Introduction

This document describes how to modify a G4 CNC equipped OmniTurn GT-75 or GT-Jr to accommodate an OmniTurn ZipLoader.

The installation involves hardware and software changes to the CNC and hardware changes to the spindle drive cabinet.

To complete the installation, refer to document "ZipLoader Setup & Operations".

Overview

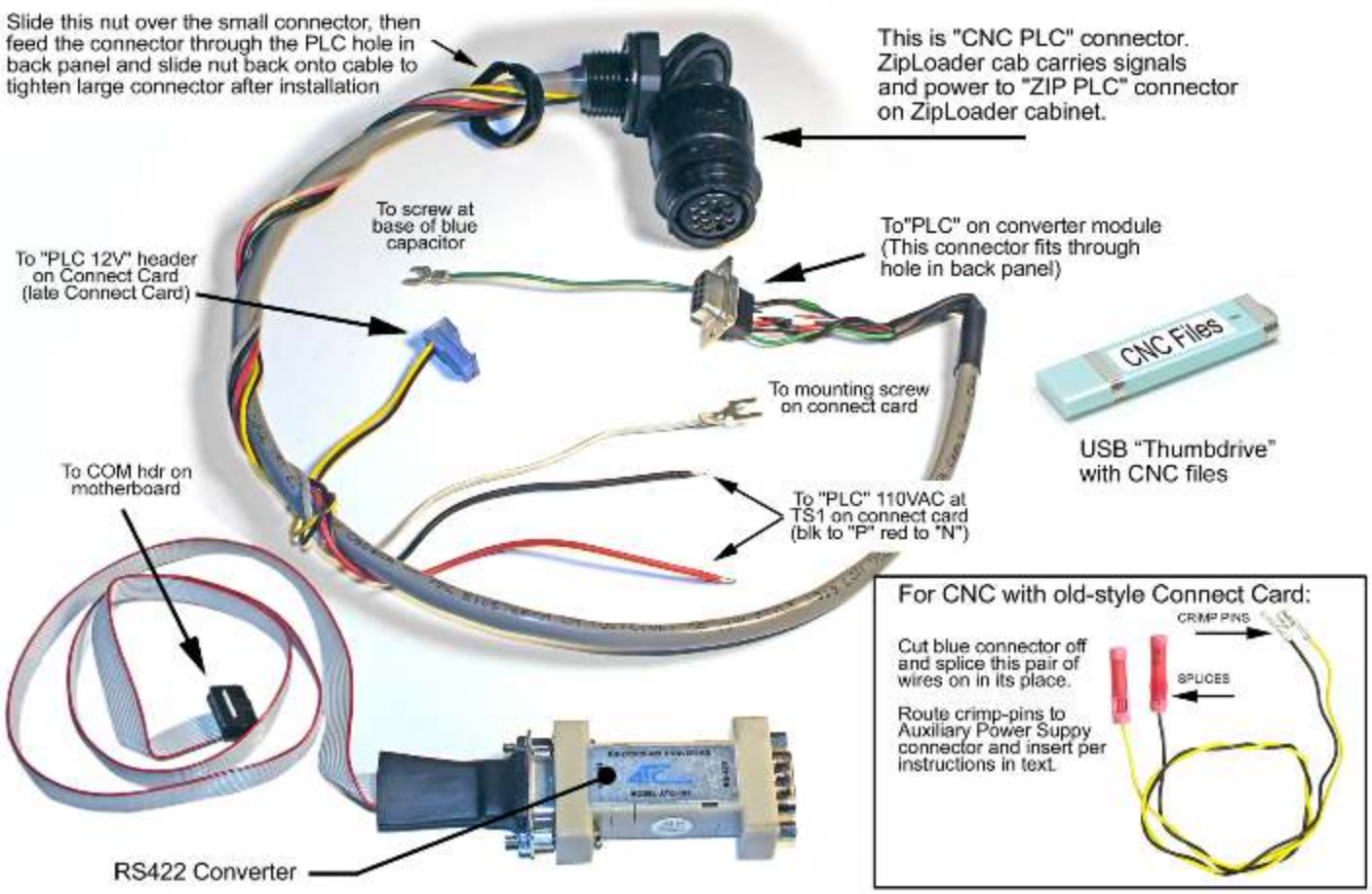
CNC: Install right-angle 14-pin bulkhead on rear panel to connector to carry communications and power to the PLC. Install RS422 Converter to communicate with the PLC. Determine if you have motherboard type ML, M830 or VB7009.

Spindle Drive: Install 16-pin bulkhead connector in Spindle Drive Box for E-Stop and Collet Closer signals to/from PLC. Determine if you have Terminal Board or Printed Wiring Board version; connect wires as required. Install Air Fitting and route air line.

Frame: Attach loader mounting bracket to the OmniTurn, and align the loader to the machine. Modify sheetmetal as required.

Computer: Copy new files to the hard drive so OmniTurn can control the loader.

ZipLoader Kit Parts



Alignment Tool for 1/2" liner

Spindle Liner, 1/2" (793-28-008)

Test Block, Hardware, Labels

Pushrod (790-02-006) & Pusher (790-02-011) with Adapter Plate (790-02-007)

Air line and fittings

Spindle Drive Cabinet Bulkhead Cable (794-07-002)

