Using Manipulators:

**Sample File**

drive MANIPULATOR\_DRIVE

name "CustomManip"

parameters 32900(-20000|0), 0(0|180), 0(0|0), 90(0|0): 5000(0|0), 0(0|0), 0(0|0), 90(0|0): 10000(0|0), 0(0|0), 0(0|0), 0(0|0)

gripper

**Building a Manipulator**

parameters determine the DH parameters. Each limb is determined by a set of DH parameters. Each set consists of:

d, theta, r, alpha

In the example: the first limb is:

32900(-20000|0), 0(0|180), 0(0|0), 90(0|0)

I.e.

d: 32900 units long by default, range is between 12900 and 32900

theta: angle of 0°, range is between 0 and 180

r: 0 units long, no motion on this parameter

alpha: angle of 90°, no motion on this parameter

Whitespace does not matter for parameters.

**Setting Limbs**

To use SERVOSet on a limb:

Each limb has 4 parameters. Examples:

To set ‘d’ of the first limb, its ID would be 1.

To set ‘theta’ of the third limb, its ID would be 10.

To set the gripper of a 3-limbed manipulator, its ID would be 3\*4 + 1 = 13.

All parameters can be set between 1 and 255, these scale between the range set upon creation.

E.g. SERVOSet(1, 255) will extend ‘d’ of the first limb to it’s maximum length (32900 in the example).

E.g. SERVOSet(13, 1) will open the gripper, assuming it’s a 3-limbed robot.

**Mounting Arms onto Vehicles**

Mounting is done in the sim file:

1. LabBot 1194 780 89 circles.x
2. Manipulator LittleArm.robi 0 0 0 -45 0 0 mount 1 theta\_set.x

First, the vehicle is created in line 1). The Manipulator is added. It refers to a .robi file to create it.

The next 6 parameters determine the relative position and angle (x, y, z, alpha, beta, gamma) on the mounted vehicle. The ‘mount 1’ tells it which robot it is mounting to i.e. mount the first robot listed in the sim.