

AMERICAN RECORDER SOCIETY

INFORMATION BOOKLET #1

RECORDER CARE

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INTRODUCTION

This information packet is intended to provide ideas for discussion and group activity at ARS meetings and workshops. The packet is organized into discussions of different common problem areas encountered by recorder players.

The subject of recorder care is not as straightforward as it might seem at first glance. The science of acoustics is still in many areas an inexact one and much of the recorder maker's work is still done on the basis of intuition and experience. Thus, it is possible on some questions to be given directly conflicting advice from two equally expert recorder professionals. This sometimes means that there is more than one solution to a given problem; it can also mean that no one is completely certain about the answer and that it is up to the individual recorder player to work things out for him- or herself.

It is the aim of this packet to give sufficient information about alternative views to spur recorder players on to their own discoveries in the context of a group meeting. While little playing is likely to be involved, it is hoped that at least a few minutes of meeting time might occasionally be given over to this subject in light of the fact that many of the topics covered here are unnecessarily mysterious or even substantially misunderstood by many recorder players.

It is suggested that group activities first and foremost take the form of a free discussion about a given topic, perhaps led by someone particularly knowledgeable about the topic at hand. Often comparing experiences can shed light on the most difficult of problems; as well, many ingenious recorder players have discovered their own solutions to the most common problems. In some cases it might be possible to carry out some cleaning or adjusting operations as a group or to look on while one more experienced individual does the work.

Thanks are extended to recorder makers Jean-Luc Boudreau of Montreal, Friedrich von Huene of Boston, Philip Levin of Newfoundland, New Jersey, and Thomas Prescott of Katonah, New York for their assistance.

Scott Paterson, March, 1990

ACCESSORIES

Whether for comfort of playing or for protection of the instrument, certain additions can be made to the recorder by the player.

Thumb rests:

Some players find thumb rests a hindrance while others find them indispensable for keeping the instrument in position and balanced with a minimum of strain to the fingers and wrists. Obviously, the larger and heavier the instrument, the more cause there is to employ a thumb rest; however, there is little evidence that recorder players used thumb rests before the twentieth century. Instead, the third finger of the right hand was left in contact with the instrument, or even on its hole (the buttress finger technique), in order to help support the recorder.

Designs for thumb rests come in many forms: ad hoc devices made from erasers, rubber chair leg supports, rubber washers, wine corks. Plasticine or elastic bands; plastic, wood or metal supports designed to attach to the instrument with glue or tape; and metal or plastic rests which are attached to the instrument with screws. Every method has its benefits and drawbacks, and every hand is shaped differently, so the choice of a thumb rest is in the end a personal decision.

The most commonly recommended types of thumb rests are: the use of Plasticine or a similar substance, which can be securely molded into position, but also easily removed or adjusted; a metal thumb rest padded with cork and affixed with hot glue, which is also very stable but which can be removed with the application of heat; and the use of a wooden thumb rest affixed with tape, if the thumb rest is truly comfortable and if the instrument is not too heavy for the tape.

There are thumb rests which can be more permanently affixed with regular glue or screws, but these should be used with caution. They can be removed, but only with great difficulty. As well, screws that penetrate the bore could cause harmful leakage of the air. These rests should first be attached with tape or string and tried in several different positions before they are installed permanently. It is wise to live with a proposed positioning for a few days to be sure that it is completely comfortable.

Bass recorder supports:

A related topic is the use of makeshift or specially constructed supports for the bottoms of the bass sizes of recorder. Many players support the basses on their leg or ankles or with a neck strap, but adjustable supports with sufficient venting not to interfere with the flow of air out the bell are often available from inventive local recorder players or instrument repair shops.

Thumb bushings:

Any player who uses his or her thumbnail in venting the hole will eventually wear away a groove around the hole, even on plastic instruments. It is likely that this wear will eventually affect the sound of the instrument, at which point a wooden recorder should be sent to a repair shop to have a bushing fitted. The bushing is a hollow plug of a hard substance such as ivory, which, in effect, replaces the wood around the hole and wears much better than the original wood. Many makers install bushings on new instruments to avoid the necessity of repairs later on.

