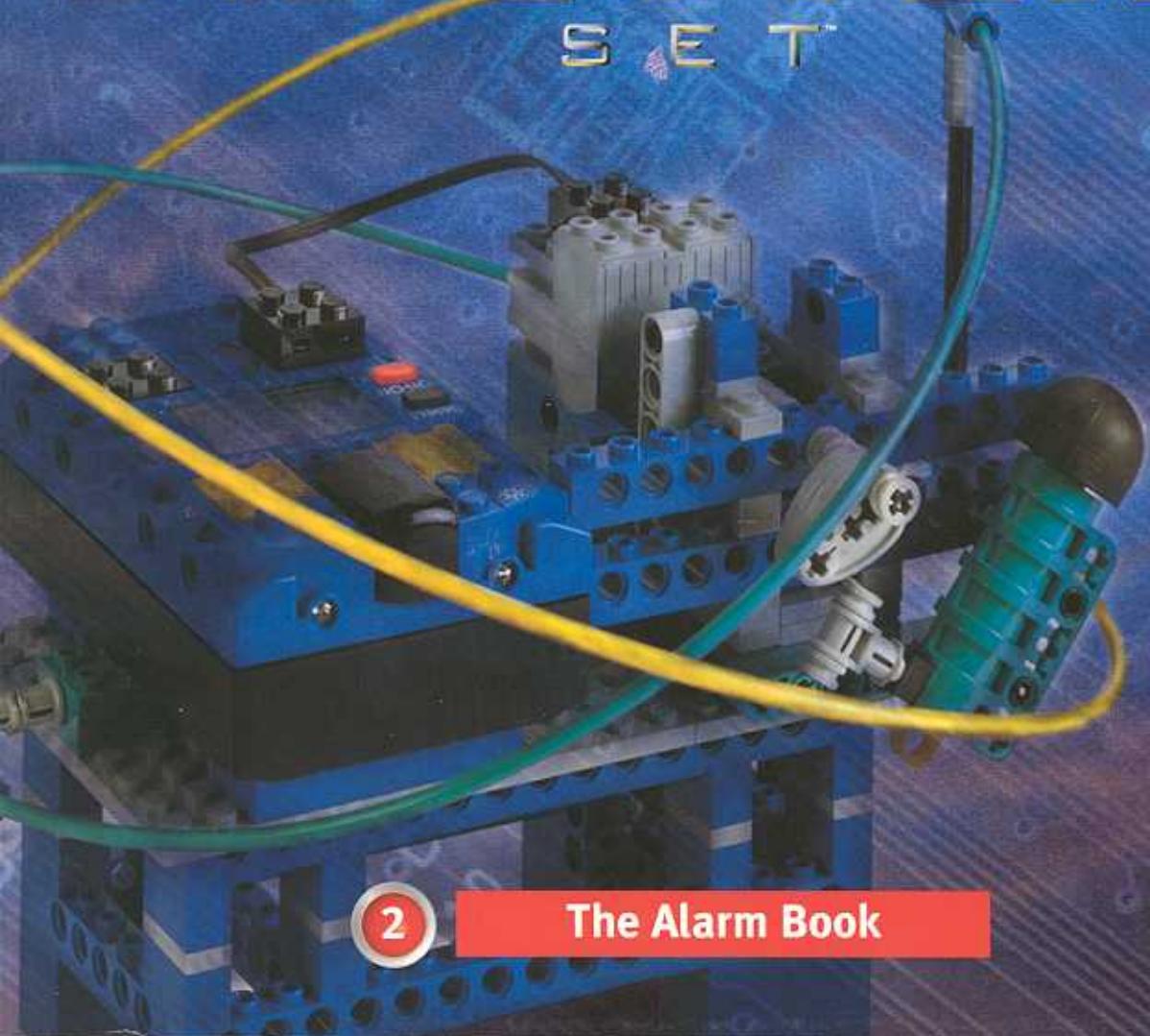




MINDSTORMS™

ROBOTICS DISCOVERY SET



A
D
E
I
O
P
O
T
U
R
T
S
Z
O
U



The Bug: Book 1

A robotic insect that can explore your house.

The Hoop-o-bot: Book 3

A robotic basketball hoop that can challenge you to a game.

The Intruder Alarm: Book 2

A light-triggered alarm to keep people out of your room.

...and other things found only in the depths of your imagination.

CONTENTS

Introduction

page 2

Getting Started

Connecting Motors, Using WaitFor Light, Using Alarm FX

page 4

Building Instructions

page 7

Explorations

page 25

Part 1 – Setting the Trap

page 26

Part 2 – Sounding the Alarm

page 27

Challenges

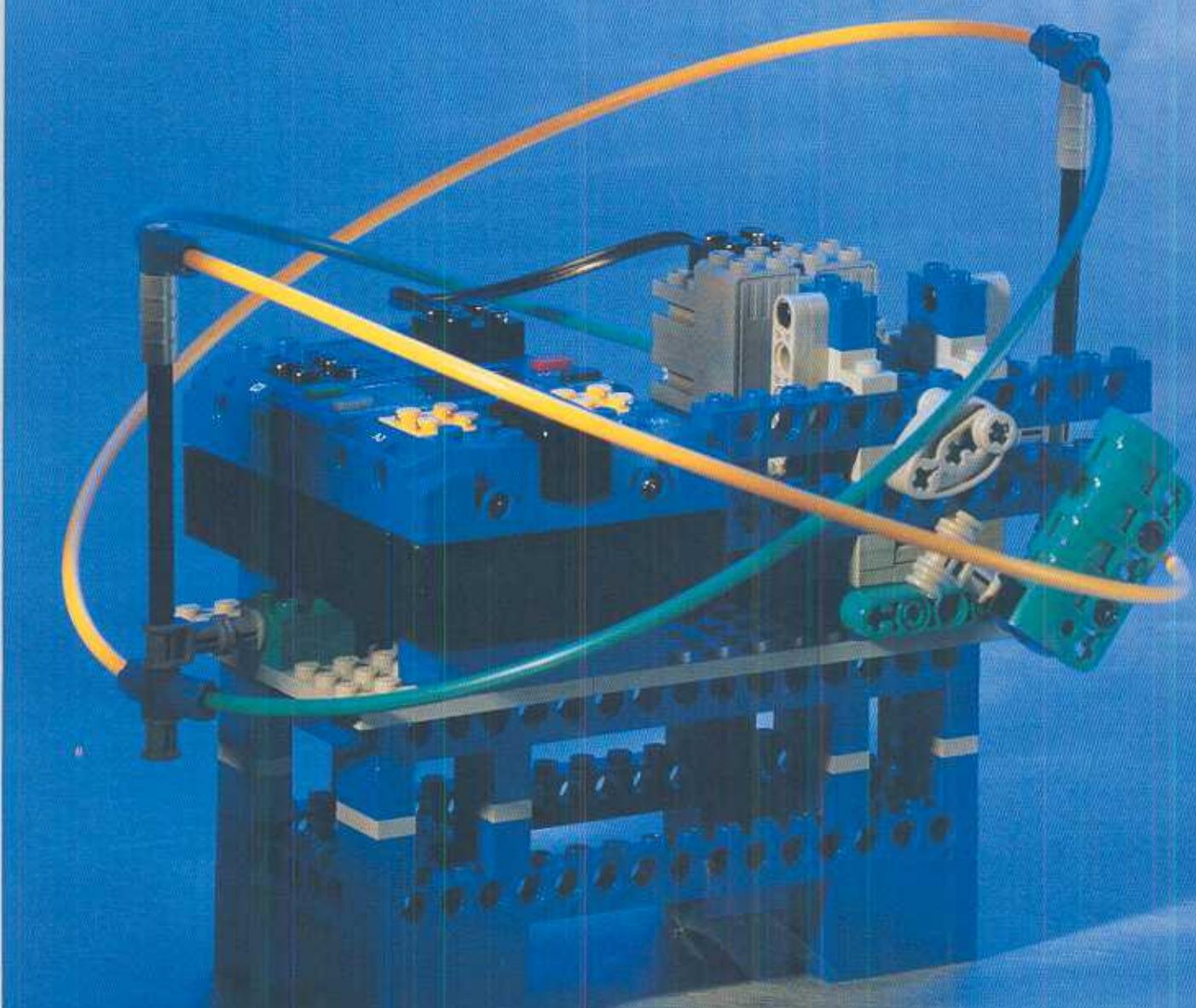
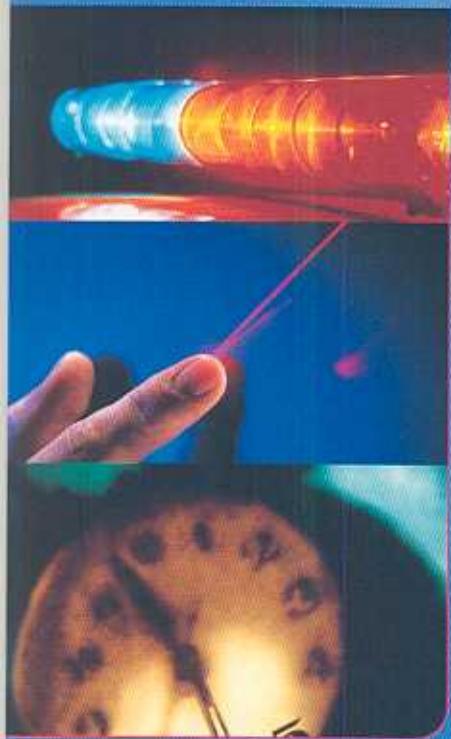
page 29

Special Features

page 34

Tips & Tricks

page 35





The Intruder Alarm

Alarms are used for many different things.

They can:

- Wake you up.
- Protect your stuff.
- Scare off intruders or unwanted guests.

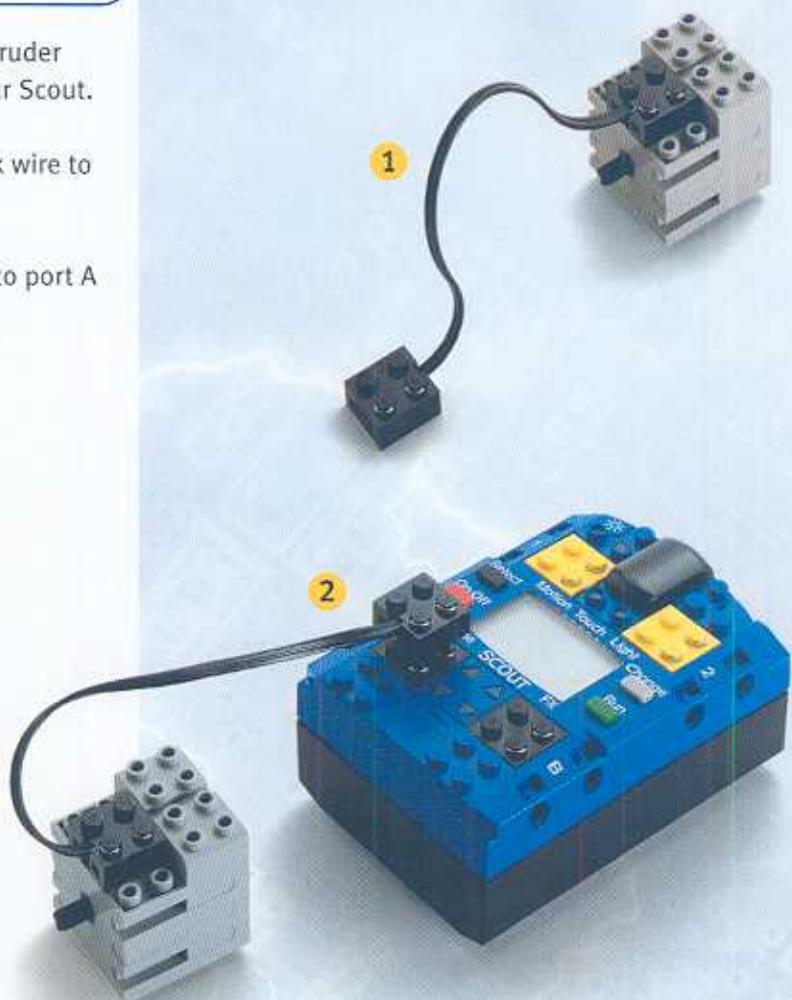
This book will show you how to build an Intruder Alarm with the Scout.

- The Intruder Alarm sounds an alarm when something crosses in front of the Scout's light sensor.
- It also launches a dart into the air when the alarm is set off.

CONNECTING MOTORS

To try out the commands for the Intruder Alarm, first attach one motor to your Scout.

1. Attach one end of the short black wire to a motor.
2. Attach the other end of the wire to port A on the Scout.



For the Intruder Alarm model, make sure you connect the motor like this:



USING WAITFOR LIGHT

The WaitFor command is great for making alarms. It tells the motors to stay off until something happens (like a change in light).

To use WaitFor:

1. Make sure the Scout is turned on.
2. Set the Scout's Motion to Forward.
3. Use the Select and Change Buttons to set Light to WaitFor.

*The display should match the picture shown here.
(Check out Getting Started in The Bug Book if you need help using the buttons.)*

4. Aim the Scout's light sensor at a bright light, like a lamp or a sunny window.

5. Press Run.

Nothing happens, right? Wrong! The Scout has secretly measured how bright the light is. Now the Scout is "waiting for" the light to change.

6. Cover the light sensor with your hand.

The Scout should see the change in light and start spinning the motor.

7. Press Run to stop.

You can also stop the motor by waving your hand in front of the light sensor.



Stuff You Don't Need to Know:

The Scout always resets the light sensor when you hit Run (as well as On-Off). The light sensor then looks for the light to get brighter or darker.

(To be really technical, it looks for a change of 15%.)

If the light gets darker, the Scout will make a low sound (bup, bup).

If the light gets brighter, the Scout will make a high sound (beep, beep). Check it out!

USING ALARM FX

The  Alarm FX command lets you add special sounds that play as the motors move. The Scout plays eight different alarm sounds, one for each set of motor directions.

