

## Beginnings

The earliest references to recorder makers, direct and indirect, turn up in the late 14th century, about the same time as the first references to the instrument itself. According to William Waterhouse's *The New Langwell Index*, a man called only Nicolaus is documented as a "flute maker" (recorder maker?) in Prague in 1397. Eleven years later, a *pifaro* (wind player) named Bartolomio who worked for the count of Urbino was paid for "four new recorders" he had sent to the court in Brescia, presumably having bought them locally, or even made them himself. (In the 16th century, a number of makers were also accomplished players.) Waterhouse also reports that one Guillelmus d'Ager was noted as "*tornerius sive flahuterius*" (turner or recorder maker) in Barcelona in 1420. Significantly, Anthony Rowland-Jones has established that some of the earliest incontrovertible depictions of the recorder are in paintings from the Catalan court of Aragón in Barcelona around the turn of the 15th century.

The rest of the surviving evidence about recorder makers in the 15th century stems from Flanders, the Dutch-speaking part of what is now Belgium. In 1426, Duke Philip the Good of Burgundy ordered from Loys Willay in Bruges "four large minstrel instruments [probably a set of shawms], four *douçaines* (still shawms), and four recorders, all furnished with leather cases and chests ... to send to the Marquise of Ferrara." (The influence of that gift may be reflected in the set of "four Flemish recorders" found in the 1463 inventory of the Medici Court in Florence.) In 1443, the Burgundian Court paid Jean Chapuis, described as a *luthier* (lute maker), but perhaps also a woodwind maker—for "4 ivory recorders, one decorated with gold and jewels and the others plain."

In the 1481/82 fiscal year, the Bruges city minstrel Anthuenis Pavillon purchased for the use of the four minstrels, "a case of recorders," presumably from a local maker. But the only recorder maker we know of from that city after Willay and perhaps Chapuis is one Jean van Pitchem, *floutmaker*, mentioned in a document from 1541.

Unfortunately, with the exception of a few archeological specimens such as those from Dordrecht and Göttingen, clearly belonging to another era, no recorders have survived from before the early 16th century, so we shall devote the remainder of the article to makers, making, and instruments during that century.

# Renaissance Recorders and their Makers

by Adrian Brown and David Lasocki

In March 2004, David Lasocki published an article in AR describing the lives of Renaissance recorder players and delving into some of the situations in which they were employed during that period. In the present article, the modern recorder maker Adrian Brown joins with him to examine what we know about Brown's Renaissance counterparts and what we can learn from their surviving instruments.

They draw on research, by themselves and others, recently published in the proceedings of the 2003 Utrecht symposium, especially the article by Peter Van Heyghen listed in the bibliography following this article. Other sources and authors mentioned in the article are also compiled in the bibliography.

Adrian Brown studied instrument-making at the London College of Furniture in the early 1980s, specializing in recorders under the supervision of Ken Collins. Since then, he has been an independent craftsman of custom-made recorders. Over the last 12 years, he has conducted extensive research into surviving Renaissance recorders, and hopes one day to have examined them all. He is the author of several articles on the subject and recently collaborated with the Vienna Kunsthistorisches Museum on a new catalogue of their recorder collection. He lives in Amsterdam, The Netherlands, with his wife, the recorder player Susanna Borsch.

David Lasocki is Head of Music Reference Services at Indiana University. He just completed editing for publication the proceedings of the 2003 Utrecht symposium. Now he is writing a book on the recorder for Yale University Press and another on the New Orleans modern-jazz group Astral Project.

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## Training

Like instrumentalists, instrument makers were trained not in schools, but by one-on-one instruction: the system of apprenticeship. The apprentice's father found a "master" for him—master and apprentice were always male—and he went to live in the master's household for a number of years to learn the trade. A contract between father and master specified the apprenticeship period, living conditions, what was to be taught, and the sum of money to exchange hands. One such surviving contract, dated May 16, 1542, involves a French woodwind maker:

Victor Thomassin, haberdasher, living in Paris, rue Garnetal, declares that he has entrusted and apprenticed, for six years as of today, his son Jehan Thomassin, aged sixteen years or thereabouts, in whom he has thoroughly inculcated the virtues of loyalty and probity, to Mathurin de la Noue, master instrument-maker living in the city of Lyons, who by the present agreement accepts and engages the said Jehan Thomassin as his apprentice, to whom he has promised this obligation and promises to give training and instruction in his said occupation and the manner of correctly and appropriately making all the kinds of instruments that he creates and fabricates, and, during the said period, to provide for his livelihood in regard to drink, food, fire, bed, lodging, light, woolen clothing and footwear, and undergarments, well and honestly, according to his station and needs; and to this end, the said Victor Thomassin has promised ... to give and pay to the said Mathurin de la Noue, his heirs or his assign, over the next four years, the sum of two gold ecus. This contract was created in the presence of the said apprentice, who has agreed to its terms, has promised and promises to serve his master the said Mathurin de la Noue well and loyally, to obey all his lawful and honest commands, to work for his benefit, to avoid any loss or injury to him, to inform him immediately upon learning of any such harm, and to refrain from leaving his employ or serving elsewhere during the period in question.

La Noue died two years later, so his apprentice would have had to be "translated" (passed on) to another maker.

We have plenty of examples besides Willay of makers making several kinds of woodwind instruments—sometimes also bowed and plucked stringed instruments, and even percussion. La Noue's probate inventory included eight recorders, three flutes, three tabor pipes, four "*piffres à*

*chant*," five other "*piffres*," three *musettes* (bagpipes), four *musette chalumeaux* (bagpipe chanters), and four shawms. The Bassano family, whom we will meet below, made bassanelli, cornetti, crumhorns, curtals, flutes, recorders, shawms, and probably still shawms, as well as lutes and viols.

Woodwind makers were often, perhaps always, trained in the general art of woodturning, not just instrument-making, so they could have turned other objects when business was slow. In a few cases, their titles imply that they were so trained. Blanchet Duchesne was described as "*maître tourneur de boys à Paris*" (master woodturner in Paris) in a bill of sale in 1542, when he and La Noue sold a set of flutes to a merchant. In Nuremberg, four makers were called both *Holzdrechsler* or plain *Drechsler* (woodturner or turner) and *Pfeifenmacher* (woodwind maker): Georg Hartmann I (d. 1574), Jörg Hertwaich (fl. 1590), Hans Metzick (d. 1608), and Friedrich Purrer (d. 1619).

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## Dealing with Customers

How did makers find customers, and who were they? For example, did makers sell directly, or (also) through dealers or players? Did they sell abroad as well as in their own localities?

The most useful document on these questions is a three-year contract made in 1559 between Jacomo Bassano and his son-in-law Santo Griti [Bassano], on the one hand, and three members of the *pifferi* of the Doge of Venice (Paolo Vergeli, Paulo de Laudis, and Francesco da Zeneda), on the other hand. The main purpose of the contract for the makers was evidently to even out the unpredictable cash flow typical of the instrument-making business.

The players gave them 40 ducats, which was about the annual salary of a lower-paid singer at San Marco.

The money was to be "reimbursed at the rate of four ducats a month [in the form of] instruments and services." The makers promised to make several kinds of woodwind instruments—cornetti, curtals, flutes, recorders and shawms—"of the sort and quality that the three partners will request and order" and at prices listed at the end of the contract.

