

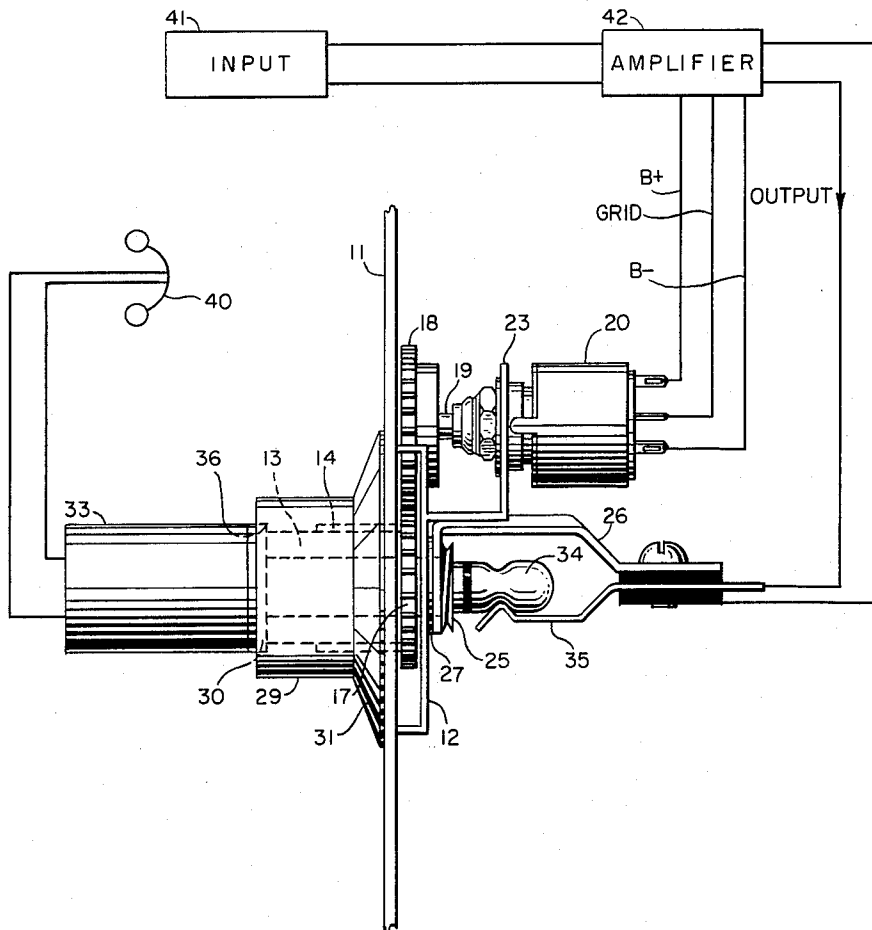
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PERIPHERAL IMPEDANCE CONTROL

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PERIPHERAL IMPEDANCE CONTROL

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates in general to variable impedance devices of the potentiometer variety and in particular to a multi-purpose device of this variety.

The prior art discloses a number of receptacles having controls associated therewith but few if any that are useful for incorporation on a control panel or other mounting where the control may be combined with the receptacle. Many prior art devices for controlling amplitude consist of a knob mounted separately from the unit to be controlled or mounted separately from a receptacle where the controlled quantity is relayed, heard or displayed. Such a separate mounting requires interrupting the operator's work sequence as well as adding to a complexity of dials and receptacles on a control panel or other mounting. This complexity of instrumentation becomes more serious in miniaturized equipment such as a transistorized communication receiver where the number of controls and receptacles is generally unchanged but the space available for placement thereof is greatly reduced.

Accordingly, it is an object of the present invention to provide means for controlling amplitude at the receptacle in use.

Another object of this invention is to provide a potentiometer type variable impedance device which is controllable at a panel station or other mounting and requires no interruption in an operator's sequence of movement.

A further object of the present invention is to provide a variable impedance control which will occupy a minimum of additional space on a control panel or other mounting.

A further object of this invention is to provide a collar type of potentiometer control on the front of a panel with the potentiometer offset from the control on the rear of the panel.