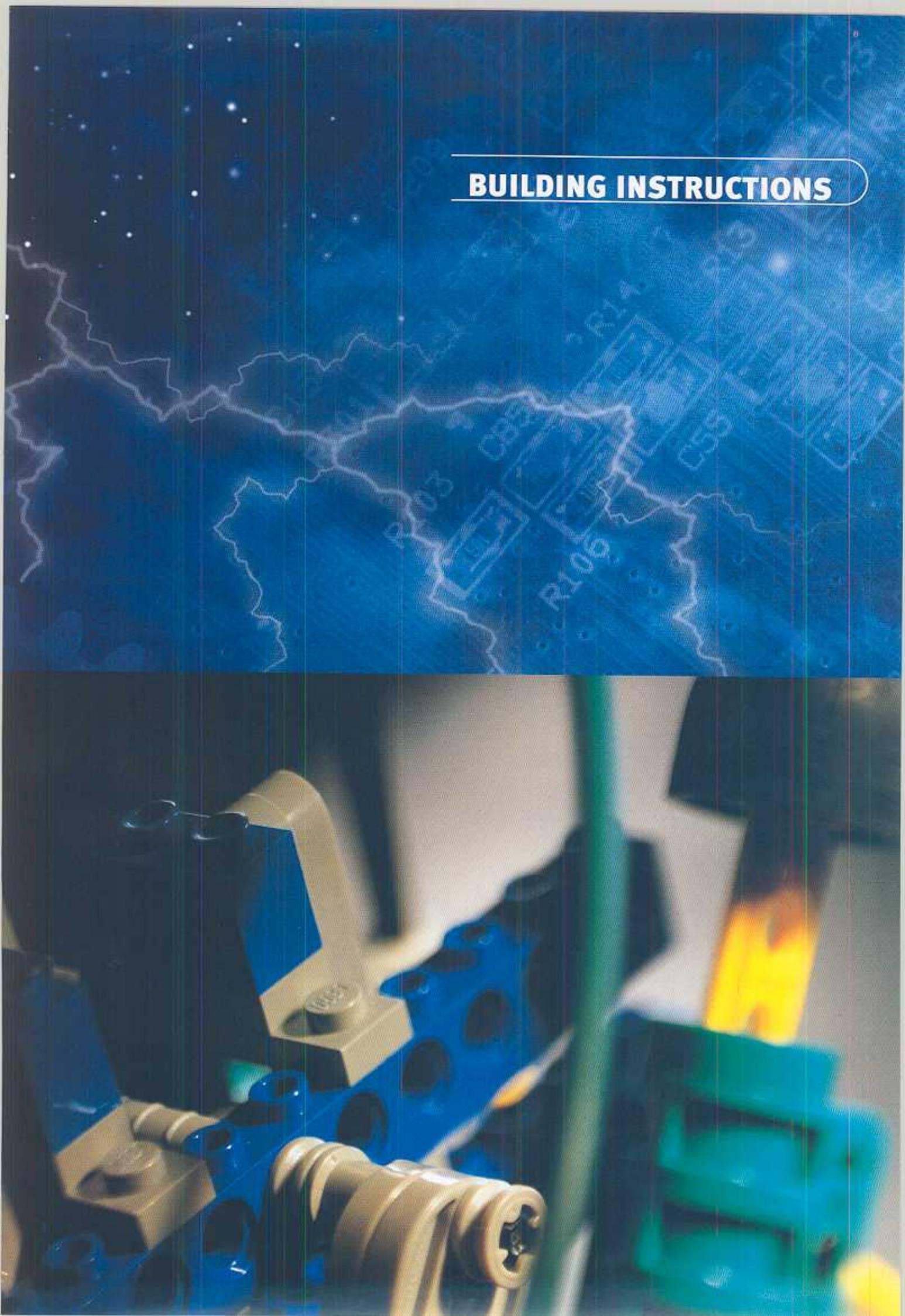
To use the  command:

1. Make sure the Scout is turned on.
2. Set the Scout's Motion to Forward.
3. Set the FX command to .
4. Press Run.
Do you hear the alarm sound? If not, make sure your display matches the figure shown.
5. Press Run to Stop.

Try other Motion commands to hear different alarm sounds.



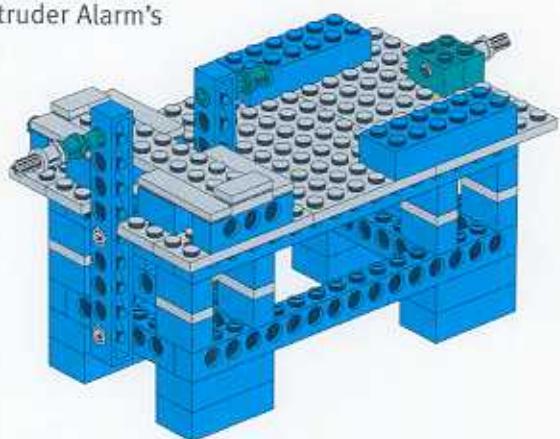
BUILDING INSTRUCTIONS



The Intruder Alarm

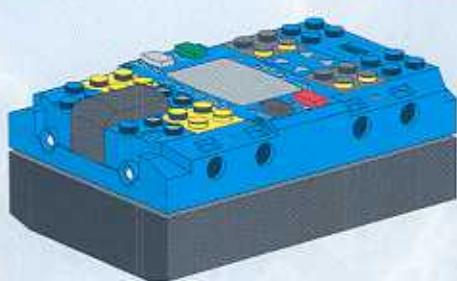
Module 1

The Intruder Alarm's base.



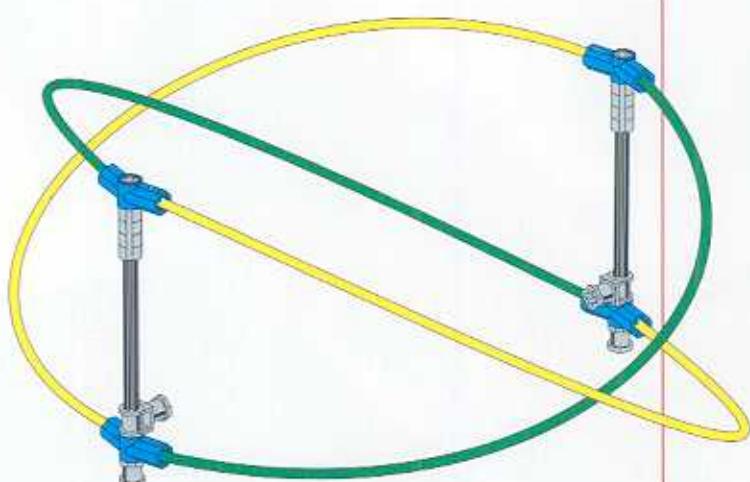
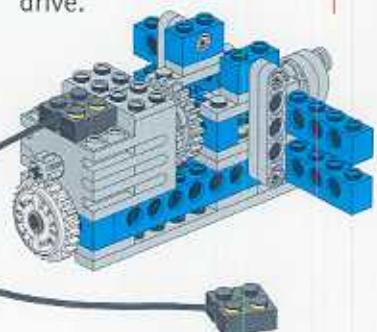
Module 3

The Intruder Alarm's launcher.



Module 2

The Intruder Alarm's drive.



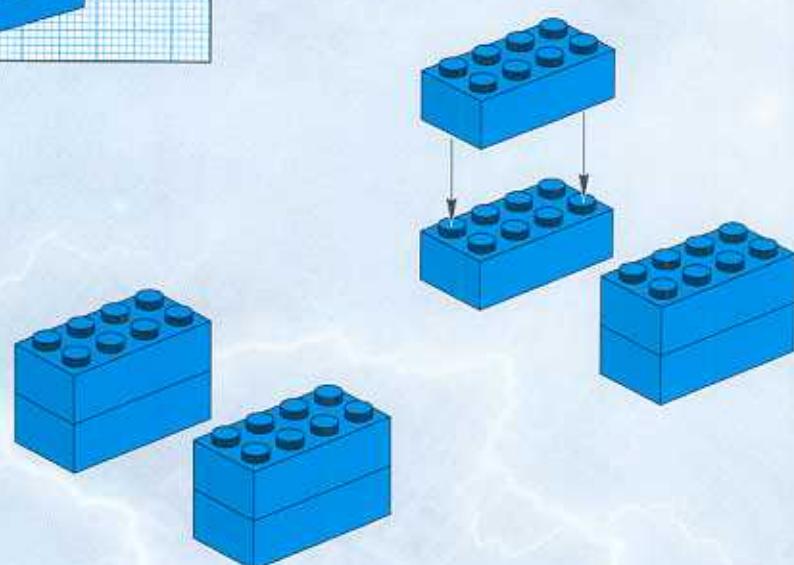
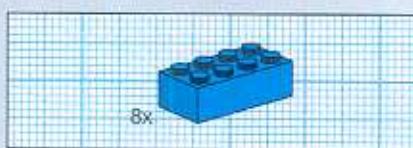
Module 4

The Intruder Alarm's rings (for decoration).

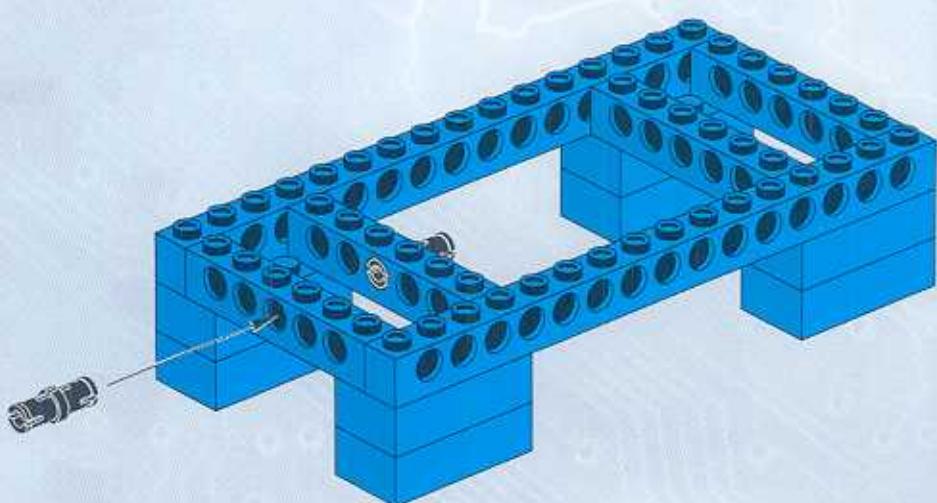
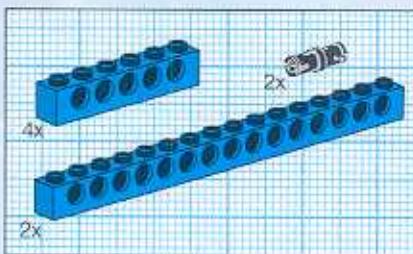


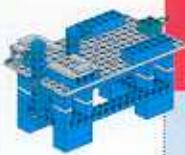
Module 1

1

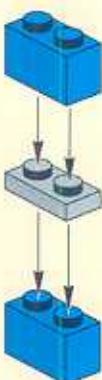
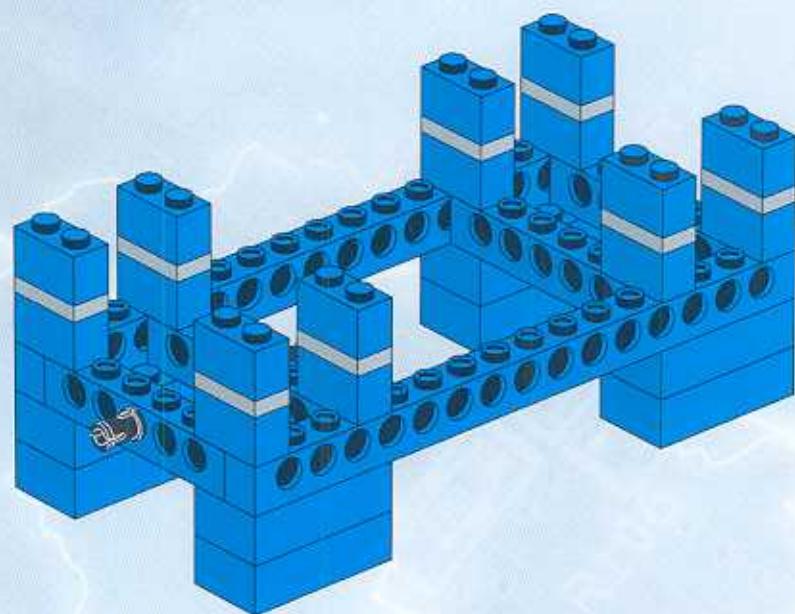
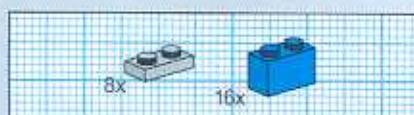


2



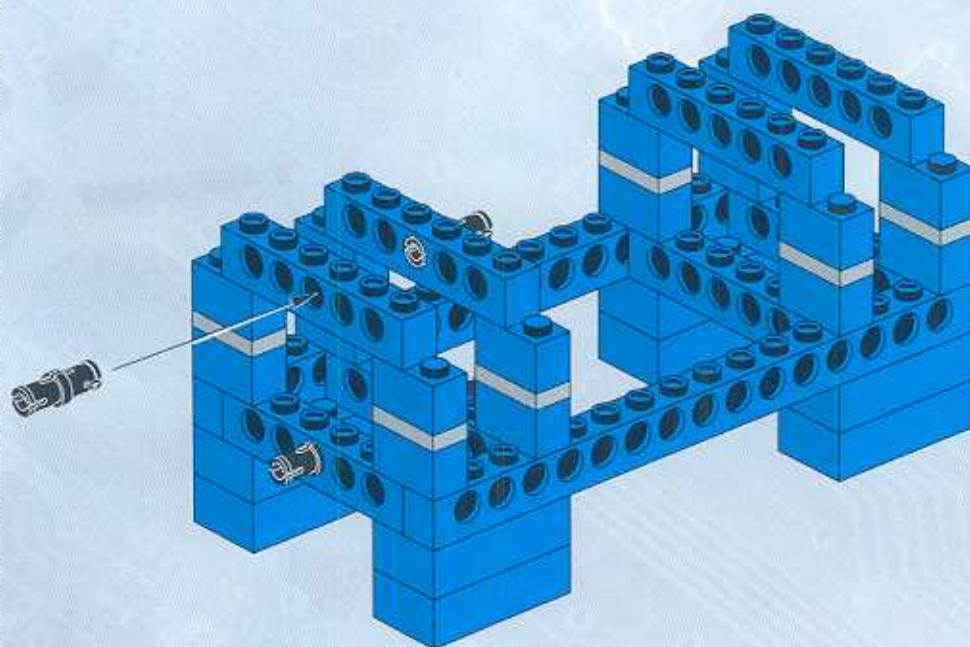
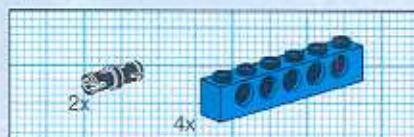


