

Industrial Technology

MAD

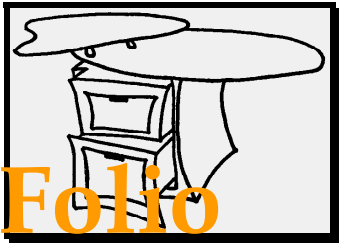
CONTENTS

DESIGN & MANAGEMENT:

- Statement of Intent – p.2
- Research – p.9
- Development of Concepts & Ideas – p.16
- Selection & Justification of Materials, Components, Processes & Other Resources – p.24
- Timeline – p.27
- Finance Plan (& Receipts) – p.28
- Use of Appropriate Industrial Processes & Equipment – p.30
- Evidence of Safe Working Practices & OH & S Issues – p.41

WORKPLACE COMMUNICATION:

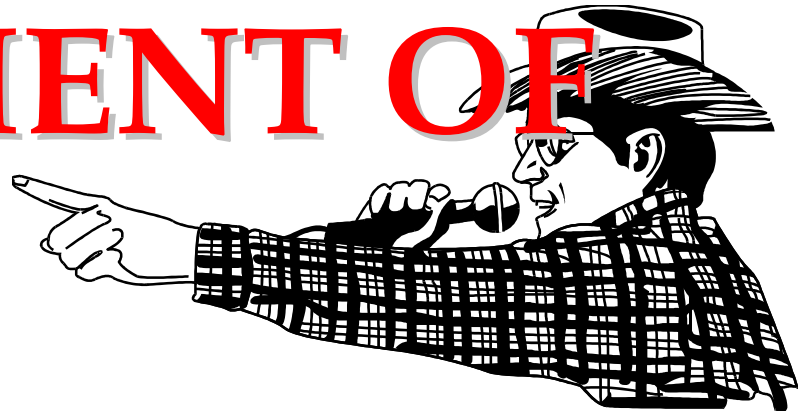
- Workshop Drawings – p.47
- Evidence of Ongoing Evaluation – p.49
- Calculations – p.61
- Appropriateness of Design and/or Modifications – p.63
- Problems – p.64
- Student Evaluation – p.68



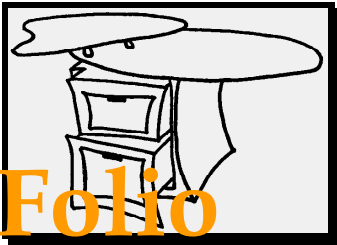
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MAD

STATEMENT OF INTENT



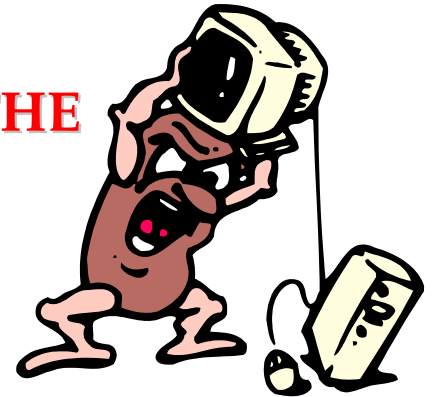
- I have decided to design and construct a modern, free-form multi-applications desk for my HSC major work.
- It will consist of a two-drawer cabinet, a large writing surface with space for computer/keyboard/mouse and other accessories (where required), as well as an upper level for a computer monitor.
- The form of the top and the pedestal (including drawers) will complement each other.
- The project will be called '**MAD**' which is an acronym for '**Multi-Applications Desk**', as it can be used in a variety of applications. Such as:
 - a computer desk; and/or
 - a writing desk; and/or
 - a study desk etc.



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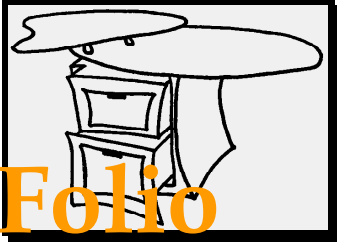
MAD

MOTIVATION & PURPOSE OF THE PROJECT



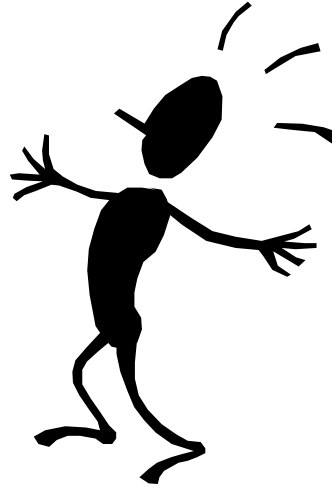
MOTIVATION

- The project is being developed to produce a suitable desk for my bedroom. This is an innovative design to solve my problem. It could also be used in future in a study or office.
- It will be easily transportable for when I leave home so I can take it to university or my new home when I leave school.
- It will consist of all requirements for a working desk, with room for all parts of a computer, a large comfortable writing area and two large, easy gliding drawers.
- I would like to create a piece of furniture with high quality workmanship, artistic value with a contemporary design.



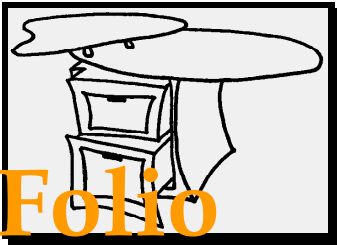
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PURPOSE

- If it proves to be a *marketable product* it will be aimed at the general population who have needs for a multi purpose desk either at home or work.
- The large desk area and top level could be used to display photographs, ornaments, store books and even CD players.
- The large, deep drawers can be used to store multiple necessities.
- Overall, '**MAD**' is a very effective, practical storage and working unit.



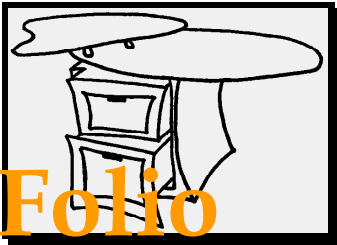
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PARAMETERS OF THE DESIGN

My parameters for '**MAD**' are:

- Have a new modern appearance
- Allow all sized people to sit at it comfortably
- Strong, sturdy and stable
- Fit in the space required 3m by 4m area in size
- Look attractive to people who look at and/or sit at it
- Have a heavy enough pedestal so that it does not tip over as it is a candle-stick design, yet light enough to be carried by two people
- Be no more than \$1,000.00 in total (c.f. Finance Plan), therefore cheap to manufacture if it does ever become a *marketable* design
- Have many applications and purposes for use
- Have a smooth wood grain finish, which will make it aesthetically pleasing to the eye and to the touch.
- **As I am 194cm (6' 4½"), 'MAD' was designed to cater for me. Hence, size requirements are larger than average.**



