Tetra-Motion

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To: Interested Maker

From: Peter Schwarzel

Topic: Quote for Maximus CNC Router kit

Hello Maker, good to see you here.

The sheetmetal quotes have come in so I thought I'd put together some costings for you. One issue has come up with getting the 15mm linear rail from Hong Kong. The supplier has indicated that it does not travel well in long lengths, so instead of getting it in pieces I will have to update the design to 20mm rail. My prior machines have used 20mm and I used 15mm in this case to make it more compact. But 20mm is a good size in the end. So I shall keep you informed about that. Otherwise all other suppliers have stock and have confirmed prices to date. Freight costs can be calculated once your basic package is compiled.

Objective:

To realise an economical CNC router kit that can cut full 8'x4' sheets of plastic, timber and foam. May cut aluminium occassionally. Please note you will be assembling this yourself! And ordering overseas product yourself. I'm happy to provide email and phone support. Full drawing sets are included for the overseas parts and the assemby drawings for you to build. Maximus can also be built as a 1220x1220mm machine (half sheet)

I shall break the costs into the following chunks:

1) Bench and stand $$$ up to you, I supply a construction drawing of the plywood stand if you buy parts.
2) Electronics $778 AUD
3) Tetra Mechanical Parts $2524 AUD
4) Motion Parts (motors and bearings) $1500 AUD includes 80mm dia spindle
5) Software & Computer $$$ up to you

There are many bells and whistles, I shall keep the costs cut to the minimum amount to start making sawdust, the bells etc can come later...

Total budget cost excluding bench, software, computer and freight **$4802 AUD+gst** if applicable.

I'll start with the software and computer

You will need a computer with a USB port, wifi or HDMI output. If you use the Buildbotics system look at their site and gain an understanding of whats needed. You can download its interface and trial it.

https://buildbotics.com/ and its free toolpath simulator https://camotics.org/

Computer cost $$$ up to you. I have used notebooks, laptops and towers,. If you use Buildbotics you do not need a dedicated computer.

Buildbotics $778AUD delivered to your door. This includes all the wiring and connectors. I think its really good value. Its plug and play; You just need to learn to drive it.

Software – you will need a CAD program and a CAM program. These can be free (see Fusion360 from Autocad or FreeCAD) or there are many commercial solutions for these applications. Happy to discuss this further.

Motion Parts & Spindle

I have been discussing various bits with BST Automation in Hong Kong. They have answered all my questions promptly and have been recommended by many in a CNC forum.

https://bstmotion.aliexpress.com/store/314742?spm=2114.12010617.pcShopHead_324926.0

Motion parts vary in cost by their quality and accuracy. I have picked the generic brand name parts. These are basic quality but good. If you go from basic quality to name brands you can double or triple these costs. I can also get these locally, better quality but they will be at least twice the price.

Item Number	Quantity	Part Name	Supplier	Unit Cost	MC Cost
9	1	249-123 FK-12 Bearing	see 249-124 item 65		
10	1	249-117 Gantry Rail 1540mm 4 cars	BST	$260.00	$260.00
35	1	249-116 Z Rail 15mm & Cars 450mm	BST	$123.00	$123.00
47	1	249-100 Coupling	BST	$12.00	$12.00
63	2	249-150 Long Rail 2860mm	BST	$350.00	$350.00
65	1	249-124 FF-12 Bearing	BST	$28.00	$28.00
90	1	249-94 Nut 1605	BST	$72.00	$72.00
					$845.00

