XV1-R Portable Stereo Recorder

USER GUIDE

Basic Workflow

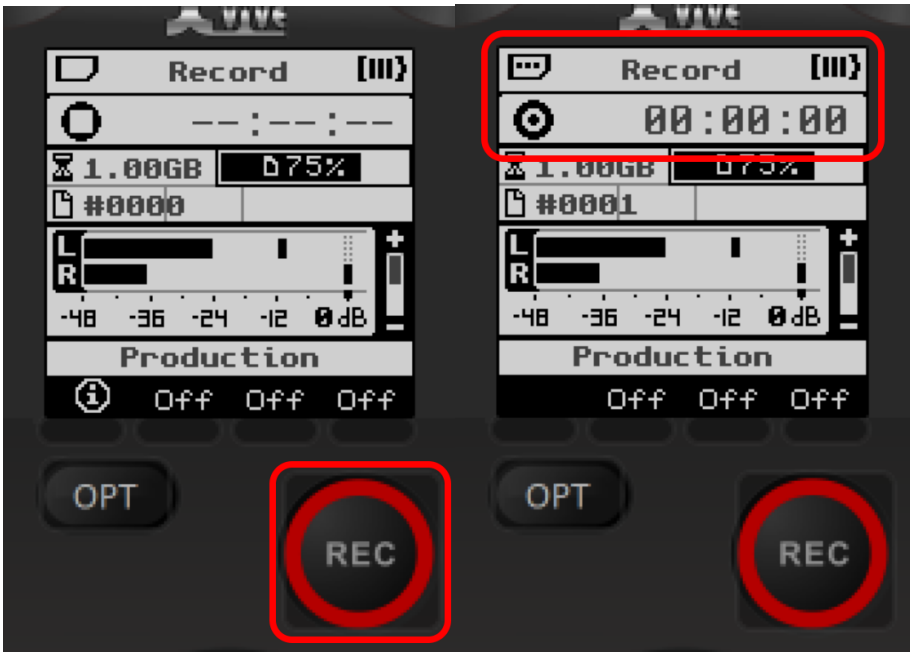
Layout

Power

Turn the device on by holding the power switch in the down position for 2 seconds. When the device is on, holding down the power switch again will shut down the system. See ‘Power Switching’ for more.

Recording

1. Press RECORD to navigate to the recording screen.
2. Press RECORD again to begin recording. When the record button LEDs are orange, the device is recording.
3. Press STOP to complete the recording.
4. Press HOME to navigate to the playback screen. The last recorded file will be opened.



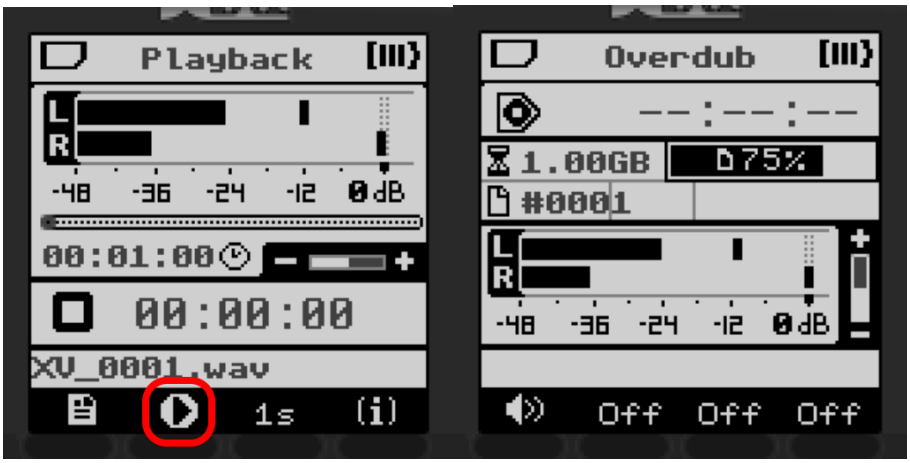
Playback

1. Press HOME to navigate to the playback screen.
2. (Optional) Tap the PREV/NEXT arrows to navigate through marks and files.
3. Press the PLAY button to play and pause the current file.
4. Hold the PREV/NEXT buttons to seek back and forth in the current file.
5. Press STOP to end playback and seek back to the start of the file.

Overdub

1. Open a WAV file in the playback screen.
2. (Optional) Seek to any point in the file to overdub there.
3. Press the overdub icon in the button bar to open the overdub screen.
4. See ‘Recording’ for more info on how to record files.

Note: Auto-level, pre-record, and auto-record are not available in overdub mode



Marks

In playback

Press MARK to add a mark.

Press PREV or NEXT to skip between the next and previous marks. This will show a dialog of the mark which has been skipped to. Attempting to add a mark will also show this dialog if a mark is already present at that position in the file.

- Press MARK while this dialog is open to delete the mark.

- Press PREV/NEXT while in this dialog to navigate to the previous/next mark.

Pressing stop will cause a prompt to appear, asking the user to save their changes.

- Press the confirm icon  , or PLAY, to save any changes made to the marks in the current file.
- Press CANCEL  or STOP to return to the playback screen.
- Press the trash icon  to discard your changes without saving.

