Installation & User's Guide

Voice & Data Recorder

(NORSEE Certified Edition)

Models:

VBox / VBox PLUS

Date: 11/29/2022

Ref: VBox-X-01

Rev A1

Revision History

Revision	Date	Description
A	11/11/2022	First Release
A1	11/29/2022	RS232 Input Limitation

1 Limited Warranty / Disclaimers

Microkit Solutions LLC warrants this product for materials and workmanship for a period of one year starting from the date of installation. Microkit Solutions, at its sole discretion, will either repair or replace this product if found to be defective due to material or workmanship during this period and under normal use.

This limited warranty does not cover units which have been opened, disassembled, altered, modified, or tampered with in any form. This warranty does not apply to cosmetic damage, damage caused by accident, misuse, abuse, fire or flood, theft, improper connections, or installation errors.

All repair and/or replacement under this warranty are free to the customer. However, the customer is responsible for any shipping charges and any related removal and reinstallation costs.

This warranty covers the original purchaser only. This limited warranty is not transferable to subsequent purchasers or owners of this product.

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SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO PART OF THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

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2 Introduction

The Microkit Voice & Data Recorder (VBox) is a fully digital device that records Audio & Data feed. It is the General Aviation equivalent of the known aviation BlackBox. Recording up to 50 hours (Looping) of audio voice communication on the radio and internal intercom communications. Basically, VBox records all communications heard on the headphones.

This Voice & Data Recorder is also designed to record up to 50 hours (Looping) of data if the aircraft is equipped with an RS232 Out feed for Telemetry and/or Engine monitoring data using a fully isolated RS232 interface.

The Voice & Data Recorder is fully encapsulated with a UL94V-0 flame retardant self-distinguishing electronic potting compound. This potting compound protects against shocks, vibrations, moisture and heat.

The unit uses WiFi to download saved voice and data recordings. The VBox is designed to be running all the time with Aircraft Master Switch. All recordings are looping; this means once full, the unit records over from the beginning, resulting in the last 50 hours remaining available for download.

3 Specifications

- Voltage Supply: 9V-28V (30V MAX)
- Power consumption: 0.5W Nominal; 80mA @ 12V Peak
- Operating Temperature: -4° F (-20° C) to +140° F (60° C)
- Storage Temperature: -4° F (-20° C) to 185° F (85° C)
- Weight: 6 oz
- General Dimensions: 4” x 3” x 1.5”

4 Installation Instructions & Limitations

Installers are required to read this section fully before starting the installation and to note any limitations for the installation of this Voice only or Voice & Data Recorder.

Installation of this system is supplemental only; it is not intended as a replacement for or modification to an existing, approved, or required system. No operational credit may be taken for installation of this system.

4.1 Installers

This unit must be installed by an authorized mechanic for the Aircraft type and model. Installers are required to log the installation appropriately. The installation of the Voice only or Voice & Data Recorder is considered a 'minor alteration'.

4.2 Location

All VBox models include mounting flanges. Installers are required to mount the unit hidden from view at an appropriate location with an appropriate mounting plate if required. The VBox unit is very light (6 oz) and can be installed at various locations (preferably behind the aircraft instrument panel, connected to the pilot headphone jack)

Do not install the unit within 1" of wiring that carries high-current, such as alternator or battery wiring. Do not install the unit within 12" of transmitting antennas such as Radio antenna, Transponder Antenna or ADS-B out Antenna.

Any adjacent cables, control rods or moving parts must be checked for its full movement range. The unit can be installed at any angle, or orientation, including upside down.

4.3 Connection Limitation

A dedicated 1A circuit breaker with Push/Pull feature is the recommended method for aircraft power connection to the VBox unit. This circuit breaker must be labeled appropriately, such as “VBox” or “Recorder”. The VBox can also share power with non-essential equipment only.

4.4 Wiring

Depending on the unit or features ordered, VBox models come with either a Quick-Disconnect Aviation Connector or a Quick Disconnect Aviation plug pre-wired with a 7-color coded wiring harness.

