Computer Keyboard With Integrated AM/FM Radio

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ABSTRACT

Portable media devices such as personal music devices are ever increasing in popularity. Today, people are listening to music everywhere they go, around the house, outdoors, at school, and at work. Anyone who works on a computer usually listens to some sort of music for entertainment. College students would be a good example of this because large majorities of them carry personal music devices. Common portable devices include personal CD players, tape players, radios, and digital players for such formats as MP3. Small radios are common but are usually not incorporated into any of the other devices. If one chooses to listen to the radio while working on a computer they will usually need a separate unit other than their typical device for personal listening.

INTRODUCTION

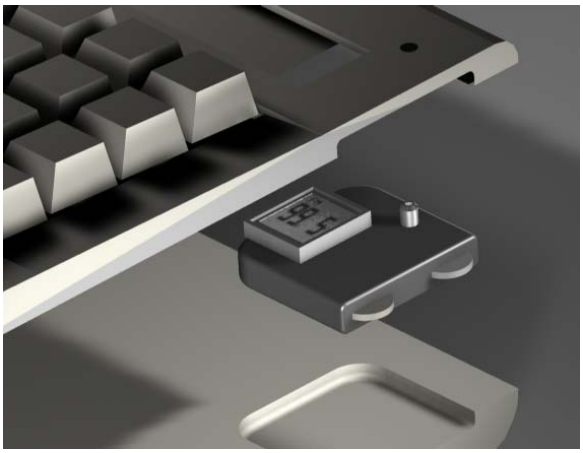
Standard configurations for computers usually include a CD or CD/DVD player. Standard operating systems on computers, such as Microsoft Windows, will usually have software that will play music in digital formats such as MP3's. Regular AM/FM radios are not typically part of a computers configuration. To be able to listen to a radio while working on a computer it has to be external or have a special board installed into the computer. My invention makes an AM/FM radio accessible to anyone who uses a computer and has a set of headphones. Operation of the device would be simple and easily accessible at your fingertips. A port for the headphones is conveniently located for easy access. As shown in **Figure 1**, the device would be fully integrated into the design of the keyboard. Power for the radio would come from the computer as part of the keyboard power. Manufacture of the device would mean a simple integration into the assembly of keyboard. The interior of the keyboard could be used for an antenna extension if needed. The radio unit itself would be a self-contained unit ready for insertion as the keyboard is being assembled. The device could be used by anyone who accesses the computer for use. Computer labs or workplaces equipped with multiple computers could be equipped with this style of keyboard for college students or employees in a work environment. Currently there are no designs in computer keyboards that allow for integration with a common AM/FM radio. This invention would be a seamless integration into the keyboard such that it would not matter what computer the keyboard was used on. The keyboard could be sold as a replacement item for any computer. Possible areas for use could be college campuses, work environments, libraries, home computers, and schools.

Figure 1. Computer Keyboard With Radio Integration

CONSTRUCTION BASICS

Computer keyboards can be configured in a variety of ways with many button options. Some keyboards are cluttered with a variety of buttons for operating features such as computer volume, quick links to Internet features, power shut off, and hibernation. Most keyboards have an unused area in the upper right corner of the keyboard. This is a good area to incorporate the radio. Construction of the assembly is simple with addition of two pieces into the keyboard. A simple circuit is needed to reduce the normal keyboard voltage of 5 volts to 3 volts. Once the voltage circuit is installed the radio can be placed inside. If the radio unit is designed with tuning and volume on one side they can be placed near the edge so as to be exposed once the radio is installed. A small screen can be can be adapted in the design so as to display the channel once installed. **Figure 2** shows a concept of the installation.

