TestLink

Test Plan Execution Report

Test Project: MATeF
Test Plan: Integarted BenchTest

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Test Project: MATeF

MATeF – 2 Qualification Tests.

Date	Tester
2017.12.06	Bence Góczán

Configuration:

MATeF-2 Engineering Model

OBC

Bootloader: Arduino/Genuino uno18v (1.8V brownout)
Firmware: 2017_11_28_2305

COM

Bootloader: ATmega328 on a breadboard (8 MHz internal clock, 1.8 V BrownOut)
Firmware: 2017_11_28_2308 (RFM69 library)

GPS

uBlox NEO 6M

APRS

DARPS default firmware
Callsign: HA3PL

EPS

EPS Proto

Test type:

Bench test

Summary

Test Suite	Test Case	Result	Notes
Preconditions	matef-85:Inegrated Tests	Passed	
OBC.mega328	matef-1:Startup	Passed	
OBC.mega328	matef-3:Outgoing Telemetry	Passed	
OBC.mega328	matef-4:Outgoing COM-housekeeping request	Passed	
OBC.mega328	matef-5:Incoming COM-housekeeping	Passed	
OBC.mega328	matef-89:Current Consumption	Passed	SD CARD current consumption is ~30mA by datasheet
OBC.mega328	matef-90:Voltage Drop	Passed	
OBC.mega328	matef-6:Timing	Passed	
COM.RFxxx	matef-9:Startup	Passed	
COM.RFxxx	matef-10:Incoming Telemetry message	Passed	
COM.RFxxx	matef-11:Incoming Housekeeping request	Blocked	Out of scope
COM.RFxxx	matef-88:Current Consumption	Passed	
COM.RFxxx	matef-15:Voltage Drop	Passed	
Integrated Flight System/Flight Operations	matef-30:Telemetry - Valid GPS	Passed	
Integrated Flight System/Flight Operations	matef-32:House keeping	Passed	
Integrated Flight System/Flight Operations	matef-33:Environmental Data	Passed	
Integrated Flight System/Flight Operations	matef-34:Radio Downlink	Passed	
Integrated Flight System/Flight Operations	matef-35:Radio Uplink	Blocked	out of scope
Integrated Flight System/Flight Operations	matef-39:Complete Flight - over 18K - no limit	Passed	'quick log' was used
Integrated Flight System/Flight Operations	matef-82:Telemetry - No GPS Connection	Passed	
Integrated Flight System/Flight Operations	matef-91:Current Consumption After EPS	Passed	proper 500 ohm APRS antenna
Integrated Flight System/Flight Operations	matef-92:Current Consumption Before EPS	Passed	proper 50 ohm APRS antenna
Integrated Flight System/Flight Operations	matef-93:BEACON mode	Passed	
Integrated Flight System/Flight Operations	matef-36:Radio Power	Not Run	
Main GPS	matef-26:Below 18K	Not Run	already tested
Main GPS	matef-27:Over 18K	Not Run	already tested
Main GPS	matef-80:Over 50K	Not Run	already tested
Integrated Flight System/Durability	matef-40:Voltage Drop - GPS bypass	Not Run	
Integrated Flight System/Durability	matef-41:Voltage Drop - GPS connected	Not Run	
Integrated Flight System/Durability	matef-42:Voltage Drop - Brownout Reset	Not Run	
Integrated Flight System/Durability	matef-43:Battery Capacity - GPS bypass	Not Run	
Integrated Flight System/Durability	matef-44:Battery Capacity - Live GPS	Not Run	

Test Suite : Preconditions

Test Case matef-85: Inegrated Tests

Summary:

1. Place and connect the prepared modules on the testboard
2. Place and connect diagnostic cards on the testboard
3. Connect additional wiring
4. Properly fix the modules and cables

ALWAYS USE DUMMY LOAD OR ANTENNA ON RF COMPONENTS!

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Suite : OBC.mega328

Test Case matef-1: Startup

Summary:

Check if module starts up properly after Vcc-ON

- Wait for COM-ready
- Buzzer test
- SD-card init
- LOG created
- Default values before GPS fix

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium
Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Case matef-3: Outgoing Telemetry

Summary:

Check if proper telemetry message is sent by OBC

- TMLTM message in correct format

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium
Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	
Test Case matef-4: Outgoing COM-housekeeping request	

Summary:

Check if proper COM-housekeeping request message is sent by OBC

- TMHKR

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-5: Incoming COM-housekeeping

Summary:

Check if incoming COM-housekeeping message is processed properly

- TCHKD (sent by PC simulator)

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-6: Timing

Summary:

Check if timing for automated functions is properly set

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details

Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-89: Current Consumption

Summary:

Measure current consumption during operation.

