

Harmonic Exercises

to play harmonics: finger the diamond-headed note, blow to the upper note.
accidentals carry through the measure, for harmonics as well.

tempo: slow enough
to be precise

dynamics: *mf*, then experiment

articulation: legato, t (d), h, k (g), p

The image displays a musical score for 'Harmonic Exercises' in treble clef. It consists of 12 staves of music, each containing a sequence of notes with diamond-shaped heads. The notes are grouped into triplets, indicated by a '3' below the group. The exercises progress through various keys and intervals, with accidentals (sharps, flats, and naturals) placed above the notes. The first staff starts with a C4 note. The second staff continues with D4, E4, and F4. The third staff introduces G4 and A4. The fourth staff includes B4 and C5. The fifth staff features D5 and E5. The sixth staff has F5 and G5. The seventh staff includes A5 and B5. The eighth staff has C6 and D6. The ninth staff features E6 and F6. The tenth staff includes G6 and A6. The eleventh staff has B6 and C7. The twelfth staff concludes with D7 and E7. The notes are connected by stems, and the diamond-shaped heads are positioned to indicate the specific fingerings and breathings required for each harmonic.

Multiphonics – playing two or more notes together. One of the easiest to start with: play second octave D and F together by fingering F and adding the two trill keys. See "List of studies for further practice" on page 10 for further resources which include fingerings for multiphonics.

Benefits: multiphonics help improve embouchure refinement and strength, control of air pressure and speed, and control and awareness of the angle of your air column.

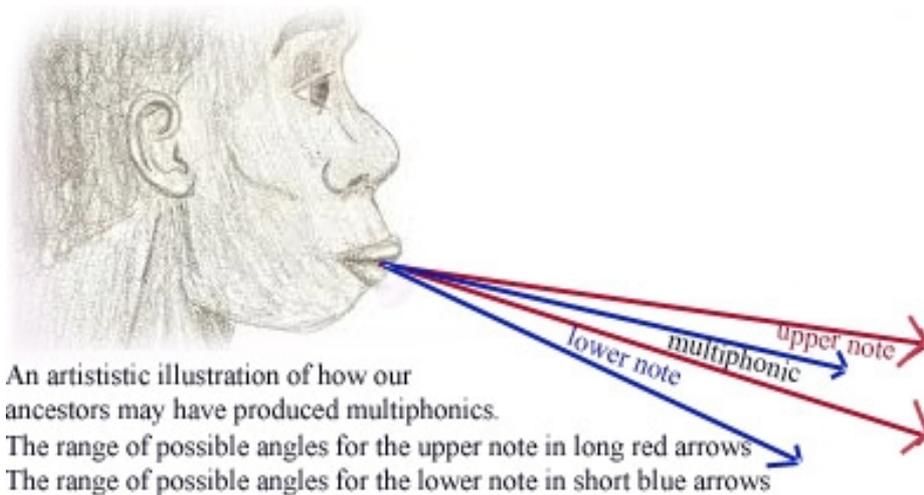
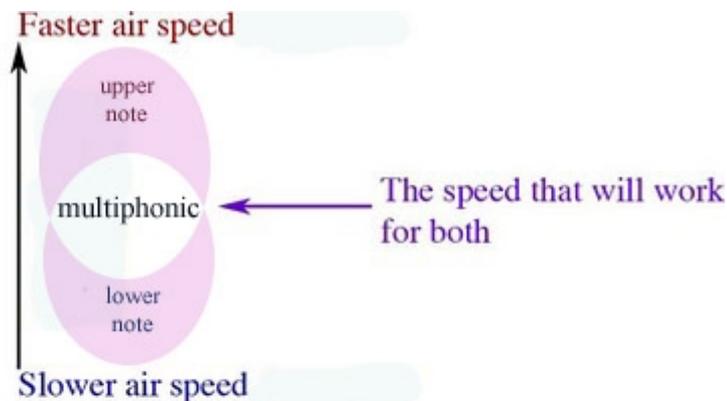
Check-points for playing multiphonics:

- ✓ Play each note separately, get to know the speed and angle of the airstream needed for each. Explore their range of dynamics.
- ✓ Starting on one note (it can be either the lower or the upper), bring in the other note by changing the angle of the air. Try to keep a steady air speed.
- ✓ It may help to think of the upper lip playing the upper note, and the lower lip playing the lower note.
- ✓ It may help to tune your throat to the weakest note (see throat tuning).
- ✓ Small interval multiphonics work better with the flute pushed all the way in; large interval multiphonics work better with the flute pulled out a bit.

