








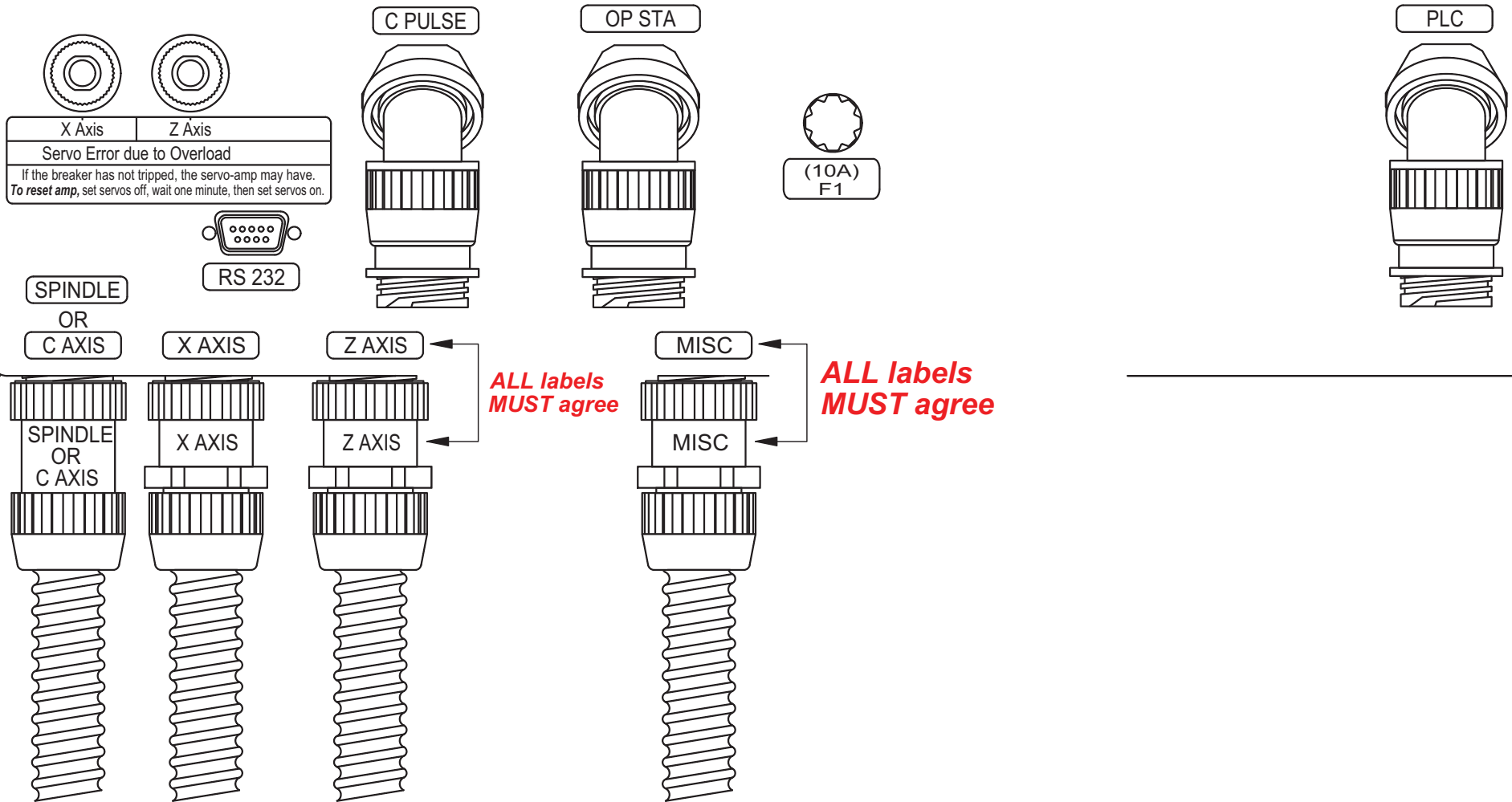


**Packing List for G4 Baumuller**

Parts	Express Box 1:	Included
	<b>OmniTurn Programming &amp; Service Manual</b>	
	<b>Installation Instructions In Zip-Lock Bag</b>	
	<b>5" jumper</b>	
	<b>2" jumper</b>	
	<b>USB flash drive</b>	

	Express Box 2:	
	<b>14 pin to 16 pin C axis Adapter Cable</b>	
	<b>BEDAS Board (PWMG4)</b>	
	<b>Op Station Extension cable</b> Connected to Op Sta - back of CNC control	
	<b>Ethernet loop-back test plug</b> Located inside of CNC control On back of LCD	
	<b>MISC. PLUG</b> Pre-connected to MISC. on back of control Must save this plug- store inside CNC control	

