

Pilot Knob Missionary Baptist Church, Bobtown, Kentucky. Photo by Jan Faul

HOW TO MAKE AN APPALACHIAN DULCIMER

Hank Levin

material.

In the late thirties Rev. W. Herbert Brewster of Memphis, Tennessee, composed "How I Got Over" and "Move On Up a Little Higher" with which vocalist Mahalia Jackson rode out of Chicago to assume a throne as the "Queen of Gospel." She was the first Gospel singer to win international acclaim, and possessed one of the greatest vocal instruments that American music has produced.

Gospel music has produced outstanding male and female soloists, trios, quartets, ensembles and choirs featuring a great variety of styles. Most notable singers are Alex Bradford, Brother Joe May and Rev. James Cleveland. Female soloists include Clara Ward, Marion Williams, Bessie Griffin, Delois Barrett Campbell and Rosetta Tharpe.

The great male groups include The Five Blind Boys, the Golden Gate Quartet, the Soul Stirrers, the Swan Silvertones and the Dixie Hummingbirds. The Ward Singers, the Caravans, the Stars of Faith, the Davis Sisters and Dorothy Love Coates and the Original Gospel Harmonettes comprise leading female ensembles. Major choirs have been the Angelic Choir, the Edwin Hawkins Singers and the Southern California Community Choir.

Gospel music continues to be a means through which Afro-Americans celebrate the mysteries and realities of their physical and spiritual existence operating through a force that can move, strengthen and revitalize the human spirit.

Behold, listen and feel.

This article is extracted from the author's chapter on dulcimer construction in the book, Dulcimer Styles by Jean Ritchie, to be published in late 1973 by Oak Publications. The complete article contains information on fretting the fingerbord, head designs, tuning pegs, body designs, faces and backs, rib bending, assembling, and finishing.

Dulcimer Styles contains many absorbing chapters on dulcimers and dulcimer people with extensive historical information and notes on playing and tuning styles, dulcimer music in other countries, "old timers," and places where dulcimers can be bought. In addition, the book concludes with a bibliography, a discography, and fifteen songs transcribed for the dulcimer.

It's fun to build a dulcimer, and it's something that anyone should be able to do. Experience in woodworking is useful, but the primary requirement is a love for the dulcimer. Some ability to play, or at least a deep appreciation of the dulcimer and her music will provide far more incentive than superficial cabinet-making skills. My good friend Dharmendra Jadeja, an Indian prince from Gujerat, built many of the instruments in use in the United States today and he had no professional knowledge of woodworking before building dulcimers!

Hank Levin, born in New York City and now living in Los Angeles, is a talented craftsman who is dedicated to the production of folk instruments.

TOOLS

The beginner may be amazed at how few tools are essential for building a dulcimer. *Don't* hesitate to begin with whatever tools might be lying around the house. *Do* go to the library and get a book on basic carpentry and become familiar with what tools you will probably end up with before you're done: coping saw with an assortment of blades (unnecessary if you're lucky enough to have access to a jig saw); a big coarse half-round file ($\frac{3}{4}$ " or 1" bastard); a fine flat mill file for dressing the frets when the instrument is done (check for flatness at the hardware store with a small steel rule—most are flat on one side, but many are flat on neither); a tapered reamer for pegs (unless you use tuning machines); a cabinet maker's scraper (you *must* find out how to sharpen and use this from a book on carpentry); sandpaper in the following grades: 80, 100, 150, 180, 200, 400, and a container of Franklin's Titebond glue.

However, the only tools above that are *absolutely* essential are the coping saw, files, and whatever grades of sandpaper you can scrounge, and of course the glue.

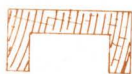
DULCIMER STYLES AND BASIC PARTS OF THE DULCIMER

By dividing the dulcimer into three sections and treating each section separately you will get a better understanding of the different styles of dulcimers. There are actually only a couple of types of head, the same of bodies, and even fewer types of fingerboards. Obviously, we will then easily understand the many possible combinations of the three!