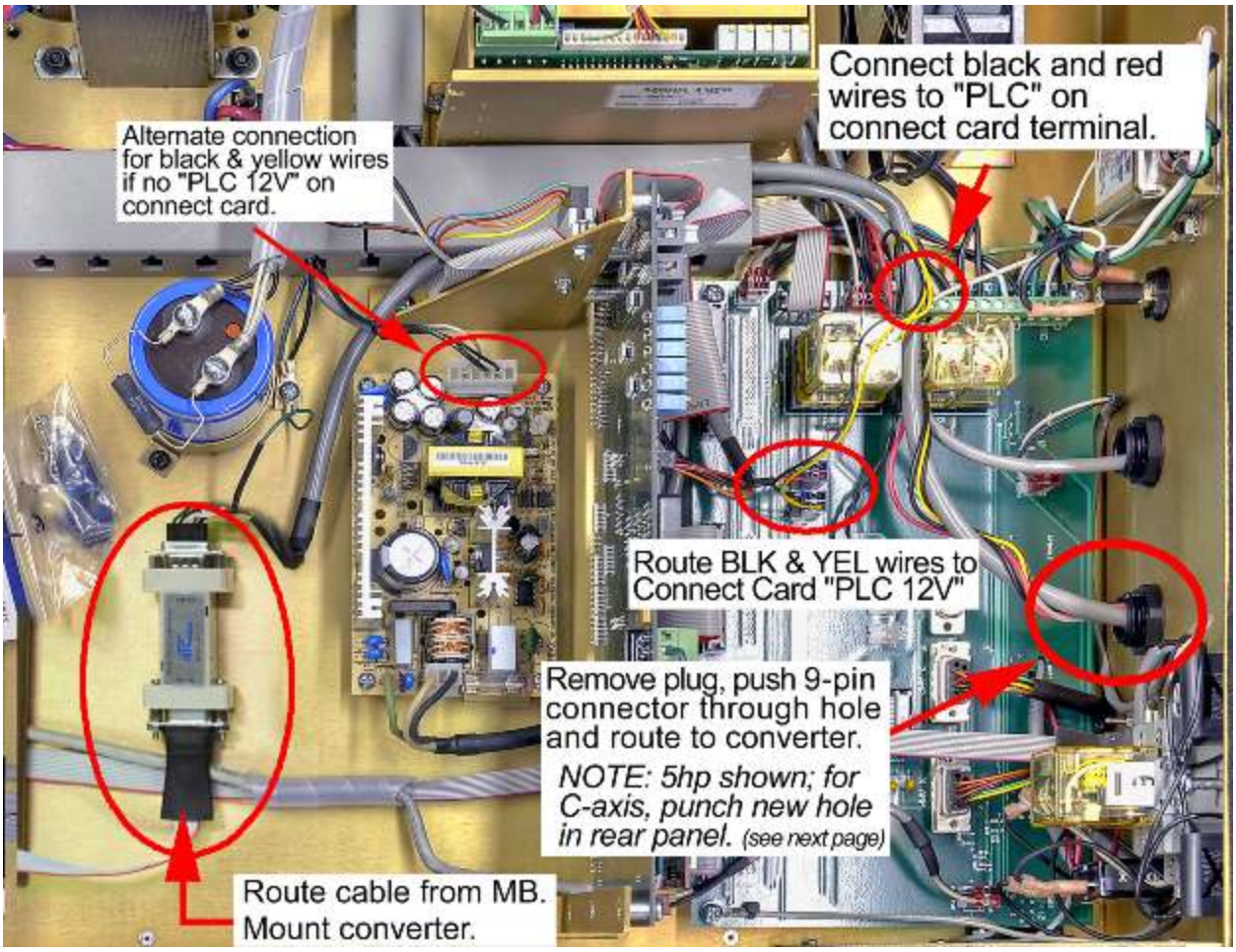
Loop-back test plugs 995-18-003 & 995-18-005

CNC Control Modification Summary

The general steps to install PLC option in the CNC Control are listed below.

More detailed instructions start on next page. See previous page for illustrated parts list.

1. Install special bulkhead connector in rear panel (must punch hole for C-Axis CNC); route cables to connect card (110vac), Auxiliary Power Supply (+12vdc) and RS422 Converter.
2. Connect black & red wire to “PLC” stations on Connect Card terminal strip.
3. Connect blue plug on black & yellow wires to “PLC 12V” on connect card (new-style) OR insert black & yellow wires into existing Auxiliary Power Supply output connector.
4. Route 10-pin ribbon cable from serial port on computer; connect cable to RS422 Converter and stick it to chassis.



Install PLC Connector

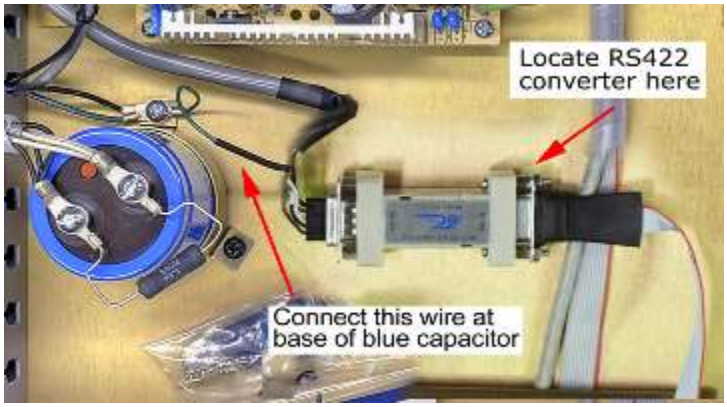
CNC controls equipped for standard 5hp spindle drive have plugged hole next to Operator's Station connector on back panel (see photo at right). C-Axis CNC control uses this hole, so additional hole must be punched at far right of rear panel to accommodate PLC.

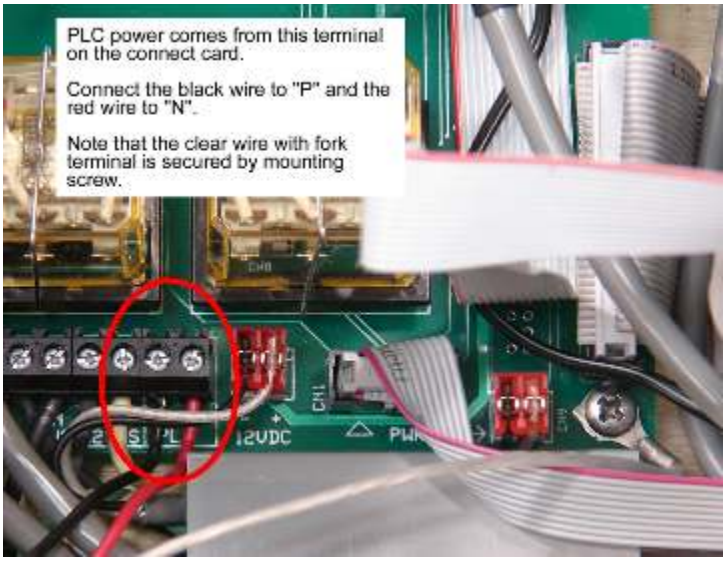
1. Remove plug (5hp) or punch 1/2" knock-out (7/8" dia) hole (C-Axis) in rear panel.
2. Push all cables through the nut that secures the connector to the panel. The 25-pin connector *does* fit, but the nut must be squeezed hard to 'oval' it for clearance.
3. Route the cables to their final locations per overall picture on previous page.

