

# *BANJO CARE & FEEDING (Irish Tenor version)*

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## INTRODUCTION

While the information contained on the following pages is designed to make life a little easier for novice Irish traditional banjo players, it does not pretend to be exhaustive.

This file consists primarily of ideas that came to mind in response to queries I had come across in various areas of the Internet. As such, it might qualify more for a "FAQ" designation than anything else.

I welcome the comments and criticisms of the musical community, and will update this material from time to time as worthwhile suggestions are received.

Thanks to Bob Lusk, Mike Keyes, and Pete Strickler for their input!

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## I. BANJO TYPES

Banjos come in different shapes and sizes, and are used for different types of music. Five-string banjos are popular with bluegrass and old-time players, tenor banjos were the stringed backup instrument of choice in the early recording days and remain popular in Dixieland groups, plectrum (= long necked 4 string) banjos were also backup instruments, tuned mostly C-G-B-D; there are fretless banjos, and banjo-mandolins, and lovely little eight-string tenors called banjoloons (I own the only one!)

The banjo of choice for most musicians wishing to use the instrument for playing Irish traditional music is the tenor banjo. Tenor banjos come in many shapes and sizes; the most common neck sizes are either 17- or 19-fret. A tenor banjo can be open-backed or equipped with a resonator.

The tenor banjo in Irish traditional music is normally played strictly as a melody instrument; chording is very rare but can be effective if not overdone. The Irish tenor banjo is most often tuned to G-D-A-E (bass to treble), one octave below the corresponding notes on the fiddle or mandolin. You may encounter other tunings, but the G-D-A-E arrangement is most popular because it enables the banjo player to play any tunes that a fiddler or accordion player would be able to play. I'll refer to the G-D-A-E tuning henceforth as "Irish tuning".

Note that for solo purposes, the original tenor tuning of C-G-D-A (= up a 4th from G-D-A-E) may be used; Mick Moloney and Gerry O'Connor both use this tuning from time to time. The higher pitches of the strings result in a distinctly brighter sound, but the disadvantage in session playing is the limitation on the

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notes in the low end. (I'll refer to C-G-D-A as the "standard" tuning.)

If you have the opportunity to try both tunings, you should take it and determine which is most suitable to your tastes and style of playing. Keep in mind, however, that using standard tuning may require you to make some changes in the way you play certain tunes ("Martin Wynne's #1" or "#2" reels, for example, or "The Bush on the Hill" jig) that call for notes not playable on your instrument. It's no big deal because flute and whistle players do it all the time, but you may not like the jumpy and unnatural effect of moving between octaves.

I personally prefer the Irish tuning because I like the power of the heavier strings, but it remains a matter of taste. It should be pointed out, however, that the fingerings for the two tunings are totally different - that is, you can't put your finger on the same string or fret in one tuning and expect to produce the same note as you would in the other tuning. That's important to keep in mind: since switching between tunings will quite likely become harder as your proficiency in a particular tuning increases, you should decide fairly early in your musical career which tuning you'll be spending the most time on.

Since this is such an important topic, there are more detailed discussions of preferred GDAE string gauges later in this file and in the Appendix (page 48).

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## II. BANJO ANATOMY

Here's a list (in no particular order) of the essential bits and pieces that are found on almost every banjo. I apologize in advance for jumping around a bit, but trust me - it all makes sense eventually!

### [A] Neck

The long piece that supports the strings and the fingerboard; attached at its lower end to the pot. The peghead that holds the tuning pegs is at the top, separated from the neck by a piece of bone or plastic called a nut. The nut is slotted to keep the strings in place as they cross over it.

Banjo necks are usually slightly tapered (= they're narrower at the nut than at the last fret). I'm not sure what if any practical value this tapering is supposed to have, although in bringing the strings closer together it may seem to make fingering a little easier on the "busier" frets between 1 and 7.

The strip of lighter-colored material that runs up the side of the neck alongside the fingerboard is called binding. Its purpose is decorative only, although some binding also has positioning dots that can help you locate a fret. Not all banjos are fitted with binding.

### [B] Fingerboard

This is the shaped piece, usually of ebony or rosewood, that is glued atop the neck and holds the frets (and decorative inlay if any). The fingerboard is often finished with binding at the sides.

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### [C] Frets

The thin metal strips, usually slightly rounded, that cross the fingerboard in various locations. Tenor banjos have 17 or 19 of them. They are irregularly spaced to accommodate the even-tempered scale (we won't go there). The purpose of the fret is to "stop" the vibrating action of the string, and thus produce a pitch or musical sound. Most frets perform this feat admirably, but older banjos may suffer from frets that are either worn or loose. Neither of these is usually a terminal condition but your sound will definitely suffer unless corrected. Fret replacements or adjustments should be handled by a pro.

### [D] Pot or Rim

The round piece attached to the bottom of the neck. It supports the head. Can be made of solid wood or laminate, and can be flat-top or arch-top depending on whether the banjo is equipped with a tone-ring (of which more later).

Pots are frequently "out of round" on older banjos, which won't mean anything until you try to replace a head (gory details to follow later).

Pot diameters vary widely (ditto); the "standard" diameter is eleven inches. Consider yourself fortunate if your banjo is that size!

If you hold a (good) banjo up sideways, you'll note that the pot and the neck are slightly angled with regards to one another. This neck angle helps maintain the proper string height and allows the pulling force of the strings to be counteracted. The neck can be reset if need be, but this is normally a job best left to a pro.

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### [E] Tailpiece

The metal piece at the bottom of the banjo that holds the strings in place. Can be plain or fancy (some are adjustable). Usually seated on the tension hoop. Secured to the rim by various ingenious means that depend on the make of the banjo. Adjustable tailpieces permit the player to make significant changes in the string height (above the fingerboard - this distance is also referred to as "the action"), and can be well worth the few additional bucks they cost.

### [F] Head or Skin

The "membrane" that's stretched across the rim and is responsible for the banjo's sound production. Can be made of plastic (Mylar) or calfskin; the decision as to which material you should use depends on the sound you want to reproduce. I think most of today's players (except as always for a few die-hards, none of them Irish as far as I know) prefer the plastic heads for their weather-resistant qualities, their availability, and their general good behavior.

Details on tightening or replacing heads can be found in the Banjo Maintenance section below. WARNING: replacing a head, especially on an older banjo whose pot may be out of round (i.e., not exactly circular), can be a gut-wrenching and ultimately unsuccessful experience...

... Or not. Details for an emergency head replacement begin on page 29.

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### [G] Tension hoop

The metal ring that sits on top of the rim and keeps the head fitted firmly in place. May be notched or grooved; no appreciable difference in what the banjo sounds like either way. A grooved tension hoop will fit any banjo, while the notches in a notched hoop will have to match the number of bracket hooks that your banjo requires - see next entry.

### [H] Bracket hooks

The round metal hooks that exert the downward pressure on the tension hoop to ensure that the head stays tight. The number of hooks varies from banjo to banjo; generally the cheaper the banjo, the fewer the hooks. The most I've ever seen on one banjo is 28. The hooks, which are threaded at the bottom, are normally held in place by means of bracket shoes (the L-shaped pieces that are bolted to the rim - that's the purpose of those bolts that you see around the inside of the rim). Once the hook is in place, a nut is tightened to pull the hook downward. The hook in turn pulls down the tension hoop, which in turn acts upon the head ... the short version of all this: to tighten the head, you tighten the nuts. Particulars of this routine procedure are provided in the Maintenance section.

You should note that there are some types of banjo that have a different arrangement for maintaining the pressure on the head involving what is referred to as "top tension". In this setup, the bracket hooks pass through the rim, and are threaded into, not through, the bracket shoes below. The hooks tighten from the hoop down - unfortunately you need a special tool to manage this properly, since the square tops of the hooks are not easy to maneuver with any kind of normal wrench (and if your banjo has a hoop that includes a built-in armrest, it's even harder to get



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at the tops of the hooks because they're almost countersunk into that part of the hoop). I was given a tightening tool by a kindly repair person a number of years ago, but I have no idea where you'd locate one these days. (And a recent query to the banjo user group on the Internet didn't help either.) *STOP PRESS: I have been advised that this "mystery tool" is nothing more exotic than a wrench for tightening drum heads, which means it should be available at any drum supply source or large music store.*

### [I] Dowel stick / coordinator rods

These are two systems for keeping the pot attached securely to the neck. They are readily visible when you turn your banjo face down.

