Visit my website on www.pa1hr.nl (redirect page of www.remeeus.eu)

QST Magazine Product Reviews - Key Measurements Summary - HF-Transceivers or Receivers (page 1/7)

			Receiver								Transmitter								
		Subject of measurement, band: 14 MHz	20 kHz reciprocal mixing dynamic range	20 kHz blocking gain compression	20 kHz 3rd-order dynamic range	2 kHz reciprocal mixing dynamic range	2 kHz blocking gain compression	**2 kHz 3rd-order dynamic range**	20 kHz 3rd-order intercept	2 kHz 3rd-order intercept	Transmit 3rd-order IMD	Transmit 9th-order IMD	5 kHz Transmit keying bandwidtch	10 kHz Transmit phase noise	NEW: TX/RX turnaround time	RX/TX turnaround time (TX delay) SSB	Price in USD (2006-2016)	Company's site	
		Min/max of scale	-60/-140 dBc	70/140 dB	50/110 dB	-60/-140 dBc	70/140 dB	**50/110 dB**	-40/+35 dBm	-40/+35 dBm	-20/-35 dB	-20/-70 dB	-55/-95 dB	-110/-150 dB					
		Transceivers/receivers sorted by 2 kHz 3rd-order dynamic range and if equal by 20 kHz 3rd-order dynamic range																	
	1	**Yaesu FTdx5000D, December 2010**	-109 dBc	136 dB *	**114 dB ****	-102 dBc	136 dB *	**114 dB ****	**+41 dBm ****	**+40 dBm ****	**Class AB: -30 dB, Class A: -43 dB**	**Class AB: -47 dB, Class A: -72 dB**	N/M	N/M	66 ms	37 ms	**$5,399**	www.yaesu.com	
	2	**WiNRADIO WR-G31DDC, January 2012**	N/M	128 dB	107 dB	N/M	128 dB	**107 dB**	+32 dBm	+32dBm	N/A	N/A	N/M	N/M	N/A	N/A	**$899**	www.winradio.com	
	3	**Kenwood TS-590SG, July 2015**	-118 dBc	139 dB	106 dB	-94 dBc	130 dB	**106 dB**	+29 dBm	+29 dBm	**-42 dB ~****	-58 dB ~	N/M	N/M	28 ms	17 ms	**$1,609**	www.kenwood.com	
	4	**Icom IC-7851, July 2016**	-125 dBc	131 dB	110 dB	-114 dBc	129 dB	**105 dB**	N/M	N/M	-36 dB ~	-61 dB ~	**-92 dB**	**-148 dB**	**8 ms**	16 ms	**$13,099**	www.icomamerica.com	
	5	**Elecraft K3S, November 2016**	-119 dBc	**145 dB ****	105 dB	-115 dBc	136 dB	**104 dB**	N/M	N/M	-35 dB ~	-62 dB ~	**-95 dB**	**-142dB**	33 ms	40 ms	**$2,900**	www.elecraft.com	
	6	**Elecraft K3 %, after Synthesizer Upgrade, November 2015**	-119 dBc	**143 dB ****	106 dB	-115 dBc	**143 dB ****	**103 dB**	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	**$2,200**	www.elecraft.com	
	7	**Elecraft K3 %, January 2009 with update, November 2015**	-115 dBc	**143 dB ****	106 dB	-93 dBc	135 dB	**103 dB**	+29 dBm	+28 dBm	-29 dB	-51 dB	N/M	N/M	25 ms	12 ms	**$2,200**	www.elecraft.com	