Mount RS422 Converter

Double-sided tape is used to affix RS422 converter to the control chassis. Locate the converter as shown at right, peel off the backing and stick it to the chassis.

Route black wire with terminal to one of the screws that mount the blue servo power supply capacitor. This is the shield wire for the communications cable.





Connect 110vac Wires

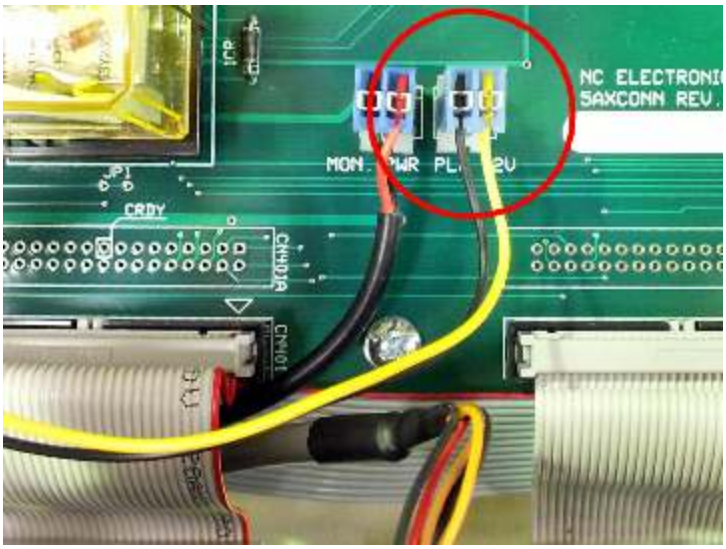
1. The "PLC" terminals are at end of Connect Card terminal board as shown at left.
2. Loosen the locking screws, insert the wires and re-tighten.
3. The black wire should go to "P" and the red wire to "N".

These wires supply power to the PLC.

Route Black & Yellow wire to "PLC 12V" header

"New-style" Connect Card

If your G4 CNC has the old-style Connect Card, there is no "PLC 12V" header available, so you must cut off the blue connector, and use the butt-splices on black & yellow pair of wires provided with crimp-pins to plug into auxiliary power supply as shown on next page.

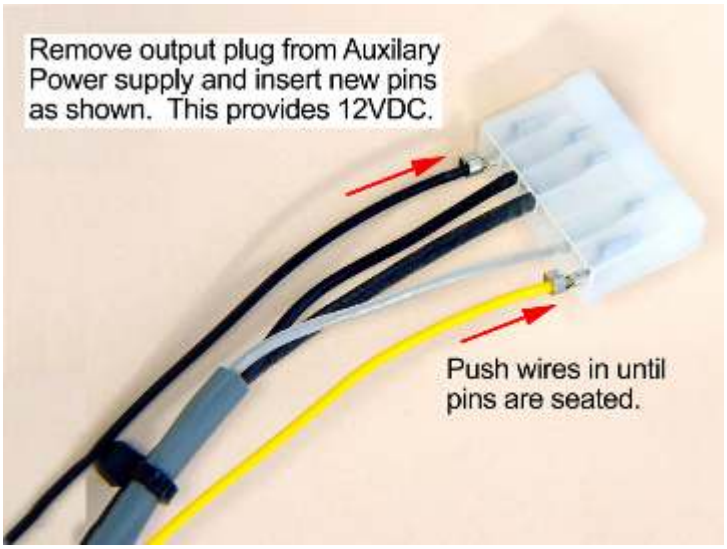


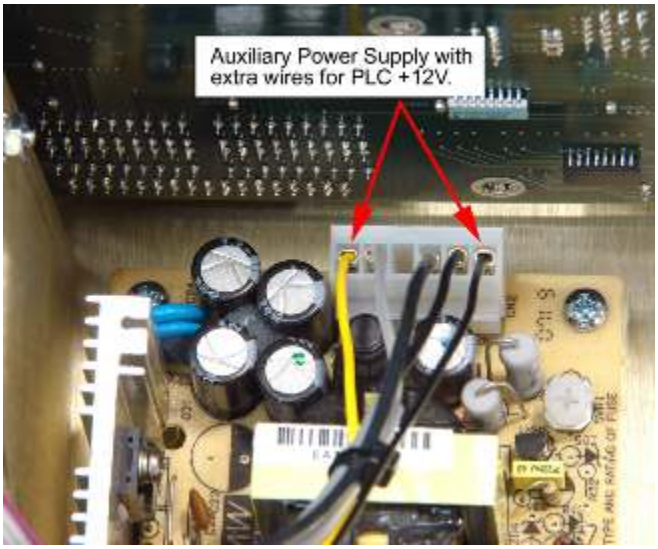
For "old-style" Connect Card without "PLC 12V" header

If your Connect Card doesn't have the "PLC 12V" header, you must use the auxiliary power supply extension wires (supplied). Cut blue connector off the black and yellow wires and strip the wires about 1/4". Use the supplied butt-splices to connect these wires to the black and yellow pair which have the silver crimp-pins, matching the colors. Add the wires to the Auxiliary Power Supply Connector as shown below.

To modify auxiliary power supply connector:
Remove output connector from Auxiliary Power Supply and insert black and yellow wires into connector as shown below. Pins will 'click' when properly seated; verify seating by pulling on the wires.

If necessary to remove pin, use small screwdriver to lift flap on connector; pull wire out.



