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COMPOSER DANS LA LANGUE DES MODÉCHELLES

PRÉSENTATION & MODE D'EMPLOI DES MODÉCHELLES
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CATALOGUE DE TOUTES LES TRANSPOSITIONS LIMITÉES
DES 18 MODÉCHELLES DE FACTEUR 1 ou 2
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TABLEAU DES INTERSECTIONS ENTRE CHACUNE DES TRANSPOSITIONS
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TABLEAU D'ANALYSE D'UN CERTAIN NOMBRE D'ACCORDS OU ARPÈGES ITÉRATIFS
SELON LES MODÉCHELLES

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Composer dans la langue des "Modéchelles"

Une présentation de ma propre manière de concevoir l'harmonie
et des outils développés à l'Ircam avec Serge Lemouton
pour en étudier toutes les facettes

1°/ Construction des modéchelles : un nouveau système de modes & d'échelles harmoniques

Comme beaucoup de compositeurs de ma génération qui ont commencé à composer dans les deux dernières décennies du XXème siècle, j'ai cherché à trouver mon propre langage à partir du double héritage de l'histoire de l'harmonie (depuis l'Ecole de Notre-Dame au XIIème siècle et l'Ars Subtilior Ytalica jusqu'à Olivier Messiaen, la tonalité n'ayant formé qu'un moment particulier dans l'histoire beaucoup plus vaste de la modalité) et de la musique sérielle (de la seconde école de Vienne - surtout pour l'expressionisme exacerbé encore post-romantique d'Arnold Schönberg et Alban Berg - et des grands compositeurs de la génération de 1925 - Nono, Boulez, Berio, Stockhausen mais aussi Xenakis, Ligeti, Penderecki ou André Boucourechliev), dont les musiques avaient revêtu une importance particulière dans la construction de notre sensibilité, de par les qualités expressives inhérentes au chromatisme (tout comme on l'entend déjà dans la musique des époques baroque et romantique, et même chez Mozart par rapport à Haydn par exemple, l'histoire de la musique jouant d'un constant aller et retour entre clarté tonale ou modale et conquête du chromatisme dans la recherche de moyens d'expressivité toujours plus importants). Sans oublier les plus récents développements de la musique spectrale, de l'accord de Prométhée de Scriabine à Tristan Murail, revenant aux sources de la modalité (puisque les premiers modes sont issus des notes du cycle des quintes) tout en ouvrant l'harmonie à de nouvelles perspectives.
Si la génération précédente s'était définie plutôt par opposition entre musique tonale et musique atonale (quoique Luciano Berio avait montré un premier chemin de conciliation possible entre sérialisme et modalité en jouant notamment de la notion de polarité, mais au risque, comme dans la Sinfonia ou chez Schnittke, d'une impression trop forte de collage), il nous semblait avoir besoin de pouvoir intégrer la multiplicité de nos héritages à son propre langage.
Première génération sans doute à disposer d'un accès aussi illimité aux musiques du passé et des contrées les plus éloignées, publiées et enregistrées de manière presque compulsive dans la seconde moitié du XXème siècle, nous avons réalisé combien l'histoire de la musique est celle d'un déploiement exponentiel des individualités et des techniques de composition, amenant notre époque à une diversité de styles et de personnalités tout à fait extraordinaire et réjouissante. Une belle métaphore pour souligner que si nous avons beaucoup en commun, chacun d'entre nous est unique et donc capable d'une parole distincte pour apporter à l'humanité ce qu'aucun autre ne pourra lui dire - la raison d'être de la création artistique, que ce soit en littérature, dans les beaux-arts ou en musique.
Il ne faisait donc pas de doute qu'il nous fallait trouver chacun sa propre manière pour s'exprimer en musique, sans rejeter l'un ou l'autre de nos multiples héritages, mais en tentant d'éviter le risque d'une synthèse sans cohérence propre.
C'est ainsi que j'ai commencé à rechercher une autre logique possible dans l'organisation des hauteurs.

Il m'est aussi apparu que la conception de systèmes harmoniques dans la musique occidentale, qu'il s'agisse des modes antiques et du Moyen-Âge, de la tonalité, du sérialisme, ou des modes développés par Olivier Messiaen, est restée trop longtemps contenue dans les limites de l'octave, comme si le tempérament égal ne permettait pas de concevoir des échelles harmoniques plus complexes dont les composants diffèrent d'une octave à l'autre.

Même les systèmes en quarts de tons développés par Ivan Wyschnegradsky (séries de 24 notes en quarts de tons comme une gamme chromatique démultipliée par 2) aussi bien que par Alain Bancquart (essentiellement des gammes modales, généralement de 13 notes, sélectionnées parmi les 24 quarts de tons pour les qualités de leurs relations respectives) sont restées développées dans les limites de l'octave, là aussi comme si la notion de gamme devait rester intrinsèquement liée à l'octave.
Pourtant, l'analyse spectrale nous a depuis longtemps appris que les formants du son sont de plus en plus riches et complexes dans les fréquences élevées. De même, les musiques extra-européennes comme les ragas indiens « montent » des gammes beaucoup plus complexes, quoique transmises essentiellement oralement.
Que l'on limite son langage harmonique à l'emploi exclusif des 12 sons du tempérament égal, ou qu'on y intègre des micro-intervalles, nous ne voyons pas de raison valable à cette limitation.
Il nous est au contraire apparu non seulement possible mais aussi fructueux de construire un système de modes et d'échelles harmoniques cohérent et ordonné à partir de la simple itération de séquences génératives plus ou moins complexes, quel que soit le caractère octaviant ou non-octaviant des modes et des échelles ainsi obtenus, et dont l'ensemble permet de faire sonner l'orchestre aussi bien que le piano dans toute la largeur de sa tessiture avec une richesse renouvelée.
Grâce à cette conception, le redoublement de certaines notes à une ou plusieurs octaves trouve même sa justification échelle par échelle, et l'on peut vérifier que, dans un contexte harmonique donné, ces redoublements sonnent mieux que ceux qui seraient étrangers à l'échelle donnée.

Dans le prolongement du travail d'Olivier Messiaen et sans quitter encore le cadre du tempérament égal tel qu'il est employé depuis la fin du XVIIème siècle, j'ai donc avant tout entrepris de construire et classer tous les modes (octaviants) et les échelles harmoniques (non-octaviantes, ou plus exactement ne se reproduisant pas à l'identique d'une octave à l'autre), obtenus par l'itération d'une séquence de base (ou « séquence générative ») composée d'une suite d'intervalles de ton(s) et/ou de demi-ton(s).

Afin de circonscrire ce système harmonique dans un cadre raisonnable et pour s'assurer qu'il resterait possible de distinguer chaque mode facilement d'oreille, je me suis limité à des modes et des échelles harmoniques dont la séquence de base est « de facteur ≤2 », c'est à dire composée d'une alternance de tons et demi-tons sans qu'un même intervalle soit jamais répété consécutivement plus d'une fois, ce qui a permis de définir un ensemble harmonique à la fois cohérent et suffisamment limité.

J'ai également choisi de limiter l'ensemble des séquences génératives à celles comprises entre le demi-ton (mode 0 correspondant à la gamme chromatique) et l'octave - même si ce système comprend un ensemble d'échelles non-octaviantes, et qu'on pourrait donc aussi bien imaginer des séquences génératives plus grandes que l'octave, tout du moins celles de facteur ≤2 qui ne se recoupent pas avec les modes et les échelles déjà définis, ce qui restera à explorer ultérieurement.

De même, je n'ai pas considéré les intervalles plus grands que le ton entier dans ce premier système (si ce n'est dans la construction d'arpèges spécifiques comme on le verra plus loin), car il m'a semblé que la tierce mineure ou la seconde augmentée peut toujours être mentalement comblée ou divisée en ton + ½ ton (ou trois ½ tons).

J'ai nommé chaque mode ou échelle ainsi défini en fonction de l'intervalle dans lequel s'inscrit chaque fois sa séquence générative (0 pour la gamme chromatique, 1 pour la gamme par tons, 2 pour le Mode 2 (–u aussi bien que u-)… et jusqu'à 11 pour l'octave).

Jusqu'à l'échelle 7 incluse, on peut considérer qu'il n'existe qu'un seul mode ou échelle possible, car toutes les permutations possibles d'une séquence générative de facteur ≤2 dans un intervalle inférieur ou égal à la sixte mineure aboutissent à l'une ou l'autre transposition de l'échelle obtenue à partir de la séquence générative originale.
A partir de l'échelle 8 construite dans un intervalle compris entre la sixte majeure et le mode 11, plusieurs séquences génératives sont possibles, et nous avons distingué les différentes échelles ou modes construits à partir de séquences génératives différentes dans un même ambitus par des lettres (8a, 8b, 9a, 9b, 10a, 10b,10c, 11a, 11b, 11c).

Il apparaît qu'un système cohérent de 18 modes et échelles harmoniques ou "modéchelles" (8 modes et 10 échelles), ou plus exactement 16 modéchelles itératives auxquelles nous ajoutons la gamme chromatique et la gamme par tons, regroupe l'ensemble des possibilités harmoniques ainsi définies.

Ce système permet de repenser les relations entre la gamme chromatique, la gamme par tons, les modes 2, 3 et 5 déjà « trouvés » par Olivier Messiaen, et les échelles 4, 6, 7, 8a, 8b, 9a, 9b, 10a, 10b et 10c nouvellement définies.

On notera bien ici qu'en nous limitant à des modes « itératifs », c'est à dire procédant de la répétition à l'infini d'une même séquence générative, elle même inscrite dans un intervalle inférieur ou égal à l'octave et de facteur ≤2, ainsi qu'en excluant les intervalles plus grands que le ton entier, on a exclu de ce premier système tout un ensemble de modes anciens, aussi bien que certains « modes à transposition limitée » d'Olivier Messiaen.
Par comparaison à la technique du langage musical de Messiaen, nos Modes 1, 2 et 3 sont identiques à ceux ainsi dénommés par Messiaen, mais ce n'est pas le cas des suivants.
Notre Mode 5 (Ionien ou Grand Ionien) {1 ton + 1 ton + ½ ton + ½ ton} correspond exactement au « mode 6 » de Messiaen, et il est tout autant apparenté au « mode 5 » de Messiaen {½ ton + 3M + ½ ton + ½ ton + 3M + ½ ton} dont une permutation circulaire est résumable à {3M + ½ ton + ½ ton} qu'on peut redévelopper en {1 ton + 1 ton + ½ ton + ½ ton}.
Ceci dit, les modes de Messiaen numérotés « 4 » et « 5 » comprenant des tierces mineures ou majeures, tout comme son mode « 7 » qui est de facteur 4 {½ ton + ½ ton + ½ ton + 1 ton + ½ ton + ½ ton + ½ ton + ½ ton + 1 ton + ½ ton} et dont une permutation circulaire peut se résumer à {1 ton + ½ ton + ½ ton + ½ ton + ½ ton}, sont exclus de notre système.
Nos échelles numérotées 4, 6, 7, 8a, 8b, 9a, 9b, 10a, 10b et 10c n'avaient à notre connaissance jusqu'ici pas encore été explorées.
Ils sont à la base de la plupart de mes compositions, comme on l'entend déjà bien par exemple dans la fantaisie symphonique *Eclair physionomique* créée en 2018 au Printemps des Arts de Monte Carlo, le concerto pour flûte & orchestre *Memento vivere* créé en 2019 par Emmanuel Pahud, l'*Ouverture philharmonique* créée par Mikko Franck en 2021 à la Philharmonie de Paris ou le cycle *Cavernes & Soleils* créé en 2022 par l'Ensemble intercontemporain, Christina Daletska et Matthias Pintscher.

On peut travailler dans ce système suivant une logique plutôt sérielle ou plutôt modale à volonté, voire une combinaison de « stratégies locales » sérielles dans un ensemble harmonique d'essence plutôt modale ou « scalaire ».
On peut aussi à volonté intégrer à ce système une réflexion sur un langage tonal élargi, les différentes expressions du mode 11 (11a, 11b et 11c) étant apparentées aux modes majeur et mineurs mélodiques ascendant ou descendant, « enrichis » chaque fois d'un intervalle complémentaire.

Pour explorer les propriétés des modéchelles, leurs points communs et leurs différences, la quantité d'informations à manipuler étant assez importante (18 modéchelles dans chacune de leurs transpositions limitées), j'avais besoin d'un outil de C.A.O. (composition assistée par ordinateur), non pas pour composer, mais pour travailler sur mon matériau au stade des esquisses de la composition.
Pour cela, j'ai d'abord élaboré quelques premiers patches sous OpenMusic (un logiciel lui-même dérivé de Patchwork développé à l'Ircam à la fin des années 1980) pour développer chaque mode ou échelle et pour en analyser toutes les caractéristiques et les relations les uns avec les autres. Mais ce travail restait un work in progress et je n'étais pas assez aguerri en programmation pour développer seul des outils suffisamment maniables, au point de travailler encore à la main pour réaliser des calculs complexes.

Les outils dont j'avais besoin pouvant être utiles à d'autres compositeurs, quel que soit le système harmonique qu'ils choisissent d'utiliser ou d'inventer, j'ai donc proposé à l'Ircam de développer un nouveau logiciel de C.A.O., ce que nous avons pu réaliser en 2025 avec Serge Lemouton grâce à l'accord de Frank Madlener pour réaliser ce projet à l'Ircam.
Une bourse du CNM m'a permis de consacrer le temps nécessaire à la réflexion pour préciser le cahier des charges du logiciel programmé par Serge Lemouton, mais surtout pour commencer à l'exploiter en dressant le catalogue qui suit cette présentation et en tirer un certain nombre d'enseignements qui pouront servir de guide dans la composition de nouvelles partitions.

2°/ Classification des modes & échelles harmoniques de facteur ≤2

Précisons ici que :

- Les modes ou échelles sont ordonnés suivant l'ambitus croissant de leur séquence générative, du ½ ton à l'octave, soient 12 intervalles numérotés de 0 à 11.

- C'est dire que l'ambitus de la séquence générative de chaque mode ou échelle constitue l'intervalle caractéristique de base de chacun, et on a donc nommé chaque mode ou échelle à partir du numéro de l'intervalle correspondant.

- Il existe parfois plusieurs « expressions » d'un même mode ou échelle, correspondant à toutes les combinaisons possibles de tons et demi-tons dans un même intervalle de base : on a donc désigné chacune de ces expressions par une lettre de l'alphabet (par exemple 8a et 8b).

- En revanche, on n'a pas distingué les modes ou échelles obtenus par permutation circulaire des intervalles d'une même séquence générative, puisque ces permutations circulaires engendreraient au total les mêmes suites harmoniques que toutes les différentes transpositions du mode ou de l'échelle construite à partir de la séquence générative originale (du fait du caractère itératif des modes ou échelles construits ici chaque fois à partir d'une seule et même séquence générative).

- J'ai ajouté une dénomination faisant référence à leur séquence générative en suivant les règles de la métrique latine.

- Le nombre qui désigne le mode ou l'échelle correspond également au nombre de transpositions limitées du mode (il n'y a pas de transposition possible de la gamme chromatique, une seule transposition de la gamme par tons, 2 transpositions du mode 2 etc. jusqu'à 11 transpositions du mode 11a aussi bien que du mode 11b ou du mode 11c)

o	Mode 0 = chromatisme (ou mode Pyrrhique **u**)	2m	(octaviant)	12 sons
o	Mode 1 = Gamme par tons (Spondée -)	2M	(octaviant)	6 sons
o	Mode 2 = Messiaen 2 (Iambe **u-** = Trochée **-u**)	3m	(octaviant)	8 sons
o	Mode 3 = Messiaen 3 Dactyle **-uu** = Amphibraque u-u = Anapeste uu-	3M	(octaviant)	9 sons
o	Echelle 4 = Crétique **-u-** = Bacchius u-- = Palimbacchius --u	4J	(échelle) (sur 5 octaves)	7/12 sons
o	Mode 5 = Ionien **uu--** = GrandIonien --uu = Antipaste u--u = Choriambe -uu-	4+	(octaviant, = Messiaen 6)	8 sons
o	Echelle 6 = Trochée+Dactyle **-u-uu** = -uu-u = u-uu- = uu-u-	5J	(échelle) (sur 7 octaves)	8/12 sons
o	Echelle 7 = Crétique-Trochée **-u--u** = Iambe+Crétique (u--u-) etc	6m	(échelle) (sur 2 octaves)	8/12 sons
o	Echelle 8a = **-uu--u** Choriambe+Trochée = uu--u- Ionien+Iambe etc	6M	(échelle) (sur 3 octaves)	8/12 sons
o	Echelle 8b = **-u--uu** Crétique+Dactyle = u--uu- Bacchius+Anapeste etc	6M	(échelle) (sur 3 octaves)	8/12 sons
o	Echelle 9a = **-uu--uu** Dactyle+GrandIonien = uu--uu- etc	7m	(échelle) (sur 5 octaves)	8/12 sons
o	Echelle 9b = **-u-u-uu** Trochéex2+Dactyle = u-u-uu- etc	7m	(échelle) (sur 5 octaves)	8/12 sons
o	Echelle 10a = **--uu--u** GrandIonien+Palimbacchius = -uu--u- = --u--uu etc	7M	(échelle absolue/ambitus)	8/12 sons
o	Echelle 10b = **-uu-uu-u** Dactylex2+Trochée= uu-uu-u- etc	7M	(échelle absolue/ambitus)	9/12 sons
o	Echelle 10c = **-u--u-u** Crétique+Trochéex2 = u--u-u- etc	7M	(échelle absolue/ambitus)	8/12 sons
o	Mode 11a = **--u-uu-u** Palimbacchius+Dactyle+Trochée = -u--u-uu etc	8	(octaviant)	8 sons
o	Mode 11b = **-u--uu-u** Crétique+Dactyle+Trochée = u--uu-u- etc	8	(octaviant)	8 sons
o	Mode 11c = **-u-uu--u** Crétique+Anapeste+Trochée = u-uu--u- etc	8	(octaviant)	8 sons

- On notera bien entendu que les différentes expressions du Mode 11, dont la séquence générative est comprise dans l'intervalle d'une octave, sont apparentées au système tonal :
    - Mode 11a = -u--uu-u (mineur mélodique descendant + 6m/M)
    - Mode 11b = -u-uu--u (mineur mélodique descendant + 4+)
    - Mode 11c = --u-uu-u = u (Majeur + 6m/M) = -u--u-uu (mineur mélodique ascendant + 7m/M) = u-uu-u-- (mode andalou)

- Etant donné le caractère itératif de nos échelles ou modes, nous voudrions souligner ici que les différentes permutations de chacun des modes ne forment pas de nouveaux modes proprement dit, mais appartiennent nécessairement toutes à l'une des différentes transpositions du même mode. Ce qui donne un système de 8 modes & 10 échelles harmoniques de facteur ≤2.

La classification des modes de facteur ≤2 est donc relativement simple et limitée.

- On peut réordonner cette liste de Modes et d'Echelles suivant le caractère octaviant ou non octaviant de chacun, et mieux encore en fonction du nombre d'octaves dans lesquels ils s'inscrivent, une échelle pouvant se trouver octaviante toutes les 2, 3, 5, 7 octaves... en fonction de l'intervalle dans lequel s'inscrit sa séquence générative (plus ou moins sous-multiple de 2, 3, 5 ou 7 octaves :
    - Mode 0 2m (octaviant)
    - Mode 1 2M (octaviant)
    - Mode 2 3m (octaviant)
    - Mode 3 3M (octaviant)
    - Mode 5 4+ (octaviant)
    - Mode 11a 8 (octaviant)
    - Mode 11b 8 (octaviant)
    - Mode 11c 8 (octaviant)
    - Echelle 7 6m (échelle) (sur 2 octaves)
    - Echelle 8a 6M (échelle) (sur 3 octaves)
    - Echelle 8b 6M (échelle) (sur 3 octaves)
    - Echelle 4 4J (échelle) (sur 5 octaves)
    - Echelle 9a 7m (échelle) (sur 5 octaves)
    - Echelle 9b 7m (échelle) (sur 5 octaves)
    - Echelle 6 5J (échelle) (sur 7 octaves)
    - Echelle 10a 7M (échelle absolue / ambitus du piano)
    - Echelle 10b 7M (échelle absolue / ambitus du piano)
    - Echelle 10c 7M (échelle absolue / ambitus du piano)

- Ce premier système harmonique n'est bien sûr qu'un point de départ ouvrant sur d'autres possibilités, qu'on y intègre plus tard des échelles construites sur des séquences génératives de facteur ≥3 (y compris la gamme majeure classique !), dans des intervalles plus grands que l'octave (9èmes, 10èmes, 11èmes....), ou en micro-intervalles.
- On pourrait bien sûr aussi plus tard étendre cette première étude à des échelles plus complexes comme par exemple la suite {–u-u--/uu-uu--/uu--uu-/-uu-u-u} composée de différentes expressions de la 9ème échelle harmonique, etc.

3°/ Parenté / Résolution :

On peut reclasser les modéchelles en observant la structure de leurs séquences génératives respectives, suivant leur plus ou moins grand lien de parenté.
On peut notamment rapprocher les modes ou échelles dont la séquence générative est construite dans un intervalle multiple ou sous-multiple de celui d'un autre mode ou échelle.
On notera aussi que les échelles 4 « crétique » et 9a qu'on appellera « grand-crétique » sont particulièrement proches, l'échelle 9a pouvant être lue comme { (- -) + (u u) + (- u u) } que l'on peut résumer en {2 tons + 1 ton + 2 tons} à l'instar du mode 4 « crétique » composé de {1 ton + ½ ton + 1 ton}.

Grâce au logiciel développé à l'Ircam, nous avons pu explorer plus avant l'analyse comparative de toutes les transpositions de tous les modes, à partir du nombre de leurs notes communes deux à deux, dans la tessiture du piano et de l'orchestre ou pour un ambitus donné (choisi en fonction de l'instrumentation de chaque projet ou passage sur lequel travailler).
Nous en avons déduit le tableau numérique des intersections entre toutes les modéchelles dans chacune de leurs transpositions (pièce jointe, lisible au format A3).

On peut aussi concevoir une classification en fonction du degré de complexité de la séquence générative de base de chaque mode ou échelle si l'on développe un système de modes et d'échelles de facteur >2 :

- de facteur 1 (modes 0, 1 et 2) ou de facteur 2 (modes 3, 5 et 11 et échelles 4, 6, 7, 8, 9, et 10), puis de facteur 3 etc.
- et du nombre de sous-groupes composant la séquence de base.

4°/ Construction d'arpèges :

Il nous a paru intéressant de créer des outils pour générer et étudier différentes sortes d'arpèges harmoniques à partir des modéchelles :

- arpèges simples, c'est à dire réguliers (toutes les 2 ou 3 notes etc.),
- arpèges dérivés, composés sur le modèle de la séquence de base (ex : mode 4 -u- toutes les 2 notes - 1 note - 2 notes, puis toutes les 3 notes – 1 note – 3 notes / 3 notes – 2 notes – 3 notes / 4 notes – 2 notes – 4 notes etc.),
- arpèges dérivés puissance 2 (ex mode 4 -u- = toutes les 4 notes – 2 notes – 4 notes / 2 notes - 1 note - 2 notes / 4 notes – 2 notes – 4 notes),
- arpèges caractéristiques définis à partir de l'analyse des notes communes à 2 transpositions d'une même échelle,
- arpèges caractéristiques définis a contrario à partir de l'analyse des notes exclues, c'est à dire n'appartenant pas aux 2 transpositions d'une même échelle,
- nous pouvons bien sûr filtrer ou non les résultats pour éviter les répétitions de note modulo 12, du grave à l'aigu ou bien de l'aigu au grave, à partir d'une note donnée,
- et nous pouvons analyser l'appartenance des résultats aux différentes transpositions de tous les modes & échelles harmoniques.

5°/ Autres outils :

- Par ailleurs, nous avons créé un outil d'analyse permettant de comparer un fragment mélodique ou harmonique donné à toutes les transpositions des différents modes ou échelles harmoniques, afin d'analyser son appartenance à l'une ou l'autre. On a même la possibilité d'analyser si le fragment appartient à l'un quelconque de tous les arpèges réguliers ou dérivés des modéchelles.

- Nous avons aussi créé un outil de recherche pour vérifier l'appartenance d'une suite d'intervalles donnée à telle ou telle modéchelle (ex : à quelle modéchelle appartient la suite 3m3M4+5J6m6M ?), étudiée non plus comme une suite de notes précises, mais dans l'absolu. On peut ainsi étudier toutes sortes d'arpèges à partir de suites d'intervalles donnés, dont le logiciel nous permet de vérifier l'appartenance à telle ou telle modéchelle. Ces arpèges peuvent être structurés suivant une logique chaque fois redéfinie, par exemple exponentiellement croissants ou décroissants, ou bien alternant deux logiques opposées, etc.

- On peut également réordonner les résultats obtenus pour en proposer une description aléatoire, ou bien selon un mouvement centripète ou centrifuge, en mouvements conjoints ou deux en deux notes, dans une direction ou dans l'autre.

- Nous avons ajouté un outil d'analyse spectrale permettant de vérifier le caractère plus ou moins spectral d'un arpège dérivé.

- Et nous avons ajouté un outil permettant de vérifier à quelle classe d'accord (selon l'analyse d'Allen Forte) appartient un arpège dérivé.

- Enfin, un outil « maquette » permet de rapprocher différents résultats sous forme de partition polyphonique,

- un travail parallèle a pu être réalisé pour la construction de cellule rythmiques caractéristiques de chaque modéchelle, ce qui permet de présenter les modéchelles rythmées selon leur schéma intervallique, et pourquoi pas développer des polyrythmies polymodales en superposant les résultats ainsi obtenus.

Grâce au logiciel "Modes/Echelles", nous sommes à même d'explorer plus avant les caractéristiques de chaque modéchelle et de leurs relations.
Les résultats en sont présentés sous forme de tableaux et de listes, comme :
- le tableau donnant le nombre de notes communes à deux modéchelles dans chacunes de leurs transpositions limitées (intersections), à partir duquel on peut définir des règles de modulation (avec les tonalités les plus proches ou au contraire les plus éloignées, ou selon un parcours plus ou moins progressif),
- le catalogue des arpèges réguliers et des arpèges dérivés de chacune des modéchelles,
- le tableau d'analyse des accords ou arpèges itératifs permettant de vérifier, selon le nombre d'itérations, à quelle(s) modéchelle(s) ils appartiennent, et d'en déduire des accords ou arpèges caractéristiques propres à certaines modéchelles.

Naturellement, ces tableaux ne sont là que comme un support à l'imagination et seule la pratique quotidienne de ces explorations harmoniques permet d'en maîtriser les couleurs, les relations possibles et les conséquences formelles ou expressives.

*

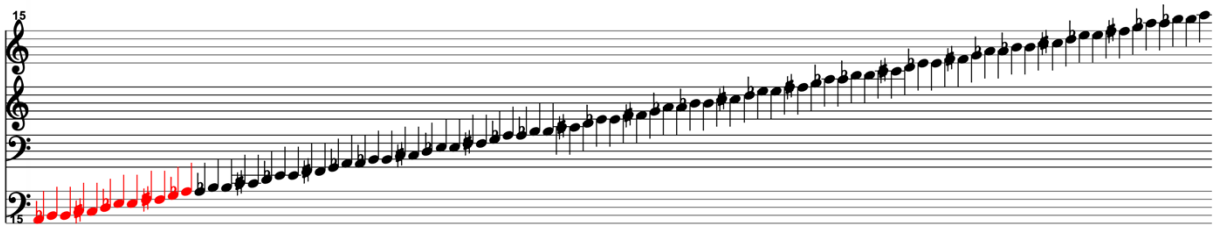
En conclusion, je voudrais préciser un point important.
La recherche de cohérence propre à son langage me paraît toujours essentielle. Mais elle ne doit bien sûr pas enfermer l'écriture dans un système déterministe d'où serait chassée toute musicalité.
À l'ère des multiples synthèses de styles auxquelles je n'ai jamais pu adhérer, que j'entends plutôt comme un collage sans raison d'être, mais alors que je ne voulais pas renoncer à la fois à l'héritage sériel si fortement capable d'expressivité, et à une pensée harmonique issue de toute l'histoire de la musique modale, voire sans omettre jusqu'à certains éléments de musique spectrale, il m'a semblé que le système des modéchelles apporte une clef essentielle à une pensée harmonique refondée pour accueillir tous ces héritages dans le creuset d'un système nouveau, à la fois plus large mais aussi plus cohérent.
Et si j'invite naturellement chacun à l'apprécier dans ma musique, je n'exclue pas que ce système puisse servir à d'autres, en invitant d'autres compositeurs à se l'approprier et à le remodeler chacun à sa propre façon.

Eric Montalbetti

CATALOGUE DE TOUTES LES TRANSPOSITIONS LIMITÉES
DES 18 MODÉCHELLES DE FACTEUR 1 ou 2
donné dans l'ambitus du piano (La0 à Do8 en notation américaine)

<u>Modéchelle 0 = chromatisme</u> (u) (12 sons, octaviant)

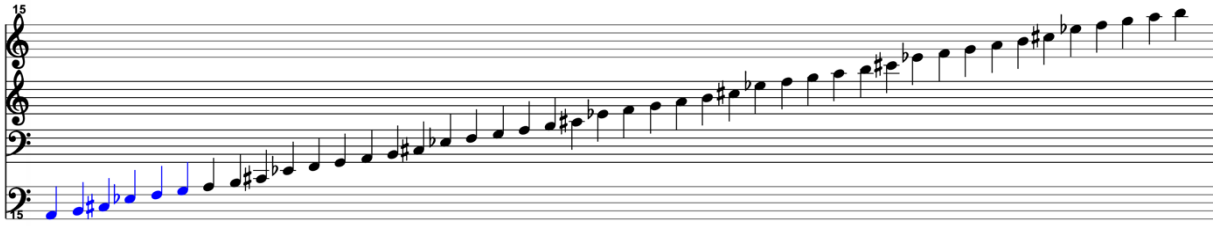
zéro transposition (1 seule expression de 12 sons)



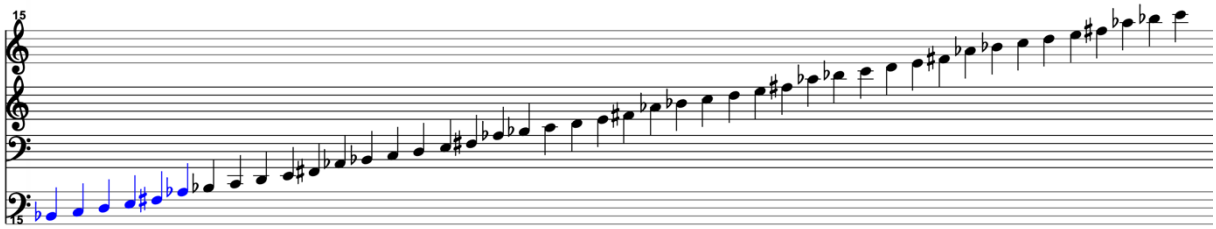
<u>Modéchelle 1 = gamme par tons</u> (-) (6 sons, octaviant)

1 seule transposition (= 2 expressions de 6 sons chacune)

1.0



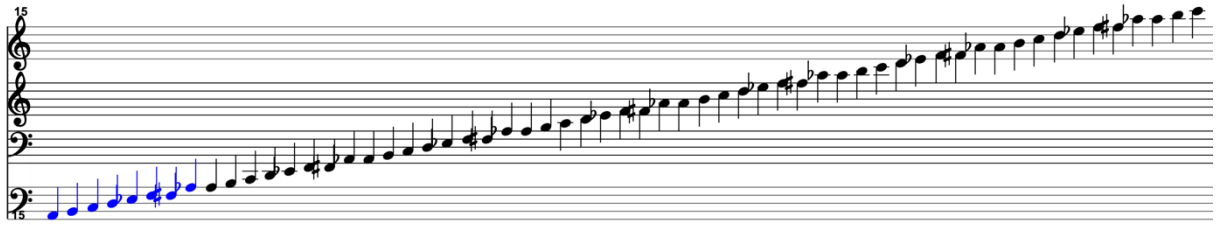
1.1



<u>Modéchelle 2</u> (-u) (8 sons, octaviant)

2 transpositions = 3 expressions

2.0



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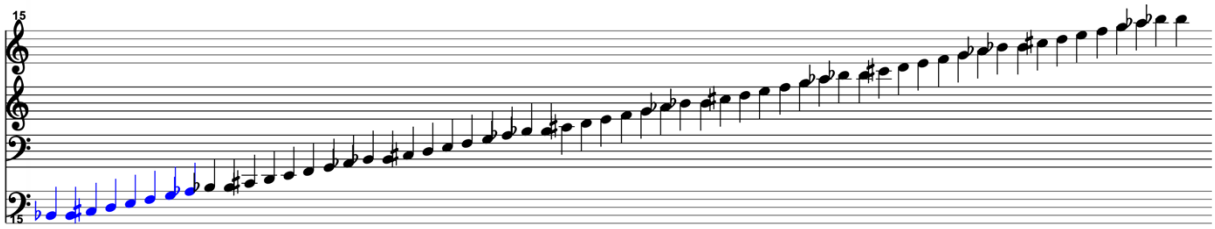

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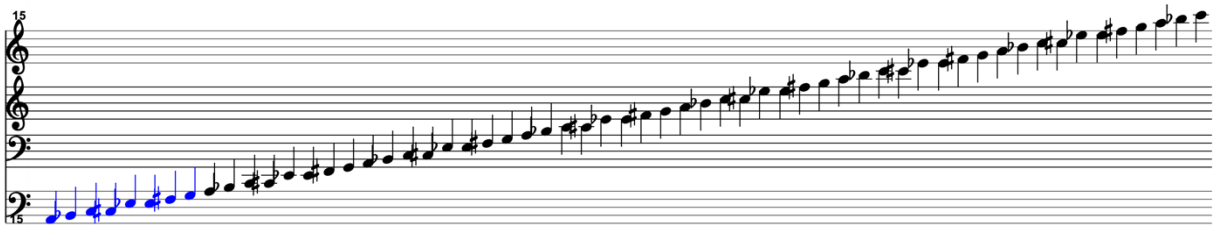
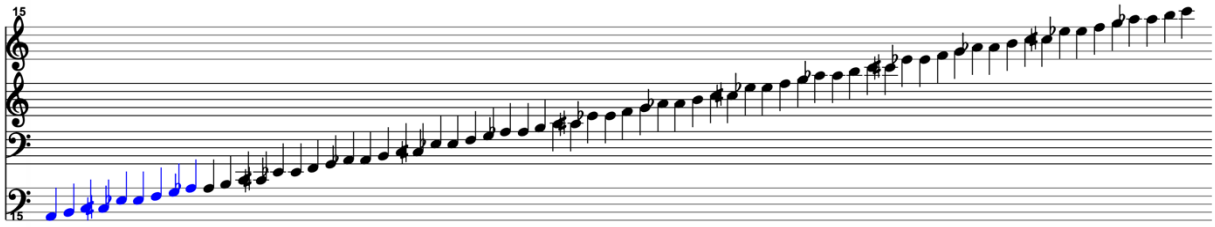


<u>Modéchelle 3</u> (-uu) (9 sons, octaviant)

3 transpositions = 4 expressions

3.0



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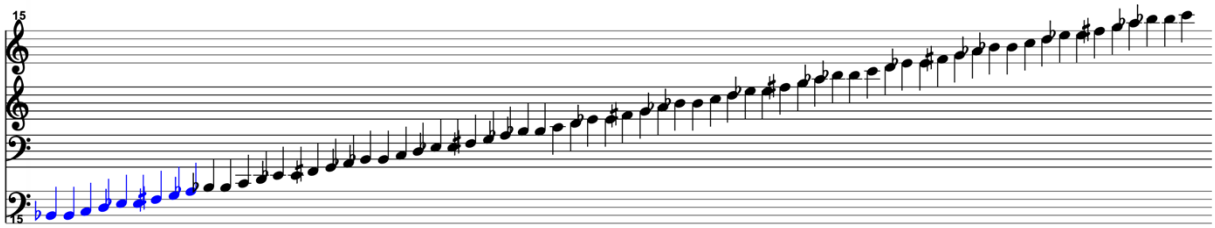

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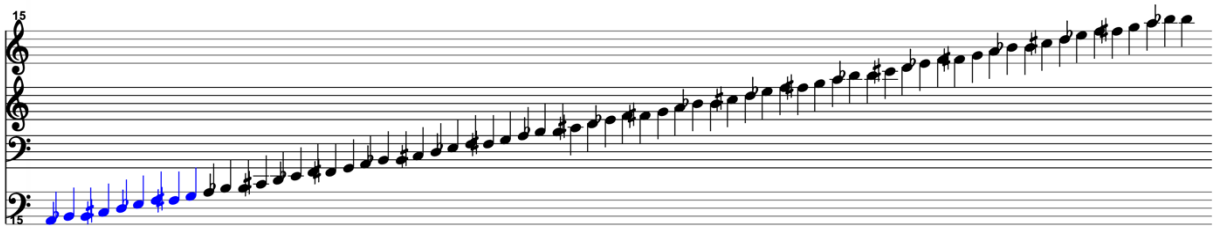
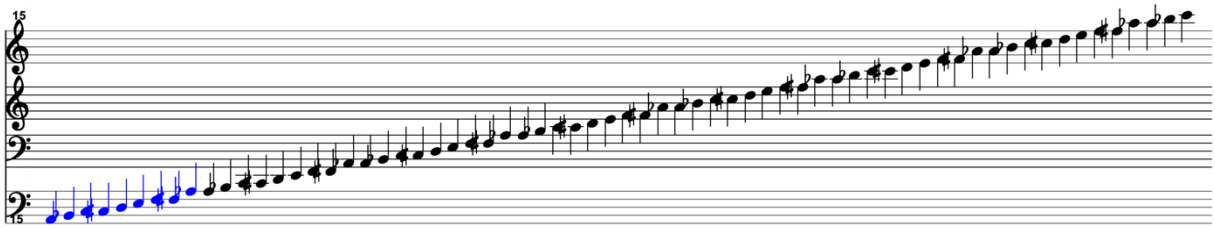


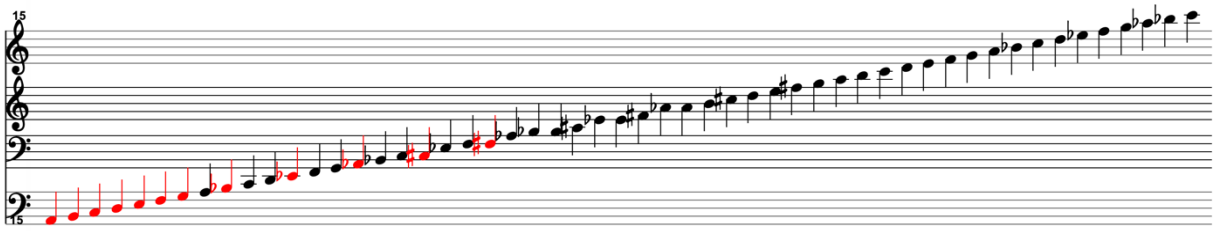
3.3



Modéchelle 4 (-u-) (7 à 12 sons, non-octaviant sur 5 octaves)

4 transpositions = 5 expressions

4.0



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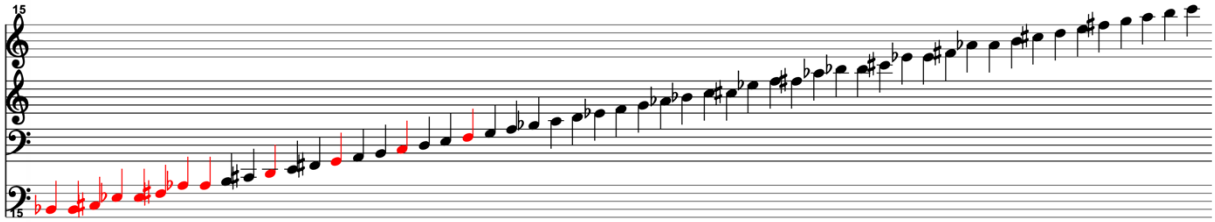

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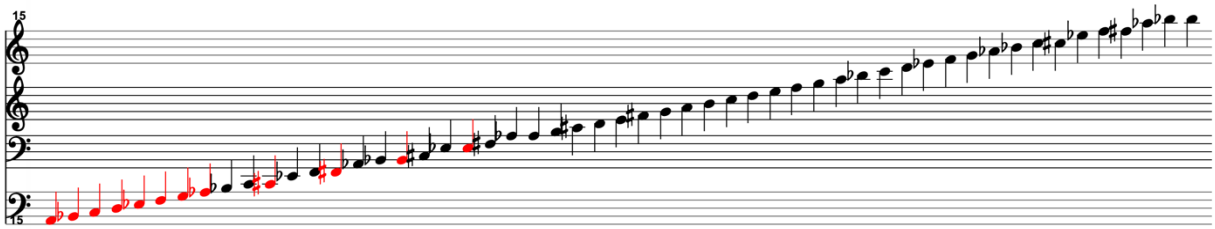

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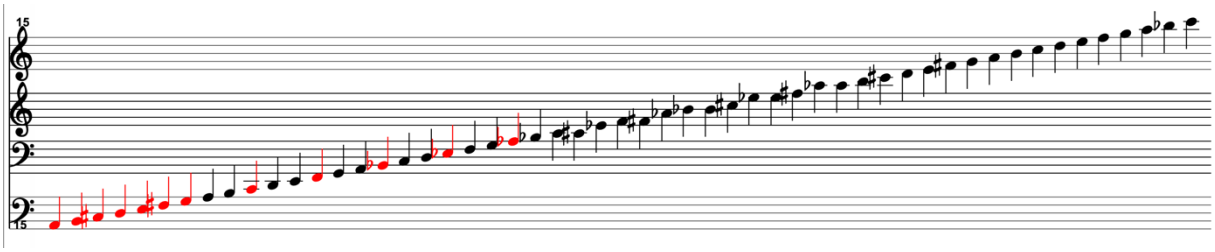

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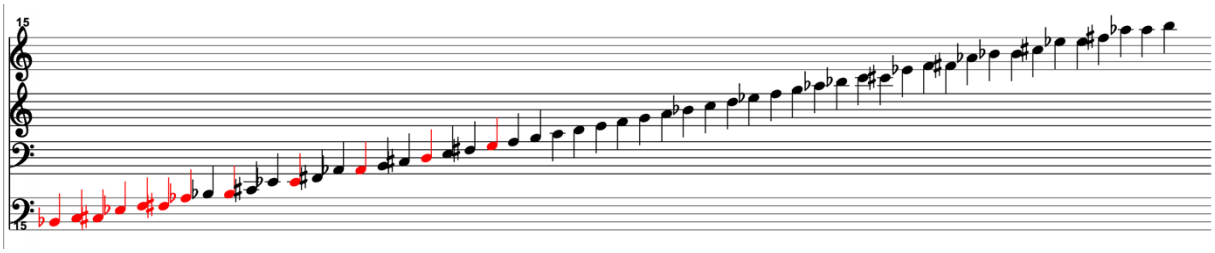
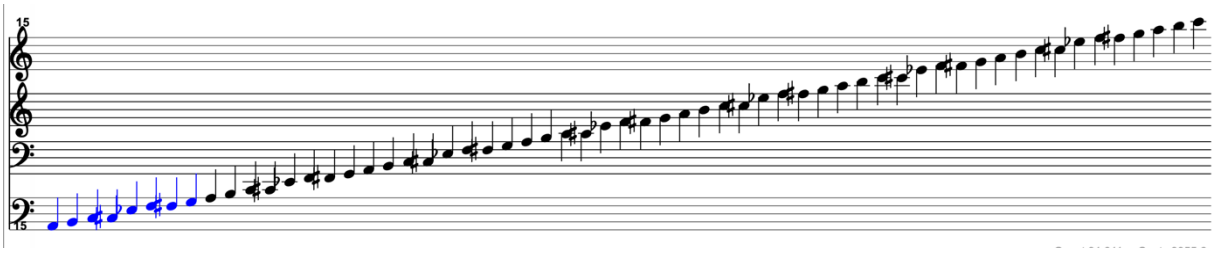


Modéchelle 5 (-uu-) (8 sons, ctaviant)

5 transpositions = 6 expressions

5.0



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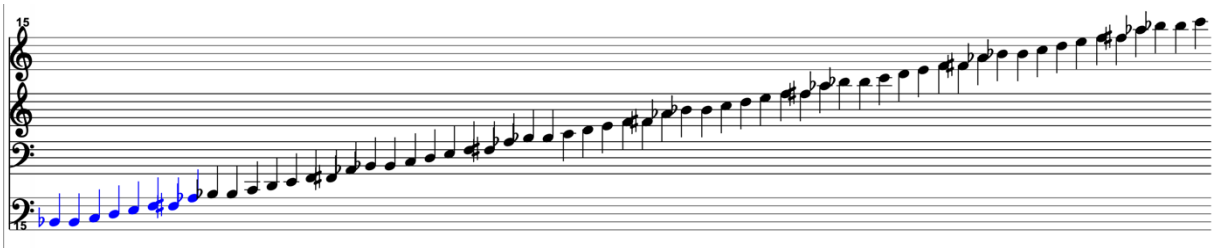

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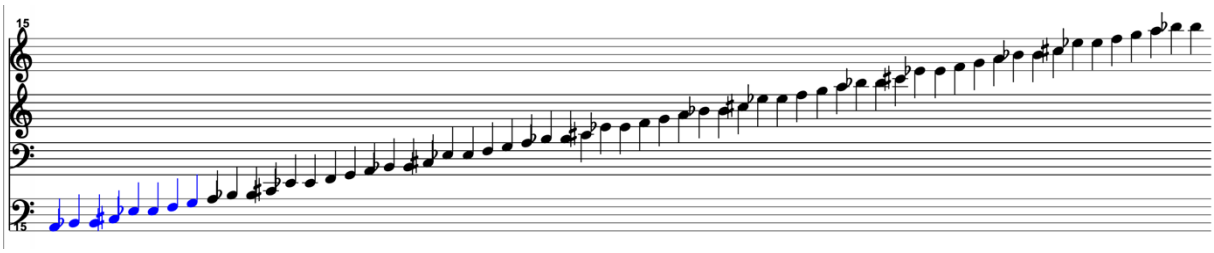

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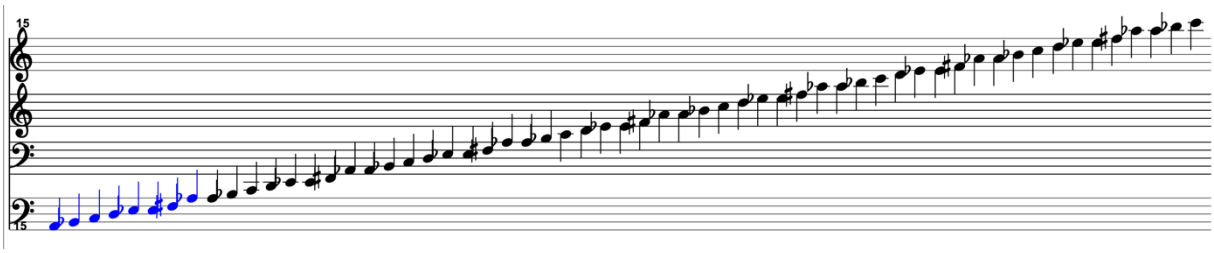

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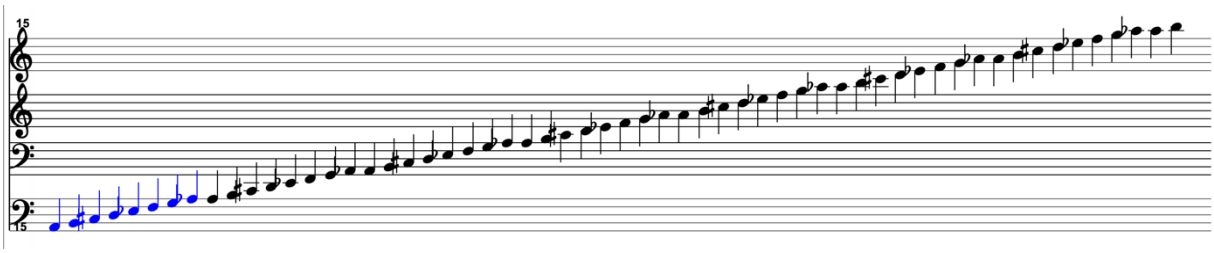

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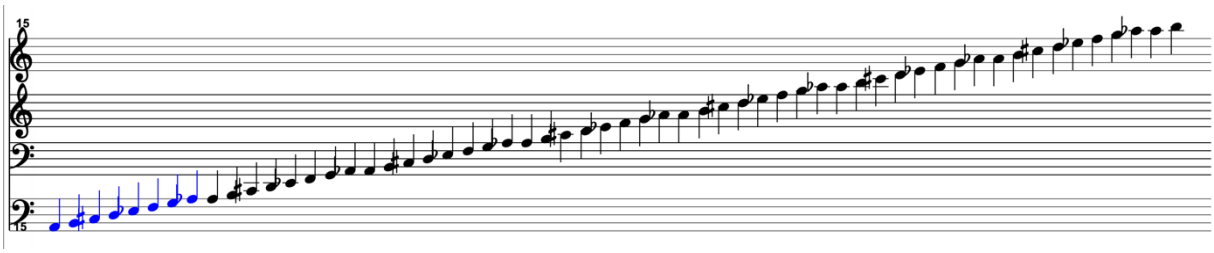
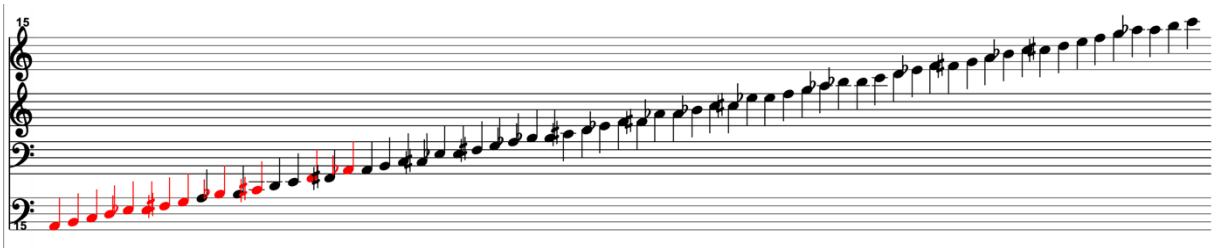


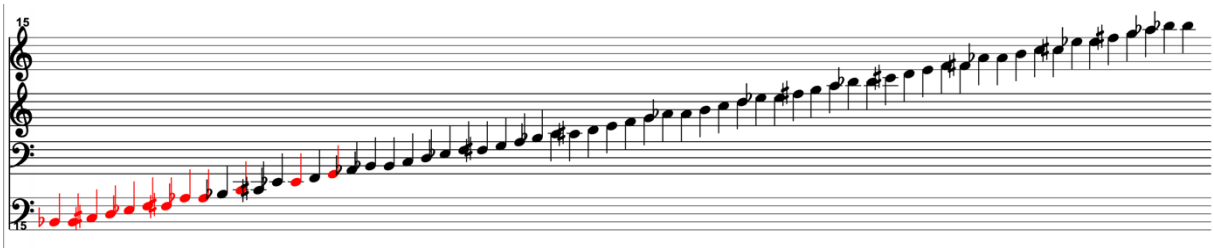
Modéchelle 6 (-u-uu) (8 à 12 sons, non-octaviant sur 7 octaves)

6 transpositions = 7 expressions

6.0



6.1



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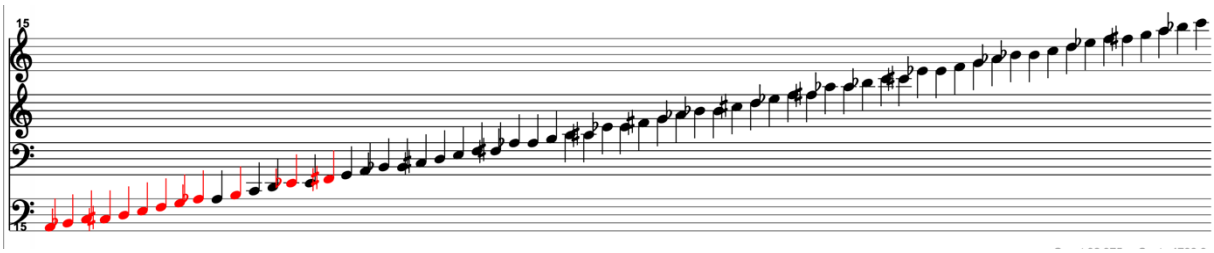

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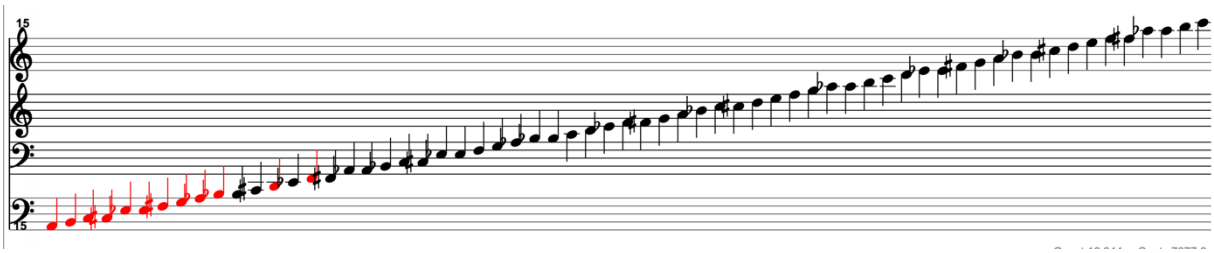

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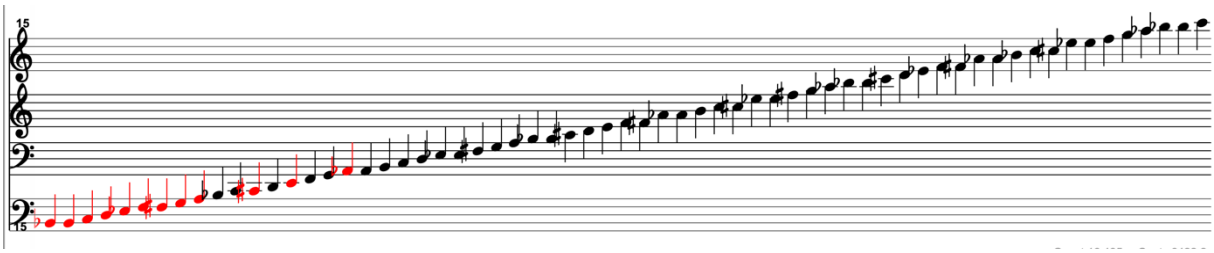

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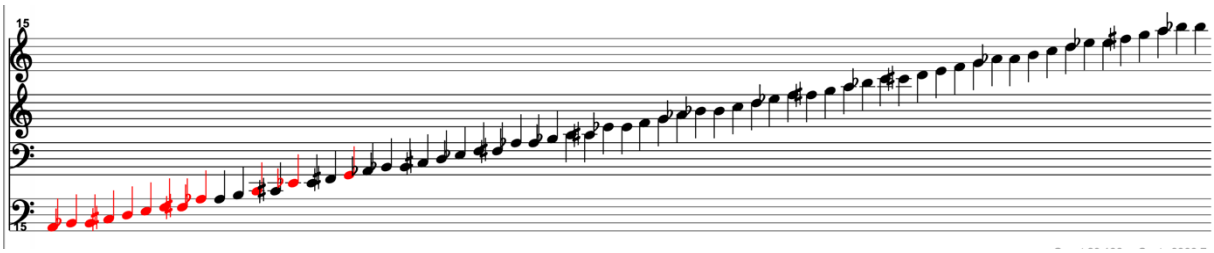
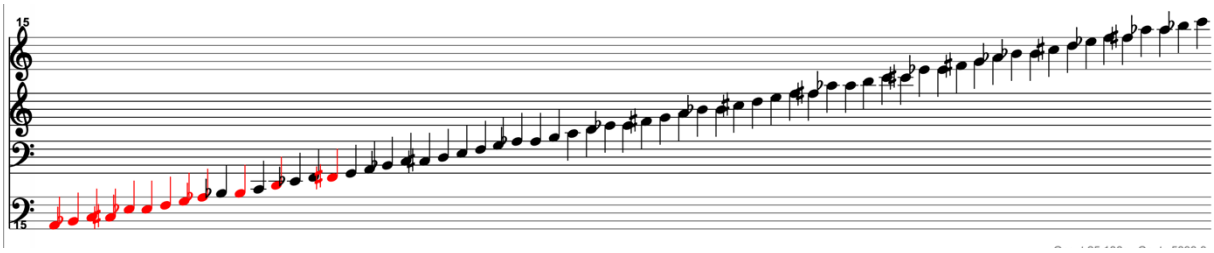


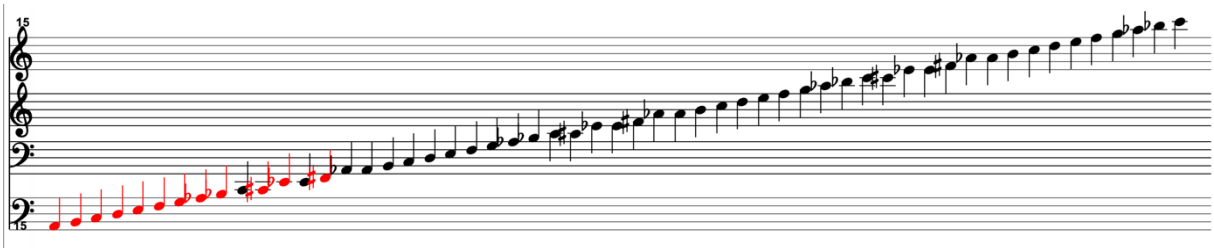
6.6



Modéchelle 7 (-u--u) (8 à 12 sons, non-octaviant sur 2 octaves)

7 transpositions = 8 expressions

7.0



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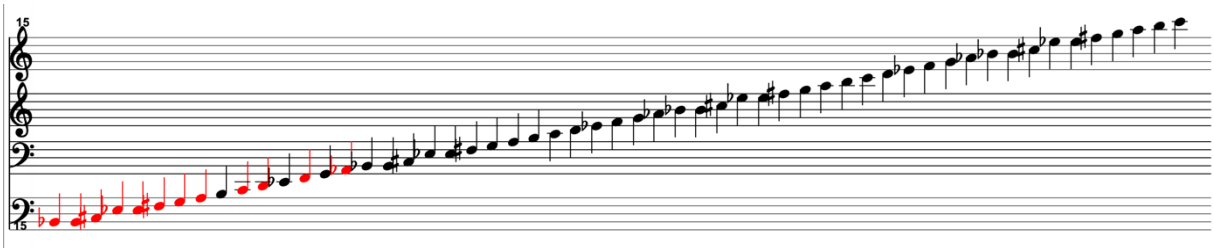

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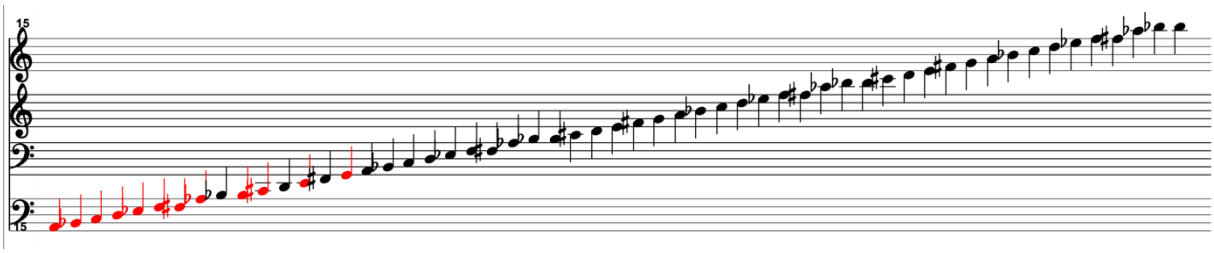

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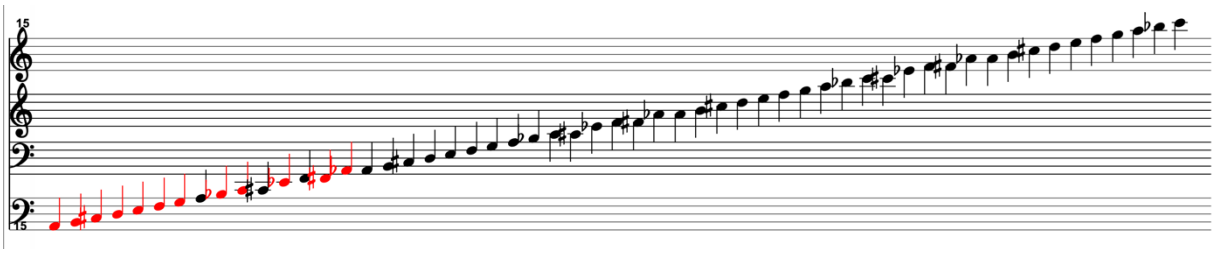

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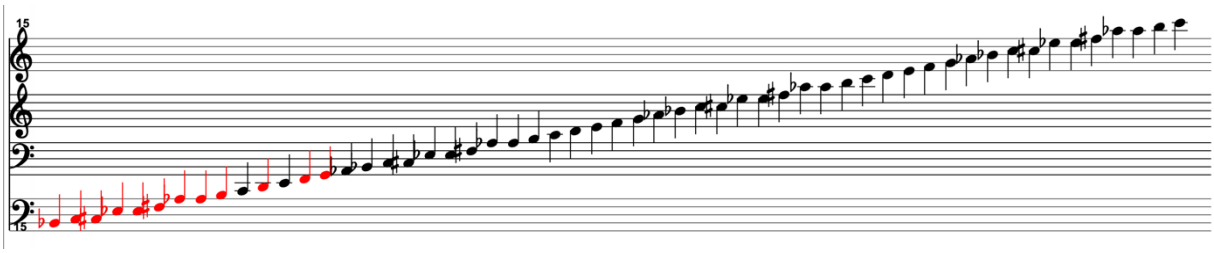

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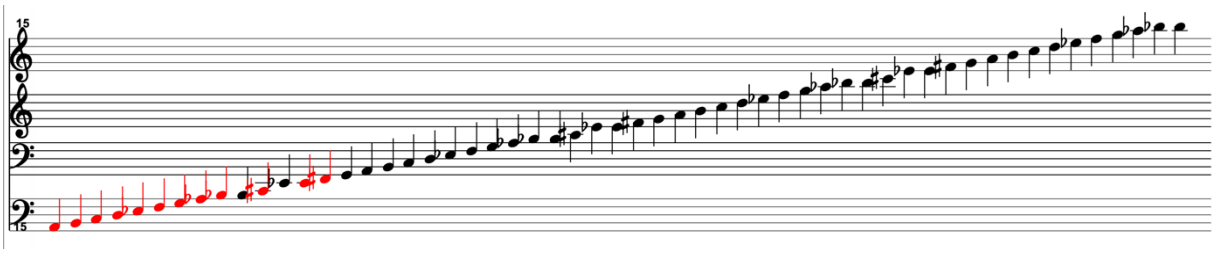

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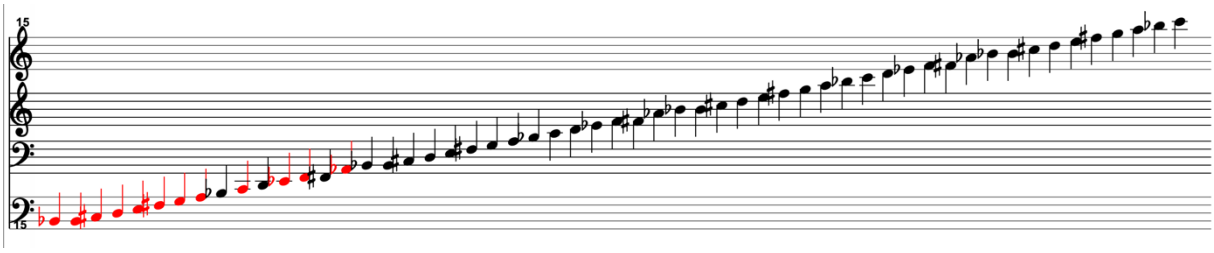

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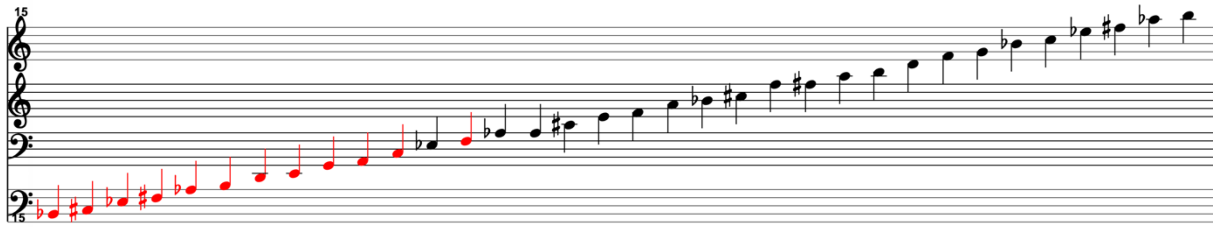
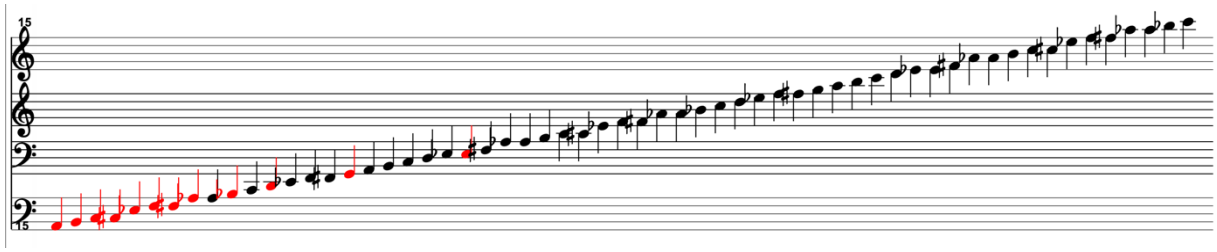


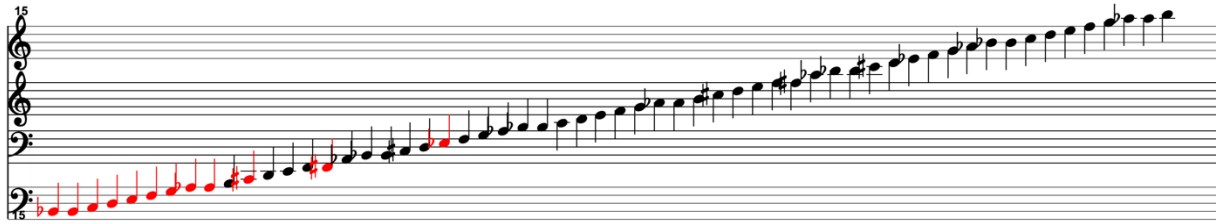
Modéchelle 8a (-uu--u) (8 à 12 sons, non-octaviant sur 3 octaves)

8 transpositions = 9 expressions

8a.0



8a.1



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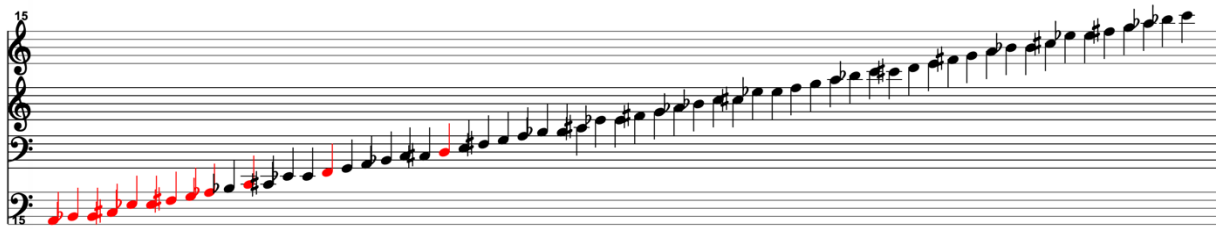

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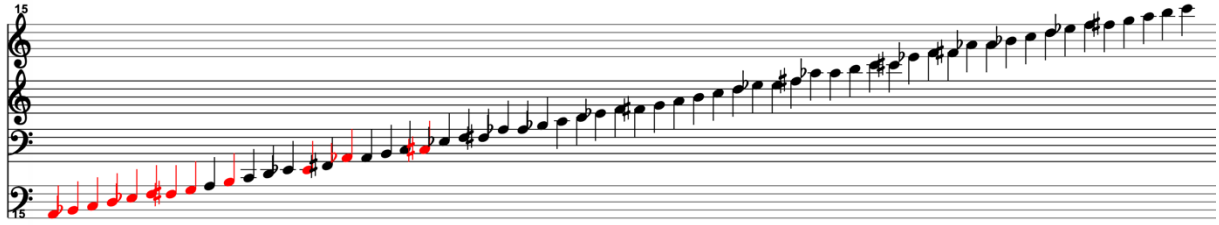

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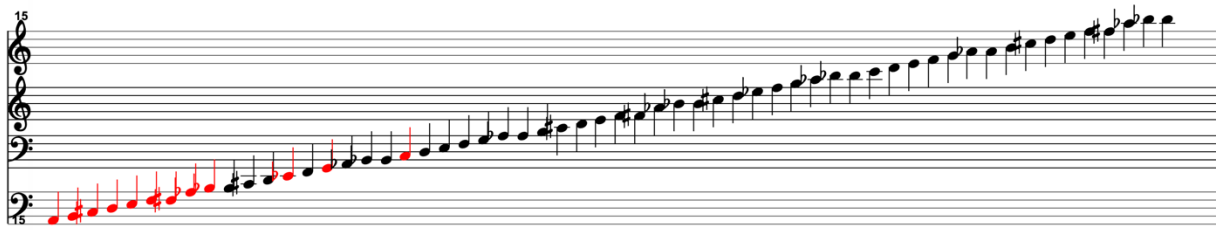

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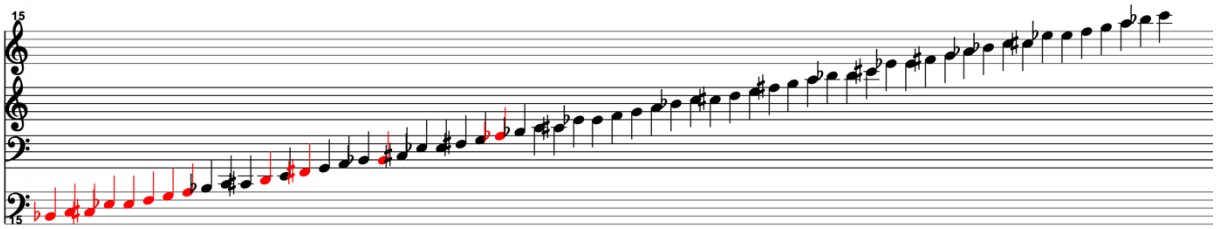

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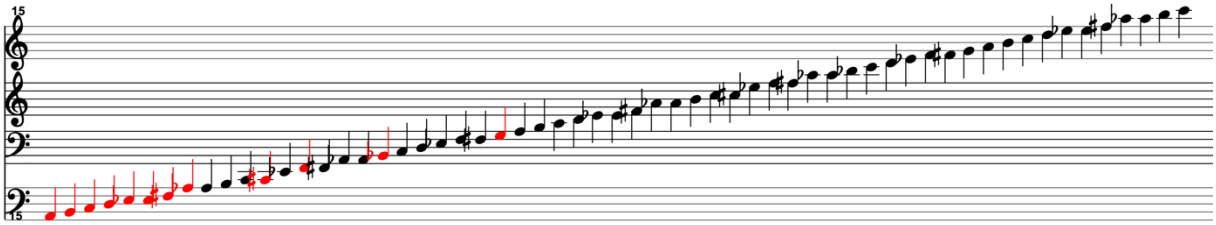

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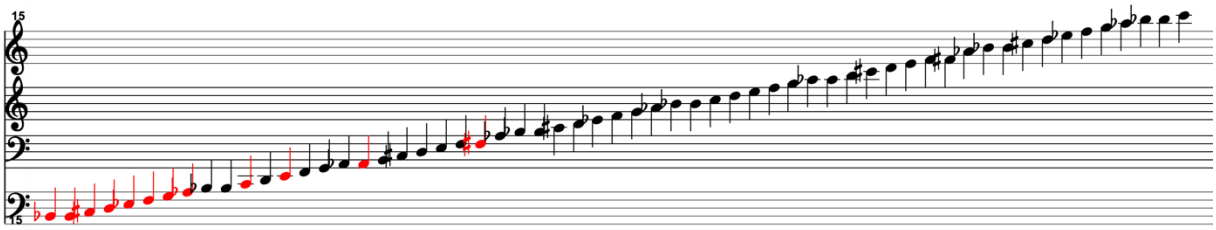
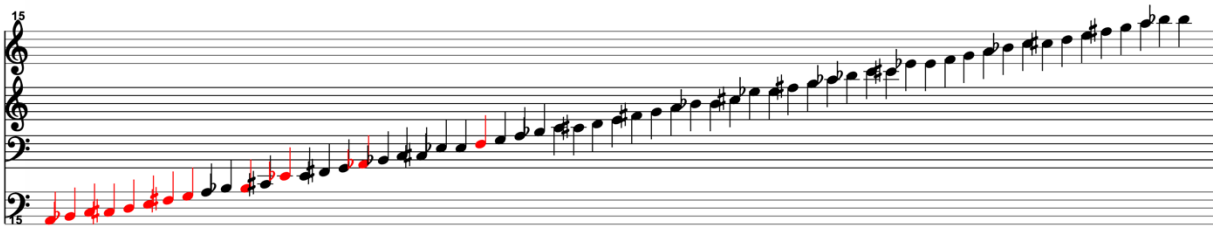


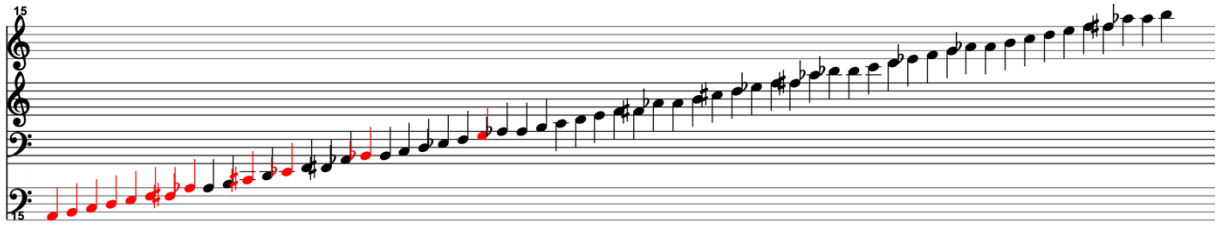
8a.8



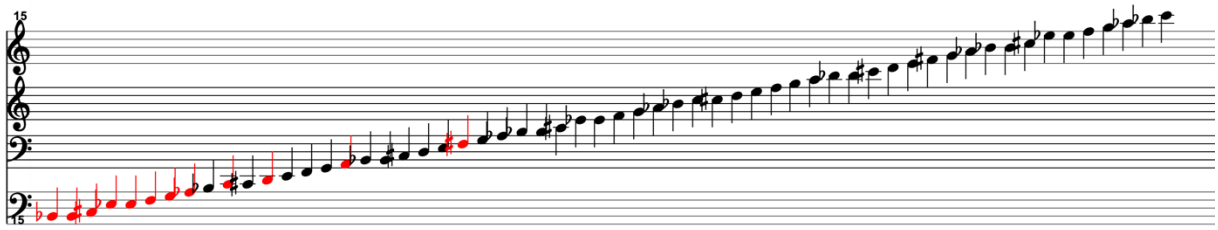
Modéchelle 8b (-u--uu) (8 à 12 sons, non-octaviant sur 3 octaves)

8 transpositions = 9 expressions

8b.0



8b.1



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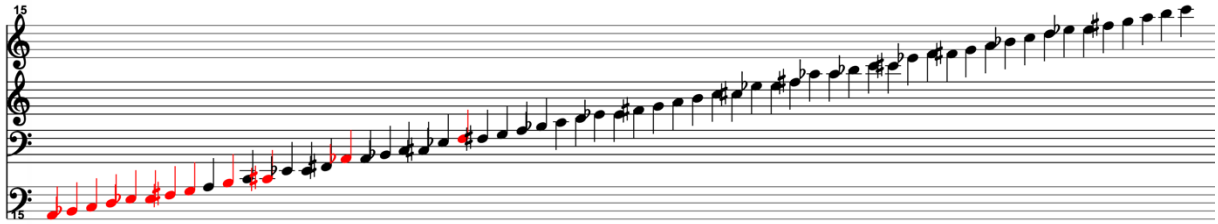
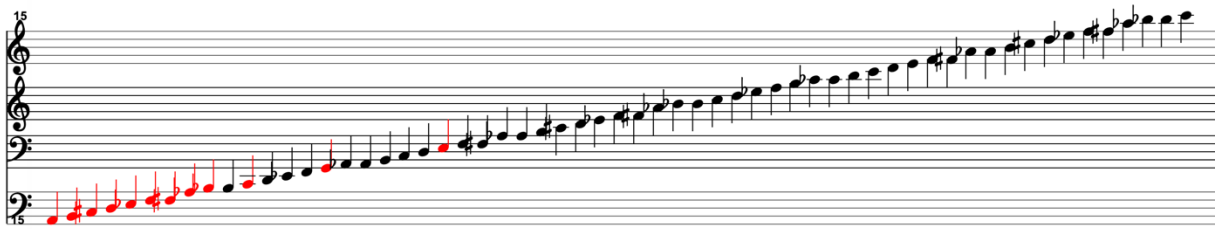
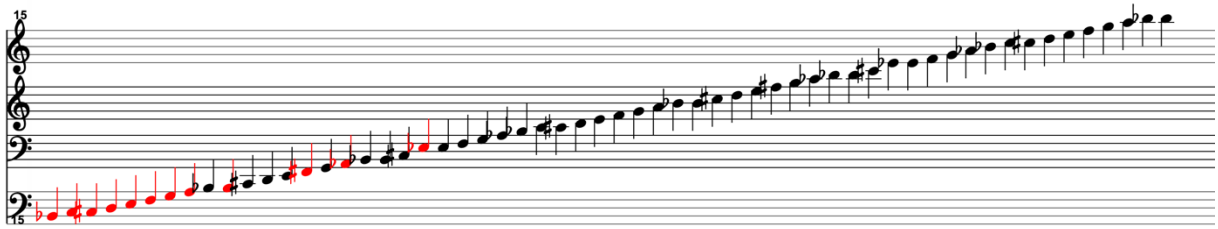