The *dowel stick* is a solid piece of wood that is either glued to or bolted to the neck and bolted to the inside of the rim, while the *coordinator rods* are thin metal rods that perform the same function (and have the added virtue of being adjustable so that the neck angle can be changed). Most dowel sticks have a brace arrangement at the end closest to the neck that allows for a degree of flexibility in adjusting the neck angle.

Perhaps this is the place to mention that serious adjustments to a banjo's neck angle should be left to a professional. This is particularly true if the string action suddenly changes on its own - it could be a symptom of a bigger problem that you really shouldn't be dealing with on your own.

### [J] Bridge

The piece of wood - usually maple, occasionally with a layer of ebony on top - that holds the strings away from the surface of the head as they cross between the tailpiece and the finger-

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board. The bridge is responsible for transferring the string vibrations to the head, so bridge configuration (and there are several) has a profound effect on a banjo's sound. Like the nut at the top of the fingerboard, the bridge is slotted to keep the strings evenly spaced as they cross. The height of the bridge has a direct relationship to the action: normally the higher the bridge, the higher the action. A bridge height can be reduced for a more comfortable feel (see the section on maintenance below), and also because excessive distance between the string and the fingerboard can lead to intonation problems (= the note you expect to hear just doesn't sound right, you can't play scales that sound any good, etc.).

The placement of the bridge on the head (i.e., its position along the diameter running between the end of the neck and the tailpiece) is very important to the proper intonation of the strings.

More information about bridge placement is on page 23 and in the Appendix (page 50).

### [K] Nut

The thin piece of bone or bone-like material between the fingerboard and the peghead. It is slotted to allow the strings to be seated securely as they cross towards the tuning pegs.

### [L] Resonator

This is a shallow bowl-shaped piece - usually but not always of wood - that is attached to the back of the rim on some banjos to enhance the sound. Resonators come in all shapes and sizes - most are slightly curved, some are flat, some are "fitted" into the rim while others are held in place by screws, etc. etc. Five-string banjos, and some vintage tenor banjos, were never

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equipped with resonators, but with the use of a stock resonator from a catalog and the appropriate hardware, almost any banjo can be provided with one.

Resonators are removable and can be used at the player's discretion. I like them for session playing, but if your banjo is equipped with one and you or (more likely) your fellow musicians find the sound overwhelming, stick a sock or a washcloth into the resonator area and the sound will be deadened. A patent mute or "tone enhancer", available from the supply houses, is more effective (and a lot more sanitary).

The other option, of course, is to remove the resonator entirely, a procedure which usually consists of no more than removing a screw or two (make sure you don't lose the screws).

### [M] Flange

The metal rim that runs between the side of the pot and the inner edge of the resonator is called a *flange*. It may be a solid piece (if the resonator is original equipment), or it may be composed of individual pieces that attach to the bracket hooks. The flange serves two purposes - first, functional: it supports the hardware that actually attaches the resonator to the pot, and second, cosmetic: it covers the space between the pot and the edge of the resonator that would otherwise be visible. (On some banjos - some models of Vega, for example - where the resonator attaches from the back by means of a screw and bracket arrangement to the dowel stick, the flange serves only the cosmetic purpose.)

Besides cleaning the crud off the flange occasionally, there's normally not much to concern you about this particular item.

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### [N] Tuning pegs a/k/a/ tuners

These are the four machines mounted on the peghead that keep the tension on the strings and enable you to tune them properly. As you will note, they are inserted upwards through the peghead; better models are normally anchored in place by means of a threaded sleeve. The post is the piece on the upper surface of the peghead that the strings wrap around and through. The string tension is adjusted by turning the part of the tuner projecting below the peghead. This motion is then transferred to the post and the string attached to it.

There are two main types of tuners: the older direct-action friction tuners and the more popular geared planetary tuners. Planetaries - or any type of geared tuner - enable more precise tuning and eliminate the slippage factor that occurs with most friction tuners. If you're very lucky in your choice of banjo, the original friction tuners may work for a while, but in my experience even the best of them will eventually have problems dealing with the heavier gauge strings required by Irish tuning. (The problems will probably take longer to manifest themselves if you stay with standard tuning, but arrive they will.)

My recommendation is to remove the friction pegs and replace them with a good set of planetary tuners as soon as possible after you're sure that it's going to be long-term relationship between you and your banjo. (Keep the friction pegs somewhere in case you decide to sell the banjo to a someone who wants them.)

Since the tuners are one of the elements of a banjo that can actually cause pain and suffering to a player, there are more details on this subject a little later on.

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### [O] Tone rings

These are various configurations of metal rim that are fitted between the top of the rim and the head, and their purpose - as the name implies - is to enhance the tone. Not all banjos have tone rings.

The engineers who designed these gizmos really let their imaginations run wild - some of them have holes, some were fitted with ball bearings, some are rolled brass, et cetera et cetera. The tone ring normally sits happily in place doing its job without much fanfare; the only time you are likely to have any contact with it is during the dreaded "head changing process" (more on this below).

However it's important to know if your banjo is equipped with a tone ring, and if so what type, before you order any heads, since these come in different heights depending on whether or not they will have to be fitted over a tone ring. The parts catalogs that you'll be likely to order from have diagrams that help you through this little confusion (and if the diagrams don't help, a friendly customer service rep will).

### [P] Armrest

A metal piece that extends out slightly over the head from the 7 to 9 o'clock position. There are several designs, usually involving the armrest being secured to a couple of bracket hooks. As the name implies, it's for resting your picking arm on - certainly not essential, but an extra that many players like. If your yoke doesn't have an armrest, you can order one from a catalog if you're so inclined.

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### [Q] Inlay

Though technically not a banjo "part", I'll mention the inlay in passing - that's the decoration on the fingerboard and on the peghead. It's usually done in mother-of-pearl or abalone on older banjos. Some banjos are quite ornate, some are very plain. Inlay doesn't affect a banjo's sound but it may affect its price. If you're lucky enough to have inlay work on your banjo, check it occasionally as you wipe down the fingerboard. That way you can catch broken or loose pieces that can be repaired or replaced. (Catalogs stock a number of these replacement pieces.)

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## III. WHAT YOU NEED TO KNOW ABOUT STRINGS

### [A] Tunings

Once you have decided on the banjo of your dreams, you'll have to decide how you want to string it. As mentioned earlier, the two most common tunings for a tenor banjo are G-D-A-E and C-G-D-A, bass to treble (i.e., away from you if you hold the neck in your left hand).

I'll repeat what I mentioned earlier: the GDAE tuning is the best way to go for Irish music. It enables you to play each and every note that a fiddler or box player can play; the heavier gauge strings make ornamentations easier; the deeper sound will allow you to "hold your own" even in the most accordion-heavy of sessions; it's the natural tuning for a music whose primary keys are D, G, A minor and major, and E minor.

The CGDA tuning has a long and respectable history in jazz and popular music - find an old piece of 1920-era sheet music and first thing you'll notice is the banjo chord fingerings over the staff.

### [B] Choosing Strings

#### [1] Packaged Sets

But where CGDA tuning is very well adapted to chords in flat keys, it is not suited to Irish trad banjo playing, based as it is on single string playing in non-flat keys. And the idea of having a banjo able to play in exactly the same scale range as a fiddle or accordion (i.e., G below the staff to B or C above the staff) make the use of CGDA tuning a non-starter.

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You can't safely tune CGDA strings up to GDAE without snapping some of them (never a fun experience). Nor can you tune them down to GDAE without having them feel like linguini.