Use AWG24 or better shielded cables. Refer to each section below.

PIN	Color	Function
1	**Red**	+12V/28V Power Supply
2	**Black**	Aircraft Ground
3	Yellow	Headphone Sleeve
4	**Blue**	Headphone Tip
5	**Green**	RS232 Ground ***(VBox PLUS model)***
6	White	RS232 Input ***(VBox PLUS model)***
7	Brown	Do Not Connect. Optional Input (future use)

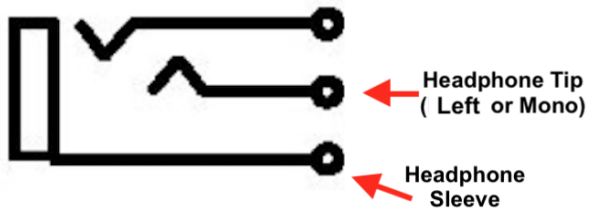
4.4.1 Power Supply (Pins 1 & 2)

It is recommended to use a 2-core shielded cable with all shields to be combined and attached to the Aircraft Ground from one end.

4.4.2 Headphone Jack Connection (Pins 3 & 4)

Do not remove any existing wiring from the headphone Jack. Connections mentioned here are (EXTRA or SPLICED) and not INSTEAD

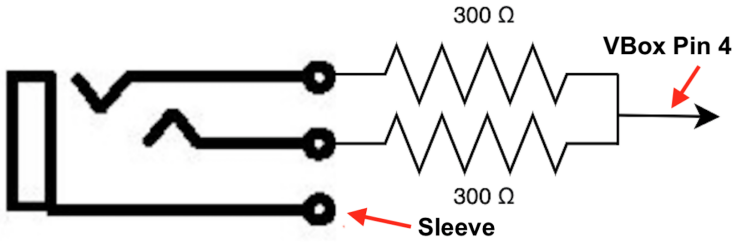
It is recommended to use a 2-core shielded cable with the shield joined as above. Pin 3 (Yellow) connects to the Sleeve at the back of any headphone jack. Pin 4 (**Blue**) connects to the Tip (Left Channel) at the back of any headphone jack.



FOR 3D AUDIO

Airplanes that have a 3D capable Audio Panel and using Stereo headsets are still able to use the above connection method. New panels are offering 3D Audio, allowing pilots to set up the active channel to be heard on one ear while the standby channel to be heard on the other ear. However, using the above method causes the Ring (Right channel) to be recorded at a lower volume when 3D Audio is active. To record 3D audio, installers can use two 300 ohm resistors and join both Left & Right channels to the single audio wire of the VBox (Pin 4: **Blue**).

Refer to the following diagram for resistor connections.



For Stereo or Mono Headsets without 3D, a resistor is not required and the VBox can connect directly to the Tip of the headphone jack.

USING AN EXTERNAL HEADPHONE SPLITTER

Using an external Headphone jack splitter such as pictured is possible, providing the cabling is not obstructive to pilot view or other equipment or switches. Such a splitter connects to the headphone jack and offers a wire to be connected to the VBox and a female Headphone jack to be connected to the headset.

4.4.3 RS232 Input Connection (Pins 5 & 6) (VBox PLUS model)

RS232 Input Limitation (for Certified Airplanes only)

RS232 real-time data feed to the VBox RS232 input is limited to Systems that have been approved and authorized by the FAA to output such data in-flight. This means the manufacturer of such equipment must have included the RS232 output in their FAA approval and the manufacturer allows external devices to use their RS232 output pin to record/gather this data in real-time.

VBox firmware is able to retrieve "saved" data after the flight for equipment that do not offer real-time in-flight data or are not FAA approved for real-time external RS232 output connection.