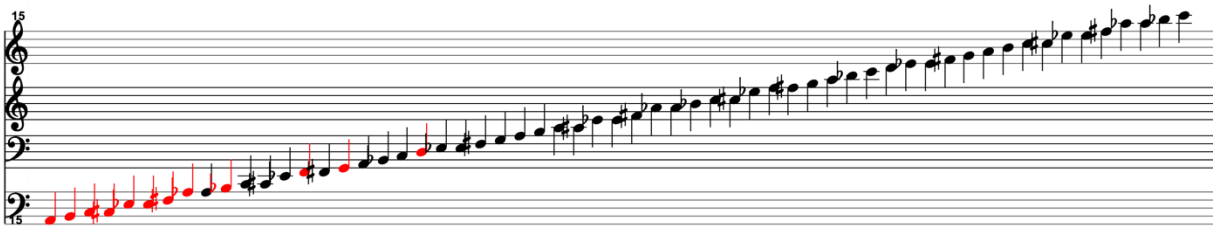
8b.3



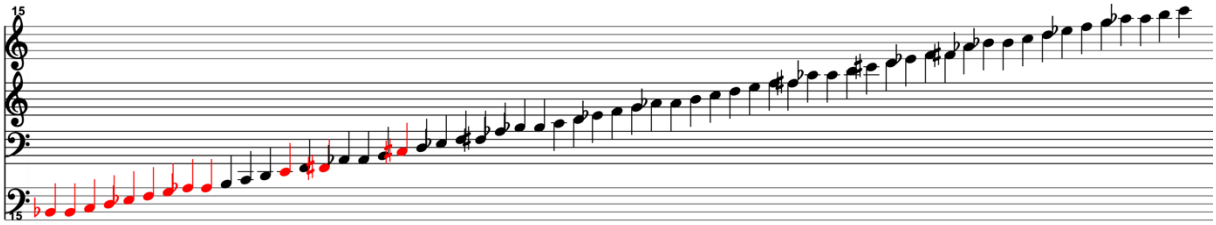
8b.4



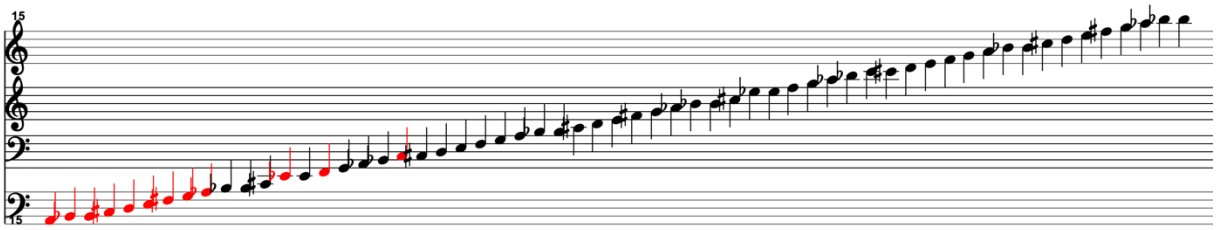
8b.5



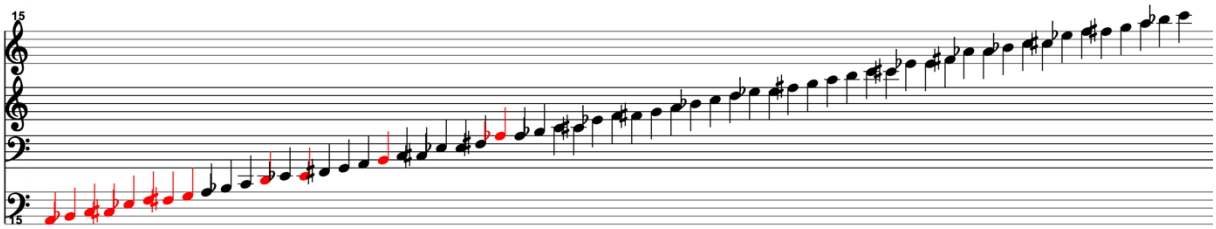
8b.6



8b.7



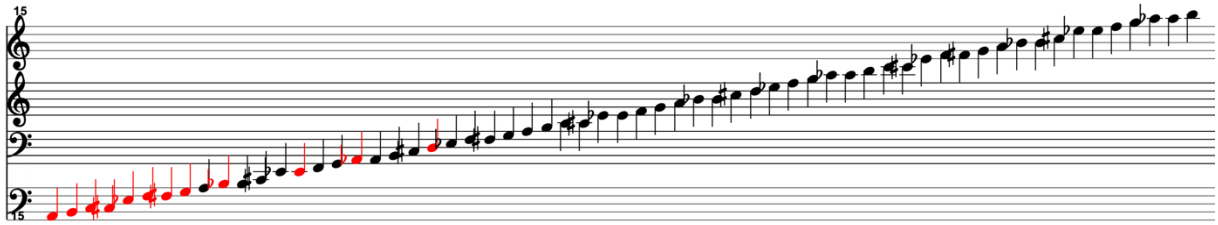
8b.8



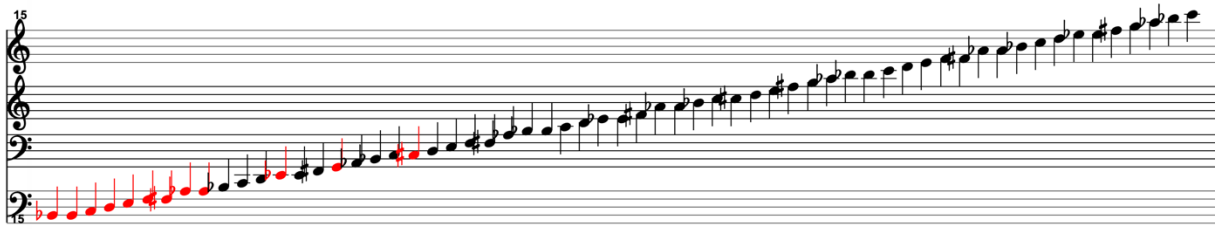
Modéchelle 9a (-uu--uu) (8 à 12 sons, non-octaviant sur 5 octaves)

9 transpositions = 10 expressions

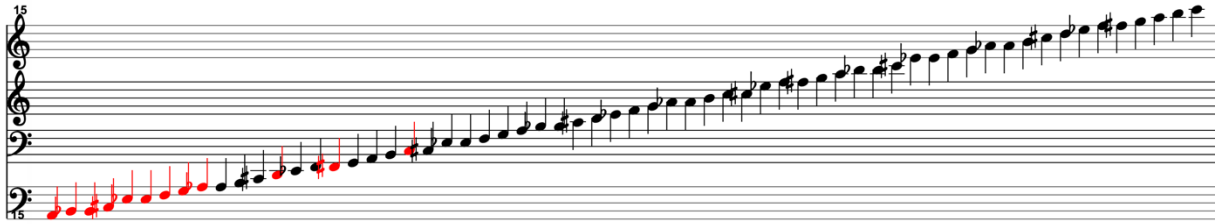
9a.0



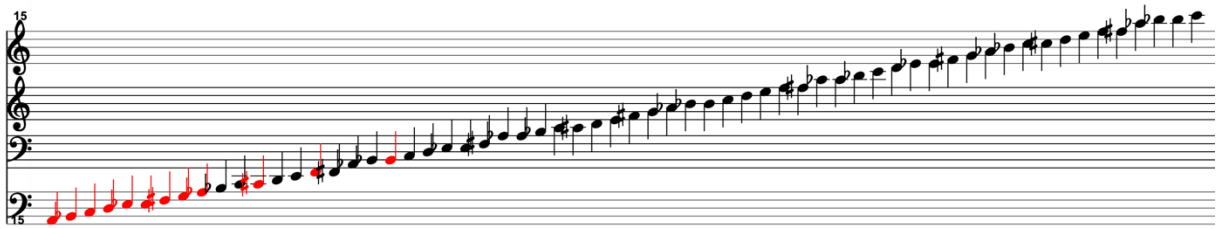
9a.1



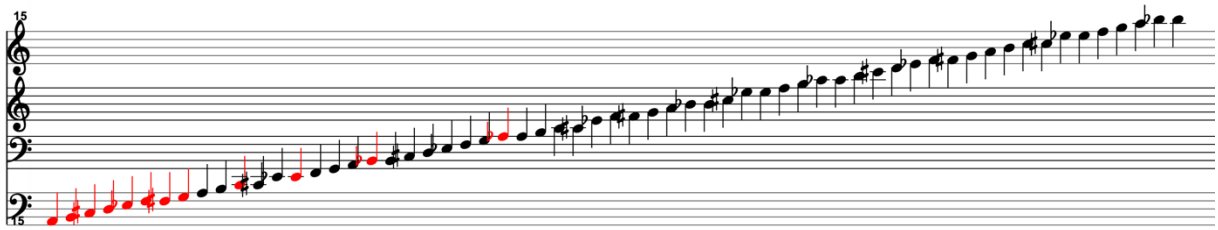
9a.2



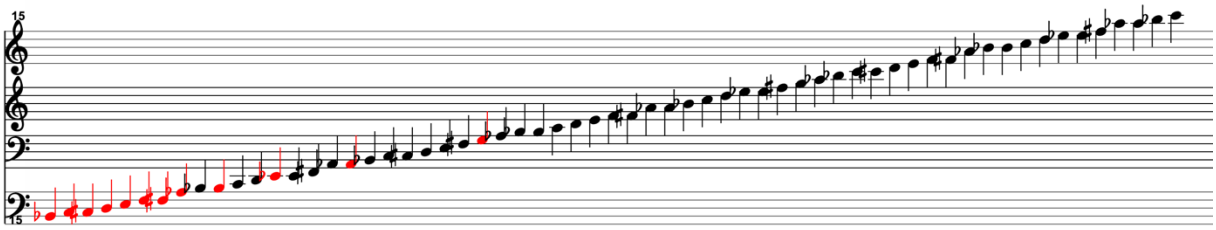
9a.3



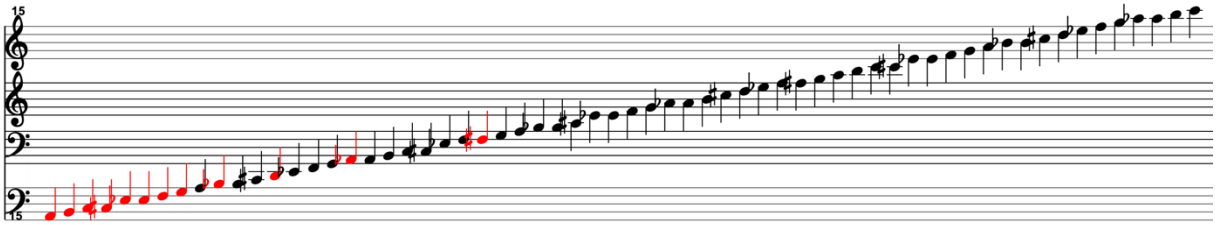
9a.4



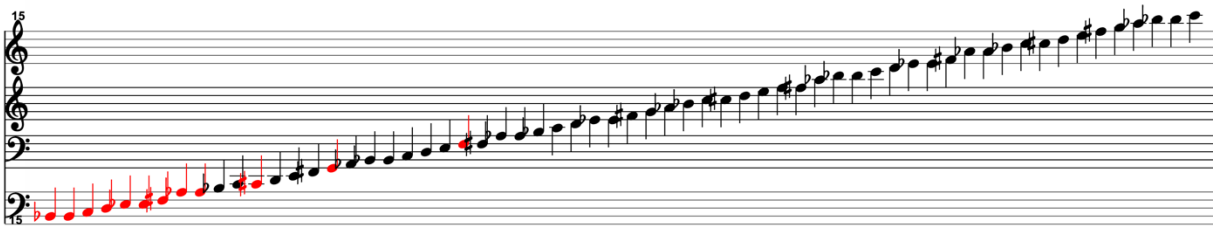
9a.5



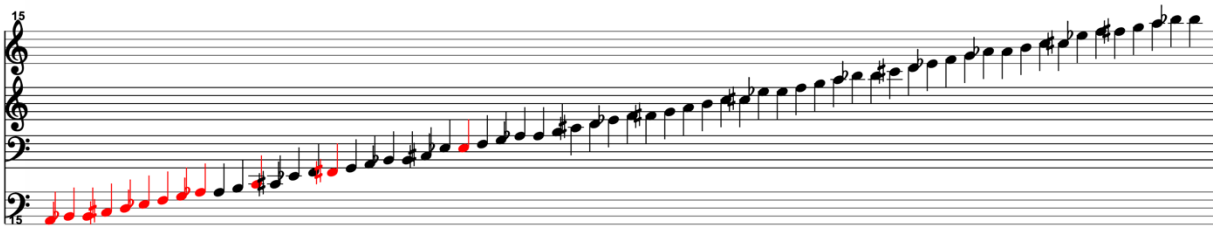
9a.6



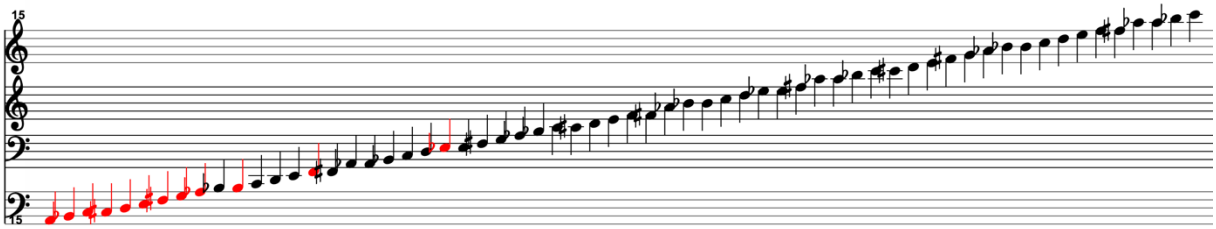
9a.7



9a.8



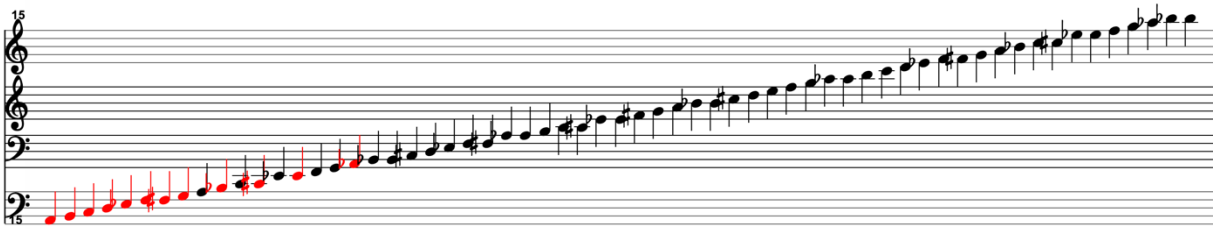
9a.9



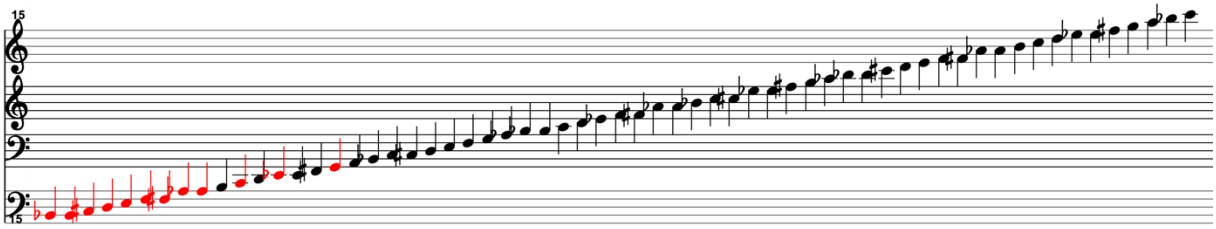
Modéchelle 9b (-u-u-uu) (8 à 12 sons, non-octaviant sur 5 octaves)

9 transpositions = 10 expressions

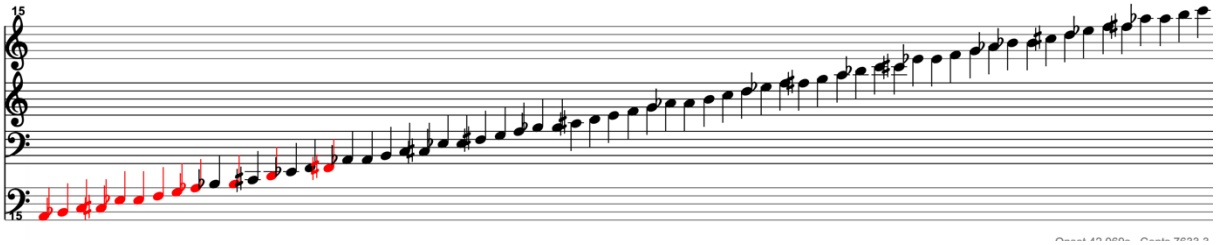
9b.0



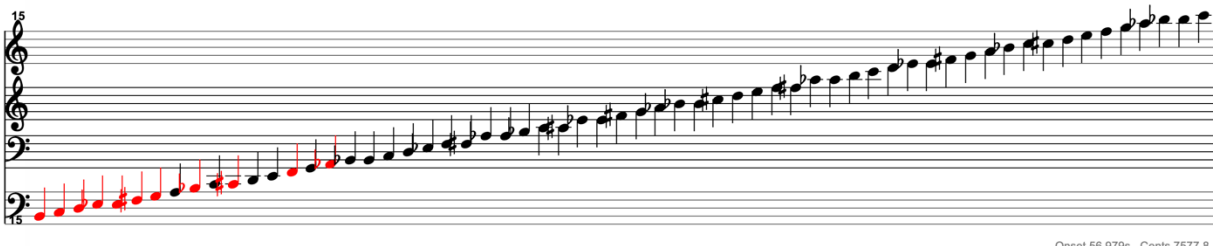
9b.1



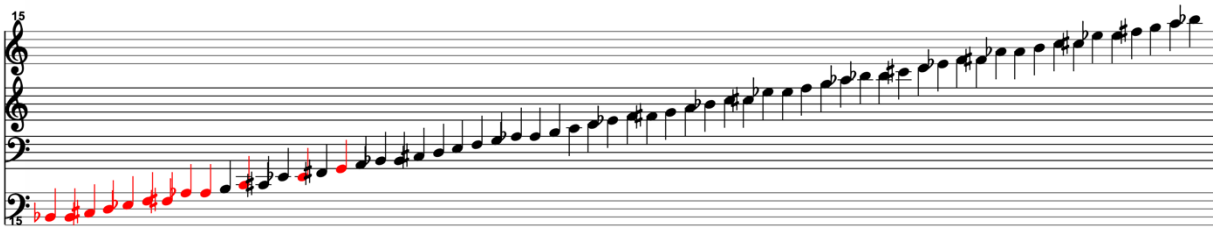
9b.2



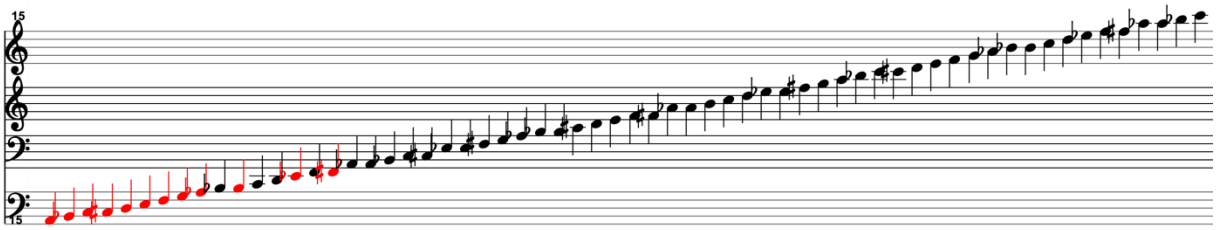
9b.3



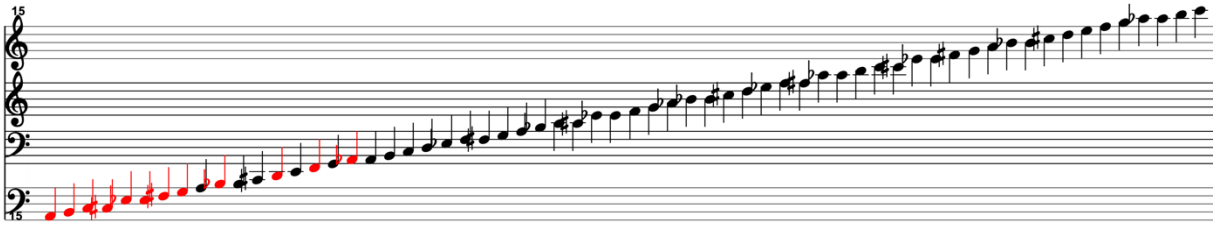
9b.4



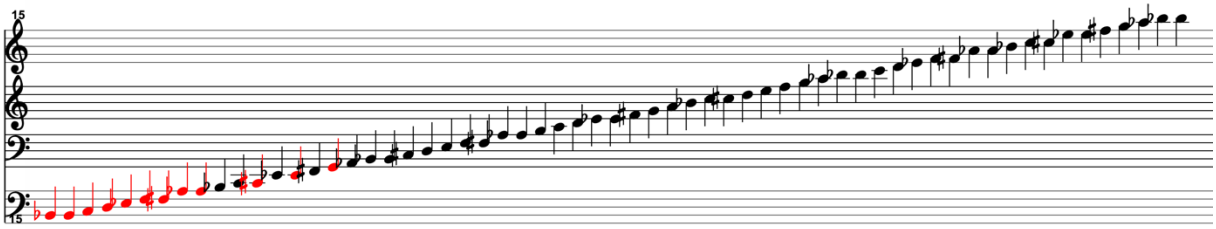
9b.5



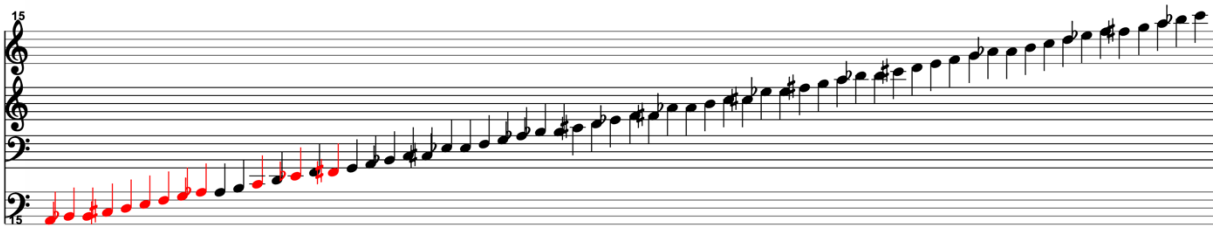
9b.6



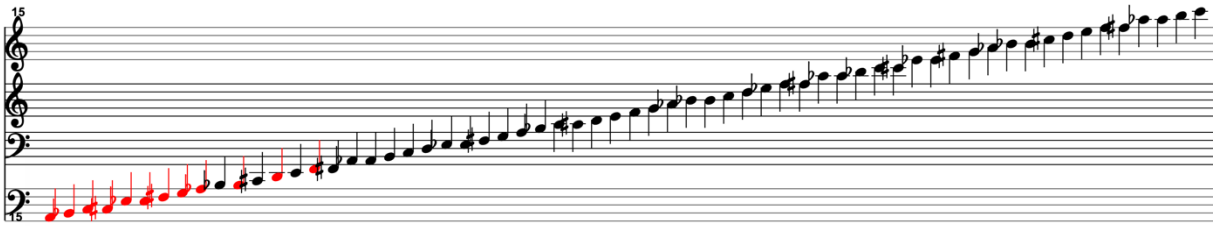
9b.7



9b.8



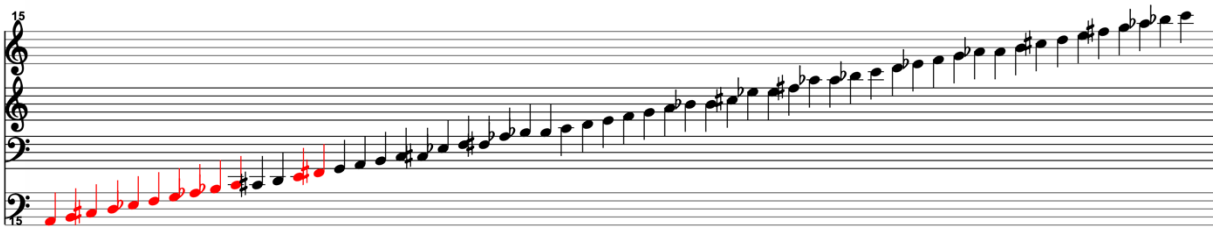
9b.9



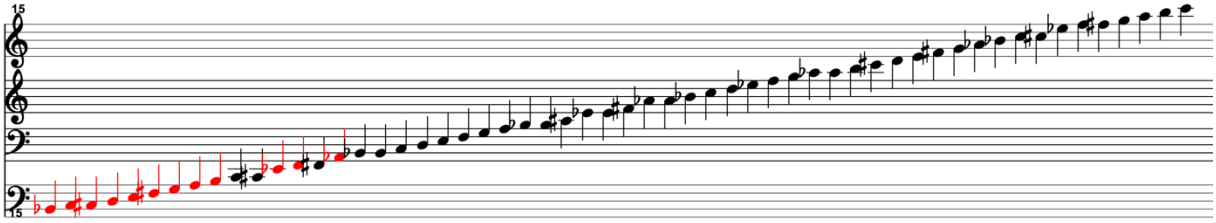
Modéchelle 10a (--uu--u) (8 à 12 sons, non-octaviant sur tout l'ambitus)

10 transpositions = 11 expressions

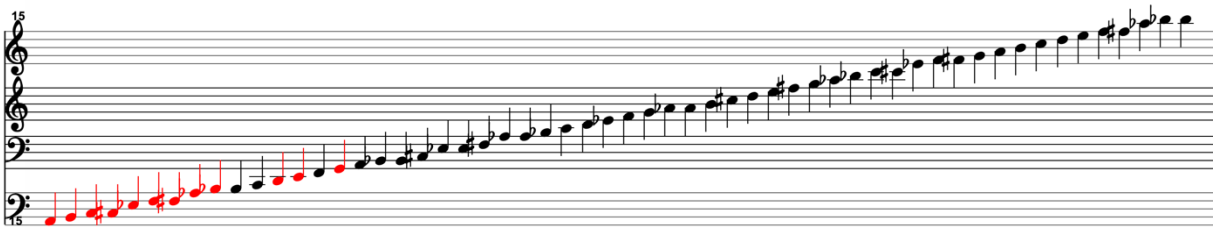
10a.0



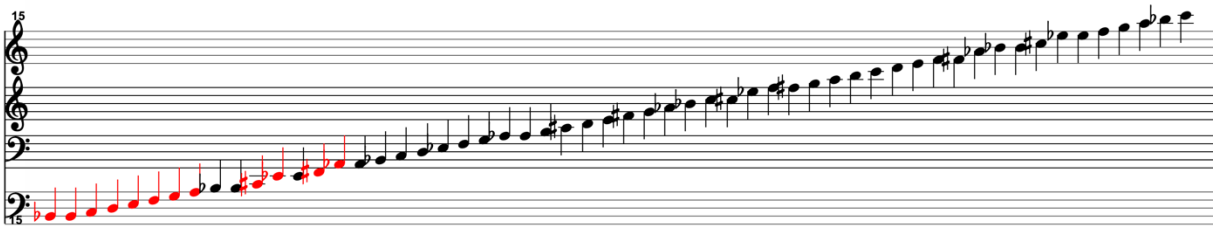
10a.1



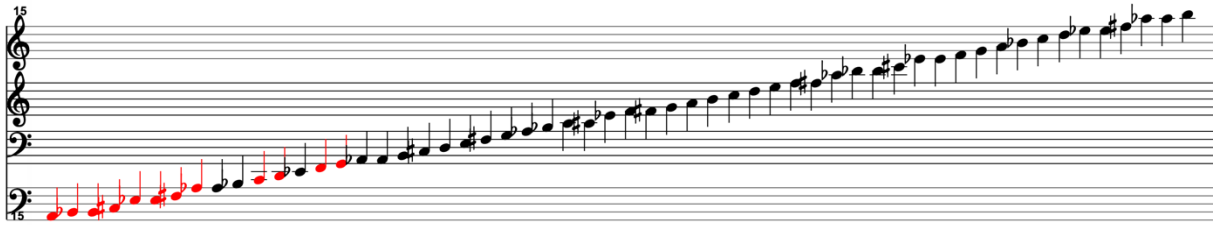
10a.2



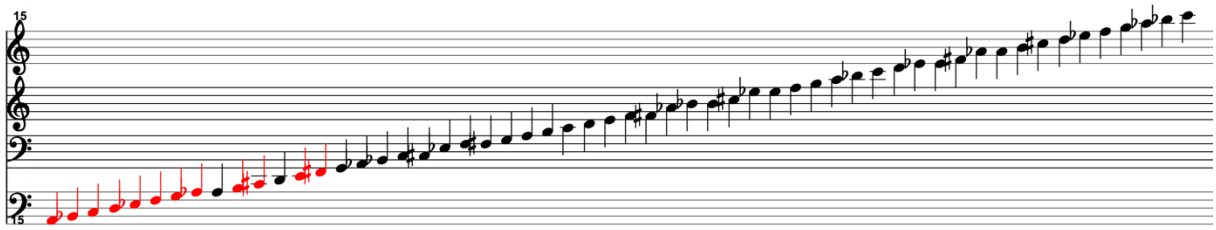
10a.3



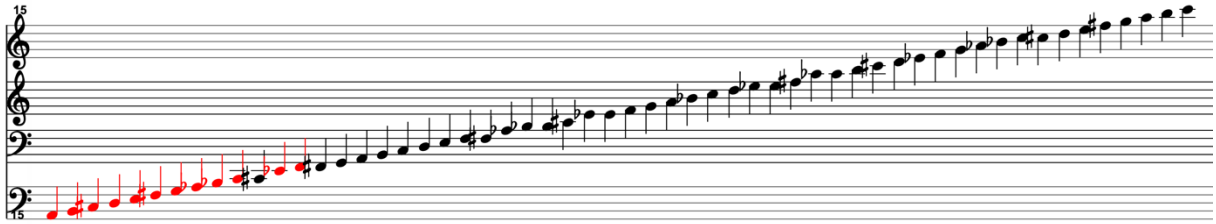
10a.4



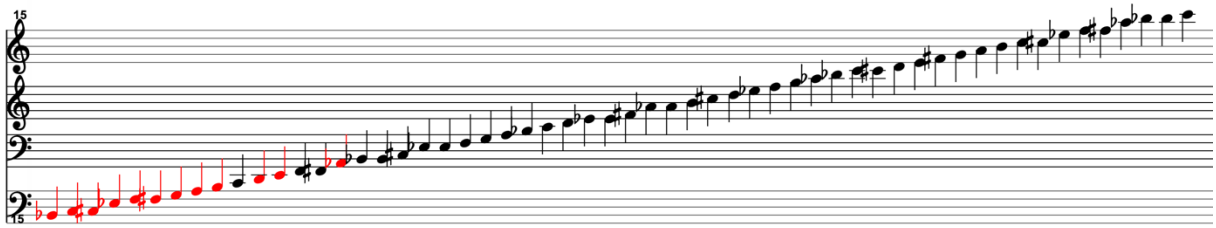
10a.5



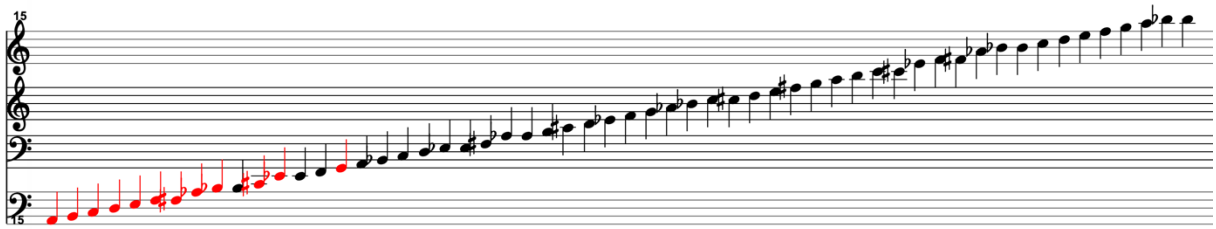
10a.6



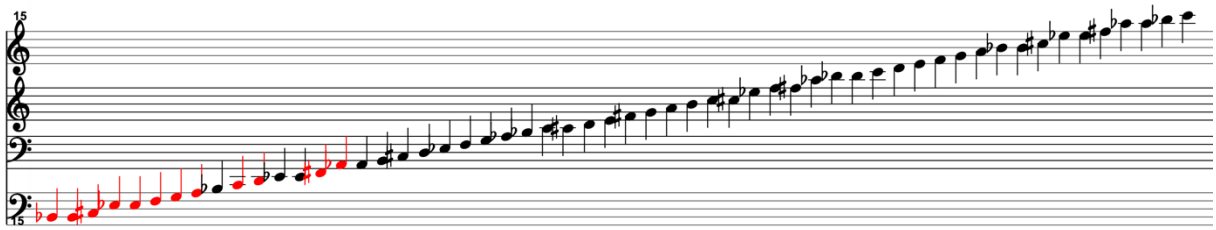
10a.7



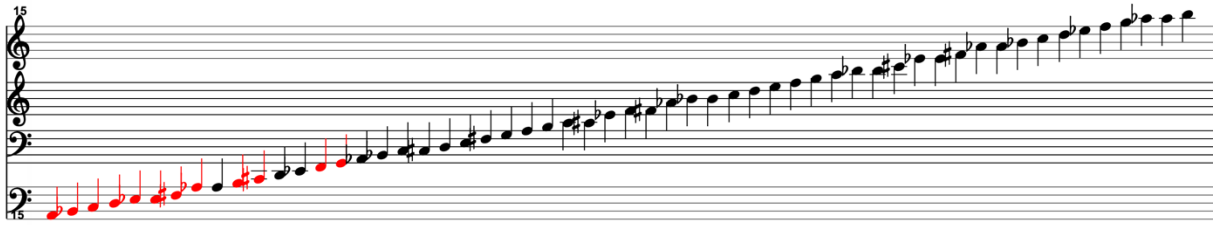
10a.8



10a.9



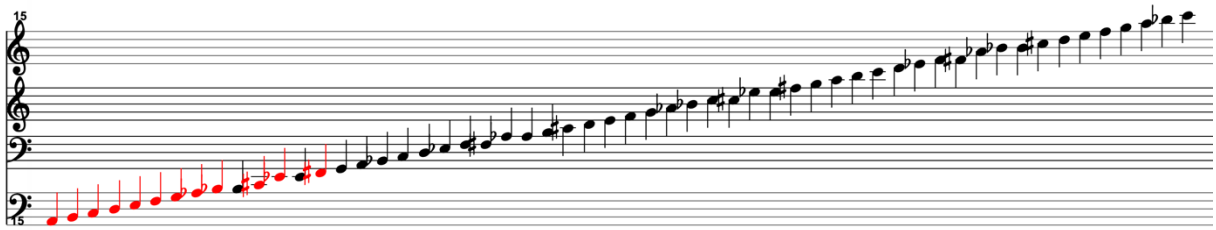
10a.10



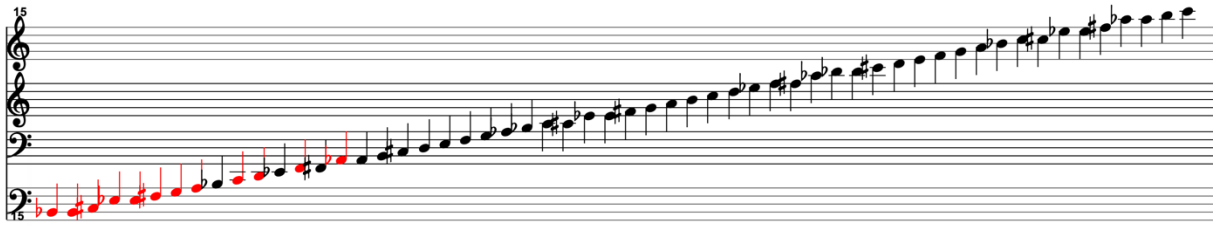
Modéchelle 10b (-u--u-u) (8 à 12 sons, non-octaviant sur tout l'ambitus)

10 transpositions = 11 expressions

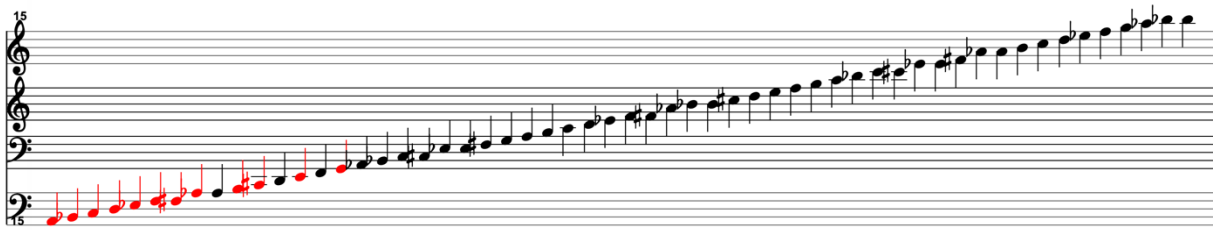
10b.0



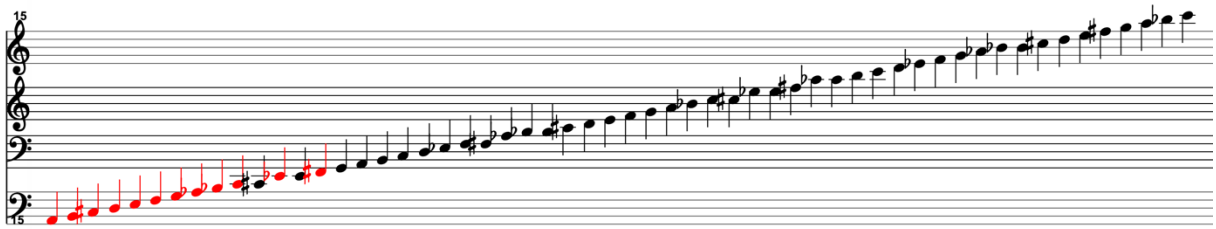
10b.1



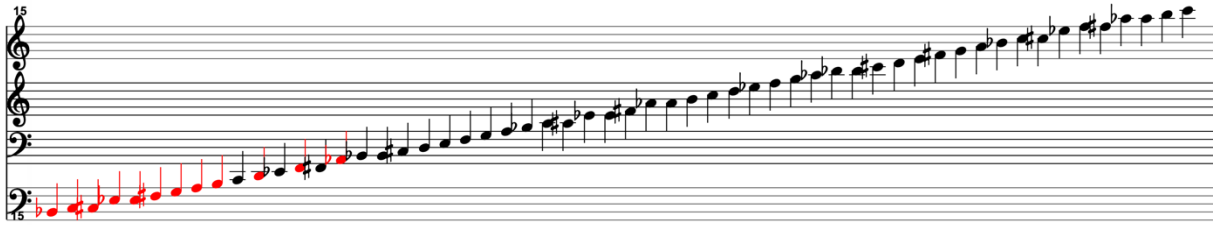
10b.2



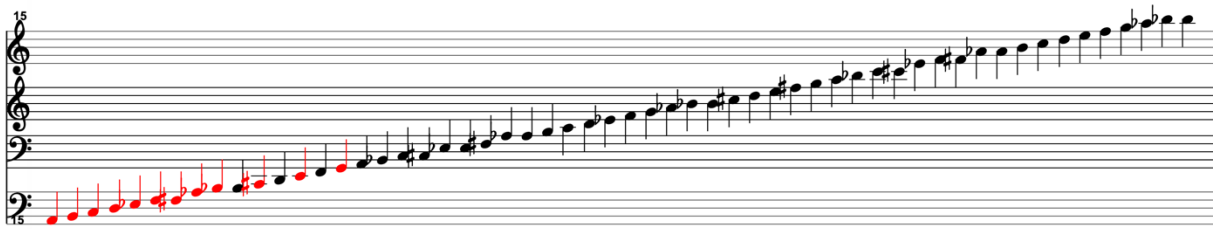
10b.3



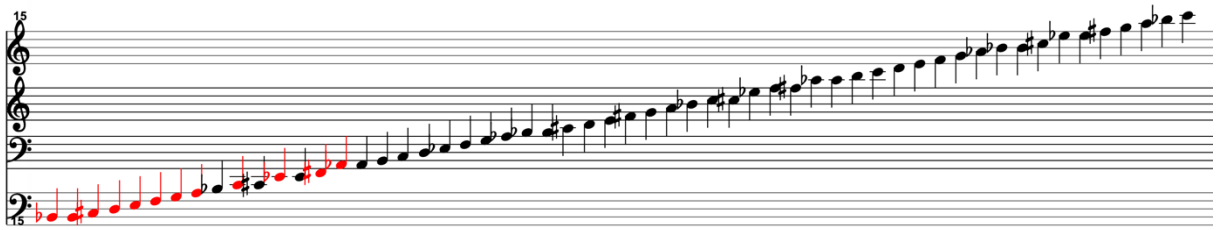
10b.4



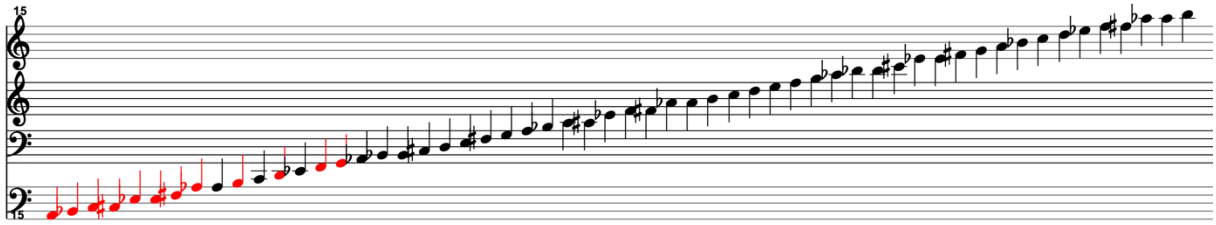
10b.5



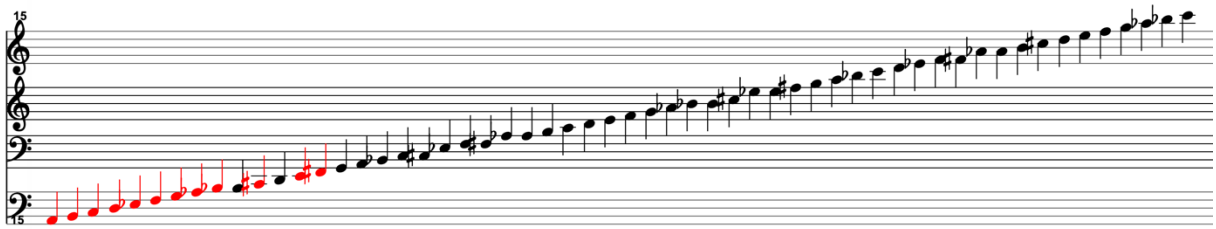
10b.6



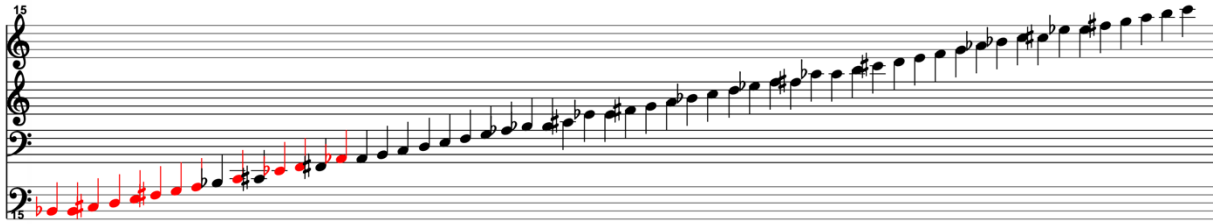
10b.7



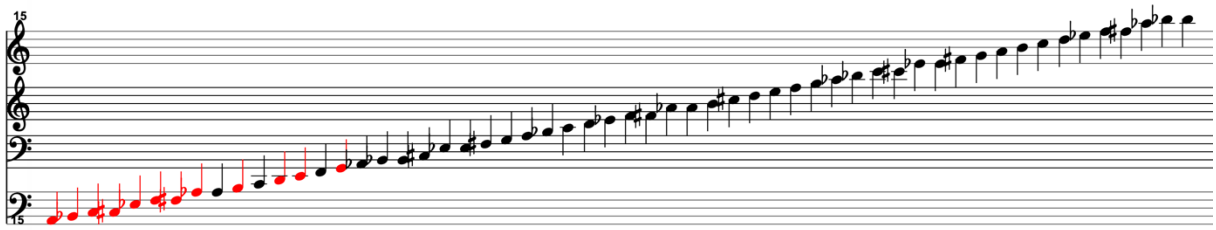
10b.8



10b.9



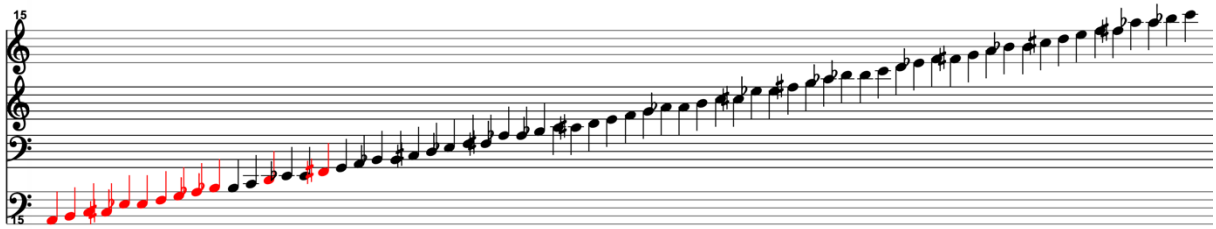
10b.X



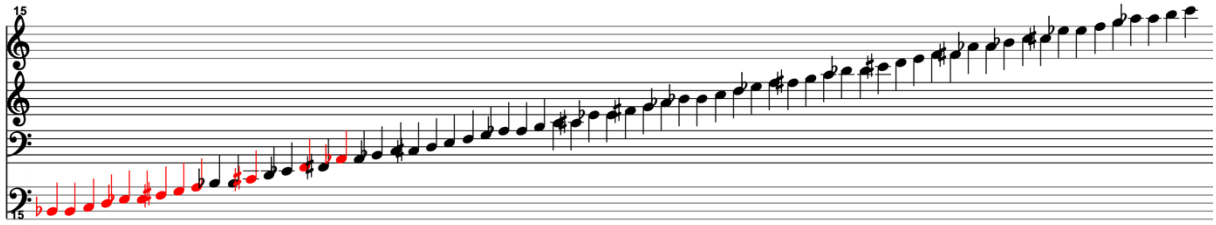
Modéchelle 10c (-uu-uu-u) (9 à 12 sons, non-octaviant sur tout l'ambitus)

10 transpositions = 11 expressions

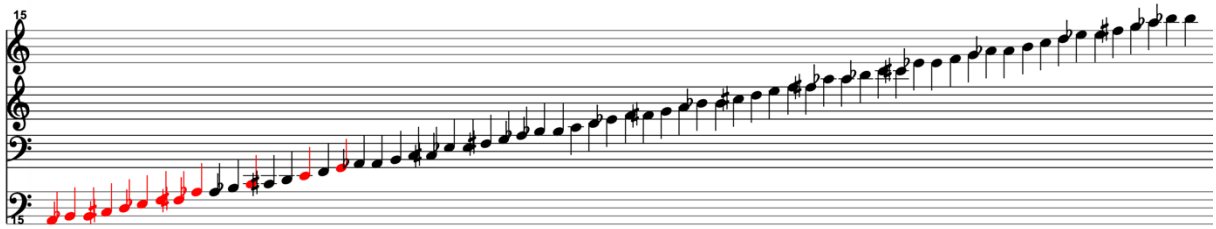
10c.0



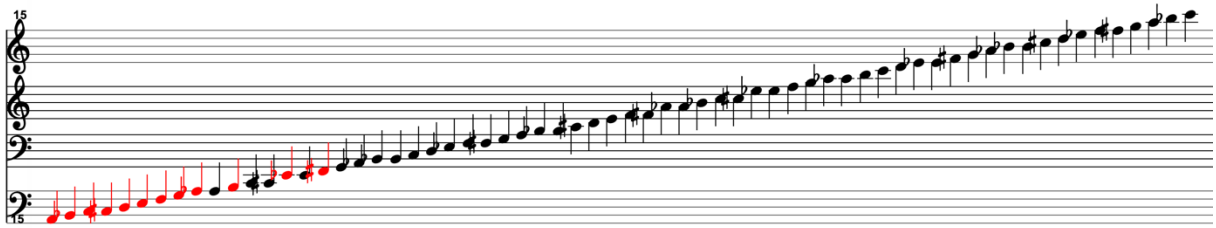
10c.1



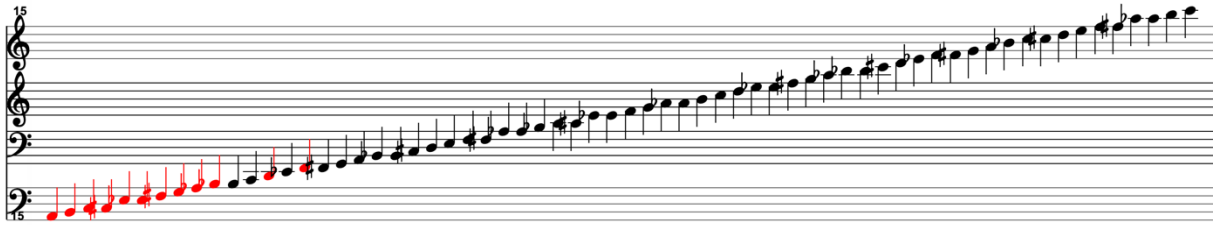
10c.2



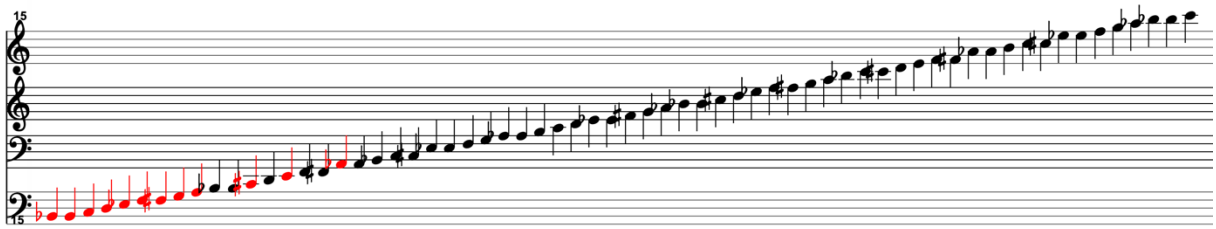
10c.3



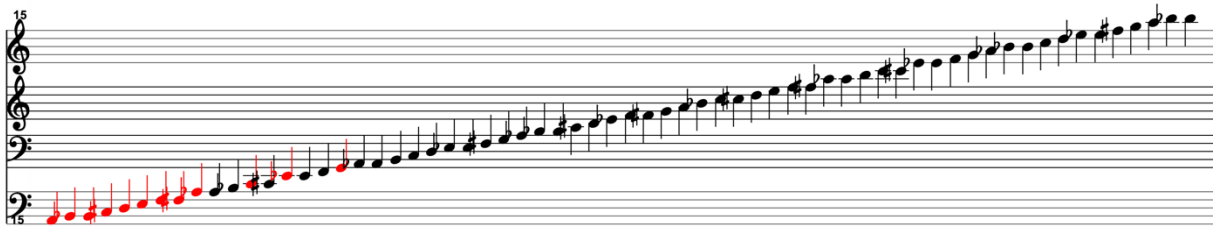
10c.4



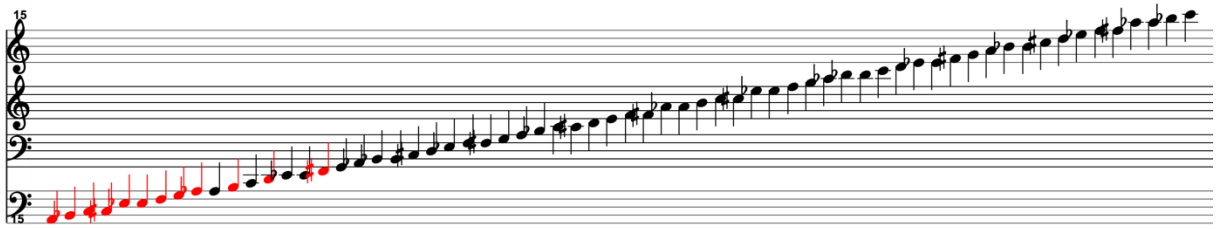
10c.5



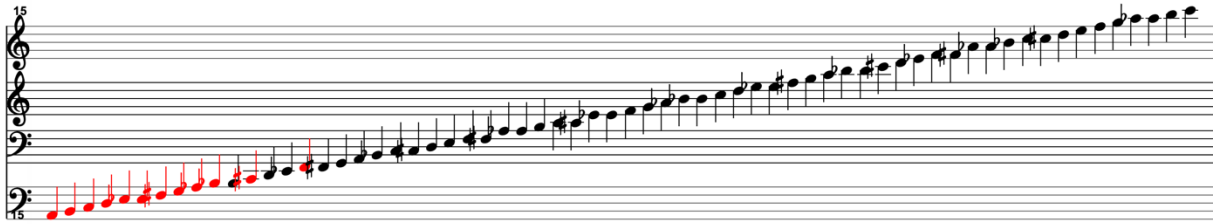
10c.6



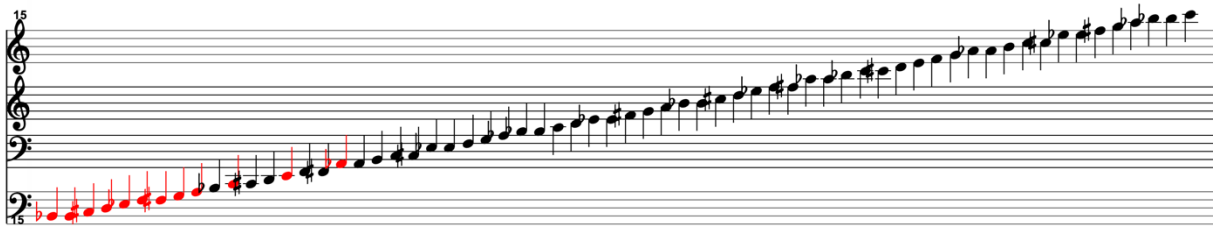
10c.7



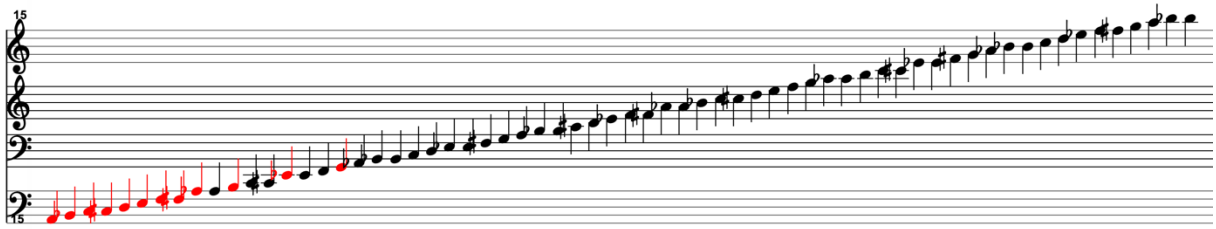
10c.8



10c.9



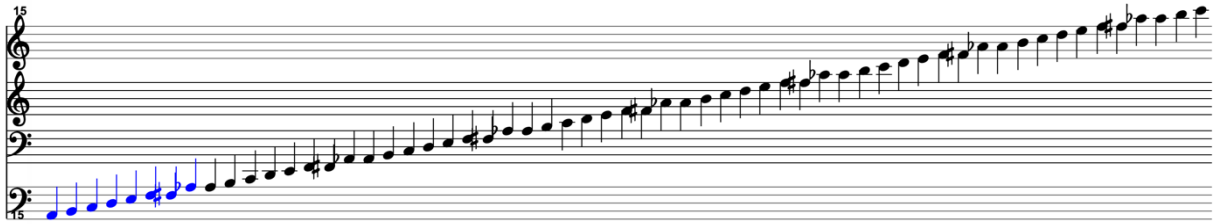
10c.X



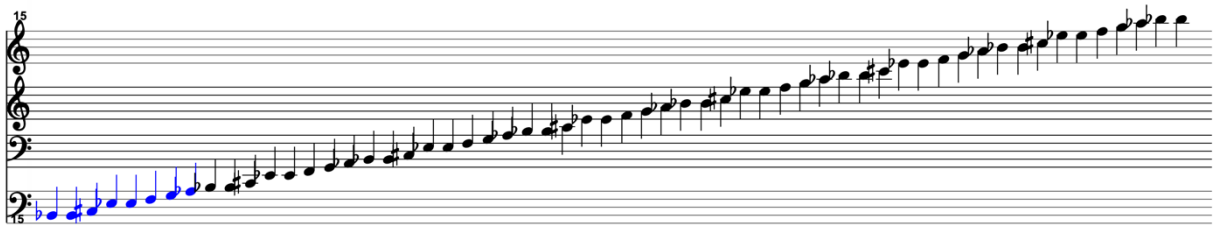
Modéchelle 11a (-u--uu-u) (8 sons, octaviant)

11 transpositions = 12 expressions

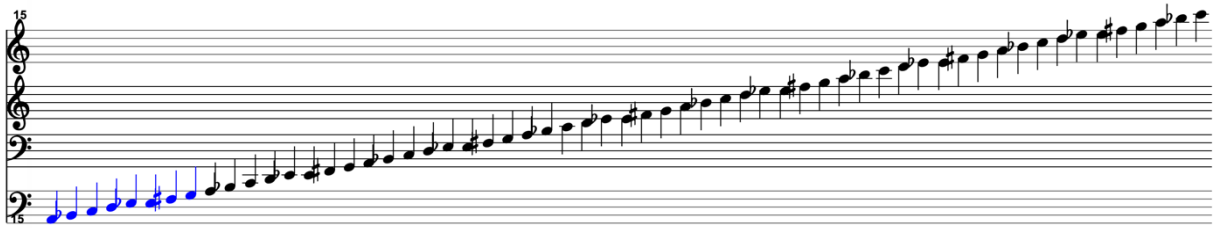
11a.0



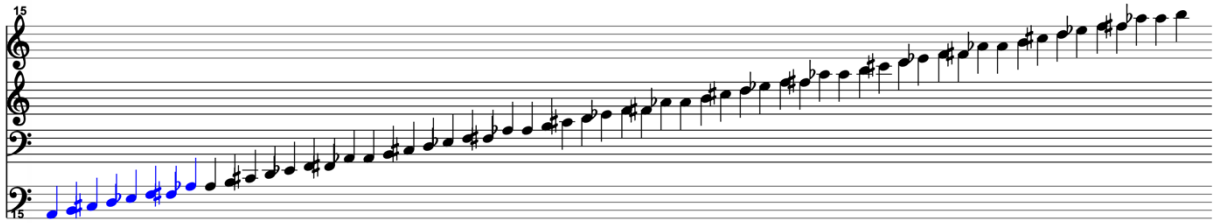
11a.1



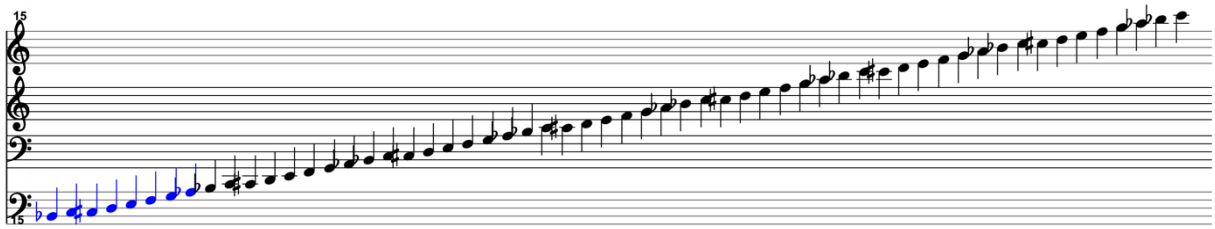
11a.2



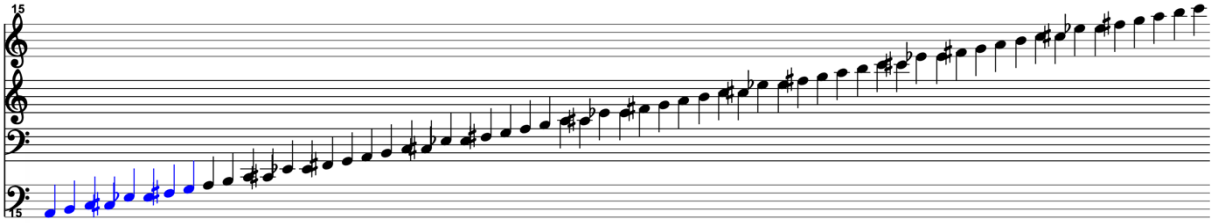
11a.3



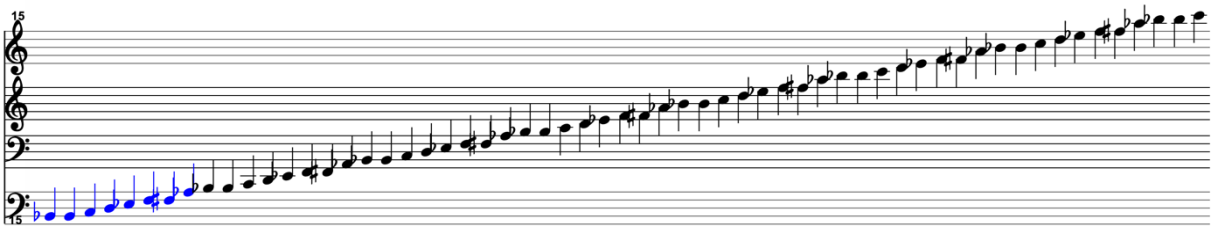
11a.4



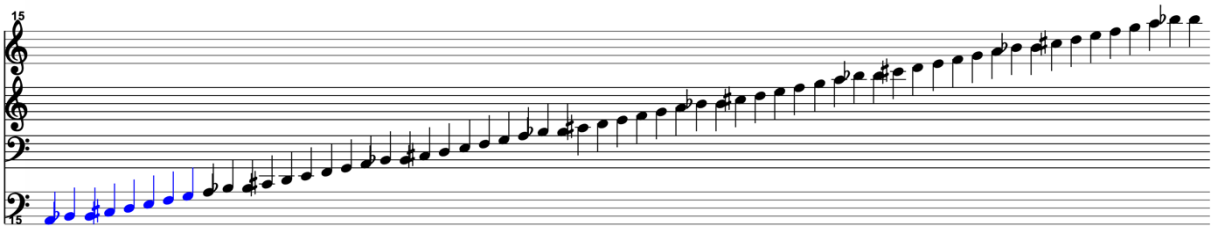
11a.5



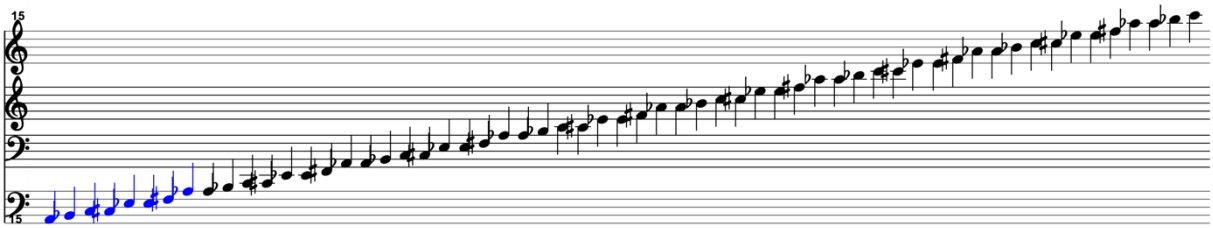
11a.6



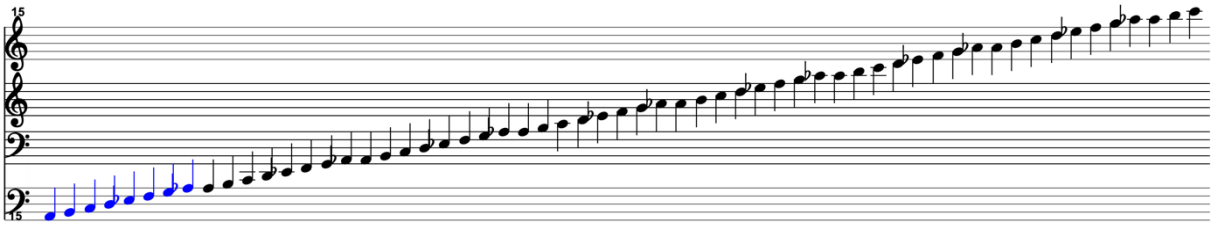
11a.7



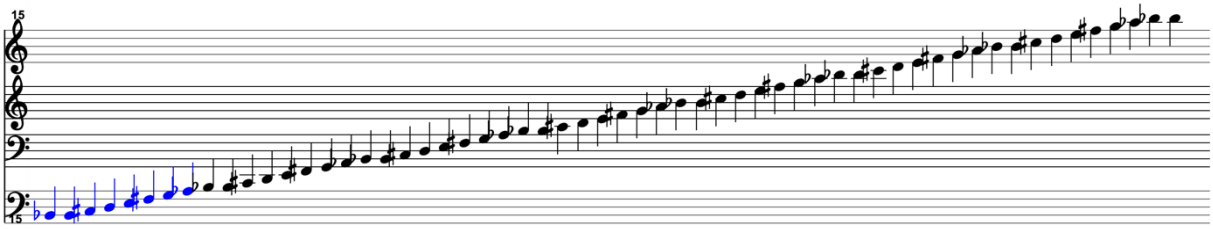
11a.8



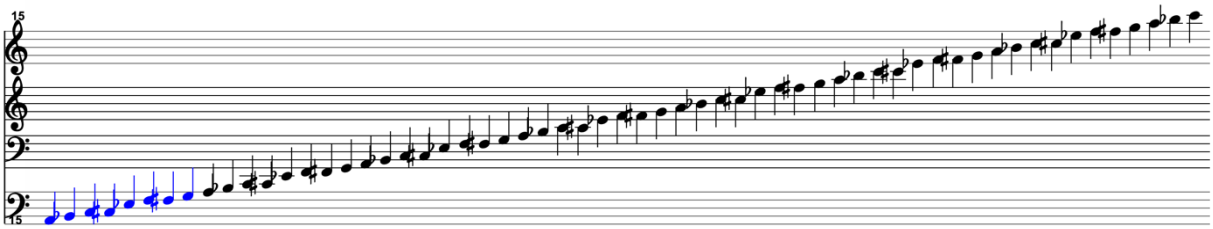
11a.9



11a.10



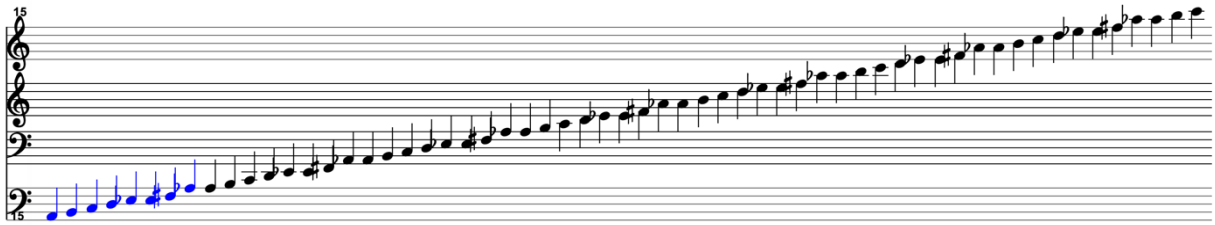
11a.11



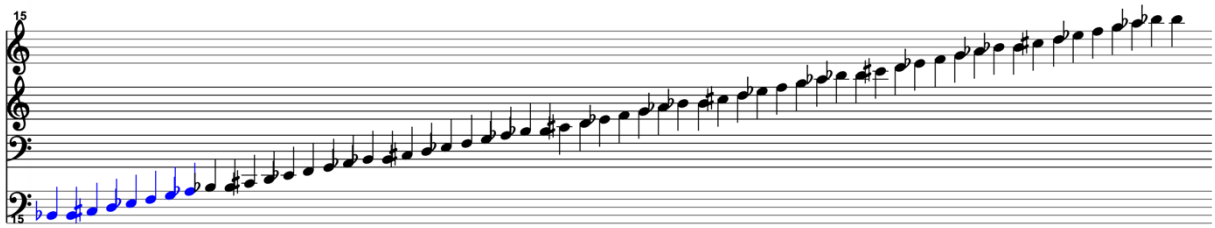
Modéchelle 11b (-u-uu--u) (8 sons, octaviant)

11 transpositions = 12 expressions

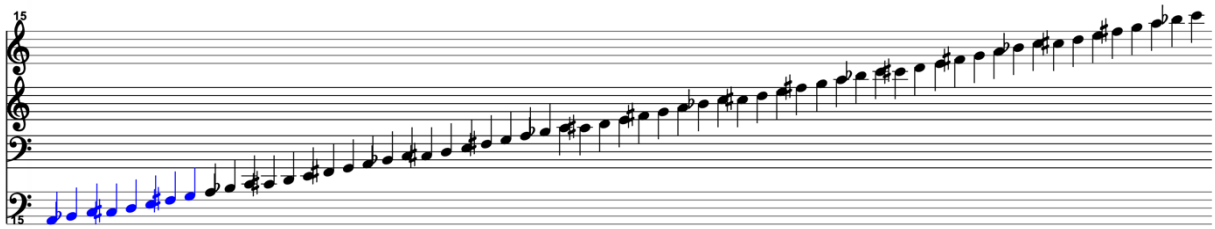
11b.0



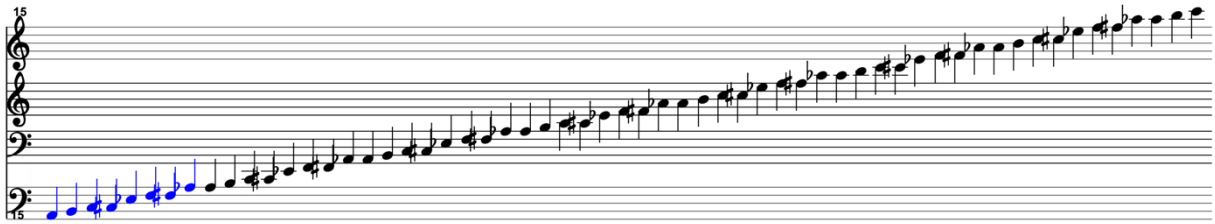
11b.1



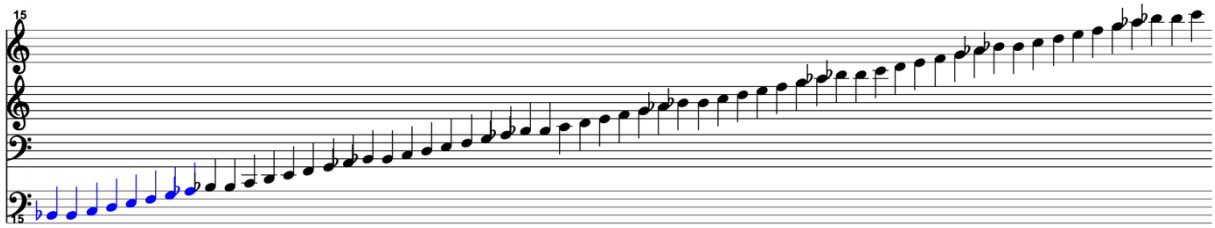
11b.2



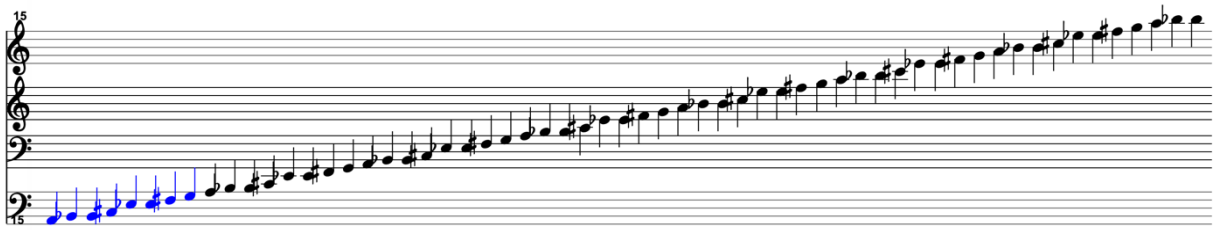
11b.3



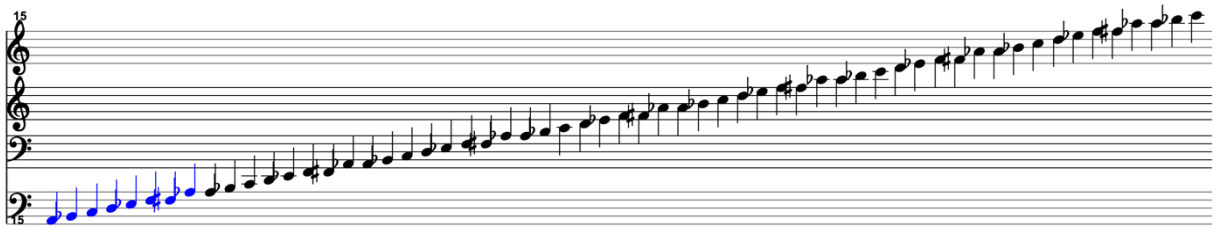
11b.4



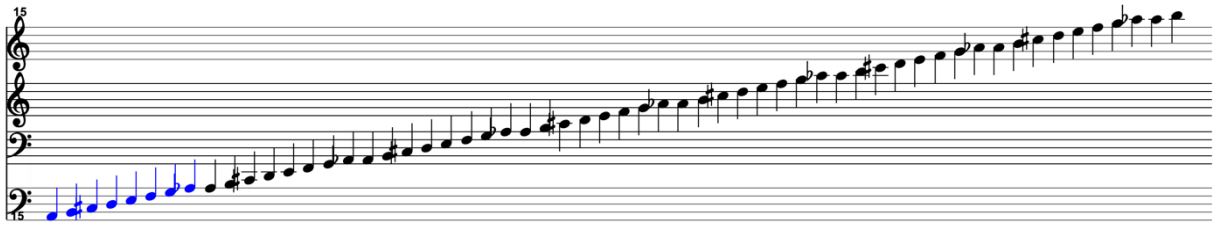
11b.5



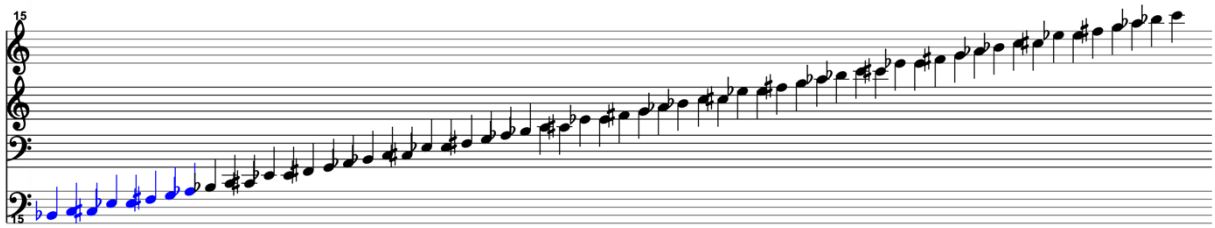
11b.6



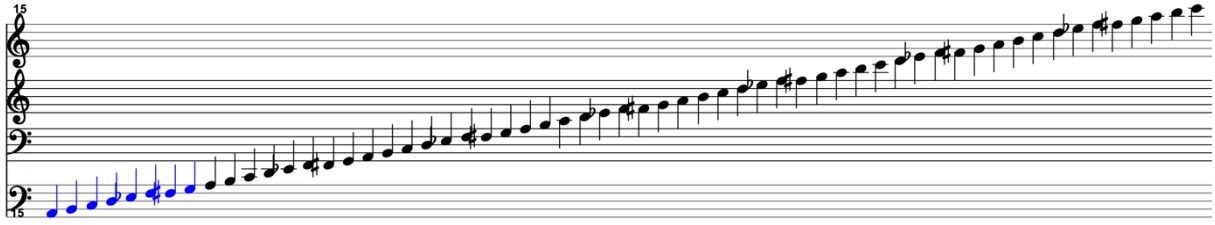
11b.7



11b.8



11b.9



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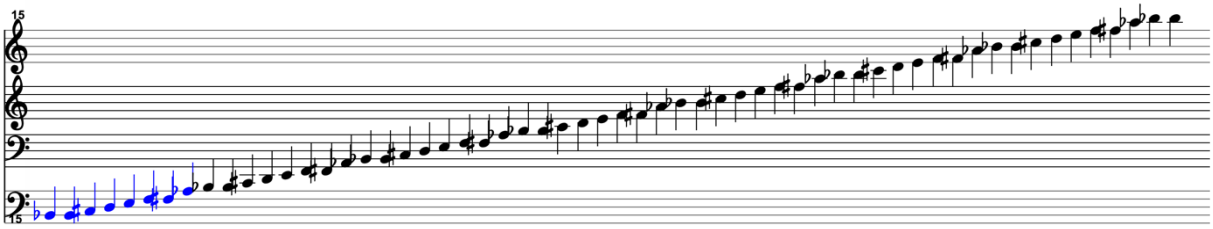
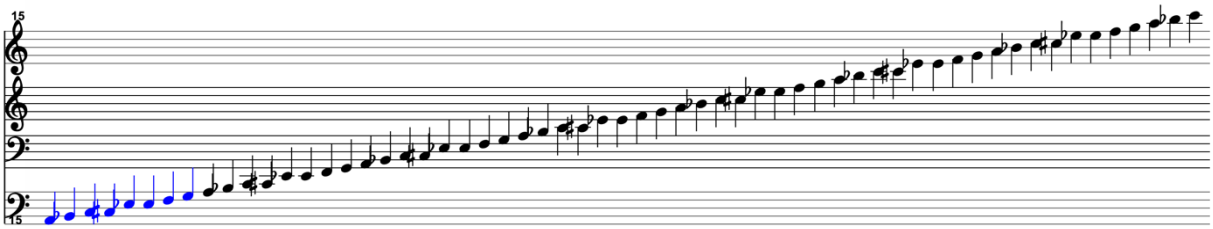