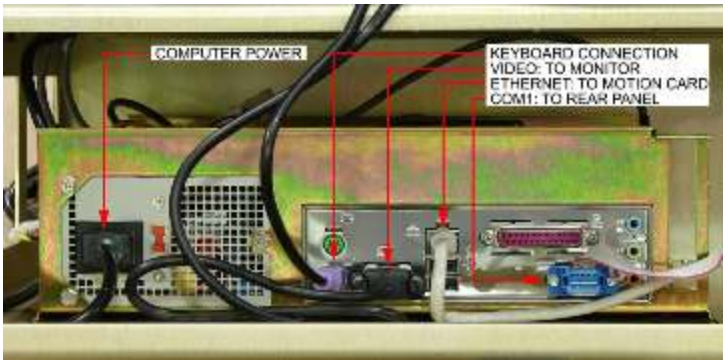


IMPORTANT! Verify which MotherBoard before continuing

Three different motherboards have been used through the years; review this page and next two pages to determine which motherboard you have.

Epia ML MotherBoard
(Earliest G4 CNC's; floppy drive)

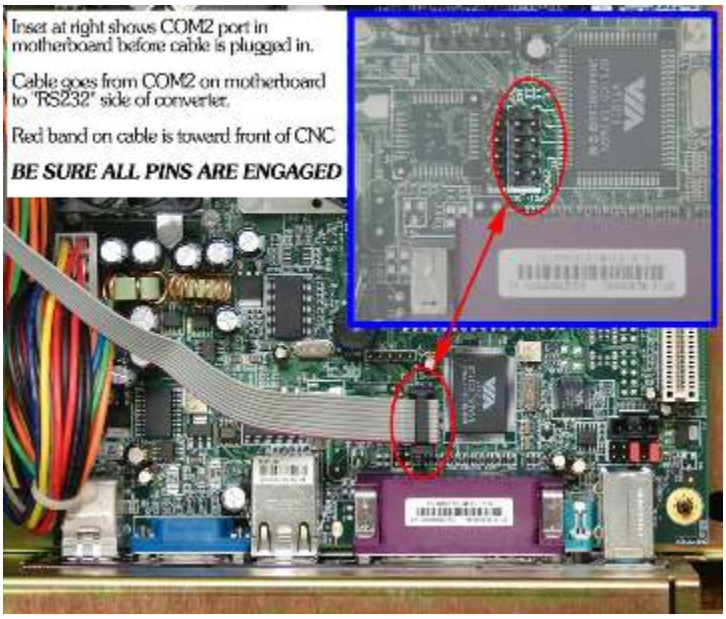
Connecting to Epia ML MotherBoard

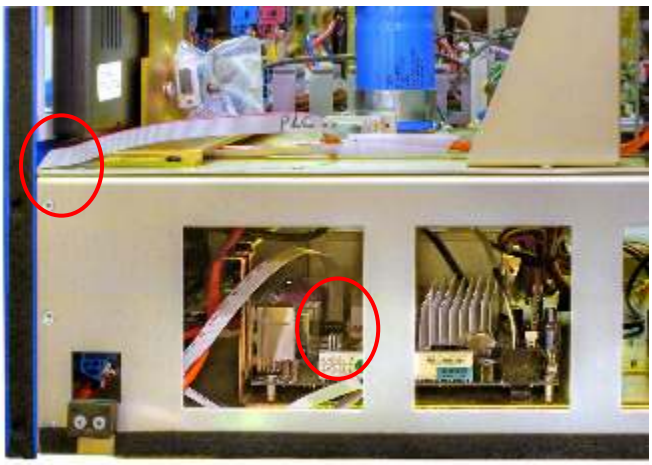


Back Panel of Epia ML Mother Board

Route Ribbon Cable to COM2

The 10-pin ribbon cable from RS422 converter connects to COM2 port on computer motherboard: remove front panel, disconnect cables, and slide computer chassis out to access the COM2 port. ***Be sure that all pins are engaged;*** it's easy to miss a row a row or column. route cable through space between front-panel and chassis (see below).

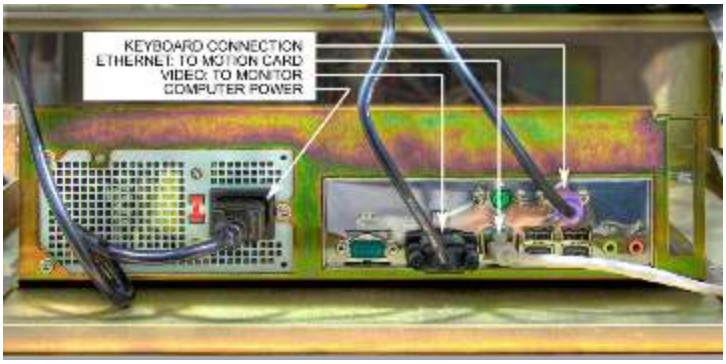




IMPORTANT! Verify which MotherBoard before continuing

Epia M830 MotherBoard
(Mid 2011 - late 2016; no floppy)

