Set-Class Table[1]

The following pages contain a complete listing of all of the (T_n/T_nI) set-classes (after Allen Forte and John Rahn).[2] A set-class (or SC) is a collection of all the sets of pcs (pcsets) that are related under transposition (T_n), inversion (I), or both (in pc-space). (All of the pcsets within a set-class are of the same cardinality).

Reading the Table

1. A SC's "name" consists of two numbers separated by a hyphen in parentheses followed by its "prime form" written in brackets. The second of the hyphenated numbers indicates the position of a particular set-class on the list and the first number gives the set-class's members' cardinality. The "prime form" portion of the SC's name is simply one of the pcsets included in the current set-class and is in (so-called) normal order.[3] For example, SC(4-5)[0126] is the name of the set-class whose cardinality is 4, and is fifth on the list of set-classes of that cardinality. [0126], its prime form, is an ordering of one member of the SC. Two SCs, one possessing the complements of the pcsets in the other, have the same number after the hyphen in their names.

2. The M/MI column refers to the set-class whose members are related under T_nM or T_nMI to those of the present set-class; the column's entry gives the second of the hyphenated numbers in its name. If this number is identical to the second number of the present set-class's name, the set-class has sets that are invariant under T_nM and/or T_nMI.

3. Z tells whether or not the SC has a unique interval-class vector (see below). If there is an entry in the column, it indicates the other SC with the same vector. (A vector is shared by only two SCs at most.)

4. ICV (Interval-Class Vector) gives the interval-class content for any set within the current set-class. Seven successive numbers occur within brackets. The leftmost number gives the number of interval-classes of size 0 (and thus, the cardinality of the SC's members), the second number from the left gives the number of interval-classes of size 1, and so forth until we get to the last (seventh, rightmost) number, which indicates the amount of ic6s in any set within the set-class. For example, [3011010] indicates that any set within the set-class with which it is associated has 3 pcs, no ic1s, one ic2, one ic3, no ic4 or 6, and one ic5.

5. Invariance Vector indicates the properties of the sets within a set-class. The first four of the vector's eight positions show whether or not the SC's sets have T_n, T_nI, T_nM, and T_nMI

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[1] This document is extracted from Morris (1987).

[2] This table corresponds to that of "Appendix 1, 'Prime forms and Vectors of Pitch-Class Sets,'" in Forte (1973:179-81) and "Table II, 'T_n/T_nI-Types of Sets,'" in Rahn (1980:140-43).

[3] This table's prime forms were generated by the set-type representative algorithm in Rahn (1980), not that of the prime-form algorithm in Forte (1973). Thus the prime-form of five set-classes differs from that of Forte: SC(5-20)[01568]; SC(6-29)[023679]; SC(6-31)[014579]; SC(720)[0125679]; SC(8-26)[0134579A].

O algoritmo utilizado é o de Rahn, resultando em 5 conjuntos diferentes da tabela de Forte !!!

invariance respectively. The last four positions tell if the member sets map into their complements under T_n, T_nI, T_nM, and T_nMI respectively. If a position is zero, the sets with the set-classes do not have the associated property. When the position is greater than zero, the number within the position gives the number of different ns in the T_n portion of the operator associated with the position. (Note: all SCs have a 1 in the first position of their vectors, which indicates (trivial) invariance under T_0.)

The degree of symmetry of an SC (counting M and MI operators) is given by the sum of the vector's first four positions. The number of pcsets in the SC can be calculated by dividing 24 by the sum of the first two positions. For instance, the SC(6-38)[012378] has the invariance vector 11000011, which tells us that the sets within this SC have (total) invariance under one value of n in T_n, one value of n in T_nI—that they map into their complements under T_nM and T_nMI with one value of n in each case. The sets within 6-38 have no other special properties of this kind.

6. $CINT_1$, is the cyclic "adjacent interval array" of Richard Chrisman of the prime form of the SC.[4]

References Cited

Chrisman, Richard
1979 "Describing Structural Aspects of Pitch-Sets Using Successive-Interval Arrays." *The Journal of Music Theory* 27/2:181-201.

Forte, Allen
1973 *The Structure of Atonal Music*. New Haven: Yale University Press.

Morris, Robert
1987 *Composition with Pitch-Classes: A theory of Compositional Design.* New Haven: Yale University Press.

Rahn, John
1980 *Basic Atonal Theory.* New York: Longman.

[4] See Chrisman (1979:79). Since Chrisman's arrays are correlated to Forte's prime-forms, we have adjusted the adjacent arrays of the prime forms that deviate from Forte's (see the previous footnote).

