

CHAPTER FIFTY-SIX

THE CONSTRUCTION OF LOCALLY MADE REHEARSAL DRUMS PAD

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Abstract

This study addresses one of the main issues of development in the Nigerian music industry. Unless treated insouciantly, the lack of skill to construct locally made instruments of equal quality and for the same use as that of western instruments is a limiting factor in the development of the Nigerian music industry. This study is all about creating a comprehensive, detailed and workable solution to this challenge. This work attempts to break the barrier by constructing a western musical instrument with locally sourced materials. The instrument chosen as a case study is a “practice pad”. This paper gives a background study on the developmental stages of drum sets, types and uses. This documentation, if favourably considered by the government can be improved, perfected by specialists and funded by the government. By so doing, it may turn out to be the start of a new era in the technical arm of instruments making and eventually bring about the exportation of quality locally made instruments of western pedigree.

Keywords: Nigerian music industry, construction of instruments, locally made materials and Drum pad.

Introduction

This project work attempts to give detailed information on the evolution of the drums pad from its mother instrument which is the drum set, otherwise referred to hitherto as trap set or drum kit. The drum set that is known was not just invented; it came about as a result of the coming together of different percussion instruments. Individual percussion instruments such as the snare, bass drum, tom-tom (usually two), cymbals etc. were played separately in the military orchestral band. As music matured through time, there arose the need for one drummer to play several units of these percussions at the same time. Hence, the birth of what we now know as the drum set.

This project analyses the various stages of percussion development is highlighted, from the military orchestral to the big band era, the style of music that gave birth to the Ragtime, the jazz era, then the progressive thinking of drummers in these developmental stages to create the full drum set. This documentation has a comprehensive detail of what the drum set and drum pad kit is all about.

Drum kit: The Musical Instrument

A drum kit, drum set or trap set is a collection of drums and other percussion instruments set up to be played/struck by a single player. The traditional drum kit consists of a mix of drums (classified classically as membranophones and idiophones. A standard modern kit (for a right-handed player), as used in popular music and taught in many music schools, have different components which includes

- A snare drum, mounted on a stand, placed between the player's knees and played with drum sticks (which may include rutes or brushes)
 - A bass drum, played by a pedal-operated by the right foot
 - One or more cymbals played with the sticks
- All of these are classed as non-pitched percussion

Historical background of the Drum kit

Drum set or trap set came about by the putting together of more than one instrument which first started in the year 1865 marking a significant date for drummers and their instrument because of the combining of multiple drums. In military and orchestral music settings, drums and cymbals were traditionally played separately by one or many percussionists. The bass drum, snare drum, cymbals, and other percussion instruments were all played using hand-held drum sticks the practice generally referred to as Band set. The progressive thinking of drummers at this time brought the concept of having one drummer to do the job of multiple percussionists. The first breakthrough in this direction was Double-drumming where a single drummer can play the bass and snare with sticks, and the cymbals to be played by tapping one's foot on a 'low-boy'. With this approach, the bass drum was usually played on beats one and three and the music was designed to assist large groups of soldiers march. This simple drumming approach eventually led to the birth of ragtime music due to the simplistic marching beats becoming more syncopated, resulting in more of a swing and dance feel. The drum set was referred to as a "trap set" and the drummers were referred to as "trap drummers" from the late 1800s to around the 1930s.

As early as 1840, experimentation with foot pedals began. It became a standard for drummers to use what was called an "overhang pedal." Most drummers in the 1870s preferred to do double drumming without any pedal at all as a way to play multiple drums, rather than use an overhang pedal. Brushes were introduced in 1912. The need for brushes arose due to the ongoing problem of drummers playing overshadowing the other instruments on stage.

Drummers in this period began using metal fly swatters to be able to reduce the volume on stage next to the other acoustic instruments, while at the same time being able to play the rudimental snare figures and grooves they would normally play with drumsticks. As brushes gained popularity, the drum companies of that day started manufacturing these metal fly swatters into what would eventually become named and known as, brushes.

Evolution of the practice pad

A time came in the history of drumming that drummers, amateurs and professionals wanted an extended practice time. They want limitless rehearsal time, private rehearsal sessions away from group or band rehearsals perhaps to perfect what they had done earlier at band rehearsal. To do this, there is a need for a full set of drums that will eliminate noise and disturbance and allow for any time of the day rehearsal, hence the invention of the drums pad. The drums pad is an imitation drum, designed to play and feel like a drum, without making a lot of noise. They are usually small and lightweight, making them very portable and handy to have around the house so you can practice. A practice pad can easily turn into a drummer's best friend.

