

# Sound Reinforcement and the Autoharp

## *Playing into a microphone*

### Contests

This topic is addressed first because our primary mission here is to prepare folks to confidently and effectively play in a contest.

There are two main points to remember about microphones when playing in a contest. First keep in mind that the microphone produces the best sound when the source is very close and directly within the sensitivity pattern. The rules prohibit adjusting the sound system to compensate for different people's approach. Secondly, to hit the mic with an instrument, pick, or hand is extremely distracting and to be avoided. There is no specific scoring for such things but it is bound to leave a negative impression and it is not competitive. While one has to work close to a mic, there must be a compromise for a safe distance to allow some movement without hitting the mic.

Contestants may sit or stand but typically they sit. Getting seated and then getting back up without hitting the mic requires some concentration. If necessary, pull the chair back until seated and then inch up to the mic. Remember that when you bend over to sit down or get up, the instrument will pitch forward toward the mic. Hold your hand on the strings between the instrument and the mic and you should be okay.

Microphones have different sensitivity patterns and ranges. Typical stage mics can be thought of as having a pattern somewhat like an ice cream cone. The ice cream is where you need to be, not the cone. In that way more of the surface of the instrument will be covered. Figure that the source, whether an instrument or voice will sound warmest if within a foot of the typical mic.

If a bit apprehensive about working with the mic, a useful tip is to practice with a microphone, even if a dummy. Simulating as close to stage conditions as possible will increase your comfort level when you get to the real thing.

### Performing

The majority of autoharp performers sing as well as play, involving more than one microphone and possibly pickups and effects. While there is no substitute for the natural sound of an autoharp played in an area with good acoustics, amplification can be done that achieves a pleasant if not natural sound. It remains debatable which type of equipment yields the most desirable stage sound. Each performer will find what works for them.

A performer who both sings and plays will typically have separate microphones for the instrument and for singing. The performer stands in an almost frozen position singing very close to the vocal mic with the instrument mic spaced proportionately at a lower level and slightly farther away from the body. It works well to have the vocal mic on a boom reaching straight in and the instrument mic on a straight up stand or much shorter boom length. This achieves the standoff necessary and provides plenty of room to play underneath the vocal mic.

Note: During the workshop Bill Belz, the sound man showed how setting the two mics close to each other and in a wishbone configuration would be optimal. In this way they were not picking up as much of the same source when positioned in parallel and offset in distance.

Vocal and instrument mics are usually different types, optimized for each application. There are many grades and specs on microphones, and the expensive ones do generally sound better. However, if the performer works VERY close to a mic, the result will usually be quite adequate with any decent microphone. The best way to select a microphone is to test models that have been recommended by other performers. There may be newer generation models available too, so consider those also.

Microphones are either omnidirectional, unidirectional, or some variation of a cardioid pattern, somewhat resembling a mushroom. The omnidirectional microphone is more prone to feedback and may need to be run at lower levels. The unidirectional will require a very disciplined user who will play the mic rather than dance around. The cardioids have some tolerance for movement and are a strong recommendation, being the typical pattern used on higher end performing equipment.

Wireless microphones do not have the full potential to produce as good a sound but fill the bill for performers whose act includes movement on stage. The headset microphone included for vocals is a fine idea because it fixes the distance from the voice to the microphone for a consistent level.

When playing in a group, note that one must step up to a mic and back again when playing a break, illustrating that the loudest and clearest source is close to the mic. Each instrument should have its own mic but note that there are some newer mics now where an entire ensemble can gather around a single mic that has an incredible sensitivity and range, yet apparently not especially prone to produce feedback..

## ***Vocals***

The voice requires reverberation (reverb) effect to give it any presence. When choosing amplifiers and designing setups for vocals, it is essential that reverb be provided. Not all amplifiers include reverb. In fact there are some promoted for music performance that are in fact speech amps, since there is no reverb nor even any effect loop to allow adding external effects devices.

The amount of reverb is adjustable and the level chosen is a matter of testing during setup. Basically, a good setup would not make one particularly conscious of the effect, since the goal is to achieve a natural sound that is apparently just louder.

## ***Instrument amplification***

### **Lavaliere mics**

Among autoharp performers it is common to see use of lavaliere microphones, following Bryan Bowers' lead. This is a small unit that can be pinned to ones shirt. It is intended to pick up the significant amount of very desirable sound on the rear of the instrument. Lavalieres can be omnidirectional but these are intended for speech applications like public address and lecturing. Music lavalieres are unidirectional or cardioid. An omni on stage would cause feedback. Cheap units can provide volume but not nearly as good a sound as a quality music microphone. Effective quality units start at around \$100. High end lavalieres may be too fragile to use on the road. Careful packing and handling is required always. Midrange units do not appear to be a problem. The Audio-Technica Pro7A super-cardioid is a good example, but there are other choices endorsed by those who own them.

### **Magnetic pickups**

Magnetic pickups can actually sound quite natural if properly installed on a hollow bodied, lightweight instrument. The very electric, unnatural sound sometimes attributed to a magnetic pickup like that available from Oscar Schmidt is most prominent on a solid body model or any harp that is heavy. The effect is also seen when the pickup is installed flat, contacting the top of the instrument. The best installation puts a slight arch in the pickup so that the magnetic bar is suspended between the top and the strings.

A magnetic pickup requires some system tuning to sound best. EQ allows tuning individual frequency ranges. Typically the bass and highs have to be boosted. The same effect can be achieved by backing off the midrange. On a solid body model, the bass is very prominent and must be backed off significantly. The mass of the solid body instrument dramatically increases the response of the pickup. The same is true of guitars. Thus the typical combat guitar is a solid body. That effect is not particularly prized among autoharp players but you will at least have some insight into why a solid body might sound quite different than an accessory pickup on an acoustic model.