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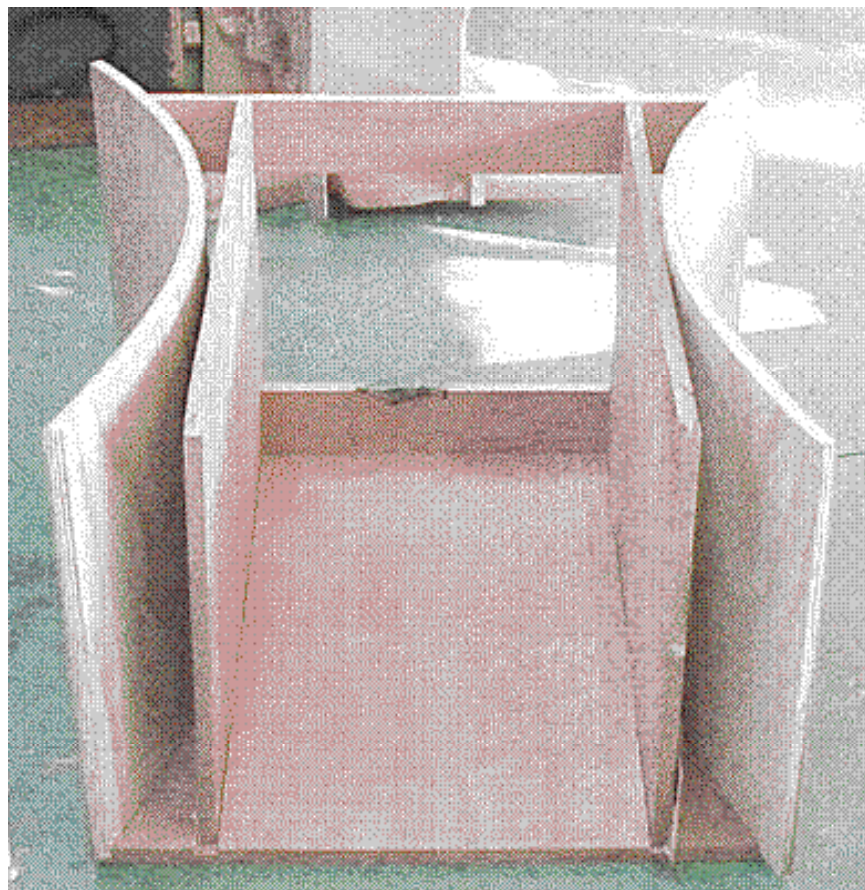
WHAT ARE THE POSSIBILITIES?

The drawers glide smoothly on runners fixed to the carcass of the pedestal→.



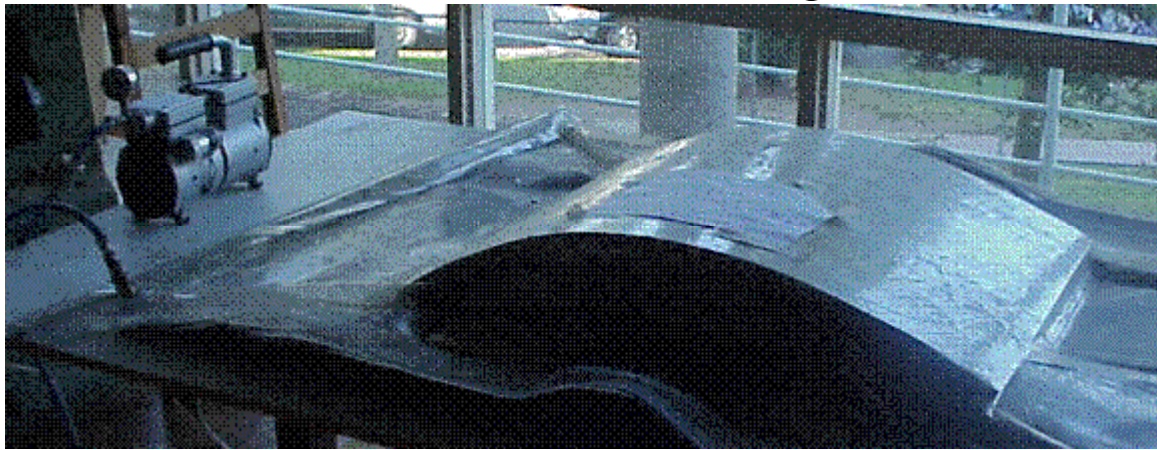
The drawer handles are of a modern design and made from metal.

The sides will be curved to complement both of the top levels of the desk→.



They will be made from bendy ply with Lauan ply (similar coloured sheet) to match the texture of the Sydney Bluegum.

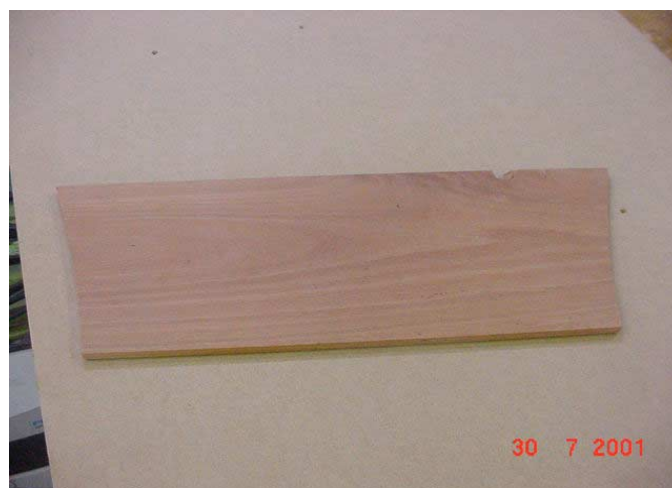
This is because it can bend easily and produce a perfect curve from a mould and a vacuum bag ...



'MAD' is made from Sydney Bluegum, which is a natural hardwood of Sydney, apart from the curved sides. It was ordered through school and personally from 'Harper Timber' in Narrabeen. There was a problem with the ordering process, so my wood took longer to receive than planned, which cut into my timeline plan significantly.

There was a possibility to use other woods (Pacific Maple, Jarrah etc) but I decided the Sydney Bluegum would produce a better final appearance and would be easy to work with. The entire product will be smooth and attractive and show off the Bluegum grain.

There is also the added face on both the drawers, still holding the consistent curve, which creates an additional 3-Dimensional element.

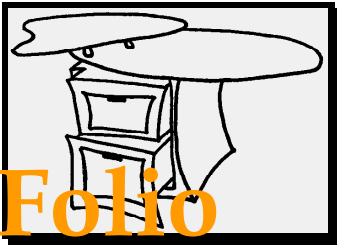


The three 'stilts' holding up the top tier, also curved, are made from Sydney Bluegum and 'Malaysian Red Cedar' to create a slight yet interesting contrast in the texture of the unit.