A Practice Pad, or Drum Pad, is a type of percussion implement utilized by drummers and percussionists to quietly practise or warm-up before a performance. In recent years, a variety of types of practice pads have been designed to assist percussionists. These implements may commonly include the use of either an actual disk of Mylar or a similar element (equivalent to the material used in the construction of true drumheads). This typically is stretched over an underlying buffer, affixed by way of a rim of metal or plastic to an underlying rigid surface to approximate the stretch and reflection similar to that a true drumhead when struck Many more

modern devices utilize a thin layer of elastomer, such as natural gum rubber or synthetic rubber equivalent consisting of various densities as a playing surface. This type of rubber surface, (having become a significant standard appliance when fabricating most modern practice drum pads), is either placed directly over the top of an existing drumhead in some form or adhered onto the top of a dense and flat substrate (usually wood) allowing for the material to reflect a drumstick or mallet after being struck which generally bears a response and "feel" to the players that are similar to that of a true drumhead.

Literature Review

Since this work is considered an invention, there were not many documents that give a guide or full direction on how to construct a drums pad locally. The only useful information available is that of the electric drum set because there are some similarities in the methods employed in constructing these instruments. Procedures for constructing the electric drum set are very different from the ones used in constructing this local drums pad set. Nevertheless, some steps are similar. This chapter of the project contains some of the construction techniques employed in building foreign drum kit instruments.

The choice of materials used in the construction of this locally made drums pad is melaina wood on which a Marco 8 is laid as padding. Some foreign instrument builders do it differently using different materials. Some use Medium Density Fibre (MDF) board in place of the melaina wood. They also use a purple laminate (Formica) for the shell of each drum disc after cutting. Some also use green glues soundproofing compound with the Medium Density Fiberboard layer to create a damping effect. Their choice of materials is to no end. According to Djibout Mala (2006) he opined that:

The Green Glue compound's unique properties act as a damping material, which dissipates vibrations caused by sound waves travelling through linked solid structures such as floors, ceilings and walls.

This is a typical model of materials used by some of these manufacturers

- Three 18 x 2400 x 1200 mm MDF boards.
- Two tubes of Green Glue, plus applicator gun.
- High-density Class-O acoustic foam sheets (25mm) or RW5 high-density Rockwool (75mm).
- Some 35mm MDF screws.
- A drill and a jigsaw.

Since the invention of the practice pad, many attempts are being made to develop the instrument for efficiency and durability. To achieve this, drum makers have come up with a series of materials for production. Drums makers use a variety of wood species for drum heads. Wood is the best choice for drums because of its natural ability to produce a good tone. Mike Radcliffe (2017) opines in his publication on drum shells that; "The harder and denser a material is, the more evenly it will vibrate. When it vibrates evenly and as a whole, it helps to create even tones when struck" For wood to be considered economically feasible for mass production, it must be inexpensive, workable and attractive. Some of the wood that fits this category are: Maple, Birch, Beech, Poplar, Ash and Mahogany (or Luan) Popular padding material used for the drums pad is called neoprene. Also called polychloroprene is a family of synthetic rubber produced by polymerization of chloroprene. Neoprene exhibits good chemical stability and maintains flexibility over a wide temperature range. In an experiment to test for material suitable for padding, Alex Rigopoulos, (2005) of Harmonix music system, made the following statements, "Elastic pads and the materials they are made of one a balancing act. The thicker the pad, the wood the reduction in sound"

Alex Rigopulos believes that Neoprene and latex has a sturdy feel and that Gum rubber 1/16 and 1/8 seems to be the best option. The different types of sticks used are also to be considered. Anti-vibe sticks are the quietest, producing subtle sound followed by the lighter 7As. The 5As and 5Bs are the loudest. The price of a six-piece drum kit ranges from \$69.9 – to \$731. 98. Different drums pad kits come with different features such as real-feed touch, rebound sensitivity, etc. Gene Okamoto (2008) of pearl drums in his review of the trend in the market price of drums pad commented that; “The continuous improvement on the drums pad and addition of various amazing features is responsible for the wide range of prices. Nevertheless, any drummer will find a suitable drums pad at an affordable price”

The construction Process

Tools for construction

The following tools are used for the construction of rehearsal drum pad: step down transformer, screwing machine, extension box, sandpaper machine, grinding machine, jigsaw, 3 – in – 1 spanner (13mm, 8mm and 10mm), pinchers, electric plain machine, circular saw, hammer, pliers, chisel (1/2 inch and 1 inch), filing block, scissors, pencil, set of sandpapers, tape rule, brush and jigsaw blade.

