Title: TABLET CASE WITH INTEGRATED SPEAKERS

Abstract: A case for a tablet computer having embedded speakers. The casing provides an analog audio interface with a tablet computer such that the audio capabilities of the tablet computer can be augmented by speakers and circuitry embedded in the casing. Additional features can include microphone support, directional positioning of the embedded speakers and positioning of the tablet computer display in a stable vertical orientation.
CROSS-REFERENCE TO RELATED APPLICATION

[0001] Cross-reference is made to co-pending application by Jorge V. Ragde for "TABLET CASE WITH INTEGRATED SPEAKERS" and "TABLET COMPUTER CASE" filed on the same date as the present application and commonly owned. The cross-reference application is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The embodiments of the invention relate to a case for a tablet computer. Specifically, the embodiments of the invention relate to a hard case with an embedded speaker system that provide an improved sound quality for the tablet computer.

BACKGROUND

[0003] Tablet computers have become popularized by products such as the iPad by Apple, Inc. of Cupertino, California. These devices can have varied screen sizes, but typically have a screen size in the range of 7 to 12 inch along the diagonal. These devices also typically have a 4:3 or 16:9 aspect ratio. The typical thickness of tablet computers is less than an inch and they weigh less than 3 pounds. Due to design constraints and the compact nature of these devices, the sound quality of the embedded speakers is poor. These devices are not able to produce sound levels above 25 decibels at one meter.

[0004] Cases for these devices focus largely on providing basic protection to the device from impact and from wear on the outer surfaces of the device. Existing cases have a book form factor or layout. The book style case includes a sleeve into which the tablet computer has a form fit. The book style case also defines an opening through which the touch screen display of the tablet computer can be accessed. The cover of the book style case is a flap that folds over the screen and back behind the tablet computer. The book style case flap has a mesh or fabric exterior covering an interior rigid panel formed of plastic, metal or organic materials. Some of these case flaps can bend backwards to form a stand or prop for the display of the tablet computer such that the display is angled away from a surface upon which the tablet computer is resting.
BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The embodiments of the invention are illustrated by way of example and not by way of limitation in the figures of the accompanying drawings in which like references indicate similar elements. It should be noted that references to "an" or "one" embodiment of the invention in this disclosure are not necessarily to the same embodiment, and they mean at least one.

[0006] Fig. 1 is a diagram of one embodiment of the tablet computer case with embedded speakers in an open position.

[0007] Fig. 2 is a diagram of one embodiment of the internal components of the tablet computer case.

[0008] Fig. 3 is a diagram of one embodiment of the tablet computer case with the speakers in the rear facing position.

[0009] Fig. 4 is a diagram of one embodiment of the tablet computer case with the one portion of the cover in a closed position and one in the rear position.

[0010] Fig. 5 is a diagram of one embodiment of the tablet computer case from a side view showing a position of openings on the side of the case.

[0011] Fig. 6 is a diagram of one embodiment of a tablet computer case with a single length wise flap with embedded speakers.

[0012] Fig. 7 is a diagram of one embodiment of a tablet computer case with a single-end hinged cover with embedded speakers.

[0013] Fig. 8 is a diagram of one embodiment of a tablet computer case with sliding covers with embedded speakers.

[0014] Fig. 9 is a diagram of one embodiment of a case with a folding cover with embedded speakers.

DETAILED DESCRIPTION

[0015] Figure 1 is a diagram of one embodiment of a tablet computer case with embedded speakers. The tablet computer case includes a central housing 101 and a set
of cover panels 103A, 103B. The central housing 101 defines a casing to protect the tablet computer from impact, such as the impact caused from dropping the tablet computer, the pressure or impact caused from placing the tablet computer into a carrying case with other items and similar types of scenarios where the tablet computer would be impacted and damaged. The central housing 101 also protects the back and sides of the tablet computer from scratches, markings and similar damage that can be caused in every day use of the tablet computer, especially due to the portability of the device.

[0016] The central housing 101 can be formed from various types of hard plastics, metals or organic substances. The central housing 101 can also be formed from a combination of these materials. The central housing 101 typically has dimensions that roughly match those of the underlying tablet computer to be protected. The tablet computer is held and secured in an interior sleeve or compartment defined by the central housing 101 by a form fit, snap fit or similar securing mechanism. The hard central housing 101 can also be covered by mesh or fabric material. Tablet computers typically have form factors with a 7 inch, 10 inch or 12 inch diagonal. Thus, central housings 101 designed to hold tablet computers in this range are complimentary to these tablet form factors.