These strips of Sydney Bluegum, 22mm wide, were placed down the curved sides of the carcass to also add to the 3-D effect and to also clear up the edges of the curves. That way a clean design is created. ↓

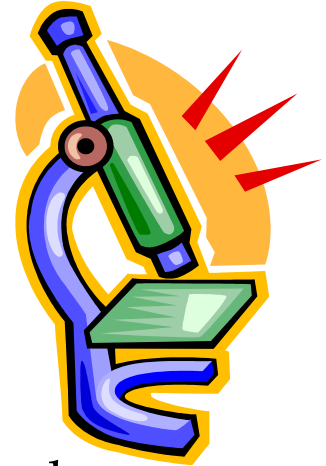




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RESEARCH



The following research was conducted:

- Sydney Bluegum is the cheapest hard wood that would fit into my requirements and parameters. Other wood types were either too hard to get or too expensive

E.g.

American Beech
 Australian
 Blackwood
 American Cherry
 Red Lauan

Brazilian Mahogany
 Jarrah
 Teak
 Queensland Walnut

- Pictures and computer desk information were found at these Internet sites:

www.biodesk.com/

www.bhg.com.au

www.standupdesks.com

www.betterhomesandgardens.com.au

http://www.homeofficedirect.com/computer_desks.htm

www.furnituregalleryinc.com/deskscomputer/desks.htm

http://www.theoaksuperstore.com/computer_desks.htm

- These are some of the pictures downloaded from the Internet with positive and negative points.



⊗ no sitting desk



⊗ computer use only



⊗ looks uninteresting



⊗ too simple,

😊 compact, tidy, hidden

😊 compact, tidy, hidden

😊 good for small space

😊 standing desk



⊗ not timber



⊗ computer use only



⊗ old fashioned



⊗ not sturdy enough

😊 modern, compact

😊 functional, pleasing design

😊 hidden, compact

😊 good for small areas



⊗ non-original design, too simple

😊 good for small space



⊗ still too simple non-original design

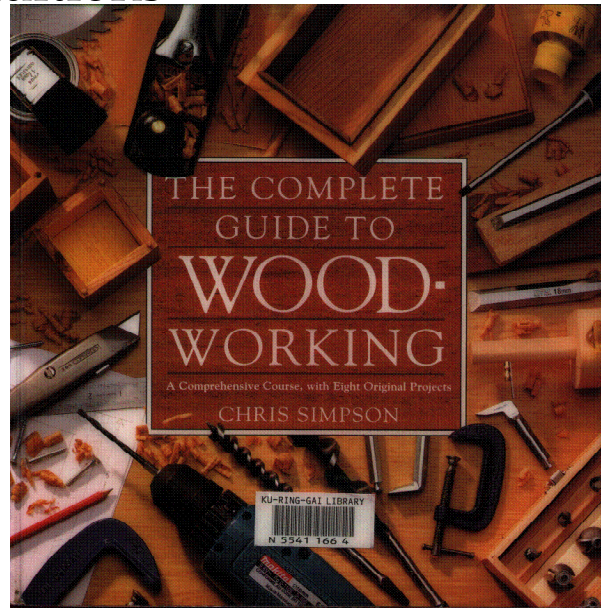
😊 defined areas for equipment



⊗ interesting, yet only use is

for computer

- contrasting wood types look superior over single woods in the given surroundings/conditions

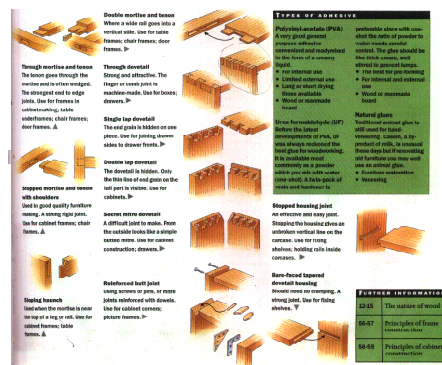


- I hired books from my local library (Gordon Municipal Library) for ideas, e.g. 'The Complete Guide to Woodworking' by Chris Simpson →

- It also had joinery and tools information that was vital for the construction of my project √.

E.g.

- how to join drawers together



- how to create a perfect bend in plywood (i.e. vacuum bag)
- dowel, biscuit and mitre joints
- I discovered that a footrest takes a lot of strain off your lower back whilst working. There is enough room under the overhanging top for you to place a footrest on the floor.

- The key to being comfortable is to not slouch over too much nor be sitting too erect. This comes down to the chair, but the height of the desk needs to be comfortable. An adjustable working space (as here→) was an option for me, but having a flat surface, I felt, had more of a purpose for my desk.



19

- Most of my size requirements came from 'Principals of Table Construction'. Eating at a dining table can either be an enjoyable social occasion or a nightmare of cramped knees and colliding elbows, depending on the amount of room provided by the designer. Most people are able to write and draw comfortably at a dining-table height for short periods of time, but for designing a table for someone to work at for long periods of time, the table needs to be around 650 - 750mm, with an adjustable chair.

'MAD' height allows for user to adjust sitting height to accommodate demands for multiple applications. When the adjustable chair is at maximum height, the desk for computer keyboard is at the correct, comfortable height.

When height of the chair is changed, '*MAD*' can be used for writing, eating etc.

COMPONENTS	mm
Desk height	750
Max reach	475
Leg room	600
Knee clearance	250



- leg room and knee clearance comfortable

- desk height comfortable for typing (elbows at approx 90 degrees to shoulders)



- maximum reach to lowest drawer is comfortable and inside the 475mm range
- The *height* of the typing desk is 650mm. A

worktable should be 50mm lower than the average desk to accommodate typing or word processing.



- The *maximum reach* is 475mm. A seated person can reach a drawer or bookshelf at this height below or above the desk.
- There should be 600mm *legroom*. A seated, working person needs this much room between the floor and the lowest table rail or any other possible obstructions.
- 250mm *knee clearance* is the minimum distance from the edge of the tabletop to a table leg or pedestal in order to provide clearance for your knees when your chair is drawn up to the desk.

I visited several furniture stores in Crows Nest to try and get inspiration for my HSC project. These are some pictures of furniture from the store 'Town & Country'.