Cases:

All recorders are supplied by the maker with some form of case, but often a sturdier or more convenient form of case is desirable. Hard cases obviously offer the best protection against accidental injury, but these tend to be bulky and are rarely airtight. Instrument rolls, while less sturdy, can be very convenient allowing a whole consort to be rolled up into a very small space. They can also be made water- and airtight to help with humidification. A compromise between these two forms can be arrived at by converting a briefcase or other convenient carrying case into a recorder case, which, with some careful planning, can be made to hold a complete consort. Plans for such a conversion are available in articles by Joscelyn Godwin (*The American Recorder* XIII/1 (1972), pp.10-11) and by Edgar Hunt (*The Recorder and Music Magazine* VII/8 (1969), pp.196-197).

BREAKING-IN

"Breaking-in" an instrument refers to the treatment given to a new recorder over the first few weeks of ownership. The wood used in recorders is seasoned and dried so that it is as stable as possible for working by the maker. However, once completed and purchased, a recorder is subjected to a considerable amount of moisture after only a few minutes of playing from the condensation formed when the warm, moist air of the breath meets the cool interior surfaces of the instrument, and from whatever saliva finds its way into the recorder.

A new wooden instrument will be strongly affected by this sudden onslaught of moisture and by the almost equally dramatic drying process which follows when the instrument is put away; as well, the wood near the bore will be affected more strongly than the wood on the exterior of the instrument. For these reasons, it is thought by the majority of recorder professionals that some form of breaking-in process is necessary to accustom a new instrument gradually to these unusual strains. This process involves increasing the amount of time spent playing the instrument from an initial fifteen to thirty minutes (some suggest as little as two minutes for the first few days) to a maximum of 1 to 2 hours over a period of 3-4 weeks. A similar approach is to play a new instrument for the first few days only until it first becomes clogged, then to coax the instrument past that point until, after a couple of weeks, a normal amount of playing is possible. Those living in a dry climate should take particular care to break in their instruments thoroughly.

These procedures will ensure that the critical and very close relationships between the various components of the sound-producing apparatus remain constant and unaltered by wood that has become permanently swollen by immoderate exposure to moisture (see also the section of this packet devoted to **Moisture Control**).

A further consideration is the danger of cracking posed by the internal surfaces' becoming waterlogged faster than the exterior surfaces, and the unequal stresses that are thereby created. Kenneth Wollitz, in his guide, *The Recorder Book*, suggests that on this score it might actually be best to subject the instrument immediately to these stresses by playing for at least thirty minutes at first and by quickly increasing the length of the playing period. This will encourage the recorder to expose its weaknesses immediately so that these can be fixed and the instrument given a better chance to completely stabilize.

Since plastic instruments are impervious to moisture, there is no necessity with them to worry about a breaking-in period.

JOINTS

On wooden instruments, joints are normally lined with cork or thread windings. Basic maintenance of cork entails keeping it moist with regular applications of animal-based grease (mineral-based preparations such as Vaseline lubricate less well and will eventually dissolve the glue which attaches the cork to the wood). Suitable cork grease should be available at any large music store. Too much grease is as bad as too little; all that is necessary is that the cork should be moist and firm to the touch. On plastic instruments, joint grease can be of any origin, but it should only be used if absolutely necessary and then should be wiped away and reapplied frequently (perhaps every time the instrument is used) to avoid a sticky build-up. A plastic instrument should also occasionally have its joints washed in a basin of warm water in order to further guard against this troublesome build-up of material.

Any kind of joint should be assembled carefully with a constant twisting motion (not straight on and not twisting back and forth) to keep the stresses as gentle and as regular as possible. Obviously, a joint should never be unduly forced together or apart, as the wood at the joints is relatively thin and prone to cracking.

Cork that has become compressed over time so that the joint is too loose can often be restored by a good application of grease followed by a careful, even heating over a match or pocket lighter flame or with the tip of an electric iron. It is also possible to wrap thread or dental floss around a cork joint which has become compressed. However, although this action remedies the problem, it further compresses the cork and effectively transforms the cork-wrapped joint into a thread-wrapped joint (see below).

Cork that has begun to disintegrate will obviously lead to loose joints and even to tuning problems as air is allowed to escape. Cork is best replaced by a professional instrument repairer, but this operation can be done at home if sufficient care is taken. Cork is available in sheets of pure cork, or as bonded cork particles, a form that is cheaper but less flexible. Philip Levin's article in *The American Recorder* XXIII/3 (1982), p.117, entitled "Joints", describes in detail how the repair can be made.