# CAUTION! Check ALL cables BEFORE POWER ON!



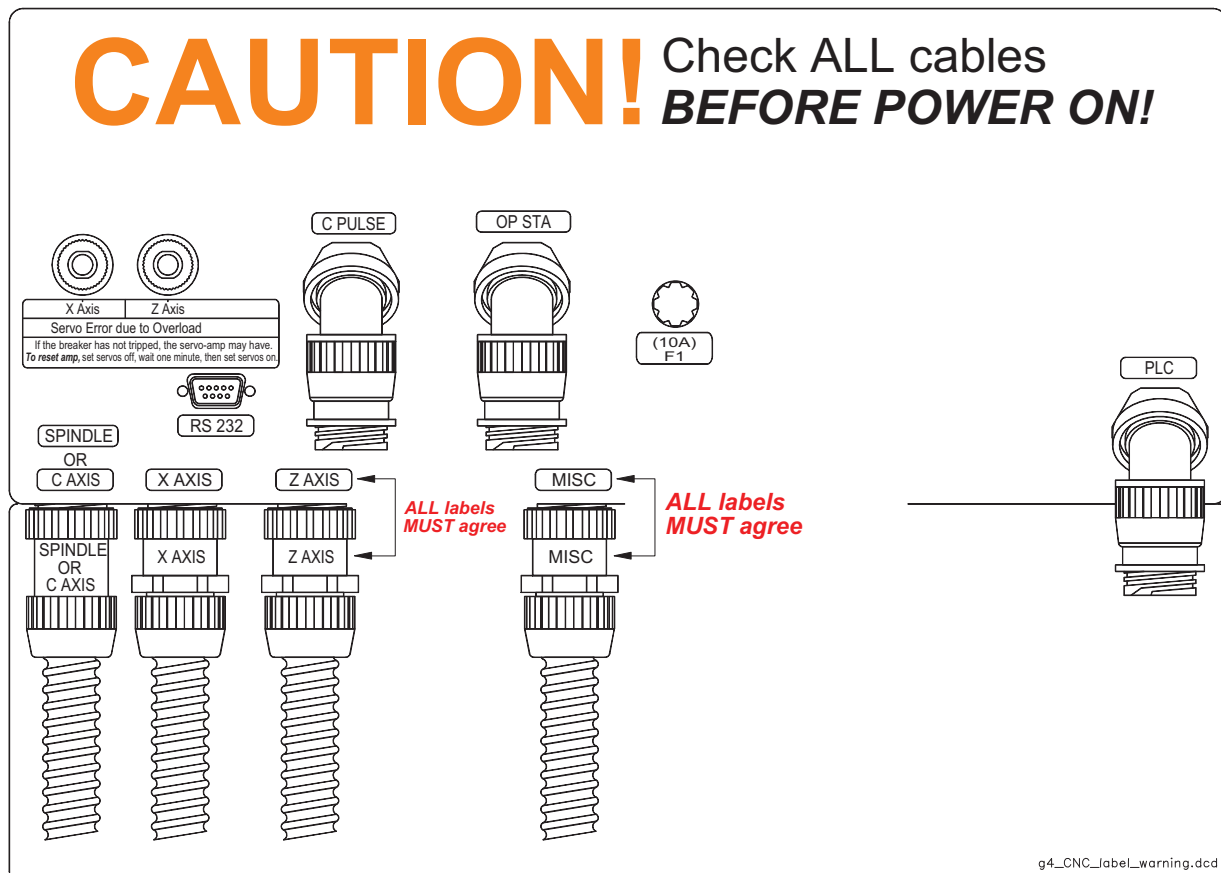
### Be Careful!

Before you disconnect your old control, check to make sure that each cable is marked with the socket that it is connected to (X Axis, Z Axis, Spindle, Misc, and C Axis if applicable). If the original markings are not legible, make labels with masking tape or something similar and mark the cables as you remove them so that you will be sure you know where they belong. Plugging cables into the wrong sockets on the new control can cause serious damage, which will not be covered by warranty.

Make sure that the jumpers on the electrical panel are installed on the correct terminals. Terminal 1 is at the top of the terminal strip, and terminal 30 is at the bottom.

Be sure to disconnect your Operator's Station (palm box) from the main electrical cabinet and plug it into the Op. Sta. connector on the back of the control using the provided extension cable.

Do not turn the new control on until you are certain that each cable is in its proper socket and each jumper is on the correct terminals. If you have any doubts, call us at 541/332-7004 before turning the control on.



## G4 CNC Conversion for Baumuller C-Axis

### *Preparing the electrical box*

*These instructions are illustrated on pages 2 -6*

The new control uses a new interface board to connect to the Baumuller drive. We refer to this board as the PWMG4 board. We refer to the small black Baumuller module that plugs into the face of the Baumuller servo amplifier as the BEDAS module. This Baumuller module is configured for the motor and performance characteristics of your machine.

