Tactical Combat Series

Consolidated Errata, Optional Rules, and Variants: dated 30 March 90

Included herein is the new **and all old errata** generated by this series. Also, you will find all errata for the game **Bloody 110th**. Errata that was **not** contained in the errata sheet dated 15 Nov 89 will be marked with **bold** rule numbers.

Errors in the Series Rules

On page 3...
Weapon Unit Types diagram has the labels for "AT Gun" and "Mortar" switched from their symbols; the reverse is correct.

The Paralyzed Marker at the bottom of the page is not labeled as such.

On page 9...
The example op sheet at the top of the page should have a size of 7, not 6.

Standard Rounding Rule: In all cases requiring the rounding of fractions, unless specifically stated otherwise, the following rounding rule is applied. .01 to .50 round down, .51 to .99 round up. Fractional parts smaller than hundreds are dropped.

1.3c Change "Suppressed units may not change mode" to "Suppressed units may not change to move mode."

3.6 Change "AT guns have a morale of 3 and do not have a company morale" to "AT guns have a morale of 3 (if not given on the counter) and do not, generally, have company morale."

AT Roll Example: This example is incorrect in having a suppressed unit fire overwatch, suppressed units cannot fire overwatch

9.1d To this rule add the following: replace the usage of the word "unit" with "infantry platoon" so the the rule states that **only** when infantry platoons are destroyed via an Area Fire Table result is the +2 company morale addition made. Destruction by other means (SYR, Morale results) never causes this addition. It is meant to affect those units which, by destruction, are avoiding the Morale Table and potential adverse Company Morale changes.

9.2a It should be explicitly stated that suppressed units cannot fire overwatch. The statement that "suppression has no effect on mode change" is incorrect. Suppressed units can change to fire mode freely; they cannot, however, change to move mode (unless at the end of an SYR, which removes the suppressed marker anyway.)

10.7 Procedure. Here, unlike in other sections of the artillery rules, it is incorrectly stated that scatter rotation occurs at range 3 or more. As stated in other rules (e.g. 10.7b, the called fire example, and the Artillery Concentration Table) **scatter rotation occurs at range 2 or more.**

The statements in 13.1c and 14.1b are incorrect in stating that attacking units in overruns and assaults may enter from different adjacent hexes into one combat. Individual units and "stacks" (which are defined and follow the addenda below) are the only unit(s) which may be included in one assault or overrun. There are no restrictions on separate attacks coming from different adjacent hexes, but these are, of course, resolved separately.

Addenda to the Series Rules

8.7g The **maximum** allowable Total Dice Modifier (due to all causes) allowed on the Area Fire Table is **+16**. Any modifiers above this number are dropped. There is no limit to the minimum modifier.

8.7h Point weapons may fire on the Area Fire Table using the firepower multipliers at the top of the page. Note that the range effects are the same for most point weapons as area weapons, with the exception of AT guns which have their own multiplier. AT guns are x1/2 at all ranges due to a lack of HE ammo. **No attack factor of a point weapon greater than 10** (before range multipliers) may be applied from one source weapon to the Area Fire Table. Therefore, a modern tank with an attack of 15 would become a 10 when applied to the Area Fire Table. This tank, in an adjacent hex, would give a modifier for firepower of +3 (10 x3 for range.)

8.8f Point fire attacks may never be made at differentials less than -5 (exclusive.) Such fires, if made, are ignored.

8.8g The maximum modifier that may be applied to the dice on the Point Fire and ATGM Tables is +3. Modifiers greater than +3 are treated as +3. There is no limit to the minimum modifier.

8.8g (Optional) Minor Weapons Differences. This rule gives life to the steps of differential between +2 and -2 on the Point Fire Table. It is not recommended for play, unless a given player is particularly concerned about such things. This small table has no effect on Point Fire Table columns other than that of +2 to -2.

Attack-Defense

Dice Mod	+2	+1	0	-1	-2
-1 on -	-	1	1-2	1-4	
0 on 1-2	1-4	2-5	3-6	5-6	
+1 on	3-6	5-6	6	-	-

Die Roll

The above modifier is in addition to any others that might be applicable.

