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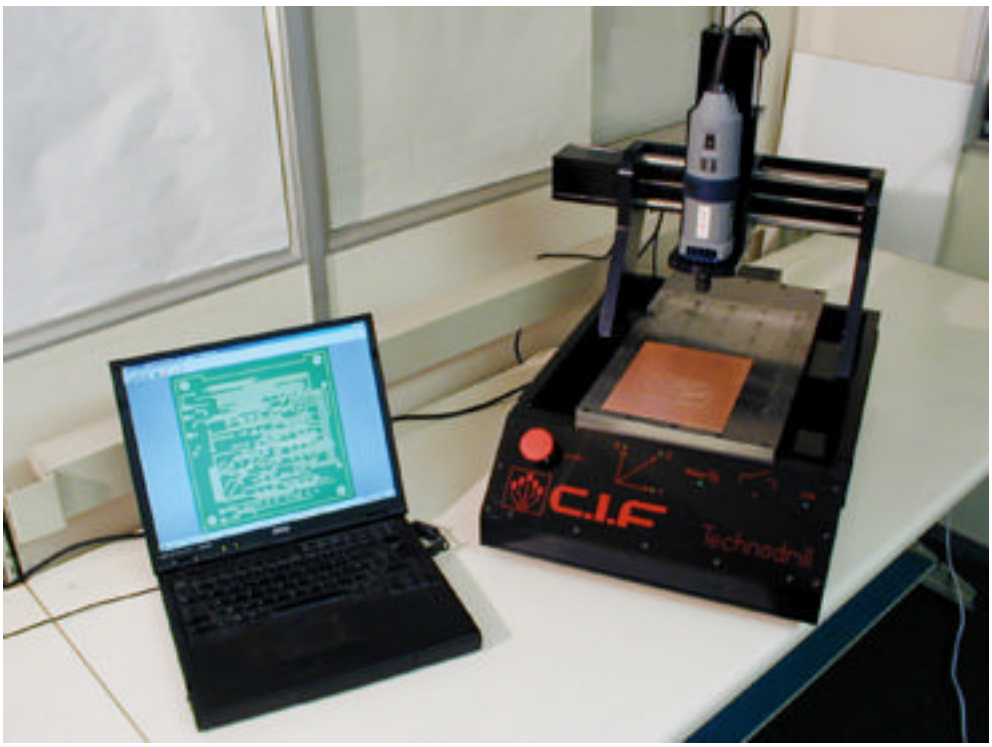
# DRILLING / MILLING 3 AXES MACHINE TECHNODRILL

## (Item Code C11 000  C11 020)

## Instruction manual




CE

# Conformity Certificate EC

We,

**C.I.F**
**Circuit Imprimé Français**
**11 rue Charles Michels – 92227 Bagneux Cedex France**
**Tel 33 01 45 47 48 00 FAX 33 01 45 47 16 14**
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certify under our responsibility that this product conforms to European Economic Community standards :

**DRILLING / MILLING 3 AXES MACHINE - Item Code: C11 000 C11 020**

In conformance With European guidelines,

**(89/392/CEE – 89/336/CCE) and to EN60-204-1 standard**

**(F) Déclaration du constructeur**
La société C.I.F. – 92220 BAGNEUX, France, certifie que le produit répond bien aux directives de la Communauté Economique Européenne.

**(GB) Manufacturer declaration :**
C.I.F. company – 92220 BAGNEUX, France, herewith declare that this product conforms to E.E.C. regulations.

**(D) Hersstellererklärung :**
Hiermit erklärt die Firma C.I.F. S.A. – 92220 BAGNEUX, France dass dieses produkt der Richtlinie EWG entspricht.

**Conforms to the following standards**

In accordance with the following European Decrees :

- **Directives 73/23/EEC for low voltage machines amended by 93/68/EEC**
- **Directives 98/37 EC for Machines**
- **Directives EMC 89/336/EEC amended by 92/31/EEC and 93/68/EEC**

Is conform to the standards:

