

# Amplifiers & Preamplifiers

## Transducer Amplifier Interface



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### Isolated GSR Preamplifier

- For GSR on human subjects for teaching purposes only

The front end of the preamplifier is battery powered (2 x 9 volt transistor radio batteries) while the back end receives its power from the host unit. A meter shows battery state and the batteries are connected only when linked to the host unit. There are 3 ranges (0 to 10 k $\Omega$ , 0 to 100 k $\Omega$  and 0 to 1 M $\Omega$ ) and DC level control, built in audio speaker with modulation facility and a normal/differential switch. The maximum sensitivity is 50 $\Omega$ /cm of pen deflection when used with the Harvard Apparatus oscillographs. It is supplied with the BS4 50-9521 GSR Finger Electrode Set.

The BS4 50-5966 Isolator Interface is needed to connect this unit to a Universal Oscillograph or Interface Adapter, or it plugs directly into the Harvard Apparatus Student Oscillographs.

Catalog No.	\$	Product
BS4 50-9505		Isolated GSR Preamplifier
BS4 50-7954		Male 3-Pin DIN Input Connector
BS4 50-9810		GSR Palm Disposable Electrode Set, see page 172; use as an alternative to the BS4 50-9521 2-Lead Input Cable with Finger Electrodes which is included with the Amplifier



### Isolated Preamplifier

- For ECG, EMG, ENG, EOG on human subject for teach purposes only

The front end of the Preamplifier is battery powered (2 x 9 volt transistor radio batteries) while the back end receives its power from the host unit. A meter shows battery state and the batteries are connected only when linked to the host unit. The input is via either the 3-pin binder socket or the row of five standard color coded 2 mm sockets (labeled LA, RA, LL, RL and C) for 5 electrode ECG measurements. A 7-position 'limb' selector allows connection of the standard ECG electrode configurations.

There is a 3-position gain switch (x10, x100 and x1000), an input selector for AC or DC coupled, a filter selector (3 dB down at 30 Hz, 150 Hz and 15 kHz) and a DC level control. Maximum gain when used with a Harvard Apparatus Oscillograph is 30  $\mu$ V/cm of pen deflection. A comprehensive range of electrodes and input leads is available.

The BS4 50-5966 Isolator Interface is needed to connect this unit to a Harvard Apparatus Universal Oscillograph or Interface Adapter. The Isolated Preamplifier will plug directly into the Harvard Apparatus Student Oscillographs, see page I68.

Catalog No.	\$	Product
BS4 50-9513		Isolated Preamplifier

\* For Biopotential Leads and Electrodes, see pages 171 to 177.



### AC/DC Preamplifier

This is a general purpose differential preamplifier for use on animals. It is powered by two 9 volt batteries (not supplied) and has a battery meter. Input is via a 3-pin binder socket and there is a two position gain control (x10 and x100 for DC coupled; x100 and x1000 for AC coupling). LF out (3 dB down at 1, 5, 10, and 100 msec and 1 sec) and HF out (3 dB down at 40 Hz, 100 Hz, 1 kHz, 10 kHz and 40 kHz) are selectable by two controls. Input impedance is 4.7 M $\Omega$  and the output is from a BNC connector. It measures 95 x 165 mm (3.75 x 6.5 x 6.3 in) and weighs 0.75 kg. (1.65 lb).

Catalog No.	\$	Product
BS4 50-5131		AC/DC Preamplifier



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*The Amplifier Modules on pages I60 to I62 are designed to interface with Harvard Apparatus's Amplifier Case, see page I69, Chart Recorders, see pages I65 to I70 and the CEPTU physiology system, see pages I65 and I64.*