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Magnetic Analysis Corp.
100 Fairview Park Drive
Elmsford, New York, 10523-1544 USA

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Test form

# FD4/FD4A CALIBRATION VERIFICATION FORM

**Customer:** Fine Tubes
**Date of Calibration:** 6th June 2023
**Location:** Plymouth UK
**MAC Std # :**
**Send Report To:** Darren Bennett
**Purch. Order # :** 35123X
**Software Vers.:** 3.0.95.48
**Calibration Frequency:** ☑ 6 Months ☐ 1 Year ☐ 2 Years

**Equipment :** Fd4
**Equipment SN/LN:** UTES 13346
**Next Calibration Date:** 5th December 2023
**District No.:** 21
**S.C. #:**
**Cust. Std #:**
**Title:**
**R.T.M.:**

**Pulse Amplitude test:**

| Minimum (V) | CH1 | CH2 | CH3 | CH4 | Maximum (V) |
|---|---|---|---|---|---|
| 400 | 532 | 520 | 512 | 516 | 550 |

**Receiver sensitivity:**

| Min Vsens (V) | 5MHz | | | | Max Vsens (V) |
|---|---|---|---|---|---|
| | CH1 | CH2 | CH3 | CH4 | |
| 0.02 | 0.0256 | 0.0256 | 0.0258 | 0.0256 | 0.05 |

**Damping resistance check:**

| Damping (ohms) | Minimum Amplitude (%) | 5MHz | | | | Maximum Amplitude (%) |
|---|---|---|---|---|---|---|
| | | CH1 | CH2 | CH3 | CH4 | |
| 200 | Set to 80% | 80% | 80% | 80% | 80% | Set to 80% |
| 50 | 40 | 44 | 46 | 46 | 45 | 58 |

**Gain control linearity test:**

| Attenuator (dB) | Stripchart (%) | Receiver Gain (dB) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Min (dB) | 5MHz | | | | Max (dB) |
| | | | CH1 | CH2 | CH3 | CH4 | |
| 50 dB | 80% | 40 | 41 | 41.5 | 41.25 | 41.5 | 44 |
| 40 dB | 80% | 31 | 31.5 | 32 | 31.5 | 31.75 | 33 |
| 30 dB | 80% | 22dB | 22 dB | 22 dB | 22 dB | 22 dB | 22dB |
| 20 dB | 80% | 11 | 12.5 | 12.25 | 12.5 | 12.25 | 13 |
| 10 dB | 80% | 0.5 | 2.75 | 2.25 | 2.75 | 2.5 | 3.5 |



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# FD4/FD4A CALIBRATION VERIFICATION FORM

**Customer:** Fine Tubes
**Date of Calibration:** 6th June 2023

**Equipment :** Fd4
**Equipment SN/LN:** UTES 13346

**Vertical linearity test:**

| Attenuator (dB) | Signal Amplitude (%) | | | | | |
|---|---|---|---|---|---|---|
| | Minimum (%) | 5MHz | | | | Maximum (%) |
| | | CH1 | CH2 | CH3 | CH4 | |
| 24 dB | 94 | 100 | 100 | 100 | 100 | 106 |
| 27 dB | 67 | 72 | 72 | 72 | 72 | 73 |
| 30 dB | Set to 50% | 50% | 50% | 50% | 50% | 50% |
| 36 dB | 22 | 23 | 22 | 25 | 24 | 28 |
| 46 dB | 3 | 7 | 6 | 8 | 8 | 13 |

**Receiver noise:**

| CH1 | CH2 | CH3 | CH4 | Max Vnoise (%) |
|---|---|---|---|---|
| 9 | 7 | 9 | 8 | 30 |

**Thickness test (optional):**

| Step Thicknes (Inches) | Thickness Min (Inches) | Thickness | | | | Thickness Max (Inches) |
|---|---|---|---|---|---|---|
| | | CH1 | CH2 | CH3 | CH4 | |
| 0.2000 | 0.1980 | 0.1997 | 0.1995 | 0.1998 | 0.1995 | 0.2020 |
| 0.3000 | 0.2970 | 0.2981 | 0.2979 | 0.2983 | 0.2981 | 0.3030 |
| 0.4000 | 0.3960 | 0.399 | 0.3993 | 0.3995 | 0.3985 | 0.4040 |

**Frequency response:**

| Frequency | Min. Amplitude (%) | CH1 | CH2 | CH3 | CH4 | Max. Amplitude (%) |
|---|---|---|---|---|---|---|
| 5 MHz | Set to 80% | 80% | 80% | 80% | 80% | Set to 80% |
| 15 MHz | 35 | 54 | 36 | 58 | 47 | 75 |

**Filter test (Only applicable to FD4A):**

| Bandpass filter (MHz) | Lower cutoff frequency must be lower than (MHz) | CH1 | | CH2 | | CH3 | | CH4 | | Upper cutoff frequency must be higher than (MHz) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Lower cutoff frequency | Upper cutoff frequency | Lower cutoff frequency | Upper cutoff frequency | Lower cutoff frequency | Upper cutoff frequency | Lower cutoff frequency | Upper cutoff frequency | |
| 10MHz | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 5MHz | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 2.25MHz | 2.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 |

**Reference:**
The above data was verified using the following instruments which have a current calibration to NIST specifications.

Scope: DS2D155101179
Digital voltmeter:
Attenuator: 626835-1236
Function generator: DG4D150200023

As Found Condition: ☑ **In Tolerance** ☐ **Out of Tolerance** ☐ **Non Functional**

As Left Condition: ☑ **In Tolerance**

Notes:

**Analogue outputs: 100% - 5.01V, 80% - 4.03V, 60% - 2.98V, 40% - 1.95V, 20% - 0.999V**

Name: Paul Smyth Signature:



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# FD4/FD4A CALIBRATION VERIFICATION FORM

**Addendum:** Velocity Measurement test:

| Piece number | Min Velocity (in/us) | *Station 1* | *Station 2* | Max Velocity (in/us) |
|---|---|---|---|---|
| *1* | *0.2227* | | | *0.2247* |
| *2* | *0.2227* | | | *0.2247* |
| *3* | *0.2227* | | | *0.2247* |
| *4* | *0.2227* | | | *0.2247* |
| *5* | *0.2227* | | | *0.2247* |
| *6* | *0.2227* | | | *0.2247* |
| *7* | *0.2227* | | | *0.2247* |
| *8* | *0.2227* | | | *0.2247* |
| *9* | *0.2227* | | | *0.2247* |
| *10* | *0.2227* | | | *0.2247* |
| *11* | *0.2291* | | | *0.2311* |
| *12* | *0.2291* | | | *0.2311* |
| *13* | *0.2291* | | | *0.2311* |
| *14* | *0.2291* | | | *0.2311* |
| *15* | *0.2291* | | | *0.2311* |
| *16* | *0.2291* | | | *0.2311* |
| *17* | *0.2291* | | | *0.2311* |
| *18* | *0.2291* | | | *0.2311* |
| *19* | *0.2291* | | | *0.2311* |
| *20* | *0.2291* | | | *0.2311* |



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