[0017] The central housing 101 also defines a set of openings or ports through which the input/ output (I/O) mechanisms of the tablet computer can be accessed and interfaced. Most tablet computers are touch screen devices, thus the central housing 101 defines a large opening through which the touch screen can be manipulated by a user on the front facing of the central housing 101. The back surface of the central housing 101 can define openings or ports for cameras and similar sensors. The openings can also be defined in the central housing 101 for ventilation purposes that can match the positioning of ventilation in the underlying tablet computer or may be positioned to allow radiating heat to escape. The casing may be opaque, transparent or translucent. In some embodiments, differing sections of the central housing 101 can be opaque, transparent or translucent. Openings and ports for buttons, power sockets, universal serial bus (USB) sockets and similar mechanisms of the tablet computer can be defined.

[0018] The positioning of these ports in the walls of the central housing 101 is selected based on matching them with the intended tablet computer model that the central housing is designed to protect. For example, the central housing 101 can be
designed to fit the Apple iPad created by Apple, Inc. of Cupertino, California. The iPad has volume control buttons, a screen lock or mute switch, a power button and a home button as well as a power adaptor socket or proprietary transfer socket. Openings in the casing are defined for each of these or for groups of these mechanisms enabling the user to access these mechanisms while using the tablet computer case.

[0019] A tablet computer can be inserted into the central housing 101 through a fixed opening, a removable and lockable section of the central housing 101, seperable sections of the central housing 101 or similar mechanism that enables the tablet computer to be securely placed within the central housing 101 and subsequently enclosed by the central housing 101. In one example embodiment, the central housing 101 separates into two discrete and interlocking halves. The tablet computer can be inserted into one half of the central housing 101 and then enclosed with the other half, which locks onto the first half to secure the tablet computer. Any type, number and combination of locking mechanisms can be utilized.

[0020] The central housing 101 can also include input mechanisms for the manipulation of the imbedded speaker system. Alternatively, these controls can be in the cover panels 103A, 103B. These input mechanisms can include switches or dials for managing the power and volume level for the speakers. The central housing 101 can also have embedded support for other peripherals such as keyboards or microphones that do not necessarily interface directly with the tablet computer within the tablet computer case. For example, the central housing 101 or the cover panels 103A, 103B can include a port to receive a microphone such as a 3.5 mm or 2.5 mm jack, which enables a user to receive an audio signal from the microphone and output audio from the microphone through the speakers.

[0021] Alternatively, the microphone signal can be input into the tablet computer before being output to the speakers by the tablet computer through its audio port. The exact combination of these features can be dependent on the underlying tablet computer. For example, the Apple iPad does not support a USB interface or microphone input, nor does it include a camera sensor. The Galaxy Tab by Samsung of Seoul, South Korea includes front and rear facing cameras. Tablet computer cases for each of these devices include ports for their specific ports and sensors. In further embodiments, communication between the peripherals, tablet computer case component and tablet computer can be through wireless protocols and devices. For example, the BLUETOOTH wireless protocol can be used to communicate with the
tablet computer through a wireless communication device embedded in the tablet computer case to transmit an audio signal between the components of the tablet computer case and the tablet computer.

Each of the tablet computer case cover panels 103A, 103B is connected to the central housing 101 by hinges 109A, 109B, respectively. These hinges allow the cover panels 103A, 103B to have a nearly 360 degree range of rotation such that the panels can be rotated to be flush with the front surface of the tablet computer and central housing 101, as well as flush with the back surface of the central housing 101. The cover panels 103A, 103B can also be rotated to an in-line or angled position in relation to the main central housing 101. The hinges 109A, 109B can be any type of hinge mechanism including friction hinges, barrel hinges, spring loaded or biased hinges and similar hinge types or combinations thereof. Hinges such as frictional hinges or spring loaded hinges can offer a degree of resistance such that a position of the cover panels 103A, 103B can maintain a relationship to the central housing 101 or the cover panels 103A, 103B can be biased to a particular position or set of positions.

In one embodiment, each of the hinges 109A, 109B includes two hinges with a connecting bridge to provide a large degree of articulation and range of motion. The hinges 109A, 109B enable a user to set up the tablet computer in the tablet computer case in a vertical orientation such that the cover panels 103A, 103B form anywhere from a 45 degree to a 330 degree angle with front surface of the central housing 101 and display of the tablet computer enabling a user to set the tablet computer up on a flat surface and view and interact with the tablet computer while in a relatively stable configuration.