Other objects and advantages of this invention will become apparent upon a careful consideration of the following description when read in conjunction with the accompanying drawing wherein there is shown an isometric view partly in section of a first embodiment of the present invention.

In accordance with the teachings of the present invention, a variable impedance control for a phone jack, a phono plug, or the like, is provided wherein the control knob is positioned at the front of a panel or other mounting around the periphery of the phone jack prong and coaxial therewith. The control knob, which is hollowed, is mechanically connected through the panel to a potentiometer or other variable impedance control means attached at the rear of the panel. The control knob, although shown cylindrical, may be of a variety of configurations each, however, having a primary feature of rotatability about a prong or receptacle. A portion of the phone plug is accommodated within the control knob thereby further reducing the space in front of the panel

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occupied by the plug and prong and placing the control knob at the finger tips of an operator when he inserts the plug into its receptacle.

Referring to the drawing, panel 11 is shown with bracket 12 mounted on the rear surface thereof, the panel being cut through to accommodate shaft 13 and collar 14. Shaft 13 is rigidly attached to bracket 12 while collar 14 rotates freely about the shaft. Attached to collar 14 is gear 17 which is coaxial with shaft 13 and, in the present embodiment, coplanar with gear 18, gear 18 being attached to shaft 19 of potentiometer 20 which in turn is attached to bracket 12 by fitting 23. Shaft 13 is threaded at 25 to receive matching threads of phone jack 26 and hence has a flange 30 at the opposite end. Lock washer 27 is inserted between the shaft and phone jack to provide secureness. It will be appreciated that the phone jack may be attached to shaft 13 in any of a variety of manners than that stated, such as riveted or soldered. Control knob 29 is cored to fit tightly over collar 14, is recessed at 36 to receive flange 30, and has dial 31 attached to it. Other connection of these parts, i.e., the knob and collar, such as threading or riveting may, of course, be effected to transmit motion to potentiometer 20, or knob 29 may be omitted and gripping means such as a knurled surface on collar 14 used in lieu thereof. Phone plug prong 34 extends through shaft 13 to engage phone jack contact member 35. The signal to be amplified, measured, etc., is detected at earphones 40 after being introduced from an input indicated at 41. The signal is relayed through an amplifier indicated at 42 from which unit the output is taken, as shown, by a pair of output leads connecting the amplifier to phone jack 26 and phone jack contact member 35. Leads designated B+, grid, and B- are shown connecting potentiometer 20 and amplifier 42. These leads are presented as one means of controlling an amplifier circuit through potentiometer 20 and are not to be construed as limiting such control to the means depicted. The earphones 40 are shown connected by a pair of leads to phone plug 33. It is to be understood that the signal direction can be reversed with an input introduced through phone plug 33 and the output taken from the opposite side of the amplifier to that shown.

In a preferred embodiment, the operation of the device is virtually that of inserting the phone plug prong 34 through shaft 13 to engagement with phone jack 35 since finger control of potentiometer 20 is immediately accessible at the point of insertion of the phone plug prong. The potentiometer and phone jack contact member may be connected such that a circuit is completed therebetween with rotation of control knob 29 in one direction increasing signal volume and rotation in an opposite direction decreasing signal volume.

Other embodiments incorporating the principal features of the present invention may have one or more variable impedance means positioned to the rear of a panel coaxially with or generally in a line with the inserted member, or may have the inserted member mechanically connected with a variable impedance means whereby rotation of the inserted member effects variation of impedance or other controlled quantity. Panel modifications such as a pilot light above the panel aperture and at the rear of the panel, with the potentiometer in this embodiment disposed below the aperture, and slots cut through the panel to illuminate both a dial attached to the control knob and a dial position indicator are, of course, possible additions to the present invention.

It will be understood that a primary advantage of the present device is the inclusion of two separate operations in the space normally required to accommodate equipment for but one operation. If desired, three operations can be so included by the addition of an ON-OFF switch

attached to the potentiometer shaft, or more than three by other additions to the potentiometer shaft. Another primary advantage is that variable control is instantly available as soon as the inserted member is engaged in the receptacle or phone jack, thereby assisting untrained operators as well as permitting a trained operator's attention to be directed to other matters once contact with the phone jack is established.