Here is some further advice for preparing harmonic multiphonics, according to Robert Dick. Harmonic multiphonics are produced by playing adjacent partials on the harmonic series together. You find this, for example, in Luciano Berio's *Sequenza*.

- ✓ Practice octaves, fifths, and fourths - in that order.
- ✓ With octaves, it is easiest to begin where the flute has a short tube: C2 - C3. then work your way down.
- ✓ With fifths and fourths, begin where the flute is longest, low C or B and work your way up.

Here are some visual representations that may help you see where the air speeds and angles overlap when playing a multiphonic, and why it is so important to explore the complete range of possible air speeds and angles for each individual note. If you don't do that, you may never find the areas that overlap.



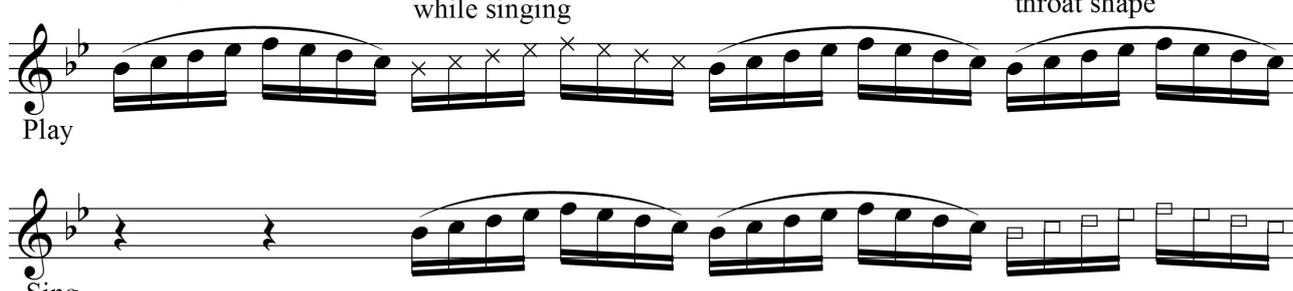
Singing and playing. This is activating your vocal chords while playing the flute. Benefits: singing while playing helps to open the sound, improve of the sense of pitch, and control the air flow.

At first, the best way to blend your voice with your flute sound is to sing like a child, openly and airily. If you try to sing with the focus of a trained singer, it will interfere with the focus of your flute sound. Don't try to sing "properly" or project your voice, just keep on pitch.

Throat tuning is the best basic application of singing and playing. Tuning your throat to a pitch you want to play will help you to achieve maximum resonance. You can find a more detailed explanation in [Robert Dick's Youtube videos](http://www.youtube.com/watch?v=FCxXc5p96YA) (<http://www.youtube.com/watch?v=FCxXc5p96YA>) and his exercises from *Tone Development Through Extended Techniques*.

Here is one of the exercises he demonstrates. This exercise is also much loved by Peter Lloyd:

1. play 2. finger only while singing 3. sing and play 4. don't sing, but keep throat shape



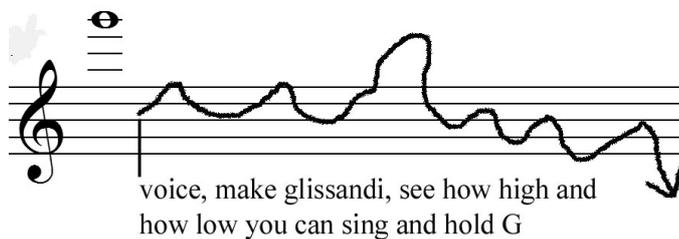
Play

Sing

Start with Taffanel & Gaubert's first daily exercise in any key. I have chosen B-flat because it falls easily in my range. You can also choose any octave you wish. In case the musical example is not clear, here is what you do: 1. play the 5-note pattern, 2. sing the 5-note pattern while silently fingering the notes on the flute, 3. sing and play together, 4. play only, but keep the feeling and resonance as if you were singing and playing. You may notice a big change in your resonance.