The sound achieved with a magnetic pickup can be enhanced considerably by adding effects that give a touch of echo and chorus, but not enough to draw attention. Otherwise the effects become novelties and the gear is just toys.

## Acoustic or piezo pickups

Also known as contact pickups, acoustic pickups are often referred to as having a more natural sound but may in fact be quite hot and lacking in presence. Placement of the pickup is critical and is best positioned in a very responsive but balanced area of the instrument's surface. The best results can only be achieved by experimentation. Like magnetic pickups, the sound can be enhanced by adding conservative levels of reverb, echo, and chorus effects. Examples of this type of pickup include the STB-C (classical guitar) by Fishman and the hammered dulcimer model by McIntyre.

Note that this type of pickup requires preamplification to produce the intended sound. The pickup needs to plug into an impedance matching box that often includes EQ adjustments and volume control within reach of the player. An example is the Fishman ProEQ.

## Internal microphones

Use of microphones that are permanently mounted inside the chamber of an autoharp has been largely discredited. The sound is hot and unnatural. There are better alternatives.

## Combinations

Perhaps surprisingly, a very nice effect can be achieved by a balanced combination of magnetic pickup, lavalier, and conventional instrument mic all at the same time, keeping in mind that the magnetic pickup still includes a low level of echo and chorus and the whole mix has some reverb. This combination samples enough of the various sounds of the instrument to achieve something reasonably described as natural. The lavalier gets the back, the instrument mic gets the front, and the magnetic provides consistent power, warmth, and effects. Such a setup could be a bit much to deal with routinely but is well worth considering when practical. Running all of it into an amp on stage and feeding the complete signal to the house will give the player more control and satisfaction (no one to blame:>)). Significant setup and testing time is needed.

## **Gear**

- Portable amps

When getting started with autoharp amplification, the question always arises about what type of amp to get. Something small and inexpensive is not going to have a good sound. The best sound is not very portable. Ultimately two systems may result...one especially portable and one for home and performing use. Using only a cheap little amp will not create much of a fan for amplification.

Keyboard amplifiers have a frequency response range better suited to the autoharp than a guitar amp. Amps are available that have adequately sized speakers with a good sound and which have wheels and popup handles. If possible, find one with both reverb and an effects loop or tape in/out jacks. You would need at least two inputs, one for instrument and one for vocal. Nothing like that is available in a model that could be considered inexpensive.

For general performing, a complete sound system is best, providing ample microphone, instrument and effects loop jacks and individual channels to control separately. Sound distribution with at least two speakers will be appreciated by the audience.

- Effects

Adequate effects are usually not built into the typical amplifier or sound system. They may provide what is called an effects loop. That is simply a channel and a pair of connectors so that the signal can be routed out to an external device and back again (a loop). Effects can include digital reverb with room (hall) size, echo, chorus and also a few others not particularly valuable for an autoharp.

Reverb/echo adds presence to the sound by eliminating the one dimensional effect of straight amplification.

Chorus used with some reserve and discretion also adds presence. When used very conservatively, a touch of chorus can be the key to achieving a very satisfying if not more natural sound.

- Foot pedal switches for effects

Effects driven by the magnetic pickup and the pickup signal itself can be turned on and off at will using a foot switch box. This is especially useful when the instrument is amplified by more than one method. Some numbers or a break may include the pickup and others may not.

- The system

The amplifier itself has all the necessary controls to tune the sound. There is a virtually endless range of power, size, and expense, any of which is selected based upon suitability for the application.

It is very useful for the player to have both volume and EQ within reach. Thus the Fishman ProEQ or something similar is a great item to have nearby.

EQ or equalization is used to balance the frequency ranges or bands. Generally the autoharp midrange is too strong when amplified. A three band; low, mid, high adjustment is adequate, with 6, 9, or higher number of bands nice to have but not essential for basic applications.

Size of system depends on the application but for small group or solo gigs and playing at home a 4-6 port head is very versatile and often adequate. Effects loops are often not present until you get up to the 6 port units. Speaker size is often proportional to the amplifier head size. 10-12" speakers should be considered a minimum for up to a 100-150 person audience.

Power is a technical issue but a system that is designed and packaged together has enough power to drive all the equipment and the speakers chosen and to produce a good sound across its volume range. A complete system must also be able to handle extension speakers and monitors.

A truly good sound requires BIG speakers and hopefully more than one. Big speakers are heavy, so portability as a priority cannot easily coexist with a goal to have a good sound. Once again the best advice is to try out equipment and see what can work for you.

- Tripods - speaker stands get the speakers up where they can project and avoid floor effects.
- Monitors

Monitors are speakers that are dedicated to and aimed at the performer. They serve to give the immediate sound presence and accuracy necessary to aid in performing with confidence and having a sense of being inside the sound, virtually eliminating the hall effects that would be present in the house system without monitors.

Size and quality of monitor is very important. Get a good one. A group should have enough of them for all members to be comfortable with the sound. A professional setup would cover the whole stage or at least the entire area where performers would stand or sit.

- Carts and dollies

There are some very nice folding units available for moving sound equipment to and from a vehicle in only one or a few trips. Some pieces of really nice equipment may be too heavy to carry for any significant distance. Getting the whole rig loaded without a cart could require several trips in and out.

## ***Summary***

Fully equipped to be electrified and worth listening to, one would have spent at least \$750-2000 on quality equipment. It is not too bad to be electric at home but complete performance equipment can be a major expense. This will depend on what you want to do and how big an audience you have to serve.