

## Guidelines for the Blood Transfusion Services

### Annexe 2: ISBT 128 check character calculation

<http://www.transfusionguidelines.org/red-book/annex-2-isbt-128-check-character-calculation>

## Annexe 2:

### ISBT 128 check character calculation

ISBT 128 donation numbers utilise check characters based on the ISO 7064 modulus 37,2 algorithm. This Annex shows how to calculate the check character for a given number. The calculation is based on the donation number string excluding the leading '=' symbol and the flag characters.

The steps in the process are as follows:

1. For each character in the string determine its check value as required by ISO 7064 (see Table A2.1).
2. For each character determine its weighted check value by multiplying the check value from (1) by the nth power of 2 where n is the position of the character from the right-hand end of the string.
3. Sum the weighted check values from (2).
4. Find the modulus 37 value of the sum from (3).
5. Subtract the value obtained in (4) from 38.
6. Find the modulus 37 value of the result of (5). This is the 37,2 checksum.

The calculated checksum is used to generate both the barcode check characters used in the flag positions of the ISBT 128 barcode and the eye-readable check character. The barcode check characters are determined by adding 60 to the checksum. The eye-readable check character is determined by cross-referencing the checksum to Table A2.1.

#### Table A2.1 Mapping from characters to ISO 7064 check values

<b>Char</b>	0	1	2	3	4	5	6	7	8	9	A	B	C	D
<b>Value</b>	0	1	2	3	4	5	6	7	8	9	10	11	12	13

<b>Char</b>	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
<b>Value</b>	14	15	16	17	18	19	20	21	22	23	24	25	26	27

<b>Char</b>	S	T	U	V	W	X	Y	Z	*
<b>Value</b>	28	29	30	31	32	33	34	35	36

**Table A2.2 Example of displayed numbers**

<b>Donation number</b>	G123 498 654 321
------------------------	------------------

<b>Character</b>	<b>ISO7064 value (step 1)</b>	<b>Position from right (n)</b>	<b>2<sup>n</sup></b>	<b>Weighted value (step 2)</b>
G	16	13	8192	131072
1	1	12	4096	4096
2	2	11	2048	4096
3	3	10	1024	3072
4	4	9	512	2048
9	9	8	256	2304
8	8	7	128	1024
6	6	6	64	384
5	5	5	32	160
4	4	4	16	64
3	3	3	8	24
2	2	2	4	8
1	1	1	2	2

<b>Sum of weighted values (step 3)</b>	148354
<b>Modulus 37 of sum of weighted values (step 4)</b>	21
<b>Subtract from 38 (step 5)</b>	17
<b>Modulus 37 of result (step 6)</b>	17

<b>ISO 37,2 checksum</b>	17
<b>ISBT128 barcode check character</b>	77
<b>ISBT128 eye-readable check</b>	H