In Recording

Marks can be added by pressing MARK. The marks will later be available for navigation in the playback screen.

Deleting Files

Files can be deleted from multiple menus:

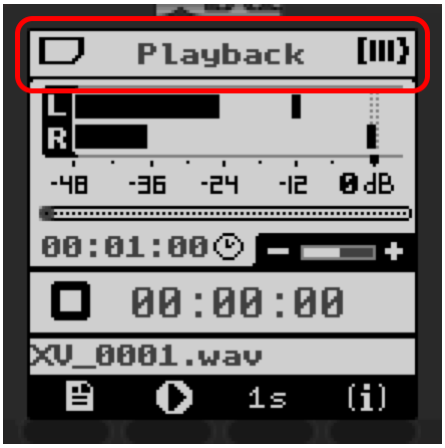
- The active file can be deleted on the playback screen by pressing DELETE.
- The last recorded file can be deleted on the record screen by pressing DELETE.
- The selected file can be deleted in the 'Files' menu by pressing DELETE or the trash icon  .
- In the file menu, pressing DELETE or the trash icon  will delete the active file.

Each of these prompts the user to confirm deletion  or cancel  .

User Interface

Status Bar

The status bar is present in all menus, and displays the status of the SD card, the current menu name, and the battery level.



The SD card status is shown in the top left corner.

In order, the symbols are:

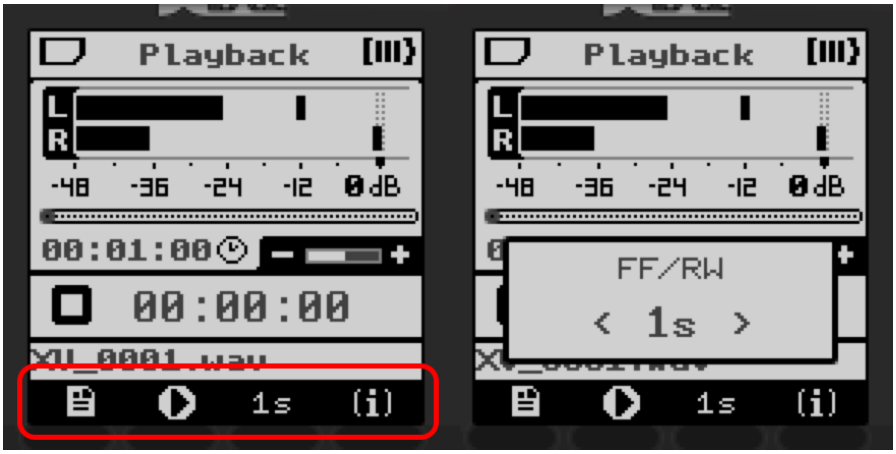
1. Card OK: Displays during normal operation. The user may safely eject.
2. Card Busy: Displays when the card is being written to, reformatted, or checked. This also shows when the card is in the process of mounting or unmounting. Ejecting when this symbol is displayed may lead to a corrupt file or file system.
3. No Card: Displays when no card is inserted. If a card is inserted and this symbol still shows, eject the card and reinsert.
4. Warning: Indicates an error. Reformatting (if prompted) or reinserting may be helpful.

The current menu name is shown in the top center. When the UI is locked, this will read ‘[LOCKED]’ instead. See UI Lock.

The battery level will show 0 to 3 bars in the top right corner.

At 1-3 bars, the device will operate as normal. After 0 bars, there may be restrictions. See ‘Battery Levels.’

Multi-Button Bar



The bottom of the screen contains symbols showing contextual actions or values for quick-access parameters. Pressing the button underneath a symbol will perform the corresponding action (e.g., deleting a file, or switching to another menu).

If a value is displayed, pressing the button underneath moves focus to a parameter pop-up allowing the user to change the parameter’s value. This pop-up contains the parameter name, the parameter value, and arrows indicating whether the parameter is at its minimum or maximum.

In certain contexts, holding the OPT button brings up a second set of multi-button options.

Recording Screen

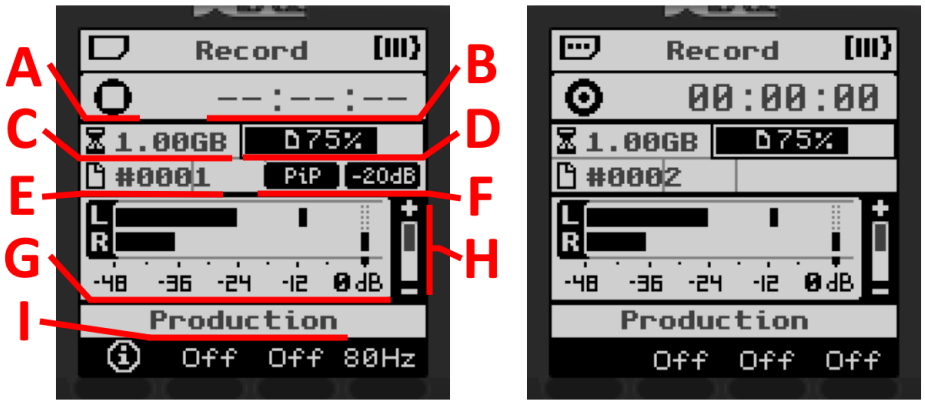
The recording screen allows the user to record new audio files. To navigate to this screen, press the record button from any context.

