Piper Computer Kit Accessibility Conformance Report

Revised Section 508 Edition (VPAT® Version 2.5)

Name of Product/Version: Piper Computer Kit Platform (including Wooden Enclosure, Raspberry Pi 3 Hardware Unit, Raspberry Pi OS runtime environment, PiperCode Blockly interface, Minecraft Story Mode Pygame Wrapper, and teach.playpiper.com teacher materials)

Report Date: November 2026

Product Description: A physical-digital STEM learning platform combining a wooden laser-cut enclosure, a Raspberry Pi 3 single-board computer, electronic breadboarding components, and custom Python/Blockly software learning modules.

Evaluation Methods Used: Architectural performance profiling, physical ergonomic assessment, codebase review (Python, Pygame API, Blockly), and input-event mapping verification.

Standards / Guidelines

This report covers the degree of conformance for the following accessibility standard/guideline:

Standard / Guideline	Included In Report
Web Content Accessibility Guidelines (WCAG) 2.0	Level A (Yes) / Level AA (Yes) / Level AAA (No)
Revised Section 508 Chapter 3 (Functional Performance Criteria)	Yes
Revised Section 508 Chapter 4 (Hardware)	Yes
Revised Section 508 Chapter 5 (Software)	Yes
Revised Section 508 Chapter 6 (Support Documentation and Services)	Yes

Terms & Conformance Levels

Term	Definition
Supports	The functionality of the product has at least one mode that meets the criteria without known defects or meets with equivalent facilitation.
Supports with Exceptions	Some functionality of the product does not meet the criteria.
Does Not Support	The majority of product functionality does not meet the criteria.
Not Applicable	The criteria are not relevant to the product.

Executive Summary, System Hardware Constraints & Equivalent Facilitation

Raspberry Pi 3 Platform Architecture & Limitations

The Piper Computer Kit is powered by an embedded **Raspberry Pi 3 Model B** single-board computer (featuring 1GB LPDDR2 RAM and a quad-core ARM Cortex-A53 CPU). The combined memory footprint and processing requirements of running the Linux desktop kernel, the Minecraft Pi Edition Java engine, and the Pygame execution layer create specific technical limitations:

1. **Screen Reader Overhead:** Resource constraints prevent the simultaneous execution of heavy Linux desktop screen reader suites (e.g., Orca TTS engine) alongside the Minecraft graphics/game loop without causing severe frame drops, audio buffer underruns, or software crashes.
2. **Built-in UI Scaling:** The legacy Pygame rendering pipeline operates on fixed low-resolution pixel buffers that do not support dynamic hardware-accelerated UI magnification or font scaling at the software layer.

Compliance Strategy via Equivalent Facilitation

To maintain compliance under **Section 508 Subpart C (Equivalent Facilitation)** without compromising system stability:

- **Native HID / Keyboard Event Mapping:** Hardware circuit closures (buttons, switches, breadboard connections) map directly to standard USB HID keyboard events inside the Pygame wrapper. Alternative adaptive switches, foot pedals, or large-button HID peripherals function natively via USB ports.
- **The Co-Pilot Pedagogical Framework:** Available in teacher resources (teach.playpiper.com), enabling students with visual or severe fine-motor impairments to lead design logic, circuit planning, and programming while working with a partner for screen navigation or fine wire/component placement.
- **External Hardware Display Accommodations:** Standard HDMI output allows the Raspberry Pi 3 display signal to be routed to large-format desktop monitors or external hardware magnifiers.
- **Digital Circuit Simulation Fallbacks:** Web-accessible circuit simulators (e.g., Tinkercad Circuits, PhET) on standard desktop computers can be used as an alternative for physical breadboarding.

Chapter 3: Functional Performance Criteria (Revised Section 508)

Criteria	Conformance Level	Remarks and Explanations
302.1 Without Vision	**Partially Supports**	*System Limitation:* Raspberry Pi 3 hardware constraints (1GB RAM CPU/GPU limits) prevent concurrent execution of full screen-reader TTS software alongside the Minecraft/Pygame game engine. *Equivalent Facilitation:* Blind users achieve learning outcomes via the **Co-Pilot Framework**, where a partner or educator assists with visual screen narration while the student directs conceptual design, code structure, and logic blocks.

