



### 1) upward motion analysis

	Back	Mid	Front
Right	$-0.01 * \text{time}$	$-0.01 * \text{time}$	$-0.01 * \text{time}$
Left	$-0.01 * \text{time}$	$-0.01 * \text{time}$	$-0.01 * \text{time}$

### 2) downward motion analysis

	Back	Mid	Front
Right	$0.01 * \text{time}$	$0.01 * \text{time}$	$0.01 * \text{time}$
Left	$0.01 * \text{time}$	$0.01 * \text{time}$	$0.01 * \text{time}$

### 3) Cosine motion

	Back	Mid	Front
Right	$-50 * \cos(\text{time})$	$-50 * \cos(\text{time})$	$-50 * \cos(\text{time})$
Left	$-50 * \cos(\text{time})$	$-50 * \cos(\text{time})$	$-50 * \cos(\text{time})$

#### 4) Sine motion

	Back	Mid	Front
Right	$-50 * \sin(\text{time})$	$-50 * \sin(\text{time})$	$-50 * \sin(\text{time})$
Left	$-50 * \sin(\text{time})$	$-50 * \sin(\text{time})$	$-50 * \sin(\text{time})$

#### 5) Front motion analysis:

$L_{bR}$	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115$
$L_{bL}$	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115$
$L_{fR}$	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115$
$L_{fL}$	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115$
$L_{MidR}$	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115$
$L_{MidL}$	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115$

#### 5') Front motion analysis (color encoded):

	Back	Mid	Front
Right	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115$	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115$
Left	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115$	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115$

6) Sideways motion analysis:

1	B	M	F
R	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115$	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115$	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115$
L	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115$
2	B	M	F
R	$-\text{SQRT}(25899.98 + (-\text{time} - 53.286)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + (-\text{time} + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + (-\text{time} + 41.64319426)**2) + 152.596115$
L	$-\text{SQRT}(28604.1361 + (-\text{time} + 11.64)**2) + 152.596115$	$-\text{SQRT}(28604.1361 + (-\text{time} + 11.64)**2) + 152.596115$	$-\text{SQRT}(25899.98 + (-\text{time} - 53.286)**2) + 152.596115$
Superposition	B	M	F
R	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115 - \text{SQRT}(25899.98 + (-\text{time} - 53.286)**2) + 152.596115$	$-\text{SQRT}(28604.1361 + (\text{time} + 11.64)**2) + 152.596115 - \text{SQRT}(27005.28342 + (-\text{time} + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115 - \text{SQRT}(27005.28342 + (-\text{time} + 41.64319426)**2) + 152.596115$
L	$-\text{SQRT}(25899.98 + (\text{time} - 53.286)**2) + 152.596115 - \text{SQRT}(28604.1361 + (-\text{time} + 11.64)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115 - \text{SQRT}(28604.1361 + (-\text{time} + 11.64)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + (\text{time} + 41.64319426)**2) + 152.596115 - \text{SQRT}(25899.98 + (-\text{time} - 53.286)**2) + 152.596115$