Set-Class Table

Name (prime form)	M/MI	Z	ICV	Invariance Vector	$CINT_1$
Set-Classes of cardinality 1 (a pc)					
(1-1)[0]	1		[1000000]	<1111BBBB>	<0>
Set-Classes of cardinality 2 (equivalent to interval-classes)					
(2-1)[01]	5		[2100000]	<11009988>	<1B>
(2-2)[02]	2		[2010000]	<11119999>	<2A>
(2-3)[03]	3		[2001000]	<11119999>	<39>
(2-4)[04]	4		[2000100]	<11119999>	<48>
(2-5)[05}	1		{2000010]	<11009988>	<57>
(2-6)[06]	6		[2000001]	<2222AAAA>	<66>
Set-Classes of cardinality 3 (trichord types)					
(3-1)[012]	9		[3210000]	<11007744>	<11A>
(3-2)[013]	7		[3111000]	<10005655>	<129>
(3-3)[014]	11		[3101100]	<10005655>	<138>
(3-4)[015]	4		[3100110]	<10105656>	<147>
(3-5)[016]	5		[3100011]	<10016776>	<156>
(3-6)[024]	6		[3020100]	<11117777>	<228>
(3-7)[025]	2		[3011010]	<10005655>	<237>
(3-8)[026]	8		[3010101]	<10016776>	<246>
(3-9)[027]	1		[3010020]	<11007744>	<255>
(3-10)[036]	10		[3002001]	<11118888>	<336>
(3-11)[037]	3		[3001110]	<10005655>	<345>
(3-12)[048]	12		[3000300]	<33339999>	<444>

Set-Classes of cardinality 4 (tetrachord types)

(4-1)[0123]	23		[4321000]	<11005511>	<1119>
(4-2)[0124]	22		[4221100]	< 10003411>	<1128>
(4-3)[0134]	26		[4212100]	<11003322>	<1218>
(4-4)[0125]	14		[4211110]	<10001323>	<1137>
(4-5)[0126]	16		[4210111]	<10002432>	<1146>
(4-6)[0127]	6		[4210021]	<11114444>	<1155>
(4-7)[0145]	20		[4201210]	<11003333>	<1317>
(4-8)[0156]	8		[4200121]	<11114444>	<1416>
(4-9)[0167]	9		[4200022]	<22226666>	<1515>
(4-10)[0235]	10		[4122010]	<11113333>	<2127>
(4-11)[0135]	11		[4121110]	<10101313>	<1227>
(4-12)[0236]	27		[4112101]	<10002432>	<2136>
(4-13)[0136]	13		[4112011]	<10012442>	<1236>
(4-14)[0237]	4		[4111120]	<10001323>	<2145>
(4-15)[0146]	29	29	[4111111]	< 10000331>	<1326>
(4-16)[0157]	5		[4110121]	<10002432>	<1425>
(4-17)[0347]	17		[4102210]	<11113333>	<3135>
(4-18)[0147]	18		[4102111]	<10012442>	<1335>
(4-19)[0148]	19		[4101310]	<10103535>	<1344>
(4-20)[0158]	7		[4101220]	<11003333>	<1434>
(4-21)[0246]	21		[4030201]	<11116666>	<2226>
(4-22)[0247]	2		[4021120]	<10003411>	<2235>
(4-23)[0257]	1		[4021030]	<11005511>	<2325>
(4-24)[0248]	24		[4020301]	<11116666>	<2244>
(4-25)[0268]	25		[4020202]	<22226666>	<2424>
(4-26)[0358]	3		[4012120]	<11003322>	<3234>
(4-27)[0258]	12		[4012111]	<10002432>	<2334>
(4-28)[0369]	28		[4004002]	<44448888>	<3333>
(4-29)[0137]	15	15	[4111111]	<10000331>	<1245>

Set-Classes of cardinality 5 (pentachord types)

