

# The ANITA BONDING CONSOLE OT9701

## for advanced patch repair with dual heat circuit control and more advanced features



## 1 PRESENTATION

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The ANITA OT9701 is the latest version of the famous ANITA version NG with enhanced new features.

In a compact size the ANITA OT offers all the features to control with an advanced software **a bonding patch** of small or very large size . It allies the small size to a simplicity of use that made it a **standard** among manufacturers or repair stations.

The ANITA OT takes benefit of the simplicity of use of the ANITA NG and offers new additive features grouped in the same compact size.

- ⇒ 12 Thermocouple scan capacity <sup>1</sup>,
- ⇒ Possibility of extension up to 24 Thermocouples scanning,
- ⇒ Test of heating blanket, detection of connection and of blanket break,
- ⇒ Additive heat control on a third heating channel for compensation of heat losses (very useful for metal bonding on heavy structures).

## 2 MAIN FEATURES

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The OT is, as the NG version, the smallest compact bonder on the market. It is the only equipment of this category to offer for **one patch bonding** the capability of **dual heating channels** to maintain a balance of temperature on the whole area.

The ANITA is conceived for push button operations for an automatic cycle where all aspects of curing process are handled by an advanced software that benefited from twenty years of experience of GMI in the field of composite repair.

The OT has been conceived to offer all the necessary functions to perform a bonding repair on an advanced carbon structure.

### ⇒ **A large temperature scanning capacity**

The ANITA OT offers the capacity of temperature scanning through up to **12 thermocouples**. This feature is appropriate for a large repair with complex structures where it is necessary to detect differences of temperature.

For demanding processes, a scanner of 12 thermocouples can be connected to enhance the total capacity up to **24 thermocouples**.

### ⇒ **A dual heating channel control**

The dual heat control allows, as explained below, to balance the heat control according to the thermal reactions of the structure areas covered by the patch.

### ⇒ **A third heating channel**

Also the third heat channel is conceived to compensate heat losses when the patch is surrounded by heat sink that generates gradient of temperatures. This feature is specially appropriate for metal bonding.

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1. see at the end of the document comparative features of NG and OT versions

⇒ **An extreme simplicity of programming**

Since its introduction with the ANITA NG, the principle of programming designed has been the favorite feature of shop technicians. The programming needs only to key the resin manufacturer data or SRM spec: plateau temperature and duration. The software controls all other parameters.

⇒ **A push button operation**

After the cycle is selected or programmed, the run starts after just a switch down operation. All tests are handled by the software and automatic decisions are taken so that the cycle is conducted in continuity without halt or hold for defects that the operator cannot interpret.



**Figure 1:** On left, the Anita OT closed showing external connectors of high quality. When opened (right) the Anita appears straightforward to be used; no complicated keyboard; a software has been designed so that the ANITA answers automatically **to switch selections**.

### 3 MAIN ADVANTAGES ILLUSTRATED

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#### 3-1 A Patch Repair with Appropriate Temperature Control

It is possible to connect one heating blanket to cover the patch and cure its resin. However the ANITA OT has an extra asset to deal with the usual difficulty met when dealing with an aircraft part, the various thicknesses of structures that induce different behaviors in terms of heat transfer.

It is possible to connect One blanket with **Two Heating circuit independent** for compensation of difference of heat behavior in two areas of the structure. Each circuit is energized independently.

To day, it is no more possible to deal with patch temperature control as twenty years ago. A true bonding console must have this minimum feature to deal with modern advanced carbon structures.

The patch being small (30 cm diameter) or large (60, 80 cm dia.), the ANITA can face the job... because the ANITA offers a switching capacity of 30 Amperes.

#### 3-2 Temperature Control

##### 3-2.1 Innovative temperature control for automatic profiling

The temperature of the part heated by the heating blanket is under control of a software that manages the set of 6 thermocouples.

As the raise of temperature is the result of a conduction process by a heating mat, the temperatures on various points of the structure may be different because of variable losses of heat according to the area and measurement locations. To face this control dilemma, a special treatment of all the measures is made automatically by the software and the orders to the heating blanket are derived.

Amalgamation of all data is thus used to improve the conduct of heat transfer on the whole surface so that an optimum temperature profile is found no temperature above the tolerated limit and avoid of cold areas.

### 3-3 Dual Heat Control

#### 3-3.1 Dual Circuit Blankets

When a bonding is made on a structure having obviously a variation of thickness, the use of the second heating channel becomes a necessity.

GMI offers supply of two different circuit mats so that the heat control can be differentiated on the two areas.



Figure 2: Here a blanket with two circuits to control differently two adjacent areas: one being a uniform laminate, the other with stringer constituting a heat sink.

#### 3-3.2 Two Blanket Control

In other cases of repair, laying two separate blankets side by side allow to get similar results as a unique

#### 3-3.3 Two patch repairs

Thanks to the dual channel installation with independent temperature control it is also possible to bond Two Patches simulatenously with the same profile.

#### 3-3.4 Large area control

The control of temperature in large area is also greatly facilitated with the ANITA dual control feature. Say, the repair patch has a diameter of 600 mm, a two circuit blankets is used. One circuit for the internal area control (40 cm diameter), a second circuit for the periphery. This will allow the control of the center of the area at the rated temperature, while the second peripheral circuit will be also maintained at the same temperature.

Other cases find easily a solution thanks to this feature. For example, when heating a long vertical surface. The two circuit blanket will avoid to overheat the upper area.

