

*Journal of the
American Musical
Instrument Society*

VOLUME XIV • 1988



Copyright by the [American Musical Instrument Society](#).
Content may be used in accordance with the principles of fair
use under [Section 107 of the United States Copyright Act](#).
Content may not be reproduced for commercial purposes.

Miniaturization of the Positive Organ, 1570–1750

CECIL ADKINS AND ALIS DICKINSON

IN OUR TECHNOLOGICAL AGE miniaturization has become so commonplace that we scarcely raise an eyebrow at the performance of an organ concerto on an electronic gadget no larger than a shoebox. Such a tiny device would doubtless have filled the hearts of earlier organ builders with awe; but given the materials with which they worked, builders of two and three centuries ago accomplished feats of diminution that rival the most modern accomplishments.

The process of miniaturization applied to the positive organ from the middle of the sixteenth century to the middle of the eighteenth resulted in a small, easily moveable instrument—most often one with a 4' foundation stop—that was versatile enough to serve a variety of functions. The builder of such a miniature positive, required to retain the essential elements of a larger organ, was challenged to create an instrument that was aesthetically pleasing in appearance and sound yet sturdy enough to withstand the rigors of transport.

We have only iconographic evidence of the earliest of these organs, virtually all of which are pictured with open metal pipes of 4' pitch. The only two known instruments dating from before the mid-sixteenth century both corroborate this, having large open pipes as the foundation rank. The oldest specimen, an uncased pyramidal positive built by Lorenzo de Pavia in 1494¹ that has two ranks of open paper pipes based on a 6' G, is the only surviving uncased instrument (fig. 1). The other example—dating from the early sixteenth century, perhaps as early as the time of Pope Julius II (1503–13), whose Rovere family arms it bears—features three open metal ranks, at 4', 2', and 1' pitch.² It is housed in a square tripartite case with round arches, a design typical of early Roman organs (fig. 2).

Although all of the known instruments of the period are cased, throughout much of the seventeenth and eighteenth centuries organs were generally illustrated without cases. To the artist's eye, perhaps, an

1. Venice, Museo Civico Correr. Described in Marco Tiella, "The Positive Organ of Lorenzo de Pavia," *Organ Yearbook* 7 (1976): 4–15.

2. Leipzig, Musikinstrumentenmuseum der Karl-Marx-Universität 241. Described in detail in Klaus Gernhardt, Hubert Henkel, and Winfried Schrammek, *Orgelinstrumente, Harmoniums* (Leipzig: VEB Deutscher Verlag für Musik, 1983), 14–18.

organ was best represented by the gleaming metal pipes, and the tapered line of the rank often contributed significantly to the overall lines of the representation. In an early seventeenth-century painting by H. de Vries, the order of the pipes was actually reversed for artistic effect (fig. 3).

Posts placed at each end of the ranks to support the pipe rack served as the first step toward encasing the positive. At a later time the top was enclosed by a horizontal or diagonal plank placed across the posts (fig. 4). Such instruments may well have been equipped with removable panels, though none was represented in this way. Surviving sixteenth-century organs are generally enclosed by doors on the back as well as on the front of the case. Yet another method of casing is depicted in Hans Burgkmair's woodcut "Kaiser Maximilian's Triumph," where the organ is shown with a box that has been lifted off the pipes and placed behind the regal at the back of the wagon (fig. 5).

During the seventeenth and eighteenth centuries builders increasingly favored the 2' principal as the largest rank of open pipes. Commentators of the time even referred to this level as the defining characteristic of the positive. Praetorius observed in 1619 that small instruments were not classified under the name *Orgelwercken*, but under the name *Positiff*. When there were larger pipes, such as a gedackt or quintadena of 4' or 8', the instrument would be called *Grosspositiff* or *Kirchenpositiff*.³ One hundred fifty years later Jacob Adlung still reiterated this distinction:

If its largest [rank], or the so-called principal, is not greater than a 2', then it is commonly called a *Positiv*; but where this is larger, it is *eine Orgel*.⁴

This emphasis on the 2' principal did not preclude the use of lower-pitched ranks as foundation stops. Praetorius, for example, allowed either a quintadena or gedackt at the 4' or even 8' level.⁵ Mersenne, writing in 1636, established the stopped 2' rank (sounding at 4' pitch) as the founda-

3. Michael Praetorius, *Syntagma musicum* 2 (Wolfenbüttel, 1619), 123:

Ob auch etzliche gar kleine Wercklein deren *principal* nur von 2. Fuß Thon gefunden werden so gehören doch solche nicht unter der Orgelwercken Zahl der Namen sondern allein unter die *Disposition* der Positiff: Aus Ursachen weil sie gemeinlich auch andere größere Stimmen zu ihren *Fundamentis*, als Gedackt oder Quintadehn von 4. auch wohl von 8. Fuß Thon zu haben und daher Gross- oder Kirchenpositiff auch klein Octaven *Principal* Wercklein genennet werden.

4. Jacob Adlung, *Musica mechanica organoedi* 2 (Berlin, 1768): 97: "Wenn deren größtes, oder das sogenannte *Principal* nicht größer ist, als 2' Ton; so heißt es insgemein ein *Positiv*: wo aber dasselbe größer ist; so ist es eine *Orgel*."

5. Praetorius, 123.

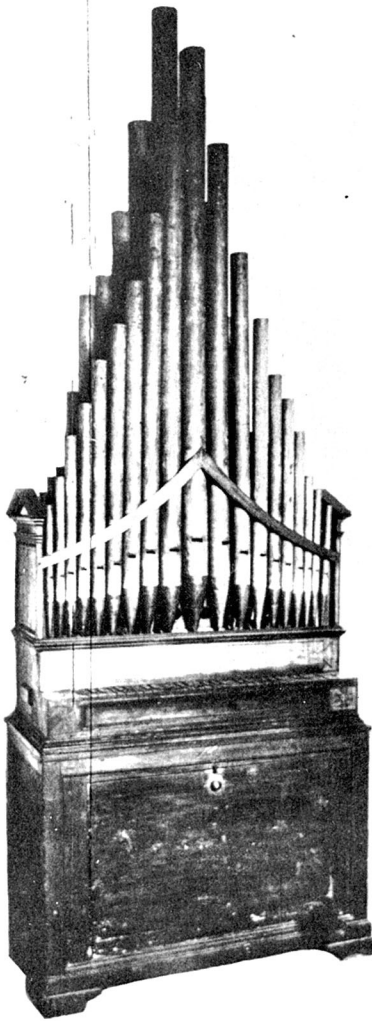


FIGURE 1. Positive built by Lorenzo de Pavia, 1494. Venice, Museo Civico Correr.

