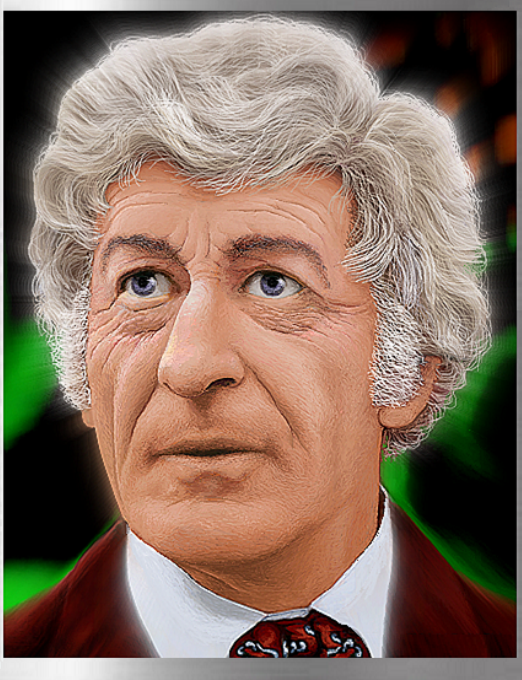
BUILD YOUR OWN TARDIS CONSOLE

THE PERTWEE YEARS

BY

TONY FARRELL



CONTENTS

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INTRODUCTION

In the autumn of 1963, Peter Brachacki was appointed as the first designer on Doctor Who. Whilst - due to illness - he only worked on the Pilot Episode, in his designs for the TARDIS he created a true cultural icon: With its roundel walls and six-sided control console, the TARDIS became instantly recognisable to millions of viewers.

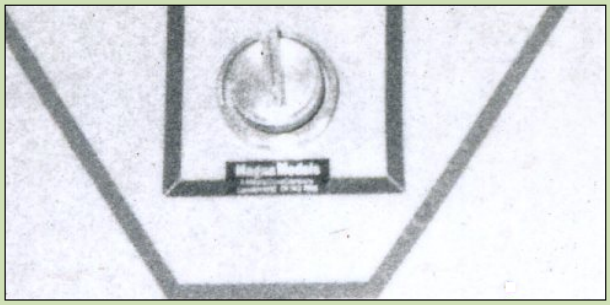
Brachacki's console remained in use from 1963 to 1970 - making its final appearance in "Inferno". By this stage - it is fair to say - it was in a poor state of repair. Conscious of this, and of the fact that Jon Pertwee was several inches taller than his two predecessors, producer Barry Letts made the decision to replace the console with a new, larger, version.

The task of re-designing the console was given to Kenneth Sharp . In a career which spanned over thirty years, Sharp was a well-respected TV studio set designer whose work covered many fondly-remembered shows such as "Mike Yarwood", "The Liver Birds", "The Prince and the Pauper", "By The Sword Divided" and Monty Python's "The Spanish Inquisition"! In terms of Doctor Who, as well as designing the new TARDIS console for "The Claws of Axos", Sharp had previously worked as the designer on 1967's "The Macra Terror" and was to return for "The Robots of Death" where he gave us the Art Deco world of the Sandminer's beautiful interiors.

Designated production code "GGG", "The Claws of Axos" entered pre-production in September 1970 with the scripts for this adventure being finalised at the end of December that year. Location filming took place in early January 1971 with the story going before the studio cameras later in the same month - the new console's first appearance was recorded in Studio Four at Television Centre on Friday 5th February 1971.

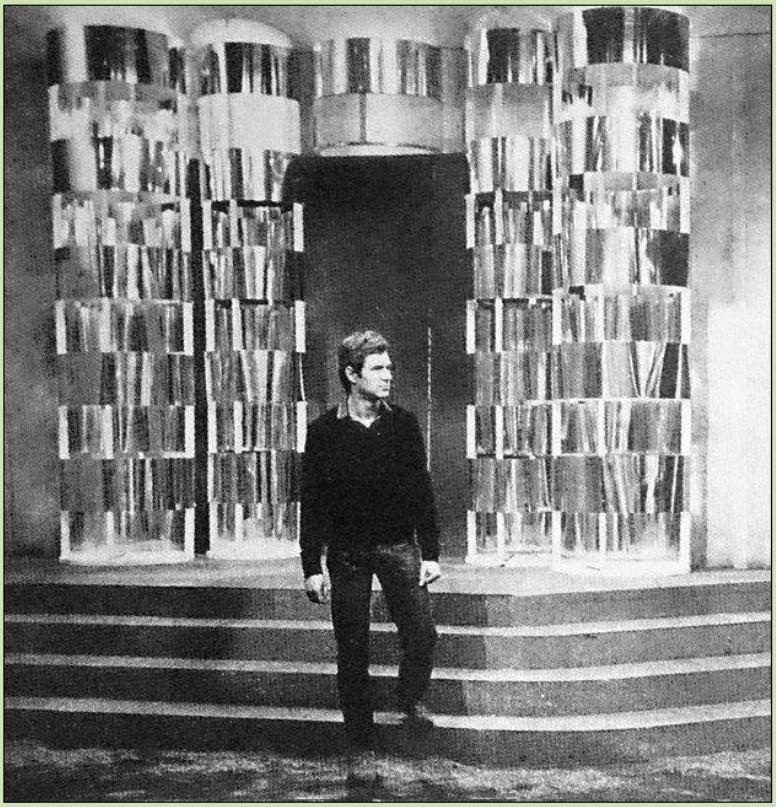
Typically, in television productions such as Doctor Who, the 'lead time' allowed for the construction of specialist props and scenery is comparatively short - no more than a few weeks at best. The scripts for "The Claws of Axos" were only finalised in late December 1970 - this meant that from commissioning to delivery, the builders had four weeks to complete the console before it was required in the studio.

Echoing the construction of the original Brachacki version, the building of Kenneth Sharp's console was also contracted-out to a specialist props maker: The first TARDIS console was built by Shawcraft, the Sharp version was constructed by Magna Models. Makers of high-quality models, Magna had earlier supplied much of the model work 1969's "The Space Pirates" & later went on to supply the computer equipment for "The Time Monster".



One of the two "Magna Models" plaques on the console

Art Deco: 1977's "The Robots of Death" - photo © BBC



Kenneth Sharp on the set of 1967's "The Macra Terror" - photo © BBC

Like the version it replaced, the new console was painted a pale green. To the modern eye, this choice of colour might seem somewhat odd. However, it should be remembered that the number of UK colour TV licences didn't exceed the number of monochrome licences issued until 1975 - when Kenneth Sharp designed his version of the TARDIS console, the majority of Doctor Who's audience was still watching in black and white. Painting the console white would have caused too much flare on the images generated by the TV studios' cameras; a satin, or sheen finish, pale green would minimise any flare whilst still giving those watching in black & white the illusion of a gleaming, futuristic console. (It is interesting to note that the console was eventually repainted an off-white/pale grey colour for 1975's "Pyramids of Mars" - just at the same time that the majority of the audience began to watch in colour.)

It wasn't just in the choice of basic colour that Sharp remained faithful to Brachacki's original version: The control panels' layouts were retained and - indeed - the majority of the surviving original controls were refurbished and re-fitted on the new console.

In one crucial respect however, Kenneth Sharp re-interpreted the design of the TARDIS console: Whereas the central 'time' column of the original console was largely made up of clear and dark grey acrylic pieces, in view of the increasing popularity of colour television Sharp opted for a complex array of flashing lamps, multi-coloured angled acrylic panels and tubes.

Accompanied by rarely seen photographs, here - for the first time - are screen-accurate plans for Kenneth Sharp's version of the console. We hope that you enjoy this article and that it inspires you to build your own TARDIS console!

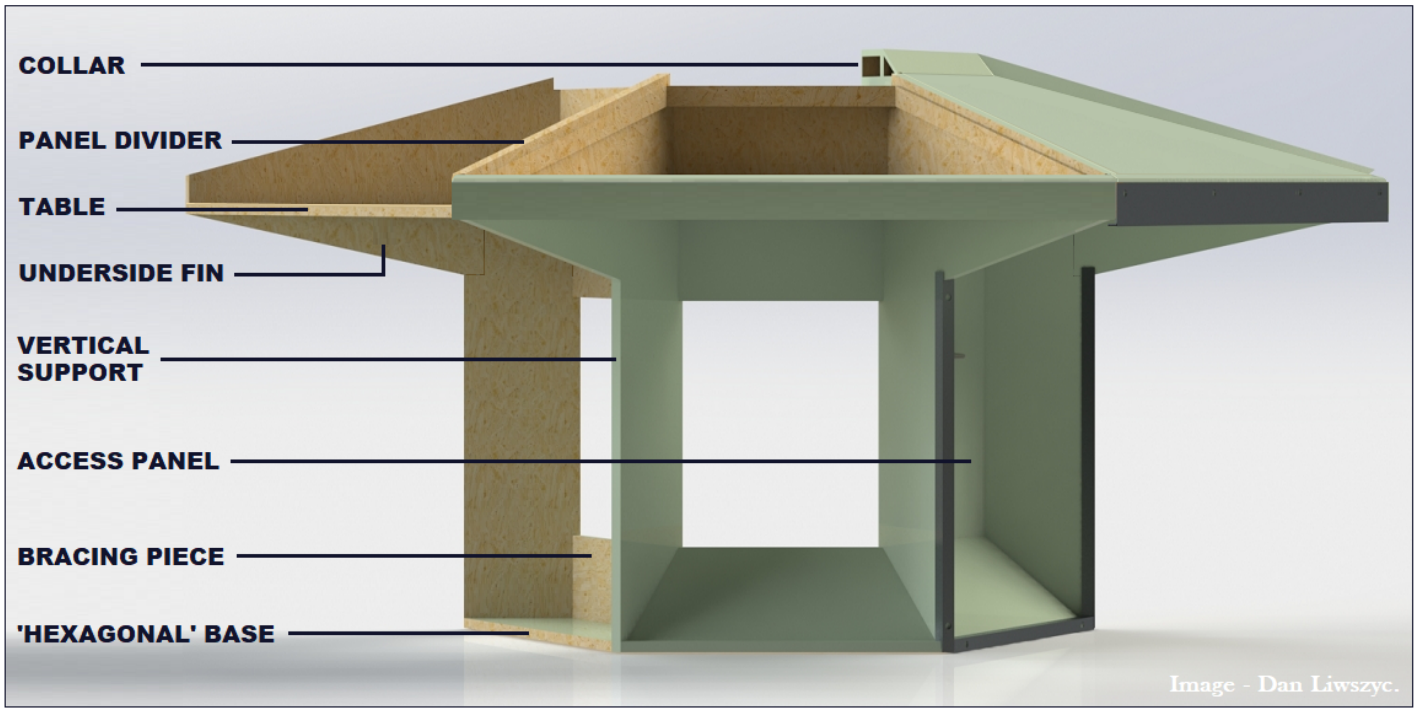
DIMENSIONS IN TIME

When the new console was being built in January 1971, the UK had yet to fully adopt the metric system. As such, the use of imperial measurements was still commonplace. To be consistent, all dimensions will be stated in inches with the following table providing clarity as to how the various fractions of an inch are expressed in the subsequent plans and diagrams:

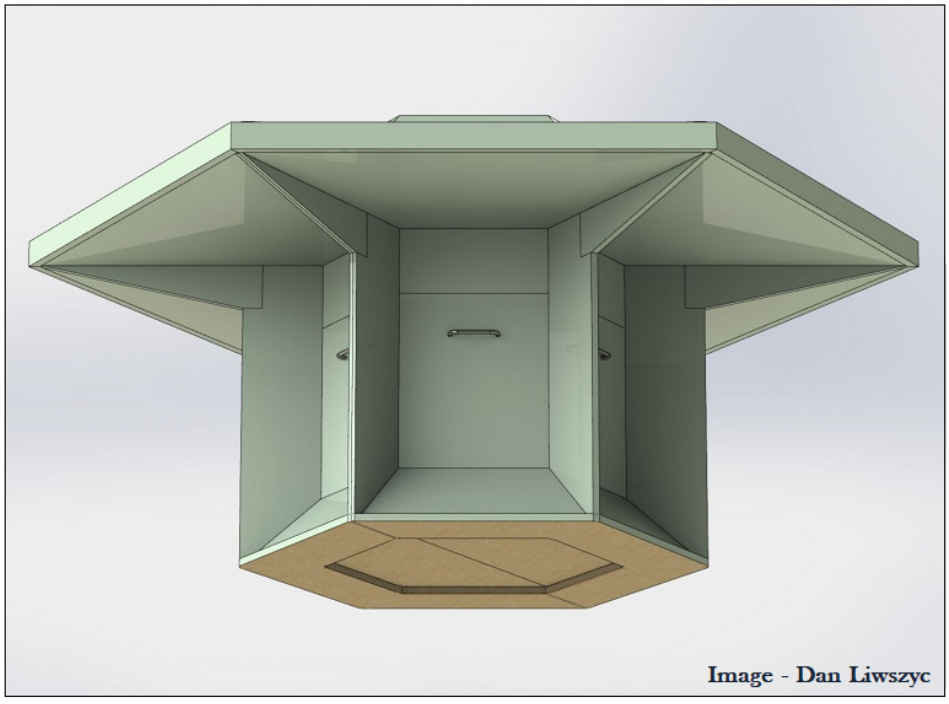
1/16 — 0.0625	5/16 — 0.3125	1/2 — 0.5	11/16 — 0.6875	15/16 — 0.9375
1/8 — 0.125	1/3 — 0.33	9/16 — 0.5625	3/4 — 0.75	1 — 1.0
3/16 — 0.1875	3/8 — 0.375	5/8 — 0.625	13/16 — 0.8125	The words inch and inches are written as "
1/4 — 0.25	7/16 — 0.4375	2/3 — 0.67	7/8 — 0.875	

MAKING THE PLINTH AND TABLE

SIDE ONE	SIDE TWO	SIDE THREE
SHOWING THE UNPAINTED SUPPORTING SHEET TIMBER FRAMEWORK	SUPPORTS FOR THE CONTROL PANELS, THE FASCIA AND PLINTH'S SLOPING PANEL HAVE BEEN FITTED	SHOWING THE COMPLETED ASSEMBLY INCLUDING THE METAL TRIMS ON THE FASCIA AND PLINTH



Kenneth Sharp's design for the console was both elegant and simple. Whilst it retained the 'feel' of the Brachacki original, Sharp's version had a somewhat sleeker - less bulky - appearance. Consisting of a detachable 'table' section which rested on top of a plinth, the Sharp console was designed to be de-mountable for maintenance and transportation purposes; as the photo on page 18 shows, each of the principal components - the collar, the table and the plinth - were made in two halves which were then bolted together.



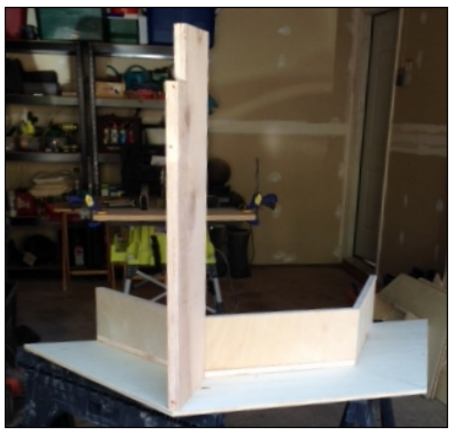
The illustration above shows the console viewed from below. The table's underside fins slot on top of the plinth's vertical supports; the underside fins and the vertical supports have to be the same thickness (i.e., 0.75 inches).

The diagrams on the following pages describe the plinth both before & after the fitting of the metal trims.

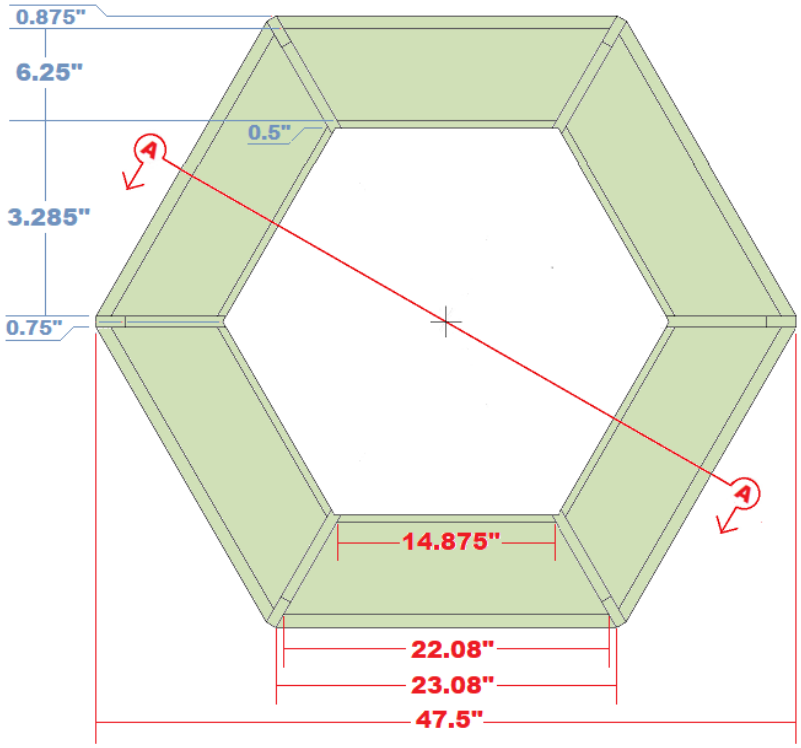
In 1971, Sharp & his team elected to use plywood when building the console. Other sheet materials, such as Medium Density Fibreboard (MDF), are now available and are equally suitable.

Whichever sheet material is chosen, the plinth's base and vertical supports should be 0.75" thick. The plinth's top & bottom bracing pieces and the six 'access panels' should all be made from 0.5" thick sheet timber.

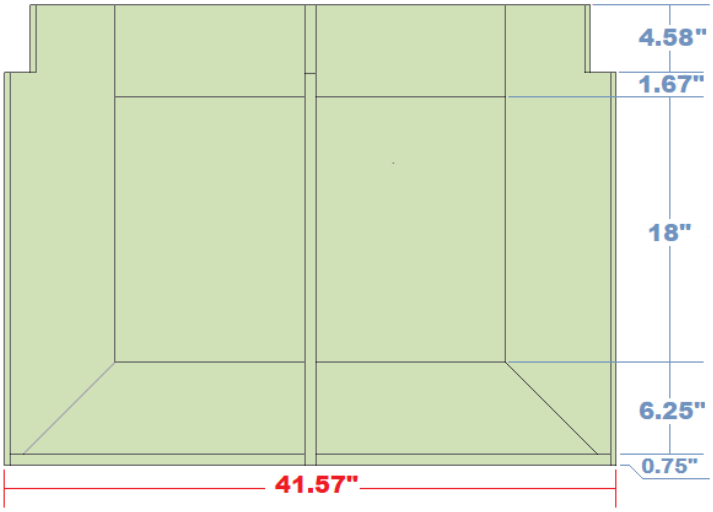
Below: The bracing pieces are mitered to sixty degrees before being attached to the hexagonal base & to the vertical supports.

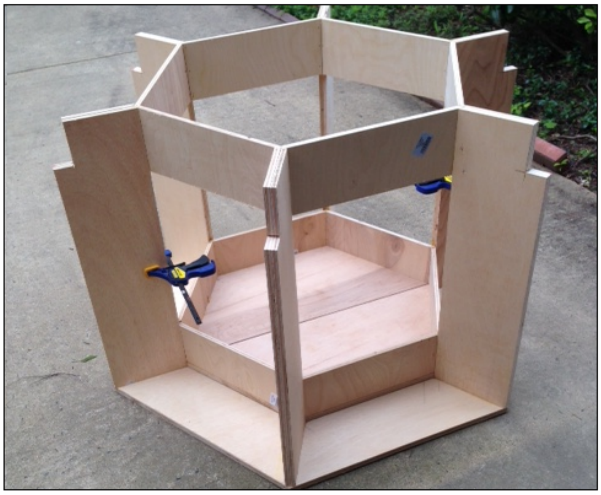


MAKING THE PLINTH

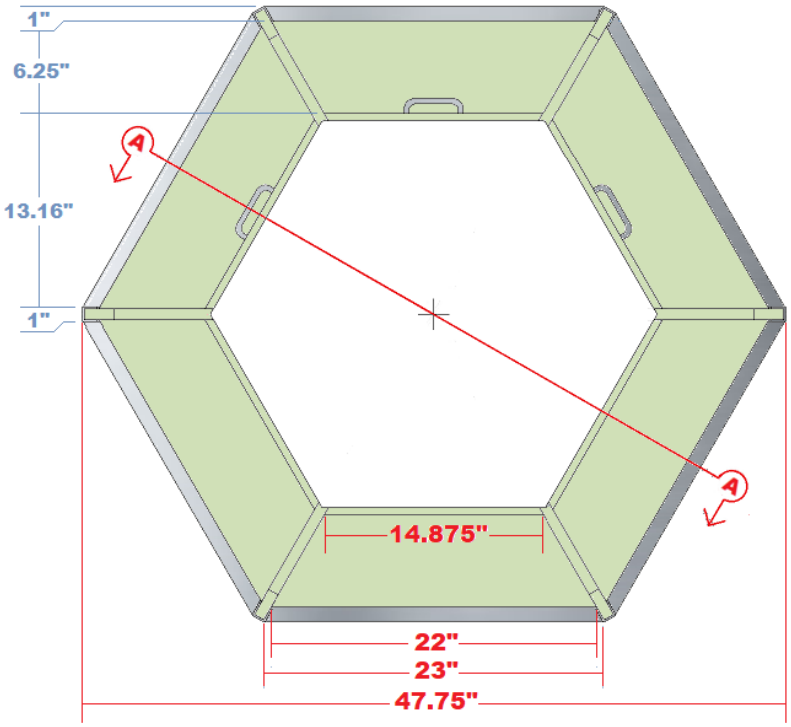


Top Right: Overhead view of the plinth before the metal trims have been fitted.
Below: Section view of the plinth ('A' to 'A') before the addition of the metal cladding.

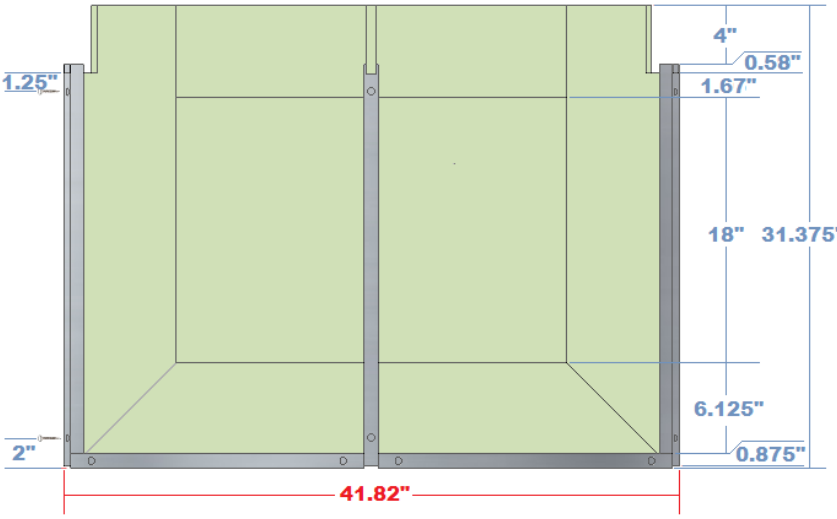




Right: Overhead view of the plinth complete with metal trims and 'D'-shaped access panel handles.
Below: The re-created plinth nears completion, its sloping panels have been fitted & the trims added.



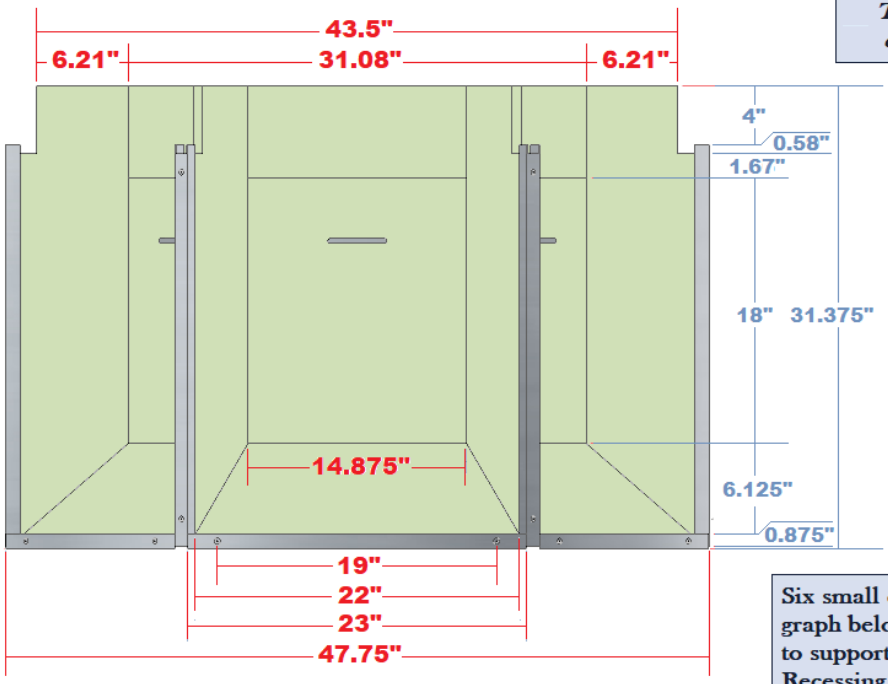
SECTION VIEW OF THE CONSOLE'S PLINTH ('A' TO 'A')
(DIAGRAM SHOWS THE PLINTH COMPLETE WITH THE METAL TRIMS)



Above: Camera rehearsals for 1972's "The Time Monster". Note the access panel hanging open on the underside of the console's table section - this allowed a stagehand to operate the "Time Ram" dial from below and out of camera shot. Note the damage to the 'underside fin' immediately above the plinth's left-hand vertical metal trim. It seems this damage occurred when the console was being dis-assembled and re-assembled for this story and that the 'underside fin' has been badly chipped by getting caught on the plinth's vertical metal trim...

The moral of this story - remove the metal cladding before dismantling the console!

CLADDING THE PLINTH



The plinth should be clad with 1" by 1" (0.125" thick) square-section satin aluminium channel. These 'metal trims' protect the wooden framework and also conceal the joins if the plinth is made in two halves.

Screw holes should be drilled into the trims at the points shown in the diagrams to the left. 4" long "D"-shaped aluminium handles should be fitted to the plinth's access panels as shown.

A notch should be cut to a depth of 0.58" at the top of each vertical metal trim so that the table section can be correctly seated on the plinth.