	8	**FlexRadio FLEX-6700, April 2015**	-124 dBc	128 dB	103 dB	-116 dBc	128 dB	**103 dB**	**+46 dBm ****	**+46 dBm ****	**-41 dB ~****	-55 dB ~	N/M	N/M	**184 ms**	**140 ms**	**$7,499**	www.flexradio.com	
	9	**Elecraft K3, April 2008**	N/M	139 dB	103 dB	N/M	139 dB	**102 dB**	+26 dBm	+26 dBm	-27 dB	-53 dB	N/M	N/M	22 ms	N/M	**$2,200**	www.elecraft.com	
	10	**Kenwood TS-990S, February 2014**	-117 dBc	138 dB	**112 dB ****	-87 dBc	133 dB	**101 dB**	**+44 dBm ****	+35 dBm	-31 dB	-57 dB	N/M	N/M	35 ms	18 ms	**$8,000**	www.kenwood.com	
	11	**FlexRadio FLEX-6500, February 2017**	-122 dBc	130 dB	103 dB	-115 dBc	129 dB	**101 dB**	N/M	N/M	**-39 dB ~ ****	-55 dB ~	**-95 dB**	**-153 dB ****	84 ms	50 ms	**$4,299**	www.flexradio.com	
	12	**Yaesu FTdx3000, April 2013**	-106 dBc	137 dB *	110 dB	-82 dBc	127 dB	**100 dB**	**+40 dBm ****	+23 dBm	-27 dB	-52 dB	N/M	N/M	36 ms	34 ms	**$2,699**	www.yaesu.com	
	13	**SSB Electronic ZEUS ZS-1, June 2014**	-128 dBc	129 dB	105 dB	-120 dBc	129 dB	**100 dB**	+31 dBm	+31 dB	-34 dB	-60 dB	N/M	N/M	**344 ms**	68 ms	**$1,700**	www.ssb.de	
	14	**Hilberling PT-8000A, November 2014**	-118 dBc	138 dB	104 dB	-111 dBc	138 dB	**100 dB**	+35 dBm	+30 dBm	-35 dB ~	-59 dB ~	N/M	N/M	40 ms	43 ms	**$17,500**	www.hilberling.de	
	15	**Elecraft KX3, December 2012**	-120 dBc	130 dB	103 dB	-114 dBc	128 dB	**100 dB**	+34 dBm	+34 dBm	-30 dB	-55 dB	N/M	N/M	44 ms	30 ms	**$999**	www.elecraft.com	
NEW	16	**Icom IC-R8600, November 2017**	-122 dBc	115 dB	103 dB	-108 dBc	124 dB	**99 dB**	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	**$2,599**	www.icomamerica.com	NEW
	17	**ELAD FDM-DUO, May 2016**	-108 dBc	124 dB	99 dB #	-104 dBc	106 dB	**99 dB #**	N/M	N/M	**-39 dB ~ ****	**-70 dB ~**	-88 dB	**-141 dB**	52 ms	18 ms	**$1,149**	http://ecom.eladit.com	
	18	**FlexRadio FLEX-5000A, July 2008**	N/M	123 dB	99 dB	N/M	123 dB	**99 dB**	+35 dBm	+30 dBm	-34 dB	-54 dB	N/M	N/M	29 ms	25 ms	**$2,799**	www.flexradio.com	
	29	**TenTec 599AT Eagle, August 2011**	N/M	136 dB	98 dB	N/M	126 dB	**98 dB**	+22 dBm	+22 dBm	-28 dB	-48 dB	N/M	N/M	70 ms	16 ms	**$1,795**	www.tentec.com	
	20	**Kenwood TS-590S, May 2011**	N/M	**141 dB ****	106 dB	N/M	121 dB	**97 dB**	+26 dBm	+22 dBm	-29 dB	-52 dB	N/M	N/M	30 ms	14 ms	**$1,649**	www.kenwood.com	

