


NOTATION

There are **8 Tracks** for writing and composing **FORMULAS**. Select one of **16 Instruments** for each **Track**, or leave it **empty**. A maximum of **8 Instruments** can be played at one time (one per track).


Select one of four digits, **0, 1, 2, 3**. Each digit indicates a different level of intensity. **0** (or leaving the box blank) is a **silence**, **1** is **low**, **2** **medium**, and **3** **high**. So, the intensity of the sound varies according to the number entered, but what about note length? How do you write the type of note? The system is easy to understand even if you don't know anything about music, because it's really just maths. Enter as many digits as you want, from 0 to 8, in each **beat**. If a whole beat represents a crochet, you can program any note from a crochet (1), to a demisemiquaver (11111111). To make the first of the eight notes **high intensity**, the fifth **medium intensity** and all the others **low intensity**, enter 31112111

To make a sound last a whole **Beat**, enter only one digit (0, 1, 2, 3, according to the intensity required) in the **Beat** box. To fill a **Beat** with two sounds of equal length, enter two digits. To fill the **Beat** with three sounds of equal length, enter three digits, and so on. In other words, to make a number of notes of equal length play in a single **Beat**, enter the same number of digits. For example:

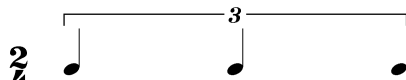
| NOTES | B1 | B2 | B3 | B4 |
|--|----|----|-----|------|
|  | 1 | 11 | 211 | 1131 |

In this example all the notes in **Beats B1** and **B2** are low-intensity, in **B3** the first note is medium-intensity and in **B4** the third note is high-intensity.

The **0** is used to indicate a silence, but it is also used to lengthen a note, representing either a tie or a dotted note, or to show that one note lasts longer than another. For example, to write three notes of different lengths in one **Beat**, divide the **Beat** into equal parts, using the shortest note as the measure. To write three notes with one note lasting half the beat and the other two notes together lasting the other half (one quaver and two semiquavers, for example) divide the **Beat** into four and write **1011**. The **0** adds another quarter of a beat to the first **1**. A blank box or a **Beat** with a **0** means a silent **Beat**. Here are some examples.

| NOTES | B1 | B2 | B3 | B4 | B5 |
|---|----|------|-----|----|------|
|  | 01 | 1110 | 110 | | 1011 |

The rhythmic unit can be divided by any number (1, 2, 3, 4, 5, 6, 7, etc.). When this unit lasts one **Beat**, follow the instructions outlined above, but what if it lasts longer than one **Beat**? This is slightly more complicated, as the notes have to be distributed proportionally among the beats. The distribution is calculated using the **least common multiple rule**. The least common multiple is calculated by multiplying the number of notes by the number of beats they last. This least common multiple is divided by the number of **beats** and the notes are divided into the same number of groups as the number of beats that the artificial group lasts. For example:

| NOTES |
|---|
|  |

Here, **three notes** last **two beats**. The least common multiple is found by multiplying **notes** (3) by **beats** (2) = 6 (least common multiple), so you write a total of **six digits**. However, as only **three notes** are to sound, the other three numbers which do not sound are zeros (**0**) between the **notes**. The formula is: 101010, distributed in two **beats**: (**B1**) = 101 (**B2**) = 010.

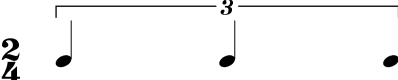
This is the theory, but it is rather complicated. It is best summarised as follows:

Number of **beats**= 4 Number of **notes**= 3


Digits to be entered: 3 (**notes**) x 4 (**beats**) = **12**


As only 3 of the numbers are **notes** which will sound, the other 9 digits are **zeros**, distributed evenly between the **three notes**. $9 \div 3 = 3$ **zeros per note**. The result is: 1000+1000+1000


So, each sound (1) is followed by the number of notes (three) in zeros (000), distributed among four beats: (B1) 100 (B2) 010 (B3) 001 (B4) 000


| NOTES | B1 | B2 | B3 | B4 |
|---|-----|-----|-----|----|
|  | 100 | 010 | 001 | |


Here are some examples, because a picture is worth a thousand words. In the following examples all the sounds are **low** intensity (1).


| NOTES | B1 | B2 | B3 | B4 |
|---|----|----|----|----|
|  | 1 | | | |

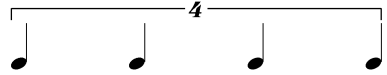
| NOTES | B1 | B2 | B3 | B4 |
|---|----|----|----|----|
|  | 1 | | 1 | |


| NOTES | B1 | B2 | B3 | B4 |
|---|----|----|----|----|
|  | 1 | 1 | 1 | 1 |

| NOTES | B1 | B2 | B3 | B4 |
|---|----|----|----|----|
|  | 1 | 0 | 1 | |


| NOTES | B1 | B2 | B3 | B4 |
|---|----|----|----|----|
|  | 1 | 1 | | 1 |

| NOTES | B1 | B2 | B3 | B4 |
|---|----|----|----|----|
|  | 11 | 11 | 11 | 11 |

| NOTES | B1 | B2 | B3 |
|---|------|------|------|
| $\frac{3}{4}$  | 1001 | 0010 | 0100 |

| NOTES | B1 | B2 | B3 | B4 | B5 | B6 |
|---|----|----|----|------|------|------|
| $\frac{6}{8}$  | 1 | 1 | 1 | 1001 | 0010 | 0100 |


| NOTES | B1 | B2 |
|---|------|-------|
| $\frac{2}{4}$  | 1111 | 11111 |


| NOTES | B1 | B2 | B3 | B4 | B5 | B6 |
|---|----|----|----|-------|-------|-------|
| $\frac{6}{8}$  | 1 | 1 | 1 | 10010 | 01001 | 00100 |


| NOTES | B1 | B2 |
|---|------|--------|
| $\frac{2}{4}$  | 1111 | 111111 |

| NOTES | B1 | B2 |
|---|--------|--------|
| $\frac{2}{4}$  | 100111 | 111100 |

| NOTES | B1 | B2 |
|---|------|---------|
| $\frac{2}{4}$  | 1111 | 1111111 |

| NOTES | B1 | B2 | B3 | B4 | B5 | B6 |
|---|----|----|----|---------|---------|---------|
| $\frac{6}{8}$  | 11 | 11 | 11 | 1001001 | 0010010 | 0100100 |

| NOTES | B1 | B2 | B3 |
|---|----------|----------|----------|
| $\frac{3}{4}$  | 10010010 | 01001001 | 00100100 |

| NOTES | B1 | B2 | B3 | B4 | B5 | B6 |
|---|----|----|----|----------|----------|----------|
| $\frac{6}{8}$  | 11 | 11 | 11 | 10010010 | 01001001 | 00100100 |