8.9k Whether one unit or a stack of units enters a hex causing an overwatch trigger, only one shot/ die roll is made for the trigger. Exception: AT Rolls of a unit in overwatch and area fires are still applied to each viable target in the hex. For example: if six tanks, moving as a stack, enter a hex causing an overwatch trigger, each eligible unit that may fire overwatch may fire at only one target (which need not be the **same** target) and units with overwatch markers may roll only once for the stack (and not six times.)

8.9l Any unit that moves adjacent to an enemy unit either through movement or SYR (an exception to the usual SYR rules) has overwatch fires automatically triggered against it. Units marked with overwatch markers may also fire automatically and do not need to make their die roll check. Only those units currently adjacent to the moving unit/stack which are otherwise eligible to fire overwatch may fire in this automatic method.

Other, non-adjacent units may also fire using the usual, and not automatic, overwatch rules in conjunction with automatic firers. This rule is **not an exception** to the rule stating that suppressed units cannot fire overwatch.

10.3 Change "...with a maximum of four battery fires in a single mission" to "...with a maximum of **eight** battery fires in a single mission." **This is a very important change and should be noted by all players.**

10.3a Change "...and no less than two missions of four" to "...and no less than one mission of eight."

12.0i Units may move, overrun, and assault as a "stack" only if they existed as a stack at the beginning of the Action Phase. Whether operating as a stack or individually, units are still required to maintain their own movement allowance and points spent. Stacks may be broken at any time during the Action Phase, with units going their separate ways (individually or in smaller stacks.) These units may be left in place (with their remaining movement points intact) while a player moves other portions of the broken stack. Units may stack at any time during an Action Phase but may not move as a stack unless they start the Action Phase together.

12.0j A mixed stack (one with vehicles and infantry components) may conduct what amounts to a combined overrun and assault on a given hex by attacking all at once. To resolve such an attack, conduct the overrun to completion using those units capable of overrun combat, and, then, conduct an assault with the remaining units. The two forces may not combine fires in one attack, nor may the overrun force conduct another overrun against the target hex before the assault is finished. The overrunning vehicles **do** receive the benefit of being stacked with infantry on the AT Roll Table. No other special rules are involved, only that the attacks are conducted separately, with the overrun first.

17.3b (add the following) While the ability to fire AA fires is usually unaffected by mode, AA fires may never be conducted by a unit that is being towed. AA fires are affected by LOS and visibility as are all other fires and the sortie is considered to be 20 meters above the ground.

21.0 Spotting *(Optional)*

This rule is for players who do not like the gaminess of the shooting-at-those-who-haven't mentality created by the alternating fire sequence.

21.0a *Application.* If players wish to use this rule, it must be applied to all direct fires in the game. It has no effect on artillery observing or on other indirect fires. In direct fires only (suppressive or overwatch), all units that wish to fire must "spot" their target.

21.0b *When Determined.* **After** all firers have been identified for a given fire combat, each potential firer has its spotting determined. Units that successfully spot must then fire, others may not. Failure to spot and fire in a given attempt does not affect a unit's ability to attempt to fire at other possible targets later in the phase.

21.0c *How Determined.* Spotting may be accomplished in one of two ways: automatic and die roll.

Automatic spotting occurs when: the target unit is at or within three hexes of the potential firer; the target unit has fired in the current game phase (any range); or the target is in move/dual mode in the open and at or within 10 hexes. *Die Roll Spotting* occurs when the conditions of automatic spotting are not met. Only two die rolls are possible: success on a 1-3 roll (one die) if the target is "unconcealed" in either mode or is "concealed" in move/dual mode; 1-2 if it is "concealed" in fire mode.

21.0d *Terrain Types.* Open terrain without any type of feature in the hex or hexside is considered unconcealed. All other terrain is considered concealed.

21.0e *Other Conditions.* All spotting methods require a clear LOS which is at or within the current visibility limit. No unit may make a die roll spotting attempt more than once against a given target. Spotting determination is made before rolling the die for multiple overwatch fires. Failure at spotting attempts does not cause units to be overwatch marked. Any announced unit that successfully spots and passes any required overwatch die roll check, **must** fire.

