



AEROSPACE INFORMATION REPORT

AIR1425™

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Superseding AIR1425A

Methods of Achieving Electromagnetic Compatibility of
Gas Turbine Engine Accessories, for Self-Propelled Vehicles

RATIONALE

The content of this technical report has been superseded by ARP60493 and ARP5583. This document does not specifically address the major concepts associated with modern turbine engine designs. For example, engine ignitor circuits are a significant source of conducted and radiated impulsive electromagnetic signals, but the document does not address any design or mitigation concepts for the ignitor circuits. Most modern turbine engines use full authority electronic engine controls, but these are not specifically addressed in this document. Finally, electromagnetic compatibility of the engine cannot be separated from electromagnetic compatibility of the aircraft in which the engine is installed. Electromagnetic compatibility cannot be handled for the turbine engine separately from the aircraft electromagnetic compatibility.

It also does not address the issues of integrated electromagnetic compatibility for all engine electrical and electronic systems, such as sensors, electronic engine controls, thrust reverser controls, engine control generators, such as PMAs, and the integration of the engine with the aircraft.

This document focuses on test methods associated with early versions of MIL-STD-461, and makes no mention of civil electromagnetic compatibility standards, such as RTCA/DO-160 and ARP60493. It makes no mention of other electromagnetic environments, such as lightning and HIRF, that should be considered in the overall engine electromagnetic environment.

ARP60493 provides more up-to-date information on integrated aircraft electromagnetic compatibility, and ARP5583 provides more up-to-date information on HIRF.

CANCELLATION NOTICE

This technical report has been declared "CANCELLED" as of February 2023. By this action, this document will remain listed in the respective index, if applicable. Cancelled technical reports are available from SAE.

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1. SCOPE:

This SAE Aerospace Information Report (AIR) is a description of methods to be employed to achieve Electromagnetic Compatibility (EMC) of gas turbine engine accessories. Its primary objectives are to aid those system designers of gas turbine assemblies who are employing commercial accessories, which are not always EMC designed, and to outline methods of achieving EMC employing readily available test instrumentation.

- 1.1 Electromagnetic Compatibility (EMC) as defined for this AIR is the ability of all engine accessories to perform within their specified capabilities when subjected to an electromagnetic environment generated by adjacent engine accessories.

2. REFERENCES:

The following references, which by no means can be considered all inclusive, does give information that is easily understood and of a practical nature. Most items listed below may be obtained from their source or from State and University Library Systems.

Charts Simplify Prediction of Noise from Periodic Pulses, by Robert B. Cowdell; Electronics, Sept. 2, 1968.

Simplified Interference Analysis of Waveshapes, by A. W. DeMarzio, Part I Frequency, May 1968, Part II June 1968.

Graphical Analysis of Signals, by Vernon R. Rizzino, Electro-Technology, February, 1966.

2. (Continued):

Simplified Prediction of Conducted and Radiated Interference Levels for Pulses and Step Functions, by L. F. Babcock and P. J. Lagasta, IEEE Transactions on Electromagnetic Compatibility, Vol. EMC-8, No. 2, June, 1966.

Designers Guide to EMI Shielding, by Willem F. Bakker, Machine Design, March 23, 1972.

Modeling of Fields Produced by Currents on Power Supply Wiring, Ralph M. Showers, IEEE Transactions on Electromagnetic Compatibility, November 1971.

Oscillatory Effects of EMI Power Line Filters, by Neal Orkin, IEEE EMC Symposium, July, 1971.

Grounding and Shielding Techniques in Instrumentation, by Ralph Morrison, John Wiley & Sons, Inc., Copyright 1967, 144 Pages.

Filters - a Handbook on Theory and Practice, by The Staff of White Electromagnetics Inc., Rockville, MD, Copyright 1963, 279 Pages.

Electrical Interference, by Rocco F. Ficchi, Hayden Book Company, Inc., New York, Copyright 1967, 262 Pages.

EMC Handbook, Volumes 1 - 5, by Donald R. J. White, Don White Consultants, German Town, Maryland, Copyright 1971-1974.

Electromagnetic Field Theory, by Robert D. Stuart, Addison-Wesley Publishing Company, Inc., Copyright 1965, 214 Pages.

Interference Control Techniques, Sprague Technical Paper, #62-1, by The Staff of the Interference Control Field Service Department Sprague Electric Company, North Adams, Massachusetts.

Electromagnetic Interference Sources and Suppression Techniques, A Compendium of Principles and Practices, EPA HI-693-1540-04-410-000, December 1964, Prepared by N. J. Sladek, Amphenol Connector Division, Amphenol Borg Electronics Corp., Chicago, Illinois.

Interference Reduction Guide, Volumes 1 and 2, A.D. 619666 and A.D. 619667, Prepared by Filtron Company Inc., New York, for U.S.-Army Electronics Laboratory, Fort Monmouth, NJ, Copyright 1965.

AFSC Design Handbook, DH1-4, Electromagnetic Compatibility, First Edition, January 10, 1969.