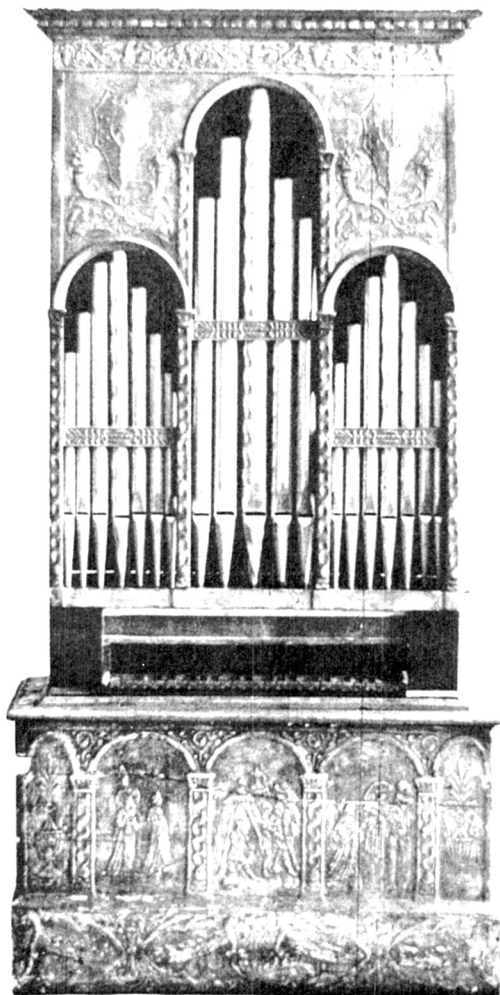


FIGURE 2. Italian positive from the early sixteenth century. Leipzig, Musikinstrumentenmuseum der Karl-Marx-Universität 241.



FIGURE 3. H. V. de Vries (1527–1604), detail from a painting illustrating palatial architecture. Vienna, Kunsthistorisches Museum, GG 2336.

tion for a small cabinet organ, using the composite diameters of the various stops to determine the width of the chest.⁶

6. Marin Mersenne, *Harmonie universelle* (Paris, 1636), Livre sixiesme des orgues, prop. 44, p. 400:

Le dis neantmoins que le sommier des petits Cabinets est ordinairement de deux pieds & demi, ou de trois pieds de long: quant à largeur, on la determine suiivant le nombre des jeux que l'on y veut mettre, comme s'il y auoit quatre jeux, dont le plus gros fust de deux pieds bouchez, & qu'on voulust laisser la place du Clavier sur le mesme sommier, ce seroit assez de luy donner quatorze pouces de large, dont quatre pouces seruiroient pour place le Clavier, & le reste pour l'estenduë des quatre jeux. Et si l'on y adiuostoit encore quelques petits jeux, par exemple celuy de la Cymbale & des Regales, l'on adiuosteroit quatre pouces à la largeur, afin que toute sa largeur fust d'un pied & demi.



FIGURE 4. Fabián Pulér (ca. 1520–62), detail from an illumination in the Czech *Zlutický Gradual* (1557–58).



FIGURE 5. Hans Burgkmair, *Kaiser Maximilian's Triumph*, 1516. The case of the positive has been placed behind the regal, at the back of the wagon.

Although the tonal character of the Baroque positive was defined by the 2' principal, it was the larger stopped ranks that controlled the size of the instrument. Much of the effort of builders was directed toward fitting such lower-pitched pipes into spaces whose size was determined by the length of the 2' principal. The limitations of space dictated the use of a light, simple pin action (fig. 6) and such obvious expedients as thinner, lighter materials, a short octave in the bass, and slightly reduced widths for keys and pallets. Builders were also challenged to develop more ingenious techniques of construction: horizontal or offset pipes, single and double miters, and wooden pipes with common walls or space-saving rectangular cross sections—all stuffed into an attractive, functional case.

In practice this resulted in the development of three exterior designs characterized by varying positions of the bellows. The first design employs a pair of bellows at the back in the Renaissance tradition. It is distinguished either by a rectangular case divided into towers or flats featuring elaborate pipe shades, doors, and openwork decorations (fig. 7), or by an elaborately decorated case in the shape of a coffer (fig. 8). Cases of these types severely limited the use of ranks larger than 4'. In such instruments three to nine ranks of thirty-eight to forty-five pipes each, often with divided registers, were set on chests ranging from 24 x 8 inches (62 x 20 cm) to 45 x 23 inches (115 x 60 cm). No positives with posterior bellows are known to have been constructed after the mid-seventeenth century.⁷

The second design is characterized by a pair of bellows placed laterally atop a rectangular case (fig. 9); the earliest surviving example dates from after 1600. Because of the requirements of the bellows, such positives were restricted to cases that were simply rectangular, though many of them bear elaborate surface decoration. This style was in use as late as the mid-eighteenth century; it was the most easily portable of the positives, for almost all specimens have handles or stave brackets for easy transport. Instruments of this design range in size from three to six ranks of forty-one to forty-five pipes each. They are usually set on chests smaller than those of the preceding group. A typical instrument with bellows above the case will measure only 32 x 20 inches (80 x 50 cm).⁸

A third type, resembling the second in size and number of stops, was de-

7. Examples of organs with posterior bellows are: Basel Historisches Museum no. 1927–258, the “Ab Yberg” positive (ca. 1550); Schluderns, Italy, Churburg Castle, positive by Michael Strobel (1559); Paris, Musée Instrumental du Conservatoire National no. 1172, by Bartolomeo Ravani of Lucca (1651).

8. Instruments with superior bellows: Leipzig, Musikinstrumentenmuseum der Karl-Marx-Universität nos. 244 and 251 (first half of the eighteenth century), and Poznan, Muzeum Instrumentów Muzycznych I 375 (ca. 1740).

