments, HW & SW instrumentation
- ▶ Active participation in standardization committees
- ▶ Future-ready, modular flexible test solution for debug, pre-compliance & full-compliance
- ▶ Scalable after sales service & calibration support



TYOLOGY OF EMC SYSTEMS



WHY STARTING EMC AS EARLY AS POSSIBLE

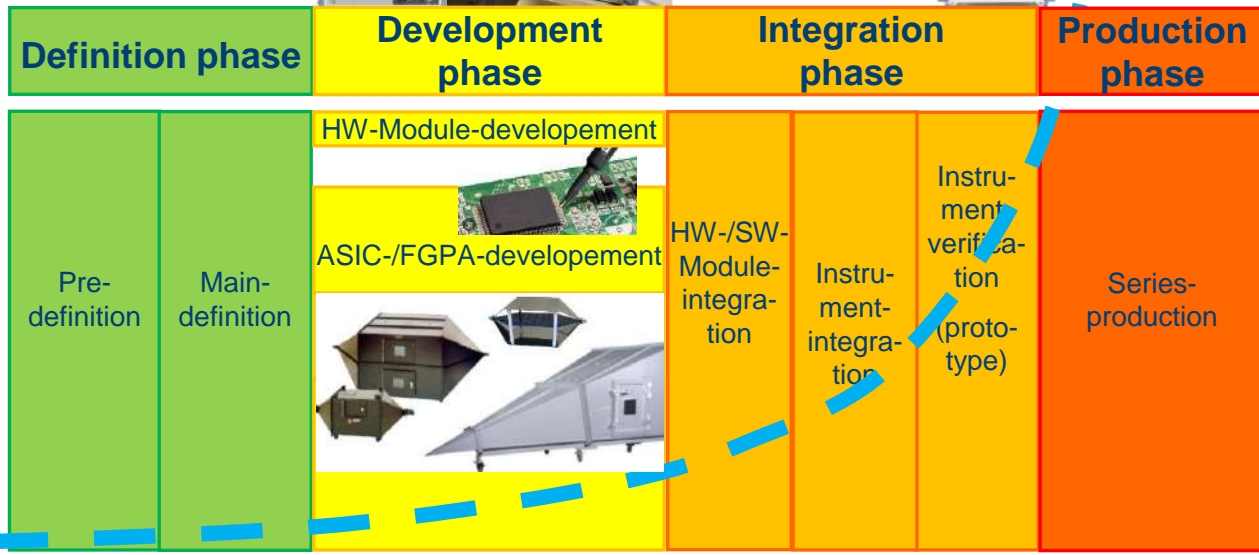
▶ **RIGHT EMC TOOLS** versus DUT phase



▶ **DONT START DUT dev.**
wo any EMC testing
even only EMI conducted

▶ **More near to standards**
will secure your EMC mark
ending as well your own
time to market

DUT Costs



	Simulation	Debug EMI	PRECERTIF	CERTIF
<i>meas. type</i>	--	near field	Cond or rad cell	chamber
<i>EMI</i>	--	RTO / FPL	FSV ESRP	ESW FSW
<i>EMS</i>	--	BONN SMC	BBA TS 7HU high	BBA150/300



LET'S START WITH EMI !

VHF / UHF band in 1957



OUR EMI HISTORY

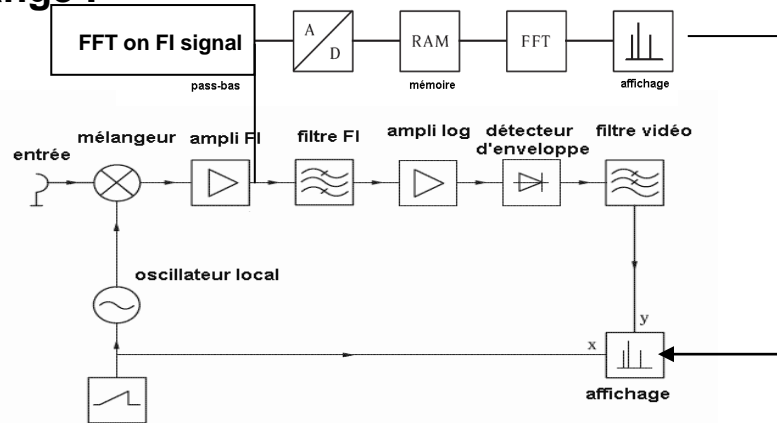
As everybody knows our EMI receivers... starting in 1957