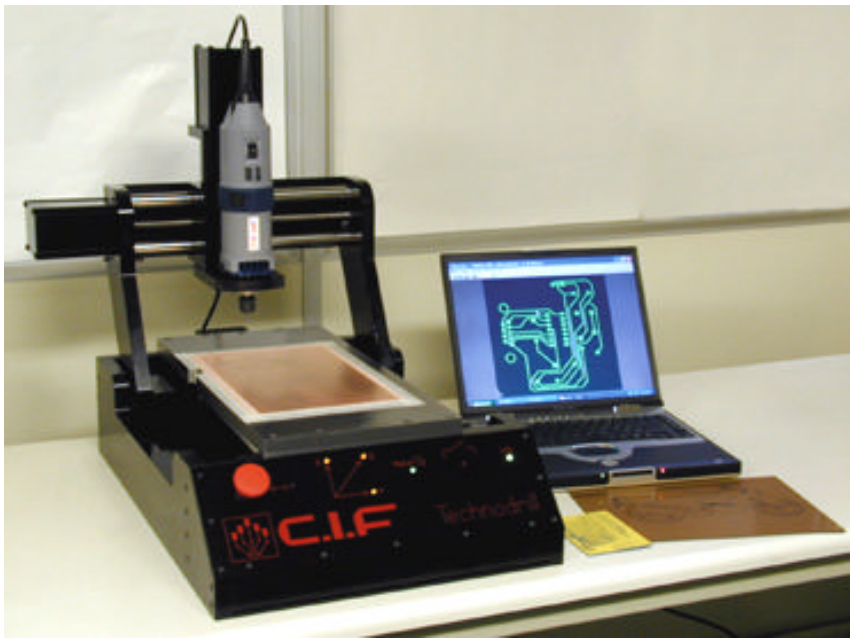
**EN-60204-1**
**EN 292**

Bagneux**,** September 2005,

Authorised signature
M. Bernard ANDRIOT

# Table of content

# 1. Presentation




**TECHNODRILL**

## 1.1 Technical characteristics

| | |
|---|---|
| Technical characteristics | **TECHNODRILL** |
| Moving X, Y, Z | **215 x 360 x 90 mm** |
| Plate (working area) | **215 x 320 mm** |
| Resolution | **0,0025 mm in microstep (0,1 mil *)** |
| Reproductibility | **+ or - 0.005 mm (0,2 mil *)** |
| Spindle power | **800 W** |
| Spindle speed | **8000 to 26000 turns/min** |
| Chuck | **3.17 - 8 mm** |
| Tool feeder | **Semi-automatic** |
| Drilling capacity | **120 holes/min (ø 0,8)** |
| Minimum drawing width | **0,2 mm (8 mil *)** |
| Minimum insulation | **0,2 mm (8 mil *)** |
| Minimum drilling Ø | **0,3 mm (12 mil *)** |
| Moving speed | **50 mm/s maxi** |
| Linear guiding | **Ball vice and precise screw (pas 4 mm)** |
| Motor X, Y, Z | **Motors step by step, 400 steps by turn, 1 / 2 to 1 / 16 steps by adjustable turn (3200 steps). Piloting in microstep avoids mechanical resonances.** |
| Frequency | **Up to 50 KHz** |
| Table | **Iron XC48 rectified 0,05 for a better positionning thanks to magnets, tapping M6 on the whole surface** |
| Interpolation | **3 axes** |
| Power supply | **220 V - 50 Hz - 0,8 A** |
| Net weight | **64 Kg** |
| External dimensions L x w x H | **500 x 720 x 590 mm** |
| Tool positioning | **Included** |
| Capot | **En Option** |

| | |
|---|---|
| Sound level (with cover) | **< 65 dBA** |
| Delivered with | **GALAAD 3 Software** (Free updates) |
| Version | **Multi –installations, network possible** |
| System requirements | **486DX - 50MHz 80Mo RAM up to XP PRO** |

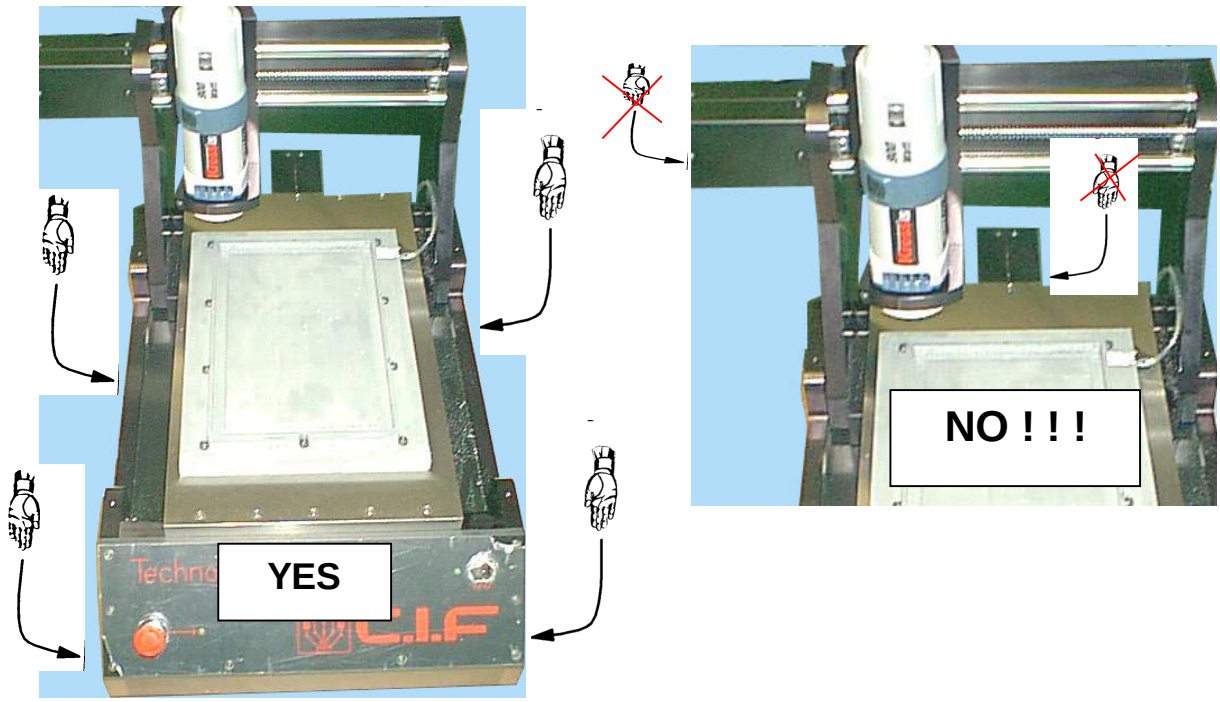
**Description**
3D software including « milling» of PCBs.
Compatible with many machines and many CAE-CAD softwares. Accepts HPGL, ISO, EXCELLON, GERBER, GCODE, DXF files.