(5-1)[01234]	35		[5432100]	<11003300>	<11118>
(5-2)[01235]	23		[5332110]	<10001211>	<11127>
(5-3)[01245]	27		[5322210]	<10001110>	<11217>
(5-4)[01236]	29		[5322111]	<10000200>	<11136>
(5-5)[01237]	14		[5321121]	<10000111>	<11145>
(5-6)[01256]	20		[5311221]	<10000111>	<11316>
(5-7)[01267]	7		[5310132]	<10012332>	<11415>
(5-8)[02346]	34		[5232201]	<11002200>	<21126>
(5-9)[01246]	24		[5231211]	<10000201>	<11226>
(5-10)[01346]	25		[5223111]	<10000110>	<12126>
(5-11)[02347]	11		[5222220]	<10101111>	<21135>
(5-12)[01356]	12	36	[5222121]	<11110000>	<12216>
(5-13)[01248]	30		[5221311]	< 10000201>	<11244>
(5-14)[01257]	5		[5221131]	<10000111>	<11325>
(5-15)[01268]	15		[5220222]	<11112222>	<11424>
(5-16)[01347]	32		[5213211]	<10000110>	<12135>
(5-17)[01348]	37	37	[5212320]	<11001122>	<12144>
(5-18)[01457]	38	38	[5212221]	<10000110>	<13125>
(5-19)[01367]	19		[5212122]	<10010220>	<12315>
(5-20)[01568]	6		[5211231]	<10000111>	<14124>
(5-21)[01458]	21		[5202420]	<10103333>	<13134>
(5-22)[01478]	22		[5202321]	<11112222>	<13314>
(5-23)[02357]	2		[5132130]	<10001211>	<21225>
(5-24)[01357]	9		[5131221]	< 10000201>	< 12225>
(5-25)(02358]	10		[5123121]	<10000110>	<21234>
(5-26)[02458]	26		[5122311]	<10100202>	<22134>
(5-27)(01358]	3		[5122230]	<10001110>	<12234>
(5-28)[02368]	28		[5122212]	<10010220>	<21324>
(5-29)(01368]	4		[5122131]	<10000200>	<12324>
(5-30)[01468]	13		[5121321]	< 10000201>	<13224>
(5-31)[01369]	31		[5114112]	<10010330>	<12333>
(5-32)[01469]	16		[5113221]	<10000110>	<13233>
(5-33)[02468]	33		[5040402]	<11116666>	<22224>
(5-34)[02469]	8		[5032221]	<11002200>	<22233>
(5-35)[02479]	1		[5032140]	<11003300>	<22323>
(5-36)[01247]	36	12	[5222121]	<10010110>	<11235>
(5-37)[03458]	17	17	[5212320]	<11001122>	<31134>
(5-38)[01258]	18	18	[5212221]	<10000110>	<11334>

Set-Classes of cardinality 6 (hexachord types)

(6-1)[012345]	32		[6543210]	<11001100>	<111117>
(6-2)[012346]	33		[6443211]	<10000100>	<111126>
(6-3)[012356]	25	36	[6433221]	<10000000>	<111216>
(6-4)[012456]	26	37	[6432321]	<11000000>	<112116>
(6-5)[012367]	18		[6422232]	<10000100>	<111315>
(6-6)[012567]	38	38	[6421242]	<11000011>	< 113115>
(6-7)[012678]	7		[6420243]	<22222222>	<114114>
(6-8)[023457]	8		[6343230]	<11111111>	<211125>
(6-9)[012357]	9		[6342231]	<10100101>	<111225>
(6-10)[013457]	46	39	[6333321]	<10000000>	<121125>
(6-11)(012457]	40	40	[6333231]	<10000010>	<112125>
(6-12)[012467]	12	41	[6332232]	<10010000>	<112215>
(6-13)[013467]	50	42	[6324222]	<11000000>	<121215>
(6-14)[013458]	14		[6323430]	<10101010>	<121134>
(6-15)[012458]	31		[6323421]	<10000100>	<112134>
(6-16)[014568]	16		[6322431]	<10100101>	<131124>
(6-17)[012478]	17	43	[6322332]	<10010000>	<112314>
(6-18)[012578]	5		[6322242]	<10000100>	<113214>
(6-19)[013478]	44	44	[6313431]	<10000010>	<121314>
(6-20)[014589]	20		[6303630]	<33333333>	<131313>
(6-21)[023468]	34		[6242412]	<10000100>	<211224>
(6-22)[012468]	22		[6241422]	<10100101>	<112224>
(6-23)[023568]	23	45	[6234222]	<11110000>	<212124>
(6-24)[013468]	39	46	[6233331]	<10000000>	<121224>
(6-25)[013568]	3	47	[6233241]	<10000000>	<122124>
(6-26)[013578]	4	48	[6232341]	<11000000>	<122214>
(6-27)[013469]	27		[6225222]	<10010110>	<121233>
(6-28)[013569]	28	49	[6224322]	<11110000>	<122133>
(6-29)[023679]	42	50	[6224232]	<11000000>	<213123>
(6-30)[013679]	30		[6224223]	<20020220>	<123123>
(6-26)[013578]	4	48	[6232341]	<11000000>	<122214>
(6-27)[013469]	27		[6225222]	<10010110>	<121233>
(6-28)[013569]	28	49	[6224322]	<11110000>	<122133>
(6-29)[023679]	42	50	[6224232]	<11000000>	<213123>
(6-30)[013679]	30		[6224223]	<20020220>	<123123>