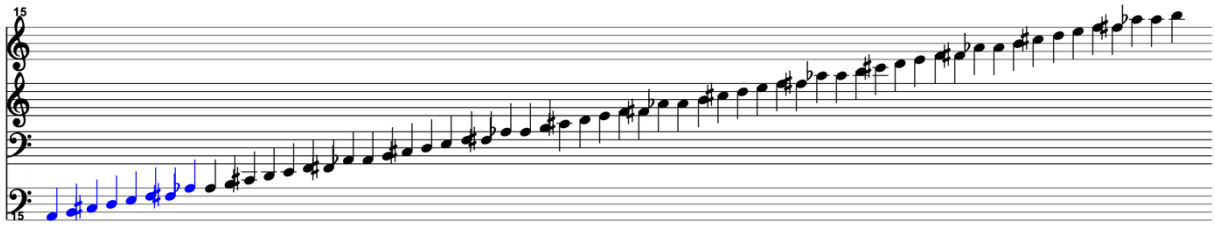
11b.11



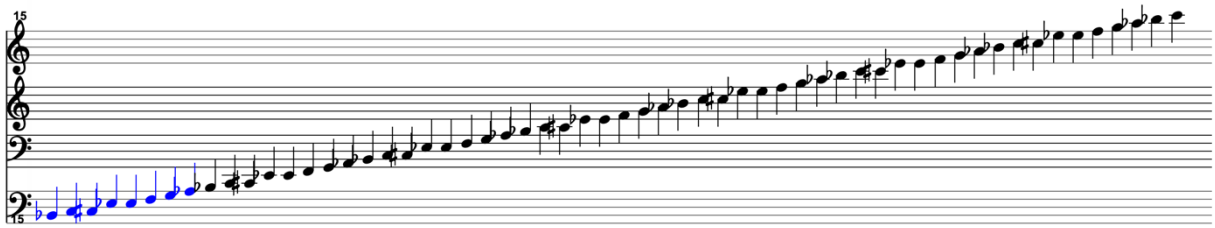
Modéchelle 11c (--u-uu-u) (8 sons, octaviant)

11 transpositions = 12 expressions

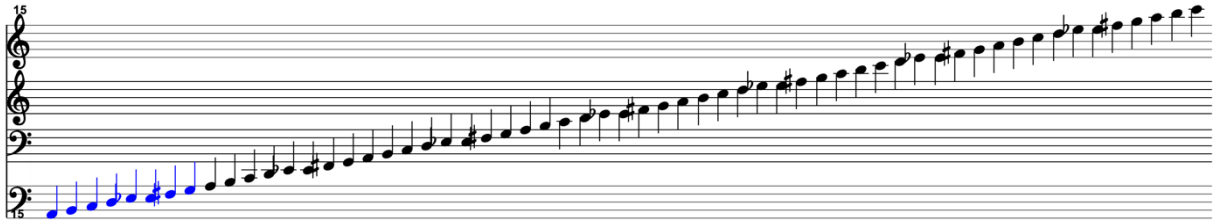
11c.0



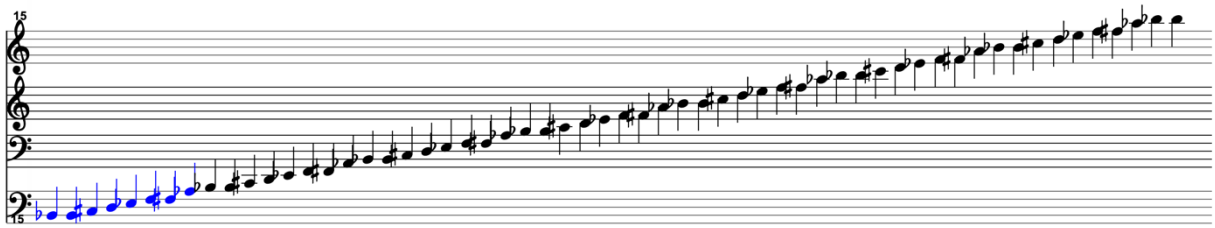
11c.1



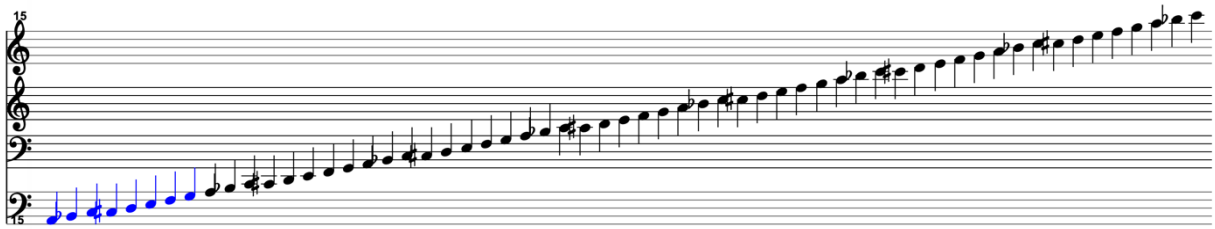
11c.2



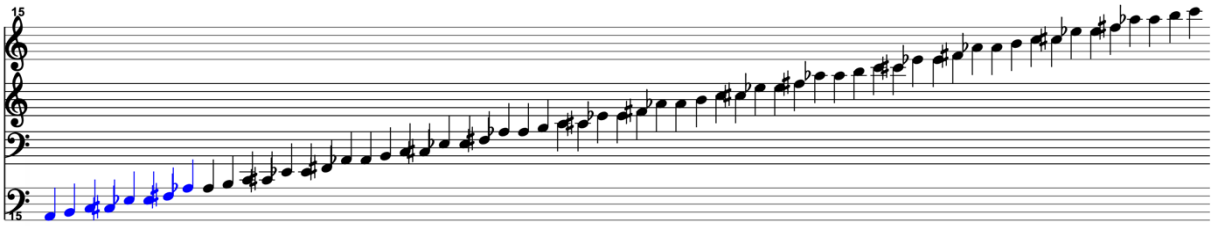
11c.3



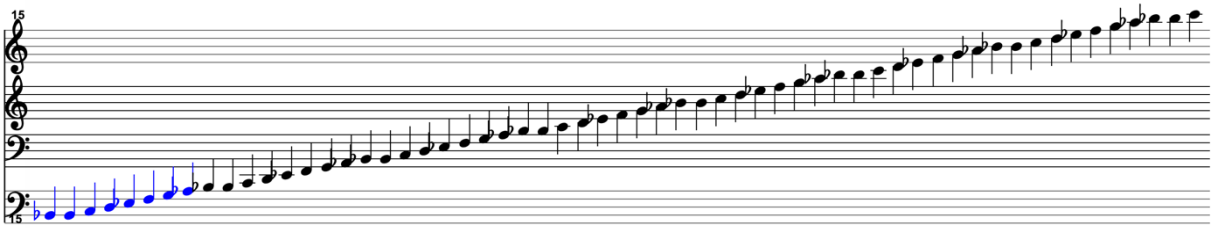
11c.4



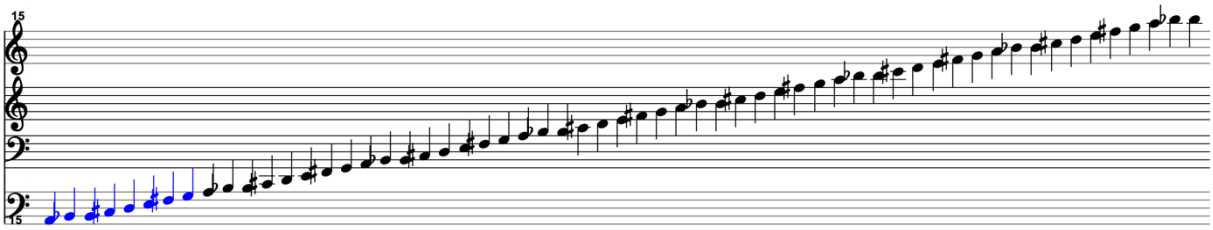
11c.5



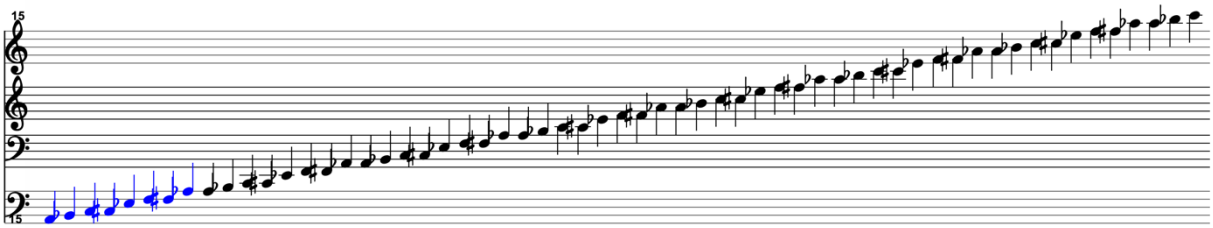
11c.6



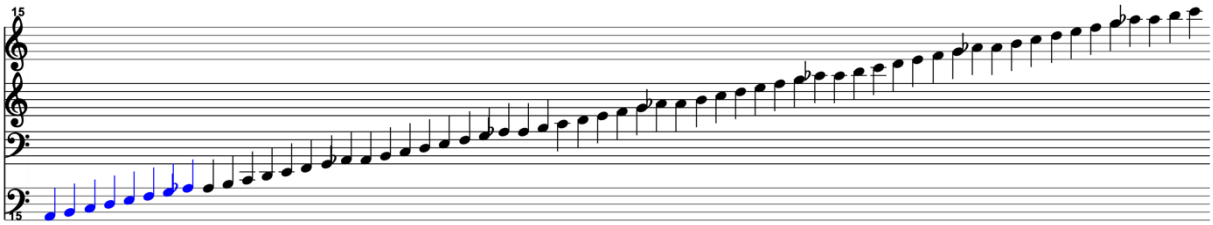
11c.7



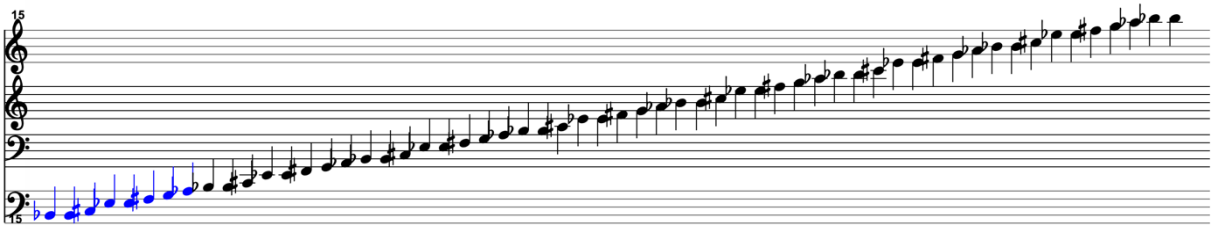
11c.8



11c.9



11c.10



11c.11

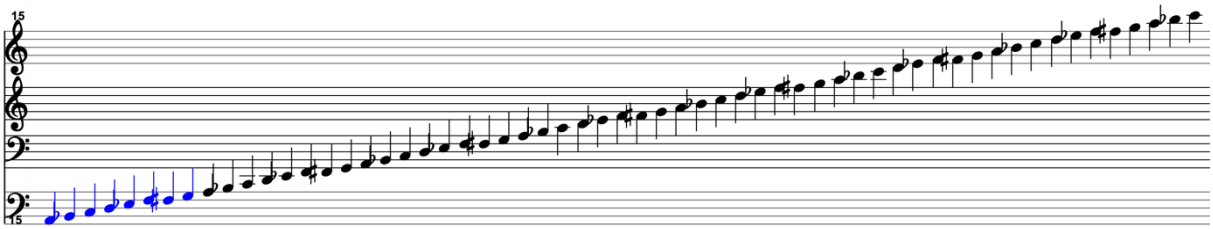
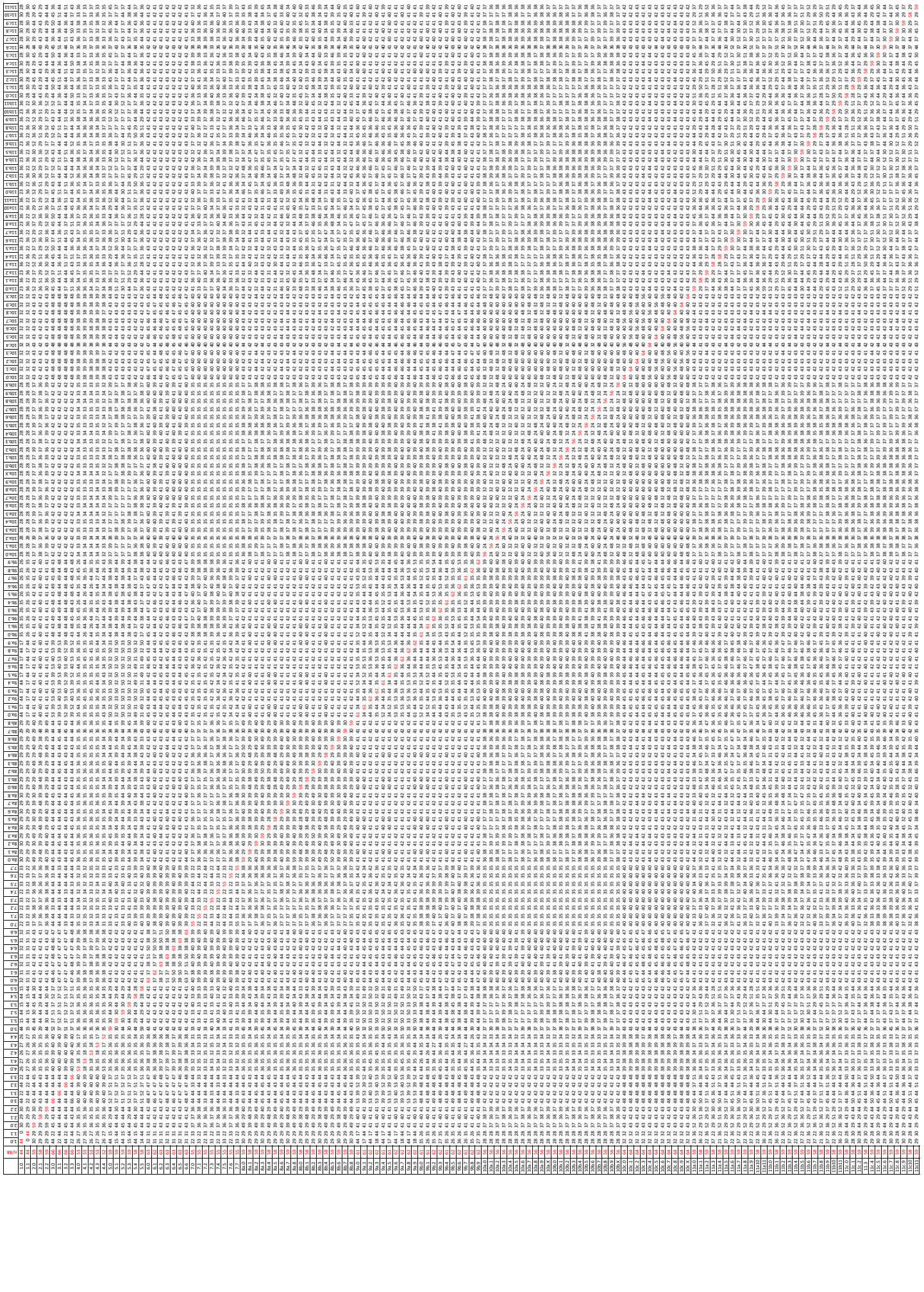


Tableau des intersections entre chacune des transpositions de toutes les modéchelles



Éric MONTALBETTI

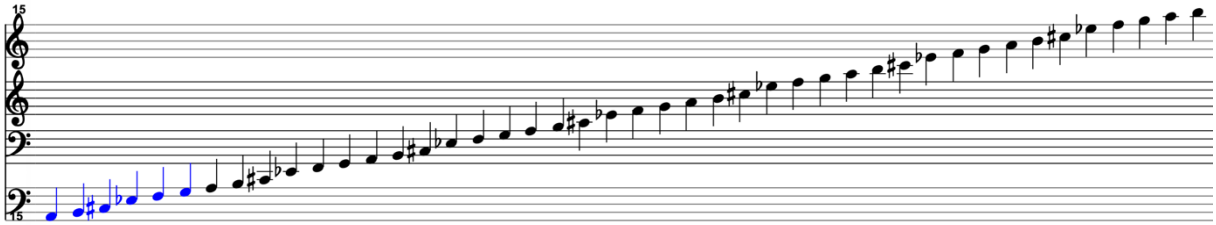
CATALOGUE DES ARPÈGES RÉGULIERS ET DES ARPÈGES DÉRIVÉS DES MODÉCHELLES

© 2026

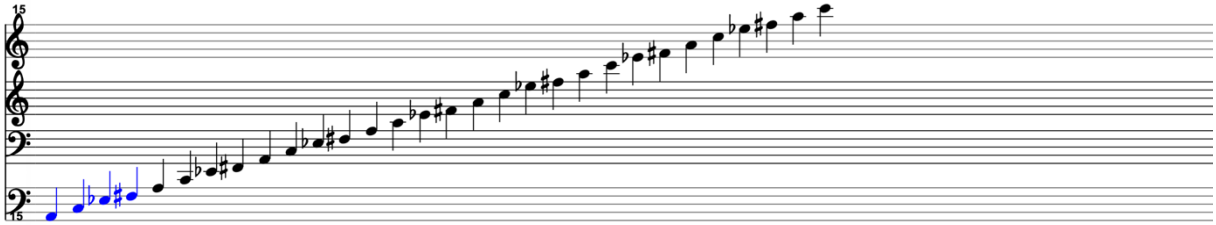
Catalogue des arpèges réguliers et dérivés des 18 modéchelles

Modéchelle 0 (gamme chromatique)
(2m / 12 sons / octaviant / 0 permutation / 0 transposition / pas d'arpège dérivé)

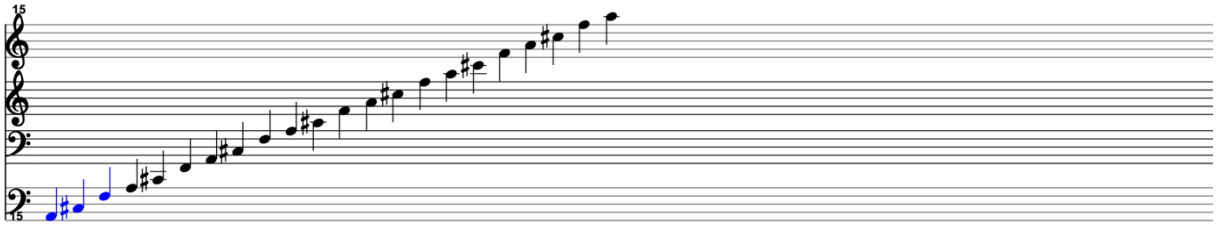
Arp 2/2 = gamme par tons (6 sons)



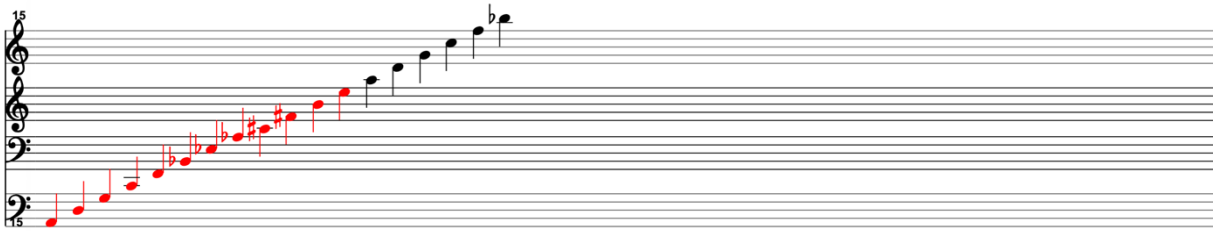
Arp 3/3 = 3m3m3m3m (7ème diminuée) (4 sons)



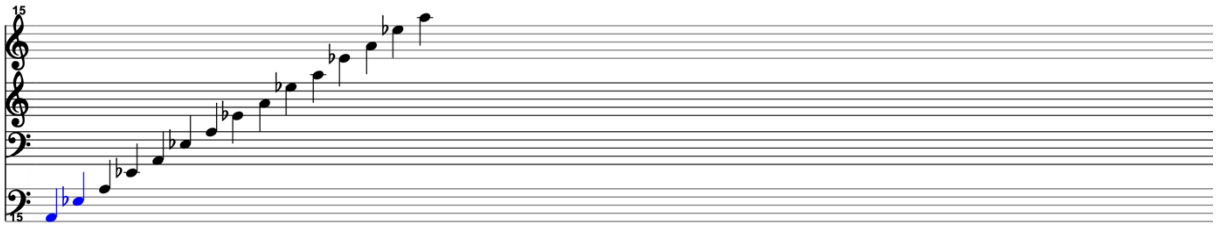
Arp 4/4 = 3M 3M 3M (5+) (3 sons)



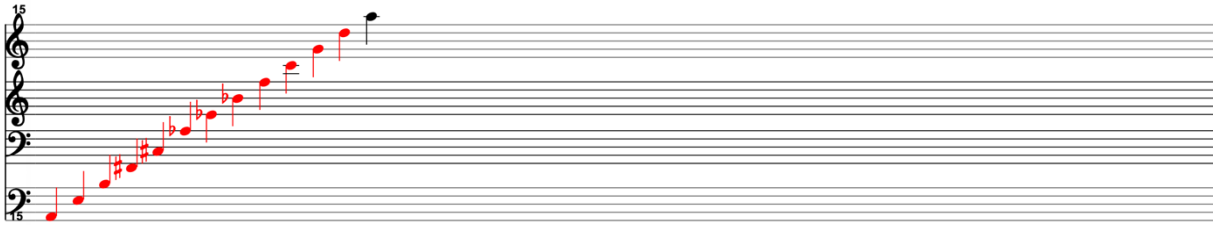
Arp 5/5 = cycle des 4J (12 sons in a row)



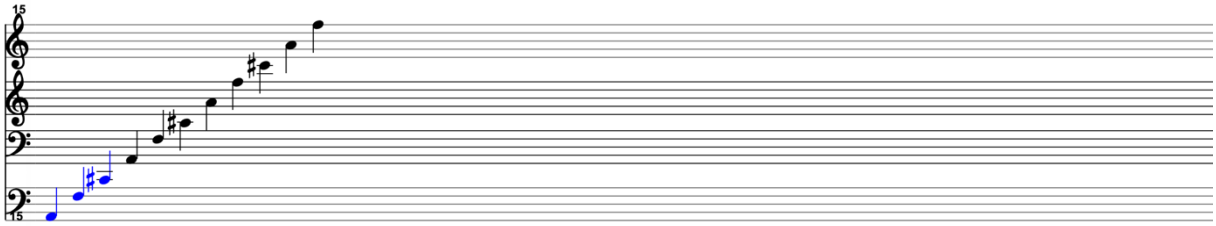
Arp 6/6 = 4+ (2 sons)



Arp 7/7 = cycle des quintes 5J (12 sons in a row)



Arp 8/8 = 6m 6m 6m puis octaviant (3 sons)



Arp 9/9 = 6M x 4 puis octaviant (4 sons)

Arp 10/10 = 7m x 6 puis octaviant (6 sons)

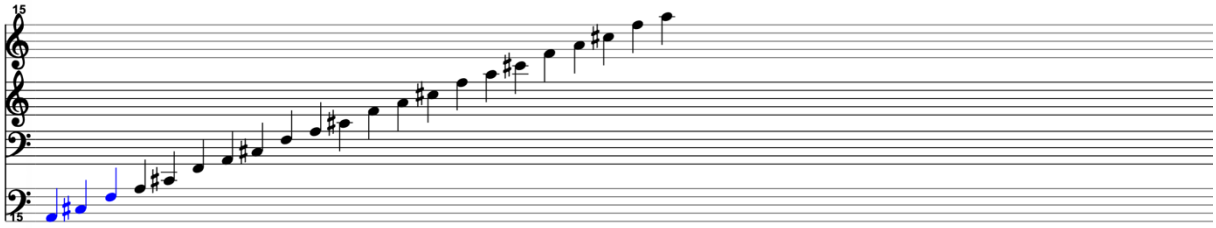
Arp 11/11 = cycle des 7M (12 sons, hors tessiture)

Arp 12/12 = Octaves

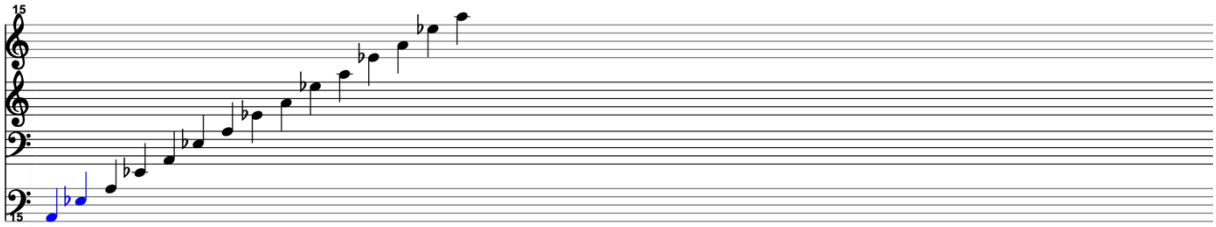
Modéchelle 1 (gamme par tons)

(2M / 6 sons / octaviant / 0 permutation / 1 transposition / pas d'arpège dérivé)

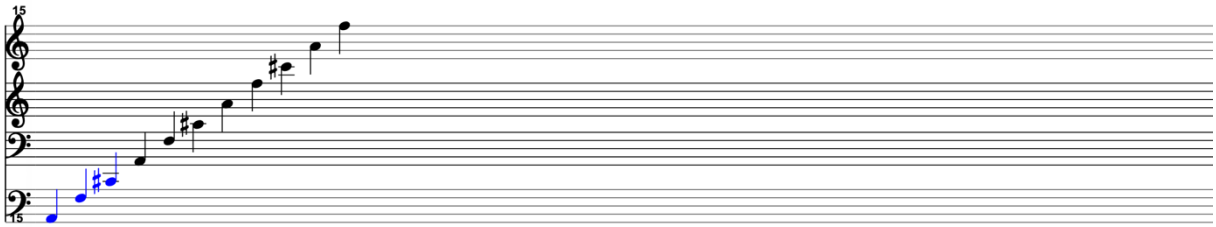
Arp 2/2 = 3M3M3M (3 sons)



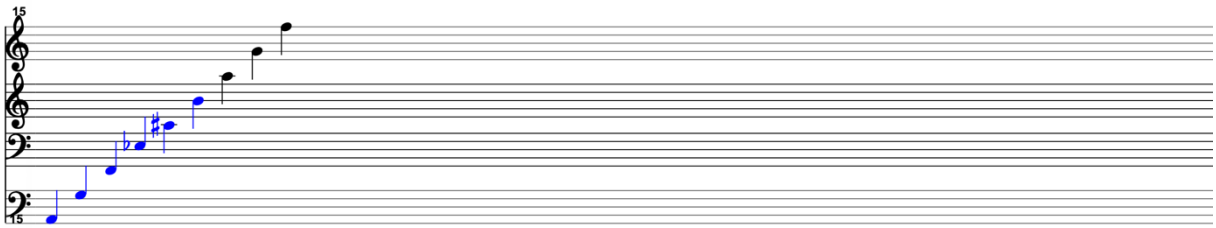
Arp 3/3 = 4+4+(2 sons)



Arp 4/4 = 6m6m6m (3 sons)



Arp 5/5 = 7m x 6 (6 sons)

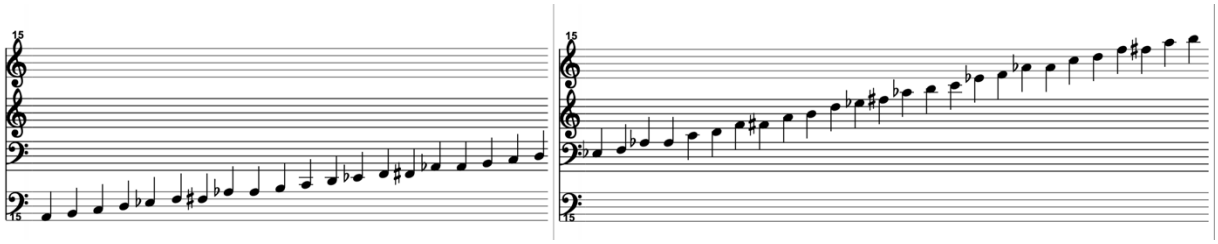


Arp 6/6 = Octaves

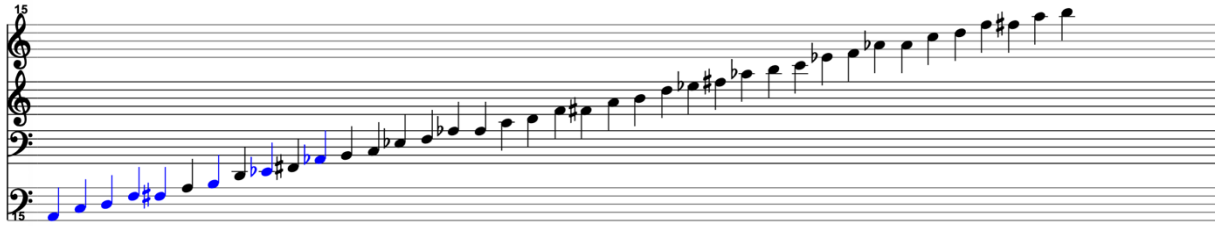
Modéchelle 2 (Messiaen 2)

-u

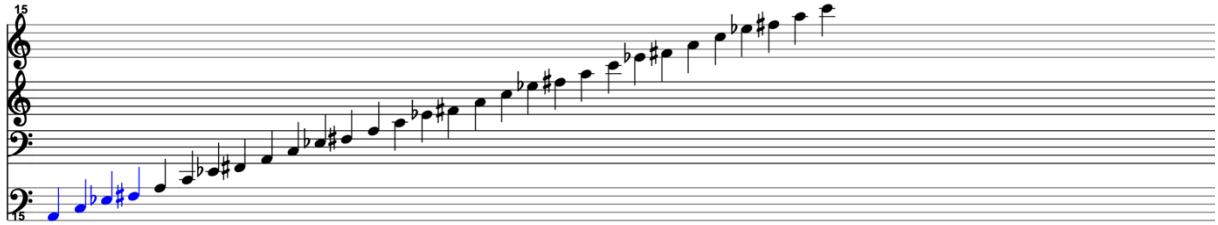
(3m / 8 sons / octaviant / 1 permutation / 2 transpositions)



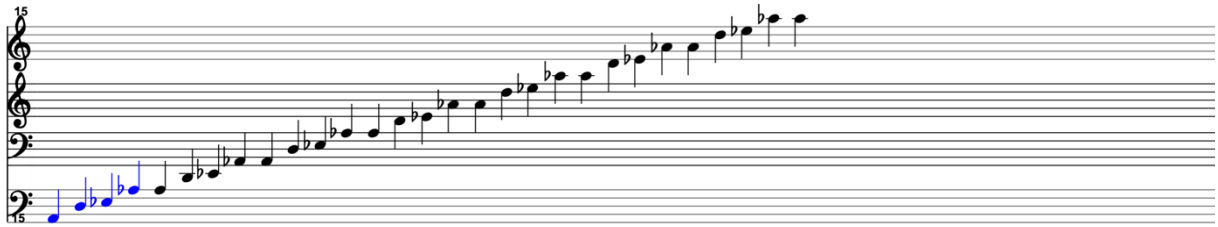
Arp 1/2 = (3m 2M 3m 2m) x 4 (puis octaviant) (8 sons)



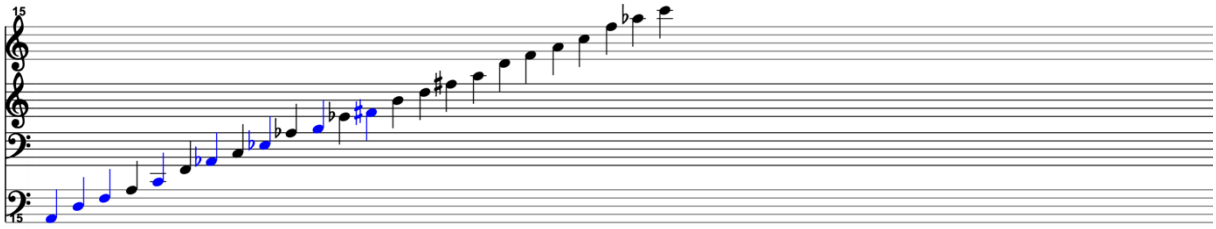
Arp 2/2 = 3m3m3m3m (4 sons, accord de 7ème diminuée)



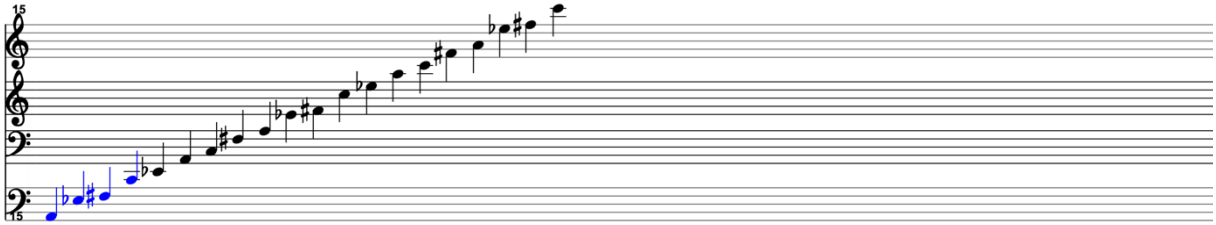
Arp 1/3 = 4J 2m (4 sons)



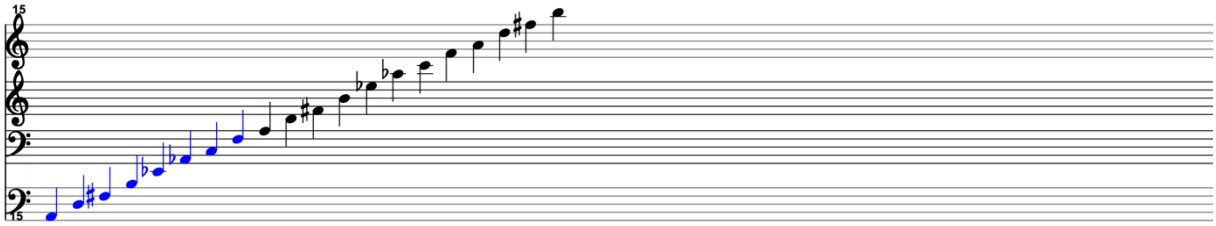
Arp 2/3 = (4J 3m 3M 3m) x 4 (puis octaviant) (8 sons)



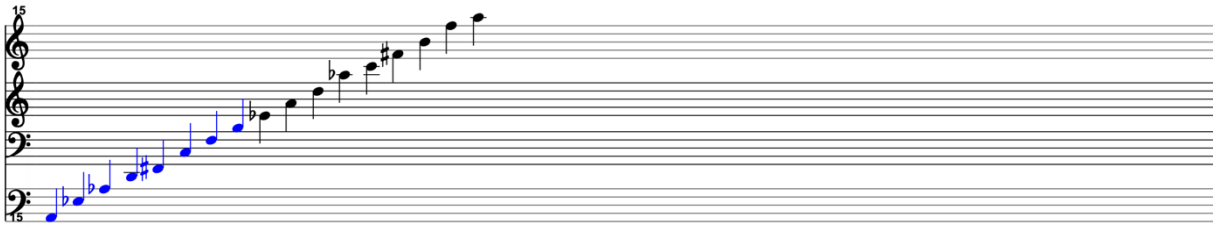
Arp 2/4 = (4+ 3m) x 4 (4 sons ± accord de 7ème diminuée)



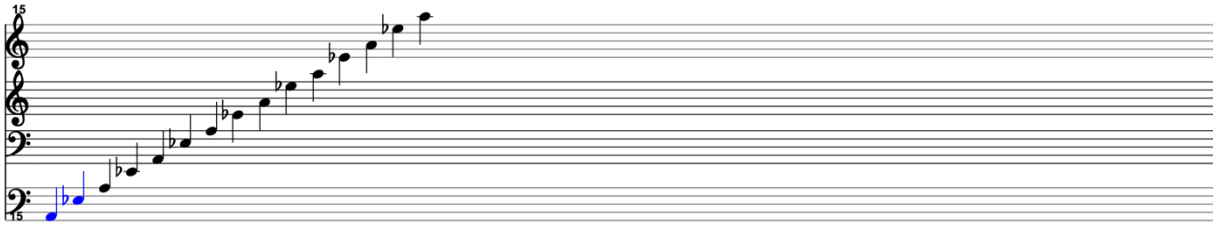
Arp 3/3 = (4J 3M) x 4 (8 sons in a row)



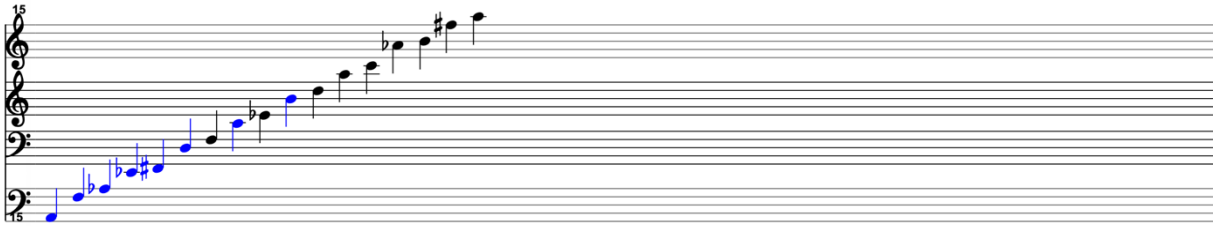
Arp 3/4 = (4+ 4J 4+ 3M) x 4 (sur toute la tessiture) (8 sons in a row)



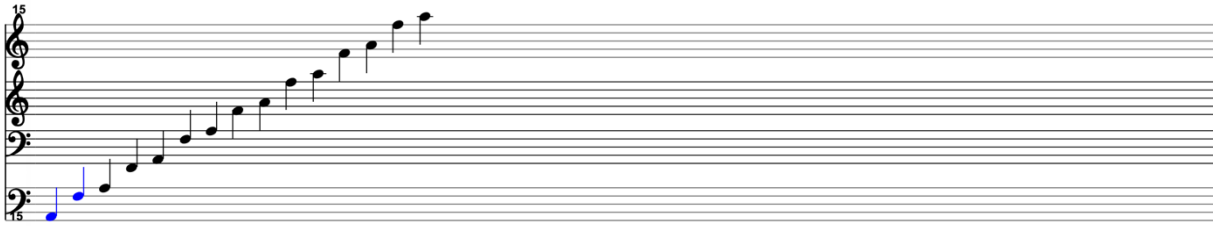
Arp 4/4 = 4+ (2 sons)



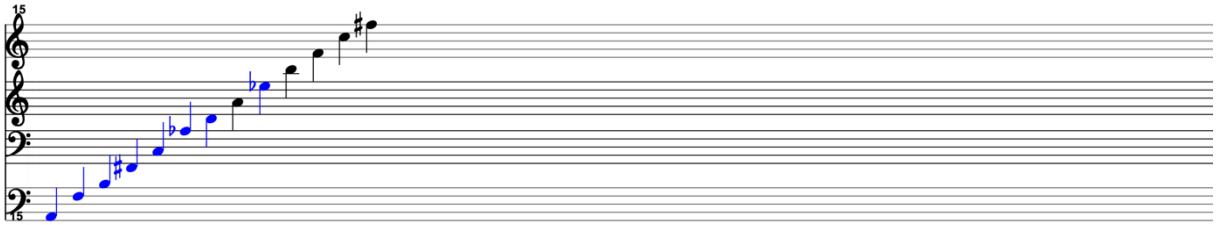
Arp 2/5 = (6m 3m 5J 3m) x 4 sur toute la tessiture (8 sons)



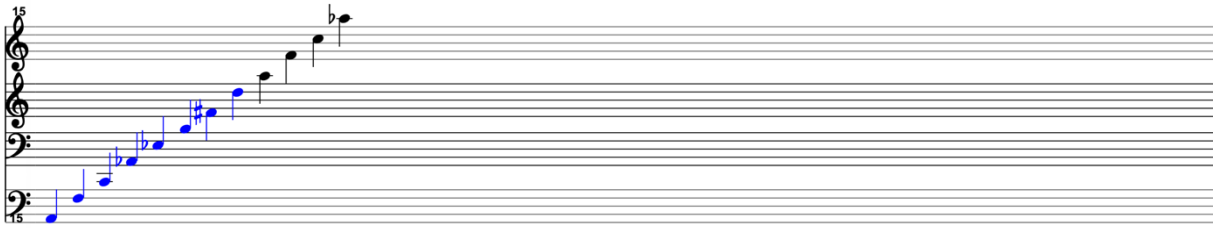
Arp 3/5 = 6m 3M (2 sons)



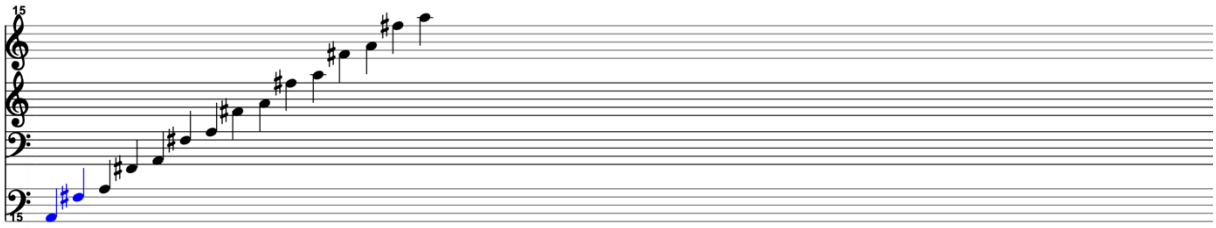
Arp 4/5 = (6m 4+ 5J 4+) x 3 puis hors tessiture (8 sons)



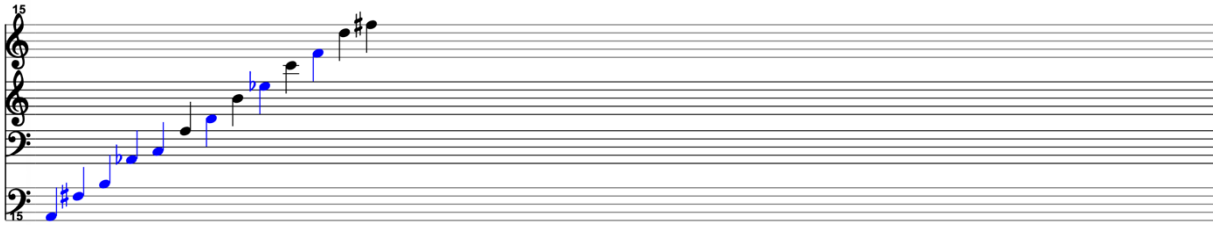
Arp 5/5 = (6m 5J) x 4 (8 sons in a row)



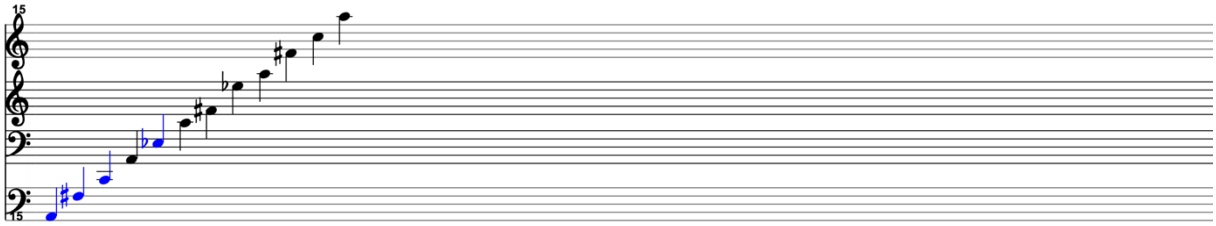
Arp 2/6 = 6M 3m (puis octaviant) (2 sons)



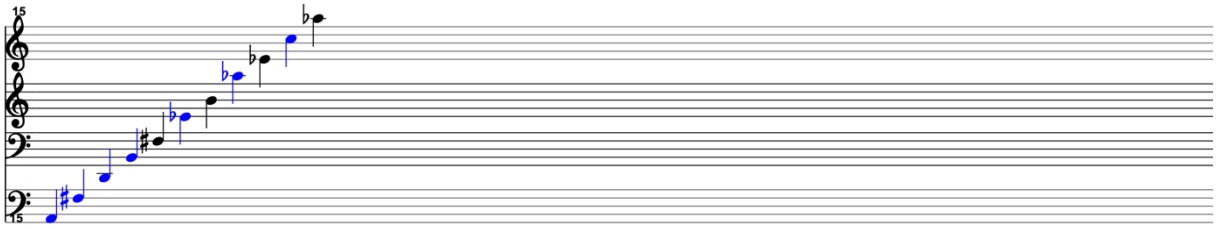
Arp 3/6 = (6M 4J 6M 3M) x 3 puis hors tessiture (8 sons)



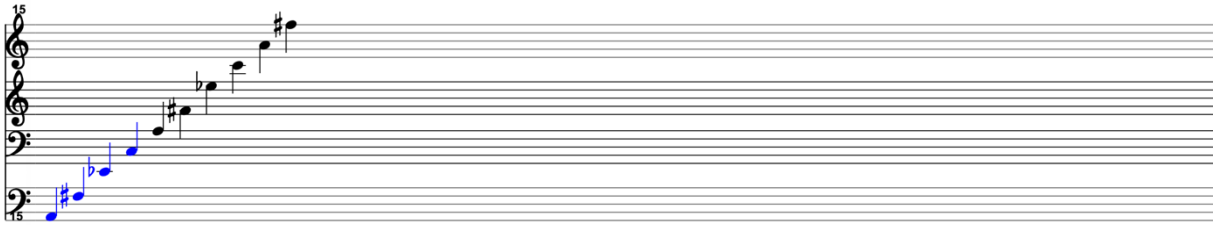
Arp 4/6 = (6M 4+) x 4 (puis octaviant) (4 sons, ± accord de 7ème diminuée)



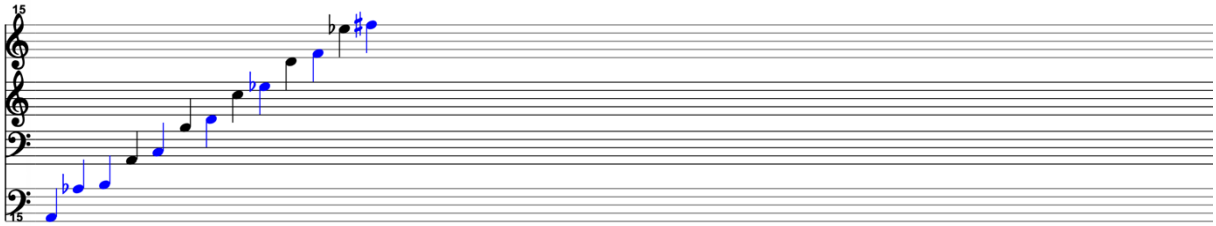
Arp 5/6 = 6M6m6M5J x 2,5 (7 sons puis hors tessiture)



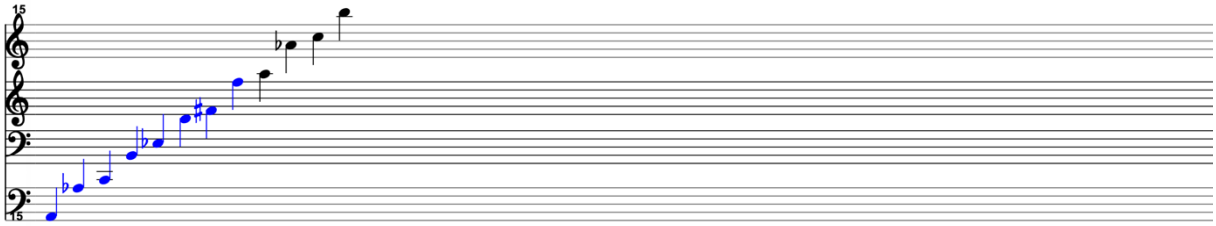
Arp 6/6 (4 sons, ± accord de 7ème diminuée)



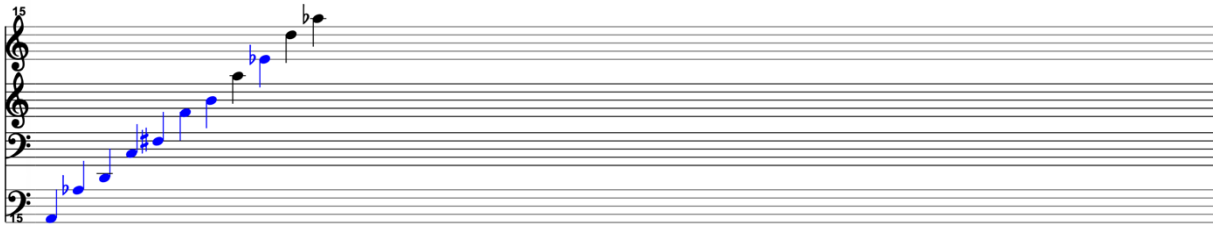
Arp 2/7 (7M3m7m3m x 3) (8 sons)



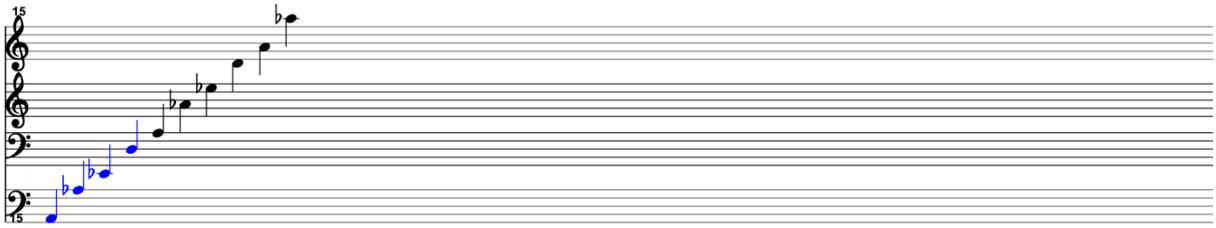
Arp 3/7 (7M3M x 5,5) (8 sons in a row)



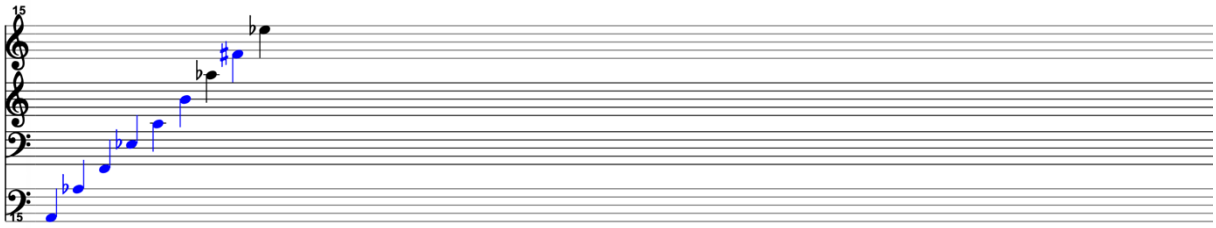
Arp 4/7 (7M4+7m4+ x 2,5) (8 sons)



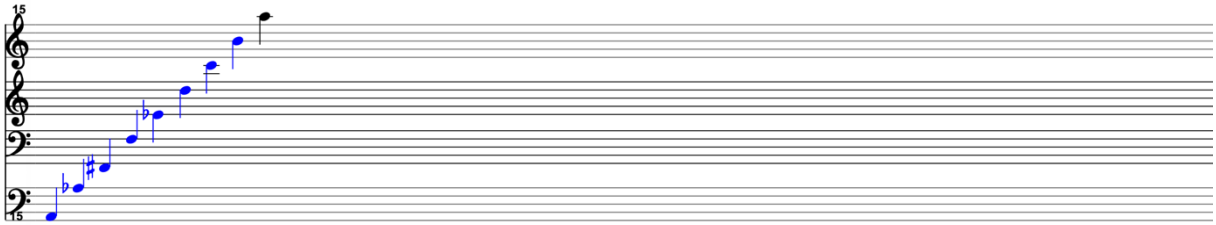
Arp 5/7 (4 sons)



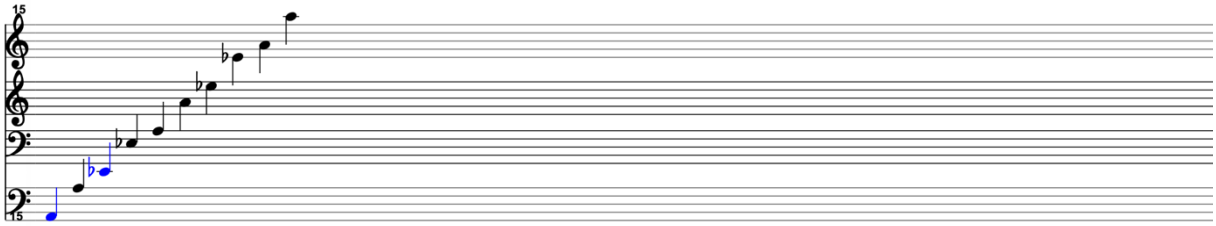
Arp 6/7 (7M6M7m6M x 2) (7 sons)



Arp 7/7 (8 sons in a row)



Arp 4/8 (8J4+) (2 sons)



Arp 8/8 = octaves

Modéchelle 3 (Messiaen 3)

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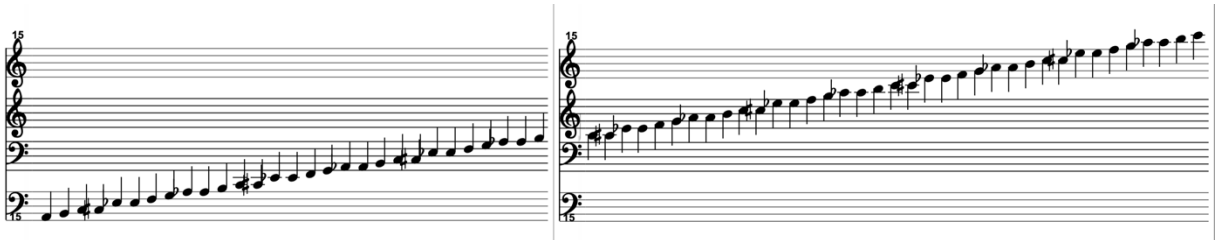
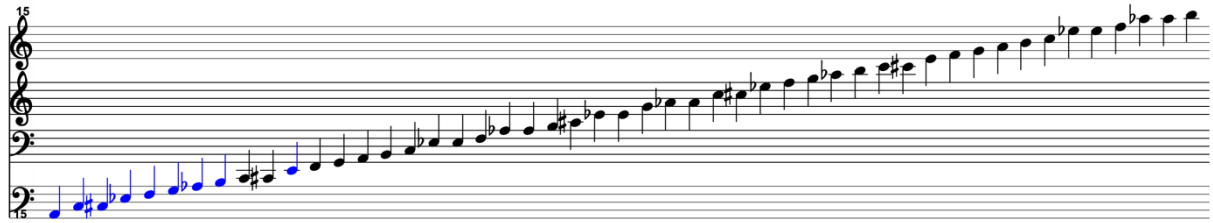
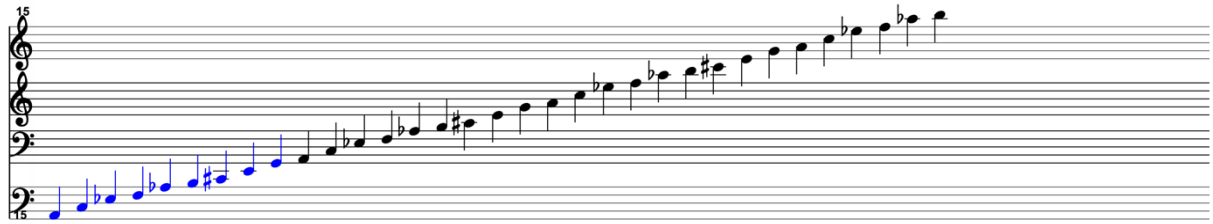
(3M / 9 sons / octaviant / 2 permutations / 3 transpositions)



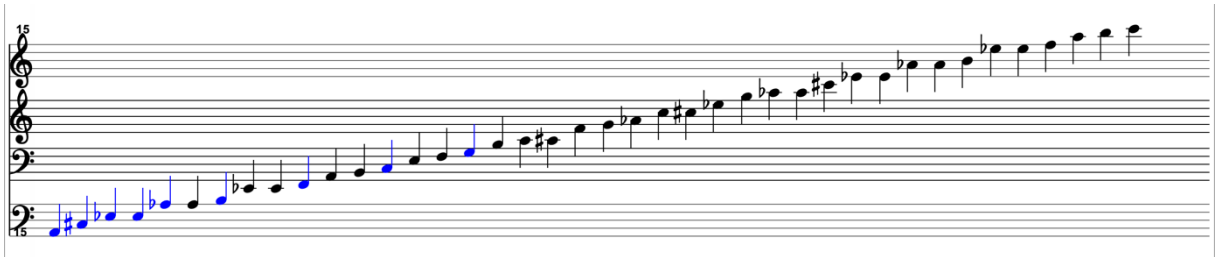
Arp 1/2 (9 sons = 8 in a row + 1)



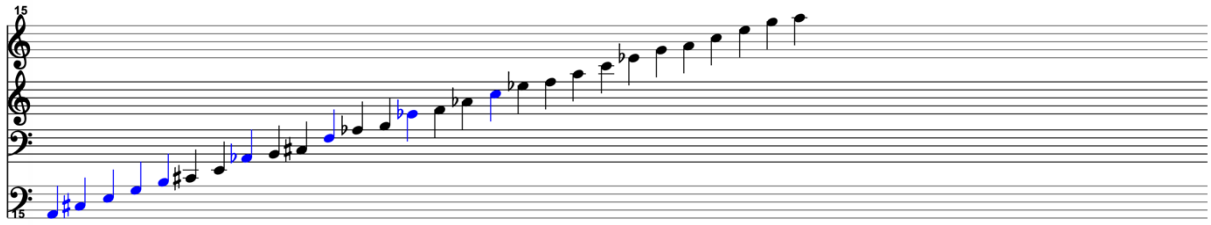
Arp 2/2 (9 sons in a row)



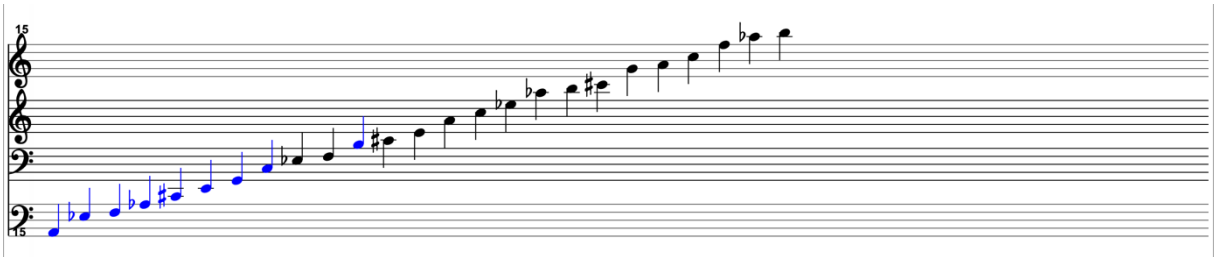
Arp 1/3 (9 sons)



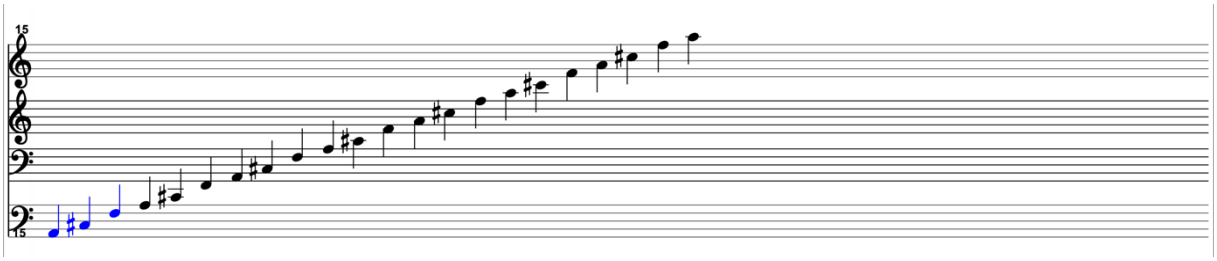
Arp 2/3 (9 sons)



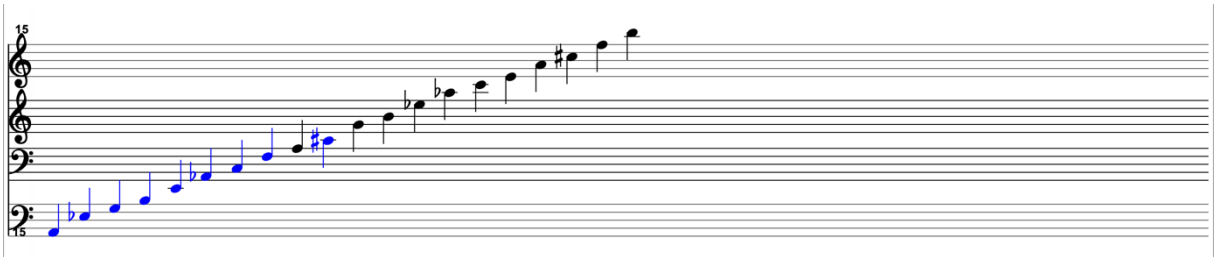
Arp 2/4 (9 sons = 8 in a row + 1)



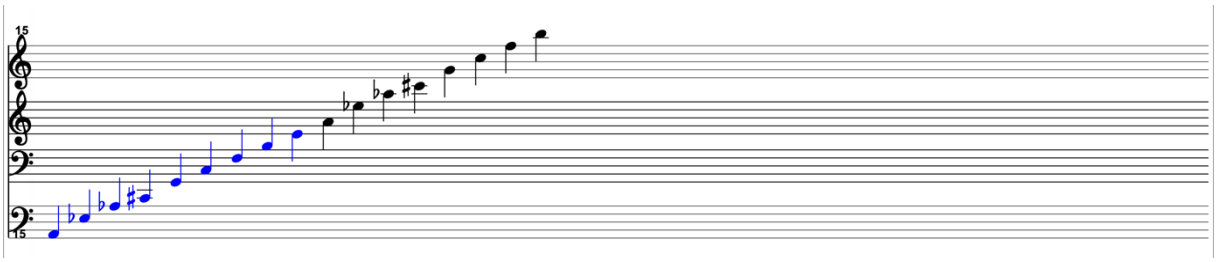
Arp 3/3 (3 sons, accord 5+)



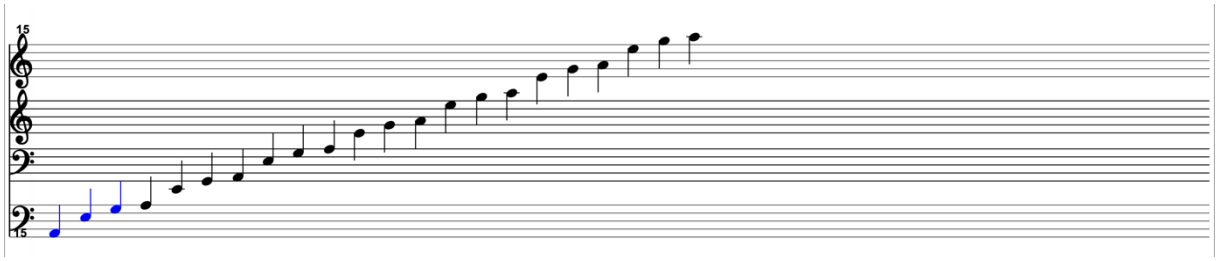
Arp 3/4 (9 sons = 8 in a row + 1)



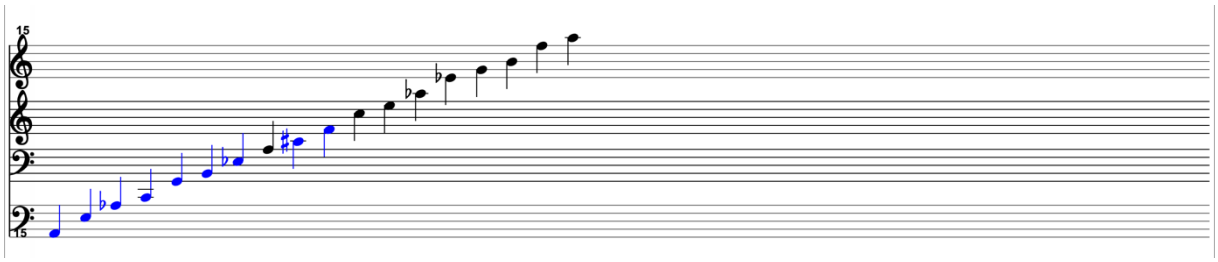
Arp 4/4 (9 sons in a row)



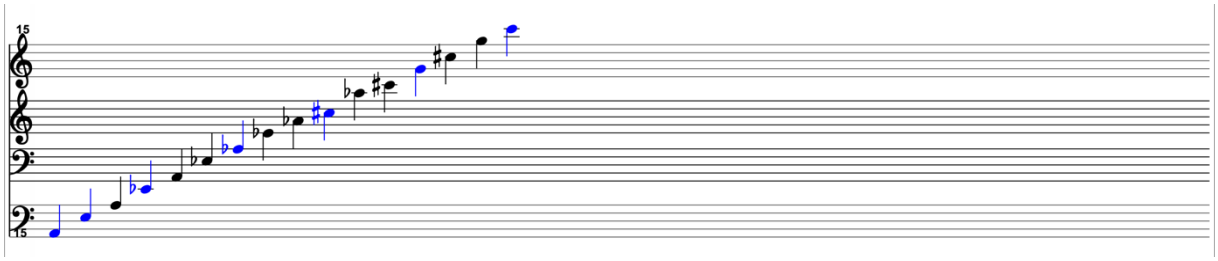
Arp 2/5 (5J3m2M, 3 sons)



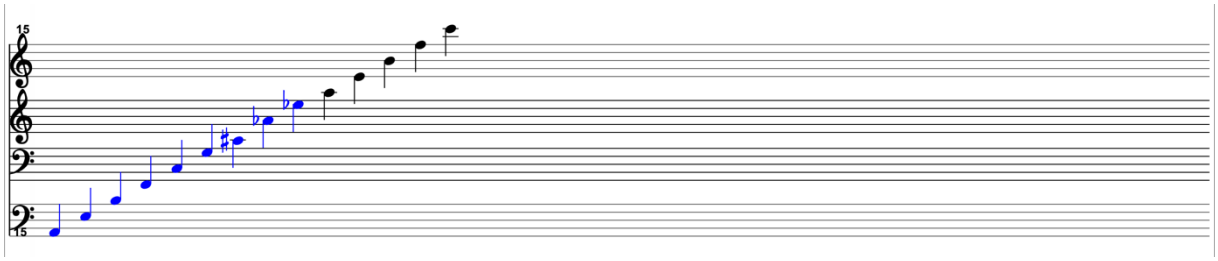
Arp 3/5 (9 sons = 7 in a row + 2)



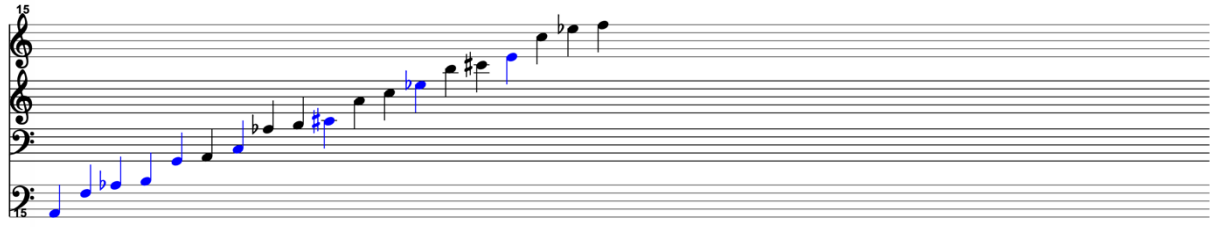
Arp 4/5 (7 sons)



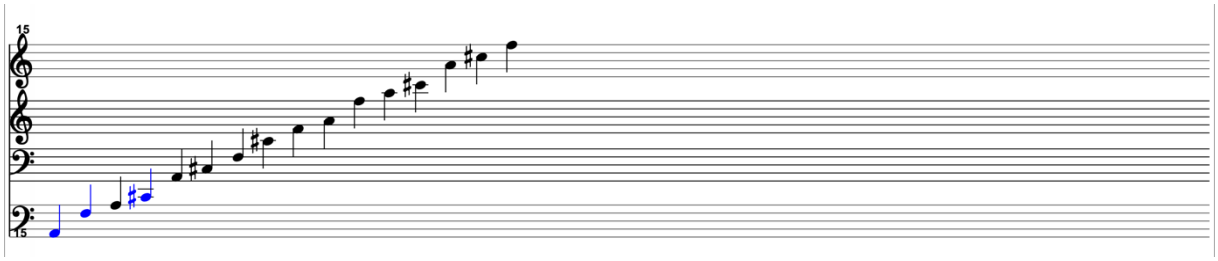
Arp 5/5 (9 sons in a row)



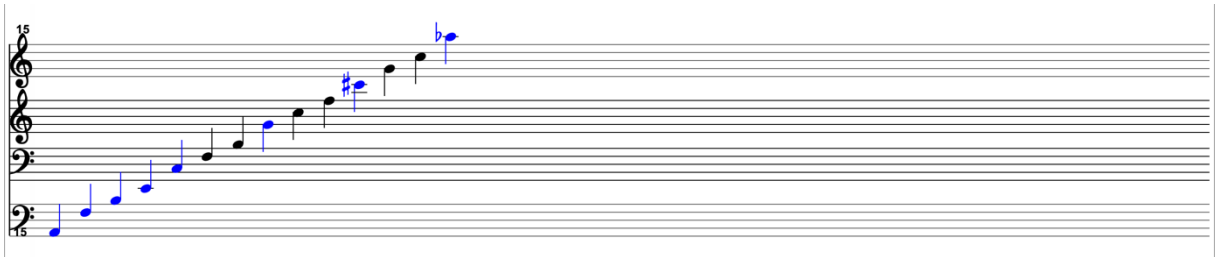
Arp 2/6 (9 sons)



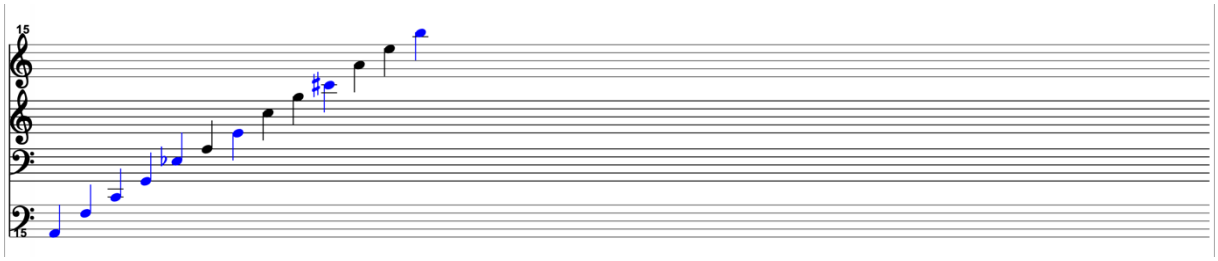
Arp 3/6 (6m3M3M, 3 sons)



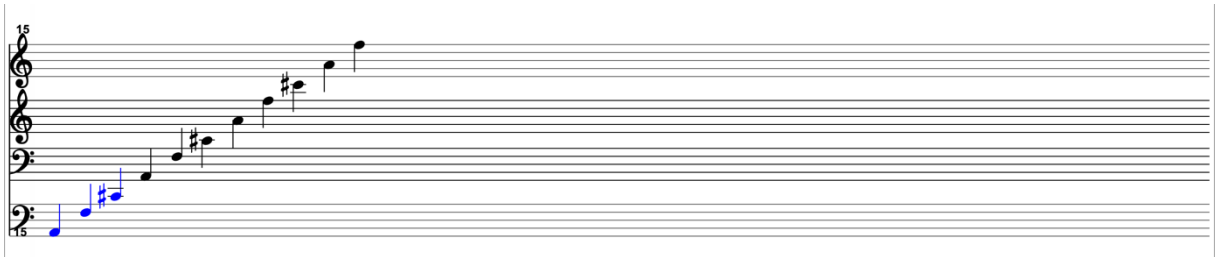
Arp 4/6 (8 sons)



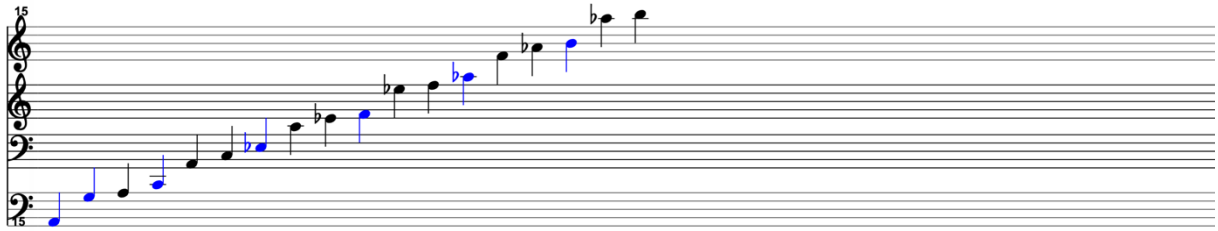
Arp 5/6 (8 sons)