The makers could make instruments "for anybody else, whether he be from this city or from abroad, who will wish to have such instruments made," on the condition that any profit above the prices stated in the contract be divided one-third to the makers and two-thirds to the players. If the three players resold instruments at a higher price than stated in the contract, then the profit was to be divided the same way. Note that the Bassanos were anticipating selling instruments abroad as well as in Venice. The players were expecting to be able to resell instruments—which would, in effect, make them agents for the makers.

The court of Mary of Hungary in Brussels ordered some recorders in 1536 through a merchant named Lazarus Tucker in Antwerp. Tucker seems to have been a dealer in both instruments and decorative objects, as the court also bought from or through him: "thirteen cornetti and a certain number of lute and clavichord strings," furs, carpets, a gold headress, and gilded silver flasks.

Curiously, in that same year, the Brussels court bought "a case serving to put fifteen recorders in"—but no instruments—from a recorder maker in Antwerp called Christophle van Stockaert.

Also in Antwerp, Petrus Alamire—best known as a music calligrapher, but also a singer, composer and spy, perhaps even a wind player—traded in music books, strings and instruments. In 1533–34 he provided the town of Mechelen with a *coker fluyten* (case of recorders) and two shawms.

A Spanish ambassador, Diego de Guzmán de Silva, was twice called upon to commission sets of recorders for people back home. While he was in England in 1567, the Ciudad Rodrigo cathedral asked him for help in obtaining "recorders and crumhorns." In Venice, five years later, he asked Girolamo dalla Casa, the *maestro de' concerti* at San Marco, to obtain shawms, cornetti, curtals, trumpets, a "case of large recorders," and music by de Rore, Lasso, Ruffo, and Guerrero for the "service and Galley Royal" of the Spanish king's half-brother, Don Juan of Austria.

## The Cost of Instruments

The recorders bought by the city of Bruges in 1481/82 cost two *livres*. The collective annual salary of its four minstrels in the previous year was 19 *livres*, raised to six *livres* apiece in 1483/84. Or, in other words, the set of what was presumably four recorders cost 30–40 percent of a minstrel's basic salary, before outside work.

In Florence in 1492, the inventory of Lorenzo "il Magnifico" de' Medici includes several sets of recorders, with valuations: "A set of large recorders in a case ... 12 florins. A set of recorders for the use of the *pifferi*, with black and white ferrules, five in all ... 10 florins. Three recorders with silver ferrules in a case garnished with silver ... 8 florins." At the end of the 15th century, the basic salary of each of the Florentine musicians who would have played those instruments—according to McGee, "the highest paid members of the special group of public servants known as the *familia* of the Signoria"—was 11 florins per month.

Ten French inventories-after-death from the period 1540–1640 collected by Lesure and Jurgens provide estimates by contemporaries of the value of the members of the flute family contained in them. Tabor pipes were valued at 2–3 *sols*, flageolets at 3–4 *sols*, a fife at 5 *sols*, flutes generally at 5–6 *sols*—and, finally, recorders the most expensive at 5–11 *sols*.

In comparison, the French Court's eight shawm and trombone players in the 1530s were paid an annual salary of 180 *livres tournois*, or 22 *livres* 10 *sols* per person (at 20 *sols* to the *livre*). Thus an individual recorder in the inventories was valued at a week's income for these musicians.

The 1559 contract just mentioned between two of the Venetian Bassanos and three *pifferi* of the Doge specifies prices for all of the instruments. Recall that the Bassanos borrowed 40 ducats, which was a year's salary for some of the singers at San Marco. "A consort of eight recorders with two keyed basses in a lidless case" cost six ducats; "a consort of sixteen recorders including great basses with their crooks in a lidless case," 24 ducats. If we arbitrarily say that 40 ducats was equivalent to \$30,000 today, then the cost of the eight recorders was \$4,500 (an average cost of \$560); the 16 recorders "paid in proportion to the aforementioned recorders," \$18,000 (much higher because of the expense of making the crooks for the lowest instruments). As a compari-

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son, 16 Renaissance recorders would probably cost around \$28,000 today.

The cost of recorders made by the Bassanos in England seems to have been comparable to prices in Venice. In 1568, the city of London paid £4 to buy for its six Waits "a whole set of recorders," no doubt from the Bassanos. The same year, the city paid each Wait £8 per year. In other words, such a set, perhaps consisting of no more than six recorders, cost half a year's basic salary for each man who played it.

The retail value of other Italian recorders was higher. In 1548, the Accademia Filarmonica in Verona paid Pietro Naldi 40 *soldi* (about 33 ducats) for a set of recorders he owned—admittedly, 22 of them. In 1572, the "case of large recorders" that the Spanish Ambassador to Venice bought through Girolamo dalla Casa cost 56 *scudi* (about 71 ducats).

## Pitch Standards

So many pitch standards were in use in the 16th century that records sometimes specified those to which instruments conformed. The Bassano contract of 1559 states that the makers could supply curved cornetti at two pitch standards: *mezzo ponto* and *tutto ponto* (the first time that such a standard is named in any surviving document). The same contract mentions that tenor and bass flutes could be supplied "at all the [or both] pitches" (*phifari tenori de tutti i tonj ... phifari bassi de tutti i toni*).

Unfortunately, it does not mention the pitches of the two sets of recorders. According to the evidence assembled by Bruce Haynes, *mezzo punto* and *tutto ponto* evidently meant "semitone" and "whole tone" below a pitch standard around A=495 Hz. In other words, *mezzo punto* was about A=466 Hz and *tutto ponto* about A=440 Hz (or modern pitch).

Both of these pitches are mentioned by name in other recorder sources. An inventory from Florence (1564) includes a set of 18 recorders "*di tutto punto*," or at *tutto punto* pitch. An order for woodwind instruments from Genoa in 1592 specifies "six mute cornetti, together in a case, at *tutto punto* ...; six [standard] cornetti, the pitch of which should if

possible be precisely *mezzo punto*, together in a case ...; six flutes, the pitch of which should be precisely *mezzo punto* ... in a common case; eight recorders, all in a case, the kinds of which will be two small sopraninos, four larger, and two keyless tenors, the pitch of which should be *mezzo punto* ...."

In March 1571, Johann (Hans) Jakob Fugger, artistic adviser and superintendent of the music at the Bavarian Court in Munich, had possession of a remarkable chest of what are said to be 45 wind instruments made by the Bassano brothers in London that he was offering for sale. The fancy descriptions of these instruments neglect to name some of them precisely, and the total number is actually 42, but we can guess that they consisted of 13 shawms (in 2 sets), 7 cornetti, a tabor pipe or flute, 12 crumhorns, and 9 recorders. It was apparently an unusual occurrence that these sets of different types of instruments "are all tuned together at common organ pitch" (*gemeinem Tonum der Orgel*). Haynes believes that this standard was probably equivalent to *mezzo punto*.

Two Austrian inventories may indirectly refer to pitch standards as well as the playing situation of both flutes and recorders. One entry (Graz, 1577) refers to "*Mehr zwo groß vnd ain khlayne ledige Zwerch Pfeiffen, so zu den Concerten gebraucht werden*" (Two more large and one small individual flutes [i.e., not in cases or sets], used for concerts). The 1596 Innsbruck inventory lists both "*2 zwerchpfeifen per concert*" (two flutes for concerts) and "*Ain grosse flaut per concert von Venedig erkhaufft*" (a large recorder for concerts bought from Venice). If these instruments were played in concerts with a mixed instrumental ensemble, they may well have been at chamber pitch. Michael Praetorius (1619) called that pitch *CammerThon*, and Haynes has concluded that it was also equivalent to *mezzo punto*.