QST Magazine Product Reviews - Key Measurements Summary - HF-Transceivers or Receivers (page 2/7)

		Receiver								Transmitter							
	Subject of measurement, band: 14 MHz	20 kHz reciprocal mixing dynamic range	20 kHz blocking gain compression	20 kHz 3rd-order dynamic range	2 kHz reciprocal mixing dynamic range	2 kHz blocking gain compression	**2 kHz 3rd-order dynamic range**	20 kHz 3rd-order intercept	2 kHz 3rd-order intercept	Transmit 3rd-order IMD	Transmit 9th-order IMD	5 kHz Transmit keying bandwidtch	10 kHz Transmit phase noise	NEW: TX/RX turnaround time	RX/TX turnaround time (TX delay) SSB	Price in USD (2006-2016)	Company's site
	Min/max of scale	-60/-140 dBc	70/140 dB	50/110 dB	-60/-140 dBc	70/140 dB	**50/110 dB**	-40/+35 dBm	-40/+35 dBm	-20/-35 dB	-20/-70 dB	-55/-99 dB	-110/-150 dB				
	Transceivers/receivers sorted by 2 kHz 3rd-order dynamic range and if equal by 20 kHz 3rd-order dynamic range																
21	**Perseus SDR, December 2008**	N/M	129 dB	100 dB	N/M	129 dB	**97 dB**	+35 dBm	+35 dBm	N/A	N/A	N/M	N/M	N/A	N/A	**$999**	www.microtelecom.it
22	**Apache Labs ANAN-100D, October 2015**	-117 dBc	124 dB	97 dB	-105 dBc	122 dB	**96 dB**	+22 dBm	+22 dBm	**Pure Signal OFF: -29 dB, Pure Signal ON: -49 dB ****	**Pure Signal OFF: -49 dB, Pure Signal ON: -60 dB**	N/M	N/M	**240 ms**	**142 ms**	**$3,489**	www.apache-labs.com
23	**TEN-TEC 539 Argonaut VI, August 2013**	N/M	N/M	96 dB	N/M	N/M	**96 dB**	+20 dBm	+20 dBm	-30 dB	-51 dB	N/M	N/M	36 ms	20 ms	**$995**	www.tentec.com
24	**Icom IC-7700, October 2008**	N/M	125 dB	106 dB	N/M	102 dB	**95 dB**	+35 dBm	+24 dBm	-28 dB	-53 dB	N/M	N/M	15 ms	11 ms	**$7,179**	www.icomamerica.com
25	**Flex-3000, Oct/Nov 2009**	N/M	113 dB	99 dB	N/M	113 dB	**95 dB**	+28 dBm	+26 dBm	-30 dB	-45 dB	N/M	N/M	16 ms	48 ms	**$1,699**	www.flexradio.com
26	**Icom IC-7300, August 2016**	-114 dBc	123 dB	97 dB	-102 dBc	123 dB	**95 dB**	N/M	N/M	-30 dB	-58 dB ~	**-95 dB**	-139 dB	15 ms	14 ms	**$1,500**	www.icomamerica.com
27	**TenTec Orion-II, September 2006**	N/M	136 dB	92 dB	N/M	136 dB	**95 dB**	+20 dBm	+21 dBm	-28 dB	-52 dB	N/M	N/M	30 ms	18 ms	**$4,295**	www.tentec.com
28	**FlexRadio FLEX-6300, April 2015**	-121 dBc	127 dB	92 dB	-116 dBc	126 dB	**92 dB**	**+43 dBm ****	**+43 dBm ****	**-41 dB ~****	-54 dB ~	N/M	N/M	**184 ms**	**136 ms**	**$2,499**	www.flexradio.com
28	**Icom IC-7410, October 2011**	N/M	**143 dB ****	106 dB	N/M	111 dB	**88 dB**	+29 dBm	+5 dBm	-30 dB	-61 dB	N/M	N/M	85 ms	45 ms	**$1,949**	www.icomamerica.com
30	**Icom IC-7600, November 2009**	N/M	122 dB	106 dB	N/M	102 dB	**88 dB**	+31 dBm	+13 dBm	-31 dB	-48 dB	N/M	N/M	16 ms	21ms	**$4,976**	www.icomamerica.com
31	**Icom IC-9100, April 2012**	-101 dBc	**142 dB ****	108 dB	-77 dBc	111 dB	**87 dB**	+29 dBm	+2 dBm	-29 dB	-64 dB	N/M	N/M	87 ms	61 ms	**$3,650**	www.icomamerica.com
32	**Elecraft KX2, May 2017**	-99 dBc	116 dB	93 dB	-102 dBc	112 dB	**87 dB**	N/M	N/M	**-36 dB ~**	-58 dB ~	**-94 dB**	-128 dB	40 ms	30 ms	**$750**	www.elecraft.com
33	**Icom IC-7800 V2, March 2007**	N/M	**144 dB ****	108 dB	N/M	117 dB	**86 dB**	**+38 dBm ****	+22 dBm	-32 dB	-52 dB	N/M	N/M	15 ms	**10 ms**	**$12,499**	www.icomamerica.com
34	**FlexRadio FLEX-1500, December 2011**	N/M	107 dB	100 dB	N/M	107 dB	**86 dB**	+31 dBm	+13 dBm	-22 dB	-48 dB	N/M	N/M	**210 ms**	**200 ms**	**$649**	www.flexradio.com
35	**Yaesu FTdx9000MP, July 2010**	N/M	137 dB	99 dB	N/M	102 dB	**85 dB**	+28 dBm	+7 dBm	**Class AB: -22 dB, Class A: -37 dB**	**Class AB: -47 dB, Class A: -75 dB**	N/M	N/M	38 ms	32 ms	**$11,629**	www.yaesu.com
36	**TenTec R4020 QRP, February 2011**	N/M	N/M	84 dB	N/M	N/M	**84 dB**	-10 dB	-10 dBm	N/M	N/M	N/M	N/M	N/M	**116 ms**	**$249**	www.tentec.com
37	**Yaesu FTdx1200, January 2014**	-104 dBc	132 dB	101 dB	-81 dBc	123 dB	**83 dB**	+31 dBm	+4 dBm	-32 dB	-50 dB	N/M	N/M	35 ms	38 ms	**$1,600**	www.yaesu.com
38	**Yaesu FT-991, November 2015**	-103 dBc	134 dB	100 dB	-75 dBc	99 dB	**82 dB**	+31 dBm	-1 dBm	-26 dB ~	-46 dB ~	N/M	N/M	39 ms	34 ms	**$1,550**	www.yaesu.com
39	**TenTec Omni-VII, July 2007**	N/M	137 dB	91 dB	N/M	134 dB	**82 dB**	+11 dBm	+6,5 dBm	-27 dB	-55 dB	N/M	N/M	20 ms	18 ms	**$2,695**	www.tentec.com
40	**Icom IC-R9500, January 2008**	N/M	**144 dB ****	5kHz/92 dB	N/M	109 dB	**81 dB**	+32 dBm	-4dBm	N/A	N/A	N/M	N/M	N/A	N/A	**$17,000**	www.icomamerica.com