***** 1 mil = 25,4 mm / 100 = 0,0254 mm

## 2. Transport

**IMPORTANT**

**Always carry or handle the machine from the bottom.**
**Never carry or handle the motor part.**
**If you do not respect this advice, the machine can be damaged.**



# 3. Safety

1. Ensure the worktable is flat and can accept the machine weight.
2. Power supply: 220/240 V – 50/60 Hz upon **differential circuit breaker 30mA 10A**.
3. **Make sure that the earth is correct and connected to the machine.**
4. Sound level > 70 dB without cover, **protections for staff** must be forecasted.
5. Always use a brush or a ducts cleaner to clean the machine.
6. Before the first use, read again the instruction notice of the spindle supplied with the machine as well as the instruction notice of the piloting software.

Always verify the pieces to manufacture are well positioned upon the plate.

# 4. Machine setup

Ensure the worktable is flat and can accept the machine weight.

## 4.1 Spindle assembly

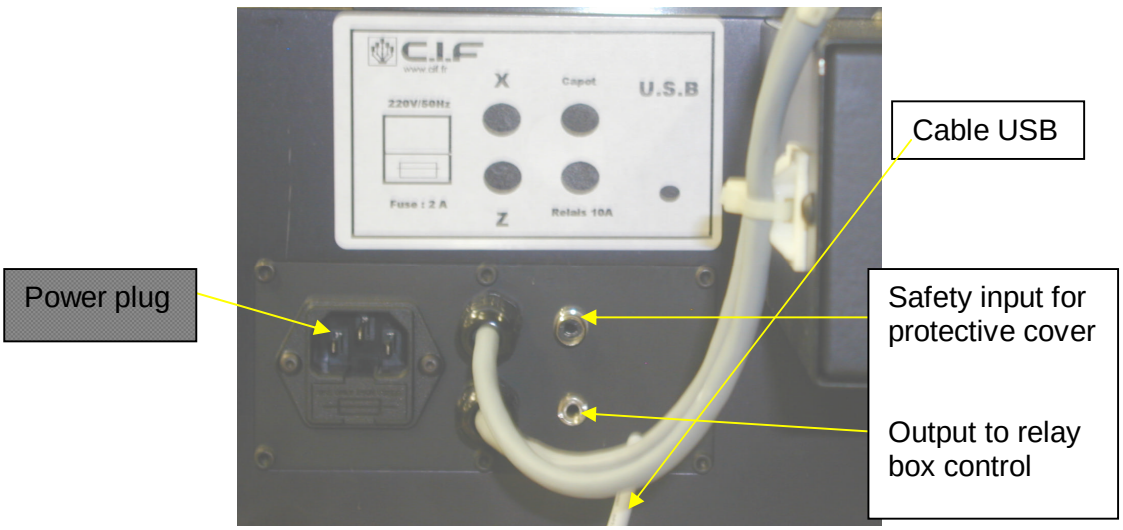
**WARNING ! !**
Before assemble or disassemble the spindle, slightly unscrew the fixing screw of the lighting as shown hereunder:

**Screw to unscrew**

Fix the spindle on Z axe, slightly tighten not to damage the spindle body.

Spindle assembly

Connect the power cable, Power supply: 220/240 V – 50/60 Hz on differential circuit breaker 30mA 10A.



# 5. Parameter of the machine

## 5.1 Software set up

To set up the software, please read the instruction notice **GALAAD 3.**
**Copy the USB driver file from the cd to your computer**

## 5.2 Configuration of the machine parameters

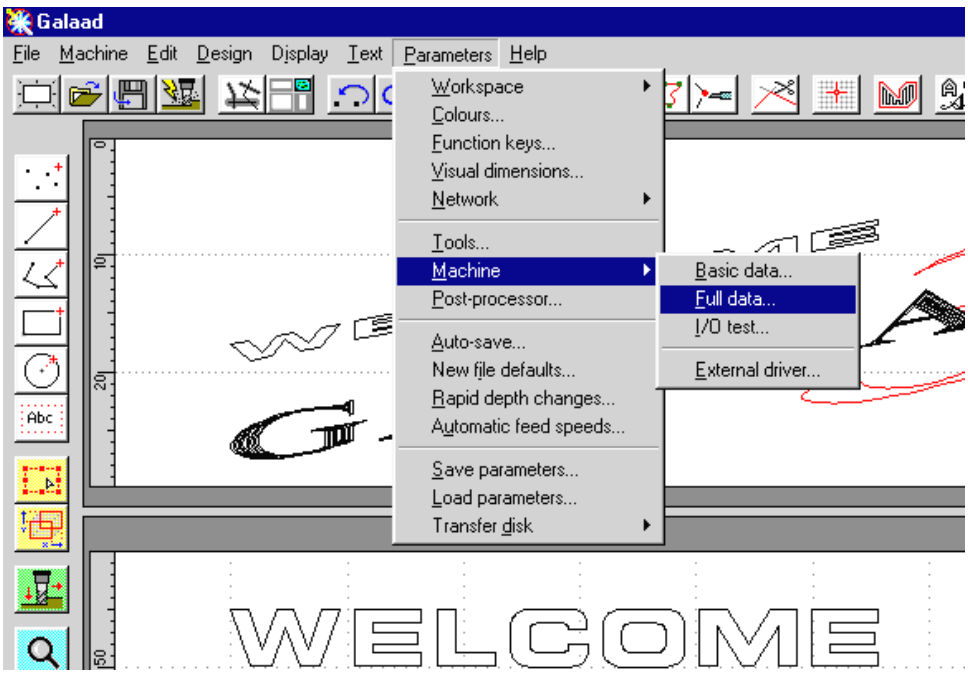
After the software installation and before switching on the TECHNODRILL, you must parameter the software according to the machine you are using.