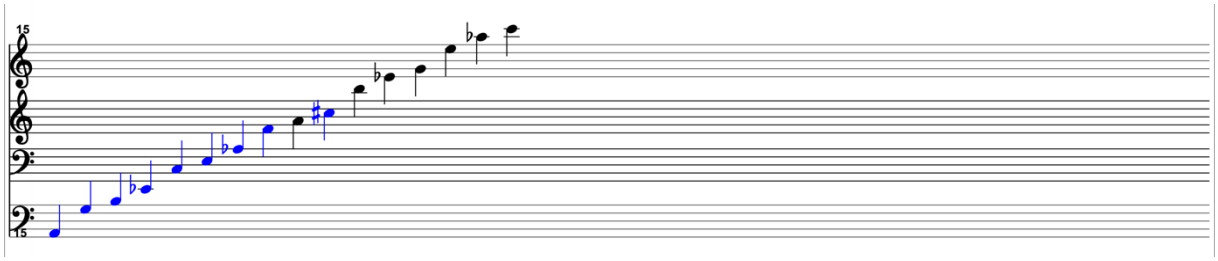
Arp 6/6 (6m, 3 sons)



Arp 2/7 (7 sons)

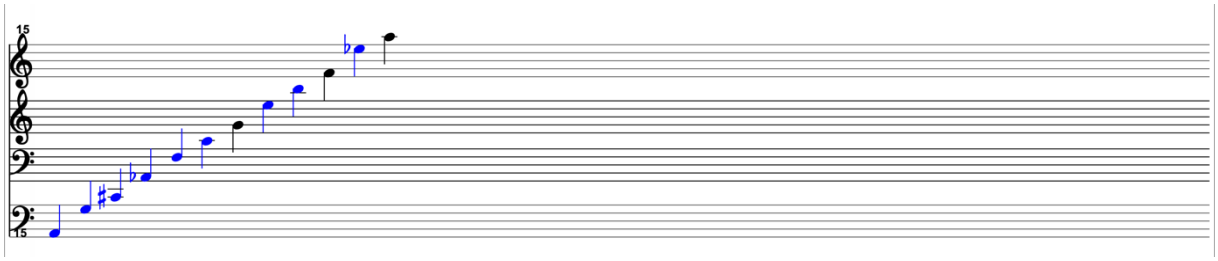


Arp 3/7 (9 sons = 8 in a row + 1)



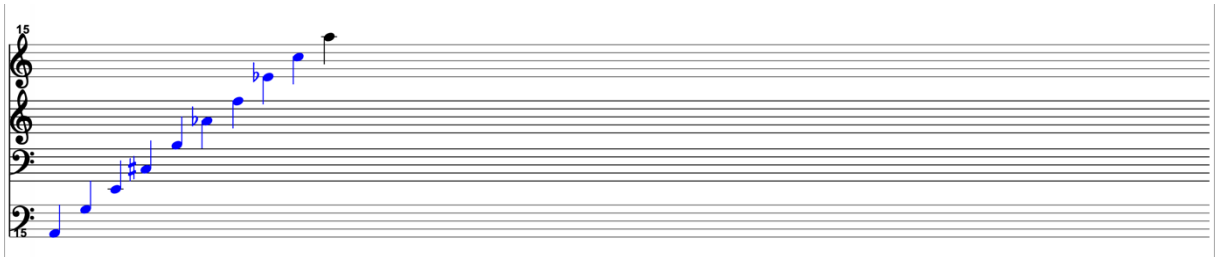
Arp 4/7 (9 sons in a row)

Arp 5/7 (9 sons)

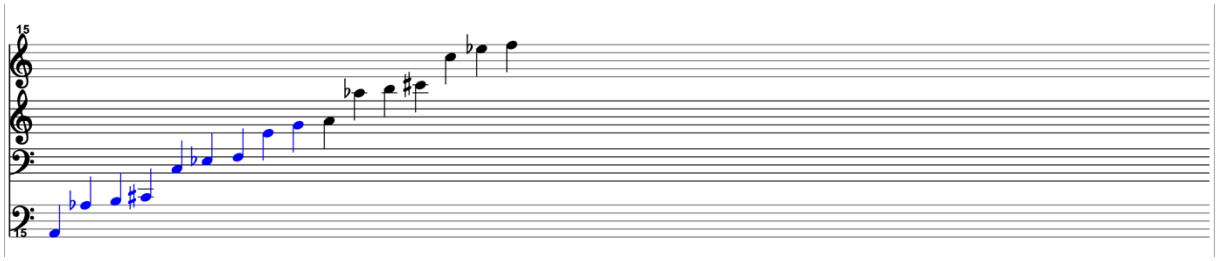


Arp 6/7 (9 sons = 7 in a row + 2)

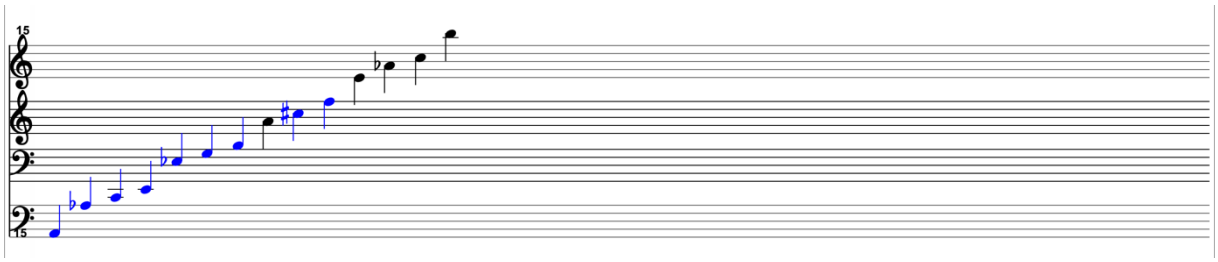
Arp 7/7 (9 sons in a row)



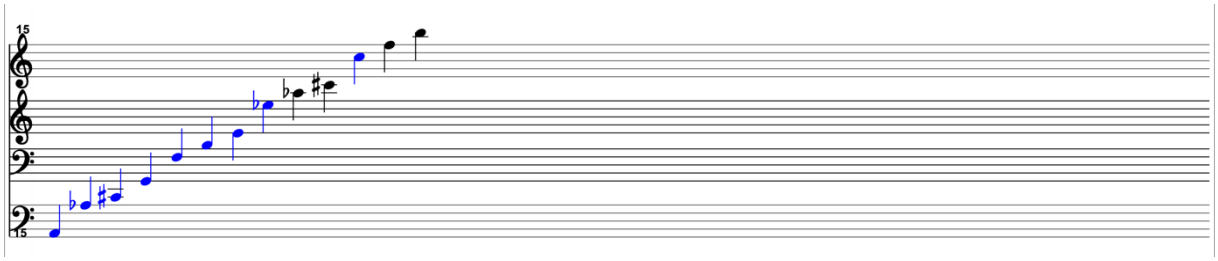
Arp 2/8 (9 sons in a row)



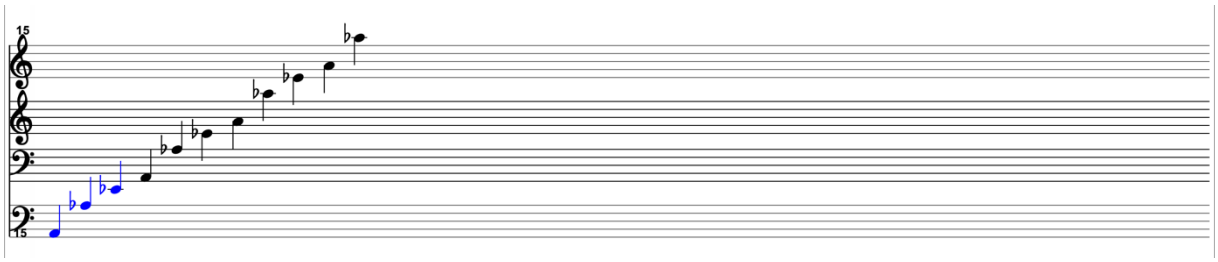
Arp 3/8 (9 sons = 7 in a row + 2)



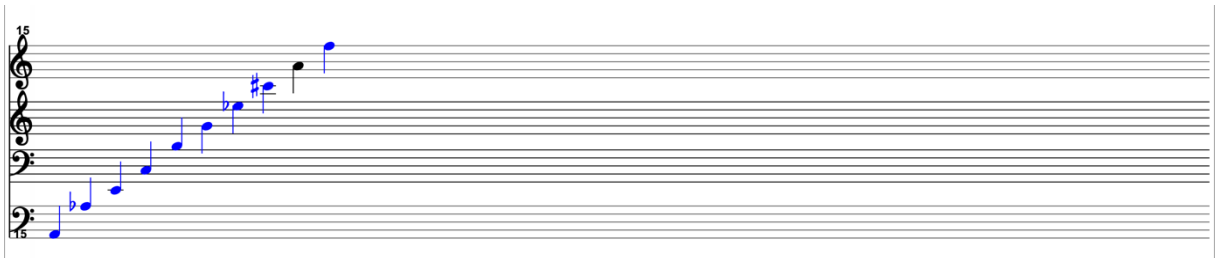
Arp 4/8 (9 sons = 8 in a row + 1)



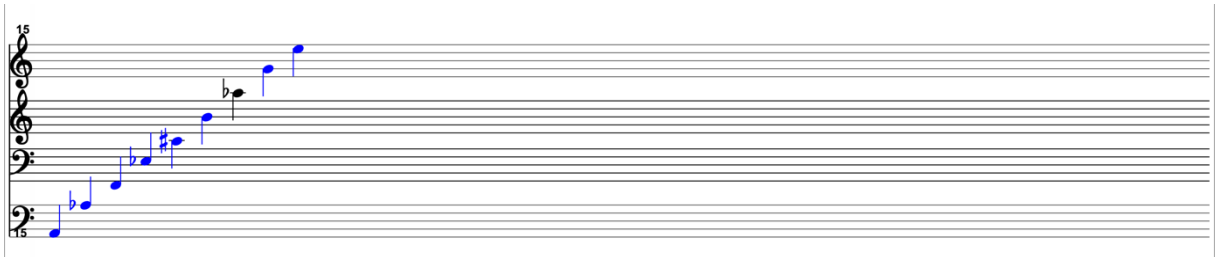
Arp 5/8 (7M5J4+, 3 sons)



Arp 6/8 (9 sons = 8 in a row + 1)

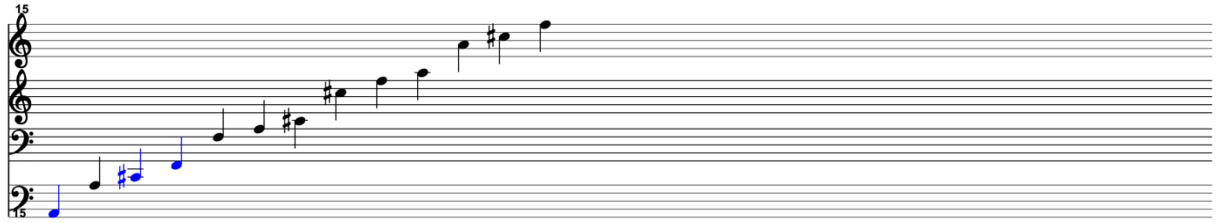


Arp 7/8 (8 sons)

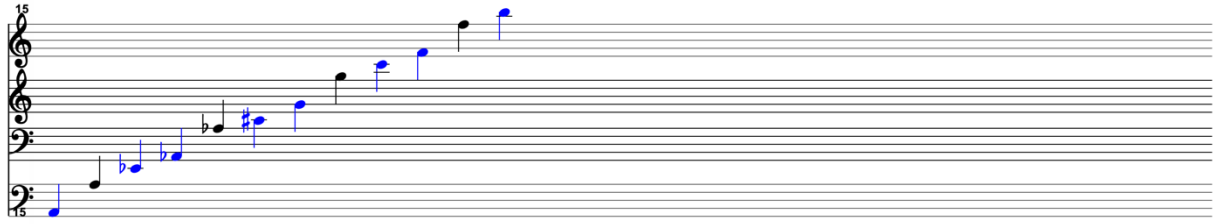


Arp 8/8 (9 sons)

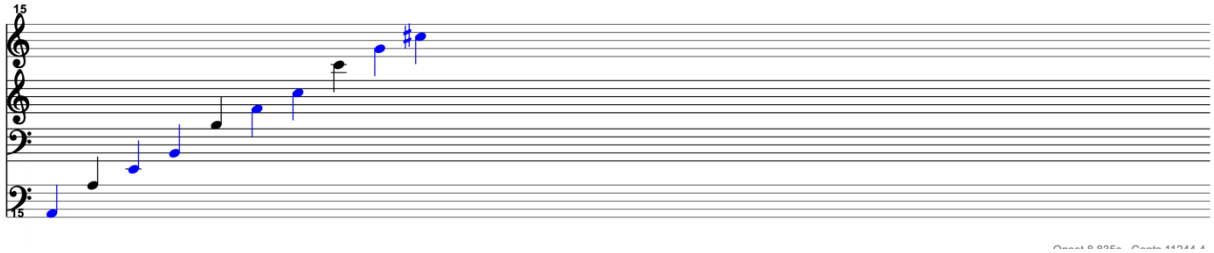
Arp 3/9 (3 sons)



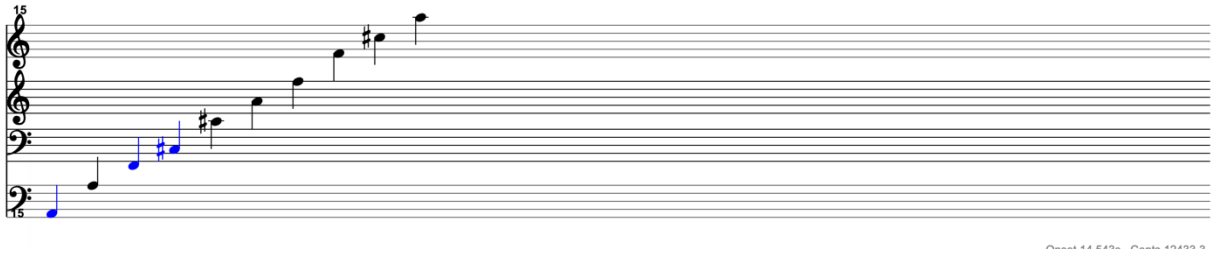
Arp 4/9 (8 sons)



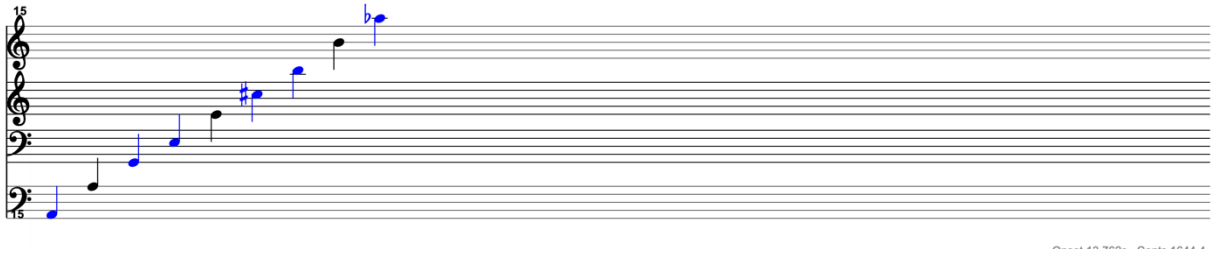
Arp 5/9 (7 sons)



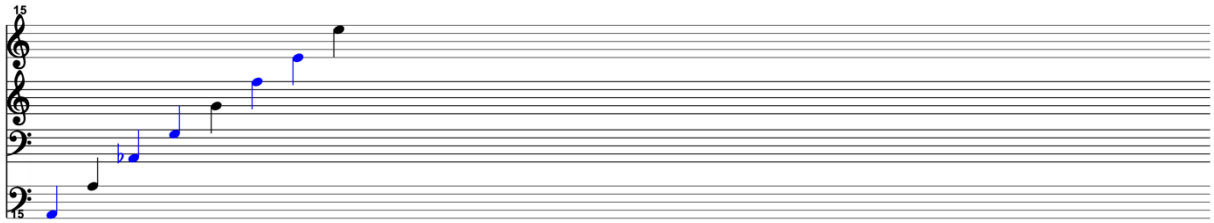
Arp 6/9 (3 sons)



Arp 7/9 (6 sons)



Arp 8/9 (5 sons)



Arp 9/9 = octaves

Modéchelle 4 (crétique)

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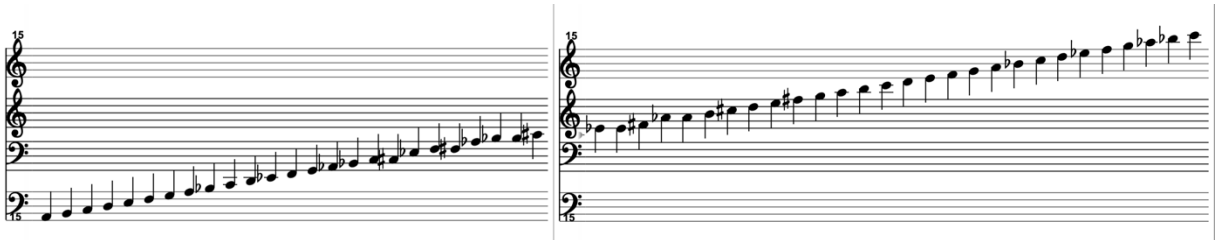
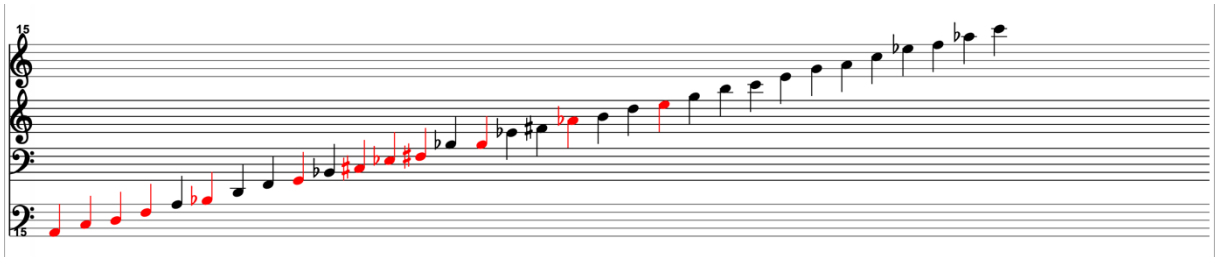
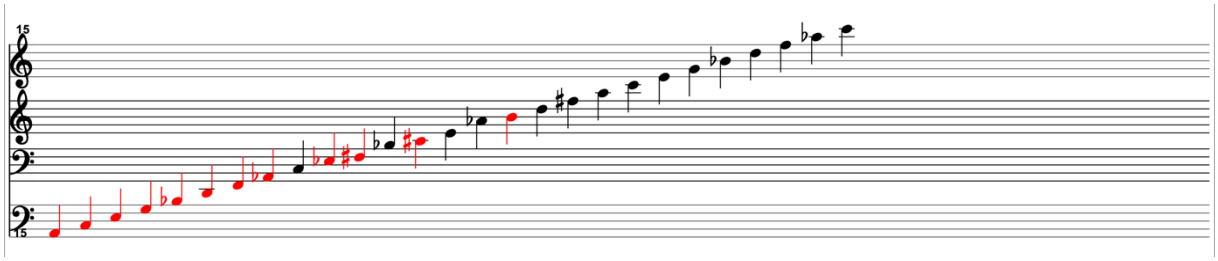
(4J / 7 à 12 sons / 5 octaves / 2 permutations / 4 transpositions)



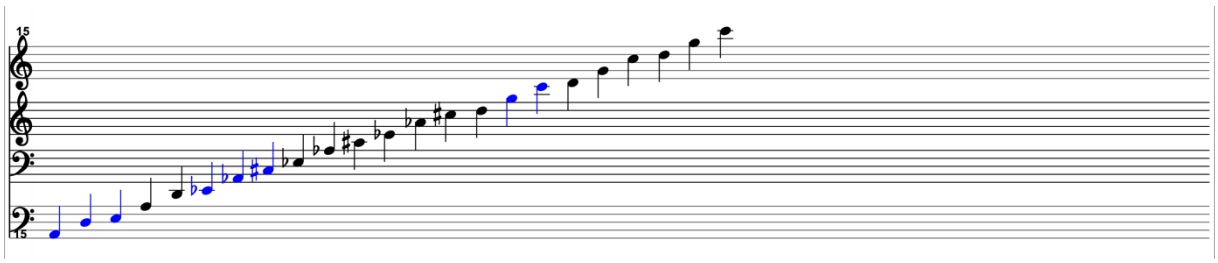
Arp 1/2 (12 sons)



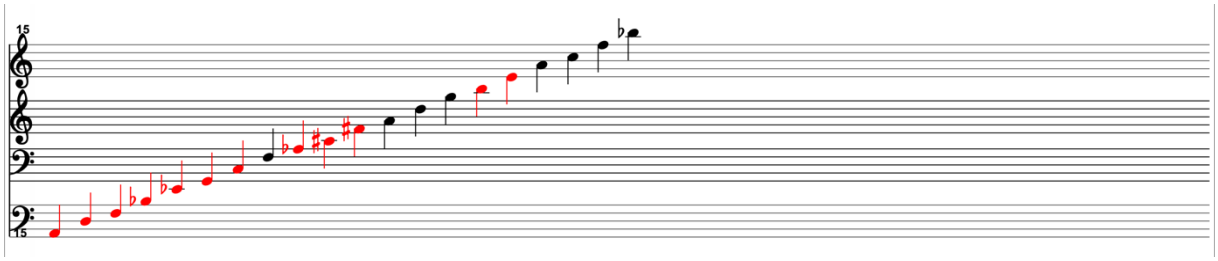
Arp 2/2 (12 sons)



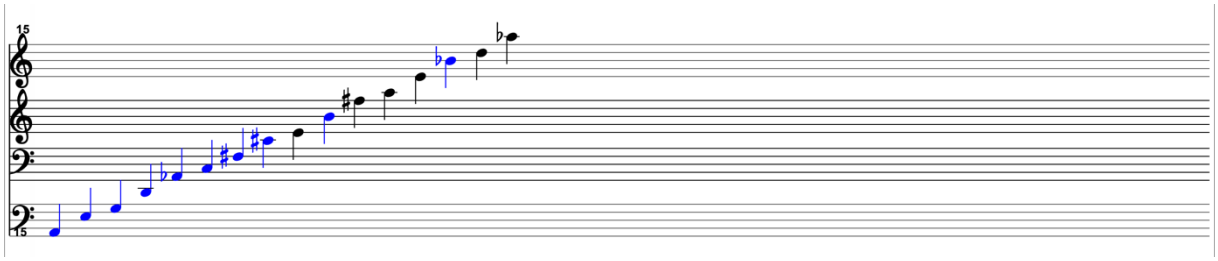
Arp 1/3 (8 sons)



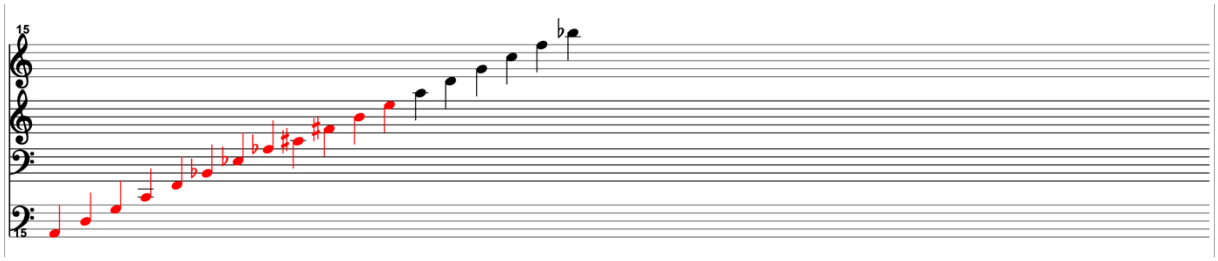
Arp 2/3 (12 sons)



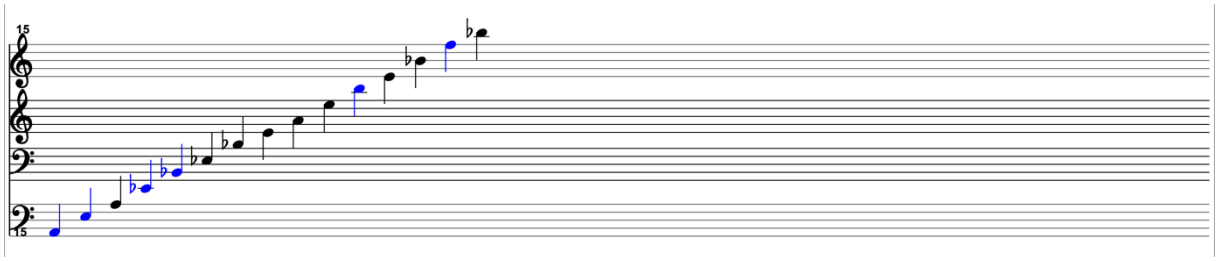
Arp 2/4 (10 sons)



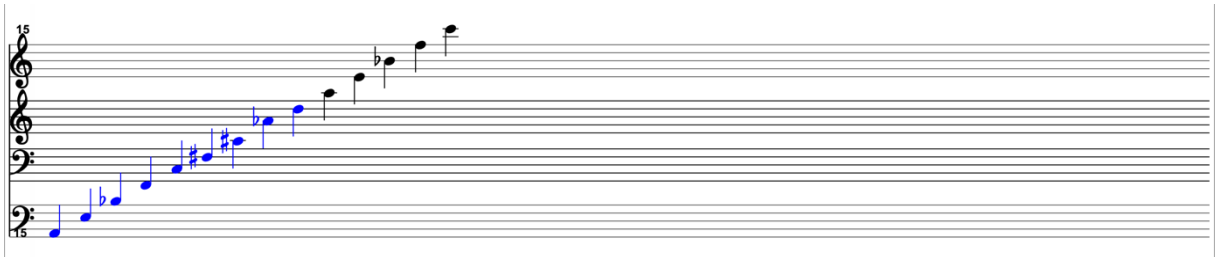
Arp 3/3 (12 sons in a row)



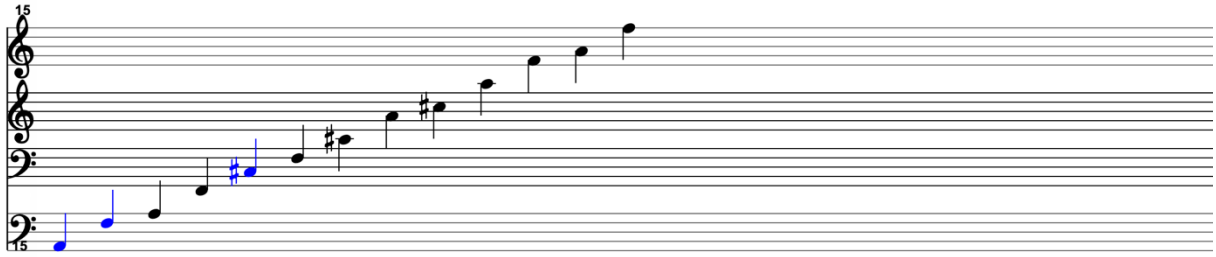
Arp 3/4 (6 sons)



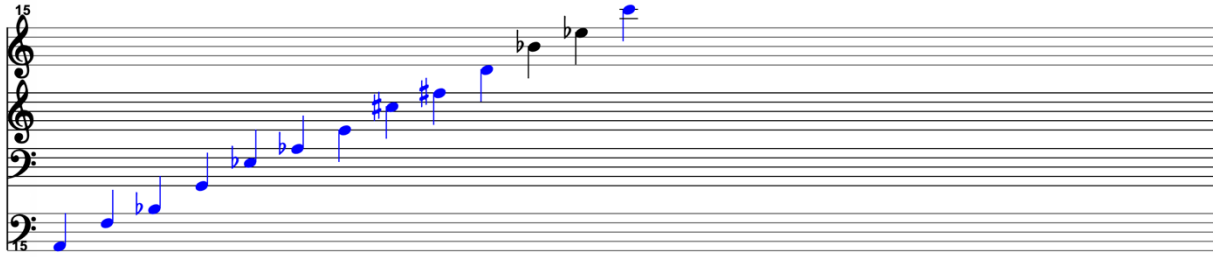
Arp 4/4 (9 sons in a row)



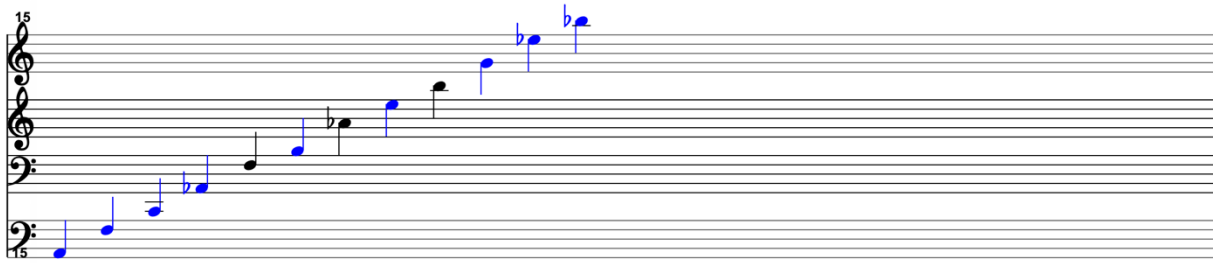
Arp 2/5 (6m3M6m, 3 sons)



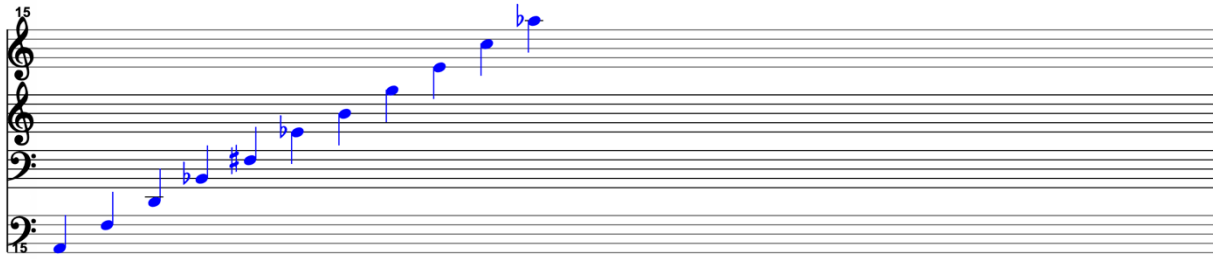
Arp 3/5 (11 sons = 10 in a row + 1)



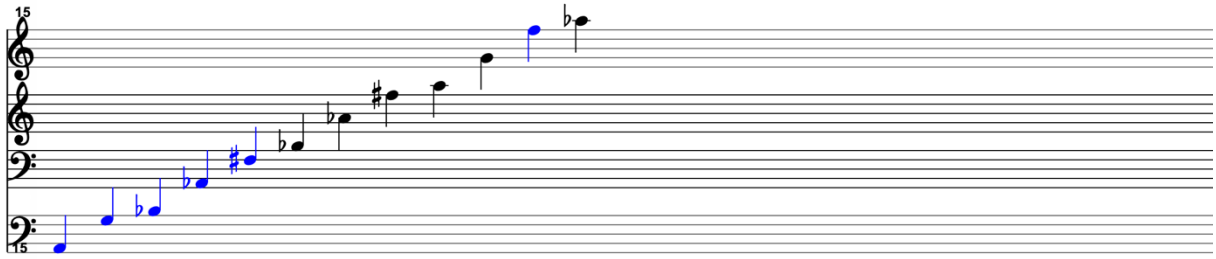
Arp 4/5 (8 sons)



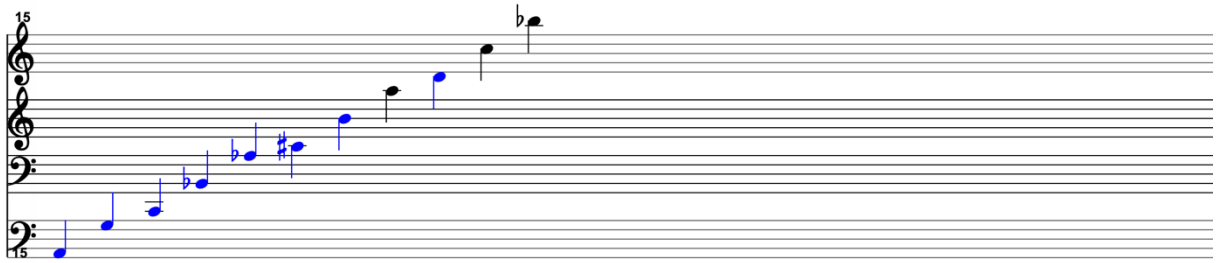
Arp 5/5 (11 sons in a row)



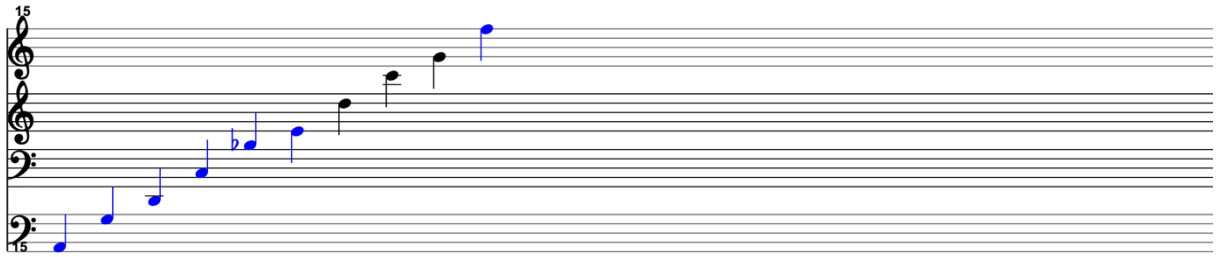
Arp 2/6 (6 sons = 5 in a row + 1)



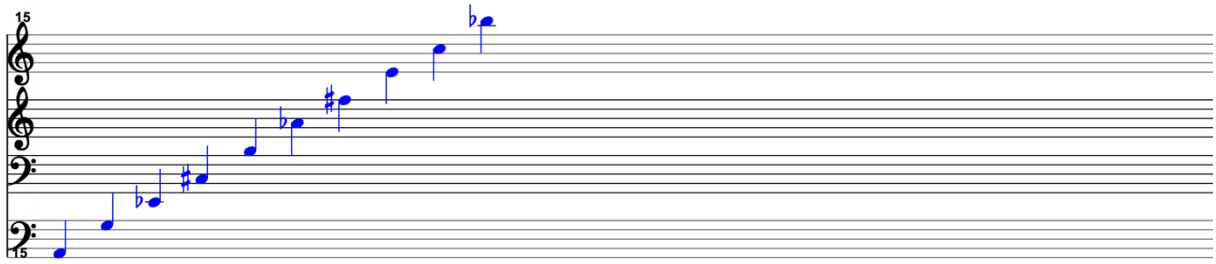
Arp 3/6 (8 sons = 7 in a row + 1)



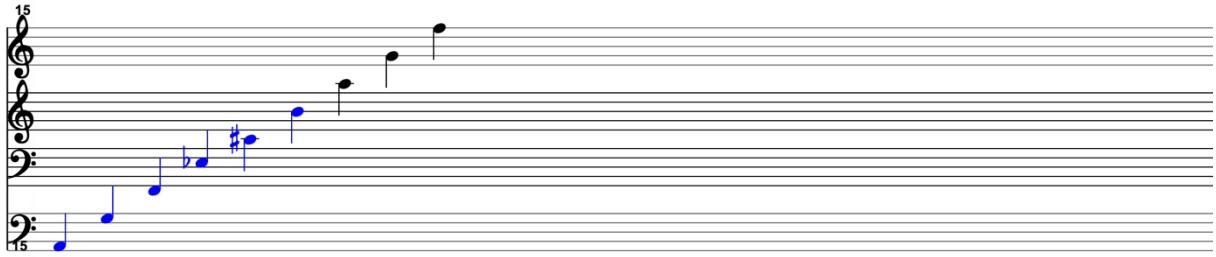
Arp 4/6 (7 sons = 6 in a row + 1)



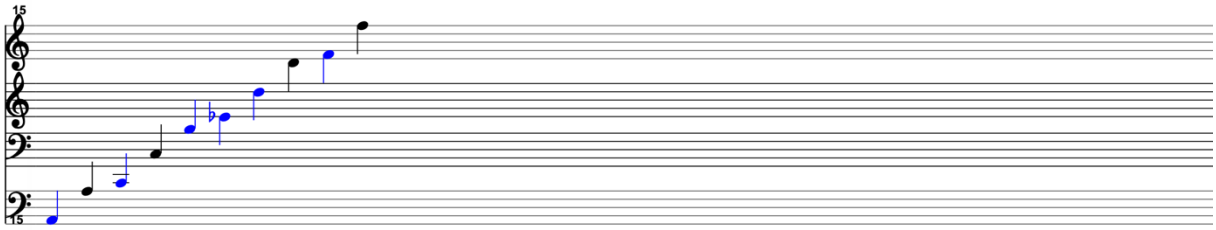
Arp 5/6 (10 sons in a row)



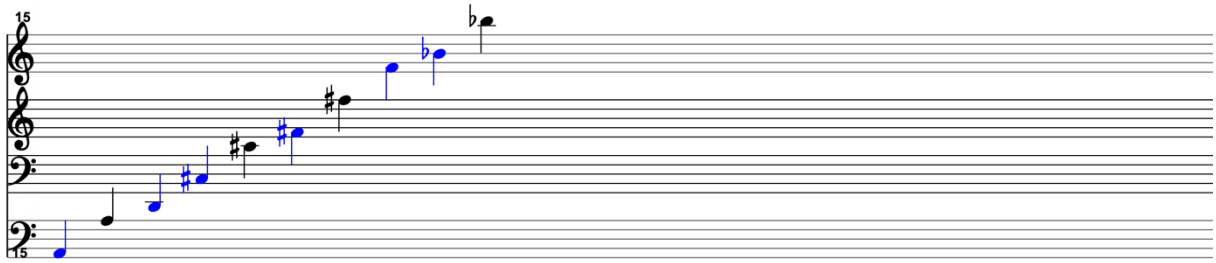
Arp 6/6 (6 sons in a row)



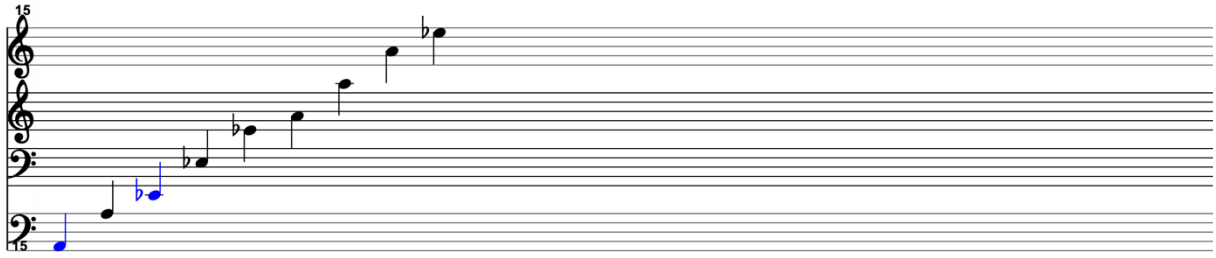
Arp 2/7 (7 sons)



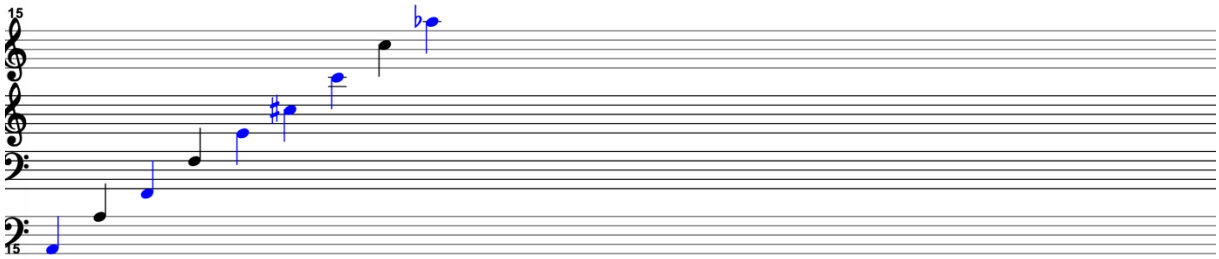
Arp 3/7 (6 sons)



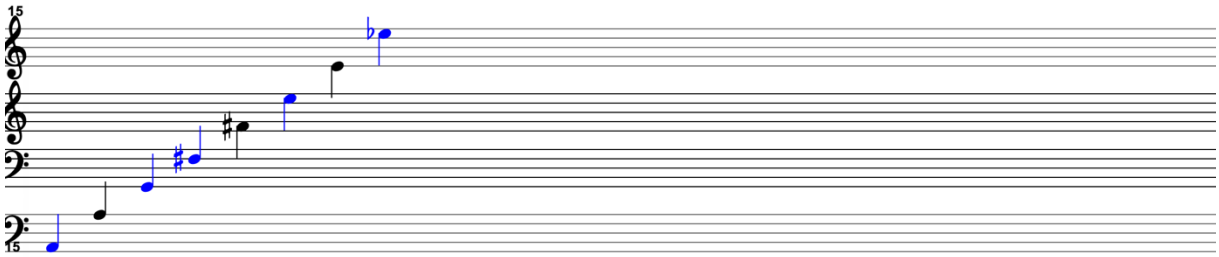
Arp 4/7 (8J4+8J, 2 sons)



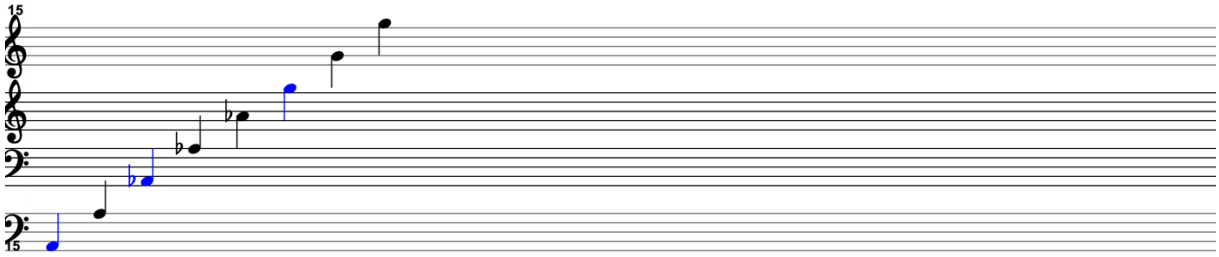
Arp 5/7 (6 sons)



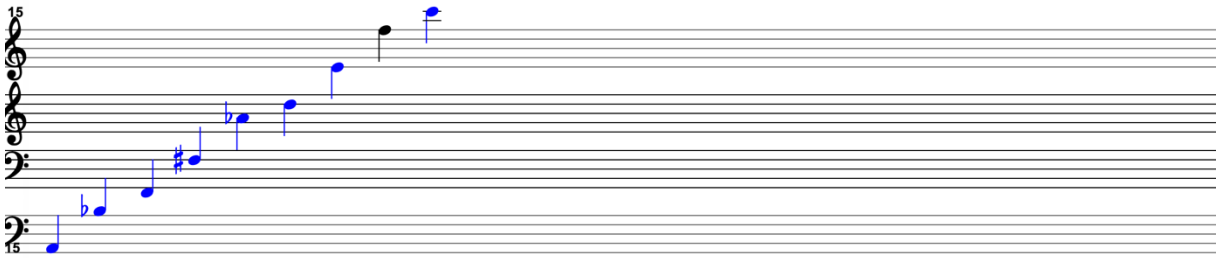
Arp 6/7 (5 sons)



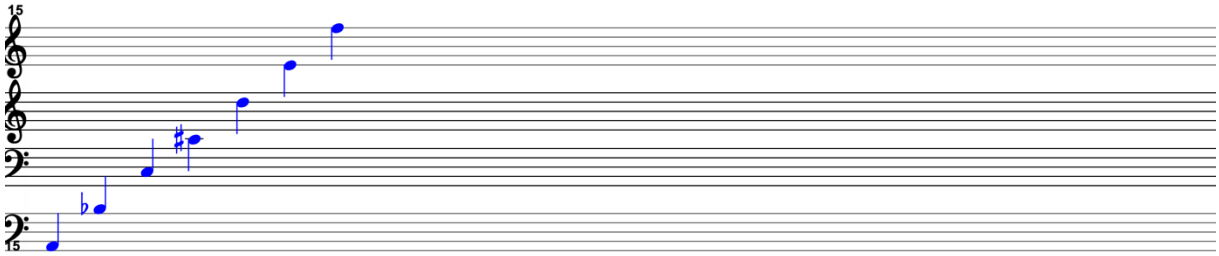
Arp 7/7 (8J7M8J, 3 sons, non octaviant quoiqu'échelle de 7 sons ab initio)



Arp 4/8 (8 sons = 7 in a row + 1, plus grand que l'octave car modéchelle de 7 sons ab initio)



Arp 8/8 (non octaviant, plus grand que l'octave car modéchelle de 7 sons ab initio)



Modéchelle 5 (Choriambe = Messiaen 6)

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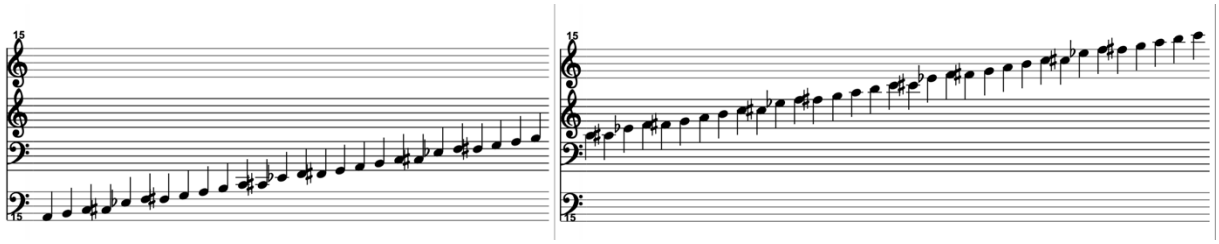
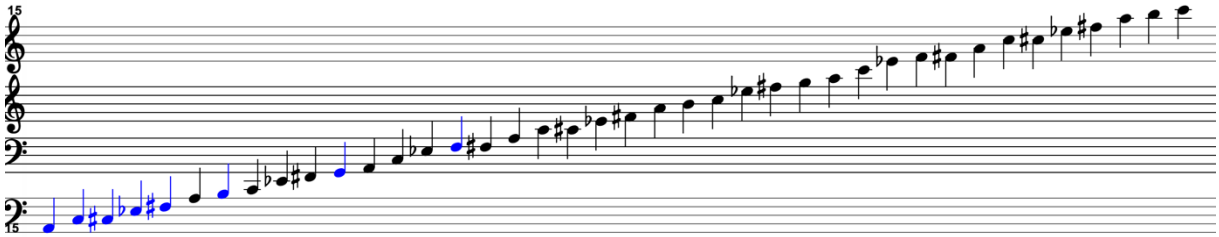
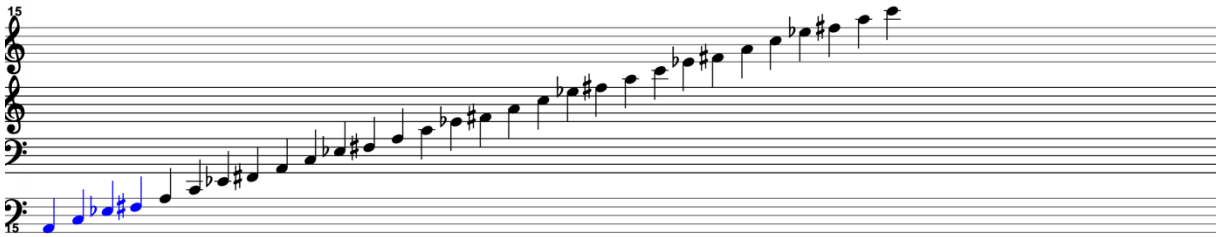
(4+ / 8 sons / octaviant / 3 permutations / 5 transpositions)



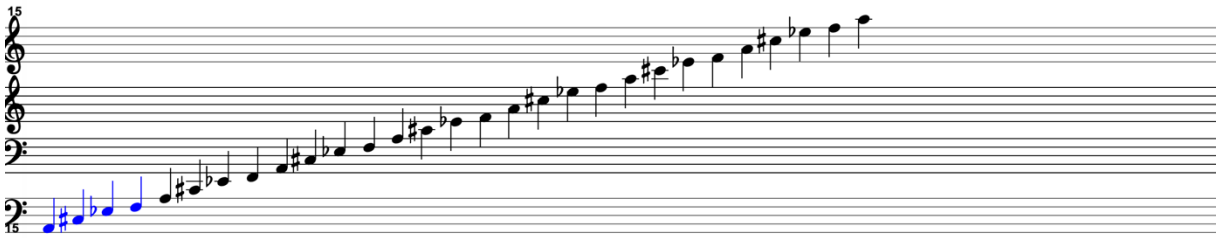
Arp 1/2 (8 sons)



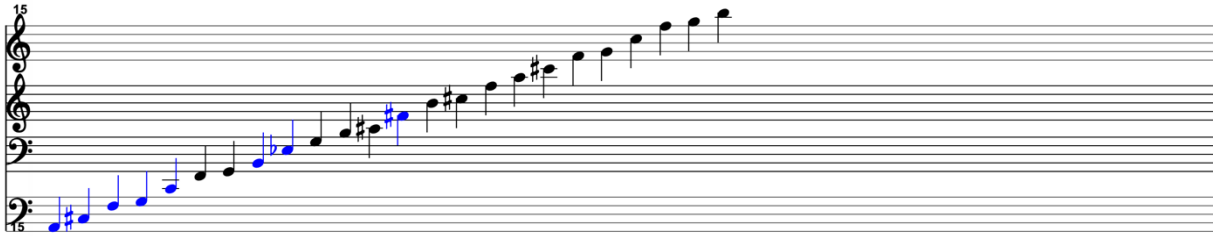
Arp 2/2 (4 sons, 7ème diminuée)



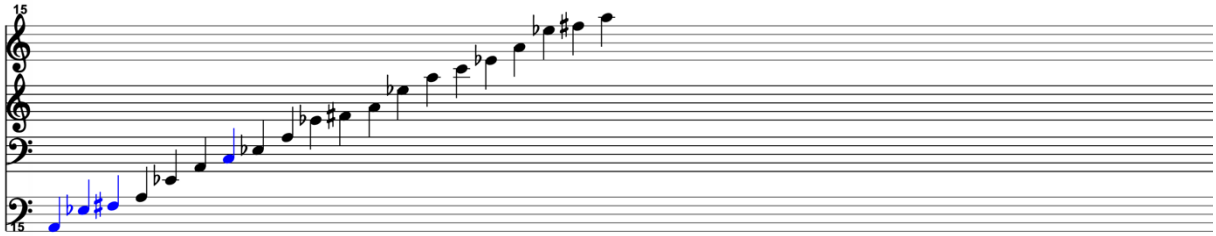
Arp 1/3 (3M2M2M3M, 4 sons)



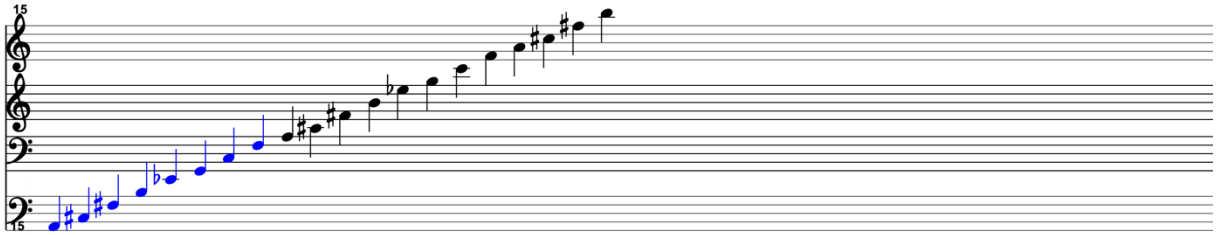
Arp 2/3 (8 sons)



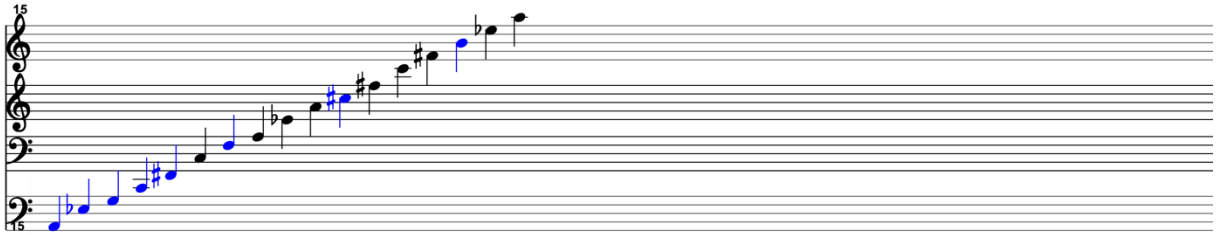
Arp 2/4 (4 sons, ± 7ème diminuée)



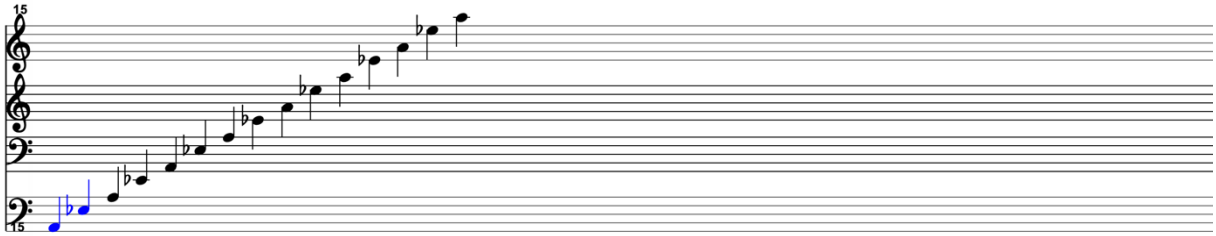
Arp 3/3 (8 sons in a row)



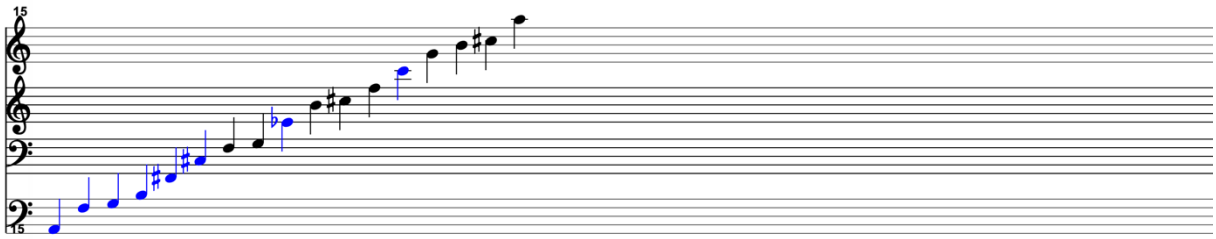
Arp 3/4 (8 sons)



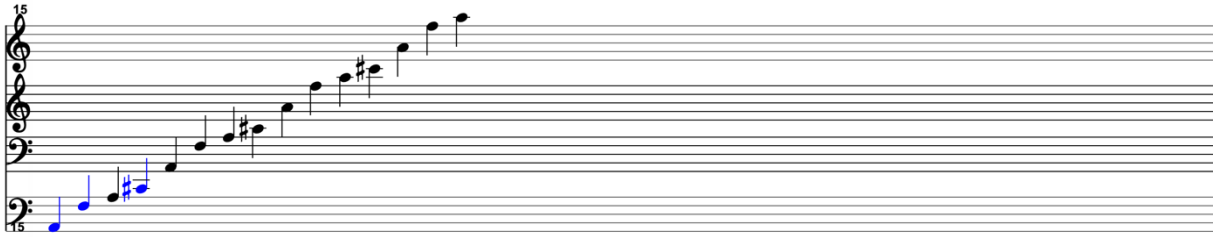
Arp 4/4 (4+, 2 sons)



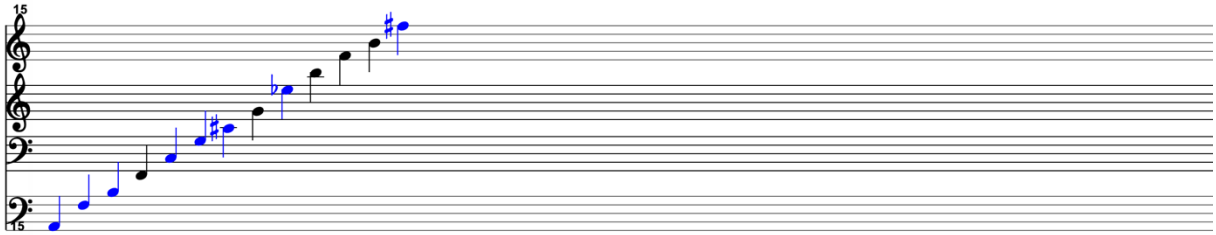
Arp 2/5 (8 sons)



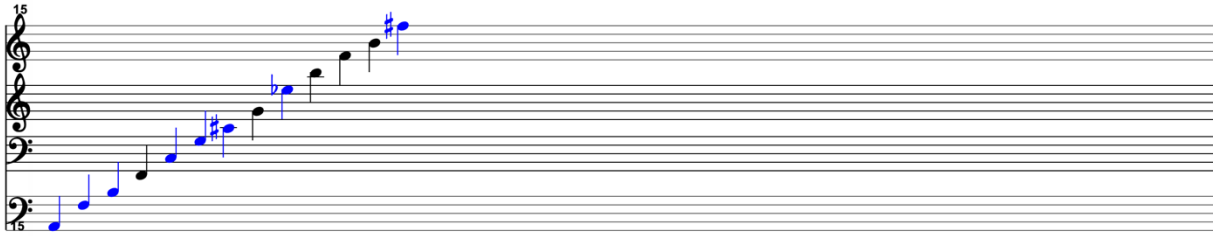
Arp 3/5 (6m3M3M6m, 3 sons)



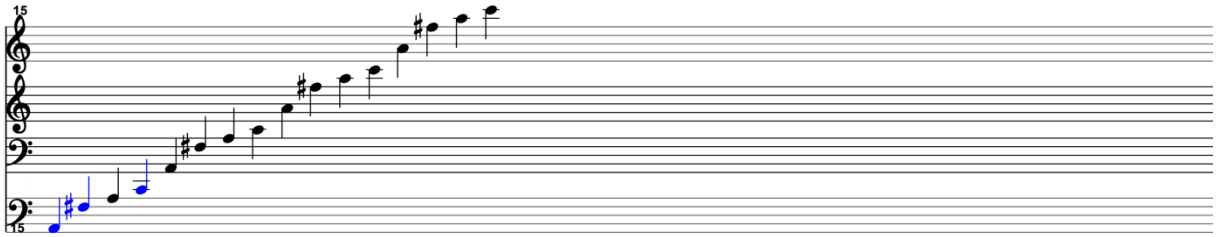
Arp 4/5 (8 sons)



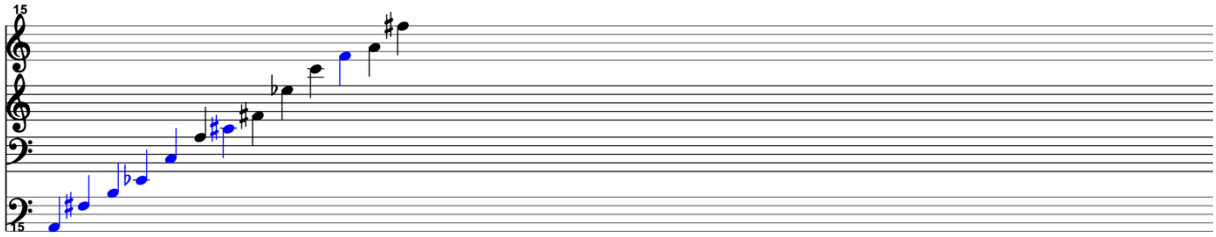
Arp 5/5 (8 sons)



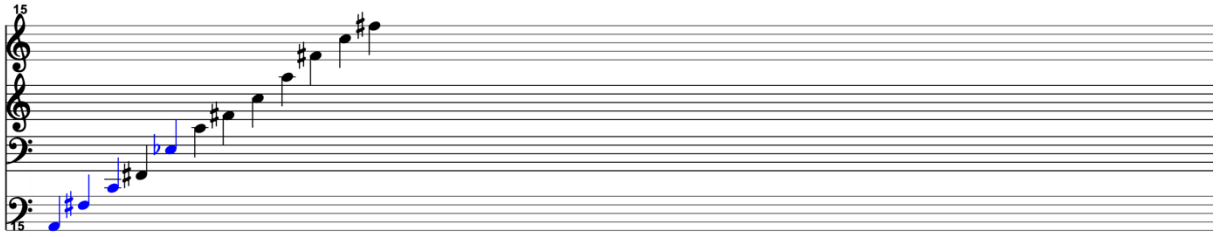
Arp 2/6 (6M3m3m6M, 3 sons)



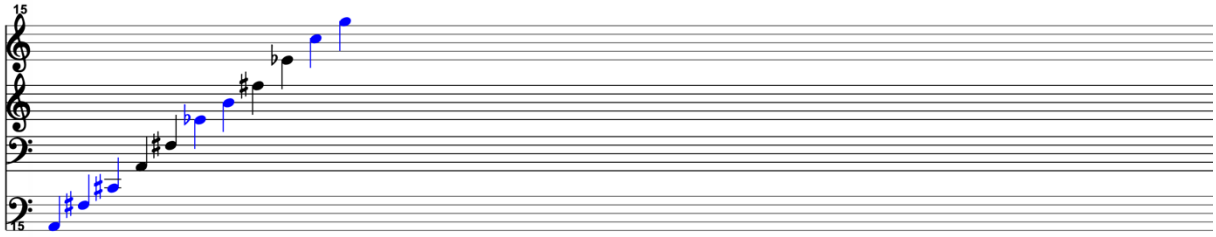
Arp 3/6 (7 sons)



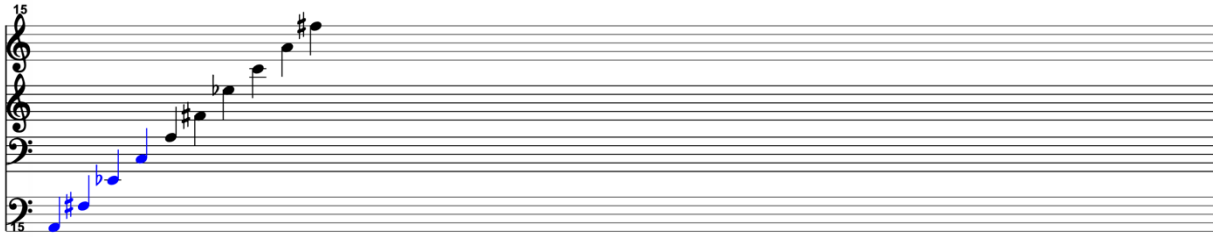
Arp 4/6 (4 sons, ± 7ème diminuée)



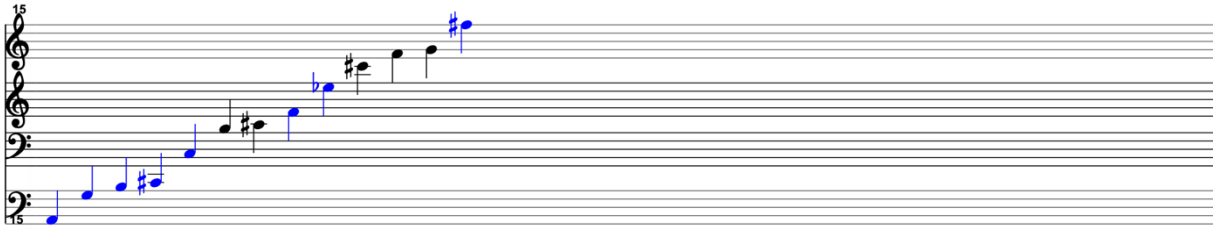
Arp 5/6 (7 sons)



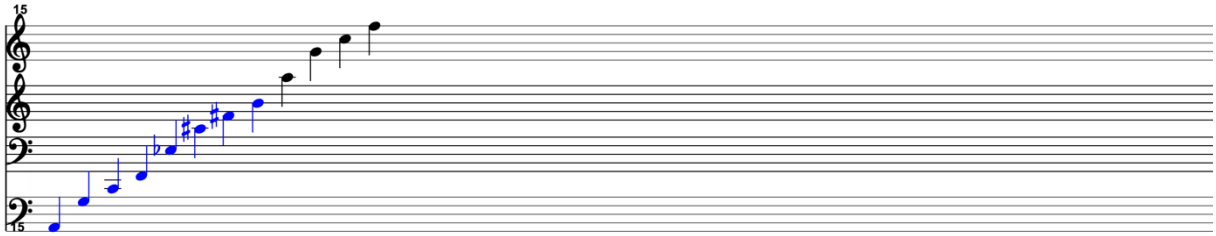
Arp 6/6 (4 sons, ± 7ème diminuée)



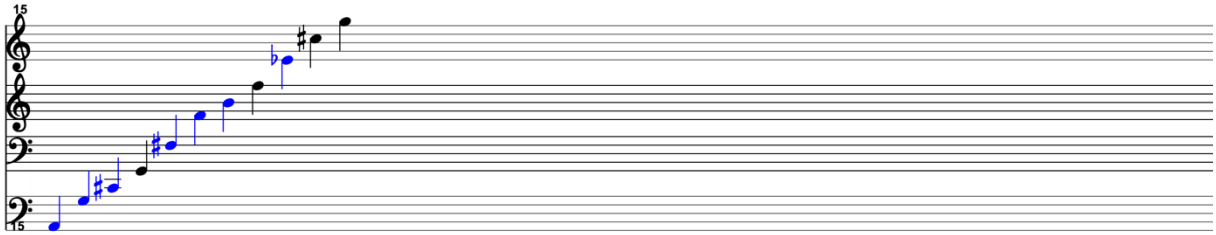
Arp 2/7 (8 sons)



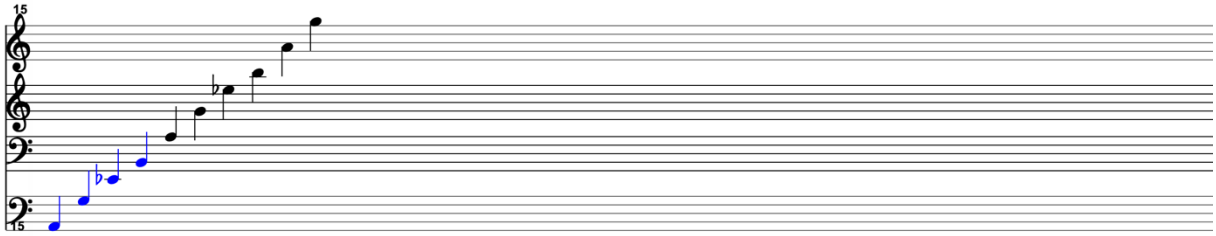
Arp 3/7 (8 sons in a row)



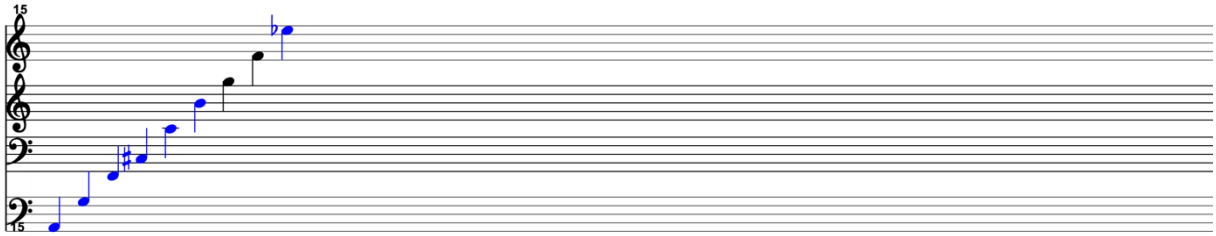
Arp 4/7 (7 sons)



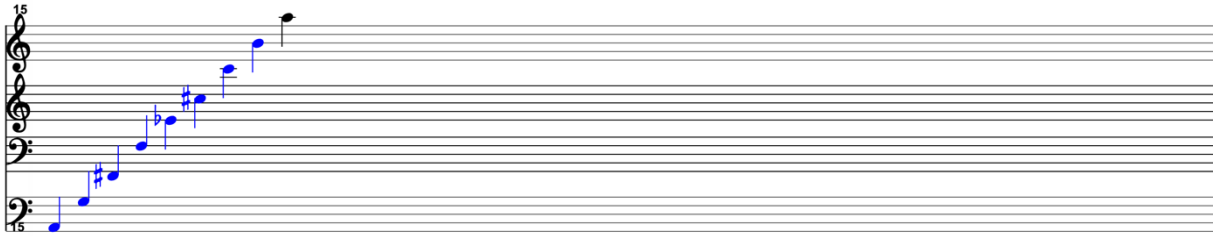
Arp 5/7 (7m6m6m7m, 4 sons)



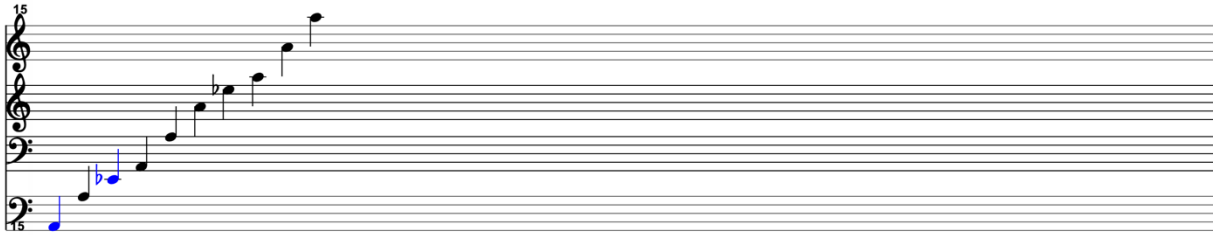
Arp 6/7 (7 sons)



Arp 7/7 (8 sons in a row)



Arp 4/8 (8J4+4+8J, 2 sons)



Arp 8/8 = octaves

Modéchelle 6 (solaire)

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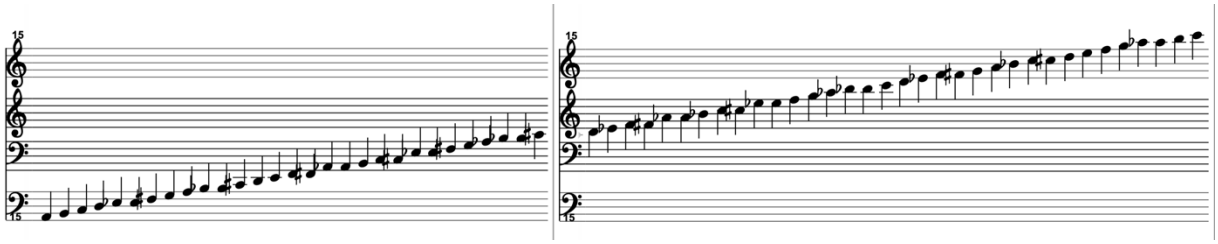
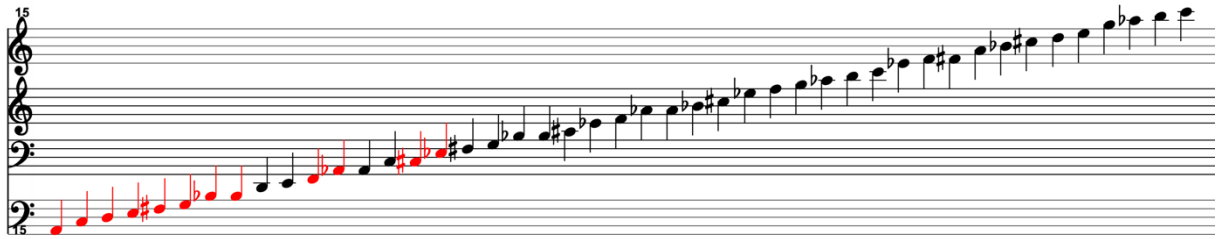
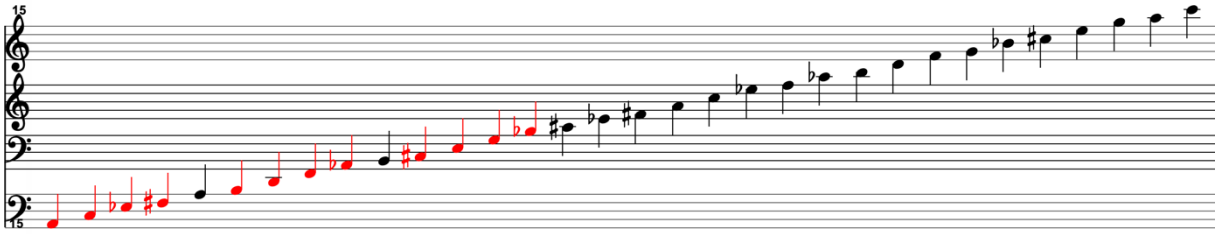
(5J / 8 à 12 sons / 7 octaves / 4 permutations / 6 transpositions)



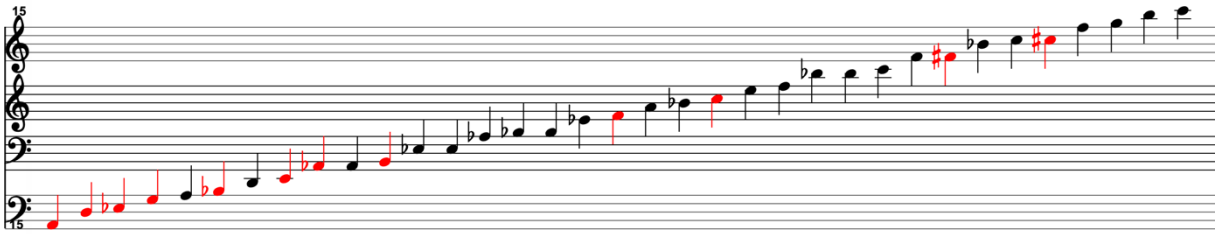
Arp 1/2 (12 sons)



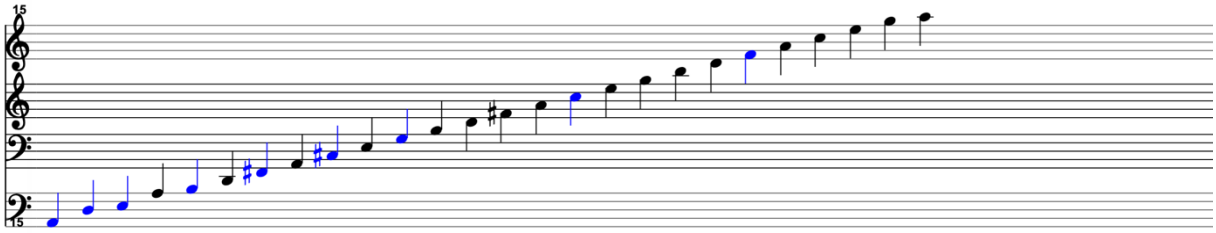
Arp 2/2 (12 sons)



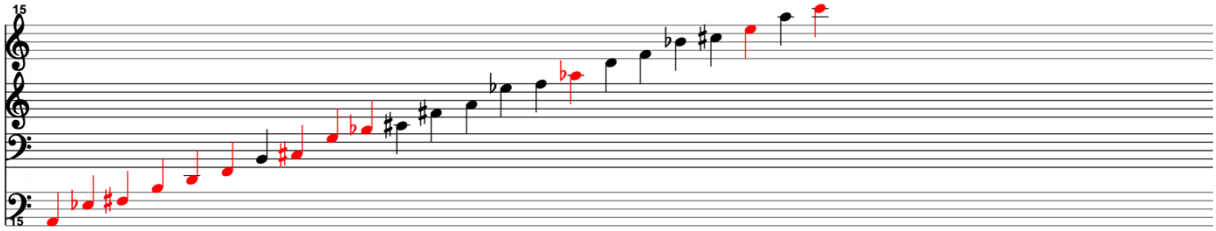
Arp 1/3 (12 sons)



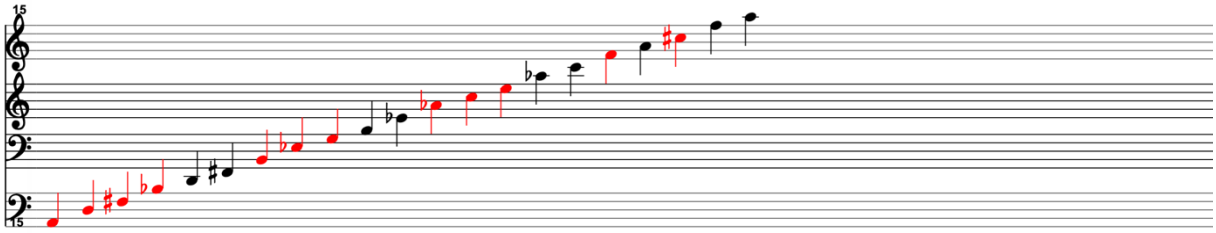
Arp 2/3 (9 sons)