SELECTION AND JUSTIFICATION FOR MATERIALS, COMPONENTS, PROCESSES & OTHER RESOURCES

MATERIALS:

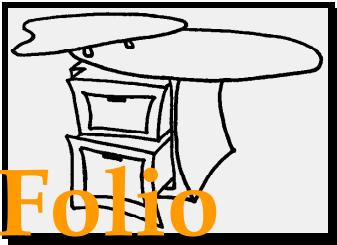
OPTIONS	CHOICE	JUSTIFICATION FROM RESEARCH
<p>Carcass, drawers, table top, tier</p> <ul style="list-style-type: none"> - American Beech - Australian Blackwood - Jarrah - Sydney Bluegum - Teak - Queensland Walnut 	<p>Sydney Bluegum</p>	<ul style="list-style-type: none"> - Most economical - Easy to obtain (although I had problems ordering it) - Nice grain - Good aesthetics - Hardwood therefore heavy - Strong - Easy to work with
<p>Sides</p> <ul style="list-style-type: none"> - Bandy ply - MDF - Carved Sydney Bluegum 	<p>Bandy Ply</p>	<ul style="list-style-type: none"> - Easy to use - Strong when formed - Clean - Inexpensive
<p>Stilts</p> <ul style="list-style-type: none"> - Metal rods - Wooden cylinders 	<p>Wooden cylinders</p>	<ul style="list-style-type: none"> - Use of lathe (industrial) - Appearance - Ease of attachment

COMPONENTS:

OPTIONS	CHOICE	JUSTIFICATION FROM
<p>Drawer runners</p> <ul style="list-style-type: none"> - Metal (bought) - Metal (made) - Wooden (bought) - Wooden (made) - Rebate 	<p>Metal (bought)</p>	<p>RESEARCH</p> <ul style="list-style-type: none"> - Easy to obtain - Simple to attach - Economical - Strong - Less chance of mistakes - Provides smooth opening and closing
<p>Drawer Handles</p> <ul style="list-style-type: none"> - Metal (knobs) - Metal (handle) - Wooden (knobs) - Wooden (handle) - Engraved 	<p>Metal (handle)</p>	<ul style="list-style-type: none"> - Comfortable to use - Easy to obtain - Simple to attach - Economical - Strong - Looks attractive

PROCESSES & OTHER RELATED RESOURCES:

OPTIONS	CHOICE	JUSTIFICATION FROM RESEARCH
<p>Moulding Sides</p> <ul style="list-style-type: none"> - Vacuum bag - Carving curve - Nailing sides to fixed supports <p>Attaching Tier</p> <ul style="list-style-type: none"> - Curved bendy ply - Dowel - Round Sydney Bluegum 	<p>Vacuum bag</p> <p>Round Sydney Bluegum</p>	<ul style="list-style-type: none"> - Gives perfect smooth curve - Easy to use - Available - Quick - Creates a Sydney Bluegum motif in creation - Looks attractive - Easy to obtain - Easy to attach - Gives best support
<p>Attaching Desk Top</p> <ul style="list-style-type: none"> - Buttons - Screws - Dowel 	<p>Screws</p>	<ul style="list-style-type: none"> - Quick and easy - Strong - Hidden



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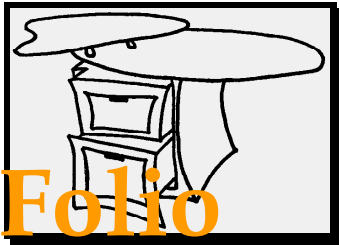
FINANCE PLAN



Item	Expected cost	Actual cost	Date of purchase	Budget/ balance
			INITIAL PURSE	\$1000.00
Mould	\$5.00	Free	16/10/00	\$1000.00
Carcass	\$20.00/m	\$26.83/m	15/11/00	\$731.70
Drawers	\$20.00/m	\$26.83/m	15/11/00	\$490.23
Stilts	\$20.00/m	\$26.83/m	17/7/01	\$476.80
Sides	\$50.00	1.5xBendy Ply \$52.00/sheet 2x Lauan Ply (1220x915x3.6) \$11.35/sheet	9/2/01 4/6/01	\$376.10
Drawer runners	\$15.00 ea	2x \$16.25	24/2/01	\$343.60
Film/	2-5x film @	1x film @	10/3/01	\$320.60
Processing NB: Digital camera used (free)	\$8.00ea 2-5xprocess @ \$15.00ea	\$8.00 1x process @ \$15.00		

Item	Expected cost	Actual cost	Date of purchase	Budget/balance
Drawer handles	\$5.00 ea	2x \$10.98	15/7/01	\$298.65
Desk top (main)	\$20.00/m	\$26.83/m (\$82.04 tot.)	17/7/01	\$216.60
Tier	\$20.00/m	\$26.83/m (left over from carcass)	17/7/01	\$216.60
Phone calls	\$0.40/call	10calls@ \$0.40	ongoing	\$212.60
Petrol	\$1.00/litre	100km@ \$0.92/litre (approx 1/2 full tank)	ongoing	\$187.60
Folio (timeline) Printing/Paper	\$2.00	\$5.00	2/8/01	\$182.60
Coating / Dressing	Free	TBA	TBA	\$182.60
Final Folio	\$40.00	TBA	TBA	\$182.60
Printing				
			\$ IN PURSE	\$182.60





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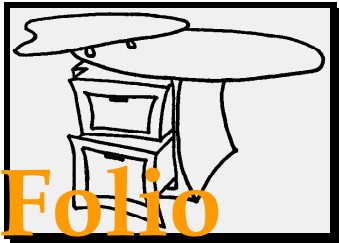
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USE OF APPROPRIATE INDUSTRIAL PROCESSES & EQUIPMENT

PROCESSES USED IN THE CLASSROOM

PROCESSES	EQUIPMENT	SAFE WORKING
cutting most wood throughout construction	table saw	eye glasses, ear muffs, apron, dust extractor
cutting angles in wood and cutting wood to certain depths (multiple cuts instead of router)	circular saw	eye glasses, apron
making wood certain thicknesses and look presentable	thicknesser	eye glasses, ear muffs, apron, dust extractor
smoothing wood	<ul style="list-style-type: none"> • belt sander • circular sander • sand 	eye glasses, ear muffs, dust extractor, apron,
	<ul style="list-style-type: none"> paper • thicknesser • cabinet scraper 	vacuum

<p>Drilling, screwing and cutting Bluegum for tier</p> <p>PROCESSES</p>	<ul style="list-style-type: none"> • variable speed cordless drill • air pressure drill • drill press <p>EQUIPMENT</p>	<p>eye glasses, apron, air-pressure</p> <p>SAFE WORKING</p>
nailing	<ul style="list-style-type: none"> • nail-gun 	eye glasses, apron, air pressure
joining	<ul style="list-style-type: none"> • biscuit joiner • dowel joints • router 	eye glasses, apron
process of moulding 1.5mm bendy ply around the mould created	vacuum bag provides equal pressure on the entire area of the	apron, air-pressure
	product creating a strong join.	
rounding top and tier	<ul style="list-style-type: none"> • router 	eye glasses, ear muffs, apron, power cord over shoulder
edge treatment	<ul style="list-style-type: none"> • table saw • edge planer 	eye glasses, ear muffs, apron, dust extractor
Cutting templates, tier and top	<ul style="list-style-type: none"> • jigsaw • bandsaw • router 	eye glasses, ear muffs, apron, dust extractor
Finishing	<ul style="list-style-type: none"> • spray gun 	eye glasses, face mask, apron



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EVIDENCE OF INDUSTRIAL PROCESSES USED IN CLASSROOM

EVIDENCE OF ADDITIONAL INDUSTRIAL
PROCESSES APPEAR IN THE NEXT SECTION
(OCCUPATIONAL HEALTH AND SAFETY, PAGE
41-46)

NAIL GUN

The nail gun uses compressed air to drive nails through the object.