3

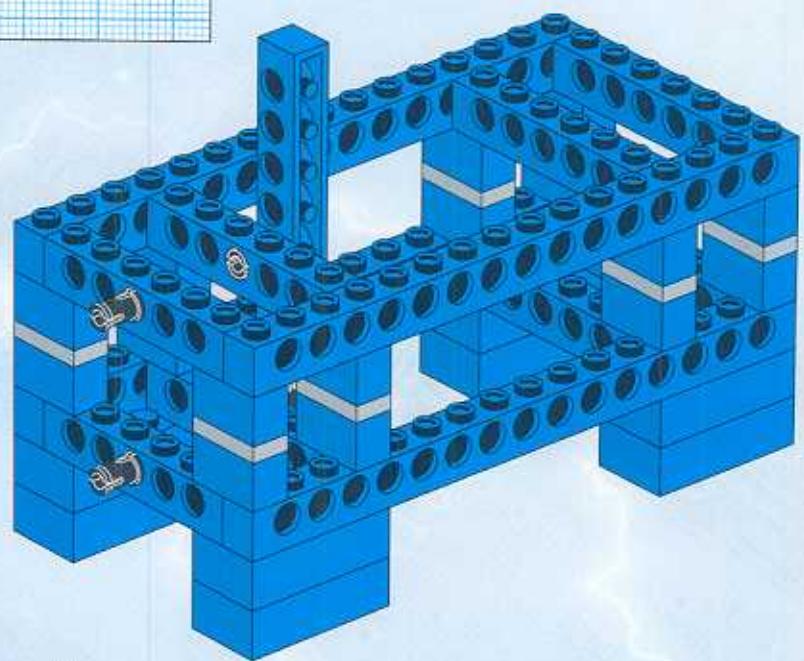
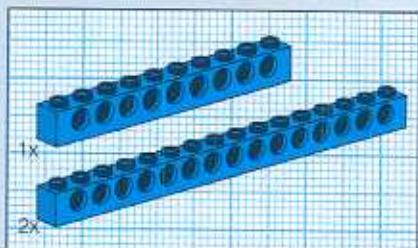


8x

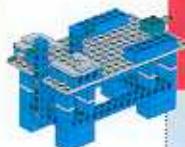
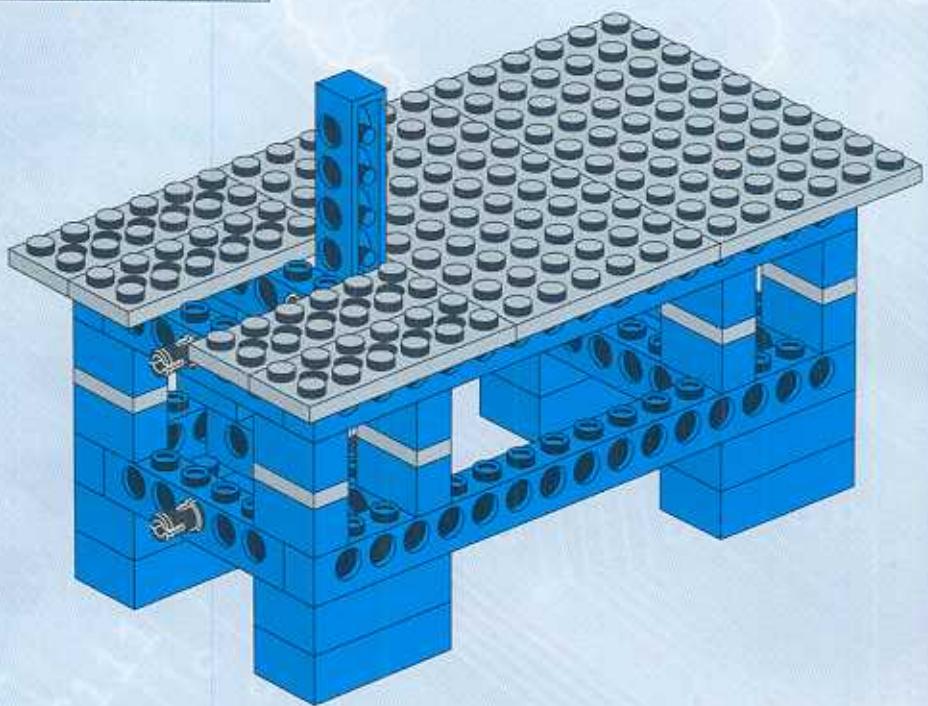
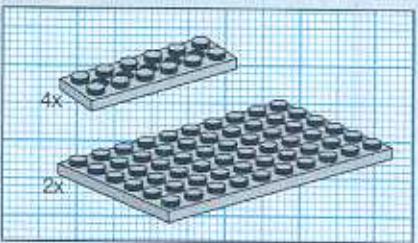
4

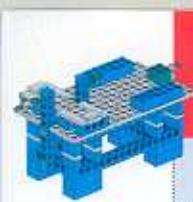


5

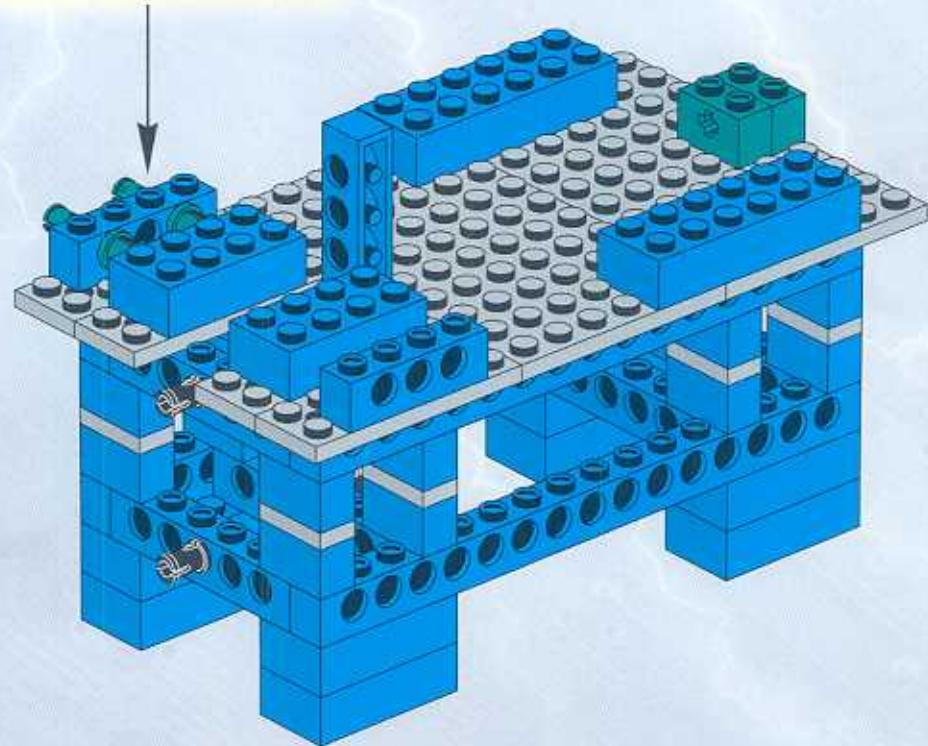
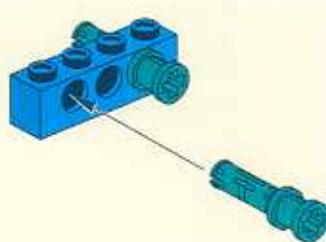
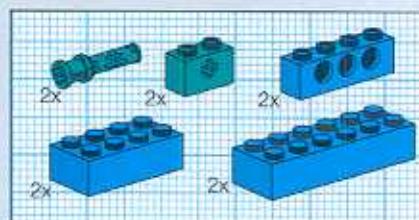


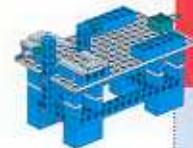
6



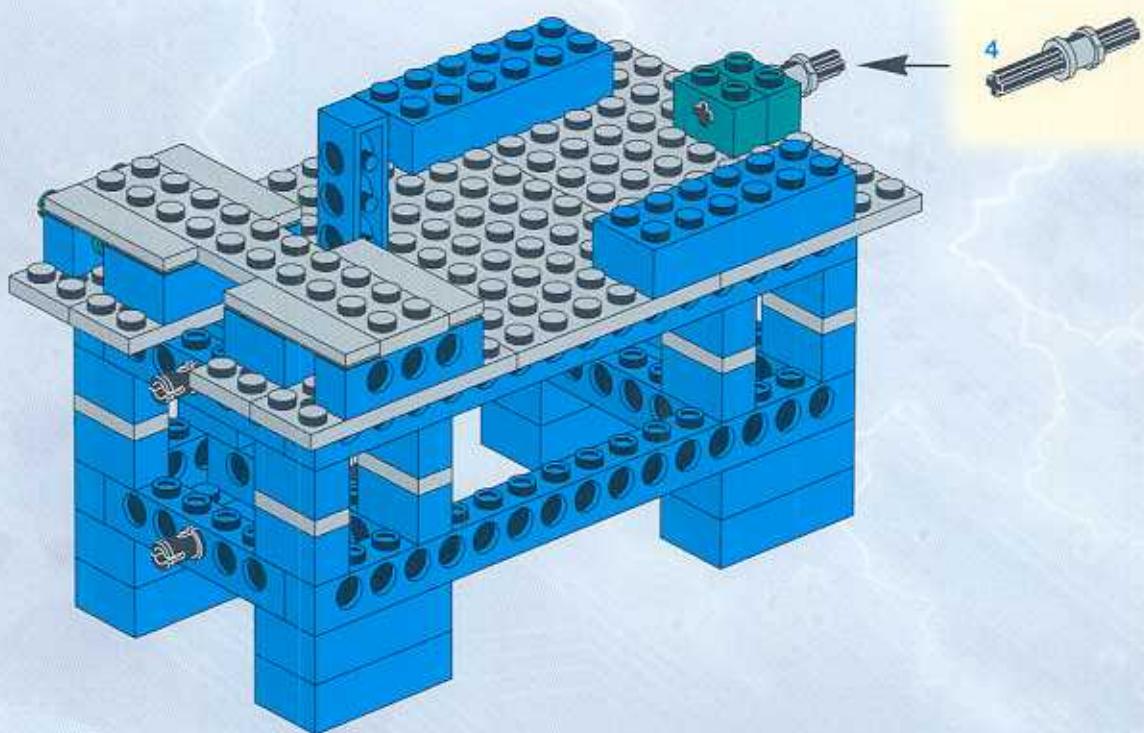
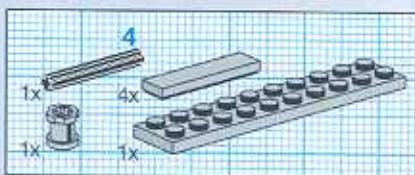


7

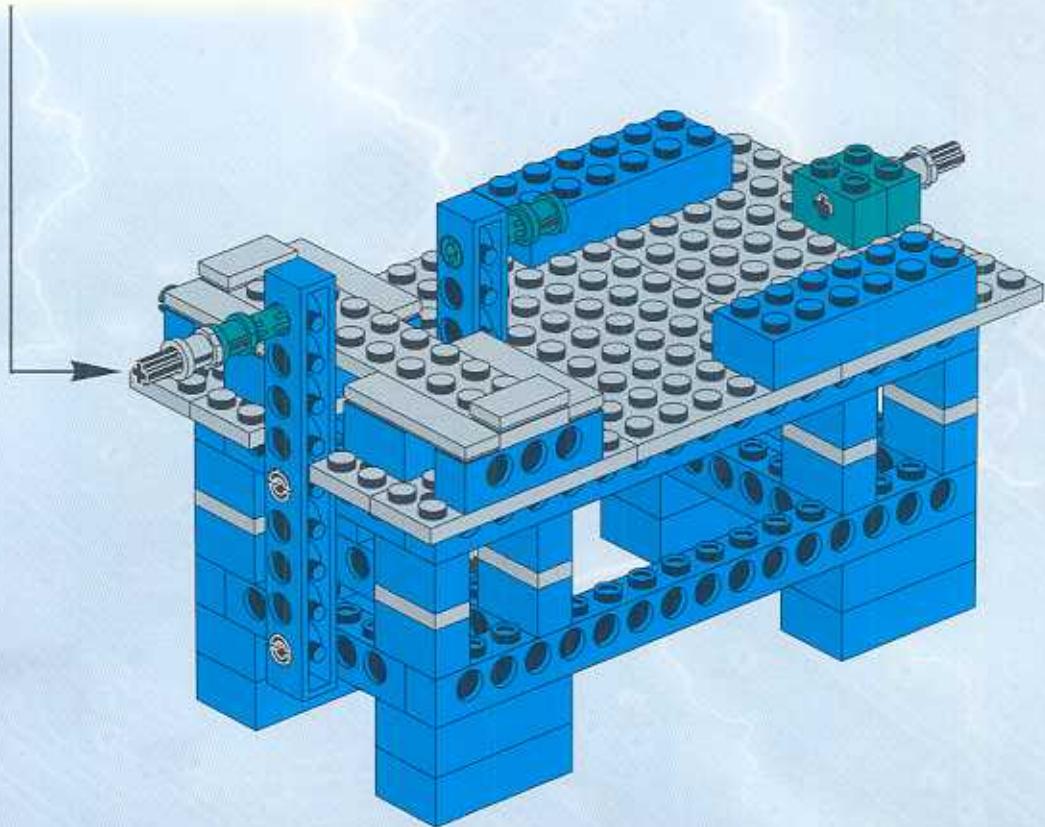
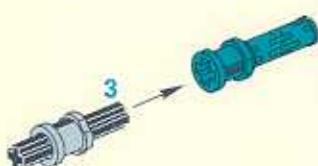
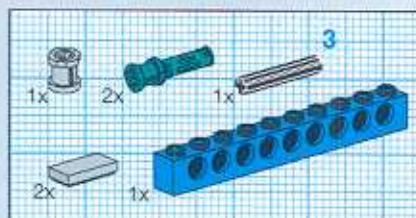




