

Signed in Washington, DC on June 18, 1995.

**Bruce R. Weber,**

*Acting Administrator, Consolidated Farm Service Agency, and Acting Executive Vice-President, Commodity Credit Corporation.*  
[FR Doc. 95-15862 Filed 6-27-95; 8:45 am]

BILLING CODE 3410-05-P

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 23

[Docket No. 125CE, Special Condition 23-ACE-81]

#### Special Conditions; Twin Commander Model 695 Airplane

AGENCY Federal Aviation Administration (FAA), DOT.

**ACTION;** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Twin Commander Model 695 airplane modified by Garrett Aviation Services, Augusta, Georgia. This airplane will have novel and unusual design features when compared to the state of technology envisaged in the applicable airworthiness standards. These novel and unusual design features include the installation of electronic displays for which the applicable regulations do not contain adequate or appropriate airworthiness standards for the protection of these systems from the effects of high intensity radiated fields (HIRF). These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to the airworthiness standards applicable to these airplanes.

**EFFECTIVE DATE:** The effective date of these special conditions is June 28, 1995. Comments must be received on or before July 28, 1995.

**ADDRESSES:** Comments may be mailed in duplicate to: Federal Aviation Administration, Office of the Assistant Chief Counsel, ACE-7, Attention: Rules Docket Clerk, Docket No. 125CE, Room 1558, 601 East 12th Street, Kansas City, Missouri 64106. All comments must be marked: Docket No. 125CE. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4:00 p.m.

**FOR FURTHER INFORMATION CONTACT:** Ervin Dvorak, Aerospace Engineer, Standards Office (ACE-110), Small Airplane Directorate, Aircraft Certification Service, Federal Aviation

Administration, 601 East 12th Street, Kansas City, Missouri 64106; telephone (816) 426-6941.

#### SUPPLEMENTARY INFORMATION:

##### Comments Invited

Although this action is in the form of a final rule that involves requirements affecting flight safety, and, thus, was not preceded by notice and an opportunity for public comment, comments are invited on these special conditions.

Interested persons are invited to submit such written data, views, or arguments as they may desire. Communications should identify the regulatory docket and special conditions number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. These special conditions may be changed in light of the comments received. All comments submitted will be available in the rules docket for examination by interested parties, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Persons wishing the FAA to acknowledge receipt of their comments, submitted in response to this request, must include a self-addressed and stamped postcard on which the following statement is made: "Comments to Docket No. 125CE." The postcard will be date stamped and returned to the commenter.

##### Background

On October 31, 1994, Garrett Aviation Services, 1550 Hangar Road, Augusta, Georgia 30906, made an application to the FAA for a supplemental type certificate (STC) for the Twin Commander Model 695 airplane. The proposed modification incorporates a novel or unusual design feature, such as digital avionics consisting of an electronic flight instrument system (EFIS), that is vulnerable to HIRF external to the airplane.

##### Type Certification Basis

The type certification basis for the Twin Commander Model 695 Airplane is given in Type Certification Data Sheet No. 2A4 plus the following:

§ 23.1301 of Amendment 23-20; §§ 23.1309, 23.1311, and 23.1321 of Amendment 23-41 and § 23.1322 of Amendment 23-43; exemptions, if any; and the special conditions adopted by this remaking action.

##### Discussion

The FAA may issue and amend special conditions, as necessary, as part of the type certification basis if the Administrator finds that the airworthiness standards, designated according to § 21.101(b), do not contain adequate or appropriate safety standards because of novel or unusual design features of an airplane. Special conditions are prescribed under the provisions of § 21.16 to establish a level of safety equivalent to that established in the regulations. Special conditions are normally issued according to § 11.49, after public notice, as required by §§ 11.28 and 11.29(b), effective October 14, 1980, and become a part of the type certification basis in accordance with § 21.101(b)(2).

Garrett Aviation Services, plans to incorporate certain novel and unusual design features into an airplane for which the airworthiness standards do not contain adequate or appropriate safety standards for protection from the effects of HIRF. These features include electronic systems, which are susceptible to the HIRF environment, that were not envisaged by the existing regulations for this type of airplane.

*Protection of Systems From High Intensity Radiated Fields (HIRF):* Recent advances in technology have given rise to the application in aircraft designs of advanced electrical and electronic systems that perform functions required for continued safe flight and landing. Due to the use of sensitive solid state advanced components in analog and digital electronics circuits, these advanced systems are readily responsive to the transient effects of induced electrical current and voltage caused by the HIRF. The HIRF can degrade electronic systems performance by damaging components or upsetting system functions.

Furthermore, the HIRF environment has undergone a transformation that was not foreseen when the current requirements were developed. Higher energy levels are radiated from transmitters that are used for radar, radio, and television. Also, the number of transmitters has increased significantly. There is also uncertainty concerning the effectiveness of airframe shielding for HIRF. Furthermore, coupling to cockpit-installed equipment through the cockpit window apertures is undefined.