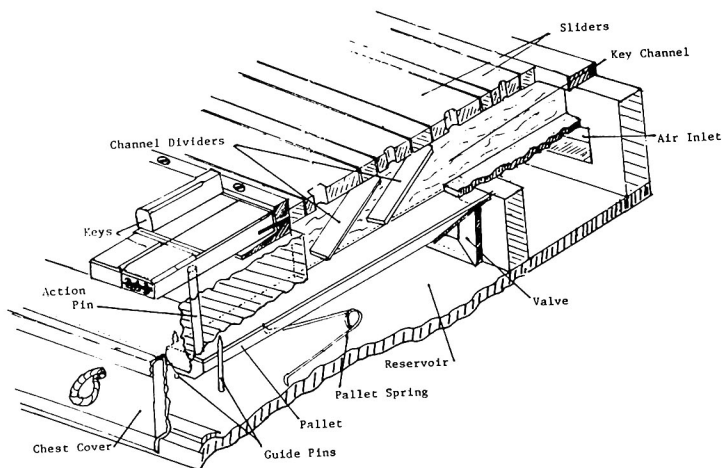


FIGURE 6. Cross section of the windchest and pin action of the "Ab Yberg" positive, ca. 1550. Basel Historisches Museum 1927–258.

veloped as a result of the invention in the later seventeenth century of the feeder bellows and reservoir. This mechanism was either attached to the top of the case in place of paired bellows (fig. 10), or conveniently installed in a pedestal or carrying case underneath the organ (fig. 11). In the latter case a separate stand or table for the instrument was no longer necessary; and subsequently, when the apparatus was attached to a foot pedal, the bellows boy became obsolete as well.⁹

The feeder bellows and reservoir were the preferred wind supply for the larger positives of the eighteenth century. Since in these larger instruments the mechanism was not part of a detachable base, but was incorporated into the unified design of the instrument's case (often two meters or more high), such organs were no longer portable.

9. Examples with inferior bellows are found in Poznan, Muzeum Instrumentów Muzycznych I 29 (ca. 1630); and The Hague, Gemeentemuseum, a small Polish organ from about 1630. The various other arrangements using a feeder bellows and reservoir may be seen in the Haase organ depicted in fig. 10; Copenhagen, Musikhistorisk Museum, Carl Claudius Collection no. 587 (eighteenth century); Leipzig, Musikinstrumentenmuseum der Karl-Marx-Universität no. 254 (eighteenth century).



FIGURE 7. Positive in the Renaissance fashion with posterior bellows. Paris, Musée Instrumental du Conservatoire National, formerly in the collection of Madame de Chambure.

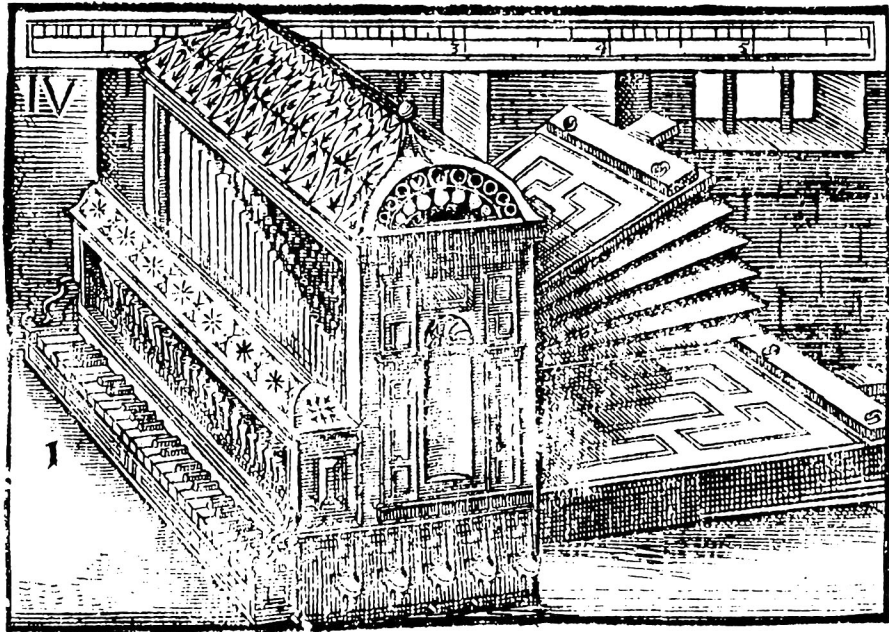


FIGURE 8. Positive with a coffer case. After Michael Praetorius, *Syntagma musicum* 2, *De Organographia*, plate 14.



FIGURE 9. Positive with superior bellows. Friesach, Carinthia, ca. 1700.



FIGURE 10a. Positive with superior feeder bellows. Reproduction after Haase (1684) by Noel Mander of London, 1978.

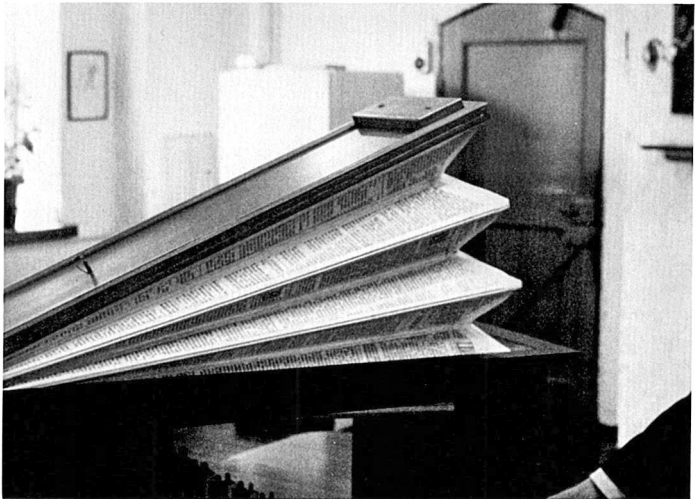


FIGURE 10b. Positive after Haase (reproduction by Noel Mander). Reservoir.