If not currently recording, pressing the record button from this menu begins a new recording (or arms the device, if using auto-record). While recording, the STOP button stops the recording and finalizes the file, and the play button may be used to pause or resume recording.

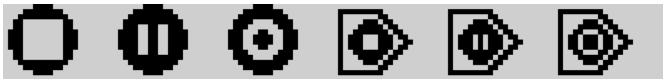
The LEDs behind the recording button will show orange when recording is active. If clipping is detected, the LEDs will flash red.

Press PLUS or MINUS to change the gain while recording. When the gain reaches a certain level, the user will be prompted to enable or disable the mic pad. Pressing confirm increases or decreases the gain as requested, though a click may be heard while the pad is changed.

While recording, pressing the MARK button adds a new mark to the file, up to a maximum of 1000.



A. **Audio status indicator:** The indicator has three states each for recording and overdub modes.



In order, the symbols show:

1. **Stopped:** Recording has not begun.
2. **Paused:** A file is open, but recording has been paused.
3. **Recording:** Recording is active, and the file is being written to.
4. **Overdub Stopped:** Recording has not begun.
5. **Overdub Paused:** Files are open for overdub, but playback and recording have been paused.
6. **Overdub Recording:** Overdub is active, and a new file is being written to while the original file is playing.

B. **Recording timecode:** This shows the length of the current recording.

C. **Card storage remaining**, in bytes.

D. **Card storage used**, as a percent. An empty card shows 0%, while a full card shows 100%.

E. **File number:** The recording will be written to a file ending with this number (e.g., recording a WAV file with “#0002” will create a file “XV_0002.wav”)

This number is incremented from the highest-numbered file currently in the XVIVE folder. For example, if XV_0100.wav is found in the folder, the next file will be named XV_0101.wav, regardless of whether files 1-99 are present.

F. **PiP:** When shown, indicates that ‘Plug-in Power’ is on.
-20dB: When shown, indicates that the mic pad is on.

See ‘System Settings’ for more information on these settings.

G. **Input audio meter:** The metered signal is post-FX, post-gain, and reflects what is written to the file.

H. **Input gain slider:** Shows the gain applied to the indicator, or ‘A’ if auto-level is used.

I. **Profile name:** The name of the currently selected profile, followed by an asterisk if the profile has been modified.

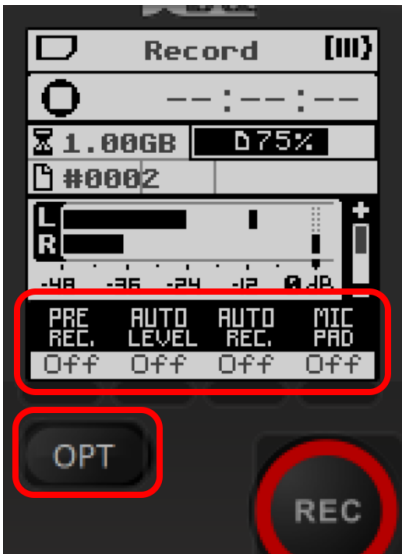
The multi-button bar in this menu contains:

1.  **Profile:** Switch to the profile select screen.

   In overdub mode, this setting is replaced by the overdub level, shown as  .
2. **Gate** Effect
3. **Compressor** Effect
4. **Lowcut** Effect

See ‘Recording Profiles’ and ‘Recording Effects’ for more information.

When OPT is held:



1. **Pre-record**
2. **Auto-level**
3. **Auto-record**
4. **Mic pad**. Enable this to reduce the effective input gain by an additional 20 dB.

See ‘Recording Settings’ for more information.

Playback Screen

The playback screen allows the user to view and play audio files on the SD card. This is often the first screen that appears when the device is powered on, and can be navigated to at any time by pressing HOME.

Any supported file with the '.wav' or '.m4a' extension should be playable through this menu. If the file is corrupted or unsupported, a prompt will notify the user on opening the file.

Pressing the play button on this screen will pause or resume playback, and pressing stop will pause and return to the beginning of playback. Pressing PLUS or MINUS will increase or decrease the system playback volume.

When playback is active, the LED on the front of the device will show GREEN.

Seeking

When a file is open, tap PREV or NEXT to jump to the previous or next mark, respectively. If there are no marks in the selected file, this will instead jump to the beginning or end of the file. When at the beginning of a file, tapping PREV will move to the previous file, and similarly, when at the end of a file, tapping NEXT will move to the next file.

