THE VDE OR FTZ RFI REQUIREMENTS

ITEM has presented a review of the West-German VDE specifications since 1975. To a large extent, each new article was somewhat redundant with the previous one. However, the publishers of ITEM considered it important to repeat the material, since ITEM readers expressed great interest in VDE. Since 1978, the FTZ/VDE specifications have stabilized considerably, consequently, the 1979-82 VDE articles are still pertinent. Also, the FCC Part 15 Subpart J RFI requirements have acquainted the US manufacturer and exporter of equipment with the similarity of the VDE and FCC limits. For these reasons, and starting with this issue of ITEM, only a summary of the VDE limits and new developments will be presented.

FTZ and VDE

Contrary to popular belief, the VDE is not a regulatory agency of the West-German government. The regulatory agency is the Deutsche Bundespost, the German Postal Service. The International Telecommunication Union Treaty of 1947 is the foundation of the "Law for the Operation of High Frequency Apparatus," dated 9 August, 1949. This is generally known as "H Fr G" law and it assigns the responsibility of interference control to the Minister fuer das Post und Fermeldewesen (DP-FTZ). The FTZ, Referat S-24, Am Kavalleriesand, D-6100 Darmstadt, is the adminstrative office, and handles all regulatory matters related to RFI. In 1982, the licensing and permit procedures for RFI matters were assigned to a new office: Deutsche Bundespost, Zentralamt für Zulassungen den Fernmeldewesens (ZZF), Referat: T-4 (for transmitters and HF equipment) Talstrasse 34-42, D-6600 Saarbrücken. The VDE Testing and Approvals Institute is the recognized testing agency of the FTZ.

The interrelationships of VDE specifications, individual permits, general permits and the H Fr G Law are shown in Figure 1. It must also be noted that a new law, Vfg 1115/1982 was released, which updates 529/1970, "The -12 dB Law" and which reaffirms the limit B of VDE 0871 from 10 kHz to 1000 MHz. The H Fr G Law stipulates that a general permit shall be issued if the equipment meets the applicable limits of VDE 0871, VDE 0872 and VDE 0875. The proof of compliance is the "Radio Protection Emblem," issued by the VDE Testing and Approvals Institute, that must be affixed to the equipment for "Limit B" of VDE 0871 or "Limit N" of VDE 0875. For the relaxed "Limit A" requirements of VDE 0871, the equipment must be registered with the FTZ and a "FTZ series Test Number" must be affixed to the equipment.

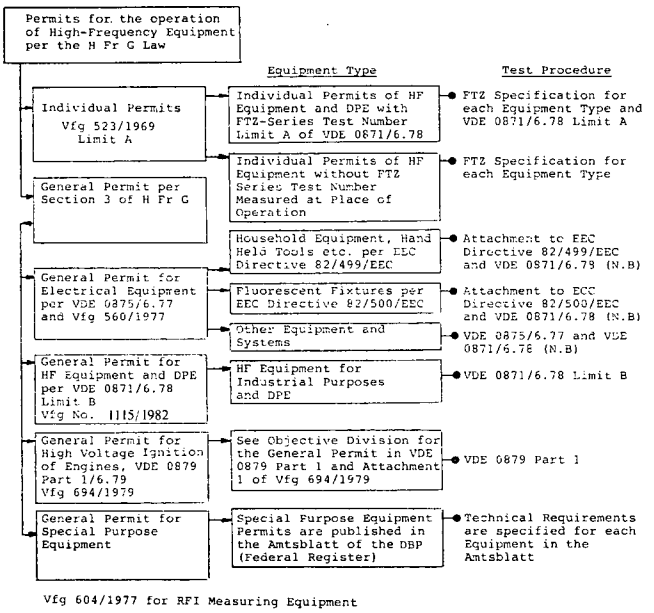

Figure 1. The West German RFI Laws and Test Procedures.

FTZ Limits and VDE Specifications

The VDE -0871 limits are shown in Figures 2 and 3, and are compared to the FCC Part 15 Subpart J limits. For specialized RFI equipment the FTZ also publishes individual RFI limits. For instance, Vfg 1141/1981 is applicable for equipment connected to public wire networks (including Class I TV devices since they may be connected to master antenna systems). The limits shown in Figure 2 are applicable *except* that the B Limit is applicable to Narrowband RFI and the A Limit is applicable to Broadband RFI. The low frequency radiated limit is shown in Figure 4. The measurement distance is 3 meters. The A refers to Broadband RFI and the B refers to Narrowband RFI. (NOTE: As an option, the 30 meter limit is 50 uV/m.) The radiated limit from 30 MHz to 1,000 MHz is 20 dBpW into a resonant dipole. This is measured by the substitution method. The RFI power limit on all conductors shall not exceed 20 dBpW from 30 to 300 MHz when measured with the absorbing clamp.

