The Kenwood KDC-MP522 Car Stereo / Satellite Radio / CD / MP3 player

PART I

The First Impression

I was quite enamored with this unit when I first saw it. It had all of the options that I was looking for in a car entertainment system. It had the classic AM/FM with CD-playing capabilities coupled with the cutting edge support for MP3 decoder/playback and Sirius satellite radio service interfacing. It had everything that I wanted all rolled into one. Using it, however, is often a different story.

Initially, the interface seemed simple and very straight-to-the-point. The AM/FM buttons, the backward/forward buttons, the rotating volume control, channel buttons, and seemingly everything else that I thought I needed was present.

I initially had two problems with the interface. Firstly, where is the power button? How do I turn it off? I disregarded this as simply being a case of “I need to read the manual”. After all, a minimal learning curve is to be expected with such items.

All in all, the pros seemed to outweigh the cons and so I purchased the unit.

System Functionality

The functionality of the system goes a bit beyond the traditional car stereo. In addition to the classic functions such as AM/FM stereo and CD playing capabilities with all auxiliary controls for volume, bass, treble, fade, etc., it also has the ability to decode and playback MP3 files as well as interface with a satellite radio service. In addition, the faceplate is also removable and when it is removed, a light flashes regularly to signify that the radio is secured from theft.

What Tasks the Typical User Would Perform

- Tuner functions
  - Select radio stations
  - Scan for viable AM/FM stations

- CD / MP3 functions
  - Switch between songs on a CD
  - Switch between MP3 folders or CDs

- General functions
  - Switch between CD/Tuner/Satellite functions
  - Adjust the volume
  - Modify unit parameters such as bass level, lighting, display, etc.
  - Eject/Insert media

This unit far exceeds the functionality that the typical user would think to find. It does everything from passenger-position optimization, interfacing with a CD-changer, and will even scroll the name of the current track across the faceplate. My car lacks a CD changer and it really does not matter what seat in the car the current playback is optimized for. As long as it sounds like it should, it is good enough.
Usability and User Experience Goals

A user should have a minimal amount of interaction with a car stereo unit. The reason being that the user is typically the driver and the drivers attention needs to be on the road. Therefore, the amount of attention paid to the unit should be minimal. The following are some common usability goals in interfacing with the car stereo.

1. A minimal difference in control from other historic car stereo models
2. Simple volume control
3. Simple radio station selection via the use of pre-programmed presets
4. No hassle in being able to immediately tell which button needs to be pushed at a glimpse to attain the desired effect
5. Automatic radio station browsing by use of a seek function
6. Simple switching between functionality (tuner, CD, etc)
7. Simple CD track changing
8. Minimal hassle in changing unit parameters such as bass and treble
9. Minimal hassle in ejecting/replacing CD media in the unit
10. Simple translation of button functions between tuner/CD/satellite radio modes
11. Minimal hassle in removing/replacing the faceplate
12. Minimal amount of time the unit responds when a channel or CD track is changed
13. No hassle in determining the mode that the unit is in or what channel/track is being played at any time
14. If the CD media is faulty, the user should be informed accordingly.

Reasonable Questions to Gauge the Acceptability of the Interface

1. How much effort is required to remove and replace the faceplate?
2. How difficult is it to find a good radio station without interfering with the driving of the vehicle?
3. With a short glimpse (while the car is in motion), can the user quickly tell which control he/she needs to interact with to achieve the required effect?
4. How many steps are required to change the treble/bass/fade/balance level?
5. How long does the user have to wait after pressing one of the channel preset buttons before he/she hears the station?
6. Having used other car stereos in the past, is a user likely to understand how to use this particular model intuitively?
7. For buttons with multiple functions, how obvious is it what each one does for each mode of play (tuner/CD/satellite radio)?
8. How difficult is it to determine the current radio station or CD track?
9. The CD doesn't seem to want to play. How difficult is it to troubleshoot?

Using the above questions, I find that the interface for this unit could definitely use some improvement. My reasons are below.

1. In college, the act of removing and replacing my stereo's faceplate lead to laziness in doing so. Having decided to forgo its removal one day, my vehicle was subsequently vandalized. This unit does not fare much better.
2. The seek functions do well in making sure that the user needs to devote minimal attention to the unit to find a good station.
3. Given the low visibility of the labels (discussed later), an unacceptable amount of time is
PART II

Usability Breakdown

The Task: Modify the “Fade” option for the stereo unit to adjust the level of audio in the front seats.

