

AMPLIFYING YOUR DULCIMER - A BASIC COURSE FOR THE PLAYER IN SMALL VENUES

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Ok, so you've been playing your dulcimer for a while now and you've learned quite a few tunes. You sound good and your friends love it. Somebody asks you to play at their wedding, or at the church or retirement home. Being the sweetheart that you are, you gather up your courage and go for it. Everybody loves you and you're hooked. But they couldn't really hear you very well.

You and a friend or two play together for fun and are thinking about playing in the local coffee house. Even though it's a pretty tame place, you know you'll need a little something more to be heard in the back row. You've seen the other groups do it, but all those wires and boxes are unknown territory.

Lots of dulcimer players perform on stage at festivals and gatherings, and some even play in bands all the time. These folks have people to help them with their sound or have become experts themselves through experience and may even have complex sound systems of their own. But this article is for the solo musician or small group who needs a little more volume for those special occasions, and especially for those who don't understand a thing that the guy at the music store says.

If any of this sounds like you, then welcome! While we'll talk mostly about the mountain dulcimer and hammered dulcimer, the basic information here can be adapted to practically any acoustic instrument like guitars, mandolins, and yes, even banjos and fiddles need help sometimes. Take note that I won't be mentioning any specific brand names, makes, or models of gear. In the music world equipment comes and goes so quickly that a specific item might be obsolete by the time you read this. Discussions about selecting brands and models are better left to the open forum where up to date information can be had.

So for anyone who has waded endlessly through confusing catalogs of musical gear or listened to the salesperson at the music store with something less than perfect confidence, a good first question might be:

WHAT DO I REALLY NEED?

That's a big question, but it can be broken down into manageable chunks. The solo musician or

small group playing to quiet, attentive crowds such as a wedding ceremony, church service, or coffee house needs very little compared to the gigging band or touring group playing to loud crowds in big, noisy venues. And since most dulcimer players don't need to rock out at ear-splitting volumes, things can be simplified. You'll need an input device to capture the sound, an output device to make that sound louder, and a couple of other items to make everything work together. It's easier than you think.

INPUT DEVICES, OR HOW TO GATHER UP THE SOUND

MICROPHONES are by far the most common input device. They work by sensing the vibrations of the air around your instrument and turning that into an electrical signal that an amplifier can use. Microphones are, of course, the only choice for singing, but they are used for all kinds of instruments. If something makes a sound, a microphone will make it louder. There are two basic kinds:

The DYNAMIC MICROPHONE. These come in a vast assortment of brands and models. Good ones are rugged, reliable, easy to use, and readily available. They connect directly to your amplifier with a simple cord. The 'cardioid' version of the dynamic microphone picks up less sound from behind and from the sides, so it is less prone to feedback, that horrible screeching noise that happens whenever a microphone and a speaker 'hear' each other.

The CONDENSER MICROPHONE works the same way, but it has a built-in pre-amplifier that allows it to hear fainter sounds from farther away. Their advantage is that they don't have to be as close to your instrument to work, but they are more prone to feedback and they require a battery. Many condenser mics can use 'phantom power', a feature of some amplifiers that takes the place of a battery. Condenser mics can hear everything around them, so be careful what you say!

Both dynamic and condenser microphones come in different sizes and styles. The hand-held style is supported by a microphone stand so that it points into your instrument. The contact style attaches directly to your instrument, usually with a suction cup or tiny bit of removable adhesive. Contact style microphones are less prone to feedback, but often result in a lot of noise as they can 'hear' you handle your instrument. The lavalier style are those little microphones you see all the time on TV that clip onto a speaker's clothing and are often adapted to clip onto an instrument. Most lavalier microphones are the condenser type.

TRANSDUCER PICKUPS work by directly sensing the vibrations in the instrument itself and converting those vibrations into electricity. There are three major categories.

The UNDER-BRIDGE PICKUP is built directly into the bridge of your instrument. They can be purchased when having a dulcimer built, or installed afterwards. They require some modifications to your dulcimer, like drilling a small hole. This makes their installation best left to a qualified technician.