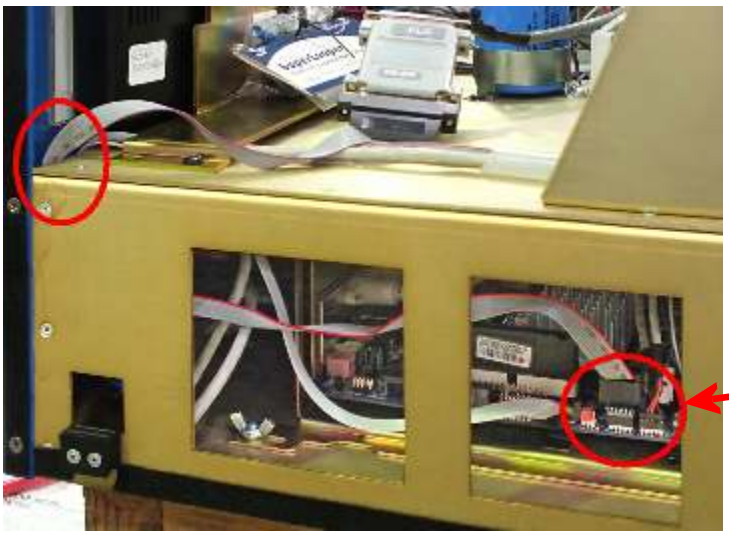
Connecting to Epia M830 MotherBoard

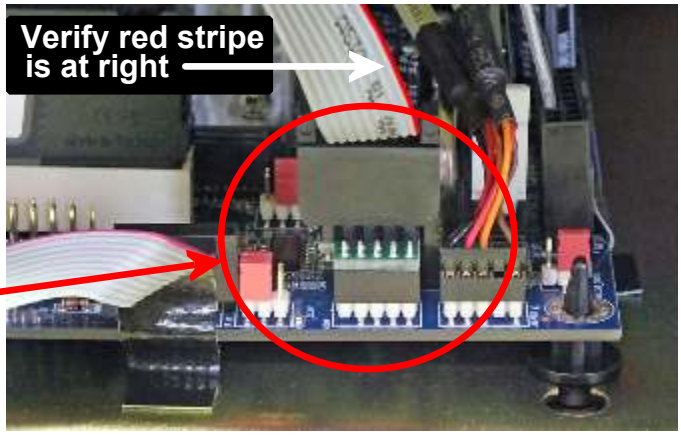


Back Panel of Epia M830 Mother Board

Route Ribbon Cable to COM4

The 10-pin ribbon cable from RS422 converter connects to COM4 port on motherboard using adapter*: route cable through space between front-panel and chassis (below left) and connect to motherboard as shown below. ***Be sure that all pins are engaged;*** it's easy to miss a row a row or column.
**Some kits may include fine-pitch cable to fit COM4 port without adapter*

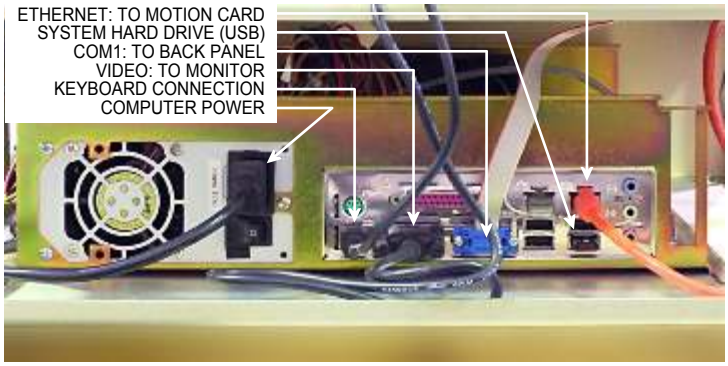




IMPORTANT! Verify which MotherBoard before continuing

VB7009 MotherBoard
(Current G4 CNC's)

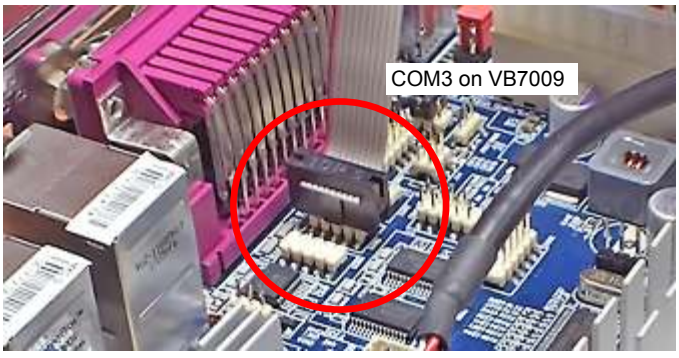
Connecting to VB70009 MotherBoard



Back Panel of VB7009 Mother Board

Route Ribbon Cable to COM3

The 10-pin ribbon cable from RS422 converter connects to COM3 port on motherboard: route cable through space between front-panel and chassis (below left) and connect to mother-board as shown below. ***Be sure that all pins are engaged;*** it's easy to miss a row a row or column.

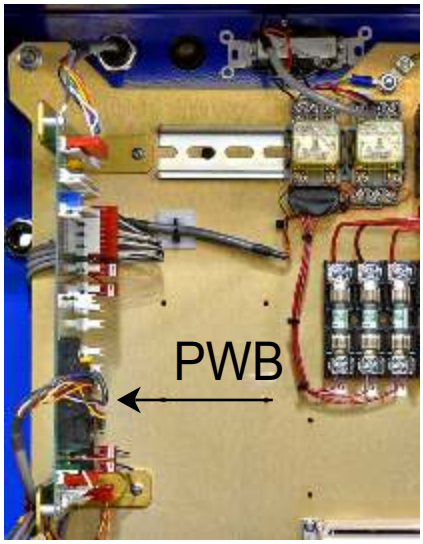


Spindle Drive Box Identification

The G4 CNC might have been installed on an earlier version GT-75. To quickly identify your version, open the spindle drive cabinet and compare it to the two pictures below. The picture on the left is the earlier "TB1" (Terminal Board) version; the picture on the right is the latest "PWB" (Printed Wiring Board) version.

If you have the PWB version, refer to the bottom picture for wiring instructions.

If you have the TB1 version, refer to the pictures on the next page for instructions.

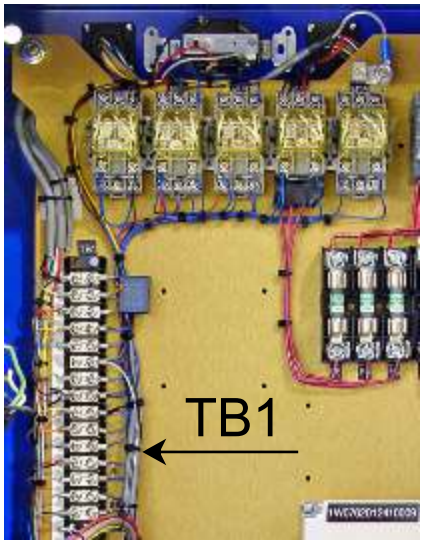


PWB Version

(see below)