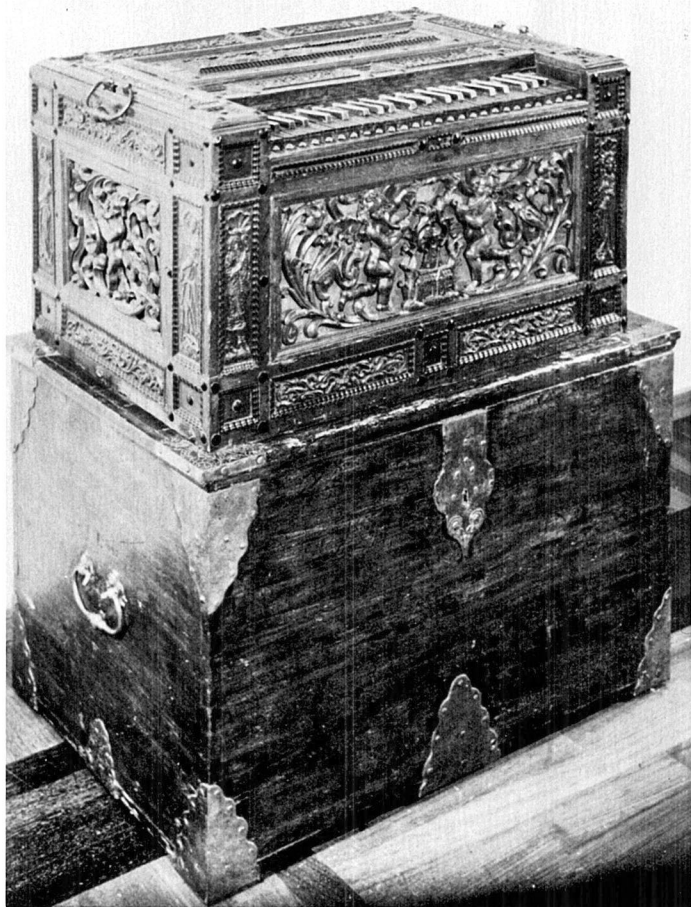


FIGURE 11. Polish positive with the bellows installed in the carrying case beneath. The Hague, Gemeentemuseum, ca. 1700.

No other space-saving modifications were as significant as the relocation of the bellows, but several techniques were developed in response to specific needs. The narrowness of the pin chest, which was no wider than the length of the keyboard (fig. 12), posed a difficult problem for builders. One apparent solution, a tracker system such as that used by Michael Strobel in 1559, did make possible a wider windchest, but thwarted the principal goal of a simple, compact instrument.¹⁰ A more successful solution was devised for a number of pin-action organs with bellows below. The keyboard was raised to the top front edge of the square case to place it in a more convenient playing position (fig. 13a), and long stickers were then used to depress the pallets at the bottom of the case. It occurred to builders early on that these vertical rods could actually be used as simple trackers by angling them out slightly onto an expanded chest instead of placing them vertically above the pallets (fig. 13b). Most builders, however, seem to have preferred the smaller windchest, employing elaborate conduit blocks (fig. 14a) or placing overlays on the toeboards to space out the pipes (fig. 14b).

It was the inclusion of 8' ranks that created the greatest challenge for designers of small positives. The incorporation of an 8' gedackt presented such difficulties that it was never attempted on organs of the first type and only rarely on those of the second, though 8' ranks are common on the larger instruments of the third type. The alternative, the addition of an 8' regal, was so often practiced that the stop gave its name to a whole genre of small organs. Although these little reeds, whose resonators are no more than a few inches in length (note the row of resonators just above the keyboard in fig. 10a), did solve the immediate problem of providing lower pitches in a restricted space, their voice was too penetrating to be serviceable in all musical situations.

In 1651 Bartolomeo Ravani of Lucca manufactured a miniature three-rank positive that incorporated a number of innovative techniques.¹¹ The size of the chest, which contains 135 pipes, is only 25 x 8 inches (64 x 20 cm), less than one and one-half square inches (9.4 cm) per pipe. Within the classically proportioned case (3:2) the head space is barely thirteen and one-half inches (34 cm), necessitating a departure from the standard 2'

10. Schluderns, Italy, Churburg Castle; illustrated in detail in *L'Organo* 10 (1972): 131–42.

11. Paris, Musée Instrumental du Conservatoire National C 1171. The inscription "Bartolomeo Ravani Luchese L'anno 1651" is found inside the windchest.

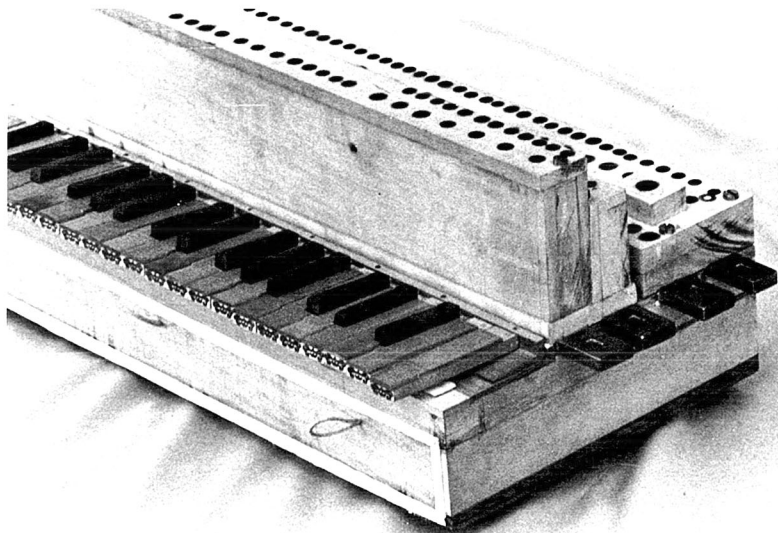


FIGURE 12. Keyboard, windchest, and toeboards. Reproduction by Cecil Adkins of the “Ab Yberg” positive of ca. 1550, Basel Historisches Museum 1927–258.