**As GALAAD is an open software, it must be parametered for TECHNODRILL use.**

You will find here under the screen printings to help you configurating the machine.

**Step 1**

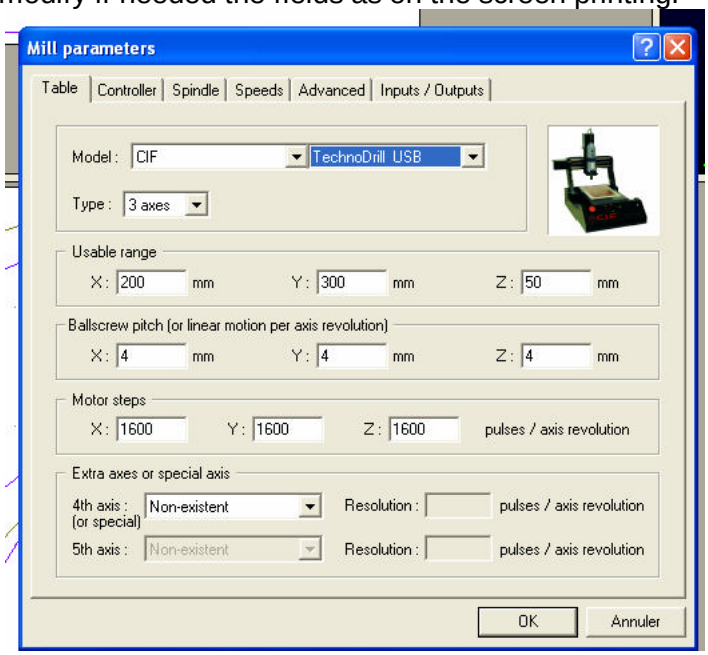
Open **GALAAD** then in the title **« Parameters »** select **« Machine »** and **« Full data ».**



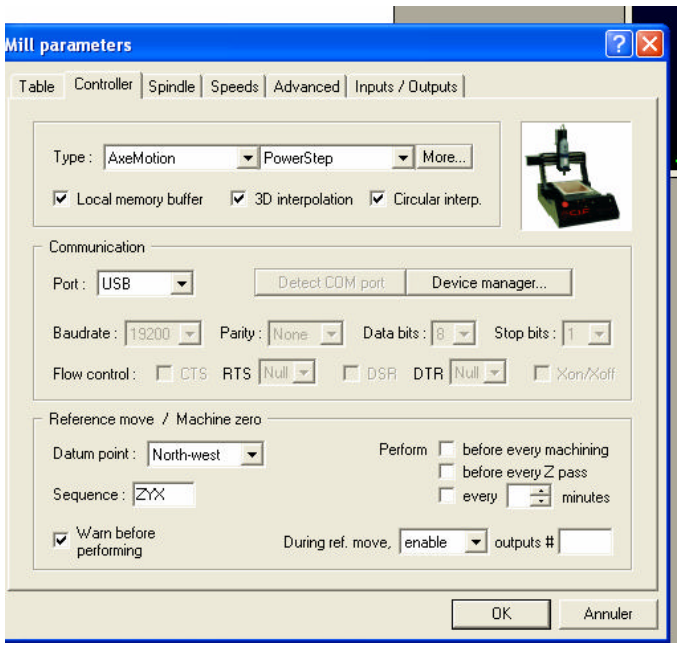
**Step 2**

A window **« Milling parameters »** opens :

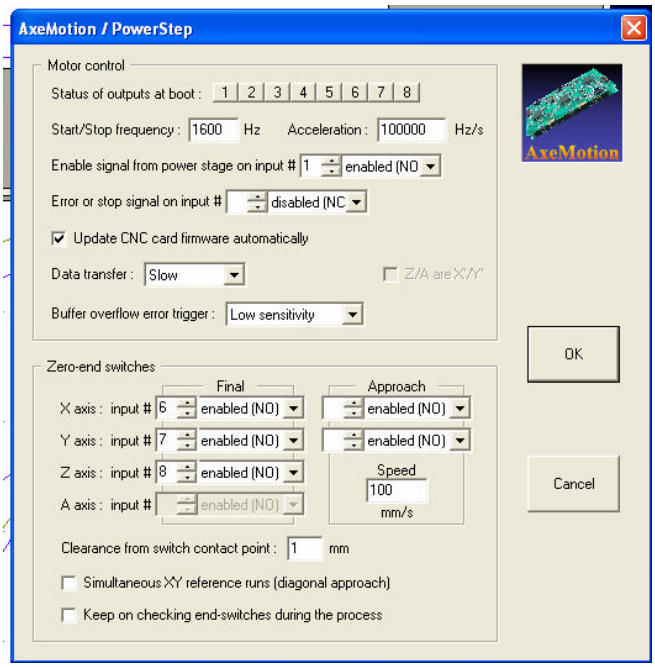
**Important:** Verify and modify if needed the fields as on the screen printing.




Click upon **« Controller »** :
**Important:** Verify and modify if needed the fields as on the screen printing.