Bloody 110 Errata

1. Add the 38th JgPz Bn (all) to the Historical Order of Arrival to the other German units arriving at 0200 17 Dec 1944. The 273rd Flak Bn did not historically enter the map area and is correct in not being in the Historical Order of Arrival.

2. Only one German bridge may be built in the game. If a bridge allows the use of Areas 3 and 4, the player need not wait to reduce Hosingen before using Area 3 after the bridge is up. They must wait only to use Areas 4 and 5.

3. 2PG Regimental troops, 2x Gw38(t), enter with 2/2PG in the Historical Order of Arrival.

4. One 38th Pioneer platoon was printed without a morale, it has the same morale as the other units of its company (5.)

10.17 The Miller Artillery Tables
(Optional)

The following tables were designed by Rod Miller of Durham, NC. I very highly recommend them as 1. they are very fast (even for the largest fire missions), 2. they remain true to the original fire patterns and probabilities involved in the series artillery simulation, and 3. they allowed me to "fix" some of the problems caused by the limitations of the six sided die (like the "black hole" in the center of an Area B and small changes to the linear pattern.)

10.17a *Guidelines for Use.* These tables are meant to be used in addition to the regular procedure and the regular artillery procedures must be used while using these tables. Also, for very small fire missions, it may be quicker to use the old method. In general, do not use these tables for a fire for effect of less than 8 rounds. FFE's less than the table's last column (but 8 or more) are fired using the last available table column.

10.17b *Procedure:*
Step 1: Fire the Designator round and adjust normally. When ready to fire for effect, go to step 2.
Step 2: Determine the number of rounds remaining to be fired in effect. This should be the

original number of rounds minus those expended in step 1.
Step 3: Find the Expected Smoke Table for the concentration used. Find the nearest column to the number determined in step 2, cross reference this column with the row of the concentration fired to determine the expected number of smoke markers to be placed. Count out this number of smoke markers, and put them aside.
Step 4: For each enemy occupied hex in the target pattern (see Target Patterns below), determine the number of hexes from the target hex, and locate the appropriate Miller Table for the concentration and distance (this is listed at the top of each table.) Roll two dice. Use the red die and the tens digit and the white one for the ones, to create a sequential roll of 11 to 66. Find the column on this table which corresponds to the number of rounds found in step 2. Follow this column down until the first row that is **greater than or equal** to your roll and follow it across to either side of the table. The resulting number there is the number of rounds impacting in the hex. Execute the attack of these rounds on the hex normally (be sure to include any adjustment rounds that might have also landed in that hex.) Do not bother to place any burst markers on the map, other than those used prior to the fire for effect. Regardless of the number of rounds remaining in the mission, always use the number determined in step 2 when figuring the table column each time.
Step 5: From your expected smoke pile, place any required smoke markers in the attacked hex as you would normally for the number of rounds hitting there.
Step 6: Repeat steps 4 and 5 for any units (friendly or enemy) in the target pattern until finished.
Step 7: Place any remaining smoke markers from your expected smoke pile using the original artillery method.
Step 8: Conduct the next fire mission or end the phase as is appropriate.

10.17c It is possible to total more rounds that hit/attack than you have to be fired in the FFE. If this does happen, on the hex that in fact exceeds the maximum, reduce the number of rounds that hit the enemy hex to the number remaining and do not continue the attack thereafter (ignore any remaining smokes.) Remaining enemy hexes, in effect, get off easy because of the misfortune of their friends.

10.17d *Target Patterns.* Point, Area A and Area B concentrations are very simple. Each will attack all hexes at or within a certain hex range. The ranges are: 2, 3, and 6 hexes respectively. Linear is slightly more complicated and is best shown by the diagram at right.

10.17e *Expected Smoke Adjustments (optional).* The expected smoke distribution was calculated by conducting 1000 repetitions of each pattern/number of rounds. The actual distributions are quite tight. To show the variance involved, roll one die for each mission (regardless of the size of the expected number) on a 1-2 subtract 1 from the expected; on a 5-6 add 1.

10.17f Players may "prioritize" fires in any desired way, although such ordering will have a negligible effect on play (unless a mission is about to run out of rounds anyway, such as in 10.17c above.)