Some folks - and you know who you are! - keep the CGDA strings on and capo on the second fret, producing DAEB'. I guess this works OK if you're not going to be playing any tunes that go lower than D, but why bother? With the treble-y sound that results from this tuning, you might as well be playing a ukulele (and - as Seinfeld once said in another context - there's nothing wrong with that!)

The practical point of all this is to warn novice Irish trad players against spending a lot of money on packaged sets of tenor banjo strings. These sets are likely to be CGDA unless they specify "Irish" or "Celtic" somewhere on the label. Over the years string makers have picked up on this, and GDAE sets are easy enough to find online (if not necessarily in your local music store). Typing "Irish tenor banjo strings" in your search engine of choice will take you to any number of places where you can buy GDAE sets.

Whoever the manufacturer is, the gauges that in my experience work best are: G ~ .040; D ~ .032; A ~ .020 (I like wound A strings), E ~ .012. I like loop ends but that decision has to be based on your individual banjo's tailpiece configuration.

But let's say that you're stuck with twenty sets of CGDA strings that Aunt Minnie gave you after Uncle Bert passed away. Of course you can't possibly dump them and break Aunt Minnie's heart, so what you - the good nephew or niece who plays Irish trad banjo - can do with Uncle Bert's legacy is the following:

- discard the A string; it's too thin to help and Aunt Minnie won't care.
- use Uncle Bert's C, G, and D strings as your third, second, and first strings respectively. If they're not 78 years old,



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they should be able to stand being tuned up a step to D, A, and E.

- add a G ~.040 fourth string from some other source. Voila: GDAE tuning (and a happy Aunt Minnie)!

By the way: the bright lads and lassies out there - I was once one of you! - who know that mandolins are also tuned GDAE might figure that buying a set of mandolin strings is an easy fix to all this. After all, it's the same tuning, even the smallest music stores stock mandolin sets, and hey - you get two sets for the price of one. Can't miss, right?

Clever but wrong: while the notes are the same, they're an octave apart. Mandolin strings are made for mandolin scale lengths, and can't be adapted for use on a one-octave-lower tenor banjo (presuming that they would even reach from the banjo tailpiece to the peghead, which they probably wouldn't, even on a short-neck banjo).

But here's a variation on that idea which will work:

GHS, John Pearse, and other companies also manufacture octave mandolin sets that are available from catalogs or online. These are intended for GDAE tuning, so it's no coincidence that the string gauges of these sets come very very close to the gauges I mention above (.012 - .020 - .032 - .040 or thereabouts), meaning that octave mandolin strings are perfect for use as banjo strings as well. Take into account the fact that they are all loop-ended (even the heavier gauges), and the fact that you're basically getting eight strings for the price of four (well, more or less!), and you can begin to understand why I have a few packages of these babies in my string drawer (naturally they also work fine at the task for which the makers intended them, i.e. stringing octave mandolins).

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### [2] Guitar Strings: Yes or No?

For most of my banjo playing career, the world of banjo strings has been a CGDA world, and as a result I had no option but to purchase and use guitar strings of the appropriate gauges to produce the feel and sound that I wanted. There was generally no problem with this, since even the smallest neighborhood music shop generally keeps a few loose strings around, so that it was usually not necessary to buy whole sets of guitar strings to get the right gauges.

Although this method of securing a supply of strings to fit your banjo may be obsolete in today's Internet world, there still may be times - emergencies mostly - when you'll have no choice but to purchase and use guitar strings on your banjo. This is perfectly OK, nothing to be ashamed of, but there are a few things you should keep in mind - one is the string gauge and the other is the string end.

### [3] String Gauges

*UPDATE: more, much more, on this topic in Pete Strickler's Appendix (not the organ but the additional pages at the end of this file).*

Whether you're buying your strings in packages or individually, it's good to know a little about the diameter of the strings you'll be using. This dimension is referred to as the *string gauge*.

To reiterate what I said above, my personal choice of string gauges for GDAE Irish tuning are as follows:

E = .012 to .014

A = .020 to .022 (wound)

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D = .030 to .032;

G = .042 to .045.

The matter of preferred gauges has a subjective element - how does the string actually feel as you play it? - which is why I emphasize the word "personal" in this discussion. Some players like the heavier gauges, some like the lighter. You won't know which one you like until you try them. But my advice to you would be not to stray too far up or down from the gauges suggested above.

Nickel wound or phosphor bronze I find work equally well, although I prefer the bright sound of the bronze. I have not tried the new "polyweb" or "nanoweb" strings, nor am I likely to until the prices come down a heck of a lot (like 80 percent or so). Silk-and-steel will work in a pinch as well, but their inherent softness doesn't provide max punch for a banjo.

### [4] Loop Ends vs Ball Ends

You probably have noticed that instrument strings come in two types, depending on how they are intended to attach to a tailpiece.

There are strings that have loops at the end - usually to secure the string to an external tailpiece such as the one used on banjos - and strings that have small brass "balls" at the end, which are intended for use on saddle-and-pin instruments such as guitars.

While a banjo player can utilize guitar strings in an emergency, the primary difficulty with using such strings - which are all ball-end and not loop-end - is that most vintage banjo tailpieces are designed to accommodate only loop ends.

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Yes, the little ball can be removed from its restraining loop - by means of hammer, chisel, vise, pliers or vise-grip, patience, a steady hand, and a hell of a lot of luck (there might be easier ways to accomplish this onerous task, but I never ran across one, although I haven't really checked into the use of lasers). And after all this, you might find that the now-empty loop is too small to do any good! (Or - equally likely - that you've actually broken the loop in your efforts to remove the ball.)

By the time you get finished with this foolishness, you wondered why the heck you didn't just get a new tailpiece for a few bucks, one that could handle ball-end as well as loop-end. But maybe you're a purist who doesn't want to change anything on your banjo ...

To make a long story short: if your banjo tailpiece can deal with ball-end strings, then guitar strings are perfectly suitable for use as banjo strings. If not, make sure you have a few tools around to get that pesky ball out of the loop (needless to say, you do this thing before you put the strings in your case!)

If, after all this, you're still interested in experimenting with individual strings, I'd recommend that if you have the option (= a reliable source and plenty of disposable income), you should string with the heavier gauges first. If they feel a little tough to work with, move to the lighter gauges. Again, it's a matter of feel, and only you know what feels best to you, so feel free to experiment. You shouldn't stray too far from the suggested gauges, however, since strings that vary too much up or down from these gauges might be difficult to tune.

*(C) Attaching Strings to the Banjo*

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Once you have selected your strings, getting them on the banjo is a relatively simple procedure - that is, once you've done it a few times. Here's the way I do it (standing end is the one that attaches to the tailpiece, running end is the end that goes around the tuning pegs):

[1] Start at the bottom of the banjo and secure the standing end to the tailpiece. Loop ends should fit easily around the hooks. On an elderly banjo, a tailpiece hook may be broken or missing, in which case it's OK to double up (two loops to one hook).

If you're stuck using ball-end strings, the ball should be securely caught under one or between two of the tailpiece hooks (some newer tailpieces, not all, even have holes or little knobby things to accommodate ball-end strings).

*Note that with the E and A strings, you might be able to get away with creating a loop-end from a ball-end by taking the running end through the hole in the ball. Exact result will depend on how much "binding" there is near the ball. Result won't be perfect but it has been known to work in an emergency.*

[2] If you have an adjustable tailpiece, it has an extension that goes over the lower edge of the head a couple inches towards the bridge. Thread the running end through whatever holes or notches there are, and be a little careful here - forcing the string over a rough edge may shorten its life.

*Here's a trick for you folks that own capos - once you have the standing end properly secured to the tailpiece (you can test this by giving the standing end a slight tug) and before you start to work the running end through the pegs, clamp the capo somewhere around the eighth fret to keep tension on the lower part of the string. This in turn will keep the standing end in place. That way you can concentrate on getting the running end taken care of without having to worry about the standing end*

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*coming loose. Once there's sufficient tension on the string to indicate that the string is secured at both ends, the capo can come off.*

[3] Don't worry about the bridge for the time being - it doesn't even have to be on the banjo during the initial stringing process.