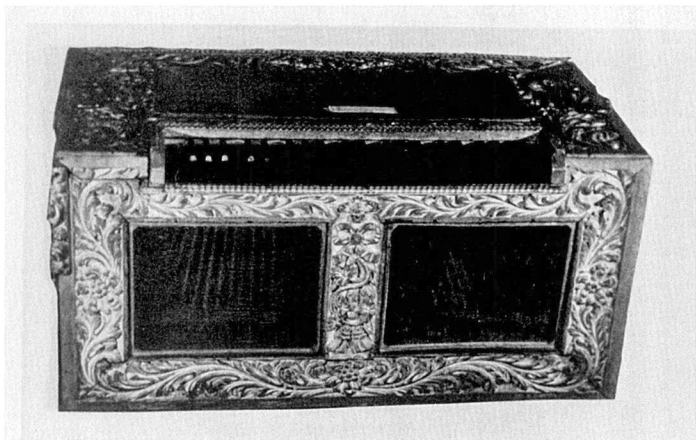


FIGURE 13a. Poznan, Muzeum Instrumentów Muzycznych I 29. Positive with superior keyboard.



FIGURE 13b. Poznan organ I 29. Enlarged view of right front. The stickers are placed at an angle to allow the use of a windchest wider than the keyboard.

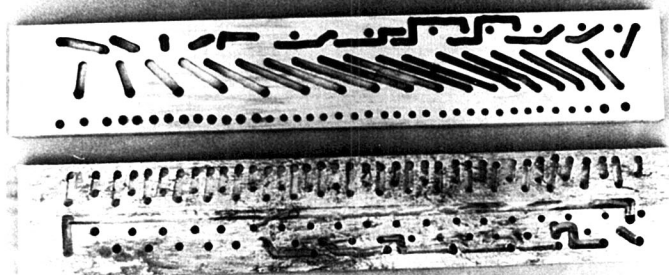


FIGURE 14a. Reproduction by Cecil Adkins after Basel Historisches Museum 1927–258. Interior of gedackt toeboard. A layer of impermeable material, pierced in the appropriate places, is sandwiched between the boards before they are glued together.

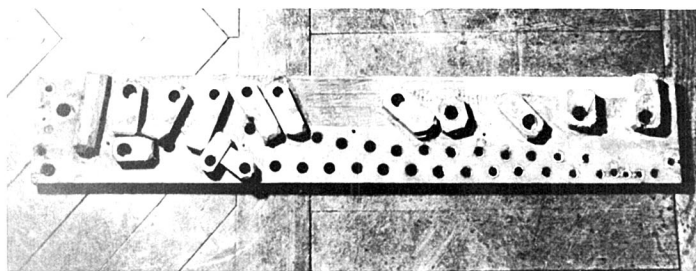


FIGURE 14b. Paris, Musée Instrumental du Conservatoire National. Formerly in the collection of Madame de Chambure. Gedackt toeboard.

principal. Ravani chose to use a 1' principal, to which he added a 4' gedackt and a 1/2' zimbel. Because of the particular design of the 4' toeboard, the gedackt plays constantly, while the two smaller ranks have sliders and can be added at will. The longer principal pipes are made with very short feet,

while the smaller pipes are often lengthened by as much as five inches (12.7 cm) to make them more accessible to the tuner.

The placement of a 4' rank in a cramped area barely five inches (13.5 cm) wide was accomplished by using a narrow, rectangular design and by carefully arranging the pipes, cheek by jowl as it were, into rows of three to seven. Seven of the pipes are mitered, and the largest three are literally constructed in a box, using a divider as the common wall of the 180° miter (figs. 15a and 15b).

Although the bellows of this tiny organ are not placed on top of the chest, it does belong with the second group of instruments described above, in which the bellows are incorporated into a rectangular case. Here the bellows are stored in the back of the case; when in use, they are opened out into a lateral position behind the organ and are connected to it by a collapsible leather trunk. By using the back of the case as one of the bellows boards, Ravani made his instrument even smaller.

All in all, these techniques preserve a certain feeling of spaciousness within the case, which, surprisingly, allows ample room for maintenance. Ravani even managed to incorporate a miniature Italian facade complete with false display pipes, gilded lions, and floral garlands above the rosewood naturals and ivory sharps (fig. 16). As with other chest instruments in this style, a front panel completes the enclosure. The case is painted black and decorated with gilt arabesque flowers and dryads.

The speech of this miniature positive is pleasant, but it is quite soft spoken as a result of the extremely low wind pressure of 24 mm. As a small chamber instrument it was probably adequate, though scarcely as versatile as a slightly larger eighteenth-century positive now in the Music Instrument Museum in Poznan.¹² This Polish instrument (fig. 17) embraces within its small case a full six ranks—8' gedackt, 4' flute, 2' principal, 1¹/₃' gemshornquinte, and a two-rank mixture. Altogether 225 pipes are enclosed in a space 31 x 20 x 20 inches (79 x 52 x 51 cm)—only half again as large as the tiny three-rank Ravani. As might be expected, the interior of the case is an architectural nightmare (fig. 18). Pipes are folded and fastened together in every conceivable way, and the outer walls of the case are lined with many of the 8' pipes laid horizontally. The bellows are attached to the top of the case and supply a firm pressure of 30 mm through two trunks on the bass end.

12. Poznan, Muzeum Instrumentów Muzycznych I 375.

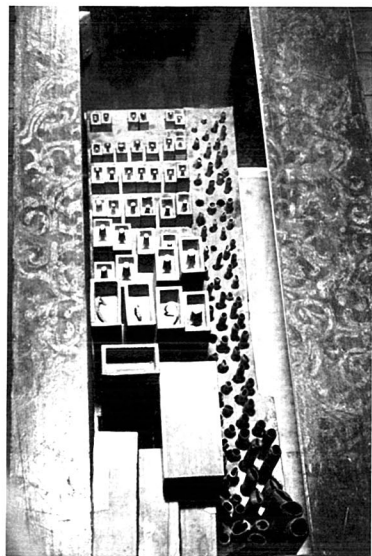


FIGURE 15a. Paris, Musée du Conservatoire National C1172. Positive by Bartolomeo Ravani, Lucca, 1651. Interior of the case showing rows of gedackt pipes.

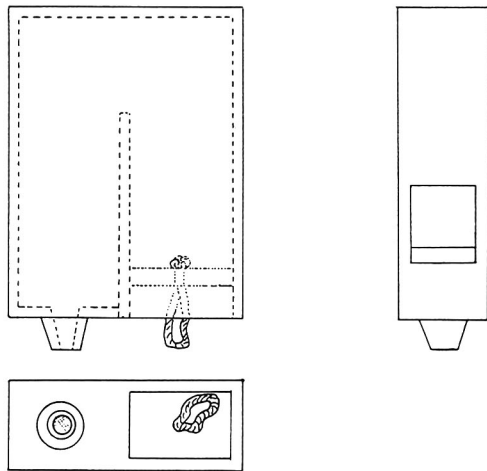


FIGURE 15b. Paris, Musée du Conservatoire National C1172. Gedackt pipe with double miter.