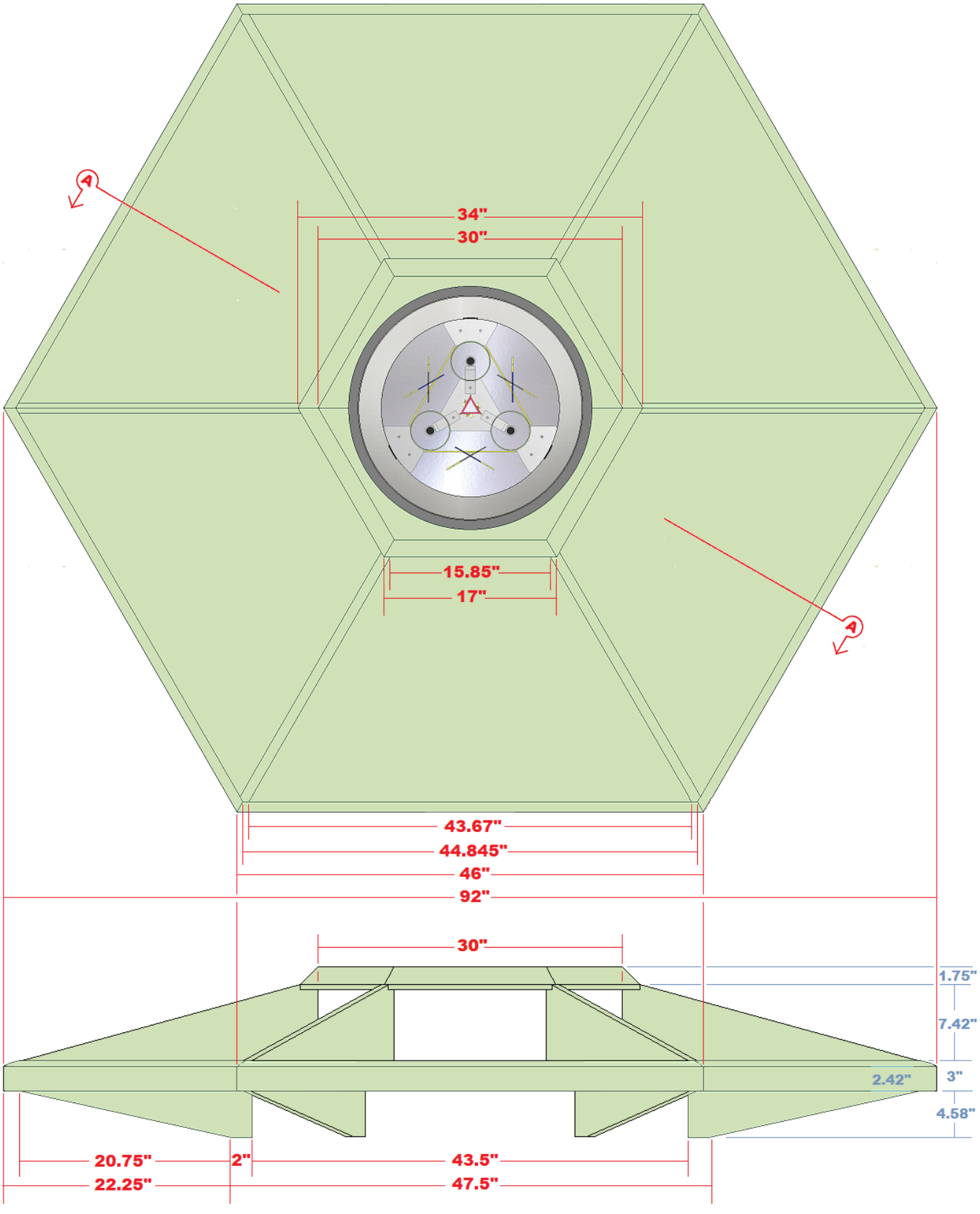
Remove 0.875" from the bottom of each side of the vertical trims to allow them to be fitted over the plinth's 'hexagonal' base.

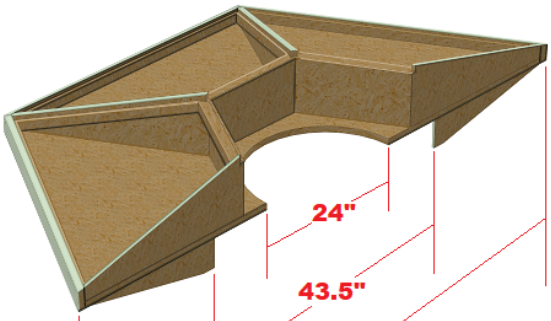
Six small castors should be fitted as shown in the photograph below. The castors should be of sufficient strength to support the weight of the console.
Recessing the castors into the underside of the plinth's base will not only help conceal them from view but will also provide sufficient clearance underneath the console for the power supply cable(s).

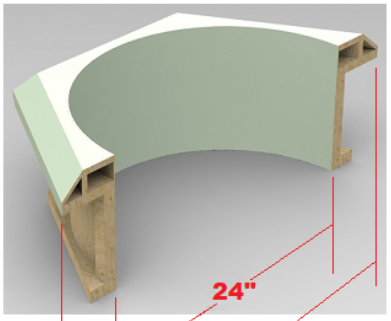
THE TARDIS CONSOLE'S TABLE SECTION

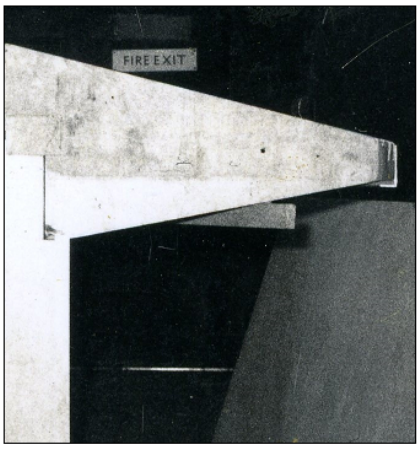
DIAGRAMS SHOWING THE TABLE SECTION BEFORE THE FITTING OF THE OF THE CONTROL PANELS AND WITHOUT THE FASCIAS' METAL TRIMS

The table, the panel dividers & the fascias should all be made from 1" thick timber. The underside fins should be 0.75" thick.





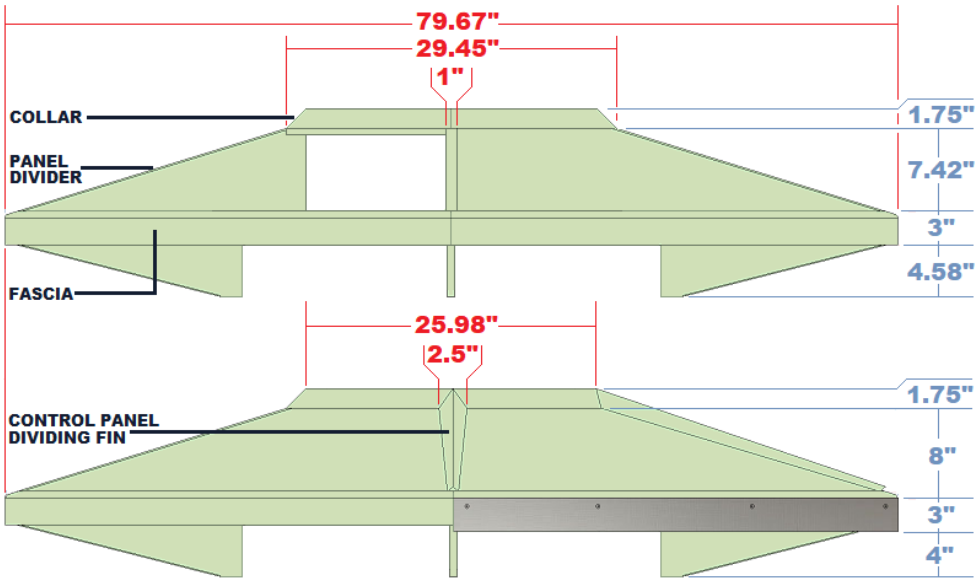




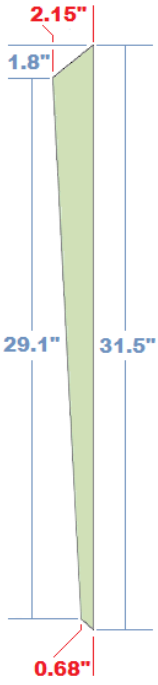
Like the 'table', the console's collar was constructed in two halves. Each half was lined with hardboard so that, when joined together, the two sections created the cylinder in which the Central Column rises & falls when the TARDIS is in flight.

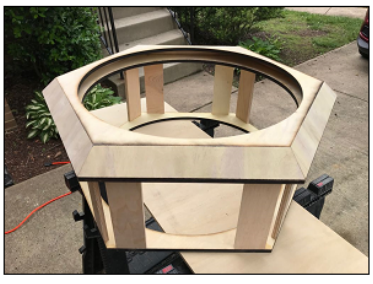
Top: Recreating the console's 'table' section.
Note that the fascia's top surface has been planed and sanded to the same angle as the 'panel divider's' sloping edge.
Above: Kenneth Sharp's console in May 1972.
Note that the fascia has been clad with an L-shaped metal trim which underhangs the wooden fascia itself. The metal trim was made from the same satin aluminium as the plinth's and measured 3" by 1" by 0.125 inch.

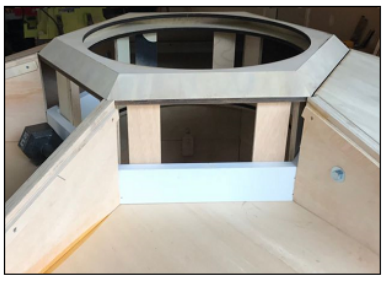
THE CONSOLE'S TABLE - SECTION VIEW 'A' TO 'A'



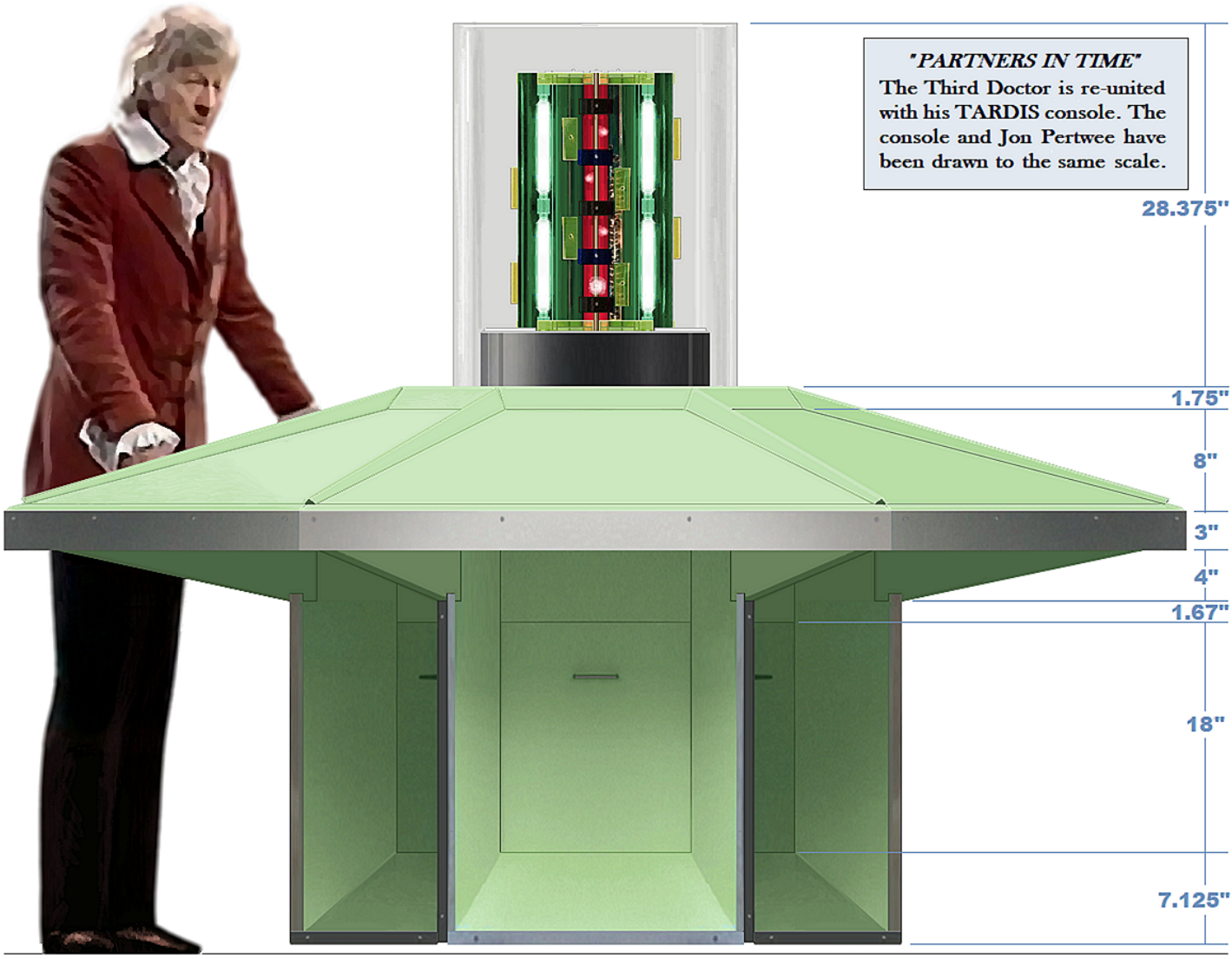
Like Brachacki before him, Sharp chose to use 0.75" thick sheet timber to create the console's control panels. To support these panels, batons were attached to both sides of each 'panel divider' three quarters of an inch below the sloping edge of the panel divider - the distance of 0.75" being measured at a right-angle to the panel divider's sloping edge. The panel dividers were concealed from view by the 'control panel dividing fins'; originally made from 0.125" thick plywood, these 'fins' can be re-created using various materials. In the photograph on the right, heavy-duty plastic has been used to create a template from which the finished fin will be created. Plasticard has been used to line the 'collar' through which the Central Column will rise and fall.







THE COMPLETED TABLE AND PLINTH



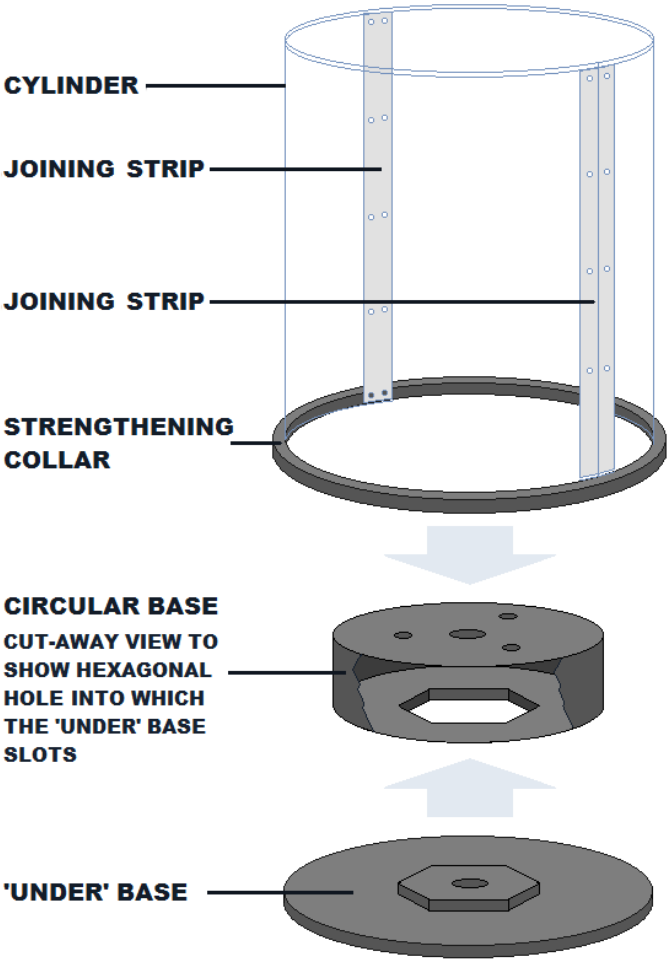
"PARTNERS IN TIME"
The Third Doctor is re-united with his TARDIS console. The console and Jon Pertwee have been drawn to the same scale.

The completed console's table and plinth are fitted together - the table's underside fins rest on top of the plinth's uprights and the table section is 'locked' in place by the addition of the plinth's vertical metal trims. Note the slight gap between the plinth and floor - this is to allow space for the power supply cable(s). The exact height of this gap will vary depending on the size of castors chosen but, should be kept to a maximum of 0.75" so that the castors are concealed from view. The "Central Column" rises and falls by 12 inches and is shown at it's maximum height. The "Central Column" is described in the following section.

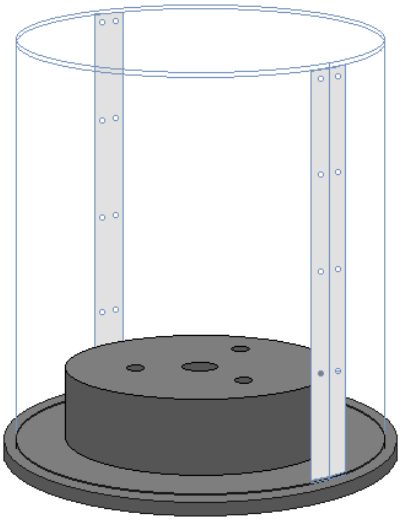
Below: The recreated console's components being readied for assembly; the table section's two halves have been bolted together awaiting the plinth's final assembly. Right: The console's table & plinth fully assembled and the central column is test-fitted.

MAKING THE CENTRAL COLUMN

DIAGRAM SHOWING COLUMN'S COMPONENT PARTS IN 'EXPLODED' FORM



The central column is made using a 22" diameter, 0.25" thick, acrylic top disc and a 22" diameter 'under base' around which are wrapped two sheets of thin acrylic to create a cylinder that is 30.875" tall. These sheets are joined together using two thin metal strips - each strip measuring 30.625" by 1" by 0.0625" - which are attached to the inside of the cylinder using M2 nuts and bolts. Small black nylon screws are used to secure the top disc to the cylinder.



Though not fitted on the original, a 'strengthening collar' around the bottom edge of the cylinder will provide extra rigidity & help prevent the joins from splaying apart during any dis-assembly for maintenance purposes. In order to allow the completed column to rise and fall freely, the outside diameter of any strengthening collar should not exceed 23.5".

Inside the cylinder is a 6" tall, 17.75" diameter, black circular base. This circular base is constructed from two sheet timber discs around which are wrapped three sheets of thin sheet timber such as plywood or 'bendy' MDF with the joins being concealed by three vertical strips; each vertical strip measures 1.5" by 6" by 0.25". In order to provide wiring access for the column's lighting, holes should be cut in the top disc at the points shown in the subsequent diagrams.

ELEVATION VIEW OF THE CENTRAL COLUMN

(DIAGRAM SHOWS THE 'ARRAY' BEFORE THE ADDITION OF THE ANGLED COLOURED PANELS)

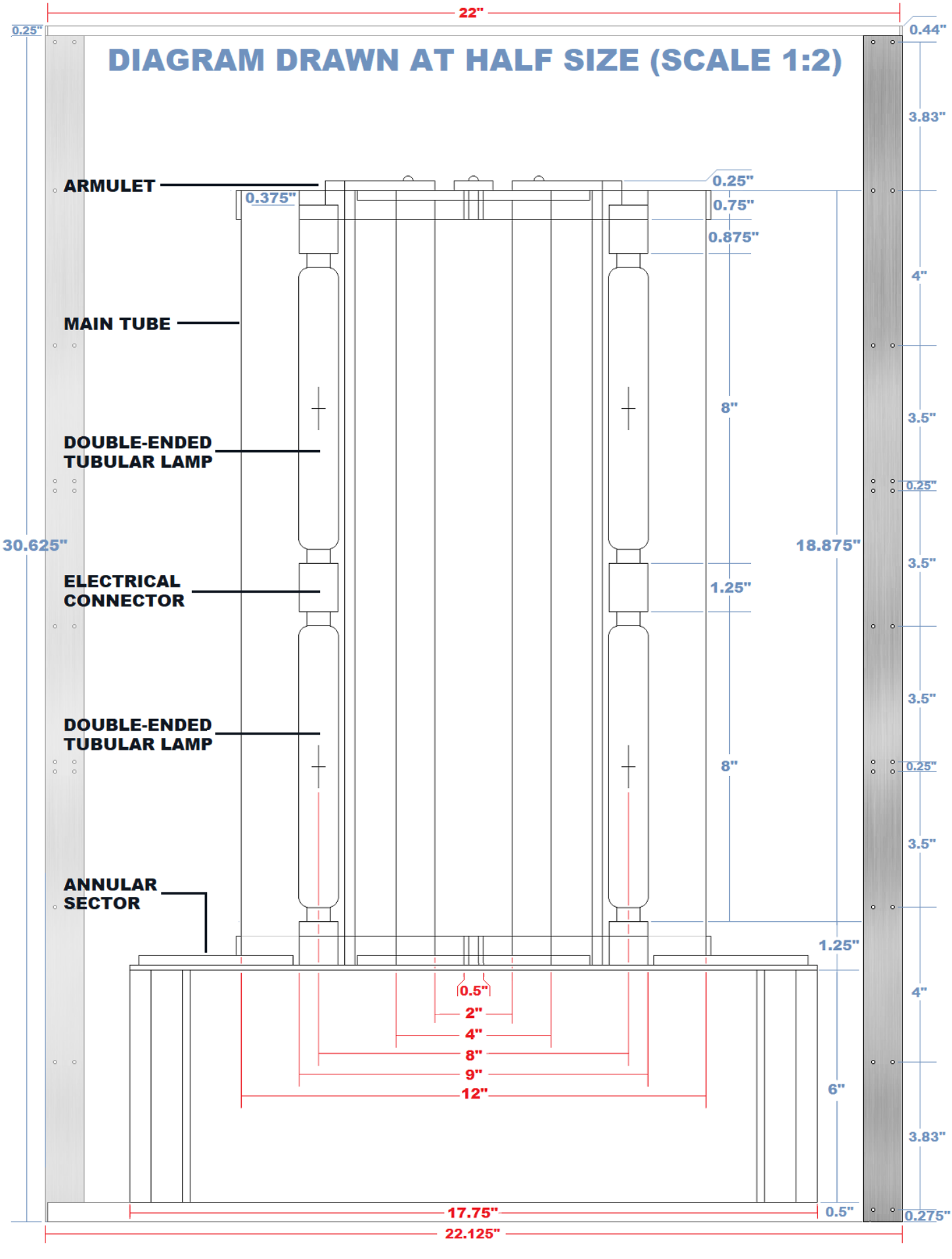


DIAGRAM SHOWING OVERHEAD VIEW OF THE MIRRORED DISC

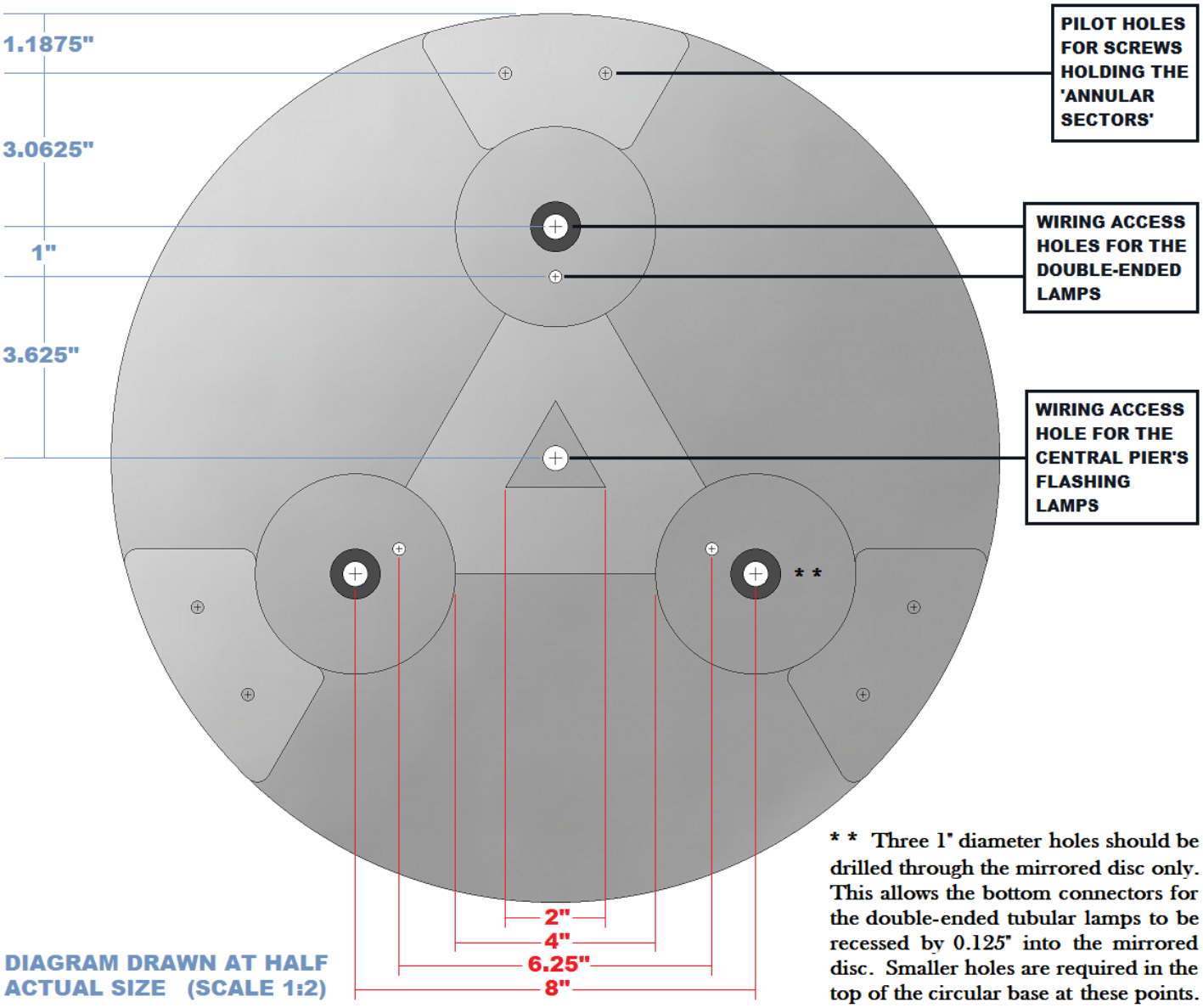


DIAGRAM DRAWN AT HALF ACTUAL SIZE (SCALE 1:2)

** Three 1" diameter holes should be drilled through the mirrored disc only. This allows the bottom connectors for the double-ended tubular lamps to be recessed by 0.125" into the mirrored disc. Smaller holes are required in the top of the circular base at these points.

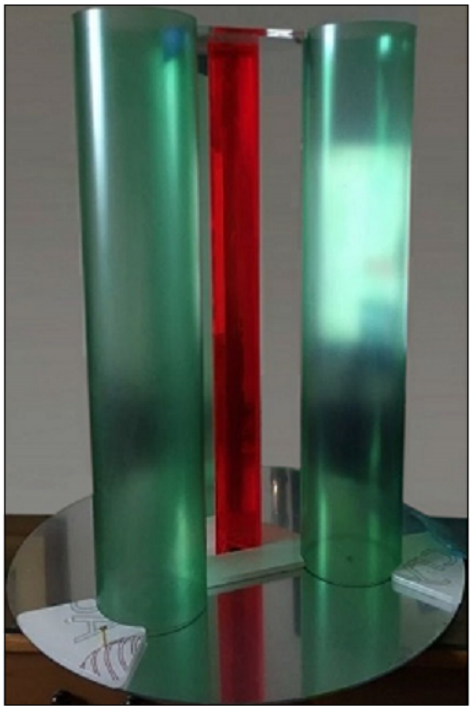
A 0.125" thick, 17.75" diameter, acrylic mirrored disc is attached to the top of the black circular base. A 0.5" diameter hole is drilled through the centre-point and three one inch diameter holes as indicated above. ** A further three small holes are drilled as shown; each of the holes corresponds to the ones drilled in the top of the circular base and each of the holes acts as a wiring access point.