The SURFACE MOUNTED PICKUP, sometimes called a soundboard pickup, attaches to the wood of the instrument very easily with a bit of removable adhesive and can be moved from instrument to instrument. They can also be permanently installed inside the instrument, and when they are, that too is best left to the professional technician.

The MAGNETIC PICKUP is normally built into the instrument when it is made. These are just like the pickups found in electric guitars, and usually show up only on solid-body electric dulcimers.

Some pickups require a separate PRE-AMPLIFIER that boosts the strength of the signal and helps to adjust the sound before it enters the main amplifier. They have volume and tone controls and a battery to run their small on-board amplifier. They go between the transducer and the main amplifier.

The DIRECT BOX is an item that has generated a lot of confusion for the first-time user. In its simplest form a direct box is a device used to send the instrument's signal through long lengths of cable without suffering loss. In recent years many manufacturers have included lots of additional features in direct boxes, and some models have all the functions of the pre-amplifier as well. The good part of this is that we can buy a single item that has many features, the bad part is that it can be very confusing. For the small systems described here, the direct box is not a necessary tool, although the pre-amplifier feature might be useful.

SO WHICH ONE IS RIGHT FOR ME?

That's probably the hardest single question of all, and in the end every player must decide what's best for themselves. To summarize the pros and cons:

Microphones give the best chance of a perfect acoustic reproduction, and many players will settle for nothing less. They require no modification of your dulcimer, and any acoustic instrument can play into one. They take the most effort, skill, and practice to use. They usually involve carrying more gear and taking up more space, and can be very prone to feedback. Their performance varies if you move your instrument when you play, and they are not suitable for MD players who stand up and move around the stage. Cardioid and hyper-cardioid designs help

control feedback from reflected sound.

Transducers are dead simple to operate, are nearly trouble-free, and require buying, carrying, and handling far less equipment. They are especially suitable for use in tight, cramped quarters. They are prone to handling noise and often have a less than perfect acoustic reproduction. If attached to the outside of the instrument they are easily removed, but some folks think that is ugly. Putting them inside can mean modifying your dulcimer permanently, and not all transducer types are available for all instruments. A transducer may need an additional pre-amplifier.

OUTPUT DEVICES, OR GETTING THE SOUND TO THE CROWD

Simply put, these are the amplifiers. There is a bewildering variety of these, but they fall into some manageable categories.

The ELECTRIC GUITAR AMP. For someone playing a solid-body electric dulcimer, this is often the first choice. For the acoustic soloist needing only to amplify the dulcimer alone these can be handy, if not optimum, choices. It's often asked "My son has a guitar amplifier. Can I use this for my dulcimer?" Yes, you can. While not ideal for microphones, you can plug a transducer into the 'clean' channel of the guitar amp. The biggest problem with electric guitar amps is that they are designed to modify the sound of the instrument as well as make it louder. That's important to electric guitar players and electric dulcimer players alike, but not so important for the acoustic dulcimerist wanting a natural sound. While not ideal, they can work well for small crowds. For those who are especially concerned about reproducing the acoustic sound, or who expect to play on a more frequent basis, investing in another kind of amp is usually desirable.

The ACOUSTIC AMPLIFIER is, for all intents and purposes, a small self-contained public address system. They are designed to give a very realistic sound. Many also allow you to use microphones, transducers, or even both at once. For instance, depending on the particular model you could amplify both your dulcimer and another instrument or a vocal microphone for singing. For those who want very realistic sound, want to sing and play at the same time, or have a friend who plays along on another instrument, the acoustic amp is often a top choice. There are even battery-powered models that are very handy for playing outdoors.

The PUBLIC ADDRESS SYSTEM or PA is the recommended solution for anyone who plays in many different locations where they need maximum flexibility, and for small groups who need to amplify a number of instruments or voices. The primary differences between acoustic

amplifiers and PA systems are that PAs can be much more powerful, they have separate speakers that can be placed where they will work best, are versatile for solving countless problems, and have multiple inputs for lots of instruments and singers. The simplest PA systems consist of a pair of speaker cabinets and a box that contains the 'guts' of the amplifier and all the controls. Surprisingly, while they have more pieces, in small PA systems those pieces can be very light and compact and are often much easier to carry. For the someone who is playing in lots of new places with unexpected conditions the PA is the number one choice. For duos and small groups, especially for those who sing and play, the PA is the serious tool.

