

## Model 1700

# Differential AC Amplifier



The Model 1700 Differential AC Amplifier has been designed for research or teaching applications which require extracellular neurophysiological recording from excitable tissue, such as nerve, muscle (EMG), EEG, EKG, and ERG recordings. The instrument contains four independent, isolated amplifiers in a single enclosure allowing the researcher to record several signals simultaneously. Combining four channels in one instrument significantly reduces equipment costs while providing a more convenient research environment.

Each channel in the Model 1700 consists of an high-gain, low-noise differential amplifier stage followed by high-pass, low-pass, and notch filters. A stimulator input is also integrated into each channel to allow for recording or stimulating through the same electrode. Simply connect your stimulation signal source to the input and set the MODE switch to STIM; this eliminates the need to disconnect the electrode inputs from the amplifier during stimulation. Four 1-meter-long input cables are included with the amplifier. These cables can be extended up to a total length of 4 meters for an additional fee.

The Model 1700 Differential AC Amplifier is designed for use with low impedance (<1.5 megohm) electrodes, and is therefore suitable for use with suction, nerve cuff, hook, surface, and simple metal electrodes. A-M Systems recommends the use of a headstage probe (preamplifier) for use with higher impedance electrodes (*see Application notes on reverse for additional information*).

Common applications for the Model 1700 Differential AC Amplifier include, but are not limited to:

- Multiple-Unit Recordings
- Evoked Potentials
- EEG / EMG / EKG / ERG recordings
- Long-term Potentiation

The Model 1700 Differential AC Amplifier is designed for research grade recording quality, with a straightforward interface that also makes it ideal for teaching applications.

- Four independent amplifiers in one instrument
- No Headstage required
- Three gain settings
- Adjustable Low-Pass and High-Pass filters
- Notch filter for power line frequency
- Low noise
- High input impedance
- High common-mode rejection
- Low input bias current
- Driven cable shield provides reduced capacitance
- Custom gain and filter settings available
- Includes Four one-meter long input cables
- Includes rack mount hardware
- 3-year warranty

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### Application

#### Notes:

Recording with high-impedance electrodes

While the Model 1700 Differential AC Amplifier was designed to record using low-impedance electrodes, many researchers have requested headstage probes that could be mated to one or more channels of the Model 1700 for measurements using electrodes with impedances greater than 1.5 megohms. A-M Systems can modify one, two, three, or all four channels to work with one of our headstage probes (*pictured below*). Following the modification, the overall gain of the Model 1700 is not altered; however, the impedance mismatch and filtering often produced by a high impedance electrode recording configuration is eliminated. For more information, contact A-M Systems, or your distributor.



### Specifications

Gain*	x100, x1000, x10000
High Pass Filter*	0.1, 1.0, 10, 100, and 300 Hz; -40 dB / decade
Low Pass Filter*	500, 1000, 5000, 10000, and 20000 Hz; -40 dB / decade
Notch Filter	>-35dB at 50 or 60 Hz.
Noise	1.0 microvolt p-p typical (10 Hz to 10,000 Hz)
Common Mode Rejection	> 80 dB
Input Impedance	>10 <sup>12</sup> ohms in parallel with 50 pF
Crosstalk	90 dB at 1 kHz
Other Features	Can pass stimulation current direct to electrodes

\* Can customize these values for an additional fee. Contact A-M Systems or your distributor for information

### References

Chen FP and Evinger C (2006) Cerebellar modulation of trigeminal reflex blinks: Interpositus neurons. *J Neuroscience* 26(41):10569-10576

Weiss SA, Preuss T, and Faber DS (2009) Phase encoding in the Mauthner system: Implications in left-right sound source discrimination. *J Neuroscience* 29(11):3431-3441

Werk CM and Chapman CA (2003) Long-term potentiation of polysynaptic responses in layer V of the Sensorimotor Cortex induced by Theta-patterned tetanization in the awake rat. *Cerebral Cortex* 13(5): 500-507

### Ordering Information

For use on 220 V / 50 Hz power systems:	Product #690005 <i>Country-specific power cords are not supplied.</i>
For use on 110 V / 60 Hz power systems:	Product #690000
Optional: Headstage and Modification:	Product #692200 and Product #694500 (modification)
Stimulation input cables:	Product #701700 (dual banana plug to 5-pin connector) Product #701800 (BNC to 5-pin connector)

All units include a product manual and rack mounts.

ZYKANG

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