Table 4-1. HEMP/TEMPEST-related standards and specifications. (Sheet 1 of 3)

Specifications and Standards	Issuer	Superseded by	Short title.
AFSC DM 1-4	USAF	-	Electromagnetic Compact
AFSC DH2-7	USAF	-	Sys Survivability
AFSCM 500-6	USAF	-	EMP Ef on Air Force
AIR-STD-20/16	USAF	-	Des Gde Haz of EMR-Argon Wpn Sys
AIR 1221	SAE	-	EMC Sys Des Require
AIR 1255	SAE		Spect An for EMI Mgmt
AIR 1173	SAE	-	Test Proc-Mar RF Shldng Char
AIR 1404	SAE	-	DC Resis vs. RF IMP-EMI Gask
AIR 1500	SAE	-	Bib Lossy Filters
AN-J-1	USN/USAF	MS 2508	Bonding Jumpers
ANS C63.2	ANSI	IF	RI-FI Meters < 30 MHz
ANS C63.3	ANSI	IF	Msrmts, < 25 MHz
ANS C63.5	ANSI	IP	Msrmt 20 MHz-1 GHz
ANS C63.8	ANSI	IP	Msrmt < 30 MHz
ANS C63.9	ANSI	IP	RI-FI Meters 0.01-15 kHz
ARP 935	SAE	-	Sugg EMI Cntl Plan Outline
ARP 936	SAE	-	EMI 10-microF Capacitor
ARP 958	SAE	IF	Antenna Factors
ARP 1172	SAE	-	Filt. Conv EMI Gen Spec
DCA-330-190-1	DCA	-	Equip Performance
DCAC-330-175-2	DCA	-	DCS Engr Installation
DIAM-50-3A	DIA	-	Phy Security Stds for Sensitive Compartmented Information Facilities
DNA 2114H-1	DNA	-	EMP Hdbk, Des Principles
DNA 2114H-2	DNA	-	EMP Hdbk, Anal & Treating
DNA 2114H-3	DNA	-	EMP Hdbk, Env & Applications
DNA 2114H-4	DNA	-	EMP Hdbk, Resources
DNA 3286-H	DNA	-	EMP Preferred Test Proc.
D65/9371	BSI	-	RFI Aircraft Require
FED-STD-222	All Feds	NACSEM-5100	Info Process Emissions
FED-STD-1030A	DCA/NCS	Proposed	Balanced Dig. Interface Ckts
FED-STD-1030A	DCA/NCS	Proposed	Unbalanced Dig Interface Ckts
FED-STD-1040	DCA/NCS	Proposed	Data Term, Data Ckt Interface
JAN-I-225	USA/USN	MIL-I-6181	Interfer Cntl/Test
J551	SAE	J551A	Vehicle RFI
J551A	SAE	IF	Vehicle RFI
MIL-B-5087B(ASG)	USN/USAF	Amend #2	Aerospace Bonding
MIL-C-11693A	USANAR	MIL-C-11693B	R-I Feedthru Capacitor
MIL-C-11693B	USANAF	IF	R-I Feedthru Capacitor
MIL-C-12889	USA SC	MIL-C-12889A	R-I Bypass Capacitors

Table 4-1. HEMP/TEMPEST-related standards and specifications. (Sheet 2 of 3)