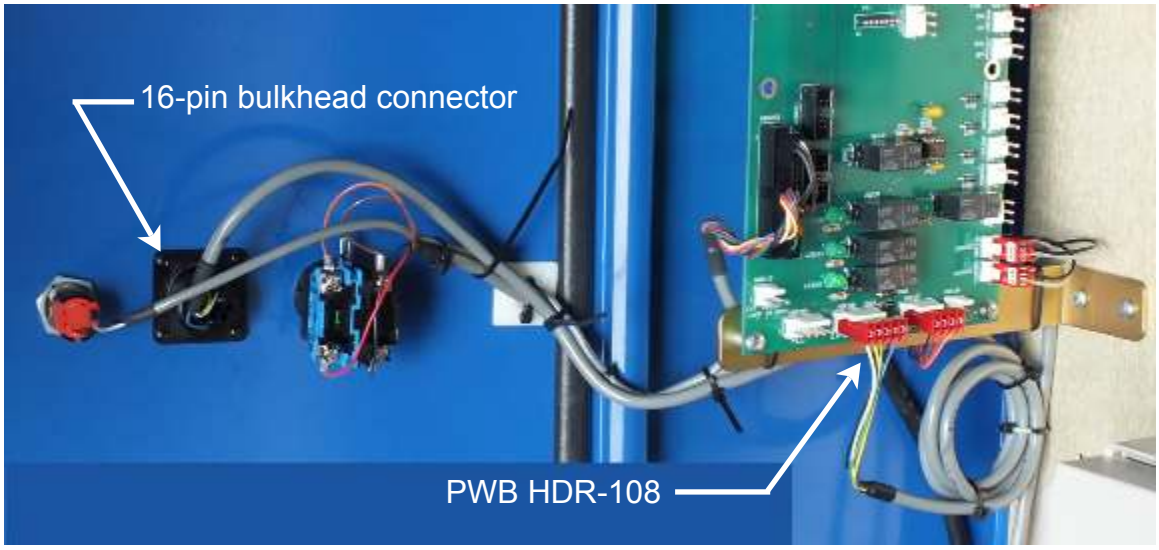
TB1 Version

(see next page)



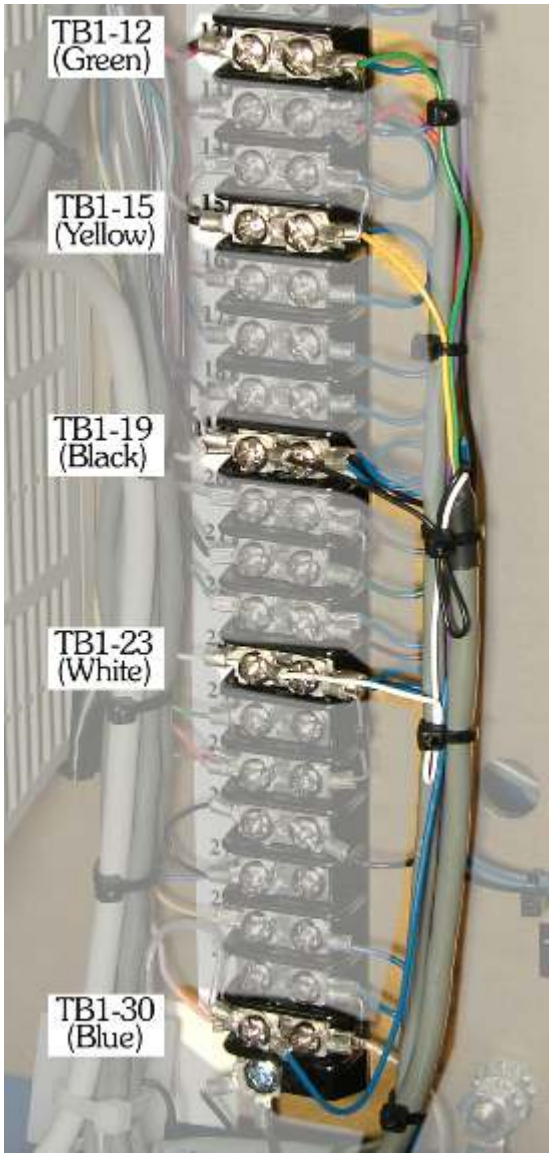
Wiring PWB Version *(see next page for TB1 Version)*

Make a 1-1/16" diameter hole (use 3/4 conduit knockout punch). Use connector as template for four mounting screw holes. Install connector with screws provided. Don't over tighten. Connect to Printed Wiring Board at HDR-108 per picture below.



Wiring TB1 Version

1. ***Refer to picture below.*** Install bulkhead connector in door to right of the Reset Button:
   A. Make a 1-1/16" diameter hole (use 3/4 conduit knock-out punch)
   B. Use connector as template for four mounting screw holes.
   C. Install connector with screws provided. Don't over tighten.
   D. ***Refer to picture at right***. Connect wires to Terminal Board TB1 per tag on each wire.
2. ***Refer to picture below right.*** Examine Reset Switch lamp; *if there is no diode installed,* remove clear wire from Reset Switch lamp (X1), cut off fork terminal and strip wire 1/4".
   A. Splice diode to clear wire using butt splice; connect diode fork terminal to Reset Switch X1.



Connections at TB1

New Connector & Air Fitting

Air Routing (Both Versions):

Install 1/8 NPT tee at input to main air regulator/filter
Install tee/nipple/air-fitting assembly between existing air line input and GT-75 main air regulator

Route air line to ZipLoader main air regulator/filter from push-lock fitting on tee. (see picture at right)

Air Routing ←

Diode on Reset Switch
(NOTE: TB1 version only)