It is widely used in industry, as it is a fast, effective way to join wood together with minimal effort.

Maximum care was taken when using the gun. I used it for attaching my drawer faces to the drawer.↑ I used the nails in order to stabilise the faces whilst the glue dried and before I put two screws in for extra support.

The other time I used the gun was to join together the modified mould. ↓

A rectangular box with a yellow border containing the text "Image not available".



High band 6

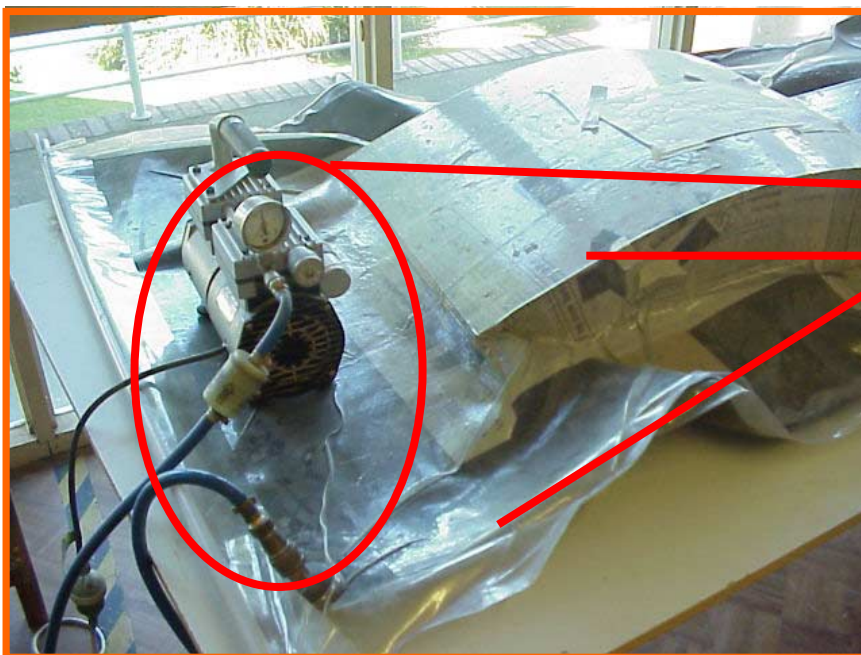
In this photo you can see the use of safety glasses and apron. You can also see the construction techniques used for the mould, with multiple struts (all cut with template and router to be even), to give a perfect curve.

The **weakness of the nail gun** (YET strength of glue in the vacuum bag) was shown when after out of the vacuum bag the curved ply stuck to the mould with some excess glue. When I tried to pull the curved plywood sides off, some of the glue had stuck to the mould and pulled it away from the nails.



VACUUM BAG

The vacuum bag uses an air pump to suck close to 98% of air out of a big, clear, plastic bag. Multiple layers of plywood (I used 4 x 1.5mm bendy ply) are glued together and placed on a mould covered in newspaper to stop the glue coming in contact with the bag. I hammered two small nails through the plywood into the edges of the mould to stop the plywood from moving around in the bag so they were all directly on top of each other and stayed that way throughout the process.



- vacuum pump
- ply, wood newspaper
- bag



- clamp ply to mould. Glue can dry fully now, because it is outside of the vacuum bag

EVIDENCE OF INDUSTRIAL PROCESSES USED IN INDUSTRY

Processes used in industry differ from processes used in the classroom. In industry, the machines are more precise and use computer aided devices that are set up and can produce multiple cuts, which is much faster and uses less manual labour.

I visited 'Woodstock Inc.', a recycled timber furniture making industry in Gosford/Wyong, and saw the difference a proper furniture making industry is to school.

53

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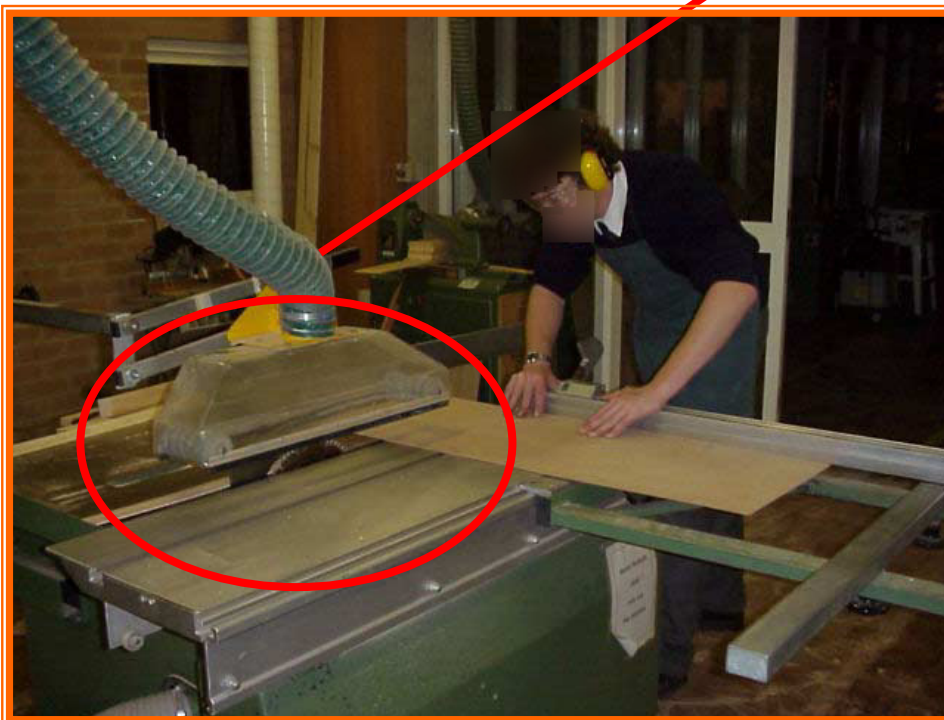
All of the machinery was larger and capable of cutting more wood and larger sizes of wood with ease.