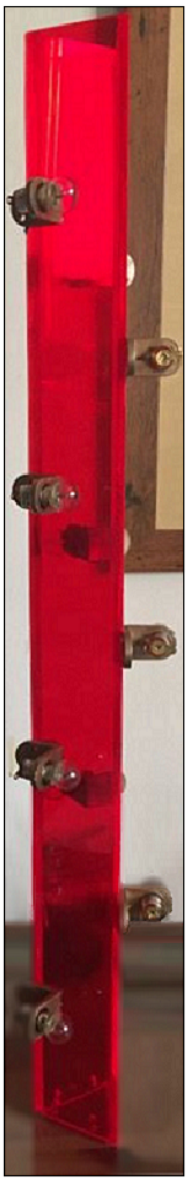
On top of the mirror stands a complex array of multi-coloured components. At the centre is a transparent pinkish-red acrylic 'pier' to which ten small flashing lamps are fitted. When viewed from above, the pier forms an equilateral triangle with sides measuring two inches.

Linking the central pier to the three large tubes are the two 'triangular' supports. One is fitted at the top of the pier and one is fitted at the bottom. Together with the 'annular sectors', the 'triangular' supports lock the three main - 4" diameter - tubes in place. The triangular supports and annular sectors should be cut from 0.25" thick transparent acrylic.

The central pier and the three main tubes are all twenty inches tall.

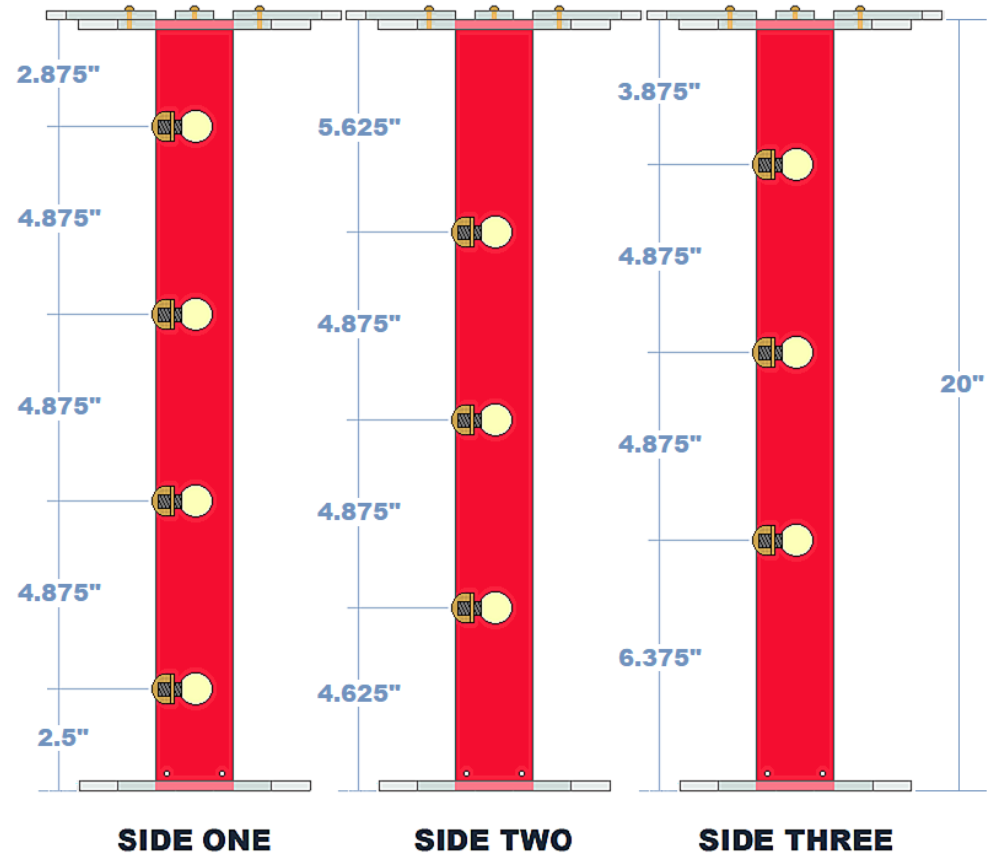
Originally, the three main tubes were made from clear acrylic & were then lined with transparent green-coloured acetate sheets. An alternate approach would be to spray the tubing with a suitable translucent green paint or to buy transparent green acrylic tubes. Whichever approach is taken, the tubes' walls should not be greater than 0.125" thick.





Two small holes should be drilled at the bottom of each side of the 'central pier' to act as wiring access points. Ten Miniature Edison Screw (MES), 6 volt, "bi-metallic strip flashing filament" lamps should be fitted in the orientations and positions shown. As these lamps warm up, their metal filaments expand at different rates which breaks the circuit causing the lamps to extinguish. As the lamps cool, the filaments contract re-establishing the circuit thus causing the lamps to intermittently flash on and off at random.

DIAGRAM SHOWING THE POSITIONS OF THE LAMPS FITTED ON THE CENTRAL COLUMN'S "PIER"



Inside each of the three 'main tubes' are fitted two double-ended tubular lamps. In 1971 tungsten filament lamps were used & are still available today. However tungsten lamps are inefficient and generate a lot of heat - more energy-efficient LED double-ended tubular lamps are now available.

Each pair of lamps is attached to a clear acrylic rectangular 'support' measuring 20" tall by 1" wide by 0.25" with the lamps' electrical connectors being mounted at the top, middle and bottom of the acrylic 'support'. Each support is glued to the underside of the 'armulet' which is - in turn - screwed to the top 'triangular' support. This allows the armulet, acrylic support and each pair of lamps to be removed as a single unit for maintenance purposes.

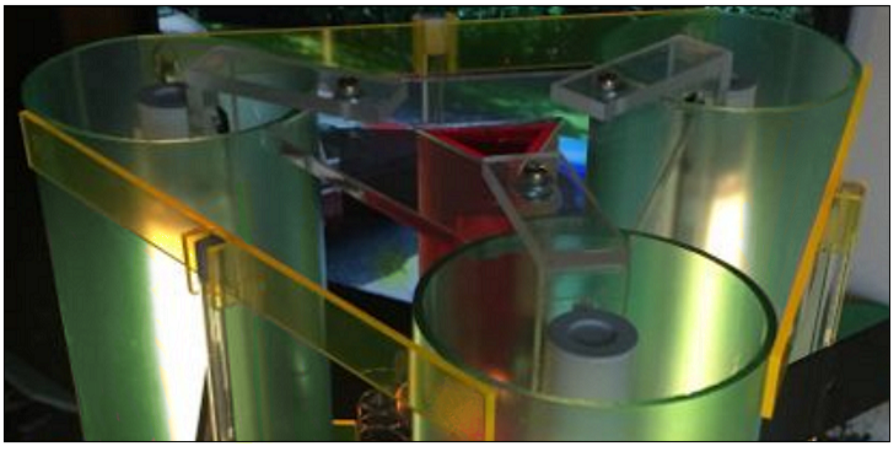
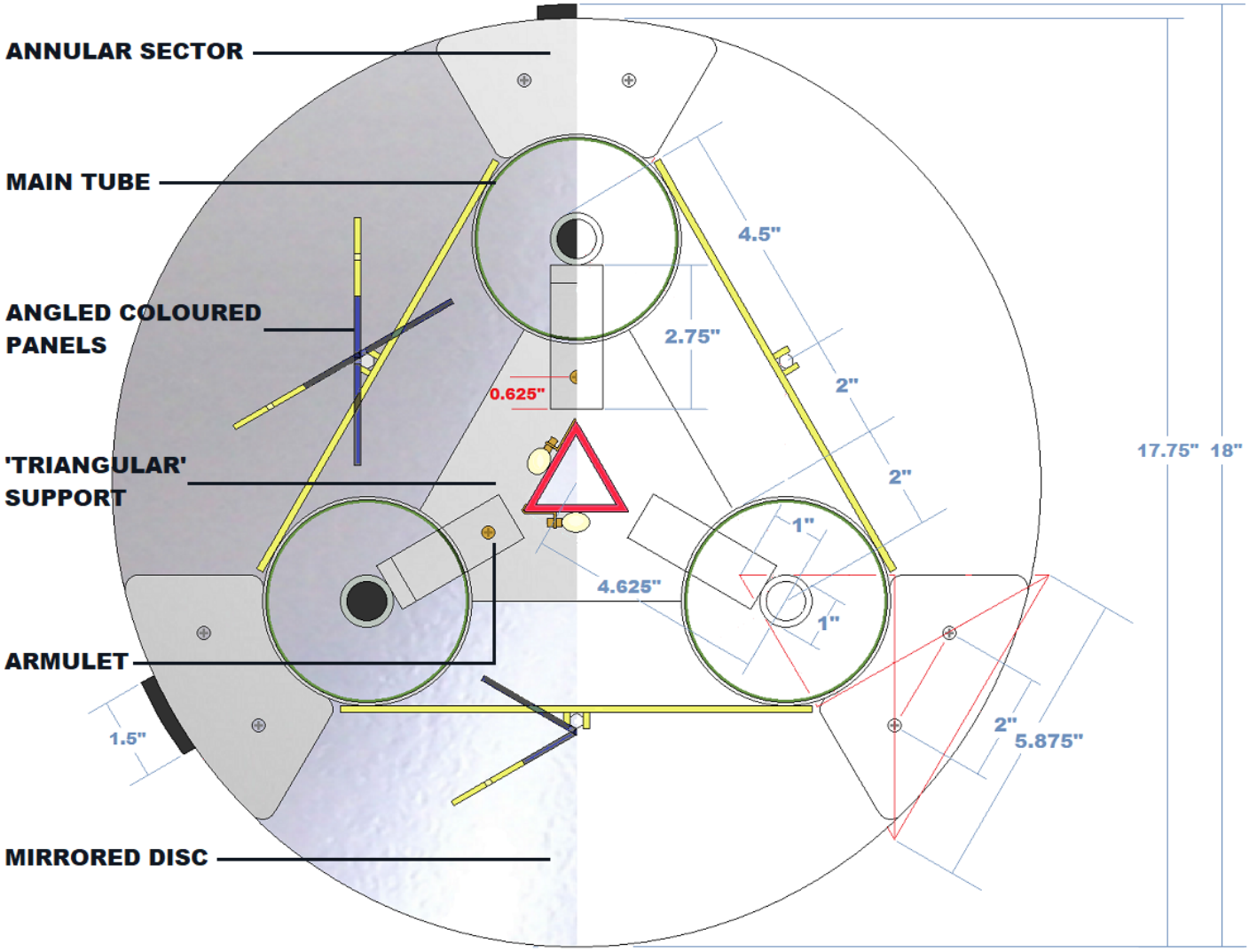


DIAGRAM SHOWING THE OVERHEAD VIEW OF THE CENTRAL COLUMN

DIAGRAM DRAWN AT HALF ACTUAL SIZE (SCALE 1:2)



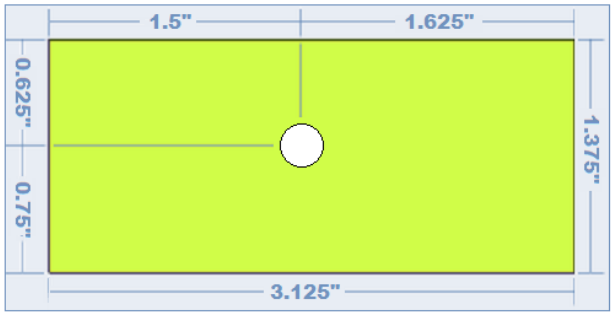
Below: A close-up photo of the console's Central Column from 1972's "The Time Monster". Note the use of black nylon screws to hold the acrylic outer cylinder's top disc in place. The small brass bolts securing the cylinder's metal joining strips are also visible. Also note Jon Pertwee's simultaneous use of the three secondary levers on Control Panel One - refer to page 32 for further details.

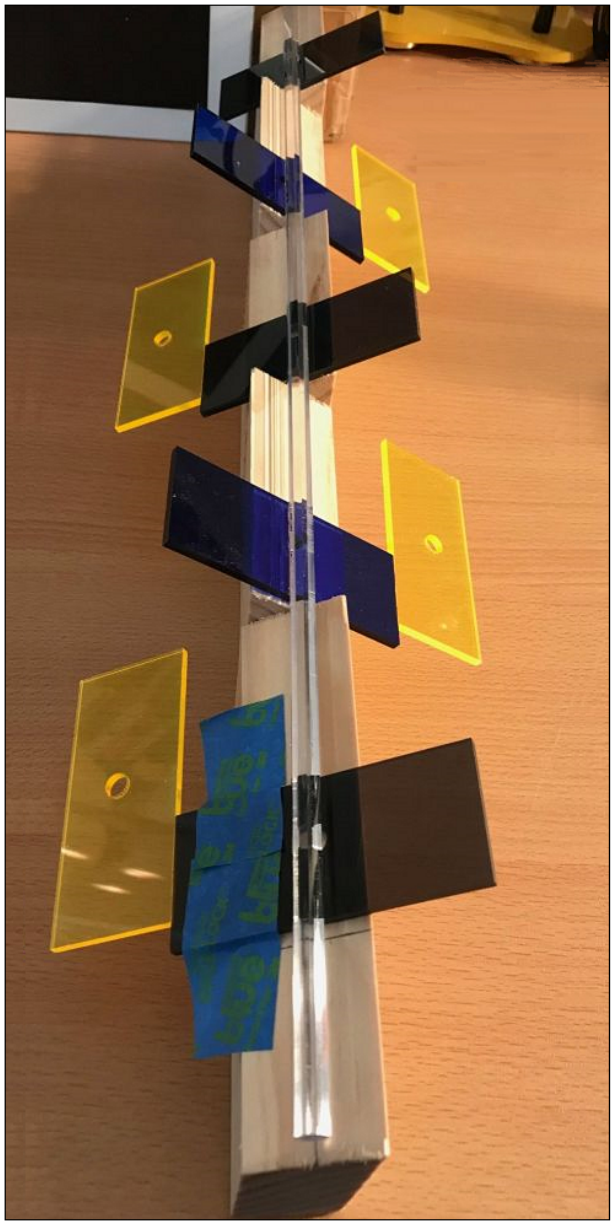
Each coloured panel is 0.125" thick & is glued onto a transparent hexagonal supporting rod in the position shown.

Coloured transparent acrylic is readily available from plastics manufacturers; many will cut the panels to the required sizes. The hole in each panel can be readily cut using a drill fitted with an HSS bit.

The clear plastic 'wand' from a venetian blind can be used to create the transparent hexagonal supporting rod onto which the coloured panels will be mounted.

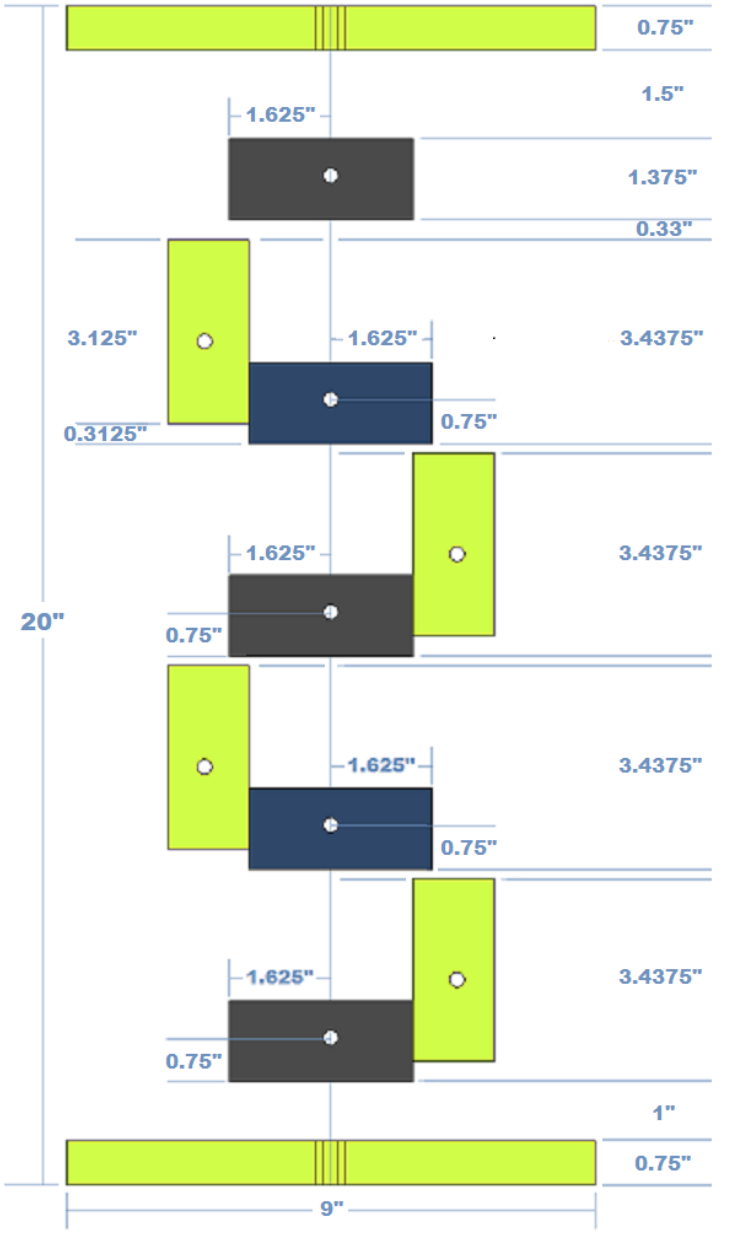
The photograph below shows the panels being glued to the hexagonal supporting rod. In order to hold the panels in place at the required angles, a jig made from pieces of wood angled at 60 degrees will be helpful.



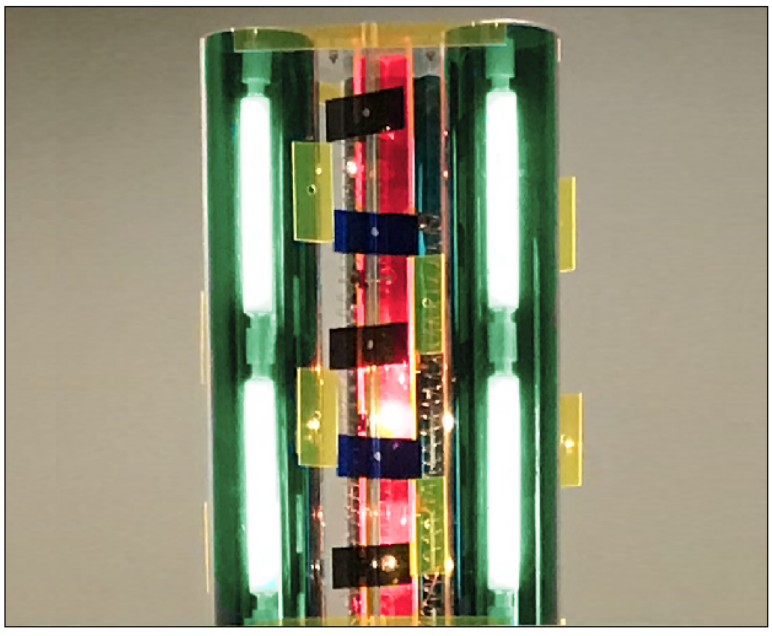


THE ANGLED COLOURED PANELS

DIAGRAM WITH PANELS LAID FLAT TO SHOW VERTICAL SPACINGS



Below: The fitting of the angled panels completes the Central Column.



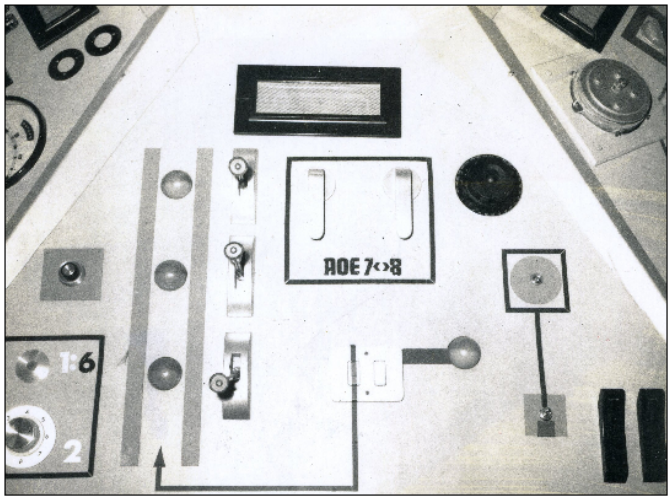
1972's adventure "The Time Monster" is unique in the annals of Doctor Who:

Firstly, it gave us the newly refurbished TARDIS interior set with somewhat strange 'bowl-lined' roundel walls & new soffits and fascias which topped these walls. Secondly, it is the first story to introduce the "Extreme Emergency Switch". Thirdly, it was the first time that the Master's TARDIS console was seen to be physically different from the Doctor's console - with the Master's console's central column being replaced with an up-turned dustbin which was sprayed silver and topped with a '70s metal light fitting! Lastly, it was the only story in which the console's control panels were explicitly referred to by a number.

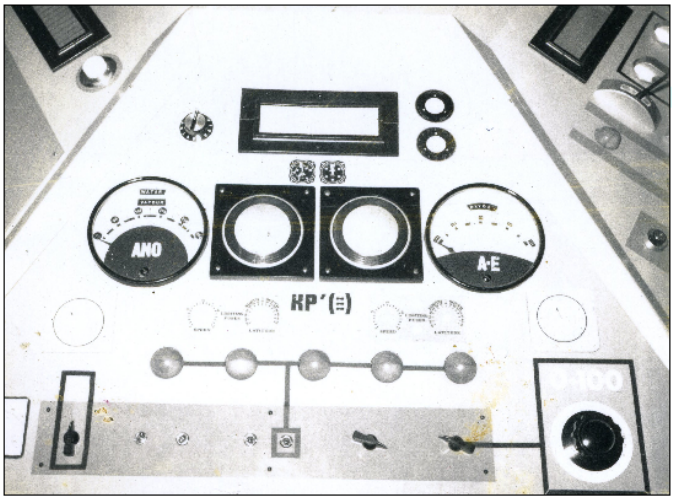
Trapped in the vortex, the Doctor contacts Jo via the TARDIS telepathic circuits & asks his assistant to go to Control Panel Three to operate the Extreme Emergency Switch. This she does and the Doctor rematerialises within his beloved TARDIS.

The following photographs were taken in the first week in May 1972 and were taken immediately prior to the console being prepared for the recording of The Time Monster. Panel numbering runs in a clock-wise direction when the console is seen from above and is used for identification purposes only. Photographs courtesy of Richard Bignell.

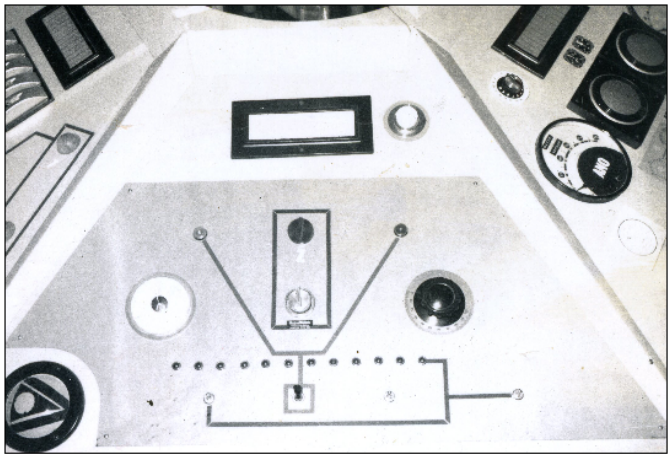
CONTROL PANEL 1



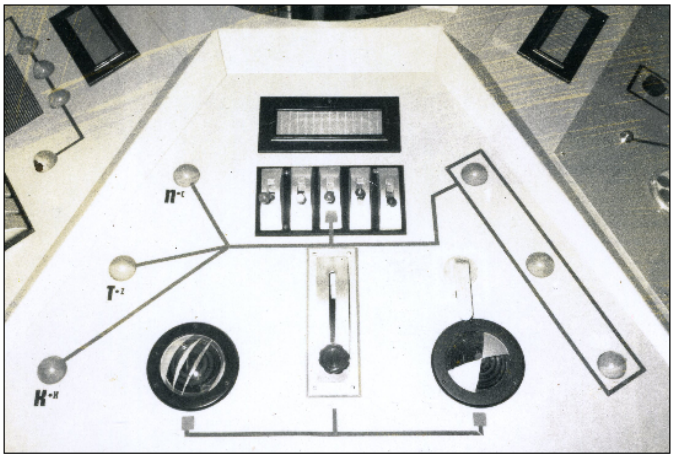
CONTROL PANEL 2



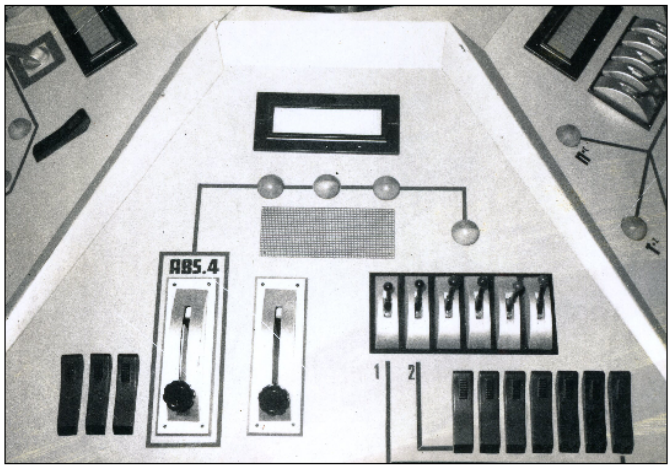
CONTROL PANEL 3



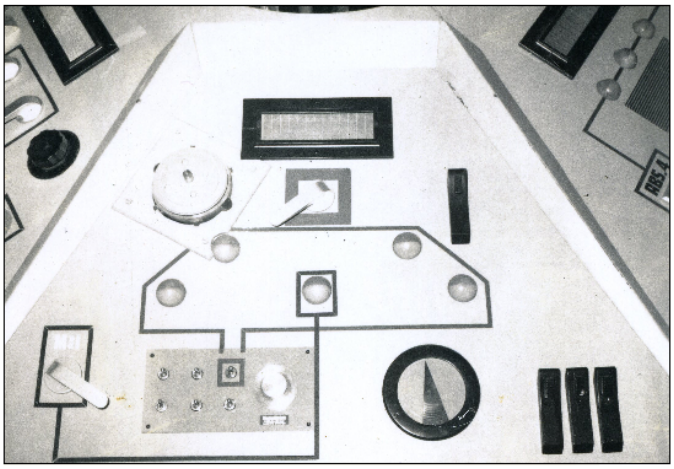
CONTROL PANEL 4

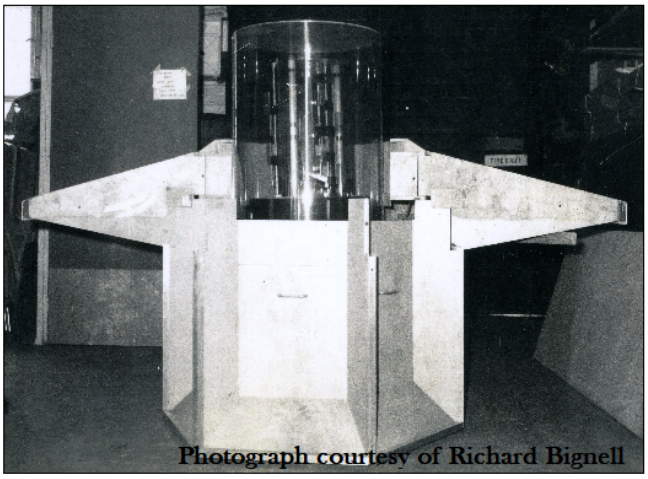


CONTROL PANEL 5



CONTROL PANEL 6





Bottom left: Jo Grant at Control Panel Three ready to operate the 'Extreme Emergency Switch'. This control was fitted for this scene. Middle left: The console being dis-assembled ready to remove the central column and to replace it with an up-turned dustbin & lamp. Top left: Jon Pertwee in camera rehearsal with the central column on a stool in front of him. (Top right: the scene as transmitted.)