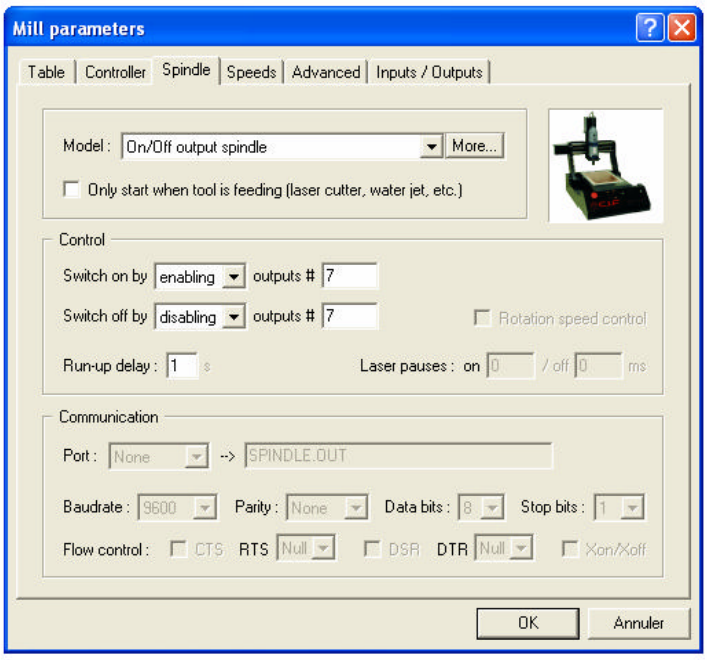


Click on **« More »**
**Important:** Verify and modify if needed the fields as on the screen printing.



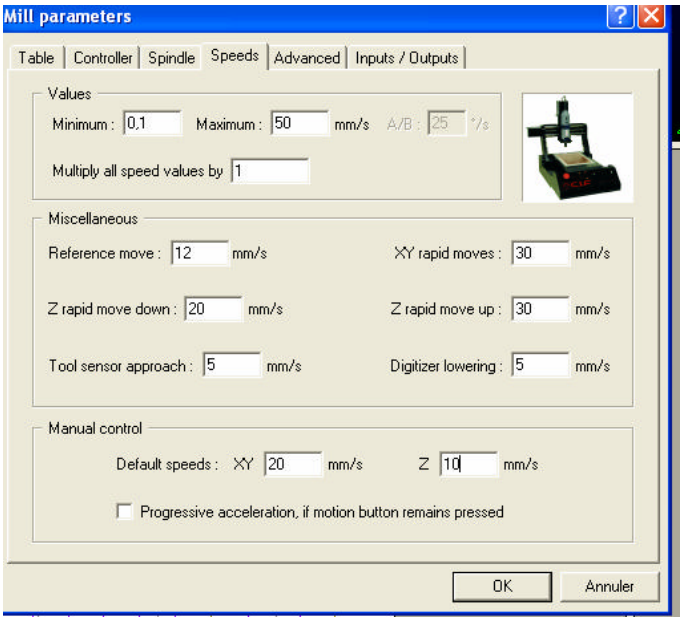

validate with **OK**.

Click on **« Spindle »**
**Important:** Verify and modify if needed the fields as on the screen printing.