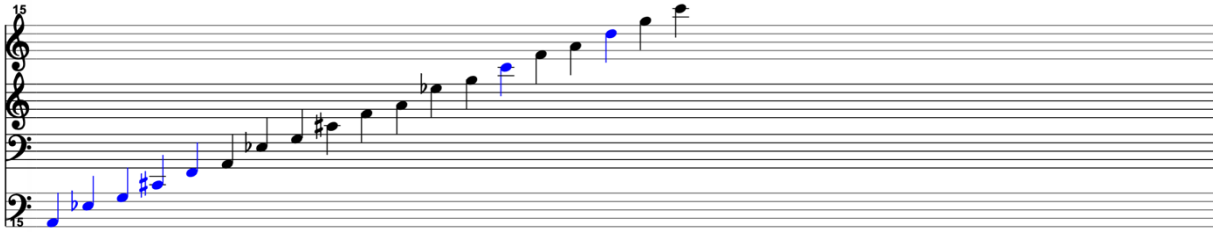
Arp 2/4 (12 sons)



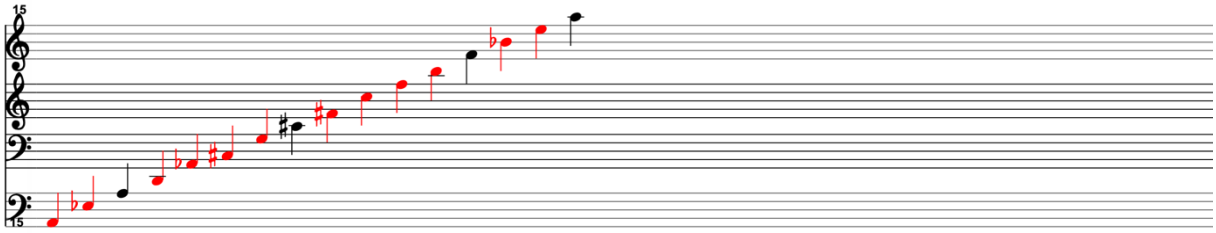
Arp 3/3 (12 sons)



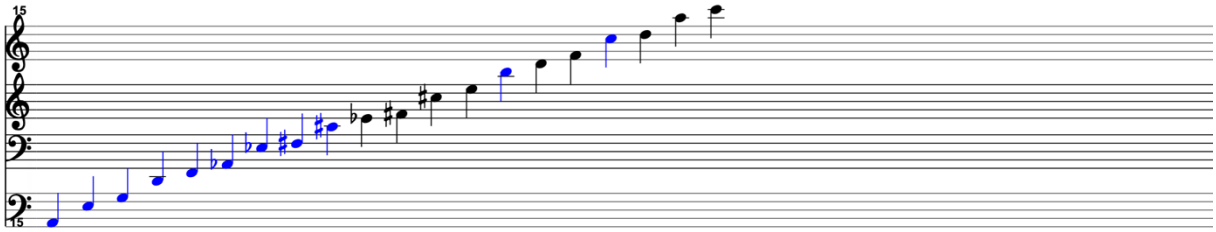
Arp 3/4 (7 sons)



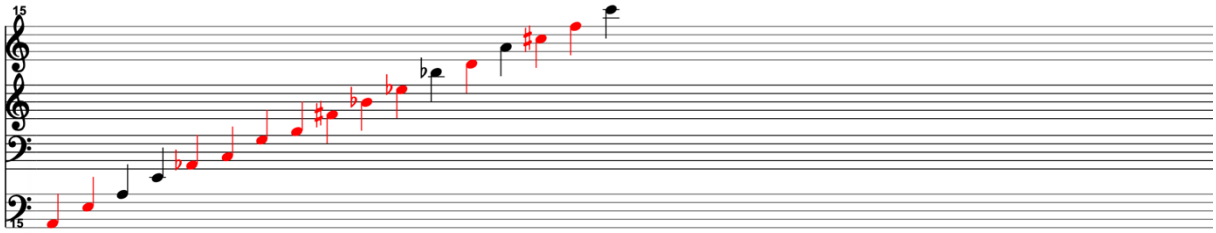
Arp 4/4 (12 sons)



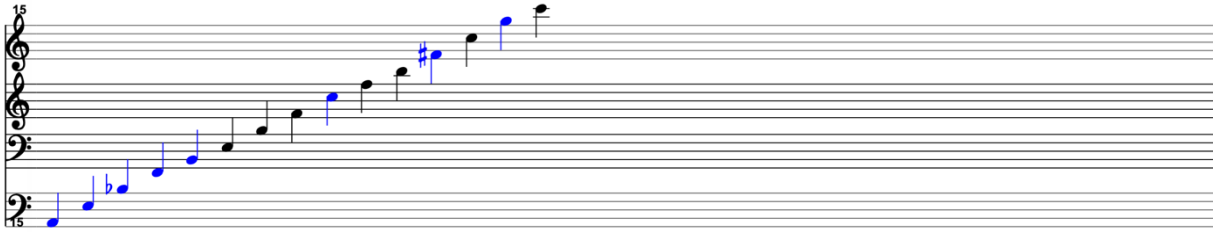
Arp 2/5 (11 sons = 9 in a row + 2)



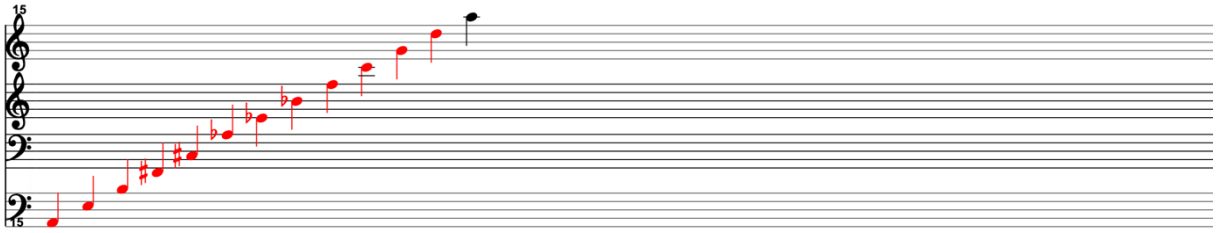
Arp 3/5 (12 sons)



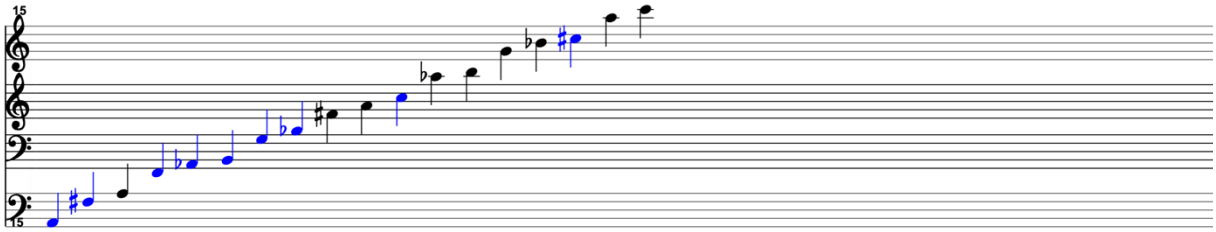
Arp 4/5 (8 sons)



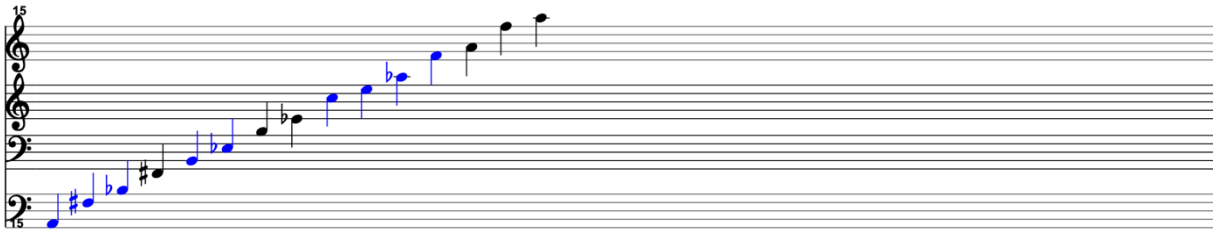
Arp 5/5 (12 sons in a row)



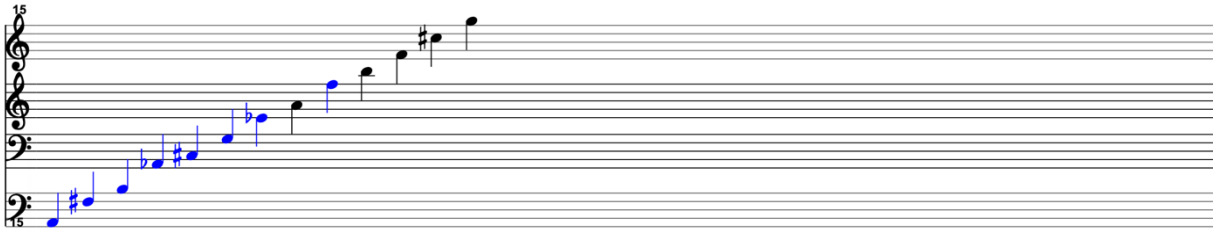
Arp 2/6 (9 sons)



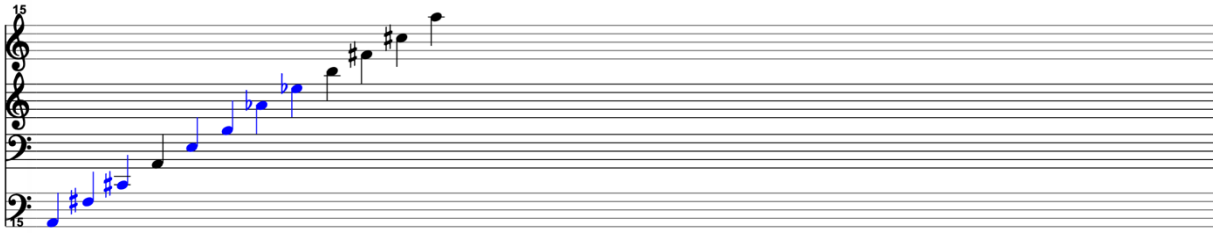
Arp 3/6 (9 sons)



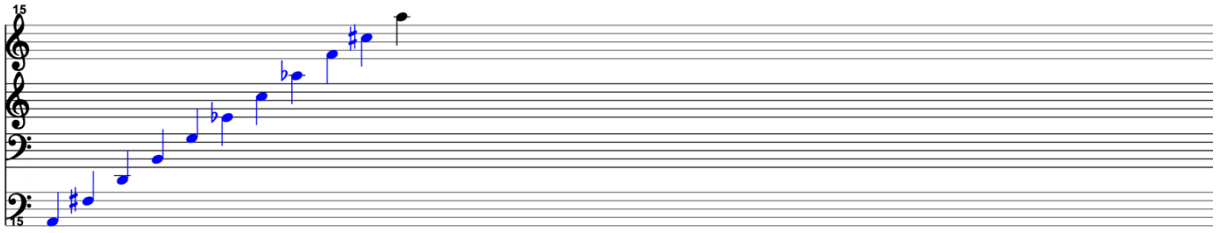
Arp 4/6 (8 sons = 7 in a row + 1)



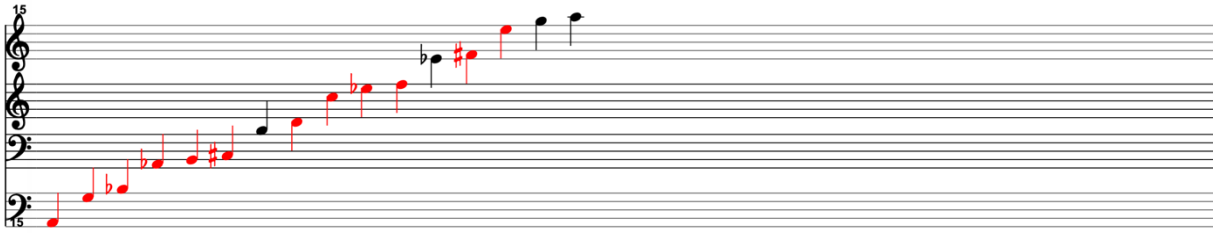
Arp 5/6 (7 sons)



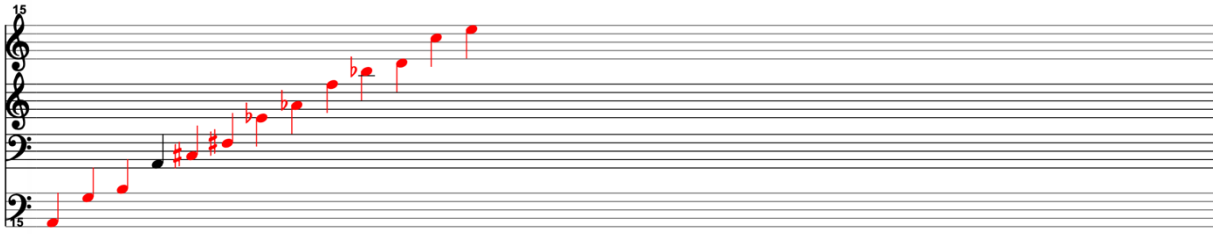
Arp 6/6 (10 sons in a row)



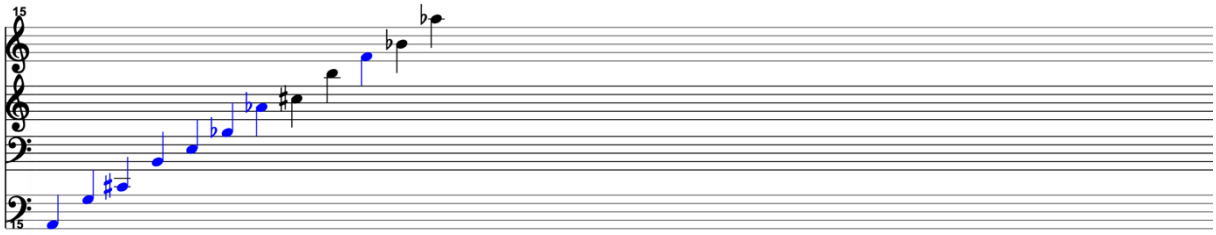
Arp 2/7 (12 sons)



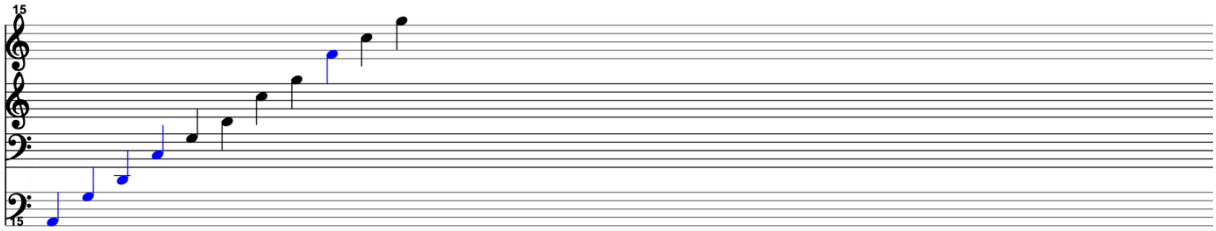
Arp 3/7 (12 sons)



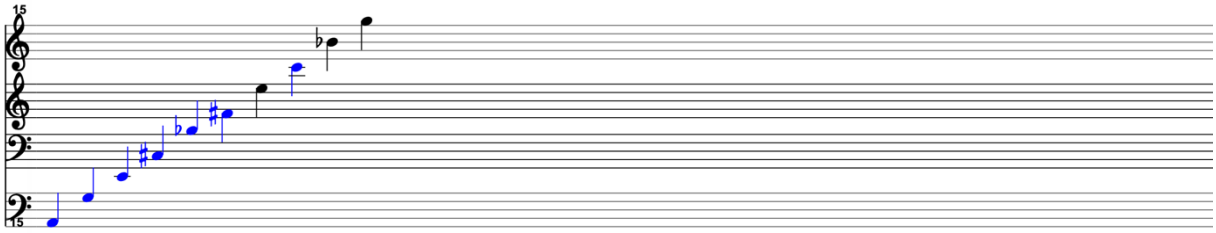
Arp 4/7 (8 sons = 7 in a row + 1)



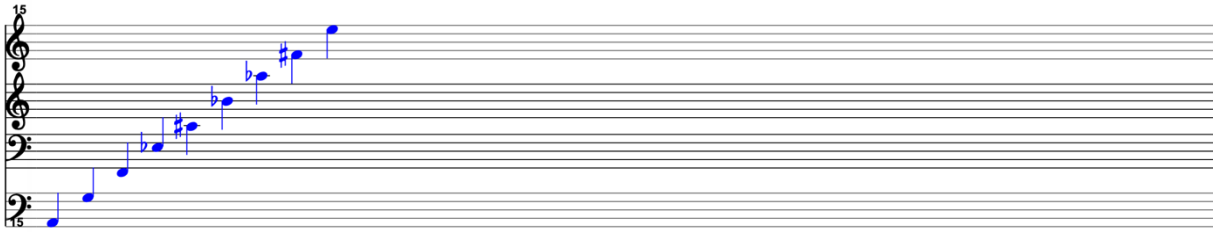
Arp 5/7 (7m5J7m5J5J7m5J7m5J5J, 5 sons)



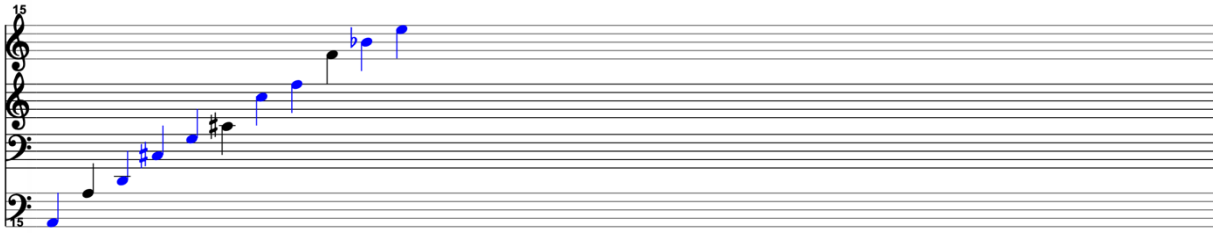
Arp 6/7 (7m6M6M6M6m7m6m7m6M, 7 sons = 6 in a row + 1)



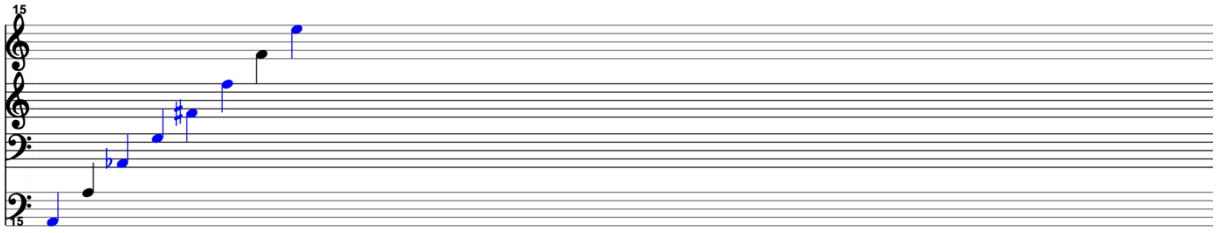
Arp 7/7 (7m x 8, 9 sons in a row)



Arp 4/8 (8 sons, 8J4J7M4+4+7M4J8J4J4+)



Arp 8/8 (6 sons, non octaviant, 8J7M7M7M7M8J7M)



Modéchelle 7 (bi-octaviante)

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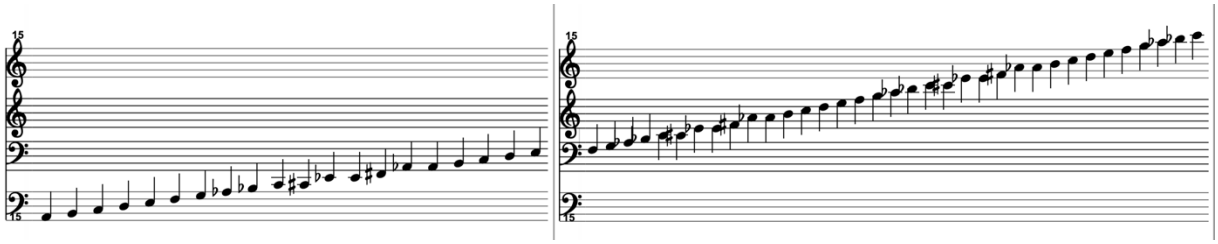
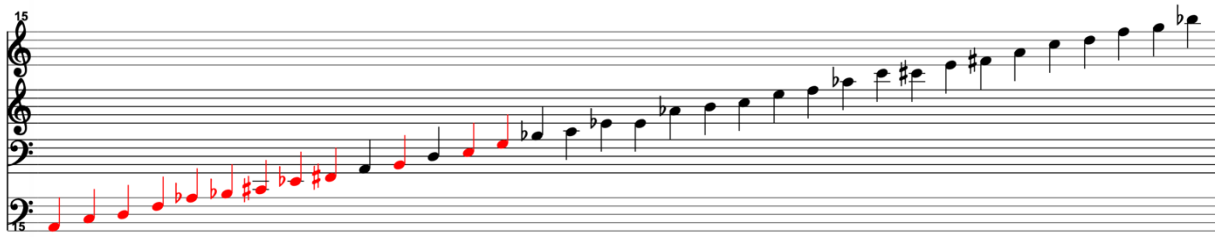
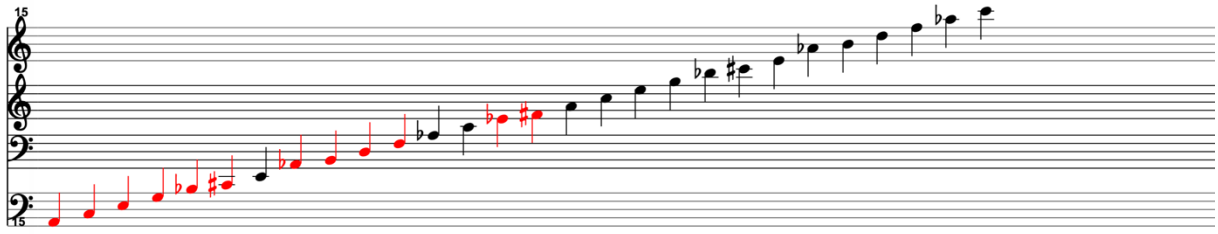
(6m / 8 à 12 sons / 2 octaves / 4 permutations / 7 transpositions)



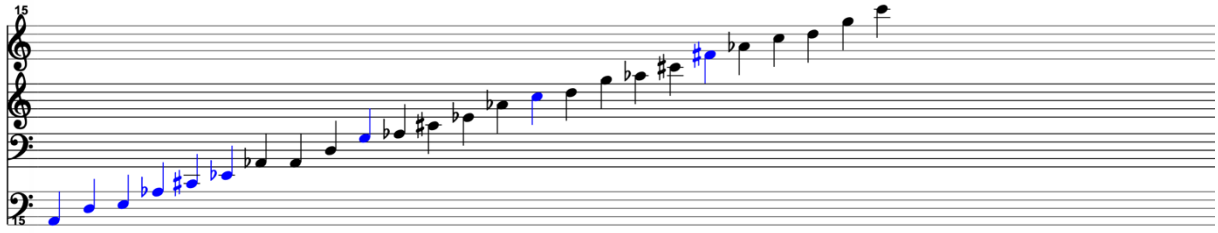
Arp 1/2 (12 sons)



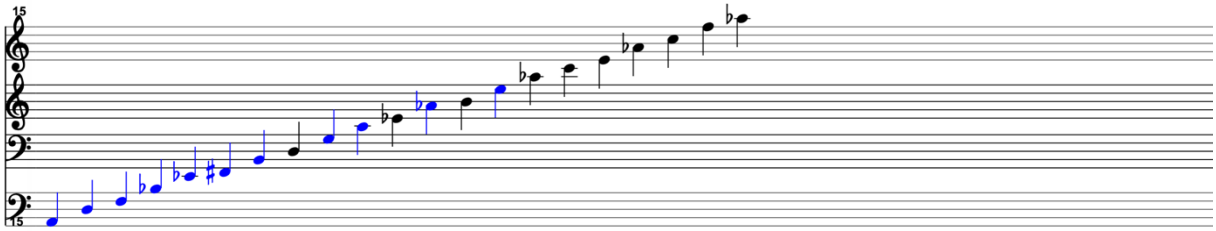
Arp 2/2 (12 sons)



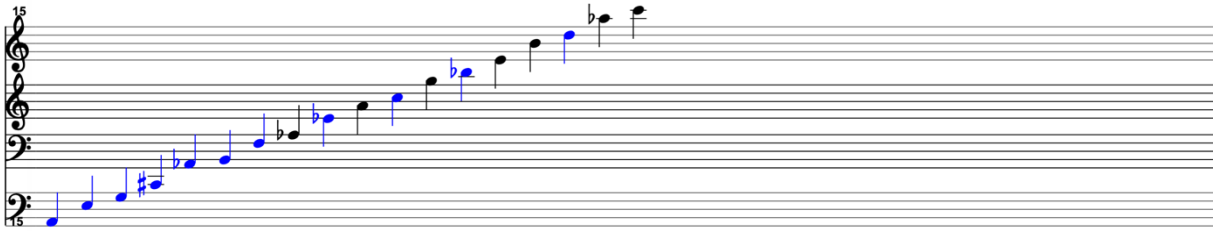
Arp 1/3 (9 sons)



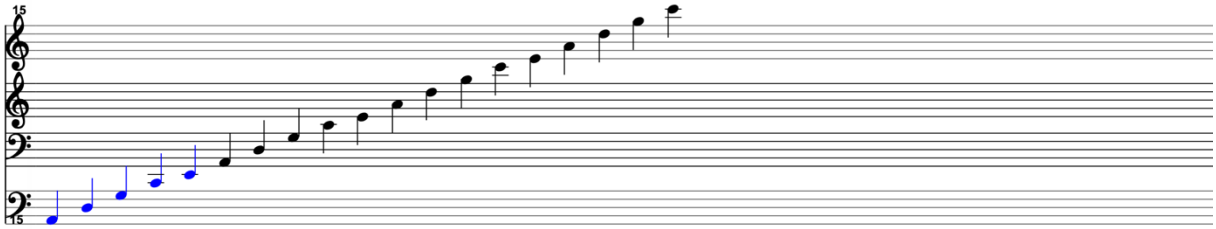
Arp 2/3 (11 sons)



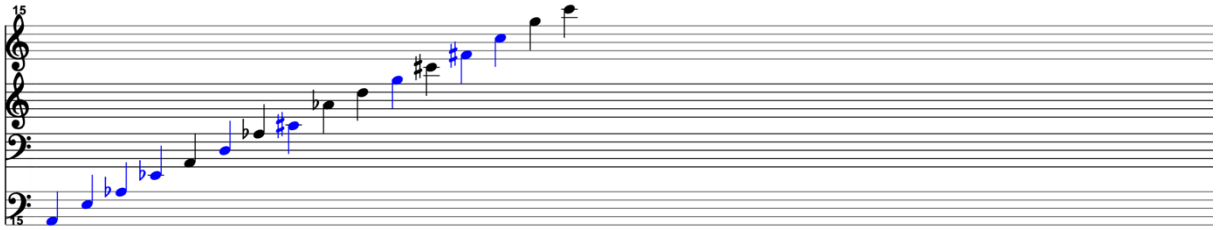
Arp 2/4 (11 sons)



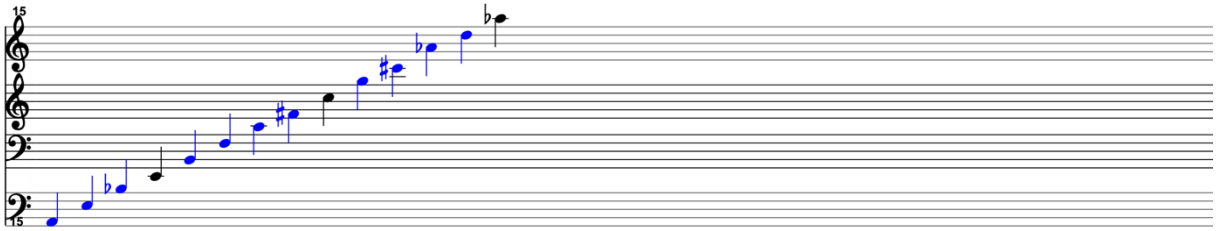
Arp 3/3 (5 sons in a row)



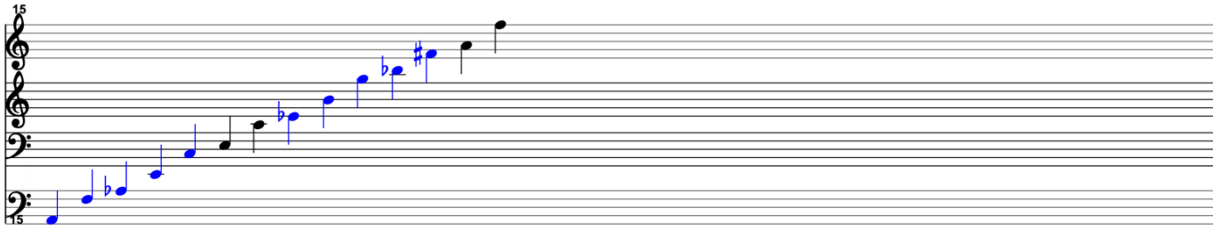
Arp 3/4 (9 sons)



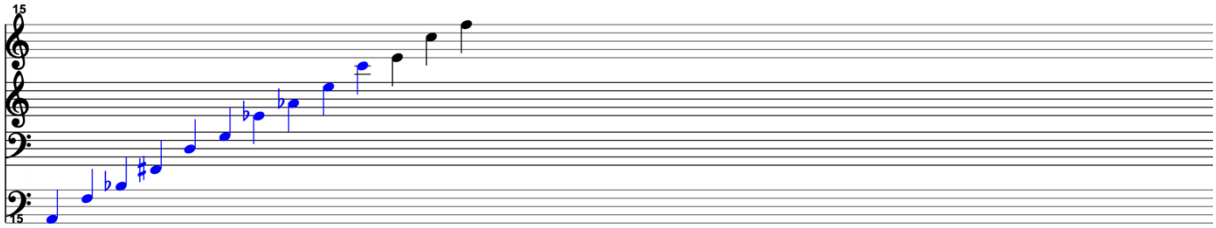
Arp 4/4 (11 sons)



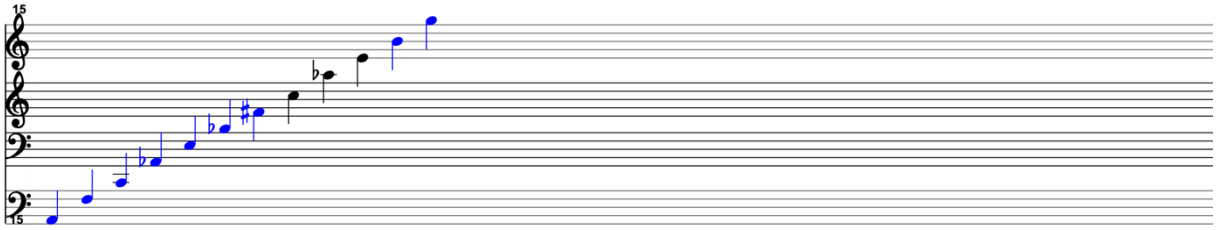
Arp 2/5 (10 sons)



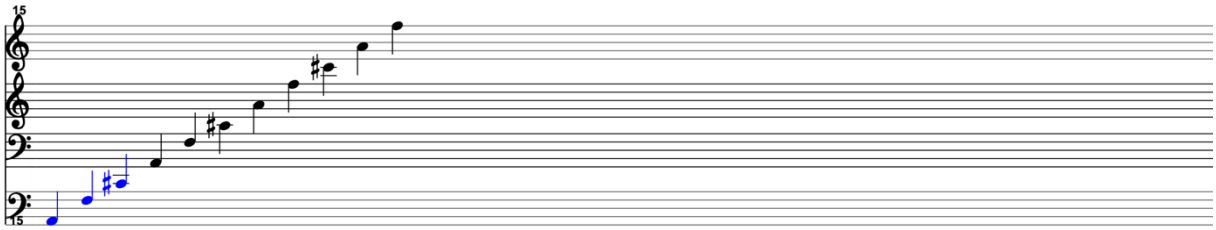
Arp 3/5 (10 sons in a row)



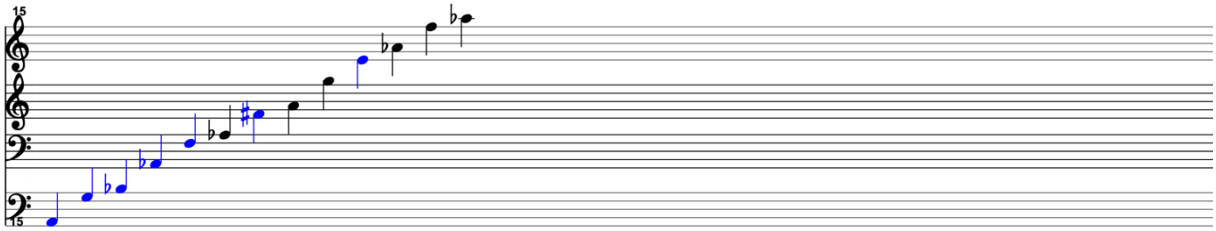
Arp 4/5 (9 sons = 7 sons in a row + 2)



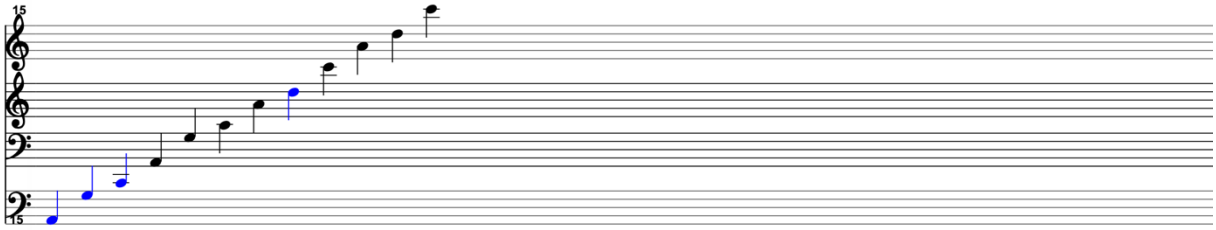
Arp 5/5 (6m, 3 sons)



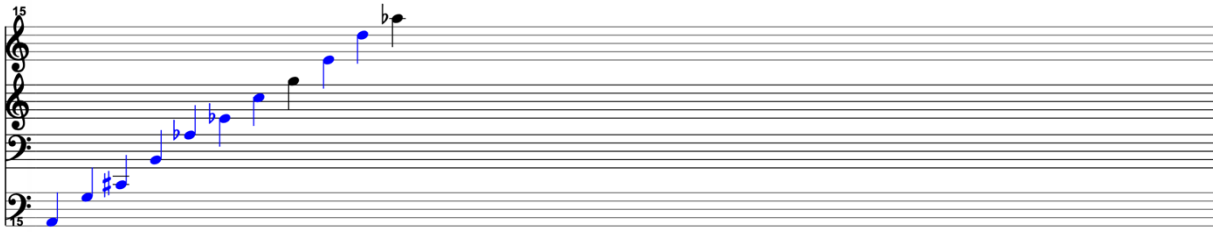
Arp 2/6 (7 sons)



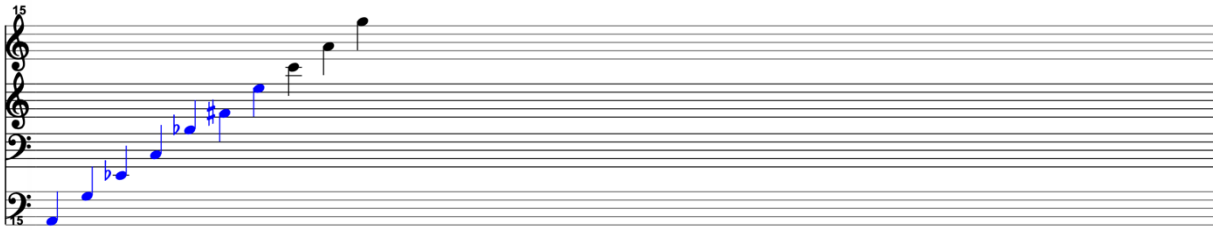
Arp 3/6 (4 sons)



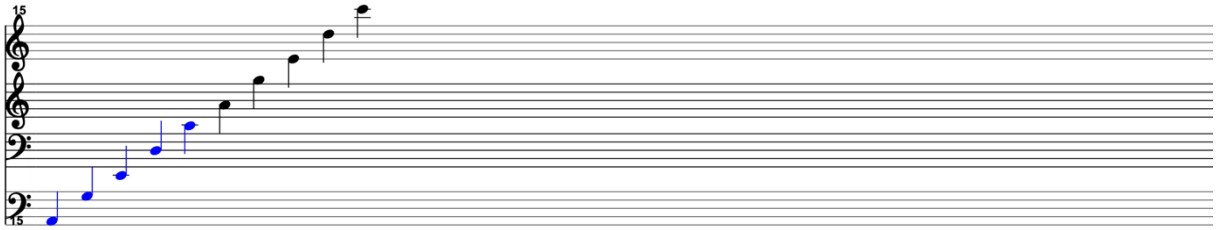
Arp 4/6 (9 sons = 7 in a row + 2)



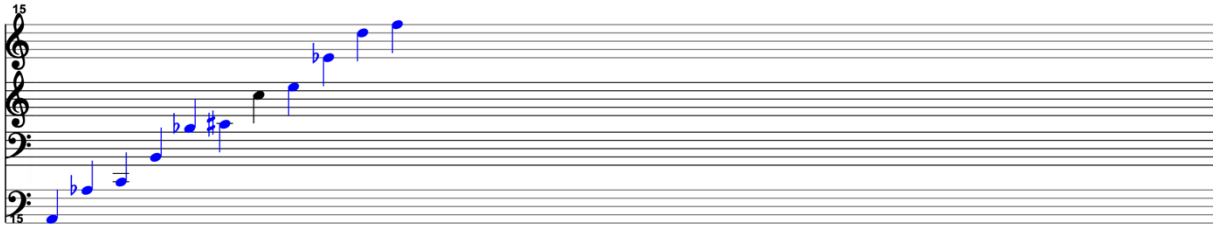
Arp 5/6 (7 sons in a row)



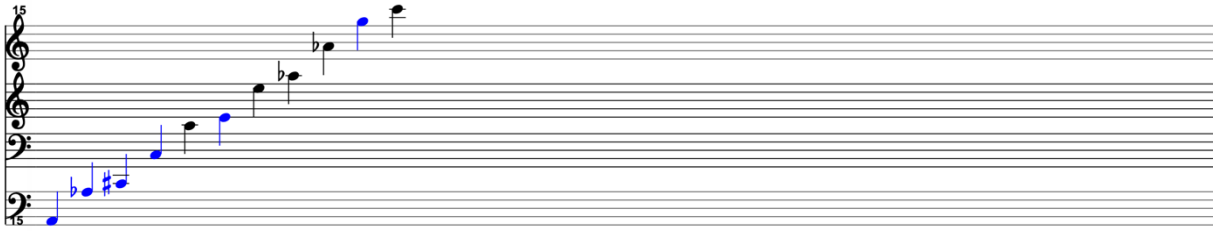
Arp 6/6 (5 sons in a row)



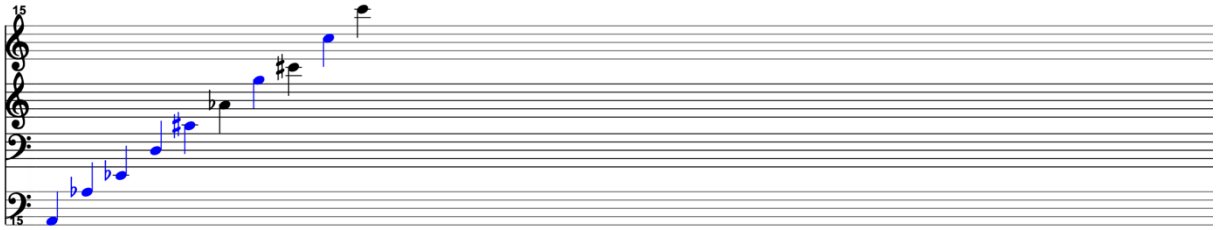
Arp 2/7 (10 sons = 5 + 5)



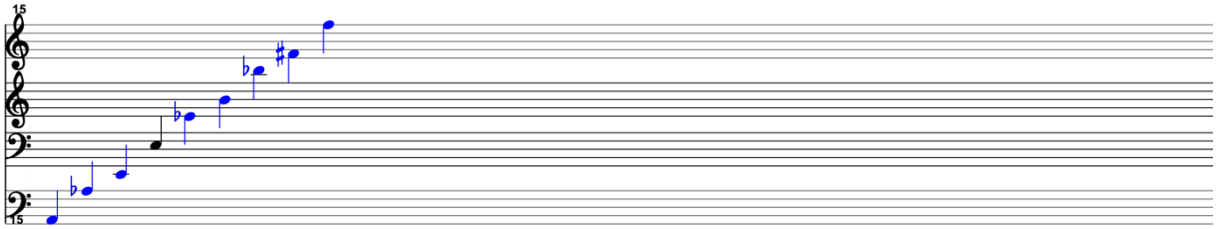
Arp 3/7 (6 sons)



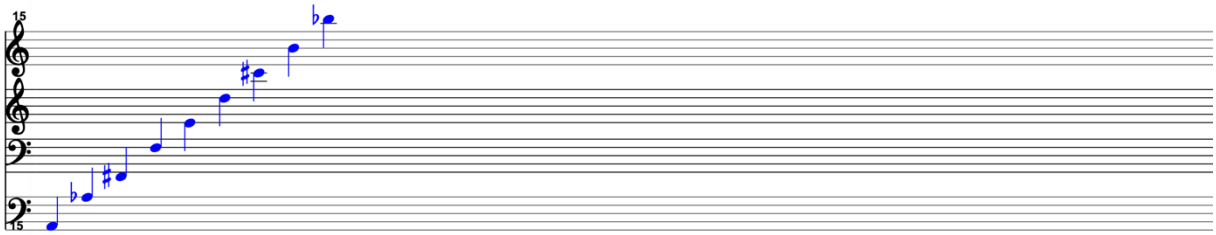
Arp 4/7 (7 sons)



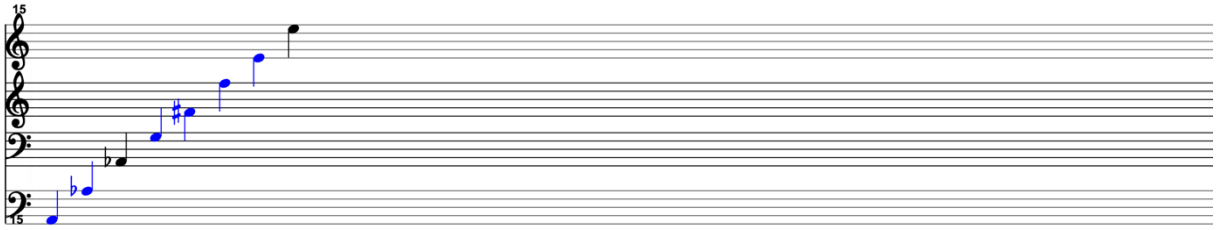
Arp 5/7 (8 sons)



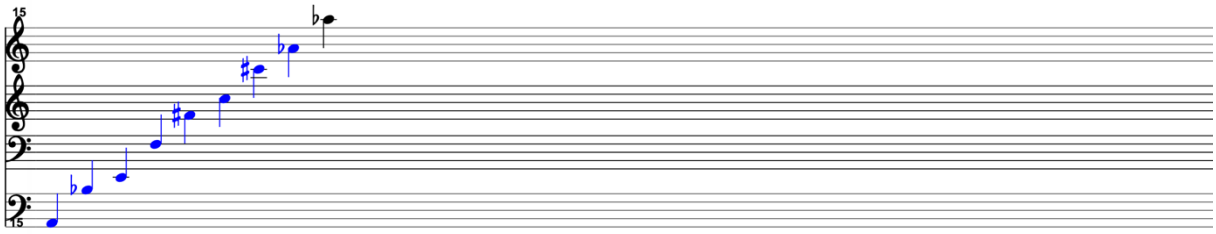
Arp 6/7 (9 sons in a row)



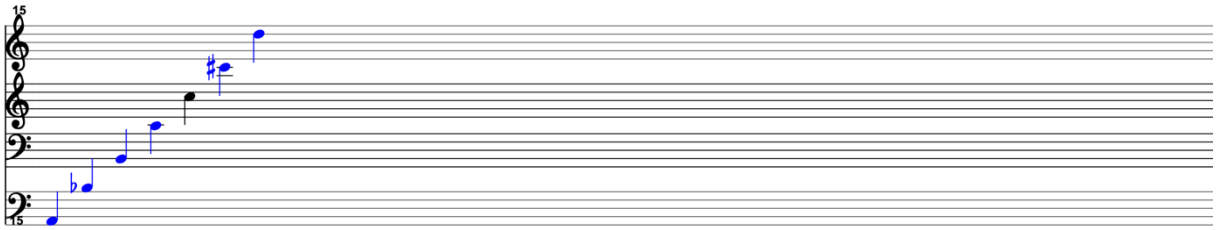
Arp 7/7 (6 sons, non octaviant)



Arp 4/8 (8 sons in a row)



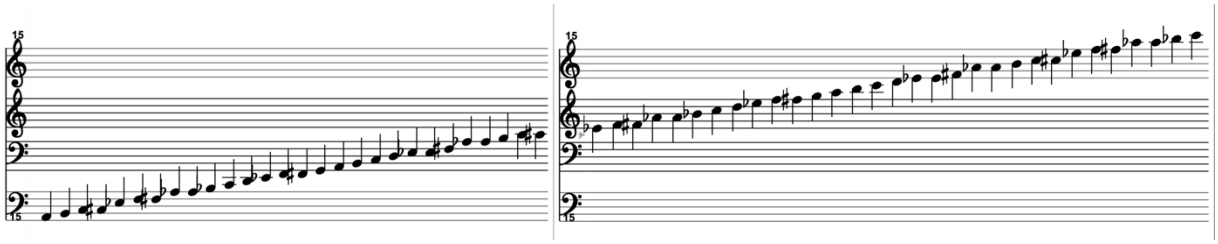
Arp 8/8 (6 sons, non octaviant)



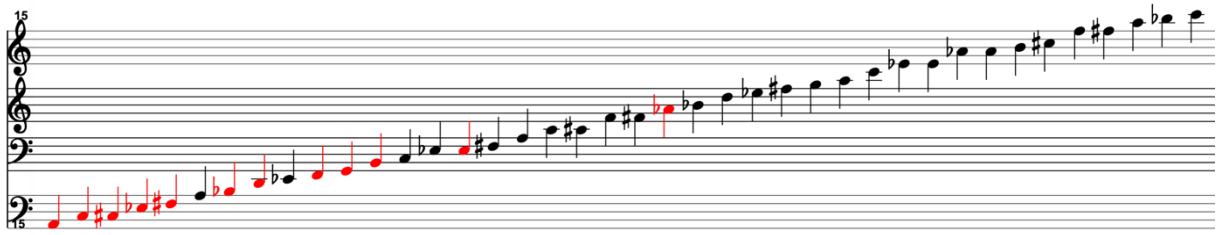
Modéchelle 8a

-uu--u

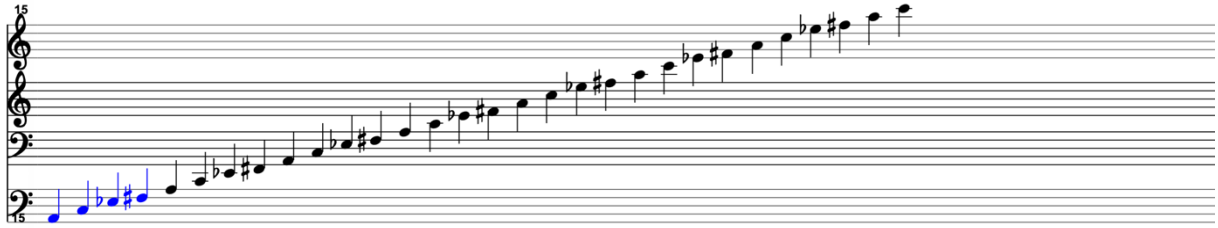
(6M / 8 à 12 sons / 3 octaves / 5 permutations / 8 transpositions)



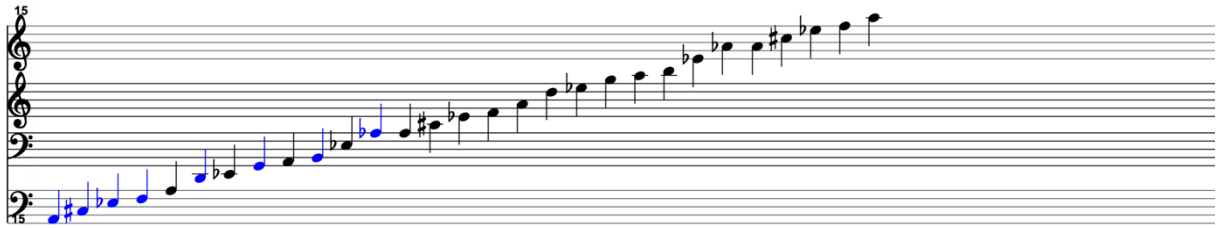
Arp 1/2 (12 sons)



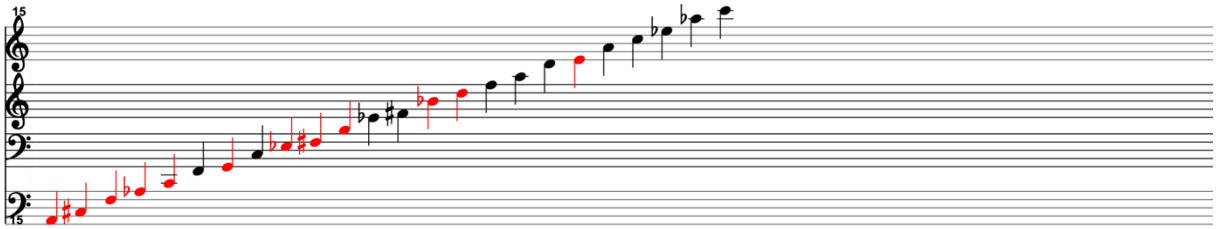
Arp 2/2 (4 sons, accord de 7ème diminuée)



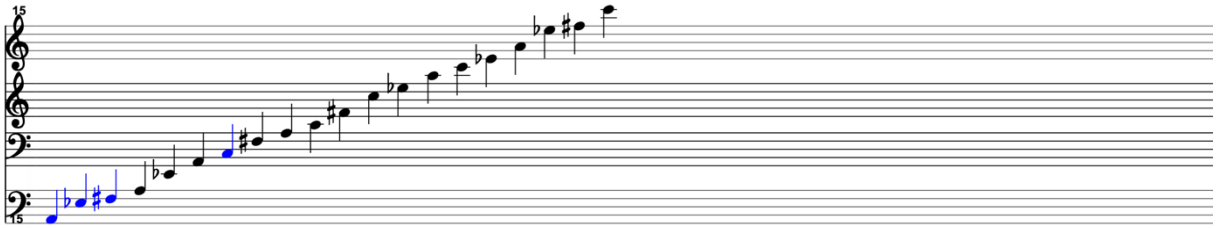
Arp 1/3 (7 sons)



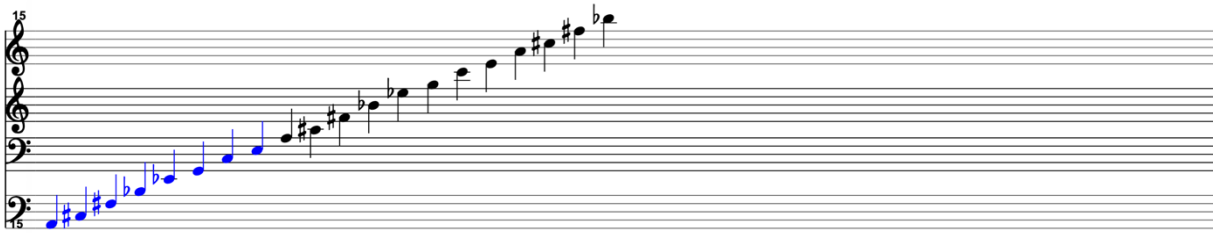
Arp 2/3 (12 sons)



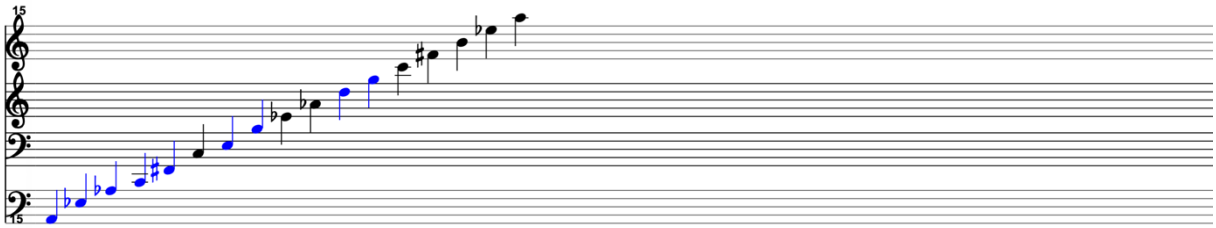
Arp 2/4 (4 sons ± accord de 7ème diminuée)



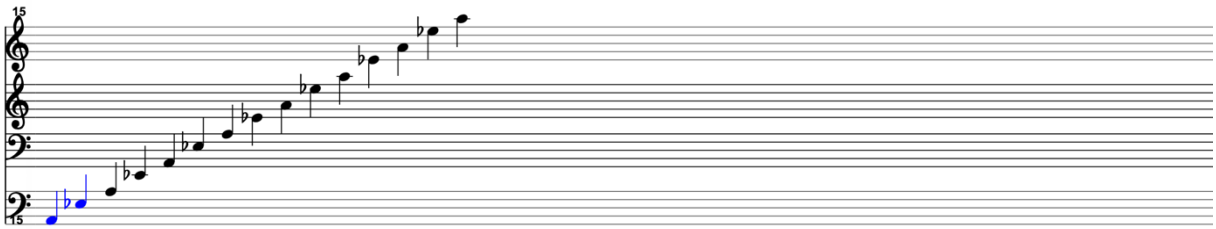
Arp 3/3 (8 sons, 3M4J x4 puis octaviant)



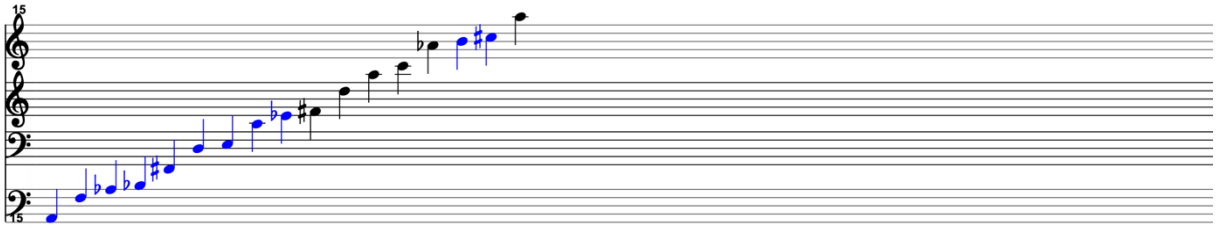
Arp 3/4 (9 sons)



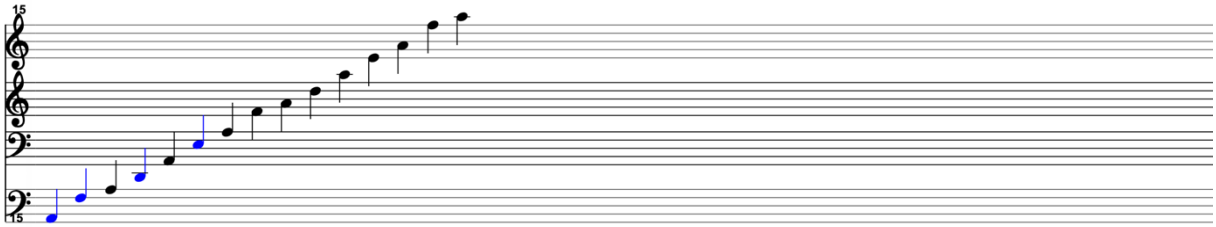
Arp 4/4 (4+, 2 sons)



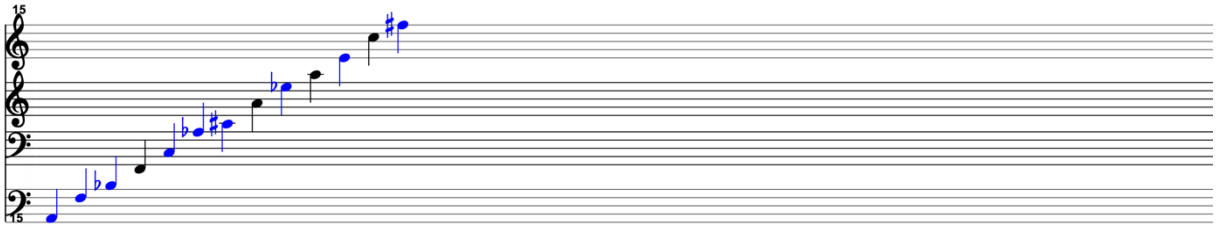
Arp 2/5 (11 sons)



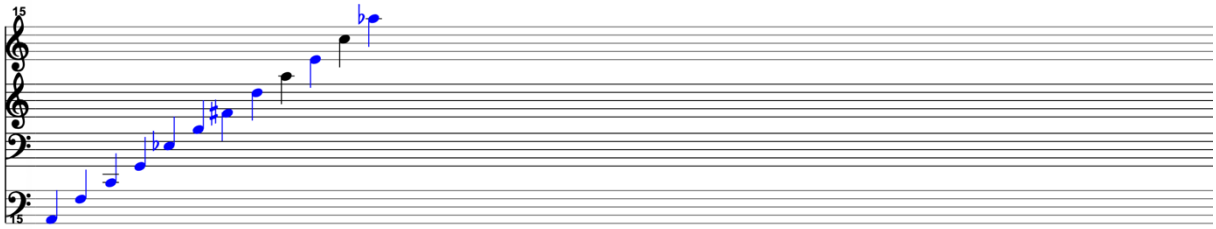
Arp 3/5 (4 sons)



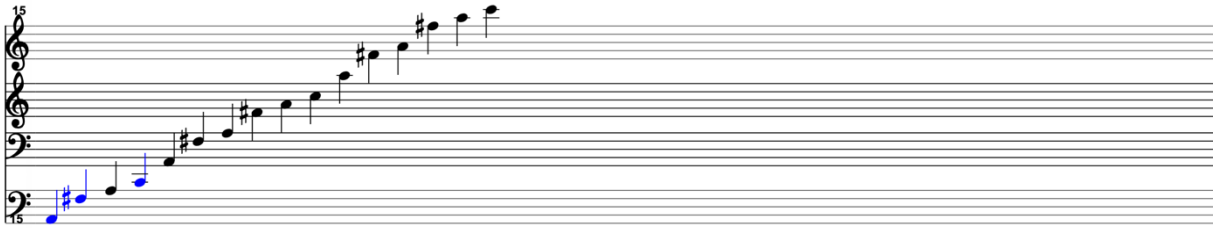
Arp 4/5 (9 sons)



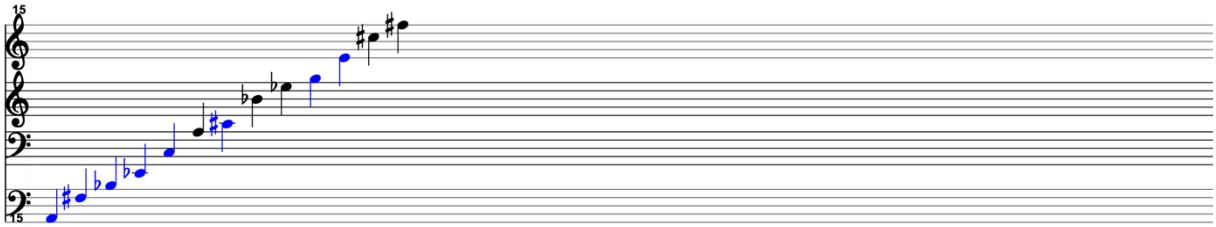
Arp 5/5 (10 sons)



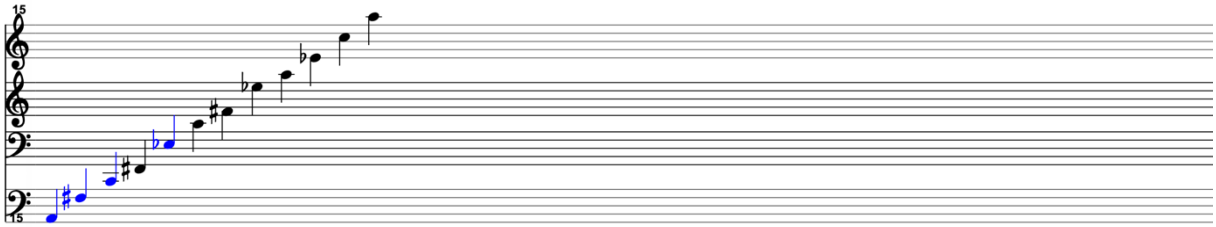
Arp 2/6 (3 sons)



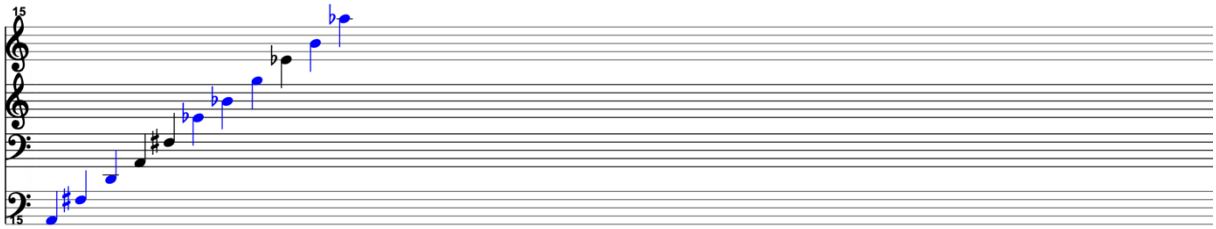
Arp 3/6 (8 sons)



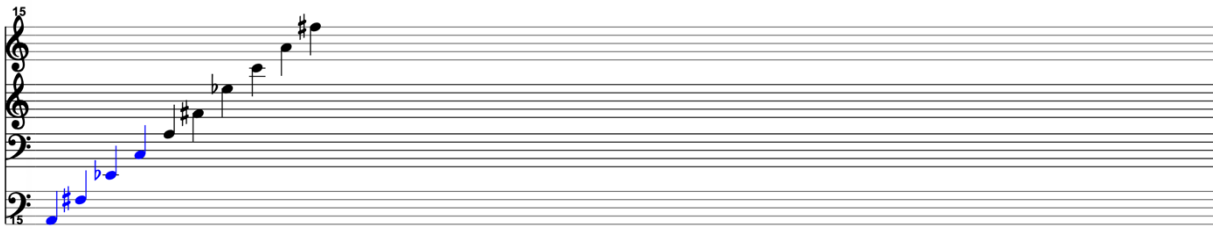
Arp 4/6 (4 sons, ± 7ème diminuée)



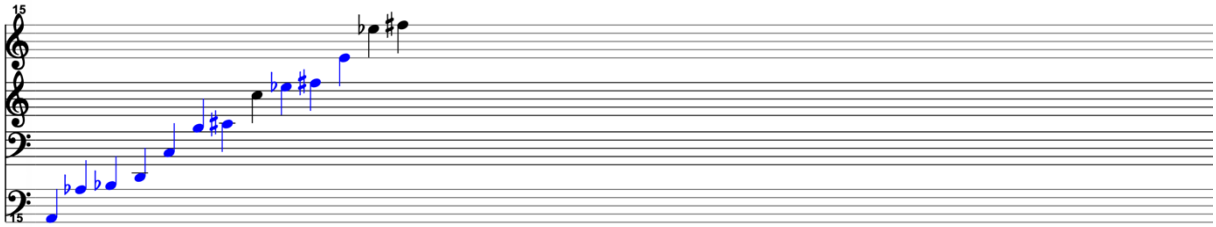
Arp 5/6 (8 sons)



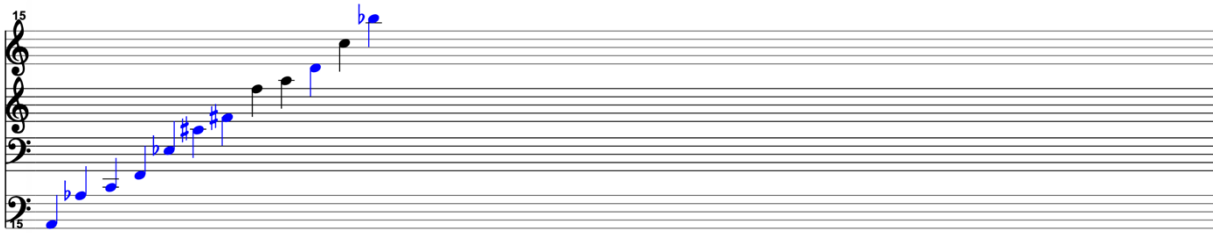
Arp 6/6 (4 sons, ± 7ème diminuée)



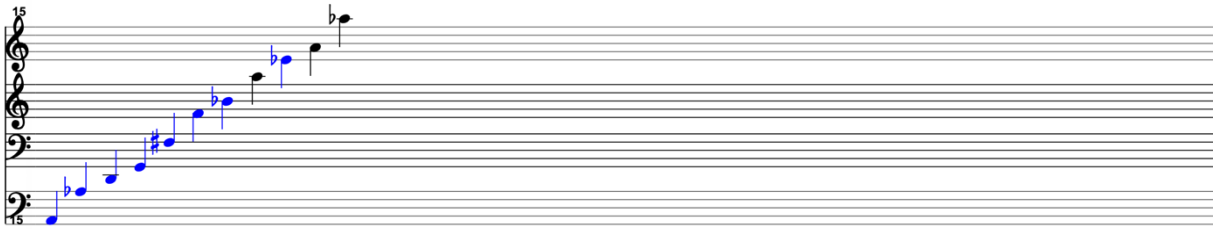
Arp 2/7 (10 sons = 7 in a row + 3)



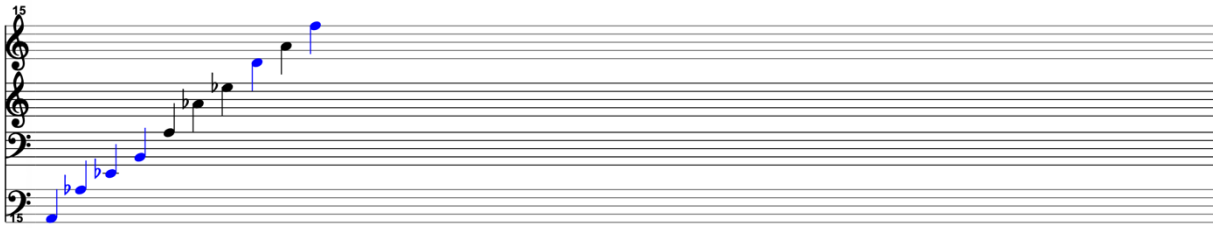
Arp 3/7 (9 sons)



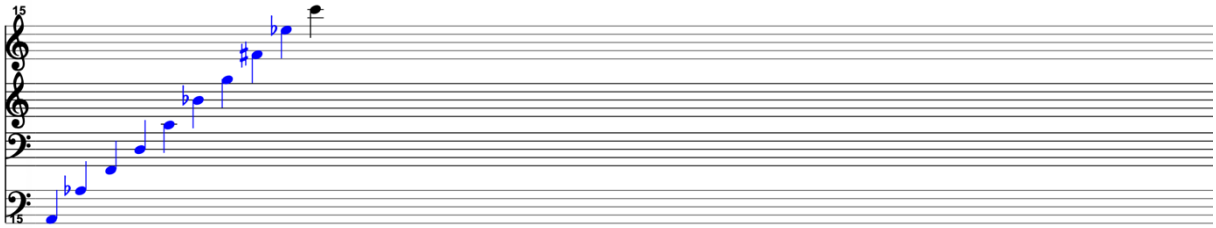
Arp 4/7 (8 sons = 7 in a row + 1)



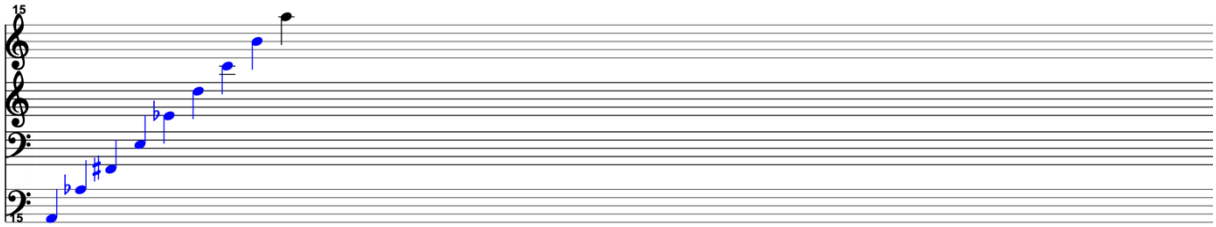
Arp 5/7 (6 sons)



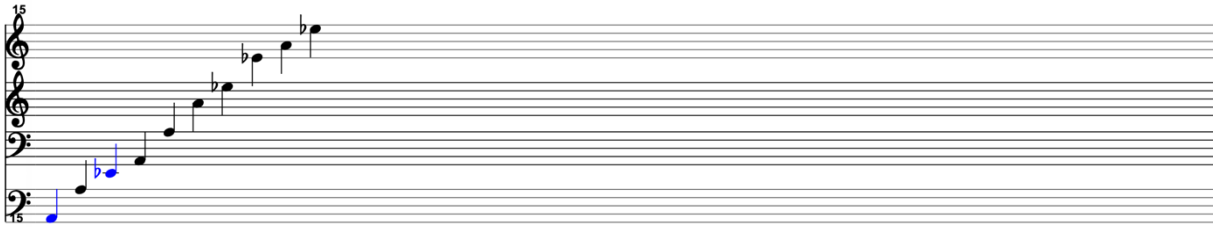
Arp 6/7 (9 sons in a row)



Arp 7/7 (8 sons in a row)



Arp 4/8 (2 sons, 8J & 4+)



Arp 8/8 = octaves

Modéchelle 8b

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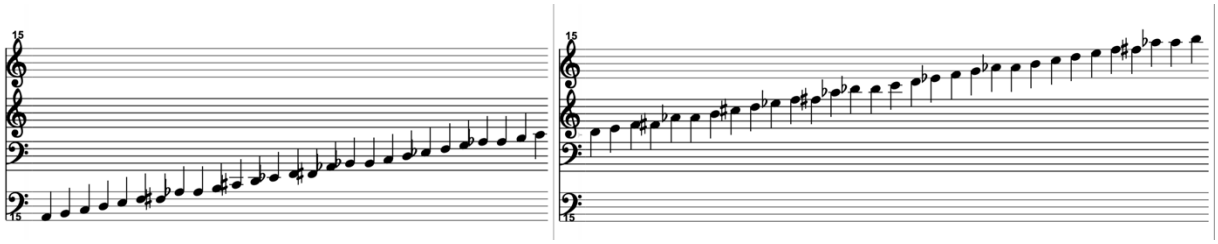
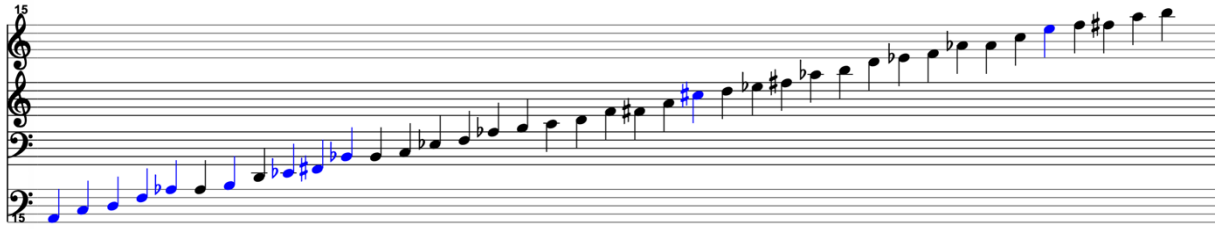
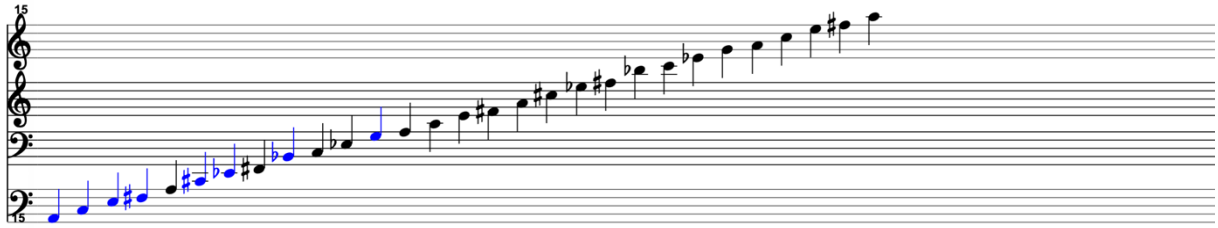
(6M / 8 à 12 sons / 3 octaves / 5 permutations / 8 transpositions)



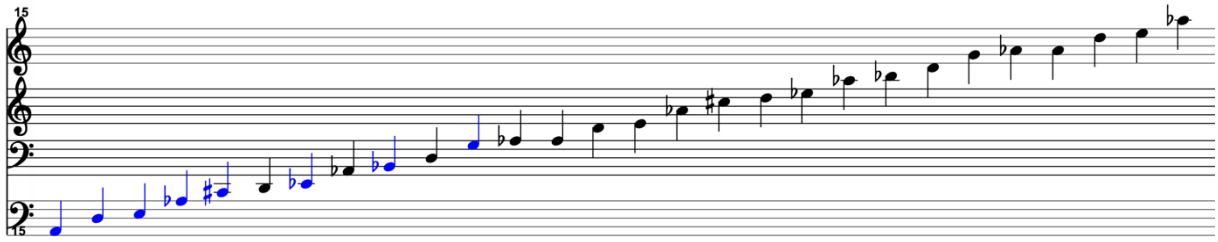
Arp 1/2 (11 sons)



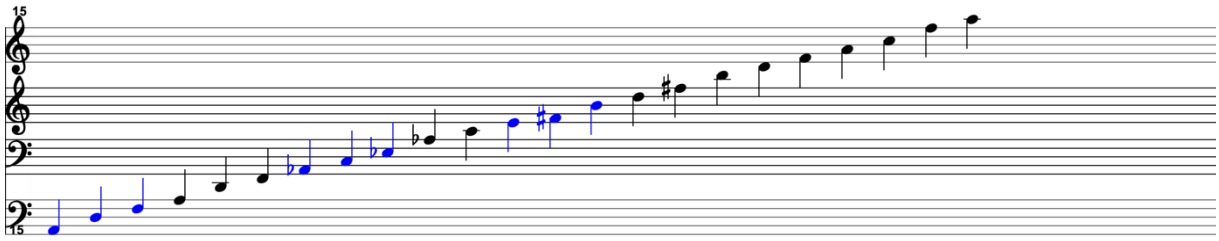
Arp 2/2 (8 sons)



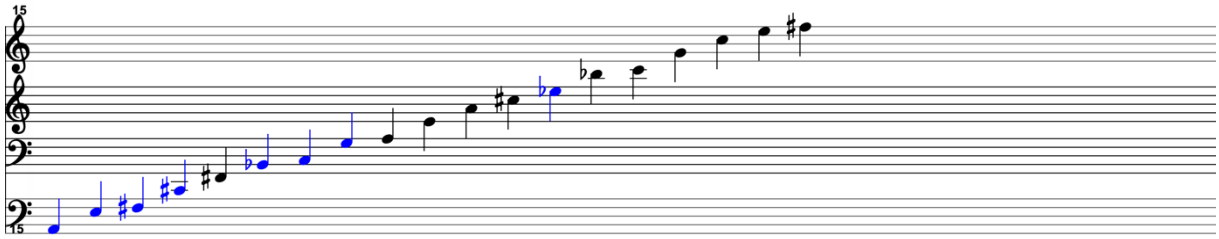
Arp 1/3 (8 sons)



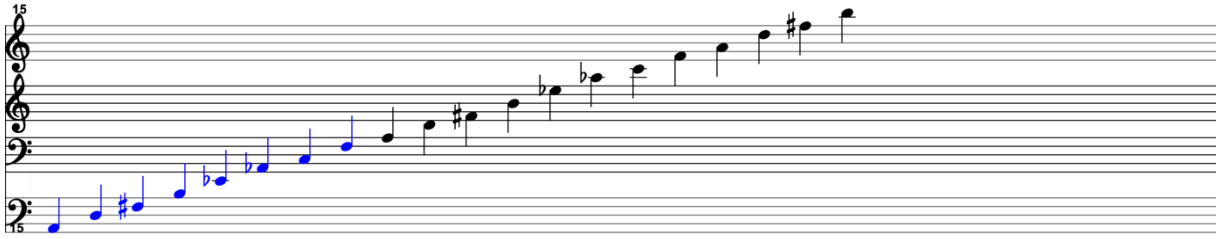
Arp 2/3 (9 sons)