1. Unplug the remote Operator's Station from the electrical cabinet, and connect it to the OP STA connector on the control with the supplied extension cable. To find the connector, follow the cable from the Operator's Station under the hopper to the back-side of the spindle drive cabinet mounted on the left side of the GT-75 or GT-Jr.

#### ***Steps 2 - 6 are illustrated on Page 2.***

2. If TB1-3 and TB1-4 are jumpered together, remove the jumper.
3. Remove the light brown wire that runs from TB1-3 to the misc. connector and tape it up.
4. Remove the violet wire that runs from TB1-24 to the misc. connector and tape it up.
5. Run the 5" jumper provided from TB1-13 to TB1-4.
6. Run the 2" jumper provided from TB1-30 to chassis ground (the mounting screw next to TB1-30 is a good ground).

#### ***Steps 7 - 10 are illustrated on Pages 3 - 6.***

7. Cut the 2 black and 2 violet wires connecting the BEDAS module to the existing interface board. Cut them as close to the interface board as possible so that you will have as much wire as possible to connect to the new PWMG4 board (*Page 3*).

8. Some of the old interface boards had connectors along the bottom edge, and some had a terminal strip. In either case, the first

two wires on the left are not used with the new PWMG4 board. If the 3rd, 4th, and 5th wire from the left are in a connector on the old interface board, cut the connector off and strip about 3/16" of insulation from each of the wires. (*Page 3*). Remove the existing interface board from the Baumuller. Remove the red & black pair, and two orange wires from X6-3 and X6-4 (*Page 3*). Also remove the black & white wires from X6-5 & 6 (*Page 4*). The orange wires and the black & white wires are no longer needed; the black & red pair will be connected to the new PWMG4 board.

9. There is a short cable connected to terminal 6 and 7 on the new PWMG4 board. The black wire from this cable goes to Baumuller terminal X6-4 and the white one goes to X6-3. The terminals on X6 are counted up from the bottom (*Page 5*).

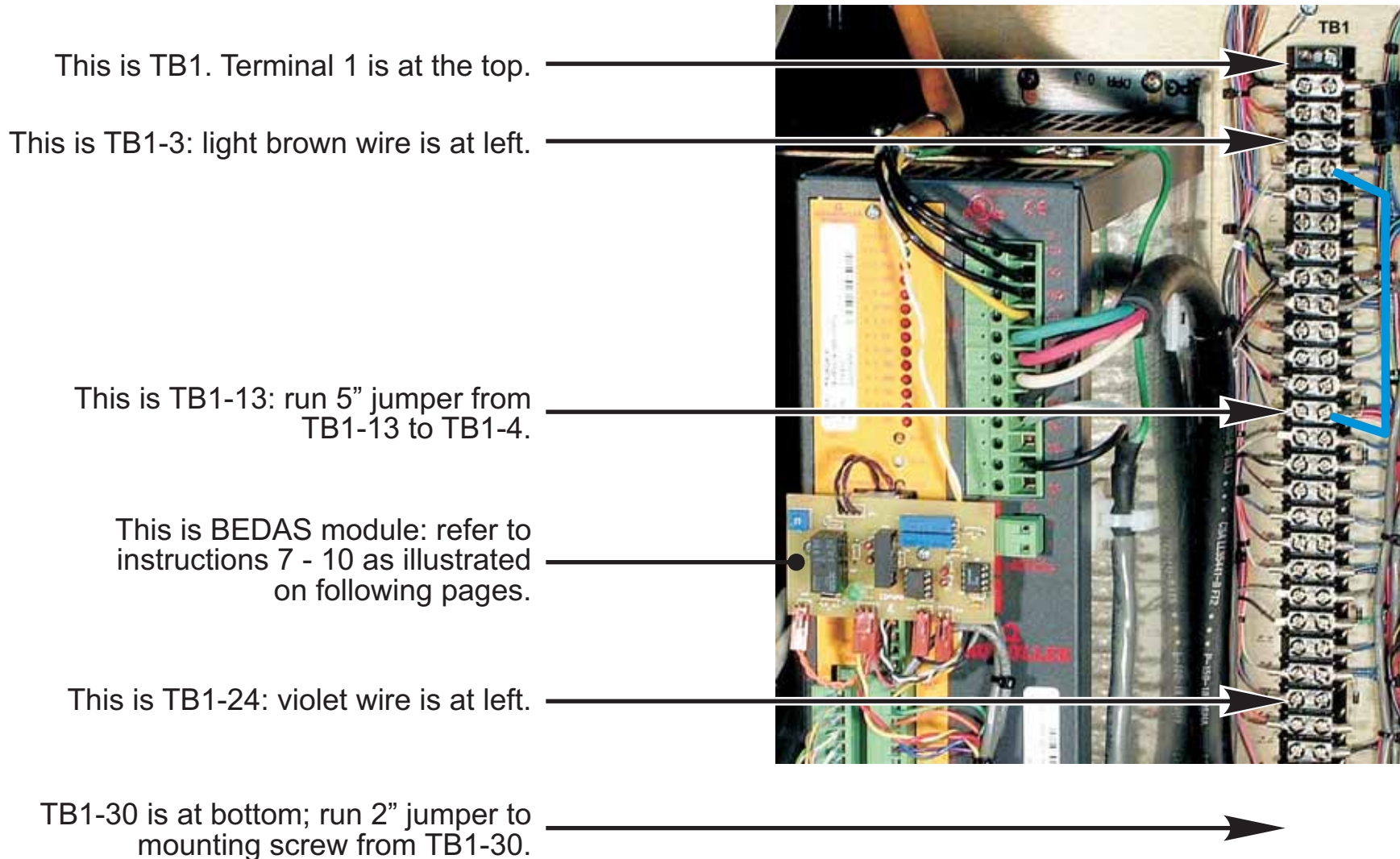
10. Install the new PWMG4 board on the standoffs. Strip about 3/16" of insulation from the 2 black and 2 violet wires coming from the top of the BEDAS module and connect them to the four terminals on the top edge of the PWMG4 board. The 2 black wires go to terminals 1 & 2 (left two). The 2 violet wires go to terminals 3 & 4 (right two). It doesn't matter which black or violet is at terminal 1 & 3 (*Page 3 & 6*).