Materials for construction

The following materials are used for the construction of rehearsal drum pad: efostic gum, Solegard lacquer, Abro thinner, Corasyn sandy sealer, Batummy, Top bond, Foam, Pole/packing case, 1-inch plywood, 1/2 inch plywood, Engine oil and Galvanize rod.

Procedures for Constructing Locally-Made Drums Pad

The technique and constructional processing of locally made drums pad give room for its production in various sizes and shapes. Also, it is more comprehensible when compared to the construction process of foreign-made drums pad. As a music technologist, that is craving for the production of foreign-made musical instruments locally this following technique and procedure will be of great advantage.

1. Cutting

Begin with the cutting of the various components of the drums pad set. But before that, the equipment/tool with which to cut should be decided. In this case, a jigsaw machine was used. The blade is fixed to the mouth of the jigsaw machine and tightened with a multi-mouth 2 screwdrivers.

Cutting the Toms

Tom 1:-

Cut a dimension of 8inch x 8inch circular shape on the 1/2 plywood having traced the shape before cutting.

The thickness of plywood used - 1/2 inch

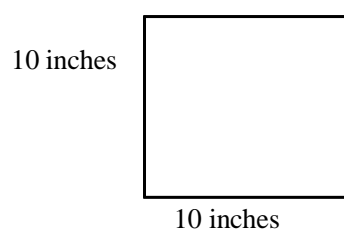


Diagram 1

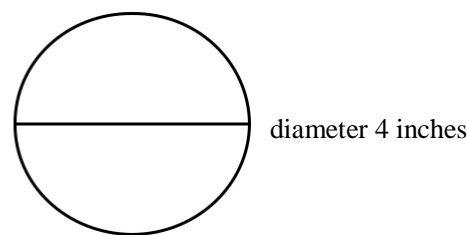


Diagram 2

Tom 2:-

Cut a dimension of 9 ½ inch x 9 ½ inch circular shape also on the ½ inch plywood.

The thickness of plywood used - ½ inch

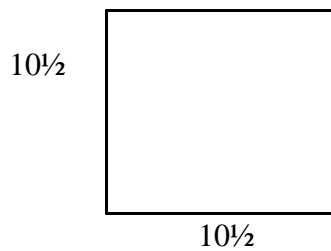


Diagram 3

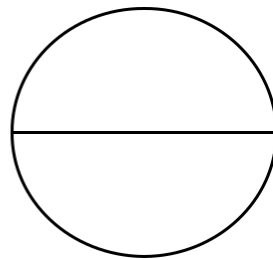


Diagram 4

Cutting the Snare

Cut a dimension of 9 ½ inch x 9 ½ inch circular shape on the 1-inch plywood with the jigsaw machine to get the snare.

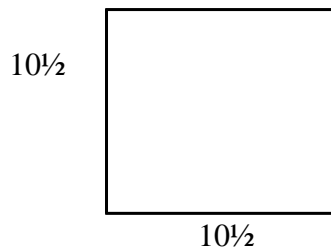


Diagram 5

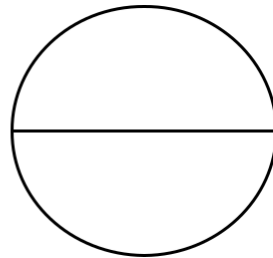


Diagram 6

Cutting the Floor Tom

Cut a dimension of 9 ½ inch x 9 ½ inch circular shape on the ½ inch plywood.

Thickness of ply wood used - ½ inch

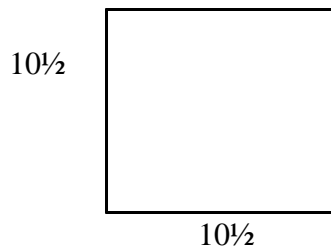


Diagram 7

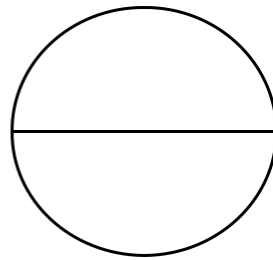


Diagram 8

Bass Drum

Thickness of plywood used - ½ inch

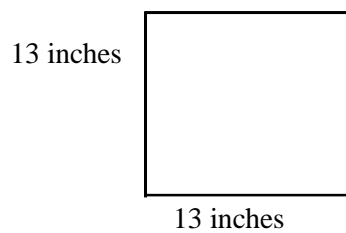


Diagram 9

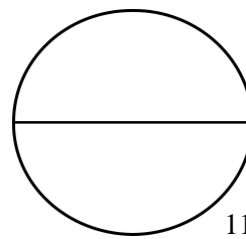


Diagram 10

The Floor / Base Support

The dimension of the foot is $17\frac{1}{2}$ inches x $9\frac{3}{4}$ inches. It can be designed into any shape of choice.