Fast Forward / Rewind

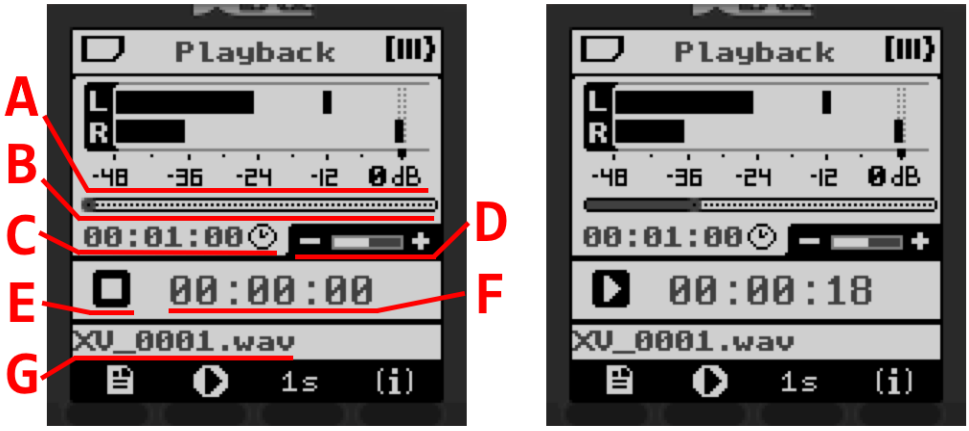
Holding PREV or NEXT will rewind or fast forward until the button is released. Fast forward and rewind both jump in increments of the 'FF/RW' parameter every 0.5 seconds. Using this does not pause the audio during playback.

Marks

Pressing MARK while a file is open will place a mark at the current time position. If a mark already exists at this position, pressing this button will instead show a pop-up with the mark number, and pressing once more will delete the current mark.

Note that any marks added or removed are not saved until the file is closed. Ejecting the SD card with unsaved marks will lose these changes.

To save edited marks, press the STOP button and confirm  when prompted to save. If you do not wish to keep these changes, press the delete  icon in this prompt to discard all unsaved marks, or cancel  to return to playback. This prompt is also shown when navigating away from a file with unsaved marks.



A. **Output audio meter:** The metered signal is the content of the audio file and is unaffected by the system volume.
B. **Playback bar:** This shows the current position of playback.
C. The **length** of the selected file.
D. **System volume** slider.
E. **Audio status** indicator.

In order, the symbols show:

1. **Stopped:** Playback is stopped at the beginning of the file.
2. **Paused:** Playback is paused.
3. **Playing:** Playback is active.

F. **Playback timecode:** This shows the current position of the playback.
G. **Selected file name**.

The multi-button bar in this menu contains, in order:

1.  **Files:** Switch to ‘Files’ screen.
2.  **Overdub:** Switch to ‘Overdub’ screen. This is only displayed when a WAV file is selected.
3. FF/RW: Fast forward/rewind interval. While the PREV or NEXT button is held, the playback position will jump by this amount every 0.5 seconds.
4.  **File Info:** Switch to ‘File Info’ screen for the selected file.

And when OPT is held:

1.  **Repeat:** The repeat parameter controls if and how files repeat.

2. **No action.**
3. **Playback rate parameter:** Applies a time-stretch to the audio.
4.  **Test tone:** Press once to play a test tone through the LINE OUT, and press again to end. The test tone does not play on the speaker.

Settings Menu

Pressing the MENU button will open the Settings Menu, which contains a number of sub-menus to change parameters, interact with the file system, and more.

To navigate these menus, press PLUS or MINUS to move the selection up or down, respectively. The selected item will be indicated with a black border above and below. While an item is selected pressing PLAY or NEXT will interact with this item. If the item is a submenu, this will navigate into the corresponding submenu. If this item is a parameter, the selection will move to the parameter value, which can then be set using PLUS/MINUS.

If the number of items extends beyond the visible range, arrows in the top left and/or bottom left corners indicate that the user can scroll further.

The multi-button bar contains a return arrow  . When pressed, this returns to the previous menu or screen.

Each of the sub-menus is described in more detail below.

Recording Settings (Rec. Menu)

Settings Menu > Rec. Menu

The recording menu contains the following settings/submenus:

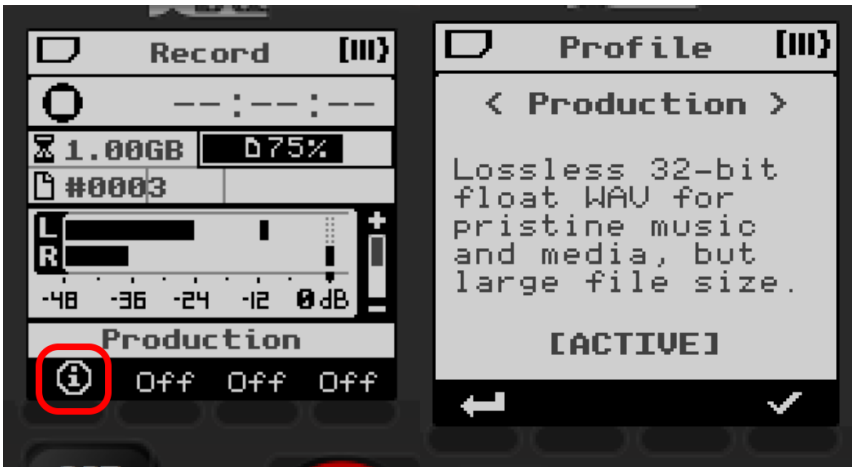
1. **Profile** (Submenu)
   See *Recording Profiles.*
2. **Effects** (Submenu)
   See *Recording Effects.*
3. **Format** (*WAVF32, WAV24, AAC-HBR, AAC-MBR, AAC-LBR, HE-AAC*)
   See *Recording Formats.*
4. **Samplerate** (*24 kHz, 44.1k, 48kHz, 96kHz*)
   High sampling rates offer higher quality audio, but take up considerably more storage space. Options depend on recording format. WAV formats support 44.1, 48, or 96 kHz. AAC formats support 24 or 48 kHz.
5. **Channels** (*Mono, Stereo*)
   Mono sums the left and right channels, using less storage space but removing any 'width' in the audio. Stereo takes advantage of both microphones for 2-channel recording.
6. **Time Limit** (*30m, 1h, 2h, 3h, 4h, 5h, 6h, 8h, 10h, 12h, None*)
   The recording will automatically end after the set amount of time. For AAC files, a max recording time of 12 hours is used.
   Note that depending on battery life and storage space, the recording may end before the set time limit. Using USB power and a WAV recording format will allow recording well beyond 12 hours, only ending when the SD card is full.
7. **Auto Record** (Auto Rec.) (*Off, -36db, -24db, -12db, -6db*)
   After enabling, press the record button to arm the device for auto record. Recording will then begin immediately after the meter detects a sound louder than the threshold level.
8. **Prerecord** (*On, Off*)
   Record in the background for an additional 2.5 seconds of recorded audio before the record button is pressed.
9. **Auto Level** (*On, Off*)
   Slowly adjusts input gain to allow for optimal headroom while recording. Intended for loud environments with constant noise such as concerts, crowds, vehicles, etc.
10. **Tone Mark** (*On, Off*)
    Insert a tone (sine wave, 500 milliseconds, 1000 Hz) at the start and end of a recording.

Recording Profiles

Settings Menu > Rec. Menu > Profile

This menu may be accessed through the  multi-button at the bottom left of the record screen or through the record settings menu. In this submenu, use PREV/NEXT to navigate left and right between profile descriptions, and press the confirm multi-button to use the selected profile. A profile will show [ACTIVE] if in use and [MODIFIED] if in use with parameters changed.

Selecting a profile sets all recording effects and settings (excluding time limit and plugin power) to the default values of the profile. If any of these settings are modified an asterisk (*) will appear beside the name of the profile on the record screen.



The profile descriptions and settings are as follows:

1. **Production**
   - Lossless 32-bit float WAV for pristine music and media, but large file size
   - Format: WAVF32, stereo, 48 kHz
   - Effects: None
2. **General**
   - High quality AAC for ambient, voice, or music recordings
   - Format: AAC-HBR, stereo, 48 kHz
   - Effects: 80 Hz lowcut
3. **Meeting**
   - High efficiency stereo AAC optimized for meetings and lectures
   - Format: HE-AAC, stereo, 48 kHz
   - Effects: Limiter, compressor, 80 Hz lowcut, -60 dB gate
4. **Voice Memo**
   - High efficiency mono AAC for minimum file size speech
   - Format: HE-AAC, mono, 24 kHz
   - Effects: Limiter, compressor, 100 Hz lowcut, -36 dB gate
   - Prerecord enabled
5. **Concert**
   - High quality AAC for transparent encoding of music and media
   - Format: AAC-HBR, stereo, 48 kHz
   - Effects: None
   - Auto level enabled

Recording Formats

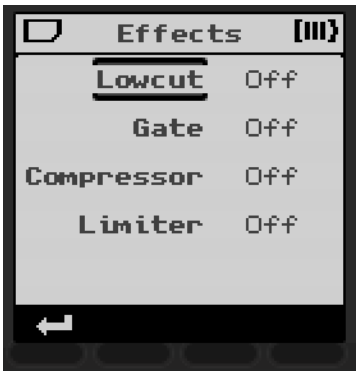
1. WAVF32
   32-bit float WAV
   Lossless, maximum quality recording format.
   When using float recordings, post-processing tools are able to recover audio that would be 'clipped' in other formats. This process is called normalization, and can be accomplished with a variety of programs.
2. WAV24
   24-bit PCM WAV
   Lossless, very high-quality recording format
3. AAC-HBR
   MPEG-4 AAC-LC, high bitrate
   Compressed, high-quality recording format
4. AAC-MBR
   MPEG-4 AAC-LC, medium bitrate
   Compressed, medium-quality recording format
5. AAC-LBR
   MPEG-4 AAC-LC, low bitrate
   Compressed, low quality recording format
6. HE-AAC
   MPEG-4 HE-AACv1 for mono recordings
   MPEG-4 HE-AACv2 for stereo recordings
   Very compressed, low-quality recording format with the minimum file size

Wav File Splitting

Long WAV recordings are split into multiple files, each with a maximum size determined by the file system. The time between file splits will vary from 1 to 8 hours, depending on the sample rate and format of the recording. Splits will always occur at an hour mark and will remain consistent for the duration of the recording.

Recording Effects

Settings Menu > Rec. Menu > Effects



1. **Compressor**

   An effect that reduces the range of volume of the signal. This can be useful for voice recordings where the speaker may change in distance from the mic, such as meetings or lectures.

2. **Limiter** (*On/Off*)

   This effect temporarily reduces gain to prevent clipping. May be useful for preserving loud noises in quiet environments.