10.17g When firing DPICM/ICM that has adjacent hex attack effects, players must roll for each of the surrounding hexes of a given unit **before** rolling for the number which actually land on the

unit. A method of marking these hits that proves useful is to use step loss markers. Remove these markers when all fire combats are finished. Remember to replace those markers with smokes from your smoke pile as appropriate before distributing the remaining (if any) smoke markers.

10.17h *Use of Miller Tables to Fire Smoke Missions.* The Miller Tables can be used to quicken the placement of smoke markers when firing a smoke mission, but several things must be kept in mind when doing so. First, fire the designator round and adjust normally placing smoke markers as you go. For the FFE, do not refer to the Expected Smoke Tables at all (all rounds will make smoke markers.) Last, you must roll for every hex in the target pattern (or until you run out of smoke rounds, whichever occurs first.) Should you run out of hexes before running out of rounds, fire the remaining rounds using the regular artillery rules. The order of hex rolling can be done in any convenient manner.

Example: Miller Table FFE.
The following is the resolution of a 36 round FFE in a point concentration. The target hex has been hit and all adjustments have ceased. The expected smoke is 14 markers, and these are counted out and set aside. Three units exist in the 2 hex range target pattern. One is in the 0 range target hex. The table is found and two dice are rolled. The result is a 65, giving a table result of 11. Since the final adjusting round fell in the target hex, 12 rounds attack that unit. The combat is resolved and 6 smoke markers placed (leaving 8 remaining in the pile.) The next unit is at range 1. The table is found for point concentration, 1 hex range and two dice are rolled. Again the 36 column is used, and with a roll of 56, gives 5 rounds. This attack is made and 2 smokes are placed. This leaves 20 HE rounds and 6 smokes. The last unit is at range two. The point concentration, 2 hex range table is used and with a 44 dice roll gives one round with which to attack. The remaining 19 HE rounds fell somewhere in the target pattern, but not on a unit, so they are ignored. The last 6 smoke rounds are then placed using the old method. This ends this fire mission.

Linear Concentration Pattern
(may be rotated in any of the three possible orientations)

■ Linear (0, 1 hex range Preferred) Table

▒ Linear (2 hex range preferred) Table

□ Linear (3 hex range, 1 & 2 hex range non-preferred) Table

Table: Expected Smoke: Point, Linear, Area A

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
Pnt	43	37	31	25	24	22	21	19	18	17	15	14	12	11	9	8	7	5	4	3	Pnt
Lin	41	36	30	24	22	21	20	18	17	15	14	13	11	10	9	8	6	5	4	3	Lin
ArA	40	34	28	22	21	20	18	17	15	14	13	11	10	9	8	6	5	4	3	2	ArA

Table: Point (0 hex range), Linear (0, 1 hex range preferred), Area A (0 hex range)

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
0																11	11	11	12	14	0
1											11	11	11	11	13	14	16	23	32		1
2								11	11	11	12	12	14	15	22	25	32	41	51		2
3							11	11	12	12	13	15	16	23	25	33	41	45	54	62	3
4				11	11	11	12	13	14	15	21	24	26	33	41	44	52	56	63	65	4
5			11	12	12	13	14	16	22	24	26	34	41	44	52	54	61	64	65	66	5
6			12	14	15	16	22	24	31	34	36	44	51	54	61	62	64	65	66		6
7		11	13	21	23	24	31	33	41	44	46	53	56	62	64	64	66	66			7
8		12	15	25	32	33	41	43	46	53	55	61	63	64	65	65					8
9	11	14	22	34	41	42	46	52	55	61	62	63	65	65	66	66					9
10	12	16	26	43	46	51	54	56	62	64	64	64	66	66							10
11	14	23	34	51	54	55	61	63	64	65	65	65									11
12	16	26	42	55	61	62	63	64	65	66	66	66									12
13	23	34	46	62	63	64	64	65	66												13
14	26	42	54	64	64	65	65	66													14
15	34	46	61	65	65	66	66														15
16	42	53	63	66	66																16
17	46	56	64																		17
18	53	62	65																		18
19	56	63	66																		19
20	62	64																			20
21	63	65																			21
22	64	66																			22
23	65																				23
24	66																				24

Table: Point (1 hex range)