Probably the worst usability breakdown that I have encountered came when I tried to adjust the “fade” function of the radio. The fader is the mechanism that balances the output of the speakers in the front and the rear of the vehicle per the users preference. The problem was two-fold (and mainly due to my innate male stubbornness to read the documentation). The task can be summarized in the following steps:

1. Try to figure out how to access the fader menu. This entails clicking on every button at random and figure out if it has a dual purpose which is not obvious to the user. Some items of interest are labeled below...
   - (Item #1) Did you know that the “SRC” button also turns the unit off?
   - (Item #2) What is that weird glowing blue triangle? It serves no purpose but to add a useless ethereal geometric shape to the user interface. Interestingly enough, it took me a couple of weeks to get used to the fact that it was NOT the button which opened the CD player to eject the media.
   - (Item #3) There are two random red glowing buttons off to the right. I initially had no clue what they do whatsoever.
   - (Item #4) Most people wouldn’t think that the AM/FM buttons are used to scroll through menus.
   - (Item #5) The Play/Pause button is used to access yet another menu for things such as “beeping style” and “display color”.
   - (Item #6) I do not think that most people would be able to tell what the button with the rhombus on it does.
   - (Item #7) Lo! There are labels after all! The problem is that they are hardly visible. In fact, it took me months to notice that they were even there and I am constantly forgetting. In fact, in the picture below, the only reason that the reader can tell that they are there at all is that they are highlighted and accentuated. They are black letters behind a dark gray plastic face and are also printed in what looks to be an
2. I finally found the menu. I just needed to hold down the “AUD” (rhomboid) button down for an extended period of time to access it. The problem is that it says one word: “Bass”. Not very intuitive. There was no indicator (label or audible noise) letting me know that I was in a menu.

3. Given the nature of the word presented, I figured this to be a menu item. I then use the “<” and “>” buttons to scroll the menu. Unfortunately, I find that these only change the value of the current item. After more trial and error, I found that the “AM/FM” buttons were used to traverse through the menu(s). This is hardly what I thought that the AM/FM buttons would do. My conception (based on my familiarity with previous models), once a menu is entered, the “<” “>” buttons can be used to traverse the menu and the volume control can be used to modify the values. This is hardly the case here. The functionality of the buttons in many cases is not obvious at all.

4. The above steps make it sound easier than it actually was. In reality, I fumbled through the menus pressing (what I thought would be the correct) buttons. In the end, I had ended up disabling the speakers in the front of my vehicle. It took me about 10 minutes to figure out what I had done wrong and to fix it. I spent more time fixing what I had done wrong than I had actually making the modifications that I wanted to the fader. Although orthogonality was satisfied, it was very difficult to undo the damage.

**Suggested Improvements**

I believe that this usability breakdown problem could have been avoided with some simple modifications to the interface.

Firstly, I believe that the three different menus provided in the interface could be consolidated into a single menu. The creators of the unit clearly tried to separate the menu functions by category. This also could serve to confuse the user. Which button access which menu? This hinders the learnability of the interface. Not only are the menus separated, but they are poorly and ambiguously labeled.

Secondly, menu navigation could be optimized. Given the nature of the controls and my
familiarity with other stereo units, I find that the natural affordances of the controls could better be utilized to make menu navigation easier. The volume control is a knob. It can turn clockwise or counterclockwise depending on the volume that the driver desires. Simply put, it affords turning. When I see this control I think “Turn == Modify non-discrete value” (such as the volume). Therefore, if I want to set the value of the fader to “-5”, the counterclockwise turn of the knob would be a logical choice. That would leave the selector buttons (with the very obvious selection labels) to be used to traverse the menu items.

When I want to modify the volume, I turn the knob. When I want to modify the bass, I should also turn the knob as well (after reaching the right menu item). The same applies to treble, fade, and balance functions. This would strengthen the consistency of the controls and how they map to certain actions.

Thirdly, there is a serious problem with visibility. It is hardly obvious what the two buttons below . Upon (very) careful inspection, a label can be found for each. However, “Disp”, “AUD”, and “AME” are not very obvious descriptors for these buttons. Not only are the labels hard to read, but it is impossible to know the secondary function of each button (like the menus that are displayed after holding the buttons down for a period of time). Those functions are simply missing labels altogether.

As Norman mentions in The Design of Everyday Things, “Whenever the number of possible actions exceeds the number of controls, there is apt to be difficulty” (Norman, 15).
Certification of Authenticity:

I certify that this submission is entirely my own work, as per course collaboration policy.

Signature:  Jason Miller  Date:  1/31/05