[4] Wrap the running end around the appropriate tuning peg a few times from the inside (i.e. clockwise for the A and E strings, counter-clockwise for the G and D strings), then insert it through the tuner hole (making sure that the coiled part is below the hole, or else the whole thing will unravel). Ideally you should be able to remove most of the slack from the string by this wrapping procedure, especially with the lighter strings.

*Some players dispense with the preliminary coiling and put the running end immediately through the tuner hole. This doesn't affect the sound but it doesn't leave you with any string to work with in the event of a break.*

[5] If you're not using the capo trick suggested above: before you start to tighten, give the bottom part of the string (i.e., the part over the head) a slight tug to ensure that it's still hooked onto the tailpiece. Nothing is more frustrating than twisting the bejayzus out of a tuning peg only to discover that the string isn't properly secured to the tailpiece - talk about wasted effort!

[6] Once you're satisfied that the string is secure on the tailpiece, and you've removed as much slack as you can, you can start to tighten the tuning peg. You can be as cautious as you like, but it generally takes a number of healthy turns before the string approaches its proper tension. Since you'll probably be tightening with your left hand, you can check the string tension by keeping your right hand thumb on the string somewhere in the vicinity of the nut (which can also serve to minimize

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slack - remember, slack is your enemy because it might sneak the loop or ball off the tailpiece!)

*Remember: don't tighten all the way until after any bridge repositioning has taken place.*

[7] Once you're happy with the bridge position and you have a working tension on the strings, you can start to think about tuning.

Some players prefer to let the new strings stretch awhile before starting the tuning procedure - a good idea but not always practical for on-the-fly string changes (e.g. five minutes into a two-hour gig). Some people - the ones with the digital tuners - set the initial tuning about a half-step higher than normal and then let the strings gradually ease downwards into concert pitch.

One last item before we move on: a lot of players prefer to keep the excess string (i.e., the length of string that was first to pass through the hole in the tuning peg and is now just kind of hanging around the peghead) on their instrument, usually but not always wrapped in a coil of some sort. I personally don't like this idea - I view the loose pieces of string as potentially dangerous to the eyes (and I wear glasses!) If the idea is to keep some slack handy in case of a string break, my feeling is that it would probably be better to keep a few spare strings handy and pop a fresh one on as necessary, rather than count on using the slack end of the damaged string.

### *(D) Correct Placement of the Bridge*

I won't go into this topic here since it's treated in detail later in this document.

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For now just note that due to the physical laws having to do with vibration of strings, care must be taken to place the bridge in exactly the right position on the head, or else you won't stand a chance of getting the strings to tune properly. (If you're really hot to know more about the mathematics of all this, consult the Harvard Dictionary of Music and prepare to have your head spinning shortly thereafter.)

### *(E) Stringing Issues with an Older Banjo*

Since the chances are excellent that you'll be working with an older banjo, here are a few items relevant to stringing them that should be remembered:

[1] As I mentioned earlier, the friction tuning pegs found on most older banjos are at best tired and at worst useless, especially when they're forced to deal with the heavier-gauge strings of the Irish tuning. Unless your yoke is a fifteen-thousand-dollar museum piece, my recommendation would be to get the friction pegs replaced by good planetary gear pegs as soon as possible.

Replacement units are available from Stewart McDonald and other catalogs, and the procedure is so simple that even I can do it (biggest deal may involve enlarging the peg hole to 3/8" to accommodate the new pegs). If you're too busy maintaining your stock portfolio to fool around with drills, your local music shop will be glad to assist.

Fast-breaking news story dept.:

A fellow banjo person who was kind enough to read through the first draft of this whatever-it-is tells me that "reproduction" geared tuners are now available that don't require drilling (and hence would be perfect for the fifteen-thousand-dollar museum piece referred to above).



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You can save the old pegs for sentimental value if you have a lot of room in your hope chest, but I'll bet dollars to doughnuts you never give them another thought once you've got the new ones on. (The old pegs are worth saving too if the banjo is an expensive one that might have resale value as a collector's item.)

[2] Another important thing to remember when re-stringing an older banjo is the likelihood that the string slots on the bridge and the nut will have to be enlarged to accommodate the heavier-gauge strings you'll probably be using. (This problem won't arise if you insist on using standard CGDA tenor strings.)

A fine-toothed saw and a small round file can be good investments for this purpose. The idea is to enlarge the respective slots just enough so that the new heavier strings sit comfortably in them ("comfortably" in this case meaning that a minimum amount of string should be above the plane of the nut or the bridge).

# *BANJO CARE & FEEDING (Irish Tenor version)*

## IV. BANJO MAINTENANCE

In general, banjos (like lop-eared rabbits) need lots of love but (unlike lop-eared rabbits) a minimum of care and feeding. Here are a few items you'll have to attend to from time to time to keep your banjo happy and hard-working.

### [A] Tightening the Head

All banjo heads need tightening from time to time - that's a fact of banjo life, nothing to be ashamed of.

To perform this task, you will need a bracket wrench (a small t-shaped tool that serves no other purpose than to tighten banjo bracket nuts). I have used nut drivers and small box wrenches on occasion, but these tools may scratch the surface of the nut, so a bracket wrench would be a good investment. Make sure however that it fits the nuts that go with your hooks - as with most banjo parts, the nuts (annoyingly) come in various sizes. 1/4" and 3/8" seem to be the most common.

Since even a plastic head can be sensitive to rough handling, the tightening procedure should be performed carefully.

[1] Don't over-tighten the nuts. (If you hear squeaking, that horrible sound that indicates you're in danger of stripping the thread, stop immediately.) Tighten them until you're satisfied with the feel - I know that's very subjective, but you'll understand what I mean the first time you try it.

When you've tightened them all, go back and give one final thumb-nudge just to make sure.

[2] To avoid damaging the head, you should partially tighten two or three nuts, then go across the banjo and do the same to their opposite numbers, back and forth until they're all finger

## *BANJO CARE & FEEDING (Irish Tenor version)*

tightened. If the banjo head were a clock, you'd start off tightening 1,2,3, then do 7,8,9, then back to 4,5,6, then finally 10,11,12 (the order isn't important). That way the pressure on the head is balanced. (The final tightening need not follow this rotation.)

As with most human endeavors, there are alternate ways of accomplishing this goal (for example, tightening the nuts sequentially instead of in the "star" pattern recommended above - however this method requires a fairly close monitoring of how the tension hoop is "balancing" on the head).

### *(B) Replacing the Head*

It may happen that you're faced with the necessity of replacing a head on your usual banjo or on some little treasure that you've picked up at a flea market (I'm still talking banjos here, guys). There are more pleasant tasks than this, believe me, but you still should know how to do it in case of an emergency.

#### [1] What Material?

Banjo heads, especially the 11" standard size, are available in different materials, each of which produces a different sound: real skin is "dark", fiberskin is "soft", frosted plastic is "bright", mylar is "brassy". (All very subjective but you get the idea.) The same banjo will - not surprisingly - sound totally different depending on which head material is used.

If you've been playing a banjo with a particular type of head and you love the sound, it's no-brainer time: replace the old head with a new one of the same type. If however you have no particular commitment one way or another and just want to get something on the banjo so you can play it, my own recommendation would be frosted plastic for a nice "middle" sound.

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The "real calf-skin" vs. "phony everything else" debate has a long and distinguished pedigree dating to Neolithic times, but in the end it comes down to personal taste and - equally important - convenience. I regard real skin players like I regard funeral home directors - I respect what they do but wouldn't want to be one. Know what I'm sayin'?

### [2] Measurements

Step two in the replacement planning process is the determination of the exact - and I mean exact, to 1/16 of an inch - diameter of the pot. I have never figured out why any banjo maker would think his product would be improved by the presence of a 10-9/16" pot (as opposed to the 11" standard), but enough of them did to make it a problem. (I'm not even sure why 11" is the standard!)