It is recommended to use a 2-core shielded cable with the shield joined as above. Connect RS232 TX output from an approved equipment that sends telemetry and/or engine monitoring data to VBox PLUS Pin 6 (White) Connect RS232 GND pin (if offered) to VBox PLUS Pin 5 (**Green**). Leave (**Green**) unconnected if the approved equipment does not offer an RS232 GND reference pin.

4.4.4 Optional Input (Pin 7)

An input channel intended to be used with a Toggle Switch for future functions once required.

5 Maintenance

The VBox and VBox PLUS units do not require any field maintenance or inspection.

6 Software Features & WiFi Connection

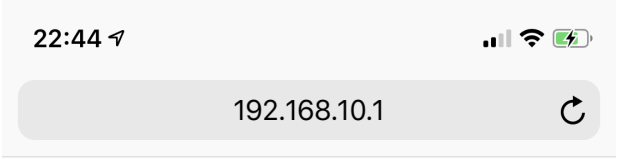
6.1 Wi-Fi Connection

VBox uses a Wi-Fi connection to generate and retrieve audio and data files. All data are initially recorded in raw format for faster acquisition and recording. Once a segment or partial recording is required, WiFi connection to the unit allows the unit to generate the required segment.

Use your device Wi-Fi Search and look for **VB_xxxxxx**. The xxxxxx is the unique serial number of the unit. The default Wi-Fi Password: **19251970**

The Wi-Fi System is designed for the Phone screen, but can be used with PCs/Laptops and Tablets such as iPads.

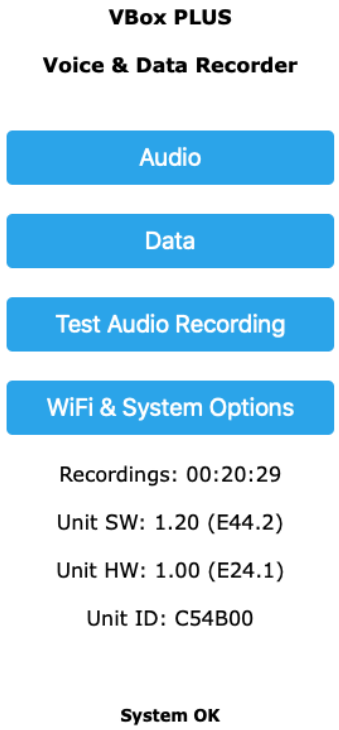
Once connected, use your device Browser (Safari / Chrome / others) to connect to the system. Input **http://192.168.10.1** on the browser. New devices may require the HTTP:// part, while most devices can accept the IP directly.



6.2 Main Page

Once connected, the main page is displayed, which includes the software firmware, hardware edition and current stored **Hour:Min:Seconds** of Audio Recordings available.

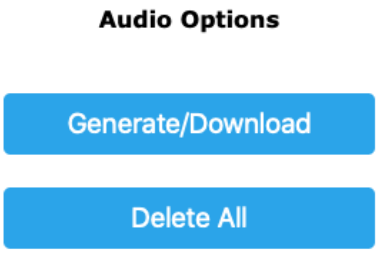
This page also displays the unit serial number.



6.3 Audio Menu

This page displays available options for the Audio Recording portion of the VBox unit.

Delete All: Wipes the system clean of all audio recordings, and audio raw data.



Back

THIS IS NOT RECOMMENDED. IT IS BEST TO LET THE SYSTEM LOOPS AROUND.

This is offered for certain situations such as after testing, when the airplane is being sold, or if it's hired then Delete All can be used after downloading all recordings.