Finally, cork should be protected from coming in contact with oil when you oil your instrument (see the section of this packet devoted to **Oiling**). Similar precautions should be taken with thread windings.

Wound thread was by far the most common means of sealing joints before the twentieth century, and the method still has its advantages. Although thread windings need more attention than do cork joints, they can easily be adjusted to the exact thickness required by winding or unwinding thread as needed, and thread can very easily be replaced if necessary. When adjusting thread windings,

the free end of the thread can be found by scratching gently in a direction opposite to that of the winding. A small amount of excess thread is best left to hang outside the joint (as long as it does not interfere with the fingers) so that it will be available should the joint later need to be tightened. Added string should be sealed down at the free end with wax or cork grease.

Winding joints from the wood takes a little practice, but can be done by anyone. Using fine cotton, linen or silk thread, begin by holding a short length of thread across the joint and making the first few windings over it to keep the thread in place (it is even possible to glue the first few windings in place with a solvent-based glue). Wind slowly and keep the windings as close together as possible. Most joints will take at least two or three layers of thread, which allows for all the spaces to be securely sealed and for the thread to build up evenly. Test the winding by assembling the joints to see if the fit is tight. The joint should be quite snug to allow for a little compression, but the sections should not have to be forced together. Be sure to keep in mind the fact that a wooden recorder will swell appreciably after approximately 30 minutes of playing. When a proper fit is found, the thread should be cut and the end pasted down with wax or cork grease, or tucked under the last few windings so that it can be easily found again when adjustments become necessary. Waxed thread should be used if possible; otherwise the thread should be liberally coated with cork grease to reduce friction.

Sometimes the joints of plastic instruments can become loose over time. A small piece of paper placed between the joints every time the instrument is assembled can remedy the problem, as can the more permanent use of a short length of thin tape.

MOISTURE CONTROL

One of the most nagging problems facing recorder players is the harmful effect of the water condensed from the player's warm, moist breath onto the cool inner surfaces of the instrument. In some cases, saliva can also find its way into the recorder. This moisture in the short term causes the windway to become clogged and the block to slowly swell and, thus, the sound of the instrument to deteriorate and eventually to disappear. Over the long term it can lead to warping and cracking throughout the instrument.

Since wooden instruments can absorb a certain amount of moisture and plastic instruments cannot absorb any, they are affected differently by the problem. The windway of a plastic instrument will become clogged long before that of a wooden one, while a wooden recorder is in much greater danger of cracking than is a plastic one.

The first step in guarding against undue clogging is to break in a wooden recorder carefully to slowly accustom the new instrument to the rather dramatic wetting-drying cycle (see the section of this packet devoted to **Breaking-In** a recorder). It is also important for both wooden and plastic instruments to be played away from drafts and to be warmed thoroughly before being played in order to minimize the difference in temperature between the breath and the inside of the recorder. This warming should be done gradually, preferably by placing the various sections of the recorder (particularly the headjoint) next to a warm part of the body (i.e., under an arm, in a pocket or under the belt) for 10 to 15 minutes with the window toward the body. Warming the instrument between the hands is not quite as effective and takes longer. Fires, radiators and even direct sunlight are too strong and should be avoided at all times. The von Huene Workshop has recently made available a heated instrument roll, which should help alleviate the moisture problem.

Even the most careful warming procedure cannot protect completely against condensation, especially with plastic instruments. Various compounds are available which, when introduced into the windway, act to cause the moisture to run off the flat surfaces. The commercially available products are "Anticondens" from Moeck, and "Duponol", an industrial detergent available from the von Huene Workshop and some music stores. Similar solutions can be made at home by mixing one part of unscented liquid detergent with three parts of water. Any of these solutions should be carefully and sparingly applied to the windway with an eyedropper or a feather (which has been carefully sterilized) and left to dry. Similar applications can be performed as necessary, usually about once a month. Philip Levin has written a pamphlet that describes in detail an alternative method of application that involves soaking the block in the solution to produce a longer-lasting effect. If serious clogging problems arise more frequently than once a month, the instrument might well be in need of revoicing (see the section of this packet devoted to **Voicing and Tuning**).

