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Supplement No. 2 — May 20, 1952

SUBJECT: 16.30 Design and Tests

The following rules and policies have been adopted by the Civil Aeronautics Administration and are hereby issued in page form for your use:

16.30-1 Cross-Pointer Indicators
16.30-2 Approval of Crystals

CAM 16.30-1 appeared in the Federal Register on July 16, 1949 and is being picked up in manual form for the first time. This supplement supersedes Safety Regulation Release No. 288, dated June 3, 1948.

CAM 16.30-2 contains current policy governing the approval of crystals used in type certificated radio equipment. This material appeared in the Federal Register on May 3, 1952 as an adopted policy.

The attached pages should be retained as pages in a series of similar statements that will be issued explaining or implementing CAR 16.

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16.30 Design and tests.

To be eligible for type certification, aircraft radio equipment must be so designed and constructed that it will satisfactorily perform the function or functions for which it is intended to be used in aircraft under all flight conditions which may be met in regular service and must:

(a) Be free from hazard both in itself and in its method of operation;

(b) Be constructed of suitable and dependable materials;

(c) Satisfactorily pass a visual inspection of the construction, layout, an electrical arrangement of all components of the particular aircraft radio equipment and such electrical, humidity, temperature, pressure, vibration, drop, and other tests as the Administrator may prescribe.

16.30-1 Cross-pointer indicators (CAA rules which apply to 16.30).

(a) At the time the type I-101 Cross-Pointer Indicator was type certificated for use in conjunction with airborne ILS and VHF navigational equipment, it was recognized that the Indicator did not have incorporated in it certain warning features considered to be important in the interest of safety. However, as there was no indicator being manufactured at that time which did incorporate those features, the I-101 Indicator was type certificated for air carrier use subject to certain limitations.

(b) There is now in quantity production at least one type of ILS cross-pointer indicator which incorporates the so-called "flag alarm" indicator. There may be other equally satisfactory indicators under development.

(c) In view of the availability of the improved type indicator, it appears to be in the best interest of safety to discontinue use of the type I-101 Indicator as soon as practicable.

(d) Effective immediately, no cross-pointer indicator shall be type certificated for installation in air carrier aircraft unless a flag alarm or other satisfactory alarm system has been incorporated in the indicator. Effective December 31, 1948, the type certificate is canceled for the type I-101 Cross-Pointer Indicator, and after that date such Indicator shall not be used in air carrier operations.

16.30-2 Approval of Crystals (CAA policies which apply to 16.30).

The art of crystal manufacturing has improved considerably since CAM 16 was issued in 1941. At that time it was the policy of the CAA to type certificate all crystals used in type certificated radio equipment to insure that crystals used in such radio equipment were within specification limitations and that reliability could be maintained. However, in view of the relatively small failure rate on modern commercial and military crystals, the CAA is relaxing this policy to approve the use of crystals, which conform to the minimum standards outlined in CAM 16, in type certificated radio equipment without the necessity of type certification of the individual crystal unit. The CAA will not conduct evaluation tests on non type certificated crystals before granting approval for their use in aircraft radio equipment. In lieu of such tests, approval will be granted on an evaluation of the specifications to which the crystals are manufactured. Such approval may be obtained irrespective of whether the

crystal is manufactured to specifications established by the military, equipment manufacturer, the airline industry, or an established crystal manufacturer. For example, the following military crystals may be approved for use in type certificated radio equipment provided they are manufactured to the specification listed:

Crystal Unit	*Military Specification*	*Date*
CR-18/U	MIL-C-3098 & Amendment No. 1.	7 December 1949
CR-19/U	MIL-C-3098 & Amendment No. 1.	7 December 1949
CR-23/U	MIL-C-3098 & Amendment No. 1.	7 December 1949
CR-24/U	MIL-C-3098 & Amendment No. 1.	7 December 1949
CR-33/U	MIL-C-3098 & Amendment No. 1.	7 December 1949

It should not be assumed however, that minimum standards set forth in military or industry crystal specifications are equal to, or are more stringent than, those provided in CAM 16. A comparative evaluation should be sufficiently thorough to insure that the radio equipment in which the crystal is to be used will not evidence any degradation of performance or reliability by the use of such crystal. Caution should be exercised in substituting a different type crystal than that called for in the specifications of the radio equipment in which it is to be used. Generally, equipment has been designed with the characteristics of a specific type crystal in mind. In substituting a different crystal, satisfactory operation may not be achieved, since the crystal parameters may vary considerably from those originally called for. The crystal characteristics, as spelled out in its specification sheet, should be carefully considered before the substitution is actually made.

These policies do not in any manner alter the status of previously type certificated crystals. Crystals may continue to be type certificated in the same manner and under the same CAM 16 standards as in the past. CAA approval is not required for the use of such type certificated crystals in any radio equipment for which they are type certificated or for their substitution for other approved types of crystals.

In the case of crystals used in newly designed equipment, approval of the equipment specification and parts list will constitute approval of the crystal.

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