HOW POWERFULL SHOULD MY AMPLIFIER BE?

Since we're talking about playing in smaller venues to quiet, attentive audiences, the answer is "Not as much as you might think". While big, ear-splitting amplifiers are desired and even needed by a lot of musicians, you'll find that most dulcimer audiences expect to hear you without suffering from you. And of course, most churches honestly don't want you rattling their stained glass. For most people dulcimers are, by their nature, an instrument you sit quietly and listen to. For the vast majority of players in the kinds of venues we're discussing, a 50 to 75 watt amp will handle most needs. If using a PA system for multiple performers, 100 to 200 watts is almost always sufficient for the kinds of places we're talking about. Even if you're playing the cocktail hour for a wedding reception, the crowd will be quieter than it will become once the DJ starts the dance music. If you expect to play outdoors, then go for the larger sizes of the ranges shown or even beyond. !

Outdoor playing invariably requires more power.

You will often hear advice about 'never having enough amp'. For a great many (indeed most) musicians, this is usually true. But amplifiers are funny things. Small amps don't like to be turned way up to the top of their limit and big amps hate to play turned way down low. For the majority of small venues, smaller amps are actually better. The only thing I would personally advise dulcimer players to avoid are really huge systems. In the circumstances where you'll need it, like festivals and fairs, the really big gear is usually provided and operated by pros. If you're in a band that plays large, noisy rooms with raucous crowds, well, that's another story too.

SETTING IT ALL UP

Once you've chosen your input device and the amp type you'll need, then what else? Well, you'll need some cable. The kind of cable you'll need depends on the mic or transducer you

have and the kind of connectors they use, but the right cables can be bought at any music store. The best advise I can think of is to have your cable a little longer than you think you'll need, and don't buy cheap ones. Cheap cables are disasters waiting to happen. Nor is there any need to invest in excessively long cables. When playing the small venue, you will be quite near the amplifier, and excessively long cables are not only clumsy and expensive, but can even degrade your sound. A 15 to 20 foot cable meets the need almost every time with length to spare.

If you've chosen a small PA system, it will likely come with speaker wires to connect the amplifier to the speakers. It's important to use speaker wires only for speakers, and instrument/mic cables only for their particular purposes. They are not interchangeable, even though they might have the same kind of connectors. Your PA will come with directions for proper hook up. Follow them closely. Plugging the wrong cord into the wrong place can result in damage. To protect your amplifier, make sure the speakers are correctly plugged in before you turn the power on. An amplifier without speakers attached can be damaged by heat.

It's always a good idea to have a high quality extension cord to reach the power outlet. If you play outdoors, make sure to get an outdoor type. Much to your chagrin, you may need to plug your amplifier into an outlet that isn't the one that's right next to you. Sometimes, in fact, often, you have to go in search of a 'clean' outlet. Other devices that are on the same circuit as your amplifier can often cause audible hums and buzzing.

For hand-held style mics, you'll need a microphone stand and boom. These let you position the mic for the best sound. With dulcimers the mic often ends up pointing nearly straight down. To avoid losing it in the middle of a tune and having it crash into your instrument, secure it in its holder with a bit of electrical tape or better yet, gaffer's tape available in most larger music shops or on-line.

When selecting mic stands, stability is the watchword. A wobbly stand is no good at all. Stands come in a variety of styles and sizes. One of the handiest has three telescoping sections. This allows it to be very low or very high when you need it, and these are especially good for hammered dulcimers players who use a microphone under their instrument. Some have folding legs, others have heavy, cast iron bases. Folding is nice, but heavy is stable.