Four consoles appeared in what has now been called the 'classic series' of Doctor Who: The original Brachacki, the Kenneth Sharp version, Barry Newbery's Jules Verne style wooden console & Mike Kelt's iteration which made its debut in 1983's 20th anniversary celebration "The Five Doctors". Of the four consoles, Kenneth Sharp's version was the longest-serving. Appearing first in 1971's "The Claws of Axos", it was used all the way up to 1982's "The King's Demons".

Predictably during this period, the console underwent several refits - some major, some minor. Some changes (like those already noted for stories such as "The Time Monster") were as the result of specific script requirements. Indeed, the history of these 'scripted' alterations began within a fortnight of the console first going before the BBC's cameras:

In episode three of "The Claws of Axos", the Master repairs the Doctor's TARDIS - the housing for the dematerialisation circuit is conspicuous by its absence; by episode four it has been fitted. (This somewhat sudden appearance may be the origin of the rumour that a stagehand took a large hammer to the console creating a hole that was in need of a hurried - and costly - repair.) Given the importance that the dematerialisation circuit was to have in the Pertwee era, it does seem surprising that no-one thought to tell Magna Models to incorporate the 'housing' for it into the console when they were building it less than a month earlier.

Right: Script-driven changes. Roger Delgado at the controls of the TARDIS in episodes 3 and 4 of "The Claws of Axos". The housing for the dematerialisation circuit was only fitted just prior to the recording of the final episode of this story.

If some of the additions and alterations to the console were driven by a particular script requirement, then others seem to have been made for no other reason than that a story's designer and/or its director thought them to be desirable:

One example of a 'non-scripted' change or addition was the appearance of additional graphics on the console's control panels for "The Curse of Peladon". It seems that director Lennie Mayne and designer Gloria Clayton simply decided that some of the console's control panels looked too sparse and needed additional interest.

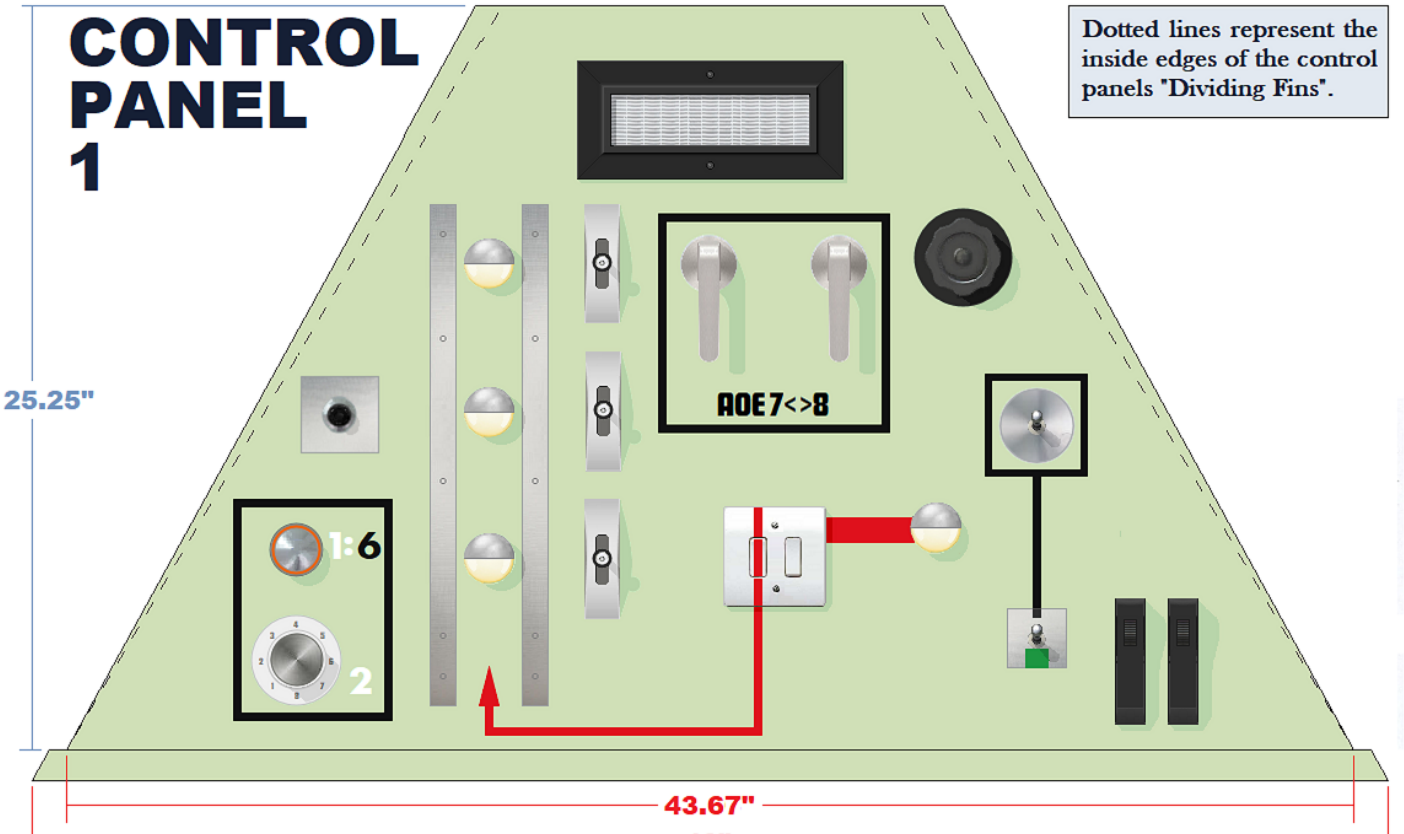
The original panels & the changes made are discussed next.

THE CONTROL PANEL LAYOUTS

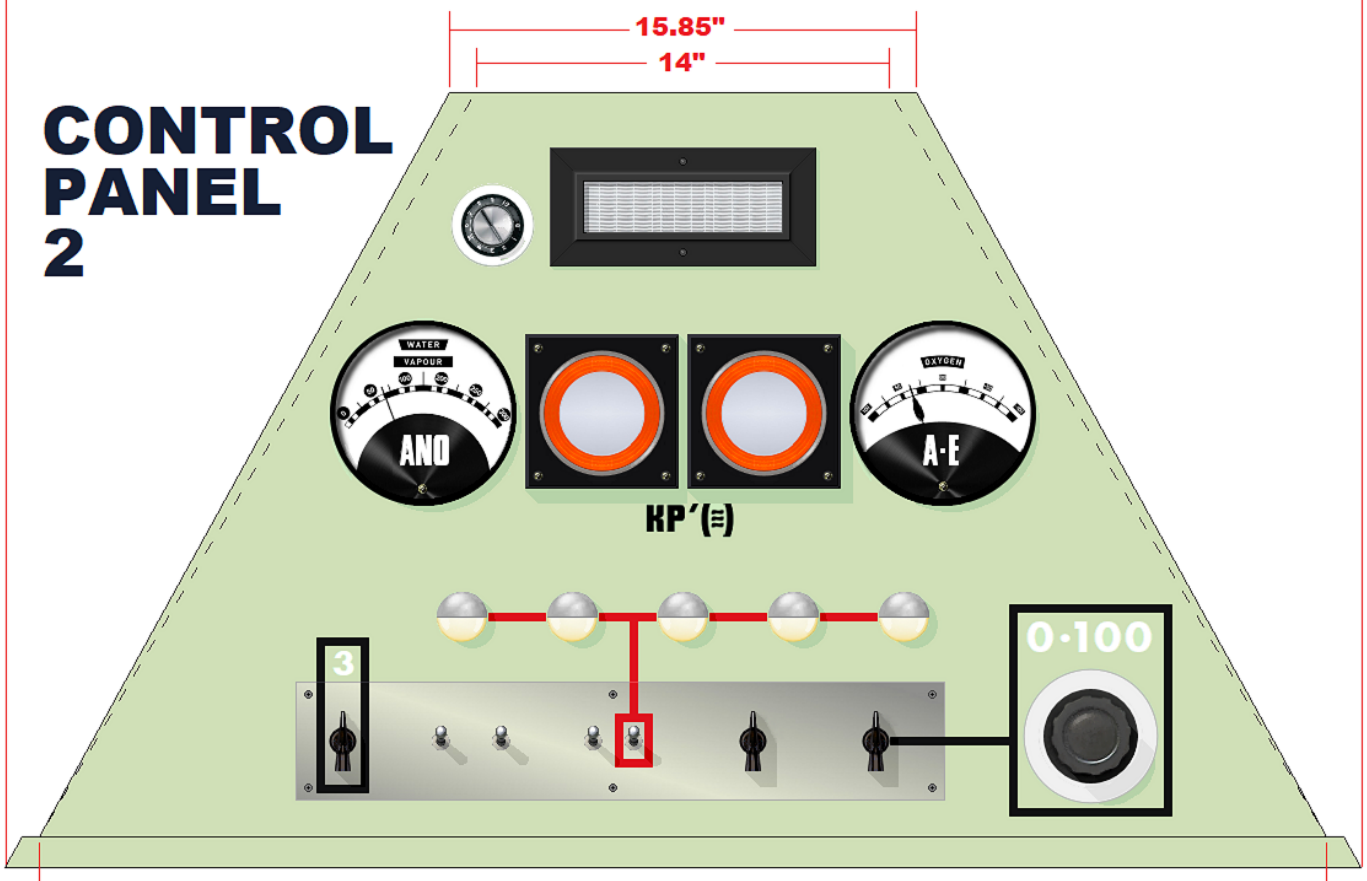
The following six diagrams show the original layouts of the control panels as designed by Kenneth Sharp. The later additions to these panels are shown in the subsequent drawings. All diagrams are drawn at a quarter of actual size (scale 1:4).

CONTROL PANEL 1

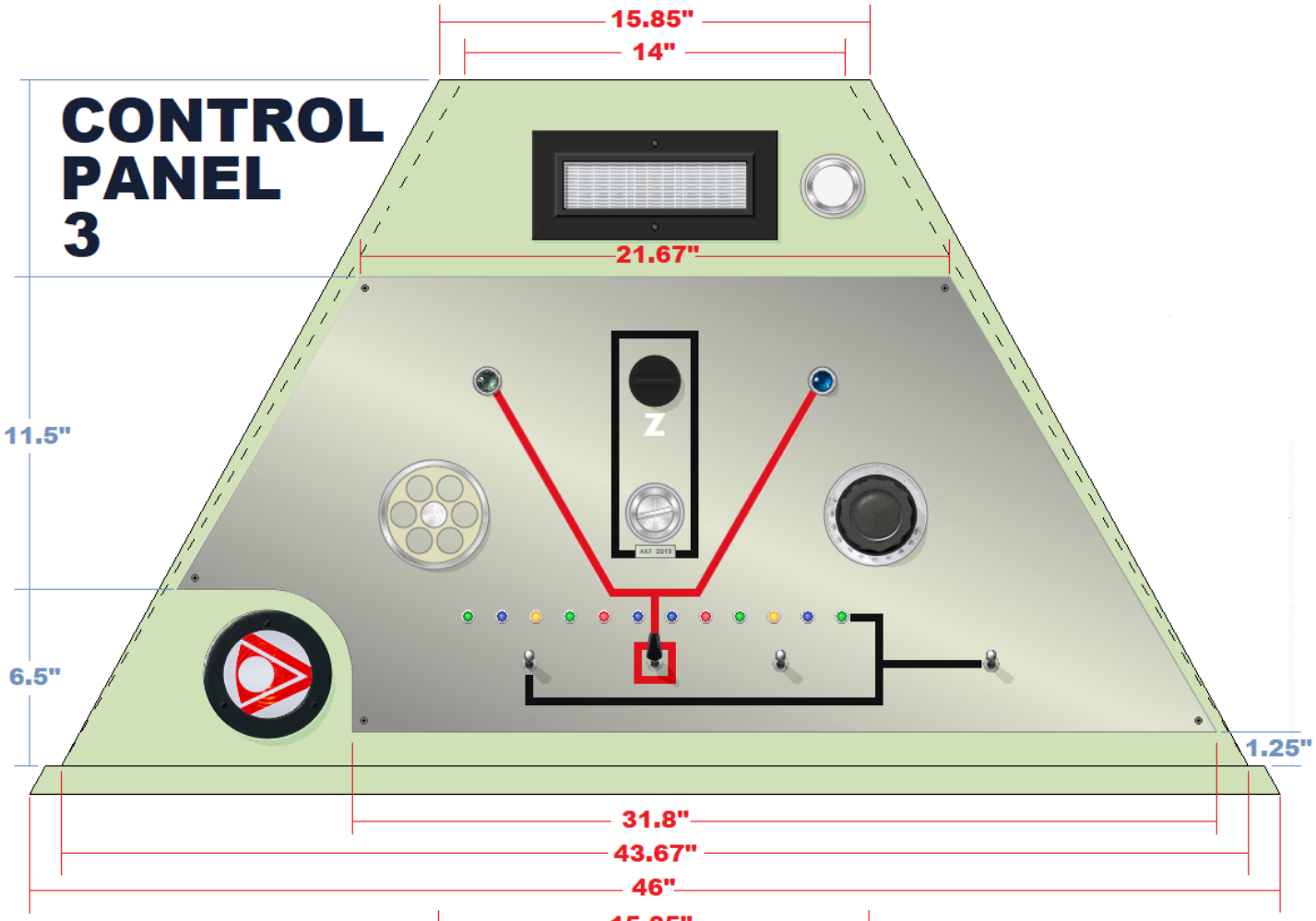
Dotted lines represent the inside edges of the control panels "Dividing Fins".



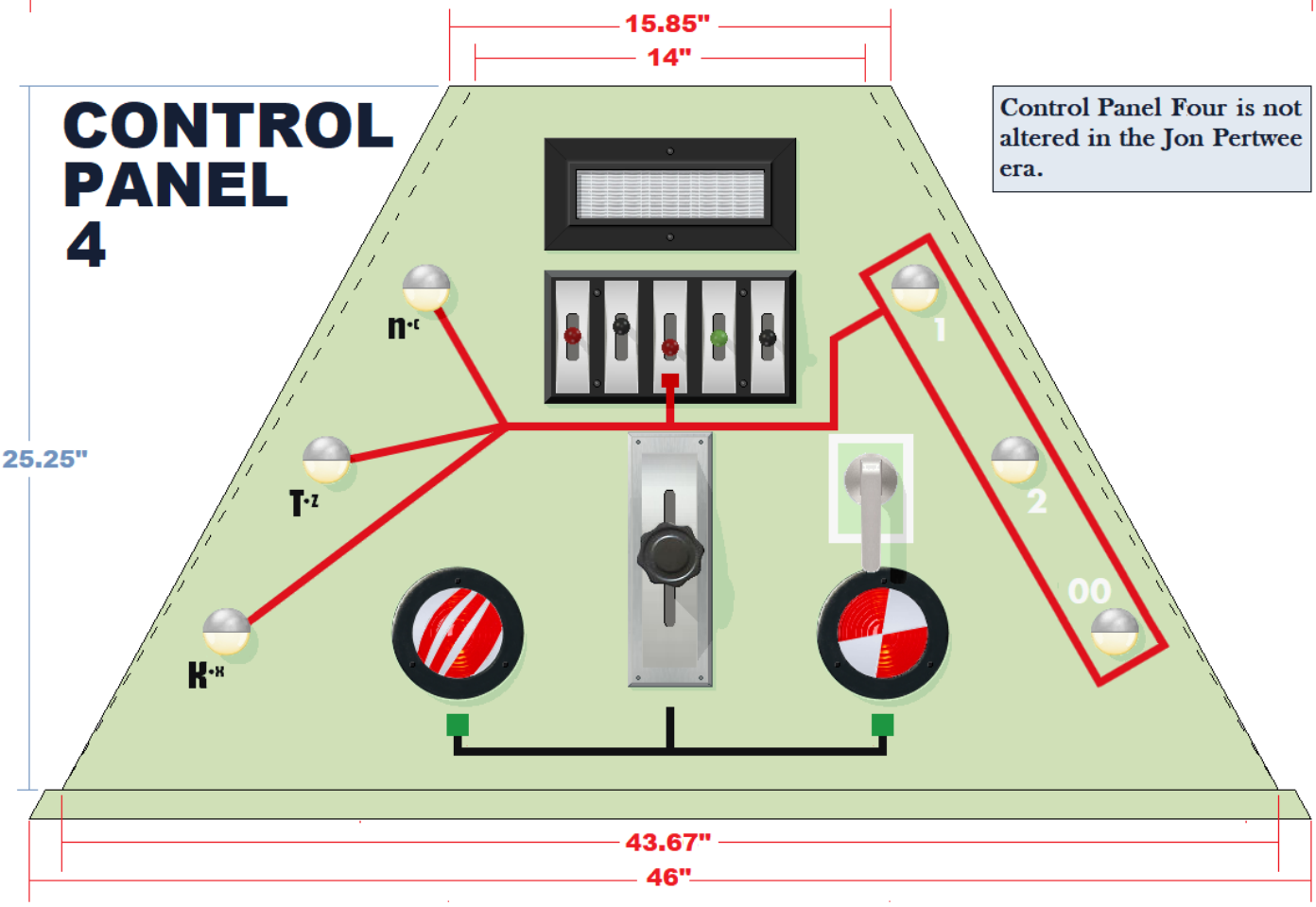
CONTROL PANEL 2



CONTROL PANEL 3



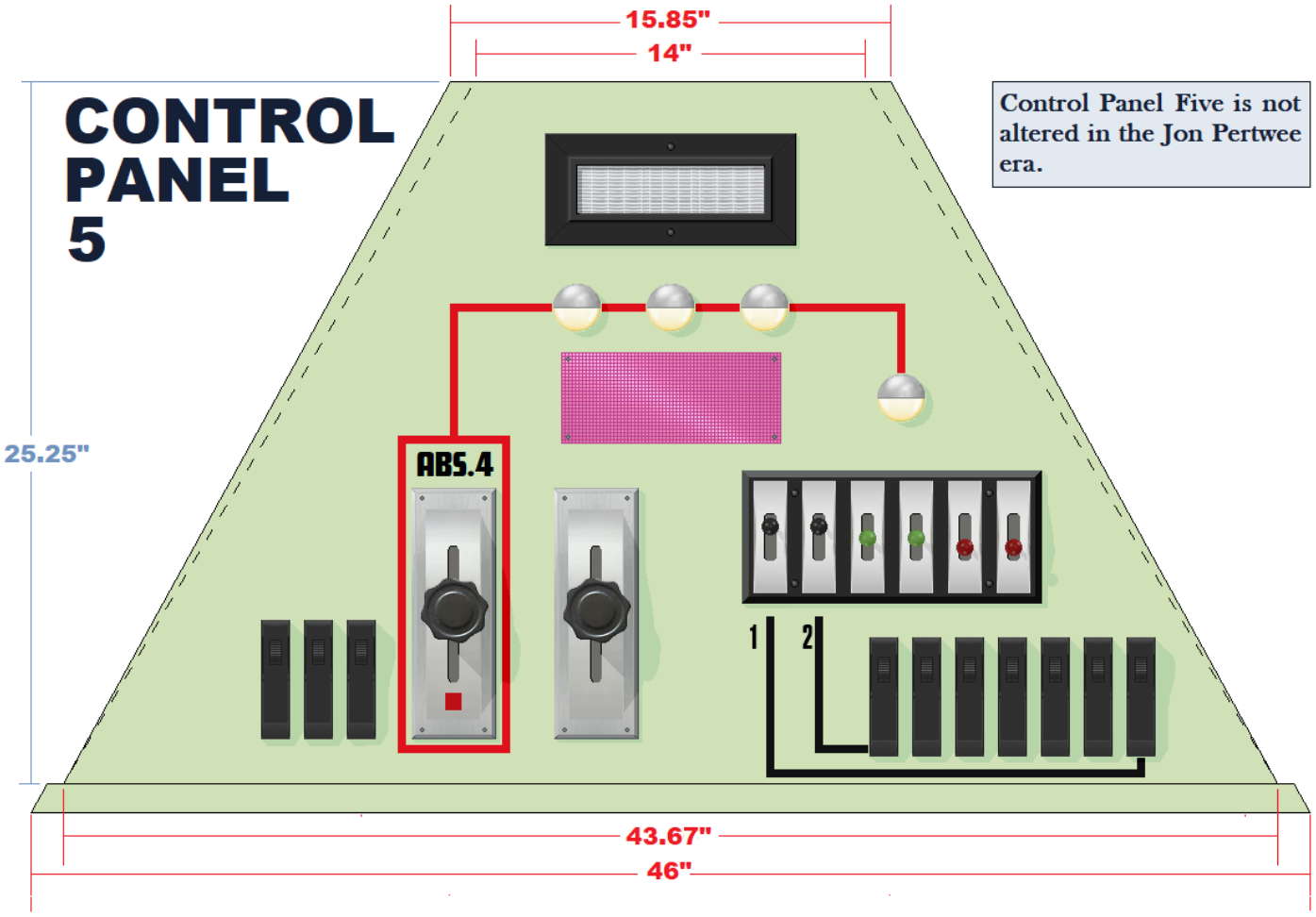
CONTROL PANEL 4



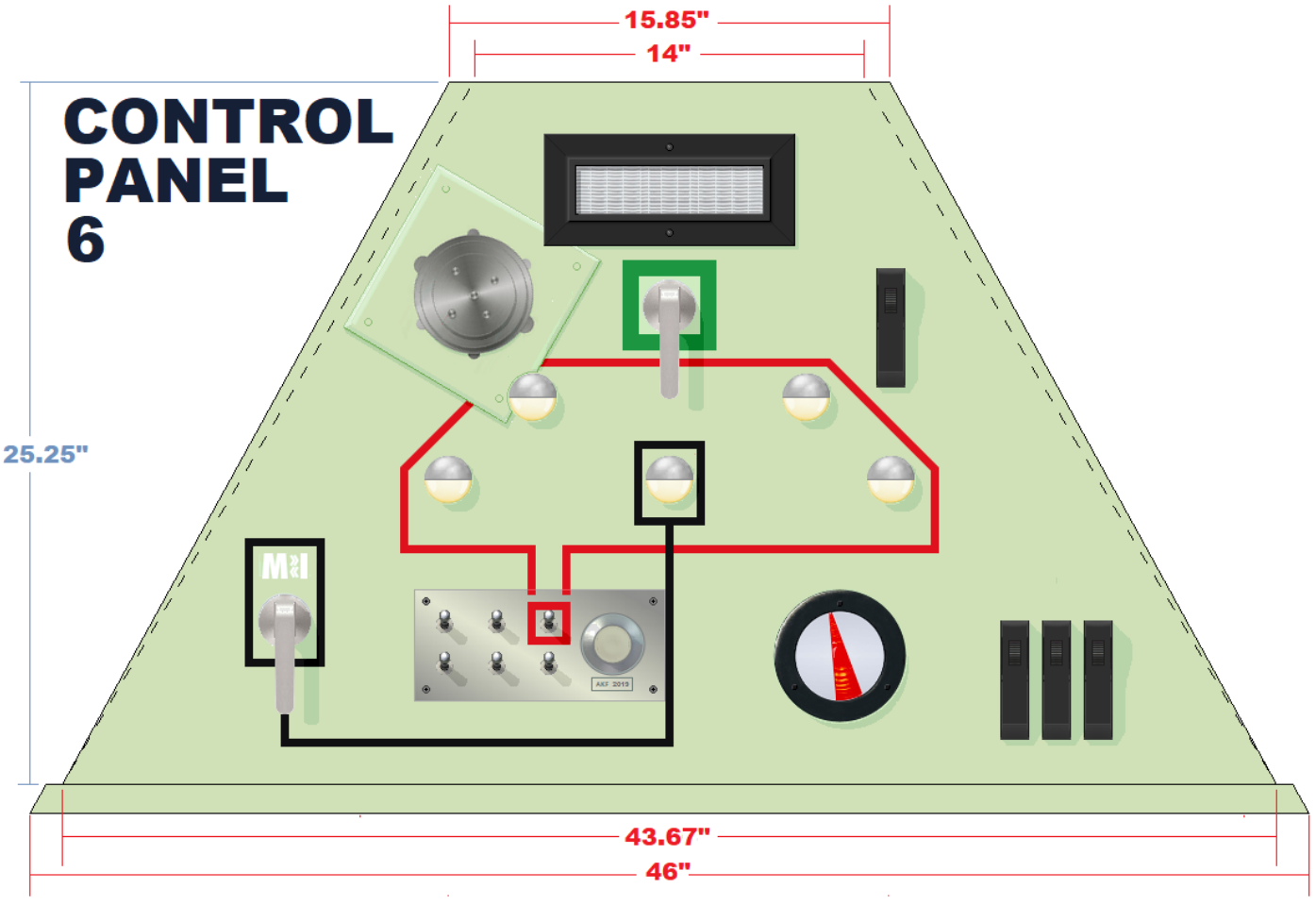
Control Panel Four is not altered in the Jon Pertwee era.

CONTROL PANEL 5

Control Panel Five is not altered in the Jon Pertwee era.

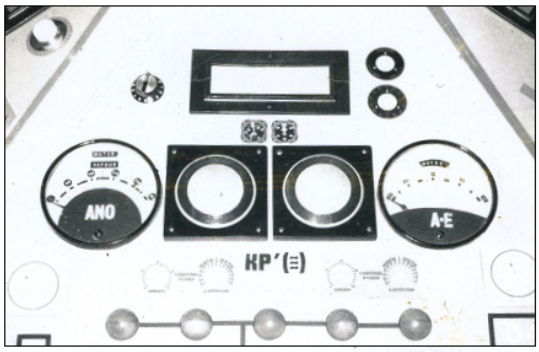


CONTROL PANEL 6



THE CONTROLS - A CHRONOLOGY OF CHANGE

If the addition of the dematerialisation circuit's housing for episode four of "The Claws of Axos" was the earliest change to the console, then the second occurred a season later when additional 'instrumentation' and graphics were added to Control Panel Two for episode one of season nine's second story - "The Curse of Peladon".



