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| Tips & Tricks |
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for Assembling the "Rug Warrior" Mobile Robot
from Univ. Stuttgart, IPVR

(1) Best order for mounting the motors: start with soldering th
e motor
cables, then fix the motors to the chassis, then add encoders a
nd wheels.

(2) the chassis plate is symmetrical except for the hole for th
e caster wheel.
Be sure to find out where the top side is before fixing parts o
n the board.
The three holes in the chassis plate for the plastic skirt have
 to match
the holes in the skirt.

(3) the shaft encoder patterns do not glue nicely to the wheel.
 We used
some plastic disks instead, which sit on the same axes (sold in
 German hobby
shops as "teddy bear joints").

(4) we found it useful to add a handle bar on top of each robot
. That way
one has a safe point to lift it and it is also easier to grasp
while running.

(5) the micro switches used as bumpers do not switch very smoot
hly.
We replaced them with almost identical micro switches that have
 tiny
free-revolving wheels at the tip.

(6) software: depending on resistopr tolerance, the calculation
 of the bumper
states may be sometimes incorrect. In that case, there are two
remedies:
either adjust the value ranges in the software library, or alte
rnatively
use higher precision resistors.

(7) check the board before starting with the assembly.
Jumper J2 is used for testing the board by the manufacturer and
 should
not be changed.

(8) when using batteries, the RAM is always battery backed, whi
ch leads
to empty batteries within about a week. If you do not want to k

eep the
RAM contents, unplug the battery connector from the board (next to the
switch).

(9) when using rechargable batteries, we found it useful to integrate
another switch with three states: (1) disconnect all rech. bat. (for loading
or just to conserve energy), (2) connect one battery to the board and the
other one to the motors, and (3) reverse both rech. battery packs (e.g. if
one has been used intensively, while the other one is still almost full)

(10) using shrink tubes around the cables prevents them from getting cut
at pointy metal edges

(11) the "-" pin of the infrared diodes is on their flat side. This pin
has be to be connected to the outside sockets.

(12) Frequent Causes of RS-232 Problems (download):
- empty batteries (6V)
- connecting only one battery pack instead of BOTH
- defective RS-232 cable (pins 2,3,7)
- wrong configuration of serial PC interface: MODE COM1: 9600, N, 8, 1
- defective PC interface

ATTENTION: We heard there may be faulty RS-232 cables with some newer kits.
            Plese make sure the RS-232 cable complies with the cable
            definition of the documentation !