Stepper motors and spindles

https://www.omc-stepperonline.com

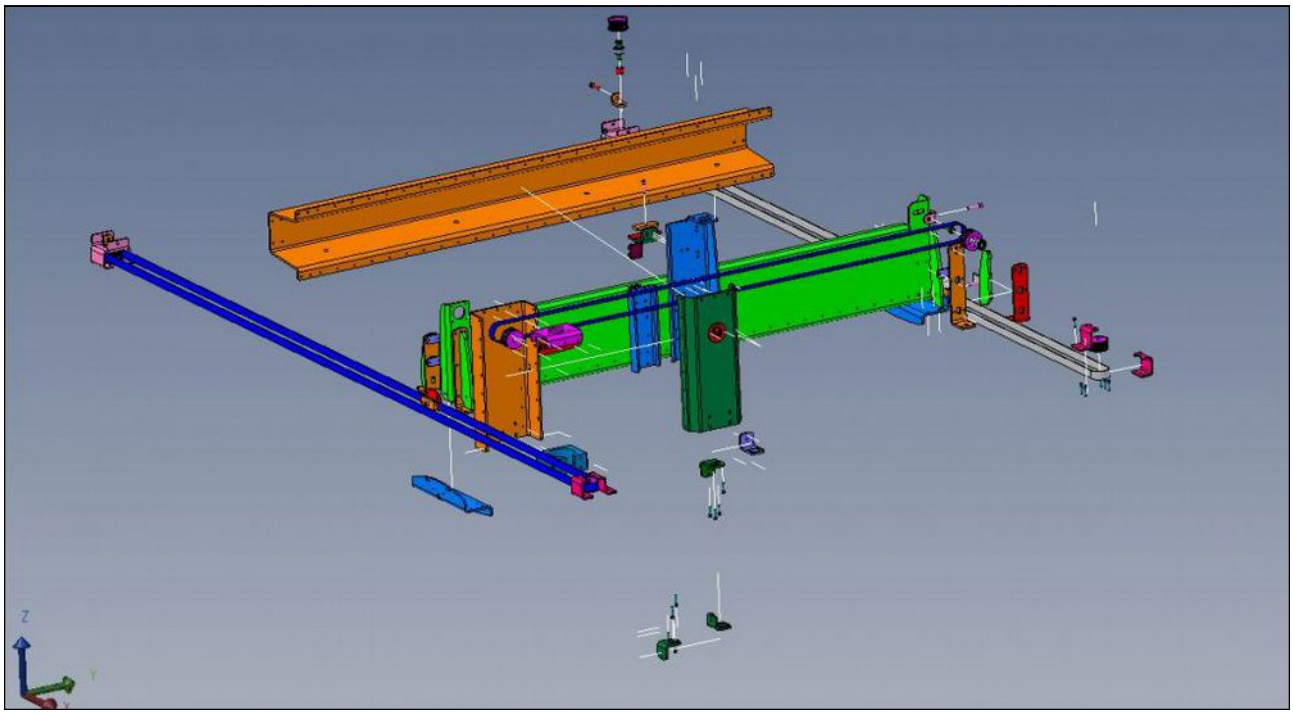
https://www.homanndesigns.com

I have so far been getting my asian motors from Stepper on Line. I have also bought local parts from Homann Designs. Both have provided good service and technical backup.

Item Number	Quantity	Part Name	Supplier	Unit Cost	MC Cost
3	1	249-69 80mm Spindle 1.5kW	SOL	$200.00	$200.00
	1	VFD	SOL	$135.00	$135.00
39	1	248-05 Stepper Motor& Brake	SOL	$104.00	$104.00
46	2	249-130 Gearbox-Motor	SOL	$108.00	$216.00
					$655.00

Tetra Mechanical & Structural Parts

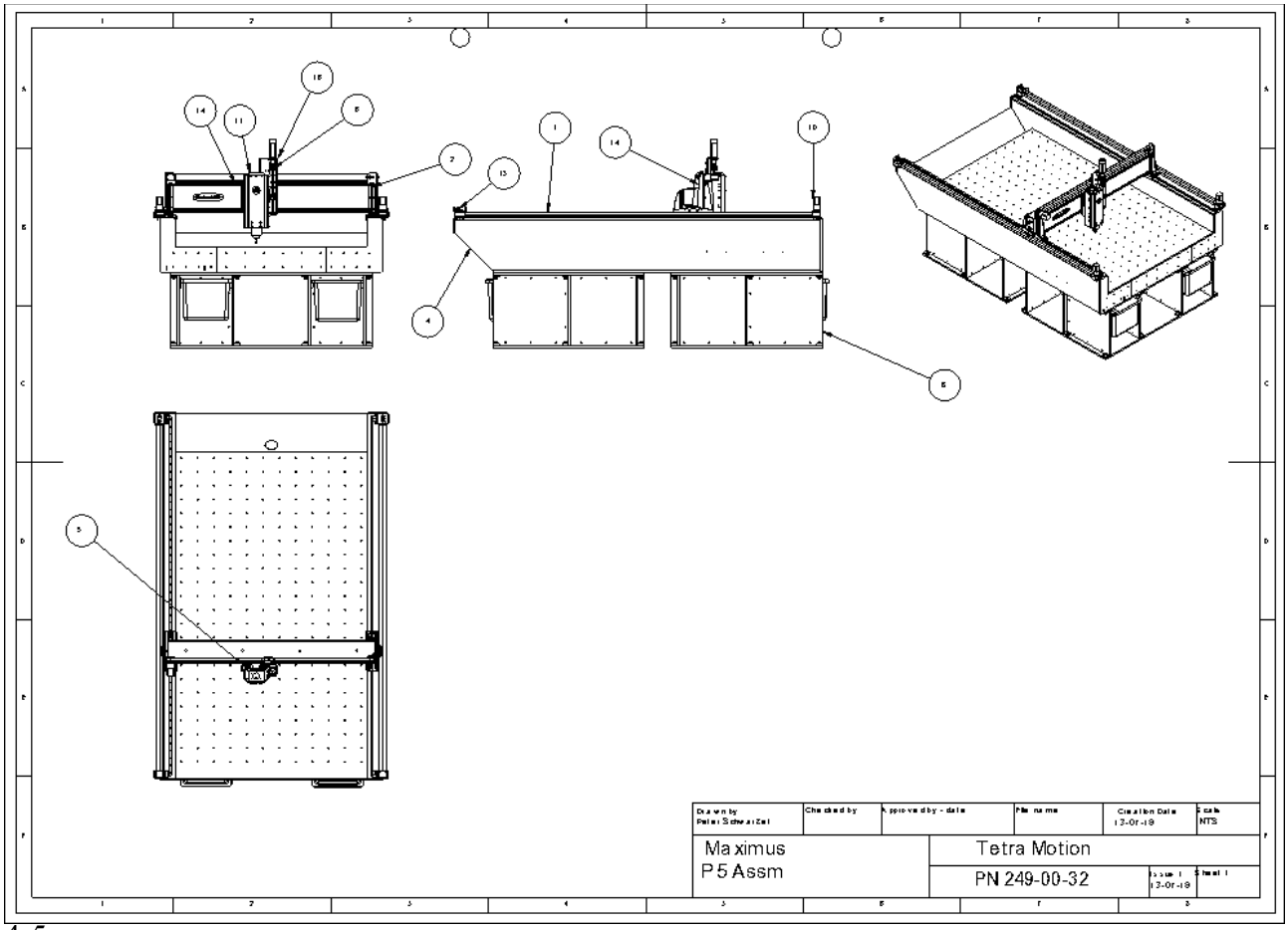
These are basically the metal structural bits of the system and some associated parts that are hard to get, like precision ATL belts.