- ▶ Today R&S Receiver can do really more than only EMI meas as:
 - all RSE and Radio measurements (Hx, C/N, CP/ACP,OB...)
 - Real Time spectrum measurements
 - Time domain acquisition (FFT)
 - signals demodulation (all analog and basic IQ).

⇒ To conclude : a real versatile RF instrument !

- ▶ What have allow this change :

Mostly,
the IF stage digitalisation



Only receivers mode



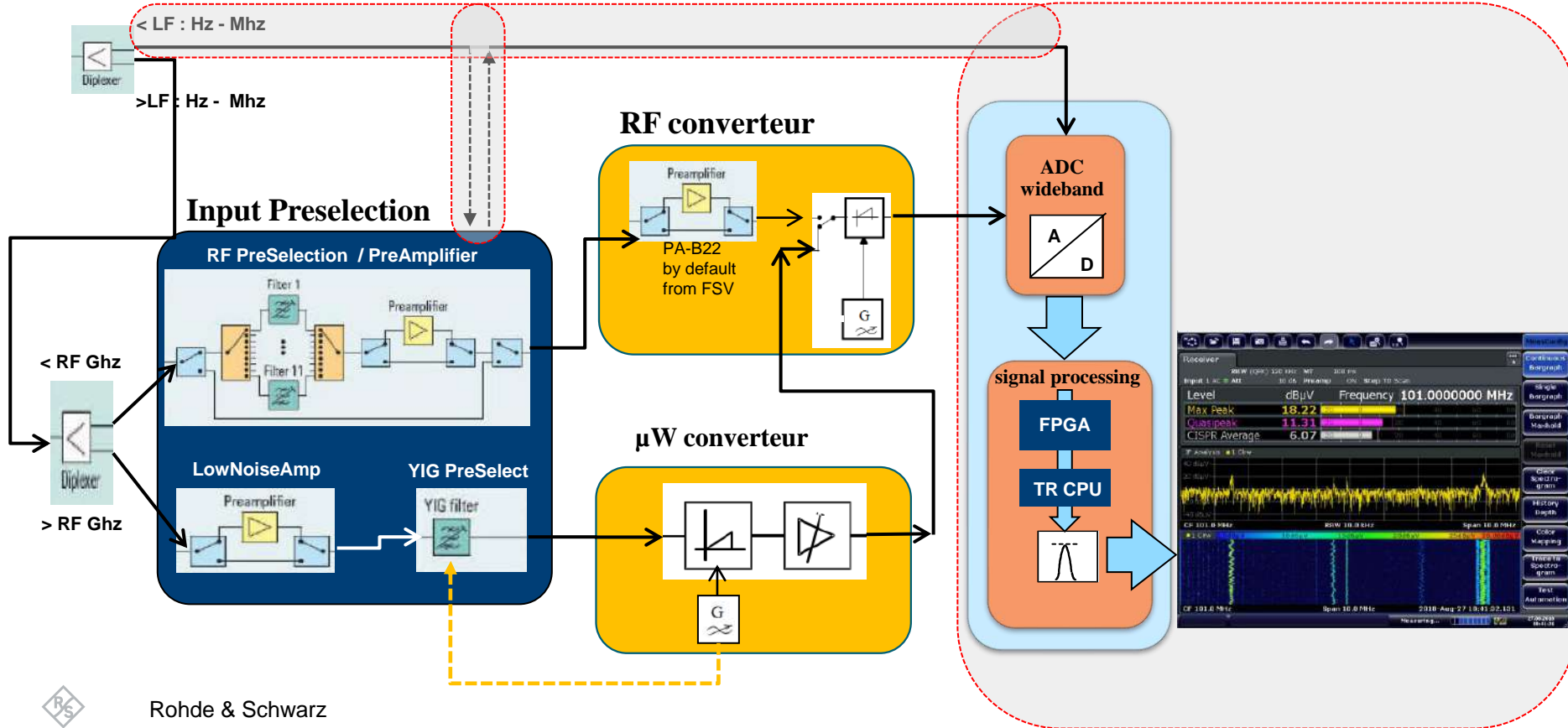
Now alls R&S emi receives have :

