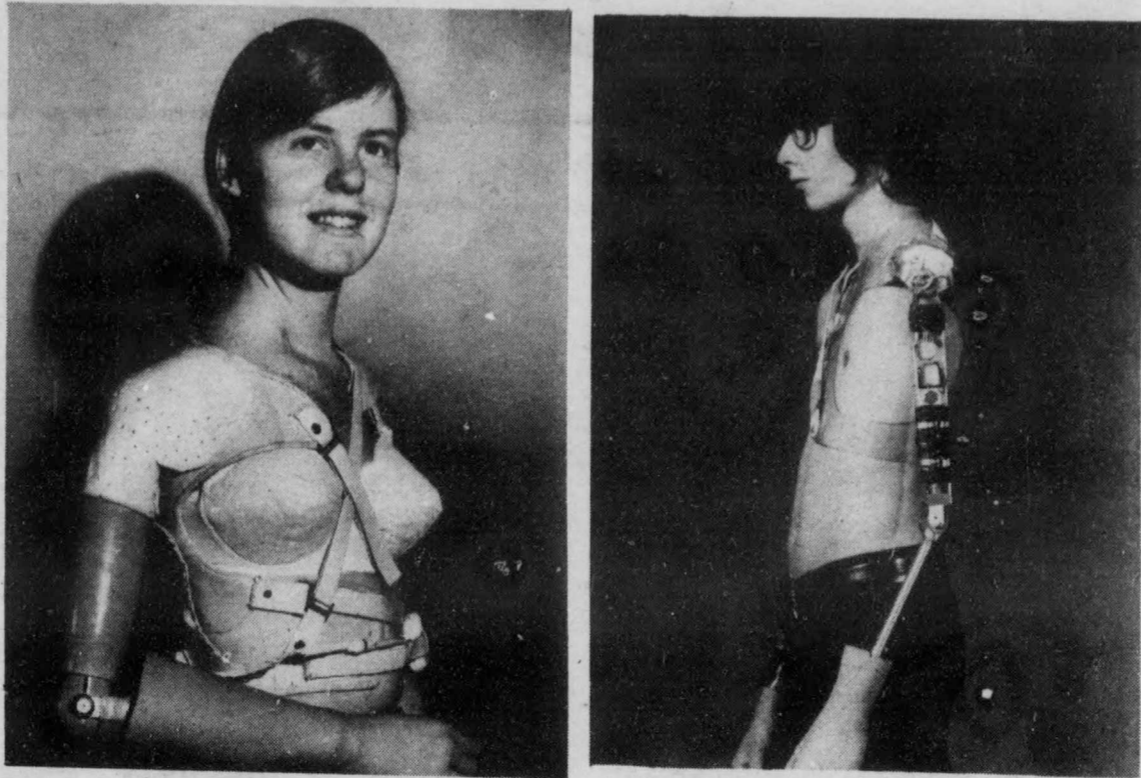
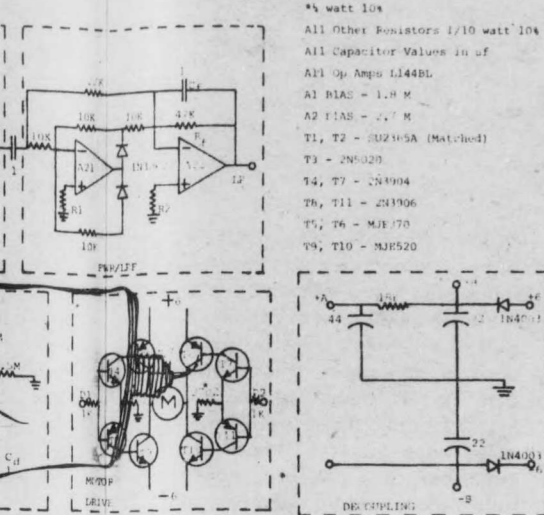
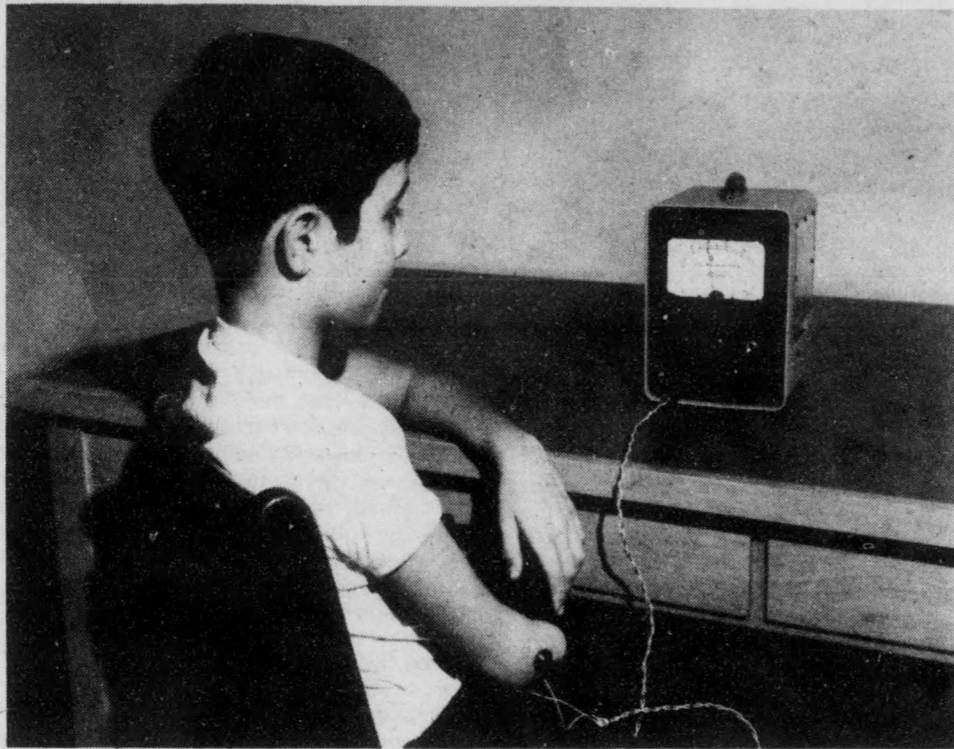