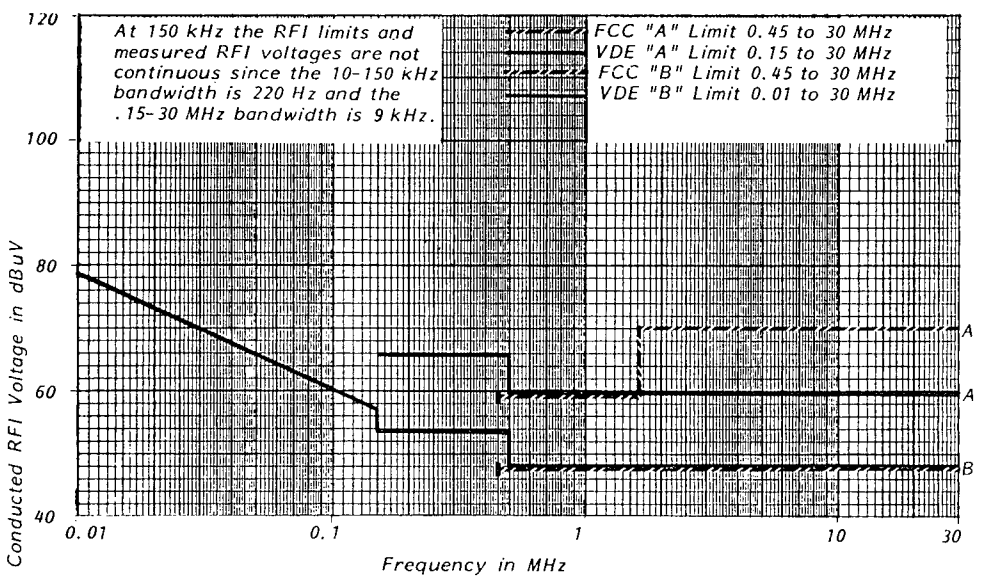

Figure 2. VDE and FCC Conducted Limits.