The cover panels 103A, 103B can have an outer shell formed from the same materials or similar materials to those used in the central housing 101. The interior surface may also be formed from or covered with materials that are softer, non-scratching materials and non-abrasive materials to protect the screen of the tablet computer when the cover panels 103A, 103B are closed to protect the tablet computer. The panels may also define openings for a set of speakers 105A-D. The cover panels 103A, 103B can include any combination of speakers and any number of low range, mid-range or high range speakers, i.e., woofers, tweeters, sub-woofers and mid range drivers. The cover panels 103A, 103B can also include apertures for interior channels 107A-D that are designed to improve the base response of the speakers. In one example embodiment, the interior channels are 3.8 inch channels that travel toward an
upper or lower edge of the cover panels 103A, 103B. The channels can flare outward as they travel away from the apertures 107A-D.

[0025] In one embodiment the cover panels 103A, 103B can be locked in a closed or rear position by interlocking parts that interface the edges of the cover panels 103A, 103B with either the other cover panel or the central housing 101. This locking mechanism can include a release mechanism to unlock the cover panels 103A, 103B from any locked position or from a particular locked position. In other embodiments, separate locking mechanisms are not utilized and the hinges have either set positions or continuous resistance that hold the cover panels 103A, 103B in position relative to the central housing 101.

[0026] Figure 2 is a diagram of one embodiment of the components of the tablet computer case with embedded speaker system. In one embodiment, the embedded speaker system can include an analog interface 201, a battery 213, signal processor 211, a digital interface 205, a microphone interface 203, a power interface 207 and a set of drivers 105A-D. In one embodiment, the microphone interface 203 and the digital interface 205 are optional. In a further embodiment, multiple batteries, signal processors and similar components can be incorporated to divide the load of audio processing and each set of components can be located in separate cover panels 103A, 103B.

[0027] The analog interface 201 connects the audio lines and speaker system of the tablet computer case with the tablet computer. The analog interface 201 can include a male 3.5mm audio plug or similar audio connector to be inserted into the audio port of the tablet computer. In other embodiments, the analog interface 201 can include other types of connectors that are complimentary to the tablet computer audio ports. For example, the tablet computer can have a set of RCA type ports for left and right speakers or similar audio port interface. The analog interface 201 can provide the audio signal to the signal processor 211 to separate the left and right signals for the respective left and right speaker.

[0028] In some embodiments, optional elements include a microphone interface 203 that provides a port (e.g., a 3.5mm female port) for the connection of a microphone to the tablet computer case and possibly to the tablet computer. Some tablet computers have a microphone input port (e.g., a female 3.5mm port). The microphone can be connected to the microphone interface 203, which can pass the incoming signal to the
signal processor 211 to be passed on to the speakers 105A-D or to be mixed with the input from the analog interface 201 to be output through the left and right speaker systems. In other embodiments, the microphone interface 203 can receive the input signal from the microphone and pass it through to the tablet computer through the microphone input port of the tablet computer. In this embodiment, a male 3.5mm plug or similar connector can be provided to interface with the tablet computer.

[0029] In a further embodiment, other types of interface ports such as universal serial bus (USB) interface, fire wire interface, HDMI or a similar interface can be provided by the tablet computer case whereby the casing enables the input of audio from external sources to be output through the speaker system or the output of audio data from the tablet computer is enabled through these types of digital interfaces 205 to be output through the embedded speaker system. For example, a tablet computer can have a USB port through which audio data is output and which is then converted by the digital interface 205 or a combination of the digital interface 205 and the analog interface 201 to drive the respective left and right speaker systems.

[0030] The power interface 207 provides a set of manual controls to the user to manage the power level including the volume level of the speaker system. The power interface 207 can include any number of buttons, switches 227, dials, touch screens or similar input mechanisms to enable the user to turn on and off power in the embedded speaker system as well as to adjust the power levels and consequently the volume levels of the speaker system. In one alternate embodiment, the tablet computer case can include an auxiliary display such as an LED display or a small LCD display that provides feedback on the status of the speaker system such as power level, battery level, speaker output mode and similar information.

