

DB and S Signal level relations
 3-18-2021, Updated to reflect that voltages are in RMS.
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There are 3 parts to this chart: 1. Combined, 2. R-390A, 3. S levels

Note: 1 S unit = 6 db, +10 db = x3.16 uv, +20 db = x10 uv
 All voltages are in RMS.

Receiver input level:	@ 50 ohms	.5uv = 0db Collins KWM2	1uv = 0db R-390A
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-115 dbm (S2)	.4 uv		
-113 dBm	.5 uv	0 db	
-109 dbm (S3)	.8 uv	4 db	
-107 dbm	1.0 uv	6 db	0 db*
-103 dBm (S4)	1.58 uv	10 db	4 db
-97 dbm (S5)	3.16 uv	16 db	10 db
-93 dBm	5 uv	20 db	14 db*
-91 dbm (S6)	6.3	22 db	16 db
-85 dbm (S7)	12.6	28 db	22 db
-83 dBm	15.8 uv	30 db	24 db*
-79 dbm (S8)	25.1	34 db	28 db
-73 dBm (S9)	50.2 uv	40 db	34 db
-63 dBm (S9 +10)	160.0	50 db	44 db
-53 dBm (S9 +20)	500 uv	60 db	54 db
-43 dBm (S9 +30)	1,600	70 db	64 db
-33 dBm (S9 +40)	5,000	80 db	74 db
-23 dBm (S9 +50)	16,000	90 db	84 db
-13 dBm (S9 +60)	50,000	100 db	94 db
-3 dBm (S9 +70)	160,000	110 db	104 db

* These are offset because there is no even 'S' signal level for them.

R-390A	
1uv = 0db	uv in RMS
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0 db	1.0 uv
10 db	3.16 uv
20 db	10 uv
30 db	31.6 uv
40 db	100 uv
50 db	316 uv
60 db	1,000 uv
70 db	3,160 uv
80 db	10,000 uv
90 db	31,600 uv
100 db	100,000 uv

S-reading on HF -----	Signal Generator emf		
	μV @ 50 ohms -----	dBm -----	(R-390A) dB above 1uV -----
S9+70dB	160,000	-3	104
S9+60dB	50,200	-13	94
S9+50dB	16,000	-23	84
S9+40dB	5,020	-33	74
S9+30dB	1,600	-43	64
S9+20dB	502.0	-53	54
S9+10dB	160.0	-63	44
S9	50.2	-73	34
S8	25.1	-79	28
S7	12.6	-85	22
S6	6.3	-91	16
S5	3.2	-97	10
S4	1.6	-103	4
S3	0.8	-109	-2
S2	0.4	-115	-8
S1	0.2	-121	-14

All voltages are in RMS.

The International Amateur Radio Union (IARU) Region 1 agreed on the S9 standard in 1981. It is the same as agreed to in 1930 (with the addition of the 50 ohms for 50 uv RMS and -73 dBm for the HF bands):