

RTCA Special Committee 209 / EUROCAE WG49

ATCRBS / Mode S Transponder MOPS Maintenance

Joint Meeting #12

**Malakoff
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**Test of acceptance of Mode S interrogations
generated with an IQ modulator**

Revision 1

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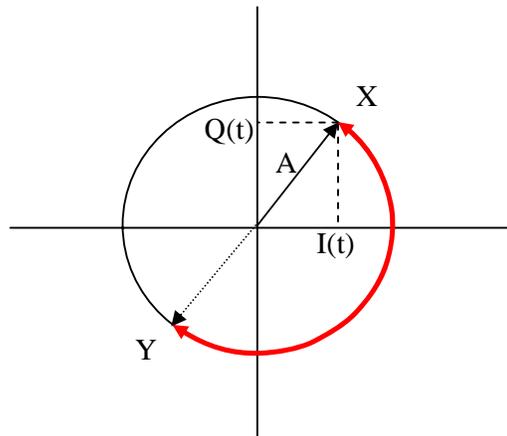
SUMMARY

This Working Paper proposes a possible test to check that a Mode S interrogation generated with an IQ modulator with maximum phase reversal duration is accepted.

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Proposed test:

1. Establish Mode S MTL using standard methods.
2. Simulate a P6 pulse at a level that the receiver would see when operating at MTL and with the sync phase reversal generated as follows:
 - Using an IQ modulator generating a 180 Deg Shift at constant or almost constant amplitude
 - 10 to 170 Deg phase reversal duration of 80ns



3. Verify on a scope that there is no power drop during phase reversal.
4. Verify that the phase reversal is properly detected when the P6 is varied from MTL to -21 dBm in increments of 10 dB.
5. Generate a P6 at MTL+3dBm with a sync phase reversal imposed as above. Simulate a non-coherent P5 pulse overlaid on the sync phase reversal with a level 3db above P6.
6. Verify that the sync phase reversal is detected in less than 10% of cases.
7. Repeat Steps 5 & 6 with P6 levels up to -21dBm in increments of 10 dB.
8. Generate a P6 at MTL+3dBm with a sync phase reversal imposed as above. Simulate a non-coherent P5 pulse overlaid on the sync phase reversal with a level 12db below P6.
9. Verify that the sync phase reversal is detected at least in 99% of cases.
10. Repeat Steps 8 & 9 with P6 levels up to -21dBm in increments of 10 dB.