FIGURE 16. Facade of the Ravani organ.

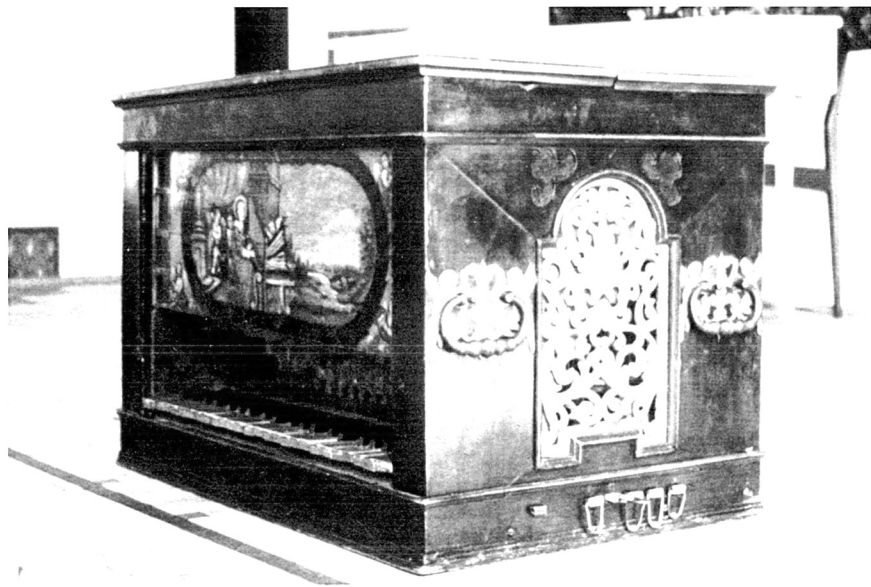


FIGURE 17. Polish positive. Poznan, Muzeum Instrumentów Muzycznych I 375.

FIGURE 18a.

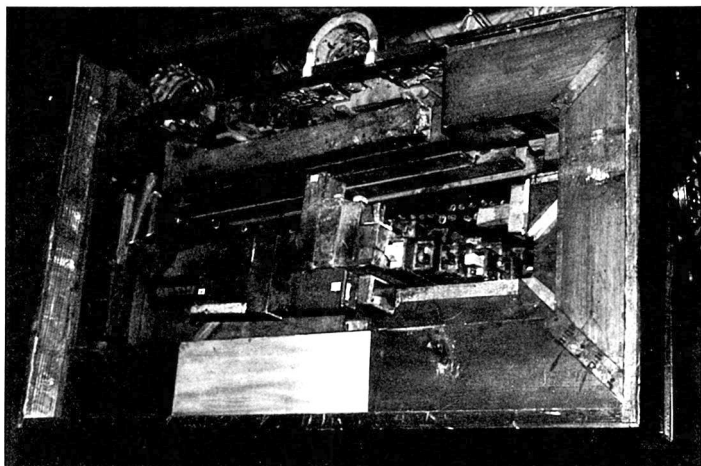
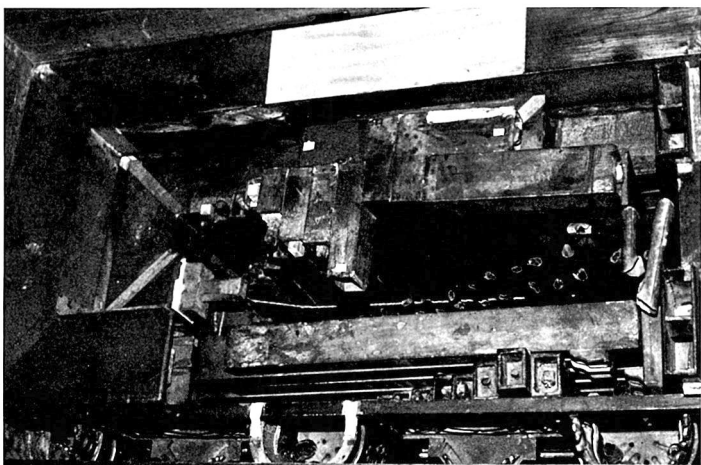


FIGURE 18b.



FIGURES 18a and 18b. Two views of the interior of Poznan organ I 375.

At first glance the instrument appears to be rather plain, but when the front panel is removed, one is greeted by an eighteenth-century version of St. Cecilia at her positive. In conformance with the dictum that no space should be wasted, the scene is painted on the horizontal pipes of the 8' rank. The ends of the case are decorated with gilt filigree panels and delicately chased wrought-iron handles that might seem out of character for the instrument until its back is removed to reveal a magnificent facade of "pedal" towers and filigreed flats (fig. 19). All of these are speaking pipes with embossed fronts, upon which great care was lavished in each detail. The maker of this unique positive is unfortunately anonymous, and even the decorative coats of arms of four towns (Topiř, Jelita, Pobó, and Prawda) from the area around Krakow offer no clue as to its early owners.

One final feat of miniaturization can be observed in an instrument from 1630 now in Blair-Atholl castle outside Pitlochry, Scotland (fig. 20).¹³ The lowest rank is an 8' regal, whose brass boot and shallot together measure barely over 1 x 1/4 inches (29.6 x 6 mm) (fig. 21). The upper ranks—a 4' gedackt, 2' principal, quinte, and 1'—are all of wood and are fastened together in a solid mass (fig. 22). The two lower ranks are actually constructed of three long boards, between which appropriately-sized dividers are inserted to form the individual pipes. The stopped flute is tunable, but the only way to adjust the pipes of the other ranks is to cut away the edge of the pipe or pierce a hole in its side—an unfortunate built-in obsolescence (fig. 23).

