

## [54] MULTI-BAND MEMORY ASSEMBLY

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[51] Int. Cl. .... **H04b 1/16**

[58] Field of Search..... **325/470, 455, 452, 458, 467, 325/460, 462, 315, 316; 178/DIG. 15; 334/53, 54, 18**

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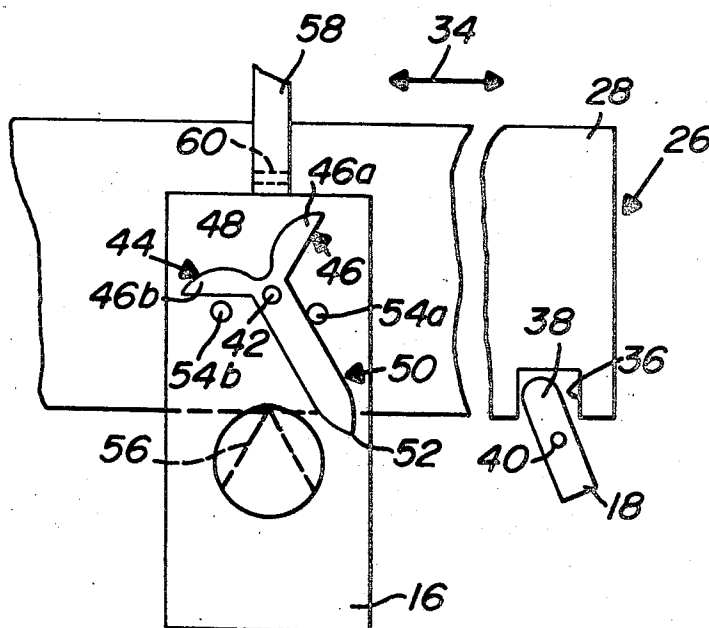
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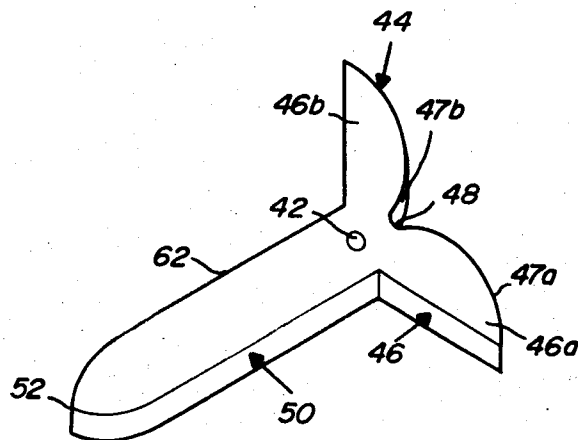
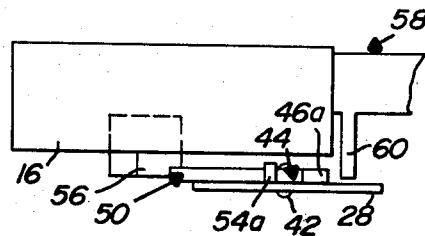
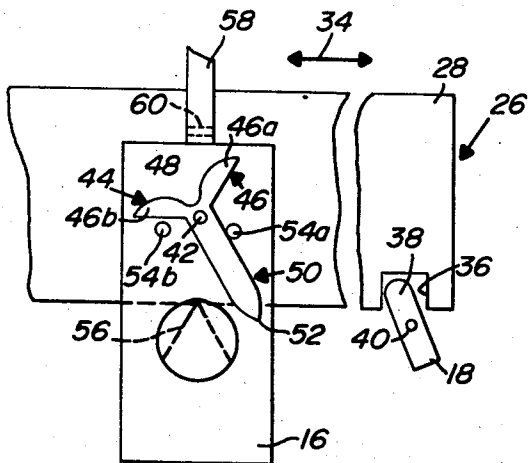
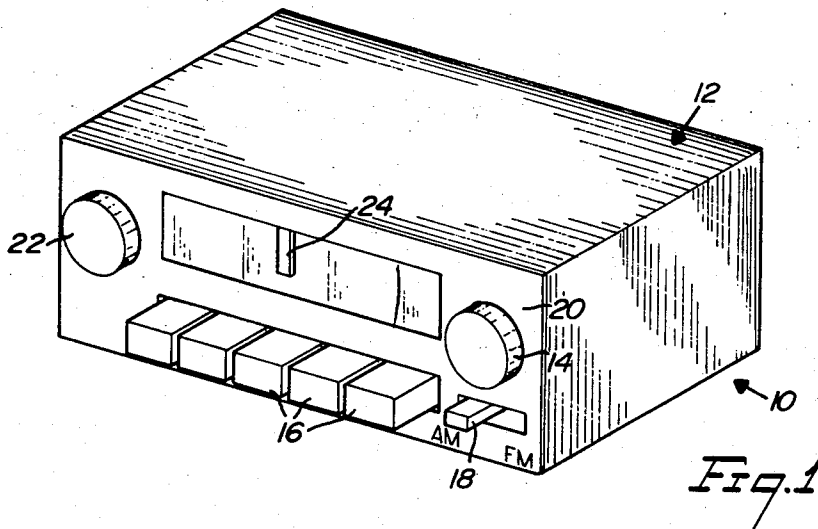
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### ABSTRACT