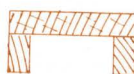
Fig. #1 Fingerboard Cross-sections



a) Easiest



b) Preferred



c) Glued (not as easy as it looks.)

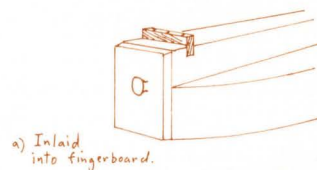
FINGERBOARDS

Most fingerboards are $\frac{3}{4}$ " high by $1\frac{1}{4}$ " wide. The fingerboard is rectangular with a "plucking hollow" cut or sanded into the top surface anywhere between the 15th fret and the bridge. The length of the fingerboard (and to some extent the length of the body of the instrument) is determined by the "vibrating length" of the strings, i.e., the distance between the nut and the bridge. The exact placement of the frets is also determined by this distance, and I will say more about that below.

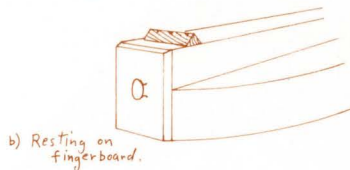
The fingerboard gives a better sound when it is hollowed out, which must be done before the frets are put in, but this is not essential on your first dulcimer. The top surface of the fingerboard must be placed perfectly flat. It may be best to have a carpenter do this on a joiner.

Fig. #2

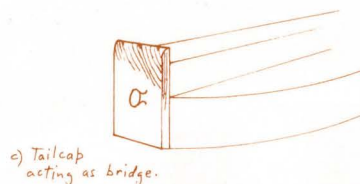
Kinds of Bridges



a) Inlaid into fingerboard.



b) Resting on fingerboard.



c) Tailcap acting as bridge.

THE BRIDGE

There are several traditional ways of placing the bridge at the lower end of the fingerboard. I've found the best sound to result from a saddle being set into a notch cut into the top of the fingerboard to receive it. A less desirable variation would be to simply place a prism-shaped bridge on the surface of the uncut fingerboard, but it will be found that if this is not glued into place it can be expected to shift constantly and throw the fingerboard out of tune. The least preferable style is nevertheless quite common. As illustrated, the tailcap is extended up slightly above the top surface of the fingerboard at its very end. It is rounded into a sort of bridge, and notched to hold the strings. Apart from being non-replaceable, it hampers the sound by transmitting the strings' vibrations directly to the most solid and least resonant part of the body—right into the tail block! For this last style of "bridge," the fingerboard and the body must be designed to end at the correct bridge distance from the nut to maintain the validity of the fret spacings.

THE NUT

The nut, which supports the strings above the fingerboard at the head end, is nearly always fit into a groove in the fingerboard as described above for the first (and preferred) kind of saddle. This groove should be just at the joint between the fingerboard and the head. It can be made of hard wood such as rosewood, or of bone, ivory, or plastic. I generally set it into a notch about $\frac{1}{8}$ " deep, and take care that it fits quite well into the notch all the way across the fingerboard, and seats all the way to the bottom of the notch. It should extend about $\frac{3}{32}$ " above the surface of the fingerboard. Later, after the dulcimer is finished, this nut will be notched to space the strings correctly and hold them just barely above the height of the frets.

Similarly, the bridge should be set into a notch about $\frac{1}{8}$ " deep, and should extend above the finger-

board about $\frac{1}{4}$ ". It will also be notched with the same string spacings as the nut, but it will hold the strings up to a height of $\frac{5}{32}$ " above the fifteenth fret when measured at that fret.

