

ETHer NDE Application Note: AP003

DUAL FREQUENCY NON-FERROUS TUBE INSPECTION USING MIXING OR ABSOLUTE DIFFERENTIAL

Mixing on a non-ferrous tube to minimise the effect of a ferrous support ring

The conventional example of mixing is to use a non-ferrous tube and minimise the effect of a ferrous support ring, this test uses 21kHz on Channel 1 and 18kHz on Channel 2.




TEST PROCEDURE

Equipment Required:

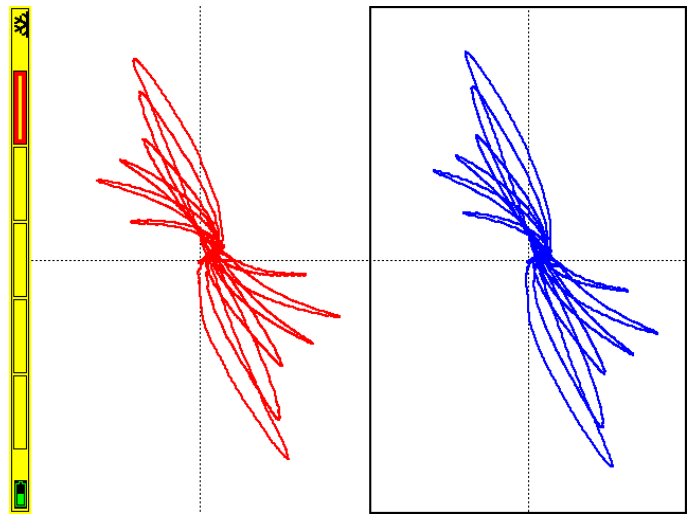
- Instrument: IAER002 - Instrument, AeroCheck+, Dual Frequency, (20Hz- 20MHz)
Hand Held, Portable Flaw Detector
- Probe: Probe, Internal Diameter, Differential, Dia 13.80, Disconnect, 18k - PID138D0018K.
- Lead: Accessory, ID Lead, 12-Way Lemo, Flexible, 3.0m - CIDL03F.
- Reference Tube: Reference Tube - ATBTB1587.
- Support Ring: Accessory, Test Block, ID Probe Support Ring OD 25.4 x ID 16.6 x 20.00mm Long - ATB010.

Setup:

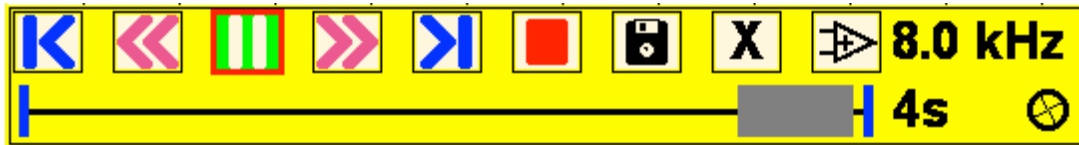
1. Connect probe to cable and cable to instrument.
2. Switch instrument on.
3. Set the instrument as follows:

- CH1 -	Summary	- Probe -
Freq 21.0 kHz	Phase 0.0 °	Drive: 6 dB
Phase 254.0 °	Gain X 6.0 dB	Type Bridge
Gain X 38.0dB	Gain Y 6.0 dB	Load Auto
Gain Y 38.0dB	- Alarm -	- Panes -
Input gain: 12 dB	Source 1st	Pane 1 XY
High Pass DC	Action 	Source Ch 1
Low Pass 300	Stretch 500ms	Pane 2 XY
- CH2 -	Type Off	Source Ch 2
Freq 18.0 kHz	- Offset -	
Phase 272.8 °	P1 XY 0,0 %	
Gain X 38.0dB	P2 XY 0,0 %	
Gain Y 38.0dB		
Input gain: 12 dB		
High Pass DC		
Low Pass 300		