A waveband memory assembly in a dual band radio receiver includes a plurality of memory tabs mounted for pivotal movement on a slide plate; the latter being movable sidewise to two positions representing two radio waveband settings. Each memory tab is associated with a pushbutton selector, and includes a pair of wing-like projections extending outwardly from one end thereof and an elongated leg portion extending outwardly in the direction generally opposite thereto. Each of the memory tabs is pivotal to two positions representing the two waveband settings. Inward movement of the pushbutton moves a guide member depending therefrom into engagement with the elongated leg portion of a corresponding memory tab to move the slide plate to a position corresponding to that of the memory tab. Withdrawal of the pushbutton moves a finger-like projection on the pushbutton into engagement with the wing-like projections and ultimately into a recess therebetween. Subsequent thereto, the slide plate may be moved to a desired waveband setting. The memory tab is pivoted to the selected setting in accordance with the movement of the slide plate while the finger-like projection remains in the recess.

6 Claims, 8 Drawing Figures





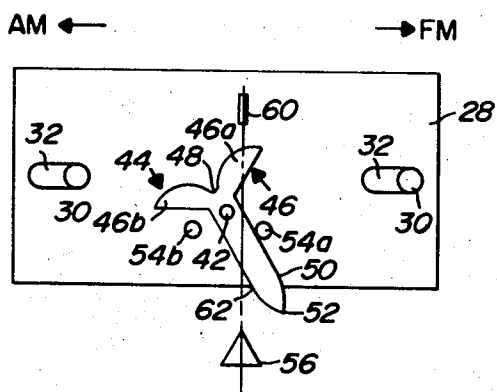


Fig. 5

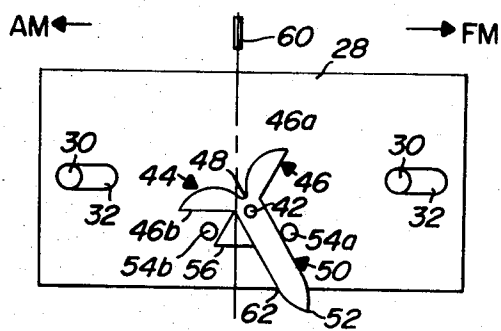


Fig. 6

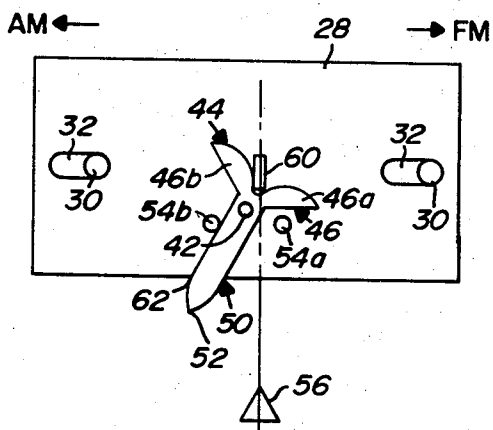


Fig. 7

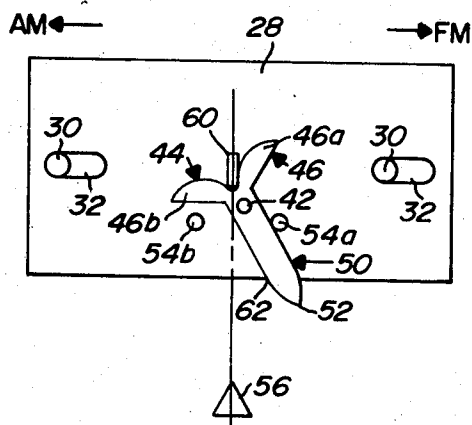


Fig. 8

## MULTI-BAND MEMORY ASSEMBLY

### BACKGROUND OF THE INVENTION

This invention relates generally to dual band pushbutton type radio receivers and more particularly to memory devices used in such radio receivers for programming the selection of predetermined frequencies on selected wavebands to be recalled upon inward movement of the pushbuttons.

Pushbutton operated memory assembly for selecting a preset waveband in a dual band radio receiver are known in the art. One such memory assembly described and illustrated in co-pending U.S. Pat. application, Ser. No. 135,912, filed Apr. 21, 1971, in the name of Jack C. Fiore and assigned to the same assignee as the instant invention, includes unique band setting memory tabs mounted for pivotal movement on a linearly movable band selecting plate. A finger associated with each of the pushbuttons is moved upon pulling a corresponding pushbutton outwardly of the radio receiver, to set the memory tab in accordance with a selected position of the band selecting plate. Thus, upon depression of the pushbutton subsequently, the preset radio waveband is recalled.