Fig. #3 Fingerboard fret scale layout for $28\frac{3}{4}$ "

Distance from "nut" to 1st fret	=	3.13	inches
" " " " 2nd	"	5.92	"
" " " " 3rd	"	7.21	"
" " " " 4th	"	9.57	"
" " " " 5th	"	11.64	"
" " " " 6th	"	12.62	"
(optional)			
" " " " 6a	"	13.51	"
" " " " 7th	"	14.38	"
" " " " 8th	"	15.96	"
" " " " 9th	"	17.34	"
" " " " 10th	"	17.97	"
" " " " 11th	"	19.15	"
" " " " 12th	"	20.21	"
" " " " 13th	"	20.67	"
" " " " 14th	"	21.56	"
" " " " 15th	"	22.34	"
Bridge saddle	=	28.83	" *

* $28.75" + .08"$ correction—see text.

FRETS

Finally, we come to the location and inlaying of frets. It is worth noting that dulcimers, as well as many guitars, are seldom in tune with themselves. This is not difficult for an accomplished musician to detect listening to the instrument played solo, but it becomes painfully obvious to nearly anybody who hears the dulcimer played in concert with another instrument. This defect is always caused by reliance on any one of a number of "folk" techniques for locating fret placement. (The most commonly recommended error is to divide the distance between nut and bridge by eighteen, subtract the result from the total length, divide again, etc., then for the dulcimer utilize the second, fourth, fifth, seventh, etc., steps to ascertain the correct locations of the dulcimer's frets. When this is done, it will be found that the octave fret does not fall halfway between the nut and bridge as it theoretically should, and this is evidenced in the simplest test for intonation—the octaves are out of tune! To cover this up, makers who out of ignorance persist in using the above method will usually hide the defect by correcting the octave fret and letting the mistake fall somewhere else. This is common on inexpensive Spanish made guitars as well as dulcimers.)

Correct fret placement is made in reference to a formula found in most musical engineering textbooks, and according to this formula I have provided a fingerboard layout correct for a calculated *theoret-*

ical scale of $28\frac{3}{4}$ ". Note that the bridge is actually located .08" further from the center of the seventh (octave) fret than is the nut. This corrects the tendency of the strings to be stretched into sounding sharp when they are pressed down to the frets. The distance from the fret side of the nut to the fret side of the bridge must therefore measure exactly 28.83".

If you plan to make several dulcimers, you will want to lay these measurements out on the edge of a piece of smooth white chalkboard, or even a strip of metal (I use the back surface of cheap aluminum yardsticks) and transfer the markings carefully onto the joined top surface of your fingerboard using a hard sharp pencil. You will need to buy a wooden drafting ruler which has a scale measuring $\frac{1}{50}$ th of an inch. When measuring, each $\frac{1}{50}$ th" mark will equal .02". (You are more likely to find such a ruler at a drafting supply shop or large art supply store than in a hardware store.)

When the correct positions of the nut, bridge, and frets have been marked lightly but accurately, use a sharp metal point (like an ice-pick) to scribe lines perpendicularly across the fingerboard with the aid of a carpenter's try-square. The fingerboard is now ready to receive the frets.*

*If you want to make your dulcimer longer or shorter, lay out the measurements I've given you on a large sheet of heavy paper along a straight vertical line. Then draw a horizontal base line across the end of that measured vertical. Now choose a point on the horizontal line as far as possible from the vertical, and from this point draw lines to the fret locations on the vertical, but extending these lines beyond the vertical if the new scale is to be longer. Now by drawing other vertical lines perpendicular to the base line you can get any size fingerboard and it will be proportionately correct and in tune.

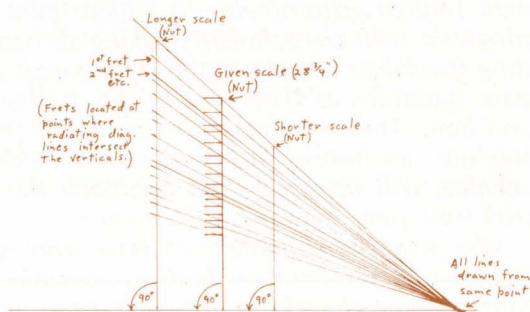


Fig. #4 How to get longer or shorter fingerboard scales from the given ($28\frac{3}{4}$) scale.