3. **Gate** (*On/Off*)

   This effect suppresses continuous background noises. It is tuned to respond to the range of the human voice, preserving speech while reducing sound of fans and hum.

4. **Lowcut** (*80hz, 100hz, 120hz*)

   This effect reduces undesirable low frequencies that can occur when the user speaks very close to the mic, or when handling the device. Not desirable for live music, especially when capturing bass is desired.

   a. 120hz - an aggressive reduction, suitable for noisy environments
   b. 100hz - a moderate reduction for handling noise
   c. 80hz - a gentle reduction outside the common human vocal range acceptable for speech and song

Playback Settings (Play Menu)

Settings Menu > Play Menu

These settings are also accessible via multi-buttons in the playback screen.

1. Repeat Mode (*Off, One, All*)

   Affects behavior when playback reaches the end of the file.

   a. **Off** - Stop at the end of each file
   b. **One** - Repeat the current file
   c. **All** - At the end of each file, continue to the beginning of the next file until the end of the file listing is reached

2. **Fast Forward/Rewind Speed** (FF/RW) (*1s, 2s, 5s, 10s, 30s, 1m, 2m, 5m*)
   Change the speed seeking through files while holding the PREV or NEXT buttons. These buttons will seek forward or backward twice per second, so selecting FF/RW 10s will move at 20x speed. Seeking can be done while stopped or during playback, allowing the user to listen to the file as they find their desired seek destination.
3. **Playback Rate** (Play Rate) (*0.50, 0.75, 1.00, 1.25, 1.50*)
   Select the audio speed when listening to playback. Unlike the FF/RW speed, this can be used passively to listen to long recordings faster than realtime. However, it will also change the tone of sounds and speech.

File Listing (Files)

Settings Menu > Files

This menu can be accessed through the settings menu or by selecting the files  multi-button from the playback screen.

In this menu, all files found in the '/XVIVE' folder in the SD card are shown. When a file is selected, pressing PLAY or NEXT will open the file for playback. The last file opened will have an asterisk (*) next to the file name.

Pressing or holding PLUS/MINUS moves the selection as normal. For SD cards with many files listed, holding PLUS or MINUS for more than 5 seconds scrolls much faster, moving one page at a time. Also, pressing PLUS when the top of the list is selected will jump to the bottom, and pressing MINUS at the bottom jumps to the top.

The info  multi-button opens the file info menu for the selected file. See 'File Info'.

The delete  multi-button prompts the user to delete the selected file from the card. This frees space on the card, but cannot be undone.

System Settings (System)

Settings Menu > System

The system menu controls system-wide functionality.

1. **Backlight** (*10s, 15s, 30s, 60s, On, Off*)
   The amount of time for the backlight to remain on after a button press.
   'On' or 'Off' sets the backlight directly and ensures the backlight does not toggle. The backlight will be forced off when the battery is low.

2. **Brightness** (*10% - 100%, increments of 10%*)
   Sets the brightness of the backlight and the record button LEDs.
3. **Power Off** (*1m, 5m, 10m, 15m, 30m, 60m*)
   The amount of time to wait to automatically power off when the device is idle. This will not occur when recording is active or when plugged into USB power.
4. **Mic Pad** (*On, Off*)
   Apply a pad to the input, reducing the effective input gain by 20dB.
5. **Plug-in Power** (Plugin Pwr) (*On, Off*)
   Supply 3.1V through LINE IN. Required for recording with electret condenser microphones.
6. **Set Date** (*Submenu*)
   See *Date Menu*.
7. **Check Card** (*Submenu*)
   See *SD Card Check*.
8. **Format Card** (*Submenu*)
   See *SD Card Check*

Date Menu

Settings Menu > System > Set Date

This screen can be used to set the time of the RTC which is used to set the creation date on recorded files. Use the PLUS/MINUS buttons to change the selected value and use PREV/NEXT to select different values. This screen will also appear when the device is powered on after being left to sit without batteries for some period of time.

SD Card Check

Settings Menu > System > Check Card

This menu is accessible through the system settings menu. To check a card, insert and wait for the card to be opened. This symbol must appear in the status bar before a check is allowed:  .

Checking the card is able to detect errors in the file system. These errors are not fatal, and the card should still be readable by most tools, but for the best performance, it is recommended that any discovered issues are repaired.

When checking or formatting the card, a prompt is first given to confirm or cancel. On confirmation, the check begins, and when the check completes, the user is notified if any errors are found. A prompt appears to repair the card if so. If the user confirms again, the repair process begins and the user is notified when the card is successfully repaired. Ejecting the card while repairing could lead to further damage to the file system.

SD Card Format

Settings Menu > System > Format Card

This menu is accessible through the system settings menu. The user may also navigate here from a reformat prompt that is given when a card with a corrupt or incompatible file system is inserted.

To format a card, the card must be inserted, and show one of these symbols in the status bar:  or  . The card may still be reformatted if the device is unable to open the file system.

When this menu is opened, a warning is shown that all data on the card will be erased. When the user confirms that they would like to proceed, the formatting process begins. Ejecting the card while this occurs may lead to a corrupt card. When formatting completes, the card will contain an empty FAT32 file system.

See *'SD Cards'* for more information.