A $5\frac{2}{3}$ x $3\frac{1}{2}$ inches is cut out to house the pedal. The thickness of the marine wood/packing case is 11 inches.

A hole is drilled to house the screw that will be used to tighten the tension on the pedal.

The Radius Of The Wooden Discs Are Listed Below:

1. Tom 4 – 4 inches
2. Tom 2 – 4.75 inches
3. Snares – 4.75 inches
4. Floor tom – 3.75 inches
5. Foot – 8.75 inches
6. Bass drum – 5.75 inches



Fig. 1: Cutting the Wooden Drum Discs from the 1 & 1/2 Inch Plywood

Working on the Pole

The first thing to do on the pole is to decide where to use as the top, front, bottom and back of the pole. From the upper side of the back, measure 7 inches downward. This is the spot where the snare and the toms connect. The breadth of the pole is 5 inches. Measure $\frac{3}{4}$ inches towards the middle from both ends. The shoulder of the pedal is usually between 6 – 7 inches, a choice of $6\frac{1}{2}$ inches in size can be made. Note: Since the breadth of the pole is 1 inch, measure about 0.9 inches for the iron to be fixed to not slack. The pole/packing case is marine wood. The diameter of the pole is as follows:

Length – 23 x 5 inches

Thickness – $5\frac{1}{2}$ x $4\frac{1}{4}$ inches

Grinding/Smoothing

The main tool used for effective and stress-free smoothing is the sandpaper machine which

comes with an option of the sandpaper to be used, whether rough or smooth.

1. Fix the rough sandpaper on the sandpaper machine.
2. Plug the sandpaper machine into a D.C power output.
3. Place the wooden disc on the workbench, in this case, the tom 1.
4. Hold down with the clamp and begin grinding and remove the rough surface on both faces of the disc including the circumference.
5. Further, smoothen one particular side of the disc with smooth sandpaper.
6. Repeat the same procedure for all wooden discs; the tom 2 snare, bars and floor tom.
7. Smoothen also the pole thoroughly.

PADDING

Before padding, we use the dimension of each drum disc to cut off a complimentary size of Marco for each drum head that is; the toms, snare, bars and floor tom.

Note:- During smoothening, a particular facet of the drum disc is smoothened than the other, this part of the disc is where the *efostic* gum will be spread to hold the Marco to the drum disc.

- (1) Spread the *efostic* gum on the drum disc in this case the tom 1 and also the Marco size for tom 1.
- (2) Allow drying for about 2 minutes.
- (3) Place Marco on a wooden disc carefully and gently beat with a mallet for it to hold properly.

Note: - Be careful when placing Marco on the disc in order not to misplace it. If Marco is not placed properly on the disc, it may result in swelling which will turn to cause the drum to give a damp sound.

- (4) Repeat the same procedure for the tom 2, and snare drum.

Laying the Foundation and Padding of the Floor Tom and Bass

- (1) Cut a thin strip from the half-inch, Marco.
- (2) Add some gum the one side of the Marco strip.
- (3) Add gum also to one part of the bass and floor tom disc.
- (4) Place the thin Marco strip around the circumference of the drum disc on the more smoothened face.
- (5) Leave for about 2minutes for the wood and Marco strip to dry.
- (6) Cut a 1-foot high foam complimenting the size of the bass and floor tom.
- (7) Place the foam within the circumference of the Marco strip.
- (8) Place the 1-inch Marco on the circumference of the Marco strip containing the 1-foot foam.
- (9) Beat with a mallet to hold down.



Fig. 2

**Wooden Disc with
Marco Strip
and Padding Foam**

Making a Potty Filler

A potty filler is used to fill holes in wood that may be natural or infected during cutting.

A potty filler is made by mixing top bond with batumy.

- (1) Add a suitable amount of top bond to the batumy.
- (2) Mix properly until even.
- (3) Apply the putty filler to every part where there may be a hole.