Another application of singing and playing that I like to utilize is to use singing as a check-point for keeping a relaxed throat while playing high notes. If you can sing a low note while playing a high one, then likely you are using your embouchure and support correctly. If you can't produce a low note while playing high, you are likely squeezing your throat in order to "help" the high notes out. That's the easy way out! A good high register, though, has its support down below, and the lips do the work of narrowing the passage of air, not the throat.

To experiment, play a high note (any will do, I have G here, but you can go higher or lower) and see how high and especially how low you can sing while holding that note.

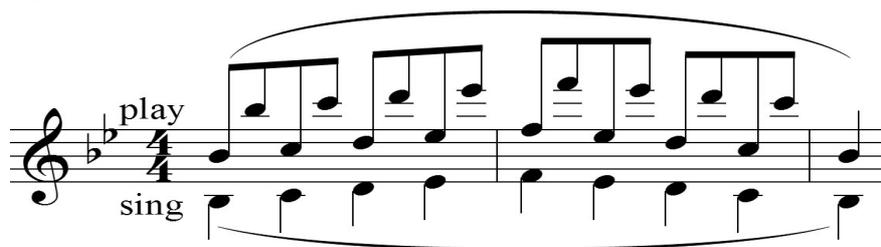


voice, make glissandi, see how high and how low you can sing and hold G

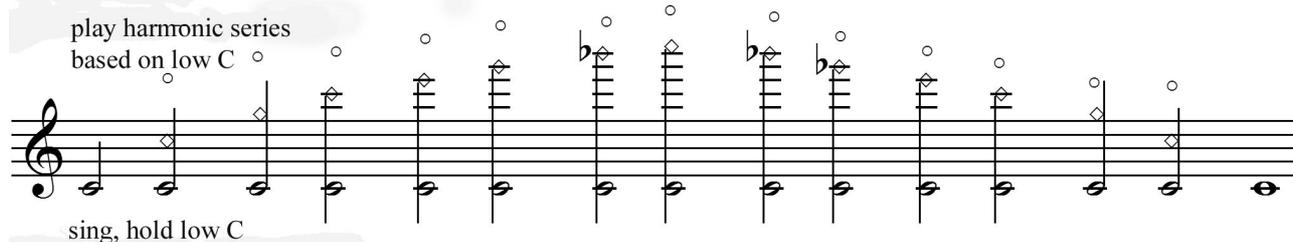
You will hear many strange difference tones while doing this; as your voice goes up, you may hear a "ghost" glissando going down, and vice versa. Being able to create this effect is an application I love about singing and playing. Some composers use it effectively, and it also comes in handy when improvising.

Now, back to the point about keeping the voice low: try playing octaves and keeping the voice in the lower octave. Keep the voice steady on pitch. Again, you can choose

any key and any octave:



A bit trickier is to keep the voice on a single low pitch while blowing through the harmonic series (go back to page 1 if you need to review the harmonic series).



C is a good note to start on, but you can choose another. Don't be discouraged if you can't produce the highest harmonics while singing (or even without singing) at first, just work on getting them one at a time. No vocal glissandi allowed here, really keep the throat relaxed and try not to sing higher or louder as you play higher.

And just because I am a bit fanatical, I wrote a vocalise to one of Reichart's daily exercises. The voice sings the top line:



If anyone wants the whole exercise, I can send it as a Finale or pdf file. Just send me an email at hbledsoe@helenbledsoe.com.

Whistle tones. These are very quiet, high tones, not actually whistled, but produced by blowing gently enough to vibrate only the air around the embouchure hole. Also called Whisper tones.

Benefits: whistle tones help develop control and awareness of the lip's aperture, they can also be a listening and refining exercise for your air-stream.

Check-points for producing whistle tones:

- ✓ tongue placement determines the pitch. To find the correct placement, whistle the pitch you need to produce, and if you can't whistle (many flutists can't!), don't worry about the lips, just place your tongue where you would if you could whistle the note. You should be able to produce a whisper of the pitch you want.
- ✓ It may help to think of gently blowing enough to vibrate only the air around the embouchure hole, not the whole flute or even the whole head joint.