8



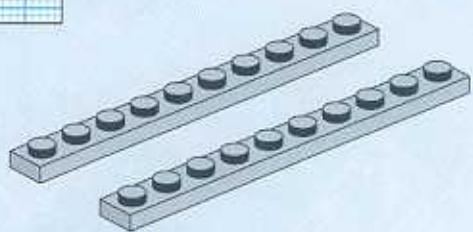
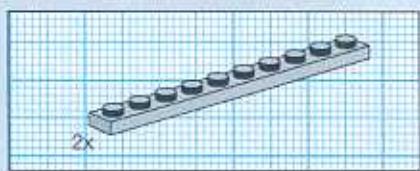
9



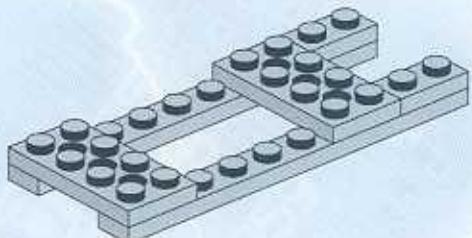
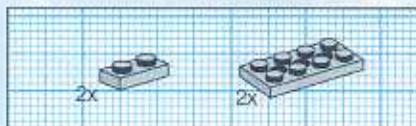


Module 2

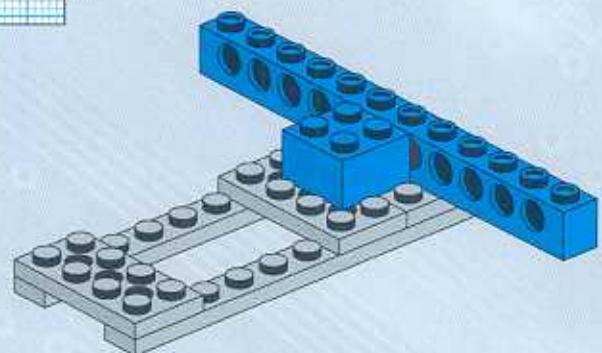
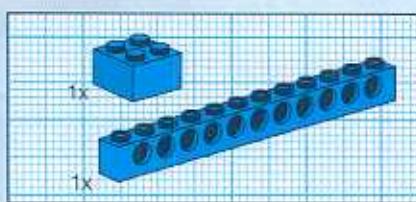
10



11

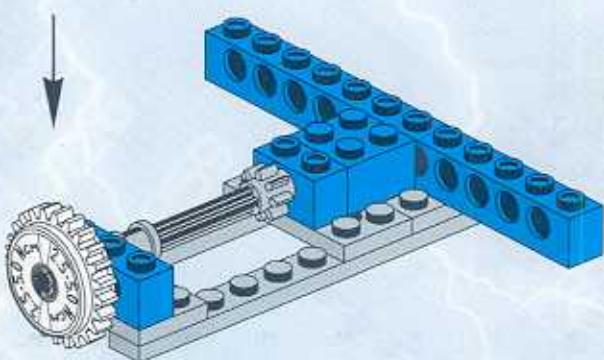
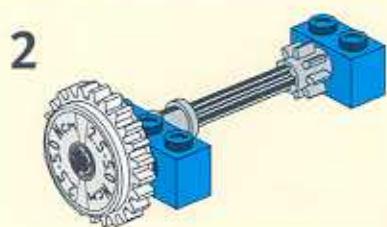
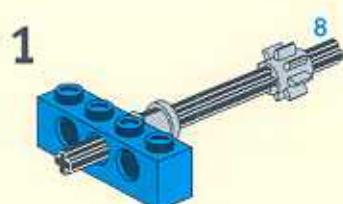
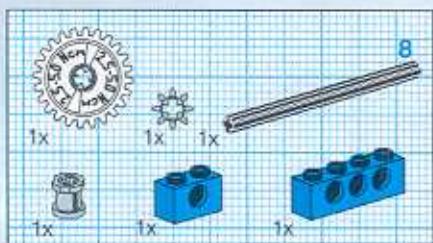


12

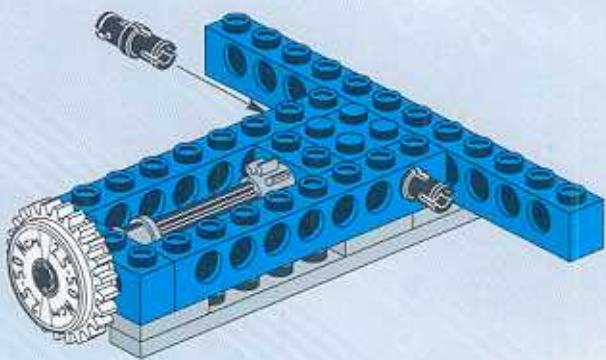
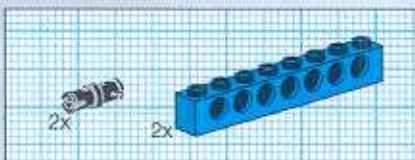




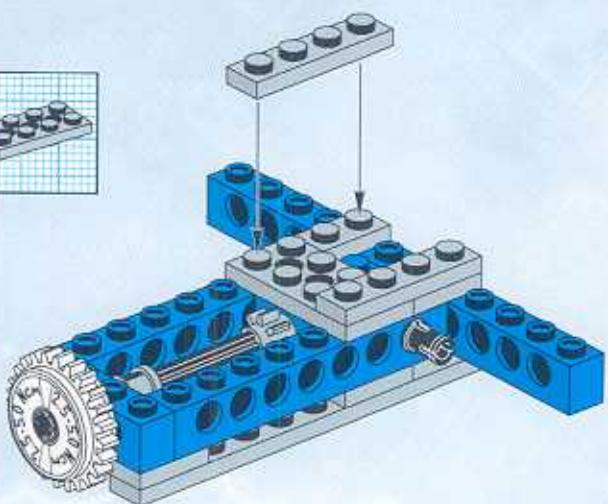
13



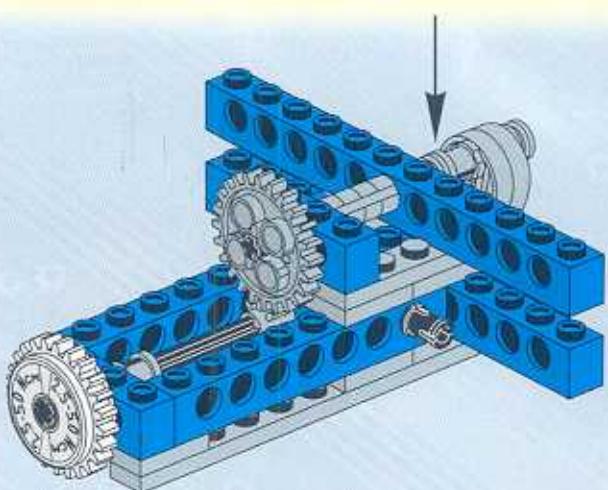
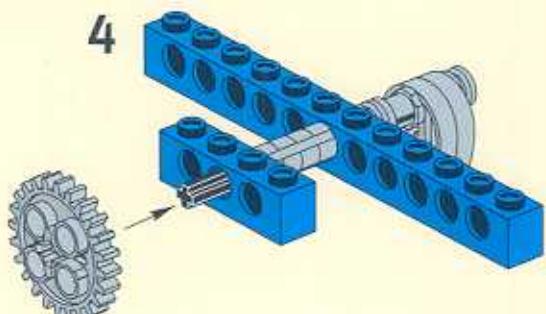
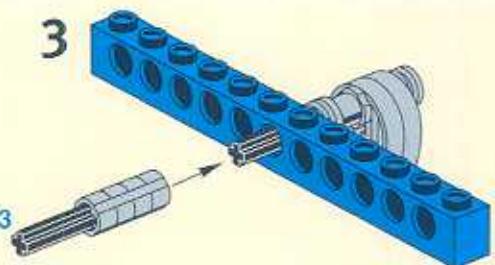
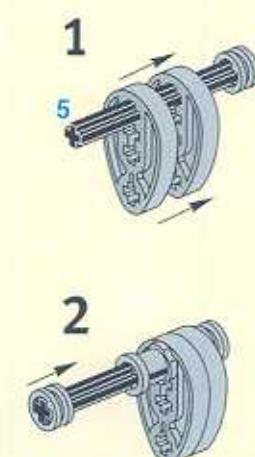
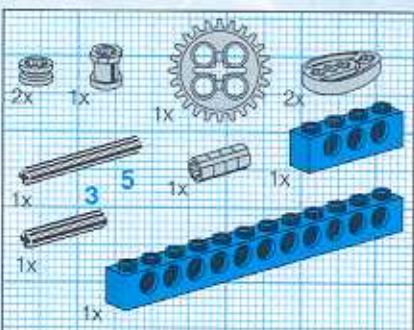
14



15

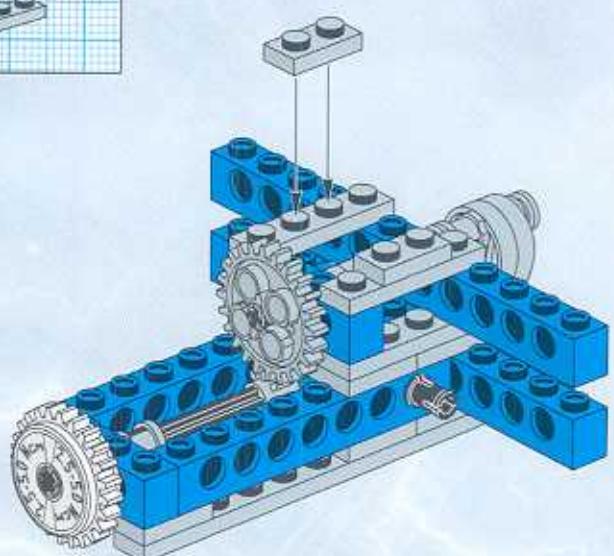
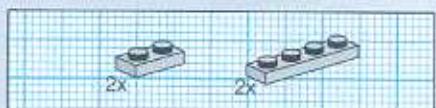


16

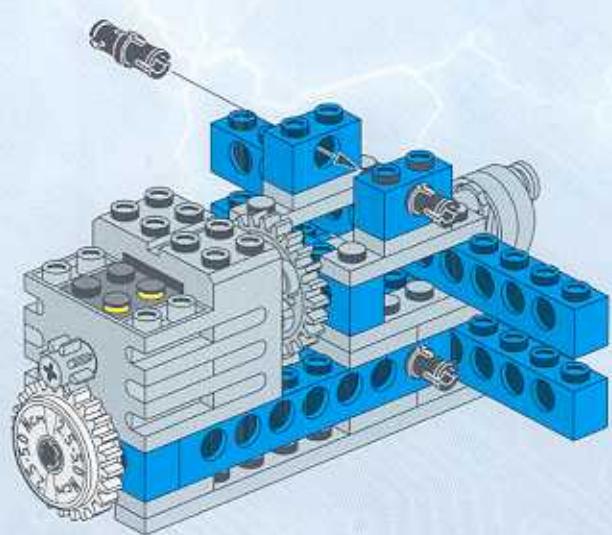
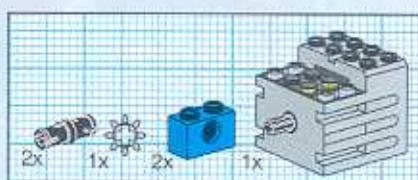