[0031] At least one of the left and right panels 103A, 103B includes a battery 213, a signal processor 211 and a set of drivers 105A-D. The left or right audio signal is received from the analog interface 201 at signal processor 211. The signal processor 211, depending on the power settings, amplifies the audio signal before providing it to the speakers 105A-D. The digital signal processor 211 is powered by the battery 213. In one embodiment, the digital signal processor 211 is a ASIC. For example, the digital signal processor 211 can be a Yamaha Digital Amplifier (YDA) 147 by Yamaha Corporation of Hamamatsu, Japan. In one embodiment, the battery 213 is a rechargeable battery such as nickel-cadmium or lithium-ion batteries. In other embodiments, non-rechargeable batteries or receptacles for non rechargeable batteries
can be provided by the tablet computer case. Any size or number of batteries can be supported. In one embodiment, the battery 213 is 11.1 volt and 2000 mAh.

In other embodiments, multiple batteries can be provided that are housed in both cover panels 103A, 103B or in the central housing. In a further embodiment, the battery 213 can be omitted and power can be drawn from a tablet computer through a USB port or similar port providing a power source from the tablet computer or any combination thereof. The battery 213 can be controlled through the power interface 207. The power interface 207 can include a switch, dial or similar mechanism to enable a user to turn the speaker system on and off by connecting and disconnecting or otherwise altering the power level from the battery. The output level of the speaker system can also be controlled through the same or a separate mechanism of the power interface 207.

The digital signal processor 211 can be any type of audio processor including a YDA 147 or similar processor. The digital signal processor 211 can amplify the audio signal for from the tablet computer, microphone or other audio input source. In one embodiment, the digital signal processor 211 and speakers 105A-D can generate a 90 decibel peak output at 1 meter. The digital signal processor 211 can also divide the incoming signal into a left and right channels or into any number of channels to support surround sound formats such as Dolby Digital, Sony Dynamic Digital Sound, and similar formats.

The digital signal processor can separate the audio signal for a set of frequency ranges for the corresponding drivers. Any number of separate frequency ranges can be divided out depending on the available number and types of drivers. In one embodiment, the available drivers are identical and the digital signal processor 211 provides the entire frequency range to each speaker. In another embodiment, the digital signal processor 211 provides high-range, mid-range and low-range signals for a tweeter, mid-range driver and woofer, respectively. In other embodiments, the digital signal processor 211 supports additional functionality and processing of the audio signals to enable surround sound formats and similar audio technologies.

Any number and variety of speaker 105A-D can be utilized in any configuration. The speakers 105A-D can have a combined output of range of 90 decibels at one meter (peak). The speakers 105A-D can be designed to output any frequency range. The speakers 105A-D have a low profile with a depth less than 0.5
inches. In one example configuration, four identical speakers with a diameter less than 1.5 inches and a depth less than 0.5 inches can output 90 decibels at one meter at peak output and can continuously output 75 decibels at one meter.

[0036] The various components of the tablet computer case and embedded speakers are described with an example embodiment illustrated in Figure 2. However, one skilled in the art would understand that many of the components such as the analog interface 201, microphone interface 203, digital interface 205, power interface 207 and similar components can be housed either partially or completely in either cover panel 103A,B both cover panels 103A,B, the central housing 1010 or any combination thereof. Similarly, components such as the battery 213 and digital signal processor 211 can be housed either partially or wholly in the central housing rather than in a cover panel. Those components that are split between the right and left embedded speaker systems can also be unified or further split and housed in a single cover panel, the central housing, or both cover panels or any combination thereof. One skilled in the art would understand that the structures illustrated and described are for purposes of example and not limitation and other variations of the arrangement and interaction of these components are possible in line with the example structures and principles described herein.

[0037] Figure 3 is a diagram of one embodiment of the cover panels rotated to a rear position. The cover panels with the embedded speakers can be rotated to a rear position of the tablet computer case such that they are flush with the back surface of the tablet computer case exposing the speakers 105A-105D and channel apertures 107A-107B. Having this rear exposed position enables the user of the tablet computer to control the output of the speakers while having them face in the same direction as the speaker. This can be used in many applications to assist users with impaired speech or similar impairments. The user can use an application or program of the tablet computer to select from a set of possible audio outputs or sources on the screen of the tablet computer, which then generates an audio output to the embedded speakers that are directed toward the intended recipient of the audio.