Far left: Considered too sparse? Panel 2 appeared in its original configuration in "Colony in Space".

Left & top: Instruments and graphics are added by the story's designer for 1972's "The Curse of Peladon".

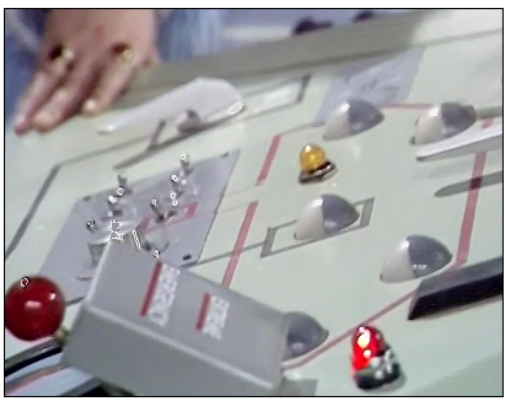
Following The Curse of Peladon, the TARDIS console next appeared in season nine's finale - "The Time Monster". Designer Tim Gleeson was responsible for this story and took the opportunity to add his own 'flourishes' to the console. As well as the scripted addition of the "Time Ram Dial" & the "Extreme Emergency Switch", Gleeson also added additional graphics to the console; this time, it was Control Panel One's turn to be updated and given the appearance of increased complexity. Not only was a new ventilation grille and microphone added but several 'dummy' meters were too. To complete the changes, the right-hand "Lighting Fuse" decal (one of the two decals added to Panel Two in "The Curse of Peladon") was moved to Panel One.

Right and far right:

The TARDIS interior's set gets its first "make-over" of the Pertwee era for Robert Sloman's tale of the death of Atlantis.

Before and after - Control Panel One as it appeared in "The Curse of Peladon" and the revamped version designed by Tim Gleeson for "The Time Monster".

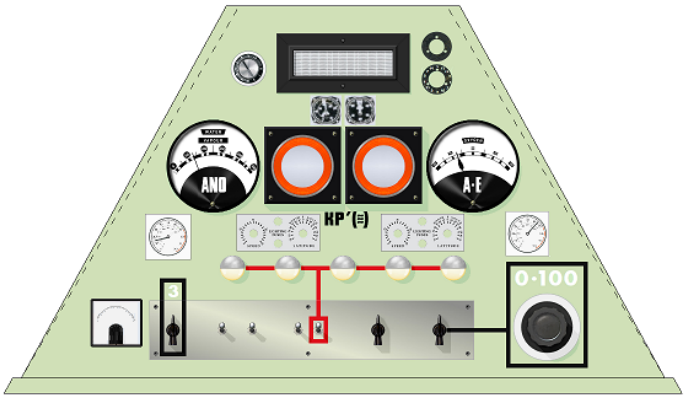
The designer in charge of the tenth anniversary celebratory adventure "The Three Doctors" was Roger Liminton. Once more, the TARDIS interior set was revamped - prompting Patrick Troughton's line "Oh.. I can see you've been doing the Tardis up a bit. Hmm.... I don't like it!" Specific to the console, Liminton moved the Extreme Emergency Switch from Control Panel 3 to Panel 6 and added an amber and a red warning lamp to the latter. The "Lighting Fuse" decal changed panels again and was now - like the Extreme Emergency Switch - fitted on Panel Six.



Left and centre: The Extreme Emergency Switch is moved from Panel 3 to Panel 6 for "The Three Doctors"; the hole left in Panel 3 has simply been taped over.
Below: The final 'script-driven' change of the Pertwee era - Panel 6 as it appears in Serial XXX, 1974's "Death to the Daleks".

DIAGRAM SHOWING THE CHANGES MADE TO THE CONTROL PANELS (THE CHANGES ARE SHOWN IN CHRONOLOGICAL ORDER)

THE CURSE OF PELADON (PANEL 2)

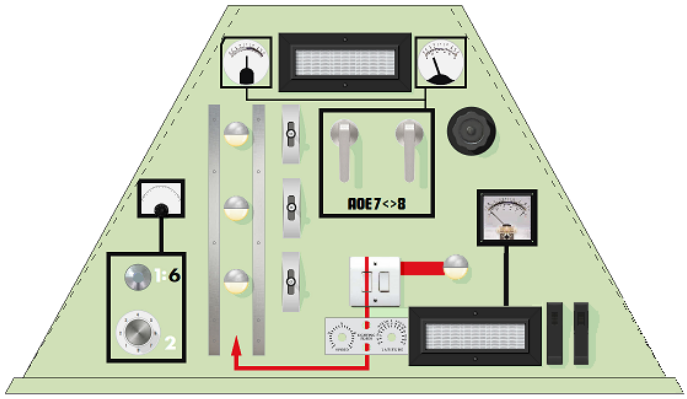


Two-inch diameter bezels from rotary switches added.

Additional 'dummy' meter graphics added.

Two "Lighting Fuse Decals" added.

THE TIME MONSTER (PANEL 1)

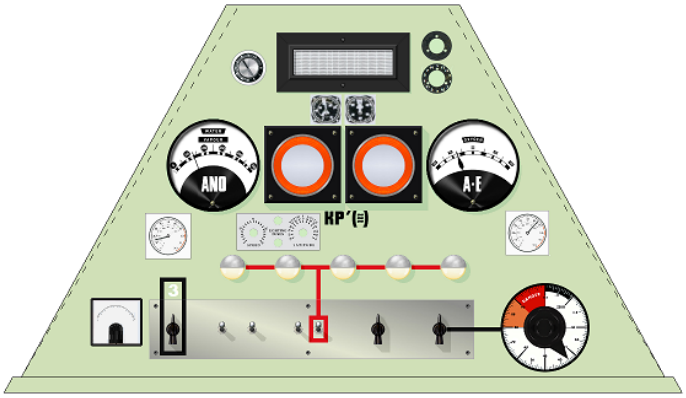


Right-hand decal relocated from Control Panel 2.

Additional 'dummy' meter graphics added.

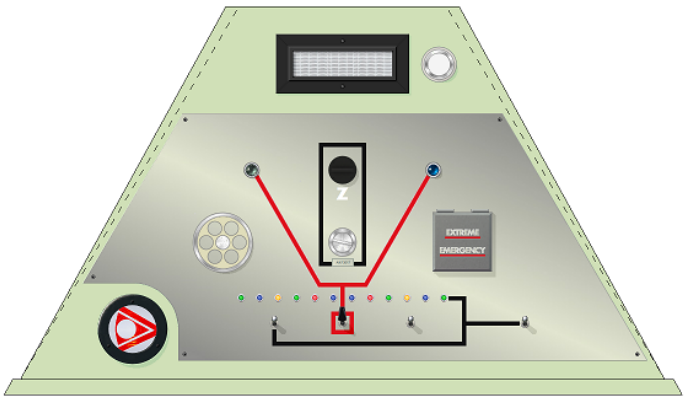
An additional ventilation grille is fitted & a real analogue meter is added.

THE TIME MONSTER (PANEL 2)



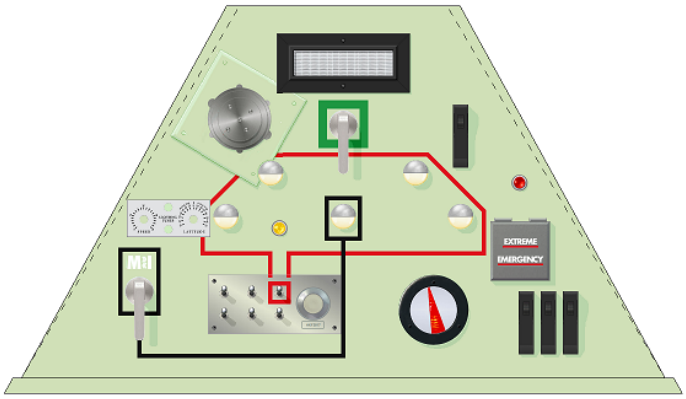
First appearance of the "Time Ram Dial".
It replaces the Bakelite rotary finger-grip knob.

THE TIME MONSTER (PANEL 3)



First appearance of the "Extreme Emergency Switch".
It replaces the black Bakelite rotary finger-grip knob.

THE THREE DOCTORS (PANEL 6)

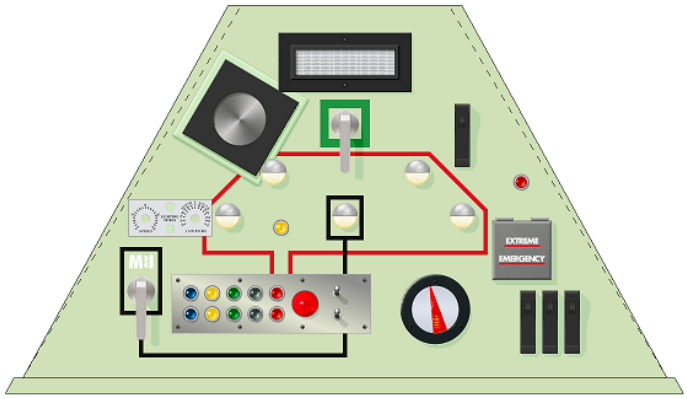


Decal now relocated from Control Panel One.

Amber and red flashing lamps added.

"Extreme Emergency Switch" moved to this panel.

DEATH TO THE DALEKS (PANEL 6)

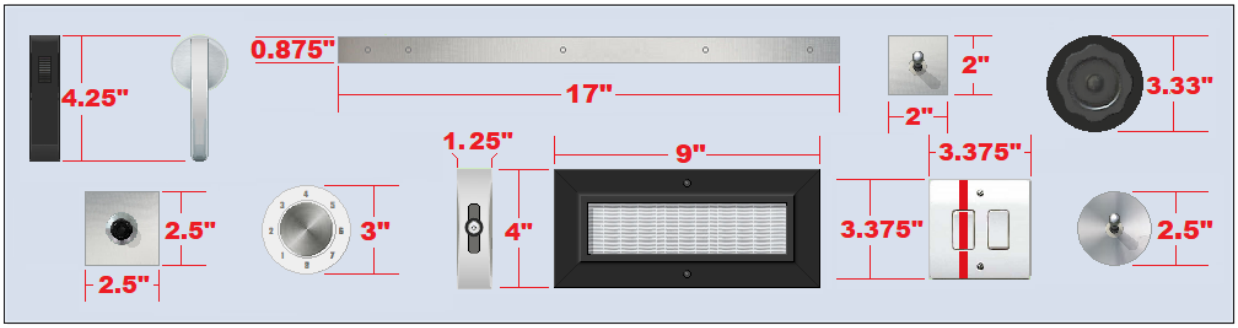


The housing for the Dematerialisation Circuit is modified with a black top-plate now being added.

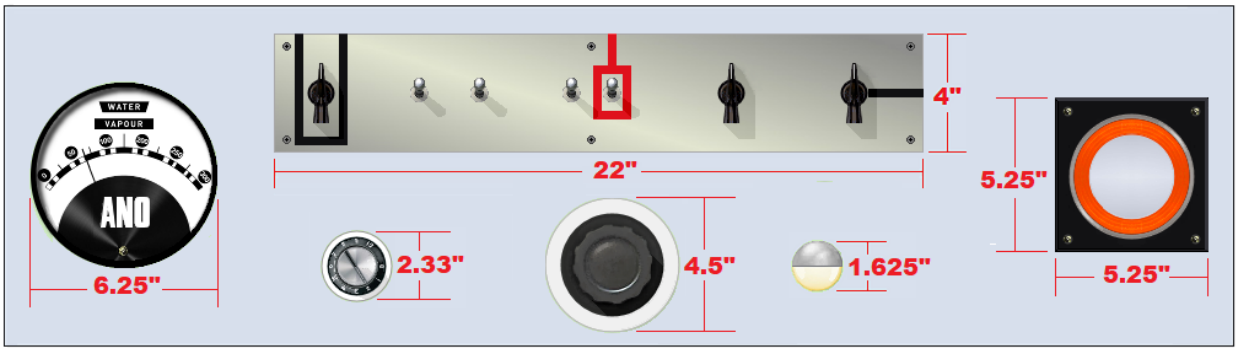
A new panel with flashing lamps is created.

MAKING THE TARDIS CONTROLS

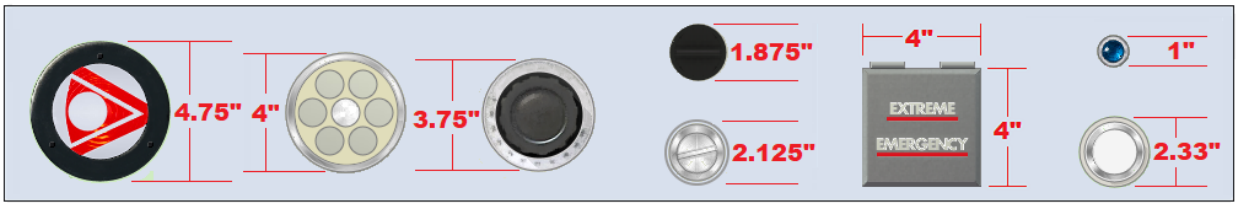
CONTROL PANEL 1



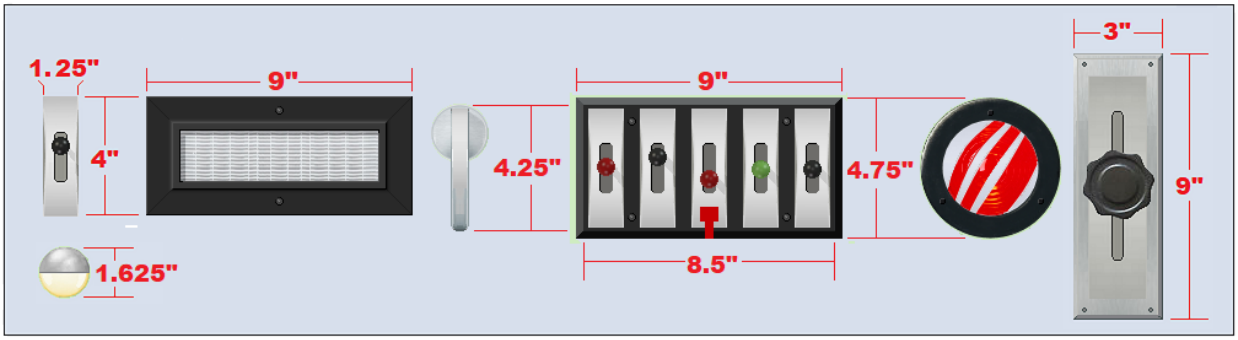
CONTROL PANEL 2



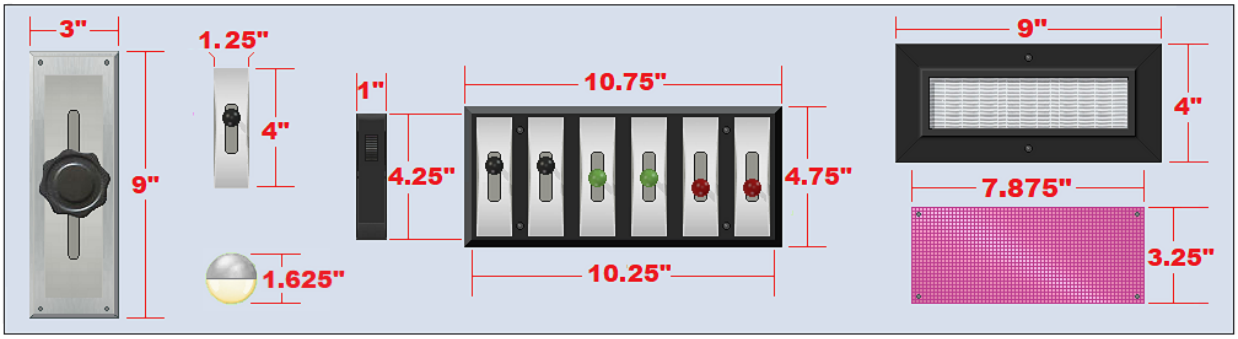
CONTROL PANEL 3



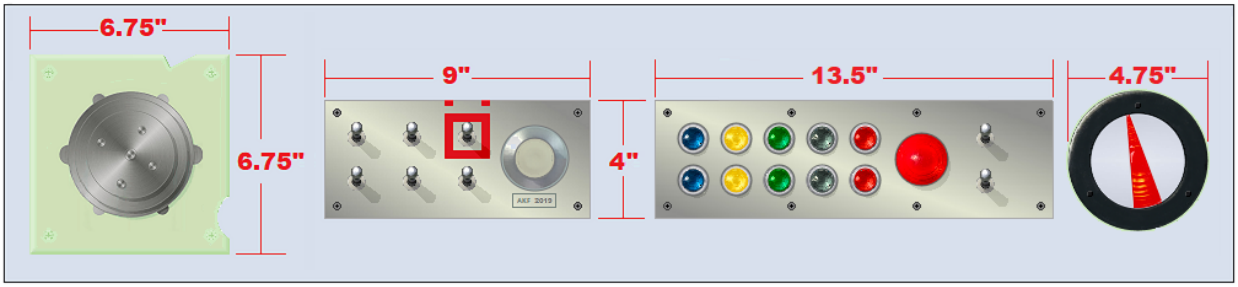
CONTROL PANEL 4

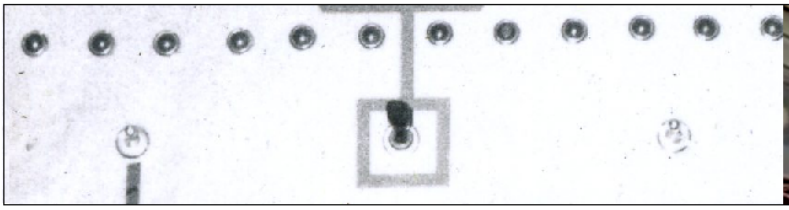


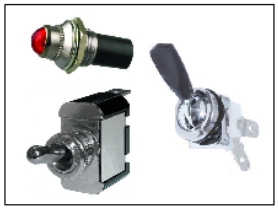
CONTROL PANEL 5



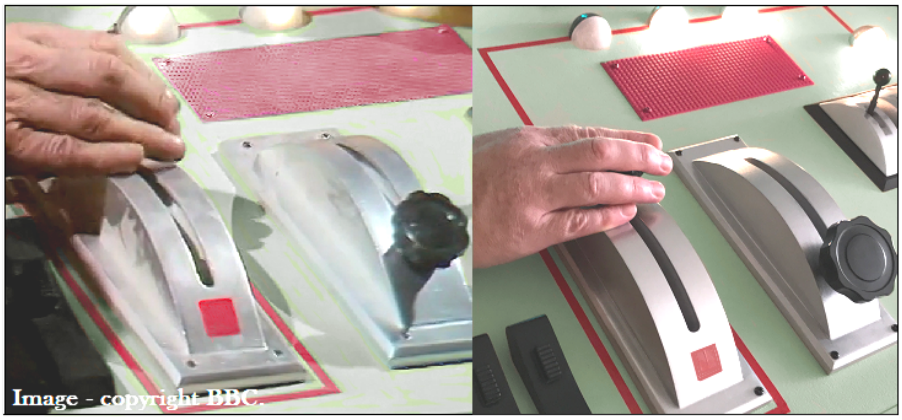
CONTROL PANEL 6







In the introduction, it was noted that many of the controls from the Brachacki console were retained & refurbished before being fitted onto Kenneth Sharp's version. Other controls were beyond repair and were replaced with new versions which 'echoed' those being replaced. For the replacement controls, Sharp and the team at Magna Models turned to commercially available items, many of which are still available now - for example, the black Bakelite 'finger-grip' knobs used on the main lever housings. Similarly, the 0.5 inch diameter small lamps used on Control Panel Three are also still being manufactured - they are known as 12 volt, Lucas-style car dashboard indicator lamps and come in a variety of colours. The silver toggle switches used on Panels 3 and 6 are also still available as, indeed, is the larger 'paddle-headed' toggle switch seen on Panel 3.



Top: Close-up shots of Control Panel 3 showing the "Lucas-style" car dashboard lamps, toggle switches and "paddle-head" toggle switch.

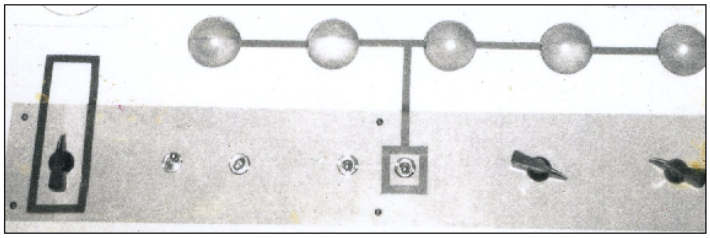
Top Right: Modern equivalents of these lamps and switches.

Far Left: The main levers with the new black Bakelite finger-grip knobs which were fitted for "The Claws of Axos".

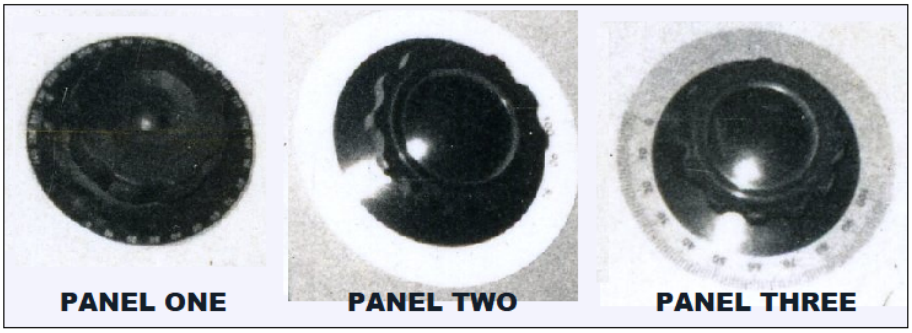
Left: The modern-day equivalents fitted on the re-created main lever housings.

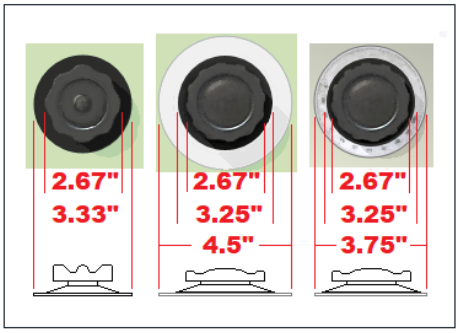
Below: Still available - 'chicken-head', 2" long, rotary pointer switches.

The same toggle switches used on Control Panels Three & Six were also used on Panel Two. In addition to the toggle switches, two-inch long "chicken-head" switches were also added. Again, these are still commercially available today. Though of different sizes, the metal plates on which these controls were fitted are all 0.125 inches thick and made of the same satin aluminium as the fascia's and plinth's metal trims. (Refer to the section on building the table & plinth.)



Three large Bakelite rotary finger-grip knobs were fitted on the console - one on Control Panel 1, one on Control Panel 2 and one on the third panel. Their exact origins are unknown however, as each had a graduated scale around its dial, they would appear to be from some kind of transmitting or receiving equipment. As such, it should be possible to source very similar controls from a specialist radio equipment supplier. Alternatively, facsimiles of each could be cast or 3D - printed.





It is interesting to note that the finger-grip knob from Panel One survives to the present day & is now fitted on Mark Barton Hill's magnificent reproduction of the 1982 iteration of the Sharp console. An early version of this console appeared in the BBC's trailers for the 50th anniversary of Doctor Who & the final version was in 2017's special release of "Shada" on DVD and Blu-ray disc. The Barton Hill console was also on display at the - now closed - Doctor Who Experience in Cardiff.

In addition to the large finger-grip knob, Control Panel 3 was originally fitted with one clear lens and one blue lens, 1" diameter, Dialco-style, domed beehive dashboard lamps. In the picture on the left, the clear lamp is illuminated - warning the Doctor that the TARDIS' oxygen supply was nearly exhausted - from 1973's "Planet of the Daleks".

Two further domed beehive dashboard lamps - one amber and one red - were added to Panel 6 for "The Three Doctors". The photograph on the right shows a near-identical version of these lamps. These lamps are currently available in all of the required colours.

Left: Recreating the final script-driven change of the Pertwee era from commercially available parts. The large red lamp is a 2" diameter brake light from a Land Rover, whilst the ten small lamps are 1 inch diameter Dialco-style car dashboard lights with domed 'beehive' lenses.

N.B., if 'Dialco-style' lamps are chosen, ensure that the lens diameter of 0.625" (five eighths of an inch) is specified when ordering the parts.

The two toggle switches fitted are longer than those used elsewhere on the console.

The use of commercially still-available parts wasn't just limited to toggle and rotary switches or to the various lamps. As these images of Control Panel One show, some somewhat surprising choices of "instrumentation" were made by Sharp & the team at Magna Models:

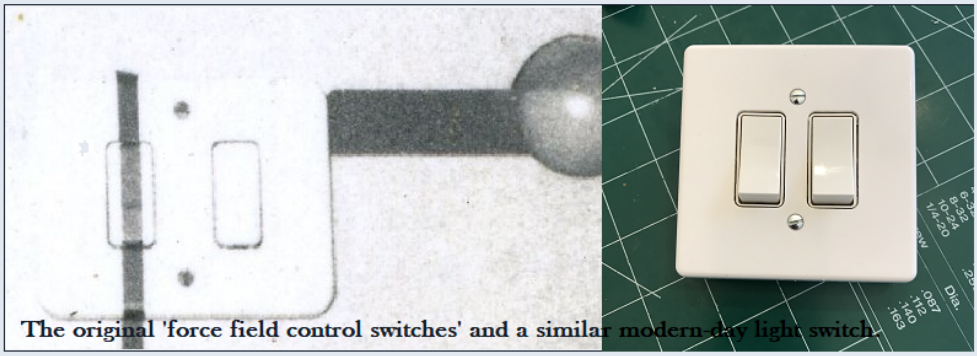
Image - copyright BBC.

Image - copyright BBC.

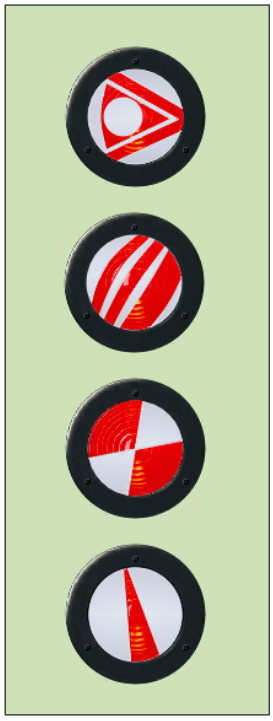
Above and above right:

Patrick Troughton is ready to deactivate the TARDIS' force field.