GETTING THE MOST OUT OF IT

Using sound reinforcement for the small venue is not difficult but it can be challenging. While there is no substitute for experience, there are a number of simple rules of thumb that will get

you through those first few nervous performances.

If you've never played through an amplifier you're in for a surprise. It's like the first time you ever heard your own recorded voice. You're likely to say "Is that ME!?" The first two common reactions to this are both mistakes. First, do not suddenly play shyly. The whole idea is to be louder. Play as you normally do and let the amplifier do the work. Second, do not automatically re-adjust the controls of your amplifier to change what you THINK you hear. What does that mean?

Have you ever heard someone playing through an amplifier and not liked the quality of the sound? Odds are that if you sat next to the player, things would sound much better. When you are very near or behind a loudspeaker things will sound different to you than they do to the audience. A common problem happens when the musician adjusts the amplifier to sound good on stage while the sound the audience hears is completely different (and often terrible!). It takes time and practice to get used to hearing yourself through an amplifier. It sounds weird and alien at first, but you will adjust to it in time. In large, complex sound systems there are ways of correcting for this, but here we are discussing the small, simple set up.

When adjusting the controls of your amplifier it's a good idea to have a friend help out, either by standing out in front to give advice about how things sound, or by speaking into your microphone or strumming your instrument while you listen. If using a microphone, have your friend speak into it normally. Start with the volume at zero and the EQUALIZATION controls (treble, mid-range if there is one, and bass) set at the 12 o'clock positions, and the sliders of your graphic equalizer set to their middle positions.. Turn on the power and increase the volume slowly to avoid feedback. Adjust the bass if you sound muddy and the treble if you sound tinny. The objective is to get a natural sound. With a microphone, if your friend's voice sounds normal, your instrument will too. For transducers, it is a matter of adjusting the controls to get an even response from the treble and bass strings. Take your time and remember that turning these knobs will hurt nothing.

Probably the biggest single trap that players fall into is in trying to use the sound system to change the tone of their instruments or voices. For acoustic players, you won't add lower notes by turning up the bass, you'll just get muddy sound and probably feedback. Conversely, if you want your instrument to sound brighter, you need to get a brighter dulcimer. Turning up the treble is not the solution. Unlike the electric guitar (or dulcimer) that is deigned to have a broad range of tones, an acoustic instrument can really only sound more or less like itself, but louder. This is especially true when using microphones.

Once you have a natural sound that you like you need to get loud enough, and the next biggest problem you'll likely encounter is feedback. When playing at low volumes feedback almost never happens, and in most small, quiet rooms where you're not pushing the amplifier you can sometimes get away with breaking a lot of rules and not have feedback. But if you do have it there are a couple of rules of thumb.

The first most important consideration for feedback control is to not let the microphone 'hear' the speaker. This means placing your amp or PA speakers in positions where they don't point into the microphones. Keep speakers in front of you if you're playing loud. Point them slightly away from the mics.

Your amplifier will likely have at least two volume controls. One will be marked MASTER and does just what it sounds like it does. It controls the overall volume of the amplifier. The other is the GAIN control. That is the input volume coming into the main part of amplifier from your instrument. That control should normally be set lower than the master control. The higher you set the gain the more sensitive your microphone or transducer becomes and the more likely you will be to have excessive noise and feedback. A basic rule of thumb is to put a small volume into a larger one.

Many amplifiers have a GRAPHIC EQUALIZER, a series of small sliding switches that control the overall response of the amplifier. While it is used to control the general output of the amplifier, it is also a primary tool for correcting feedback. It helps to think of a graphic equalizer (or EQ) is a combination tone and volume control that is broken up into small sections from bass to treble. It allows you to reduce the volume of only that part of the sound that is causing feedback. Getting good at using the EQ is a big step in getting the most from your set up, so practice with it. By reducing the volume of each sliding switch in turn, you can usually isolate the particular part of the sound (or frequency) that is causing the feedback.

Mostly, if feedback happens, turn the amp off, turn the volume down, and start again. Reposition the speaker(s), turn down the gain, and adjust the equalization. Often reducing the bass or treble slightly will help with feedback.