QST Magazine Product Reviews - Key Measurements Summary - HF-Transceivers or Receivers (page 3/7)

		Receiver								Transmitter							
	Subject of measurement, band: 14 MHz	20 kHz reciprocal mixing dynamic range	20 kHz blocking gain compression	20 kHz 3rd-order dynamic range	2 kHz reciprocal mixing dynamic range	2 kHz blocking gain compression	**2 kHz 3rd-order dynamic range**	20 kHz 3rd-order intercept	2 kHz 3rd-order intercept	Transmit 3rd-order IMD	Transmit 9th-order IMD	5 kHz Transmit keying bandwidtch	10 kHz Transmit phase noise	NEW: TX/RX turnaround time	RX/TX turnaround time (TX delay) SSB	Price in USD (2006-2016)	Company's site
	Min/max of scale	-60/-140 dBc	70/140 dB	50/110 dB	-60/-140 dBc	70/140 dB	**50/110 dB**	-40/+35 dBm	-40/+35 dBm	-20/-35 dB	-20/-70 dB	-55/-99 dB	-110/-150 dB				
	Transceivers/receivers sorted by 2 kHz 3rd-order dynamic range and if equal by 20 kHz 3rd-order dynamic range																
41	**Yaesu FTdx9000C, March 2006**	N/M	128 dB	101 dB	N/M	97 dB	**78 dB**	+35 dBm	+1 dBm	**Class AB: -34 dB, Class A: - 43 dB**	**-80 dB ****	N/M	N/M	35 ms	38 ms	**$5,779**	www.yaesu.com
42	**Expert SunSDR2 Pro, October 2016**	-118 dBc	129 dB	**78 dB**	-65 dBc	107 dB	**78 dB**	N/M	N/M	-30 dB	-57 dB	**-95 dB**	-135 dB	**120 ms**	69 ms	**$2,100**	www.eesdr.com
43	**Yaesu FT-450D, November 2011**	N/M	134 dB	97 dB	N/M	88 dB	**76 dB**	+16 dBm	-21 dBm	-25 dB	-50 dB	N/M	N/M	50 ms	26 ms	**$999**	www.yaesu.com
44	**Yaesu FT-950, March 2008**	N/M	128 dB	95 dB	N/M	98 dB	**71 dB**	+21 dBm	-4 dBm	-35 dB	-56 dB	N/M	N/M	25 ms	39 ms	**$1,449**	www.yaesu.com
45	**Alinco DX-SR8T, June 2011**	N/M	100 dB	94 dB	N/M	83 dB	**70 dB**	+1 dB	-30 dBm	-28dB	-53 dB	N/M	N/M	**102 ms**	50 ms	**$519**	www.alinco.com
46	**Yaesu FT-2000D, October 2007**	N/M	136 dB	98 dB	N/M	87 dB	**69 dB**	+26 dBm	-16 dBm	**Class AB: -31 dB, Class A: -41 dB**	Class AB: -47 dB, Class A: -65 dB	N/M	N/M	24 ms	37 ms	**$3,549**	www.yaesu.com
47	**Icom IC-7100, July 2014**	-103 dBc	120 dB	95 dB	-84 dBc	89 dB	**68 dB**	+13 dBm	-25 dBm	-34 dB	-49 dB	N/M	N/M	30 ms	22 ms	**$1,370**	www.icomamerica.com
48	**Yaesu FT-891, June 2017**	-98 dBc	131 dB	93 dB	-72 dBc	123 dB	**68 dB**	N/M	N/M	-30 dB	-49 dB	-85 dB	-116 dB	30 ms	49 ms	**$700**	www.yaesu.com
49	**Icom IC-7200, June 2009**	N/M	140 dB	99 dB	N/M	83 dB	**67 dB**	+23 dBm	-11 dBm	-32 dB	-58 dB	N/M	N/M	30 ms	13 ms	**$1,396**	www.icomamerica.com
50	**Yaesu FT-450, December 2007**	N/M	134 dB	97 dB	N/M	90 dB	**67 dB**	+13 dBm	-31 dBm	-30 dB	-48 dB	N/M	N/M	40 ms	20 ms	**N/A**	www.yaesu.com
51	**Yaesu FT-2000, February 2007**	N/M	126 dB	95 dB	N/M	92 dB	**64 dB**	+16 dBm	-22 dBm	-32 dB	-60 dB	N/M	N/M	27 ms	35 ms	**$2,819**	www.yaesu.com
52	**Icom IC-7000, May 2006**	N/M	112 dB	89 dB	N/M	86 dB	**63 dB**	+6 dBm	-27 dBm	-33 dB	-58 dB	N/M	N/M	24 ms	12 ms	**$1,299**	www.icomamerica.com
53	**Alinco DX-SR9T, October 2014**	-88 dBc	114 dB	87 dB	-72 dBc	91 dB	**60 dB**	+17 dBm	-25 dBm	-28dB	-47 dB	N/M	N/M	96 ms	60 ms	**$770**	www.alinco.com