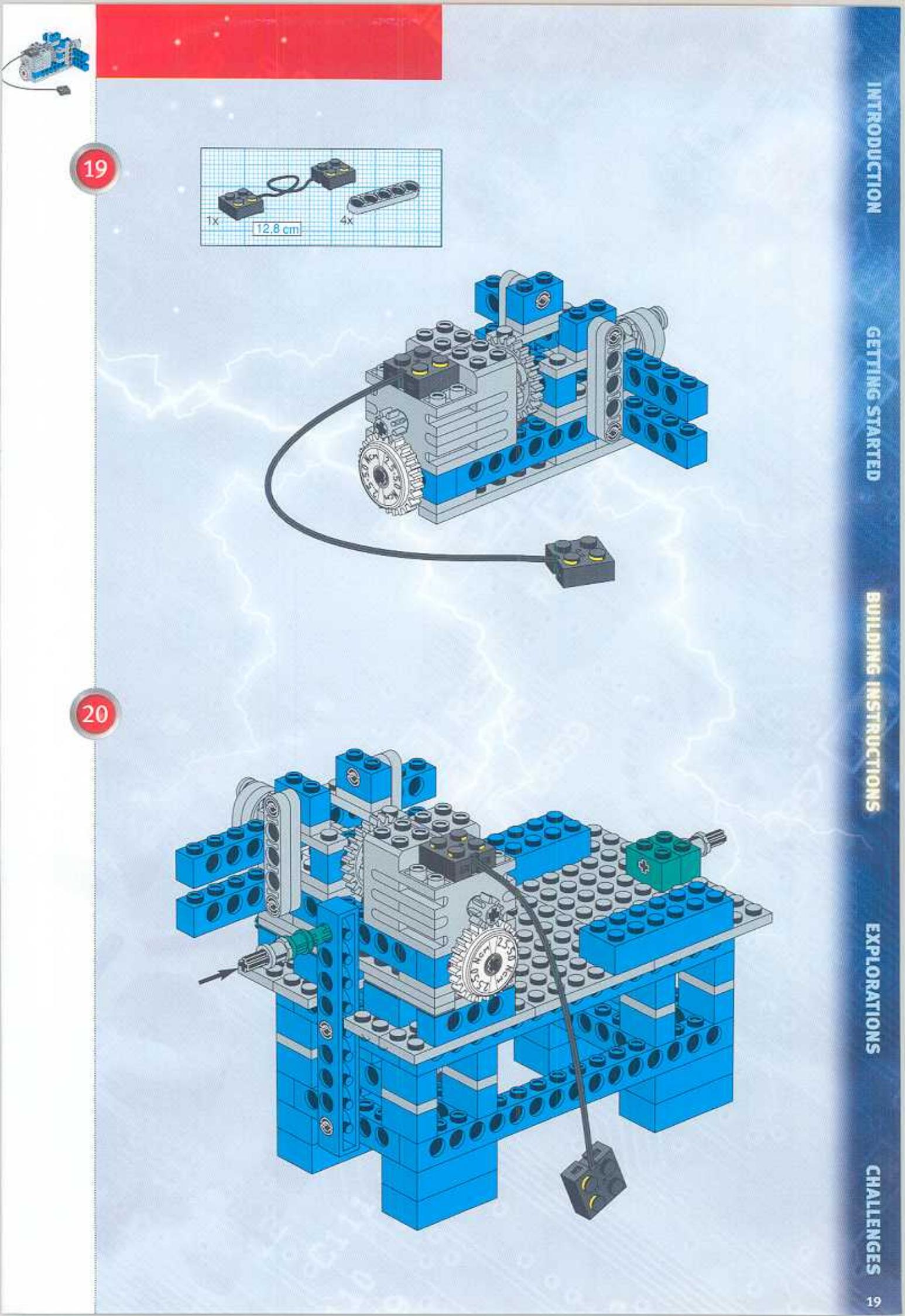


17



18

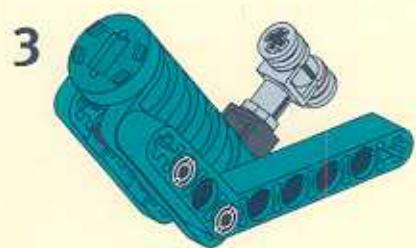
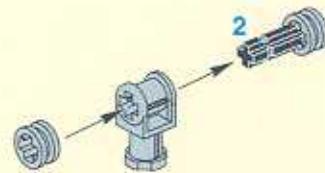
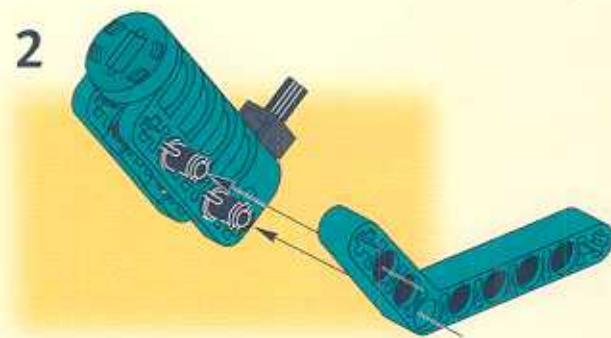
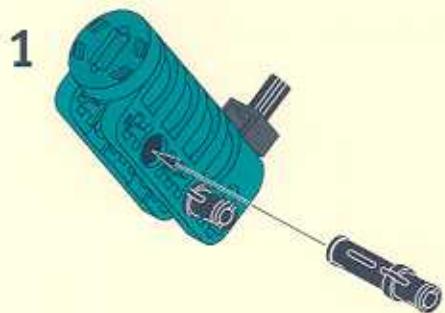
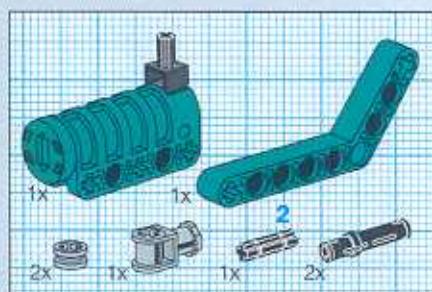


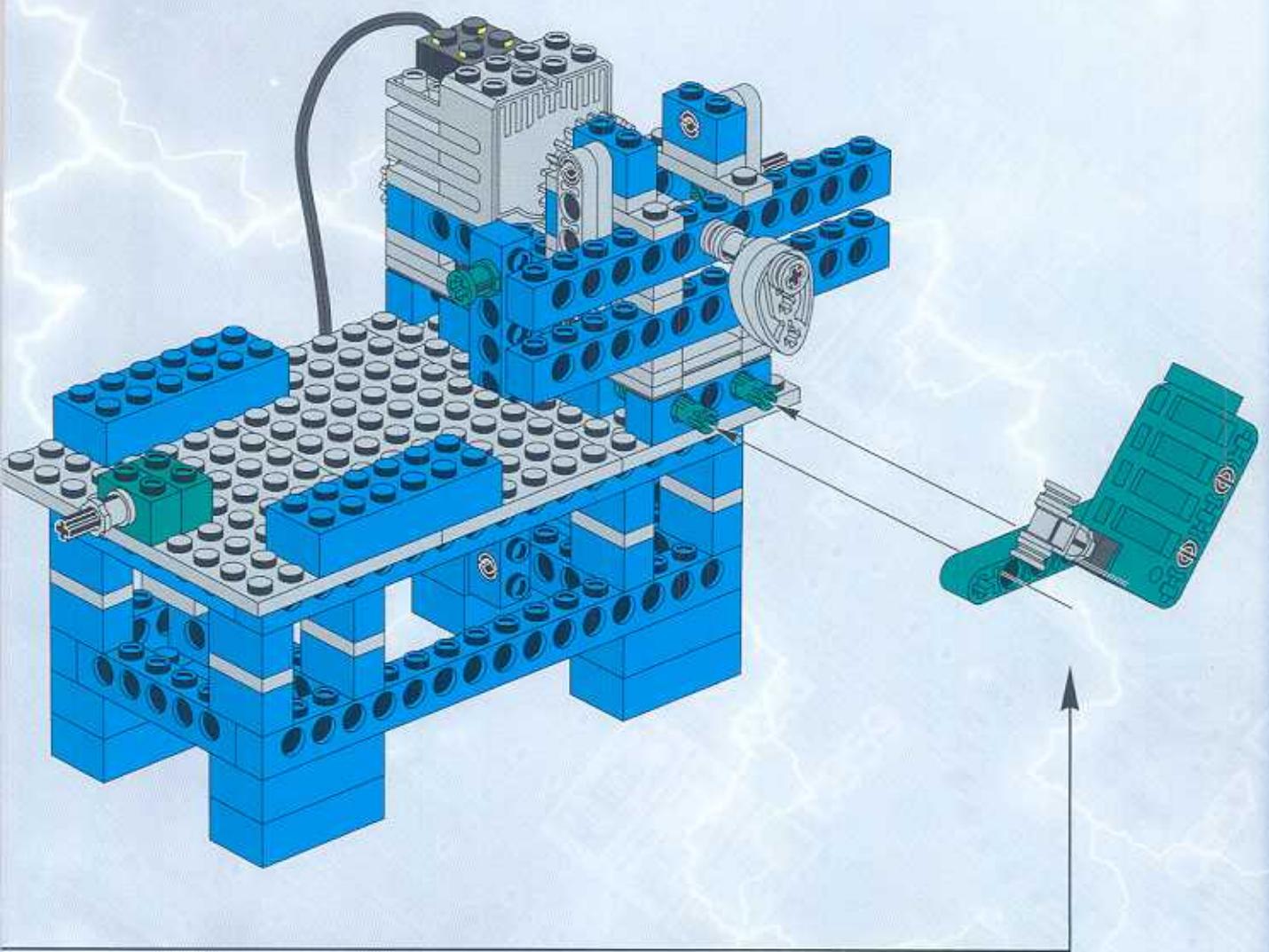


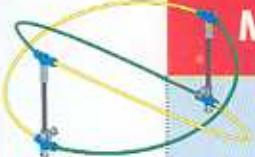


Module 3

21

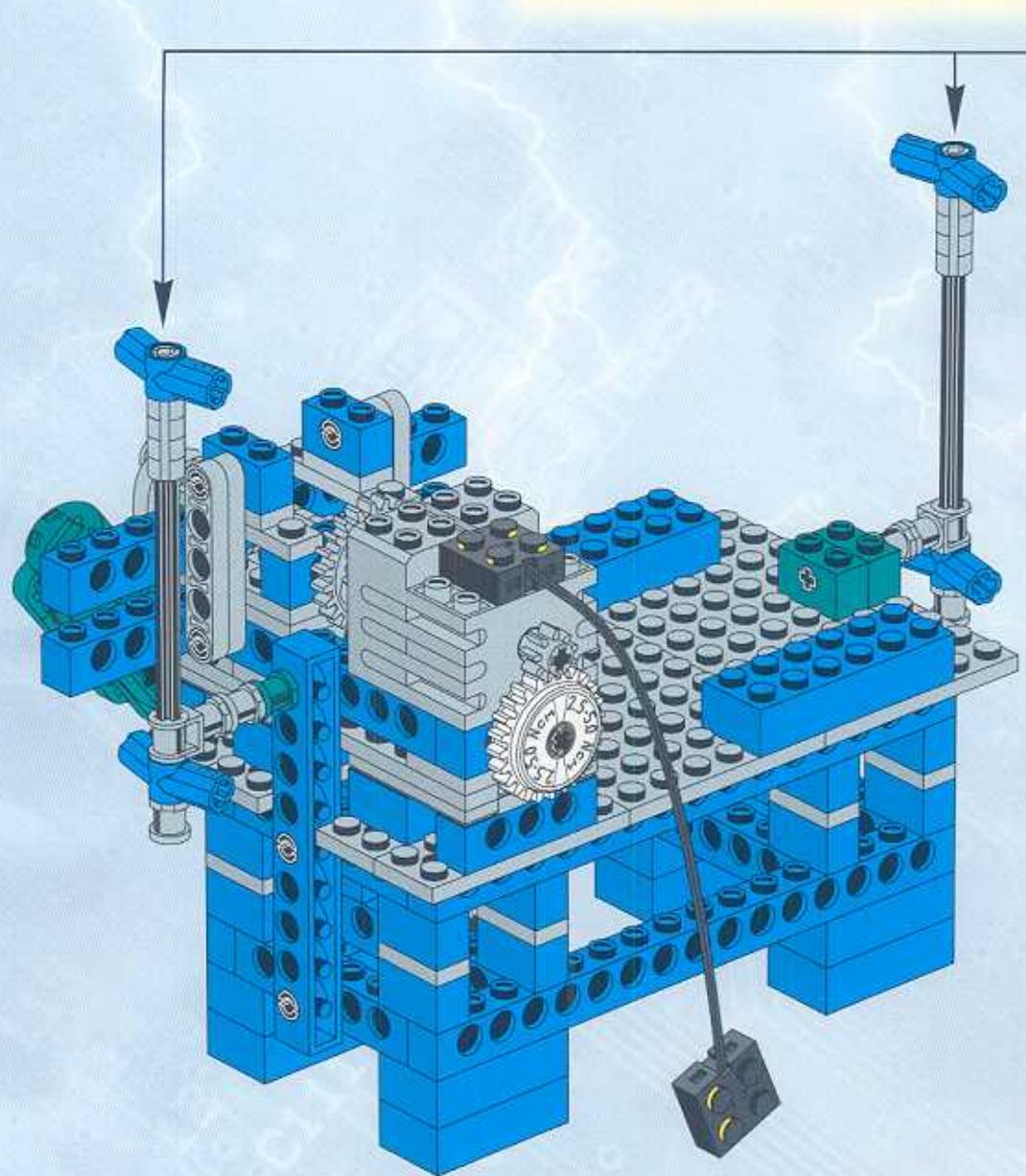
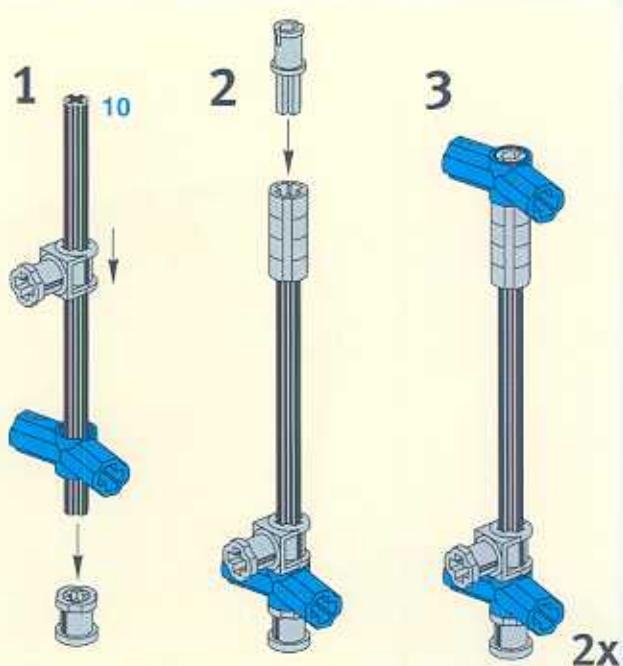
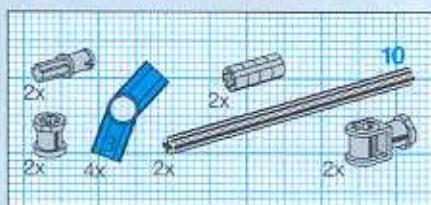




