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Post box no. 7087, 27th cross, 12th Main, Banashankari 2nd Stage, Bengaluru- 560070, INDIA

Ph: 91-80- 26711780/81/82 Email: principal@bnmit.in, www.bnmit.org

Department of Electrical & Electronics Engineering



**IEEE PES Bangalore Chapter and IEEE BNMIT PES Student Chapter
Presents**

ELECTROTHON

Abstract Format

Team Name	Anchor Mind
Theme	HEALTHCARE
<p align="center">Problem Description (Max up to 600 Words)</p> <p>Elderly individuals with memory lapses and people experiencing anxiety or panic attacks often require immediate assistance and reassurance. In such situations, any delay or complexity in accessing help can increase stress, reduce independence, and worsen symptoms.</p> <p>Current solutions — such as smartphone apps, wearable devices, or digital assistants — are often impractical for these users. Elderly individuals may struggle with small screens, complicated menus, or the need for internet connectivity. Those with anxiety may find that unlocking a phone and navigating to the right feature takes too long during an episode.</p> <p>The limitations of existing solutions include:</p> <ul style="list-style-type: none">• Slow activation during urgent situations.• Complex interfaces unsuitable for non-tech-savvy users.• Single-mode feedback, lacking multi-sensory cues for reassurance.• Bulky or costly designs that are inconvenient for daily carry.	

These challenges result in reduced confidence, prolonged anxiety episodes, and increased dependency on caregivers. For caregivers, the absence of quick, accessible tools increases the emotional and logistical strain of providing support.

There is a need for a simple, portable, and always-ready device that operates without reliance on a smartphone or internet connection. Such a device should:

- Provide clear, readable text for instructions or reminders.
- Use visual (LED), tactile (vibration), and auditory (buzzer) cues for guidance.
- Be compact, affordable, and easy to operate in a single step.

Addressing this gap can significantly improve independence, reduce stress, and provide instant reassurance to both elderly individuals and those prone to anxiety or panic episodes.

Possible Solution (Max up to 600 Words)

We propose a pocket-sized mood and memory assistant designed for elderly individuals and people facing anxiety or panic attacks. The device offers instant access to calming prompts, mood tracking, and reminders — all without relying on smartphones or the internet.

Key Features:

- Simple interface: 4×4 keypad with large, easy-to-press buttons.
- Clear visuals: High-contrast OLED display for readability.
- Multi-sensory feedback: RGB LED mood indicator and gentle vibration for reassurance.
- Pre-programmed support: Calming affirmations, breathing guidance, and task reminders.
- Portable & discreet: Fits easily in a pocket, lightweight, and ergonomic.