Snap shot of the Tetra mechanical parts.

Item Number	Quantity	Part Name	Supplier	Unit Cost	MC Cost
1	16	249-152 ATL Belt 25mm 16m	Tetra	$62.21	$995.28
	16	AT belt 25mm 16m	Tetra	$44.72	
2	2	249-172 Tool Plate Cap	Tetra	$17.91	$35.83
14	1	249-171 Front Tool Plate	Tetra	$63.57	$63.57
15	1	249-151 Return Bracket	Tetra	$16.80	$16.80
16	2	249-86 Rear Column	Tetra	$12.61	$25.22
17	1	249-137 Bracket	Tetra	$8.23	$8.23
20	2	249-87 Rear Column Web	Tetra	$16.90	$33.80
21	6	249-153 Backer	Tetra	$2.16	$12.95
26	1	249-169 Roundel	Tetra	$2.77	$2.77
31	1	249-125 Bearing Bracket	Tetra	$7.41	$7.41
34	3	249-131 Pulley Bearing 5201	Applied	$16.25	$48.75
40	1	249-140 Motor Mount	Tetra	$7.29	$7.29
42	2	249-127 Beam Sled	Tetra	$38.74	$77.48
44	1	249-118 Large Bearing Beam	Tetra	$74.67	$74.67
48	1	249-161 Bearing Bracket	Tetra	$7.33	$7.33
50	1	249-115 Bearing Beam	Tetra	$29.99	$29.99
51	3	249-129 Belt Clamp	Tetra	$7.23	$21.68
61	2	249-136 Tensioner	Tetra	$4.88	$9.75
66	4	249-119 AT10-18T-25 Pulley unbored	Tetra	$17.16	$68.64
67	2	249-98 Nut Bracket	Tetra	$7.27	$14.53
78	1	249-62 Gantry Back Plate	Tetra	$477.10	$477.10
79	1	249-61 Gantry Face PLate	Tetra	$330.20	$330.20
82	2	249-84 Front Column	Tetra	$14.48	$28.96
86	1	249-168 nameplate	Tetra	$6.67	$6.67
87	1	249-139 Motor Mount Rail	Tetra	$7.29	$7.29
88	1	249-170 Rear Tool Plate	Tetra	$92.92	$92.92
92	2	249-128 Belt Anchor	Tetra	$9.31	$18.62
					$2,523.75

It comes together like this.



Going forward

I have a small machine at home with the same motor system for Maximus that I have been testing. You can see this running anytime. We can do trial machining on Scoot my half sheet machine on Tuesdays, Wednesdays and Saturdays if you want. If you send me an image or CAD file of what you want to do I can set that up. Or we can do it on the spot if you can get here so you get a feel for how its done. If you are remote I can video the trial for you.

Once you digest this and decide that the budget is Ok and that you can build the bench etc I'm happy to support you through your build.

I plan on building one unit of Maximus and having two sets of parts made. I also planned on doing this when I sold my old machine so I have space. But if you are keen and pay a deposit I shall order parts early.

The figures quoted are for budgeting purposes only. The exact values can be nailed down as the project proceeds.

So happy to chat some more.

Regards Peter Schwarzel