11. Connect the yellow, brown and red wires to the first 3 terminals on the left end of the bottom strip on the new PWMG4 board. The yellow wire goes to terminal 1 (the leftmost terminal), brown to 2 and red to 3. (*Page 6*).

12. Connect the red & black pair removed from X6-3 & 4 (*Page 3 & 4*) to terminals 4 and 5 on the new PWMG4 board (*Page 6*). The black wire goes to 4.

## G4 CNC Conversion for Baumuller C-Axis

*This picture illustrates the location of TB1 and the BEDAS module.  
Follow instructions 1 - 6 for to modify TB1.*



## G4 CNC Conversion for Baumuller C-Axis

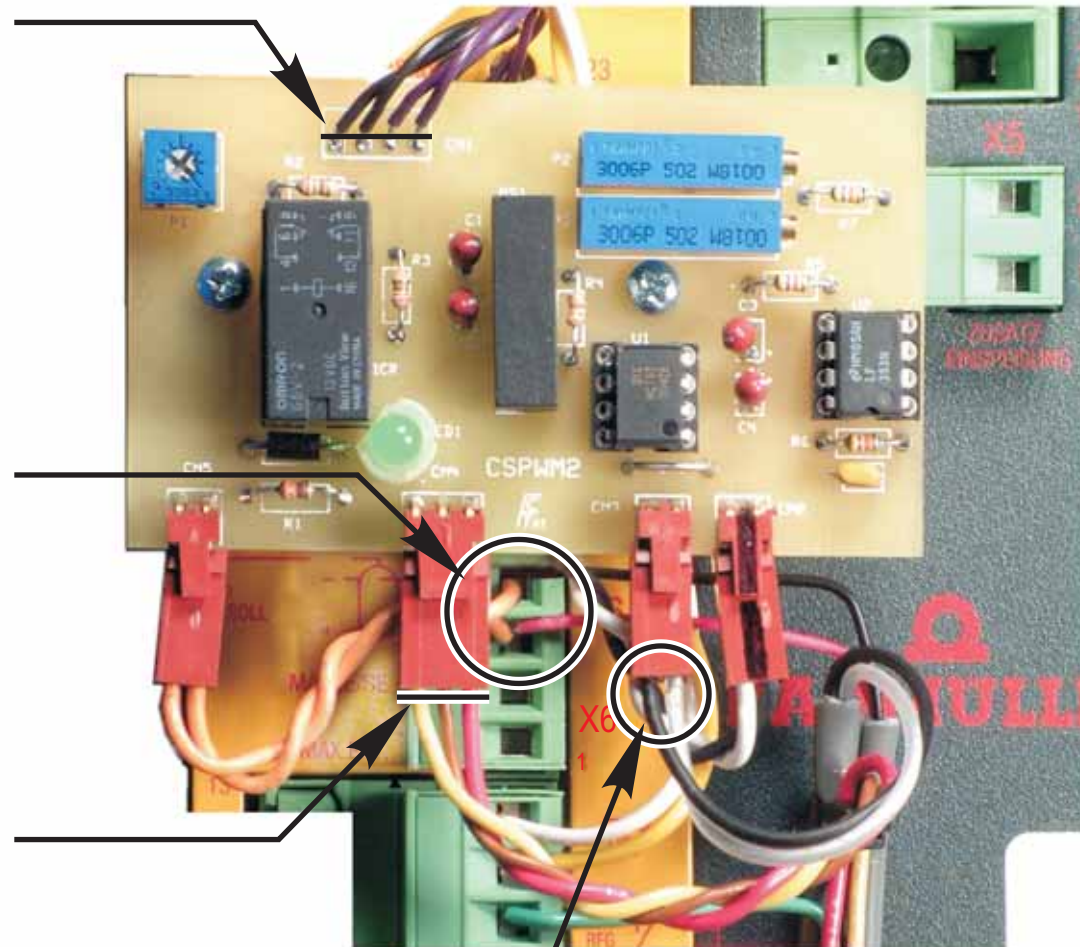
*This picture summarizes the removal of existing BEDAS interface card as described in steps 7, 8 & 9 of instructions*