Specifications and Standards	Issuer	Superseded by	Short title
MIL-C-12899A	USANAF	IF	R-I Bypass Capacitors
MIL-C-19080	USAN SHIPS	MIL-C-11693B	R-9 Bypass Capacitors
MIL-C-39011	USANAF	IF	Feedthru Capacitors
MIL-E-4957A	USAF	MIL-E-4957A(ASG)	EMI Shielded Enclosure
MIL-E-4957(ASG)	USN/USAF	Cancelled	EMI Shielded Enclosure
MIL-E-55301(EL)	USA	MIL-STD-461/462	EM Compatibility
MIL-E-6051C	USANAF	MIL-E-6051D	Sys EMC Require
MIL-E-6051D	USANAF	IF	Sys EMC Require
MIL-E-8669	USN BuA	MIL-E-4957A(ASG)	EM Shielded Enclosure
MIL-E-8881	USANAF	IF	Shielded EnclosureMIL-F-
15733C	USANAF	NIL-F-15733D	Radio Interf Filters
MIL-F-15733D	USANAF	NIL-F-15733E	Radio Interf Filters
MIL-F-15733G	USANAF	IF	Radio Interf Filters
MIL-F-18327C	USANAF	-	Filter Specs
MIL-F-18344A	USN	MIL-F-15733C	Radio Interf Filters
MIL-HDBK-232A	USANAF	-	RED/BLACK Engr Instal Gdlines
MIL-HDBK-411	USANAF	-	Long Haul Comm & Env Cntl
MIL-HDBK-419A	USANAF	IP	GBS for Telecomm Facilities
MIL-I-6051	USANAF	MIL-I-6051C	Aircraft EMI Limits
MIL-I-6051A	USAF	MIL-E-006051B	Aircraft EMI Limits
MIL-I-006051B	USAF	MIL-E-6051C	Sys EMC Require
MIL-I-6181	USANAF	MIL-I-6181B	EMI Cntl Aircraft
MIL-STD-188-124A	DOD	-	Grounding, Bonding and Shielding
MIL-STD-202A	DOD	-	Test Methods for Electronic and Electrical Component Parts
MIL-STD-220A	DOD	-	Method of Insertion--Less Measurement
MIL-STD-248C	DOD	-	Welding and Brazing Procedure and Performance Qualification
MIL-STD-285	DOD	-	Attenuation Measurements for Enclosures, etc. Methods
MIL-STD-461C	DOD	-	Electromagnetic Emission and Susceptibility Requirements for Control of EMT
MIL-STD-1542	DOD	-	EMC and Grounding Reqmts for Space Sys Facilities
NACSEM 5109	NSA	-	Tempest Testing Fundamentals
NACSEM 5110	NSA	-	Facilities Evaluation Criteria--TEMPEST

Table 4-1. HEMP/TEMPEST-related standards and specifications. (Sheet 3 of 3)

Specifications and Standards	Issuer	Superseded by	Short title
NACSEM 5201	NSA	-	TEMPEST Guidelines for Equipment/System Design
NACSEM 5204	NSA	-	Shielding Enclosures
NACSI 5004	NSA	-	TEMPEST Countermeasures for
NASCI 5005	NSA	-	TEMPEST Countermeasures for Facilities Outside the U.S.
NACSIM 5000	NSA	-	TEMPEST Fundamentals
NACSIM 5100A	NSA	-	Compromising Emanations Laboratory Test Reqmts, Electromagnetics
NACSIM 5203	NSA	-	Guidelines for Facility Design and RED/BLACK Installation
NSA 65-5	NSA	-	NSA Specification for RF-Shielded Acoustical Enclosures for Communications Equipment
NSA 65-6	NSA	-	NSA Specification for RF-Shielded Enclosure for Communications Equipment
NSA 73-2A	NSA	-	NSA Specification for Foil RF-Shielded Enclosure

Table 4-2. Peak magnetic field values for close lightning strokes.

Peak current (kA)	Magnetic fields (amps/meters)		
	10 m from flash	100 m from flash	10 km from flash
10	1.6×10^{2}	16	1.9×10^{-2}
20	3.2×10^{2}	32	3.8×10^{-2}
30	4.8×10^{2}	48	5.8×10^{-2}
70	1.1×10^{3}	1.1×10^{2}	1.3×10^{-2}
100	1.6×10^{3}	1.6×10^{2}	19×10^{-2}
140	2.2×10^{3}	2.2×10^{2}	27×10^{-2}
200	3.2×10^{3}	3.2×10^{2}	38×10^{-2}

