Explorer Board HAT

Test Procedure

Test Number	Test	GPIO18 Power to HAT	GPIO25 USB Power	GPIO16 Power to Battery	GPIO12 EEPROM PGM Enable	GPIO 13 +3.5V Enable	GPIO 26 +3.2V Enable	Display
Idle	Idle, Connect HAT	L Power Off	H Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Display = Idle, Connect HAT then click Top Button
1	Button and Display Test 1	H Power On	H Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L +3.2V Off	All Pixels on
2	Display Test 2	H Power On	H Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Checker Board Pattern
3	Display Test 3	H Power On	H Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Reversed Checker Board Pattern
4	Battery Charging Test, Charging LED Test	H Power On	H Power On	H Batt Connected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Display = Test 4: Read amp meter and Battery voltage meter, Charging LED on
5	ADC Test	H Power On	H Power On	H Batt Connected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Display = Test 5: Compare ADC voltage to Battery voltage meter
6	Synchronous Boost Test	H Power On	L Power Off	H Batt Connected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Display = Test 6: Read +5V voltage meter, +4.8 volts
7	Low Batt Voltage LED Test	H Power On	H Power Off	L, then this Batt Disconnected	L PGM Disabled	H, this first +3.5V On	L +3.2V Off	Display = Test 7: Low Batt LED On
8	Synchronous Boost Low Voltage shut down	H Power On	H Power Off	L Batt Disconnected	L PGM Disabled	L, then this +3.5V Off	H, This first +3.2V On	Display = Test 8: Low Batt LED Off
9	Bit Bang (Program) the RF Transceiver	H Power On	H, this first Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L, then this +3.2V Off	Display = Test 9: RF Transceiver Programmed
10	RF Transceiver Test	H Power On	H Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Display = Test 10: Tested RF Transceiver
11	Program EEPROM	H Power On	H Power On	L Batt Disconnected	H PGM Enabled	L +3.5V Off	L +3.2V Off	Display = Test 11: EEPROM Programmed
12	Verify EEPROM	H Power On	H Power On	L Batt Disconnected	L PGM Disabled	L +3.5V Off	L +3.2V Off	Display = Test 12: EEPROM Verified
13	Go to Idle							

Buttons

Top Button	Start Tests and Go forward to next test
Bottom Button	Go back to previous test
Double Click Top Button	
Double Click Bottom Button	Stop Testing go to Idle

Test Set-up

1. Test Fixture and Raspberry Pi Zero W connected together
2. Connect the six cables between the Test Fixture and the three DVMs
3. Connect the Cable between Test Fixture and Explorer Board HAT
4. Connect the USB cable
5. Connect 5V 2.4A Switching Power Supply with 20AWG MicroUSB Cable
6. Explorer Board HAT in Idle state after power up
7. Connect the Lithium Ion Battery
8. Plug HAT into Test Fixture

Test Equipment

1. Rasberry Pi Zero W
2. Explorer Board HAT Test Fixture
3. Three DVMs (for example: Fluke Model 115)
4. Lithium Ion Battery (Lithium Ion Polymer Battery - 3.7v 2500mAh, Adafruit ID 328)
5. 5V 2.4A Switching Power Supply with 20AWG MicroUSB Cable (Adafruit ID 1995)
6. USB cable - A/MicroB - 3ft (Adafruit ID 592)
7. MicroSD Card with Test Program (Patrick Kelly, Jack Kelly and Bryan Neilson supplied)
8. Cable between Test Fixture and Explorer Board HAT (Patrick Kelly, Jack Kelly and Bryan Neilson supplied)
9. Six cables between Test Fixture and DVMs, Banana plugs (Patrick Kelly, Jack Kelly and Bryan Neilson supplied)