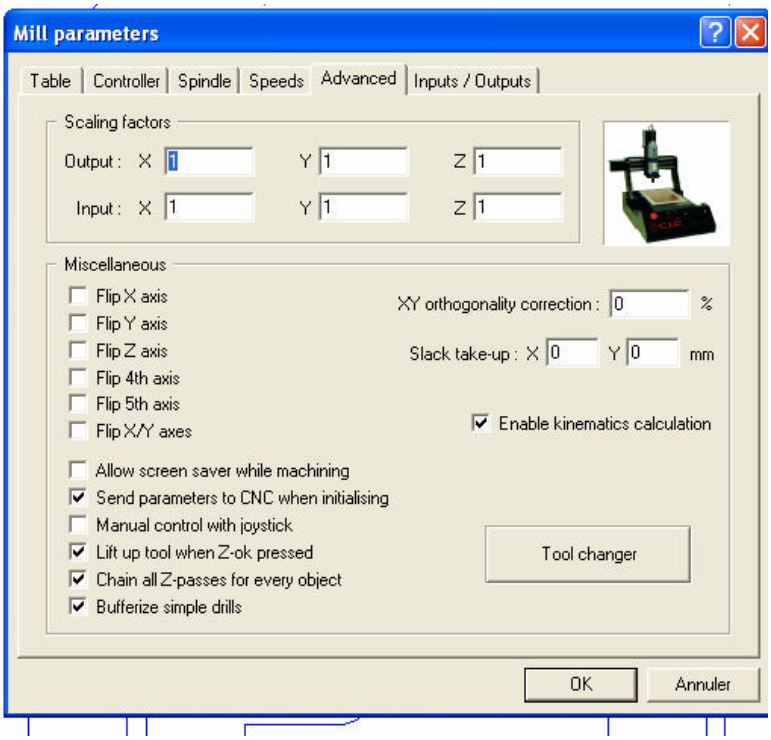
Click on **« Speeds »**

**Important:** Verify and modify if needed the fields as on the screen printing.



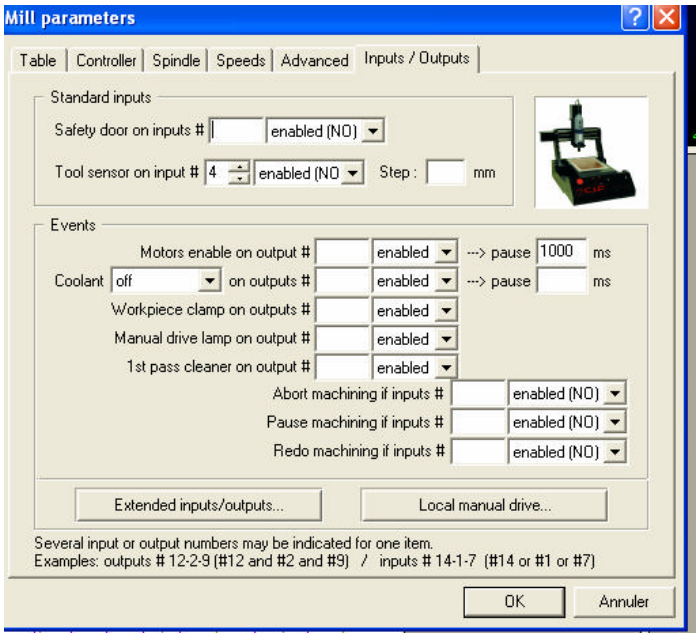

Click on **« Advanced »**

**Important:** Verify and modify if needed the fields as on the screen printing.



Click on **« Inputs / Outputs »**

**Important:** Verify and modify if needed the fields as on the screen printing.



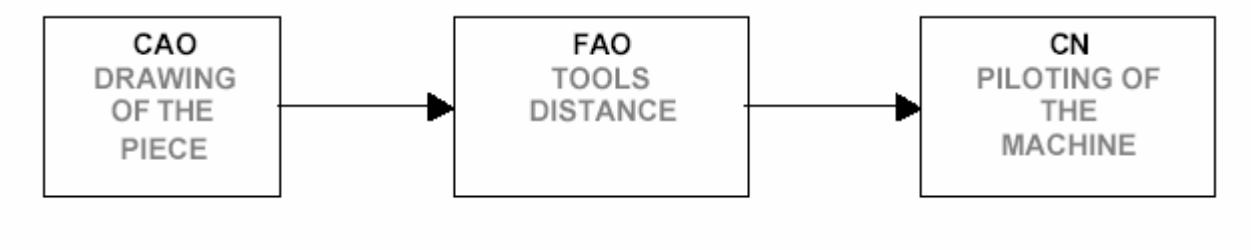

The machine is now ready to use.

Plug the USB cable from TECHNODRILL to an free USB plug on your PC, switch on the TECHNODRILL.
WINDOWS at this time will request you to install the driver for this new material.
Follow the WINDOWS instruction to load the driver.

## 5.3 Information upon piloting software of the TECHNODRILL

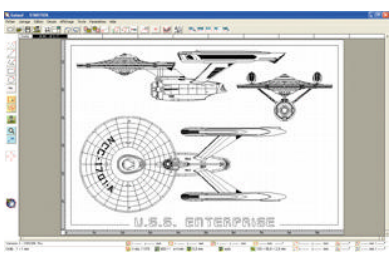
GALAAD 3 is a set of Windows® softwares (95 / 98 / ME / NT / 2000 / XP) dedicated to the **intelligent piloting of numeric controlled machines** from 1 to 5 axes. Thanks to its « all in one » conception, it purposes a complete manufacturing process, and adds supplementary modules for special applications. The GALAAD software is available in **German, English, French** and **Italian.**

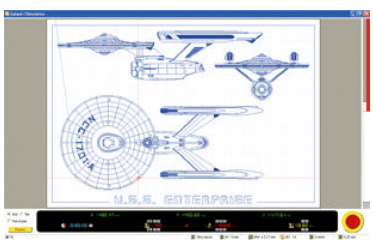
From the design to the object, the process includes three steps : **drawing of the piece,** thanks to a CAO (Conception Assisted by computer) software 2D, 2D 1/2 or 3D which creates a file giving the coneived geometry, for example HPGL, DXF or other files ; then **definition of the tools distance**, thanks to a FAO (Manufacturing assited by computer) software which creates the distance the tools will have to make, on ISO G-code file the most frequently ; and at last a CNC (Computerised Numerical Control) software to **pilot the machine**, dedicated to realise the required piece according to the produced tools distance.

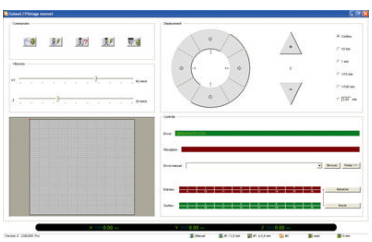




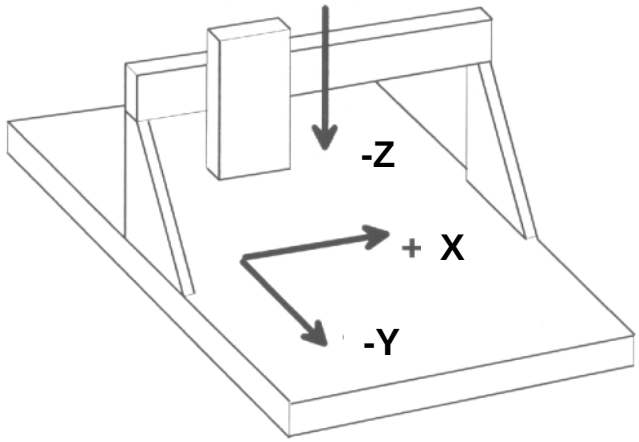
GALAAD offers those **three steps** in one software. Offering a module for special drawing, taking into account that the piece to design must be manufactured, the user can create manufacturing information. The link with manufacturing part is immediate, which does not need to use intermediary files. From the design module, a simple click launches the manufacturing process with **a machine piloted by GALAAD.**
Galaad is an **open software**. GALAAD is not necessary for all the steps. You can also use an external software to some key-points of the process. So, a design file can be issued from another software than GALAAD. The design module can also use an external pilot to work with the machine, without using many files.