The combined effect of the technological advances in airplane design and the changing environment has resulted in an increased level of vulnerability of electrical and electronic systems required for the continued safe

flight and landing of the airplane. Effective measures against the effects of exposure to HIRF must be provided by the design and installation of these systems. The accepted maximum energy levels in which civilian airplane system installations must be capable of operating safely are based on surveys and analysis of existing radio frequency emitters. These special conditions require that the airplane be evaluated under these energy levels for the protection of the electronic system and its associated wiring harness. These external threat levels, which are lower than previous required values, are believed to represent the worst case to which an airplane would be exposed in the operating environment.

These special conditions require qualification of systems that perform critical functions, as installed in aircraft, to the defined HIRF environment in paragraph 1 or, as an option to a fixed value using laboratory tests, in paragraph 2, as follows:

(1) The applicant may demonstrate that the operation and operational capability of the installed electrical and electronic systems that perform critical functions are not adversely affected when the aircraft is exposed to the HIRF environment defined below:

FIELD STRENGTH VOLTS/METER

Frequency	Peak	Average
10-100 KHz .....	50	50
100-500 .....	60	60
500-2000 .....	70	70
2-30 MHz .....	200	200
30-70 .....	30	30
70-100 .....	30	30
100-200 .....	150	33
200-400 .....	70	70
400-700 .....	4020	935
700-1000 .....	1700	170
1-2 GHz .....	5000	990
2-4 .....	6680	840
4-6 .....	6850	310
6-8 .....	3600	670
8-12 .....	3500	1270
12-18 .....	3500	360
18-40 .....	2100	750

or,  
 (2) The applicant may demonstrate by a system test and analysis that the electrical and electronic systems that perform critical functions can withstand a minimum threat of 100 volts per meter, peak electrical field strength, from 10 KHz to 18 GHz. When using this test to show compliance with the HIRF requirements, no credit is given for signal attenuation due to installation.

A preliminary hazard analysis must be performed by the applicant, for approval by the FAA, to identify electrical and/or electronic systems that perform critical functions. The term "critical" means those functions whose

failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane. The systems identified by the hazard analysis that perform critical functions are candidates for the application of HIRF requirements. A system may perform both critical and non-critical functions. Primary electronic flight display systems, and their associated components, perform critical functions such as attitude, altitude, and airspeed indication. The HIRF requirements apply only to critical functions.

Compliance with HIRF requirements may be demonstrated by tests, analysis, models, similarly with existing systems, or any combination of these. Service experience alone is not acceptable since normal flight operations may not include an exposure to the HIRF environment. Reliance on a system with similar design features for redundancy as a means of protection against the effects of external HIRF is generally insufficient since all elements of a redundant system are likely to be exposed to the fields concurrently.

**Conclusion**

In view of the design features discussed for the Twin Commander Model 695 Airplane, the following special conditions are issued. This action is not a rule of general applicability and affects only those applicants who apply to the FAA for approval of these features on these airplanes.

The substance of these special conditions has been subject to the notice and public comment procedure in several prior rulemaking actions. For example, the Dornier 228-200 (53 FR 14782, April 26, 1988), the Cessna Model 525 (56 FR 49396, September 30, 1991), and the Beech Model 200, A200, and B200 airplanes (57 FR 1220, January 13, 1992). It is unlikely that additional public comment would result in any significant change from those special conditions already issued and commented on. For these reasons, and because a delay would significantly affect the applicant's installation of the system and certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions without notice. Therefore, these special conditions are being made effective upon publication in the **Federal Register**. However, as previously indicated, interested persons are invited to comment on these special conditions if they so desire.

**List of Subjects in 14 CFR Part 23**

Aircraft, Aviation safety, Signs and symbols

**Citation**

The authority citation for these special conditions is as follows:

**Authority:** Secs. 313(a), 601, and 603 of the Federal Aviation Act of 1958; as amended (49 U.S.C. 1354(a), 1421, and 1423); 49 U.S.C. 106(g); 14 CFR 21.16 and 21.101; and 14 CFR 11.28 and 11.49.

**Adoption of Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the modified Twin Commander Model 695 airplane:

1. *Protection of Electrical and Electronic Systems from High Intensity Radiated Fields (HIRF).* Each system that performs critical functions must be designed and installed to ensure that the operations, and operational capabilities of these systems to perform critical functions, are not adversely affected when the airplane is exposed to high intensity radiated electromagnetic fields external to the airplane.

2. For the purpose of these special conditions, the following definition applies: *Critical Functions:* Functions whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane.

Issued in Kansas City, Missouri on June 1, 1995.

**Henry A. Armstrong,**  
*Acting Manager, Small Airplane Directorate, Aircraft Certification Service.*

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**14 CFR Part 39**

[Docket No. 94-NM-252-AD; Amendment 39-9285; AD 95-13-05]

**Airworthiness Directives; Boeing Model 747 Series Airplanes Equipped with Rolls Royce Model RB211 Series Engines**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule.

**SUMMARY:** This amendment adopts a new airworthiness directive (AD), applicable to certain Boeing Model 747 series airplanes, that requires modification of the nacelle strut and wing structure, inspections and checks to detect discrepancies, and correction of discrepancies. This amendment is