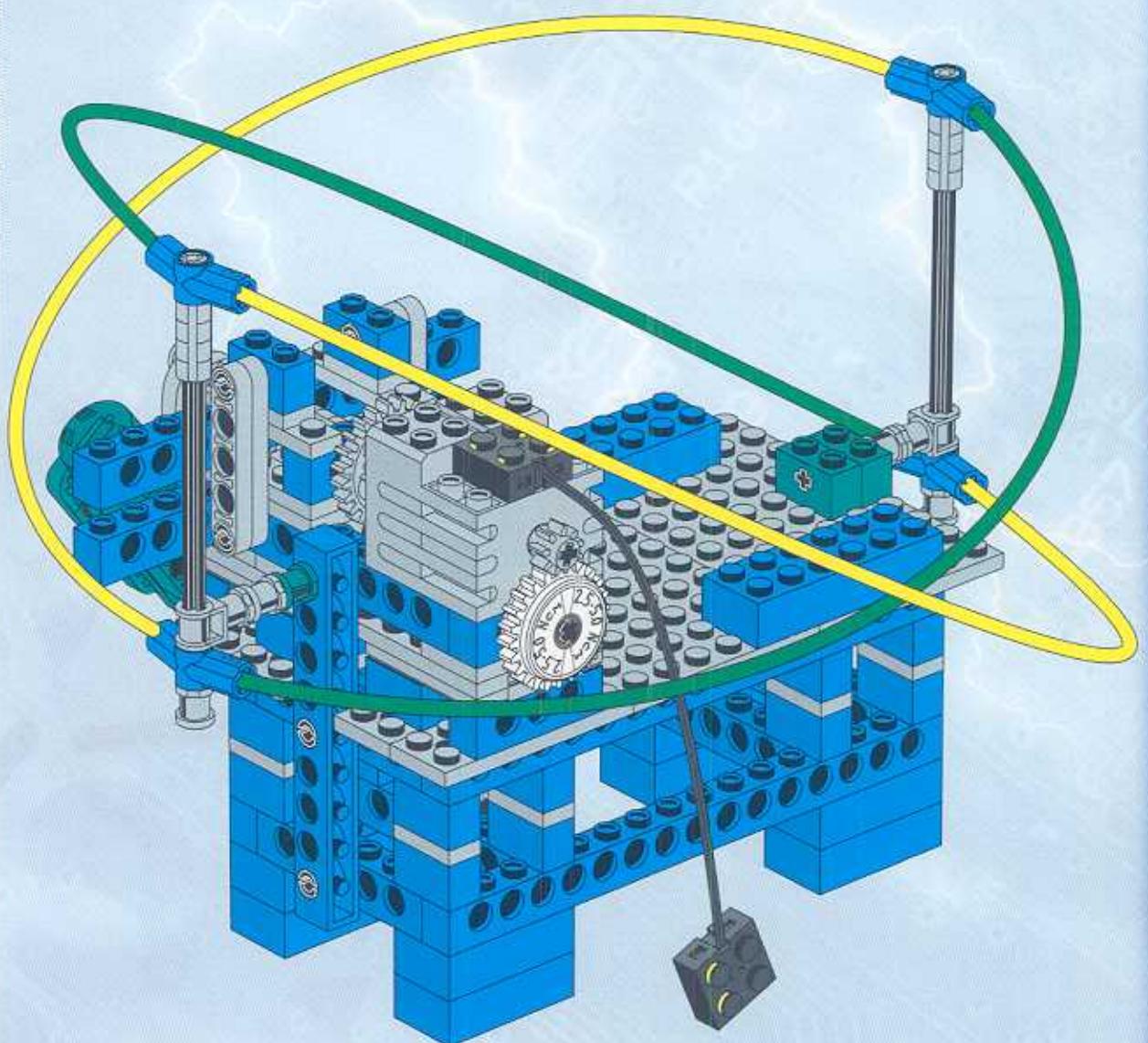
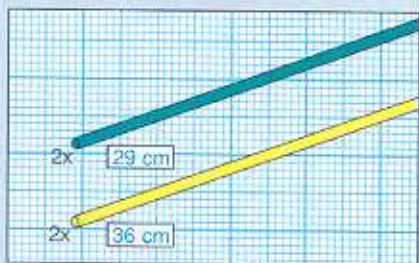


Module 4

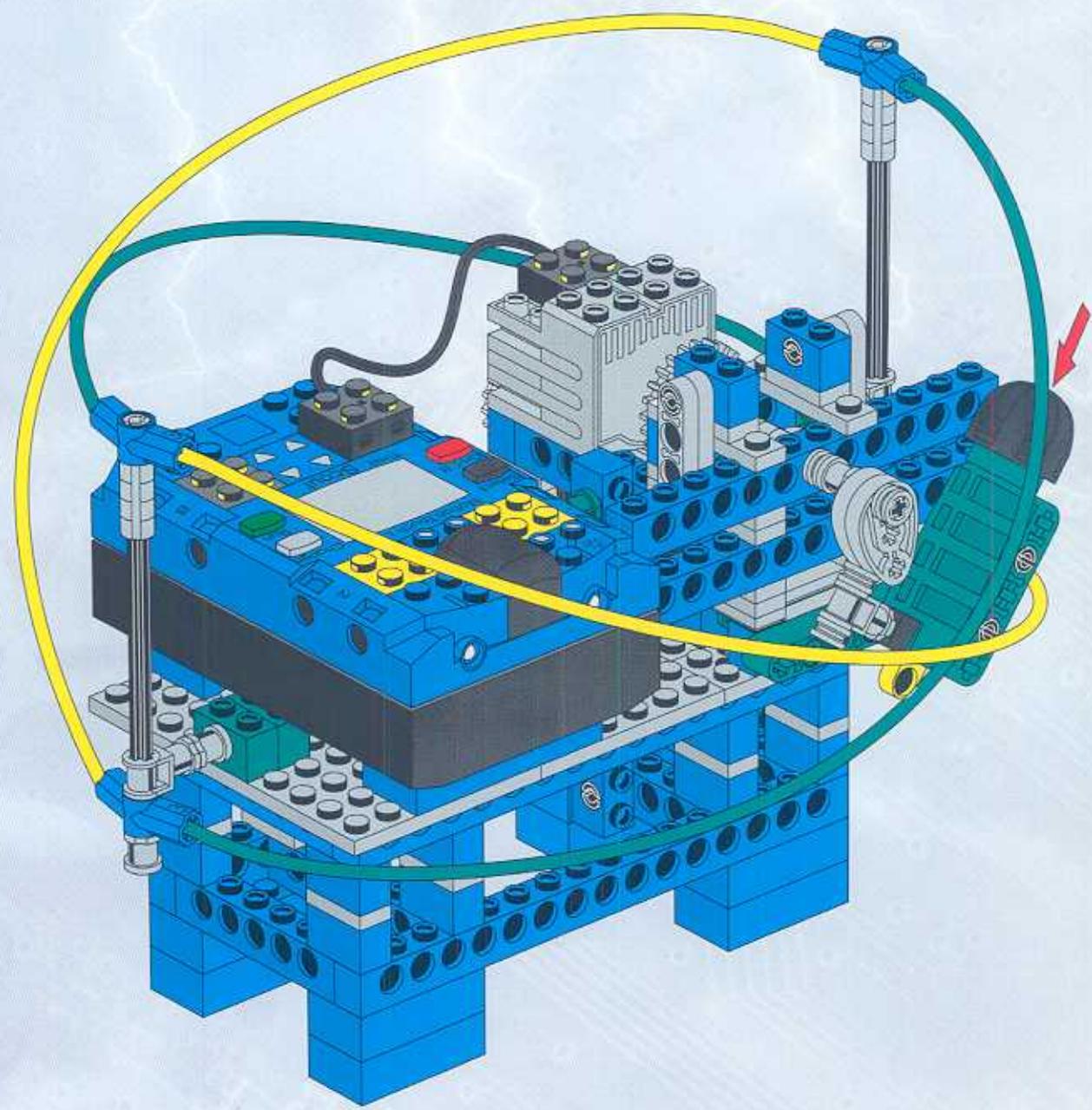
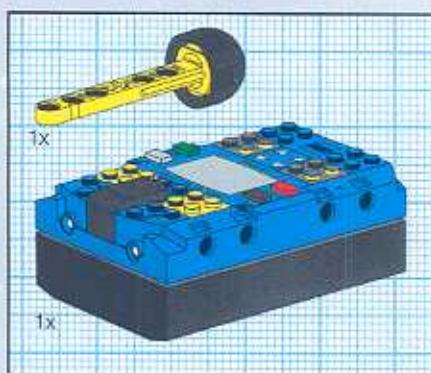
22



23



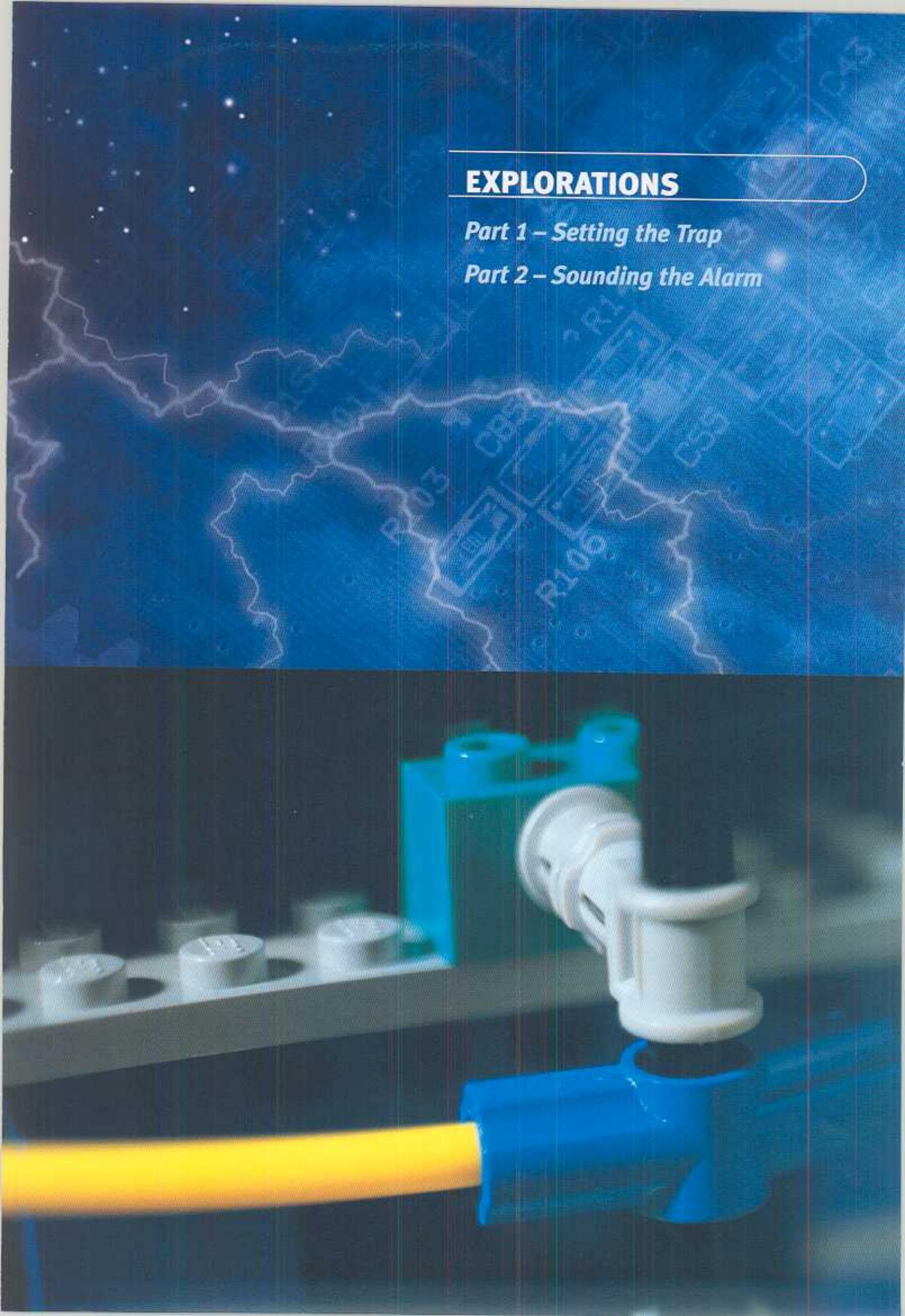
24



EXPLORATIONS

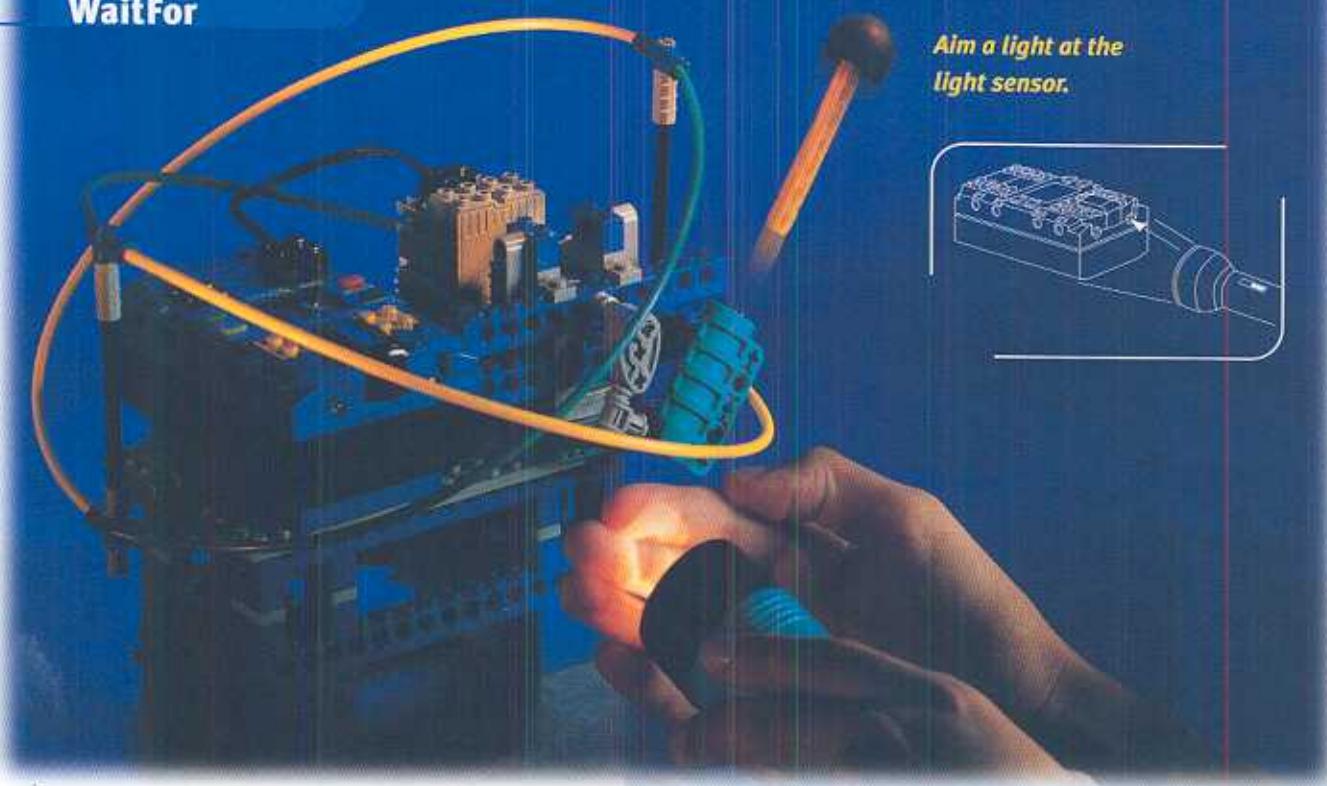
Part 1 – Setting the Trap

Part 2 – Sounding the Alarm



Part 1 – Setting the Trap

WaitFor



Real alarms often have electric eyes that see if something crosses a light beam. The WaitFor Light command lets you use the Scout's light sensor like an electric eye.