QST Magazine Product Reviews - Key Measurements Summary - HF Power Amplifiers (page 4 / 7)

	Subject of measurement, HF	Driving Power	Output Power, CW	Spurious and harmonic suppression 3rd harmonic worst case	**Transmit 3rd-order IMD**	Transmit 5th-order IMD	Transmit 7th-order IMD	Transmit 9th-order IMD	TR switching time key to RF	TR switching time un-key to power off	NEW: Weight	Listprice in USD (1997-2016)	Company's site
	HF Power Amplifiers sorted by 3rd-order IMD and if equal by 9th-order IMD												
1	**Alpha 8100, April 2007**	50-55 W	1500 W	-55 dBc	**-52 dB**	-48 dB	-53 dB	-61 dB	N/M	N/M	**31.3 kg**	**$4,850**	www.rfconcepts.com
2	**Ameritron AL-800H, September 1997**	41-61 W	1500 W	-50 dBc	**-49 dB**	-55 dB	N/M	N/M	N/M	N/M	**23.6 kg**	**$2,295**	www.ameritron.com
3	**AlphaPower 91b, September 1997**	45-80 W	1500 W	-52 dBc	**-45 dB**	-49 dB	N/M	N/M	N/M	N/M	**29.9 kg**	**$2,798**	www.rfconcepts.com
4	**Acom 1000, November 2002**	70 W ~	1000 W	-53 dBc	**-44 dB**	-55 dB	N/M	N/M	N/M	N/M	**22 kg**	**$2,750**	www.acom-bg.com
5	**OM Power OM2500A, November 2014**	48-60 W ~	1500 W	-49 dBc	**-43 dB**	-44 dB	>-60 dB	-56 dB	10 ms	10 ms	**41.7 kg**	**$7,995**	www.om-power.com
6	**QRO Technologies HF-2500DX, September 1997**	40-80 W	1500 W	-46 dBc	**-43 dB**	-40 dB	N/M	N/M	N/M	N/M	**40,8 kg**	**$2,895**	www.qrotec.com
7	**SPE Expert 1K-FA, September 2009**	28-32 W ~	900 W	-51 dBc	**-42 dB**	-43 dB	-49 dB	-56 dB	N/M	N/M	**20 kg**	**$3,850**	www.radio-ham.eu
8	**Acom 600S, August 2015**	22-28 W ~	600 W	>-60 dBc	**-42 dB**	-39 dB	-49 dB	-55 dB	12 ms	23 ms	**12 kg**	**$2,800**	www.acom-bg.com
9	**RM Italy HLA305V, April 2016**	3.3-14.4 W ~	200 W ***	57-70 dBc	**-40 dB *** **	-40 dB	-50 dB	-63 dB	3 ms	4 ms	**4.4 kg**	**$700**	www.rmitaly.us
10	**Ten-Tec Centaur Model 411, June 1997**	90-100 W	600 W	-48 dBc	**-39 dB**	-45 dB	N/M	N/M	N/M	N/M	**18 kg**	**$750**	www.tentec.com
11	**Ameritron ALS-1300, September 2011**	65-100 W ~	1200 W @	-49 dBc	**-38 dB**	-43 dB	-54 dB	**-49 dB**	N/M	N/M	**6.8 kg**	**$2,400**	www.ameritron.com
12	**Hardrock 50, December 2014**	2,4-5 W	50 W	-48 dBc	**-38 dB**	-33 dB	**-38 dB**	**-46 dB**	3,2 ms	3,8 ms	**1.4 kg**	**$299**	www.hobbypcb.com
13	**Acom 2000A, May 2000**	50-60 W	1500 W	-50 dBc	**-37 dB**	-60 dB	N/M	N/M	N/M	N/M	**35.8 kg**	**$5,500**	www.acom-bg.com
14	**Acom 1010, December 2006**	60 W ~	500 W	-53 dBc	**-37 dB**	-53 dB	-56 dB	-62 dB	N/M	N/M	**18 kg**	**$2,340**	www.acom-bg.com
15	**Emtron DX-1d, December 2004**	40-60 W	750 W	-45 dBc	**-37 dB**	-46 dB	N/M	N/M	N/M	N/M	**20 kg**	**$2,184**	www.emtron.com.au
16	**Ameritron ALS-600, August 2001**	100 W ~	400 W	-49 dBc	**-37 dB**	-40 dB	N/M	N/M	N/M	N/M	**22 kg**	**$1,130**	www.ameritron.com