These treatments will further increase the windway's resistance to condensation, but, even so, the recorder will at some point still become clogged. The fastest way of clearing the windway is to suck back on the mouthpiece. Another reasonably quick method is to cover the window with the hand so that the instrument will not speak, and then to blow sharply through the windway. Great care must be taken, however, that the instrument is muted completely and that the hand does not come into contact with the delicate surface of the lip. A slower but more thorough method is to separate the headjoint from the body, cover the bottom of the headjoint completely and blow sharply into the window. However, it should be noted that this method too poses some danger to the lip, and some feel that blowing more moist air into the instrument can only encourage further condensation.

Problems of excessive salivation are more difficult to solve, although it helps to put as little of the instrument in the mouth as possible. Any material obstructing the windway can often be dislodged with the careful use of a small feather (again, carefully sterilized).

Both the headjoint and the rest of the instrument must be dried thoroughly before being stored away to prevent unequal stresses in the wood and to guard against mildew. The bore of the instrument should be swabbed out using a clean cloth wrapped around a narrow stick or around the fluffy swab sometimes supplied with recorders (these swabs themselves are liable to shed material onto the surface of the bore). For the bottom joints, the cloth can also be attached to a string and a small soft weight and pulled through the bore. Care should always be taken to avoid scratching the bore. After having been swabbed, the instrument should be taken apart and left in a safe place for a few minutes, the headjoint set upright, to dry in the air. A portable fan or hair dryer can also be used to dry the instrument, but only if the blown air is cool!

If an airtight case is used (see the section of this packet devoted to **Accessories**), it can be helpful for some residual moisture to be left in the instrument to act as a humidifying agent, especially if the prevailing conditions are somewhat dry. If recorders are stored assembled on a wallboard, the room should be carefully humidified (Philip Levin has written a pamphlet on the topic of humidification). Sometimes mildew can develop through excessive humidity. The affected areas can be treated with hydrogen peroxide, left to stand for five minutes and then rinsed.

It should be noted that no recorder can be played steadily for longer than 1 to 2 hours without the risk of damage, since the danger to the instrument lies in extreme conditions of humidity or heat or from sudden, dramatic changes in those conditions.

OILING

Because all woods are porous to some extent, it is necessary to seal the surfaces, especially along the bore, to present as smooth and consistent a surface as possible to the airstream. Wood that has been so treated will also be more stable in regard to repelling moisture (see the section of this packet devoted to **Moisture Control**).

Many recorder makers, especially those producing large numbers of inexpensive instruments, prepare the wood from which their instruments are made by soaking it in wax, which has a long-lasting stabilizing effect. Some makers put a coat of varnish or epoxy on the inner and outer surfaces of their instruments, a treatment which is also very long lasting and which effectively repels moisture, while allowing the wood to resonate more freely than does the wax treatment. Some prefer to permit the greatest possible resonance by treating the wood with an application of oil only, which must be renewed fairly frequently.

In general, a bore treated with wax or a heavy coating of varnish needs only an occasional light treatment of oil (perhaps once a year) as a cleaning action, since the oil will not be able to penetrate into the interior of the wood. Similarly, the exterior surface of any instrument need only be oiled for the sake of appearance, though the easiest and safest course is to lightly oil the exterior whenever the bore is oiled.

The bore of an otherwise untreated instrument should be oiled frequently when new (some suggest every six weeks, while others suggest once a month) until the instrument has become well saturated with oil (after about a year). From then on, oiling once every six months or even once a year should be sufficient. Even instruments treated with a thin layer of varnish will benefit from such infrequent applications of oil after a few years of use. In all cases, a dry, grainy appearance to the wood is a sign that oiling is required.

When setting out to oil an instrument, it is important that the recorder be clean and dry (most professionals recommend letting the instrument stand for at least 24 hours before oiling). The most widely recommended oil for use on recorders is raw (not boiled) linseed oil, which stays liquid long enough to penetrate deeply into the wood before setting. Some recommend thinning the linseed oil with one part of turpentine to three or four parts of oil. Boiled linseed oil will tend to harden before fully soaking into the wood, while other oils, such as almond or mineral oils (which make up the greater part of commercial woodwind bore oils), do not set and so need much more frequent application. By the same token, however, linseed oil has a tendency to leave a deposit over time and some prefer the more frequent application of almond or mineral oil.