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
0							11	11	11	11	11	12	12	13	13	14	16	21	24	31	0
1			11	11	11	12	13	13	14	15	15	21	22	24	25	32	35	41	45	53	1
2		11	12	14	14	16	21	22	24	25	31	33	35	42	43	46	53	55	62	64	2
3	11	13	15	23	24	26	32	33	36	41	43	45	51	54	55	61	63	64	65	66	3
4	13	16	24	33	35	41	43	44	51	52	54	55	61	63	63	64	65	65	66		4
5	16	24	34	44	46	51	53	54	56	61	62	63	64	65	65	65	66	66			5
6	25	33	44	54	55	56	61	62	63	64	64	65	66	66	66	66					6
7	34	43	53	62	62	63	64	64	65	65	66	66									7
8	43	52	61	64	64	65	65	65	66	66											8
9	52	56	63	65	65	66	66	66													9
10	56	63	64	66	66																10
11	62	65	65																		11
12	64	66	66																		12
13	65																				13
14	66																				14

Table: Area A (1 hex range)

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
0			11	11	11	12	12	12	13	13	14	14	15	16	22	23	25	31	33	36	0
1	11	11	13	15	16	21	22	23	24	25	31	32	34	36	42	44	46	53	54	61	1
2	13	15	22	26	32	33	35	36	41	43	45	51	52	54	55	61	62	64	64	65	2
3	21	25	33	42	44	45	51	52	53	55	56	62	62	63	64	65	65	66	66	66	3
4	31	36	44	53	55	55	61	61	62	63	64	65	65	65	66	66	66				4
5	42	46	54	62	63	63	64	64	65	65	65	66	66	66							5
6	52	55	62	64	65	65	65	66	66	66	66										6
7	56	62	64	65	66	66	66														7
8	63	64	65	66																	8
9	64	65	66																		9
10	65	66																			10
11	66																				11

Table: Point (2 hex range), Area A (2 hex range)

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
0	12	13	15	21	21	22	23	23	24	25	26	31	32	34	35	36	42	44	46	52	0
1	23	25	33	36	41	42	43	44	45	46	51	52	53	55	56	61	62	63	64	65	1
2	36	43	51	54	54	55	56	61	61	62	62	63	63	64	65	65	65	66	66	66	2
3	52	55	61	63	63	64	64	65	65	65	65	65	66	66	66	66	66				3
4	61	63	64	65	65	66	66	66	66	66	66	66									4
5	64	65	65	66	66																5
6	65	66	66																		6
7	66																				7

Table: Linear (3 hex range, 1 & 2 hex range non-preferred), Area A (3 hex range)

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
0	33	34	36	43	43	44	44	45	46	46	51	52	52	53	54	55	55	56	61	62	0
1	54	55	61	62	62	63	63	63	64	64	64	65	65	65	65	65	65	66	66	66	1
2	64	64	65	65	65	66	66	66	66	66	66	66	66	66	66	66	66				2
3	66	66	66	66	66																3

Table: Linear (2 hex range preferred)

	96	84	72	60	57	54	51	48	45	42	39	36	33	30	27	24	21	18	15	12	
0	11	11	12	13	13	14	14	14	15	16	21	22	23	24	25	31	33	35	41	44	0
1	13	15	21	24	25	26	31	32	34	35	41	42	44	45	46	53	54	56	61	63	1
2	22	25	33	41	43	44	45	51	52	53	54	55	61	61	62	64	64	65	65	66	2
3	33	41	45	53	55	55	56	63	62	63	63	64	65	65	65	66	66	66	66		3
4	44	52	55	62	63	63	64	65	65	65	65	66	66	66	66						4
5	54	61	63	64	65	65	65	66	66	66	66										5
6	62	64	65	65	66	66	66														6
7	64	65	66	66																	7
8	65	66																			8
9	66																				9

Table: Expected Smoke: Area B

700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10
319	269	219	169	120	71	27	23	19	16	12	9	6	5	4	3	2	1	1

Table: Area B (0 & 1 hex range)