Many modifications and variations of the present invention are possible pursuant to the above teachings. It is therefore to be understood that the practice is not to be limited by the specific examples in the foregoing description and that this invention is only to be limited by the scope of the appended claims.

What is claimed is:

1. A control device for mountings on a control panel comprising a variable impedance element having a variable tap, hollowed rotatable means rotatable about a selected axis and extending through said control panel, first connecting means for mechanically connecting said hollowed rotatable means to said variable impedance element to vary the impedance thereof upon rotation of said rotatable means, electrical signal conductive means axially disposed along said selected axis with respect to said hollowed rotatable means and electrically isolated therefrom, an amplifier having input circuits, the output circuit of said amplifier connected through said electrical signal conductive means to a pair of output terminals, potential means connected across said variable impedance means, and a connection from the variable tap of said variable impedance means to the input circuit of said amplifier whereby the bias of said amplifier may be varied through rotation of said rotatable means.

2. A control device for mountings on a control panel comprising a hollowed shaft having a uniform axial bore, a phone jack attached to one end of said hollowed shaft and axially aligned therewith, a collar rotatably positioned about said hollowed shaft and having a first gear attached at one end thereof, support means attached to said panel for supporting said hollowed shaft and said collar in position through said panel, said first gear positioned adjacent to a face of said panel, said jack attached to said hollowed shaft adjacent to said support means, a potentiometer attached to said support means and having a rotatable shaft extending parallel to the axis of said hollowed shaft, said potentiometer shaft having a second gear attached thereto positioned so as to engage said first gear, and hollowed gripping means attached to said collar adjacent to the opposite face of said panel from said first gear for transmitting rotary motion through said panel to said potentiometer.

3. A control device for mountings on a control panel comprising a phone plug having an axially extended prong, a hollowed shaft having a uniform axial bore of substantially greater diameter than the diameter of said

prong and adapted to receive said prong through said bore, a phone jack attached to one end of said hollowed shaft and axially aligned therewith, a collar rotatably positioned about said hollowed shaft and having a first gear attached at one end thereof, support means attached to said panel for supporting said hollowed shaft and said collar in position through said panel, said first gear positioned adjacent to a face of said panel, said jack attached to said hollowed shaft adjacent to said support means, a potentiometer attached to said support means and having a rotatable shaft extending parallel to the axis of said hollowed shaft, said potentiometer shaft having a second gear attached thereto positioned so as to engage said first gear, and hollowed gripping means attached to said collar adjacent to the opposite face of said panel from said first gear for transmitting rotary motion through said panel to said potentiometer.

4. A control device for mountings on a control panel comprising a phone plug having an axially extended conductive prong, a hollowed shaft having a uniform axial bore of substantially greater diameter than the diameter of said prong and adapted to receive said prong through said bore, said hollowed shaft being electrically isolated from said prong, a conductive phone jack attached to one end of said hollowed shaft and axially aligned therewith, said phone jack having a conductive contact member extending therefrom, a collar rotatably positioned about said hollowed shaft and having a first gear attached at one end thereof, support means attached to said panel for supporting said hollowed shaft and said collar in position through said control panel, said first gear positioned adjacent to a face of said control panel, said phone jack attached to said shaft adjacent to said support means such that said prong when inserted will engage said contact member, a potentiometer attached to said support means and having a variable tap and a rotatable shaft extending parallel to the axis of said hollowed shaft, said potentiometer shaft having a second gear attached thereto positioned so as to engage said first gear, hollowed gripping means attached to said collar adjacent to the opposite face of said panel from said first gear for transmitting rotary motion through said panel to said potentiometer, an amplifier having input and output circuits, the output circuit of said amplifier connected through said phone jack and phone plug to a pair of output terminals, potential means connected across said potentiometer, and a connection from the variable tap of said potentiometer to the input circuit of said amplifier whereby the bias of said amplifier may be varied through rotation of said collar.

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