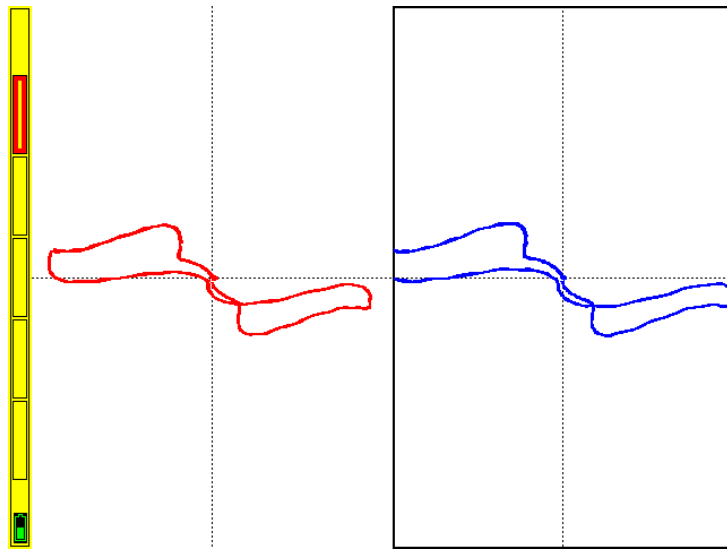
- 4. Balance the probe in the tube on a non-defect area, run the probe along the tube, check that the display looks as follows:



- 5. Go into the Record function.



- 6. Press clear and balance, record just the support plate signal, press record button, move support plate over the probe, press the record button again to stop recording.



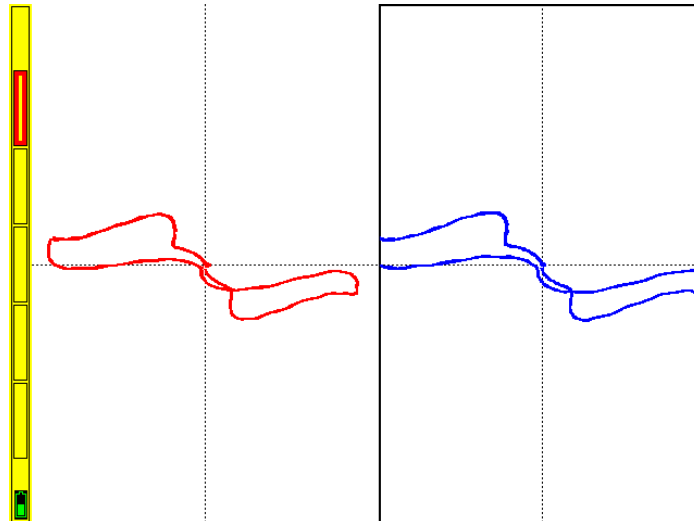
- 7. Then select the Auto Mix function



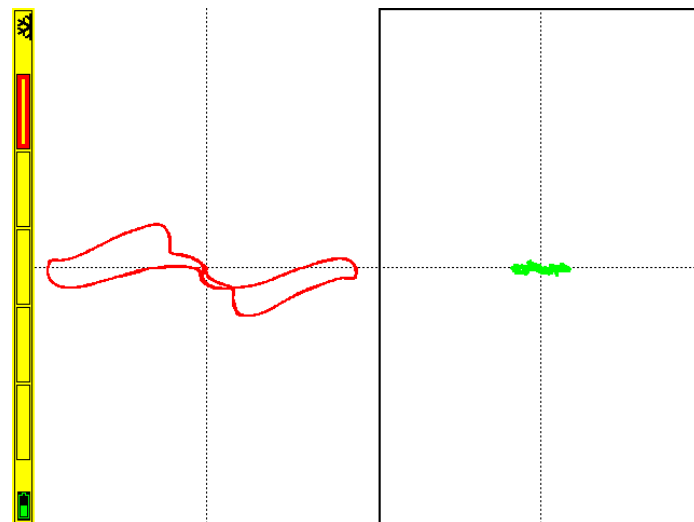
- 8. Once the message "Auto Mix Complete" is displayed return to the operating screen by selecting Exit



- 9. The signal from the support plate should look as follows:



10. Now adjust the pane settings to show the Mix channel in Pane 2, adjust the mix phase to set the signal as required. The mix is now complete and the mix channel should not show the support plate and look as follows:



11. Now add the through hole signal by hold the support plate on a defect and moving the probe, the signal should look as follows:

