

ASSEMBLY INSTRUCTIONS FOR TL1, TL2 TRANSMISSION LINES.

Contents.

1. INTRODUCTION.
2. PRODUCT DESCRIPTION.
3. GENERAL COMENTS.
4. ASSEMBLING THE CABINET.
5. FITTING DAMPING MATERIALS

6. FITTING THE FRONT PANEL.
7. ATTACHING THE REAR PANELS.
8. THE TERMINAL TRAY.
9. FITTING THE DRIVERS.
10. THE TERMINUS GRILLE.

11. NOTES ON FINISHING.
12. SUGGESTED READING ON FINISHING.
13. GENERAL ACOUSTIC SETTING UP PROCEDURES.
14. SKETCHES AND DRAWINGS.
15. PARTS LISTING

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TLAKIT01

CONSTRUCTIONAL DETAILS.

1. INTRODUCTION

Welcome to the world of kit construction. Whichever kit option you have purchased we hope you will derive many hours of pleasure from both the construction and the sound experience that this will provide.

Before you delve into the practicalities of construction, a few words of advice.

These kits are designed to give a good level of performance and satisfaction subject to you providing a consistent and 'accurate' build standard'. Within limits the panels are precision pieces of woodwork and should be treated as such. MDF damages easily, some of the panels have feather edges, so take care, it bursts or dents if dropped and will be difficult to repair. Throwing panels together like kitchen cupboards just will not do. An element of patience and dexterity is required during assembly and there are no real shortcuts to doing the job properly, so...

Please read and follow the instructions carefully, allocating sufficient time for each operation. Follow the assembly instructions in the order advised. If you are unclear on any point or you have a problem please ask for advice. The sketches at the rear of the text cover most items and of course a picture is worth a thousand words, or so they say. So lots of words eh! Or is it pictures? There are no target times for construction and it is recommended you go at your own pace; these are not four-hour wonders on the kitchen table or living room floor.

This text covers assembly for both types of TL (Models 1,2 and the active options), as the basic woodwork is very similar. Of course, if you are using external filters or electronic filters, you can bypass those comments, which relate to fitting internal crossovers etc.

Whilst we take particular care to ensure you have a 'complete' kit of components, errors do sometimes occur. As an exercise in parts identification and familiarisation please check the components as you unpack them against the kit listing.

In the event of any shortages please advise immediately.

Note the listing specifies components for one unit, for pairs, double up.

In the construction of 'any' kit, a number of tools are always required. We recommend the following, which range from useful to essential. You get to decide which is which.

- (1) Soldering Iron 25W. A (10 or 15) W will not be adequate for soldering the Bass Driver connecting cables.
- (2) Pozidrive Screwdriver /s with PZ1 and PZ2 end bits, i.e. small and a bit bigger.
- (3) Small hammer.
- (4) Hand Drill. You can use an electric drill but you get less control over the job, quicker is not always better.
- (5) A 1.0mm and (1.8 – 2.0) mm, drill bit. 1.0mm can easily break, so best go for two.
- (6) Clamps. F Clamps are best as they have a loooooonger internal reach, but simple clamps can be made from ½" threaded rod, nuts, large steel washers and some scrap 4 by 2. Don't know what 4 by 2 is!! To the wood yard.
- (7) Hobby knife or scalpel and a 150, 300mm steel rule or similar as a straight edge.
- (8) Some jacking blocks, (scraps of wood of like thickness, or similar) to support / elevate the case whilst clamped and some scraps to use beneath the clamp heads to prevent case damage.

(2) PRODUCT DESCRIPTION.

The cabinets are built from 18mm MDF main body panels with 25mm top and bottom panels. They incorporate a number of lengths of damping materials for both line and side panel damping. Internal baffles are of 18mm MDF, All cables and fitments are supplied to produce finished working models, (excluding adhesives).

The outer side panels are constructed from pre-veneered board materials and have hardwood lippings on the top and bottom edges. They are sanded to a flat finish. Further sanding with a very fine abrasive paper will enhance the surface but 'basic' stock removal with course papers is not recommended as the veneer is already very thin and you may sand through it. A non-recoverable situation.

The front and rear panels also employ pre-veneered materials and have rounded, machined, outer edges. These edges require further sanding with a fine paper, subsequent to the completion of the cabinet to produce a 'smooth' contoured surface.

Rear panels are screw fixed, whilst the fronts use dowels to provide mechanical strength and aid location. To achieve a good airtight fit, 'pressure' must be applied across the front / rear panel surface whilst the glue sets. This does not mean sticky carpet tape of an old book balanced on top.

The veneered surfaces are left in their natural finish for you to apply your required colour scheme and finish, eg staining, painting etc. However, this technically requires some knowledge and a little experience, (have a look at the suggested reading matter), otherwise you may end up with a finish like 'dogs dinner', unfortunately, the dog won't eat it.

In order to keep to simple finishing techniques we recommend the application of a few coats of wood finishing oil. This is slightly coloured, (i.e. vaguely light yellow brown) and darkens with age. It is easy to apply, is a penetrant sealer, dries hard and is difficult to chip off as it soaks into the work-piece.

Drivers; - The TL's use either a Focal or Scan Speak Mid Bass driver depending upon the version ordered. The TL1's use a Focal, so...that sorts that, partnered with a Morel MDT30S Tweeter. The Scan speak option is available in passive or active format. The tweeters are offset mounted to reduce diffraction effects. They produce in common with most TL's a free, airy sound with good imaging characteristics and a capably solid bass performance without undue extension. This makes them suitable for the smaller sized living room.

The Active crossovers comprise of a very high quality electronic package with inbuilt rumble filters and separate power supply. When provided with appropriate amplification (4 channels are required), the results are superb and give domestic realism a new twist.

Note active cabinets / systems cannot be used in passive format without the matching passive crossover networks, not supplied but which can be made available as a separate item.

ASSEMBLY INSTRUCTIONS

(3) GENERAL COMMENTS.

A few words on assembly order. The baffles, panels and deflectors are built up upon one of the side panels. It is 'VERY' important to assemble the first few panels with the utmost regard to accuracy, rather like corner stones on buildings. Failure to start the project with a square geometry will result in subsequent panels being an ill fit, or at worst no fit at all.

Some of the panels are keyed / doweled to assist in assembly accuracy although a four to six inch carpenters square to check alignment is also helpful.

Whilst the cabinets are effectively vented through their Terminus Port, (bottom grille), the total system performance relies on all joints and seals being airtight. So, when gluing panels ensure all appropriate surfaces and joints to be glued have a 'thin' coating of adhesive. In addition, during the assembly process it is advisable to caulk the joints / seams with a thin film of adhesive, hot melt glue, silicone etc. once the initial bond has been made. Do not obstruct the location of subsequent panels with glue, as once set it will be difficult to remove and may frustrate further panel assembly.

Dry assemble a complete cabinet in order to see how the components fit together. It is a good idea to assemble the woodwork on carpet squares, a small mat etc. in order to prevent damage / marking of the cabinet surfaces. Sample squares / scraps can be obtained from most carpet outlets at little cost.

Do NOT use rapid setting woodworking adhesives. It is not a short cut, merely a pain, should you need to make some latter adjustments.

The cabinet panels may be identified in order that you can retain the identity of a complete set, sticky label, pencil etc Please retain the 'SET' identity in order to minimise variances / tolerances on component dimensions etc.

No adhesives have been supplied and you will need to provide the following: - PVA Woodworking Adhesive, 100ml should prove to be sufficient and one spray can of carpet adhesive or a thixotropic contact adhesive for attaching damping materials etc.

Note that glued joints can creep / float, (infers to much glue), as the joint relaxes or comes under pressure. It is a good idea to check this aspect periodically during assembly. Make any adjustments as required. You did use slow curing glue, didn't you?

Most adhesives contain volatile solvents; especially contact types, which need to be dispersed before fitting the drivers. Failure to observe this point may result in the very thin insulative coating around the driver voice coil being attacked by the volatiles, no... volatiles not vandals, leading to subsequent driver failure. Allow around 24 hours for the adhesives to cure / dry before fitting the drivers. If your kit contains silver-plated cables, readily identified by their colour: what colour? Well, answers on a postcard. Please solder the silver cables with the 'silver' loaded solder provided. This melts at a slightly higher temperature, depending upon the silver content. Without the tech. Lecture, unless you do this, you may, at some later stage in life, (months / years) get a naff joint so...

The parts list contains a full description of each part, most of which are available separately. If you have any doubt as to the identity of a particular item eg screws and inserts etc, this should help you.

To aid future updates or editing, all figures and diagrams are collated at the rear of the text. A GA, (General Assembly) diagram is included and should be viewed in conjunction with the individual figures and instructions for assembly.

(4) ASSEMBLING THE CABINET.

Lay the left side panel on a soft surface with rebates (grooves) facing upwards and with the panel Top to your left. Dry assemble the cabinet panels, minus (front, rear, and the second side panel) to achieve the panel pattern as shown in Fig. (2).

The internal panels are all numbered to aid identification. Note L6 is slightly angled. Familiarise yourself with the design.

When gluing the top and bottom panels they are required to be EXACTLY flush with the sides, otherwise the front and rear panels will not sit flat. This results in poor subsequent panel fit and possible air leaks. Each cabinet end is glued separately with its supporting baffles in order to ensure squareness.

Do NOT be tempted to screw-fit the panels / fittings other than when advised. Most screws are not straight and will pull the assembly / baffles out of square and this notwithstanding you positioned the screw pilot-holes accurately. We do our best to get it square at the start; so don't muck it up.

Identify the following components, one of each: -

Component

LH Side Panel.

Bottom Panel

Baffle pieces L1, L2, L3, L4, L5

M4 crossover mounting inserts qty 4.

In addition you will require Pencil, 150 / 300mm rule, PVA glue, Two F clamps with around 30cm capacity, 4 scrap wood clamping pieces and a damp NOT wet cloth. Some clamps have plastic covers on the clamp ends but clamping scraps are better as the footprint is larger and spreads the clamp loading over a larger area.

Dry assemble the parts as shown in Fig. (3). Using the pencil, draw an outline around the baffles on the inner surface of the side panel.

Note: - where the veneers have highly patterned exterior surfaces, the interior of the side and top panels will be marked to indicate which direction gives continuity of veneer pattern. This does not apply to the bottom panel.

If you are installing / fitting an internal crossover, it will be necessary to fit the M4 inserts into the bottom panel prior to gluing it into place. Thread an insert onto the M4 bolt provided and using it as a drift, tap the inserts into place to achieve a flush fit. Unscrew the bolt and repeat the process for the remaining inserts. Ensure you 'squarely' tap the inserts home, the insert shoulder helps here, else you'll be redrilling / enlarging the PCB mounting holes to get a fit.

Lightly spread adhesive on the 'Bottom Panel' joint, Fig (4) suggests the glue location. Excessive glue is to be avoided, as when clamped it will exude, (squirt) over the work piece and may spoil it, hence the cloth. Locate this panel exactly.

Working reasonably quickly, you did eyeball the layout, didn't you? Lightly smear adhesive to give total coverage over the bottoms and contacting surfaces of the baffle, not over the outlines else you won't see them.

Place the parts onto the pencilled outline in the following manner. L2, L1, L3, L4, L5. Using the rule and a square, check the dimensions and firm baffles into place. Make any small adjustments to ENSURE baffles and panels are flush fits where required. Note; L1 is used to ensure squareness of the bottom panel.

Dry hand fit the remaining top and side panel to act as location jiggling. Use the clamping scraps to protect the surfaces and lightly clamp the bottom section to ensure the bottom panel is pressed home into its rebate, Fig (5). Check the clamping process doesn't force any of the joints out of contact / squareness with its neighbour. Readjust if required and wait for the glue to set. A minimum of six hours is suggested but overnight is better. Any exuded glue from the external joints should be removed with the cloth. Do not smear the excess glue over the externally veneered surfaces. If you wait until it is semi-set, (plastic, not wet), it can be removed reasonably cleanly with a scalpel blade and the damp cloth.

When the glue has set remove clamps, side and top panel and caulk all accessible seams with glue, sealant etc. Don't wait until you've assembled it all to do this, because it's not possible, so...

Using the same procedures as before fit and glue the baffles L6, L7, L8, L9, along with the 'Top Panel', taking note of any orientation marks. Again ensure the panels and baffles are a flush fit. Dry fit the remaining side panel as before and lightly clamp the top section. When dry unclamp remove loose panel and caulk all the new joint seams.

(4) ASSEMBLING THE CABINET.

Insert the speaker cable through the bottom baffle L2 to about 270mm and caulk the holes to provide an airtight seal. Lay the cables through the labyrinth so the cables emerge from their respective cutouts, Fig. (6). Using cable clips, optional and not supplied you can route / fix the cables to a secure position as required. Your cabinet should now match the General Assembly drawing Fig. (1), if it doesn't, find a large lake.

(5) FITTING THE DAMPING.

Tools / materials required: -

Largish Scissors, felt pen or similar, NOT a biro. Steel or plastic rule, spray / contact adhesive.

The damping materials may be provided in bulk form, in which case you get to exercise the scissors etc. These are (a) Felt, (b) Foam, and (c) Stuffing. They are identified on the GA (General Assembly), as F, FO, and ST. Do not confuse them with the 35ppi-reticulated foam, eh! Well, the thin black bendy stuff then. That's for the Terminus / port covers. In conjunction with the drawings Fig (7), use the rule, marker pen and scissors to cut to size the various damping panels. It is not necessary to be too precise with the dimensions. The nearest couple of mm will do.

Note there may be more materials than strictly required. This allows for the Screw-up factor. If you used it all, study the drawings more closely.

Stick the damping pads (F1, F4, F5, etc) onto the interior panels in the positions shown. If you make a mistake just remove and reposition the offending pad. F2 and F3 are fitted through the rear, 'after' the cabinet is complete. In this manner you will not obstruct the assembly / fitting of the remaining side panel with an ill-fitting pad. Check that F5 does not obstruct the fitting of the rear panel, which should fit flush with the main bodywork.

Damping pads are fitted to the rear of the bass driver in order to reduce internal reflections.

Do NOT obstruct the rear "aperture" on the bass of the driver with the pad material OR get adhesive down the vent. Have fun cutting the central hole. 3/4" to 1" diameter should do.

Note, Adhesive spray cans often suffer from serious over spray and mis-direction, usually in your hair or eye etc and they don't work too well, if at all, when upside down. Give this matter some thought. Avoid spraying driver cones etc. they just don't like it and it's hard to get off.

Cut and fold ST3, ST4 (the white stuffing), and insert between the baffles as shown in the GA, Fig (1). Position these accurately as it will be difficult to adjust them once the second side panel has been attached. ST1 and ST2 are inserted at final assembly through the rear of the cabinet.

(6) FIXING THE SECOND SIDE PANEL.

Tools Required: - Mallet or similar, clamps or clamping jigs. If you don't have clamps use a heavy weight for the centre and tourniquets or home made clamps to pull down on the edges. Heavy means 100 lbs or so.

Dry assemble the side panel and check it all fits according to scheme. Note any orientation required re veneer matching, as the panel can fit either way. Check out your clamping arrangement before gluing, NOT after! The centre of the panel needs compression to provide a good airtight fit with the internal baffles. If you have assembled it correctly, take a coffee break, if not, then have two.

The Top / Bottom joints need coating with adhesive in the same manner as previously described, Fig 4) refers. The baffle edges should now be adequately coated with adhesive, as it will no longer be possible to caulk all of the interior seams. If you have long arms and a finger like ET you can do your own thing. The rest of us just use a little more adhesive. Lay the side panel onto the work piece and lightly press it into position. Make any adjustments to alignment using (hand / mallet / soft scrap wood) to ensure a flush fit with the top and bottom panels. Clamp and retain clamped until the glue is set. Remove surplus adhesive from the case exterior in the same manner as before. Avoid smearing the adhesive "over" the veneer, as once dry; it is virtually impossible to remove.

(6) FITTING THE FRONT PANEL.

The front panel is a flush fit and uses dowels to aid location and provide strength. It is to be clamped / placed under pressure in order to achieve good joint integrity and be airtight. The usual way of doing this other than with a press is to use F clamps or sash clamps. Such items as heavy books rarely achieve the same result.

Simple tourniquets are also quite effective provided the case corners are protected against the forces involved, i.e. use paper pads, 'white' not newsprint as the ink may discolour the woodwork.

Ensure the panels are correctly positioned / centralised before clamping. A 'small' amount of movement is allowed for / possible on the front panel even though it is doweled. Polyvinyl Acetate adhesive, (the white messy stuff), otherwise known as PVA sets by a combination of water loss and pressure. Once clamped the curing process will start and it will be very difficult to adjust panel positions after a few minutes. If you do need to adjust, unclamp, and readjust position. More drastically pull the joint apart, remove the adhesive with scraper / cloth, reglue and reposition. Do this task quickly; don't sit there all day thinking about it because the remaining glue still attached to the main work piece is still setting. Hence the earlier comments about rapid setting adhesives.

As per the baffles it is a good idea to dry assemble the front panel and your clamping technology "prior" to coating the components with adhesive. In this way you can check all aspects of assembly and avoid possible errors. The front Panel MUST be clamped flush with the front surface in order to achieve an airtight seal. The dowels are a reasonably good fit. Any wood movement or misalignment may make it hard to clamp the front panel to a flush fit. In the dry assembly mode locate any problem dowels and reduce its / their diameter slightly, (by sanding, penknife, whatever), until a good fit is achieved. In order to protect the side panel veneers the front and rear panels are designed to overhang the side panels by a small amount. Tops and bottoms are almost flush.

Gluing. Insert small pea sized drops of adhesive into the dowel holes in the main case panels. Tap the dowels into the holes until they bottom out, they make a different tapping noise when they hit the bottom. A small amount of glue should exude from the hole. The maximum protruding dowel height should be no more than 10mm. smear a thin film of adhesive over the upper dowel sections. Spread adhesive thinly, but without breaks over the 'inner' half of ALL external edges and full width over the L8 baffle. See Fig (8). This minimises the amount of glue, which will run from the joint when clamped. Place peas sized droplets of adhesive into the Front Panel dowel holes and bring the two sections together. Lightly clamp and make any positional adjustments. Clamp fully and remove any excess adhesive as previously described, i.e. with scalpel and damp cloth. Allow the glue to reach working strength, 6 hours minimum before removing the clamps. Caulk internal joints as best possible. If you prefer, you can screw fit the front panel using fancy screws with decorative heads. Don't forget however to pilot all holes else you may split the casework. A 2.8mm drill works well for No8 supascrews, i.e. parallel-shanked screws.

(7) ATTACHING THE REAR PANEL.

The rear panel consists of two sections, which are both screwed to the main casework. The upper section may also be screwed 'and' glued if required. Sufficient screws are used for glue to be unnecessary providing the rear surface is 'flat'. The purist may wish to use glue as a form of sealant and provide additional rigidity to the total structure. The lower panel and chamber contain the crossover where fitted and that particular panel should not be glued. This provides access to the crossover should it prove necessary.

MDF is a layered material and the screws are being driven between the layers. As a consequence the screw body tends to burst it apart. In order to prevent splitting it is therefore NECESSARY to pilot the screw holes BEFORE screwing the back to the bodywork. The pilot diameter is important, so don't use any old drill bit, use the recommended size!!

Centre the upper section rear panel onto the bodywork such that an equal overhang exists down the sides. It is flush at the top. Using one of the screws as a marking punch insert it through one of the TOP holes and lightly punch it to make an imprint into the work piece. Do NOT remove it (unless you have clamped the panel) as the work piece may move. Use a second screw and repeat the process furthest distance from the first hole, Fig (9). This reduces angular error. Remove the screws, panel, clamps etc and lightly centre-punch the two marks. Pilot the two holes VERTICALLY to the full screw length. If you don't drill it vertically the back will be pulled off centre as you tighten the screws. You then get to do it all over again so..... Replace the rear panel and screw it down to a flush fit. Before it finally tightens ensure it is centred squarely on the bodywork.

If it doesn't centre it's because (a) The punch was forced off alignment by variations in wood chip hardness, (b) bent screws, (c) incorrect marking, (d) non-square drilling. Whatever... unscrew the rear panel and repeat the process using two new screw locations. Note a small sideways pressure can correct for minor misalignment before retightening the screws.

With the panel now firmly positioned mark out the remaining holes. Punch and pilot as per the originals. Repeat the process for the lower panel.

The remaining pieces of wadding ST1, ST2 may now be added to the chamber and the rear panels partially screw fitted. Don't fit all the screws as you may wish to remove the panel later. If you are going to glue the top section take note of the comments made earlier about glue position and excess removal.

If you are going to sand any of the woodwork further, 'now is the time for all good men to'...etc. Use only fine 220, 320 grade papers, hand or power sand. Prevent dust from entering the enclosure by blanking-off the various apertures with card, cornflake box etc and some double-sided tape. When done, remove the card blanks and thoroughly clean all dust from the surface Hoovers are good with a soft brush.

Note: - Any cabinet 'finishing' system will need to be applied BEFORE fitting the mechanical items, terminal tray, drivers, and front port grille.

(8) THE TERMINAL TRAY.

Allocate the cables to their respective solder locations. It is usual to assign the top terminal pair as Treble and.... 'wait for it', the lower, Bass. Refer to Fig (10) and solder the cables to the PCB / tags as shown. Note tags are not supplied but if you want it plugable etc you will need to fit your own. Silver plated cables should be soldered with the special silver loaded solder provided. If you are using 'external', passive crossovers note the shorting bars should be on the external crossover case inputs and NOT on the terminal tray. For bi-wiring / bi-amping options the shorting bars are to be removed. If you are using electronic filters / crossovers NO shorting bars are to be used.

Insert the terminal tray into the bottom panel cutout, correctly orientated, Treble terminals to the top, (you'll be real sorry if you stuff 100W into your tweeters), and mark the hole centres. Pilot the holes with a 2.4mm drill bit to get the screws started and fix the tray to the panel with No. 6 screws. Fix the lower panel to the main bodywork using No. 8 screws and piloting the holes with a 2.8mm drill bit.

(9) FITTING THE DRIVERS.

Whichever variant of case you are assembling, the basic techniques re drivers and fitting are the same. The cutouts may be different shapes, sizes etc but.... So what.

To minimise errors, a few general comments. Do not 'over solder' or 'linger' on the joint once the solder has flowed. The fine wires involved may become detached or break.

Check the cable orientation as cutouts have minimal clearance between the front facia and the tweeter body. Heavy-duty cables can become jammed / trapped between the tweeter body and the cabinet cutout.

Do not stress any of the cables.

When using silver plated or solid silver wires note that special solder is required for the prevention / circumvention of naff joints. In addition the melting point is higher. This can fry your gear faster so.....

Lastly, driver diaphragms and suspensions get a bit hot under the collar and don't take kindly to being splattered with solder droppings. Take all reasonable precautions, solder driver cables to drivers with the cones facing upwards so that the driver terminals are below cone level. Use sufficient, but minimal solder and cover the cones with a piece of card or paper.

Tools / materials required: -

No. 6 and No. 4 fixing screws for the bass and treble drivers. Small hammer, centre punch, gasket-sealing tape, hand drill, 2.4 and 1.8 mm drill bits. Screwdriver with PZ1, PZ2 end bits. Scalpel / scissors, soldering iron.

Place the Bass driver, minus sealing gasket into its cutout and orientate to your preferred screw pattern. Using a No. 6 screw or similar accurately mark the hole centres. Remove the driver and centre punch the marks. Pilot the holes using a 2.4mm drill bit. Follow the same procedure using the treble driver but use a 1.8mm drill bit to pilot the holes.

Fashion gaskets using the gasket tape. Remove the backing film before applying to the rear of the drivers. Ensure the tape passes on the inside of the screw holes and forms a complete seal, (butt joint NOT lapped). You 'can' attach the tape to the woodwork instead of the driver, but it doesn't stick so well.

Attach the speaker cables according to whether you are using plugable or solderable terminations. We only recommend soldered joints unless you wish to continuously change drivers and why should you need to? Take care to observe the correct cable polarity, see Fig (11). Don't forget to use the appropriate solder if you have silver plated cables.

Insert the drivers into their cutouts and using the screws provided tighten the driver chassis onto the front baffle. Do not over tighten the screws as this could buckle the driver castings. In addition take care the screwdriver doesn't slip, use a long stem screwdriver as this improves the blade location within the screw head.

(10 THE TERMINUS, (FRONT BOTTOM), GRILLE.

Tools required: - Scalpel straight steel rule and a square.

The front grille is manufactured from 35ppi reticulated black foam. In short it's a whole load of nothing held together with very little. It provides minimal sound absorption, even at high frequencies and looks good. The downside is that it can be attacked by UV radiation, as in sunlight. It doesn't moan or like lotions, but it can crumble. So keep it out of strong light / sunlight. It is attached to the frame / cutout by self adhesive MVA8 hooked Velcro strip, Fig (12).

Using the scalpel, slit the Velcro strip into two lengths / pieces about 3mm wide. If you don't want to play with scalpels and lost fingers you can use scissors instead. You do however get to remove the dross adhesive off of mum's best kitchen scissors, real aggressive it is too. If you use a cleaning solvent you can have petrol flavoured chicken legs to boot. Cut the reduced strips into pieces about (70 and 150) mm long, four of each. Remove the backing paper, a somewhat tedious task and stick the strips to the inner ledge in the terminus port, hooks facing outwards. Press it down firmly between the hooks. Use the back of a screwdriver blade or something similar. Trim it flush with the port edges. Scissors won't do, so..... Scalpel?

With a new scalpel blade, cut the reticulated foam to fit the aperture. Scissors make a dogs dinner of it so.... You need to hit this first time because subsequent trimming of small quantities is tricky. Use the square and rule to generate a right-angled corner. You need two pieces (179 by 93) mm. If you are undersize you can stretch it slightly. It don't stretch back however so...

Press it into the recess and onto the Velcro, which will hold it in place. If you still have some rear screws to insert, now is a good time to fit them unless you are planning on altering the tuning. Time for a coffee.

The front and rear badges can be fitted as required. They have a self-adhesive backing. Panel pins are provided to physically pin the badges to the woodwork. You need to drill pilot holes through the front badge indents from the rear face. About a 1.3mm hole should do. Glue first, then tack. In this manner you can "square" the badge before irremovably nailing it down. Well you didn't want it to fall off, did you?

(11) NOTES ON FINISHING.

There are many options on finishing and a few points are worthy of consideration.

The easiest option is to do nothing, but veneers need some form of protection so.

Second easiest?? Paint the surface, fine for plain MDF materials but not much use for veneers. If you are experienced in paint systems and lacquers you will know what to do, otherwise it is well worth purchasing a book containing ideas and details. The terminal tray can be fitted retroactively, (well later then), providing you observe the cable polarities.

So... a few pointers on MDF materials. If you're boned up on this then you can do your own thing. For the rest, pay attention.

These notes are not designed to be a definitive exposé, just suggestions / outlines and are not 'guaranteed' to work or designed to be a recipe for any particular finish.

1) Use a dummy piece of MDF material to test your colour and paint scheme 'BEFORE' you tackle your cabinets. A piece of scrap some 200mm square should do. Sand the surface to a minimum of a 220-grit finish. Ensure it is dust free before further treatments.

Note, finishes are only as good as the effort you put into them, which should indicate why good finishes are expensive.

2) Use an alcohol based aniline dye or NGR (non-grain raising) compound to stain the surface to a reasonably close match to your requirements. Water based stains will always raise the grain and will involve a lot of sanding to achieve a smooth surface. Check the stain is compatible with your paint / lacquer system, sometimes difficult to do.

3) Edges always absorb 'more' material / stain than faces. Use a good quality sealer suitable for MDF edges and apply after staining.

4) Consider the use of staining waxes, which are less of an agro than discrete operations. To get deep colours however, you do need to apply multiple coats.

5) A spray gun will always give a better uniformity of spray than a spray can.

6) If you use a spray can, expect to spray 4 to 5 coats, as the contents are very thin. Good coloured acrylic lacquers are readily available from automotive stores. Remove any dust spots etc. Note the performance of a spray-can may deteriorate rapidly as it empties.

7) Acrylic lacquers dry very slowly and can be soft, (imprintable) for several weeks after spraying.

8) A top coat/s of fast drying nitrocellulose can solve this problem. However, check for compatibility on a scrap work piece first. Some 6 to 7 coats, 3 & 4 with light sanding in-between with 600/800 grit "wet and dry" should suffice for a good finish. Allow a minimum of 3 days to harden preferably more. Avoid handling.

9) When sanding with papers take care not to sand through on the corners.

10) Use polishing compounds for a gloss finish and 0000 wire wool for satin.