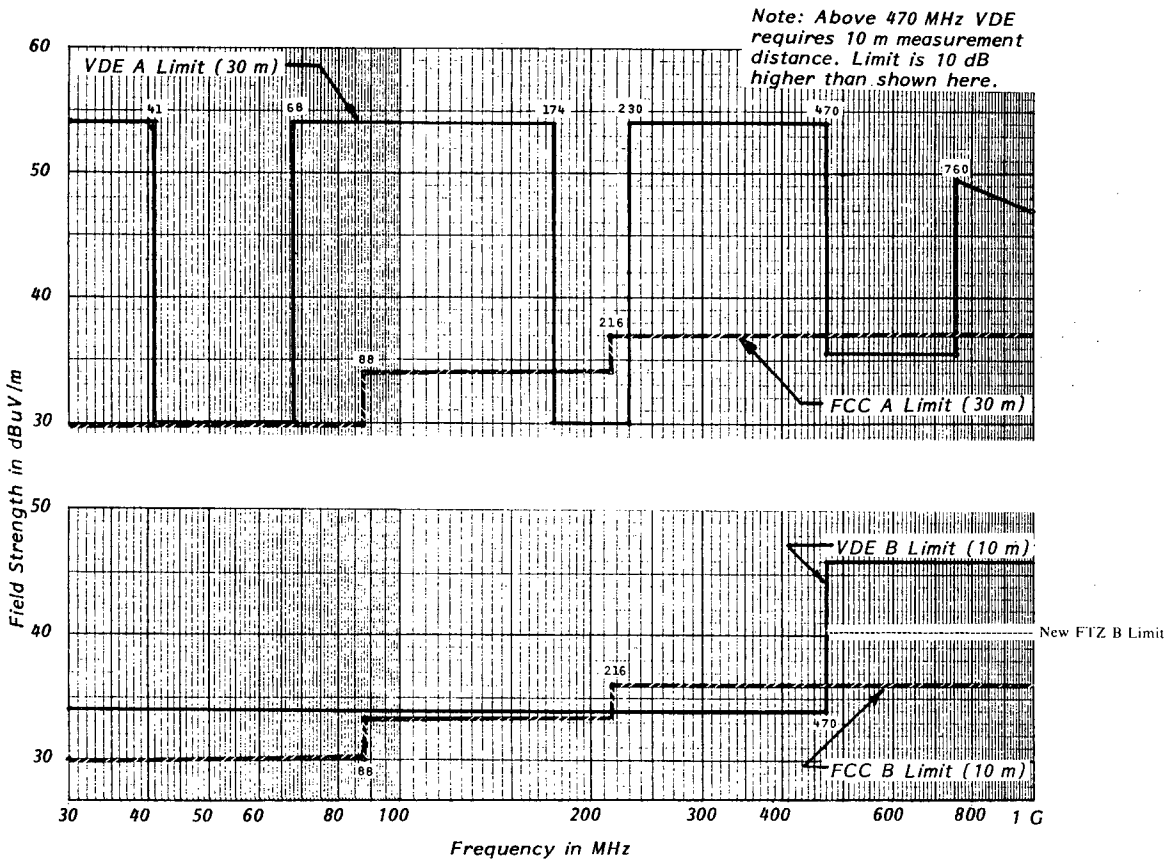

Figure 3. FCC and VDE Radiated Limits.

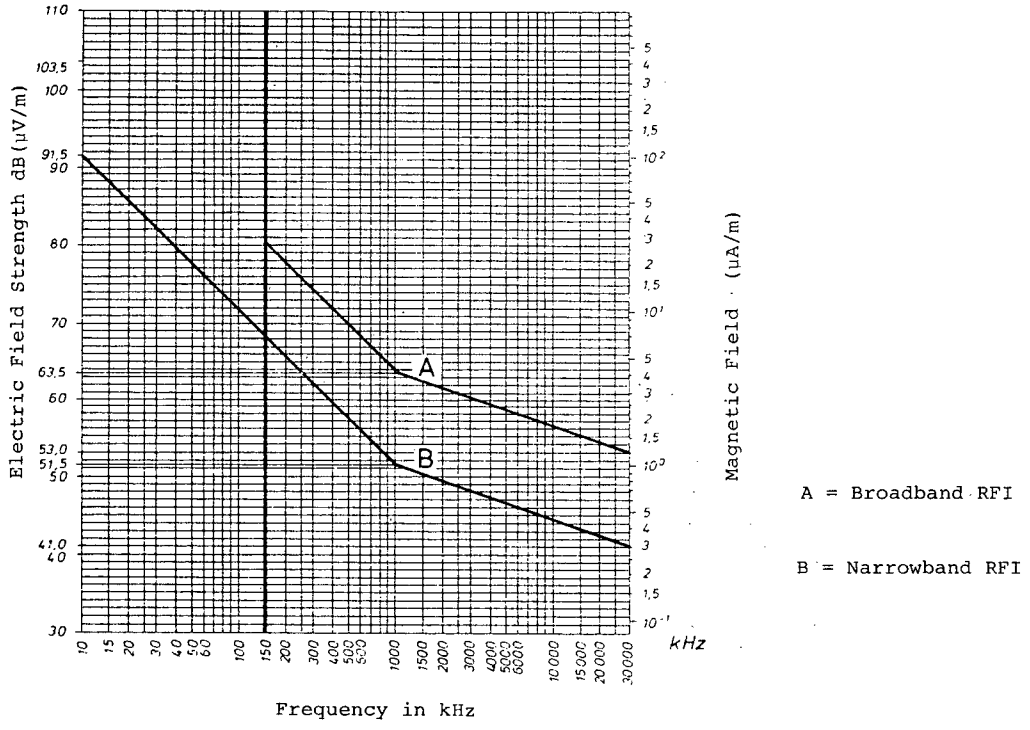

Figure 4. Radiated RFI Limit of Vfg 1141/1981 Measured at 3 Meters; or 50 µV/m Limit at 30 Meters may be used.
A = Broadband RFI
B = Narrowband RFI