1. Cut and strip these four here. They will be re-connected to new board at top terminal strip in same order.

4. Remove board; remove four wires from X6-3 & 4. BLK & RED wires will be re-connected to new board; ORG wires are no longer needed. Also remove BLK & WHT wires from X6-5 & 6; these are also no longer needed.

2. Cut and strip these three here. They will be re-connected to new board in same order, at bottom terminal 1, 2 & 3.

3. Cut these two here. These are no longer needed; tape them and stow them out of the way.



G4\_baum\_conv1.jpg

## G4 CNC Conversion for Baumuller C-Axis

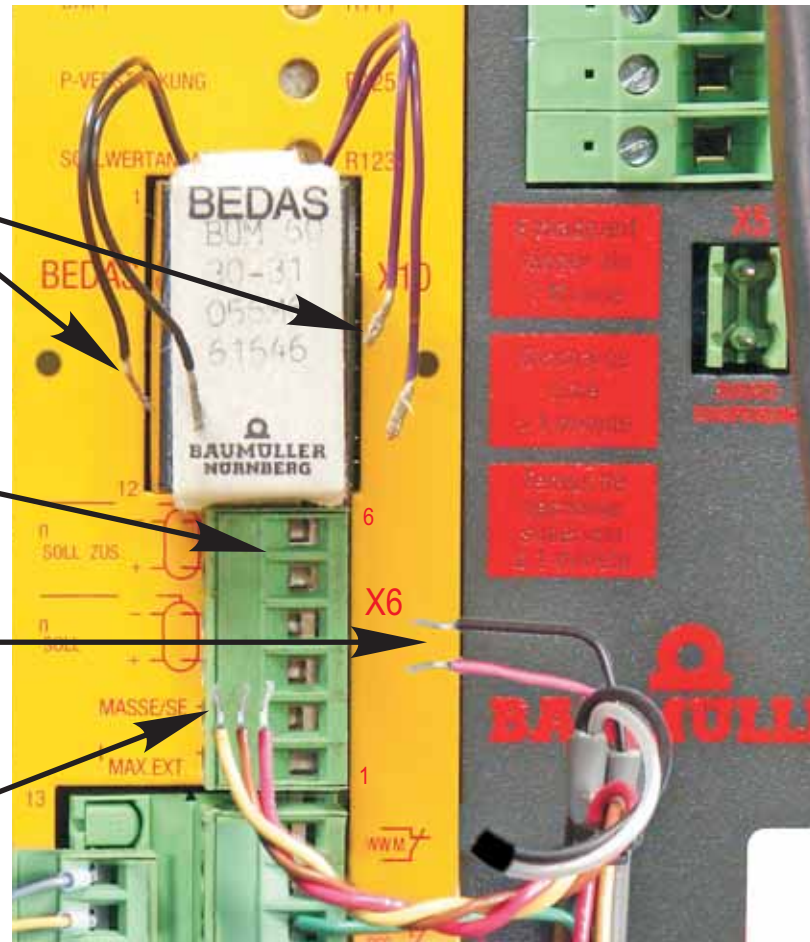
*This picture illustrates wires left after removing existing BEDAS interface card as described in steps 7, 8 & 9 of the instructions.*

These are the four wires at the top, cut and stripped. They are ready to be connected to terminal strip at top of new interface board.

Remove the BLK & WHT wires that went from X6-5 & 6 to CN2. They are no longer needed.