QST Magazine Product Reviews - Key Measurements Summary - HF Power Amplifiers (page 5 / 7)

	Subject of measurement, HF	Driving Power	Output Power, CW	Spurious and harmonic suppression 3rd harmonic worst case	**Transmit 3rd-order IMD**	Transmit 5th-order IMD	Transmit 7th-order IMD	Transmit 9th-order IMD	TR switching time key to RF	TR switching time un-key to power off	NEW: Weight	Listprice in USD (1997-2016)	Company's site
	HF Power Amplifiers sorted by 3rd-order IMD and if equal by 9th-order IMD												
17	**Ten-Tec 418, February 2013**	1-20 W	100 W	-52 dBc	**-37 dB**	-38 dB	-47 dB	-57 dB	N/M	N/M	**2.5 kg**	**$785**	www.tentec.com
18	**Ameritron ALS-1306, January 2016**	60-100 W	1100 W	-60 dBc	**-37 dB**	-40 dB	-54 dB	-56 dB	12 ms	29 ms	**5.4 kg**	**$3,000**	www.ameritron.com
19	**Icom IC-PW1, February 2001**	40 W ~	1000 W @	-60 dBc	**-36 dB**	-41 dB	N/M	N/M	N/M	N/M	**25 kg**	**$5,400**	www.icomamerica.com
20	**Tokyo Hy-Power HL-1.2KFX, June 2008**	75-95 W	630 W	-55 dBc	**-36 dB**	-39 dB	-50 dB	-68 dB	N/M	N/M	**15 kg**	**$2,350**	**None**
21	**Tokyo Hy-Power HL-1.5KFX, September 2007**	85 W	900 W	-52 dBc	**-36 dB**	-39 dB	-50 dB	-57 dB	N/M	N/M	**20.6 kg**	**$3,000**	**None**
22	**Elecraft KPA500, February 2012**	30-40 W	500 W	-51 dBc	**-34 dB**	-53 dB	-46 dB	-54 dB	N/M	N/M	**11.8 kg**	**$2,400**	www.elecraft.com
23	**Acom 1500, June 2013**	53-73 W ~	1500 W @	>-50 dBc	**-33 dB**	-39 dB	-50 dB	-55 dB	N/M	N/M	**26.5 kg**	**$4,750**	www.acom-bg.com
24	**Yaesu VL-1000, January 2002**	40 W ~	1000 W @	-60 dBc	**-32 dB**	-44 dB	N/M	N/M	N/M	N/M	**35.4 kg**	**$4,000**	www.yaesu.com
25	**SPE Expert 2K-FA, November 2013**	36-48 W ~	1500 W	-49 dBc	**-32 dB**	-39 dB	-49 dB	<-60 dB	7 ms	17 ms	**25 kg**	**$7,300**	www.radio-ham.eu
26	**Elecraft KXPA100, October 2014**	4-6 W ~	100 W	-42/-65 dBc	**-32 dB**	-34 dB	-42 dB	-52 dB	3 ms	8 ms	**2.4 kg**	**$750**	www.elecraft.com
27	**SPE Expert 1.3K-FA, July 2016**	25-35 W ~	1300 W ~	>-60 dBc	**-31 dB**	-39 dB	-57 dB	-55 dB	13 ms	5 ms	**9.5 kg**	**$4,995**	www.radio-ham.eu
28	**Tokyo Hy-Power HL-550KFX, March 2013**	50-80 W ~	550 W ~	-55 dBc	**-30 dB**	-43 dB	-50 dB	-57 dB	N/M	N/M	**9.5 kg**	**$3,000**	**None**
29	**Ameritron ALS-600, March 2005**	100 W ~	400 W	-49 dBc	**-30 dB**	-40 dB	N/M	N/M	N/M	N/M	**10.2 kg**	**$1,428**	www.ameritron.com
30	**Ten-Tec Titan III, March 2004**	75 W ~	1500 W	-43 dBc	**-30 dB**	-37 dB	N/M	N/M	N/M	N/M	**38.1 kg**	**$3,565**	www.tentec.com
31	**TenTec Titan II, September 2001**	60 W ~	1500 W	-43 dBc	**-29 dB**	**-31 dB**	N/M	N/M	N/M	N/M	**38.1 kg**	**$2,990**	www.tentec.com
32	**SGC SG-500, February 2006**	50 W ~	500 W	-49 dBc	**-28 dB !**	-48 dB !	-49 dB !	-53 dB !	N/M	N/M	**9.5 kg**	**$1,395**	www.sgcworld.com