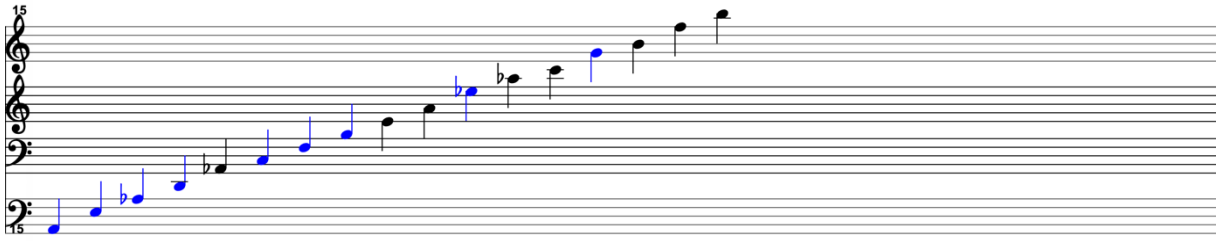
Arp 2/4 (8 sons)



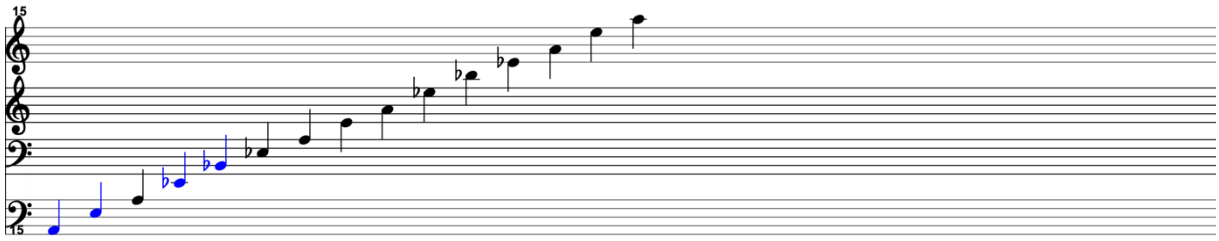
Arp 3/3 (8 sons in a row)



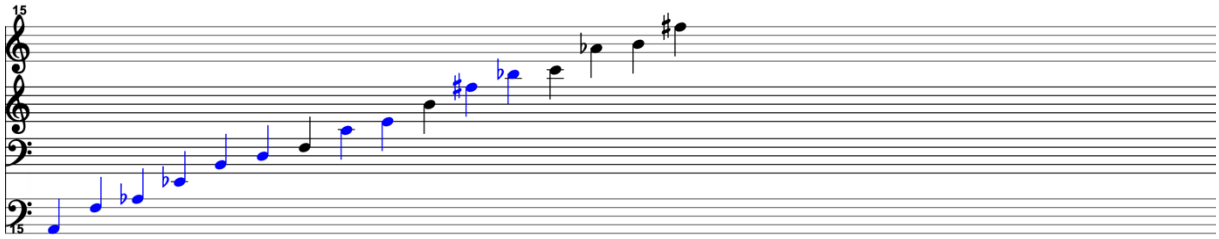
Arp 3/4 (9 sons)



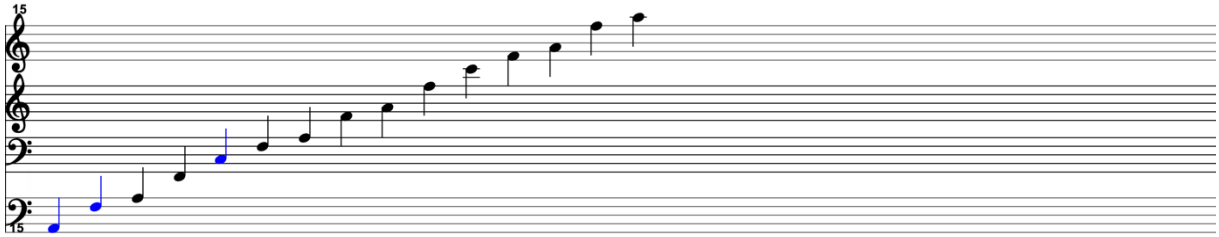
Arp 4/4 (5J4J4+, 4 sons)



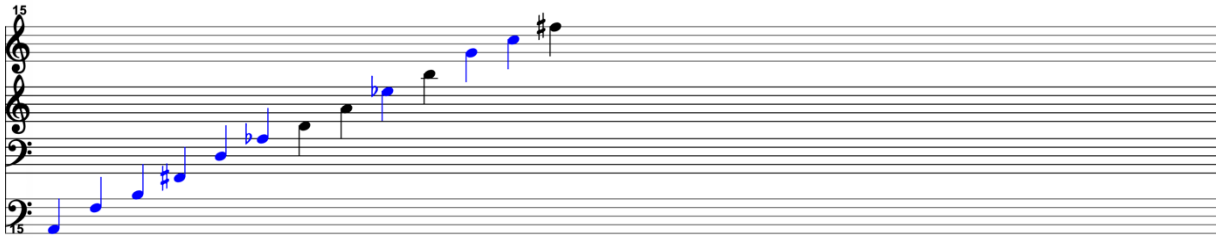
Arp 2/5 (10 sons)



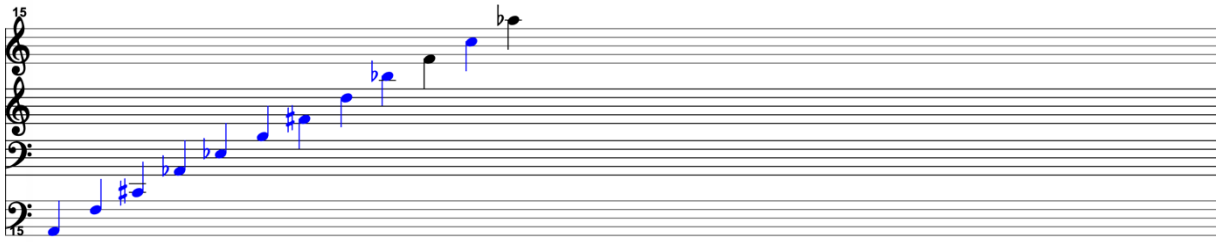
Arp 3/5 (3 sons = 6m3M6m5J4J3M x 2,5)



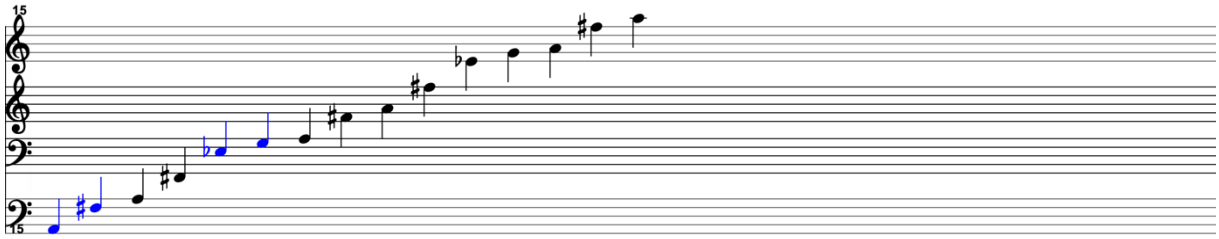
Arp 4/5 (9 sons)



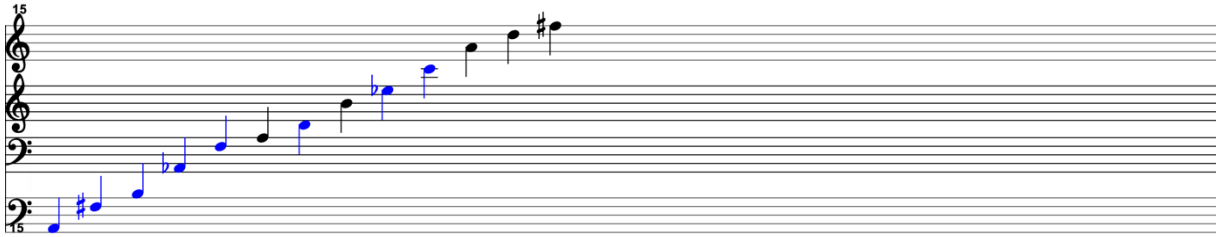
Arp 5/5 (10 sons = 9 in a row + 1)



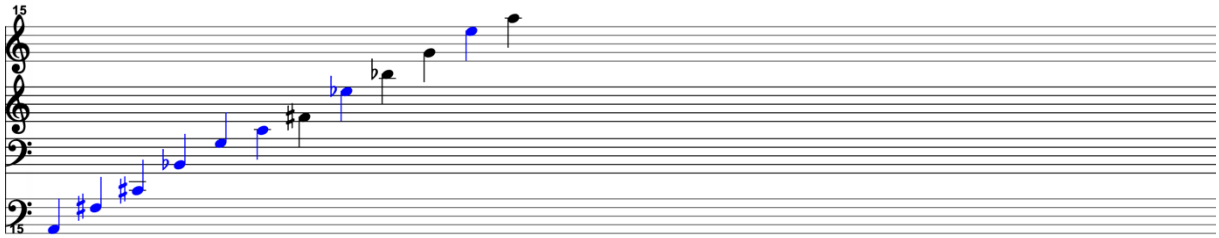
Arp 2/6 (4 sons = 6M3m6M3M2M x 2,5)



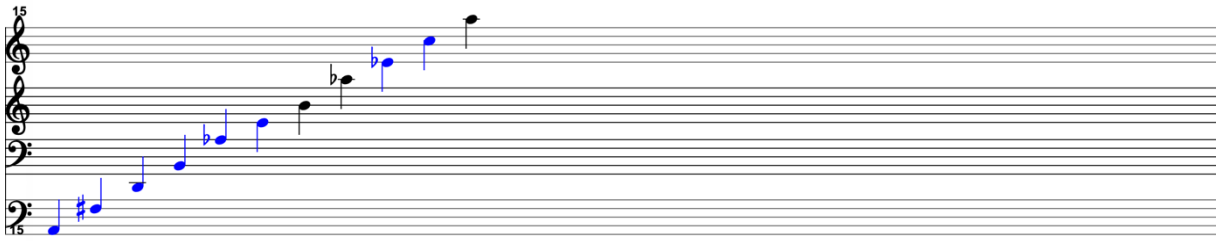
Arp 3/6 (8 sons)



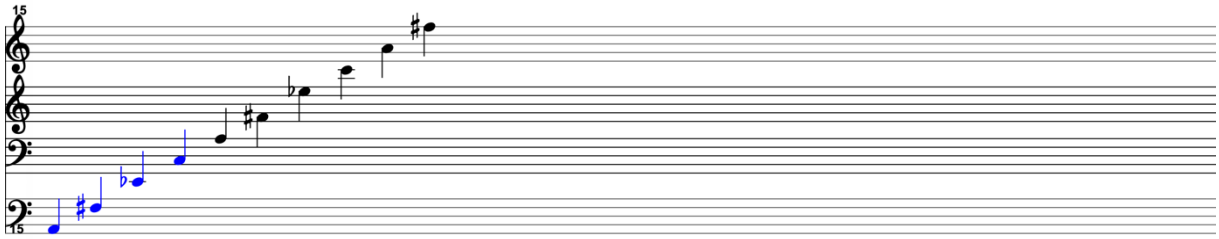
Arp 4/6 (8 sons)



Arp 5/6 (8 sons)

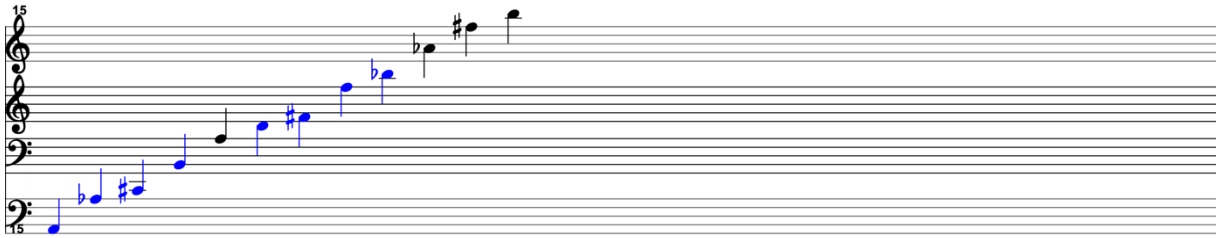


Arp 6/6 (4 sons ± 7ème diminuée)

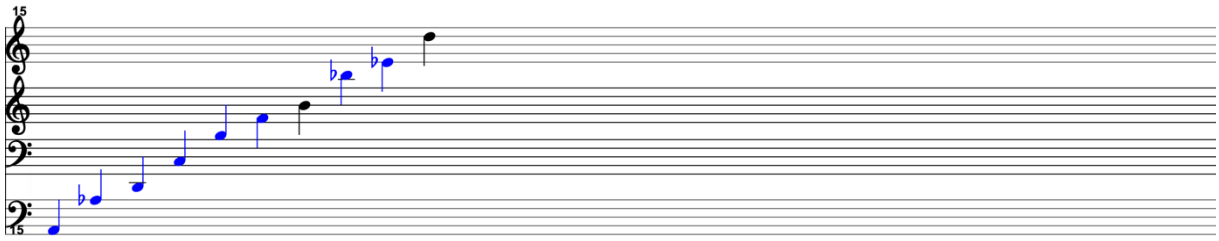


Arp 2/7 (10 sons)

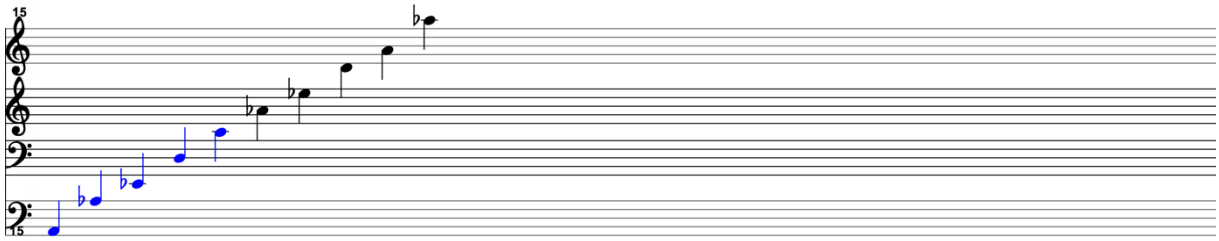
Arp 3/7 (8 sons)



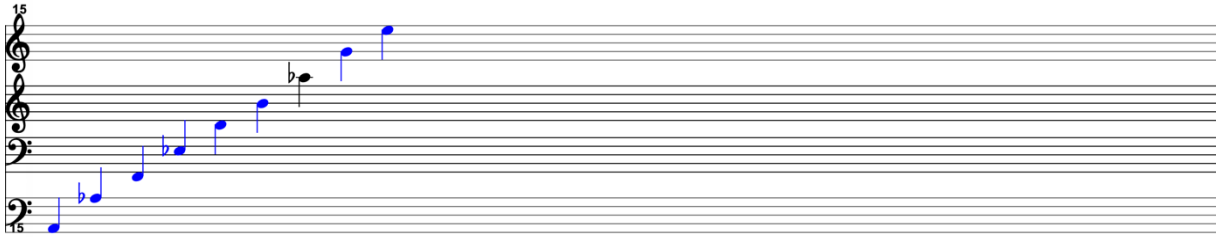
Arp 4/7 (8 sons)



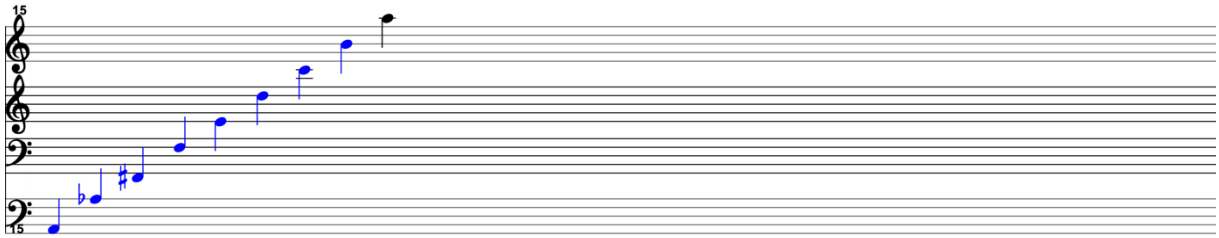
Arp 5/7 (5 sons in a row)



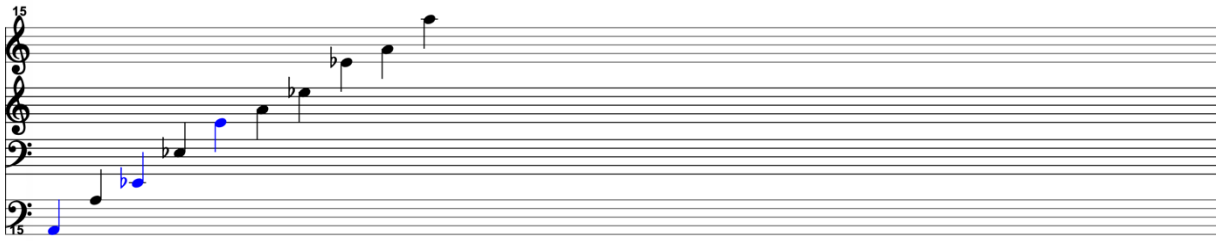
Arp 6/7 (8 sons = 6 in a row + 2)



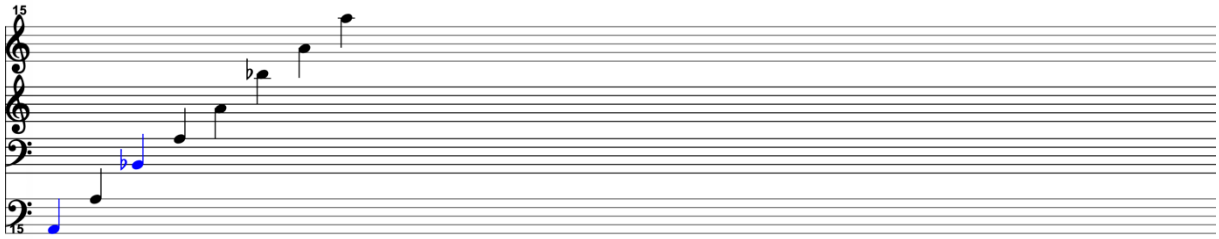
Arp 7/7 (8 sons in a row)



Arp 4/8 (8J4+8J9m4J4+8J4+8J = 3 sons)



Arp 8/8 (2 sons, non-octaviant = 8J9m7M x 2,5)



Modéchelle 9a

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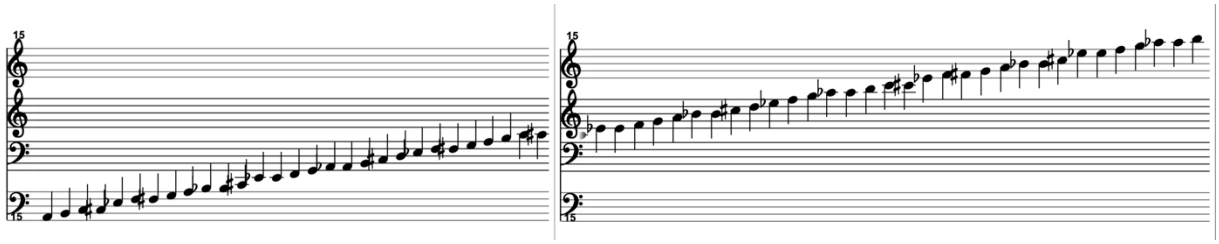
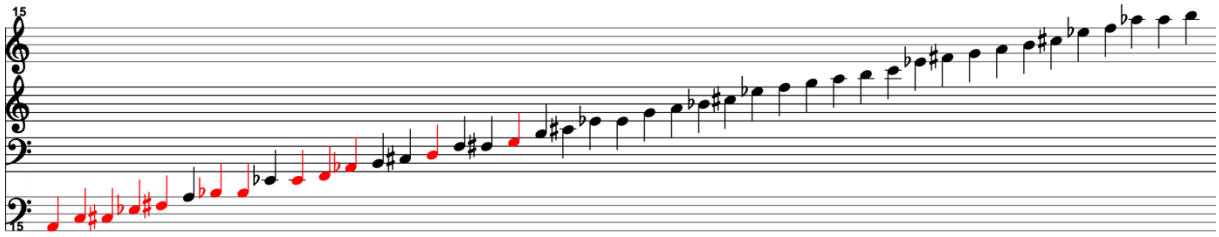
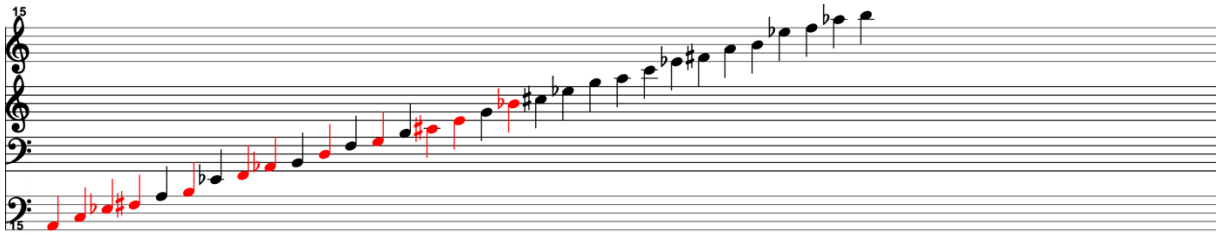
(7m / 8 à 12 sons / 5 octaves / 6 permutations / 9 transpositions)



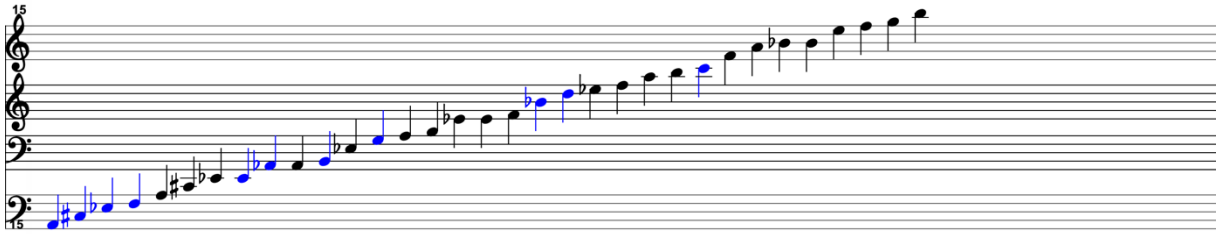
Arp 1/2 (12 sons)



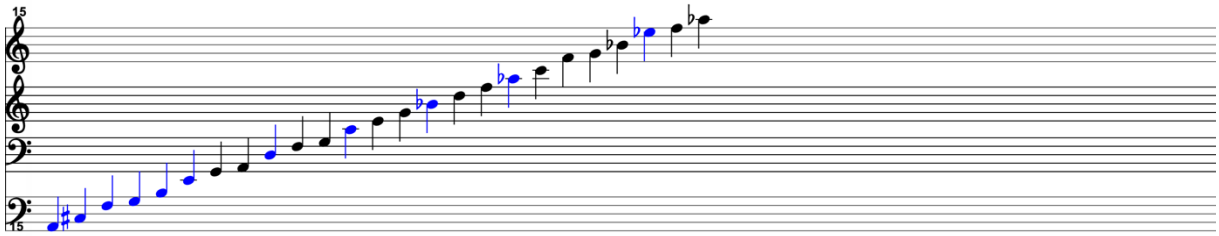
Arp 2/2 (12 sons)



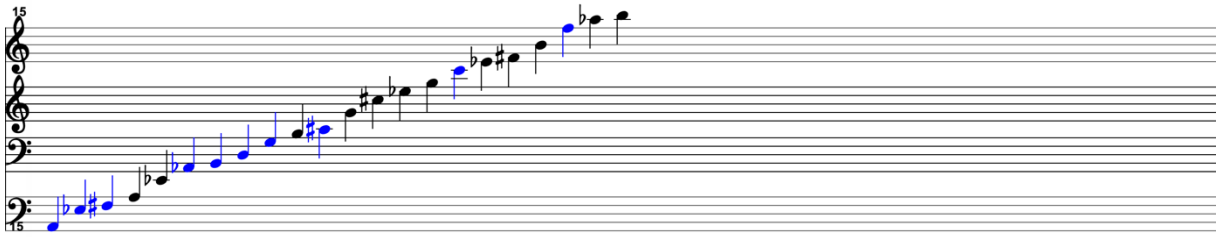
Arp 1/3 (11 sons)



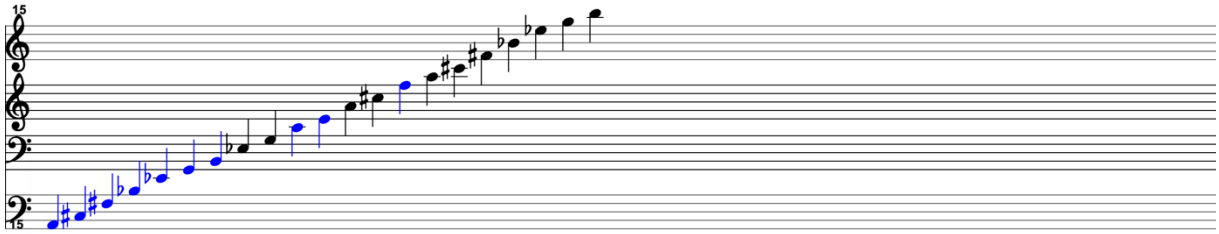
Arp 2/3 (11 sons)



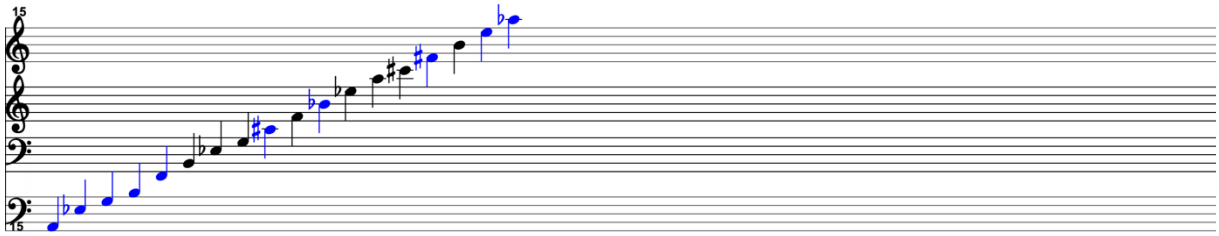
Arp 2/4 (10 sons)



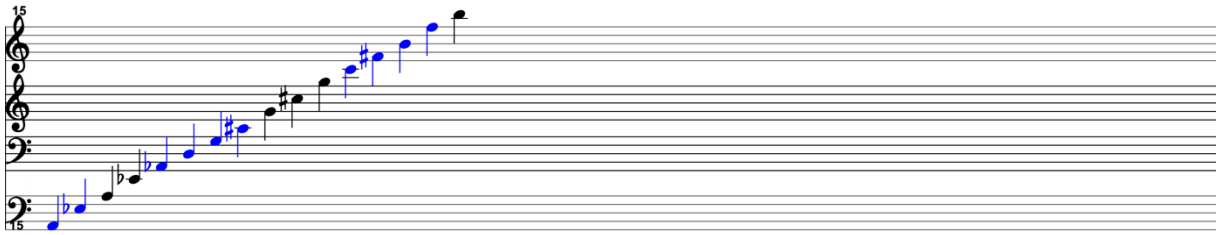
Arp 3/3 (10 sons)



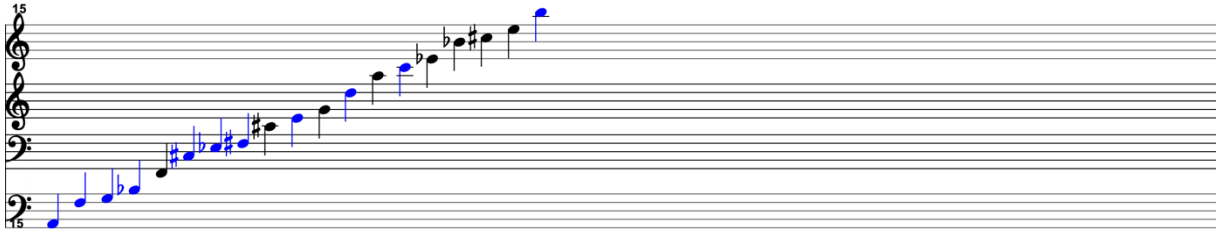
Arp 3/4 (10 sons)



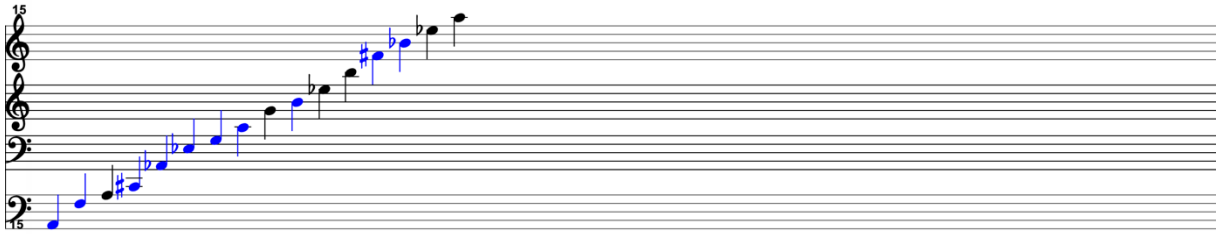
Arp 4/4 (10 sons)



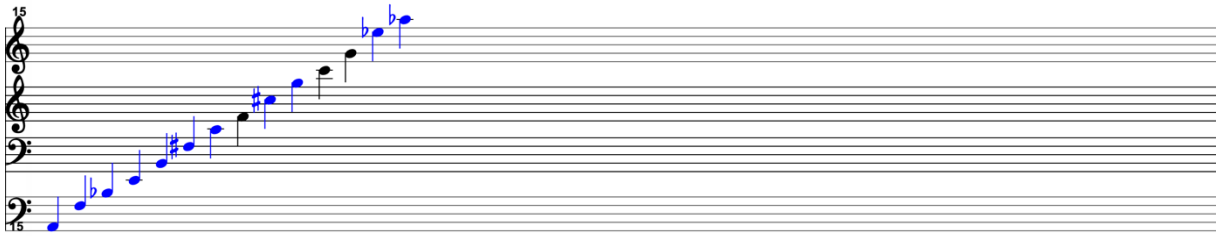
Arp 2/5 (11 sons)



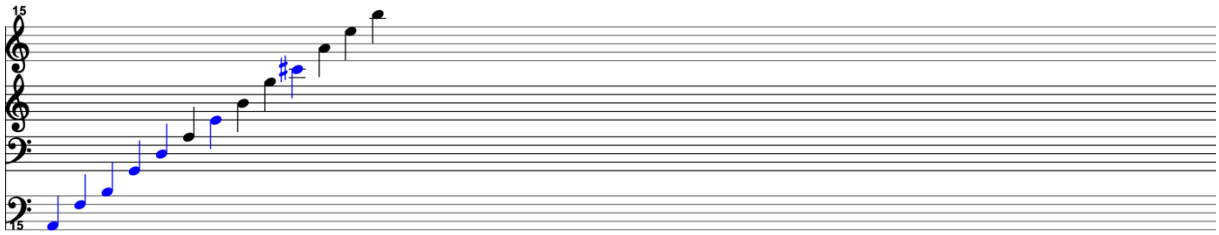
Arp 3/5 (10 sons)



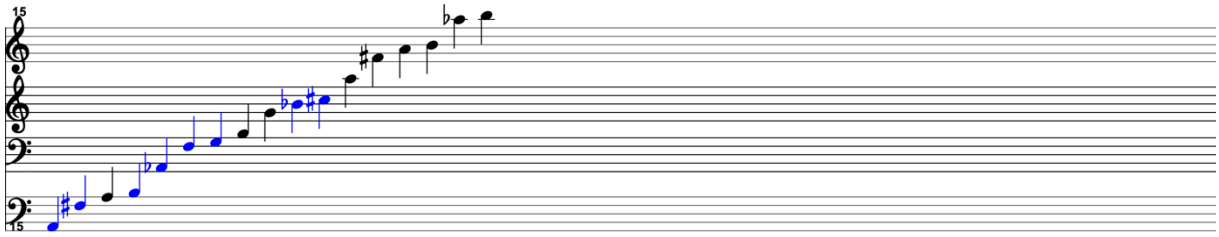
Arp 4/5 (11 sons)



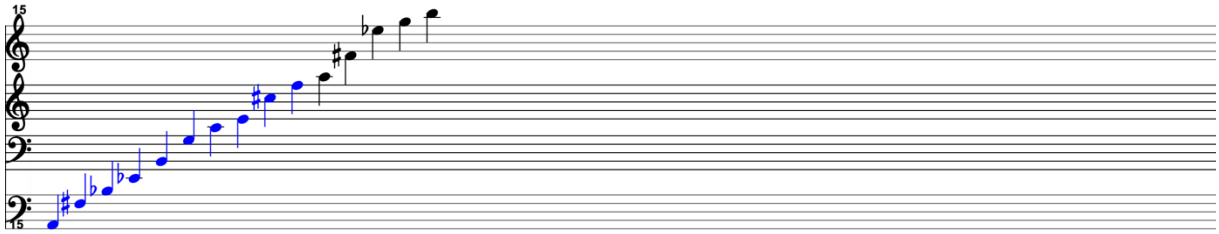
Arp 5/5 (7 sons)



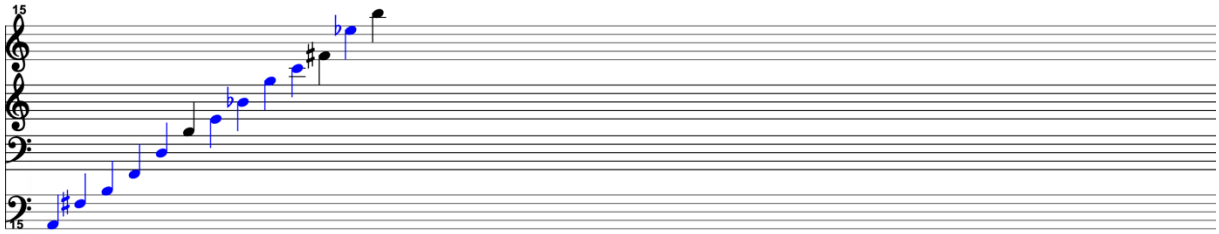
Arp 2/6 (8 sons)



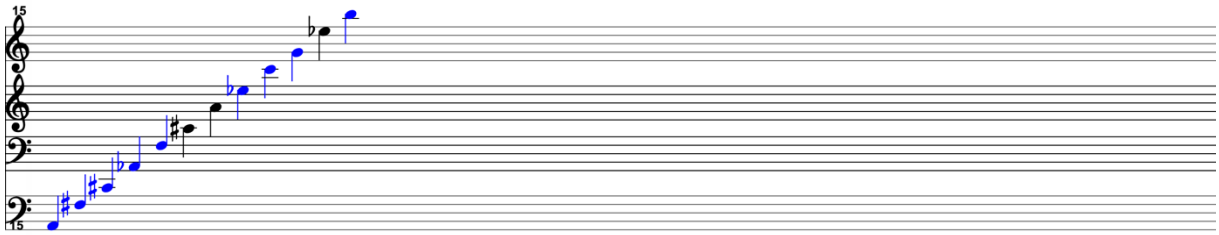
Arp 3/6 (10 sons in a row)



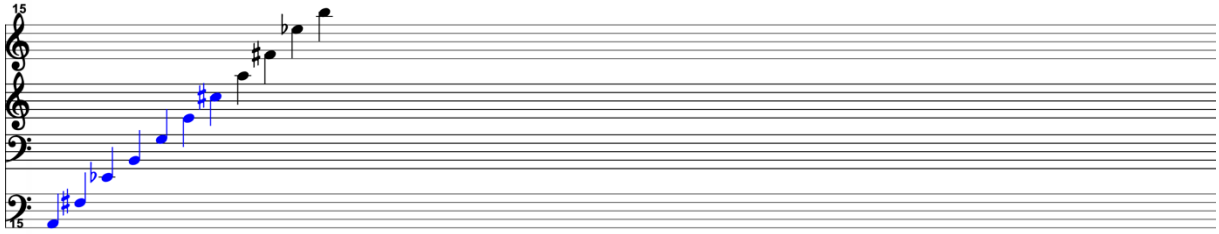
Arp 4/6 (10 sons)



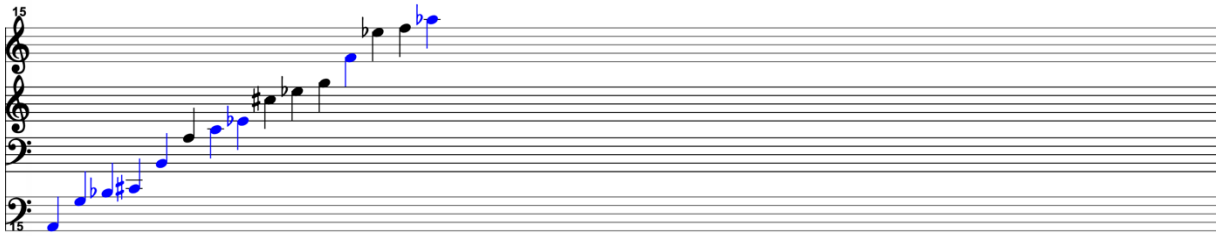
Arp 5/6 (9 sons)



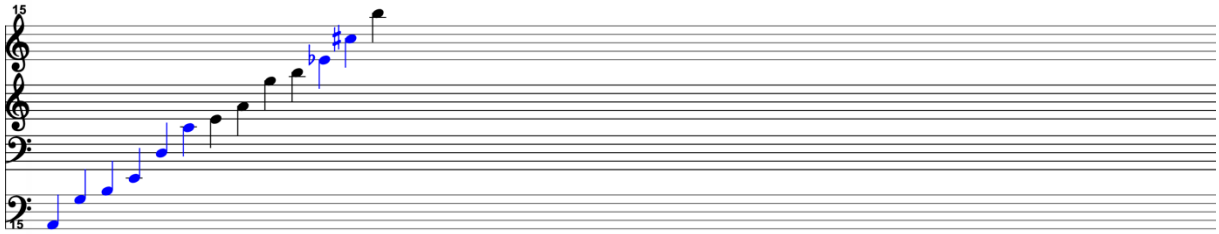
Arp 6/6 (7 sons in a row)



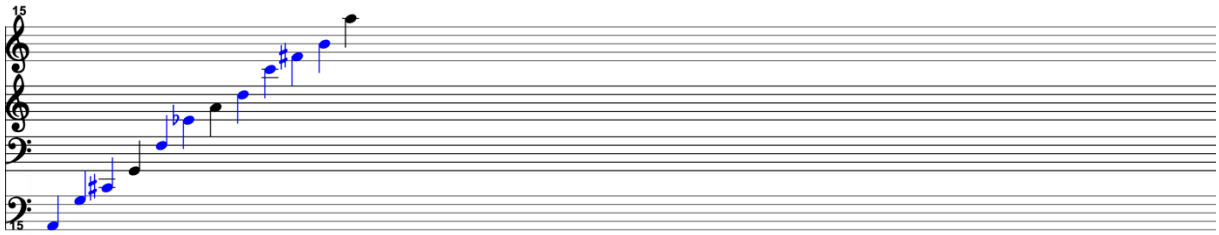
Arp 2/7 (9 sons)



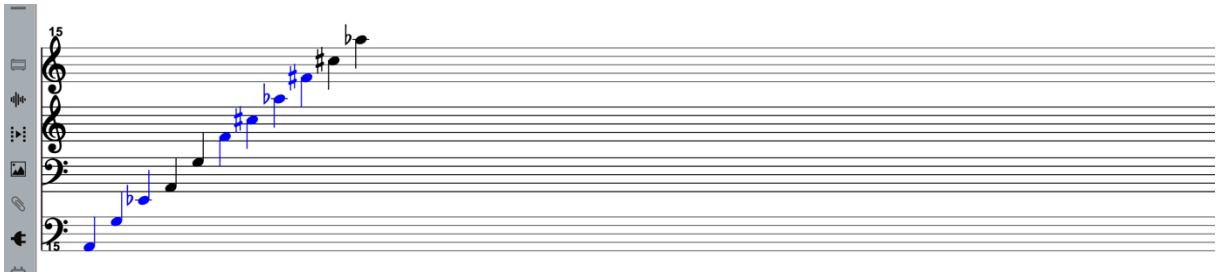
Arp 3/7 (8 sons)



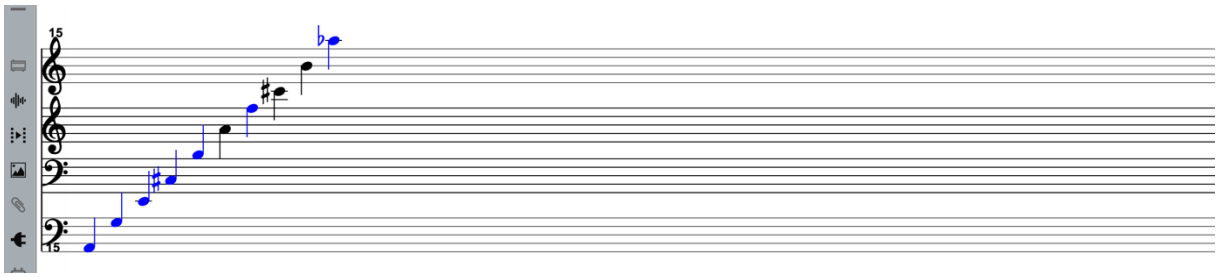
Arp 4/7 (9 sons)



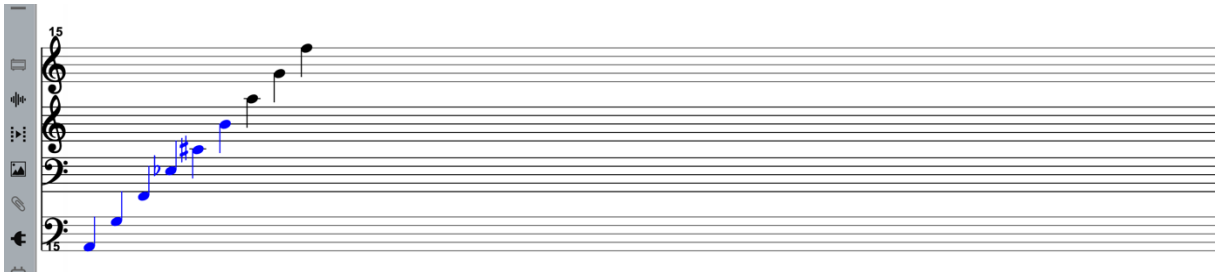
Arp 5/7 (7 sons)



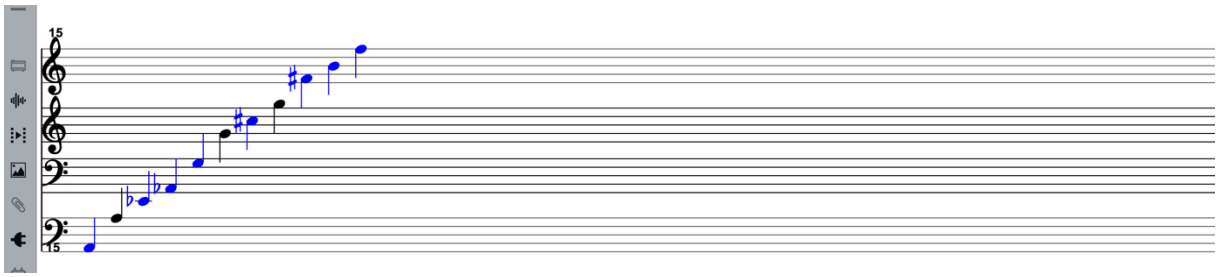
Arp 6/7 (7 sons)



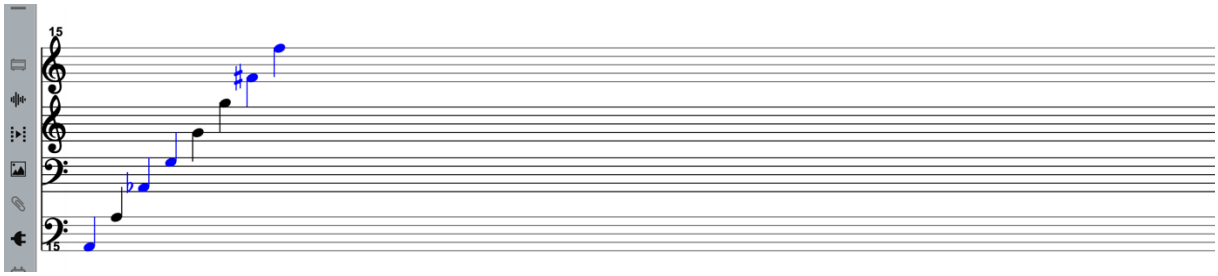
Arp 7/7 (6 sons in a row)



Arp 4/8 (8 sons)



Arp 8/8 (5 sons, non octaviant, 8J7M7M8J8J7M7M)



Modéchelle 9b

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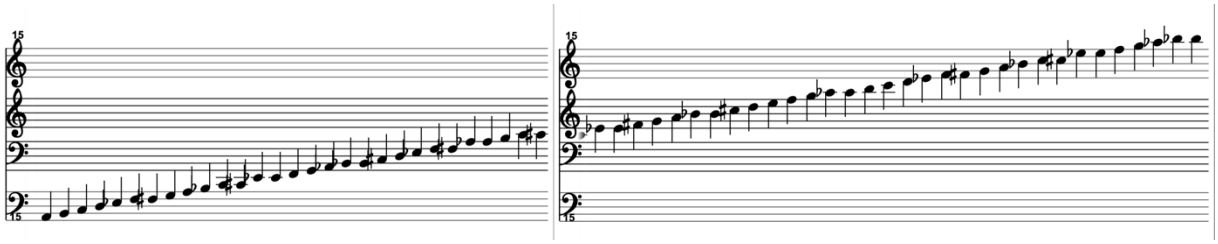
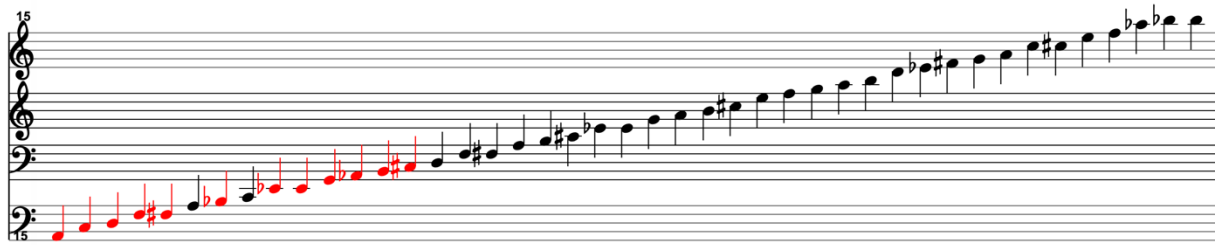
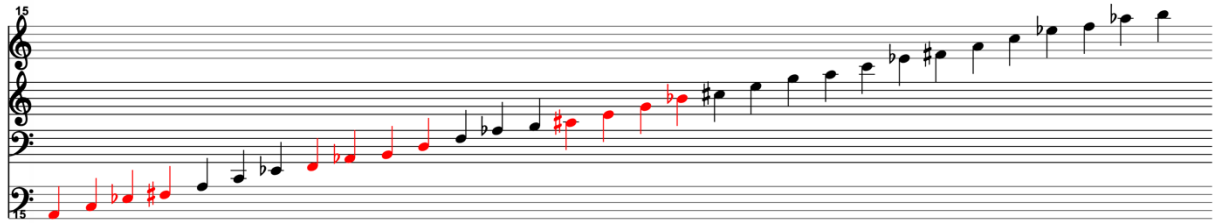
(7m / 8 à 12 sons / 5 octaves / 6 permutations / 9 transpositions)



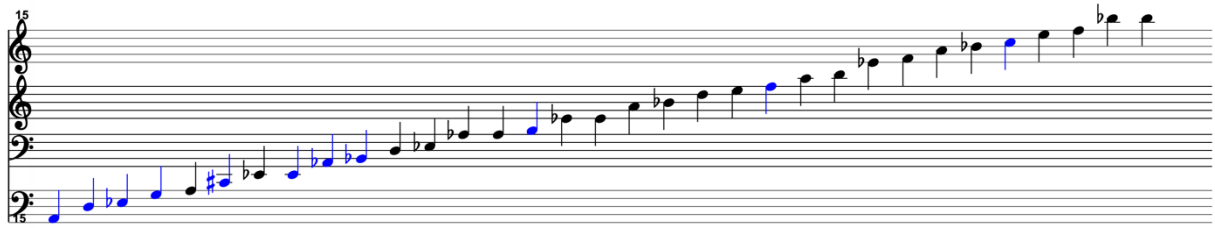
Arp 1/2 (12 sons)



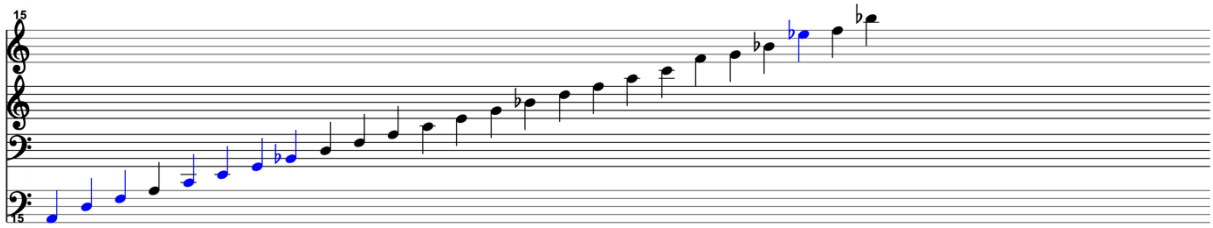
Arp 2/2 (12 sons)



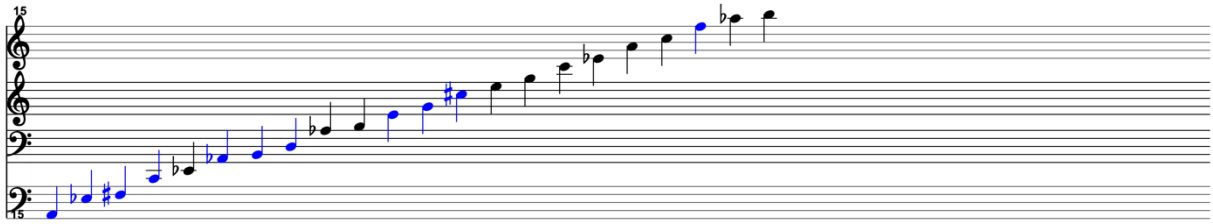
Arp 1/3 (11 sons)



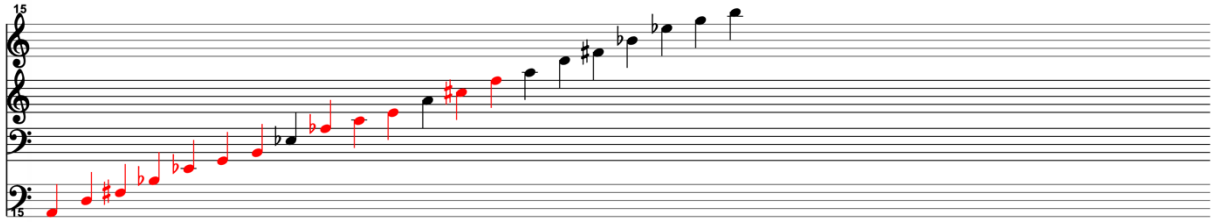
Arp 2/3 (8 sons)



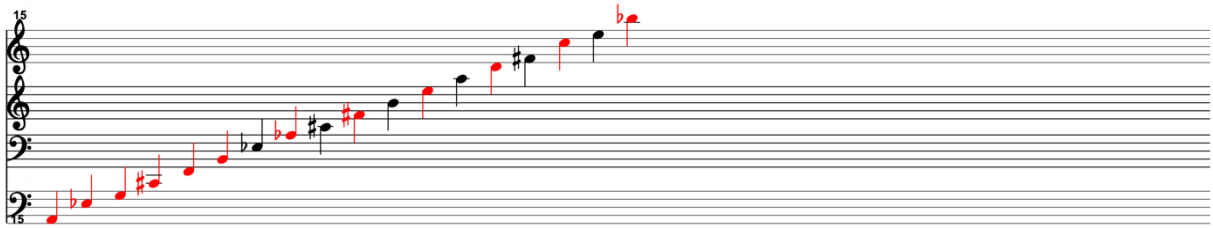
Arp 2/4 (11 sons)



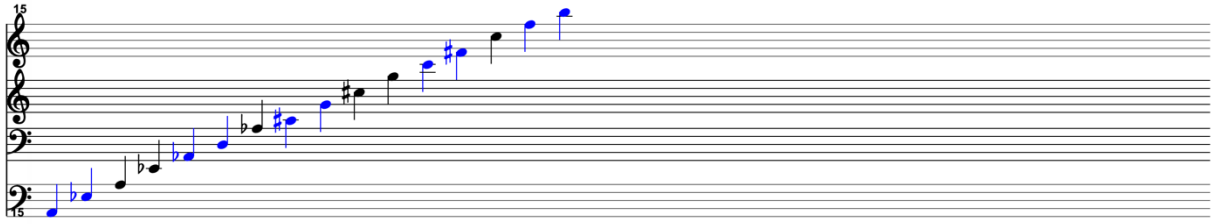
Arp 3/3 (12 sons)



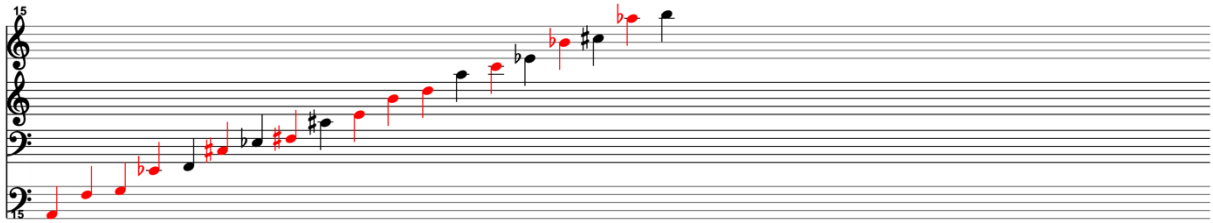
Arp 3/4 (12 sons)



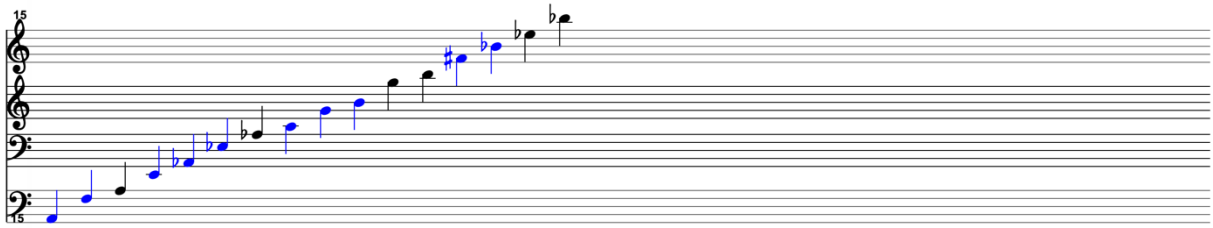
Arp 4/4 (10 sons)



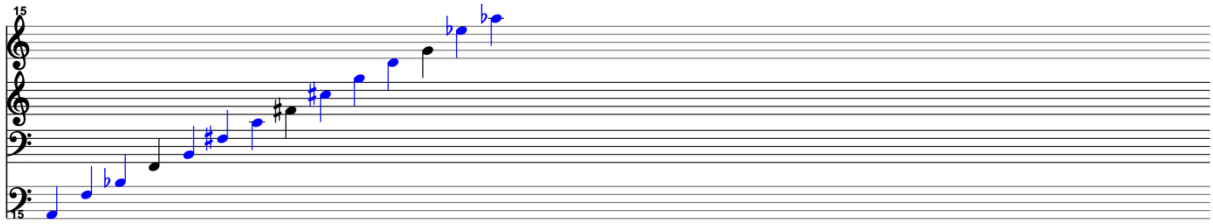
Arp 2/5 (12 sons)



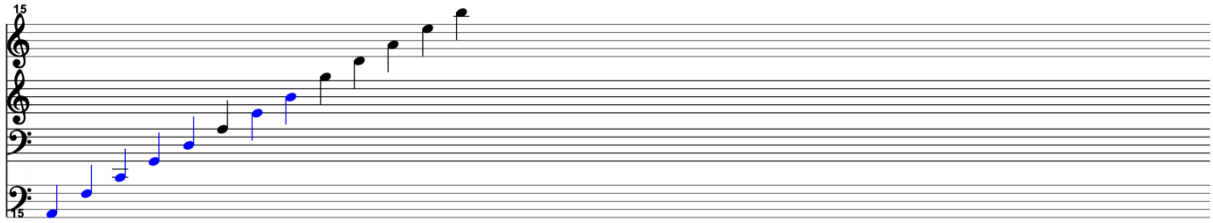
Arp 3/5 (10 sons)



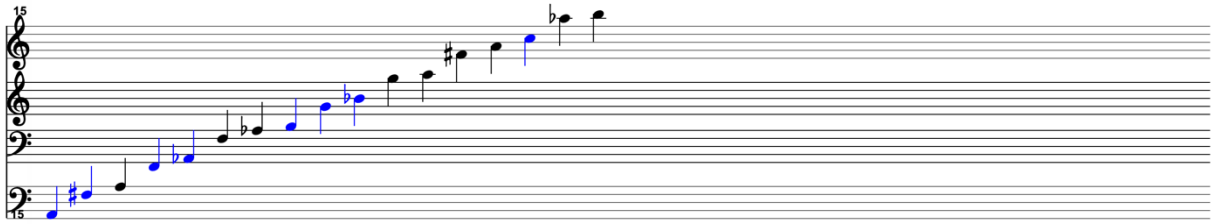
Arp 4/5 (11 sons)



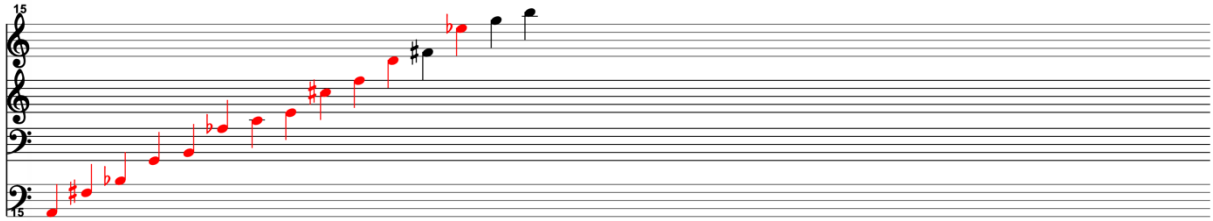
Arp 5/5 (7 sons)



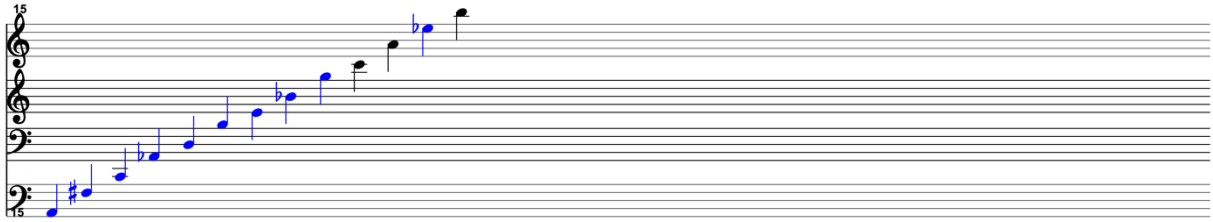
Arp 2/6 (8 sons)



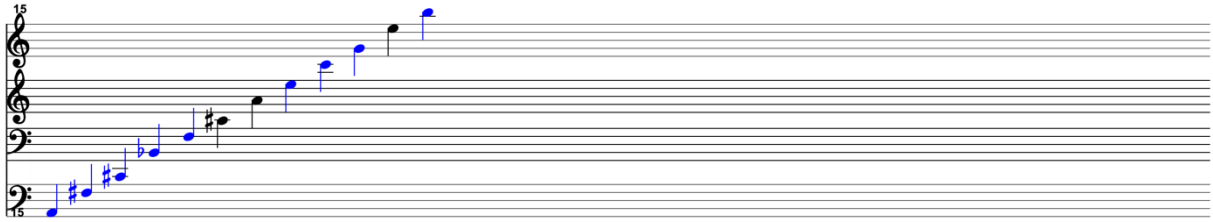
Arp 3/6 (12 sons = 11 in a row + 1)



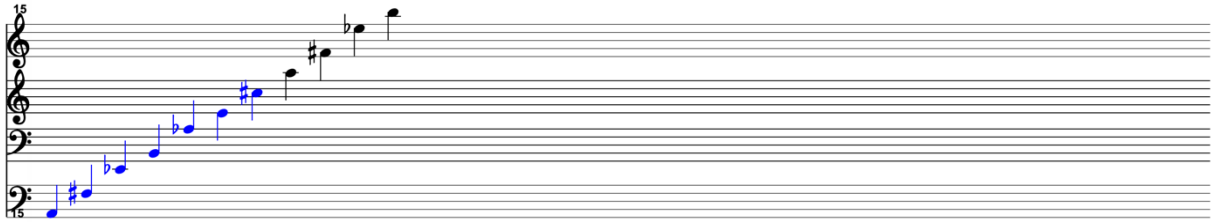
Arp 4/6 (10 sons = 9 in a row + 1)



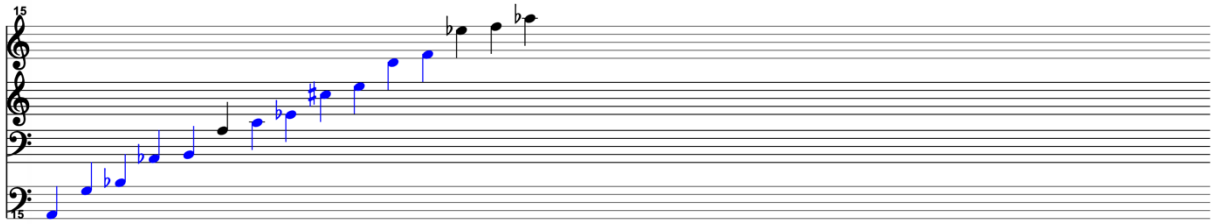
Arp 5/6 (9 sons)



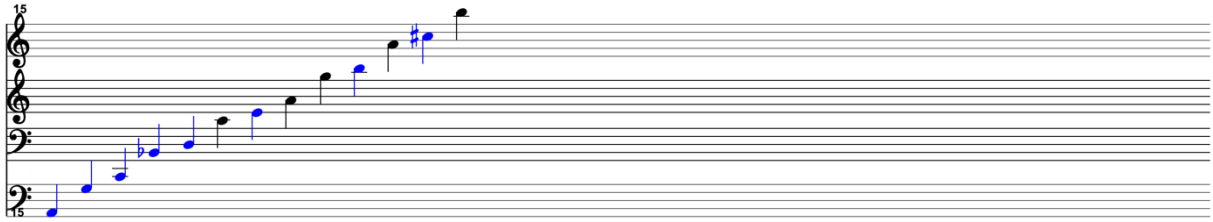
Arp 6/6 (7 sons in a row)



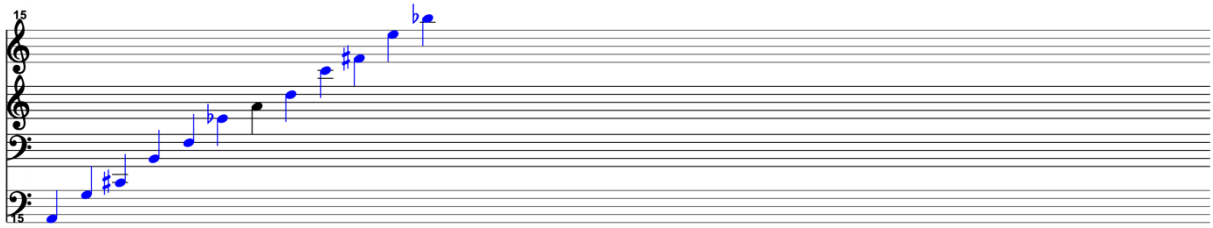
Arp 2/7 (11 sons)



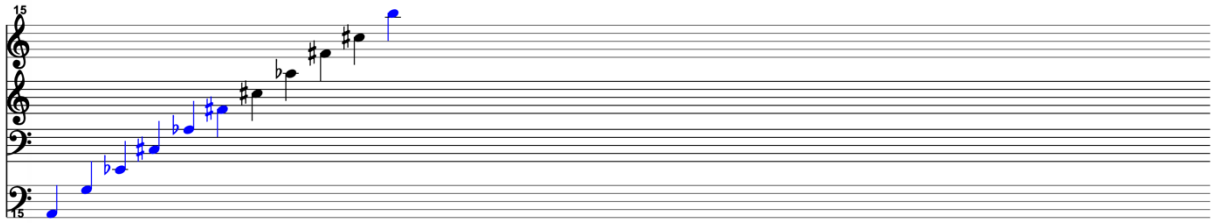
Arp 3/7 (8 sons)



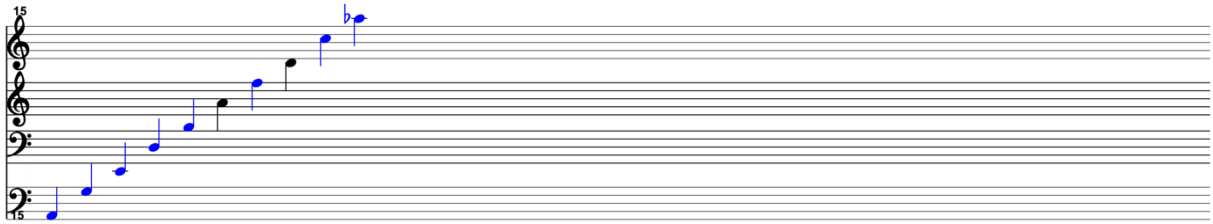
Arp 4/7 (11 sons = 6 + 5)



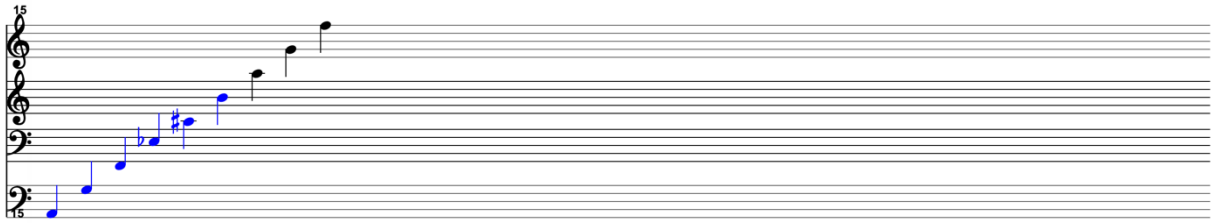
Arp 5/7 (7 sons = 6 in a row + 1)



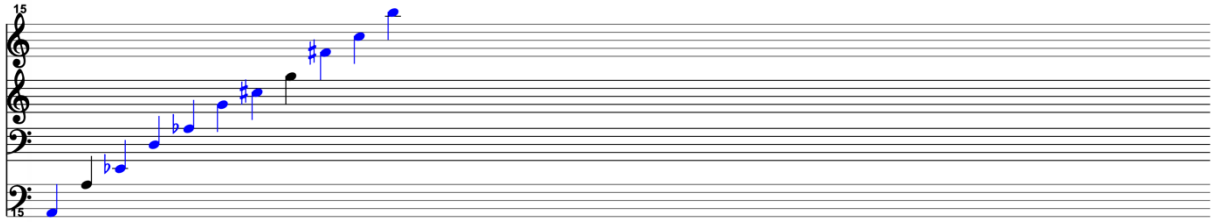
Arp 6/7 (8 sons)



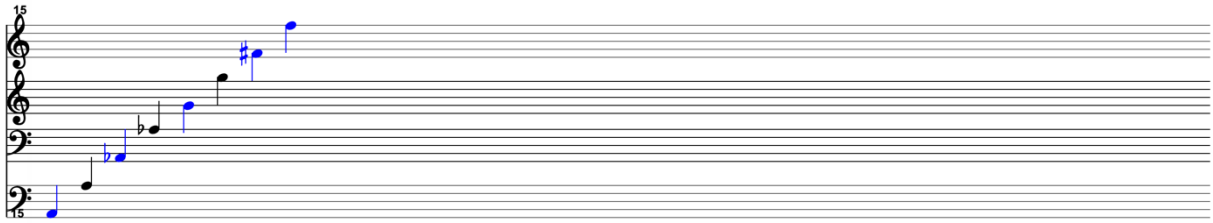
Arp 7/7 (6 sons in a row)



Arp 4/8 (9 sons)



Arp 8/8 (5 sons, non-octaviant = 8J7M x3 +7M)



Modéchelle 10a

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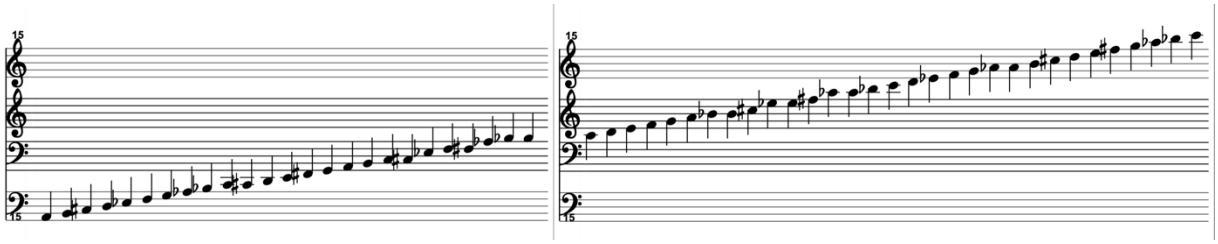
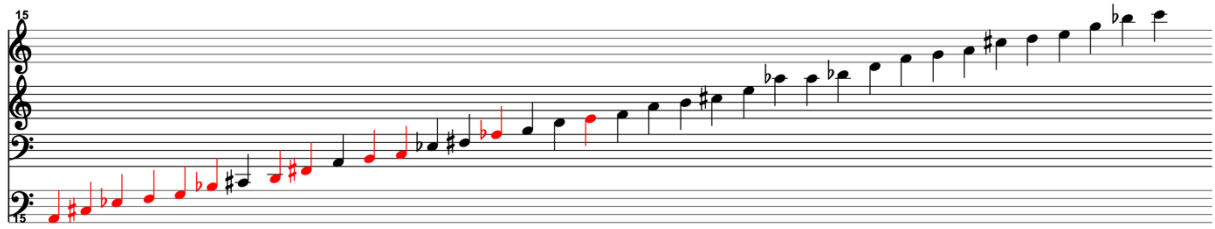
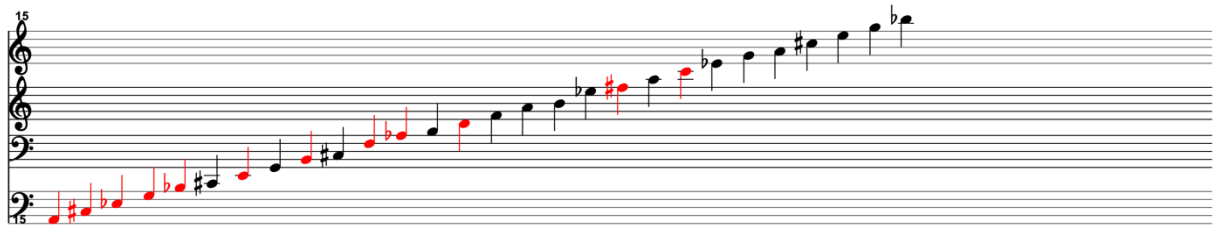
(7M / 8 à 12 sons / 12 octaves / 6 permutations / 10 transpositions)



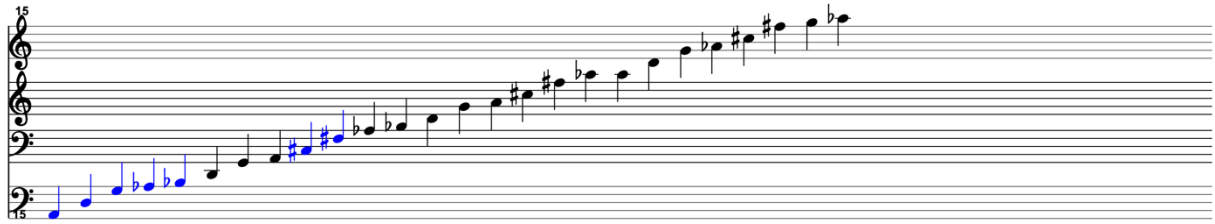
Arp 1/2 (12 sons)



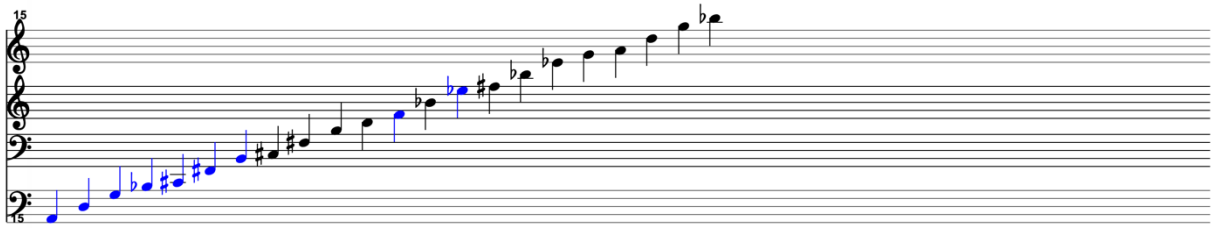
Arp 2/2 (12 sons)



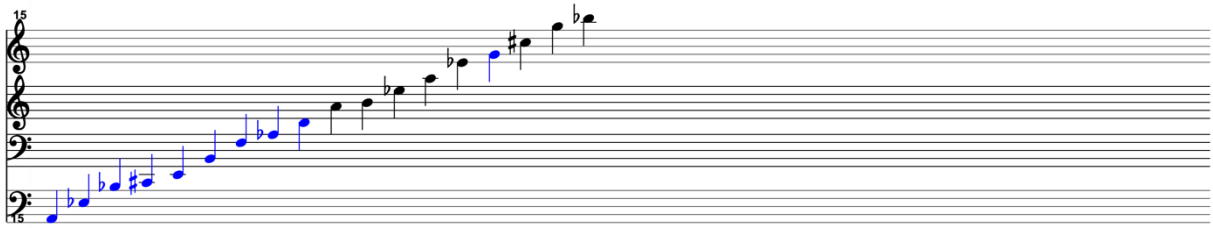
Arp 1/3 (7 sons)



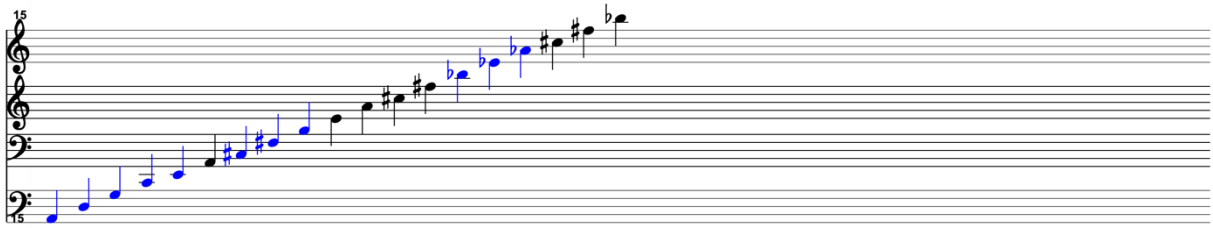
Arp 2/3 (9 sons)



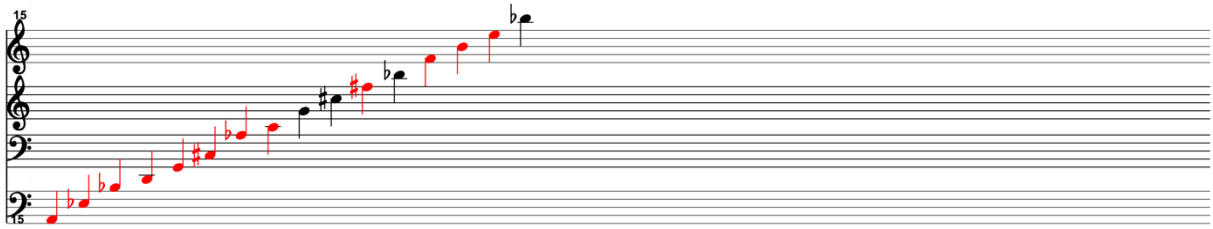
Arp 2/4 (10 sons)



Arp 3/3 (11 sons)