TABLE SAW



- ear muffs
- safety glasses
- apron
- fence back
- dust extraction lowered to just above

wood



- head over work
- hands away from blade
- no obstructions near blade

THICKNESSER

- ear muffs
- safety glasses
- apron



- roller support for extra support



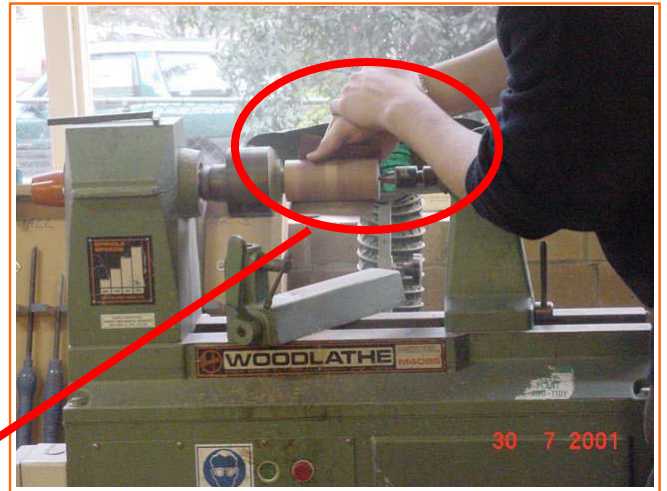
- dust extraction lowered to machine and clear from obstruction
- head over work
- hands clear of machine
- no obstructions

This would be the machine I used most, time wise, because all of my Bluegum went through at one time or another.

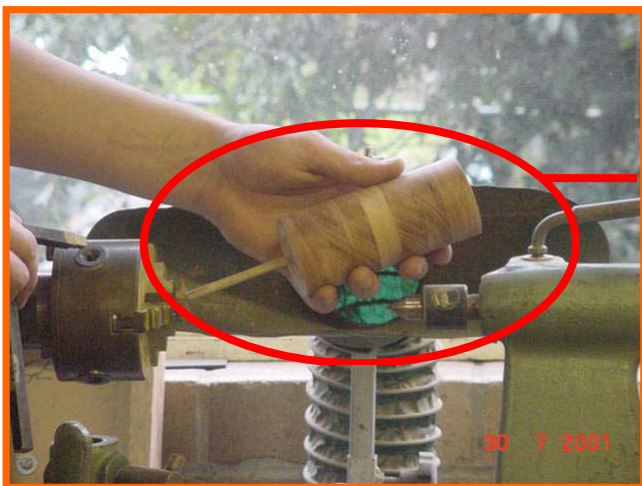
LATHE



- safety glasses
- apron



- dust extraction placed close to stilt
- head over work
- hands in safe position, sandpaper on 'up' spinning side to wood



- no obstructions near moving parts

64

- chuck used for safer spin

I only used the lathe to sand the stilts to make them round and smooth. I did not use any tools on the lathe.

I used the portable vacuum on the orbital sander and belt sander (as shown below).



To cut out the desk top I used a router with a 16mm cutter and a face to run along the template. The template is clamped to the Bluegum and the workbench for stability. Ear muffs and stable body position adds to safe cut.



OILING

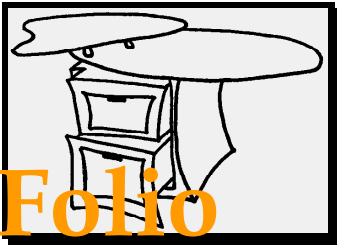
- 'Scandinavian Teak Oil' was used with a cotton cloth to oil 'MAD'
- after applying oil, and letting it dry, I used a clean cotton cloth to buff 'MAD' to give it a high quality finish



WORKSHOP DRAWINGS

Image not available



**Folio**

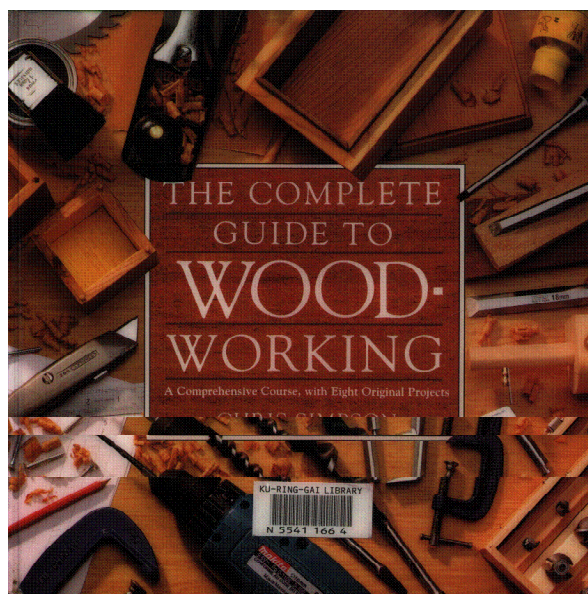
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EVIDENCE OF ONGOING EVALUATION RECORD OF PROCEDURES (DIARY)



- I visited Gordon Municipal Library and found 'The Complete Guide to Woodworking' by Chris Simpson. Here I found my main idea on which I based my project.



4/10/00

- I made many sketches and drawing ideas in this week and the next month. Every week I had a new idea and changed something about my designs. It was hard to finally rest on the plan I have.

5/10/00 → 10/11/00

- At school I figured out what type of wood I was going to use. After some convincing from my teachers, I figured out that Sydney Bluegum → would be the best wood for this design. It was the most economical and will present the best finished product. I ordered my wood.



13/10/00

- Throughout this week I made my mould for the sides of the pedestal. I made it out of radiata pine because it was easy to obtain and it was free. I made it 650mm by 60mm. This will give me room for error and later miscalculations.

16/10/00

71

- I ordered my wood after I made my cutting list (included in the back of folio). There was a problem with the ordering process so my wood came three weeks late. At present I am still waiting for my wood. Today I found out that my wood will be \$26.83/metre = about \$804.90 total for all my wood.

17/11/00

- I started to measure and cut the sides of the carcass today. Sydney Bluegum is more dense than I thought and very heavy.

2/2/01

- My original radiata pine mould is too small for my design. I started to make another one today out of MDF. I made a small template and used the router to cut them all the same.

14/2/01

- Today I did my first dry run with the vacuum bag. It turned out fine and the bendy ply worked without cracking.