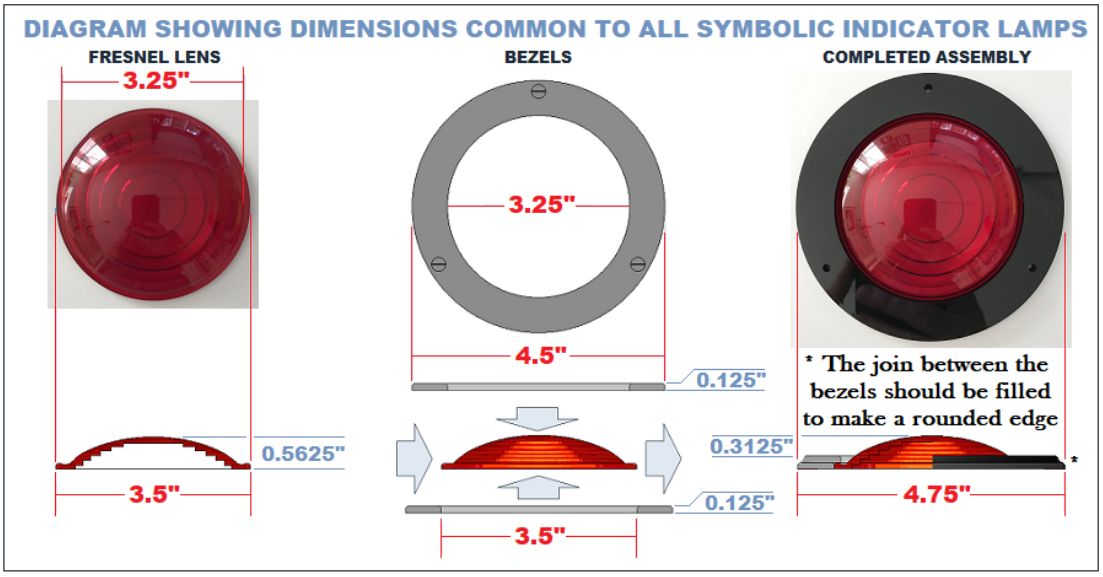
The force field control is simply a 'two-gang' light switch! Note the positioning of the two screws used to secure the switch-plate. In the UK, it is more common for these screws to be located either side of the switches. This arrangement is found on Crabtree modular light switches which are still available.

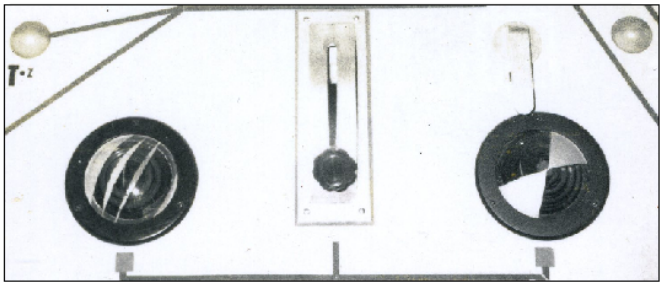


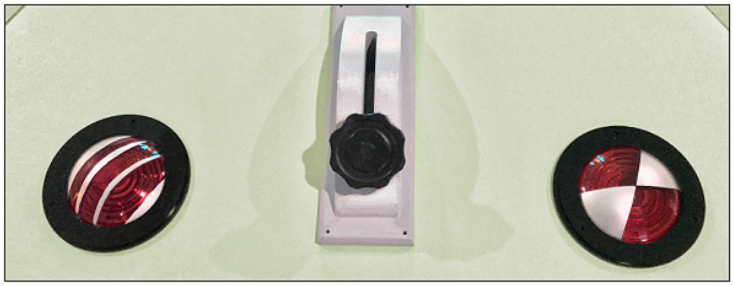
The original 'force field control switches' and a similar modern-day light switch.



Of course, the use of commonly available parts - either on their own, or, as part of something else - was nothing new. The Brachacki console was fitted with large red lamps the lenses of which were painted with strange symbols. The lenses of these "symbolic indicator" lamps appear to have come from the hand-held lanterns which were formerly carried by railway personnel to warn of danger. The lamps were refurbished, new symbols painted on the lenses, and fitted on the Sharp console.

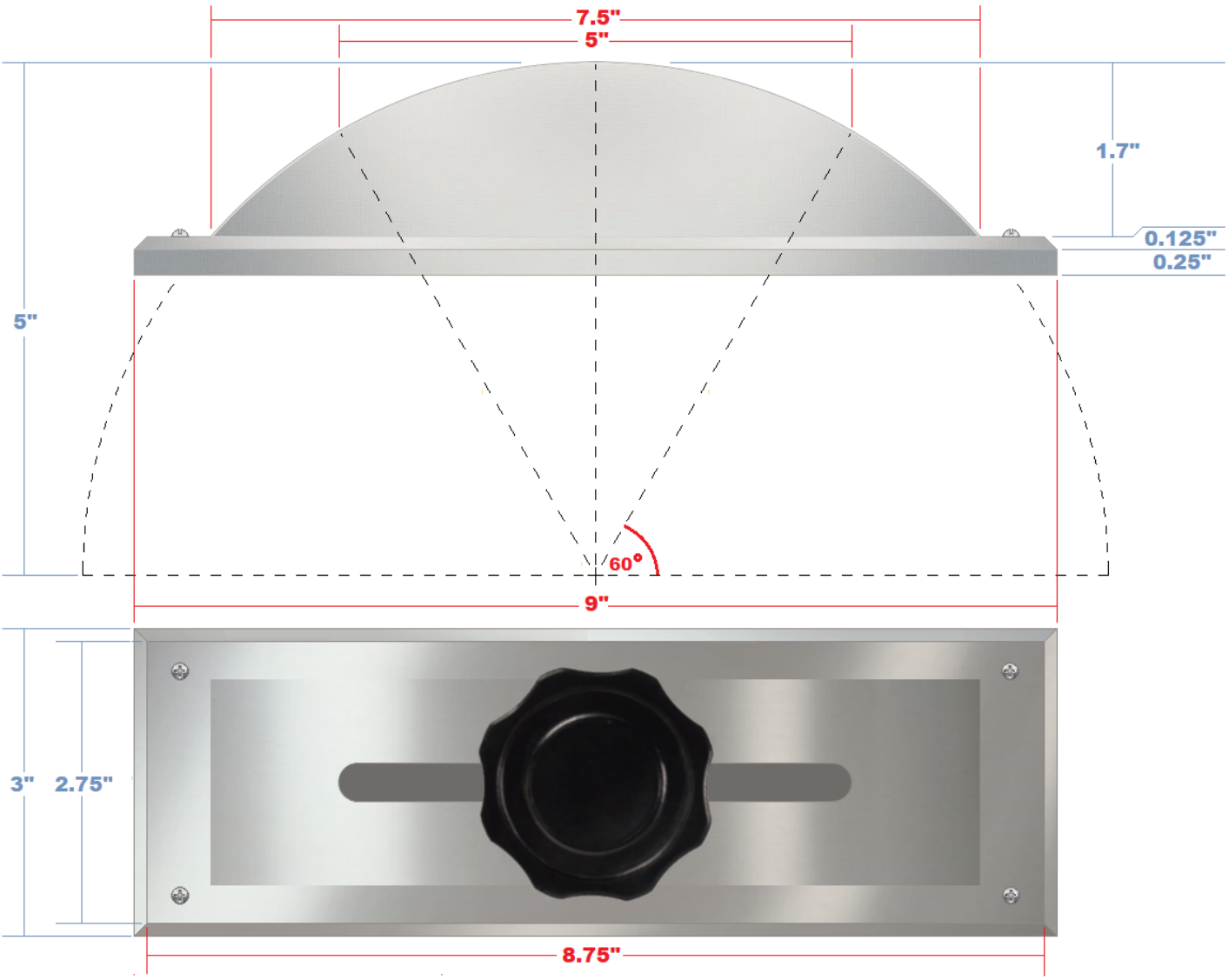


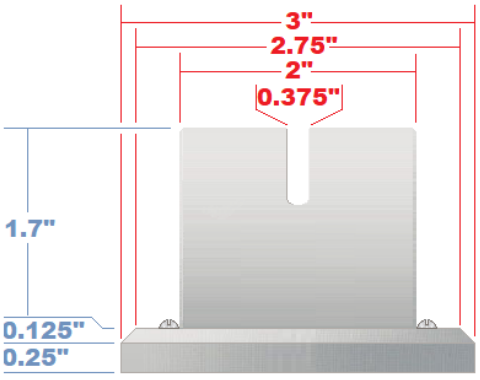


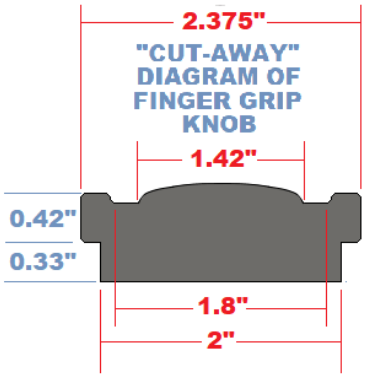


Above left: The original Brachacki 'Symbolic Indicator' lamps are refurbished - the lenses re-painted - and fitted on the Sharp console. Above right: The 'Symbolic Indicator' lamps are re-created using lenses from a hand-held railwayman's lantern & are test-fitted on Control Panel Four. At the centre of both photos is one of the three main levers fitted on the console.

THE MAIN LEVERS - DIAGRAM DRAWN AT ACTUAL SIZE (SCALE 1:1)

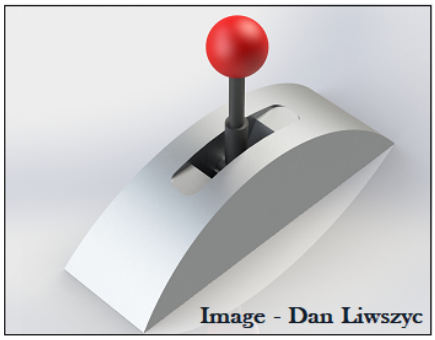






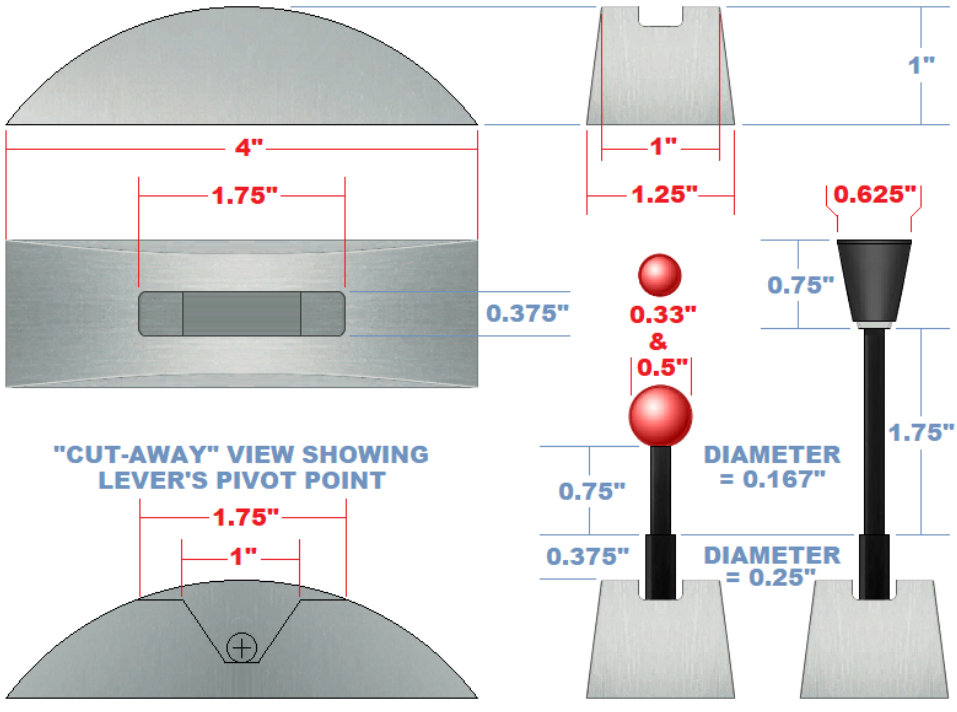
Above: Taken during camera rehearsals for episode 4 of "The Three Doctors", this photograph provides a clear view of the three main levers which were retained from the original Brachacki console and which were then re-fitted on the Kenneth Sharp version. As well as the symbolic indicator lamps, the original 'secondary levers' were also retained from the original console & refurbished.

Note the differing sizes of ball caps on the seondary levers; this came about in the Hartnell & Troughton eras when several of the original (larger) caps were lost and smaller versions were fitted. Below: One of the recreated secondary levers fitted with a ball cap of the original size. Bottom left & bottom right: The secondary levers fitted on Panel One were given completely new, taller, rods & cone-shaped caps.

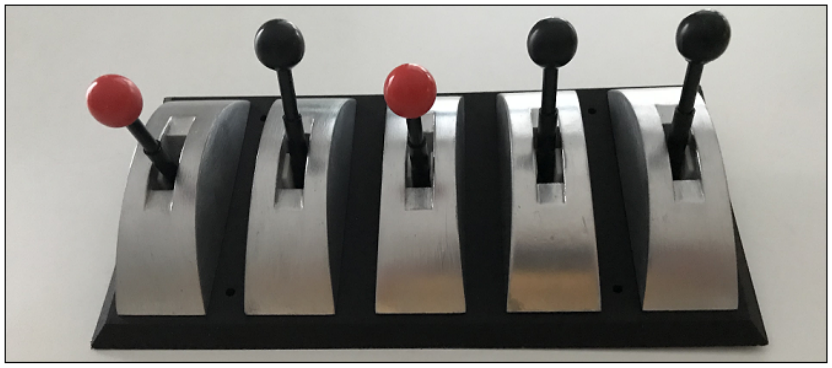


THE SECONDARY LEVERS

DIAGRAM DRAWN AT ACTUAL SIZE (SCALE 1:1)



Above, below & right: Recreating the secondary levers.

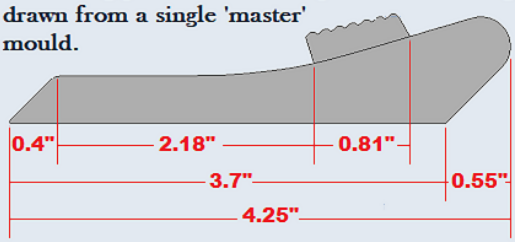


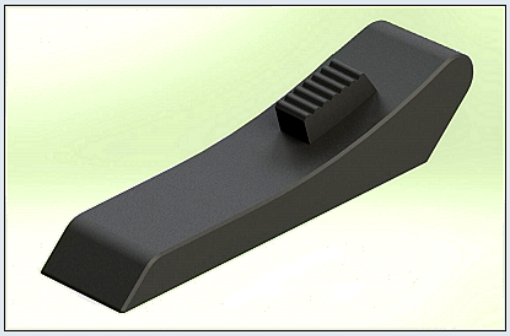
Rumoured to have been created from ping-pong balls, twenty four hemispherical, one and half inch diameter, lamps adorned the Kenneth Sharp console. Whatever the origins of these lamps, they can be recreated using readily available items. In the photographs below, clear plastic Christmas tree baubles have been used to recreate the lamps. The 'lens sections' are frosted on the inside to create the translucent appearance of the originals. A combination of standard 'on/off' and 'flashing' lamps wired to the same switch can be used to create the illusion of a more complex console without any need for complicated programming. The flashing lamps are described in the section covering the console's Central Column.

THE BLACK 'SLIDER' SWITCHES

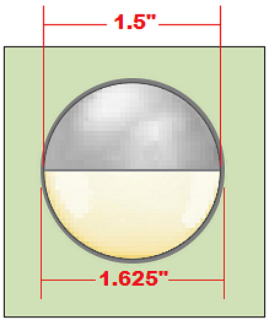
DIAGRAM DRAWN AT ACTUAL SIZE (SCALE 1:1)

The Brachacki console was fitted with 'working' black slider switches in the sense that the actual 'finger-grip' sliders could be moved. The 'slider' switches on Kenneth Sharp's console contained no moving parts - with multiple versions being drawn from a single 'master' mould.

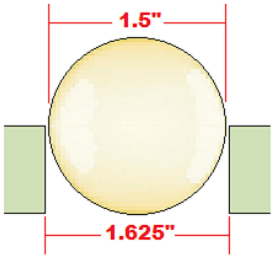


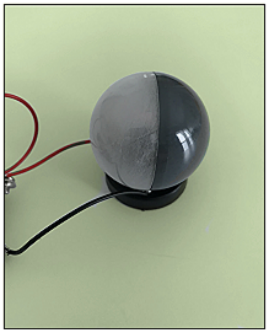


THE MAIN LAMPS

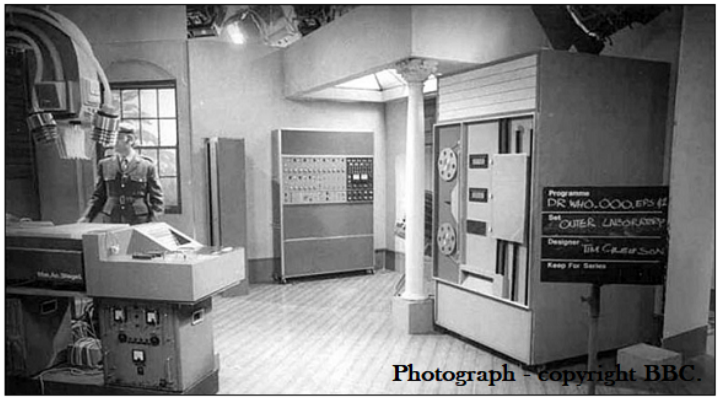


"CUT-AWAY" VIEW OF LAMP & PANEL



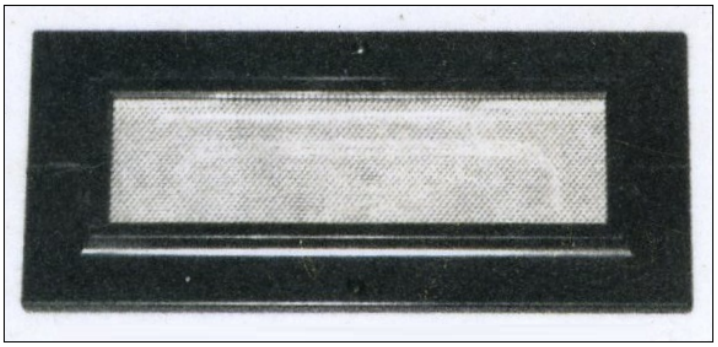


"Entropy increases", so stated The Fourth Doctor in "Logopolis". The greater the build-up of heat in a closed system, the more random that system becomes until it reaches the point of collapse - *heat death*. Put simply, the importance of good ventilation cannot be overstated. Below left: Magna Models supply the computer equipment in "The Time Monster". Below: The Master's TARDIS is disguised as a computer bank - its ventilation grilles are identical to those fitted on the console by Magna Models.



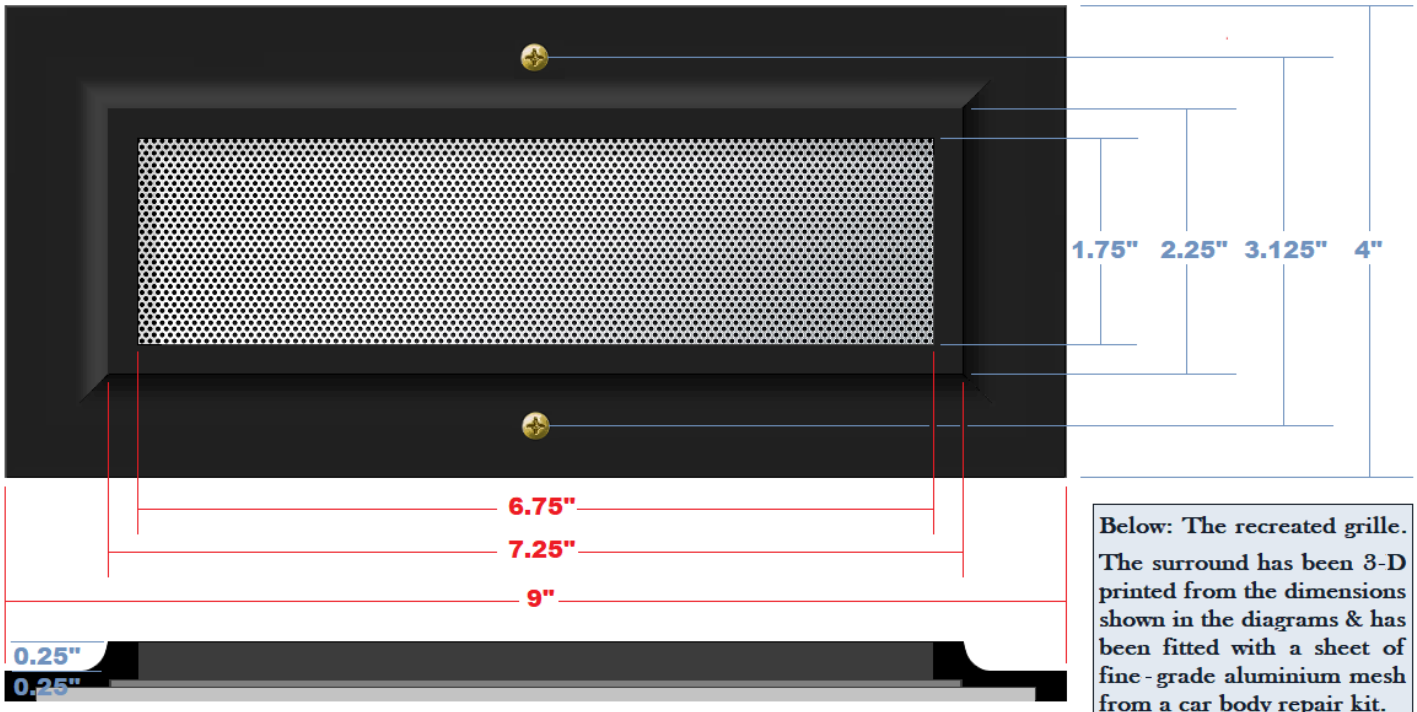
Photograph - copyright BBC.

Image - copyright BBC.



Top: A close-up photograph of one of the six new 'ventilation' grilles created for the Sharp console (a seventh grille was added for 1972's The Time Monster). A fine-grade aluminium mesh in the grille's opening is visible. Right: The Doctor removes a vital component from the console thus preventing The Master from stealing the TARDIS in epsisode four of "The Claws of Axos" - opening the grille reveals the air-filter inside the unit.

THE VENTILATION GRILLES - DIAGRAMS DRAWN AT ACTUAL SIZE



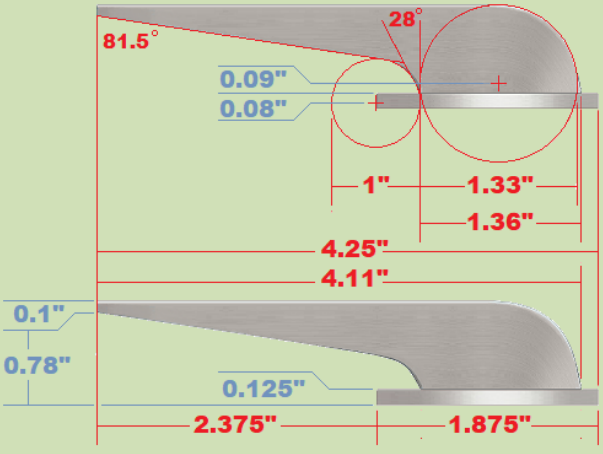
CUT-AWAY VIEW SHOWING RELATIONSHIP OF SURROUND, MESH AND FILTER

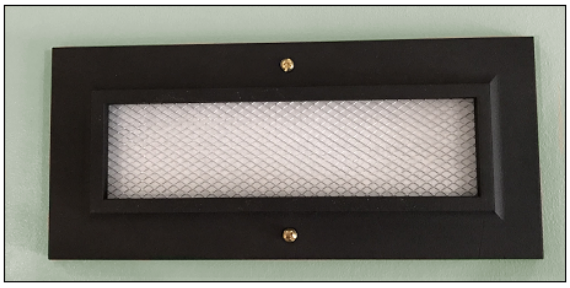
Below: The recreated grille. The surround has been 3-D printed from the dimensions shown in the diagrams & has been fitted with a sheet of fine-grade aluminium mesh from a car body repair kit.

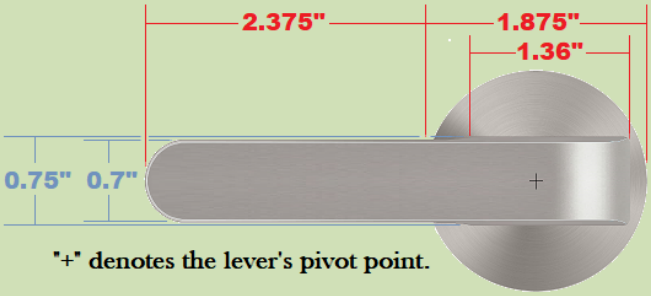
THE HANDLE LEVERS

DIAGRAMS DRAWN AT ACTUAL SIZE (SCALE 1:1)

Five completely new 'handle levers' were fitted on the Sharp console.







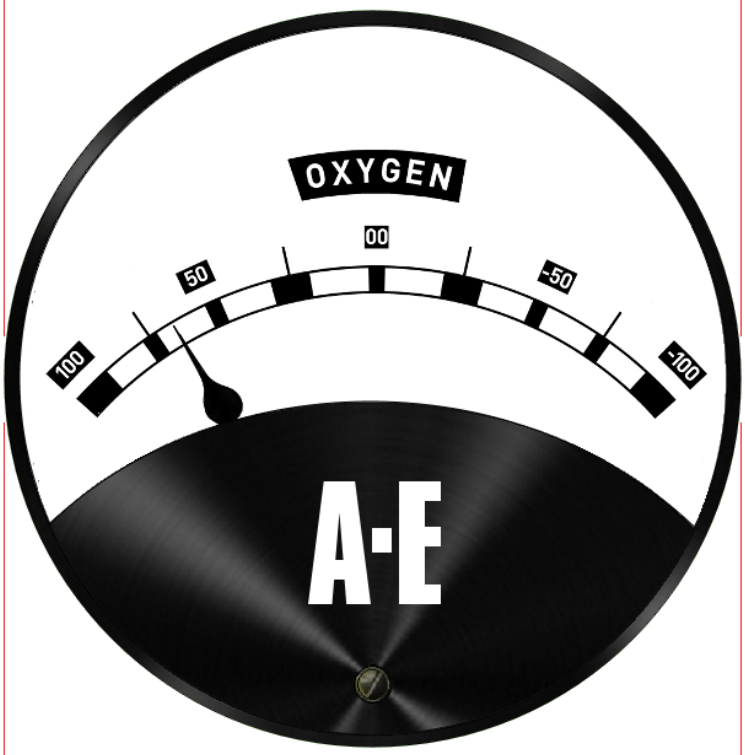
"+" denotes the lever's pivot point.