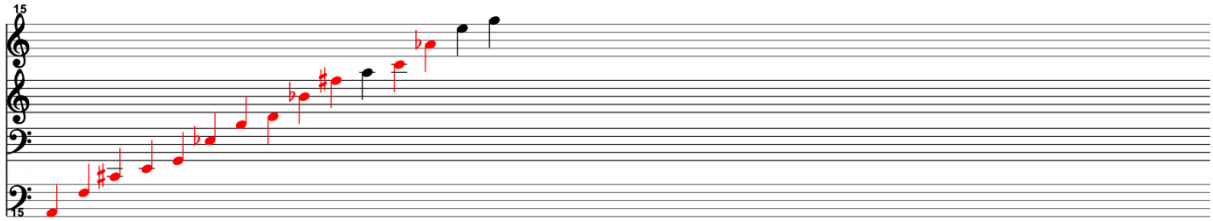


Arp 3/4 (12 sons)

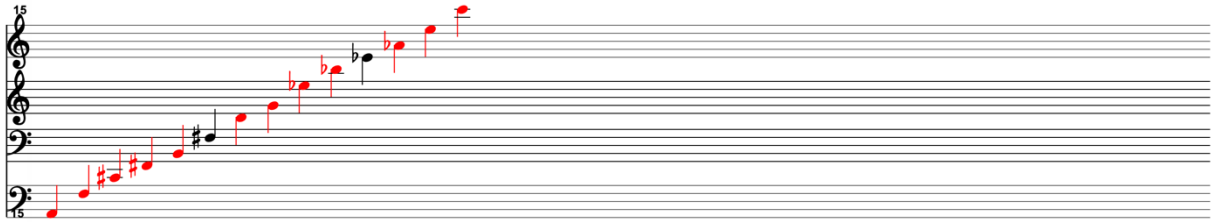


Arp 4/4 (10 sons)

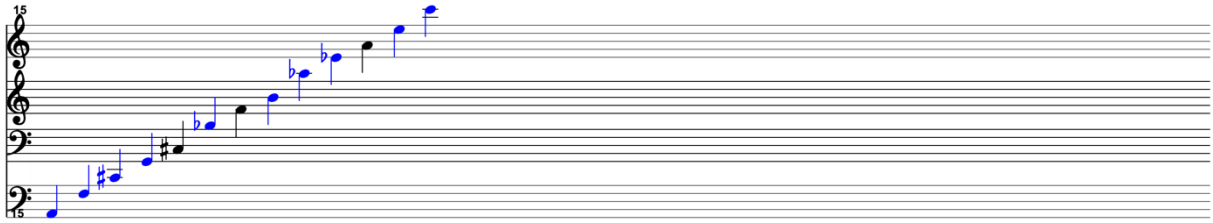
Arp 2/5 (12 sons = 10 in a row + 2)



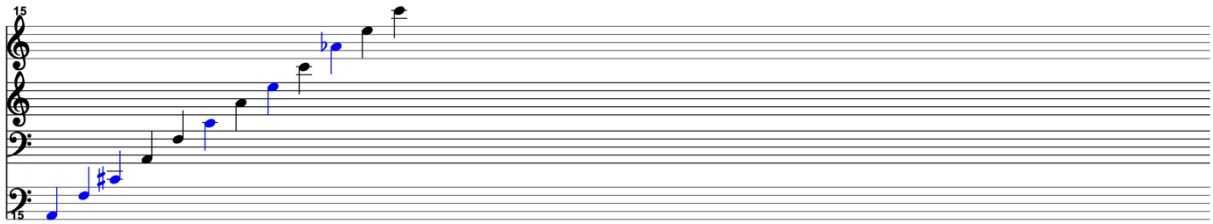
Arp 3/5 (12 sons)



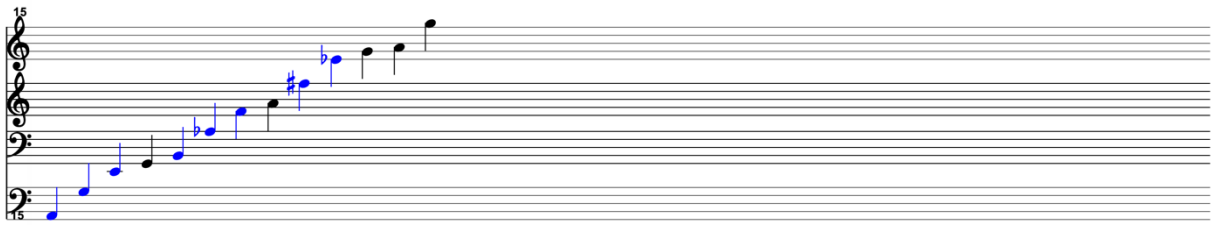
Arp 4/5 (10 sons)



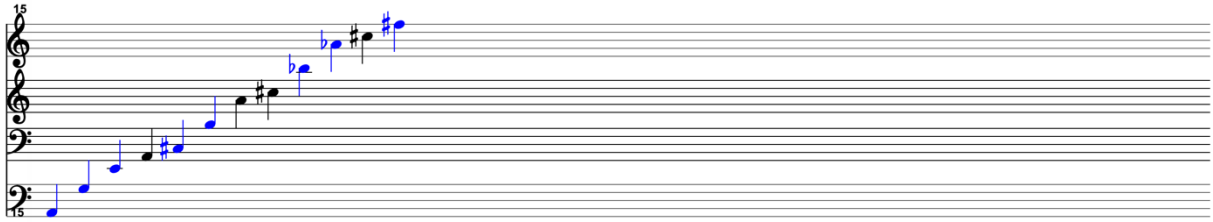
Arp 5/5 (6 sons)



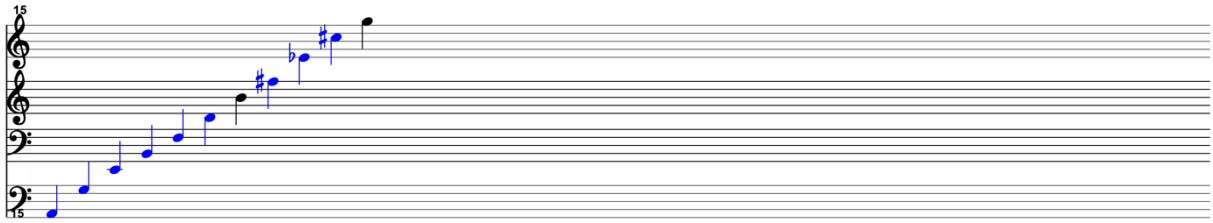
Arp 2/6 (8 sons)



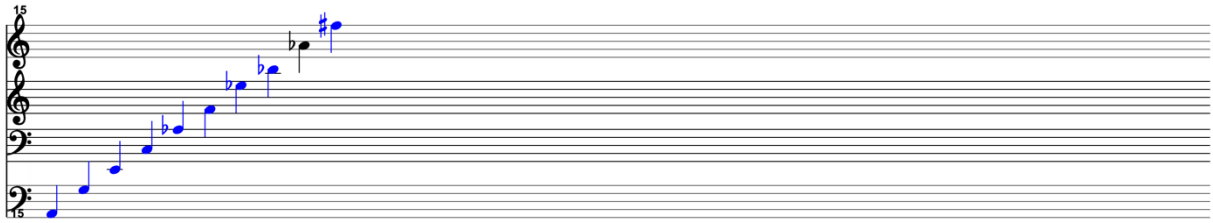
Arp 3/6 (8 sons)



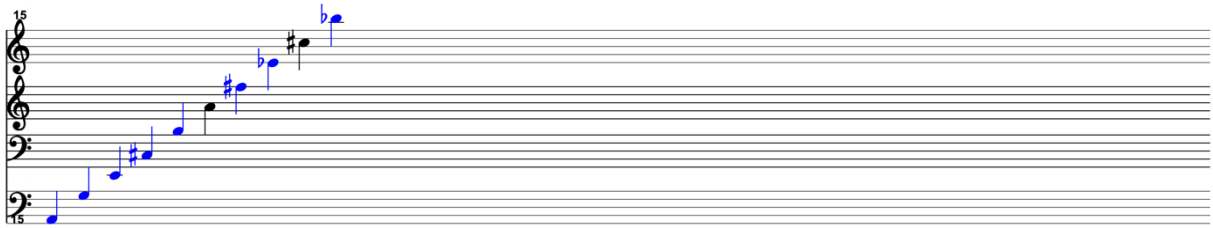
Arp 4/6 (9 sons)



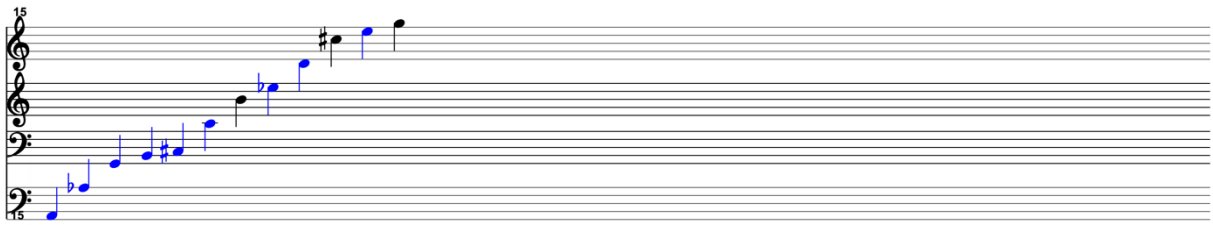
Arp 5/6 (9 sons)



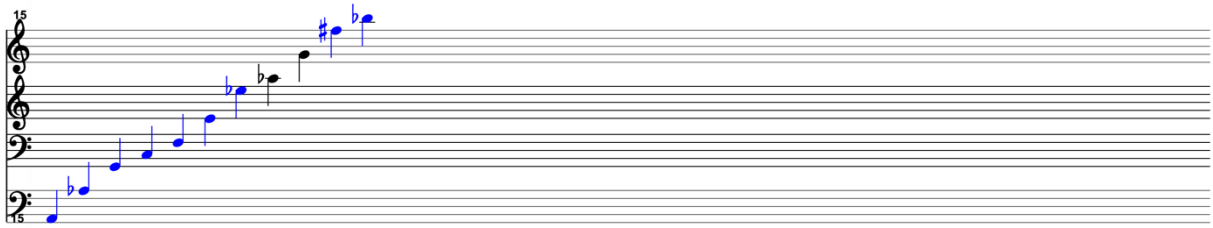
Arp 6/6 (8 sons)



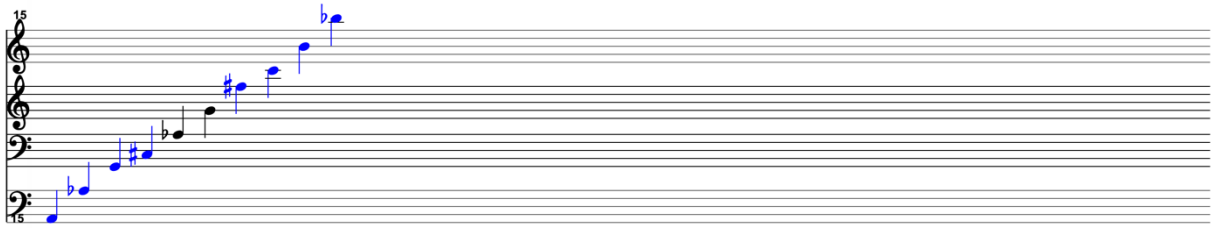
Arp 2/7 (9 sons)



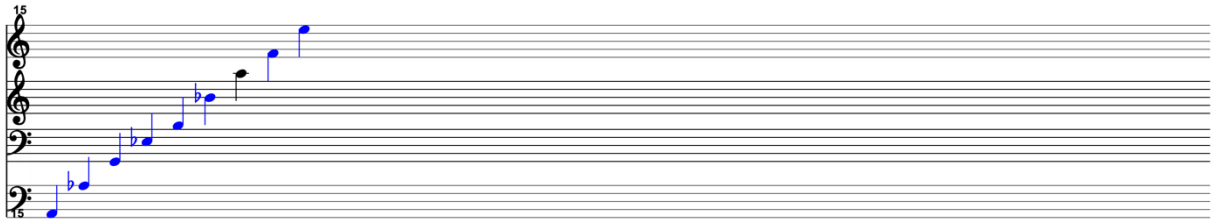
Arp 3/7 (9 sons)



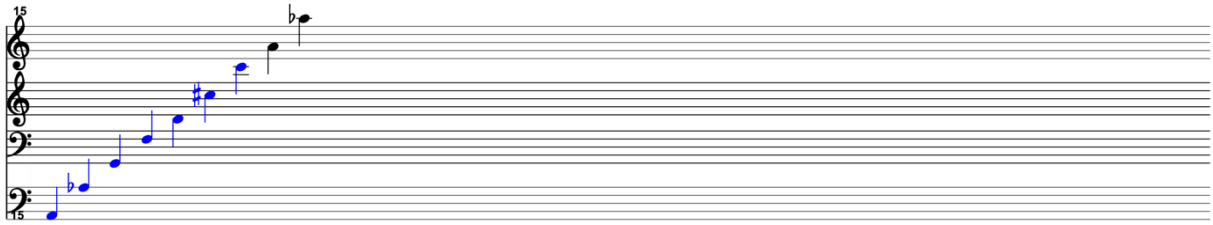
Arp 4/7 (8 sons)



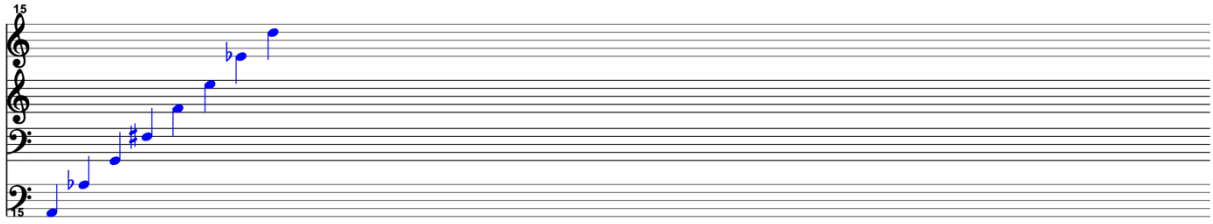
Arp 5/7 (8 sons)



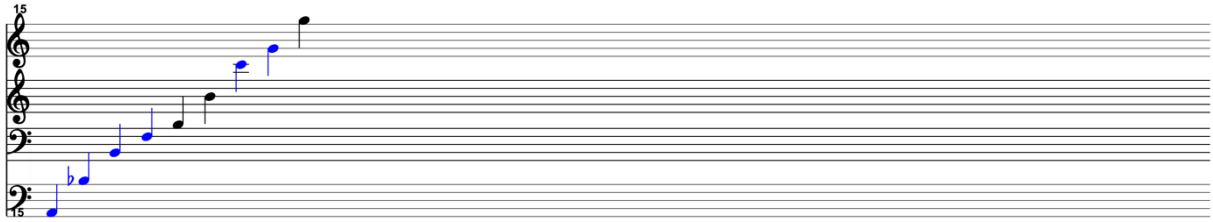
Arp 6/7 (7 sons)



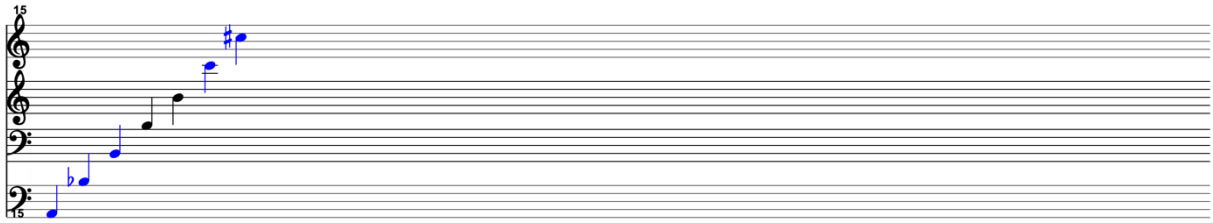
Arp 7/7 (8 sons)



Arp 4/8 (6 sons)



Arp 8/8 (5 sons, non-octaviant)



Modéchelle 10b

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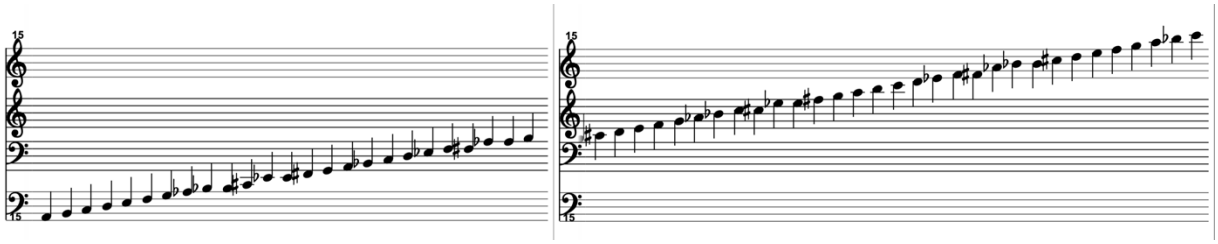
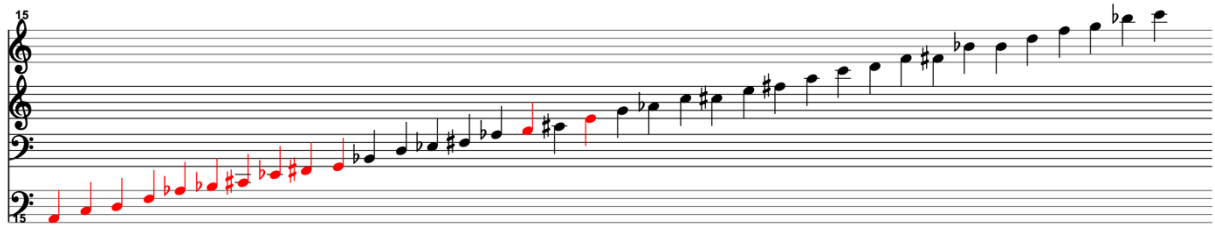
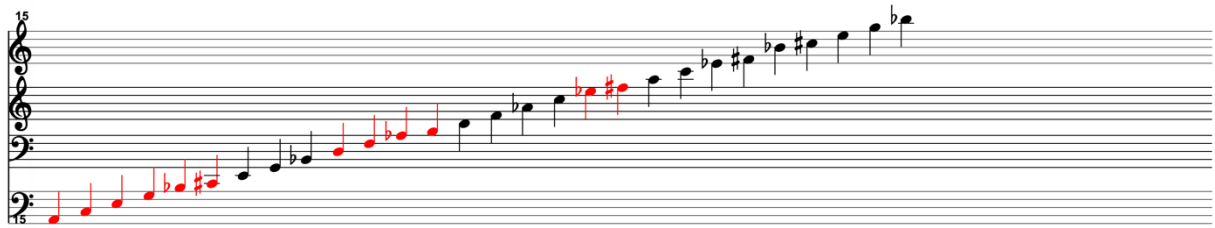
(7M / 8 à 12 sons / 12 octaves / 6 permutations / 10 transpositions)



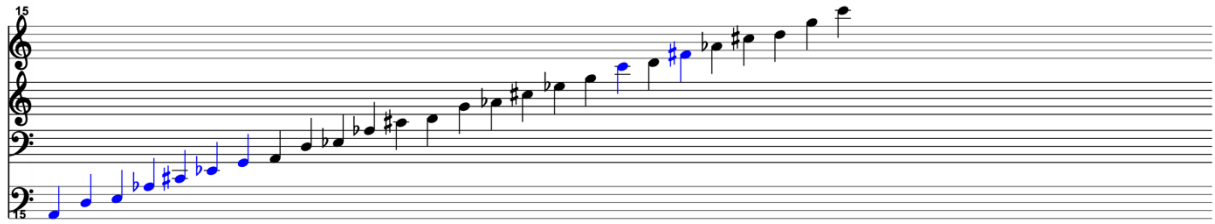
Arp 1/2 (12 sons)



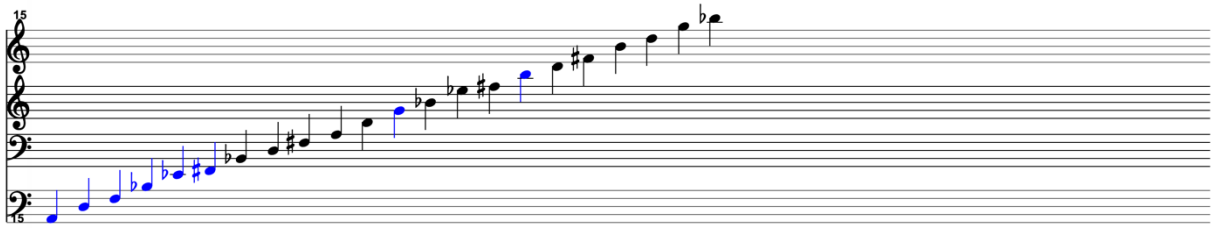
Arp 2/2 (12 sons)



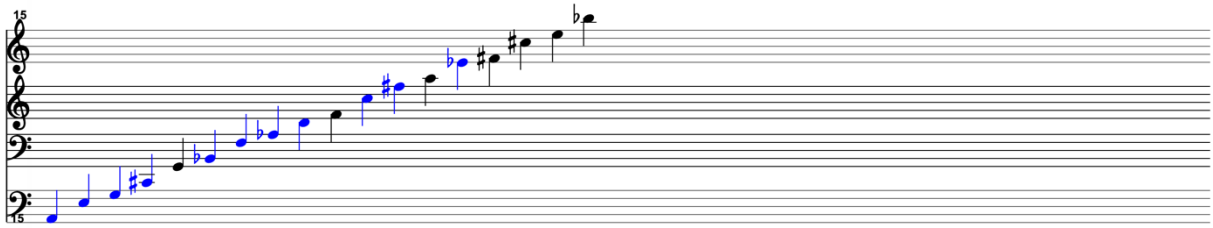
Arp 1/3 (9 sons)



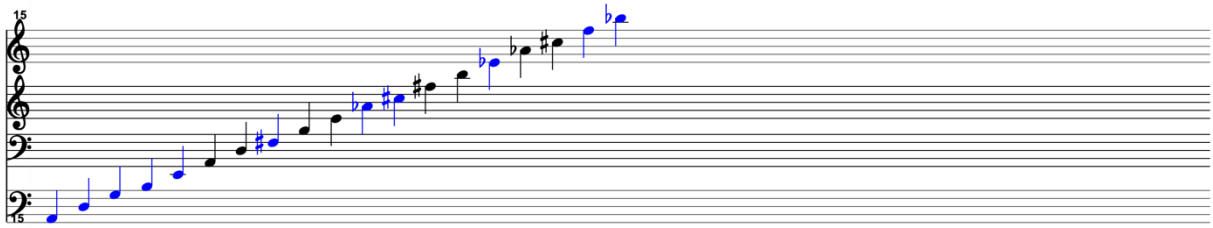
Arp 2/3 (8 sons)



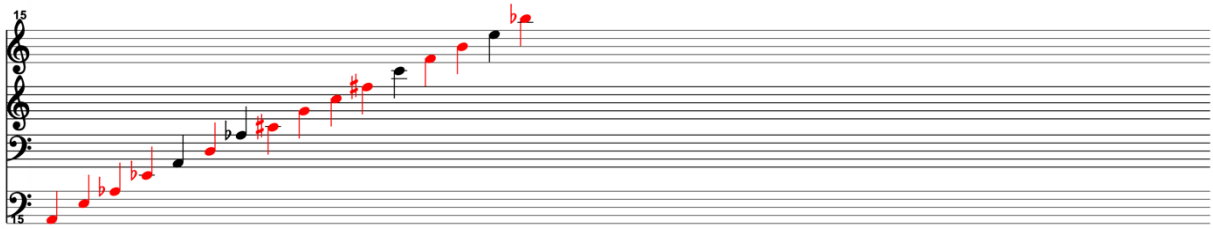
Arp 2/4 (11 sons)



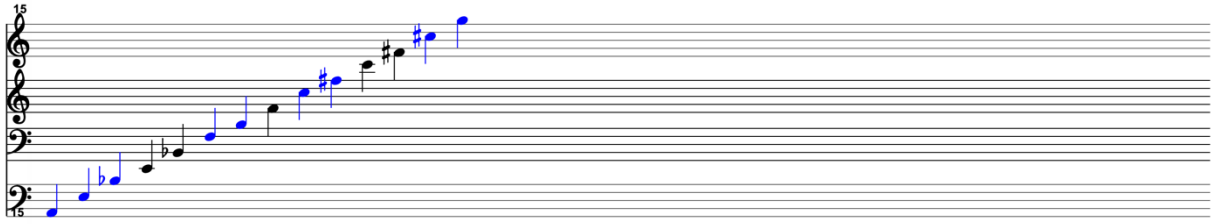
Arp 3/3 (11 sons)



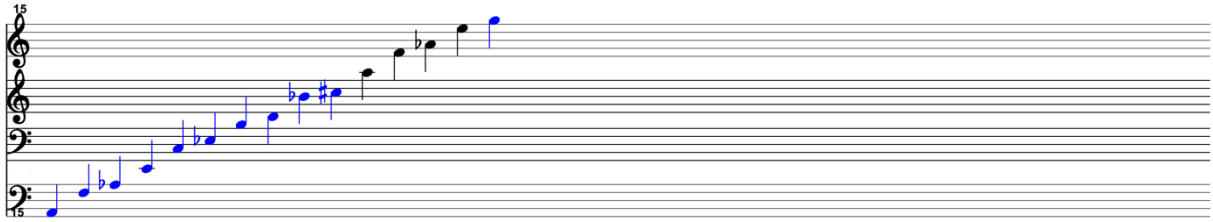
Arp 3/4 (12 sons)



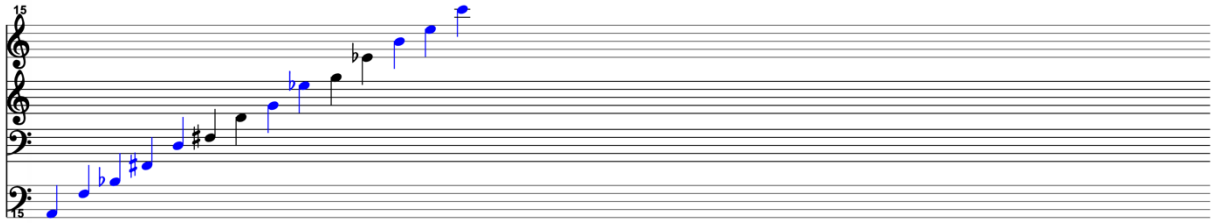
Arp 4/4 (9 sons)



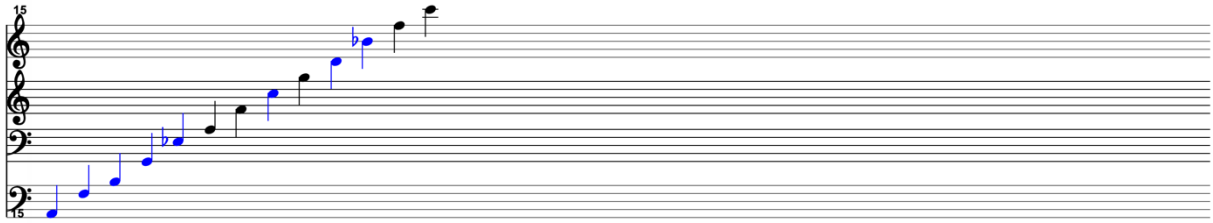
Arp 2/5 (11 sons = 10 in a row + 1)



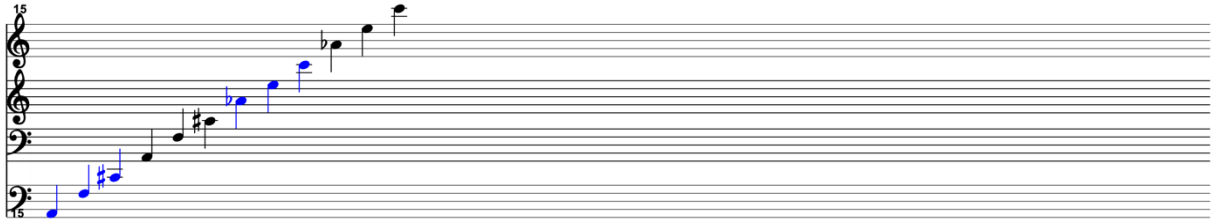
Arp 3/5 (10 sons)



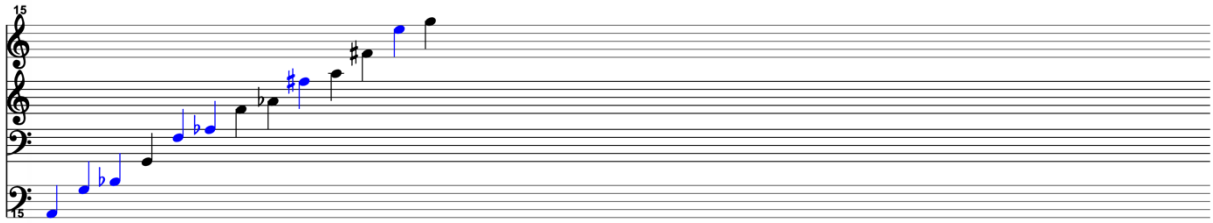
Arp 4/5 (8 sons)



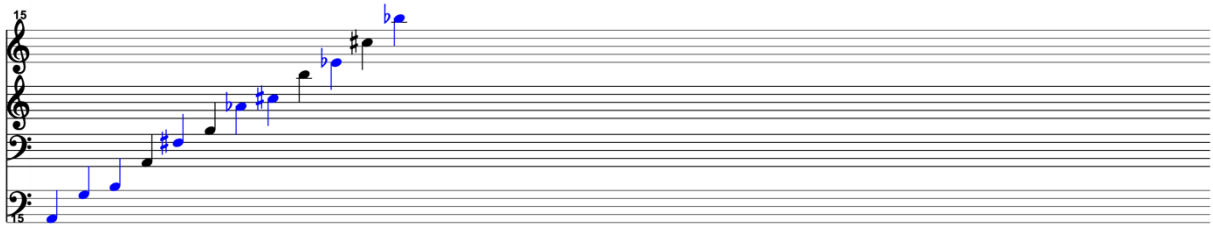
Arp 5/5 (6 sons)



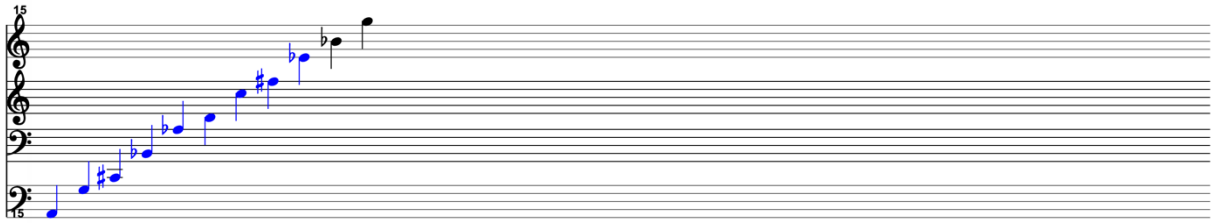
Arp 2/6 (7 sons)



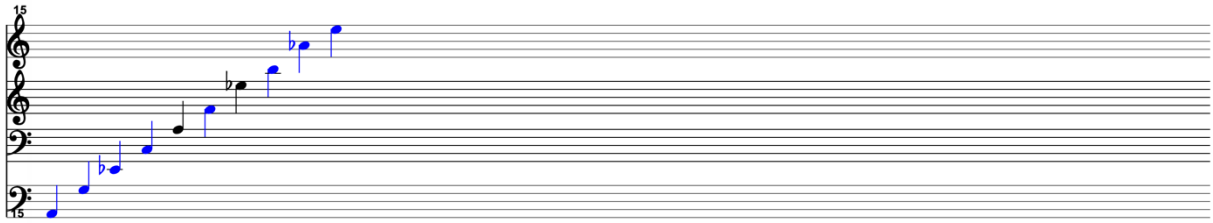
Arp 3/6 (8 sons)



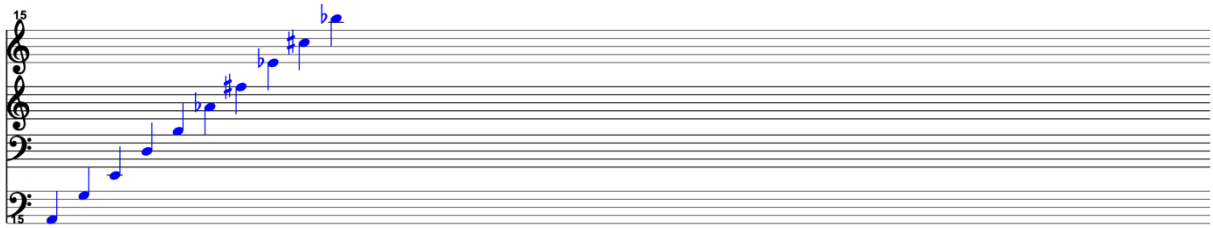
Arp 4/6 (9 sons in a row)



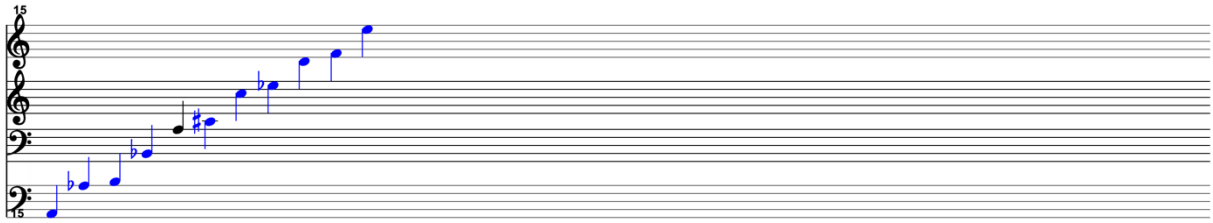
Arp 5/6 (8 sons)



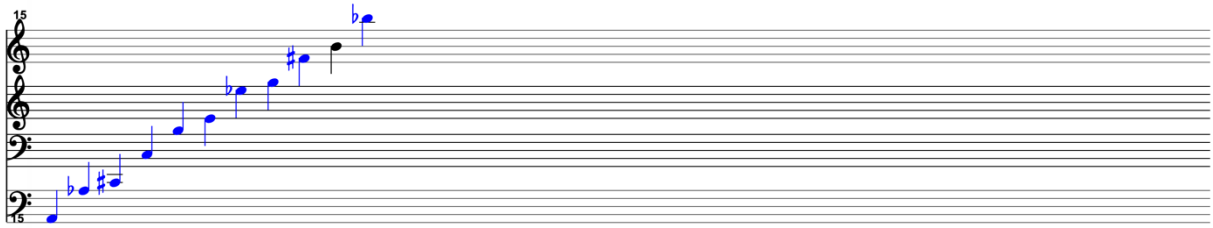
Arp 6/6 (10 sons in a row)



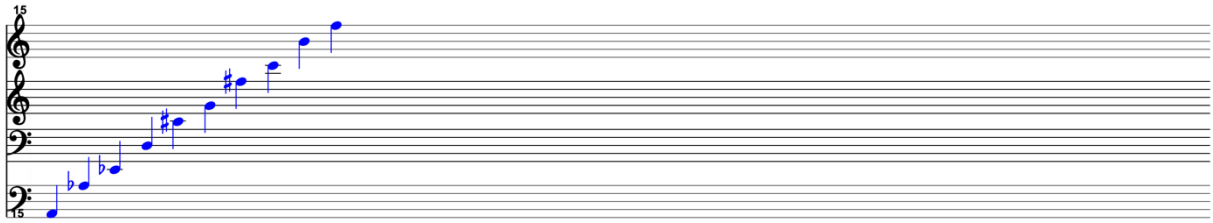
Arp 2/7 (10 sons)



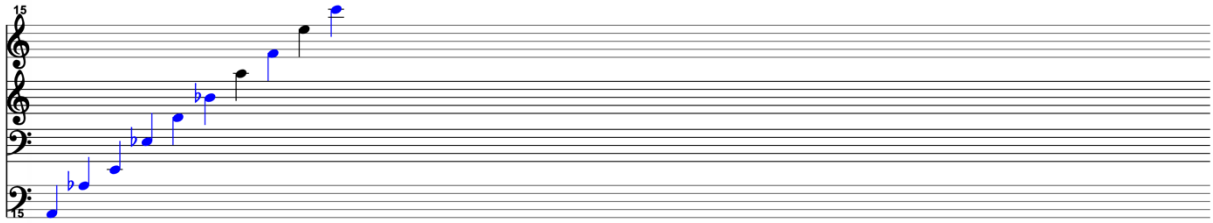
Arp 3/7 (10 sons = 9 in a row + 1)



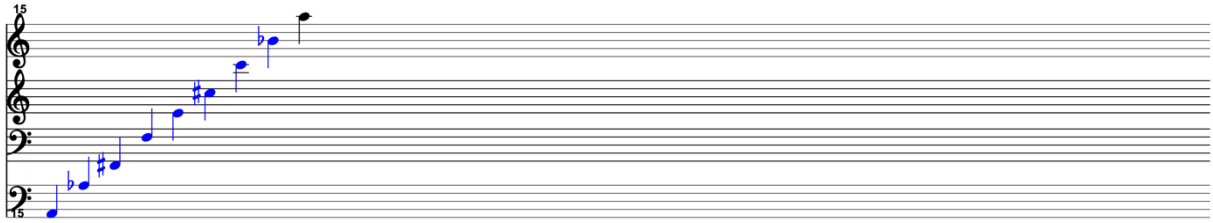
Arp 4/7 (10 sons in a row)



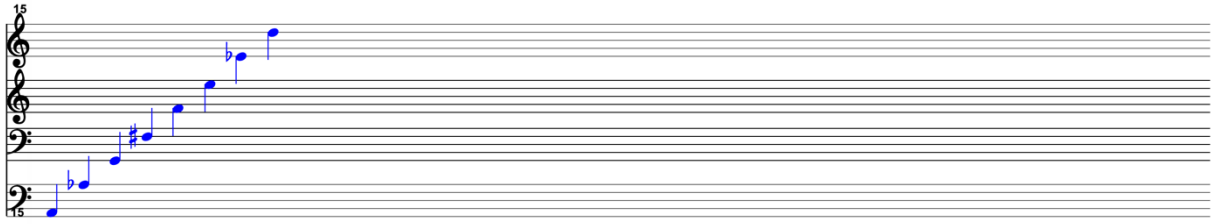
Arp 5/7 (8 sons)



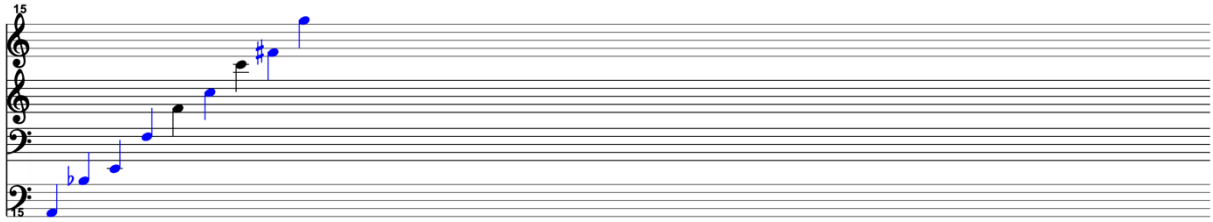
Arp 6/7 (8 sons in a row)



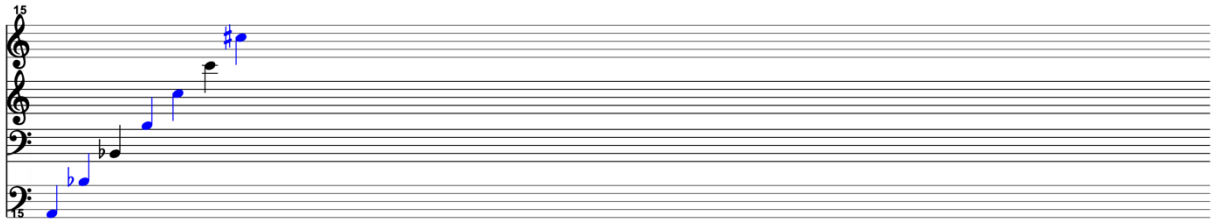
Arp 7/7 (8 sons in a row)



Arp 4/8 (7 sons)



Arp 8/8 (non-octaviant, 5 sons = 9m8J9m9m8J9m)



Modéchelle 10c

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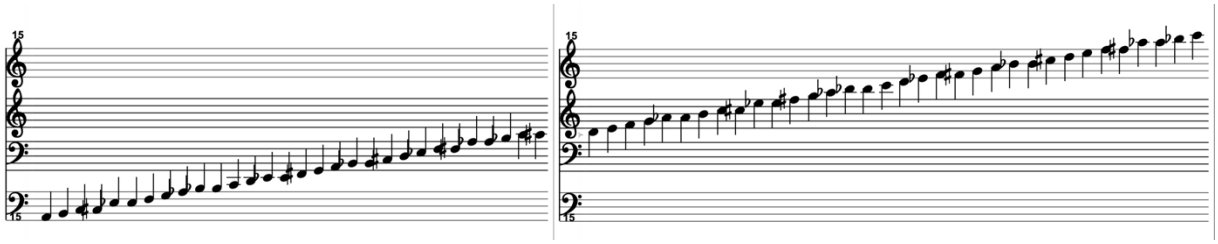
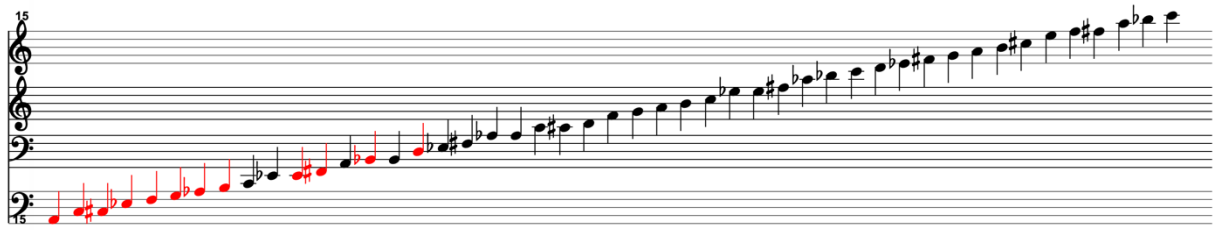
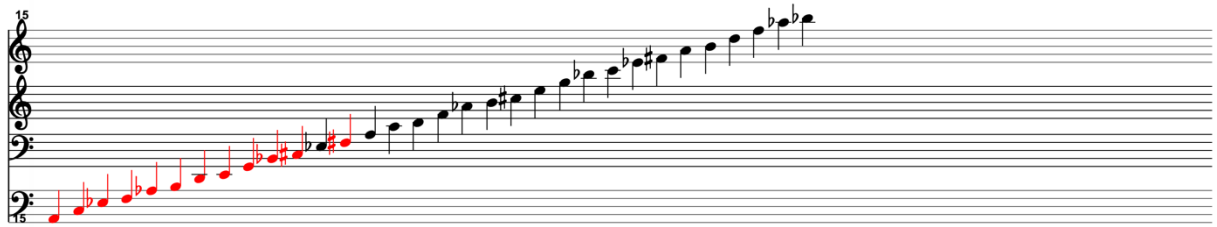
(7M / 8 à 12 sons / 12 octaves / 7 permutations / 10 transpositions)



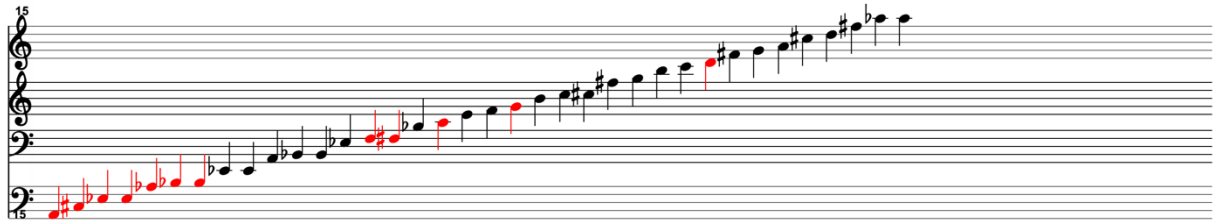
Arp 1/2 (12 sons)



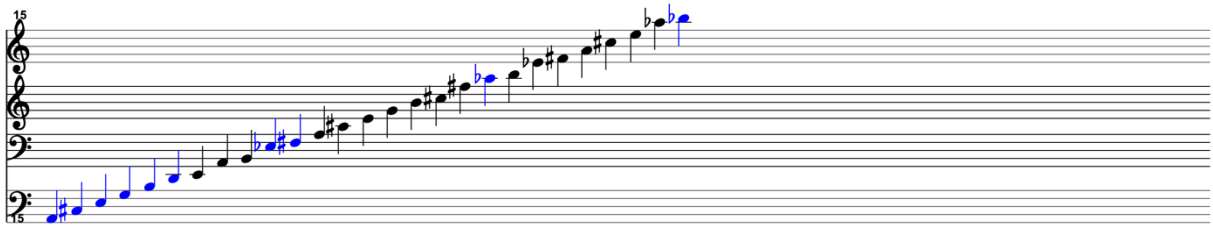
Arp 2/2 (12 sons = 11 in a row + 1)



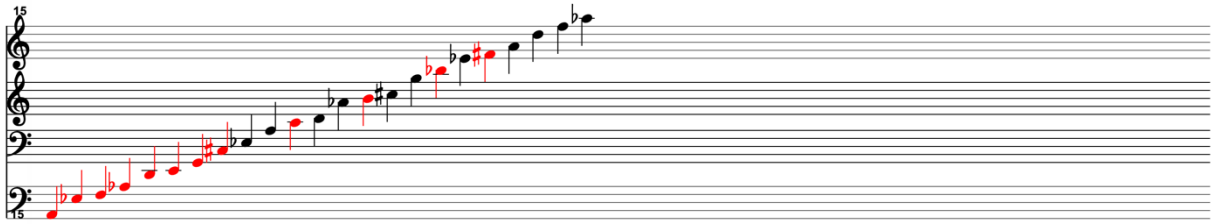
Arp 1/3 (12 sons)



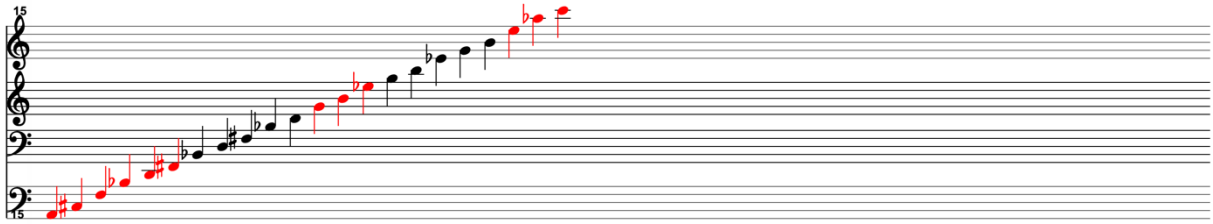
Arp 2/3 (10 sons)



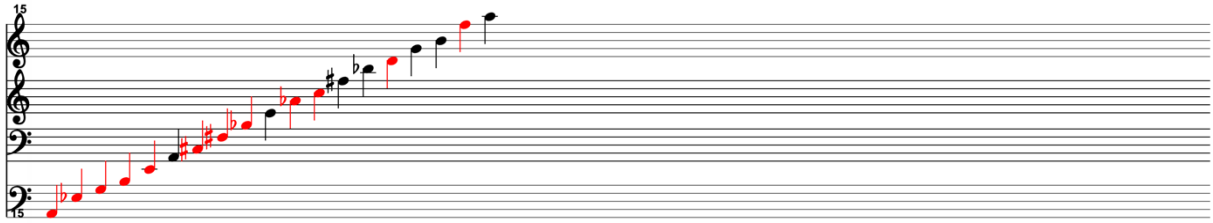
Arp 2/4 (12 sons)



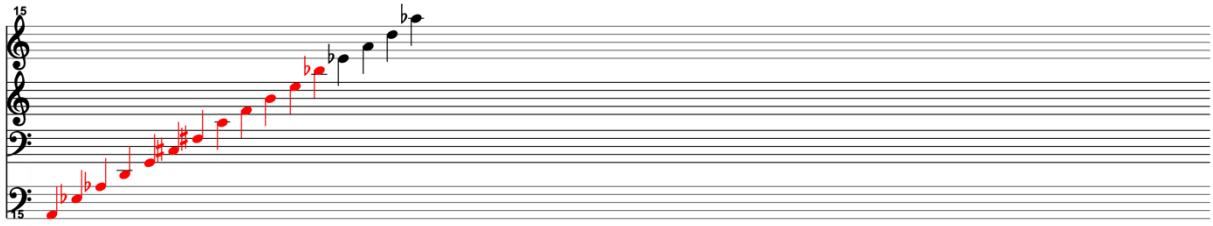
Arp 3/3 (12 sons)



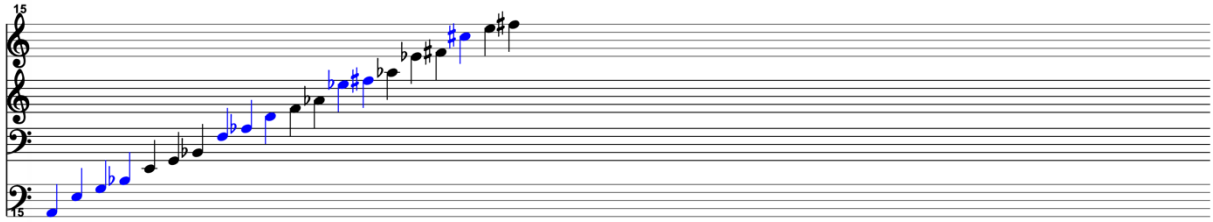
Arp 3/4 (12 sons)



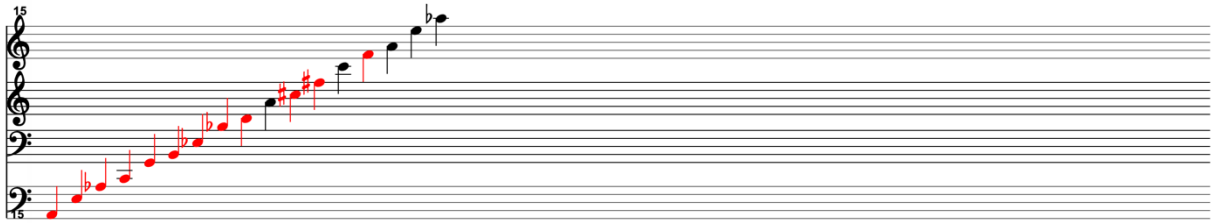
Arp 4/4 (12 sons in a row)



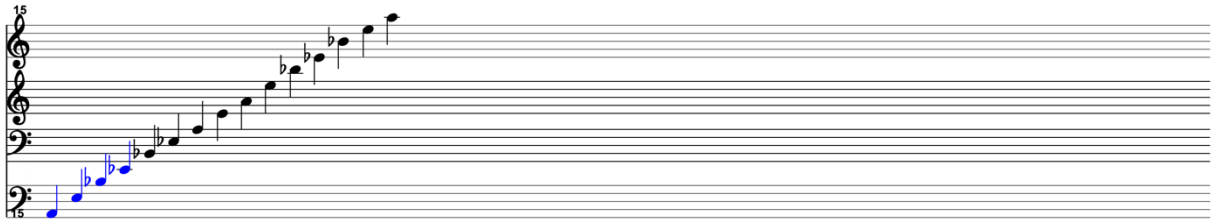
Arp 2/5 (10 sons)



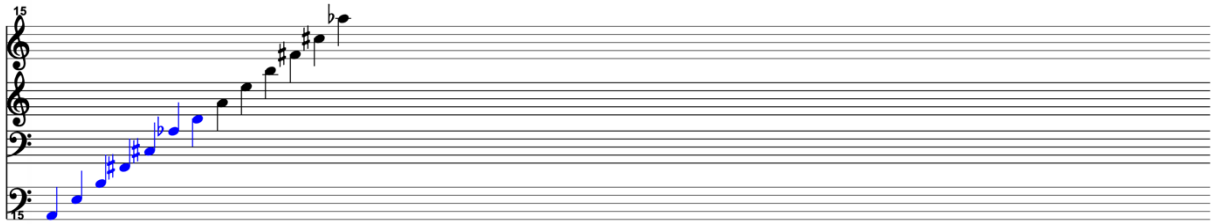
Arp 3/5 (12 sons)



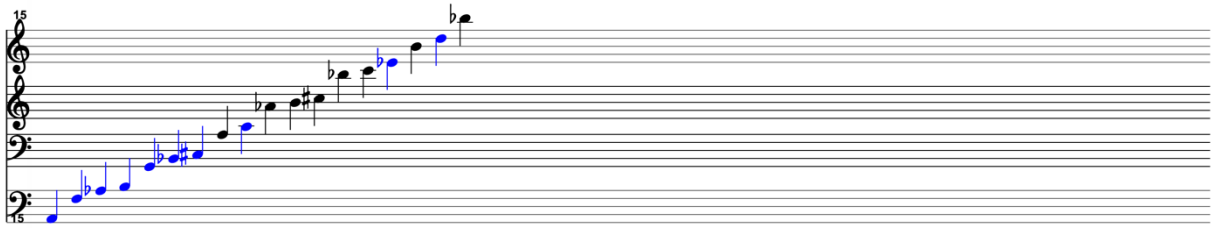
Arp 4/5 (4 sons = 5J4+4J5J4J4+5J4J5J4+4J5J4+4J)



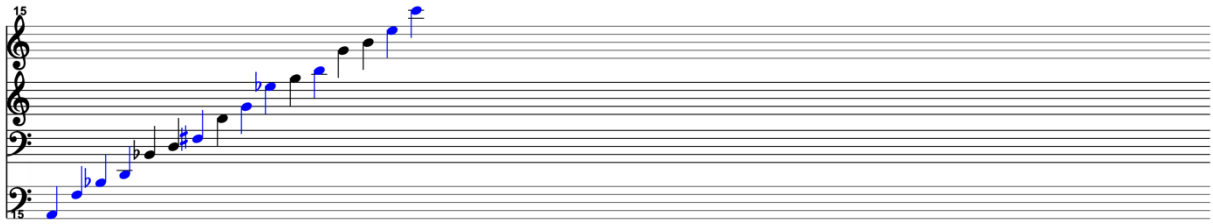
Arp 5/5 (7 sons in a row)



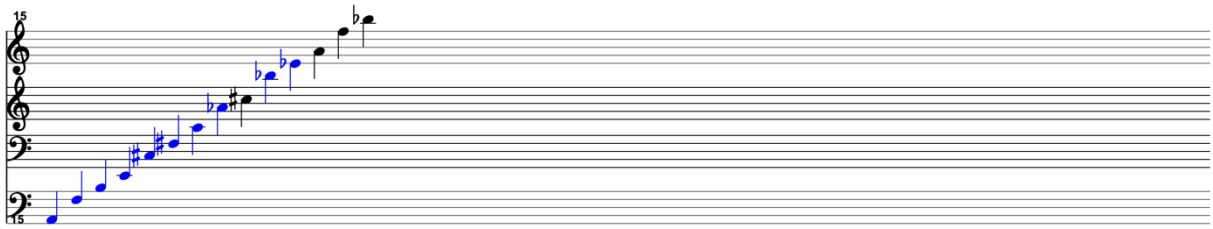
Arp 2/6 (10 sons)



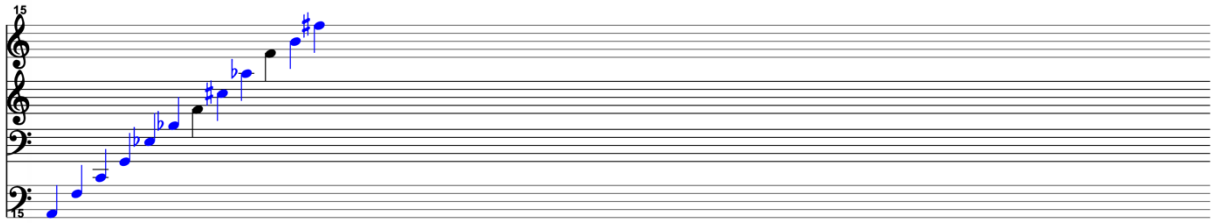
Arp 3/6 (10 sons)



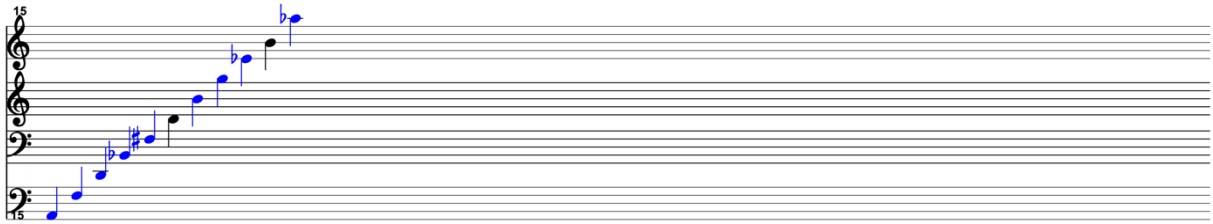
Arp 4/6 (10 sons)



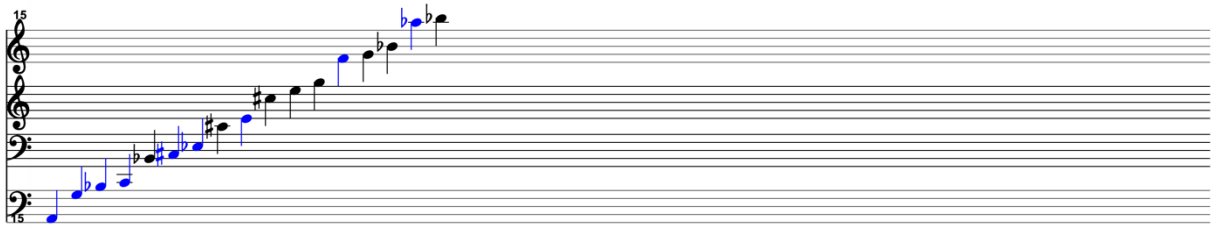
Arp 5/6 (10 sons)



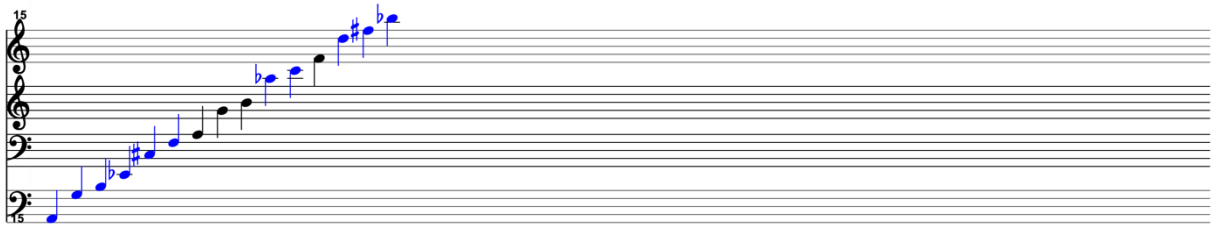
Arp 6/6 (9 sons)



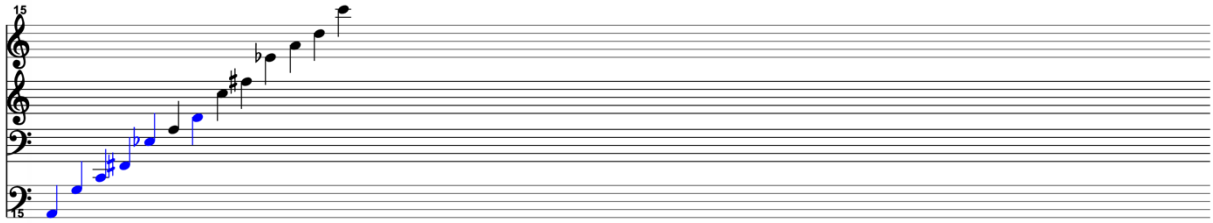
Arp 2/7 (9 sons)



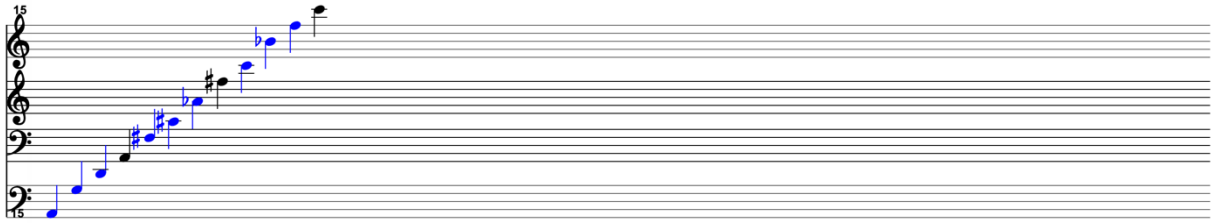
Arp 3/7 (11 sons)



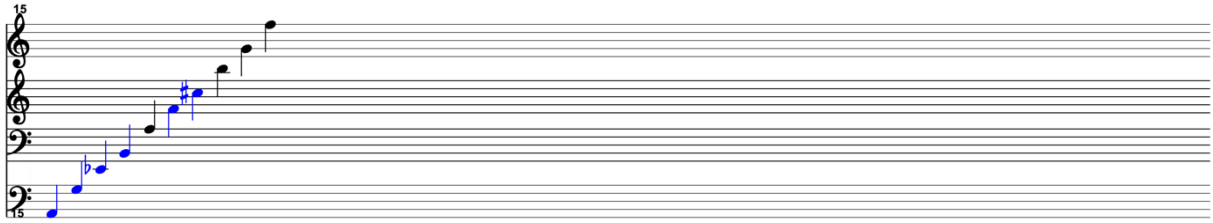
Arp 4/7 (6 sons)



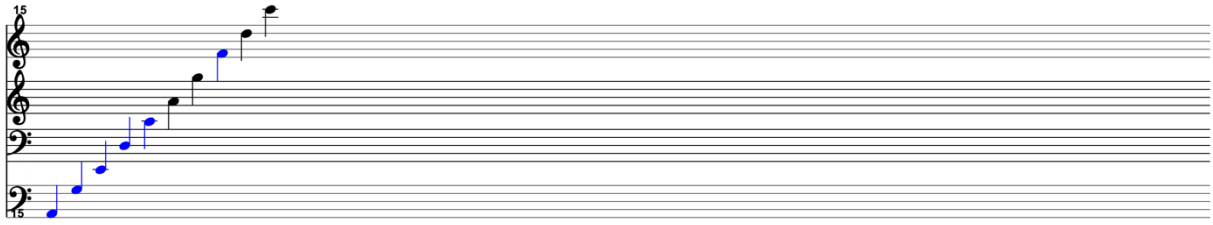
Arp 5/7 (9 sons)



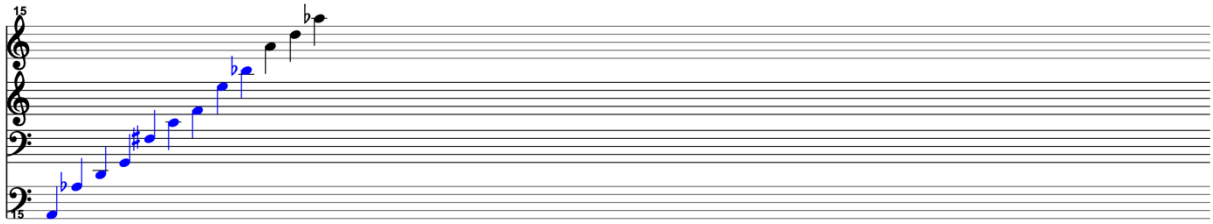
Arp 6/7 (6 sons)



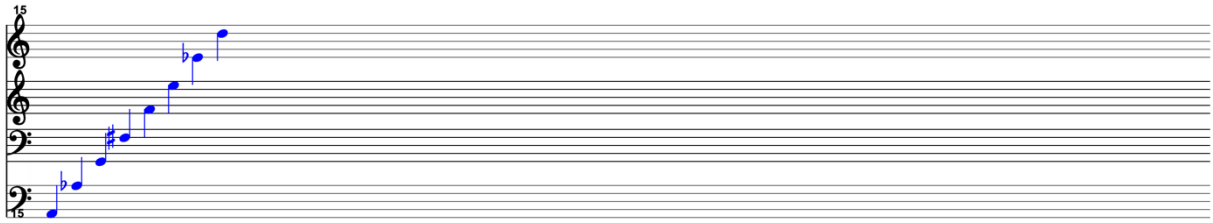
Arp 7/7 (6 sons)



Arp 4/8 (9 sons in a row)



Arp 8/8 (non-octaviant, 8 sons in a row)



Modéchelle 11a

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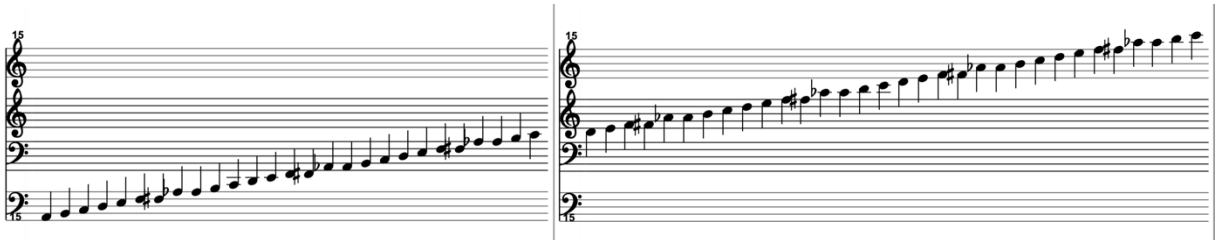
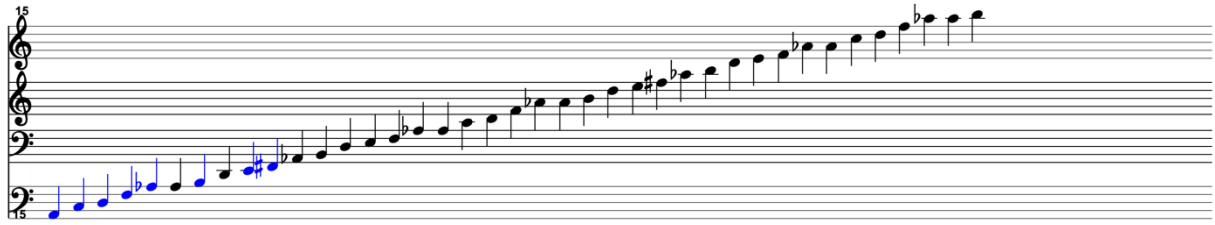
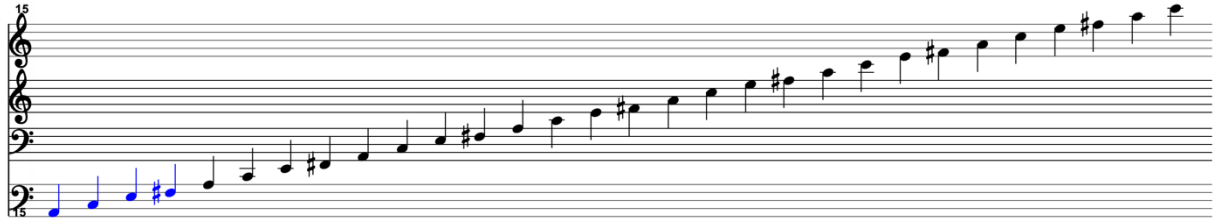
(8J / 8 sons / octaviant / 7 permutations / 11 transpositions)



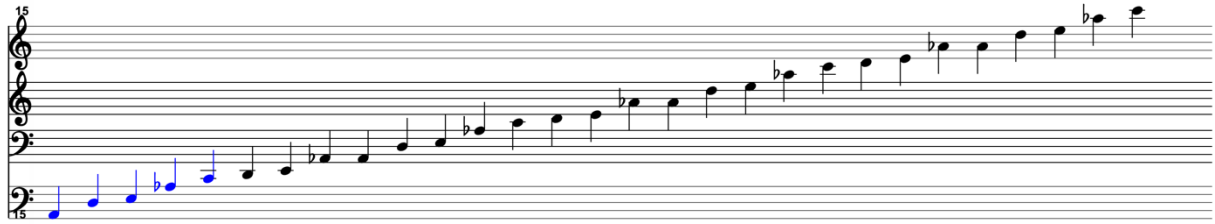
Arp 1/2 (8 sons)



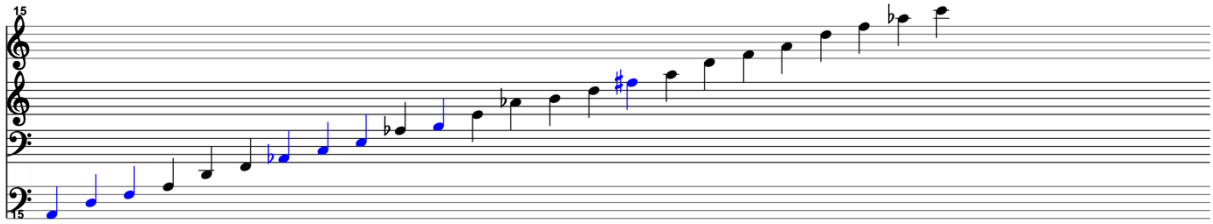
Arp 2/2 (4 sons = 3m3M2M3m)



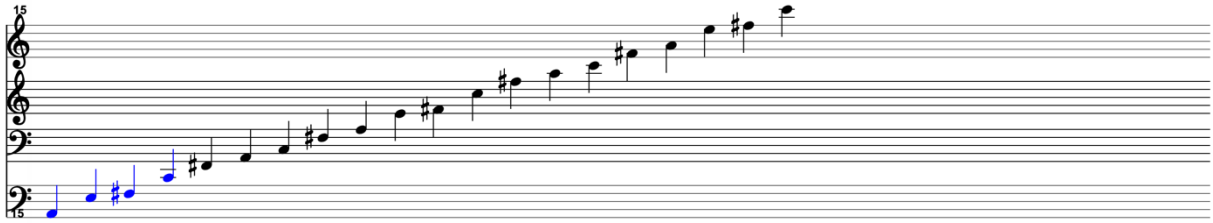
Arp 1/3 (5 sons = 4J2M3M3M2M2M3M2m)



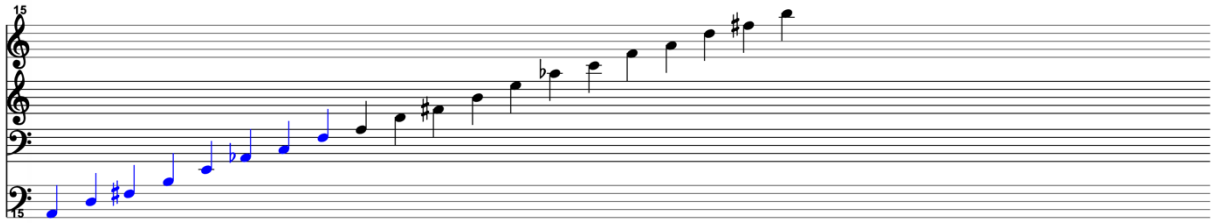
Arp 2/3 (8 sons)



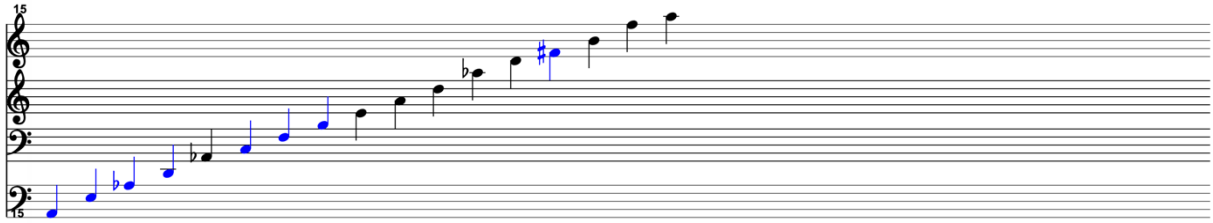
Arp 2/4 (4 sons = 5J2M4+4+3m3m4+3m)



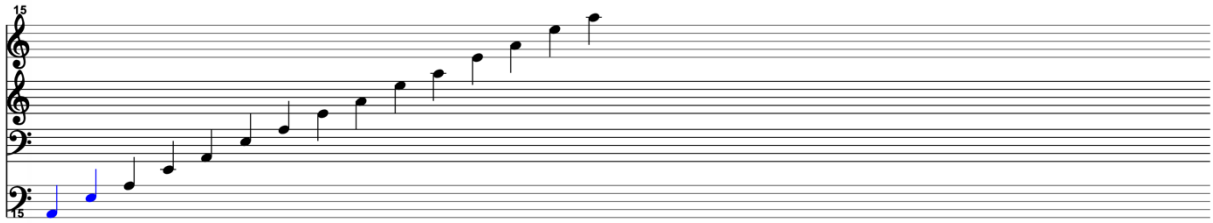
Arp 3/3 (8 sons in a row)



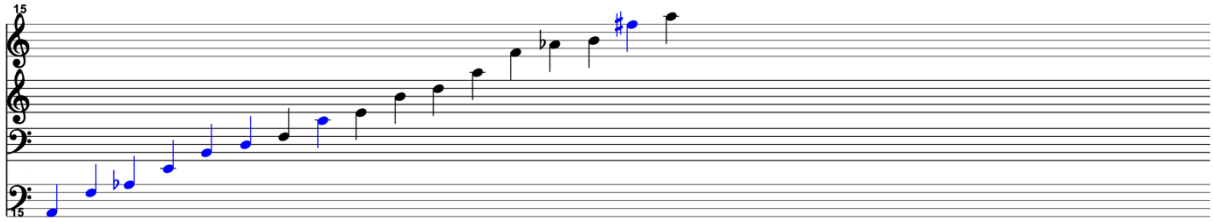
Arp 3/4 (8 sons)



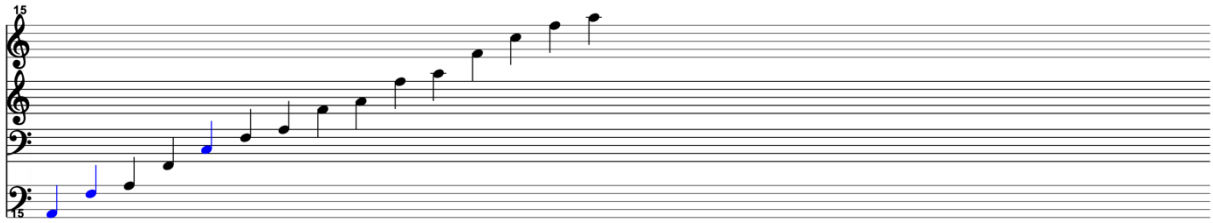
Arp 4/4 (2 sons, 5J4J)



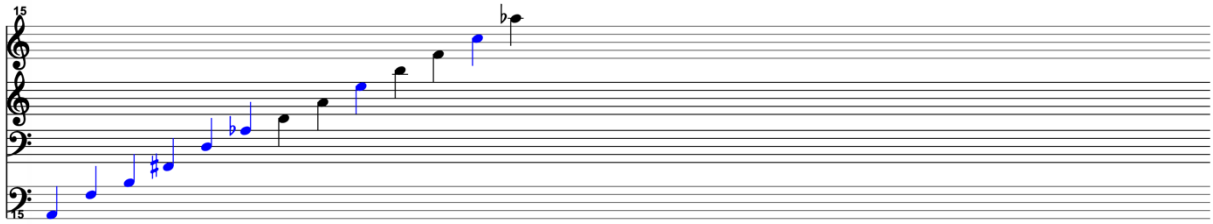
Arp 2/5 (8 sons)



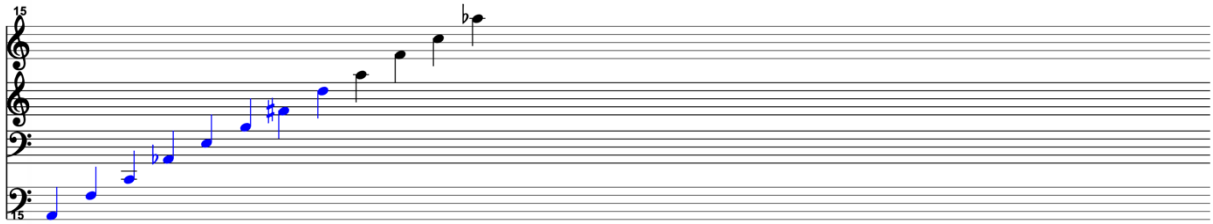
Arp 3/5 (3 sons, 6m3M6m5J4J3M)



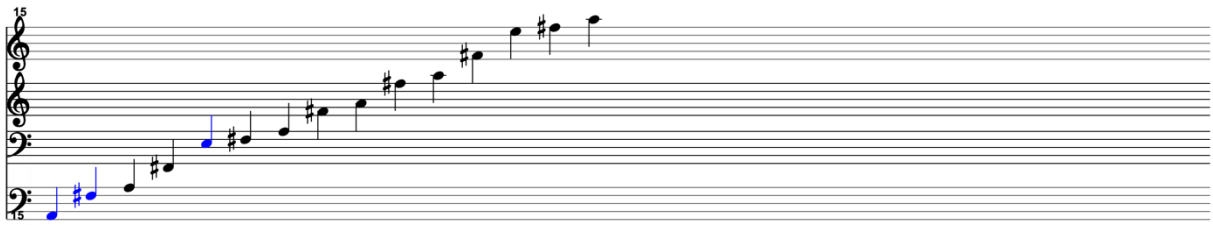
Arp 4/5 (8 sons)