It might seem that these small positives were made more as toys than as real, usable instruments; but we can see both from iconographic evidence and from literary citations that they were indeed employed frequently wherever either portability or size was a primary consideration. For private chapels the small positive was a happy solution to problems of cost and space. For example, an instrument presently in the Historical Museum in Basle (fig. 24) was for 250 years situated in the private chapel of the Ab Yberg family in central Switzerland.¹⁴ In larger churches one or more small positives were often placed close to the choir for the performance of figural music, while the large organ was used to accompany the congregation. As specific examples of this practice we might mention:

13. Blair-Atholl Castle, Pitlochry, Scotland. This instrument with the initials "I.L." and the date 1630 painted on the bellows is with little reason widely attributed to the Devonshire organ builder John Loosemore (1614–1681).

14. Basel Historisches Museum no. 1927–258.

1. A Vespers service at San Salvatore in Venice in 1607, in which the ensemble included six portable organs together with the large organ, as well as numerous wind and string instruments of every description.¹⁵

2. The 1608 festival of San Rocco at San Marco in Venice reported by Thomas Coryat, who wrote that one could find nothing in all Christendom to surpass the music of the many instruments and singers accompanied by seven small organs.¹⁶

3. A Mass heard by the French gambist André Maugars at St. Minerva's in Rome in 1639, where the ten choirs were each accompanied by an organ—eight positives and two full-sized church organs.¹⁷

In the seventeenth century these small organs were frequently placed in a position adjacent to the large organ, for organists preferred them for simple functions because of their economical use of wind and easy manipulation.¹⁸ A fixed positive of this sort, now termed a *Rückpositiv*, was earlier called *Positiv im Stuhl* or "chair organ," the latter corrupted in the late eighteenth century to "choir organ."¹⁹ It was initially of small size, with its own keyboards and bellows, and often had only two ranks, as did the organ mentioned in the accounts of Worcester Cathedral for 1613: "In the chaire organ, 1 principal of mettal, 1 diapason of wood."²⁰

The most famous use of the positive in secular music is found in the score for Monteverdi's *Orfeo* (1607), which calls for two *organi di legno* and a regal as part of the orchestra. Small positives were doubtless much used in chamber music. They are quite charming in solo pieces; they add a sprightly quality to dance music; and they can serve as satisfactory continuo instruments (figs. 3 and 25). When a continuo part is played in the normal keyboard position on a 4' positive, the result is naturally higher and

15. Sandro dalla Libera, *L'Arte degli organica Venezia* (Venice: Istituto per la Collaborazione Culturale, 1962), 73.

16. Thomas Coryat, *Coryat's Crudities* (1611; reprint, Glasgow: J. MacLehose and Sons, 1905), 390.

17. Arnold Dolmetsch, *The Interpretation of the Music of the Seventeenth and Eighteenth Centuries*, 2nd ed. (London: Novello and Co. Ltd., 1946), 465.

18. Peter Williams, *The European Organ, 1450-1850* (Bloomington: Indiana University Press, 1966), 22.

19. William Leslie Sumner, *The Organ*, 3rd ed. rev. (London: Macdonald and Co., 1962), 162-63.

20. *Ibid.*

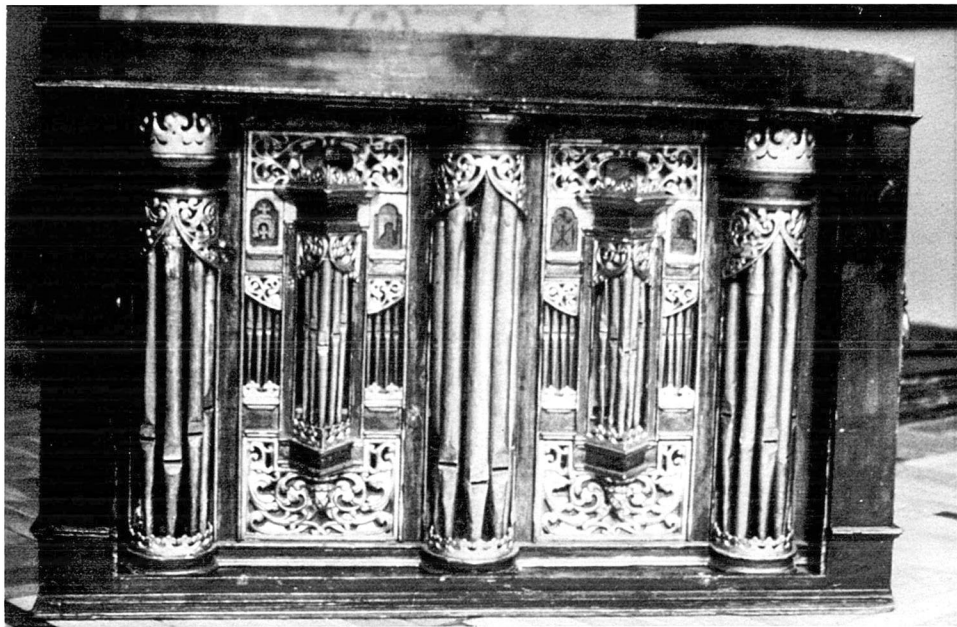


FIGURE 19. Facade of Poznan organ I 375.



FIGURE 20. Positive signed "I.L.," 1630. Blair-Atholl Castle, Pitlochry, Scotland.

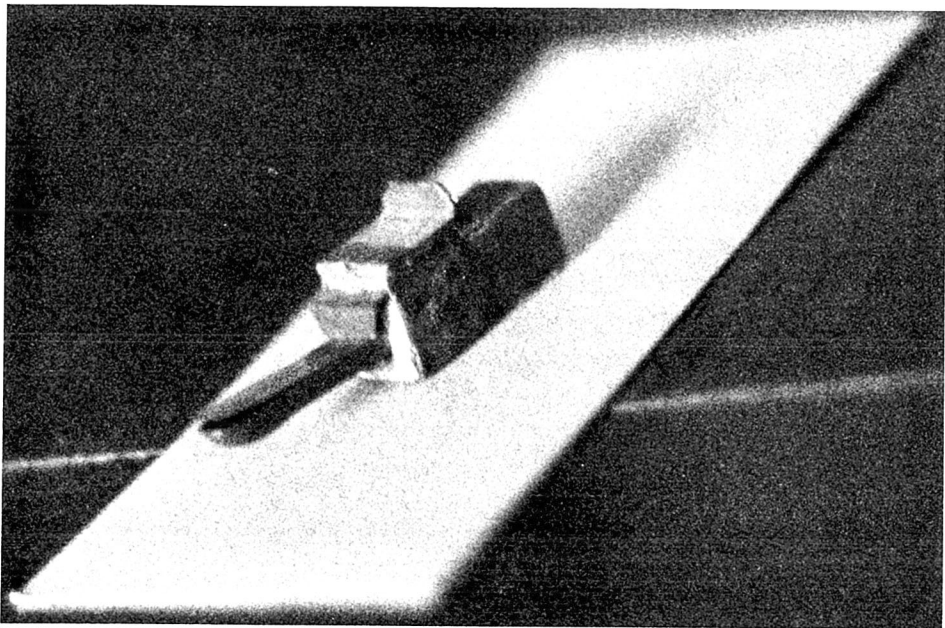


FIGURE 21. Reed from the Blair-Atholl organ.