In 1606, the monastery in Kremsmünster, Austria, paid for the repair of "two (small?) recorders (*Fleutl*) at cornetto pitch (*Cornedthöch*). Praetorius equated *Cornettenthon* with his chamber pitch, *CammerThon*, or *mezzo punto*.

An entry in an inventory from Neisse, Austria (1625) may be a tacit indication that, even at that late date, consorts of recorders were not always at one of the standard pitches: "*Item ain stiembwerk flöten sambt den fuetral, aber nicht in thon*" (Item, a consort of recorders together with the case, but not at pitch).



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#### **General Points about 16th-Century Recorders**

Adrian Brown's measurements of about 120 of some 200 surviving 16th-century recorders (and cases), and his estimates of each instrument's pitch, show that in general they were made in sizes a fifth apart. This ties in with information in the treatises. Sebastian Virdung's *Musica getutscht* (Basel, 1511), the first published treatise we have that discusses the recorder in detail, mentions a bass recorder in *F* (*Baßcontra* or *Bassus*), a *Tenor* in *c*, and a *Discant* in *g*, all notated an octave lower than sounding pitch.

Virdung tells us that a consort (*coppel*) of recorders is made from two basses, two tenors and two discants. A quartet consists of bass, two tenors, and discant, or else bass, tenor, and two discants, depending on the range of the alto part (*contratenor altus*).

Martin Agricola's *Musica instrumentalis deudsch* (1529; 2nd ed., 1545) depicts the same three sizes, calling them *Bassus*, both *Tenor* and *Altus*, and *Discantus*; his *Bassus* has a key and a fontanelle. The reason for the middle size's double name is spelled out by Philibert Jambe de Fer's *Epitome musical* (1556) in the transverse-flute chapter: "The tenor and alto (*La taille & la haute-contre*) are similar in all matters, whether with a cornetto, flute, recorder, viols, violins, and other kinds of instruments.... All instruments are formed identically in shape, length, thickness, and other matters for the two parts." Similar names and pitches of recorders are mentioned in the treatises of Ganassi (1535), Cardan (c.1546; also an unnamed higher recorder in *D*), Zacconi (1596), and Cerone (1613).

The names and ranges for these three different sizes of recorder in fact mimic the four parts in vocal polyphony. This is understandable because, except for dances, vocal music was a model for instrumental music, and most of the recorder's repertory consisted of vocal pieces, read straight off the vocal part-books. The typical four-part polyphony of the earlier 16th century could be played on bass, two tenor/altos, and discant. We will abbreviate this schema as FCCG (note that all our schemas go from low to high). If a piece called for five parts, this normally meant a third middle size: FCCCCG. Six-part music needed an additional doubling of the smallest size: FCCCCGG.

For several reasons, chiefly to avoid ledger lines in an age where writing

materials were scarce, composers in the Renaissance wrote their music using a number of different clef combinations. If the music was written in the system of "natural" clefs, *chiavi naturali* (F4–C4–C3–C1 = bass, tenor, alto, and soprano clefs), the total range of the piece would have been adequately covered by our FCCG combination, and the vocal part simply played as written.

But depending on the mode of the original chant on which the piece was based, as well as other reasons beyond the scope of this article, pieces were sometimes notated in another clef-system called *chiavette*—literally, "baby clefs," more commonly called "high clefs" (F3/C4–C3–C2–G2 = baritone/tenor, alto, mezzo-soprano, and treble clefs). These clefs placed the compositions in a higher range, too high for our FCCG combination as well as for the (male) singers of the day. Therefore, all the parts had to be transposed down a fourth (if the signature contained a flat) or down a fifth (if the music had no signature). For details about this subject, and information on the many alternative clef combinations and how to deal with them, see Peter Van Heyghen's article cited in the bibliography.

In instrumental music of the late 16th century, which often had a larger overall compass, a fourth size of recorder would be called upon, generally Cardan's higher *D*-instrument, giving us the variant schema FCGD. In *Syntagma musicum II* (Wolfenbüttel, 1619), Michael Praetorius describes this performance practice and gives suggestions on how to deal practically with the three extra sharps that the highest instrument effectively adds compared with the bass part. He even mentions a fifth size in various families of instruments, which he says makes the music difficult to play, although it could work "if the composition is accommodated to it."

In preference, he advises makers to design instruments in alternate fourths and fifths, thus laying the foundation of our modern FCFC schema. In keeping with such a schema, he also mentions a soprano recorder in *C*, an octave above his tenor, as well as one in *D*—although he omits the *C* recorder from his examples of instrumentation.

Praetorius's treatise was also the first to mention further sizes of recorder, both lower and higher. He describes what he calls a *gans Stimmwerck* or *Accort* (whole consort), consisting of no fewer than

21 recorders, which he says can be bought in Venice. Because of its extended range, he had to rename all but the tenor. Switching to 8' pitch, its sizes and numbers were: *Groß-baß* in F, 2 *Baß* in B<sup>b</sup>, 4 *Basset* in f, 4 *Tenor* in c', 4 *Alt* in g', 2 *Discant* in c'', 2 *Discant* in d'', and 2 *klein Flötlein* or *exilent* in g'', this last an octave above his alto size. To save any possible confusion, for the remainder of this article, unless otherwise stated, we will employ 8' pitch and English versions of Praetorius's size names: great bass, bass, basset, tenor, alto, soprano in C or D, and sopranino. (Note that the number of recorders in Praetorius's whole consort was close to 22, the figure given for the set that the Accademia Filarmonica in Verona bought in 1548.)

Despite Praetorius's new names and his recommendation about alternating fourths and fifths, the treatise of Marin Mersenne (1636) still describes bass, tenor/alto, and discant (*basse, taille* or *haute-contre*, and *dessus*) a fifth apart. But additionally, in a passage that has often been misunderstood by modern authors, he mentions two different interlocking registers—the *petit jeu* and the *grand jeu*, the second of which he depicts as what Praetorius called great bass, bass, and basset sizes (“The bass of this high *jeu* ... serves as discant to the low *jeu*, which begins where the other ends”). In other words, Mersenne had in mind a set of five recorders, all a fifth apart: great bass, bass, basset, tenor, and alto. (See chart below.)

Despite the lack of information in the 16th-century treatises, both the surviving recorders and the inventories of the period dispel any notion that the extra sizes were a product of the early 17th century. An inventory made at the Medici court in Florence in 1520 mentions “three new large recorders for the bass part” (*tri flauti grandi, novi, da contrabasso*). Identical terminology is found in a set of recorders that the celebrated wind player Wolff Gans (see Lasocki, “Renaissance Recorder Players” in the March 2004 AR) is said to have bought in Augsburg for the Brussels court in 1535: “one for the bass part the height of a man.” An extended great bass recorder by Hans Rauch (see below in this article), evidently dating from the same time, is the height of the tallest of men, 2.433 m (about 8 feet).

The same size of recorder is mentioned as the bottom member of a consort in an inventory from the Madrid court in 1559: “four recorders, one very large about three *baras* in length, and the others each decreasingly smaller.” One *bara* equaled 83.52 cm, so this recorder was about 2.5 m long. The consort would presumably have consisted of extended great bass, [extended] bass, basset, and tenor sizes.

