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Vision

An alarm clock that enables the User to set an alarm, toggle the alarm on/off, listen to AM/FM radio, adjust volume.

Use Cases

Use Case Section	Comment
Use Case Name	Set an alarm
Scope	AM/FM alarm system
Level	User Goal
Primary Actor	Tired Tina
Stakeholders and Interests	The owner of the alarm: Wants to be woken up at a specified time. The manufacturer of the alarm: Wants to produce a functional alarm component in a time and cost-effective manner
Precondition	The alarm clock is powered. Has alarm set.
Success Guarantee	Clock didn't lose power, user has alarm set to correct time.
Main Success Scenario	The alarm will sound at the specified time.
Extensions	Power is lost, snooze button is activated
Special Requirements	Tired Tina is sleeping within audible range of the alarm clock
Technology and Data Variation List	● Military time vs standard time ● Hour button, minute button ● 1 click increments, hour/minute increased by one ● On hold run through numbers at 5 per second. ● Alarm toggle on/off ● When setting alarm, User must choose between either; alarm noise, or a chosen radio frequency
Frequency of Occurrence	Repeat once daily unless user specifies otherwise.
Misc	Users must manually apply daylight savings time.

Use Case Section	Comment
Use Case Name	Listenin' to the radio
Scope	The AM/FM radio
Level	User Goal
Primary Actor	Tunin' Tina
Stakeholders and Interests	The owner of the alarm: Expects consistent reception to listen to the radio The manufacturer of the alarm: Wants to produce a functional radio component in a time and cost-effective manner
Precondition	Has electricity, has AM/FM radio stations broadcasting in range.
Success Guarantee	The User is tuned to a frequency which a station is currently broadcasting on.
Main Success Scenario	User gets to listen to the AM/FM Station they have tuned to.
Extensions	If there are no signals in range, the user will only hear static.
Special Requirements	User is in ear-range of the alarm clock, user can hear.
Technology and Data Variation List	● Scanner button searches for nearest non-static station. ● Tune up / down button increment / decrement by a preset amount (determined by manf.) ● AM/FM toggle switch. ● Volume knob
Frequency of Occurrence	Could be continuous
Misc	What are the standards for AM/FM receivers?

Supplemental Specs

Intro

- The following is the supplemental specs for the AM/FM Dual Alarm Clock

Functionality

- User can set two alarms on the device and tune into the radio.

Useability

- Somewhat intuitive design familiar to users
- Included user manual

Reliability

- User is can reasonably assume the device will function for a period of time
- User can expect the clock will be able to function in a reasonable climate.

Supportability

- The alarm clock will arrive in package with instruction manual
- The instruction manual will contain a tech support number

Implementation Constraints

- The alarm clock system must be able to fit on a bedside sized table.
- The alarm clock system must be reasonably light in terms of weight to reduce shipping costs.
- The sound of the radio and alarm must be loud enough to wake most people from a deep sleep.

Purchased Components

- Radio hardware
- Timekeeping module
- LED screen to display time

Free Open Source Components

- Radio broadcast (AM/FM)

Interfaces

- Volume Knob
- Set Time buttons (minute/hour)
- Frequency Scanner Button
- Digital screen to show time
- Button for a Snooze

Legal Issues

- Liability issues
    - Warn the user about possible health issues associated with the clock
- Copyright issues
    - Make sure the design is unique enough not to resemble an existing model

Information in Domains of Interest

- Radio transmission frequencies:
    - FM 88 - 108 MHz
    - AM 535 - 1705 kHz
- Range of Human hearing

Glossary

- Ear-Range: A 10 meter radius from the alarm clock assuming no barriers block sound. This figure represents the maximum reasonable distance at which the User can hear the alarm or radio at full volume.
- Alarm: Either a radio or ‘buzzer’ noise that triggers according to user specification at a given time. The radio station can be selected by the user and the alarm will repeat every 24 hours unless otherwise specified by the User.
- Snooze: Cancels current alarm sound and triggers alarm to repeat 9 minutes later.
- Radio: Receiving radio wave signals and translating them into sound. Can be adjusted to different frequencies/amplitudes to reach different stations
- AM: Amplitude Modulation. Stations are determined by the amplitude (height) of the radio wave.
- FM: Frequency Modulation. Stations are determined by the frequency (closeness) of the radio waves.