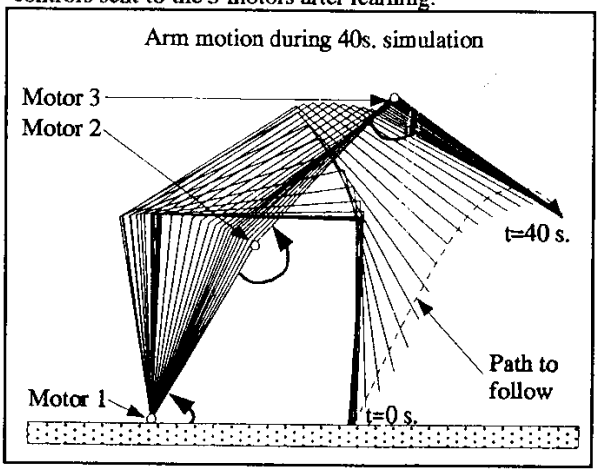
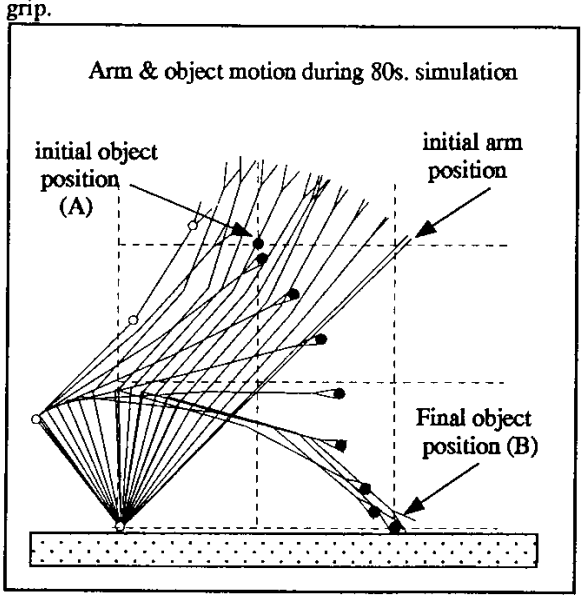
The neural crystal is activated with a 5s duration pulse. Figures show motion of the arm and the corresponding controls sent to the 3 motors after learning.



3.3. Making a given task

In this example, we trained a network to succeed in the following task: to take an object in point A and drop it in point B in less than 80s. of simulation. We used a 8x8 network, with input in neuron (0,0) and 4 outputs in (3,4)-(4,3)-(4,5)-(5,4). The fourth output is the command of the grip.



We note $\alpha_p(t)$, the opening angle of the grip in radian.

T is the position reached by the arm tip when $\alpha_p(t)$ decreased for the first time. The object is then considered as taken. G is the position where $\alpha_p(t) > 0.5$ r. after the object has been taken. The object is then considered as droped. We define the error as: $E=AT^2+BG^2$

So, E=0 implies that the robot takes the object where it is in A(1,2) and drops it where we want in B(2,1).

Initial angles are: $\alpha_1=\pi/4$; $\alpha_2=\alpha_3=\pi$; $\alpha_p=0$. Activation is done with a positive 2s. duration pulse. We used the parallelized learning algorithm for training. It took about 100 000 relaxations to get the following result (At the rate of 200 relax/s).

4. SIGNAL RECOGNITION

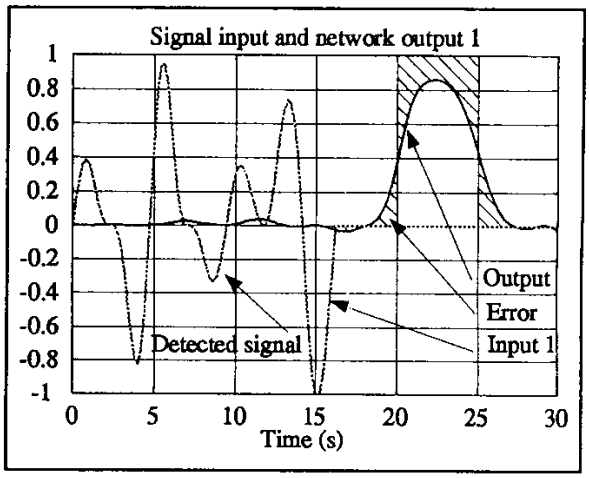
4.1. Introduction

When used for recognition of signals, the network has to learn how to produce an output $Y^p(t)$ for a set of input signals $I^{p'}(t)$. Of course, $Y^p(t)$ must be easier to recognize than $I^{p'}(t)$. In the following we will use square output signals.

4.2. Elementary recognition

The use of this network for recognition tasks is based on its capacity to produce a typical transcient response.[7]

So the question may be asked: Is the network able to recognize a signal inside another or is it only sensitive to the beginning or to the end of the input signal?

This would respectively means that the network is intrinsically too unstable or too stable to achieve any complex signal recognition.

Following figure shows that a trained network succeed to produce a positive or negative squared output signal for