[0038] This embodiment also illustrates the placement 301 of audio and microphone ports 225 on the exterior of the tablet computer case. In one embodiment, the microphone interface, analog interface, USB interface and/or power interface 227 are all embedded into one or the other of the two side panels instead of the central housing. These ports can be placed on any surface of the central housing or cover
panels. Placing the ports on an edge enables their use regardless of the position (e.g., closed) of the cover panels.

[0039] This embodiment also illustrates the placement of the release mechanism 303, that enables the separation and locking of the cover panels 103A, 103B. In the example embodiment, the release is a trigger that moves along a defined tracked along an edge of one of the cover panels 103A, 103B that actuates a locking mechanism along another edge of the cover panels 103A, 103B. In other embodiments, the release mechanism 303 can be a push button, switch or similar mechanism. In further embodiments, a release mechanism is not utilized and the cover panels 103A, 103B are held in a closed position by resistance or bias in the springs, complementary magnets or similar mechanisms.

[0040] Figure 4 is a diagram of one embodiment of the tablet computer case without the example tablet computer present in other illustrations. In this example embodiment, one of the cover panels is closed and one is rotated to the rear position showing the versatility of the configurations of the tablet computer case. The interior of the central housing 101 is exposed showing the form factor and structures of the casing designed to secure the tablet computer. When in a closed position, the hinges 109A can be flush with the outer edge of the case. The audio ports, microphone ports, power interface and similar components can also remain exposed enabling the use of the functions of the embedded speaker system when closed or partially closed.

[0041] In the example illustrated embodiment, the back of the central housing is generally opaque with a circular window. In other embodiments, different sized, shaped or positioned windows can be provided. Any number or combination of such windows can be provided in the back of the central housing or in other components of the tablet computer case. In further embodiments, the back of the central housing is entirely opaque, translucent or transparent

[0042] This illustration also shows an example position of ports 401 in the exterior of a cover panel while the cover panel is closed. Positioning the ports 401 in the exterior of the cover panels or a combination of the cover panels and central housing enables a user to access the ports of the tablet computer even when the tablet computer case is in a closed position covering the tablet display.
Figure 5 is a diagram of one embodiment of an end view of the tablet computer case where the cover panel is rotated to a rear position. This viewing angle shows the interior of the hinge where it is coupled by a set of screws to the central housing. In one embodiment, the end of the case can define a set of ports and the hinges can be designed around these ports 501.

Figure 6 is a diagram of one alternative embodiment of the case. In this example embodiment, a single cover panel 601 is provided having all of the embedded speakers embedded therein. The cover panel 601 can be attached to the central housing 603 through a set of hinges or similar mechanisms. The cover panel 601 can be weighted such that the tablet computer can remain in an upright position or angled position and the hinges can provide sufficient resistance to enable the tablet computer to be viewed in a manner similar to that of a laptop monitor. The embedded speakers can have any layout within the cover including having any combination of interior positions and exterior positions in the cover panel.

Figure 7 is an alternative embodiment of the single cover coupled at an end position with the central housing. In this example embodiment, the cover panel 701 is attached by a hinge or similar mechanism at one end of the central housing 703. In this embodiment, the tablet computer can be established in the vertical position with the angling of the cover panel 701 in relation to the central housing 703 containing the tablet computer providing a stable configuration for viewing and interacting with the tablet computer. The embedded speakers can have any layout within the cover including having any combination of interior positions and exterior positions in the cover panel.

Figure 8 is another alternative embodiment of the tablet computer case. In this embodiment, the cover panels 803A, 803B are coupled by a slide mechanism whereby the cover panels 803A, 803B can slide from a first position for viewing the entirety of the display of the tablet computer to a second position entirely enclosing the display and tablet computer. This enables a left-right configuration of speakers in each of the respective cover panels. In further embodiment, the panels when slid to the end of the track may also be rotatable within the track and able to rotate to a position such that they are flush with the rear of the central housing 801 similar to the hinged embodiment. The embedded speakers can have any layout within the covers 803A, 803B including having any combination of interior positions and exterior positions in the cover panel.
Figure 9 is a diagram of a further embodiment of the tablet computer case where the single panel cover 903 is capable of bending back to form a triangle structure with the central housing 901. In this embodiment, the cover panel 903 is segmented and the embedded speakers can be in any segment of the panel cover. In one embodiment, the embedded speakers are positioned such that the speaker positioning is facing towards the user when in the open stand configuration. The embedded speakers can have any layout within the cover including having any combination of interior positions and exterior positions in the cover panel 903.