- A full spectrum mode inside
- Real Time spectrum ode
- Analog demodulation
- APD distribution mode
- IQ Anayser



NEW HARDWARE OF MODERN RECEIVER

See inside what is new !



R&S ACTUAL EMI RECEIVERS

FSWT 26GHz TEMPEST

Test receiver with outstanding performance by narrow preselection



ESRP 7GHz EMI pre compliant RX

fast and straightforward with preselection



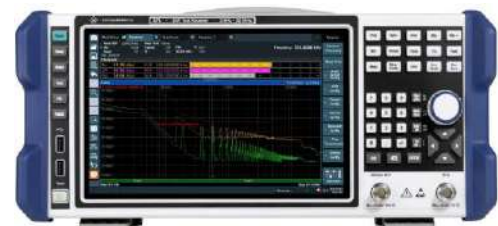
ESW 44GHz (500GHz with ext Mixer)

High-end compliant EMI receiver with maximum measurement speed, superior HF performance and multifunctional applications up to 44 GHz



ESR 26GHz Compliance receiver for lab and mobile testing with high speed and real-time sa

EPL 30MHz Compliance receiver for conducted meas



NEW HARDWARE OF MODERN TEST RECEIVER

RF preselection stage flexible

on his configuration with :

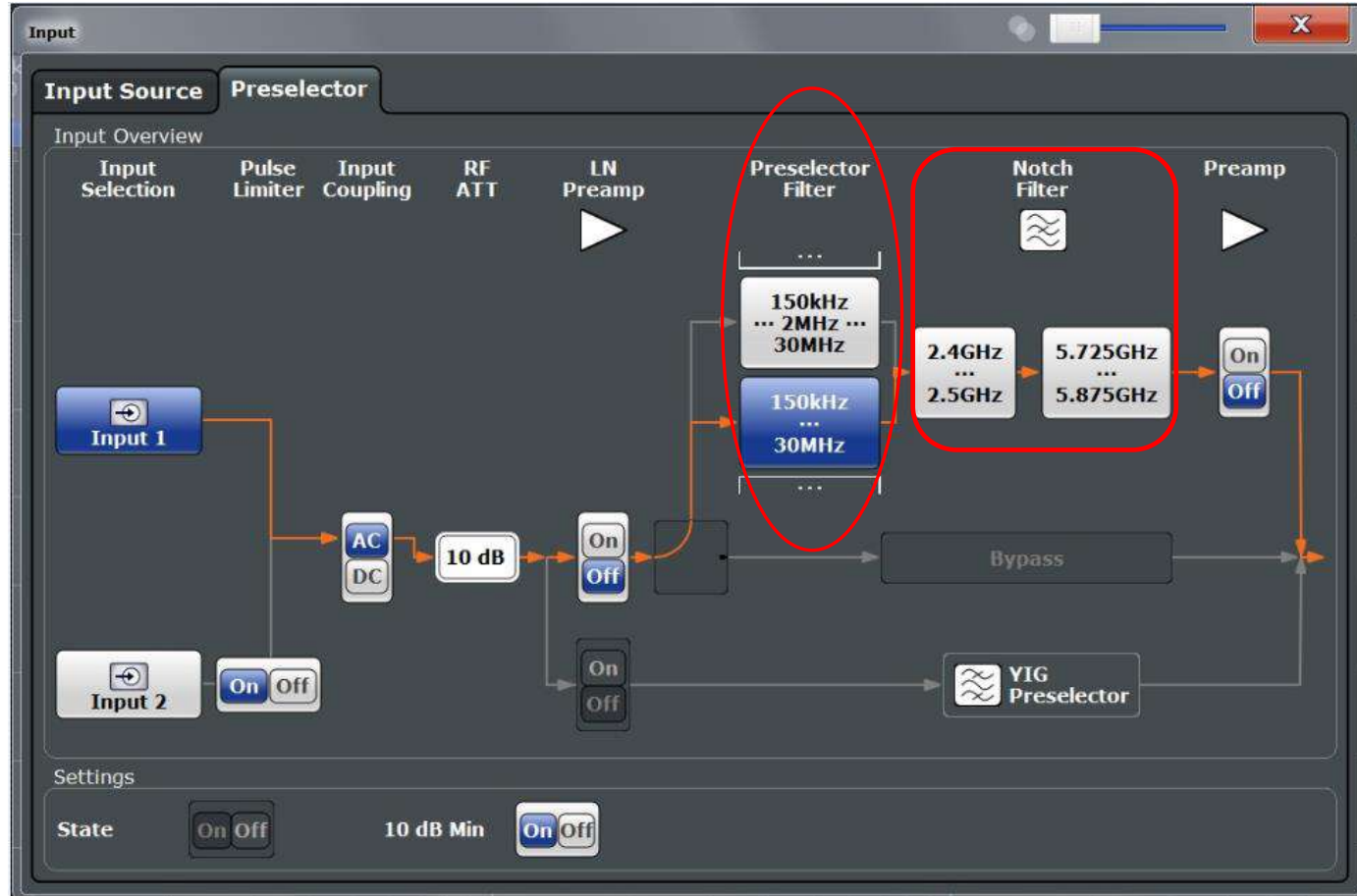
- RSE Noth filter
- Different RF bandwidths on cispr band A/B

The goal is to avoid input overloading

wich can be :

- On mixers directly
- On Rbw filters also

Usable in RX or SA mode



MODERN RECEIVERS KEEPING BENEFITS FROM HISTORY

► all R&S Receiver in spectrum mode allow to use

- all Rbw & detectors from the RX mode (6dB Rbw and all cispr detectors)
- the RF preselection stage including Ina (helps on high power density)

► All R&S Receivers integrate : scan table, Emi Auto test scenario, transducer factors, limits...

The screenshot displays the R&S receiver software interface. On the left, the 'Bandwidth' panel shows 'Bandwidth' set to 'Auto' (2.0 MHz) and 'Sweep' set to 'Auto' (100.0). Below this is a spectrum plot showing a signal at approximately 30 dBμV. The 'Traces' panel shows 'Trace 1' selected. The 'Edit Transducer' dialog is open, showing a table of transducer factors:

Range	Frequency	Factors
1	1.000 MHz 100.000 MHz	HZ-11 HZ-11
2	100.000 MHz 1.000 GHz	CBL6111 HL562

At the bottom of the dialog, 'Start Frequency' is set to 1.0 MHz and 'Stop Frequency' is set to 100.0 MHz. The interface also includes buttons for 'Insert Range', 'Delete Range', 'Add Factor', 'Change Factor', 'Remove Factor', and 'Save Set'.

