1. Reference Documentation

Document Number	Title
990-03848-01	Bioamp Test Fixture Validation Test Plan

2. Explanation of Calculation

Equipment Variation (EV):

$EV=K_1R$

$K_1=5.15/d_2$

d_2 is defined from lookup table, dependent on # of trials

$R=(R_{X1}+R_{X2}+R_{X3})/3$

R_x=Average range per appraiser

Appraiser Variation (AV):

$$AV=\sqrt{(X_{DIFF}K_2)^2-\frac{EV^2}{nr}}$$

n=number of parts

r= number of trials

$K_2=5.15/d_2$

d_2 is defined from lookup table, dependent on # of trials

X_{DIFF}= difference between maximum appraiser average and minimum appraiser average

*If negative value is calculated under square root sign, the value defaults to zero

Gage R&R (GRR):

$$GRR=\sqrt{EV^2+AV^2}$$

Total Variation (TV):

TV= tolerance/6 = (USL-LSL)/6

USL= Upper standard limit

LSL= Lower standard limit

Percent Gage R&R (%GRR):

%GRR=100*(GRR/TV)

2. Results

Frequency		
Channel	**%GRR**	**Accept/Reject**
1	18.78%	Accept
2	5.29%	Accept
3	1.14%	Accept

Amplitude		
Channel	**%GRR**	**Accept/Reject**
1	4.57%	Accept
2	5.10%	Accept
3	5.75%	Accept

3. Analysis

All active channels (#1-3) have %Gage R&R within acceptable range and therefore pass validation.