Each of these alternative embodiments can have similar materials, dimensions and structures as described above in the embodiments illustrated in Figures 1-5. One skilled in the art would understand that the principles and structures described in regard to the embodiments of Figures 1-5 are also applicable to these alternative embodiments and that all of the embodiments demonstrate the structures and principles involved.
CLAIMS

What is claimed is:

1. A tablet computer case comprising:
   - a housing having a form factor of a tablet computer, the housing to secure a
     tablet computer and protect each side surface and a back surface of the tablet computer;
   - a first cover panel coupled to the housing by a first hinge, the first cover to rotate
     via the first hinge from a first position covering a first portion of a front surface of the
     tablet computer to a second position flush with a back surface of the housing, the first
     cover panel including a first speaker.

2. The tablet computer case of claim 1, further comprising:
   - a second cover panel coupled to the housing by a second hinge, the second cover
     panel to rotate via the hinge from a first position covering a second portion of the front
     surface of the tablet computer to a second position flush with the back surface of the
     housing, the second cover panel including a second speaker.

3. The tablet computer case of claim 2, further comprising:
   - a speaker interface to receive an audio signal from the tablet computer and
     transmit the audio signal to any one of the first speaker or the second speaker.

4. The tablet computer case of claim 3, further comprising:
   - a digital signal processor housed within the first cover panel to adjust the audio
     signal power level, the digital processor to receive the audio signal from the tablet
     computer and output the adjusted audio signal to any one of the first speaker or the
     second speaker.

5. The tablet computer case of claim 4, further comprising:
   - a rechargeable battery housed within the first cover panel to power the amplifier
     circuit.

6. The tablet computer case of claim 1, further comprising:
   - a third speaker within the first cover panel, the third speaker to output mid-
     range or low-range frequencies,
   - wherein the first speaker outputs mid-range or high-range frequencies.
7. The tablet computer case of claim 9, wherein the digital signal processor separates frequency ranges within the audio signal.

8. The tablet computer case of claim 1, wherein the housing is formed from a rigid and impact resistant material.

9. The tablet computer case of claim 1, wherein the housing defines openings to access ports of the tablet computer.

10. The tablet computer case of claim 1, wherein a portion of the housing is transparent to reveal a portion of the back surface of the tablet computer.

11. The tablet computer case of claim 2, wherein the first cover panel and second cover panel are positionable at an angle to a plane of a front surface of the tablet computer to support a vertical position of the plane of the front surface of the tablet computer on a horizontal surface.

12. A tablet computer case comprising:
   a means for housing a tablet computer having a form factor of a tablet computer, the means for housing to secure a tablet computer and protect each side surface and a back surface of the tablet computer;
   a first means for covering a tablet computer coupled to the means for housing by a first hinge, the first means for covering to rotate via the first hinge from a first position covering a first portion of a front surface of the tablet computer to a second position flush with a back surface of the housing, the first means for covering including a first speaker.

13. The tablet computer case of claim 12, further comprising:
   a second means for covering a tablet computer coupled to the means for housing by a second hinge, the second cover panel to rotate via the hinge from a first position covering a second portion of the front surface of the tablet computer to a second position flush with the back surface of the means for housing, the second means for covering including a second speaker.
14. The tablet computer case of claim 12, further comprising:
   a means for audio interfacing to receive an audio signal from the tablet computer and transmit the audio signal to any one of the first speaker or the second speaker.

15. The tablet computer case of claim 12, further comprising:
   a means for digital signal processing housed within the first means for covering the tablet computer to adjust the audio signal power level, the means for digital signal processing to receive the audio signal from the tablet computer and output the adjusted audio signal to any one of the first speaker or the second speaker.

16. The tablet computer case of claim 12, further comprising:
   a means for providing rechargeable power housed within the first cover panel to power the amplifier circuit.

17. The tablet computer case of claim 15, wherein the means for digital signal processing separates frequency ranges within the audio signal.

18. The tablet computer case of claim 12, wherein the means for housing defines openings to access ports of the tablet computer.

19. The tablet computer case of claim 1, wherein a portion of the means for housing is transparent to reveal a portion of the back surface of the tablet computer.

20. The tablet computer case of claim 2, wherein the first means for covering and second means for covering are positionable at an angle to a plane of a front surface of the tablet computer to support a vertical position of the plane of the front surface of the tablet computer on a horizontal surface.