302.2 With Limited Vision	**Partially Supports**	*System Limitation:* Legacy graphics engine lacks software font scaling or built-in high-contrast mode toggles. *Mitigation:* The Raspberry Pi 3 provides standard HDMI output, enabling connection to external large-format displays or hardware magnification setups.
302.3 Without Perception of Color	**Supports**	Coding interfaces and physical wiring tasks do not rely solely on color perception; components and UI elements incorporate structural, positional, or text labeling.
302.4 Without Hearing	**Supports**	Audio elements (sound effects, background music) are non-essential; all critical learning prompts, storyline dialogs, and instructions are presented visually via on-screen text.
302.5 With Limited Hearing	**Supports**	See 302.4. No essential operational information is conveyed via audio-only channels.
302.6 Without Speech	**Supports**	The product does not require speech input for operation or navigation.
302.7 With Limited Manipulation	**Partially Supports**	*System Limitation:* Fine-motor manipulation is required to insert jumper wires into 0.1-inch breadboard headers. *Mitigation/Equivalent Facilitation:* Physical inputs map directly to standard keyboard/HID events, enabling game operation via alternative adaptive switches. Breadboarding is supported via the documented **Co-Pilot Framework** and virtual circuit simulation fallbacks (e.g., Tinkercad Circuits, PhET).
302.8 With Limited Reach and Strength	**Supports**	Operable hardware controls and connection ports require minimal physical force and are positioned within standard desktop reach parameters.
302.9 With Limited	**Supports**	Curriculum materials (teach.playpiper.com) feature visual step-by-step guidance, structured block-based

Cognitive, Language, and Learning Abilities		programming (Blockly), and collaborative problem-solving models suited for neurodiverse learners.

Chapter 4: Hardware (Revised Section 508)

Criteria	Conformance Level	Remarks and Explanations
402.1 General (Closed Functionality)	**Not Applicable**	The system operates on an open computing platform (Raspberry Pi OS) rather than a closed terminal.
403.1 Status Indicators	**Supports**	System power and operational states are visually indicated via standard hardware LEDs on the Raspberry Pi 3 board and carrier board.
404.1 Annulment / Reset of Changes	**Not Applicable**	No timed or irreversible system states are triggered by physical hardware switches.
405.1 Operable Parts (Clearance & Reach)	**Supports**	Mechanical switches, USB ports, power connectors, and HDMI ports are accessible within standard desktop reach ranges.
406.1 Operable Parts (Operation Without Fine Motor Control)	**Partially Supports**	Fine-motor control is required for breadboard pin assembly. Built circuits map directly to standard keyboard/HID events, allowing alternative switch access once connected. Physical assembly supports the Co-Pilot workflow.
407.1 Connections (Standard Interoperability)	**Supports**	Utilizes industry-standard physical interfaces (USB-A, HDMI, 3.5mm audio jack) on the Raspberry Pi 3, ensuring compatibility with third-party assistive

		hardware (e.g., adaptive keyboards, external monitors, head-tracking switches).
408.1 Display Screens (Visibility)	**Supports**	The LCD display screen is readable from standard desktop viewing angles under normal ambient lighting. External larger screens can be connected via HDMI.
410.1 Color Coding	**Supports**	Visual information is not dependent solely on color; text labels, positional cues, and numerical identifiers accompany circuit configurations.

Chapter 5: Software (Revised Section 508)

Criteria	Conformance Level	Remarks and Explanations
501.1 Scope / Application	**See WCAG 2.0 Section**	Per Revised Section 508 requirements, software applications must conform to WCAG 2.0 Level A and Level AA success criteria.
502.1 Interoperability with Assistive Technology	**Partially Supports**	*System Limitation:* Legacy Pygame and Minecraft Pi binaries do not expose full Linux accessibility APIs (AT-SPI). *Mitigation:* System accepts standard HID keypress events and standard USB input devices natively.
502.2 No Disruption of Accessibility Features	**Supports**	The software environment does not disable underlying OS-level keyboard access or standard USB hardware drivers.
502.3 Accessibility Services (Object	**Partially Supports**	Web-based curriculum (teach.playpiper.com) fully exposes programmatic object data. Legacy in-game desktop wrappers feature fixed focus states.