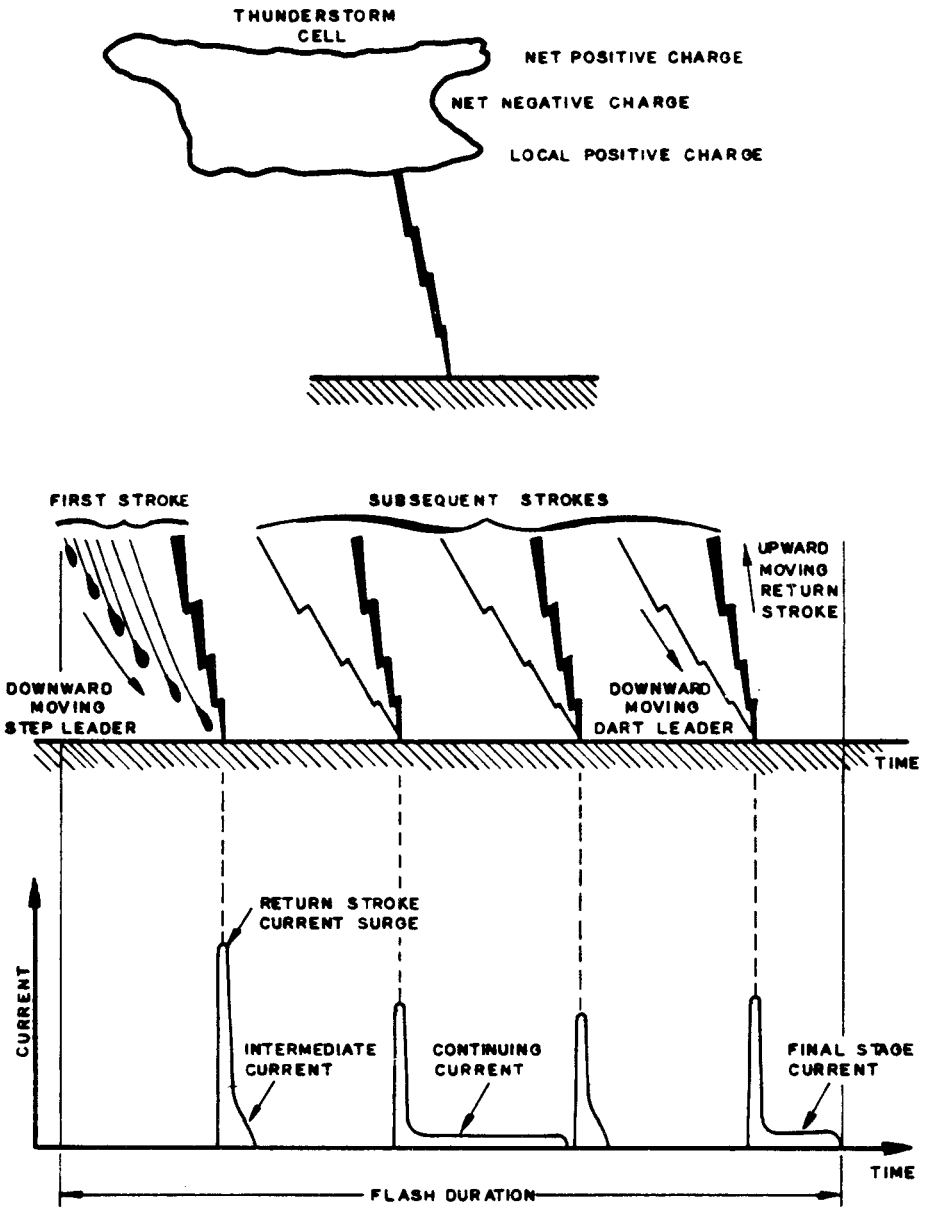

Figure 4-1. Processes and currents occurring in a flash to ground.