THE MAIN METERS

DIAGRAMS DRAWN AT ACTUAL SIZE (SCALE 1:1)

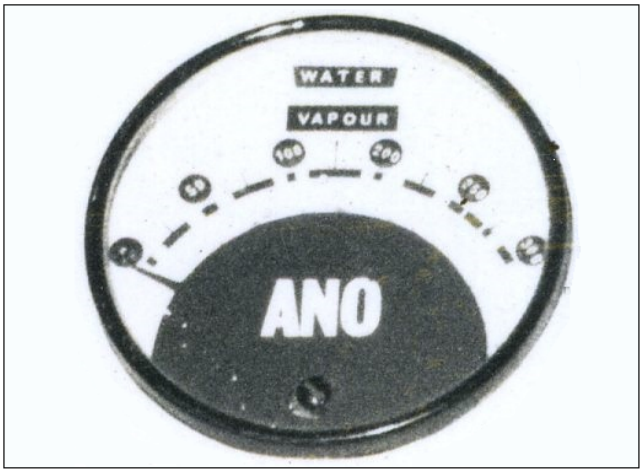
6"

6.25"



CUT-AWAY VIEW SHOWING THE RELATIONSHIP OF THE METER'S COMPONENT PARTS TO THE CONTROL PANEL

(DIAGRAM ASSUMES THAT THE CONTROL PANEL IS 0.75" THICK)



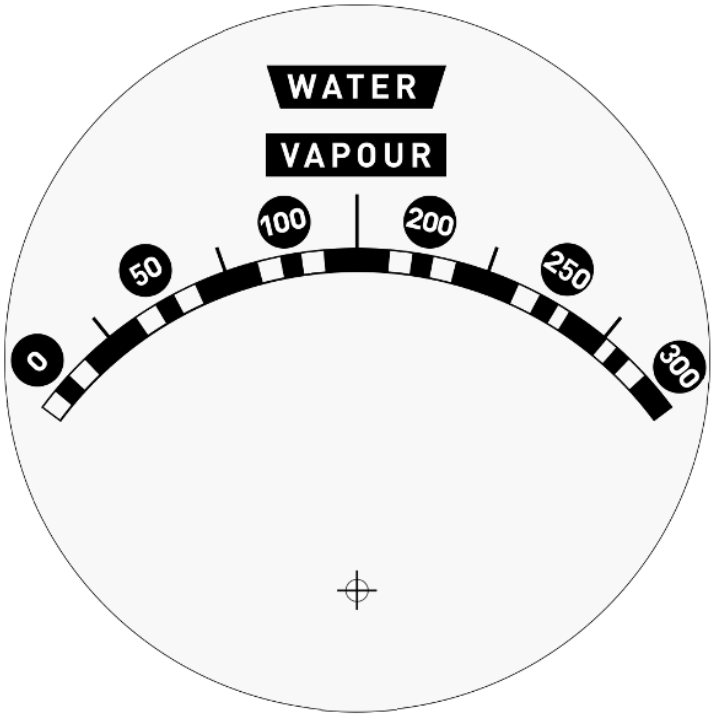
Above: One of the two main meters which were transferred from the original console to the Sharp version. The meters' graphics remained unaltered with the legends 'ANO' & 'A-E' simply being added to the meters' glass face-plates.

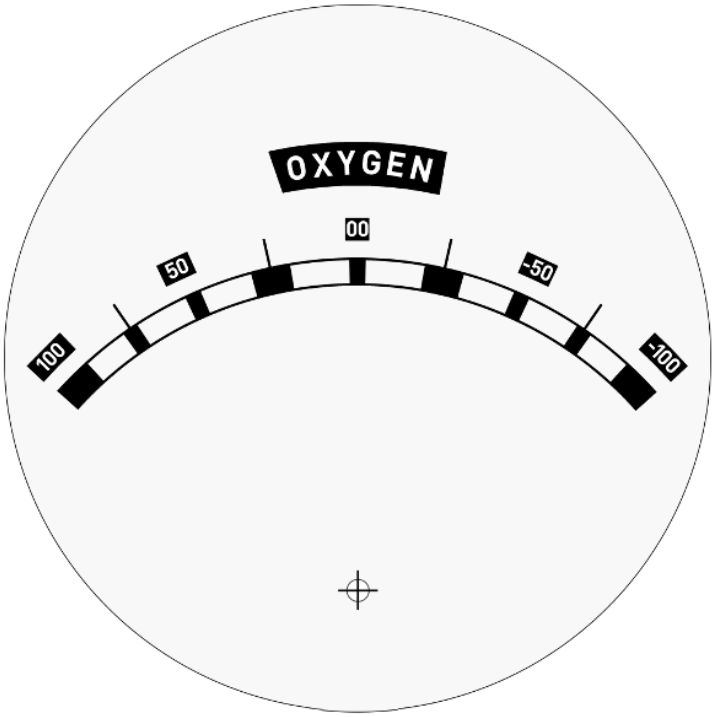
Below: A screen-grab from 1969's "The War Games" shows how much of the meters are concealed beneath the control panels on the Kenneth Sharp console.

Below: An identical meter to the ones used on the console.

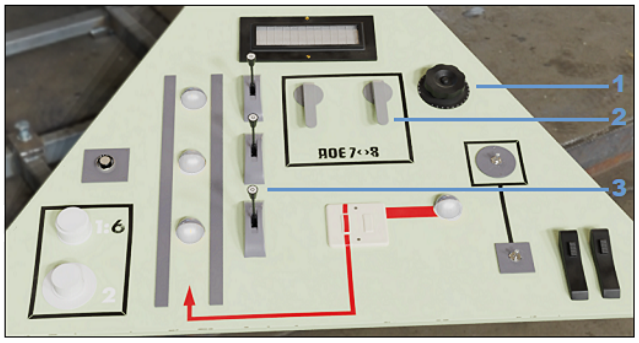
Recreating the main meters: The addition of a 'flange' or base-plate to the bottom of the meter's housing will allow the meters to be screwed to the underside of the panel.

THE GRAPHICS FOR THE MAIN METERS





METER GRAPHICS DRAWN AT ACTUAL SIZE



Above: The near-complete re-creation of Control Panel One is used to show the sequence of controls employed by both The Doctor and The Master when piloting their Tardises. 1 - Rotate the finger-grip knob. 2 - Adjust the handle levers' positions. 3 - Simultaneously operate the three 'secondary levers'.

We have already noted the open 'access hatch' on the underside of the console which allowed the operation of the Time Ram Dial in 1972's "The Time Monster". The 'script-driven' and purely artistic alterations to the console have also been described.

The script-driven & artistic changes might be described as having been the result of the fictional operation of the TARDIS or - perhaps more accurately - of the production team's efforts to create something which would convince the viewer to suspend their disbelief and to accept that the console was at the heart of an incredibly advanced time machine.

The performances of the various actors was of vital importance to this suspension of disbelief and, to this end, both Pertwee & Delgado took the trouble to establish a consistent approach when operating the main fictional functions of the console:

As a 'plot device', the TARDIS exists to transport our heroes into and away from their adventures; as such, the key function of the console is to cause the TARDIS to materialise and to de-materialise. Fictionally, in both "Colony in Space" & in "The Curse of Peladon", Control Panel Two is used to monitor the TARDIS' external surroundings whilst both Jon Pertwee and Roger Delgado consistently used Panel One's controls to land and to take-off in their respective space/time machines.

If the first 'function' of a consistent approach to the take-off & landing procedure for the TARDIS was to help 'sell' the illusion of a complex time & space machine, then the second function of this approach lies in how the console was actually operated during the recording sessions for Doctor Who.

Just as the presence of the open access hatch shows that the Time Ram Dial was operated by a stagehand hidden underneath the console, the sudden appearance of a cable beneath Control Panel 6 in "The Three Doctors" shows that the red flashing lamp added to this panel for this story was similarly operated by a VFX technician standing out-of-shot.

Whereas on the original Brachacki version of the console several switches can be positively identified as being 'wired in' - i.e., they actually activated various lamps, on the Kenneth Sharp version, this doesn't seem to have been the case. With the possible exception of episode four of "The Claws of Axos" when The Doctor activates the TARDIS' power boosters to break free of the time loop, the Control Panels' lamps are either seen to be on or off and are not seen to respond to the 'throwing' of the various switches.

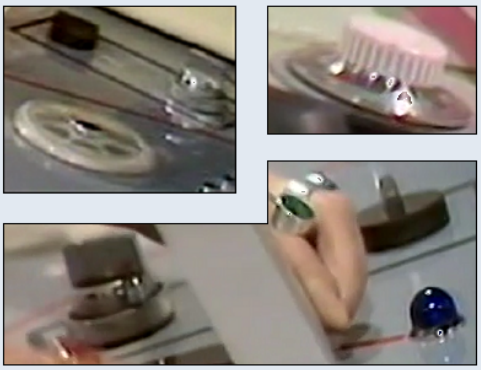
As already noted, the Time Ram Dial and the red lamp on Control Panel Six were operated by someone who was out of shot of the camera. The same is true of the console's Central Column: On Brachacki's console, the Central Column was pneumatically driven, on the Sharp version it was powered by a motor but, in both cases, the column was remotely operated. So, as well as convincing the the viewer that The Doctor and The Master both operated their consoles in a consistent manner, the take-off and landing 'routines' employed by Pertwee and Delgado has a quite separate and entirely practical function; it was to provide the person whose role was to operate the column with a visual cue to either activate or de-activate the motor.

Left: A close-up shot of one of the main meters showing how its component parts relate to one another and how the meter is mounted in relation to the Control Panel's surface. What appears to be a screw head on the meter's glass face-plate isn't the needle's pivot-point but rather is the meter's calibration/zero adjuster. The needles' pivot points are shown in the diagrams on the previous page.

The ventilation grille on this panel lacks its mesh cover and the air filter is visible inside the unit. In front of the ventilation grille is one of the 'ancillary controls' fitted on Control Panels one, two & three. These controls were fitted when Kenneth Sharp's console was first created in January 1971 and seem to have been sourced from then commercially available equipment including what would appear to be the case for a spool from a tape recorder.

Above: Control Panel One's 'ancillary controls' as originally presented in "The Claws of Axos". Above middle: The orange rotary knob has been replaced by a metallic disc for "The Curse of Peladon". Above right: For "The Time Monster", the circular switch and square plate are replaced by meter graphics and a one inch long chicken-headed rotary pointer switch.

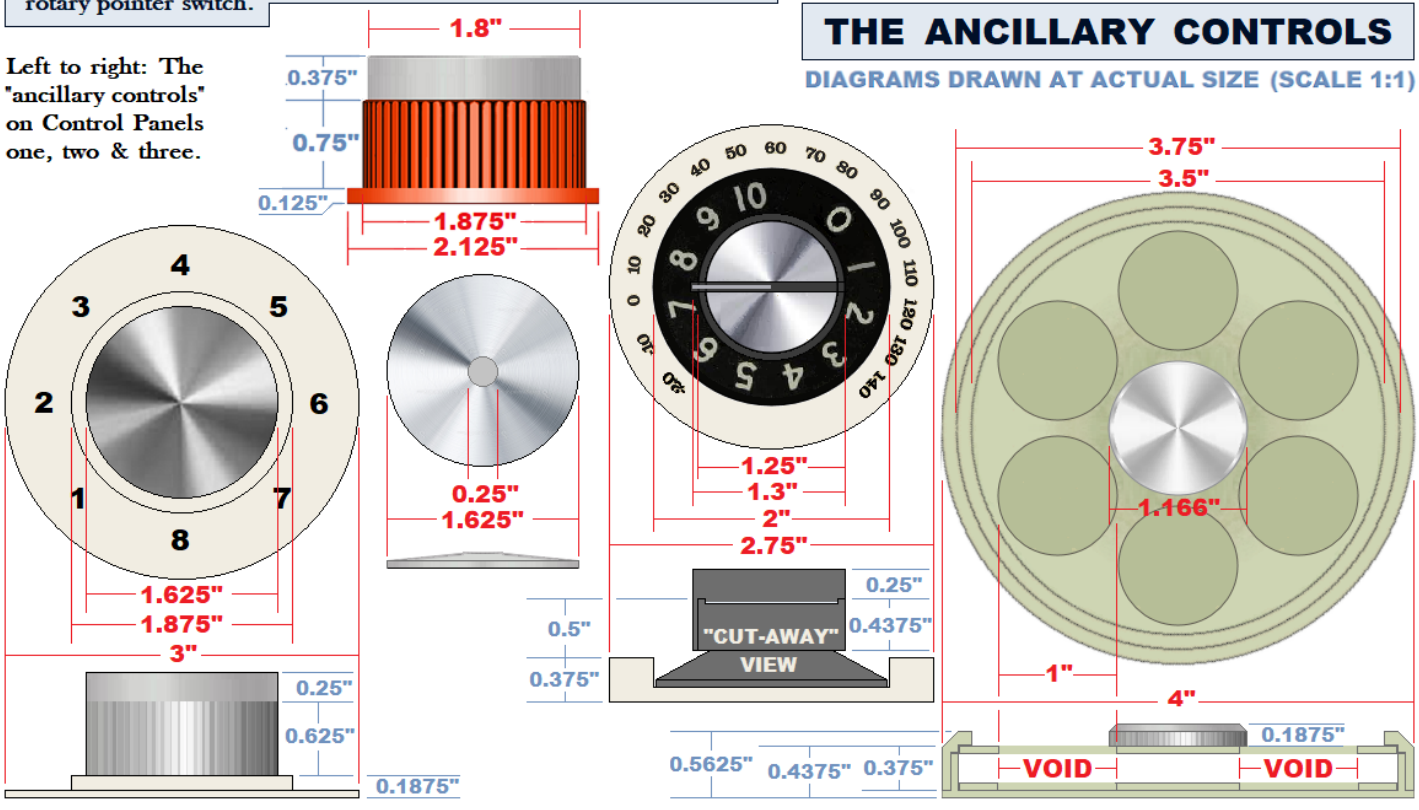
Right: Control Panel 3's original ancillary controls remain in place during the Pertwee era.

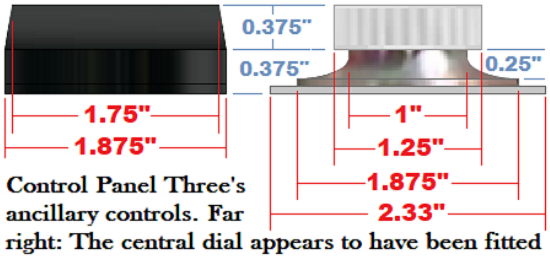


THE ANCILLARY CONTROLS

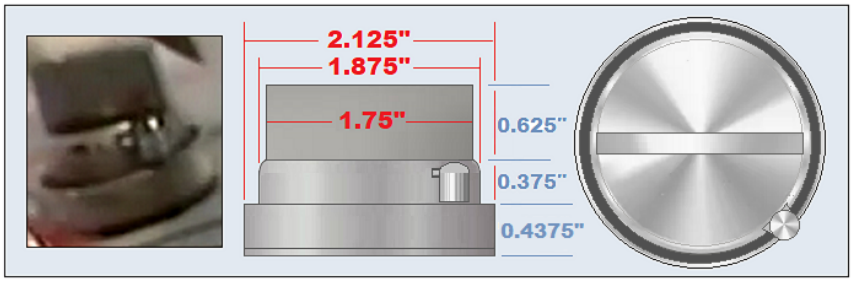
DIAGRAMS DRAWN AT ACTUAL SIZE (SCALE 1:1)

Left to right: The "ancillary controls" on Control Panels one, two & three.





Control Panel Three's ancillary controls. Far right: The central dial appears to have been fitted with a "locking mechanism" to prevent adjustment.



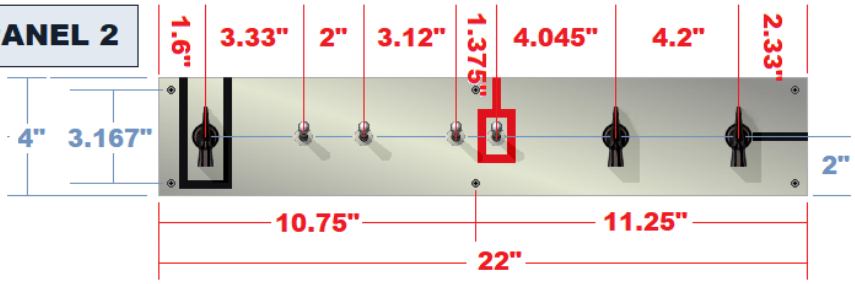
THE METAL 'INSTRUMENT MOUNTING PLATES'

The diagrams below show the metal 'instrument mounting plates' in greater detail and are intended to provide a drilling guide. As such, the dimensions stated are measured from the centre-point of each hole to be drilled. The exact diameters of the holes to be drilled will depend on the types of switches and lamps which are chosen when re-creating each of the instrument mounting plates.

DIAGRAMS DRAWN AT QUARTER OF ACTUAL SIZE - SCALE 1:4

(HOLES FOR SCREWS SHOULD BE DRILLED AND COUNTERSUNK 5/12ths OF AN INCH IN FROM EACH SIDE OF THE METAL PLATES)

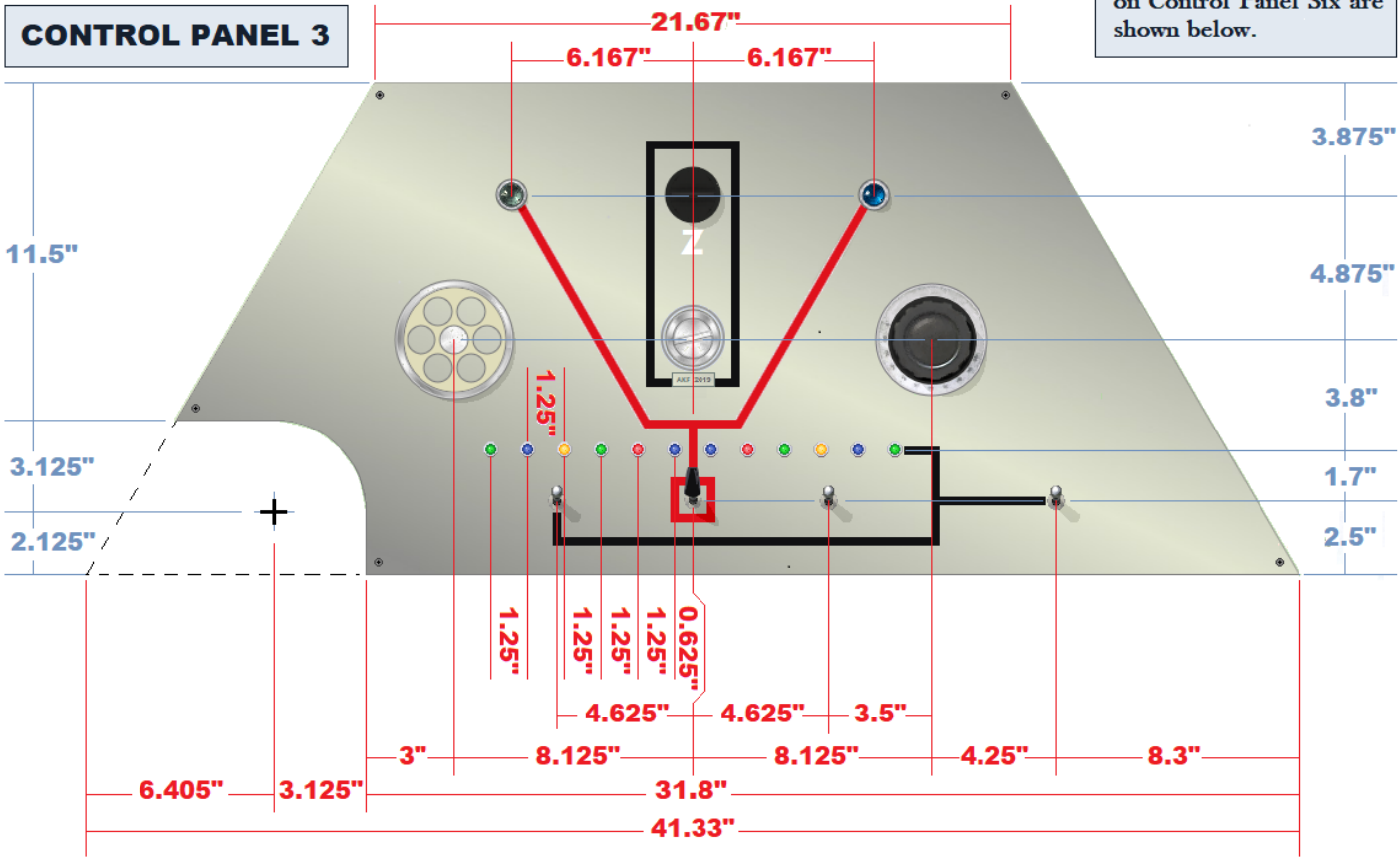
CONTROL PANEL 2



Each of the metal plates should be made from the same satin aluminium as the console's other metal trims. They should all be cut from 0.125 inch thick sheet metal.

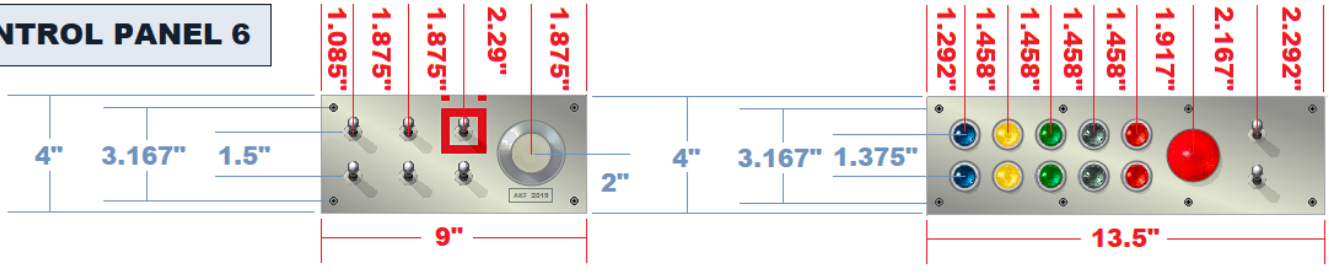
Both the original and the replacement version used on Control Panel Six are shown below.

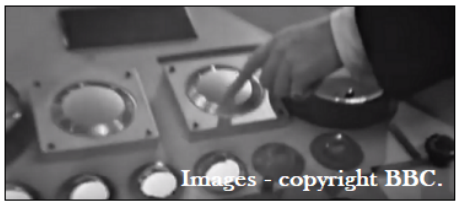
CONTROL PANEL 3



"+" on the diagram for this panel indicates the centre-point for both the 'symbolic indicator lamp' & the arc cut in the metal plate.

CONTROL PANEL 6





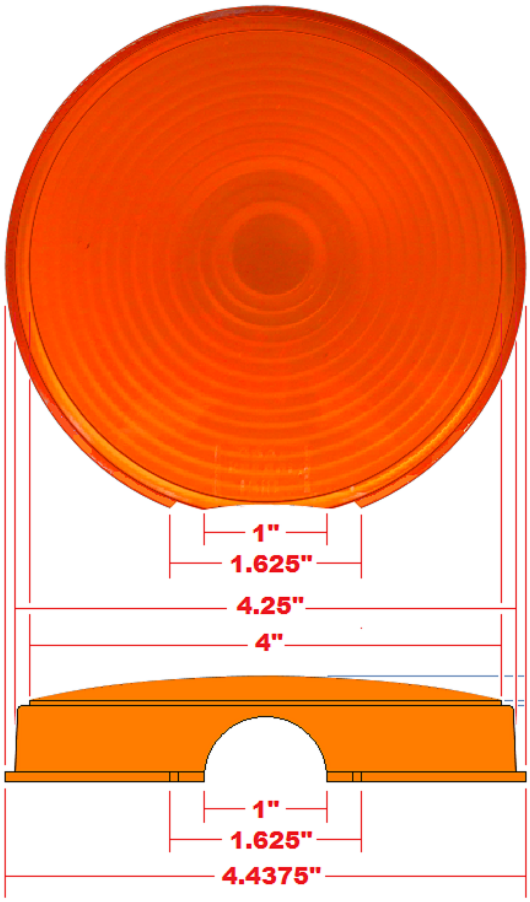
Images - copyright BBC.

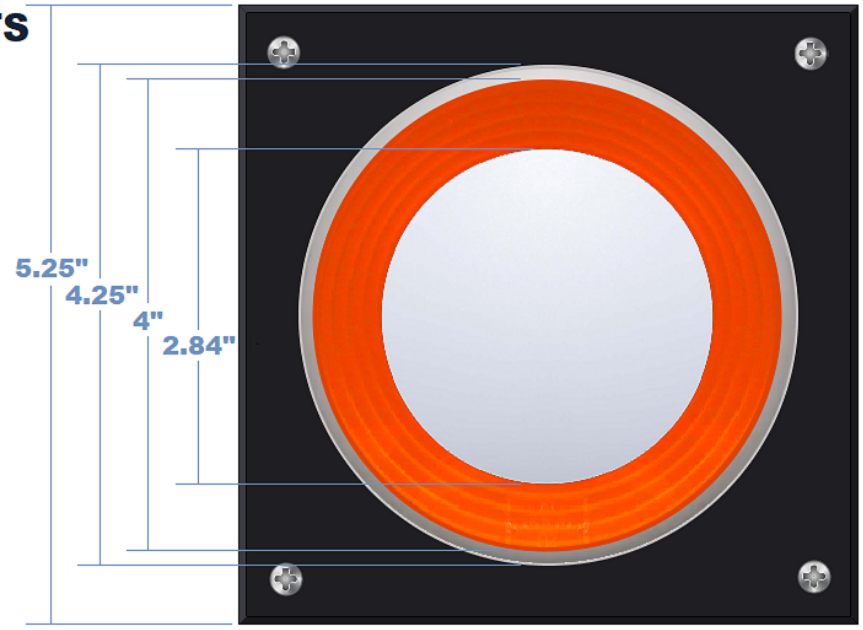
Left: The Doctor uses the "Telepathic Circuits" to ask the Time Lords for help in the opening moments of 1973's "Planet of the Daleks".

Like the main meters, the Telepathic Circuits were also retained from the original console; their casings were now painted black rather than silver-grey. As with many of the controls, the Telepathic Circuits were constructed from commercially available parts - in this case the lenses utilised were Butlers 1518 (side) lenses which are still available today.

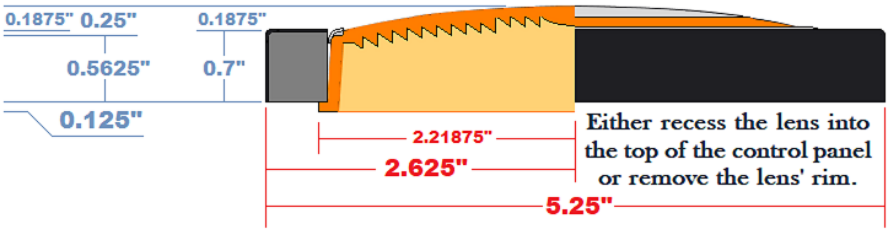
As the opening moments of 1964's "The Sensorites" show, inside each unit was a series of lamps which were wired, or programmed, to flash in sequence creating the illusion that a single light was rotating in an anti-clockwise direction underneath each amber lens.