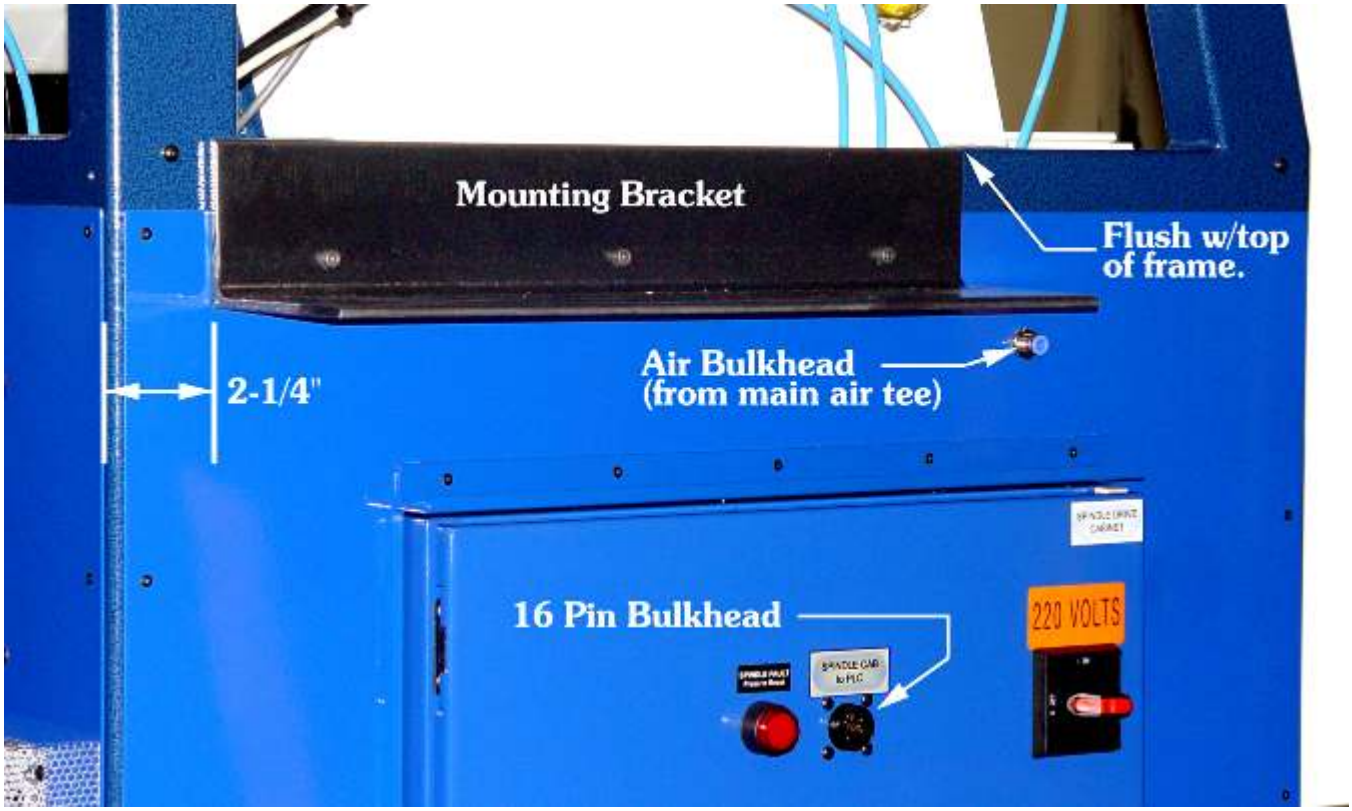
GT-75 Mounting Bracket Installation

Install loader above spindle drive door using three 1/4-28 X 3/4 SHCS (provided). Top of angle should be flush with top of frame rear of angle should be 2-1/4 inches from back of machine.

Use the mounting bracket as a template.

Drill and tap three 1/4-28 holes in frame and mount the bracket as shown below.

After ZipLoader has been installed and aligned, drill and tap two 1/4-20 holes in mounting bracket to engage the two front legs of the Zip Loader



GT-75 Panel Modification

To allow the Motor-cover Panel to be removed without disconnecting the Zip Loader from the GT-75, it is necessary to cut away a section of the panel.

The existing notch is wide enough; just cut all the way to the bottom of the panel as shown.

