Req: Schematic for BASIC electromyogram (EMG) − biofeedback type device

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2007−02/msg00292.html

- *From*: <Joe@xxxxxxxxxxxxxxxxxxxxx>
- *Date*: Fri, 02 Feb 2007 10:32:43 GMT

(previously posted in sci.engr.biomed)
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Seems that it could be done with a handful of off−the−shelf parts. From browsing the group, I've seen where these are often

class projects.

Purpose − Determine specific muscle maximum output.
Input− Standard skin electrodes.
Output − LEDs preferred over sound.
Requirement − no programmable chips.
Application − I severed the median and ulnar nerves (and a bunch of other stuff) just above the elbow. After a couple surgeries,

I've gained some motion in my thumb, and I'm trying to exerecise it to the max muscle activity level.
I've used a commercial unit in the Occupational Therapy clinic, but it has a fancy LCD display with mmv readings, timers, etc.

that I don't need.
I visualize an output of a simple string of LEDs. If I remember correctly, the commercial unit displayed readings of 10 to 60

mmv, depending on pad placement and fatigue level. With luck, this will increase, but I don't know what normal limits are, and

don't expect to get anywhere near normal levels. Changing ranges would be a nifty.

Seems it could be done with a power supply, amplifier, and LED driver chip, or maybe easier.
Any suggestions?

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Ken,
Thanks for the links; I'll check them out. I googled for 2 days, obviously with the wrong key words, and all I could find were

block diagrams and theory.

As far as skills, that's changed a tad, which leads to my request. I've breadboarded a lot, and made enough basic one−sided

circuit boards to be comfortable with the process.
Now, I call whatever I do 'therapy', and often recruit family to hold things for a second. :)
Yes, desire is 'cheaply' − crude, if need be. A simple gazinta / comesouta. On the lines of a science fair project would be

adequate.
Thanks, again.
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NNTP−Posting−Date: Thu, 01 Feb 2007 20:33:09 −0600
Newsgroups: sci.engr.biomed
Subject: Re: Req: Schematic for BASIC electromyogram (EMG) − biofeedback type device
From: Ken Moffett <KLMoffett@xxxxxxxxxxx>
References: <kxqwh.17361$%N3.16996@xxxxxxxxxxxxxxxxxxxxx>
Message−ID: <Xns98CAD11325EBDqwerty@xxxxxxxxxxxxxx>
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Joe,

The input circuitry for EMG is very similar to that used for
EEG and ECG. Basicly a high CMMR, differental amplifier with
a lot of gain. The difference is in the filtering, and what
you do with the output. Though in EEG and ECG they are trying
to filter out the muscle (noise) signal, that you want to

use.

I used to work in Biomedical Engineeing at the U of Minnesota Hospitals, but would have to dig to come up with a design from a "handfull of off−the−shelf parts"...for what I assume you want to do cheaply(?). What are your skills electronics?

Try posting your request over on the newsgroup:

sci.electronics.design

and

Google: EMG circuit schematic

I got lots of good hits, including:

http://mxp.physics.umn.edu/s02/Projects/Muscle/Project_Proposal.htm

GO GOPHERS!

This should do what you need for the front−end. Instead of sending the signal to a computer you could try driving an LED bar display:

http://www.national.com/pf/LM/LM3914.html

You may need to put some signal conditioning circuitry between the input and the display, but I'll leave it there for others to help.

As my flight instructor used to say: "Do good work...and have fun"

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