While the last-described arrangement operates satisfactorily to recall the preselected radio waveband once the memory tab is set, in order to set the memory tab to a preselected band position, one must first move the band selector plate to the desired band and thereafter withdraw the pushbutton. Once the pushbutton is withdrawn, the band selector plate cannot be shifted to the unselected band without first reinstating the pushbutton to its normal operative position. Thus if one desires to change the band selection after withdrawal of the pushbutton, he must first depress the pushbutton, change the band plate position and thereafter withdraw the pushbutton once again.

### SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to provide in a dual waveband pushbutton type radio receiver an improved memory assembly with which radio stations can be programmed on either waveband and wherein the band selector can be shifted between bands with the pushbutton in the withdrawn position.

It is another object of the present invention to provide an assembly of the above-described type which is simple and efficient in operation and is relatively low in cost.

Briefly, a preferred embodiment of the pushbutton operated waveband memory assembly according to the invention includes a waveband selector plate mounted in a radio receiver. The plate is slidably movable from side-to-side to two extreme positions representing the two wavebands received by the radio receivers such as, for example, AM-FM bands. A plurality of memory tabs are pivotally secured to the slide plate and each tab is associated with a pushbutton of the radio receiver. The tabs are shaped to include a first end having a pair of outwardly extending wing-like projections and a second, elongated end, the latter end mounted for engagement with a wedge-shaped guide member extending from a corresponding pushbutton. The winged end is mounted for engagement with a second finger-like projection also extending from the pushbutton.

The last-mentioned projection extends into a recess formed between the wing-like projections of the memory tab upon pulling the pushbutton outwardly from a normal position to reset the radio frequency. The memory tab is free to pivot about the finger-like projection with the pushbutton extended in the event one decides to change the position of the band selecting plate at that time without requiring the depression of the pushbutton prior thereto. Subsequent to setting the station, the pushbutton is depressed and the memory tab remains in the selected position for the particular radio frequency band selected.

### DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a perspective view of a dual band radio receiver incorporating a pushbutton operated waveband memory assembly according to the invention;

FIG. 2 is an enlarged, top fragmentary view of the assembly incorporated in the radio receiver of FIG. 1;

FIG. 3 is a side view of the assembly of FIG. 2 taken along the line 3—3 thereof;

FIG. 4 is an enlarged perspective view of a memory tab used in the assembly according to the invention; and

FIGS. 5-8 illustrate the various modes of operation of the memory assembly according to the invention.

### DETAILED DESCRIPTION

Referring now to the drawings wherein like numerals have been employed throughout the various views to designate similar components, there is illustrated in FIG. 1 and AM-FM radio receiver, designated generally by the numeral 10 and including a waveband memory assembly according to the invention.

The radio receiver comprises an outer housing 12 in which there is mounted radio frequency selector components (not shown) which are actuatable by a manual tuning control knob 14 or by the depression of pushbuttons 16. The radio frequency selector components within housing 12 are of a conventional type, such as, for example, a treadle bar and core carriage assembly, and as such form no part of the instant invention.

A waveband selector switch arm 18 extends from the front panel 20 of the radio receiver 10 and is manually actuatable to the AM or FM band position as desired. The manual selection of a desired waveband may be accomplished during operation of the radio receiver so that one can scan either the AM or FM band manually or by the pushbuttons 16 set to predetermined AM or FM radio frequencies.

The radio receiver 10 likewise includes other conventional components, such as, for example, an on-off/volume control knob 22 and an indicator dial 24.

Referring now to FIGS. 2 and 3 of the drawings, there is illustrated therein a preferred embodiment of the waveband memory assembly 26 incorporated into radio receiver 10 according to the invention.

The memory assembly includes a slide plate 28 which extends sidewise within housing 12 beneath pushbuttons 16, only one of which is shown in FIGS. 2 and 3. The plate is mounted for sliding movement on studs, such as 30, see FIGS. 5-8, received in elongated slots 32 in the plate. The slide plate 28 is movable to

the left and right as seen on the drawings, and as indicated by arrowed line 34 (FIG. 2). A notch or cut-out 36 in the slide plate 28 receives one end 38 of the selector switch arm 18 which is pivotal about point 40. Movement of the switch arm, as can be seen, moves the plate from the AM to the FM setting and vice versa. Movement of slide plate 28 in response to the movement inwardly of one of the pushbuttons 16 from a normal position also moves selector switch arm 18 to a corresponding setting to indicate the waveband selected to an operator. While selector switch arm 18 is shown herein as a simple mechanical lever, this is for illustrative purposes only. It should be understood that the switch arm may in practice include any number of suitable electrical and mechanical switching components required to effect a change between the AM and FM wavebands.

Mounted pivotally on the slide plate by means of fasteners, such as, 42, are a plurality of memory tabs 44. One memory tab is associated with each of the pushbuttons of the radio receiver 10. Only one memory tab and pushbutton combination is shown in FIGS. 2-8. Each of the memory tabs includes a first end 46 having a pair of opposing, outwardly extending wing-like projections 46a, 46b. Between the wing-like projections there is formed a rounded recess 48. Each of the wing-like projections 46a, 46b has a cam surface 47a, 47b, respectively, formed along the free end thereof. The opposite end of the memory tab takes the form of an elongated leg 50 which is tapered to a point at the extreme free end 52 thereof. A typical memory tab 44 according to the invention is illustrated in FIG. 4 of the drawings.

The memory tab is pivotal about point 42 near the first end thereof, between two positions corresponding to the AM and FM waveband settings, respectively. Pivotal movement of the memory tab to each position is restricted by stops 54a, 54b, respectively, extending upwardly toward the memory tab from slide plate 28 and engageable with the elongated leg 50 of the tab.