#### 3-3.5 The two skin bonding in a single operation

When a sandwich is perforated on both skins, it is thus possible to combine the dual channels to implement the bonding of the two skins simultaneously with a differentiated control.

The dual channel is also a great feature when curing a radome repair where it is a command to be able to differentiate top and side areas under a single tip blanket .

## 4 THE GENERAL SPECIFICATIONS

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- ⇒ Dimensions: 308 x 206 x 206 mm
- ⇒ Weight:...07 Kg
- ⇒ Volts: 220 or 120 VAC, **automatic switching**
- ⇒ Power Capability: 30 Amps x 220 Volts = 6000 Watts or 30 x 120 Volts = 3600 Watts
- ⇒ **Two Circuit Control: Two heating zones**; One + a **SECOND** one for temperature balance

### **Other features:...**

- ⇒ An extra third channel (220 Volts or 120 Volts - 3 Amp) for cold area heat at 70 °C
- ⇒ All blanket cables come with special circular military connectors monted for a high quality coupling  
Our blankets come also with same quality mating connectors.
- ⇒ Thermocouple scanning capacity :type J, **12 plugs**
- ⇒ Vacuum: Venturi pump installed with **high** performances: -0.87 bar(27 in Hg) - **High Flow for efficient leak compensation**
- ⇒ Vacuum panel gauge for vacuum venturi pump test
- ⇒ Vacuum electronic gauge on return hose from bag to qualify the actual vacuum in bag itself.This value is monitored permanently, displayed, printed, recorded.
- ⇒ Printer with large standard paper
- ⇒ Programming by an innovative dialogue in two immediate steps. Ramp, Plateau and Duration values are just keyed. The use is straightforward.
- ⇒ Programs can be saved in memory. Two libraries possible. One (max capacity 19 programs) is delivered with all usual resin programs already installed. A second one can be constituted by the user.The max. capacity for the user being: 19 programs
- ⇒ Panel display of Temperature and Vacuum Instantaneous Values; clear and large digits visible from far; permanent scanning of all measures of temperature and vacuum
- ⇒ Visual and audible alarms,
- ⇒ Panel mimics visible from far: lamp for identification of heat on/off, alarms for temperature and vacuum,.end of cycle.
- ⇒ Internal clock and calendar for repair identification
- ⇒ Easy accessible external fuses
- ⇒ Test of presence of blanket ; measurement of power of blanket
- ⇒ Software and electronic safety features
- ⇒ Innovative **PC Software ANITALK** delivered for:
  - Feature configuration, Library Cycles programming,
  - Real Time Supervision Training, Quality control data Files
  - Graphic analysis,
  - Circuit calibration.

## 5 DELIVERY

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The ANITA Console comes with all its accessories necessary to implement a bonding operation under vacuum: a complete set of cables, hoses, in a nice storage and transportation console.

Console Dim: 18 x 14 x 7 in (460 x 350 x 166 mm); Weight: 22 Lb. - 10 Kg

### Content List:

- ⇒ A Power cable: 1 unit of length 5 m (6-ft.)
- ⇒ Blanket cable: 2 units of length 3 m (10ft)
- ⇒ Vacuum Silicone Hoses: 2 units, one for vacuum, one for return sensing of length 3 m (10-ft.)
- ⇒ Vacuum Valves,
- ⇒ Thermocouple cables: 12 of 3 m long (6 ft.)
- ⇒ A first set of printer consumable,
- ⇒ A PC communication cable (RS232 mode), USB Optional
- ⇒ A PC software ANITALK for PC programming, supervision on line, quality control, storage of data
- ⇒ A User and Service Manual.



The accessory case very convenient to group all necessary items

## 6 NG and OT FEATURE COMPARAISON

We list here for the conveniences of the buyer the similarities and differences between the two model NG or OT.

1. The two consoles have the same small dimensions and slightly the same light weight; they are both compact, easy to handle to go to the field, to install on aircraft or on a scaffold, or in a shop bench.
2. The two consoles have the same programming easy intuitive mode
3. The two consoles have the same immediate run procedure
4. Power Switching Capacity  
The two consoles have the same capacity to handle up to 30 amperes. Each console can switch automatically from 220 to 120 Volts
5. Patch Repair Capacity  
The two consoles are designed to bond one patch with one or two independently controlled heating channels.

**NOTE** However, it is also possible to bond two patches different - thanks to the 2 channels - in the same time with the same program running.

6. Thermocouple scanning capacity

**Table 1: Thermocouple capacities compared**

NG	OT
6 circuits	12 circuits
No extension	Extension possible to 24

7. Test of presence and of power of heating blanket  
The OT is equipped with circuitry to measure the current to the blanket and is thus able to detect the connection or disconnection of a blanket. The NG is not equipped.
8. Delivery: both consoles are delivered with all appropriate accessories presented in a nice transportation and storage case.

## 7 REFERENCES TO ORDER

P/N:GMIOT9701-1 Dialog in English; units in xC and Bars

P/N:GMIOT9701-2 Dialog in French; units in xC and Bar

P/N:GMIOT0701-3 Dialog in English; units in xF and In Hg

## 8 CONSUMABLES

- ⇒ A box of 20 printer paper rolls P/N: GMINGI010-01
- ⇒ A box of 10 printer ink cartridges P/N: GMINGI010-02

In 2005  
The ANITA  
Family is  
20 YEARS

