Radio Frequency Band Designations

IEEE Standard Radar Band Nomenclature

(*IEEE Std. 521-2002, IEEE Standard Letter Designations for Radar-Frequency Bands)

Designation	Frequency	Wavelength
HF	3 - 30 MHz	100 m - 10 m
VHF	30 - 300 MHz	10 m - 1 m
UHF	300 - 1000 MHz	100 cm - 30 cm
L Band	1 - 2 GHz	30 cm - 15 cm
S Band	2 - 4 GHz	15 cm - 7.5 cm
C Band	4 - 8 GHz	7.5 cm - 3.75 cm
X Band	8 - 12 GHz	3.75 cm - 2.50 cm
Ku Band	12 - 18 GHz	2.50 cm - 1.67 cm
K Band	18 - 27 GHz	1.67 cm - 1.11 cm
Ka Band	27 - 40 GHz	1.11 cm - .75 cm
V Band	40 - 75 GHz	7.5 mm - 4.0 mm
W Band	75 - 110 GHz	4.0 mm - 2.7 mm
mm Band	110 - 300 GHz	2.7 mm - 1.0 mm

International Telecommunications Union (ITU) Radar Band Nomenclature

(ITU classifications are based on region-2 radiolocation service allocations)

Band Designation	Frequency
VHF	138 - 144 MHz 216 - 225 MHz
UHF	420 - 450 MHz 890 - 942 MHz
L	1.215 - 1.400 GHz
S	2.3 - 2.5 GHz 2.7 - 3.7 GHz
C	5.250 - 5.925 GHz
X	8.500 - 10.680 GHz
Ku	13.4 - 14.0 GHz 15.7 - 17.7 GHz
K	24.05 - 24.25 GHz 24.65 - 24.75 GHz
Ka	33.4 - 36.0 GHz
V	59.0 - 64.0 GHz
W	76.0 - 81.0 GHz 92.0 - 100.0 GHz
mm	126.0 - 142.0 GHz 144.0 - 149.0 GHz 231.0 - 235.0 GHz 238.0 - 248.0 GHz

Military Radar Band Designations		
Band	**Frequency**	**Wavelength**
HF	3 - 30 MHz	100 m - 10 m
VHF	30 - 300 MHz	10 m - 1 m
UHF	300 - 1000 MHz	100 cm - 30 cm
L	1 - 2 GHz	30 cm - 15 cm
S	2 - 4 GHz	15 cm - 7.5 cm
C	4 - 8 GHz	7.5 cm - 3.75 cm
X	8 - 12 GHz	3.75 cm - 2.50 cm
Ku	12 - 18 GHz	2.50 cm - 1.67 cm
K	18 - 27 GHz	1.67 cm - 1.11 cm
Ka	27 - 40 GHz	1.11 cm - .75 cm
mm	40 - 300 GHz	7.5 mm - 1.0 mm

ITU Frequency Band Nomenclature			
ITU Band	**Designation**	**Frequency**	**Wavelength**
1	ELF	3 - 30 Hz	100,000 km - 10,000 km
2	SLF	30 - 300 Hz	10,000 km - 1000 km
3	ULF	300 - 3000 Hz	1000 km - 100 km
4	VLF	3 - 30 kHz	100 km - 10 km
5	LF	30 - 300 kHz	10 km - 1 km
6	MF	300 - 3000 kHz	1 km - 100 m
7	HF	3 - 30 MHz	100 m - 10 m
8	VHF	30 - 300 MHz	10 m - 1 m
9	UHF	300 - 3000 MHz	1 m - 10 cm
10	SHF	3 - 30 GHz	10 cm - 1 cm
11	EHF	30 - 300 GHz	1 cm - 1 mm

Band Designation Acronyms
Extremely Low Frequency (ELF) Super Low Frequency (SLF) Ultra Low Frequency (ULF) Very Low Frequency (VLF) Low Frequency (LF) Medium Frequency (MF) High Frequency (HF) Very High Frequency (VHF) Ultra High frequency (UHF) Super High Frequency (SHF) Extremely High Frequency (EHF)

***IEEE Std 521-2002 (IEEE Standard Letter Designations for Radar-Frequency Bands)**

IEEE Standard 521 reaffirms the use of letter band designations for radar frequency bands. It relates the letter designators in common usage to the frequency ranges that they represent. The 1984 revision defined the application of V and W to a portion of the millimeter wave region while retaining the previous letter designators for frequencies. The current (2002) revision keeps the same letter band designations and includes a change in the definition of millimeter wave frequencies to conform to the ITU nomenclature. The letter band designations are not a substitute for the specific frequency limits of the frequency bands. The specific frequency limits should be used when appropriate, unless a letter designation of the radar frequency band is required. The letter designations described in this standard are designed for radar usage and are used in current practice. They are not meant to be used for other radio or telecommunication purposes, unless they pertain to radar.

Microwave Frequency Bands

The UHF (upper), SHF and EHF regions of the electromagnetic frequency spectrum are generally classified as microwave frequencies. The letter designations (L, S, C, X, Ku, K, Ka) were meant to be used for radar, but have become commonly used for other microwave frequency applications.