THE TELEPATHIC CIRCUITS





'CUT-AWAY' DIAGRAM SHOWING INTERNAL STRUCTURE OF LENS & RELATIONSHIP OF THE LENS TO THE SQUARE HOUSING

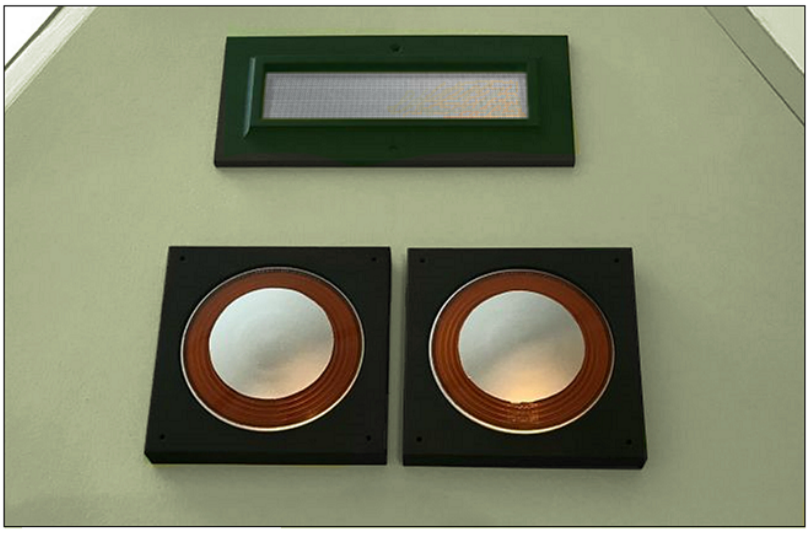


Either recess the lens into the top of the control panel or remove the lens' rim.

The dimensions stated for the lens were taked from a pair of genuine 1960s "Butler 1518 (side)" lenses.

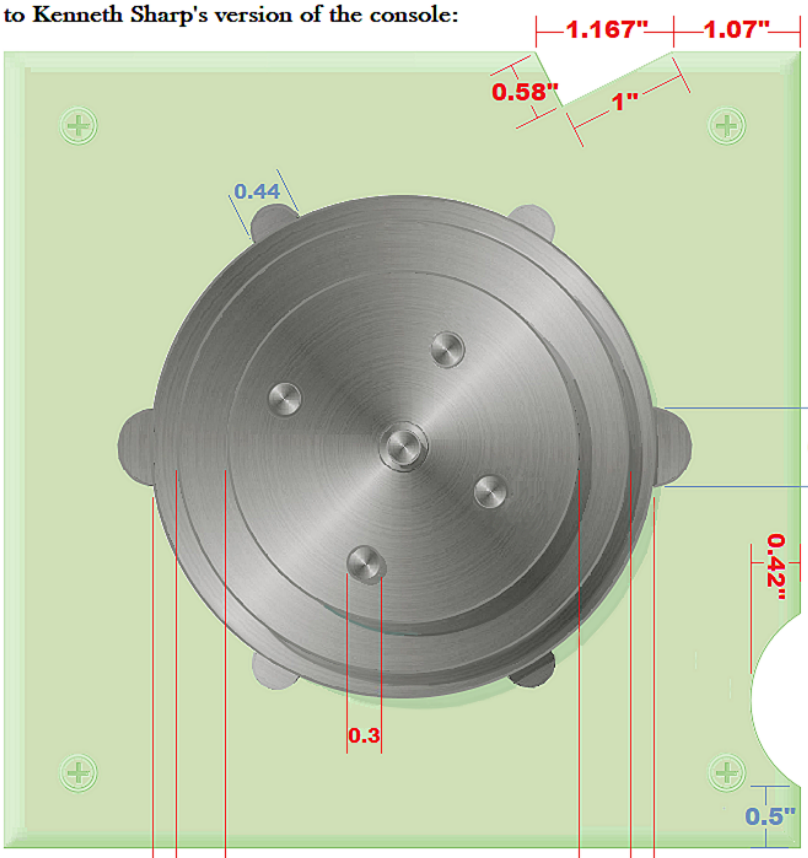
As with the 'Symbolic Indicator Lamps', the careful use of a low-tack tape can be used create a 'mask' to allow the painting of the central circle and to mimic the outside metallic rims which were fitted around the original Telepathic Circuit lenses.

Below & right: Re-creating the Telepathic Circuits.

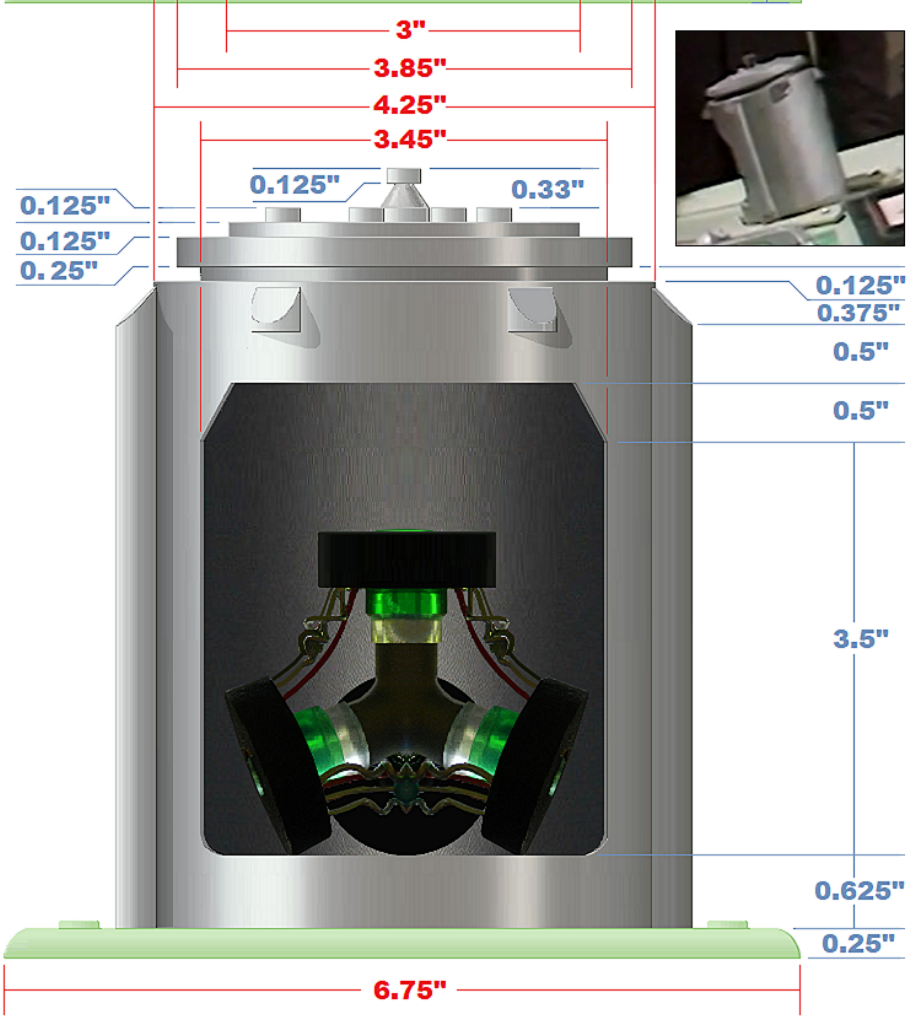


THE DEMATERIALISATION CIRCUIT'S HOUSING

In this - the final page covering the TARDIS' controls - we return to where we began with the first ever 'script-driven' change made to Kenneth Sharp's version of the console:

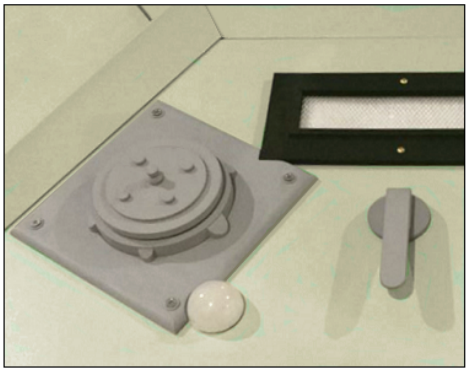


Consisting of a square base-plate & a metallic tubular holder for the actual Dematerialisation Circuit itself, the housing was fitted for episode 4 of "The Claws of Axos". Designed to be raised and lowered, on either side of the metallic tube are two semi-circular guides or stanchions which hold the unit in place - two semi-circular 'notches' are cut into the square base to take these guides. Four sloping-topped, semi-circular, stops are spaced evenly around the tube's rim to prevent it from completely sliding into the control panel.



Above: A comparison between the original housing for the Dematerialsation Circuit & the still-to-be-painted, 3D-printed, replica.

Below: The housing has been primed ready for final painting & is test-fitted on Panel 6.



THE CONTROL PANEL GRAPHICS

ALL CONTROL PANEL GRAPHICS ARE DRAWN AT ACTUAL SIZE (SCALE 1:1)

1:6 2

"FUTURA BOLD MEDIUM"

AOE7<>8

"FUTURA DISPLAY REGULAR"

0·100 3

"FUTURA BOLD MEDIUM"

KP'(≡) ANO A-E

"FUTURA DISPLAY REGULAR" "COMPACTA BOLD CONDENSED"

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"COMPACTA BOLD CONDENSED"

n·c
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2
00

"FUTURA DISPLAY REGULAR" "FUTURA BOLD MEDIUM"

ABS.4

"FUTURA DISPLAY REGULAR"

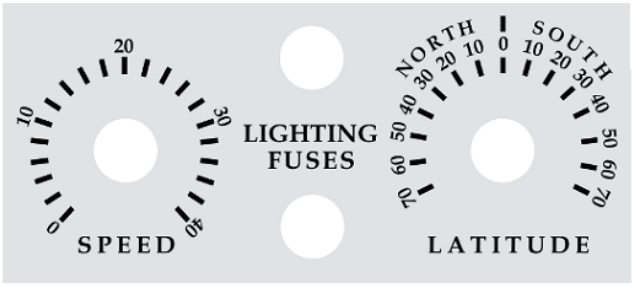
1 2

"COMPACTA ICG"

M»I

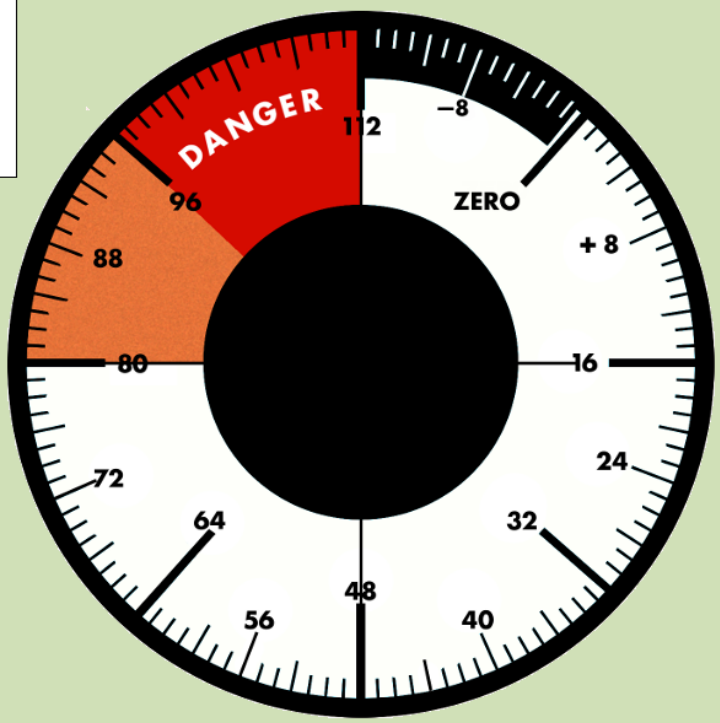
"FUTURA CONDENSED"

Below: Diagrams showing the later graphics which were added to Kenneth Sharp's console. Please refer to pages 22 & 23 - "The Controls - A Chronology of Change".

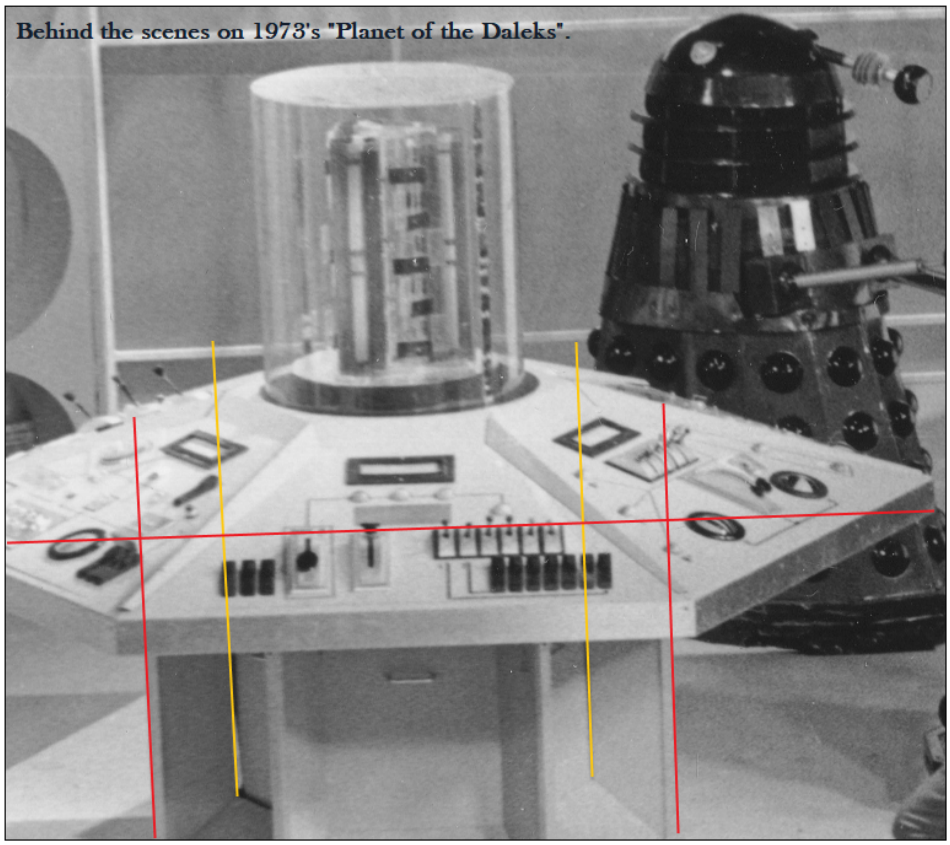


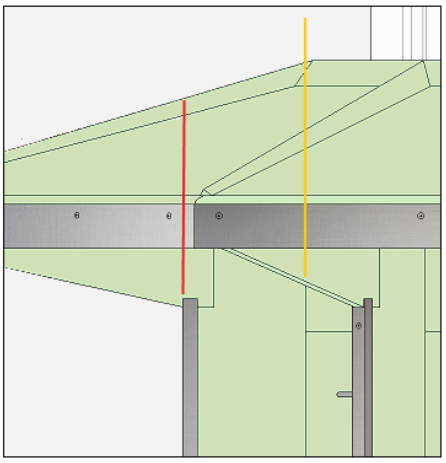
Left: The 'Lighting Fuse Decals' added for "The Curse of Peladon". Below left & below: The 'Extreme Emergency Switch' & the 'Time Ram Dial' made their first appearance in "The Time Monster".

"FUTURA BOLD MEDIUM"



RELATIVE DIMENSIONS IN SPACE


Behind the scenes on 1973's "Planet of the Daleks".



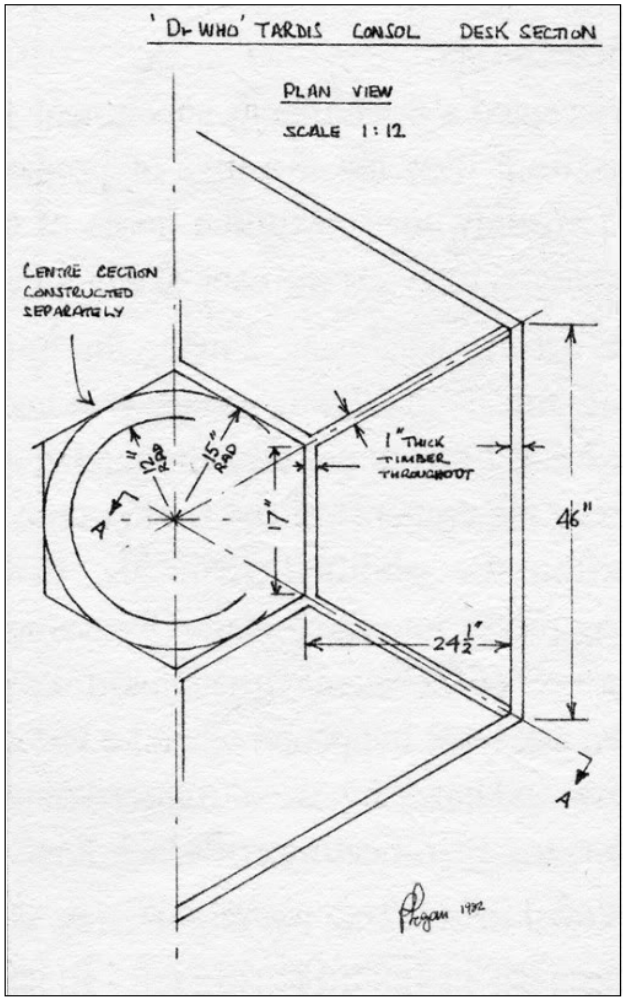
In the introduction, it was stated that one of the aims of this article was to re-create screen-accurate plans for Sharp's console i.e., if followed, these plans would result in a truly accurate, faithful, reproduction of something which was destroyed a long time ago.

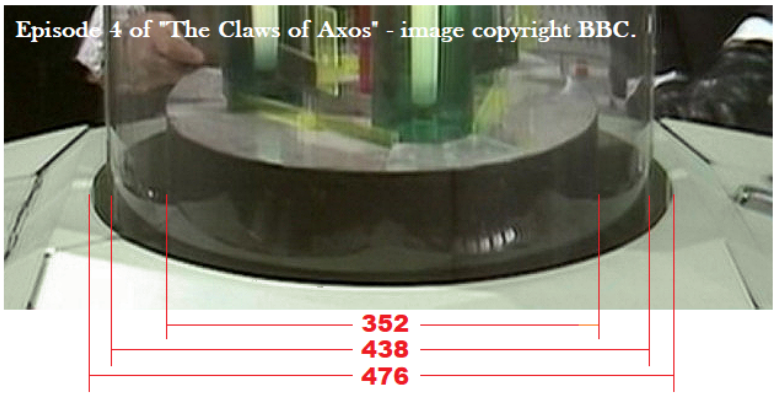
If the plans from 1971 still exist, they are yet to emerge into the public domain. So, how is it possible to re-create plans which qualify as 'screen-accurate'?

All spatial dimensions are relative to each other; on the left, the relationship of the console's collar to the inside edges of the plinth's vertical supports has been highlighted in yellow. As shown above, the collar's sloping edges lie half way over the inside edges of the plinth's uprights. The red lines show the relationship of the plinth to the 'table' section. Once the width of the table section is known, the width of the plinth can be calculated.

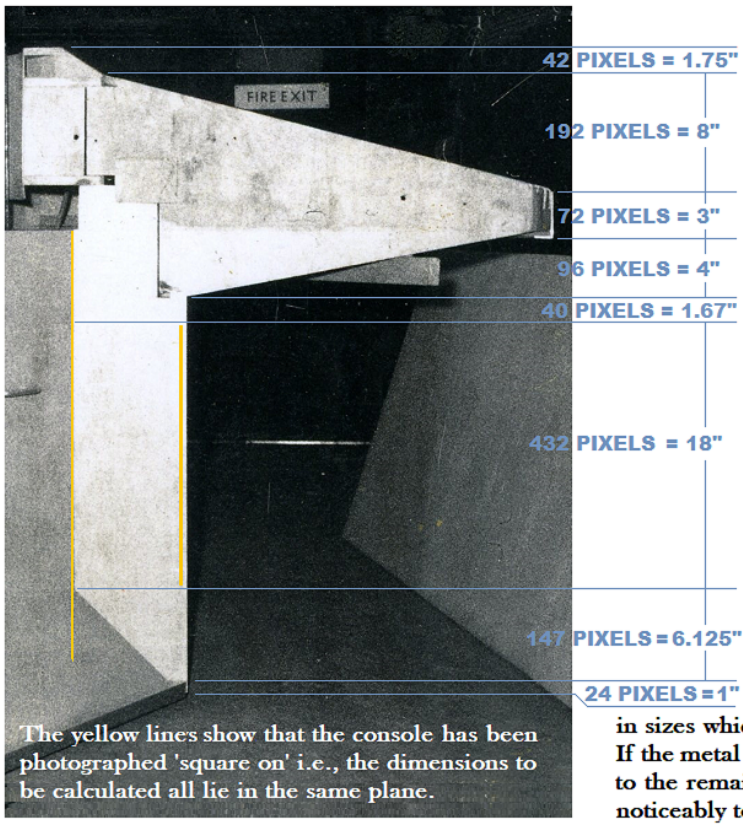
To be truly accurate, the comparison of the console's components has to be repeated using multiple sources but - hopefully - the principle is clear from this example.

The relative dimensions of the console's component parts can also be established using the same methodology. In the example seen below, the relative diameters of the collar's cylindrical opening, the acrylic central column and the internal circular black base are compared by counting the number of pixels in each component's width:





It is the relative size of each component which is important at this stage and not the unit of measurement; the internal black base's diameter is 352/476ths of the diameter of the collar's circular hole. As soon as one diameter is known, the others can be calculated. If the hole in the collar is 24" in diameter, then the black base's diameter is 352 divided by 476 = 0.7395. 0.7395 x 24" = 17.75". What is needed is a known dimension and here, a debt of gratitude is owed to Peter Logan & Steve Cambden.



The yellow lines show that the console has been photographed 'square on' i.e., the dimensions to be calculated all lie in the same plane.

Peter Logan's drawing of the console's 'table' or 'desk' section appears in Steve Cambden's highly recommended 2001 book "The Doctor's Effects" and is reproduced here solely in order to establish the "known dimensions" from which the "missing" dimensions can be calculated.

Peter Logan worked as the visual effects designer on various Doctor Who stories such as "Destiny of the Daleks" and "The Keeper of Traken". Significantly, Logan had earlier worked on "Inferno" and "The Claws of Axos" - the productions which saw both the final appearance of Brachacki's console and the first appearance of Kenneth Sharp's version.

Though obviously an 'extract' from a much fuller description of the Sharp console as it was in 1982, Peter Logan's 'partial' drawing does provide us with a few 'known dimensions' from which the remainder can be derived.

The table section's timber framework is made from 1" thick pieces throughout, the outside edges of the hexagonal table measure 46 inches. The collar is described as a separate unit with outer edges which are 17" long whilst the central column rises and falls within a cylinder which is stated as having a 12" radius.

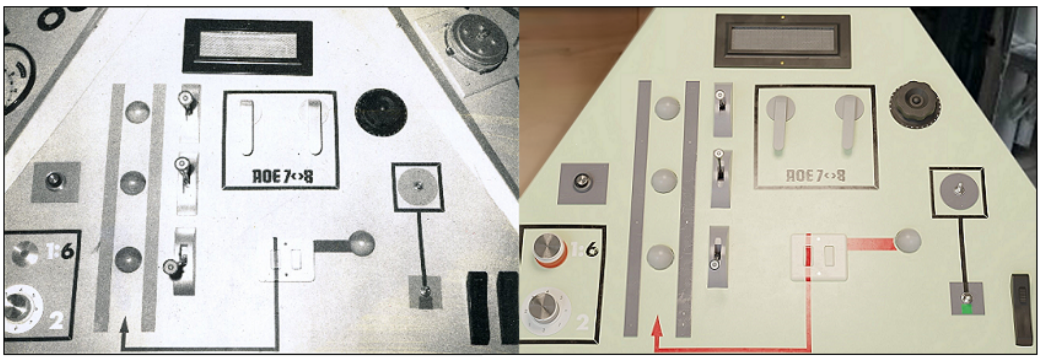
In order to determine the console's vertical dimensions, again, a known dimension is needed: In the UK, an eighth of an inch thick, square-section, metal channel has only ever been sold in sizes which increase by 0.25" increments i.e., 0.5", 0.75", 1", 1.25", etc. If the metal trim is anything other than 1" wide, then comparing this width to the remainder of the console, would result in the console either being noticeably too tall or too short when compared to its surroundings.

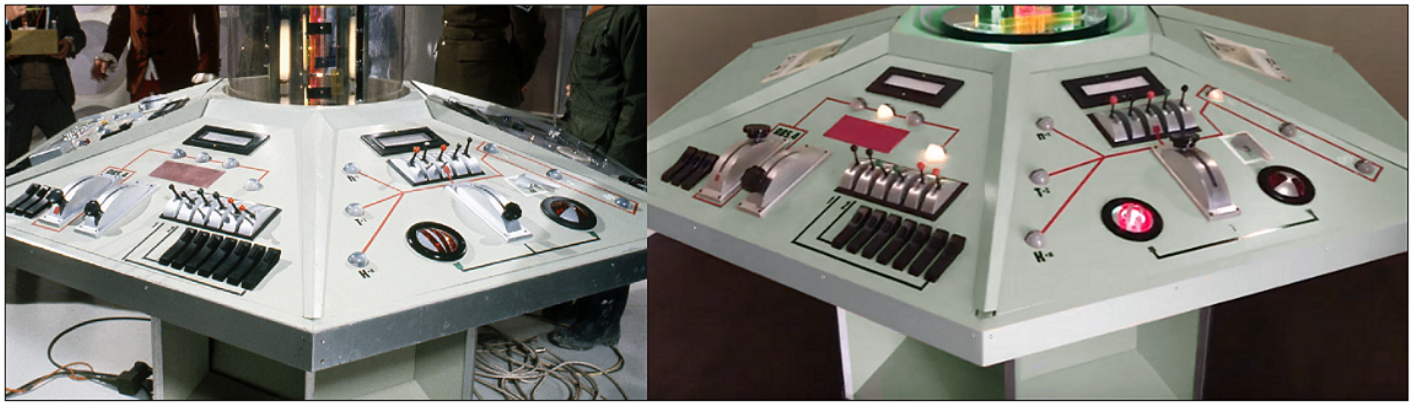
Above: Comparing the height of the plinth's bottom metal trim to the remainder of the console. Note, the photo has been taken 'square on' and the vertical dimensions all lie in the same plane i.e., they are all the same distance away from the viewer. There is no discernible 'camera lens distortion' and, as the vertical yellow lines show, there is no 'perspective distortion' either. Were we to look up at a skyscraper, even though the building is vertical, its sides will appear to taper inwards the further up we look & each storey will also appear to get progressively shorter; this is what is termed 'perspective distortion'. The angle at which the photo has been taken is therefore crucial to accurately establishing the 'missing' dimensions - the camera needs to be square on to the object being photographed. Because there is no perspective distortion, we can be confident that a known dimension will appear to be the same height no matter where that dimension lies in the vertical plane: If an inch equates to 24 pixels at the bottom of the console, one inch still equates to 24 pixels at the top of the console. Again, this process has to be repeated using multiple sources.

Once the widths and heights of the console's component parts have been established, the dimensions of the control panels can be calculated: The widths of both their top and bottom edges have been stated by Peter Logan and the height of their sloping surface has now been established which, in turn, means that we can now calculate the angle at which the panels slope and - therefore - the length of each panel as well. The final stage is to carefully compare the various controls with each other and to the control panels.

Right and far right:
Control Panel One as it was at the start of May 1972 and the re-created version.

Below and below right:
Control Panels Four & Five as they appeared in 1973's "The Three Doctors" and - for comparison - the newly completed re-creations in place on the console.





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Above all, thank you for reading. We hope that you have been inspired to build your own TARDIS Console!