Both soprano and sopranino sizes appear in inventories from Graz, 1577 (*khlainere discantl* and *khlaine flöttlen*), and Berlin, 1582 (*Dißcantt Pfeifflein* and *klein Dißcantt Pfeifflein*). The distinction between C and D sopranos, however, is not apparently made in an inventory

until Hechingen, 1609 (*alt, discant, hohe discant*) and Kassel, 1613 (*Alt, Soprani, höhere Soprani*); even then, the terms make it hard to tell the difference between a “high soprano” and a sopranino.

Praetorius supplies an important clue to the use of the lower sizes missing from earlier treatises. In his table for the whole recorder consort, he gives four groupings of *Baß/Ten.Alt./Cant.*—one starting with each of the great bass, bass, basset, and tenor sizes. He explains: “it is always possible, as I have annotated in the table above, to use three adjacent sizes.” Putting it into our terms, the FCCG schema could be used for four different registers of sizes: (1) great bass, two basses, basset; (2) bass, two bassets, tenor; (3) basset, two tenors, alto; and (4) tenor, two altos, soprano. Because these registers are a fifth apart, the players did not have to worry about what actual size of recorder they were playing, only which part they were assigned. Today we would think of this practice as transposition, but that would probably not have been the view of period players, who were unacquainted with modern notions of absolute (even “perfect”) pitch.

It should be added that in (1), the lower interval is a fourth, upsetting the system slightly. The great-bass player, whose instrument is nominally in G, would have to (actually) transpose down a tone, or else the others would have to transpose up a tone, playing nominally in D and A. The kinds of *jeu* described by Mersenne are in fact numbers (1) and (3) of Praetorius's registers; and although he doesn't mention (2), which would have been a *moyen jeu*, we assume he would have been aware of it.

Although, as we have seen, several standard pitches begin to be named in the middle of the 16th century, surviving recorders are found at many different pitches, both higher and lower than modern pitch (A=440 Hz). Praetorius even tells us that “Since among our ancestors playing together with all kinds of instruments was not usual, wind instruments were tuned and made very differently by instrument makers, one [kind of instrument] high, the other low.” In other words, because recorders tended to play in consorts by themselves, their pitch-level was immaterial, so long as the instruments of a consort were tuned to one another. Within a consort, however, because recorders do not come with labels, we cannot tell whether to consider a particular instrument as, for example, an alto at a low pitch or a tenor at a high pitch.

Base note	F	B <sup>b</sup>	f	c'	g'	c''	d''	g''
Amerbach ms. (c.1510)					Discant			
Virdung (1511)			Baßcontra or Bassus	Tenor	Discant			
Agricola (1529)			Bassus	Tenor = Altus	Discantus			
Ganassi (1535)			basso	tenor	sopran			
Cardan (c.1546)			bass	tenor	canto		unnamed	
Jambe de Fer (1556)			bas	taille = haute-contre	dessus			
Zacconi (1596)			basso	tenor	canto			
Virgiliano (c.1600)					unnamed			
Cerone (1613)			Basso	Tenor	Tiple			
Praetorius (1619)	Groß-baß	Baß	Basset	Tenor	Alt	Discant	Discant	klein Flötlein or exilent

**Common Pitch-Size Systems of Renaissance Recorders**  
(lowest notes relative to A=466 Hz)



But that would not necessarily have troubled 16th-century players. The registers that Praetorius described imply that players perceived any given recorder, regardless of its pitch or size, as *functionally* a bass, a tenor/alto, or a discant (to use what were still his own terms, even though his names for the sizes had changed). Players had only to concern themselves with the identity of their part—or in other words, where their instrument would fit into the FCCG schema.

We have no documentation of how far the concept of three functional sizes a fifth apart went back into the 16th century—but it would certainly provide a reasonable explanation for how players dealt with the actual lower and higher sizes that existed as much as a hundred years before Praetorius was writing.

From the surviving instruments, we can gain some idea of these actual sizes as well as the pitch-levels of Renaissance recorders, especially if we compare those made by a single maker. The great majority of surviving instruments from the more important makers seem to be aligned with one of two systems, which we surmise were founded on the reality that a great bass recorder in *F* at *mezzo punto* is the largest practical size.

The first system was built on a cycle of fifths starting from a low *F*, giving a great bass size in *F*, basses in *c*, bassets in *g*, tenors in *d'*, altos in *a'*, and sopranos in *e''* (no sopranino in *b''*, as that would probably have been too small to make and its tone verging on the painful).

The second system is basically a tone lower, but reduces the bottom interval to a fourth: great bass size in *F*, bass in *B<sup>b</sup>*, basset in *f*, tenor in *c'*, alto in *g'*, soprano in *d''*, and sopranino in *a''*.

In the first system, the lower recorders in *F*, *c*, and *g* are aligned with *mezzo punto*. In the second system, the higher instru-

ments in *f*, *c'*, and *g'* are at this pitch and, apart from the soprano and sopranino sizes, match those mentioned by Praetorius. From what we know about the dates when the makers of these instruments flourished, it does seem that the earlier 16th-century makers opted for the first system, and later makers for the second.

We wish to emphasize there is no evidence from surviving recorders that the lower and higher FCG registers (*F*, *c*, *g* and *f*, *c'*, *g'*) were ever made in octaves within a particular set. That would have required two varieties of basset size: one in *g* acting as soprano to the low grouping, and another in *f* as bass to the higher grouping. Recall that Mersenne described five interlocking sizes a fifth apart, using the same basset size to link the three sizes of the *grand jeu* with those of the *petit jeu*.

**The least disputable source of information about the composition and pitch of sets of recorders is their cases.**

The least disputable source of information about the composition and pitch of sets of recorders is their cases—of which eight examples have survived from the 16th century, six still containing some or all of their original instruments. The compartments of these cases have been measured; and since the length of a given compartment is always a reflection of the length of the instrument for which it was intended, simple math provides us with the pitch of each instrument.

The largest case, bearing the date 1603 and the arms of the city of Augsburg, must have belonged to the city's wind ensemble. It was made to hold no fewer than 28 instruments: 16 recorders, 6 flutes, and 6 conical instruments that may well have been cornetti. The sizes of the recorders would fit our second system exactly (minus the great bass): a single bass in *B<sup>b</sup>*, four bassets in *f*, four tenors in *c'*, three altos in *g'*, two sopranos in *d''*, and two sopraninos probably in *a''*, all at *mezzo punto*.

The other cases are all for higher sets, and two begin with basset sizes. Frankfurt X/4266, which bears the maker's mark HD, was made for basset in *f*, two tenors in *c'*, two altos in *g'*, two sopranos in *c''*, two sopranos in *d''*, and two sopraninos in *g''* at *mezzo punto*. The presence of both sizes of soprano presumably puts this case in the late 16th or early 17th century.

In contrast, the case for eight recorders marked HIERS in the Vienna Kunsthistorisches Museum, or Vienna KHM (SAM 170), was intended for two bassets in *g*, three tenors in *d'*, two altos in *a'*, and soprano probably in *e''* at *mezzo punto*, constituting part of our first system. The system would be completed if we take into consideration the separate (and caseless) HIE.S set of great bass, three basses, and two bassets found in the same collection.

The four other cases begin with tenor or alto sizes. An anonymous case in Vienna (SAM 172) was built for tenor in *c'*, two altos in *g'*, soprano in *d''*, and sopranino in *a''*, at a pitch around a tone below modern. (Such a standard, the lower version of *tuono corista*, or choir-pitch, did exist in Rome. Praetorius says that it was employed in England formerly and in the Netherlands still, and "recorders ... sound much lovelier at this low pitch ... presenting almost a different kind [of timbre] to the ear.")

