



COMPOSITE DAMAGE EVALUATION KIT THROUGH ULTRASONICS

A SYSTEM CONCEIVED FOR COMPOSITE REPAIR STATIONS

Elisa is an equipment **dedicated for MROs and Airline Maintenance Centres for NDT departments** in their tasks of damage assessment on advanced composite structures. Elisa groups all the necessary instruments and parts for conducting damage analysis by **Ultrasonic Methods** on carbon structures.

The objective is to allow the technician to draw the limit of a damage (delamination or disbonding) and to specify the depth position of a delamination.

The Ultrasonic Instrument itself is appropriate for working on carbon structures; it is light, not cumbersome. The system is conceived so that a delamination can be detected and its position determined in terms of PLY.

A Set of Composite Specimens representative of the composite thickness of planes can be offered.



Figure 1: The complete case with accessories

ELISA, A FIELD DEDICATED KIT

The Console is built according to the same principle as other repair equipment from GMI: which is to offer all the equipments and accessories for an operator to be independent in the field or in the workshop. You may find:

- The Ultrasonic Instrument (picture on the right),
- 2 Sensors for Carbon Structure Damage analysis,
- List of necessary accessories to implement the analysis in the field.
- Manual for Ultrasonic Analysis on Carbon Structures.

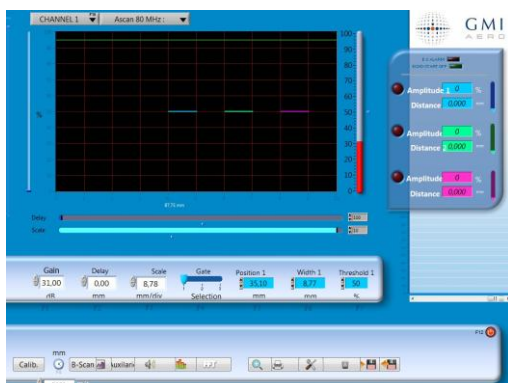


ELECTRONIC WITH UNIQUE FEATURES

- Square wave pulser < 5ns fall time
- 0.35 to 30 MHz Bandwidth
- 200 MHz A/D converter, 10-Bit
- Amplifier linearity ± 0.5 dB
- Excellent near surface resolution
- TOF/WT Resolution better than 1 μ m
- 20 KHz PRF
- 105 dB Dynamic Range
- Low Noise < 20% FSH
- Display Vertical Linearity $\pm 1\%$
- DAC Slope ± 40 dB/ μ s

SOFTWARE FUNCTIONS

- Easy and instantaneous set up,
- Memorization of settings,
- Memorisation of reference echoes
- Triggering alarms
- Display mode: HW+, HW-, FW & RF
- Gates: Yellow (IF), Red (G1) & Blue (G2)
- DAC Curve: 0% to 70% FSH (0-70dB Dyn.)
- Delay: 0 to 655 μ s - 20ns step
- A-Scan length : 100 to 512 points
- Units: μ s/mm/in



THE ULTRASONIC INSTRUMENT

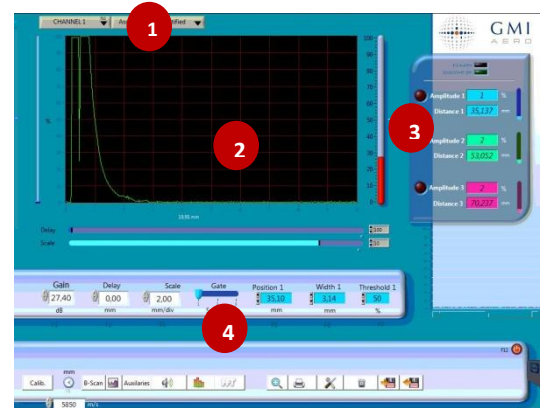
The Elisa ultrasonic board has been specially developed for the ultrasonic damage assessment. In particular the sensitivity has been studied to get the possibility to discriminate a disbonding after the first or second ply as it is frequently the case in the context of damage on composite structure after an impact. The definition of signals on the PC screen is clear for an easy analysis in the field.

ADVANCED SPECIFIC SOFTWARE

The PC software has been conceived to offer all the tuning capabilities required to program the parameters of a Scan by transmission.

The typical screen displays all the values of the operation:

- 1 - The Menu Bar
- 2 - The graphic window with the ultrasonic signal displayed.
- 3 - On the right of the screen, frame indicates the current measured amplitudes and distances, and the alarms.
- 4 - The line of buttons used to select functions.



PROBE SPECIFICATIONS

- Delivered with its cable; microdot connector
- Normal beam transducer.
- Longitudinal wave.
- Removable delay line.
- Element diameter: Piece 1: 0.250" (6,35 mm); Piece 2: 3/8" (9,5 mm)
- Frequency: 10 MHz
- Medium bandwidth.
- Thickness range: 0.006" to 0.500" (0.15 mm to 12.70 mm)
- Connector: Microdot
- Cable length 6 Ft (1.8 m) 1

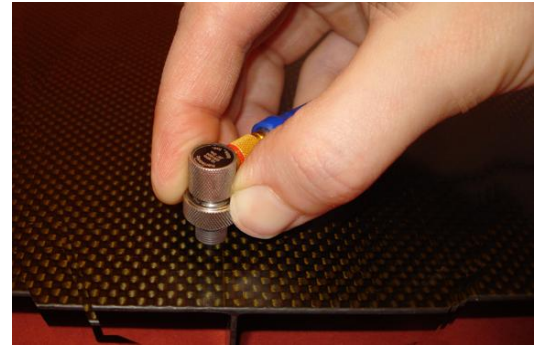


Figure 2: Sensor on carbon structure

CARBON THICKNESS SPECIMENS

GMI can propose a comprehensive set of carbon thicknesses. These specimens offer a representation of the structure as it is actually the case when an operator is conducting a test in the field: carbon with paint (1), with primer (2), with bronze mesh (3), plain (4).

Two families of specimens are available

Fabric specimens : thickness of: 2, 3, 4, 6, 8, 12, 16 plies

Tape specimens : thickness of: 4, 6, 8, 12, 16, 24, 32, 48, 64, 72, 96 plies

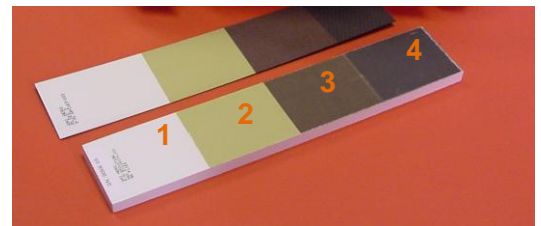


Figure 3: Carbon Specimens

TO ORDER

GMIUCS87B02-V- FT: Complete set of ultrasonic instrument kit with Portable Tablet PC

GMIUCTS2010 : Set of various carbon thickness specimens; fabric and tape – 18 specimens

GMIUCT72-5: Set of **5** specimens for **tape** laminated, Thicknesses 96, 64, 32, 16 and 8 Plies

GMIUCF72-7: Set of **7** specimens for **fabric** laminated, Thicknesses : 2,3,4,6,8,12,16 plies