The recommended way to approach this is to take four or five measurements at different locations across the pot's diameter, then test your arithmetic skills to come up with an average. Of course you'll have to measure across the bottom of the pot, which means that if your banjo is equipped with a resonator, now's the time to remove it.

If you're lucky and your yoke is in good shape, the measurements will be consistent no matter where you take them. The sad fact, however, is that pots do go "out of round" over the years. Even if it looks OK to your eye, you'll know you have a problem as soon as you try to put on the head you were so sure was the correct size. The idea of averaging measurements may succeed, or the pot may be so out of round that no off-the-shelf head will fit it correctly. That's the banjo equivalent of a terminal disease, and the only fix - if you want to keep the banjo - is to buy a new pot, since even a professional banjo technician would probably not be able to help.

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I'll go into more detail about replacing the pot later on.

[3] Off with the Old ...

From henceforth we'll operate on the presumption that you have a new head that will fit snugly on the pot (and that, in ordering the new head, you finally figured out what all that mumbo-jumbo about high and low crowns was all about). But first we have to get the old head off.

The basic procedure is fairly simple and involves loosening the bracket hooks and removing them from the tension hoop so that you can work it free of the rim, after which you can remove the old head.

If the existing head is already defective in some way, you don't have to worry too much about rotation during the loosening procedure. If it's still usable, you'd want to be a little more careful while removing it, which would be a good reason for employing the "clock" procedure mentioned above.

Also note that you don't have to remove the hooks from the banjo - you can leave them dangling in their bracket shoes while you work on the top, but they have a tendency to get in the way sometimes (and make annoying jingly noises while they're doing so).

Occasionally the pot and the neck are so tightly joined that the tension hoop or the head won't come off until a space can be made for removing them. This could be accomplished simply (for example, by loosening up the brace on the dowel stick), or it may involve having to loosen the end-bolt, which requires removing the tailpiece, etc. etc. You won't know until you actually start the procedure, so just say a Hail Mary (or whatever works in your belief system) and hope for the best.

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If the pot and the neck are still too close to remove the head easily, you might have to slack off on the coordinator rods or loosen the bolt on the outside of the pot that holds the dowel stick in place. Either of these actions should result in additional space being created between the pot and the neck. If that doesn't seem to be happening, congratulations - the procedure has just become complicated enough for you to think of taking the whole thing to a competent technician who will expect to be paid for doing the job correctly.

But let's say you lucked out and were able to separate the neck and the pot enough to feel confident that the old head will come off. It will probably take a few gentle but determined taps at spots around the bottom of the head to convince it to relax its grasp. Since the bottom rim of the head is narrow, using a slot-head screwdriver to deliver the upward pressure may work better than tapping directly with a hammer (remember to wrap the screwdriver head in a piece of cloth to avoid damaging the surface of the pot).

[4] ... On with the New!

Now you're ready to fit the new head on. If you've measured right and are very very lucky, the new head will nestle snugly onto the top of the pot and live there happily ever after. You might want to rub a little vaseline (K-Y jelly works too, I hear) around the upper lip of the pot to help the new head slide on more easily.

If there's a lot of resistance, you might try tapping lightly on the rim of the head while it's in position over the pot. (You've got to be careful with this to avoid separating the "fabric" of the head from the metal rim.) Here again the "clock" procedure should help - pressure at 1 followed by pressure at 7, then 11 and 4, etc etc, to ensure that the stubborn head will eventually be properly seated evenly around the pot.

## *BANJO CARE & FEEDING (Irish Tenor version)*

Whacking away vigorously can only damage the head, so be gentle - and prepare to back off if it doesn't seem to be working

Once the head is in place, you can replace the tension hoop - carefully, so as to avoid pulling too much on the seam on the head where the plastic joins the metal rim. No need to fit anything too snugly at this point, because the tightening of the bracket hooks will eventually take care of all that. If there's a quarter-inch or less between the bottom of the tension hoop and the rim of the head, you're in good shape.

Again, if you've measured right, the tension hoop should go on with a minimum of difficulty. But - as mentioned - things can go wrong, especially with older banjos whose various parts may have changed shape over the years (not unlike ourselves). Sometimes rocking the hoop gently from side to side on the head will aid the fitting process. Hammer taps are dangerous but you might try a few gentle ones to see if they help. Another trick is to try mounting the head and the hoop on the pot together, rather than as separate pieces (I'm not sure why this works, but it does).

(By the way, when you're replacing the tension hoop, MAKE SURE the large notch goes flush up against the neck or else you'll have problems with strings touching the hoop and creating a really interesting noise. Once the main notch is lined up, the other notches will be more or less where they're supposed to be, but don't worry about it - they'll move into correct position once the tightening process begins.)

As soon as the tension hoop is seated snugly on the head - and you'll be able to tell by seeing how much if any space there is between the bottom of the hoop and the metal rim of the head - you can start putting the hooks back, again utilizing the rotation method to balance the pressure. No need for heavy wrenching at this point - finger tight is adequate to keep the hooks firmly seated in their notches or grooves. Once all the

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hooks are on, you can begin the (careful) wrench tightening, and you're well on the way to a successful head replacement! If you've done it correctly, and if the Banjo Force is with you, you shouldn't have to do it again for a long time.

### [5] Pot Replacement

Let's review:

You start out intending to replace a head only to discover that your pot is so badly out of round that no head will fit it.

But you love your banjo so much that you decide to replace the damaged pot with a new one.

You have two alternatives: google "custom banjo parts" and see if one of the 168,000 returns can make a custom pot with the exact dimensions of your old one, or ...

Get an off-the-shelf pot from StewMac or one of the other suppliers. The raw wood will need to have a finish applied, but otherwise it will be ready to go.

So far so good. But there's a sticky part to all this ...

... namely: the off-the-shelf models are all 11" diameter, and you can't replace a (e.g.) 10-9/16" original-equipment (OE) pot with an off-the-shelf 11" model without replacing the OE tension hoop and OE dowel stick (or coordinator rods). All the OE pot accessories would be off by 7/16".

Fortunately 11" tension hoops and rods are readily available, and the dowel stick can always be shimmed out to accommodate the new pot. But nothing in BanjoWorld comes cheap, so you'd really have to do a "cost benefit analysis" to see if the value of keeping the banjo would be worth replacing all that gear (plus labor if you weren't ready to do it yourself).



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### [C] Placing and Adjusting the Bridge

The bridge exists in a three-dimensional relationship to a banjo: its "vertical" position (distance between the top and the bottom of the rim), its "height" (distance from the top of the bridge to the surface of the banjo head), and its "horizontal" position (relative to the distance between the sides of the rim).

The vertical component can be visualized in terms of "north" and "south" ("north" being the side of the rim closest to the neck), while the horizontal component can be viewed as "east" and "west".

Because of the way a banjo produces its sound, the correct placement of the bridge in all three dimensions is crucial to achieving a good in-tune sound.

### [1] Vertical Position (*also see Appendix, p.48*)

The correct vertical positioning of the bridge on the head is not accidental. It is done according to mathematical rules that date back to the days of Pythagoras (remember him?), rules which have to do with harmonics and overtones produced by a vibrating string.

The mathematics need not concern us, but it should be noted that a misplaced bridge - even by an eighth of an inch either way - can cause intonation problems that can drive a player crazy. Doing the placement correctly will help avoid that difficulty.

Despite the complicated math, the rule for placement is an easy one: the bridge should be placed at a distance from the 12th fret equal to the distance from the nut to the 12th fret. For

## *BANJO CARE & FEEDING (Irish Tenor version)*

example: if your banjo measures 11" from the nut to the 12th fret, then the bridge should be positioned on the head 11" from the 12th fret.

To put it mathematically: if A - B is the distance from the nut to the 12th fret, and B - C is the distance from the 12th fret to the bridge, then best tuning is achieved when  $A - B = B - C$ .