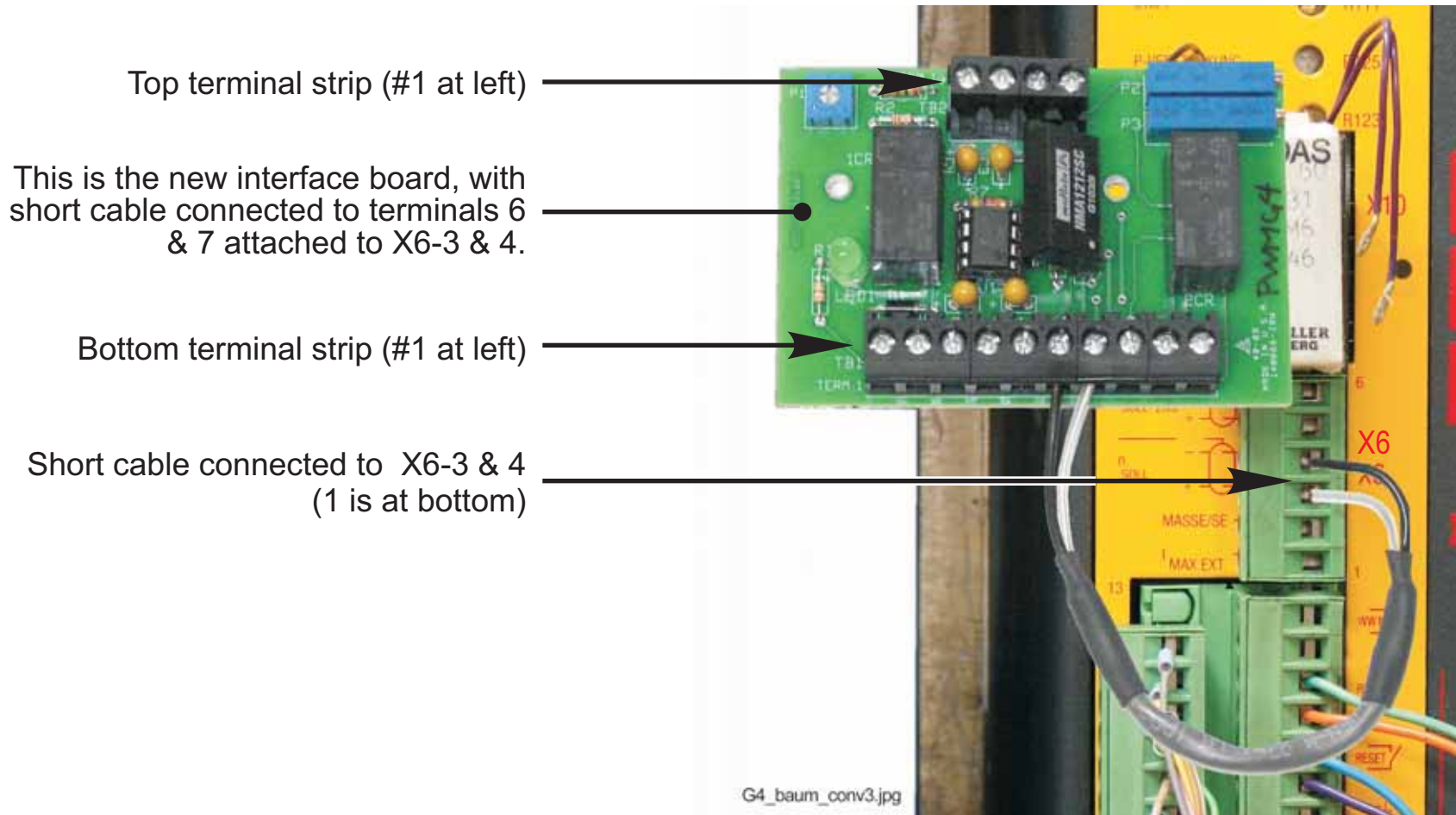
These are the RED & BLK wires disconnected from X6-3 & 4. They are ready to be connected to terminal strip at bottom of new interface board.

These are the three wires at CN4, cut and stripped. They are ready to be connected to terminal strip at bottom of new interface board.