The oil is best applied with a strip of absorbent paper or cloth wrapped around a wooden or plastic stick. A fluffy recorder swab wrapped with cloth also works well. Freely cover the interior surfaces of the instrument (a thinner application is appropriate on the exterior, as well as on the interior of instruments which have been treated with varnish or wax). It is very important to keep oil well away from keywork, thread and cork joints, and especially from the windway, block and lip. Although there is some debate, the general wisdom is that oil causes moisture to collect on the lip and windway and so should be kept at least an inch away from those surfaces, and that the headjoint should be set upright to dry. After the oil has had a chance to soak in (for two or three hours at the most), wipe away the excess oil and leave the instrument for 24 hours before playing. If all the oil has disappeared in the first couple of hours, another application is advisable.

VOICING AND TUNING

Most of the operations performed on a recorder by its owner are for the purpose of maintaining the instrument in the state in which it was received from the maker. Any changes which involve the removal of wood in the critical areas of the instrument which directly influence the sound (such as the bore, tone holes, and especially the windway and lip) should only be made by an experienced repairer (preferably the instrument's maker) or should be undertaken by the amateur in full recognition of the fact that the instrument might well be irreparably damaged. In addition, most makers will not accept for repair under warranty an instrument that shows the slightest signs of having been tampered with. For those who would like a basic understanding of the operations that are likely to be performed on their instrument, there follow some general guidelines.

The "voicing" of a recorder refers to adjustments in the construction of the windway and lip, areas that contain many surfaces that must stand in very exact relation to one another. These relationships have most to do with tone, although they also have some effect on intonation. Any alteration made to one of these surfaces will have an effect on the others; but, all things being equal, the following alterations produce the following results:

A certain amount of concavity, taper and arch to the windway are features which add to the overall resonance of the sound. A shallower windway produces a more focused, characteristic sound, though it can also lead to greater problems with moisture. The windway ends with angled chamfers at the top and bottom. Larger chamfers in general lead to a larger sound, while the upper chamfer especially affects the lower octave. The distance from the end of the block to the edge of the lip is called the "cut-up". A smaller cut-up makes for a more focused sound, but can lead to stridency and burbles on some notes. The instrument plays best when the bottom of the windway is slightly below the level of the edge of the lip, and a thinner edge on the lip helps with the clarity of articulation. These are the most important of the relationships that may be adjusted when an instrument is sent for revoicing.

Revoicing is necessary when clogging problems become acute (see the section of this packet devoted to **Moisture Control**), when the highest notes become difficult to sound and when the tone generally begins to lose resonance. It is by no means uncommon for a recorder to need revoicing from time to time, especially during the first few months of ownership, and many makers will revoice their instruments without charge during this initial period.

Tuning refers to raising or lowering the pitch of the instrument as a whole or to the adjustment of individual notes. Again, there are a number of interrelated factors involved in tuning, but several general principles apply.

Everyone is familiar with the fact that pulling out the headjoint of a recorder flattens the instrument. However, this effect is greater in the lower than in the higher octave unless a perfectly fitted ring of flexible plastic or wood is inserted to fill the space left in the bore where the joint is pulled apart. It is also possible to flatten an instrument generally by building up the height of the window on the top and sides with Plasticine.

Any individual note is most strongly affected by the open hole directly below the last closed hole. Enlarging the hole will raise the pitch of the note, while filling it in will lower the pitch. Filling in only the top of the hole affects the upper register more strongly, while filling in the bottom of the hole affects the lower register more. Holes are best filled using Plasticine or beeswax since these materials can easily be adjusted.

Unusually weak notes can sometimes be strengthened by adding a small amount of Plasticine or beeswax at a certain spot on the bore, which, unfortunately, can only be found by trial and error. Weak low notes can also sometimes be blamed on keys which have lost their tension. One remedy is to remove the axle and to coax the spring gently in the desired direction, then to reassemble the key. It is also sometimes possible to bend down the touch of the key with a pair of small smooth-jawed pliers. Keypads can also slip out of position or wear out. When making any of these adjustments, care must be taken not to break or warp any part of the key by applying undue stress, and to keep the most open part of the keypad at least 3.5-4.0 mm. above the hole to avoid disturbing air as it passes through the hole.

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