If you've placed the bridge correctly, the note you hear when you press the string at the 12th fret should be exactly an octave higher than the sound of the open string. (You might want to use a tuner for this test if your ear isn't used to working that high.) A similar test calls for a harmonic on the 12th fret, if you can handle harmonics (= string lightly touched but not pressed to fingerboard, producing a bell-like tone).

For whatever reason - degree of tension on the head, string wear, sunspots - you might find that moving the bridge very slightly away from the mathematically-correct location - in either direction - provides a more accurate tuning. Don't be afraid to experiment - if you get too lost, you can always re-measure and start at the nut-to-12th fret reference point again.

Once you get the bridge settled, you can use a pencil to make a small reference mark so that you find the "sweet spot" again in case you have to move the bridge for any reason.

Note that factors normal in the life of a banjo - being played, being removed and returned to the case, being bounced around in the back of your car- can also result in small changes in the position of the bridge. If you notice any kind of difficulty in achieving good tuning, check the bridge placement and adjust accordingly.

Some folks - not yours truly, but what do I know? - will swear on a stack of interdenominational Bibles that angling the bridge one way or another will produce a positive effect on intonation.

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I've run across this mostly from five-string types, but if you want to experiment with this on your tenor, be my guest (and if your banjo life is more full as a result, please let me the details of what you did and what result you achieved).

### [2] Horizontal Position

Since the bridge will be held in place by the tension of the strings as they cross its top, there is likely to be little or no adjustment necessary in the bridge's horizontal position. If - as occasionally occurs - the strings are slightly off-kilter as they run down the fingerboard to the tailpiece - caused by the fact that the tailpiece is off-center in relation to the centerline of the fingerboard - the bridge can be moved slightly to correct this. No measuring is necessary.

### [3] Bridge Height

The height of the bridge controls:

- how high the strings lie above the head
- the angle of strings to fingerboard

These dimensions are important because of the effect they have on the intonation of the string, which could be defined as the ability of the string to produce the proper pitch in both open and closed positions.

Bridges are usually made of maple and are pretty sturdy, but occasionally there will be an accident and one will snap. Or you'll need a new one for the proverbial flea-market special you've just picked up whose original bridge disappeared years ago. In either case, you can obtain a bridge easily enough from one of the catalogs, but it may need some adjusting to feel exactly right.

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We discussed the best placement of the bridge on the head, but bridge height - how far the top of the bridge is from the surface of the head - is a consideration as well.

Off-the-shelf bridges come in two heights, 5/8" and 1/2". If you get a 5/8" bridge and it's too high, you can go down to the 1/2"; conversely, if the 1/2" is too low, you can move up to the 5/8". The problem arises when the ideal bridge height is somewhere between the two, or is lower than 1/2" (it will rarely if ever be higher than 5/8").

### [a] Lowering

I find that the easiest way of lowering a bridge is by rubbing the bridge's supporting "feet" back and forth across a piece of medium sandpaper secured on a table top or other flat surface until the new lowered height is achieved. This method works more slowly than others, and is better suited to minor adjustments, but has the benefit of helping to ensure that you don't reduce the height to the point where the bridge is useless. If you're skilled in the use of sanding machines or shop tools like the Dremel, you may be able to speed the sanding process considerably, but the last few milli-microns (or whatever they are) should still be done by hand.

Another player recommended using a "microplane" a/k/a/ metal fingernail file, available in the (blushes slightly) "beauty" section of your local CVS, Walgreen's, Brooks, Sainsbury, Carrefour, etc etc. (also good for removing the annoyingly sharp corners of the bridge, or - let's face it - for making your fingernails look pretty).

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### [b] Raising

Note too that a bridge can also be raised, using shims of some thin but durable material (balsa wood is good; label tape from a Dymo embossing machine, an old credit card, etc. work in a pinch) attached to the bridge pedestals with Elmer's glue or whatever your adhesive of choice might be.

Shimming is best thought of as an emergency procedure, since it interposes another layer or layers of material between the bridge and the head and will thereby affect the sound to some extent, but it works - and sounds a heck of a lot better than the strings buzzing against the frets because the action's too low. (And it's quicker than doing a total neck resetting, which you'll probably need eventually!)

### (D) Enlarging String Slots on Nuts and Bridges

As I have already mentioned, the conversion of a banjo whose life has been spent in CGDA tuning to GDAE tuning involves widening the "slots" (grooves where the strings sit) to accommodate the heavier string gauges. These slots are on the nut (= the thin bone or bone-like piece between the fingerboard and the peghead) and the bridge.

If your banjo is a high-quality instrument, this job is probably best left to a professional, who will be equipped with the saws, files, etc. to do the job correctly. If you have a yard-sale special whose past and future are of equal unconcern to you, you can get the job done yourself using a small round file, a single-edged razor blade or an Exacto knife, and a few emery boards to clean out the slot after you've widened it.

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The goal is to create a rounded groove in which the string can sit comfortably (= top of string will be at same level as top of nut or bridge). The slot should not be so wide as to allow the string to "rattle" as it's vibrating.

Since the slot-widening process is one learned mainly through trial and error, having a few scrap nuts or bridges around to practice on would be very handy. Even better is finding a friendly luthier who will let you watch as he does the job, although he's quite likely to be using tools that you don't own (and will probably never own!)

I guess the easiest way to sum up this situation is to say that if you possess the interest and skill in doing something like this, give it a shot, otherwise let a pro take care of it. (If worse absolutely comes to worse, you can have the nut and bridge replaced - the parts themselves aren't that costly).

### *(E) Recommended Equipment*

The following is a list of the tools and accessories that I find handiest for routine banjo maintenance. There's nothing listed below that you can't find either from a catalog, online, or at your local hardware store.

#### [1] Bracket wrench

Convenient (but not necessary) for tightening the nuts on the bracket hooks. Come in different sizes (1/4" for Gibsons, 9/32" for Vegas, 5/16" for most other manufacturers), so make sure you know what size nuts you have (on your banjo, that is). Box wrenches, crescent wrenches, and nut drivers will also serve this purpose. (Speaking of box wrenches, you'll want a 3/8" for tightening the nuts on the sleeves of machine tuning heads.)

## *BANJO CARE & FEEDING (Irish Tenor version)*

### [2] Small slot-head screwdriver

Can't go wrong here! (I've never run across a Phillips head screw anywhere on a vintage banjo, by the way.) Shorter is better than longer, and a thinner slot head is preferable. Remember you're not working on a 1978 Yugo with this tool.

### [3] Wire cutter

Necessary for trimming string tops and quick removal of old strings. Doesn't have to be huge unless you're intending to use it for ball-removal purposes as described above.

### [4] Sandpaper (medium and fine grade)

Mainly for adjusting bridge heights as described above, also for tidying up heads. I also keep a few emery boards around for slot work (and for smoothing off the edges of picks when they get hacked up). Remember that whatever you do with the medium grade sandpaper should be finished up with the fine grade.

### [5] Steel wool (fine grade)

Handy for various purposes. Some steel wool comes with a light coating of oil already on it - avoid that if you can because there are times (e.g., cleaning the head) when you don't want the oil.

### [6] Files

A set of woodworker's files will always come in handy. A tapered round file is especially useful for shaping and enlarging string slots in nuts and on bridges. Available from catalog houses.

### [7] Paintbrush

I find a small paintbrush (1" width is plenty) handy for tidying up after using steel wool, sandpaper, etc. and for general crud removal purposes.

### [8] Toothbrush, medium or hard bristle (new or used)

For general cleaning of head, fingerboard, etc. Good for removing accumulated crud from around frets.

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### [9] Rubber- or plastic-headed hammer

Handy for helping change the minds of any pieces that may not wish to relocate, e.g. a head tight on a rim, a bracket hook stuck in a shoe, etc. Of course a metal-headed hammer will also serve the same purpose, but there's a good chance that it will damage the surface of whatever you're working on unless you're prepared to cover it in something.

### [10] Lemon oil

I use this for general tidying-up of wooden surfaces. There are other liquids out there that will do the same job.