Finally, your objective is to get enough volume for the job. This really means having MORE volume than you think you will need without any feedback, then turning the system down to where you actually want it. Sound technicians call this 'ringing out'. If the set up will run at a higher-than-needed volume without feedback, you are far less likely to encounter it during your performance. If you get feedback as you increase the volume, stop and re-adjust. There is no perfect answer, but you will gain experience with just a little practice and patience.

Why have I mentioned so much about feedback? Simple. Dulcimer players put their microphones in that odd position of pointing straight up or down. Microphones really hate that. They are designed to be held more or less horizontally to avoid feedback, and when we dulcimer players use them the way we do, we're asking for trouble.

Another important tip in getting the most from your amp is that they work better if they are up high. Placing your guitar or acoustic amp on a chair or tall stool will get you a lot more performance, and most modern PA systems use tall tripod stands to place the speakers up high. Getting the speaker(s) off the ground can make your small amp perform like a much larger one.

MICROPHONE PLACEMENT - THE KEY TO OPTIMUM TONE

If you're using a transducer pickup and have achieved your desired tone at enough volume without feedback, congratulations. You can skip this step. If you're using microphones, especially the stand-mounted kind, read on.

It is common knowledge among experienced players that placing the mic in just the right spot means everything for good response and performance. Even moving the mic an inch can change the sound enough to notice. This is called the 'proximity effect'. It is especially noticeable to vocalists who can change the very nature of their sound by moving close to the mic and singing softly or moving away and singing louder. Be sure to spend some time experimenting with your microphone placement and getting lots of input from your friends standing out front. It's important to think of your microphone as a musical instrument in its own right.

Dynamic microphones often need to be placed right up close to the instrument to get the strongest signal. This can impart a warm tone to the instrument, but can sometimes get in the way when playing. Condenser microphones with their built-in pre-amplifiers can be placed a greater distance away. They can give a very natural representation of your sound, but remember that they hear everything around them, including all the little shuffles and whispers.

For any microphone, the ideal location is where it will receive the most sound to amplify. That means in front of a sound hole. But you may find that this doesn't necessarily give the most natural tone. Why is that? It's because the sound we hear when we play is a combination of sources. We not only hear the sound from the holes, but we hear reflections as well. We're not just listening to a single sound hole, but the output of all of them at once, and the overall vibration of the instrument itself. Because of this, you may find that your ideal location for

tone is not exactly where you think it ought to be. Don't be surprised if you like the sound of your mic somewhere in the middle of your instrument. And too, many players like the sound of two or more microphones. This is especially true for hammered dulcimet.

The dulcimers have a couple of unique challenges owing to their designs. Simply put, the sound holes are pointing in the wrong directions. In mountain dulcimers the holes most often point to the ceiling. In hammered dulcimers they point at an angle back to the player, away from the audience. Even those designs with additional sound holes in their backs end up playing at an angle into the floor. In these situations some HD players use a mic under their instrument.

These challenges can be more successfully met by using 'cardioid' or even 'hyper-cardioid' microphones. These are models that reject sound coming from the sides and back, and hear mostly the sound coming directly in from the front. They are much better at avoiding feedback caused by the unusual placements of microphones used with dulcimers.

One of the most important words of advice I think I've ever received is to practice with the sound system at home on a regular basis until you really understand it and are comfortable using it. Do not expect to buy a small system and be an expert immediately. Giving a good amplified performance means incorporating the sound gear into your playing. You can always tell the players who are not comfortable with sound equipment, but just a little practice smoothes out those rough edges and you'll find that the equipment just seems to disappear.

A FEW FINAL WORDS

Well, not really. The subject of sound reinforcement fills whole books. Short articles often raise as many questions as they answer, but that's OK. Having the right questions to ask is just as important. While nothing can replace personal experience, I hope you've come away from this little article with a better understanding of the small sound system and its use. I hope that the next time you pick up a catalog or go into that music store you'll have a little more confidence and be armed with a basic knowledge of the kinds of equipment you'll encounter and a better idea of what you'll need to get out there and play loud!