About

Settings Menu > About

This will show the firmware version and an option for factory reset. If factory reset is selected, the user will be prompted to confirm. On confirmation, a factory reset will be performed.

Factory Reset

A factory reset will reset all the settings to factory defaults and power-down the unit.

File Info

This menu is accessible from the file listing menu or from the playback screen through the (i) icon. When opened, information is displayed for the file that was selected in the previous menu. Use the PREV/NEXT buttons to navigate between files.

The information displayed, from top to bottom, is:

1. File name
2. Recording date (year/month/day)
   If the file was written to this SD card by another device, this date reflects the last time the file was modified.
3. File size

If the file is a recognized audio file, the following will also be displayed:

4. **Audio length** in hours/minutes/seconds
5. **Number of channels**: stereo or mono
6. **Sampling rate**
7. **File format.** Recognized formats are:
   WAV : PCM8, 16, 24, 32, and FLOAT32, 64.
   AAC : AAC-LC, HE-AAC, HE-AAC v2, AAC-LD, AAC-ELD, MPEG-2 AAC-LC, MPEG2 HE-AAC, and MPEG-2 HE-AAC v2
   See 'Recording Formats' for more. Note that some AAC file formats may be recognized, but not able to be played.

In this menu, the multi-button bar shows:

1. < **Previous File**: Navigate to the previous file in the file listing menu. If not shown, this file is the first in the file listing.
2. > **Next File:** Navigate to the next file in the file listing menu. If not shown, this file is the last in the file listing.

3.  **Delete** current file. The user is prompted to confirm.
4.  **Return** to the previous screen.

System

Power Switching

The power switch is momentary on one side and latching on the other. The latching side locks the UI so that other button presses are ignored. See ‘UI Lock.’ Further discussion relates to the momentary side.

It normally takes about 2 seconds of holding for the power to turn on. The LEDs on the record button will show green, and the power button can be released.

When running, the device will respond to a 2 to 3 second hold of the power button by initiating a power-down sequence. A pop-up will appear to indicate the powering-off state. If the card is busy (during a format or check of the card) then power-down will be delayed or canceled. The user can re-try after the card has finished.

A power-down can be forced by holding the power button for at least 10 seconds.

UI Lock

When the power button is up in the latched position, the UI lock is engaged. When locked, all button presses are ignored and the status bar shows ‘[LOCKED].’ This is intended to prevent accidental button presses during a long recording, ensuring that the recording isn’t interrupted. Return the power button to the center position to unlock the UI.

Backlight

When the backlight is enabled, the screen visibility is significantly improved, particularly in dark spaces. However, this consumes more battery life. Interacting with the device (while unlocked) will keep the backlight on for a certain amount of time, depending on the ‘Backlight’ parameter in system settings. The backlight brightness is also controllable through system settings.

LED Colours

The brightness of the LEDs behind the RECORD button is controllable through system settings. Different colours indicate device states.

- **Orange:** The device is actively recording.
- **Flashing Red:** Clipping warning. The audio input or recorded file is clipping.
- **Green:** The device is playing back an audio file.
    - This colour is also used during the first stage of the device boot.
- **Blue:** During device boot, the LEDs will flash green, then blue.

Battery Levels

When the status bar battery icon shows 1 or more bars, the device will operate as normal. When the status bar shows an empty battery icon, device operation may be restricted. These restrictions progress in the following order:

1. A warning is shown at the start of recording explaining that the recording may be interrupted. Device operates as normal otherwise.
2. The backlight will remain off to conserve battery. The device will not begin a new recording. The device will not mount an inserted SD card.
3. The device will safely end any active recording.
4. The device will power off.

USB Modes

The active USB mode is determined on device startup. If the USB cable is connected on startup, a menu will popup asking the user what mode to activate. If the USB cable is not connected on startup, the mode will be normal runtime (Recorder Mode).

No extra driver installation is required for any USB mode (it uses standard operating system drivers in all cases.)

Normal Runtime Mode (Recorder)

USB connection in runtime mode will have the host computer web browser request the user to go to the product landing page. (Landing page functionality is provided by browsers implementing WebUSB, like Chrome.)

USB Mass Storage Mode (Card Reader)

In this mode, the SD card acts as a storage drive for the host computer.

USB Audio

In this mode, the device implements USB Audio Class 2.0, and will appear as a stereo-in / stereo-out audio device with a fixed sample rate of 48 kHz. The line-in is used as input if present, and the on-board microphones are used otherwise. For output, only line-out is used. The speaker cannot be used.

To adjust the input gain, use the PLUS/MINUS buttons. To adjust the output volume, use VOLUME +/- or PREV/NEXT. The mic pad is controlled through the multi-button bar at the far left.

USB DFU Mode

This mode is used for device firmware updates. DFU mode can be entered through USB commands, or it can be forced by holding VOLUME DOWN while powering on the device.

The user firmware update experience is intended to be through a custom web page using WebDFU over WebUSB. At the time of this writing, the custom web portal has not been developed, but the firmware can be updated through the generic WebDFU page at WebUSB DFU (devanlai.github.io) .

DFU support is compliant to the USB standards, and other DFU update utilities should also work, like command-line dfu-util: https://dfu-util.sourceforge.net/

Firmware update packages are files ending with the .dfu extension, and are about 1.5 MB in size as of this writing.

