

Harmonisation with DO-181 on the Mode A/C Side Lobe Suppression

- DO: in normal conditions for P2 , the transponder can reply at 1%

[Why 1% of accepted replies in Mode A/C and 10% for Mode S ?](#)

- ED : it is 10%

In ED Step 4 and 9 are saying the same thing between the MTL and the MTL+ 3db.

5.4.4 Side Lobe Suppression (Paragraph 3.8)

5.4.4.1 Mode A/C, Mode A/C-only All-Call and Mode A/C/S All-Call

5.4.4.1.1 Test Equipment

- a. 2 Transponder Test Sets.
- b. Wide Band Dual Channel Oscilloscope.
- c. 3 Port Divider.

5.4.4.1.2 Test Procedure

Connect the equipment as shown in [Figure 5-5](#).

a. [STEP 1 - Suppression Duration](#) (Paragraph 3.8.1 a.)

Interrogate the transponder at 450 interrogations per second with a P1-P2 pulse pair followed, after 50 μ s, by a P1-P3 (Mode A, 8 μ s) pulse pair.

NOTE: *All pulse levels should be set to -24 dBm; any reply code may be selected.*

Reduce this 50 μ s interval until the transponder reply rate falls below 10%.

Measure the time interval between the leading edges of P2 and P1 (of the P1-P3 pair), and record this as the suppression duration S(8).

Repeat the above procedure using Mode C (21-microsecond spacing) for the P1-P3 pair; record the result as suppression duration S(21).

b. [STEP 2 - Suppression Re-initiation](#) (Paragraph 3.8.1 c.)

With an interrogation rate of 450 interrogations per second, generate a first P1-P2 pair followed by a second P1-P2 pair such that the spacing between P2 of the first pair and P1 of the second pair is S(8) plus 2 μ s.

Generate a third pair, P1-P3 Mode A, 50 μ s after the second pair.

NOTE: *All pulse levels should be set to -24 dBm; any reply code may be selected.*

Reducing the interval between the P1-P2 pair and the P1-P3 pair, record the interval at which the transponder **replies fall below 10%**.

Repeat the test using Mode C spacing for the P1-P3 pair and determine suppression duration S(21).

c. [STEP 3 - Recovery After Suppression](#) (Paragraph 3.8.1 d.)

Repeat [STEP 1](#) using the following signal levels:

- (1) P1-P2 pair = -30 dBm;
- (2) P1-P3 pair = MTL.

Record the reply ratio observed when the P2 (suppression) P1 (interrogation) spacing is no more than 1 μ s greater than S(8, 21) determined in previous steps.

d. [STEP 4 - SLS Decoding](#) (Paragraph 3.8.2 a.)

Interrogate the transponder with a Mode A interrogation including a P2 pulse; (RF signal levels MTL+3dB, -50 dBm and -21 dBm; P2 level = P1 level).

As the P1-P2 spacing is varied over the range from 1.85 to 2.15 μ s, record the reply ratio and verify that it does not exceed **10%**. ([aligned with DO181](#))

- e. STEP 5 - Short Duration P2 (Paragraph 3.8.2 b (3))
Interrogate the transponder with a Mode A interrogation with :
- (1) P2 level = P1 level,
 - (2) P2 duration less than 0.3 μ s.
- Record the reply ratio and verify the minimum is at least **990%** (*aligned with DO181*) at signal levels of MTL+3dB, -50 and -21dBm.
- f. STEP 6 - SLS Pulse Ratio (Paragraph 3.8.2 b (1))
Interrogate the transponder with a Mode A interrogation including a P2 pulse; (P2 level = P1 -9dB).
As the P1-P2 spacing is varied over 1 to 3 μ s, record the reply efficiency and verify that the minimum is at least **990%** (*aligned with DO181*) at signal levels of **MTL+3dB**, -50 and -21dBm.
- g. STEP 7 - Suppression on Mode A/C/S All-Call
Repeat STEP 4, STEP 5, and STEP 6, with Mode A/C/S All-Call.
- h. STEP 8 - Simultaneous Interrogation of Mode A/C with P2 (Simultaneous decoding of Mode A/C interrogation with Mode A/C suppression) (Paragraph 3.8.2 d.)
Interrogate the transponder with a Mode A pulse pair with:
- (1) RF signal level = -50dBm,
 - (2) P2 level = P1 level.
- Generate a 0.8 μ s pulse, at the same level as P2, 8 μ s before the leading edge of P2.
Observe that the reply ratio is less than 10%.
Repeat this test with the 0.8 μ s pulse, 21 μ s before the leading edge of P2.
- i. STEP 9 - Low Signal Level Characteristics (Paragraph 3.8.2 c.)
Interrogate the transponder with a Mode A interrogation, including a P2 pulse (P2 = P1 level).
Vary the signal level from MTL to MTL+3dB.
Verify that the reply ratio does not exceed 10%.