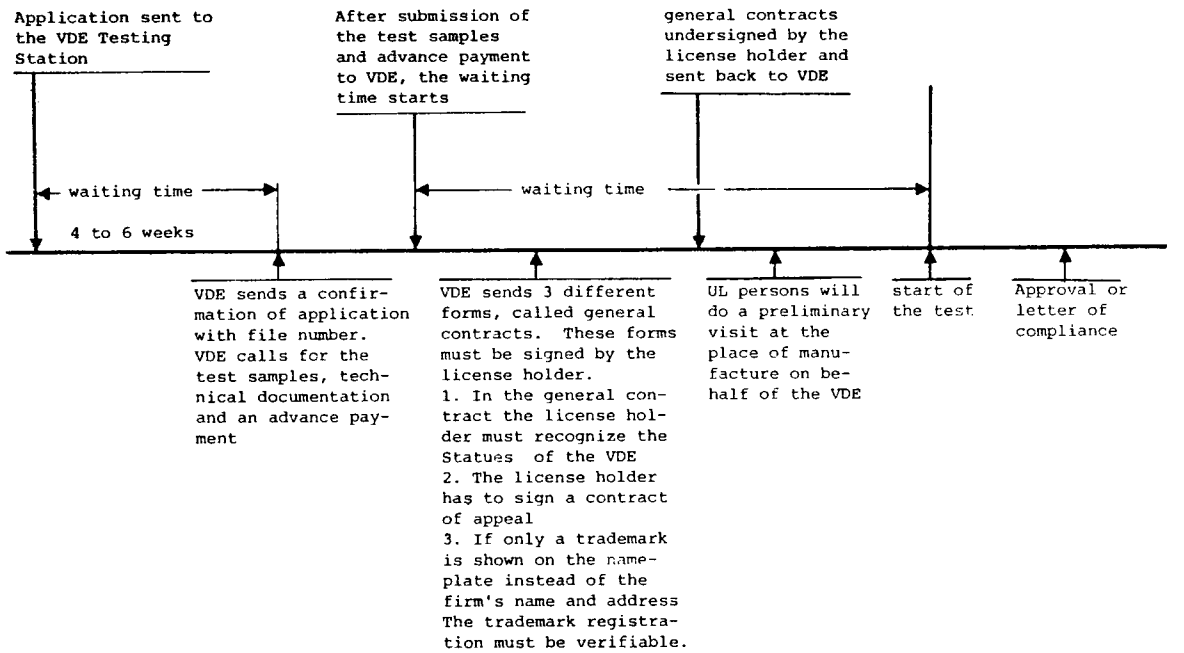

Figure 5. VDE Application Procedure and Test Schedule.

The VDE RFI Specifications

The following VDE specifications are of primary interest. These specifications have been translated as a service to the English-speaking exporting manufacturer.

VDE 0871/6.78	RFI Limits: Equipment Operation Above 10 kHz
VDE 0872/7.72	RFI Limits: Radio and TV Receivers
VDE 0874/10.73	RFI Suppression Design Guide
VDE 0875/6.77	RFI Limits: Equipment Operation Below 10 kHz
VDE 0876-1/9.78	Part 1: RFI Measurement Set
VDE 0877-1/11.81	Part 1: Instruction: RFI Voltage Measurement
VDE 0877-2/12.55	Part 2: Instruction: RFI Field Strength Measurement
VDE 0877-3/4.80	Part 3: Instruction: RFI Power Measurement
VDE 0877-101/..78	Part 101: Instruction: RFI Decoupling Factor Measurement
VDE 0879-1/5.74	Part 1: Ignition System RFI Far-Field Suppression
VDE 0879-2/1.58	Part 2: Ignition System RFI Near-Field Suppression

RFI Control and Electrical Safety

The electrical safety design of a product must comply with the West-German Safety Law. Since the RFI suppression devices influence electrical safety, the capacitors, chokes and filters must be in compliance with VDE 0565 Parts 1 to 3. The insulation requirements for capacitors are:

X Capacitors, Plate-to-Plate,	1075 VDC for 1 minute
	1625 VDC for 2 seconds
Y Capacitors, Plate-to-Plate,	1500 VAC for 1 minute
	1800 VAC for 2 seconds

In addition, the individual requirements of each equipment specification must be considered. For instance VDE 0806/IEC 380 requires a high-pot test of 1250 VAC from line to housing. For this case the 1,500 VAC Y Capacitors will be adequate.

The West-German Safety Law requires that all technical equipment is safe. Compliance with this requirement is demonstrated when electrical equipment is designed to meet the requirements of the VDE specifications. It is not mandatory to have the equipment safety-tested by the VDE Testing and Approvals Institute (NOTE: The RFI test or permit procedure is required by law). However, when the equipment is tested by a recognized testing agency (VDE or TUV) the "GS" mark can be affixed to the end-use equipment.

The VDE safety specifications are being harmonized with the international IEC specifications. For instance, IEC 380, Safety for Office Equipment, is being used by the VDE as VDE 0806. Most other European countries are harmonizing their specifications per the Common Market Directive. In 1982, a CENELEC Certification Agreement (CCA) came into effect. This means that when a test is performed to IEC 380 by the VDE they will also, upon application, issue a CCA, which is valid at the other CENELEC member countries.

The VDE Application Procedure

Applications for testing must be sent to the VDE Testing and Approvals Institute, Merianstrasse 28, D-6050 Offenbach, West-Germany, Tel: (49611) 8306-1, Telex: 4 152 796 vde d. There are two separate applications required, one for RFI and one for safety. Typical waiting time is 3 months for RFI and 6 months for safety. The initial contact should be on company letterhead requesting the type of test and describing the equipment to be tested. A brochure of the equipment will help. The subsequent steps are outlined in Figure 5.

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