FIGURE 22. Pipe mass of the Blair-Atholl organ.

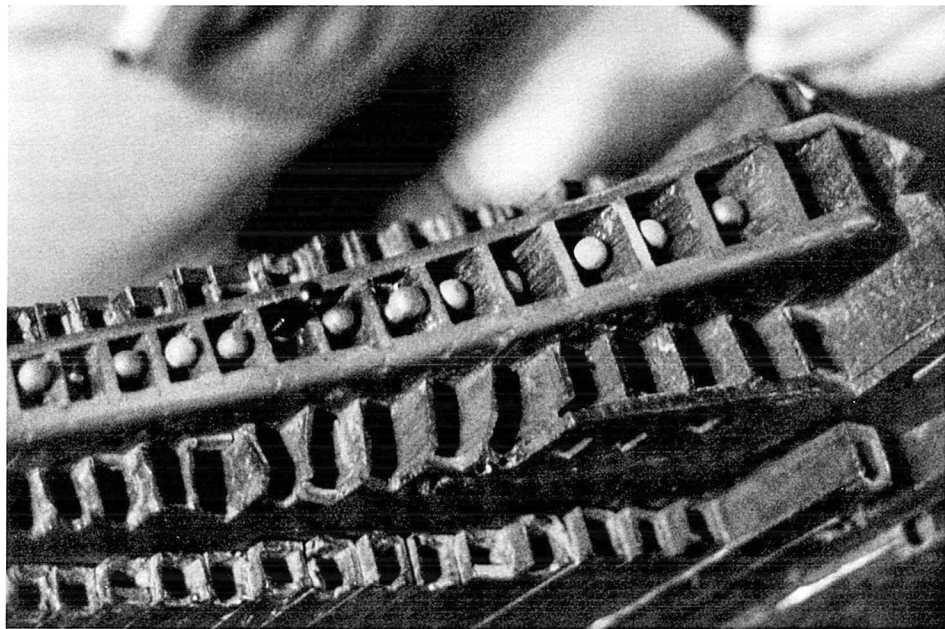


FIGURE 23. Principal and 1' pipes of the Blair-Atholl organ. These pipes are tuned by cutting away the body of the pipe.

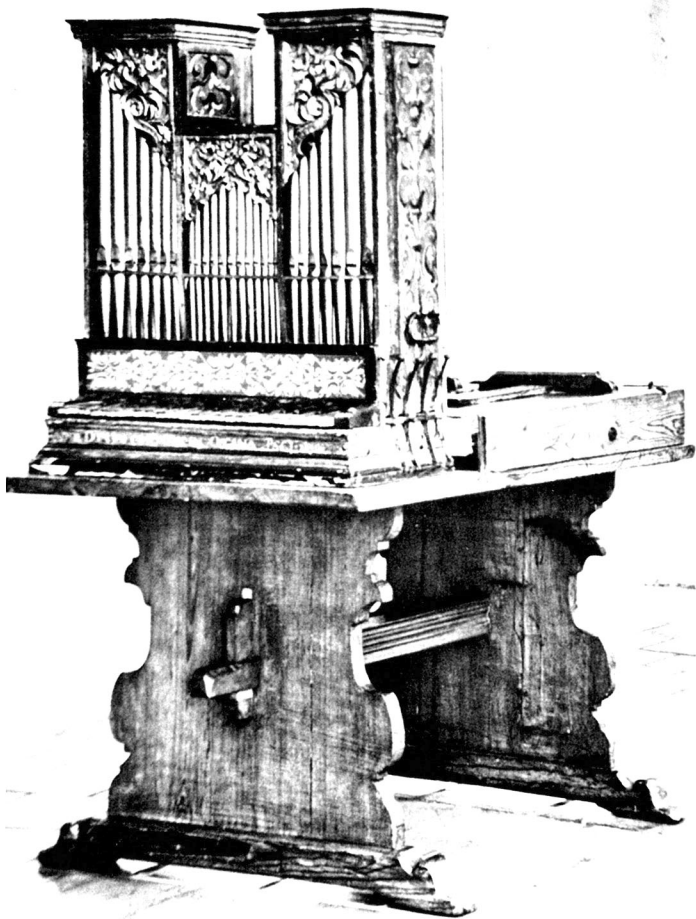


FIGURE 24. Basel Historisches Museum 1927–258.



FIGURE 25. Hieremias Buroner, *Album amicorum*, 1592–99 (British Library, Egerton MS. 1554) fol. 2. Photograph: Bettman Archive.

brighter, though it offers somewhat less support than would a larger instrument of 8' pitch. As an alternative, it is also possible to realize a continuo part in the lower octave of a 4' positive, as long as the accompanying bass instrument is sufficiently firm to cover the notes below the positive's range.

Finally, two features peculiar to performance on these small organs should be mentioned: the pitch fluctuation in the higher ranks and the percussive action of the keys. The smaller pipes are particularly susceptible to the slight variation in wind pressure caused by the closing of the folds of the bellows. This can be eliminated through the use of a reservoir, or by means of the single-fold bellows invented by the Germans, who preferred them to the multiple-fold variety they called French bellows.²¹ The key noise, however, is an unavoidable consequence of the use of the pin-action chest, and is created when the short, hinged keys slap against the check rail as they are released. Perhaps it is best to regard this happy clatter as a delightful touch that no modern electronic miniature can reproduce.

North Texas State University

21. Adlung, vol. 2, p. 35.