Set-Classes of cardinality 6 (hexachord types) continued

(6-31)[014579]	15		[6223431]	<10000100>	<131223>
(6-32)[024579]	1		[6143250]	<11001100>	<221223>
(6-33)[023579]	2		[6143241]	<10000100>	<212223>
(6-34)[013579]	21		[6142422]	<10000100>	<122223>
(6-35)[02468A]	35		[6060603]	<66666666>	<222222>
(6-36)[012347]	47	3	[6433221]	<10000000>	<111135>
(6-37)[012348]	48	4	[6432321]	<11000000>	<111144>
(6-38)(012378]	6	6	[6421242]	<11000011>	<111414>
(6-39)[023458]	24	10	[6333321]	<10000000>	<211134>
(6-40)[012358]	11	11	[6333231]	<10000010>	<111234>
(6-41)[012368]	41	12	[6332232]	<10010000>	<111324>
(6-42)[012369]	29	13	[6324222]	<11000000>	<111333>
(6-43)[012568]	43	17	[6322332]	<10010000>	<113124>
(6-44)[012569]	19	19	[6313431]	<10000010>	<113133>
(6-45)[023469]	45	23	[6234222]	<11110000>	<211233>
(6-46)[012469]	10	24	[6233331]	<10000000>	<112233>
(6-47)[012479]	36	25	[6233241]	<10000000>	<112323>
(6-48)[012579]	37	26	[6232341]	<11000000>	<113223>
(6-49)[013479]	49	28	[6224322]	<11110000>	<121323>
(6-50)[014679]	13	29	[6224232]	<11000000>	<132123>

Set-Classes of cardinality 7

(7-1)[0123456]	35		[7654321]	<11000000>	<1111116>
(7-2)(0123457]	23		[7554331]	<10000000>	<1111125>
(7-3)[0123458]	27		[7544431]	<10000000>	<1111134>
(7-4)[0123467]	29		[7544332]	<10000000>	<1111215>
(7-5)[0123567]	14		[7543342]	<10000000>	<1112115>
(7-6)[0123478]	20		[7533442]	<10000000>	<1111314>
(7-7)[0123678]	7		[7532353]	<10010000>	<1113114>
(7-8)[0234568]	34		[7454422]	<11000000>	<2111124>
(7-9)[0123468]	24		[7453432]	<10000000>	<1111224>
(7-10)[0123469]	25		[7445332]	<10000000>	<1111233>
(7-11)[0134568]	11		[7444441]	<10100000>	<1211124>
(7-12)[0123479]	12	36	[7444342]	<11110000>	<1111323>
(7-13)[0124568]	30		[7443532]	<10000000>	<1121124>
(7-14)[0123578]	5		[7443352]	<10000000>	<1112214>
(7-15)[0124678]	15		[7442443]	<11110000>	<1122114>
(7-16)[0123569]	32		[7435432]	<10000000>	<1112133>
(7-17)[0124569]	37	37	[7434541]	<11000000>	<1121133>
(7-18)[0123589]	38	38	[7434442]	<10000000>	<1311123>
(7-19)[0123679]	19		[7434343]	<10010000>	<1113123>
(7-20)[0125679]	6		[7433452]	<10000000>	<1131123>
(7-21)[0124589]	21		[7424641]	<10100000>	<1121313>
(7-22)[0125689]	22		[7424542]	<11110000>	<1131213>
(7-23)[0234579]	2		[7354351]	<10000000>	<2111223>
(7-24)[0123579]	9		[7353442]	<10000000>	<1112223>
(7-25)[0234679]	10		[7345342]	<10000000>	<2112123>
(7-26)(0134579]	26		[7344532]	<10100000>	<1211223>
(7-27)[0124579]	3		[7344451]	<10000000>	<1121223>
(7-28)[0135679]	28		[7344433]	<10010000>	<1221123>
(7-29)[0124679]	4		[7344352]	<10000000>	<1122123>
(7-30)[0124689]	13		[7343542]	<10000000>	<1122213>
(7-31)[0134679]	31		[7336333]	<10010000>	<1212123>
(7-32)[0134689]	16		[7335442]	<10000000>	<1212213>
(7-33)[012468A]	33		[7262623]	<11110000>	<1122222>
(7-34)[013468A]	8		[7254442]	<11000000>	<1212222>
(7-35)[013568A]	1		[7254361]	<11000000>	<1221222>
(7-36)[0123568]	36	12	[7444342]	<10010000>	<1112124>
(7-37)[0134578]	17	17	[7434541]	<11000000>	<1211214>
(7-38)[0124578]	18	18	[7434442]	<10000000>	<1121214>