Another anonymous case in Vienna (SAM 173) would have fit the same instruments, without the tenor: alto in *g'*, two sopranos in *d''*, and sopranino in *a''*, but at a pitch around a semitone lower than modern. (This standard, existed too, as the higher version of *tuono corista*.)

A further case in Vienna (SAM 171) marked !! (type A), a mark that we associate with the Bassano family (see below in this article), also belongs to the second system: tenor in *c'*, two altos in *g'*, and soprano in *d''* at *mezzo punto*. Note that in all these cases (pun intended), the middle size is doubled, tripled (SAM 170), or even quadrupled (Augsburg).

A second case in Frankfurt (X/4269), marked PM, has the instruments in fourths, presumably a late trait and certainly an unusual one: two tenors in *c'*, one alto in *f'*, and two sopranos in *b<sup>b</sup>'* at a pitch a semitone above *mezzo punto*.

Finally, a case survives in Quedlinburg for seven recorders tuned in alternate fifths and fourths, the surviving five instruments clearly dating from the 17th century.

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## The main limitation of recorders with the cylindrical type of bore is that the physical constraints it imposes on the positioning of the tone-holes make larger sizes impossible.

The second type of bore is the **cylindrical**, or near-cylindrical. Instruments of this type are indeed much more cylindrical than those of the previous category, although they often have a more pronounced expansion between the seventh tone-hole and the end of the bell.

Recorders with a cylindrical bore have a more open sound, richer in harmonics than those with a conical bore. Moreover, they can often play more notes in the higher register, although it is debatable whether this was the makers' original goal. Sylvestro Ganassi, a professional wind player for the Doge of Venice, tells us in his celebrated but often mistranslated treatise *Opera intitulata Fontegara* (Venice, 1535) that he discovered these notes could be extracted from some instruments: "I have never found virtuosi of this art who played more than the normal [range of] notes; certain players could add one or more notes. Having myself studied this matter, I have found that ... there are seven further notes than the normal ones that I am going to make known to you...." (*ho trovato homo degno in tale arte che piu dele voce ordinarie habi essercitato dil che protrebano havere agionto una de piu o due voce[;] onde havendo io*

*essaminato tal modo ho trovato ... cioe sette voce de piu de lordinario detto dele quali ti daro tutta la cognitione*).

The main limitation of recorders with the cylindrical type of bore is that the physical constraints it imposes on the positioning of the tone-holes make larger sizes impossible.

The third type of bore is cylindrical from the mouthpiece to a point around the seventh tone-hole, from whence follows a short, but steep conical section—creating an abrupt "stepped" contraction in the bore. For this reason, Adrian Brown coined the term **step** bore for this type, which is found in 18 percent of surviving recorders. It gives a rather sedate character to the instrument—weaker lower notes than conical and cylindrical counterparts, but an ability to play several more notes in the high register using fingerings close to our modern "Baroque" fingering. Indeed, this type of bore could be said to be the forerunner to that of the Baroque recorder. Nevertheless, Jambe de Fer already gives several variants of these fingerings in 1556, so they certainly antedate the Baroque recorder by a good hundred years.

The most popular wood appears to be maple, which was used extensively for all sizes of recorder. Boxwood was also popular, especially for the smaller types (a bass in Rome 1.3 m long is the longest surviving recorder made from this wood). Such woods as olivewood, walnut, yew, cherry, plum, and dogwood (cornelian cherry) were also used. The inventories of Henry VIII of England (1542 and 1547) even list recorders made from (white) oak.

There is some evidence that consorts were not always made using the same wood throughout. Ivory was also widely used for highly decorative recorders, although the size limitation of this material was obviously an even more restraining factor than with boxwood.

## Rauch Family

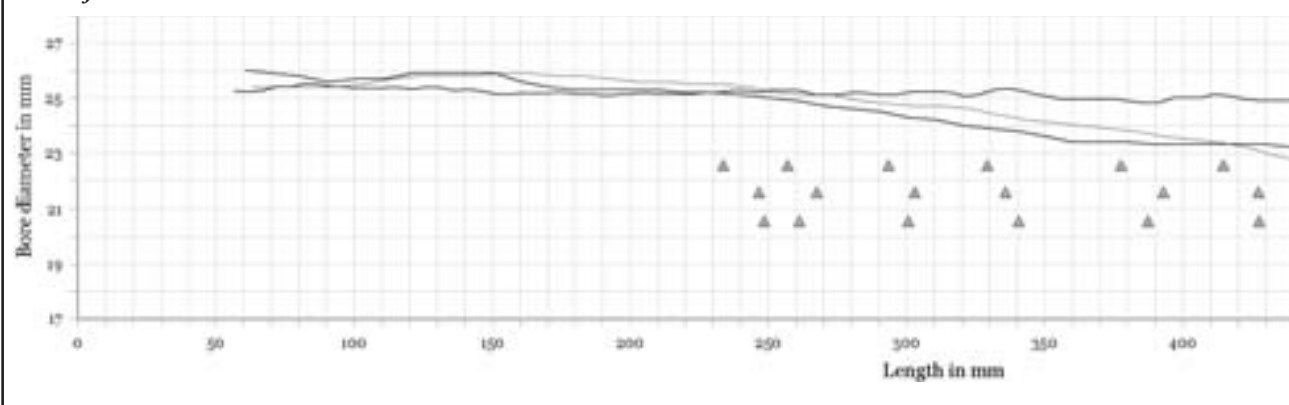
Ganassi left us a clue to makers' reputations. On the stylized recorders that make up his fingering charts, he reproduced three different maker's marks: a capital letter B, a capital A (three times), and a trefoil with a tail pointing to the right. The first mark has caused some puzzlement among scholars, as we have no surviving woodwind instruments bearing it.

At least by the 17th century, however, single capital letters were associated—but not necessarily exclusively—with makers from Nuremberg.

A double trefoil with a right-pointing tail is found on two recorders (extended bass, Munich; basset, Salzburg) that have "Hans Rauch von Schratt" engraved on their rings. The Munich instrument has the engraving on the upper fontanelle; the Salzburg instrument, on the cap. The Salzburg instrument also has engraved on the lower fontanelle ring the inscription "Ihesvs Maria Anna 1535," the same year that Ganassi published his treatise.

Rauch was one of a dynasty of *Pfeifenmacher* (woodwind makers) who are documented in the Bavarian hamlet of Schrattenbach from 1460 to 1595. One known maker named Hans married in 1490 and died in 1526, so our Hans was presumably his son. Charles Burney, visiting Antwerp in 1772, noted the presence in the Oostershuis warehouse of "between thirty and forty" recorders bearing the name "Casper Rauchs Scrattenbach ... engraved on a brass ring, or plate, which encircled most of these instruments." The two surviving instruments from that collection, however, are just signed with the double right-pointing trefoil, presumably because the identifying brass rings have fallen off and disappeared. We have no further documentation of Casper Rauch as an

**Bores of Three Tenor Recorders in Modern c#<sup>1</sup> Marked !!**







instrument-maker, although a man of that name is mentioned in the local Kempten archives in 1540.

It does seem reasonable to suppose that all right-pointing trefoils came from the Rauch family workshop. Besides the instruments with Rauch's name and the columnar recorders, the surviving recorders comprise the enormous extended bass size mentioned above (Antwerp), five basses (Brussels two, Munich, Verona two), five bassets (Merano two, Modena, Nuremberg, Paris), and one tenor (Rome). Based on biographical knowledge of this workshop, these recorders may be tentatively dated to the early 16th century.