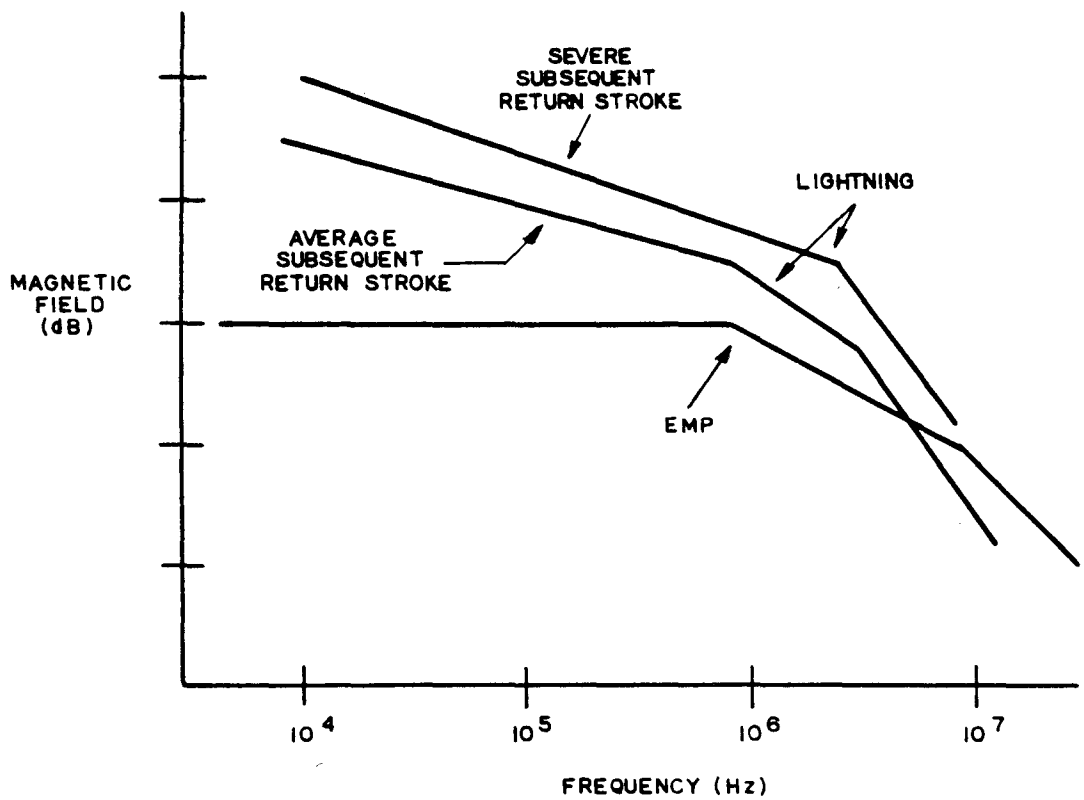

Figure 4-2. EMP and lightning comparison.

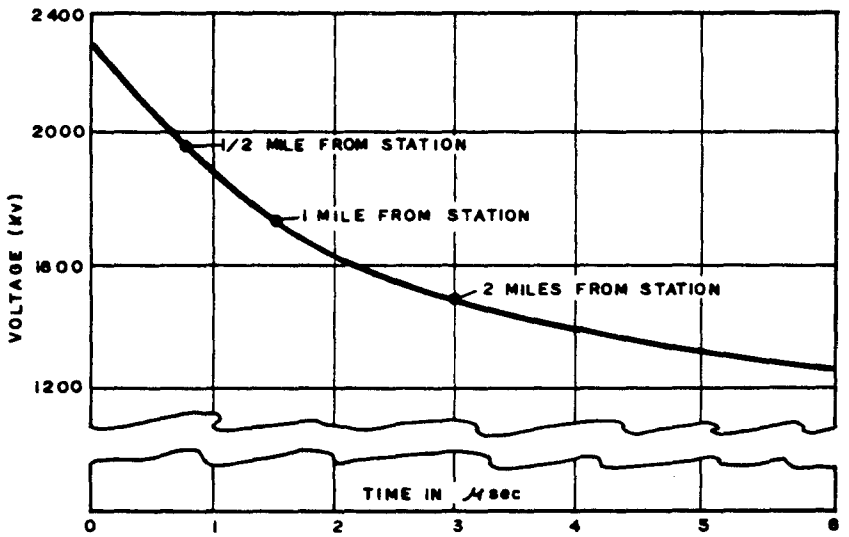

Figure 4-3. Sample power line surge voltage as a function of distance from stroke to line.