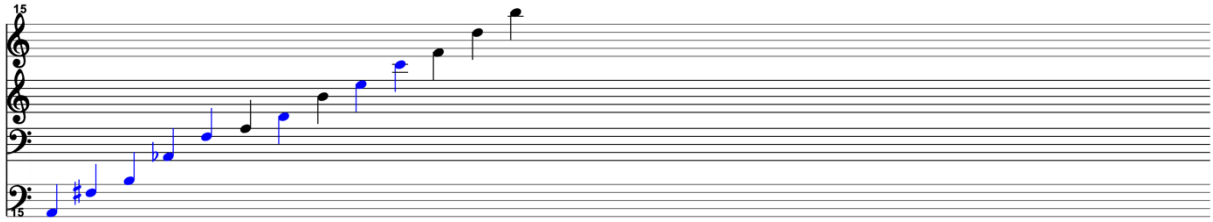
Arp 5/5 (8 sons in a row)



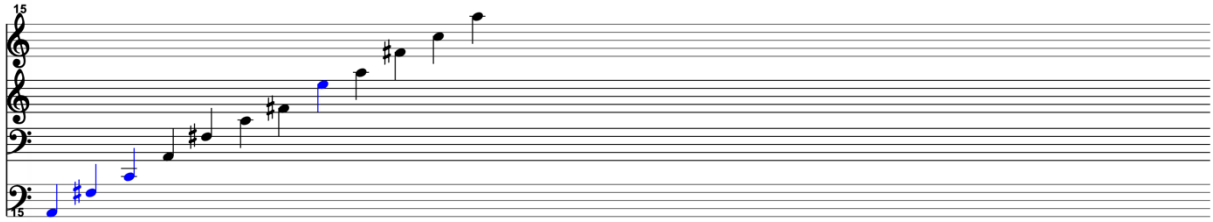
Arp 2/6 (3 sons, 6M3m6M7m2M3m6M3m)



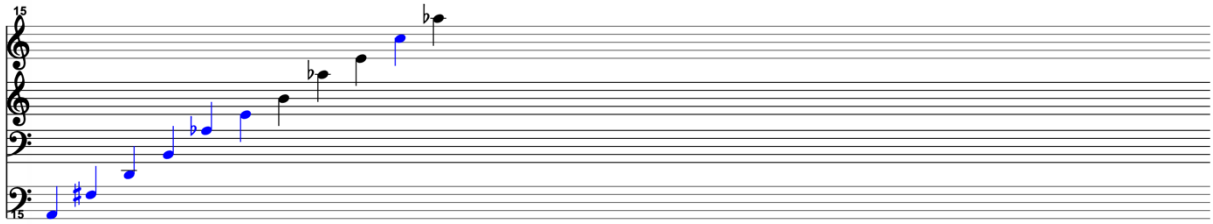
Arp 3/6 (8 sons)



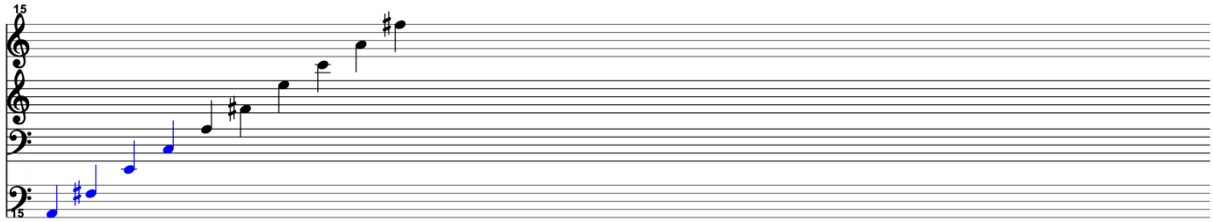
Arp 4/6 (4 sons, 6M4+6M6M4+7m4J)



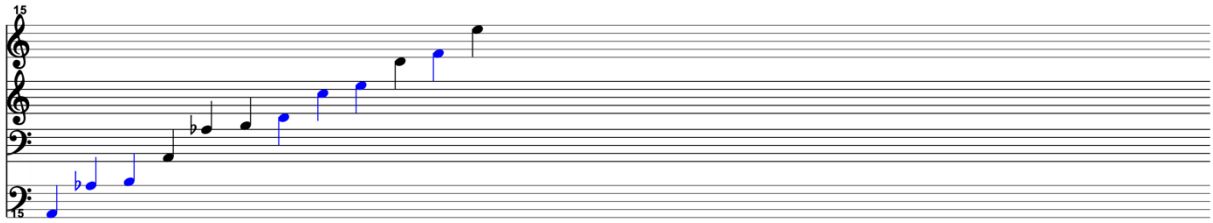
Arp 5/6 (7 sons = 6 in a row + 1)



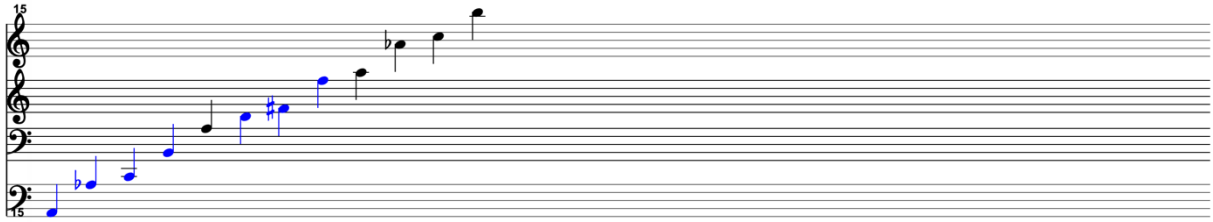
Arp 6/6 (4 sons = 6M7m6m6M)



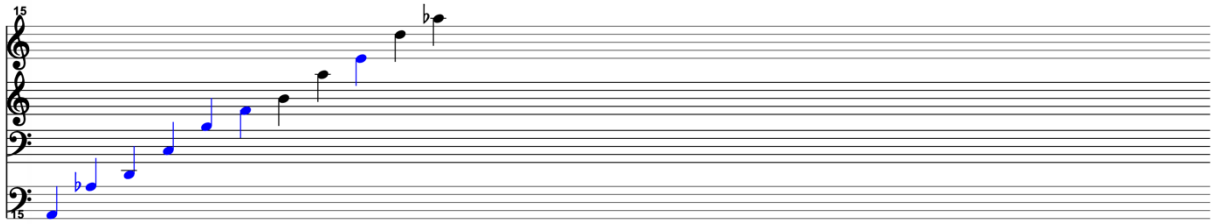
Arp 2/7 (7 sons)



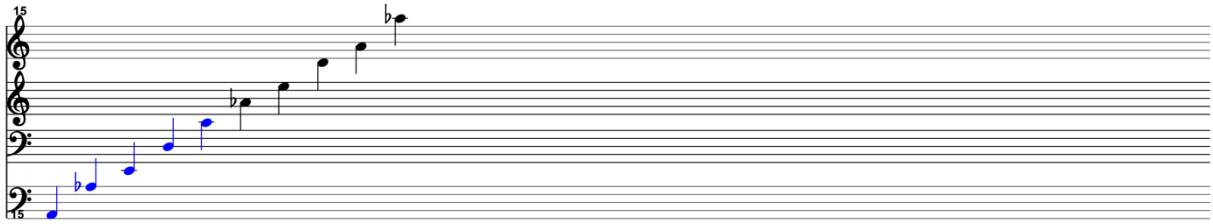
Arp 3/7 (7 sons)



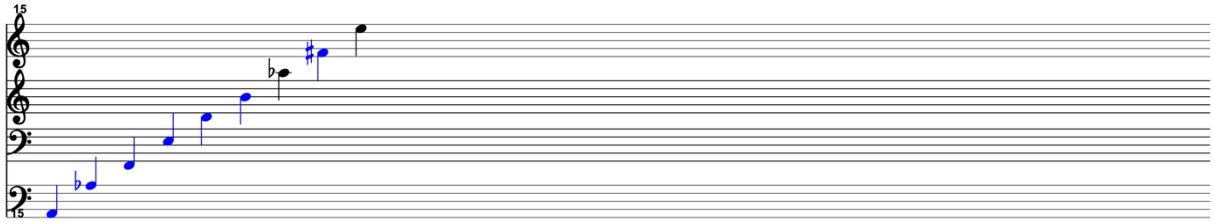
Arp 4/7 (7 sons)



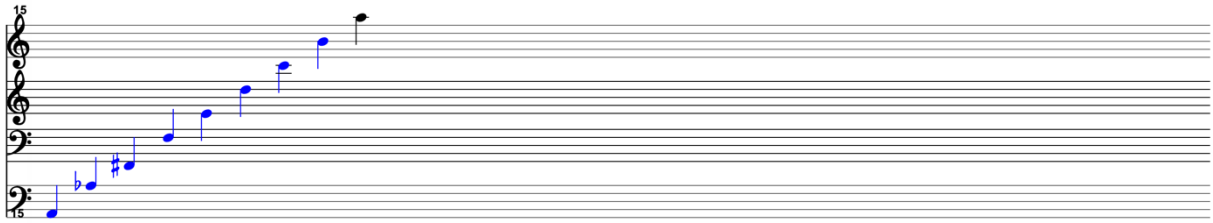
Arp 5/7 (5 sons in a row)



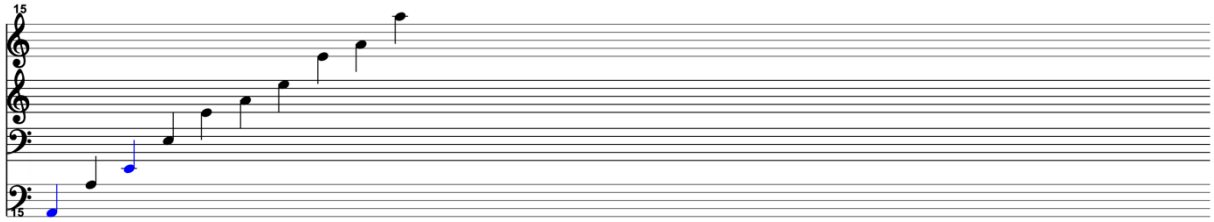
Arp 6/7 (7 sons)



Arp 7/7 (8 sons in a row)



Arp 4/8 (2 sons, 8J5J8J8J4J5J8J4J8J)



Arp 8/8 (octaves)

Modéchelle 11b

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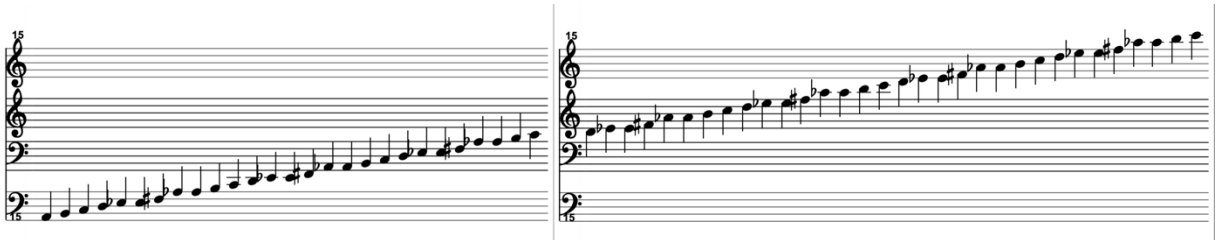
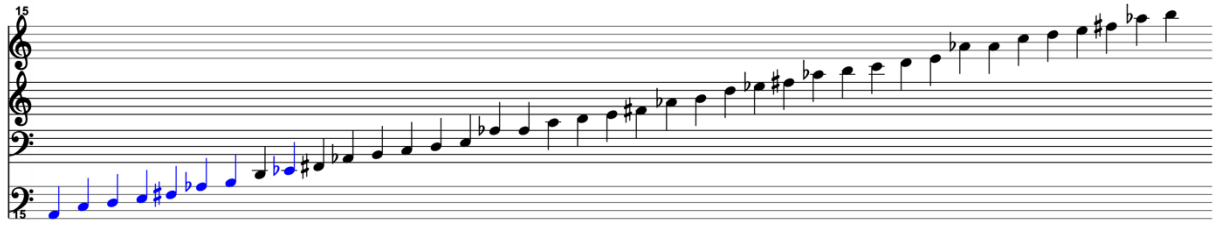
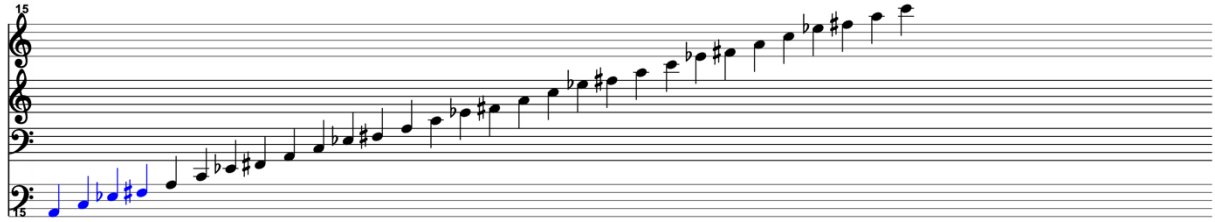
(8J / 8 sons / octaviant / 7 permutations / 11 transpositions)



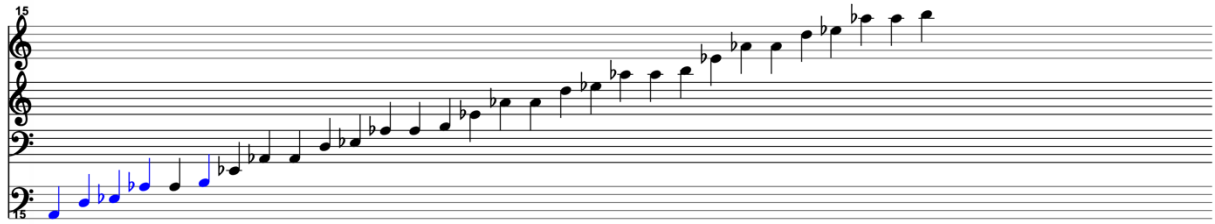
Arp 1/2 (8 sons)



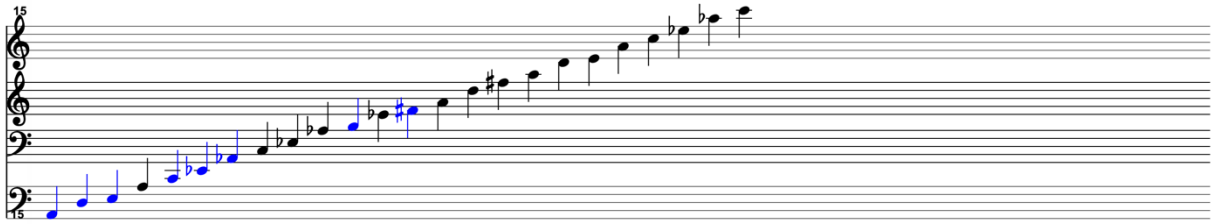
Arp 2/2 (4 sons = 7ème diminuée)



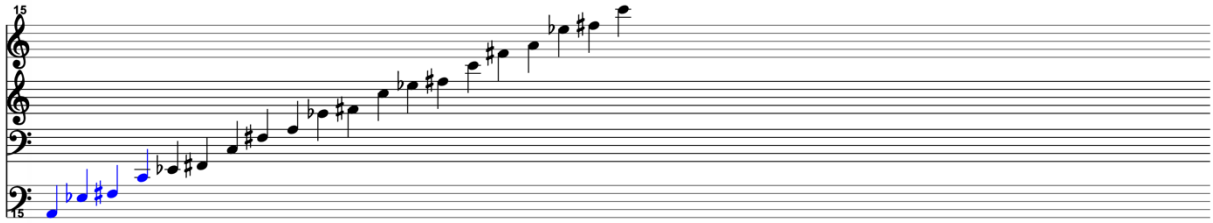
Arp 1/3 (5 sons)



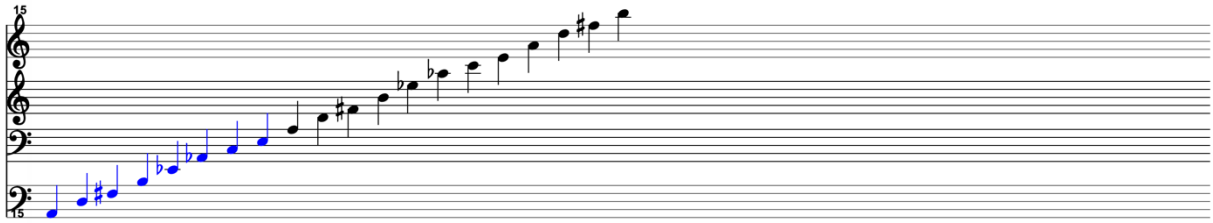
Arp 2/3 (8 sons)



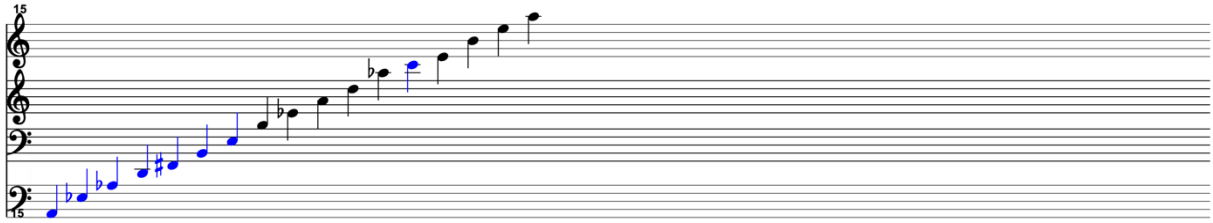
Arp 2/4 (4 sons ± 7ème diminuée)



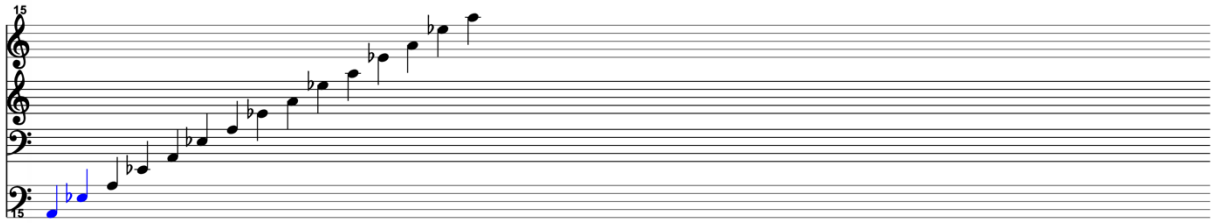
Arp 3/3 (8 sons in a row)



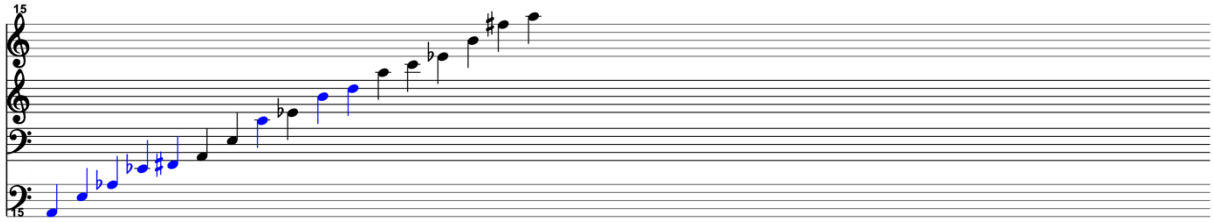
Arp 3/4 (8 sons = 7 in a row + 1)



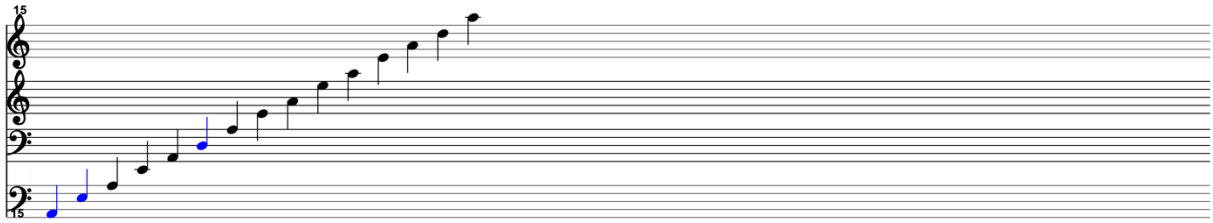
Arp 4/4 (2 sons, 4+)



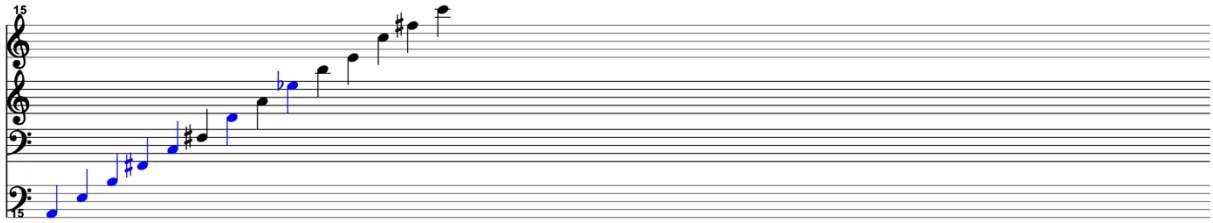
Arp 2/5 (8 sons)



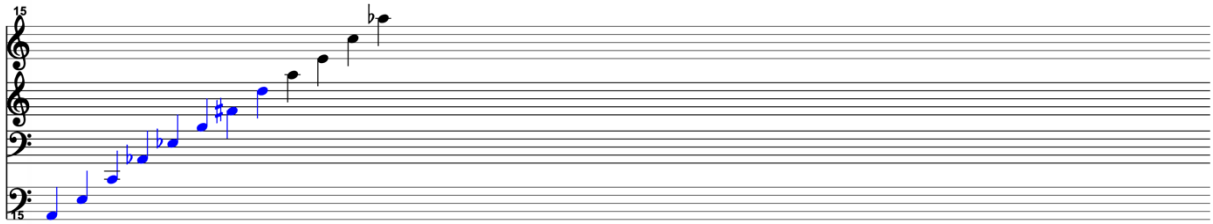
Arp 3/5 (3 sons = 5J4J5J4J4J5J4J5J4J5J4J4J5J)



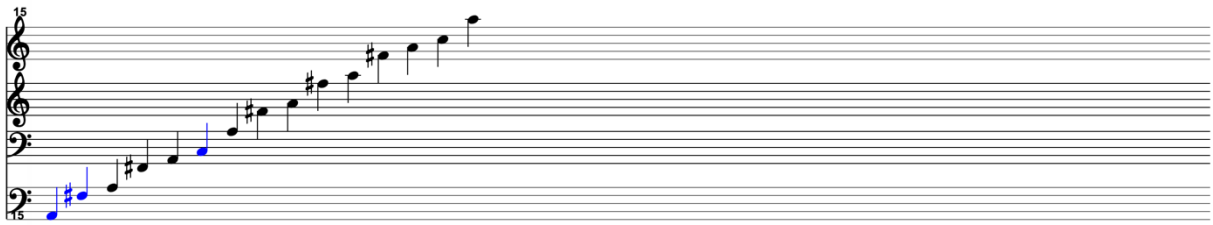
Arp 4/5 (7 sons)



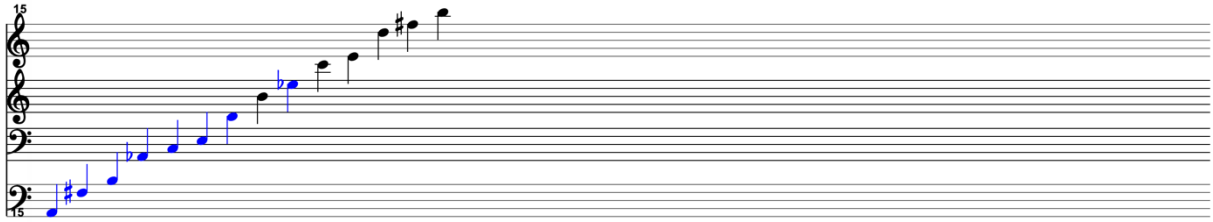
Arp 5/5 (8 sons in a row)



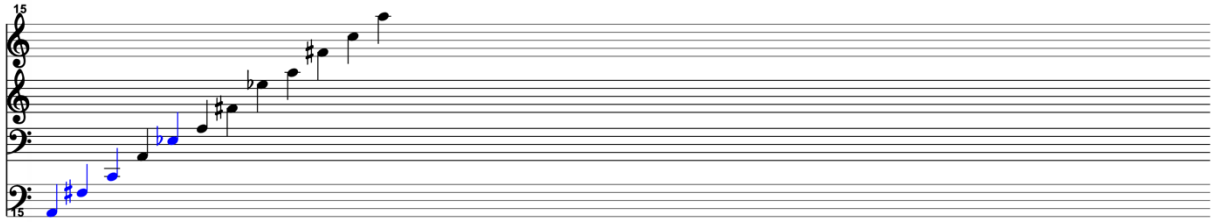
Arp 2/6 (3 sons = 6M3m6M3m3m6M6M3m)



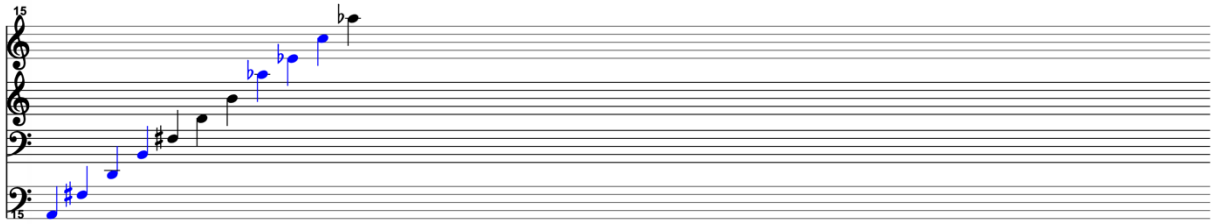
Arp 3/6 (8 sons = 7 in a row + 1)



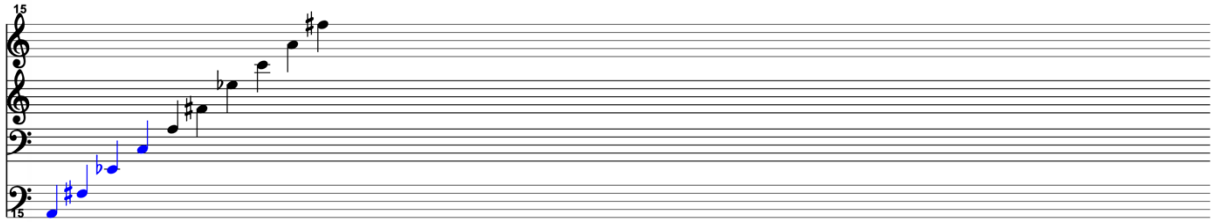
Arp 4/6 (4 sons ± 7ème diminuée)



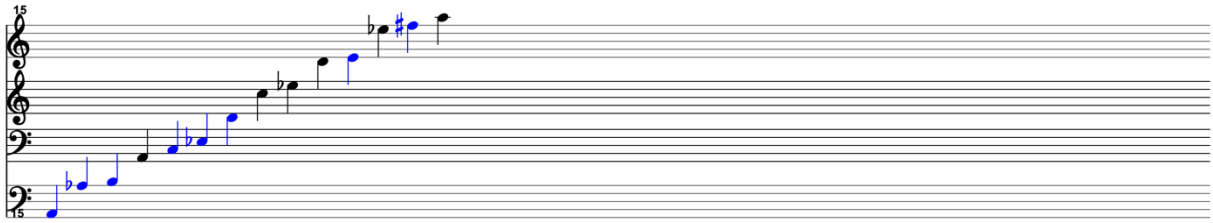
Arp 5/6 (7 sons)



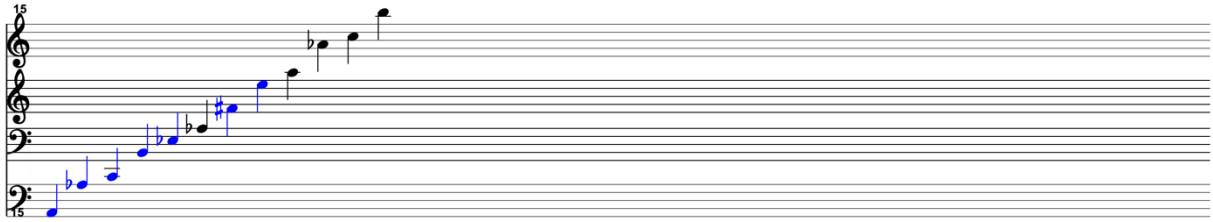
Arp 6/6 (4 sons ± 7ème diminuée)



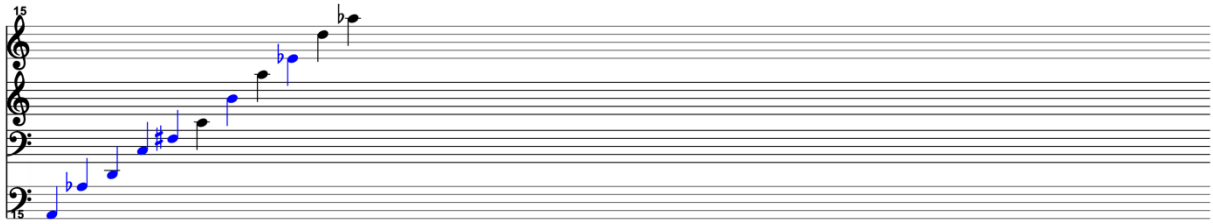
Arp 2/7 (8 sons)



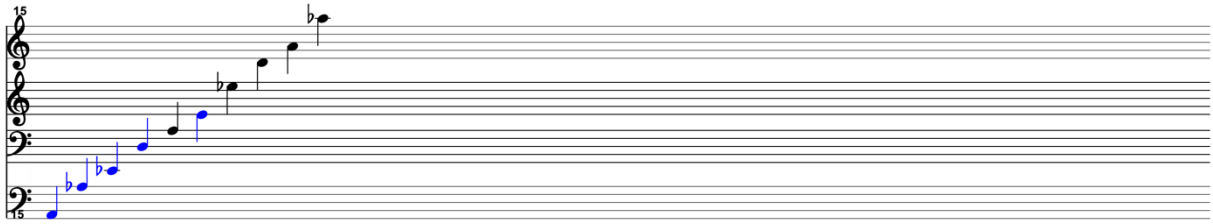
Arp 3/7 (7 sons)



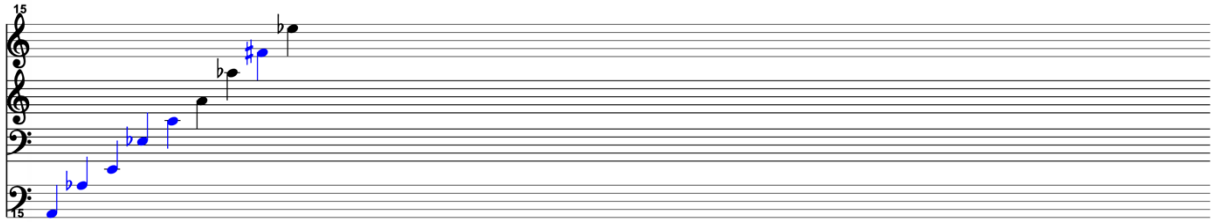
Arp 4/7 (7 sons)



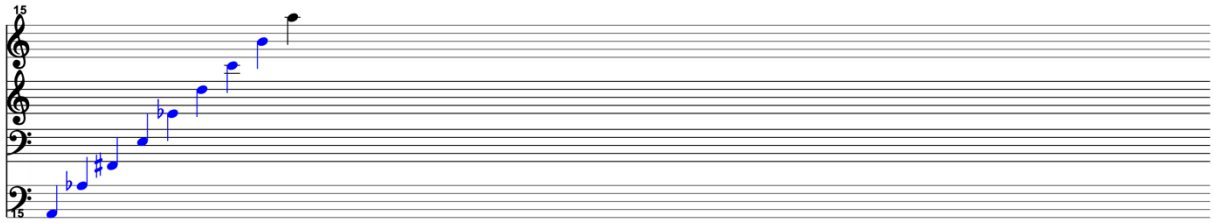
Arp 5/7 (5 sons)



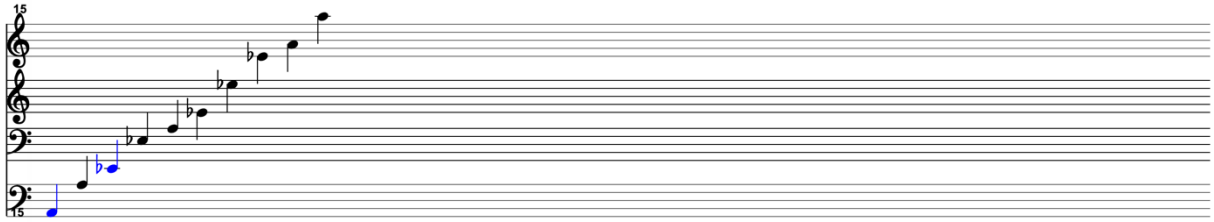
Arp 6/7 (6 sons)



Arp 7/7 (8 sons)



Arp 4/8 (2 sons = 8J4+8J4+4+8J8J4+8J)



Arp 8/8 (octaves)

Modéchelle 11c

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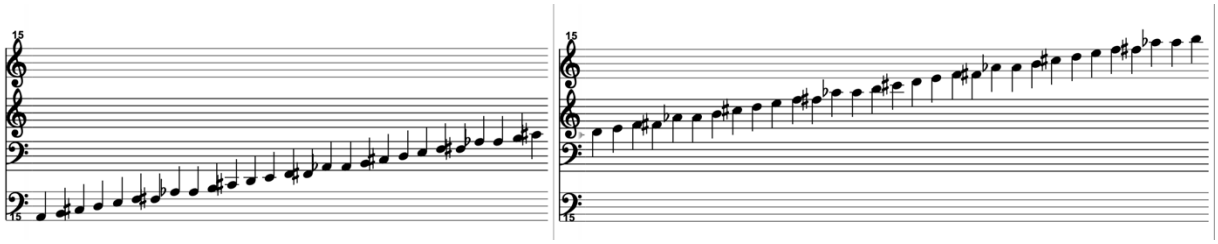
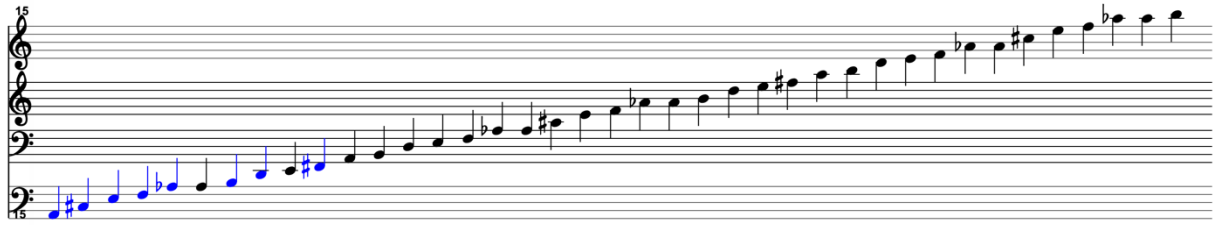
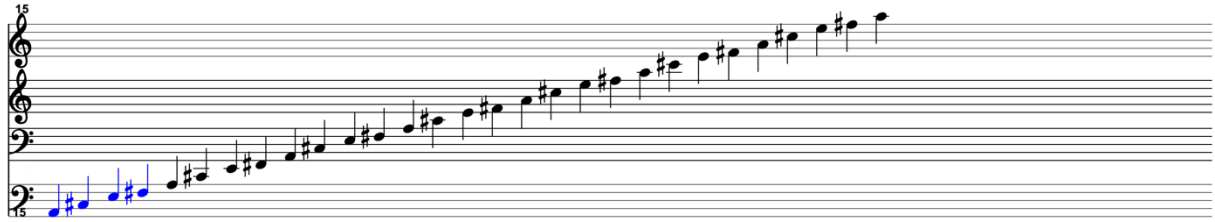
(8J / 8 sons / octaviant / 7 permutations / 11 transpositions)



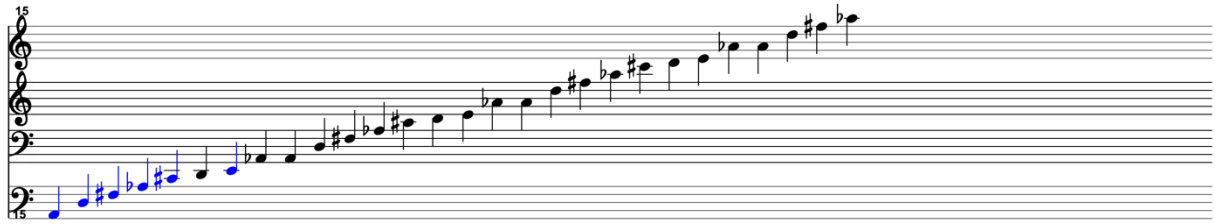
Arp 1/2 (8 sons)



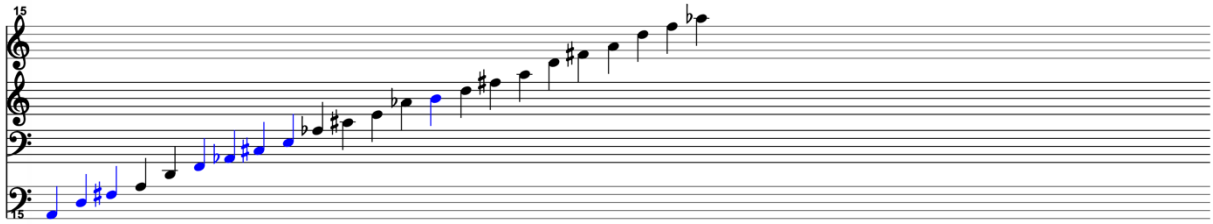
Arp 2/2 (4 sons = 3M3m2M3m)



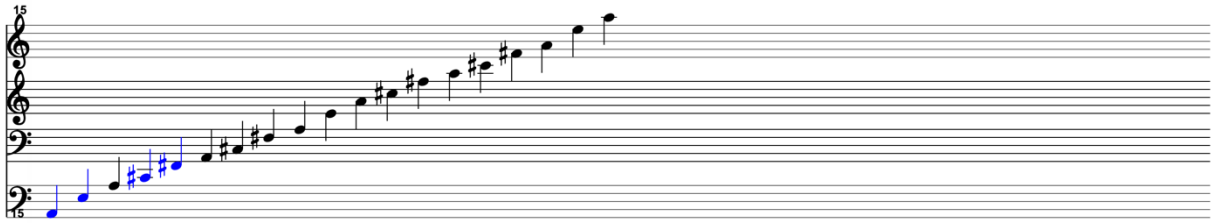
Arp 1/3 (6 sons)



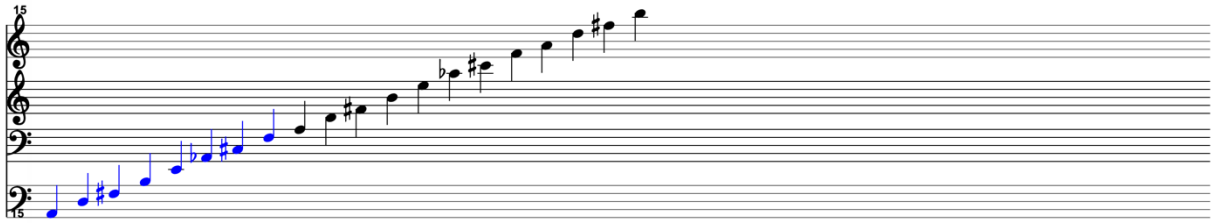
Arp 2/3 (8 sons)



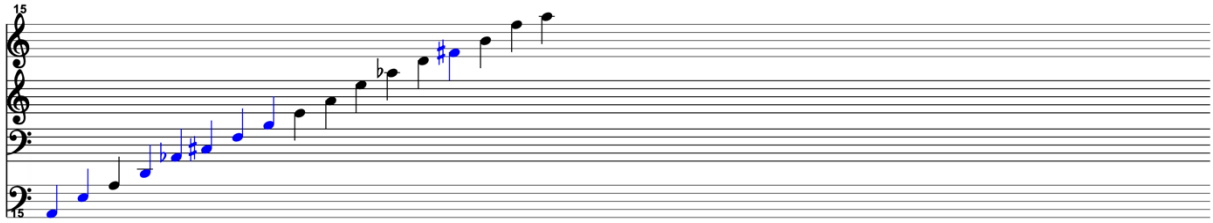
Arp 2/4 (4 sons = 5J4J3M4J3m3M4J3m)



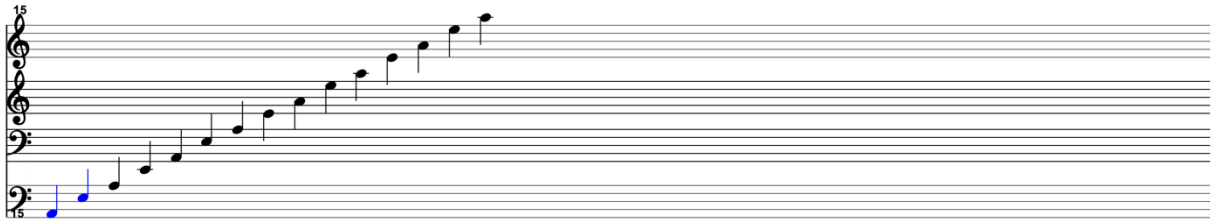
Arp 3/3 (8 sons in a row)



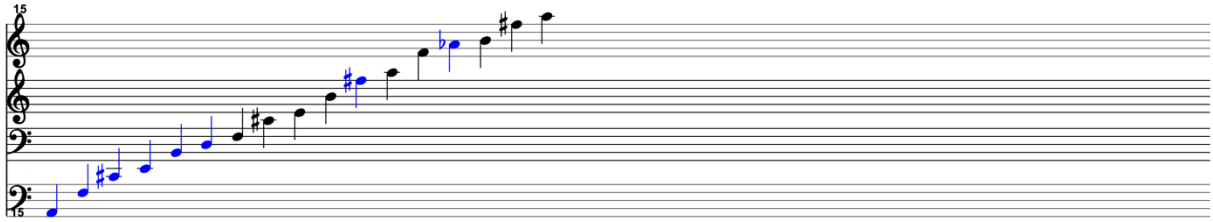
Arp 3/4 (8 sons)



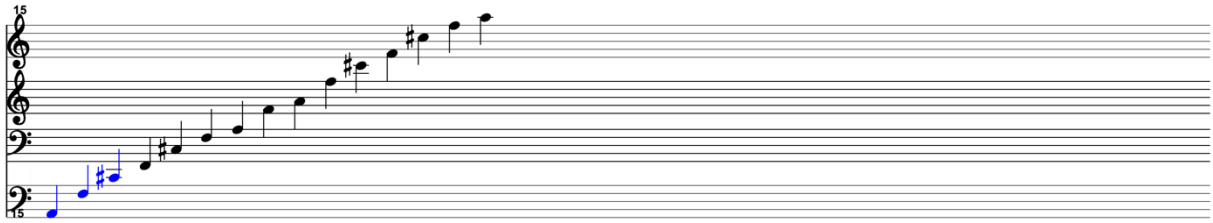
Arp 4/4 (2 sons = 5J4J)



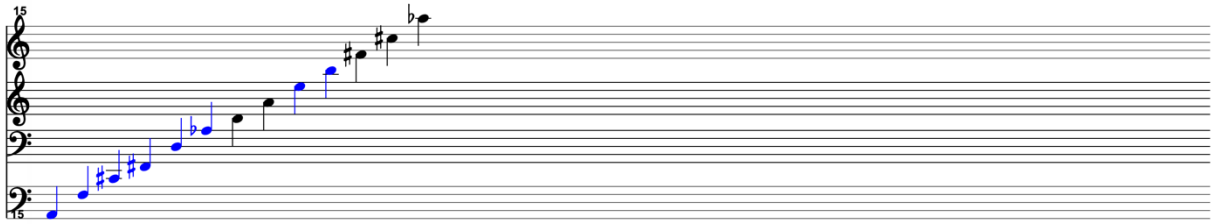
Arp 2/5 (8 sons)



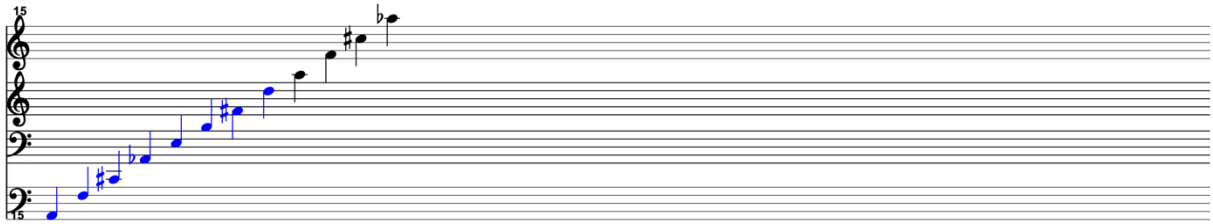
Arp 3/5 (3 sons = 6m6m3M6m3M3M6m3M)



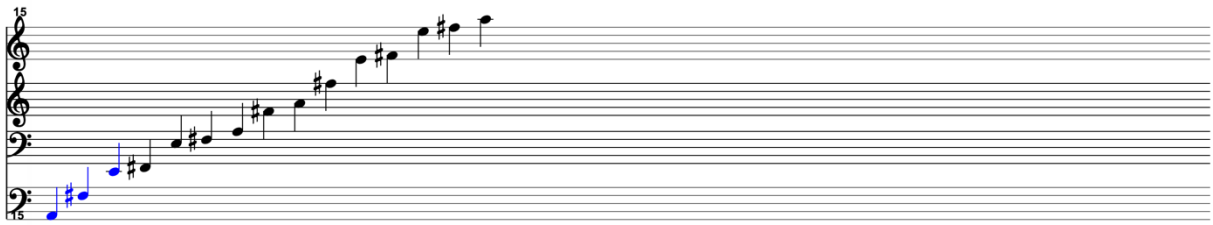
Arp 4/5 (8 sons)



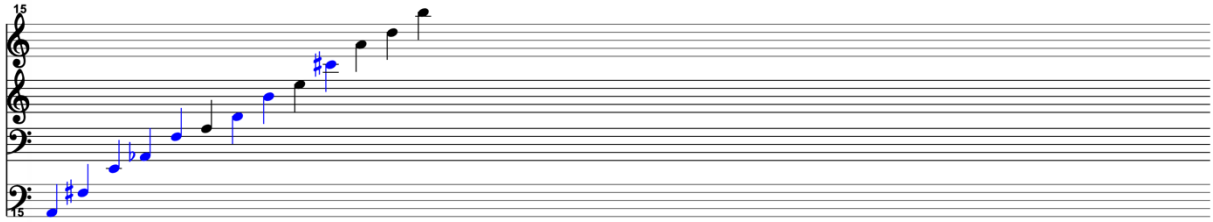
Arp 5/5 (8 sons in a row)



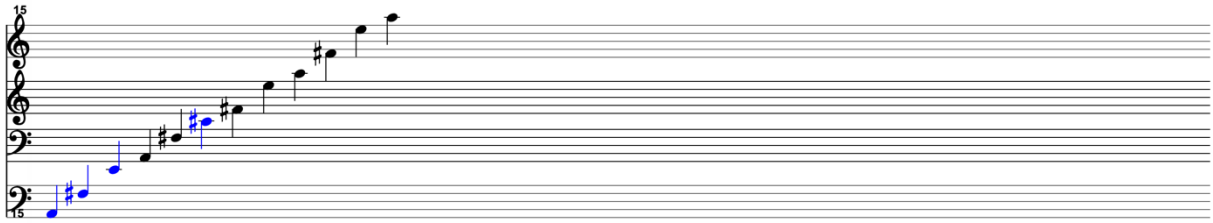
Arp 2/6 (3 sons = 6M7M2M7M2M3m6M3m)



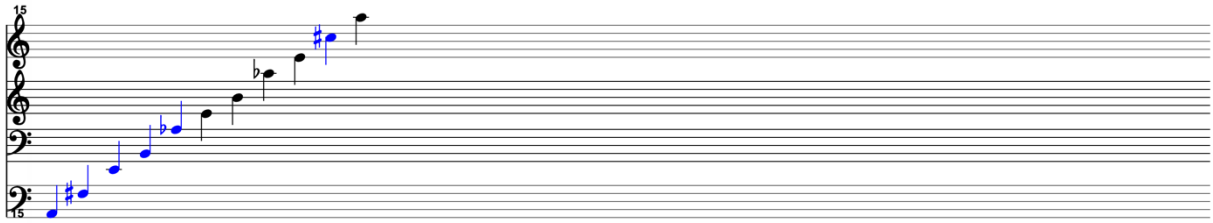
Arp 3/6 (8 sons)



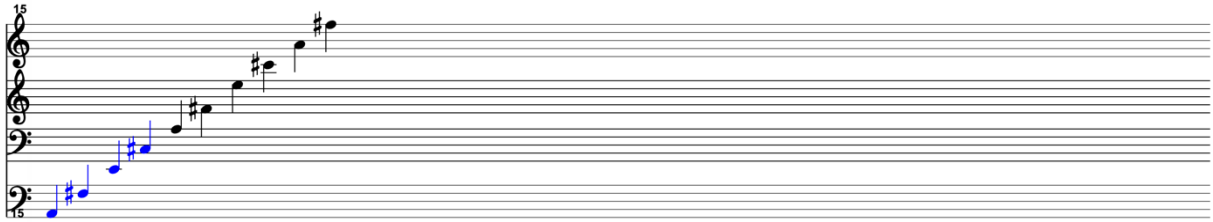
Arp 4/6 (4 sons = 6M7m4J6M5J4J7m4J)



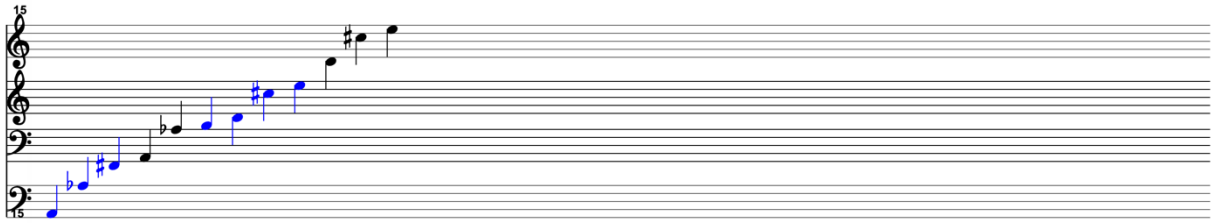
Arp 5/6 (6 sons)



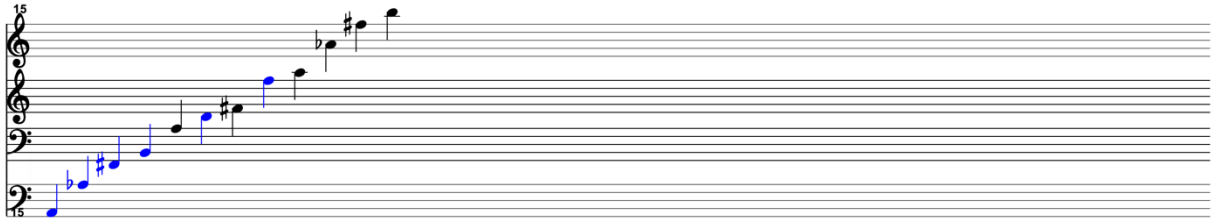
Arp 6/6 (4 sons = 6M7m6M6m)



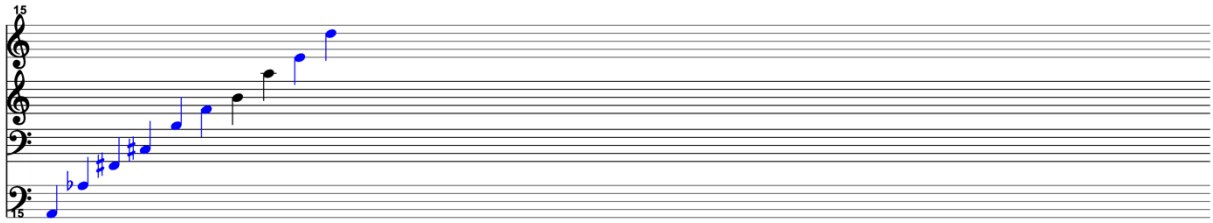
Arp 2/7 (7 sons)



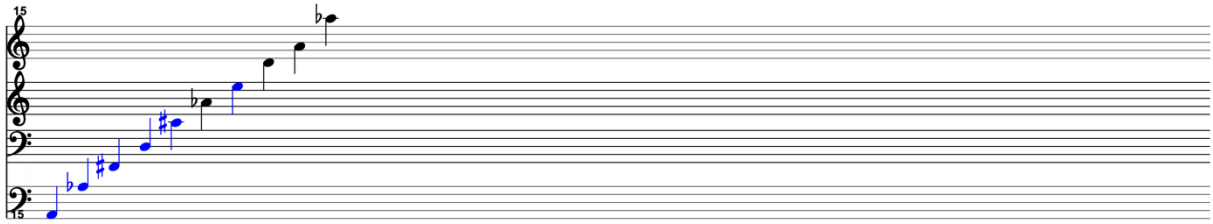
Arp 3/7 (6 sons)



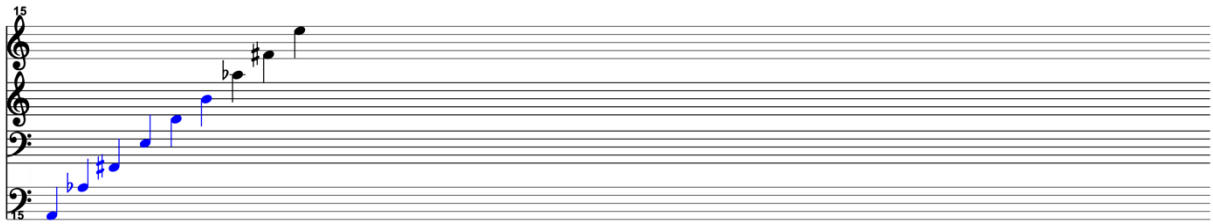
Arp 4/7 (8 sons)



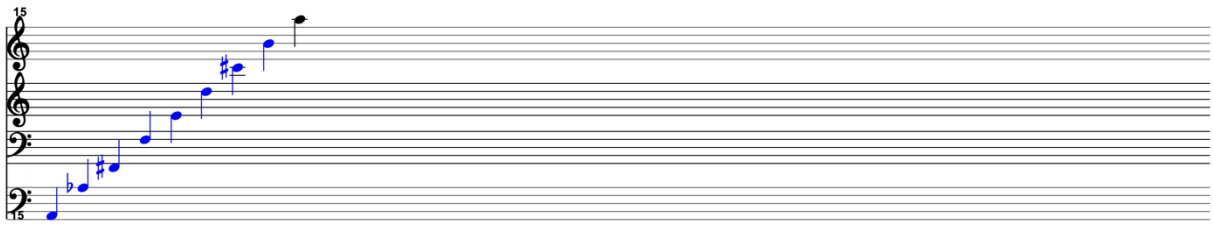
Arp 5/7 (6 sons)



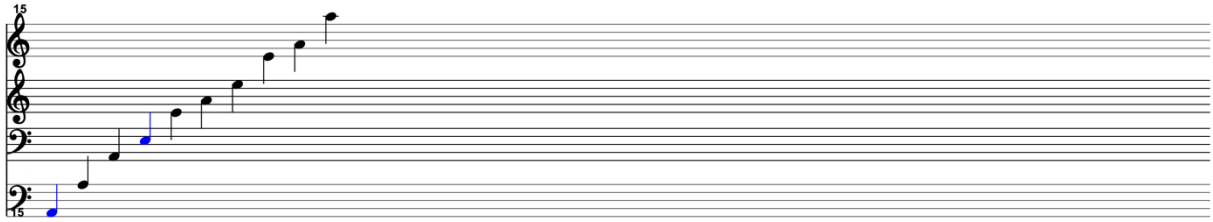
Arp 6/7 (6 sons in a row)



Arp 7/7 (8 sons in a row)



Arp 4/8 (2 sons = 8J8J5J8J4J5J8J4J8J)



Arp 8/8 (octaves)

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Tableau d'analyse d'un certain nombre d'accords ou arpèges itératifs

MODÉCHELLES		***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***
ACCORDS / ARPÈGES ITÉRATIFS	n sons	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8a**	**8b**	**9a**	**9b**	**10a**	**10b**	**10c**	**11a**	**11b**	**11c**
2m 2m (mais pas plus de 2 demis-tons dans les modes de facteur ≤2)	3			X		X	X		X	X	X	X	X		X	X	X	X
2M 2M (gamme par tons)	3	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2M 2M 2M	4	X		X		X	X		X	X	X	X	X		X	X	X	X
2M 2M 2M 2M	5	X		X		X			X	X	X		X		X	X	X	
2M 2M 2M 2M 2M	6	X		X		X					X		X		X			
2M 2M 2M 2M 2M 2M ∞	6	X		X		X					X							
2m 2M (mode 2)	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2m 2M 2m 2M	5		X				X	X		X		X		X	X	X	X	X
2m 2M 2m 2M 2m 2M	7		X									X		X		X		
2m 2M 2m 2M 2m 2M 2m 2M ∞	8		**X**															
2m 2m 2M (mode 3)	4			X		X	X		X	X	X	X	X		X	X	X	X
2m 2m 2M 2m 2m 2M	7			X							X				X			
2m 2m 2M 2m 2m 2M 2m 2m 2M ∞	9			X														
2m 2M 2M (mode 4)	4			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2m 2M 2M 2m 2M 2M	7				X				X				X					X
2m 2M 2M 2m 2M 2M 2m 2M 2M	8				X													
2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M	9				X													
2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M	10				X													
2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M	11				X													
2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M 2m 2M 2M à [2m 2M 2M] x 12 ∞	12				**X**													
2m 3m	3		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
2m 3m 2m 3m	5		X	X			X				X	X			X	X		X
2m 3m 2m 3m 2m 3m	6			X			X								X			
2m 3m 2m 3m 2m 3m 2m 3m 2m 3m	6			X											X			
2m 3m 2m 3m 2m 3m 2m 3m 2m 3m 2m 3m ∞	6			**X**														
2m 3M	3			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2m 3M 2m 3M	5			X	X				X	X	X		X			X		X
2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M 2m 3M ∞	7 à 12				X						X							
2M 3m	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2M 3m 2M 3m	5				X		X	X		X		X	X	X	X	X	X	X
2M 3m 2M 3m 2M 3m	6				X			X				X						X
2M 3m 2M 3m 2M 3m 2M 3m	7				X							X						X
2M 3m 2M 3m 2M 3m 2M 3m 2M 3m 2M 3m 2M 3m 2M 3m 2M 3m 2M 3m 2M 3m ∞	8 à 12				**X**							**X**						
2M 3M	3	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
2M 3M 2M 3M	4	X	X	X		X			X		X	X			X	X	X	
2M 3M 2M 3M 2M 3M ∞	4	X	X	X		X					X					X	X	
2m 2m 3m	4			X			X			X	X	X			X	X		X
2m 2m 3m 2m 2m 3m	7			X			X			X	X	X			X	X		X
2m 2m 3m 2m 2m 3m 2m 2m 3m	9			X			X			X	X	X			X	X		X
2m 2m 3m 2m 2m 3m 2m 2m 3m 2m 2m 3m	11			X			X			X	X	X			X	X		X
2m 2m 3m 2m 2m 3m 2m 2m 3m 2m 2m 3m 2m 3m à [2m 2m 3m] x 12 ∞	12			X			X			X	X	X			X	X		X

MODÉCHELLES		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
ACCORDS / ARPÈGES ITÉRATIFS	n sons	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8a**	**8b**	**9a**	**9b**	**10a**	**10b**	**10c**	**11a**	**11b**	**11c**
2m 2M 3m	4		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
2m 2M 3m 2m 2M 3m ∞	6		X			X				X			X	X		X		
2m 2M 3M	4		X	X		X	X		X	X	X	X	X	X	X	X	X	X
2m 2M 3M 2m 2M 3M	7						X					X			X			
2m 2M 3M 2m 2M 3M 2m 2M 3M	10						X					X			X			
2m 2M 3M 2m 2M 3M 2m 2M 3M 2m 2M 3M 2m 2M 3M à [2m 2M 3M] x 12 ∞	10						**X**											
2m 3m 3m	4		X	X		X	X		X	X	X	X	X	X	X	X	X	X
2m 3m 3m 2m 3m 3m	7						X				X	X			X			
2m 3m 3m 2m 3m 3m 2m 3m 3m	10						X					X			X			
2m 3m 3m 2m 3m 3m 2m 3m 3m 2m 3m 3m	11						X					X			X			
2m 3m 3m 2m 3m 3m 2m 3m 3m 2m 3m 3m 2m 3m 3m à [2m 3m 3m] x 12 ∞	12						**X**											
2m 3m 3M	4			X		X	X	X		X	X	X		X	X	X	X	X
2m 3m 3M 2m 3m 3M	5			X			X	X							X			X
2m 3m 3M 2m 3m 3M 2m 3m 3M	6			X				X							X			
2m 3m 3M 2m 3m 3M 2m 3m 3M 2m 3M	6			**X**				**X**										
2m 3M 3M	4			X		X	X	X	X	X	X		X	X	X	X	X	X
[2m 3M 3M] x 2	7			X					X	X								
[2m 3M 3M] x 3	10								X	X								
[2m 3M 3M] x 4 puis octaviant	12								**X**	**X**								
2M 2m 3m	4		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
2M 2m 3m 2M 2m 3m			X			X			X		X						X	
2M 2m 3m 2M 2m 3m 2M 2m 3m à [2M 2m 3m] x 12 ∞			X			X											X	
2M 2m 3M	4			X	X		X	X	X	X	X	X	X	X	X	X	X	X
2M 2m 3M 2M 2m 3M							X					X			X	X		X
2M 2m 3M 2M 2m 3M 2M 2m 3M							X								X			
2M 2m 3M 2M 2m 3M 2M 2m 3M 2M 2m 3M à [2M 2m 3M] x 12 ∞							**X**											
2M 2M 3m	4			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2M 2M 3m 2M 2M 3m							X		X	X					X			X
2M 2M 3m 2M 2M 3m 2M 2M 3m							X											X
2M 2M 3m 2M 2M 3m 2M 2M 3m 2M 2M 3m À [2M 2M 3m] x 12 ∞							X											
2M 2M 3M	4	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X
2M 2M 3M 2M 2M 3M		X		X		X		X			X					X	X	
2M 2M 3M 2M 2M 3M 2M 2M 3M à [2M 2M 3M] x 12 ∞		X		X		X		X			X							
2M 3m 3m	4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2M 3m 3m 2M 3m 3m				X				X				X	X	X		X		
2M 3m 3m 2M 3m 3m 2M 3m 3m				X				X						X				
2M 3m 3m 2M 3m 3m 2M 3m 3m 2M 3m 3m				X				X						X				
[2M 3m 3M] x 9 à 12								**X**										
2M 3m 3M	4		X	X	X		X		X	X	X	X	X	X	X	X	X	X
2M 3m 3M 2M 3m 3M			X				X		X	X			X		X	X	X	
2M 3m 3M 2M 3m 3M 2M 3m 3M à [2M 3m 3M] x 9			X						X	X								
[2M 3m 3M] x 10 à 12									**X**	**X**								

MODÉCHELLES		***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***
ACCORDS / ARPÈGES ITÉRATIFS	n sons	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8a**	**8b**	**9a**	**9b**	**10a**	**10b**	**10c**	**11a**	**11b**	**11c**
2M 3M 3M	4	X		X		X	X	X	X		X	X	X	X	X	X	X	X
2M 3M 3M 2M 3M 3M		X		X		X	X				X	X						
2M 3M 3M 2M 3M 3M 2M 3M 3M		X		X		X					X	X						
[2M 3M 3M] x 9 à 12				X		X					X	X						
2M 3M 3m	4		X	X		X	X		X	X	X	X	X	X	X	X	X	X
2M 3M 3m 2M 3M 3m			X						X	X					X		X	X
2M 3M 3m 2M 3M 3m 2M 3M 3m			X						X	X							X	
[2M 3M 3m] x 4 à 12			**X**						**X**	**X**								
3m 3m	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 3m	4		X			X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 3m 3m	4		X			X	X	X	X	X	X	X	X	X		X	X	X
3m 3m 3m 3m 3m 3m	4		X			X			X	X		X		X		X	X	X
3m 3m 3m 3m 3m 3m ∞	4		X			X			X	X						X	X	X
3m 3M	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3M 3m 3M	5			X			X		X	X	X	X		X	X	X		X
3m 3M 3m 3M 3m 3M	7						X				X	X			X			X
3m 3M 3m 3M 3m 3M 3m 3M 3m 3M	9						X					X			X			
3m 3M 3m 3M 3m 3M 3m 3M 3m 3M 3m 3M	10						X								X			
3m 3M 3m 3M 3m 3M 3m 3M 3m 3M 3m 3M 3m 3M	11						X											
3m 3M 3m 3M 3m 3M 3m 3M 3m 3M 3m 3M 3m 3M 3m 3M	12						**X**											
3M 3M	3	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X
3M 3M 3M	3	X		X		X	X	X	X	X	X	X		X	X	X	X	X
3M 3M 3M 3M 3M 3M 3M	3	X		X		X		X			X				X	X	X	X
3M 3M 3M 3M 3M 3M 3M 3M ∞	3	X		X		X		X								X	X	X
3m 3m 3M	4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 3M 3m 3m 3M	7				X		X				X	X			X	X	X	
3m 3m 3M 3m 3m 3M 3m 3m 3M	9				X		X				X	X						
3m 3m 3M 3m 3m 3M 3m 3m 3M 3m 3m 3M ∞	10 / 11				**X**						**X**	**X**						
3m 3M 3M (aussi bien que 3M 3M 3m)	4			X		X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3M 3M 3m 3M 3M	7			X			X						X	X	X			
3m 3M 3M 3m 3M 3M 3m 3M 3M	8						X						X	X	X			
3m 3M 3M 3m 3M 3M 3m 3M 3M 3m 3M 3M	12												X	X	X			
[3m 3M 3M] x 5 à [3m 3M 3M] x 8	12												**X**	**X**	**X**			
3m 3m 3m 3M	5		X			X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 3m 3M 3m 3m 3m 3M	9										X	X						
3m 3m 3m 3M 3m 3m 3m 3M 3m 3m 3m 3M	12											X						
[3m 3m 3m 3M] x 4 mais plus = chromatique	12											**X**						
3m 3m 3M 3M	5			X		X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 3M 3M 3m 3m 3M 3M	8						X				X	X			X			
3m 3m 3M 3M 3m 3m 3M 3M 3m 3m 3M 3M ∞	9 / 10 / 12						**X**											
3m 3M 3M 3M	4			X		X	X	X	X	X	X	X		X	X	X	X	X
3m 3M 3M 3M 3m 3M 3M 3M	7			X											X			
[3m 3M 3M 3M] x 3 à x 5	10 / 12														X			

MODÉCHELLES		***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***
ACCORDS / ARPÈGES ITÉRATIFS	n sons	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8a**	**8b**	**9a**	**9b**	**10a**	**10b**	**10c**	**11a**	**11b**	**11c**
3m 3m 3m 3M 3M	6					X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 3m 3M 3M 3m 3m 3m 3M 3M	10						X					X						
3m 3m 3m 3M 3M 3m 3m 3m 3M 3M 3m 3m 3m 3M 3M	12											**X**						
3m 3M 3m 3m 3M (= 3M 3m 3M 3m 3m)	6				X		X				X	X			X	X	X	X
3m 3M 3m 3m 3M 3m 3M 3m 3m 3M	8						X				X	X						
3m 3M 3m 3m 3M 3m 3M 3m 3m 3M 3m 3M 3m 3m 3M	9						X				X	X						
[3m 3M 3m 3m 3M] x 4	9											X						
[3m 3M 3m 3m 3M] x 5	11											**X**						
3m 3M 3m 3M 3M	6			X			X		X	X	X	X		X	X	X		X
3m 3M 3m 3M 3M 3m 3M 3m 3M 3M	10						X		X	X					X			
[3m 3M 3m 3M 3M 3m 3M 3m 3M 3M] x 2 = [3m 3M 3m 3M 3M] x 4	10								X	X					X			
[3m 3M 3m 3M 3M] x 5	10									**X**								
3m 3m 3M 3M 3M	5			X		X	X	X	X	X	X	X			X	X	X	X
3m 3m 3M 3M 3M 3m 3M 3M 3M 3M	8					X	X		X	X					X			
3m 3m 3M 3M 3M 3m 3M 3M 3M 3M 3m 3m 3M 3M 3M	8					X			X	X					X			
[3m 3m 3M 3M 3M] x 4	8					X			X	X					X			
[3m 3m 3M 3M 3M] x 5	8					X			X	X								
3m 3m 3m 3M 3m 3M	7						X			X	X	X		X	X	X		X
3m 3m 3m 3M 3m 3M 3m 3m 3m 3M 3m 3M	10										X	X						
[3m 3m 3m 3M 3m 3M] x 3 et 4	12										**X**	**X**						
3m 3m 3M 3M 3m 3M	7						X		X			X	X	X	X		X	X
3m 3m 3M 3M 3m 3M 3m 3m 3M 3M 3m 3M	9						X								X			
3m 3m 3M 3M 3m 3M 3m 3m 3M 3M 3m 3M 3m 3m 3M 3M 3m 3M	11						X											
[3m 3m 3M 3M 3m 3M] x 4	12						**X**											
3m 4J	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3m 4J 3m 4J	5			X	X			X		X		X	X	X	X		X	X
3m 4J 3m 4J 3m 4J	6			X				X					X	X				
[3m 4J] x 4 et x 5	6			X				X						X				
[3m 4J] x 6 à 11	6			**X**				**X**										
3M 4J	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3M 4J 3M 4J	5		X	X			X		X	X	X		X		X	X	X	X
3M 4J 3M 4J 3M 4J	7		X						X	X			X		X	X		
[3M 4J] x 4 à 9	8		X						X	X								
[3M 4J] x 10	8								**X**	**X**								
3m 3m 4J	4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3m 3m 4J 3m 3m 4J	7						X	X					X	X	X	X		
[3m 3m 4J] x 3	10							X					X	X	X			
[3m 3m 4J] x 4	11												X	X	X			
[3m 3m 4J] x 5 à x 12	12												**X**	**X**	**X**			
3M 3M 4J	4			X		X	X	X	X	X	X	X	X	X	X	X	X	X
[3M 3M 4J] x 2	7			X					X	X		X	X		X			
[3M 3M 4J] x 3 (NUL)	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[3M 3M 4J] x 4 à x 8 (NUL)	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MODÉCHELLES		***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***
ACCORDS / ARPÈGES ITÉRATIFS	n sons	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8a**	**8b**	**9a**	**9b**	**10a**	**10b**	**10c**	**11a**	**11b**	**11c**
3m 3M 4J (arpège mineur, octaviant)	3		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
[3m 3M 4J] x 2	3		X	X		X	X			X						X	X	X
[3m 3M 4J] x 3 À x 7	3		X	X		X										X	X	X
[3m 3M 4J] x 8 (puis NUL)	3															**X**	**X**	**X**
3m 4J 3M (1er renversement de l'arpège Majeur, octaviant)	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
[3m 4J 3M] x 2	3		X	X		X			X							X	X	X
[3m 4J 3M] x 3 à x 7	3		X	X		X										X	X	X
[3m 4J 3M] x 8 (puis NUL)	3															**X**		
4J 3M 3m (2ème renversement de l'arpège Majeur, octaviant)	3		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
[4J 3M 3m] x 2	3		X	X		X	X		X							X	X	X
[4J 3M 3m] x 3 à x 7	3		X	X		X										X	X	X
[4J 3M 3m] x 8 puis NUL	3															**X**	**X**	**X**
4J 4J	3			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
[4J 4J] x 2	5				X			X			X	X	X			X	X	X
[4J 4J] x 3	7				X						X	X						X
[4J 4J] x 4 à x 9 puis hors tessiture	9 à 12				**X**						**X**	**X**						
4J 4+	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
[4J 4+] x 2	5					X	X	X	X	X	X		X	X	X		X	
[4J 4+] x 3	7							X					X	X	X			
[4J 4+] x 4	9												X	X	X			
[4J 4+] x 5	11												X	X	X			
[4J 4+] x 6 à x 8 pui hors tessiture	12												**X**	**X**	**X**			
4+ 4J	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
[4+ 4J] x 2	5					X	X	X	X	X	X		X	X	X	X		
[4+ 4J] x 3	7							X					X	X	X			
[4+ 4J] x 4	9												X	X	X			
[4+ 4J] x 5	11												X	X	X			
[4+ 4J] x 6 = 4+ 4J 4+ 4J 4+ 4J 4+ 4J 4+ 4J 4+ 4J 4+ 4J et jusqu'à [4+ 4J] x 8	12												**X**	**X**	**X**			
4+ 4J 4J	4			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4+ 4J 4J 4+ 4J 4J	7			X				X			X	X	X	X				
4+ 4J 4J 4+ 4J 4J 4+ 4J 4J	9			X				X					X					
4+ 4J 4J 4+ 4J 4J 4+ 4J 4J 4+ 4J 4J 4+ 4J 4J	9			X				X										
4+ 4J 4J 4+ 4J 4J 4+ 4J 4J 4+ 4J 4J 4+ 4J 4J 4+ 4J 4J (hors tessiture)	9							X										
4J 4+ 4+	3		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
[4J 4+ 4+] x 2	5					X						X	X	X	X		X	
[4J 4+ 4+] x 3 puis NUL	7												X					
4+ 4+ 4J	3		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
[4J 4+ 4+] x 2	5					X						X	X	X	X	X		
[4J 4+ 4+] x 3 puis NUL	7												**X**					
4+ 4J 4J 4+ 4J	6			X				X	X	X	X		X	X	X			
4+ 4J 4J 4+ 4J 4+ 4J 4J 4+ 4J	10							X	X	X			X	X	X			
4+ 4J 4J 4+ 4J 4+ 4J 4J 4+ 4J 4+ 4J 4J 4+ 4J	11							X	X	X			X					
4+ 4J 4J 4+ 4J 4+ 4J 4J 4+ 4J 4+ 4J 4J 4+ 4J 4J 4+ 4J (NUL)	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MODÉCHELLES		***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***
ACCORDS / ARPÈGES ITÉRATIFS	n sons	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8a**	**8b**	**9a**	**9b**	**10a**	**10b**	**10c**	**11a**	**11b**	**11c**
4+ 4J 4J 4+ 4J 4+ 4J	7							X	X	X			X	X	X			
4+ 4J 4J 4+ 4J 4+ 4J 4+ 4J 4J 4+ 4J 4+ 4J	11												X	X	X			
4+ 4J 4J 4+ 4J 4+ 4J 4+ 4J 4J 4+ 4J 4+ 4J 4+ 4J 4J (puis hors tessiture)	11												X					
4+ 5J	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4+ 5J 4+ 5J	5					X	X	X		X	X	X	X		X		X	
4+ 5J 4+ 5J 4+ 5J	7										X	X	X		X			
[4+ 5J] x 4 à x 5 puis NUL	9 à 12											X						
5J 4+	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
[5J 4+] x 2	5					X	X	X	X		X	X	X		X	X		
[5J 4+] x 3	7										X	X	X		X			
[5J 4+] x 4 à x 5 puis hors tessiture	9 à 11											X						
5J 4+ 4J	4		X		X	X	X	X	X	X	X	X	X	X	X	X	X	
[5J 4+ 4J] x 2	4		X			X	X		X	X			X		X	X	X	
[5J 4+ 4J] x 3	4		X			X			X	X					X	X	X	
[5J 4+ 4J] x 4	4		X			X			X	X						X	X	
[5J 4+ 4J] x 5 puis hors tessiture	4					X			X	X						X	X	
5J 5J	3			X	X	X	X		X	X	X	X	X	X	X	X	X	X
[5J 5J] x 2	5						X		X	X	X	X			X	X	X	X
[5J 5J] x 3	7						X					X			X			X
[5J 5J] x 3,5 = 5J x 7	8						X								X			
[5J 5J] x 4 à x 6 (puis hors tessiture)	9 à 12						X											
5J 5J 4+	4			X	X	X	X		X	X	X	X	X	X	X	X	X	X
[5J 5J 4+] x 2	7			X	X		X		X	X	X	X	X		X			
[5J 5J 4+] x 3	9			X	X						X	X						
[5J 5J 4+] x 4 puis NUL	9			X	X						X	X						

On pourra bien sûr développer encore ce tableau selon toutes les combinaisons imaginables entre tous les intervalles, de la seconde mineure à la 7ème Majeure, mais il nous a semblé que les éléments donnés ici sont les plus utiles dans un premier temps.
On affinera bien sûr les données cas par cas selon le contexte propre à chaque composition en utilisant le logiciel développé à l'Ircam.