11) If you can't be fagged with it all, a bottle of finishing oil is easiest, else, take it to a good spray shop or wood finisher. There are many finishes possible but be prepared to pay a good price.

(12) SETTING UP PROCEDURES.

The object of setting -up is to optimise the acoustic within the acceptable / practical limits of a domestic environment.

Most of us have to 'live' with whatever arrangement is finalised and are not favoured with special listening rooms, which can be modified to suit. The comments here apply to the TL range of speakers both active and passive but not to the procedures required to optimise the active filter, which is done here, in-house. Whilst some generalisations can be made the suggestions are not 'guaranteed' to produce any specific result, as everybody's room, perceptions and ears are, different.

(1) TL's are not usually as sensitive to corner placement as some types of cabinet constructions, i.e. they don't 'need' to hide in corners for optimum operation. However, it is not a good idea to site them 'directly' in room corners, as this will produce excessive colourations at the bottom end, resulting in booming and muddy bass. Some 2ft from rear walls and 3ft from sidewalls gives a good compromise. These dimensions can be adjusted to suit or as needs must be.

(2) The cabinets have offset tweeters, which helps to disperse HF diffraction effects generated at the cabinet edges. In plain speak; they 'should' sound better. However, they do need positioning, tweeters, on the inside of the layout. There is some debate about this

point in terms of perceptual differences but.. for ease of argument, just do it. Try it the other ways round if you wish.

(3) Placement variations of as little as 5cm and rotations by 5 degrees can make all the difference to sound quality. Remember, we are changing the speaker / room interaction, not the physical acoustic of the enclosure. Start with speakers dead ahead and slowly rotate them inwards noting the sound quality / imaging. Use the 'same' piece of music each time and make some notes. Similarly shuffle them, if possible, relative to the walls, some 5cm at a time and note any observations. Try to site the enclosures at your optimum position.

(4) Tweeters should normally be at ear level when you seated. However, this can depend upon the crossover as some crossover designs tilt the acoustic up and others down.

The TL1's use an odd ordered filter so in this case there is a 15-degree acoustic tilt. Experiment by tilting the case backwards, pack some mags or books under the front and see if it makes a difference. The active filter is not a direct equivalent to the passive version and uses a different filter arrangement.

In this case, tilting the cabinet may, note, I said may, offer a different perspective.

(5) Try and avoid listening / sitting with your back close to a wall. Sound whistles past your ear, well, in this case rumbles, because we are more interested in the mid to low frequency regions and is reflected off of the rear wall. This recombines at some later time to produce an acoustic, which can muddy the sound. Of course this is happening all the time re: wall / boundary reflections but it is worth a minor consideration if you have the space.

(6) Do not have your speakers too far apart as you may generate an acoustic hole. The perception will be information all left, all right or poor imaging. However, as most living rooms are of modest proportions this should not be a problem. Typical separations range from 2 to 4 metres.

(7) Carefully choose the music for trials. Do NOT use artificially generated instruments. Real piano is good as it has a wide frequency range, as has the violin. Leave out cymbals and drums as these can be real tricky to record and some studios don't do much of a job with them.

(8) So that's about it. Instructions all finished. What follows is a list of suggested reading matter that contains a wealth of information on veneering and finishing techniques. The suggestions appear in no particular order or preference and do NOT specifically deal with speaker finishing. However if you are short on information re finishing these are typical of texts you should be looking at.

Before you make a choice, do check that your intended purchase will suit your requirements. Try the library first or your local bookshop.

(a) Wood Polishing and Finishing Techniques.

Aidan Walker

Craftmans Guide / Tiger ISBN 1-85501-634-6

(b) Step by Step Techniques Woodfinishing

Den Hatchard

Crowood ISBN 1-85223-885-2

(c) Classic Finishing techniques

Sam Allen

Stirling ISBN 0-8069-0513-1

(d) Finishing Basic

Sam Allen

Stirling ISBN 0-8069-7228-9

(e) Wood Finishing Handbook

Ian Koster

Practical Crafts ISBN 0-946819-70-X

(f) Paint Finishes and Effects

Peter and Paula Knott

Haynes ISBN 1-85960-109-X

Lastly if you have any comments or suggestions for improving the standard or understanding of these instructions please forward your ideas on paper or Email for consideration

B. J. Adams (Principal).