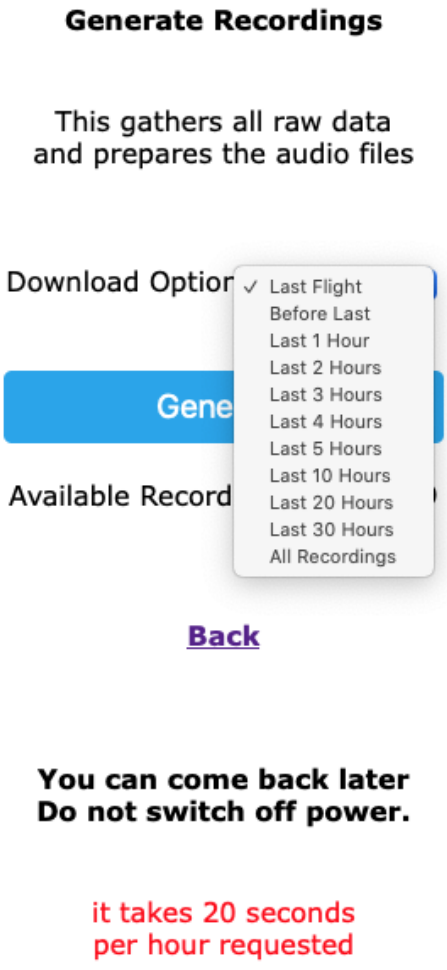
6.4 Generate/Download

Select the time-slot required. The unit flags a recording as a Flight if it recorded at least 10 min.

It takes 20 seconds for each hour of recordings to be generated and to prepare the file.

All files (except Last Flight and Flight Before) are generated based on one hour segments. Files are displayed as T-1, T-2 and so on. T stands for Time. So T-1 is the last hour.

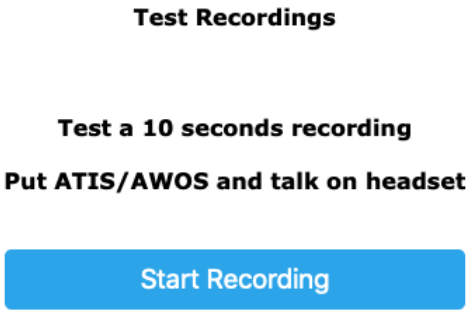
This one hour break-up of files allows faster download over WiFi (each file is about 5.6 MB).



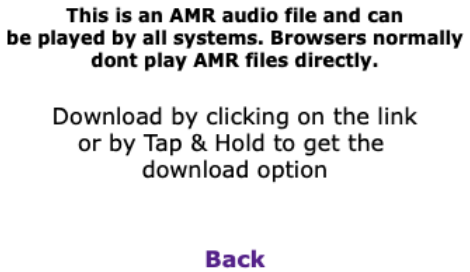
The Last Flight and Flight Before are generated as a single file each.

Downloading large files over WiFi to your device, especially phones or tablets, is slow. The browser should indicate the progress of the file being downloaded, wait until downloading is complete before closing the page, navigate to another page, or selecting another file for download.

6.5 Test Audio Recording

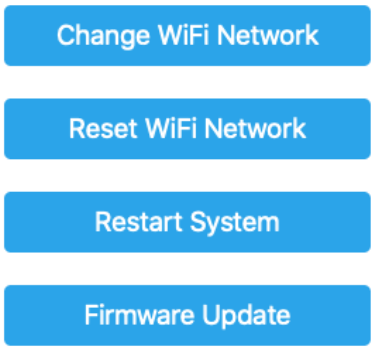


Installers can use this option to record a 10-seconds audio segment. Listen to ATIS/AWOS or Tower and also talk on the headset during the displayed 10 seconds countdown.



A file is presented immediately once completed to confirm installation and wiring are successful.

6.6 WiFi & System Options



This page allows changing the default Wi-Fi network name with any other name, such as your Tail-Number. When changed, the system will restart.

Search and connect to the new Wi-Fi network name.

Note, this is case-sensitive.

It's recommended to change the default Wi-Fi Password

When changing the password, make sure at least one of your devices (phone or iPad) saves the new password and can connect to the unit again without asking for the password. If you forget the new password, the only way to reset it is either by using a device (phone or iPad) that saved the password and reset using this page or by returning the unit back for firmware re-programming. We have no way of knowing your new password if you are unable to connect to the unit.

6.7 Firmware Update

This allows in-field Firmware upgrades once available.