14/3/01

- Finished gluing back together with biscuit joints. I made a template, from the mould, and started to test different sizes and shapes.

16/3/01→23/3/01



- I practised routing the curves with my template. ← I started to rout the actual sides with a

few troubles. These I overcame when I re-routed the side to a depth of 7mm.

3/4/01

- Attached veneer to curved sides with immense troubles due to the nature of the curve. The iron, when passed over the curve, could not equally disperse pressure or heat over the pre-glued veneer. This went on both at school and many late nights in my workshop at home during the holidays.

3/4/01 → 15/5/01

- I had to remove the veneer as it bubbled severely and split in places where it was not meant to. (It was not meant to split anywhere)

17/5/01

- I biscuited my frame and carcass with use of the biscuit joiner, biscuits and glue. I had to allow for the carcass fronts, which I routed last week. I can now start to see what my

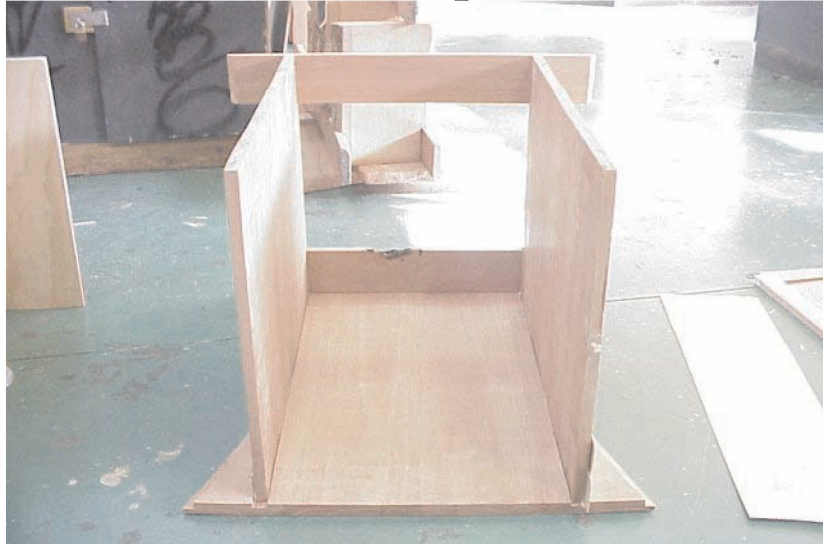


work
is

looking like!

12/6/01

This is how it looked just resting, yet it balanced pretty well not only due to the weight of the Bluegum, but also due to the fact that the routed back was square.

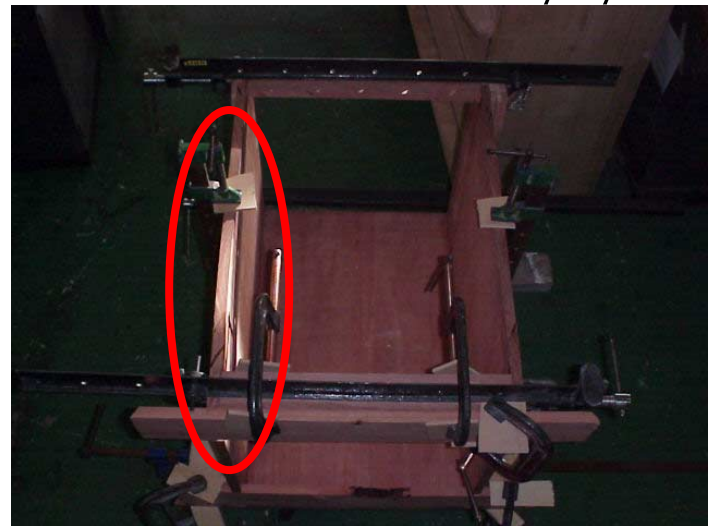


- After weeks of testing the curved sides and carcass back and sides, I finally glued and clamped the carcass together.

15/6/01



carcass glued/clamped



base view of carcass clamped

- The drawers were my next main task. I had to take into account my drawer runners (12.5mm each side), therefore making my drawers 25mm smaller than the carcass width. I measured this but my carcass sides and carcass fronts were not 100% flush, causing a 1mm difference each side of the drawer. This caused me to trim the drawer sides 1mm each. I glued the drawers together WITH the ply base in the grooves I made for them. This took up the holiday's period.

26/6/01 → 13/7/01



circular saw for rebate joint



drawer front/back

after



glued

78

and



clamped

- Drawer faces were next part to add to my '*MAD*'. I cut them out using the bandsaw and sanded them back till they were the same curve as the carcass. Problems with the drawers I encountered were a major set back to my development.

27/7/01

- With the addition of the smaller-3D-drawer facing and handle, my drawers were complete. The thicknesser was again used to transform my faces from 22mm to 9mm.

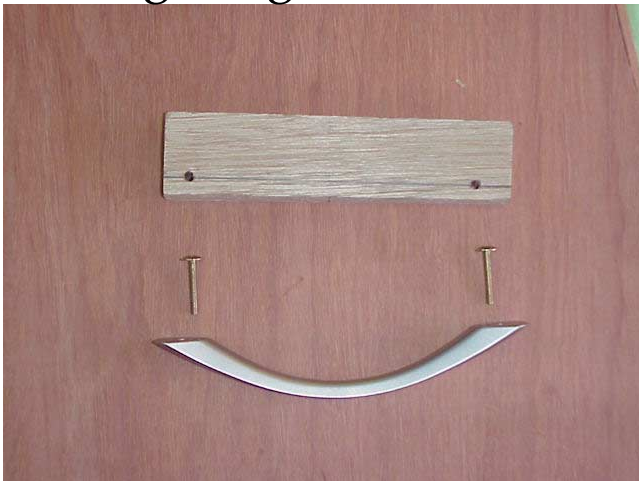
30/7/01



gluing face on



clamping



handle, screws and jig/template product



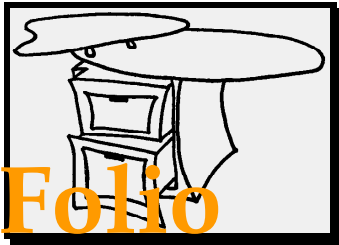
finished drawer

81

- The desk top was cut with a router and a template. The template took some work to get it smooth. A router fence was attached and could run around the top to create a perfect reproduction. The use of a different router cutter allowed me to get a nice curved finish on the edges. The use of a cabinet scraper allowed me to make the surface flat, smooth and presentable.



- I used the bandsaw to cut out the top tier and the same rounding methods as for the top. It turned out to be a good size and shape for a computer/storage/CD player stand.



Industrial Technology

MAD

MY BASIC/SET PLAN I TRY TO STICK TO...

