

Deliverable 1
CSCI 360
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Vision:

The AM/FM radio and dual alarm clock is to be the all encompassing device for the typical consumer needing an alarm to keep their scheduling organized with their musical interests intact. The radio should have the ability to store up to two alarms for the user to schedule themselves accordingly with the assistance of AM/FM radio signals.

Use Case 1:

Name:

Set an alarm

Scope:

AM/FM radio and alarm

Level:

User Goal

Primary Actor:

Clock User

Stakeholders and interests:

Consumers

Pre-condition:

Time for alarm is entered in twelve hour format as opposed to military time, alarm is set to ON, the clock is set to the correct time

Post-condition:

Alarm is set to trigger at the time specified, repeating at each occurrence of the time.

Main Success Scenario:

The user wants to wake up at a specific time. They press the button to set the alarm time for alarm number 2. They use the arrow keys on the device to specify the hour they want to wake up and press enter. Then they use the arrow keys on the device to specify the minute they want to wake up and press enter. Then they use the arrow keys on the device to specify if the specified time is am or pm by highlighting their preferred option on the screen. The time is then saved and the alarm is set to activate the speakers at the desired time.

Extensions:

1. The clock time changes before the alarm goes off. The internal alarm time will not change, however the user will not have it go off at their desired time.
2. The user can change the alarm options to play a specific radio station.

Special Requirements:

An uninterrupted source of power (can be battery operated or connected to an outlet)

Technology and Data Variations List:

1. Power to the alarm could be from various outlets around the world.

Frequency of Occurrence:

Can be done at any time, likely twice a day due to having two separate alarms.

Open Issues:

What happens when an alarm that has been previously set is triggered while the radio is already on, in the case where the user has specified that the alarm should trigger the radio turning on?

Use Case 2:

Name:

Find different radio stations

Scope:

AM/FM radio and alarm

Level:

User Goal

Stakeholders:

Consumers, broadcasters, advertisers who run ads on radio

Pre-condition:

The radio broadcasters are sending radio signals that can be received.

Post-condition:

Radio waves being received via the antenna are properly decoded and output to the speakers.

Main Success Scenario:

The user wants to listen to a particular radio station. They turn the radio on, and the device begins listening for radio signal broadcasts and outputting sound signals to the speakers. The frequency is displayed to the user, who can then use an interface to increase or decrease the frequency in set increments to other radio stations. On input to change the frequency up or down, the device will search in the chosen direction for a clear broadcast signal. The first clear signal will then be chosen, with the new frequency displayed to the user, and sound being output to the speakers.

Extensions:

1. The designated music station currently selected is inoperable at the time and no radio signal is being received from them. The radio should play white noise to indicate the lack of radio signal.
2. The user seeks the radio past the point of potential radio signals within the given radius that the antenna can receive and thus the radio should loop the seek back to the beginning of possible AM/FM station addresses instead of allowing the user to continue to push the seek to an infinitely high number.

3. The radio seeking mechanism should change the address in intervals relative to the available stations (no need to have the user seek more than twice to acquire a local station).

Special Requirements:

Functioning radio antenna

Radio dial

Ability to switch between AM and FM frequencies

Stereo speakers

Technology and Data Variations List:

Different radio stations in different parts of the world. The radio signals may be stronger with the radio placed in different locations around the house.

Frequency of Occurrence:

Every few minutes while listening to the radio which could happen multiple times a day.

Open Issues:

Hardware malfunction

Changing of broadcasting methods of AM/FM radio waves

Supplemental Specifications:

Hardware and Software Constraints - The unit should not exceed a certain wattage threshold in order to prevent possible arcing and overheating/meltdown scenarios. The unit should not have any unnecessary software in order to condense on memory allocation and ultimately save on costs per unit produced.

Physical Environment Concerns - The unit should not be housed in a location where radio signals cannot persist (ie: copper environments or chambers). The unit should also not be exposed to potentially dangerous fluids or materials that could inhibit its ability to perform its desired task (water, fire, sand, etc...).

Standards (technical, safety, quality) - The unit should be operable under most all conditions that don't impede upon the physical environmental concerns. The unit should not infringe upon the safety of the user through potential arcing and overheating.

Glossary:

Alarm trigger - The alarm clock reaches its set time and activates the alarm.

AM Radio - Amplitude modulated radio stations.

Broadcasters - The companies sending out the radio signals from their stations

FM Radio - Frequency modulated radio stations.

Military Time - 24 hour clock going from 00:00 to 23:59 o'clock.

Radio Frequencies - The various signals that the device is collecting corresponding to different radio stations.

Twelve hour format - 12 hour clock that begins at 12:00 AM (midnight), runs to 11:59 AM, then runs from 12:00 PM (noon) and runs to 11:59 PM