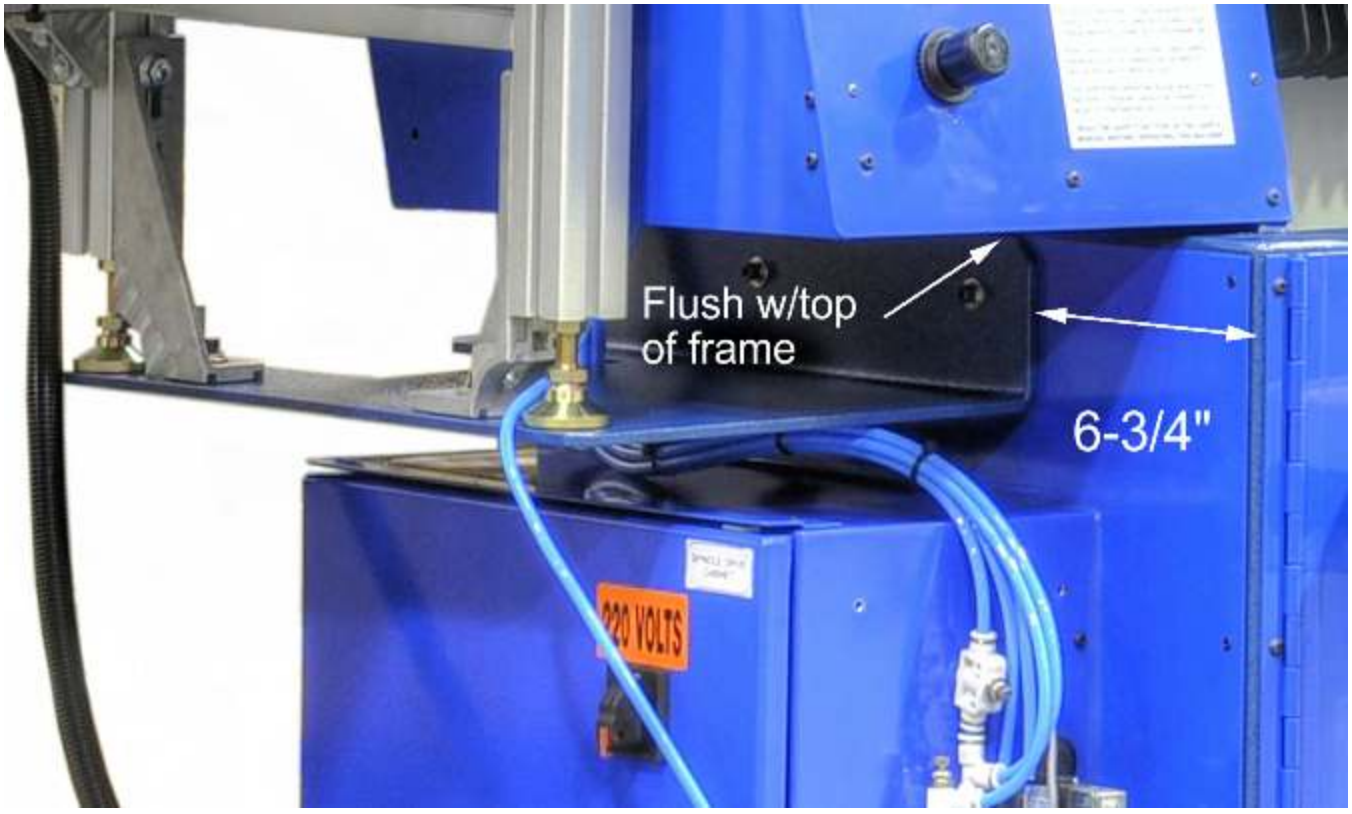
GT-Jr Mounting Bracket Installation

Install loader above spindle drive door using three 1/4-28 X 3/4 SHCS (provided). Top of angle should be flush with top of frame.

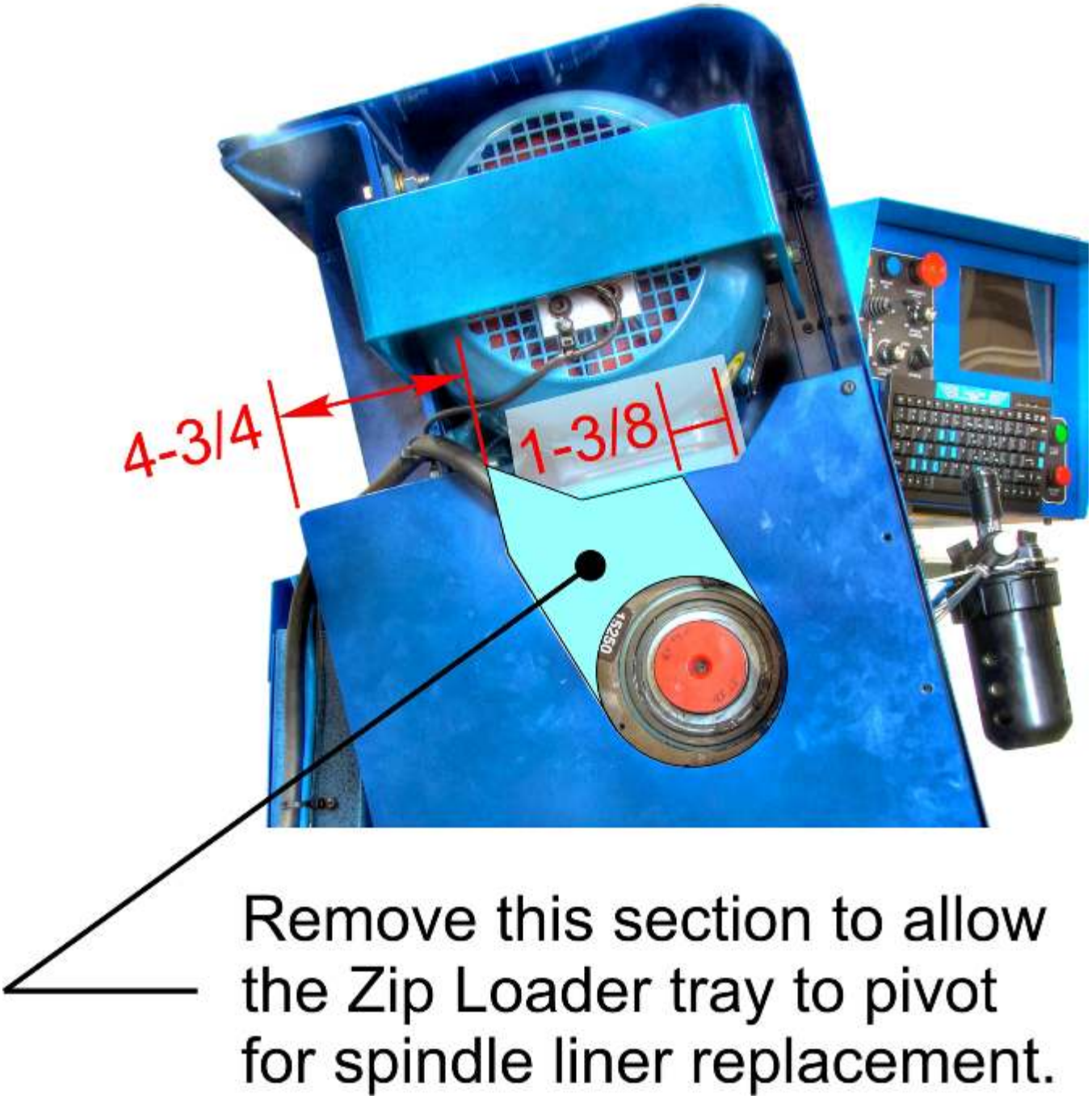
Use the mounting bracket as a template.

Drill and tap three 1/4-20 holes in frame and mount the bracket as shown below.

After ZipLoader has been installed and aligned, drill and tap two 1/4-20 holes in mounting bracket to engage the support brackets for two front legs of the Zip Loader



GT-Jr Panel Modification



Software Installation

1. Temporarily replace backup thumb drive with “CNC Files” thumb drive
2. Turn on CNC Control as usual.
3. At CNC ‘splash’ screen, press and hold the Ctrl key, then press C key (Ctrl-C).
   This will drop to DOS with K:\CNCFILES> prompt.
4. Type C: then press Enter; you should see C:\RUNFILES> prompt.
5. Type d:cncfiles then press Enter; you should see

This program will copy M-function files to CNC
Press any key to continue

6. Press any key; files will be copied to the hard drive.
7. Process should take a few seconds; you should see

ALL DONE…

1. 8. Set CNC off, then on to reboot.

This completes the installation of the Zip Loader KIT.

Proceed to separate document: "Zip Loader Setup & Operations".

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