## G4 CNC Conversion for Baumuller C-Axis

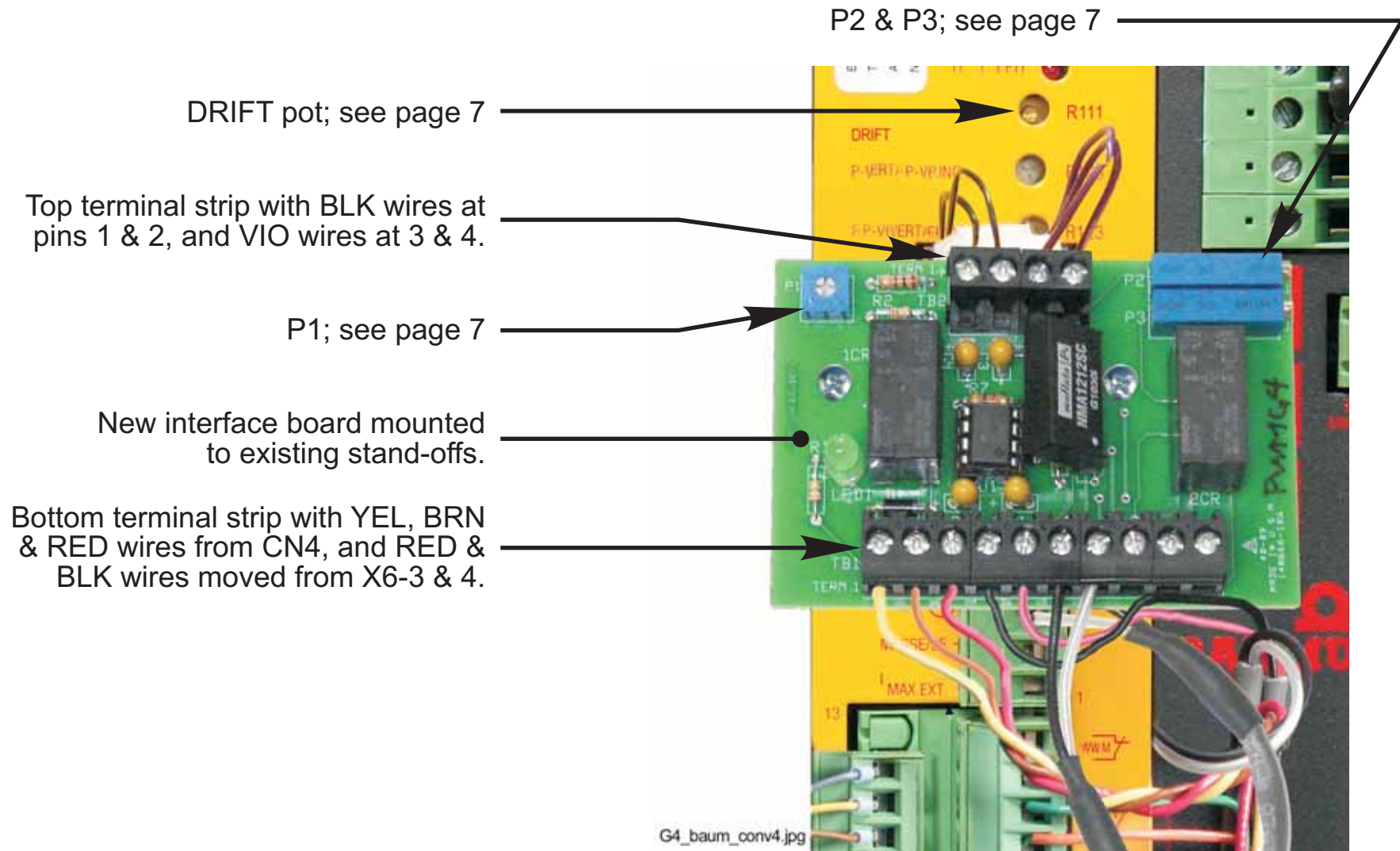
*This picture illustrates new interface card, with short cable that connects to X6-3 & 4 per step 10 of the instructions.*





## G4 CNC Conversion for Baumuller C-Axis

*This picture illustrates new interface card installed as described in steps 7 - 10 of the instructions.*



## G4 CNC Conversion for Baumuller C-Axis *Installing the Control, Adjustments, New Features*

### ***Installing the control***

The new control goes on exactly the same as the old one, except that there is a short adapter cable on the C axis connector to transition from the 16-pin cable on the machine to the 14-pin connector on the control.

### ***Adjustments***

The PWMG4 board should not need to be adjusted under normal circumstances, but if it does, follow this procedure.

*Adjustments are identified on Page 6.*

The new PWMG4 board has 3 adjustments. P2, in the upper right corner of the board, adjusts the maximum voltage on the speed command output of the board. With a voltmeter on the PWMG4 board's TB1 6&7, set this adjustment for 10 VDC at maximum speed command. The control is currently set for a max. speed of 4000 RPM. Some machines have a different top speed. If this is the case with your machine, a parameter file will need to be edited. Call us for instructions on making this change. As far as the adjustment of P2 is concerned, regardless of the top speed you require the adjustment will be 10 volts at top speed. Be sure the Spindle Override is set at 100% when making the adjustment. Adjust the DRIFT pot, located on the face of the Baumuller drive, to slow the spindle as much as possible when S0 is programmed.

P3, located directly below P2, is the servo loop gain. This adjustment controls how tightly the C axis will try to hold its position. The

adjustment can be checked by bringing up the Ctrl-E window in Jog mode. The proper adjustment will vary depending on the type of machine you have and whether or not you have a high-inertia load such as a large chuck. The default setting is 70 counts at medium jog speed. You may need to adjust this to a higher number if the C axis oscillates after positioning. Adjusting this number too high will lead to servo errors on rapid C axis moves, whereas going too low will cause the axis to be jittery.