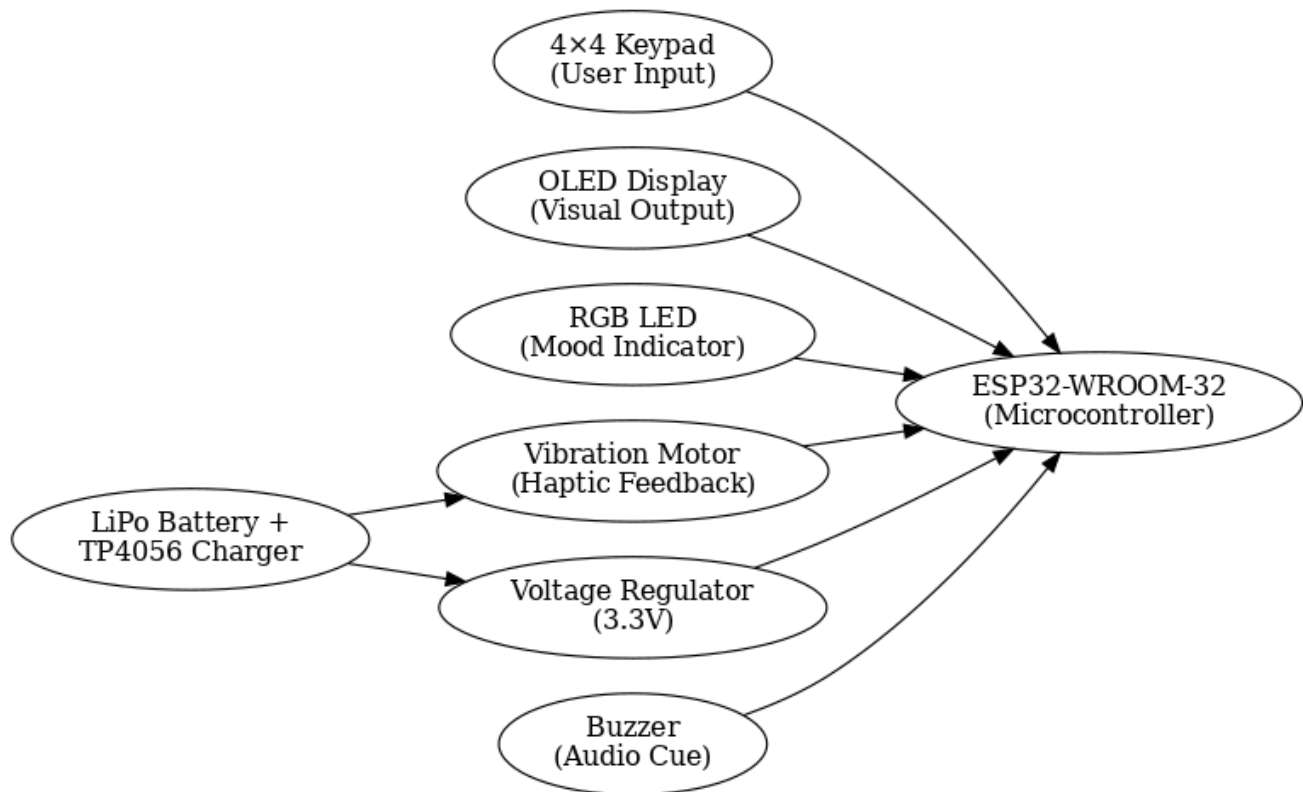
Technical Highlights:

- ESP32 microcontroller for control and future connectivity.
- 0.96" OLED display (SSD1306) via I2C.
- LiPo battery with TP4056 charging module for reusability.
- Vibration motor and RGB LED for non-intrusive feedback.
- 3D-printed enclosure for comfort and durability.

Impact:

This device delivers fast, reliable emotional support and memory assistance in a form that is affordable, accessible, and easy to use, making it ideal for both personal well-being and caregiver peace of mind.

Block Diagram



Methodology (Max up to 600 Words)

Our device offers a simple yet engaging way for elderly users to select their mood, receive affirmations, and follow guided breathing exercises with multi-sensory feedback.

Component Integration

An ESP32 microcontroller coordinates all components. A 4×4 matrix keypad allows straightforward mood selection and menu navigation. An OLED display (I²C) provides clear, easy-to-read menus, affirmations, and breathing instructions. An RGB LED gives instant, color-coded mood feedback (e.g., green = calm, blue = sad, red = anger) for quick recognition. A vibration motor, driven by an NPN transistor, delivers gentle pulses during breathing guidance. The prototype is USB-powered for stable operation.

Firmware Development

Programmed via Arduino IDE, the firmware implements a simple menu system navigated by keypad. Once a mood is selected, the device:

1. Lights the RGB LED in the mood's color.
2. Displays an affirmation and breathing guide on the OLED.
3. Activates the vibration motor to signal inhale–exhale timing.

User Interaction Flow

- 1. User powers on device.**
- 2. OLED displays mood menu.**
- 3. User selects mood via keypad.**
- 4. RGB LED lights with mood color; OLED shows affirmation and breathing steps.**
- 5. Vibration motor provides rhythmic pulses during exercise.**
- 6. A dedicated key returns to the main menu anytime.**

Testing & Validation

The OLED was tested under varied lighting for readability, RGB LED brightness was optimized for comfort, and vibration intensity/timing was tuned for relaxation. Multiple trials confirmed reliable mood selection, color mapping, and synchronized feedback.

Future Enhancements

Planned upgrades include a LiPo battery with charging circuit for portability, audio prompts for voice-guided relaxation, and mood history storage in local or cloud memory for long-term tracking.

This concise yet immersive interaction design ensures the device is easy to operate, accessible for varying sensory abilities, and well-suited to promote emotional wellness among elderly users.