Cancelled by AC 43-6 0

AC NO: 43-204A

DATE: 1/11/74

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: AIRBORNE ATC TRANSPONDER SYSTEM MAINTENANCE

1. PURPOSE. This circular sets forth one means, but not the only means, of demonstrating compliance with the maintenance requirements, contained in FAR 91.177 and prescribed in FAR 43, Appendix F (amended), governing the testing of ATC transponders.

2. CANCELLATION. AC 43-204 dated January 12, 1973 is cancelled.

3. ACCEPTABLE MEANS OF COMPLIANCE. An acceptable means of compliance with the maintenance requirements as they apply to airborne ATC transponders is as follows:

   a. Reply radio frequency. Interrogate the transponder and verify, by use of any frequency measuring technique, that the reply frequency is 1090 $\pm$ 3MH$_z$. The accuracy of the measuring device should be at least $\pm$ .5MH$_z$.

   b. Suppression. Interrogate the transponder with a Mode 3/A interrogation signal at a repetition rate of 235 interrogations per second and at a signal level 3db above receiver minimum trigger level. Adjust P_2 pulse equal in amplitude to P_1 pulse and verify that reply rate is no greater than 3 replies per second. Adjust P_2 pulse amplitude 9db less than P_1 pulse and verify that the reply rate is at least 211 replies per second.

   c. Receiver Sensitivity. With the test set connected to the antenna end of the transmission line, or connected to the antenna terminal of the transponder with a correction for transmission line loss, interrogate the transponder with a Mode 3/A interrogation signal at a nominal repetition rate of 235 interrogations per second. Adjust P_1 and P_3 equal in amplitude and apply a signal level known to be below receiver minimum trigger level. Increase the signal level until the transponder reply rate is 211 replies per second. This

Initiated by: AFS-350

is the receiver minimum trigger level (MTL). Verify the MTL is between 69 and 77 db below 1 milliwatt. Test equipment attenuator accuracy should be within ± 3db. Repeat the test using a Mode C interrogation signal and verify the MTL is within 1db of the reading obtained on Mode 3/A.

4. PORTABLE LINE TEST EQUIPMENT. Portable line test equipment may be used for any of the tests specified in paragraph 3, provided it is maintained under a regular calibration program acceptable to the Administrator. If portable test equipment is used with appropriate coupling to the aircraft antenna system, an additional 3db tolerance is permitted to compensate for antenna coupling errors during receiver sensitivity measurements.

   a. If the portable test equipment has a fixed R.F. output, it may be necessary to use a combination of a fixed precision attenuator in conjunction with a variable precision attenuator in order to determine the receiver minimum triggering level. Such attenuators should be maintained on a regular calibration schedule and have appropriate calibration charts. The repair station is responsible for assuring the accuracy of the attenuators.

   b. If the test set indicates the reply rate in terms of the percentage of reply, the values specified in paragraph 3 (items b and c) may be converted to their equivalent percentage values.

C. R. Melugin Jr.

C. R. MELUGIN, JR.
Acting Director, Flight Standards Service

32567

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Washington, D.C. 20591

Official Business

PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
FEDERAL AVIATION
ADMINISTRATION
DOT 515

U.S.MAIL