Here are some further tips for using and producing whistle tones:

- ◆ as a relaxing/de-stressing exercise: work on controlling a slow air stream by practising very low whistle tones. Your embouchure has to be very steady because there is little air behind it to support it. (Patience: It took me a long time to get to low C!) It may help to think about having a "tall embouchure" (very open in the middle). It may also help to think of having a cushion of air behind your lips (i.e., your lips are not too flat against your teeth) and to relax your jaw. Once you can do this reliably, it is a good de-stresser before going on stage.
- ◆ if you have trouble producing a fourth octave note, find the correct angle by first finding the whistle tone (you may find yourself rolling out more than usual), then blow. It should help.

Percussive sounds: Tongue or Lip Pizzicato, Key clicks

To get a good POP for a pizzicato, think about creating a **bubble** in your mouth. Close off your air passage from behind and in front, compress the trapped air, then release it: *pop!*

To block the air from the back, raise the back of the tongue as if you are beginning to swallow.

To block the air from the front, you can have the tongue between the lips, or tongue on the palate.

If on the palate, I find it more effective if the tongue is actually on the roof of the mouth and slightly retroflex (aimed up and slightly back). There should be an air-tight chamber (bubble), with the roof of your mouth as the top, and your tongue as the walls and floor. The pressure to create the pop is made by trying to push the air bubble forward. When you feel the pressure, you can release front of the tongue and

let the jaw drop a tiny, tiny bit, that will help the air bubble go down into the flute.

With tongue on the lips (behind or between the lips, both are possible), the bubble's top is the roof of your mouth, the walls are the teeth and cheeks, and the floor is your tongue. The pressure is built up by squeezing whatever muscles you can (lips, cheek tongue, whatever works), then drawing the tongue quickly back. Letting the jaw drop here a tiny, tiny bit can also help here with resonance, getting the air bubble into the flute.

The pizzicati sounds will be louder and more resonant if the flute is turned out a bit. The more you can make resonance in your own mouth, the better. For maximum resonance for key clicks, stay in playing position, open your throat as far as possible, and open your mouth just a bit more over the embouchure hole to create an extra resonance chamber.

Circular breathing. Benefits: development of the larger muscles for embouchure flexibility and stamina, ability to play longer phrases in moving passages.

Applications:

- ◆ in classical repertoire, one can use this for rapid or trill passages. I like to use it for long cadential trills because you can give full power without fear of having not enough air for the final note.
- ◆ as a checkpoint for resonance. When I am warming up or just about to go on stage, I check my circular breathing regardless if it is required in the piece I am about to play. This is a sure-fire test to see if either of my nostrils or the back of my throat is blocked. If I am clear enough to circular breathe then I should be able to play with maximum resonance.

To begin with, choose an easy third-octave note or trill.

Here are the basic steps. You could try each step with a straw and glass of water before trying it on the flute.

1. practice playing while expanding your cheeks, back of throat, or wherever you plan to store air.
2. practice playing using only the air you have stored in your mouth. These will be short bursts of sound.
3. playing with only stored air, take a quick sniff through your nose. This will also come in rather short bursts.
4. Play normally, store air, take a sniff while pushing the air out. Stop and repeat until this is coordinated. Don't worry about the next step yet.
5. Ok, now you can worry, this is the tricky part. Do step 4 and *before all the air in your mouth has run out*, let the tongue gradually (but swiftly) move the front air out, while releasing in the back so the air coming from your trachea can enter the stream. The back of the tongue really has to glide in order to equalize the pressure of outgoing air with upcoming air. Please don't give up at this point like most flutists do.

Studies for further practice

Pierre-Yves Artaud – Quatre exercices pour la respiration circulaire : applicables à tous les instruments à vent (Editions Musicales Transatlantiques, 1985) Cotage : E.M.T.1570 Editions Musicales Transatlantiques.

Robert Dick - Circular Breathing for the Flutist (MMB Music)

Robert Dick - Flying Lessons, Concert Studies with extended techniques. Volume I and II (MMB Music)

Robert Dick - Tone Development Through Extended Techniques (MMB Music)

Ulrich Gasser - Papierblüten (Paper Blooms) 24 pieces as intro to new music. Explanations in French, English, and German. 1/4 tones, glissandi, harmonics, fluttertongue, singing and playing, multiphonics.