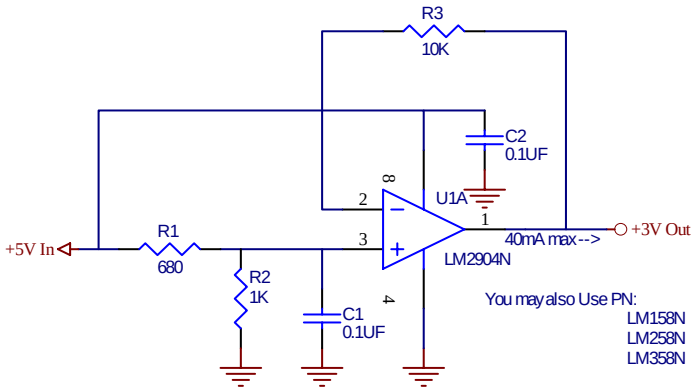
Figure 2. Keyboard Assembly With Radio Insertion



VOLTAGE CONTROL CIRCUIT

Most small radios use 3 volts (2 AAA Batteries) for a power source. The keyboard voltage is an excellent source for powering the radio unit to eliminate battery use. Although the 5 volts is a little high for most radios, the use of a voltage control circuit allows the proper voltage to be supplied. **Figure 3** shows a simple schematic that can be used to control the voltage.

Figure 3. Voltage Reduction Circuit



A parts list for the voltage control circuit would include:

Part	Description	Allied Stock #
LM 2904	OP Amp, Dual	288-1185
R1	680 Ohm	296-5278
R2	1K Ohm	296-5282
R3	10K Ohm	296-5306
C1, C2	0.1 uF	862-2142

CUSTOM RADIO DESIGN

Although a manual version radio is shown in the examples, there are a variety of radio designs can be used for this concept. The controls on small radios now range from full manual controls to push button controls with auto-scanning for tuning and push button volume. A radio can be specified in any design desired depending on the keyboard and how much room is left. If an auto-scanning unit is used it will take up less space. With a radio of this design only a volume control, push button for tuning, and a headphone jack are needed for exterior control features. **Figures 4 & 5** show a prototype keyboard with a small auto-scanning radio installed. A simple push button is used for tuning. If a final production model were proposed a more complex unit could be designed, such as the concept in **Figure 1** or it could be simplified such as the auto-scanning unit. Auto-scanning radios are easy to use and will cut down on the installation steps. The antenna is easy to run inside the keyboard and it can be installed almost anywhere in the interior as long as it does not block any of the keys. The options of an automatic radio are easy to install and cheap to purchase. Small radio units can range in price anywhere from $2 to 6$ depending upon the style. If a custom radio were designed and manufactured it would even be cheaper on a volume basis. These small radios are used in novelty radios because they are easy to customize. **Figures 6** shows some small radio designs that can be incorporated into a keyboard design. The radios in these units are small and easily converted for use inside the keyboard.

Figure 4. Keyboard With Scanning Radio

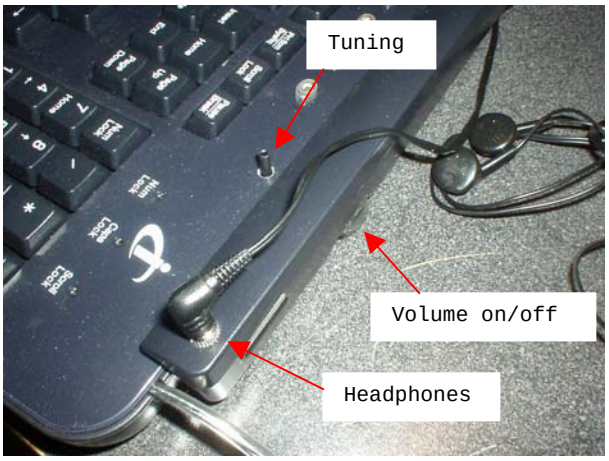


Figure 5. Keyboard With Scanning Radio

Figure 6. Various Small Radio Designs

CONCLUSION

This concept is a convenient combination of two items that get used daily. There is sometimes a need to have access to a radio while working on computers at work or at school. If there were severe weather, sporting events, or news you would have the access without having another listening device. All the user would need is a small set of headphones. Operation of the unit would be simple and fast. The keyboard concept can be manufactured easily and inexpensively. An assembly parts list includes:

Standard Computer Keyboard	1 ea.
Voltage Control Circuit (See **Figure 3)**	1 ea.
Small Radio (Auto or Manual)	1 ea.
Phone Jack (**Allied** Stock # 283-0352)	1 ea.

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