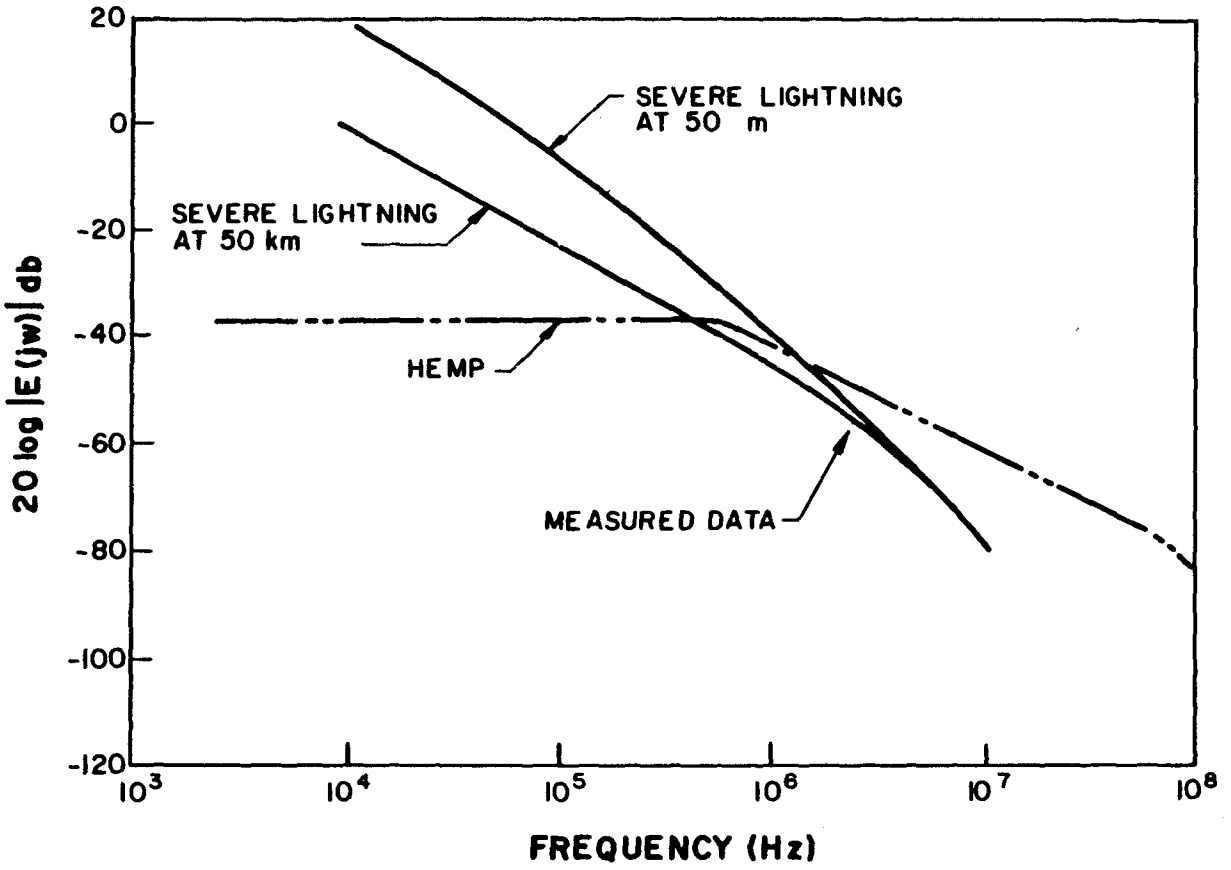

Figure 4-4. Typical spectrum of lightning radiated E-field.