Peter-Lukas Graf – Check Up for Flutists 2002 (Schott). Has chapters on Glissando, whistle tones and singing and playing.

Linda Holland - Easing into Extended Techniques (Con Brio). This set of books includes instruction and short sample pieces using sing/play, harmonics, multiphonics, pitch bends & finger slides and microtones.

Marlaena Kessick - Tecnica Avanzata (Advanced Technique), 1990. Studies for harmonics, multiphonics, timbral trills, flissandi, quarter tones, whistle tones, flz, key clicks, tongue ram, singing and playing and circular breathing. Italian text only.

Aurèle Nicolet, ed. - Pro Musica Nova / Studies for Playing Avant-Garde Music (Breitkopf & Härtel) Collection with works by E. Denissov, P.H. Dittrich, F. Donatoni, H. Erbse (duo), H. Holliger, K. Huber, W. Hufschmidt, Y. Ioannidis, K. Lechner, Y Paporisz, A. Vieru, J. Wildberger. All works are short with brief intro to extended techniques. Some works for flutes other than C flute.

Graded, selected list of solos for unaccompanied flute

The division of Easy, Moderate, Difficult, and Very Difficult is subjective. The technical difficulty of a work and the difficulty of the extended techniques are not always the same level, but I have attempted to take both into consideration.

*SF = can be played on a student flute (closed holes, C foot)

Easy, moderate tempo(s), straightforward rhythms (or rhythms completely free), may be technically challenging, but without complexity. All extended techniques are arranged so there is time to set them up.

Robert Dick, Fish are Jumping, 1999 (MMB Music)

Robert Dick - Lookout (1989) (MMB Music) melodic rock solo for flute that uses singing and playing and easy multiphonics.

Kazuo Fukushima - Mei (Suivi Zerboni) glissandi, fluttert., quarter tones, and key clicks *SF

Kazuo Fukushima - Requiem (Suivi Zerboni) fluttert., gliss, timbral trills. *SF

Anne La Berge - Revamper - (Frog Peak Music) singing and playing, one multiphonic, harmonics (can play with closed holes but need B-foot)

Phyllis Louke, Extended Techniques-Double the Fun, 2003 (ALRY)

Phyllis Louke, Extended Techniques-Solos for Fun, 2006 (ALRY)

Wil Offermans - For the Young Flutist, 1995. Easy Studies with New Techniques. I (Zimmermann)

Toru Takemitsu, Air for flute 1996 (Schott), quarter tones, harmonics, flutter-tonguing; requires a flute with a low B.

Edgard Varese - Density 21.5 (Ricordi), first use of key clicks in flute repertoire.

Walter Wretschitsch - Flute Update, New Music for Young Flutists, 2007? (L. Doblinger (B. Herzmansky) KG Wien) Collection of works by W. Aigner, M. Augustin, R. Naifar, W. Offermans, H. Hüodl, G. Ahumanda, W. Puschnig, A. Wagendristel, M. Fuss

Moderate, fast passages are diatonic/chromatic (no difficult microtonal passages) and without complexity, but extended techniques may be challenging.

Robert Aitken - Icicle 1977 (Éditions Musicales Transatlantiques : collection "la Flûte contemporaine" Artaud.

Robert Aitken - Plainsong (Universal Edition) multiphonics, air sounds, singing and playing, key clicks (also w/ tongue stop), glissandi. Better to have open holes for glissandi. Uses low B, but it can be omitted.

Ian Clarke - Great Train Race (IC Music/Just Flutes Edition, 1993/2001) residual/breathy fast tonguing, multiphonics, singing & playing, lip bending, explosive harmonics and an optional circular breathing section. C Foot and B Foot versions available.

Ian Clarke - Zoom Tube (IC Music/Just Flutes Edition, 1999) jet whistle, quartertones, multiphonics, note bending. Requires open-hole B foot.