ERING



16 and 17 year old arm & shoulder amputees



Training muscles before fitting.



Congenital left arm amputee

contraction may range from a few microvolts to several millivolts.

The important point for control is that the "amount" of myo-electric signal is subject to conscious voluntary control.

One of the difficult problems in achieving a practical myo-electric control system is to establish a good electrical contact between the signal source (i.e. muscle) and the electronic control equipment. Skin is an electrical insulator and the underlying tissues are conductive so they permit signals from many muscles to be measured at any one location. At present, all systems in clinical use employ surface electrodes.

Intermittent contact or even slight relative movement between a rigid electrode and the skin will produce "electric noise" which may be greater than the myo-electric signal.

It is important that the electrode be placed very close to the muscle whose activity is to be measured. "Crosstalk", the interfering signals from relatively distant active muscles is minimal. The present consensus is that myo-electric control systems for regular use by patients should use "dry" electrodes, usually of gold or silver with a surface area of about 1cm².

A myo-electric control system, in its simplest form, controls the flow of current to an electric motor in accordance with the "amount" of myo-electric signal. In practise, at least three distinct elements exist in the system; an amplifier, a signal processor and a controller.

The Bio-Engineering Institute has found some very good ways of setting up the required circuits so many amputees have managed to lead nearly normal life-styles. Whereas the bionic man/woman as portrayed on television are fictitious they are not totally removed from reality. But, it does come as somewhat of a shock to amputees to realize that they are not going to be lifting 1/2 tons and outrunning gazelles. The bio-engineer is not endeavouring to create superhumans, merely to make unfortunate humans capable of fending for themselves.