There are also a handful of recorders (Celle, Paris, and Vienna) bearing a single trefoil, which may perhaps be attributed to the same workshop.

The Rauch extended and columnar recorders are often highly decorated, with cleanly engraved and gilded metalwork. Both types show an ingenious use of the available technology of the time, with their intricate and well-made key systems and complicated bore profiles.

The bores of Rauch recorders are often chambered, or hollowed out at certain points, probably to correct problems of tuning and note-stability. The extended great bass in Antwerp even has extra pieces of wood glued into the bell to correct a certain imprecision in the harmonics of the sound that might otherwise cause problems with the low notes. It is possible that, in some instances, their bores may have been partly turned out using a boring-bar technique, rather than reamed using forged reamers, the more usual manner of producing tapered bores.

The sizes of most Rauch recorders fit a sequence of fifths starting from F as the great bass size. The columnar recorders are also made in sizes a fifth apart—although at a different pitch standard and, as mentioned earlier, the two largest sizes of this surviving five-piece consort are extended and have doubled-back bores in the manner of a curtal.

### Schnitzer Family

Ganassi's second mark, the capital A, is associated with the Schnitzer family working in Munich and Nuremberg. The A originally stood for Albrecht (d. 1524/25), the first known maker in the family, who was born in Augsburg and had moved to Munich by 1490. Albrecht's sons Sigmund I (d. 1557) and Mathes (c.1500–1553) were also active during Ganassi's lifetime. They were both born in Munich, then moved to Nuremberg (in 1503 and 1522, respectively).

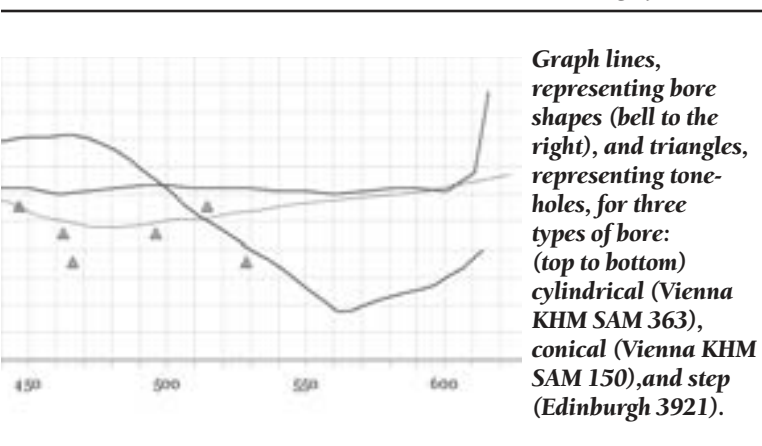
The Nuremberg teacher Johann Neudörfer published a long study of the "artists and artisans" in his home town in 1547, including a biography of Sigmund, headed "*Pfeifenmacher und Stadtpfeifer*" (woodwind maker and city wind musician). He commented that Sigmund "is skillful not only with recorders but also with flutes and trombones, but above all there is to my knowledge no one in woodwind making above him nowadays, especially in turning and tuning extremely large instruments so purely ... as in Rome and everywhere in Italy, also France, and here in the town hall, his work gives sufficient proof." Of course, in praising Sigmund so highly, Neudörfer may have just been showing his Nuremberg bias.



The majority of surviving recorders bearing the AA mark are basset sizes (Braunschweig, Brussels two,

Copenhagen, Vienna KHM, Vienna Gesellschaft der Musikfreunde [currently displayed in the Vienna KHM]), with an interesting trio of bass, basset, and tenor in Merano. The bassets are very regular, their tone-holes being drilled in the same positions on each instrument. Their bores are also similar and tend to follow the cylindrical profile more than the conical, with more pronounced bell flares. Alas, none of the "extremely large" recorders for which Sigmund was famous have survived.

The Schnitzer instruments are often able to play an extended range in the high register, using the fingerings given by Ganassi. The sizes of the surviving recorders tend to fit a sequence of fifths starting from F, as was the case for the double trefoil recorders, except that no great bass size by this family survives. Again, biographical evidence and the surviving recorders' characteristics suggest that these instruments date from the first half of the 16th century.



## Hess Brothers

A similar instance of protection relates to Bartholomeus (1515–85) and Paul Hess (or Hessen), who were *Stadt-pfeifer* in Breslau, originally from Steiermark (Styria), Austria. In 1553, Kaiser Ferdinand I gave them a privilege, renewed in 1560, protecting them against counterfeiting in Bohemia and annexed lands for “instruments of wood and brass for piping and blowing, such as trombones, trumpets, shawms, recorders, crumhorns, cornetti, rauschpfeifen, Swiss pipes, and tabor pipes large and small....” We can trace sales of the Hess brothers’ instruments as far afield as Leipzig, Stuttgart, and Graz. Unfortunately, as far as we know, none have survived.

Neither have the collections of *Viel feiner lieblicher Stucklein* (Many fine, charming little pieces) and *Etlicher gutter teutscher und polnischer Tentz* (Quite a few good German and Polish dances) that the brothers published in Breslau in 1555.

## Bassano Family

Whatever reason Ganassi had for reproducing the three particular marks, he apparently did not include any from Venetian makers. Yet one family of makers there did have a high reputation among their contemporaries.

A book about the town of Bassano published in 1577 by Lorenzo Marucini, a Venetian doctor, has a sentence on Jeronimo Bassano I (d. 1539 or 1546), the father of the brothers who emigrated to England in 1539–40. (The sentence has some ambiguities, preserved here.)

*Maestro Gieronimo, called “il Piva,” inventor of a new bass wind instrument, excellent pifaro, and employed by the Doge of Venice; he had three musician sons, trained by him, who together with their father were led to the Queen of England with a large salary and much honor; and his/their great excellence was also in the making of recorders, because these [recorders] marked with his/their mark are held in such great veneration among musicians that, when they can be found, they are very expensive.*

Marucini makes some elementary mistakes about the Bassanos: Jeronimo had six sons, not three; there is no record of his going to England; and his sons went to England during the reign of Henry VIII, Elizabeth’s father. But there seems no reason to doubt what he says about the current reputation of the family’s recorders or that they had a distinctive maker’s mark or marks. (Incidentally, the “new bass wind

instrument” he is said to have invented could well have been the curtal.)

In 1559, as we have seen, three members of the Doge’s *Pifferi* made an agreement with one of Jeronimo’s sons, Jacomo, and his son-in-law, Santo Griti, to supply instruments to them. We also know that the Bassanos in London supplied recorders to Raymund Fugger by 1566; the Ciudad Rodrigo cathedral in 1567; and Huesca cathedral sometime before 1626.

The known makers among the London branch of the family, who earned their living primarily as woodwind players, begin with Anthony (d. 1574), who was appointed “maker of divers instruments” to the Court in 1538 and was presumably responsible for most of the woodwinds listed in Henry VIII’s inventories. His eldest brother Alvisé (d. 1554) had a “working house” as well as a dwelling house in the family’s living quarters at the dissolved monastery of the Charterhouse in 1545.

Another brother, John (d. 1570), had a “brotherly company” with Jacomo in Venice. Giulio Ongaro suggests that Jacomo “served as the other brothers’ agent in Venice, providing them with instruments and probably also with music for their use in London, and perhaps for resale in England.” Since there were at least three instrument-maker brothers in England and only one in Venice, and sales were more likely in Italy than in England, the traffic could well have been largely the other way round.