Determine the current consumption of the following operation modes:

- START UP
- IDLE
- GPS READ
- SD CARD HANDLING

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Ambient temperature		24°C	Passed
2	Measure current consumption for at least 10 operation cycles			Passed
3	Start up current consumption	I < 8 mA	avrage: 6.6mA max: 29.85mA (SD CARD)	Passed
4	Idle current consumption	I < 8 mA	~6mA	Passed
5	GPS read current consumption	I < 30 mA	~6mA	Passed
7	SD Card handling current consumption	I < 10 mA	~30mA	Passed

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	
Execution notes	SD CARD current consumption is ~30mA by datasheet

Test Case matef-90: Voltage Drop

Summary:

Test voltage levels during operation.

Measure bus-voltage in the following operation stages:

- Start up
- Idle
- Radio TX
- GPS Read
- BUS communication
- SD Card write

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Ambient temperature		24°C	
2	Measure voltage level for at least 10 operational and 5 APRS TX cycles			Passed
3	Voltage drop on Start up	2.7 < U < 3.6		Passed
4	Voltage drop during Idle	2.7 < U < 3.6		Passed
5	Voltage drop during Radio TX	2.5 < U < 3.6		Passed
6	Voltage drop during GPS Read	2.7 < U < 3.6 (TBC)		Passed
7	Voltage drop during SD Card write	2.7 < U < 3.6		Passed
8	Voltage drop during APRS TX	2.7 < U < 3.6 (TBC)	5V	Passed
9	Brownout reset	U < 1.8 V		Passed

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Suite : COM.RFxxx

Test Case matef-9: Startup

Summary:

Check if module startup properly

- Startup message

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium
Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Case matef-10: Incoming Telemetry message

Summary:

Incoming Telemetry message:

- TMLTM processed
- Telemetry radio packet created in proper format
- Radio pacet sent via RF transciever

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium
Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Case matef-11: Incoming Housekeeping request

Summary:

Incoming Housekeeping request message:

- TMHKR processed
- Housekeeping data read properly
- TCHKD messages sent in proper format

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Blocked**	
Execution Mode:	**Manual**	
Execution duration (min):		
Execution notes	Out of scope	

Test Case matef-15: Voltage Drop

Summary:

Test voltage levels during operation.

Measure bus-voltage in the following operation stages:

- Start up
- Idle
- Radio TX
- Radio RX
- APRS TX

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Ambient temperature		24°C	
2	Measure voltage level for at least 10 TX, 10 RX and 5 APRS TX cycles			Passed
3	Voltage drop on Start up	2.7 < U < 3.6		Passed
4	Voltage drop during Idle	2.7 < U < 3.6		Passed
5	Voltage drop during TX	2.5 < U < 3.6		Passed
6	Voltage drop during RX	2.7 < U < 3.6 (TBC)		Blocked
7	Voltage drop during APRS TX	2.7 < U < 3.6 (TBC)	4,5V	Passed
8	Brownout reset	U < 1.8 V		Passed

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Case matef-88: Current Consumption

Summary:

Measure current consumption during operation.

Determine the current consumption of the following operation stages:

- Idle
- Radio TX
- Radio RX

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Ambient temperature		24°C	Passed
2	Measure current consumption for at least 10 TX and 10 RX cycles			Passed
3	Idle current consumption	I < 30 mA	~20mA	Passed
4	TX current consumption	I < 100 mA	~95mA	Passed
5	RX current consumption	I < 100 mA	out of scope	Blocked
Execution type:	Manual			
Estimated exec. duration (min):				
Priority:	Medium			
Execution Details				
Build	MATeF - 2 mod 2 - EN			
Tester	Bence Góczán			
Execution Result:	**Passed**			
Execution Mode:	**Manual**			
Execution duration (min):				

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Test Suite : Flight Operations

Test Case matef-34: Radio Downlink	
Summary: Check radio downlink, message format, message data • OBC+COM+EPS+GPS • Battery Powered • GPS bypass, PC simulator, valid GPS data, short, controlled datastream • Radio link to GND Output • GND Logs • DIAG Logs	
Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium
Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	

Test Case matef-35: Radio Uplink

Summary:

Check processing of incoming radio packets

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, valid GPS data, short, controlled datastream
- Radio link to GND

Output

- GND Logs
- DIAG Logs

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Blocked**	
Execution Mode:	**Manual**	
Execution duration (min):		
Execution notes	out of scope	

Test Case matef-36: Radio Power

Summary:

Check radio downlink power

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, valid GPS data, short, controlled datastream
- Radio connected directly to spectrum analizer

Output

- Spectrum analizer data

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod1
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	
Execution notes	+ 15dBm

Test Case matef-30: Telemetry - Valid GPS

Summary:

Check telemetry processing with PC-GPS Simulator providing valid GPS messages.