Fig.6 Five Drum Discs

Coupling

The short metal rod which attaches the padded drum leads to the pole or packing case is called a galvanized iron. The galvanized iron used to attach the drum disc is of different lengths and they come with screws attached to them. Before coupling, a short hole is drilled at the back of each drum disc exactly at the centre where the galvanized iron will be fixed at the back of each drum head and tightened down with screws.

The different types of screws available are:-

1. Silver screws – flat screws 2½ inches
2. Black screws – ¾, 2 inches
3. Screws with washers.
4. Centre screws – 4 inches long.

It is used to attach the top of the pad to the pole.

Screwing Process

- (1) Place the iron plate on the drilled holes.
- (2) Use a black screw to hold down.
- (3) Further drive in screws with a screwing machine.
- (4) Repeat the same process for all wooden discs except the bass.

Fixing the Bass Drum

- (1) Fix the foot to the packing case with 3 inches screw from under to attain balance for the pole.
- (2) Continue by fixing the bass drum on the part provided for it on the pole, that is; the dimension drilled for it in size and thickness on the pole.
- (3) Fix the bass drum and force its entry with a mallet until it's in place. Fixing the Tom 1, Tom 2 and Snare to the pole.
To fix the other drum discs, use galvanised rods.

The Galvanise rods are different sizes:-

- 12 inches galvanise rod is for the snare.
- 15 inches galvanise rod is for the floor tom.
- 6 inches galvanise rod for Tom 1 and Tom 2.

The placing of the drum heads on the pole is dependent on the choice of the player or builder. But generally, Tom 1 and Tom 2 are usually of the same length.

Different screws are used to attach different drum heads to the pole.

- (1) Silver screws of 2½ inches are used for the Tom 1 and Tom 2.
- (2) Screws with washers are used for the snare and floor tom.
- (3) Tighten screws with the screwing machine.



Fig. 3Drums Pad Set Assembled

3.4 Aesthetics

Beautification is dependent on the builder of this instrument. But it is advised that any beautification that will alter the natural colour of the wood or sound production should be avoided.

- (1) One may choose to paint the galvanised iron.
- (2) On the packing case, it is advised to add thinner with the natural colour to beautify and prevent insects from investing in the wood.

Methodology

The research method employed in this documentation is practical and technical. The problem which is addressed is considered empirical since there was little information as to how to construct a drums pad set locally with the available materials as the ones used in this work. This work may therefore be said to be an invention.

Acoustic Consideration

The following considerations were made on acoustics.

1. Acoustically, consideration should be given to the equality in sizes of the snare and floor Tom in contrast with the thickness. Since drum heads have equal sizes, there is a tendency that there would be no difference in pitch. This is why the floor tom and bass was padded with a 1-inch foam.

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Findings

In the course of this research, the following facts were gathered.

1. The construction of a locally made drum pad is regarded as almost practically impossible due to the lack of technical knowledge and adequate materials for construction.
2. There is an increase in demand for drums pad since there is an increased awareness worldwide of music and Nigeria is not an exception. It was discovered that a great number of drummers has emerged in Nigeria. Therefore, there is a demand for a practice pad for skill-building or acquirement.
3. Most Nigerians believe that locally made products are inferior in quality, this might have discouraged people from engaging in such a project as constructing drums pad locally.
4. The exchange rate is a big issue impeding Nigerian drummers from purchasing foreign drums pads.

Recommendations

Concerning these findings, the following suggestion may be useful.

The government can use this research work to propel the construction of drums pad locally by investing heavily in technical education and also taking such projects to technical colleges, polytechnics, and other institutions to discover students in the potential technical abilities. It will in no small way generate employment to the unemployed youth particularly, the polytechnic graduates that are technically oriented. The music industry will most benefit from this, as the prices of locally made instruments will be reduced.

In areas where an improvement is needed, professionals can be invited to assess and review the work. The end project is most likely to be a standard and quality drums pad. This quality product is a result of such a review that will convince Nigeria that standard products can be made locally. The end product can also serve as a source of export to nearby countries.

Conclusion

While some manufacturers use high-quality padding and trapping materials such as rock wool for trapping low-frequency sound, some use exotic adhesives such as green glues and spray glues. For this research, the materials used are the available ones. Some even make drums pad with materials from wood to metals. Most of these instrument building ideas had brought innovation in different ways towards the construction of the practice pad set.

The practice pad on which this project is all about was constructed within the country with materials sourced locally. The technical knowledge and invention ideas were all original. Nevertheless, some guidelines were cited from some sources and were duly referenced.

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