Documet No.3: BB3 first setup and quick start procedure

Because BB3's has been in a few times longer in unpredictible condtions, a few steps are essential to do to avoid future problems, All these tests MUST be done by trained engineers only and expected report filled in to remember initial BB3 state. If any questions, contact **Pavel** if necessary. Do not do anything if you are not sure what you do! Especially battery tests are essential and can be potentially dangerous (risk of fire)

Note: Those tests should be performed annually also, one year base recommended.

Prerequisities:

- Engineers only
- BB3 training absolved
- multimeter (voltmeter)
- dummy load 100W with cables or suitable transmitter antenna
- AC wallplug
- Suitable solar panell(s) (>150W, 25VDC open voltage MAX!!)

1/ Complex mechanical check

Conditions: - all protection switches are off

- BB3 is NOT inserted in wall plug or to solar panel(s)

- antenna(s) not connected

- observe if box itself ins not mechanically damaged
- check if battery cover is placed right on its place
- check all mainboard connectors

2/ AC Power supply test

Conditions: - all protection switches are off

- BB3 is inserted in wall plug

- antenna(s) not connected

- switch AC main switch ON
- mainboard should get running
- as it boots, check voltage displayed on service display. The voltage should be in range of 13.8V - 14.4V

3/ Battery Cell tests

Conditions: - all protection switches are off

- BB3 is NOT inserted in wall plug

- antenna(s) not connected

- disconnect loudspeaker plugs

- slightly move up front of the cover and disconnect 12V lighter connectors

- remove slowly battery cover out of the box

- check each cell voltage; do it carefully, batteries are interconnected. If anything shortcuts, inter battery fuses are going to get blown. In such case, exchanging fuses must be performed. This allows both batteries from shaft must me removed and its not very easy, so be careful with that.

- You should measure voltage ranges:

1/ >3.3V means cell is charged on safe value

2/ 3.0-3.3V cell is discharged, but safe operational value

3/ 2.7-3.0V cell is undercharged, still should get charged internally from BB3

4/ 0<2.7V cell is at dangerous level, might be damaged. There is a probability that cell can't not be charged by internal charging system. External charge to minimum level 3/ might be necessary. Contact head engineer with discussion about proper way how to make it

!note all initial voltages! are initial battery state; save them to compare annually battery state

4/ Battery package voltage check

Conditions: - BB3 powered by wall plug

- AC main switch ON, other left OFF

- antenna(s) not connected

Note: Mainboard should BOOT. If not, contact Head engineer(s)

- check mainboard service display voltage, should be equal as in 2/

- then move Battery switch ON, wait for cca 10s and check voltage again. Voltage should be equal or higher than all cell voltages in addition.

- let it charge to full voltage (should take cca 5hrs). Observe voltage, should rise up to >13.8V (fully chraged). Maximum charged voltage MUST NOT exceed 14.6V

- let BB3 working for cca 1Hr on idle to stabilize cell voltages

- check all cells voltages

!note all full charge voltages! to remember initial battery state; then compare later, every year of usage at maximum period

5/ discharge check (optionally - long time test)

Conditions: - *Battery switch ON, other left OFF, (switch OFF AC switch)*

- *antenna(s) not connected*

Note: Mainboard should still running without interruption. If not, contact Head engineer(s)

- let BB3 working unless service display displays LOW battery

- check all cells voltages

!note all discharge voltages! to remember initial battery state; then compare later, every year of usage at maximum period

- let charge to full again (should take max 6hr while on full charging power)

6/ Solar charger tests

Conditions: - *BB3 not powered by wall plug*

- *all switches off, Battery switch ON*

- *proper solar panel(s) ready to be connected*

- *antenna(s) not connected*

Note: avoid running BB3 with battery switch off. Although it should work in IDLE and with enough solar or AC power it even should works when transmits, but voltage is unstable and can potentially cause issues when fluctuates.

- check BB3 voltage before solar panel connected, should be in a range of 10.8-13.5V (if voltage higher, battery are fully charged so full load solar charger test cannot be performed)

- connect panels, observe voltage. Should rise slowly up to 14.6V maximum. If >13.5V, batteries are fully charged

- check charger temperature by hand, it should not rise over 50C under full load (battery voltage <13.4V and solar panel of >150W is fully exposed by sun)

6/ Functionality tests

After successful power and battery tests a set of functionality tests is recommended. All mainboards should be equipped with USB stick with all sample music needed for tests.

Note: if you note some issues with USB FLASH stick, don't hesitate to try to exchange it with another one. Size does not matter, FAT32 format smaller than 32GB recommended. Although we test all USB sticks through output tests, lately, we found that some USB sticks from this supplier having sometimes issues such as: they don't start sometimes after boot, must be removed and insert in again or they have mismatch in FAT table.

Conditions: - *at least Battery switch ON*

- transmitter switch is OFF or dummy load installed

- battery is charged enough to work.

- FM receiving antenna connected

- dummy load for FM transmitter properly connected

a/ Temperature sensors test

- check mainboard temperature and humidity, should be on some reasonable value

- check service menu0 bottom, there are 6x temperature sensors values.

- first four are internal sensors, should be equal or similar to ambient temperature within a few degrees +- (if BB3 is in idle and not charging/transmitting)

- fifth sensor is a spare one which is inserted in plug space

- sixth is not installed

Note: DO NOT save any sensor settings, they should be assigned properly already. If you have suspicion that something is wrong, ask Head engineer. You can adjust FAN temperatures according to local conditions.

b/ Ventilator tests

- press reset button on mainboard and listen. You should hear FANs blowing for a few seconds while booting

- go to FAN assign menu

- ensure ambient temperature is LOW enough that no FAN is blowing currently

- change temperature for one of four fans to some HIGH temperature, 10-20 deg. lower than ambient is the best. You should hear if start blowing within a few seconds. After is checked, return temperature to previous value. Do this sequentially for all of four FANs

c/ Receiver tests

- install receiving antenna

- tune receiver to proper frequency

- turn ON volume knob and listen

- check if you hear proper station, check stereo label

d/ MP3 player test

Conditions: *- at least Battery switch ON*

- transmitter switch is OFF or dummy load installed

- *battery is charged enough to work (if not, service trigger is not permitted)*

- microSD or USB memory with proper music inserted

- press manual trigger button (service menu 0 must be active)

- you should hear music from speakers, service menu should show player info

e/ Transmitter tests

Conditions: - *at least Battery switch ON*

- *transmitter switch is ON and dummy load or Tx antenna installed*

- *battery is charged enough to work (if not, service trigger is not permitted)*

- microSD or USB memory with proper music inserted

Note: do NOT!! switch on Tx switch if dummy load or Tx antenna not connected. Although BB3 has a protection system, still there is a potential risk to damage transmitter module if there is not proper load installed

- press manual trigger button (service menu 0 must be active)

- you should hear music from speakers, service menu should show player info

- you should see transmitted power at service display, value should be +- 1W equal to preset value in Transmit menu, you should hear your music from transistor radio tuned to yours frequency