

Balance Bicycle Test Procedure: (Mechanical)

Verify:

1. All seat heights are achievable
Handlebar adjustability for all heights
Portability and max lifting weight compliance
FMEA requirements are met
2. Tilt functions as desired (no people)
3. Bike max capacity at locked position and maximum tilt (13 degrees)
4. Winch stop and proper operation
5. Determine maximum allowable tilt range (protractor /w weight and string)
Feedback functionality and tilt integrated with bike.
6. Adjustable resistance for cartridges, preload
Characteristic patients for each weight class function
7. Bike functionality for actual patients
8. All Specifications are met

P8001- Feedback Subsystem Test Plan

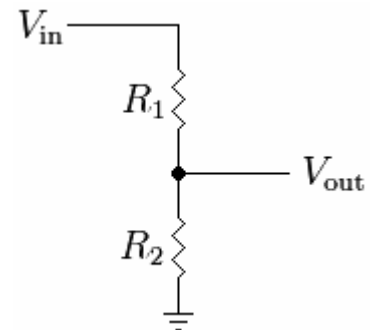
- Test inclinometer
- From measured output voltages at known values, determine appropriate gain for Instrumentation amplifier – Update in PSpice, determine resistor values
- Set general tilt angle ranges with potentiometers, update resistor values, PSpice model
- Test response on bread boarded circuit
- Begin layout plan on vector board (to solder)
- Test Output devices (LED's and Buzzers)
- Test power supply, voltage regulator
- Solder components to vector board, test connections
- Debug any known issues with performance
- Integrate with bike, calibrate tilt ranges
- Test overall performance against specifications

Reiker H4A - Inclinator - Output Voltages
Instrumentation Amp - Gain Adjustment

Reiker H4A - Inclinator - Output Voltages				
Instrumentation Amp - Gain Adjustment				
Equation for Rg:	$R_g = \frac{49.4k\Omega}{G-1}$			
			Resistor to Gain	
If desired gain is:				resistor kOhm
Then set Rg to: [in kΩ]				Gain
			Set Point	
Input Range:			0 degrees =	
Sensor Output: 66.6mV/degree			2.5V	
		(From Pspice)		
Degree	V_{sens_out} [V]	V_{IA_out} [V]	LED Label	
1			Green LED 1	

3		Green LED 2
4		Green LED 3
5		Yellow LED 4
6		Yellow LED 5
7		Yellow LED 6
8		Yellow LED 7
10		Red LED 8
15		Red LED 9
20		Red LED 10
-1		Green LED -1
-3		Green LED -2
-4		Green LED -3
-5		Yellow LED -4
-6		Yellow LED -5
-7		Yellow LED -6
-8		Yellow LED -7
-10		Red LED -8
-15		Red LED -9
-20		Red LED -10

Resistances	R1 [kOhms]	R2 [kOhms]
Voltage Dividers for LED's and Audio		
Green LED 1		
Green LED 2		
Green LED 3		
Yellow LED 4		
Yellow LED 5		
Yellow LED 6		
Yellow LED 7		
Red LED 8		
Red LED 9		
Red LED 10		
Green LED -1		
Green LED -2		
Green LED -3		
Yellow LED -4		
Yellow LED -5		
Yellow LED -6		



*R2 = potentiometer

Yellow LED -7		
Red LED -8		
Red LED -9		
Red LED -10		
Red_Aud (+)		
Red_Aud (-)		
Yellow_Aud (+)		
Yellow_Aud (-)		
Zero degree LED		

Visual Output	
LED's	
Current Limiting Resistors	R_{limit}
Green LED 1	
Green LED 2	
Green LED 3	
Yellow LED 4	
Yellow LED 5	
Yellow LED 6	
Yellow LED 7	
Red LED 8	
Red LED 9	
Red LED 10	
Green LED -1	
Green LED -2	
Green LED -3	
Yellow LED -4	
Yellow LED -5	
Yellow LED -6	

Audio Output		
Buzzer	Output	Pulsed Tone?
Input Voltage = 9Vdc		
Input Voltage = 3Vdc		
Input Voltage = 5Vdc		

Yellow LED -7	
Red LED -8	
Red LED -9	
Red LED -10	
Zero degree LED	