1. Make sure the Scout is turned on.
2. Set the Scout's Motion to Forward.
3. Set Light to WaitFor.
Check out Getting Started in The Bug Book if you need help using the buttons.
4. Aim a bright light such as a flashlight at the Scout's light sensor.
You might want to build a stand to hold your flashlight in place.

5. Press Run.

Your Alarm is now armed. Watch out!

6. Put your hand between the light and the Scout.

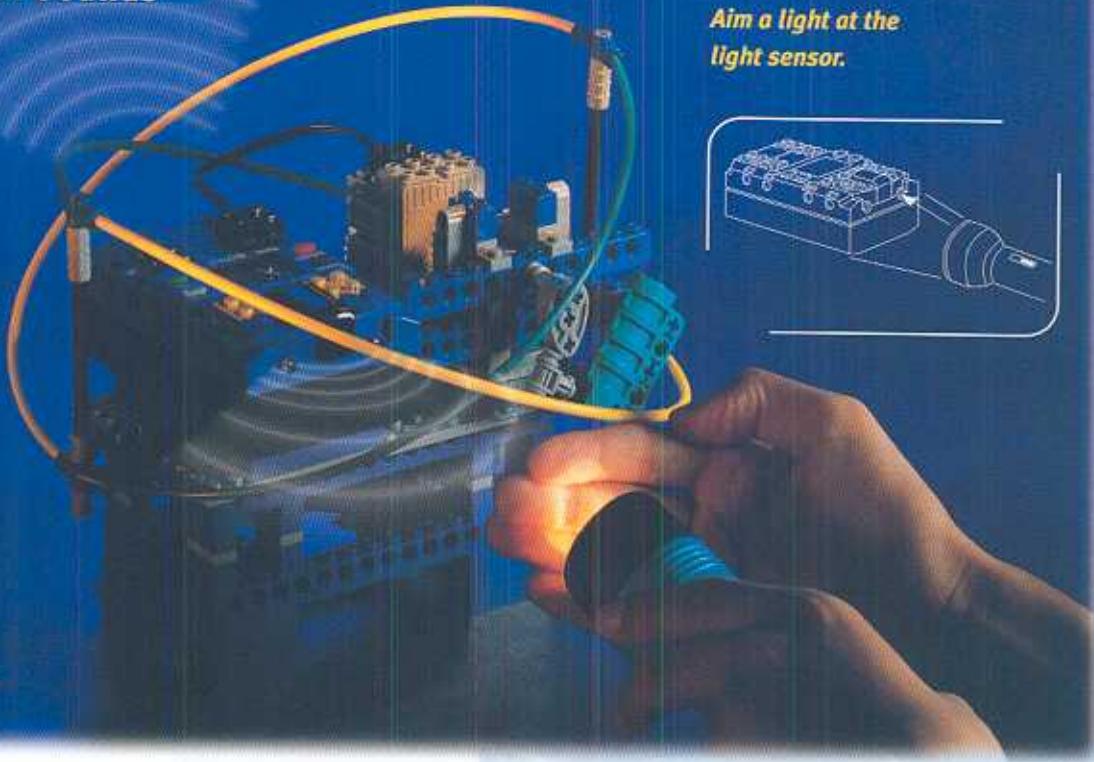
Your Alarm should spin its motor and launch the dart into the air.

Important:

*Always be careful when using the launcher.
Do not aim it at any people or animals.*



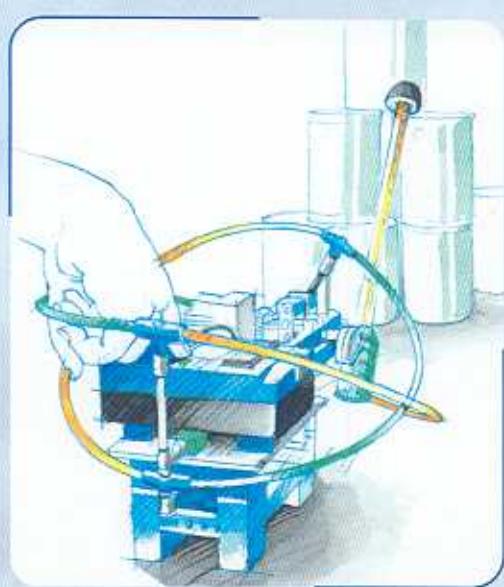
Alarm Sounds



Alarms sounds are great for letting you know when your alarm is set off. Use the  command to add special sounds to your Intruder Alarm.

1. Make sure the Scout is turned on.
2. Set Motion to Loop AB.
3. Set Light to WaitFor.
4. Set FX to .
5. Aim a bright light such as a flashlight at the Scout's light sensor.
This works best in a dark room.
6. Press Run.
7. Put your hand between the light and the Scout.
The Alarm sounds should play as the motor ports turn on.
8. Press Run to shut off your alarm.

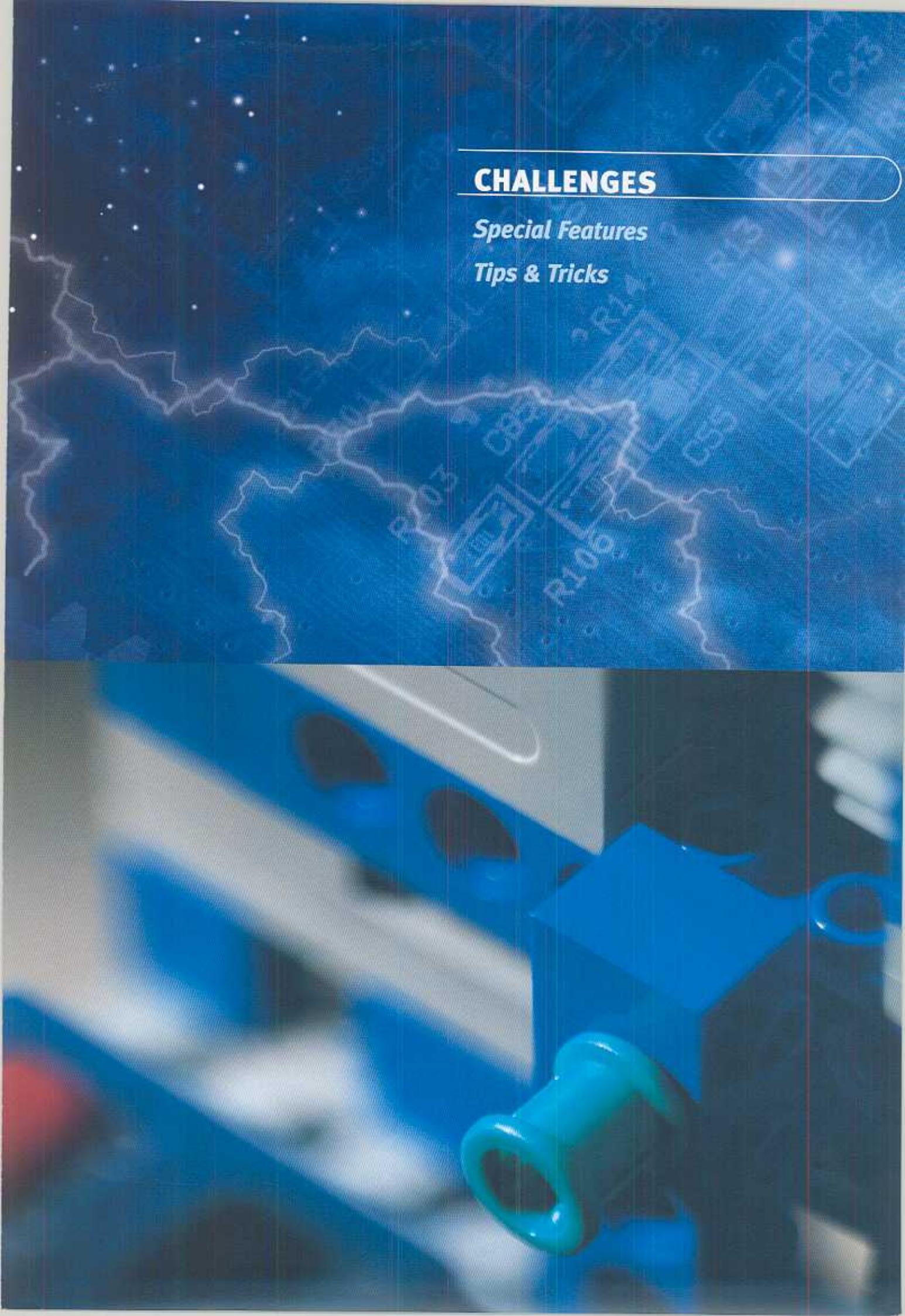




CHALLENGES

Special Features

Tips & Tricks

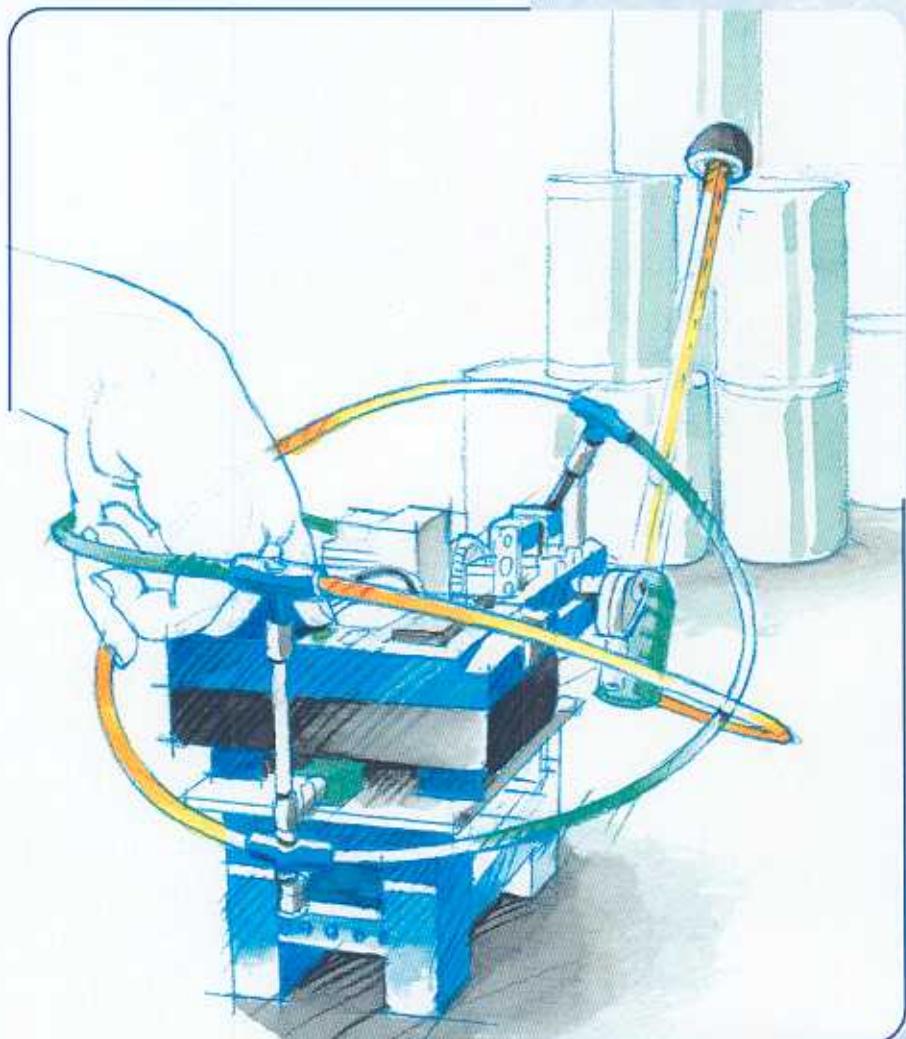




1: ALARMING CHANGES

Try to use your Alarm in different ways, like:

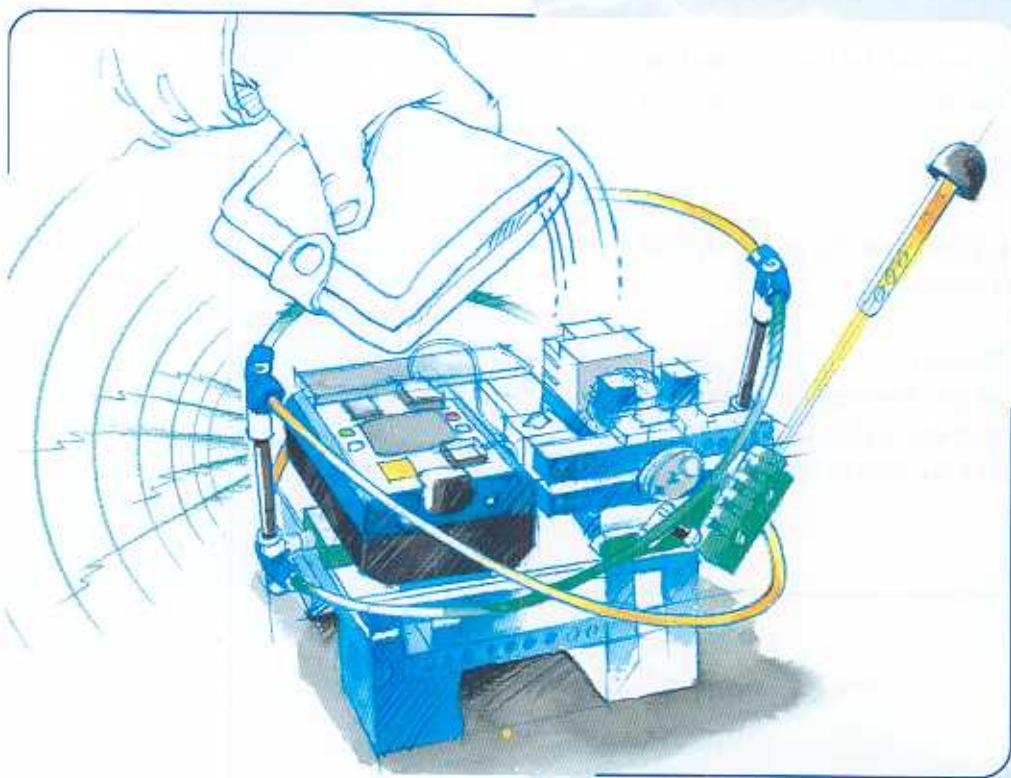
- Make your Alarm sound when someone turns on the light in a dark room.
- Turn your Alarm into an alarm clock for when the sun rises.
- Make the dart hit a target, like a stack of cans or a tower of LEGO Bricks.