## 5.4 Axes moving




# 6. Software use

All the information concerning the use of **GALAAD** software are in the manual **GALAAD 3** supplied with this machine. Please consult it.

## 6.1 Updating

**GALAAD** software is regularly updated according to the users' notes.
This updating is free and available by downloading on the following website:

**www.galaad.net.**

*Nota:* to update the Galaad modules, first download the ZIP archive, then extract the files to the GALAAD dossier, cancelling the existing ones. No Galaad module must be used at this time.

# 7. Using advice

It is very important the plate is very flat for a good final result, in case you are using a martyr plate, you need to surface it after fixing on the machine.

Router is made getting off 1/10 to 2/10 mm on the whole surface of the plate, the spindle moving will so be perfectly parallel to the plate.
A special function exists into GALAAD software.

## 7.1 Etching

The etching quality will depend on the two following criterias:

1- the flatness of the board to etch, sometimes boards are not flat or have thickness variations of some hundredths of millimetre.

2- the cutting quality of the chosen tool as well as its rotating and moving speed.

## 7.2 Drilling

Always use good quality drill bits, ensure the part to drill is well attached.
Always use the rotating and moving speed, recommended for the used tool.

**Important**

**Use a martyr plate or a drilling plywood not to damage the plate during crossing drilling.**

## 7.3 Milling

**Always verify the attachment of the part to manufacture before beginning the job.**
**Verify anything can block the axes.**
**Do not work on the wrong way (except if the tool permits it)**
**Always use the moving and rotating speed recommended for the used tool.**

## 7.4 Error code

This message mind that emergency switch is press or door of front cover (if option) is open.

**Process:**

**- Check before if nothing prevent to restart the process,**
**- Power on the machine,**
**- Click “OK” on the error message,**
**- Close the active window,**
**Restart the process, BEWARE, do a reference machine run before starting milling, if you do not you could have a shift of the axes.**

# 8. Cleaning and maintenance

## 8.1 Cleaning

Etching a board makes many copper and epoxy dust.
Those are very abrasive, you need after each operation to clean the machine, with a brush or a vacuum cleaner dedicated to the machine.

## 8.2 Maintenance

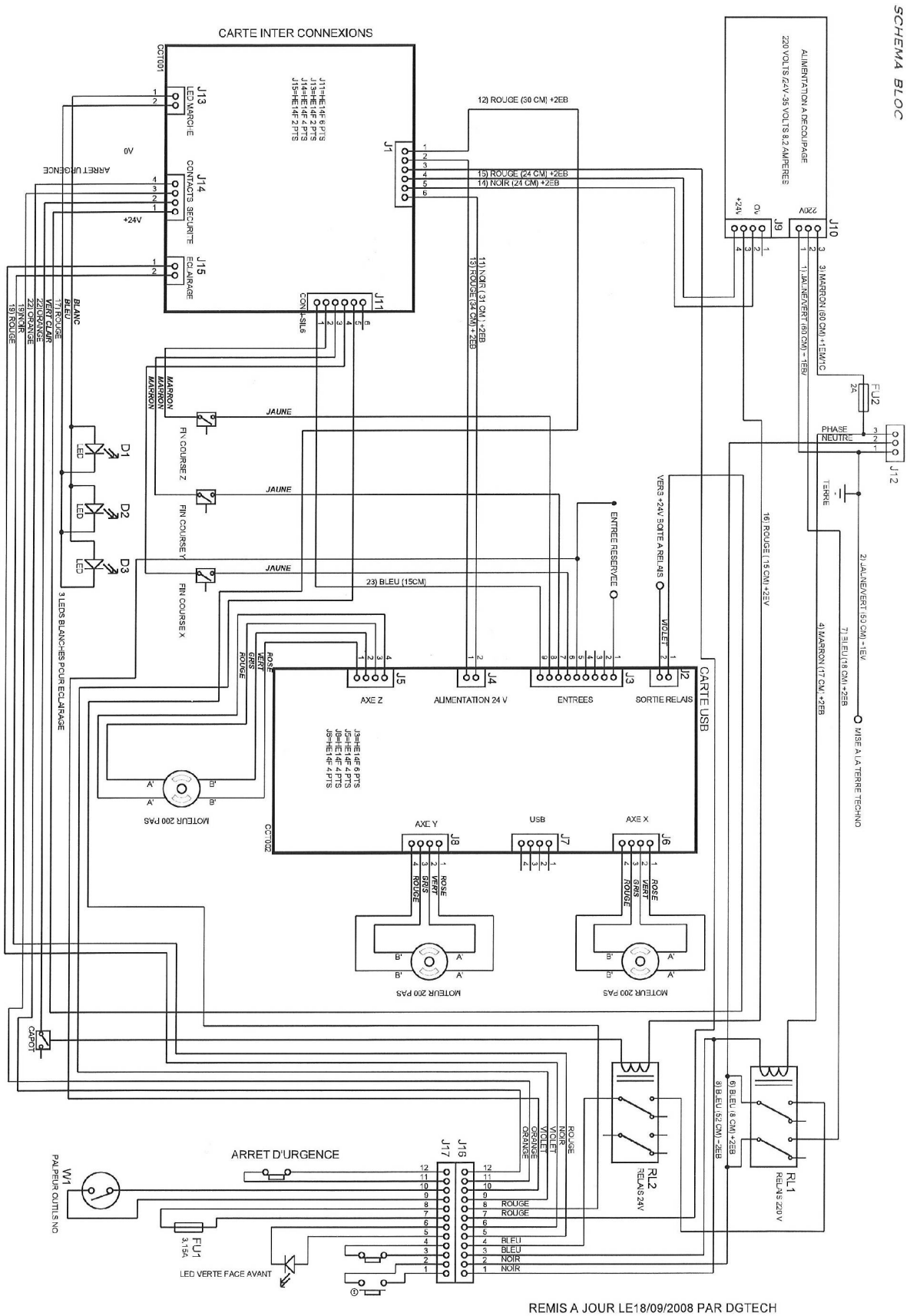
The machine axes are greased with a Teflon grease.
Only use a Teflon base grease to grease the axes, a small fat film is sufficient.

