



Field Engineering Bulletin

Designation of Frequency Emissions

BULLETIN
NUMBER

18

Purpose: The purpose of this Field Engineering Bulletin is to update information pertaining to radio frequency emission and characteristics as contained in Article 2 of Geneva 1959 Radio Regulations.

As an adjunct to the use of frequency designations, the frequency spectrum bands are included for information.

<u>Band number</u>	<u>Frequency range (lower limit exclusive, upper limit inclusive)</u>	<u>Metric subdivision</u>
4	3 to 30 kc/s (VLF)	Myriametric waves
5	30 to 300 kc/s (LF)	Kilometric waves
6	300 to 3000 kc/s (MF)	Hectometric waves
7	3 to 30 Mc/s (HF)	Decametric waves
8	30 to 300 Mc/s (VHF)	Metric waves
9	300 to 3000 Mc/s (UHF)	Decimetric waves
10	3 to 30 Gc/s (SHF)	Centimetric waves
11	30 to 300 Gc/s (EHF)	Millimetric waves
12	300 to 3000 Gc/s or 3 Tc/s	Decimillimetric waves

Note:—Abbreviations

k = kilo (10^3)
M = Mega (10^6)
G = Giga (10^9)
T = Tera (10^{12})

Emissions are designated according to their classification and their necessary bandwidth.

Emissions are classified and symbolized according to the following characteristics:

- 1.) Type of modulation of the main carrier.
- 2.) Type of transmission.
- 3.) Supplementary characteristics.

1.) Types of modulation of main carrier*	Symbol
a) Amplitude	A
b) Frequency (or Phase)	F
c) Pulse	P
2.) Types of transmission	
a) Absence of any modulation intended to carry information ..	0
b) Telegraphy without the use of a modulating audio frequency	1
c) Telegraphy by the on-off keying of a modulating audio frequency or audio frequencies, or by the on-off keying of the modulated emission. (Special case: an unkeyed modulated emission)	2
d) Telephony (including sound broadcasting)	3
e) Facsimile (with modulation of main carrier either directly or by a frequency modulated sub-carrier)	4
f) Television (vision only)	5
g) Four-frequency duplex	6
h) Multichannel voice-frequency telegraphy	7
i) Cases not covered by the above	9
3.) Supplementary characteristics:	
a) Double sideband	(none)
b) Single sideband	
—reduced carrier (—6 to —26 db)**	A
—full carrier (0 to —6 db)**	H
—suppressed carrier (below —26 db)**	J
c) Two independent sidebands	B
d) Vestigial sideband	C
e) Pulse	
—amplitude modulated	D
—width (or duration) modulated	E
—phase (or position) modulated	F
—code modulated	G

*As an exception to the provisions of paragraph 3, damped waves are designated by B.
**Carrier suppression.

SYMBOL	MODULATION TYPE OF MAIN CARRIER	TYPE OF TRANSMISSION	SUPPLEMENTARY CHARACTERISTICS
A0	Amplitude Modulation	With no modulation	None
A1	"	Telegraphy without the use of a modulating audio frequency (by on-off keying)	None
A2	"	Telegraphy by the on-off keying of an amplitude-modulating audio frequency or audio frequencies, or by the on-off keying of the modulated emission (special case: an unkeyed emission amplitude modulated)	None
A3	"	Telephony	Double sideband
A3A	"	Telephony	Single sideband, reduced carrier
A3J	"	Telephony	Single sideband, suppressed carrier
A3B	"	Telephony	Two independent sidebands
A4	"	Facsimile (with modulation of main carrier either directly or by a frequency modulated sub-carrier)	None
A4A	"	Facsimile (with modulation of main carrier either directly or by a frequency modulated sub-carrier)	Single sideband, reduced carrier
A5C	"	Television	Vestigial sideband
A7A	"	Multichannel voice-frequency telegraphy	Single sideband, reduced carrier
A9B	"	Cases not covered by the above, e.g. a combination of telephony and telegraphy	Two independent sidebands
F1	Frequency (or Phase) Modulation	Telegraphy by frequency shift keying without the use of a modulating audio frequency: one of two frequencies being emitted at any instant	None
F2	"	Telegraphy by the on-off keying of a frequency modulating audio frequency or by the on-off keying of a frequency modulated emission (special case: an unkeyed emission, frequency modulated)	None
F3	"	Telephony	None
F4	"	Facsimile by direct frequency modulation of the carrier	None
F5	"	Television	None
F6	"	Four-frequency duplex telegraphy	None

SYMBOL	TYPE OF MODULATION OF MAIN CARRIER	TYPE OF TRANSMISSION	SUPPLEMENTARY CHARACTERISTICS
F9	Frequency (or Phase) Modulation	Cases not covered by the above, in which the main carrier is frequency modulated	None
P0	Pulse Modulation	A pulsed carrier without any modulation intended to carry information (e.g. radar)	None
P1D	"	Telegraphy by the on-off keying of a pulsed carrier without the use of a modulating audio frequency	None
P2D	"	Telegraphy by the on-off keying of a modulating audio frequency or audio frequencies, or by the on-off keying of a modulated pulsed carrier (special case: an unkeyed modulated pulsed carrier)	Audio frequency or audio frequencies modulating the amplitude of the pulses
P2E	"	"	Audio frequency or audio frequencies modulating the width (or duration) of the pulses
P2F	"	"	Audio frequency or audio frequencies modulating the phase (or position) of the pulses
P3D	"	Telephony	Amplitude modulated pulses
P3E	"	Telephony	Width (or duration) modulated pulses
P3F	"	Telephony	Phase (or position) modulated pulses
P3G	"	Telephony	Code modulated pulses (after sampling and quantization)
P9	"	Cases not covered by the above in which the main carrier is pulse modulated	None
		<i>Bandwidths</i> Whenever the full designation of an emission is necessary, the symbol for that emission, as given above, shall be preceded by a number indicating in kilocycles per second the necessary bandwidth of the emission. Bandwidths shall generally be expressed to a maximum of three significant figures, the third figure being almost always a nought or a five.	

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