Notes (page 6 / 7)

= IMD
* = Blocking exceeded the levels indicated
** = Below / above measurable levels
*** = Stick with the low power (200 W) setting for the cleanest signal. On HI setting (250 W) 3rd-order IMD= -29 dB
~ = Typical
% = Preamp off
! = vs. carrier
@ = PEP
$ = Listprice in US according to Elecraft, FlexRadio, TenTec and Universal Radio
N / A = Not applicable
N / M = Not measured

Please take into account that there might be a difference in the numbers when comparing the older product reviews compared to the later product reviews, due to changes in the testing methodology, measurements filters, etcetera.

Dark green = awesome
Green = excellent
Light green = good
Yellow = average
Orange = moderate
Red = poor
Dark red = bad

Blocking gain compression:

When a very strong off channel signal appears at the input to a receiver it is often found that the sensitivity is reduced. The effect arises because the front end amplifiers run into compression as a result of the off channel signal.
This often arises when a receiver and transmitter are run from the same site and the transmitter signal is exceedingly strong. When this occurs it has the effect of suppressing all the other signals trying to pass through the amplifier, giving the effect of a reduction in gain.
Blocking is generally specified as the level of the unwanted signal at a given offset (normally 20 kHz) which will give a 3 dB reduction in gain. A good receiver may be able to withstand signals of about ten milliwatts before this happens.
The blocking specification is now more important than it was many years ago. With the increase in radio communications systems in use, it is quite likely that a radio transmitter will be operating in the close vicinity to a receiver.
If the radio receiver is blocked by the neighbouring transmitter then it can seriously degrade the performance of the overall radio communications system.

Reciprocal mixing dynamic range:

ARRL Lab reports three dynamic range measurements that determine a transceiver's overall performance.
Along with blocking gain compression dynamic range and two tone third order dynamic range, we must consider RMDR while evaluating how well a receiver hears.
Which of these measurements is the most important factor in comparing receivers depends a lot on how you plan to use that receiver. For hearing weak signals at or near the receiver's noise floor, receiver noise typically is the limiting factor. For the reception of stronger signals under crowded band conditions, two tone third order DR is the most important number.
To assess a receiver's ability to perform well in the presence of a single, strong off-channel signal (common within geographical ham radio “clusters” or with another ham on the same block), blocking gain compression DR is usually the dominant factor.
Reciprocal mixing is noise generated in a superheterodyne receiver when noise from the local oscillator (LO) mixes with strong, adjacent signals . All LOs generate some noise on each sideband, and some LOs produce more noise than others.
This sideband noise mixes with the strong, adjacent off-channel signal, and this generates noise at the output of the mixer. This noise can degrade a receiver's sensitivity and is most notable when a strong signal is just outside the IF passband.
RMDR at 2 kHz spacing is almost always the worst of the dynamic range measurements at 2 kHz spacing that we report in the “Product Review” data table.

3rd order dynamic range:

The difference in decibels between the weakest signal the receiver can handle and the strongest signal the same receiver can handle simultaneously,
- without the need of using additional controls of the receiver, manually carried out by the operator - within 20 kHz (wide spaced) and 2 kHz (close in) within the receiver's passband.
For more information on this important item, written by Rob Sherwood NC0B, please use this link: http: / / www.sherweng.com / documents / Barc2008.pdf

3rd order intercept:

This more or less theoretical point, gives a good indication of a receiver's overall strong signal performance. Third order intercept is related to two-tone third order IMD.
When receiver's response on desired and undesired signals (within the passband) were plotted in the same graph, the two lines would intersect at a point called the third-order intercept.
ARRL Product Review testing includes Two-Tone IMD results at several signal levels. Two-tone, Third-order Dynamic Range figures comparable to previous reviews are shown on the first line in each group.
The “IP3” column is the calculated Third-order Intercept Point. Second-order intercept points were determined using –97 dBm reference.
Third order two-tone dynamic range values shown are best case. IMD DR depends on band activity and signal strengths. See text and February 2010 QST, page 52, for an explanation.