### [11] Gun-cleaning cloth

I find one of these very handy for putting a shine on a banjo's brightwork. Available pretty much anywhere. There are other polishing cloths around too that serve the same purpose.

### [12] Lubricating oil

A small can of this will come in handy. I avoid sprays like WD40 because they're hard to control in an instrument context (even if you can find that little red straw that always gets lost).

### [13] Glue

Elmer's or any white glue is fine for routine repairs. Look at it this way - any job that requires a stronger adhesive (like replacing a fingerboard) you probably don't want to do on your own anyway!

### [14] Detergent

I like Murphy's Oil Soap and not only because of the name. Good for removing really meaningful grime from your favorite instrument.

Which leads us to ... Section V on the next page!



# *BANJO CARE & FEEDING (Irish Tenor version)*

## V. CLEANING the BANJO

Does a clean banjo play any better than a scuzzy one? Actually it does, particularly where the strings and the fingerboard are concerned. Here are some tips for keeping your yoke looking and sounding good.

### [A] The Strings

Like anything else that's in contact with the real world, a banjo can accumulate a certain amount of crud with regular use.

The first place that most people notice the grunge is on the strings, which spend their working lives being pushed around by sweaty greasy yucky fingers. To make your strings happier and give them a longer working life, you should make a habit of wiping down the strings after each session of playing. Nothing fancy, just a piece of soft cloth or paper towel, not moistened. Make sure you get underneath the strings too (you'll be surprised how much otherwise invisible crud you'll remove). There are also some kits on the market (e.g., FastFret) that will help clean and lubricate the strings.

Some players swear by rubbing alcohol for de-gunking strings, which is OK as long as it stays on the strings but not OK if too much of it gets on the fingerboard. Same holds true for silicone-based material. Problems of this nature can be minimized by sparing use of the liquid (i.e., no need to drench the cloth), and also by protecting the fingerboard with a paper towel or additional cloth as you work on the strings.

It's also effective to rub the strings down lightly with steel wool; again, the fingerboard should be protected.

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Whichever method you decide to use, however, the basic idea of wiping down the strings (like backing up a hard drive, or flossing your teeth) remains valuable even if we don't do it as often as we should ...?

### [B] The Fingerboard

Naturally the same glop that adheres so annoyingly to the strings can be found on the fingerboard as well, especially behind the frets. There are various cleaning products around that will help remove it (some folks advise against using any silicone-based products on a fingerboard - I'm not sure of the reason). If it's really tenacious, you can rub gently with a piece of very fine steel wool until the gunk disappears. The steel wool can be used dry, but you can put a drop of light furniture polish or light mineral oil on it to brighten up the fingerboard as you clean it (remember to wipe off any excess liquid that may remain).

Be careful of using steel wool around any inlays that may be loose - you don't want to break the inlay by catching it on a piece of wool fiber. (It's not hard to reset the loose inlay piece using Elmer's glue - just remember to wipe off the excess glue once the piece is back where it should be. You can clamp it lightly into place - with a piece of thin wood or cloth between the clamp and the inlay - and should be good to go within a few hours.)

Another player recommends using naphtha to keep fingerboards gunk-free. When I expressed horror at the idea of working with naphtha in the relatively confined space that is my workshop, he reminded me that I didn't necessarily need a 55-gallon drum of the stuff - cigarette lighter fuel is naphtha and a few-ounce can of it is pretty manageable (but ventilation is still something to keep in mind). According to him, the stuff de-

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greases and de-gunks very well and will not affect a finish. I haven't tried it yet but it certainly sounds reasonable.

### [C] The Brightwork

The bright metal on a banjo (tension hoop, hooks, tailpiece, flange pieces, armrest, etc.) should be cleaned every so often to preserve it from rust and corrosion and to ensure that the banjo looks its best.

There are different methods of accomplishing this: some players use gun-cleaning cloths or metal-polishing cloths, both of which have the virtue of being pre-moistened and easy to work with. Preparations like Brasso will also work, but can be messy. If there's obvious gunk on the metal (like drops of Guinness, for example), a gentle rub of some fine steel wool can usually loosen the offending material without damaging the surface.

### [D] The Head

Considering what it goes through in the course of its musical life, it's not unreasonable to expect a banjo head of either type, plastic or skin, to get a little grimy from time to time. Light dirt should come off with a damp cloth, but believe it or not, one of the best ways of cleaning more determined grime from a banjo head is toothbrush and toothpaste! Don't use a lot of water and don't worry much about flossing first (joke) - put a dab of toothpaste on the brush and go after bad old Mr. Dirt. Use a circular motion, and wipe off with a damp cloth when you're finished.

For more serious grime, you may want to rub the affected area of the head gently with a piece of fine steel wool or fine sandpaper. You can also use these materials to smooth out the surface of the head near the bridge - if you play like I do and

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support your right hand with the little finger resting on the head, you may have had the experience of playing on a new frosted head and having friction burn all the skin off your little finger (I actually shed blood on another guy's banjo one time without realizing it!)

Usually two or three minutes' work with the sandpaper or steel wool will smooth the surface nicely. Your little finger will be forever grateful. (But keep a few band-aids in your banjo case anyway ...)

Over the course of years a head will usually acquire a bare spot where fingers have rested or picks have scraped. These bare spots don't seem to affect the sound, so I usually don't bother with them (in fact they look kind of salty, "been there done that", like travel stickers on your luggage - but that's my personal opinion!)

### (E) The Woodwork

If your banjo gets dull-looking, you might try wiping it with a cloth or a small paint-brush lightly dipped in lemon oil (don't apply the oil directly to the banjo). This should brighten the wood finish noticeably. If the surface is really grimy, you could try an application of a cleaner like Murphy's Oil Soap - that and a little elbow grease should suffice; if not, you can always try a light rubbing with a piece of fine steel wool (this is not recommended for any area where the finish is important).

Remember always to remove any excess oil or soap from the banjo when you're finished. (Having a roll of trusty paper towels near your work area is also highly recommended.)

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## VI. RESOURCES

The following is a very brief list of resources that may be of assistance to a banjo player, primarily in the area of parts and repairs.

*I originally created this "helpful hints" website in 1998 or so. In the intervening years, the Internet - and search engines like Google - have made the job of locating various supply houses, repair facilities, and so forth much easier. (A Google search on "banjo" listed 21,800,000 hits, so the information is out there!)*

Listed below is a sample of the resources that I have had occasion to use over the years; it is by no means a complete list, but rather a point of departure. (If you try to visit a link and find it broken or gone altogether, please let me know. I had to remove a few in the process of updating this file.)

[A] Suppliers - dealers

Stewart Macdonald [www.stewmac.com, 800.848.2273]

Good all-purpose catalog for banjos and other string instruments. Selection has been reduced over the years, and you're starting to see cheesy parts made in China (bracket hooks, for example). But still an excellent resource, especially for tools. Disclaimer: you don't really need 93.2% of the stuff they carry, but it's fun to look at. (Located in Ohio somewhere)

Elderly Instruments [www.elderly.com, 517.372.7890]

Excellent selection of parts (especially weird-sized heads) plus strings, instruments, books, etc. Printed catalog available. (Lansing MI)

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Music Emporium [www.themusicemporium.com, 617.860.0049]

For instruments, repairs, general expertise (owner's personal banjo collection is to die for). Nice folks to deal with as well. Located in the Boston area.

Bernunzio Vintage Instruments [www.bernunzio.com, 585.473.6140]

When you're ready to move up in quality. These folks buy, sell, trade and consign vintage guitars, banjos, mandolins, ukuleles and other stringed instruments. I sold a bunch of banjos to them nine years ago and was impressed by their straight dealing. Located in lovely Rochester, NY (snowfall capital of the US).

Bulk string suppliers

Web search will reveal loads of them out there but you could start with www.juststrings.com. (I had two other names in the original file but neither are still around.) Another name to try is www.smakula.com.