The only member of the second generation of the Bassano family in England who undoubtedly made instruments was Arthur (1547–1624), who bequeathed to his son Anthony II (1579–1658) “all my instruments, working tools and necessities belonging to the art of making of instruments.” It may well have been Anthony who was responsible for making the very large recorders that were depicted in Marin Mersenne’s *Harmonie universelle* (1636) with the remark that the instruments “have been sent from England to one of our kings.”

David Lasocki’s theory, based on considerable circumstantial evidence, that the maker’s marks of the Bassano family were variants of !! (perhaps also HIERS: see below in this article) has been widely accepted. The !! mark was originally taken for a pair of rabbit’s paws, but Lasocki suggested it represents a stylized version of the silkworm moth found on the Bassanos’ coat of arms.

About 150 woodwind instruments

with !! marks survive, including cornetti, curtals, flutes, shawms, and no fewer than 50 recorders. Maggie Lyndon-Jones has divided the variant marks into 18 types plus some unclassified ones. The original model used by Alec Loretto and Fred Morgan for the modern “Ganassi” recorder is an alto of type A (Vienna KHM SAM 135, marked on the bell, *above*). Type-A marks survive on instruments now in Basel, Bologna, Brussels, Nuremberg, Rome, Verona, and Vienna. Note that SAM 135 was probably not a solo instrument, or even the highest instrument in a consort, but originally part of a consort comprising a tenor size, two altos, and a soprano, the case for which has survived (SAM 171). The Genoa order of 1592 cited above requests exactly double this combination: two tenors, four altos, and two sopranos, at around the same pitch (*mezzo punto*). Both consorts would have played our FCCG schema in the register that begins with a tenor size playing the bass part.

The Genoa order specifies: “All the above instruments should be of rather solid, well-seasoned wood, and above all correctly pitched, and to have them in perfection one could turn to Venice to Gianetto da Bassano, or else Gerolamo ‘of the instruments,’ or Francesco Fabretti and brothers, because all of them are most skilled in these kinds of instruments.” Gerolamo could not be Jeronimo, the patriarch of the Venetian branch of the Bassano family who had died around 50 years earlier. Perhaps Gerolamo is to be equated with the Hieronimo de li flauti, whom Armando Fiabane reports discovering in Venetian documents of the second half of the 16th century. The name Gianetto does not appear in any other records about the Bassano family that have turned up so far, so it may well be a diminutive of the well-known composer and performer Giovanni—the son of an instrument-maker (Santo), but not previously known to have made instruments himself. The Fabretti brothers are otherwise unknown.

The !! instruments are masterpieces among surviving Renaissance recorders. They are beautiful, well-proportioned instruments, and their technology is more advanced than that found on many of the other surviving recorders. Their bores are better defined and show a logic in their conception. Their tone-holes are standardized and often angled up or down the bore, giving the player an easier stretch for the hands. The caps are attuned to the instrument, in that the space inside the



cap is made to dictate the size of the air reservoir thus created, giving the recorder a better sound and control. The crooks and holes inside the caps show similar ingenuity, having a taper towards the inside space of the cap that softens the flow of air into the recorder and reduces problems with the stability of the attack.

The !! recorders are made from a great variety of woods. The variants of the mark often accompany subtle differences in making: different shapes of windows, drilling of tone-holes, styles of keywork, etc., suggesting that they may represent the different generations or workshops. This argument is strengthened by recent research in the Accademia Filarmonica of Verona, where the !! recorders—the survivors of three separate sets—show three different styles of making and have been found to be tuned in three slightly different pitches.

The type-G mark is found on a great bass size in F, two basses in B<sup>b</sup>, and four bassets in f, tuned around *mezzo punto*, that survive from a case of 22 recorders purchased by the Accademia from Paolo Naldi in 1548, but apparently deposited there four years earlier. The type-A great bass and extended basset, among the best surviving Renaissance recorders, apparently belonged to one of two cases, containing 10 and 11 recorders, that the Accademia acquired between 1562 and 1569. They are at a pitch about 30 cents lower than *mezzo punto*. (The second of these cases probably included the surviving two basses with double trefoils.)

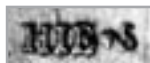


On the other hand, the type-H bass and basset could be considered among the worst surviving recorders and are at a pitch about 50 cents above *mezzo punto*. They seem to correspond to the “one black case with nine recorders with a brass crook for the *dolzaina* used as the bass” that the Accademia acquired between 1585 and 1628, the late date suggesting a decline in the Bassanos’ instrument-making ability. (The identity of the *dolzaina* mentioned in the inventory is unclear—even if Praetorius recommends that a curtal be employed on the bass part when a recorder consort plays with consorts of other instruments, a situation in which the bass recorder would be too soft.)

Most of the !! recorders fit our second system of pitch-sizes, which has the bass size in B<sup>b</sup>, basset in f, tenor in c', and alto in g'. These instruments clearly represent a long period of instrument-making, from the 1540s or earlier to the end of the century and beyond.

## Hieronimus

Twenty-nine woodwind instruments with HIERS or HIES marks survive, including 13 recorders (also cornetti, crumhorns, and curtals). The marks are presumably abbreviations of the name Hieronymus (the Latin equivalent of Jeronimo). The surviving recorders are found only in the Vienna KHM and the Biblioteca Capitolare of Verona.



The two sets in Vienna have different versions of the mark. Two basset sizes, three tenors, and an alto are marked HIER S (for comments on their surviving case, see above). A great bass, three basses, and two bassets are marked HIE.S. In Verona, the sole basset is marked HIER S.



There is a high degree of irregularity among instruments of the same size. The tenors, while obviously coming from the same set, show great inconsistencies in the placement of their holes and their bore profiles. All of the recorders have a rather crude or rustic design compared with the more refined quality of the Rauch and !! recorders. Their tone-holes are drilled straight, with none of the refinement found on the !! instruments. They also have cruder crooks and key mechanisms, and there seems to have been a great deal of experimentation in the shape and design of their caps. The sizes are again ranged in fifths starting from F.

These less sophisticated features suggest that the maker may have been Jeronimo Bassano, who flourished in the early 16th century, rather than the Hieronimo de li flauti from the latter part of the century.



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## Rafi Family

A number of recorder makers worked in Lyons in the first half of the 16th century, all listed also as players. The earliest to be documented, around 1500, is Jacques Pillon. Michaud Rafin or Raphin (d. 1524), first heard of in 1506, was presumably the maker of the bass flute in Rome marked M. RAFI. He had two sons: Pierre Raffin is documented in 1528–29; Claude Rafi (d. 1553) was famous enough to be mentioned in three literary works of the day (including François de la Salle’s reference to “the good recorder of Raffy” in ?1537). We have already encountered Mathurin de la Noue (d. 1544), who moved from Lyons to Paris late in life.



The court of Mary of Hungary in Brussels ordered “certain recorders” from “a master in Lyons” in 1536. These may be the same as the “certain large recorders with other instruments” mentioned the next year. In 1546, the Accademia Filarmonica in Verona commissioned someone “to send to Lyons to buy a consort [or a pair] of flutes.”

Amazingly, the Accademia still owns a flute made by Claude Rafi: a tenor signed Cl. RAFI plus a griffin in a shield, the emblem of the Archbishopric of Lyons. The Accademia also own the body of a bass flute, marked with the same shield.