# 7) circular motion analysis

Straight Cos Motion	Back	Mid	Front
Right	$-\text{SQRT}(27005.28342 + (50 \cdot \cos(\text{time}) + 41.64319426)^2) + 152.596115$	$-\text{SQRT}(25899.98 + (50 \cdot \cos(\text{time}) - 53.286)^2) + 152.596115$	$-\text{SQRT}(28604.1361 + (50 \cdot \cos(\text{time}) + 11.64)^2) + 152.596115$
Left	$-\text{SQRT}(27005.28342 + (50 \cdot \cos(\text{time}) + 41.64319426)^2) + 152.596115$	$-\text{SQRT}(25899.98 + (50 \cdot \cos(\text{time}) - 53.286)^2) + 152.596115$	$-\text{SQRT}(28604.1361 + (50 \cdot \cos(\text{time}) + 11.64)^2) + 152.596115$
Sideways SIN wave Motion	B	M	F
R	$-\text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115 - \text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115$	$-\text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115 - \text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115$	$-\text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115 - \text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115$
L	$-\text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115 - \text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115$	$-\text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115 - \text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115$	$-\text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115 - \text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115$
Superposition Circular Motion	B	M	F
R	$-\text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115 - \text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115 - \text{SQRT}(27005.28342 + (50 \cdot \cos(\text{time}) + 41.64319426)^2) + 152.596115$	$-\text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115 - \text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115 - \text{SQRT}(25899.98 + (50 \cdot \cos(\text{time}) - 53.286)^2) + 152.596115$	$-\text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115 - \text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115 - \text{SQRT}(28604.1361 + (50 \cdot \cos(\text{time}) + 11.64)^2) + 152.596115$
L	$-\text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115 - \text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115 - \text{SQRT}(27005.28342 + (50 \cdot \cos(\text{time}) + 41.64319426)^2) + 152.596115$	$-\text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115 - \text{SQRT}(28604.1361 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 11.64)^2) + 152.596115 - \text{SQRT}(25899.98 + (50 \cdot \cos(\text{time}) - 53.286)^2) + 152.596115$	$-\text{SQRT}(27005.28342 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) + 41.64319426)^2) + 152.596115 - \text{SQRT}(25899.98 + ((0.5773502692 \cdot 50 \cdot \sin(\text{time})) - 53.286)^2) + 152.596115 - \text{SQRT}(28604.1361 + (50 \cdot \cos(\text{time}) + 11.64)^2) + 152.596115$

## 8) Helical motion analysis

Superposition Circular Motion	B	M	F
R	- 5 *time	- 5 *time	- 5 *time
L	- 5 *time	- 5 *time	- 5 *time
Superposition Circular Motion	B	M	F
R	$-\text{SQRT}(28604.1361 + ((0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(25899.98 + ((-0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(27005.28342 + (50 * \cos(\text{time})) + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(28604.1361 + ((0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(27005.28342 + (-0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(25899.98 + (50 * \cos(\text{time})) - 53.286)**2) + 152.596115$	$-\text{SQRT}(25899.98 + ((0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(27005.28342 + (-0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(28604.1361 + (50 * \cos(\text{time})) + 11.64)**2) + 152.596115$
L	$-\text{SQRT}(25899.98 + ((0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(28604.1361 + (-0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(27005.28342 + (50 * \cos(\text{time})) + 41.64319426)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + ((0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(28604.1361 + (-0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(25899.98 + (50 * \cos(\text{time})) - 53.286)**2) + 152.596115$	$-\text{SQRT}(27005.28342 + ((0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(25899.98 + (-0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(28604.1361 + (50 * \cos(\text{time})) + 11.64)**2) + 152.596115$
Superposition Helical Motion	B	M	F
R	$-\text{SQRT}(28604.1361 + ((0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(25899.98 + ((-0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(27005.28342 + (50 * \cos(\text{time})) + 41.64319426)**2) + 152.596115 - 5 * \text{time}$	$-\text{SQRT}(28604.1361 + ((0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(27005.28342 + (-0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(25899.98 + (50 * \cos(\text{time})) - 53.286)**2) + 152.596115 - 5 * \text{time}$	$-\text{SQRT}(25899.98 + ((0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(27005.28342 + (-0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(28604.1361 + (50 * \cos(\text{time})) + 11.64)**2) + 152.596115 - 5 * \text{time}$
L	$-\text{SQRT}(25899.98 + ((0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(28604.1361 + (-0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(27005.28342 + (50 * \cos(\text{time})) + 41.64319426)**2) + 152.596115 - 5 * \text{time}$	$-\text{SQRT}(27005.28342 + ((0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(28604.1361 + (-0.5773502692 * 50 * \sin(\text{time})) + 11.64)**2) + 152.596115 - \text{SQRT}(25899.98 + (50 * \cos(\text{time})) - 53.286)**2) + 152.596115 - 5 * \text{time}$	$-\text{SQRT}(27005.28342 + ((0.5773502692 * 50 * \sin(\text{time})) + 41.64319426)**2) + 152.596115 - \text{SQRT}(25899.98 + (-0.5773502692 * 50 * \sin(\text{time})) - 53.286)**2) + 152.596115 - \text{SQRT}(28604.1361 + (50 * \cos(\text{time})) + 11.64)**2) + 152.596115 - 5 * \text{time}$