Robert Dick - Afterlight (1973/84) (MMB Music) Multiphonics, jet whistle, harmonics. II

Robert Dick - Or (1984) (MMB Music) small-interval multiphonics, sometimes a quarter-tone or less. II

Kazuo Fukushima - Shun-san "spring glory" 1969 (Murumatsu, Inc.) fluttert., multiphonics, gliss. *SF

Toshi Ichianagi - Still time IV - in memory of Takemitsu, 1998 (Schott) 1/4 tones, multiphonics

Betsy Jolas - Episode I 1964 (Leduc) and Episode Second: Ohne Worte 1977 (Heugel) harmonics, fluttert., multiphonic trills, 1/4 tones. open hole C ft.

Anne La Berge - Rollin (Frog Peak Music) circular breathing, multiphonics,

harmonics.

Lowell Liebermann - Eight Pieces (each movement can be played ad lib on C flute, alto, piccolo or bass flute) (Theodore Presser) key clicks.

Istvan Matuz - Six Studies per Flauto Solo (Akkord Music Publications)

- 1) ...L(Elek)zem - for prepared flute, C ft.
- 2) Head Join(t)s Footjoint - played with head and (B)footjoint only ("Body-less flute")
- 3) Sakura-Sakura - flute is played shakuhachi style without headjoint *SF
- 4) "Blaset, Bla-aset..." - balloon attached to end of flute (C or B ft.)
- 5) Dies Irae - for prepared flute with E-mechanism
- 6) Headlessness - theatrical satire on Mozart's Concerto in G. Flute is played without headjoint and then with a saxophone mouthpiece.

Tristan Murail - Unanswered Questions (Ed. Lemoine?) microtones, harmonics, glissandi

Will Offermans - Honami (Zimmerman) fluttertounge, note bending, multiphonics. *SF

Will Offermans - Tsuru-no Sugomori [The Nesting of Cranes], 1999 (Zimmerman) Traditional shakuhachi melody arranged for flute . breath sounds, glissandi, finger vibrato, harmonics.

Greg Pattillo – Three Beats for Beatbox Flute, 2011, Four Etudes for Beatbox Flute, 2012.

Paulo Pizzani - L'Ombra dell'Angelo (Ricordi) harmonics and timbral trills. *SF

Kaija Saariaho - Laconisme de l'Aile (Jasemusikkii - Edition Remers) - singing & playing, fluttertongue, multiphonic, whistle tone. *SF

Salvatore Sciarrino - Opera per Flauto Vol 1 & 2 (Ricordi) (some pieces *SF):

Giacinto Scelsi - Quays , 1953 (Bärenreiter) for C flute or alto flute. fluttertongue, 1/4 tones, 1/8 tones. *SF

Harvey Sollberger - Quodlibetudes for Solo Flute (McGinnis and Marx), described as "Thirteen fantasias and a coda designed to introduce the player--young or old, student or professional--to the expanded technical and conceptual worlds of the New Flute of the late twentieth century."; includes a study tape.

Karlheinz Stockhausen - In Freundschaft - (publ. Stockhausen Verlag , CD also available) - N.B. most all of Stockhausen's music require some sort of theatrical preparation which may (but not necessary) include: costume, prescribed movements, lighting. Must be performed from memory. harmonics, fluttertongue *SF

Stockhausen - Freia - (Stockhausen verlag, CD or cassette available) see "In Freundschaft" above. This piece requires costume, movement, and if possible, lighting. Also, microtones, fluttertongue, air noises *SF

Toru Takemitsu - Itenérant (Schott Japan) (can also be performed on alto flute) timbral trills, fluttertongue, timbral notes, multiphonics, whistle tones, glissandi *SF

Isang Yun - Sori (Bote & Bock) gliss., 1/4 tones, fluttert. *SF

Jos Zwannenburg - Solo for Prepared Flute (Ascolta Music Publications) flute is prepared with an end cork and cigarette paper under the A-key. whistle tones, ghost tones, jet whistle, tongue ram.

Jos Zwannenburg - Seven Pieces for Solo Flute -To Study Extended Techniques (Donemus) harmonics, gliss., lip pizzicato, vocal colorizations, whistle tones, multiphonics, singing and playing.*SF

Difficult, requires a general high level of technique. May include: rapid microtones, difficult multiphonics, complex rhythms or 4th octave notes above high D.