Set-Classes of cardinality 8

(8-1)[01234567]	23		[8765442]	<11000000>	<11111115>
(8-2)[01234568]	22		[8665542]	<10000000>	<11111124>
(8-3)[01234569]	26		[8656542]	<11000000>	<11111133>
(8-4)[01234578]	14		[8655552]	<10000000>	<11111214>
(8-5)[01234678]	16		[8654553]	<10000000>	<11112114>
(8-6)[01235678]	6		[8654463]	<11110000>	<11121114>
(8-7)[01234589]	20		[8645652]	<11000000>	<11111313>
(8-8)[01234789]	8		[8644563]	<11110000>	<11113113>
(8-9)[01236789]	9		[8644464]	<22220000>	<11131113>
(8-10)[02345679]	10		[8566452]	<11110000>	<21111123>
(8-11)[01234579]	11		[8565552]	<10100000>	<11111223>
(8-12)[01345679]	27		[8556543]	<10000000>	<12111123>
(8-13)[01234679]	13		[8556453]	<10010000>	<11112123>
(8-14)[01245679]	4		[8555562]	<10000000>	<11211123>
(8-15)[01234689]	29	29	[8555553]	<10000000>	<11112213>
(8-16)[01235789]	5		[8554563]	<10000000>	<11122113>
(8-17)[01345689]	17		[8546652]	<11110000>	<12111213>
(8-18)[01235689]	18		[8546553]	<10010000>	<11121213>
(8-19)[01245689]	19		[8545752]	<10100000>	<11211213>
(8-20)[01245789]	7		[8545662]	<11000000>	<11212113>
(8-21)[0123468A]	21		[8474643]	<11110000>	<11112222>
(8-22)[0123568A]	2		[8465562]	<1000000>	<11121222>
(8-24)[0124568A]	24		[8464743]	<11110000>	<11211222>
(8-25)[0124678A]	25		[8464644]	<22220000>	<11221122>
(8-26)[0134578A]	3		[8456562]	<11000000>	<12112122>
(8-27)[0124578A]	12		[8456553]	<10000000>	<11212122>
(8-28)[0134679A]	28		[8448444]	<44440000>	<12121212>
(8-29)[01235679]	15	15	[8555553]	<10000000>	<11121123>

Set-Classes of cardinality 9

(9-1)[012345678]	9		[9876663]	<11000000>	<111111114>
(9-2)(012345679]	7		[9777663]	<10000000>	<111111123>
(9-3)[012345689]	11		[9767763]	<10000000>	<111111213>
(9-4)[012345789]	4		[9766773]	<10100000>	<111112113>
(9-5)[012346789]	5		[9766674]	<10010000>	<111121113>
(9-6)[01234568A]	6		[9686763]	<11110000>	<111111222>
(9-7)[01234578A]	2		[9677673]	<10000000>	<111112122>
(9-8)[01234678A]	8		[9676764]	<10010000>	<111121122>
(9-9)[01235678A]	1		[9676683]	<11000000>	<111211122>
(9-10)[01234679A]	10		[9668664]	<11110000>	<111121212>
(9-11)[01235679A]	3		[9667773]	<10000000>	<111211212>
(9-12)[01245689A]	12		[9666963]	<33330000>	<112112112>

Set-Classes of cardinality 10

(10-1)[0123456789]	5		[A988884]	<11000000>	<1111111113>
(10-2)[012345678A]	2		[A898884]	<11110000>	<1111111122>
(10-3)[012345679A]	3		[A889884]	<11110000>	<1111111212>
(10-4)[012345689A]	4		[A888984]	<11110000>	<1111112112>
(10-5)[012345789A]	1		[A888894]	<11000000>	<1111121112>
(10-6)[012346789A]	6		[A888885]	<22220000>	<1111211112>

Set-Classes of cardinality 11

(11-1)[0123456789A]	1		[BAAAAA5]	<11110000>	<11111111112>

Set-Classes of cardinality 12 (U)

(12-1)[0123456789AB]	1		[CCCCCC6]	<CCCC0000>	<111111111111>