

Re: One Small Step

Source: <http://sci.tech--archive.net/Archive/sci.space.policy/2006-01/msg00358.html>

- *From:* raphfrk@xxxxxxxxxxxxx
 - *Date:* 13 Jan 2006 04:22:11 -0800
-

ianparker2@xxxxxxxxxx wrote:

- > The first requirement is for a robot which can do autonomous
- > manipulation. In short something which can take a CAD drawing and
- > produce the article, whether it is an elotrolytic cell or something
- > else.

Something like this is a clanking replicator (maybe not totally universal though).

It would probably be best to break the problem up into blocks/parts. The idea is that all the parts working together can make any of the individual parts. Ideally, it should be able to work anywhere, however as a first attempt, something which only works in a certain enviroment would be good. I think somewhere that has sand and water would be the easiest.

The problems are:

resource collection: This should be reasonably easy if the enviroment is consistant. An empty desert like region with a water supply would be easy as a start. Also, loose soil or sand would be easiest to collect. Obviously, soil of a consistant nature would be a big help.

Refining raw materials. This should take raw materials and convert them into a form usable by the manufacturing stage

Manufacturing: The should convert refined materials from the refinery stage into parts usable by the assembly stage. I think something like "lego" would be a good target here. In any case, it should be easy to assemble and many different devices should be makable from a small set of blocks.

Assembly: This puts parts together to make all the other devices.

Transport: This moves components from the different stages

Power: Some form of power is needed. Solar would probably be easiest, but is pretty low power density.

Re: One Small Step

The trick is to come up with a minimal number of types of things that each stage must be able to handle. For example, the refinery stage might just be required to produce a molten metal of any alloy rather than being required to produce a high quality ore. It would also probably be required to make a heat resistant, probably silicate material.

The system must also be capable of handling some basic computation. I remember reading something suggesting using fluidic logic for this purpose. This has the advantage that it is a lot less material dependant than electronics.

One thing that electricity would probably be useful for is electrolysis. This cannot really be handled with air pressure. I wonder if using hydrogen (from water) to reduce rock and then melting any metal produced would give you a reasonable amount of metal no matter what the soil type. Also, presumably that alloy would conduct electricity reasonably well.

Also, you could probably build a solar power system that is based on air pressure rather than electronic energy collection.

One other thing, even if different types of design are required for handling different environments, as long as you can build a reasonable system that can handle any environment, it can be used to build the modified designs to handle the new environment. If the design is separating out from a start point, then the modified designs can be constructed in the old environment.

It seems to me that the hard part is the refinery step, the rest is pretty much applying current knowledge. However, that is probably because I am not a chemist :).

- *Follow-Ups:*

- ◆ **Re: One Small Step**
◇ *From: ianparker2*

- *References:*

- ◆ **One Small Step**
◇ *From: skearney*
- ◆ **Re: One Small Step**
◇ *From: ianparker2*
- ◆ **Re: One Small Step**
◇ *From: skearney*
- ◆ **Re: One Small Step**
◇ *From: ianparker2*

Re: One Small Step

- Prev by Date: *Re: One Small Step*
- Next by Date: *Re: Not valid outside American's border*
- Previous by thread: *Re: One Small Step*
- Next by thread: *Re: One Small Step*
- Index(es):
 - ◆ *Date*
 - ◆ *Thread*