Info, Actions, Focus)		
503.1 User Preferences	**Partially Supports**	OS-level display themes do not automatically cascade into the full-screen Pygame/Minecraft rendering context due to engine architecture constraints.
504.1 Authoring Tools	**Not Applicable**	The Piper software platform is an educational runtime environment and does not function as a content authoring tool.

Chapter 6: Support Documentation and Services (Revised Section 508)

Criteria	Conformance Level	Remarks and Explanations
602.1 Documentation (Accessibility Features)	**Supports**	Product documentation and teacher guides (teach.playpiper.com) detail accessibility features, Co-Pilot implementation instructions, HDMI monitor connections, and HID switch capabilities.
602.2 Alternate Formats for Documentation	**Supports**	Digital documentation is provided on teach.playpiper.com in accessible HTML and downloadable PDF formats. Additional alternative formats are provided upon request.
602.3 Electronic Docs (WCAG Conformance)	**Supports**	Online teacher documentation conforms to WCAG 2.0 Level A and Level AA standards.
603.1 Support Services	**Supports**	Customer support and curriculum integration specialists are accessible via email

(Communication & Needs)		(accessibility@playpiper.com) to assist educators with custom accommodation requests.

WCAG 2.1 / 2.2 Conformance Summary (Software & Web Resources)

Evaluated across the desktop environment (PiperCode / Pygame Wrapper) and teacher web resources (teach.playpiper.com).

Criteria	Conformance Level	Remarks and Explanations
1.1.1 Non-text Content (Level A)	**Supports with Exceptions**	Web materials on teach.playpiper.com incorporate descriptive alt-text. Legacy in-game bitmap assets and Minecraft graphics lack programmatic alternative text due to graphics wrapper constraints.
1.4.3 Contrast (Minimum) (Level AA)	**Supports with Exceptions**	Legacy Minecraft and Pygame wrappers use fixed palette colors. Visual clarity is maintained under standard ambient lighting. Low-vision viewing can be achieved via larger external HDMI monitors.
2.1.1 Keyboard (Level A)	**Supports**	Hardware circuit closures are registered as standard keyboard strokes within Pygame/Python APIs. PiperCode (Blockly) supports keyboard-based block management.
2.4.3 Focus Order (Level A)	**Supports with Exceptions**	Web resources (teach.playpiper.com) maintain structured tab focus. Legacy desktop software wrappers present fixed focus order within modal prompts.
3.3.2 Labels or Instructions (Level A)	**Supports**	Step-by-step visual assembly prompts and programming logic blocks provide clear, scaffolded instructions throughout all learning modules.

Accessibility Support, Alternative Formats & Continuous Improvement

Piper is committed to making STEM education accessible to every learner. We recognize that classroom needs vary and actively update our curriculum and teacher materials based on educator feedback.

If a lesson plan, building step, or curriculum resource is missing an accessibility adaptation, visual adjustment, or alternative workflow needed for your classroom, please reach out to our team.

Legal Disclaimer

This Accessibility Conformance Report ("ACR"), based on the Voluntary Product Accessibility Template ("VPAT") is provided by Play Piper LLC ("Company") for informational purposes only to assist in evaluating the accessibility of the Piper Computer Kit (the "Product") against applicable accessibility standards. This ACR reflects the Company's assessment of the Product's accessibility features as of the date indicated on the template. The information in this ACR is provided "as is" without warranty of any kind, whether express, implied, or statutory, including but not limited to warranties of accuracy, completeness, merchantability, fitness for a particular purpose, and non-infringement. Nothing in this ACR constitutes a guarantee that the Product fully conforms to any particular accessibility standard. The Company reserves the right to update, modify, or revise this ACR at any time without prior notice.

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Contact Information

For questions regarding this ACR or the accessibility features of the Product, please email hi@playpiper.com.