	700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10	
0							13	14	15	21	23	25	32	34	35	42	44	51	54	0
1						11	25	31	33	36	43	46	53	55	56	62	63	64	65	1
2					11	15	43	45	51	54	56	62	63	64	65	65	66	66	66	2
3					13	25	55	56	62	63	64	65	65	66	66	66				3
4				11	16	36	63	64	65	65	65	66	66							4
5				13	24	46	65	65	66	66	66									5
6			11	16	33	55	66	66												6
7		11	13	24	42	62														7
8		12	16	32	51	64														8
9	11	13	23	41	55	65														9
10	12	15	31	45	62	66														10
11	13	22	35	53	64															11
12	15	25	43	56	65															12
13	22	33	51	62	66															13
14	25	41	54	64																14
15	32	45	61	65																15
16	36	52	63	66																16
17	43	55	64																	17
18	46	61	65																	18
19	53	63	66																	19
20	55	64																		20
21	61	65																		21
22	63	66																		22
23	64																			23
24	65																			24
25	66																			25

Table: Area B (2 hex range)

	700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10	
0					11	12	23	24	26	32	34	36	42	44	46	51	53	55	61	0
1				11	13	22	43	45	51	53	55	61	62	63	64	64	65	65	65	1
2			11	13	22	35	56	61	62	63	64	65	65	66	66	66	66	66	66	2
3		11	13	21	33	51	64	65	65	65	66	66	66							3
4	11	13	16	26	44	61	65	66	66	66										4
5	12	16	25	36	54	64	66													5
6	15	24	34	46	62	65														6
7	23	33	43	55	64	66														7
8	31	42	52	62	65															8
9	36	51	56	64	66															9
10	45	55	62	65																10
11	53	62	64	66																11
12	56	64	65																	12
13	62	65	66																	13
14	64	66																		14
15	65																			15
16	66																			16

Table: Area B (3 hex range)

	700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10	
0			11	12	16	32	34	35	41	42	45	51	52	53	54	56	61	63		0
1		11	12	14	22	34	53	55	56	61	62	64	64	65	65	65	65	65	66	1
2	11	13	16	24	35	52	63	64	65	65	65	66	66	66	66	66	66	66		2
3	14	21	26	36	51	62	65	66	66	66	66									3
4	22	26	41	51	61	65	66													4
5	31	36	51	56	64	66														5
6	41	46	56	63	65															6
7	46	55	63	65	66															7
8	54	62	65	66																8
9	61	64	66																	9
10	63	65																		10
11	64	66																		11
12	65																			12
13	66																			13

Table: Area B (4 hex range)

	700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10	
0	11	11	11	12	14	23	36	41	42	44	46	51	53	54	55	56	61	62	64	0
1	12	13	15	22	31	43	61	61	62	63	64	64	65	65	65	66	66	66	66	1
2	15	22	25	35	45	56	65	65	65	66	66	66	66	66	66					2
3	24	33	41	51	56	64	66	66	66											3
4	35	44	52	61	64	65														4
5	45	54	61	64	65	66														5
6	54	62	64	65	66															6
7	62	64	65	66																7
8	64	65	66																	8
9	65	66																		9
10	66																			10

Table: Area B (5 hex range)

	700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10	
0	11	11	12	13	21	26	42	44	45	46	52	53	55	55	56	61	62	63	64	0
1	14	15	22	26	36	51	62	63	63	64	65	65	65	65	65	66	66	66	66	1
2	24	26	35	44	54	62	65	66	66	66	66	66	66	66						2
3	35	42	51	55	63	65	66													3
4	46	53	61	63	65	66														4
5	55	62	64	65	66															5
6	62	64	65	66																6
7	64	65	66																	7
8	65	66																		8
9	66																			9

Table: Area B (6 hex range)

	700	600	500	400	300	200	100	90	80	70	60	50	40	35	30	25	20	15	10	
0	11	12	14	16	23	32	45	46	51	52	53	54	56	61	61	62	63	64	64	0
1	16	22	26	34	43	53	64	64	64	64	65	65	65	66	66	66	66	66	66	1
2	31	35	44	52	56	63	66	66	66	66	66	66	66							2
3	43	51	55	62	64	65														3
4	54	61	63	65	65	66														4
5	62	64	65	66	66															5
6	64	65	66																	6
7	65	66																		7
8	66																			8