EMI TEST RECEIVER FROM 1HZ TO 44GHZ



----- Pre-Compliant Receivers -----

----- Compliant Receivers -----

Instrument	Instrument	R&S®ESL	R&S®ESRP	R&S®ESR	R&S®ESW
Main characteristics	Main characteristics				
Frequency range	Frequency range	9 kHz to 3 GHz / 6 GHz	9 kHz to 3.6 GHz / 7 GHz	10 Hz to 3.6 GHz / 7 GHz / 26.5 GHz	1 Hz to 8 GHz / 26.5 GHz / 44 GHz
Measurement bandwidth	Measurement bandwidth	10 Hz to 10 MHz (up to 20 MHz zero span)	10 Hz to 10 MHz (up to 40 MHz zero span)	10 Hz to 10 MHz (up to 40 MHz zero span)	1 Hz to 80 MHz
Compliance	Compliance	n.a.	n.a.		
Preamplifier gain	Preamplifier gain	20 dB (9 kHz to 6 GHz)	20 dB (1 kHz to 7 GHz)	20 dB (1 kHz to 7 GHz) 30 dB (7 GHz to 26.5 GHz)	20 dB (1 kHz to 8 GHz) 30 dB (150 kHz to 8/26.5/44 GHz with B24)
RF performance	RF performance				CISPR 16-1-1 and ANSI C63.2
Preselection filters	Preselection filters	n.a.	16 (R&S®ESRP-B2 option)	16	21
Noise indication ¹⁾ 30 MHz ≤ f < 1 GHz	Noise indication ¹⁾ 30 MHz ≤ f < 1 GHz, BW = 120 kHz	< 13 dBμV	< -7 dBμV (with R&S®ESRP-B2 option)	< -7 dBμV (with R&S®ESR-B29 option)	< -7 dBμV (with R&S®ESW-B24 option)
Displayed average noise level (DANL) 1 MHz < f ≤ 1 GHz	Displayed average noise level (DANL) 1 MHz < f ≤ 1 GHz (typical) ²⁾	-160 dBm	-162 dBm	-168 dBm	-169 dBm
1 dB compression nominal @ 1 GHz ³⁾	1 dB compression nominal @ 1 GHz ³⁾	+5 dBm	+3 dBm	+10 dBm	+15 dBm
Absolute level uncertainty at 64 MHz ⁴⁾	Absolute level uncertainty at 64 MHz ⁴⁾	< 0.5 dB	< 0.2 dB	< 0.2 dB	< 0.2 dB
General data	General data				
Dimensions (W x H x D) and weight	Dimensions (W x H x D) and weight	34.2 cm x 15.8 cm x 36.7 cm up to 8 kg	41.2 cm x 19.7 cm x 41.7 cm 9.5 kg	41.2 cm x 19.7 cm x 51.7 cm from 12.8 kg to 14.6 kg	46.2 cm x 24.0 cm x 50.4 cm from 20.6 kg to 25.2 kg

Instrument	Instrument	R&S®ESL	R&S®ESRP	R&S®ESR	R&S®ESW
Key features	Key features	<ul style="list-style-type: none"> ▶ Optional tracking generator ▶ Mobile use with DC power and internal batteries ▶ Receiver and spectrum analyzer in one instrument 	<ul style="list-style-type: none"> ▶ FFT time domain scan (only SW FFT) ▶ Preselection filters for high dynamic range 	<ul style="list-style-type: none"> ▶ FFT time domain scan for fast measurements 40MHz ▶ Fully compliant CISPR 16-1-1, ANSI C63 MIL-STD-461 ▶ Real-time spectrum analysis for gapless interference (R&S®ESW bandwidth: 80 MHz) 	<ul style="list-style-type: none"> ▶ FFT time domain scan for ultrafast measurements (80 / 350MHz / 1GHz bandwidth Hardware) ▶ Fully compliant CISPR 16-1-1, ANSI C63 MIL-STD-461 (R&S®ESW bandwidth: 80 MHz) ▶ Real-time spectrum analysis for gapless interference (High-end receiver with outstanding dynamic range and pulse resolution) ▶ Multi CISPR APD measurement application