USB Microphone Test Mode

See 'Microphone Calibration'.

SD Cards

All SD cards are partitioned with a valid MBR (includes partition table) by the card manufacturer, and XV1-R requires a valid MBR. The first FAT type partition in the MBR partition table will be the active file system partition.

In some cases the MBR may get damaged or erased (like in the case of some other portable devices formatting the card) and XV1-R does not try to repartition the card. To repair the MBR, please reformat the card using the SD card formatting utility available from the SD card association. https://www.sdcard.org/downloads/formatter/ This utility can be run on the card mounted in Card Reader mode.

Cards that are formatted with an incompatible FAT file system (eg. exFAT) will be prompted to reformat to FAT32. If another file system, (eg. NTFS) has been written to the card, it may require a reformat using the SD card formatting utility.

Card sizes up to 128 GB are supported by the XV1-R.

Swapping Cards

Please do not swap the card while recording, finalizing a recording, checking, or formatting. When the card cannot be safely ejected, this symbol is shown in the status bar:  .

Real-Time Clock

The user will be prompted to set the real-time clock (RTC) on first power-up. The RTC allows accurate date stamps to be applied to created files.

A capacitor holds enough charge to maintain the RTC for a few minutes without batteries, allowing the batteries to be changed without having to reset the RTC.

Line-In / Mic-In Jack

The 3.5mm input jack can be connected to stereo headphone outputs or line-level outputs of other audio sources, or it can connect external electret style microphones.

Input Jack Wiring

- Tip: left channel (plug-in power)
- Ring: right channel (plug-in power)
- Sleeve: ground

Before connecting to external equipment headphone or line-level outputs, please turn off the plug-in power from the Recording Menu.

Lavalier Microphone Compatibility

The recorder is compatible with electret lavalier microphones having a 3.5mm TRS plug according to the following table:

Tip	**Ring**	**Sleeve**	
Mic+	Mic+	Ground	Supported
Mic+	No-connect	Ground	Supported
Mic+	Mic-	Ground	Not Supported
Drain	Source	Ground	Not Supported

Electret microphones require 3.1V plug-in power to be switched on from the System Menu.

A stereo to left/right mono pair splitter cable can be used to attach 2 external electret microphones, recording onto the left and right channels.

Line-Out / On-Board Speaker

The line-out is a 3.5mm stereo jack intended for use with headphones, and may be used for playback or to monitor recording. The line-out is also used as an audio playback device in USB audio mode.

The on-board speaker is used only for playback of audio files and cannot be used for monitoring recording. When the line-out is connected, the on-board speaker is automatically muted.

The level of both the line-out and speaker are controlled by the system volume. To raise the volume, press VOLUME +, and to lower the volume, press VOLUME -. On any screen, this brings up the volume menu. When in this menu, VOLUME +, VOLUME -, PLUS, and MINUS all move the volume in increments of 5%, and PREV/NEXT move the volume in increments of 1%.

Factory Test Mode

Test mode is intended for factory usage to verify basic functionality of each unit. This mode is accessed by holding down STOP and MARK while powering on the device.

See the document ‘XV1-R Factory Programming and Test’ for further information.

Specifications

Supported SD Cards

- MicroSD to 2GB
- SDHC to 32 GB
- SDXC to 128GB

Inputs

- Microphones: 130dB SPL max
- Mic/Line In: 3.5mm stereo jack
    - 3.1V plug-in power
    - Tip: left channel
    - Ring: right channel
    - Sleeve: ground

Output

- Line/headphone stereo 3.5mm jack

WAV Recording

- 44.1kHz, 48kHz, or 96kHz sample rate; mono or stereo
- Formats:
    - WAVF32 : 32-bit float
    - WAV24 : 24-bit PCM
- 4GB file size limit. Longer recordings are split and will create multiple files.

AAC Recording

- M4A container; 24kHz or 48kHz sample rate, mono or stereo
- Formats:
    - HE-AAC : MPEG-4 HE-AACv1 for mono recordings
      : MPEG-4 HE-AACv2 for stereo recordings
    - AAC-LBR : MPEG-4 AAC-LC, low bitrate
    - AAC-MBR : MPEG-4 AAC-LC, medium bitrate
    - AAC-HBR : MPEG-4 AAC-LC, high bitrate
- 12 hour recording time limit for AAC

Battery Life

- Alkaline: approximately 12 hours recording time, depending on usage conditions.

Playback

- Mono or stereo
- Supported sample rates: 24, 44.1, 48, 88.2, 96 kHz

- WAV files:
    - Formats: WAVE, RF64, or BW64
    - Bit depth (PCM): 8, 16, 24, 32-bit
    - Bit depth (float): 32, 64-bit
- M4A files
    - Formats: MPEG-4 AAC-LC, HE-AACv1, HE-AACv2

USB

- USB-C connector
- USB 2.0 high speed
- Supported Modes:
    - Mass Storage Class
    - USB Audio Class 2.0 (48 kHz async, 24 bits, 2-in / 2-out)
    - DFU Class

Power

- 2 x AA
    - Alkaline or NiMH recommended
- USB bus power