2: ADDING TOUCH TO YOUR ALARM

Try adding a touch sensor or two to your Alarm to:

- 💡 Make a secret shutoff button.
- 💡 Create a touch trigger that sets off the alarm when someone takes something from your desk.



- 💡 Make your Alarm turn itself off.

Hint...

Try placing the touch sensor so that it gets pressed as the motor turns.

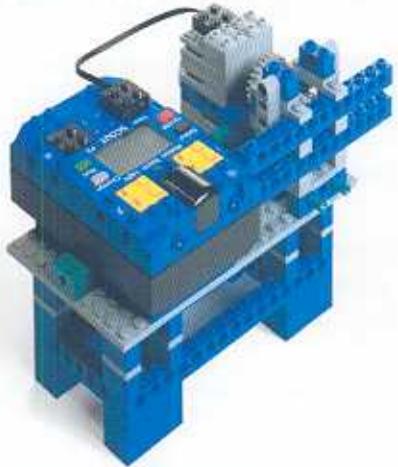


3: ARMING YOUR ALARM

You can use the attachments shown in the Special Features section to create new inventions. To start:

1. Take the green and yellow rings off the Intruder Alarm.
2. Next, pull out the gray spinning arm that is above the launcher trigger.
3. Finally, remove the launcher and dart.

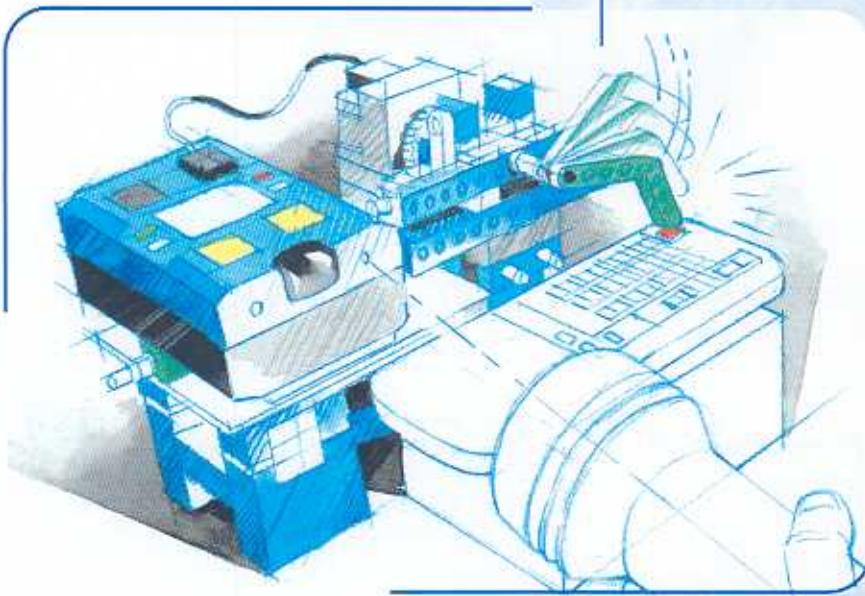
Your Alarm should now look like the photo.



Here are a few ideas for you to try with the Special Features:

Ball Thrower

Use the arm attachments (Special Features 1 or 3) to throw a ball. Check out Tips & Tricks to see how to speed up the gears.



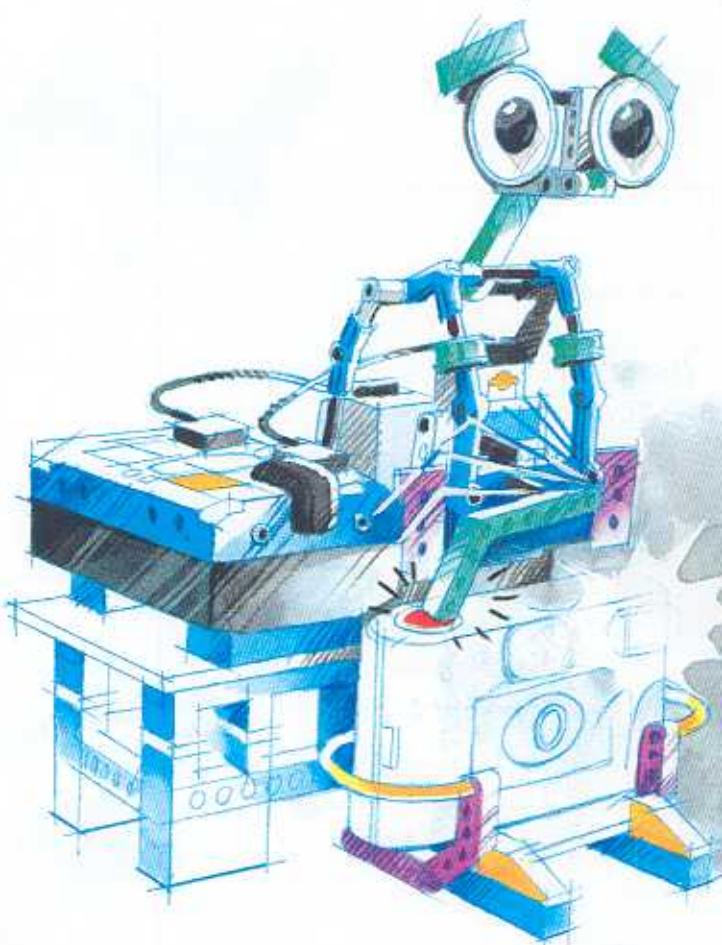
Remote Remote

Remote Remote

Use the finger attachment (Special Feature 2) to press a button on a TV remote control. Use a flashlight to control the Scout from across the room.

Try using the WaitFor Light command. You'll need to build a stand to hold the remote control in place.

Photo-bot



 **Photo-bot**

Use the finger attachment (Special Feature 2) to press the button on a camera and take a picture.

Warning: This challenge can be hard to do!

You will need to build a stand (Special Feature 5) to hold the camera in place and put enough pressure on the button to take the picture.

Special Features

Here are some ideas for additional features for your Intruder Alarm.

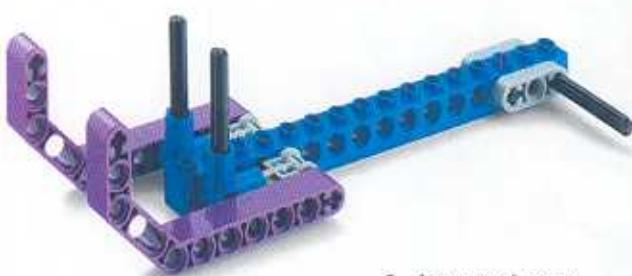
1. Ball Thrower



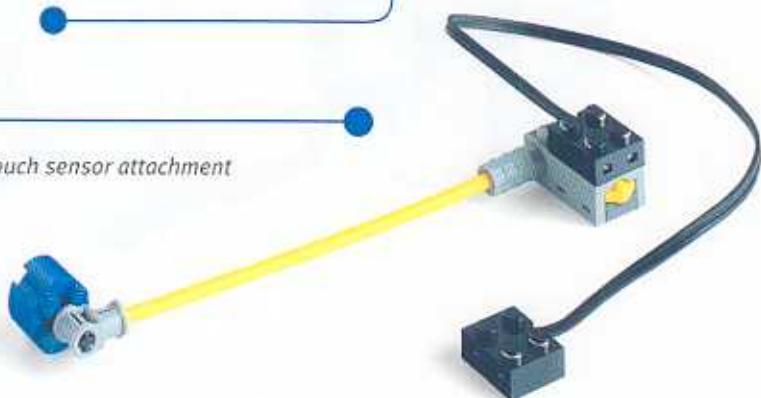
2. Finger attachment



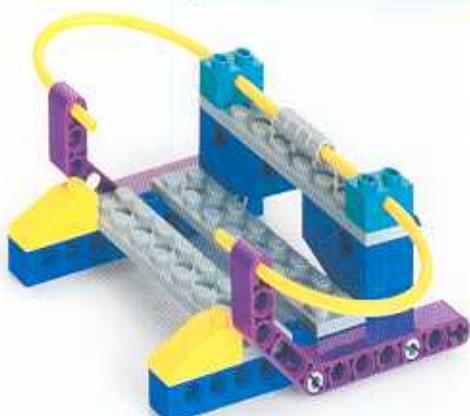
3. Arm attachment



4. Touch sensor attachment

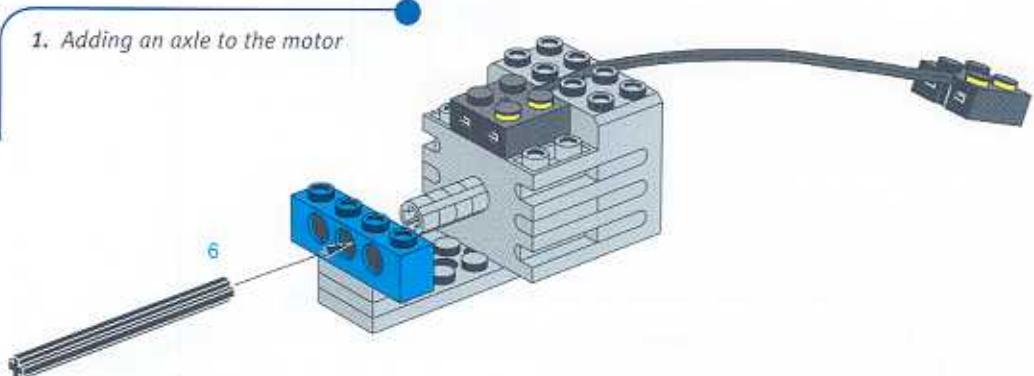


5. Camera stand

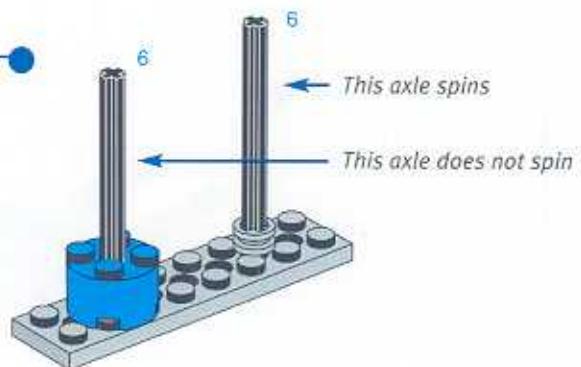


Try using these tips and tricks to change your Intruder Alarm.

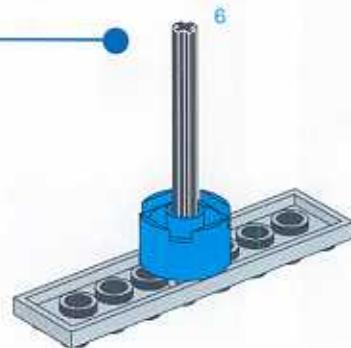
1. Adding an axle to the motor



2. Adding axles

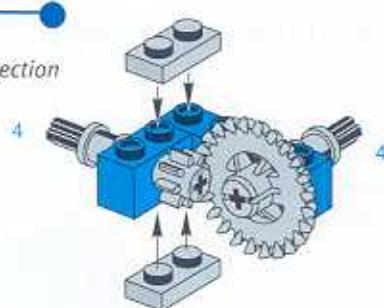


3. Adding an axle to a plate

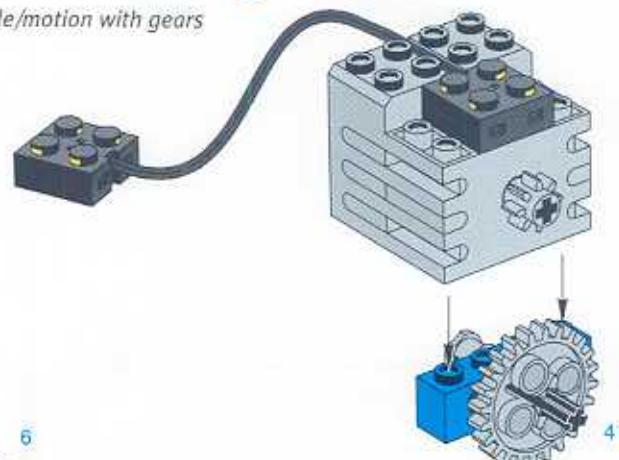


Tips & Tricks

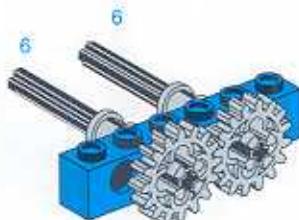
4. Using gears to change direction



5. Slowing down the speed of the axle/motion with gears



6. Linking gears



How to change the speed of gears:



Slow gearing



Fast gearing