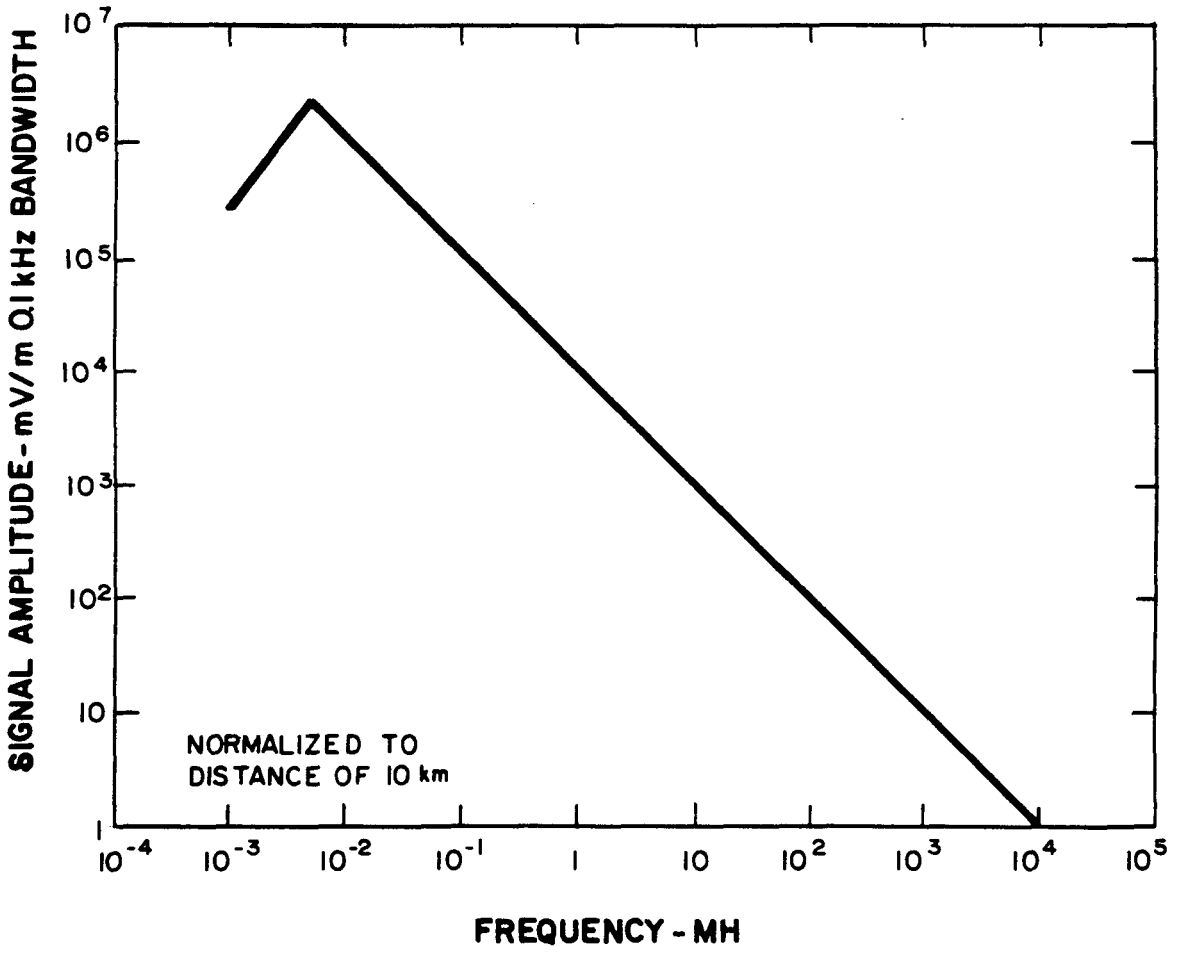

Figure 4-5. Average radiated and static fields for lightning.