[B] Banjo-related internet sites

There are probably lots more waiting to be revealed by a web search, but you can start with these:

alt.banjo

This is one of the oldest banjo user groups on the Internet. It's oriented more towards non-Irish playing styles, but occasionally a valuable discussion will get going. You can view the latest material by going to Google, clicking on "Groups", and typing in alt.banjo in the selection box. You have to join the group to post anything.

www.irish-banjo.com

Frank Nordberg's Irish banjo site. Evidently renamed or gone altogether because the URL now belongs to some kind of "green energy" investment operation. . .?

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[www.banjosessions.com](http://www.banjosessions.com)

This used to belong to the music publisher Mel Bay but is evidently being run by somebody trying to sell banjos and not publications.

[www.thesession.org](http://www.thesession.org)

A source of "occasional banjo wisdom"; also tunes

[www.banjohangout.org](http://www.banjohangout.org)

All things banjolic (my adjective - ©) and occasional ITM content; heavy on building and maintaining banjos

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## APPENDIX

(with thanks to Pete Strickler)

### STRING GAUGES

The matter of preferred gauges has a subjective element - how does the string actually feel as you play it? - which is why I emphasize the word "personal" in this discussion. Some players like the heavier gauges, some like the lighter. You won't know which one you like until you try them. But my advice to you would be not to stray too far up or down from the gauges suggested above.

However, it does help to have a fairly consistent tension across each of your strings, especially if you're a perfectionist. If the tension is fairly even, it aids in being able to place your bridge in a position where all the strings are in tune all the way up the neck. To figure out tension on a string, you can use an online calculator. One popular one is from the string manufacturer, D'Addario, at <http://stringtensionpro.com/>

For this calculator, you can calculate based on an existing set of strings (like D'Addario's EJ631 sets of Irish Tenor strings), or you can specify your own custom set of string gauges and adjust the numbers around until you have fairly evenly matched tensions. To use the calculator, you start by specifying a set of strings (or custom). Then you input your scale length (the distance from bridge to nut on the banjo). For 19 fret tenors the scale is usually around 23", for 17 fret models it's usually around 21.5", but it's best to actually measure your specific banjo.

Next you enter your tuning into the calculator (by specifying note followed by octave). For Irish tenor banjo tuned GDAE, the strings would be G2, D3, A3, E4. Then you specify the string material, including whether the A string is plain or wound (I



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prefer a wound A string). Different materials have slightly different tension properties, so choosing the material can change the outcome. For my tenor, the scale length is 23", and I use ball end strings with a wound A string, all in Nickel, except the E string, which is plain steel. So my string chart looks like this:

1	G2	.042"	Nickel	16.53 lbs
2	D3	.028"	Nickel	17.18 lbs
3	A3	.018"	Nickel	16.43 lbs
4	E4	.011"	Steel	15.97 lbs

You'll notice that each string has a tension around 16-17 lbs, so it's nice and balanced (unlike that D'Addario set!), and 17 lbs is about the tension I like on banjo. (Guitar and bouzouki usually have higher tension, around 20-22 lbs per string). You should also know that most string manufacturers don't make the odd numbered gauges above about .013". So if .027" would be the best tension on your instrument, you'll have to decide between .026" and .028", whichever is closer to your target tension.

Different string materials can have dramatically different sound on the same instrument, so if you're feeling adventurous and you can find a store that carries a wide selection of single strings, you can experiment all you like! I like to buy bulk guitar strings from

<https://www.juststrings.com/guitarbulkstrings.html>.

Choices of material include Phosphor Bronze, Stainless Steel, Brass (also called 80/20 Bronze), and Nickel windings. (And then just a plain steel E string). Each banjo is different, so it's not a one-material-is-best-for-all scenario, but most banjos I have tried sound best with Nickel strings, because Nickel provides a nice balanced, full tone. Steel strings can sound a bit more brash than Nickel. And Brass is also brighter and can be a bit brash. Phosphor Bronze is usually the warmest

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sound, but doesn't sound great on all banjos. Again, a bit of a subjective decision.

OK, so you think you got a handle on the string materials and gauges? I hate to tell you that there are other considerations too! The wound strings are generally built upon either a round or hex core wire. Hex core strings are a bit brighter and louder, but I find that the round core strings match the tone of the plain steel E string better. And then there's the type of winding wire. Most strings are round wound (meaning the winding is also a round wire). Round wound strings have the fullest tone. But some manufacturers also make flat wound and half round windings. Flat wound strings are smooth and easy on the fingers, but they're typically darker in tone and feel quite a bit stiffer than the other windings. And half round strings are somewhere in between the tone of round wound and flat wound. You can try them, but after all that, you're probably just going to use round wound strings anyway...

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### BRIDGE PLACEMENT

Despite the complicated math, the rule for placement is an easy one: the position to start with when placing your bridge is right at double the distance from the nut to the 12th fret, which makes sense because the 12th fret is an octave higher than the open string - basically, you're dividing the string in half to get an octave higher. Easy-peasy, right? Not so fast, it's a bit more complicated than that! When you watch a rock guitarist, and he bends his string upward in the middle of a ripping solo, what happens? It makes the note sharper. The same thing happens when you bend the string toward the fret board to touch the fret. So every time you fret a string, you're sharpening its tone a bit, so your bridge needs to be

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moved toward the tailpiece (flattening the tone a bit) to compensate.

The question is "how far do you need to move it?", and the answer is "it depends". It depends on how high your action is. If you don't have to bend the string very far to reach the fret, the bridge doesn't have to be moved much, whereas if your action is higher, you really sharpen the tone by bending it to the fret, and the bridge will have to be placed further back.

So how do us mere mortals figure out where to put the bridge? Well, by listening to the notes and making adjustments (or even better, using an accurate tuner). So if you tune a string to a perfect A, and then fret it at the 12th fret, it should also be a perfect A - an octave higher. An even more accurate test is to check the 12th fret harmonic against the fretted 12th fret, since they should be the exact same note. (A harmonic is achieved by lightly placing your finger on the string directly over the 12th fret, then right when you pluck the string, you remove your finger from the string. This sets up a standing wave on the string, where the string is vibrating between the nut and where your finger was AND from where your finger was to the bridge, giving you an octave higher tone that is easier to compare to the fretted note. Yeah, the rock guitarists use harmonics a lot too).

If the fretted note at the 12th fret is sharper than the open string (or the harmonic), then you need to move the bridge a bit back toward the tailpiece. If the fretted note is flat, then you need to move your bridge closer to the neck. Rinse and repeat this process with each string until you have the optimal placement of the bridge.

Here's the reason that it's good to have even tension across all your strings. A higher tension string will sharpen more with the same amount of bending. So if your strings aren't closely matched, you might have to move your bridge one way for one

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string, and another way for the string right next to it, which is impossible unless you have some new-fangled magic rubber bridge (which probably doesn't sound too good anyway).

It sounds like a complicated process, but once you've gotten used to doing it, it takes maybe 15-20 seconds to get your bridge placement correct.

OK, so one last gotcha with this process: The inner obsessive part of our brain that doesn't like pictures on the wall to be crooked, and likes a room with nice feng shui, kinda believes that the bridge should be straight across, a perfect 90 degree angle from the neck. It looks better, and we expect it to sound better. But there's another thing about strings - the fatter the string, the more it sharpens when bent, even if it's at the same tension as a thinner string. Blame the physics gods on this one. So in most cases, the bass end of your bridge is going to need to be angled a few degrees back toward the tailpiece for all your strings to be in tune all the way up the neck. (If having an angled bridge really de-fengs your shui, and the AR part of your brain can't stand it, you can play around with different string tensions to adjust for this so that your bridge can be perpendicular, but trust me, you'll be just as bothered by strings that feel floppy compared to the others...)

Once the optimal bridge position has been found, a lot of players like to make tiny pencil marks on the head, so next time they change strings they can just put the bridge back. And that works fine if you are using the same strings, and your head is a stable plastic, instead of skin (which can get unpredictable in different weather). But if you get good at placing your bridge using harmonics and a tuner, there's no real need to sully up your pretty banjo head with pencil graffiti...