P1 is located in the upper left corner of the PWMG4 board and controls the accel/decel rates for starting and stopping the spindle. If the drive tends to trip on startup or stop, make the accel/decel time longer.

### ***Differences from previous C axis machines***

The G4 control has the capability of jogging the C axis and setting the C axis home position. The jog speed or increment is selected just the same as the other axes. Pressing Alt-C (that is, Alt and C at the same time) turns the axis on and homes it, or turns it off. When the C axis is on, you may jog it to wherever you want its home position to be and press Alt-H to set the new home position. This comes in handy when you need to do C axis machining in a fixed relationship to some pre-existing part feature.

When programming C axis moves, the speed is set by the feedrate, while on older controls it was set by the RPM command. When C axis is programmed to move in conjunction with the other axes, all programmed axes will reach their target position at the same time. Old C axis programs will need to be modified if they don't have an IPM feedrate (G94F....) programmed before C moves are called out.

## Changes in G4 Control Compared to G3

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Most of the commands and functions of the G4 control are the same, and accessed by the same keystrokes, as the G3. The display has been redesigned to present more information and present the information more clearly and consistently. Listed below are the highlights.

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### **Jog Mode**

*The Position display now reflects tool selection.* When a tool is selected (by pressing "T" and entering the number, just as on the old control) the coordinates displayed are those associated with the selected tool (work coordinates), and the X value is the diameter value rather than the distance from home. To put the display back into machine coordinate mode, select tool 0.

*Manual Data Input (MDI)* is now a part of Jog mode, rather than a separate mode of its own. MDI mode allows basic operations such as the exercising of M functions and simple positioning moves. Canned cycles such as threading or drill cycles are not supported in MDI.

On machines equipped with a C axis, the *C axis is enabled in Jog mode by pressing Alt-C*. The C axis will home itself when it is enabled. The C axis can be jogged the same as X or Z and pressing Alt-H with the C axis enabled will set the current position as C axis home position. After setting this position, M19 will index the C axis to this position whether in Jog or Automatic mode. When C axis is enabled, pressing Alt-C again will disable it.

*Auto Mode is entered by pressing A* from Jog Mode. It is no longer necessary to press Esc to get out of Jog mode. If no program has been selected, a file-picking screen will come up and you must choose or create a part program before going to Auto.

### **Auto Mode**

*A distance-to-go display* has been added in the upper left corner of the screen. Previous, current and next program lines are displayed. The active tool number is also displayed.

*Tool offsets* can be adjusted at program stops or anytime the machine is not in cycle.

*Sequence Search* now presents a list of the tool calls in the order in which they appear in the program. When you select a search point from this list, you will be prompted with a list of the M-functions which will be enabled. Pressing Cycle Start will turn these functions on, and program execution will begin in Single Block mode. Note that PLC (user-defined) m-functions are not recognized by sequence search mode. If there is only one tool in the program, sequence search is pointless, so no search points will be displayed.

To copy all program files to G4 CNC from a USB stick

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**Current versions of the G4 CNC have no floppy drive; you must first copy your program files from your backup floppy disk to a USB stick using your desktop computer equipped with floppy drive.**

*If your backup is not current, put a blank floppy disk in your old control, turn it on, then press 'Y' at the "Do you want to backup your files" prompt.*

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Plug in the USB stick with your user programs *before* you turn on the CNC. If the CNC is on, turn it off, then install the stick.

Turn the control on: at the "OmniTurn CNC" screen, press and hold the Ctrl key, then press the "C" key (Ctrl-C). (Ctrl key is at extreme lower-left corner of keyboard).

You should see the prompt **K: \CNC>** Type **C:** then press Enter.

You should now see the prompt **C: \RUNFILES>**. Type **CD \PROGRAMS** and Enter.  
*Note that '\ ' (backslash) is NOT the '/' under the '?'.*

You should now see the **C: \PROGRAMS>** prompt. At this prompt, type **COPY D: \\*.\*** then press Enter. All your files will be copied into the new CNC.

After the files have been copied, set the CNC *off*, wait a few seconds, then *on* to reboot.

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## No Operator's Station (Palm Box)

The G4 CNC has dual cycle-start buttons, so operator safety is enhanced by requiring both hands to be out of the cutting area in order to start the cycle. In order to operate without Operator's Station installed, a 'jumper' must be added to the E-Stop switch on the CNC. The picture at the right illustrates jumper installation.



The Operator's Station can provide more convenient, waist-level, two-handed operation, with additional collet open and close buttons plus another e-stop switch. Available from stock for \$395. Part number 998-00-000.