The machine plate will be maintained in a perfect state, ensure it does not oxidize, lubricate it with a fatty rag.
In case of plate damaged, you can stop it with a resin.
Sandpaper after hardening to maintain the flatness.

# 9. Options & accessories

| Accessories and options | Item Code |
|---|---|
| **Martyr plate**<br>Made of PVC, thickness10 mm, dimensions 215 x 315 mm | **C12 703** |
| **Relay box 10 A** – Piloting with software<br>To automatically control the spindle and dust cleaner. | **C12 704** |
| **Transparent protective cover**<br>Aluminium and polycarbonate, made safe | **C12 705** |
| **Silent dust cleaner, 61 dB**<br>Micro filter for epoxy and swarf dust.<br>1100 W, dimensions 335 x 355 x 405 mm, net weight 7,5 Kg. | **C43 101** |
| **Drilling plywood**<br>Set of 10 in 200 x 300 mm, thickness 2 mm | **EP 116** |
| **Precise vice**<br>Made of milled steel, jaws length 60 mm, opening 46 mm | **EP 111** |
| **Starter kit for TECHNODRILL** | |
| Drilling plywoods 200 x 300 mm | **EP 124** |
| Carbide drill bits Ø 0.8 mm, queue Ø 3,17 mm, length 38 mm (Qty 3) | **DU 68** |
| Carbide drill bits Ø 1 mm, queue Ø 3,17 mm, length 38 mm (Qty 3 | **DW 101010** |
| Fraise diamant de détourage,Ø 2,5 mm for PCB | **DU FD2** |
| Fraise de surfaçage, Ø 6 mm, queue Ø 8 mm | **DU 200** |
| Single sided raw epoxy,16/10,35 µ,200 x 300 mm (Qty 3) | **AD 20** |
| Double sided raw epoxy,16/10,35 µ,200 x 300 mm (Qty 2) | **AE 20** |
| Martyr plate made of 10 mm thick PVC– dim..220 x 320 mm | **C12 703** |

# 10. Scheme


SCHEMA BLOC
CARTE INTER CONNEXIONS
CCT001
J13 LED MARCHE
J14 CONTACTS SECURITE
J15 ECLAIRAGE
J11 CONNSIL6
J1
J11=HE14F 6 PTS
J13=HE14F 2 PTS
J14=HE14F 2 PTS
J15=HE14F 2 PTS
ARRET URGENCE
0V
+24V
12) ROUGE (30 CM) +2EB
15) ROUGE (24 CM) +2EB
14) NOIR (24 CM) +2EB
11) NOIR (31 CM) +2EB
13) ROUGE (24 CM) +2EB
ALIMENTATION A DECOUPAGE
220 VOLTS /24V-35 VOLTS 8,2 AMPERES
+24V
0V
220V
J9
J10
3) MARRON (60 CM) +1EM1C
1) JAUNE/VERT (60 CM) - 1EN
FU2
2A
PHASE
NEUTRE
J12
TERRE
MARRON
MARRON
MARRON
JAUNE
JAUNE
JAUNE
FIN COURSE Z
FIN COURSE Y
FIN COURSE X
D1
D2
D3
LED
3 LEDS BLANCHES POUR ECLAIRAGE
BLANC
BLEU
VERT CLAIR
ORANGE
ORANGE
NOIR
ROUGE
17) ROUGE
22) ORANGE
22) ORANGE
18) NOIR
19) ROUGE
23) BLEU (15CM)
ENTREE RESERVEE
VERS +24V SORTIE A RELAIS
VIOLET
16) ROUGE (15 CM) +2EV
2) JAUNE/VERT (50 CM) - 1EV
7) BLEU (18 CM) +2EB
4) MARRON (17 CM) +2EB
MISE A LA TERRE TECHNO
J5
J4
J3
J2
AXE Z
ALIMENTATION 24 V
ENTREES
SORTIE RELAIS
CARTE USB
CCT002
J5=HE14F 4 PTS
J4=HE14F 4 PTS
J3=HE14F 6 PTS
J2=HE14F 4 PTS
ROSE
VERT
GRIS
ROUGE
MOTEUR 200 PAS
AXE Y
USB
AXE X
J8
J7
J6
CAPOT
ARRET D'URGENCE
PALPEUR OUTILS NO
W1
FU1
3-15A
LED VERTE FACE AVANT
J17
J16
ORANGE
ORANGE
VIOLET
VIOLET
NOIR
ROUGE
ROUGE
ROUGE
BLEU
BLEU
NOIR
NOIR
RL2
RELAIS 24V
RL1
RELAIS 220 V
6) BLEU (18 CM) +2EB
8) BLEU (52 CM) - 2EB
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