As from May 2016 you may notice ARRL is no longer publishing third-order intercept point data for receivers. Technology has changed, and most modern receivers do not have a 3:1 ratio between the IMD signal level and the IMD input level.
This ratio can be significantly higher or lower than 3:1. Since the IP3 figure is mathematically based on a 3:1 ratio, publication of this data would be meaningless. Instead, pay attention to the three dynamic ranges — IMD, blocking, and reciprocal mixing.
The lowest of these three dynamic ranges represents the limiting dynamic range of the receiver.

Notes continued, Version, Website and Disclaimer (page 7 / 7)

Transmit 3rd and 9th order IMD:
All measurements in dB are below PEP output, except note !.
Transmit two-tone intermodulation distortion, or two-tone IMD, is a measure of spurious output close to the desired audio of a transmitter being operated in SSB mode. This spurious output is often created in the audio stages of a transceiver, but any amplification stage can contribute**
If you have ever heard someone causing "splatter", the noisy audio that extends beyond a normal 3 kHz nominal SSB bandwidth, then you have heard the effects of transmit IMD.
Frequencies close to the transmit signal are affected the most, but depending on the amount of IMD, large portions of the band can suffer from one poor transmitter**
Pure Signal = Pre Distortion

Transmit phase noise
As from May 2016, ARRL introduces several changes to the Key Measurements Summary chart for HF transceivers. ARRL has added bars for transmitted phase noise, which are important parameters of transmission quality, in addition to transmitted intermodulation distortion (IMD) products on SSB.
Over the past decade, we have seen substantial improvements in receiver technology in terms of dynamic range — the ability to perform well in a band crowded with strong signals.
However, the best receiver cannot remove interference created by the poor transmission quality of an adjacent signal.
High levels of IMD products caused by poor transmitter design or improper adjustment causes SSB splatter on both sides of the intended transmitted spectrum, interfering with others on nearby frequencies.
High levels of transmitted phase noise add to the background noise level, masking signals that would normally be audible.

Transmit keying bandwidtch
As from May 2016, ARRL introduces several changes to the Key Measurements Summary chart for HF transceivers. ARRL has added bars for transmitted CW keying sidebands, which are important parameters of transmission quality.
The ranges for these new Key Measurements were determined from data of 30 transceivers tested from 2008 to the present.
The transmitter Key Measurements give an indication of the overall cleanliness of the transmitter. As with the receiver dynamic range measurements, more detailed information is available in the accompanying table of tests performed in the ARRL Lab.
ARRL will also continue to publish the detailed plots showing keying waveform, keying sidebands, and transmitted phase noise.
Note that high keying sideband levels are mainly caused by little or no rise and / or fall time (≤1 millisecond) on the keying waveform.
A transmitter with a 1 millisecond of rise and / or fall time will create key clicks and keying sidebands that are 35 dB down and 500 Hz away from the carrier and will likely interfere with neighboring stations.
The Lab tests transceivers with default settings, but some radios that are very clean at default settings can be adjusted for rise / fall times that increase the keying sidebands significantly.
Strong keying CW sidebands from an adjacent transmitter can cause a thumping sound in the speaker, with or without key clicks.

RX / TX turnaround time (TX delay) SSB:
The delay between receive and transmit, important for digital modes. A transmit-to-receive delay of 35 ms or less in SSB indicates that the rig is suitable for digital operation.

For more information (including what the numbers really mean) please read ARRL's QST Magazine August 2004 and January 2006 very interesting articles, and the ARRL Lab Test Procedures Manual which is available at the ARRL.

Version October 1, 2017
Please send me an e-mail (to: hans at pa1hr dot nl) if you have corrections, remarks, etc.

Visit my website on www.pa1hr.nl (redirect page of www.remeeus.eu)

Disclaimer:
The following applies to the pages you are currently viewing. By the pages, you agree to this disclaimer.
This overview is provided for your convenience by Hans PA1HR; it is a summary of measurement figures and gives no indication of the ergonomics, the features and / or the operational characteristics of the transceivers / receivers.
The measurement figures in this overview are from the ARRL Laboratory and published in QST Magazine.
These pages are just a non-official overview, where no one should draw any conclusions.
The overview on these pages is written with the utmost care, yet, PA1HR assumes no liability for any inaccuracies in the displayed.
PA1HR is not responsible for the content in this overview, on these pages and / or companies referenced.