STEP 1:

- figure out where you would like the project to go or where other people would want it to be placed
- measure area and work out which materials would best suit the area
- design rough sketches of initial ideas
- choose the best option keeping in mind the project requirements (i.e. 'FFD' - computer desk)

STEP 2:

- figure out sizes of materials and make a cutting list
- purchase them
- work out a timeline or work plan and try to keep to it

STEP 3:

- START CONSTRUCTION
- work your way through your plan

STEP 4:

- when you hit your first problem figure out the best way around it (e.g. size of the curved sides)
- keep in mind any tasks needed to be handed in (like the halfway point of this folio handed in week 8 Monday 20/3 and the initial Statement of Intent and pictorial sketches - week 3 Friday 16/10)

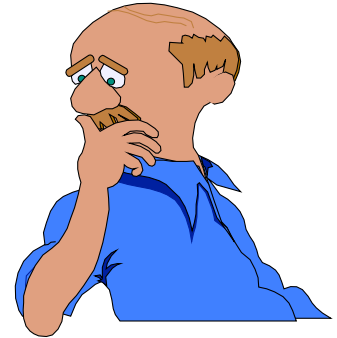
STEP 5:



- work your way through the task as well as working on your folio
- undergo any tests if needed (size of desk for all sized people)
- finish off work and make it look presentable to the best of your ability and hand ALL tasks in ON TIME!

CALCULATIONS

$$1+1=3$$



- Throughout the planning and constructing stages of this project I made many calculations. The first of these was to figure out how big I should make the project. I didn't

87

want to make a desk too big for the area in which I intend to put the desk when I bring it home. This area is 3 by 4 metres. This had to include a chair, all of my computer components and accessories.

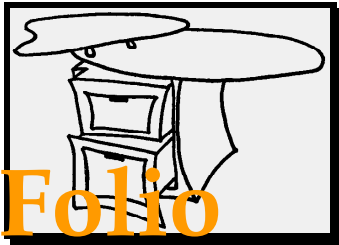
- The calculation of the size of each component was researched and mentioned in the research section (page13).

COMPONENTS	mm
Desk height	750
Max reach	475
Leg room	600
Knee clearance	250

- It was hard to figure out how much curve I wanted to make on the sides. It is not an arc of a circle but I feel the curve of the mould I made is perfect. It is 650mm in height and 75mm wide at its widest part.



- I calculated my Sydney Bluegum to be \$26.83 per metre. This will total to \$804.90 for all my wood (30 metres worth). The cost of the bendy ply is going to be around \$50.00 in total. This will mean that in total my project should be close to \$9000.00, when I add in the cost of the metal drawer runners and metal drawer handles, which is under the intent of \$1000.00.
- The hardest calculation was to figure out where the pedestal should be under the desk top. Because this is a 'candle-stick' design, it only has one support, therefore might be able to be tipped over. The weight of the carcass prevents any chance of this happening though. The sheer weight of the Sydney Bluegum hardwood structure makes it close to immovable for one person, yet easy for two, as proposed in the statement of intent.



Industrial Technology

MAD

APPROPRIATENESS OF DESIGN AND/OR DESIGN MODIFICATION

The final design was appropriate because:

- the design functioned in the way in which it was intended;
 - it is stable/sturdy and fits into all of the parameters of the design;
 - the final prototype indicated that it could be manufactured for under \$1000.00;
 - it is versatile in all of its many uses, whether it be a computer desk, a study desk, a drawing desk or just a simple storage unit;
- 90
- all of the curves complement each other, with makes the unit aesthetically pleasing in its contemporary design;
 - the modification of the table top shape is very effective as it lets the person sit closer to the tier, drawers and computer monitor.

PROBLEMS

- My very first problem was the delay in the delivery of my wood. It set me back 3 weeks from the start.
- My next problem was the size of the mould. I made one too small and I had to start all over again to make a larger one. The size of the curves, which relies on the mould, was very important to my design.
- When joining my Bluegum for the carcass sides, I put the curves of the end grain curving all the same way. This meant that when I clamped it, it curved and warped. Over time the warp gradually became worse. I had to cut off the joints and redo them with the end grain curving in alternate directions.
- As stated earlier, the veneer was my first major problem. To go out and buy the veneer with high expectations of its final appearance and to be so disappointed with the results, was a blow. It caused me great frustration. The problem was the curve of the plywood, as the iron could not get equal heat and pressure on the veneer to not only heat it up but too make it stick. The veneer bubbled ↓ ...and split, causing me to remove it. I solved this by replacing the curve into the vacuum bag and gluing on some red Lauan ply.
- The drawers were my next noticeable error. It seemed, when I put the runners on and placed the drawers in, that the carcass was not square. But it was! I was left in a huge dilemma and it took the entire holiday period to solve it. I

had to plane the fronts down 3mm, and strategically place the runners in positions so that the drawers ran smoothly.

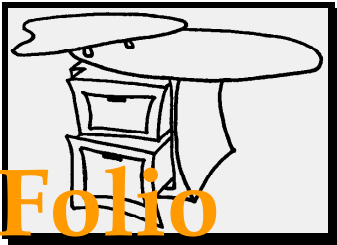


- My final problem occurred in the last available week of construction. After giving '*MAD*' its final coat of oil I had to glue the tier to the desk top. I tried using

95

clamps, but I could not get equal pressure over three stilts. So after some 'lateral' thinking I decided to place a large weight on top of the tier. I found a solid tree stump that required three people to lift and placed it in position. The strength of my design proved strong enough to hold the stump and a secure join was accomplished.

This is how it looked!

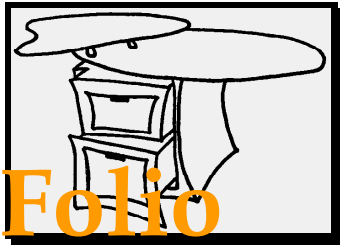


Industrial Technology

MAD



STUDENT EVALUATION



Industrial Technology

MAD

Overall, I was pleased with my efforts. I put in a lot of extra time after and before school, during free periods and in the holidays. Most of my problems were relatively easy to solve, and I did so with confidence in my ability. I like the way my design was transferred from my head; to paper; to wood.

My folio was completed by use of a computer. This made the task of including digital photographs easy and enjoyable.

The drawers are heavy and very big. Yet they run smoothly and the design of them pleases me. The top with the indentation for a worker to sit at turned out to be a good design modification. It is aesthetically pleasing and gives the desk a contemporary feel.

I was pleased with the spraying and oiling of my 'MAD', and I was very happy with the final product. **I have realised my statement of intent.**

I enjoyed making 'MAD' and am eagerly waiting to bring it home and use it for its multiple applications.