Luciano Berio - Sequenza I 1958 (Zerboni/Universal) fluttertongue, multiphonic. *SF

Maarten Bon - Whistle for a Friend (Donemus) fluttert., 1/4 tones, timbral notes, 4th octave passages, gliss., key clicks, some theatrical elements. *SF

Elliott Carter, Scrivo in vento (Hendon Music), flutter-tonguing and multiphonics.

Simon Desorgher - Concert Studies (United Music Publishers Ltd.) 1985. Concert Study I (...speed within stillness), microtonal trills/ Concert Study II (...many within one), multiphonics and multiphonic trills/ Concert Study III(...strength from softness), microtones, lip attacks, lip buzz, whistle tones, harmonics, glissandi, no. III to be played on closed hole flute.

Robert Dick - Flames Must Not Encircle Sides (1980) Combines multiphonics and circular breathing, continuous multiple trills

Christobald Halffter - Debla (Universal Edition) 1/4 tones *SF

Jennifer Higdon - Rapid Fire (Higdon) fluttert., harmonics, some theatrics, including stomping on firesnaps.

Heinz Holliger - (t)aire(e) - (publ. Schott's Soehne, Mainz) air noises, glissandi, timbral notes, quartertones, harmonics, jet whistle, key clicks, tongue ram, trumpet buzz and inhaled whistles. Normal whistle tones and whistling while playing, singing and playing, and circular breathing (can be played on open-holed flute with C-foot)

Philippe Hurel - Eolia - (publ. Billaudot) key clicks, speaking while playing, tongue ram, glissandi, multiphonics, fluttertongue, whistle tones.

Philippe Hurel - Loops - 2001 (Henry Lemoine) lip pizz, quarter-tones, flutter tongue.

Toshi Ichianagi - In a Living Memory, 2000 (Schott) 1/4 tones, harmonics, key clicks, multiphonics.

Shirish Korde - Tenderness of Cranes (Neuma Publications) Breath noises, shakuhachi sounds, gliss., harmonics, fluttertongue, multiphonics, microtones.

Bruno Mantovani - Früh - (Editions Henry Lemoine) 1998 air sounds, bisbigliando, key clicks

Brice Pauset - Euridice 1998 (Lemoine) microtones

Shulamit Ran - East Wind 1988 (Theodore Presser) lip and finger glissandi, fluttert.,

tongue pizz, key click?, passages in 4th octave.

Salvatore Sciarrino - Opera per Flauto Vol 1 & 2 (Ricordi) (some pieces *SF)

Stockhausen - Xi - (Stockhausen verlag, CD available) microtones *SF

Toru Takemitsu - Voice (Salabert) speaking and playing, breath-tones, multiphonics, timbral trills, timbral notes, harmonics, fluttertongue, glissandi, key clicks *SF

Very Difficult, may include rapid micro- or 1/4 tone passages, high degree of rhythmic complexity, extremes of range (may include extended passages above high D), difficult multiphonics, rapid changes from one extended technique to another, and a general high level of energy. These pieces should be real tests of endurance

James Dillon - Sgothan (C.F. Peters) harmonics, glissandi, lip pizzicato, tongue ram, singing and playing, whistle tones, circular breathing, flutter tongue, highly microtonal.

Brian Ferneyhough - Cassandra's Dream Song (Peters) lip pizz., key clicks, microtones, fluttert., harmonics, singing and playing, timbral notes. *SF IV-

Brian Ferneyhough - Carcieri d'Invenzione IIb (Peters) highly microtonal, fluttert., lip pizz., key clicks, harmonics, microtonal trills.

Brian Ferneyhough - Unity Capsule (Peters) fluttert., extended use of vocal sounds and key clicks (music is notated in 3 staves, one for "normal" notes, another for the key noises, and a third for the vocal sounds)

Michael Finnissy - Sikangnuqa (formerly publ. United Music Publishers, now available from composer) 1979 microtonal.

Bernhard Lang - Schrift 1.2 1998 (Zeitvertrieb, Wien) Tongue Ram, key clicks, singing and playing, multiphonics, harmonics, whistle tones.

Charles Wuorinen - Variations I (McGinnis and Marx), Variations II (Peters) fluttert., harmonics, key clicks, 4th octave notes