A consort of “eight large recorders sufficient for a consort,” “fourteen other large recorders for the consort,” and four sets of fifes by “the esteemed craftsman ... Graffi” are listed among the collection of Manfredo Settala, a Milanese physician, clergyman, and instrument inventor, in 1664. “Graffi” is presumably an understandable misreading of “Cl. Rafi” caused by the ligature between the C and the l; we are simply wise after the event.

Two recorders marked with a shield and C ∴ RAFI survive in the Accademia Filarmonica in Bologna: a basset and a tenor. The same collection also houses nine recorders (two bass sizes, three bassets and four tenors) by the otherwise unknown P. Grece that have similar characteristics to its Rafi recorders. Grece may have been a later maker who simply copied the instruments in the Accademia that were made by Rafi—and indeed, no other recorders are known to survive by him. But the degree of accuracy shown by these instruments, and the care that evidently went into making them, make it seem more likely that Grece was working in the same workshop as Rafi, or in the same tradition.



The Rafi and Grece recorders are made to the same highly unusual design, which seems to be based heavily on transverse flute traditions (recall that Rafi also made flutes). The bores are of the step type and very small in diameter compared with their length. The recorders also have a small outside diameter, which is almost cylindrical in form, giving very thin wall thicknesses—again in the manner of a Renaissance flute.

The two Grece basses are designed to be held horizontally while playing and blown through an intriguing system that has a tube bored longitudinally through the wall of the instrument, from a point just above the thumb hole, up to the block. The shape of the windows is more square than rectangular, the window widths being small and the cutups (window heights) consequently large. This detail—unknown in all other surviving instruments, but recorded in some early iconography—seems the most persuasive evidence of an older tradition of making at work.

The sizes of the Bologna instruments are in fifths, with a fourth between one of the tenors and the bassets. But that tenor shows far less wear on the thumb hole than do the thumb holes of all the other recorders—proof perhaps that the fourth-combination was used less often than that having a fifth interval.

The pitch standard is around a whole tone above modern pitch: again, an unusual feature. Two other surviving Rafi recorders (bassets in Eisenach and Sigmaringen) have no conceivable pitch-relationship either with the Bologna instruments or with each other.

For the reasons outlined above, these instruments would have to be placed in the early- to mid-16th century.



#### HD

Nine recorders survive bearing the mark HD: two basset sizes (Darmstadt, Frankfurt), five tenors (Berlin two, Brussels, Frankfurt two), and two altos (Frankfurt). A case for 11 recorders with the same mark was discussed above. Curiously, a further

basset recorder in the Vienna KHM is marked with both HD and a single left-pointing trefoil (other single trefoils on surviving recorders, in Celle and Paris, point to the right).

As mentioned before, the use of a single letter for a maker's mark might have pointed to Nuremberg. But elsewhere there were two known woodwind makers with the initials HD, at least in one spelling. Hans Danner (also Thanner), who came from Egg, a village overlooking the Rhine about 20 miles east of Basel, served the Stuttgart court as lutenist and official woodwind maker from 1572 to his death in 1581. His widow sold the court some instruments that he had presumably made: "*10 Kolonen und 8 dazu gehörige Zwerchpfeifen zu* (Ten columnar recorders [?] and eight flutes belonging to them)." Hans Drebs (also Trebs), said to be from Austria, was a *Stadt Pfeifer* (probably only an adjunct) and woodwind maker in Leipzig from 1598, and sold cornetti (1613) and recorders (1617, 1636) to the city.

The HD tenors are highly standardized instruments, showing a degree of consistency unknown with other makers' instruments. The turning of the smaller instruments is rougher than normal, and their exterior shape or profile is rather stumpy. From the general design, the presence of the *c*" as well as *d*" sizes, and the possible link to two makers of the late 16th-early 17th century, these instruments may be tentatively placed in that period.

#### Coda

The research on which this article is based—Adrian Brown's study of the majority of surviving Renaissance recorders and all the cases, David Lasocki's compilation of the inventories and purchases of the day, and Peter Van Heyghen's exhaustive examination of treatises, music, solmization and clefs—revolutionizes our view of the Renaissance recorder.

The earlier view was heavily colored by the information contained in treatises, especially Ganassi's observation that some recorders could play extra notes in the high register. This led to a search for a "Ganassi recorder"—not among the instruments of the Rauchs and Schnitzers, which Ganassi apparently endorsed, but through copying the engraving on his title page (Bob Marvin); or by zeroing in on an alto marked !! in Vienna (Loretto and Morgan), which we now know was almost certainly part of a consort.

## Large recorders ... existed from the early part of the 16th century.

Adrian Brown has shown that the Renaissance recorder was made in one of three basic bore types, which he calls conical, cylindrical, and step. Far from evolving, all three types co-existed throughout the 16th century and into the 17th century. Most recorders in his cylindrical bore category, including some of those marked !! (which probably belonged to the Bassano family) and AA (Schnitzer family), produce Ganassi's high notes.

The treatises, from Viridung (1511) to Praetorius (1619), give the impression that, during the 16th century, recorders were made in only three sizes (bass, tenor/alto, discant; or what Praetorius renamed basset, tenor, alto), with the anomalous citation of a high D-recorder by Cardan (c.1546); then they suddenly branched out to include lower and higher instruments at the beginning of the 17th century. In fact, large recorders, and even very large ones (up to 2.5 m in length), existed from the early part of the 16th century and are commonly mentioned in inventories. Both soprano and sopranino sizes appear in an inventory from 1577.

How can this apparent discrepancy between theory and practice be explained? The most plausible explanation, based on Praetorius's idea of registers of recorders in three adjacent sizes, is that Renaissance recorder players conceived their instruments not as absolute in size or pitch, but as *functionally* a bass in F, a tenor/alto in C, or a discant in G, in order to play the typical four-part polyphony of the time. The resulting FCCG schema could be applied to any three consecutive sizes, beginning with either great bass, bass, basset, tenor, or (as one small surviving case shows) even alto.

Later, an FCGD schema was added, and Praetorius mentions a schema involving sizes of instruments in five consecutive fifths, before suggesting that makers might make their instruments in alternative fifths and fourths.

The question of the sizes and pitches in which Renaissance recorders were *really* made is complicated by the lack of information about any standard pitches that

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may have existed before the middle of the 16th century. Two pitches are mentioned in inventories: *mezzo punto*, a semitone above A=440; and *tutto punto*, around A=440. Yet most of the surviving recorders are at or around *mezzo punto* (with some other standards, both higher and lower).

These recorders follow two different systems of pitch-sizes, the first apparently a little earlier than the second: F, c, g, d', a', e" and F, B $\flat$ , f, c', g', d", a". Both accommodate the FCCG schema, in at least four "registers," although the second system requires a little adjustment in the lowest (i.e., bass) part.

The makers whose instruments survive

in the largest numbers—the Bassanos, Rafis, Rauchs, and Schnitzers—turn out to have had the highest reputations in their own day and an international clientele. Archival work has illuminated the lives of the Rafis, Schnitzers, and particularly the Bassanos, but more work especially needs to be done on the Rauchs.

Some other technical and musical questions remain. Adrian Brown plans to do more analysis of Renaissance bores, trying to understand them better by matching instruments bearing the same or similar marks, to see if common reamers were used in their making. We need to learn more about the circumstances in which extended recorders were used.

Finally, we hope that the research just summarized will lead both modern makers and their customers toward recorders based more upon historical models.

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