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, valid GPS data, short, controlled datastream
- Radio link to GND

Output

- SD Log
- GND Logs
- DIAG Logs

Execution type:	Manual	
Estimated exec. duration (min):		
Priority:	Medium	
Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-82: Telemetry - No GPS Connection

Summary:

Check telemetry processing with PC-GPS Simulator providing invalid GPS messages with no fix

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, no GPS data (signal off), short, controlled datastream
- Radio link to GND

Output

- SD Log
- GND Logs
- DIAG Logs

Execution type:	Manual	
Estimated exec. duration (min):		
Priority:	Medium	
Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-32: House keeping

Summary:

Check collected house keeping data: COM module temperature, OBC module temperature

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, valid GPS data, short, controlled datastream
- Radio link to GND

Output

- SD Log
- GND Logs
- DIAG Logs

Execution type:	Manual	
Estimated exec. duration (min):		
Priority:	Medium	
Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-33: Environmental Data

Summary:

Check collected environmental data: External Temperature

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, valid GPS data, short, controlled datastream
- Radio link to GND

Output

- SD Log
- GND Logs
- DIAG Logs

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details		
Build	MATeF - 2 mod 2 - EN	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-91: Current Consumption After EPS

Summary:

Measure current consumption during operation.

Determine the current consumption of the following operation stages:

- Start up
- Idle
- Radio TX
- Radio RX
- BUS communications
- SD Card handling
- APRS TX

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Ambient temperature		24°C	Passed
2	Measure current consumption for at least 10 TX, 10 RX and 5 APRS TX cycles			Passed
3	Start up current consumption	(TBD)	avg: 90mA max: 163mA	Passed
4	Idle current consumption	TBD	~90mA	Passed
5	Radio TX current consumption	TBD	~170mA	Passed
6	Radio RX current consumption	TBD	out of scope	Blocked
7	BUS communication current consumption	TBD	~90mA	Passed
8	SD Card handling current consumption	TBD	~95mA	Passed
9	APRS TX current consumption	TBD	not appear	Passed

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	
Execution notes	proper 500 ohm APRS antenna

Test Case matef-92: Current Consumption Before EPS

Summary:

Measure current consumption during operation.

Determine the current consumption of the following operation stages:

- Start up
- Idle
- Radio TX
- Radio RX
- BUS communications
- SD Card handling
- APRS TX

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Ambient temperature		24°C	Passed
2	Measure current consumption for at least 10 TX, 10 RX and 5 APRS TX cycles			Passed
3	Start up current consumption	(TBD)	avg: 80mA max: 122mA	Passed
4	Idle current consumption	TBD	~80mA	Passed
5	Radio TX current consumption	TBD	~125mA	Passed
6	Radio RX current consumption	TBD	out of scope	Blocked
7	BUS communication current consumption	TBD	~80mA	Passed
8	SD Card handling current consumption	TBD	~80mA	Passed
9	APRS TX current consumption	TBD	~910mA	Passed

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	
Execution notes	proper 50 ohm APRS antenna

Test Case matef-93: BEACON mode

Summary:

Test BEACON mode activation:

In NORMAL mode:

- Increase altitude over 1000m
- Decrease altituder under 300m

In BEACON mode:

- Increase altitude over 500m
- Decrease altitude under 300m

#:	Step actions:	Expected Results:	Execution notes:	Execution Status:
1	Increase altitude over 1000m	Stays in NORMAL mode		Passed
2	Decrease altitude under 300m	BEACON mode activates under 500m		Passed
3	Increase altitude in BEACON mode over 500m	Automatic switch to NORMAL mode over 500m		Passed
4	Decrease altitude under 300m	BEACON modes activates under 500m		Passed
Execution type:	Manual			
Estimated exec. duration (min):				
Priority:	Medium			
Execution Details				
Build	MATeF - 2 mod 2 - EN			
Tester	Bence Góczán			
Execution Result:	**Passed**			
Execution Mode:	**Manual**			
Execution duration (min):				

Test Case matef-39: Complete Flight - over 18K - no limit

Summary:

Check behavour during a complete flight over 18000m (up to 35000m) using predictor data output. Valid GPS signal the whole time

- OBC+COM+EPS+GPS
- Battery Powered
- GPS bypass, PC simulator, valid GPS data, predictor flight data
- Radio link to GND

Output

- SD Log
- GND Logs
- DIAG Logs

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod 2 - EN
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	
Execution notes	'quick log' was used

Test Suite : Main GPS

Test Case matef-26: Below 18K

Summary:

Test GPS module with GPS Simulator

- Altitudes below 18000m

Execution type:	Manual	
Estimated exec. duration (min):		
Priority:	Medium	
Execution Details		
Build	MATeF - 2 mod1	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-27: Over 18K

Summary:

Test GPS module with GPS simulator

- Altitudes over 18000m

Execution type:	Manual	
Estimated exec. duration (min):		
Priority:	Medium	
Execution Details		
Build	MATeF - 2 mod1	
Tester	Bence Góczán	
Execution Result:	**Passed**	
Execution Mode:	**Manual**	
Execution duration (min):		

Test Case matef-80: Over 50K

Summary:

Test GPS module with GPS simulator

- Altitudes over 50000m

Execution type:	Manual
Estimated exec. duration (min):	
Priority:	Medium

Execution Details	
Build	MATeF - 2 mod1
Tester	Bence Góczán
Execution Result:	**Passed**
Execution Mode:	**Manual**
Execution duration (min):	