The elongated leg extends outwardly a sufficient distance to interfere with a wedge-shaped guide member 56 extending downwardly from a respective pushbutton 16. The wedge-shaped member prevents inadvertent movement of the tab from one band position to the other when the pushbutton is in a normal or intermediate position. Upon withdrawing the pushbutton outwardly from front panel 20 of the radio receiver in a conventional manner from the normal position, for resetting the frequency recalled by the pushbutton, clearance is provided between the guide member 56 and the end of leg 50 of the memory tab so that the latter may be pivoted between its two waveband positions.

An actuating rod 58 attached to each pushbutton for movement therewith, includes a depending finger member 60 spaced from guide member 56 and positioned to engage either one or the other of the wing-like projections 46a, 46b of the memory tab or to be received in recess 48 therebetween depending upon the position thereof when the pushbutton is withdrawn. In any event subsequent to the withdrawal of pushbutton 16, finger 60 ultimately is received and comes to rest in recess 48. Thus, if the tab member is in the position shown in FIG. 5 with the band set in the AM position,

withdrawal of pushbutton 16 causes depending finger 60 to engage cam surface 47a of the wing-like projection 46a to pivot the memory tab clockwise about pivot point 42 to assume a position as shown in FIG. 7. Thereafter, an inward motion of the pushbutton 16 causes the guide member 56 to ride along the edge 62 of leg 50 of the tab member and thus shift the plate 28 to the position it was in when the memory tab was set by withdrawal of the pushbutton.

After the pushbutton 16 has been withdrawn and one wishes to change the band selection, operation of the band selector switch arm 18 to the opposite band setting moves slide plate 28 sidewise. No interference between the memory tab 44 and finger 60 is present to prevent the latter movement because, as mentioned above, subsequent to withdrawal of pushbutton 16 to pivot memory tab 44 about point 42, finger 60 came to rest in rounded recess 48 between the wing-like projections 46a, 46b of the memory tab. Thus, any sidewise movement of slide plate 28 merely causes memory tab 44 to be pivoted about point 42 with finger 60 remaining in the recess. The latter feature permits one to change the band selection subsequent to withdrawing a pushbutton without the need to reinsert or depress the pushbutton prior to changing the band plate position.

For purposes of affording a more complete understanding of the present invention, it is advantageous now to provide a functional description of the mode in which the component parts thus far described cooperate.

With the slide plate 28 in the AM position as shown in FIG. 5, assume one wishes to depress pushbutton 56 to activate memory assembly 44, thereby to change the radio frequency to a frequency selected on the FM band as indicated by the position of memory tab 44. Upon depression of push-button 16 (FIG. 6) guide member 56 engages the edge 62 of end 50 thereof, camming thereagainst to reach a position shown in FIG. 6. Through the camming engagement of guide 56 and edge 62 of the memory tab, slide plate is shifted to the right and thus into the FM band setting indicated by the positioning of memory tab 44.

When it is desired to change the band setting to reprogram a pushbutton for a radio frequency on the other band, one withdraws pushbutton 16 from the normal position to the position of FIG. 7 or 8. In the event the positioning of the tab 44 and slide plate 28 is like that of FIG. 5, finger 60 will engage the wing-like projection portion 46a to rotate tab member 44 clockwise about pivot point 42 until finger 60 comes to rest in recess 48 between the wing-like projections. Once in the latter position, slide plate 28 may be shifted either to the AM or FM band as shown in FIGS. 7 and 8 by means of selector switch arm 18. Thereafter, whenever pushbutton 16 is depressed, the slide plate will return to the waveband selected. Thus, in the case of FIG. 7 whenever pushbutton 16 is depressed, slide plate 28 assumes the position in the AM band setting. Likewise, in the case of FIG. 8, the slide plate 28 will always move to the FM setting. The latter instance is illustrated in FIGS. 5 and 6 as discussed above wherein upon depression of pushbutton 16, guide 56 slides along edge 62 of the memory tab end 50 to shift plate 28 to the right or FM position.

The new and improved memory tab incorporated in the waveband memory assembly, provides an efficient and low cost means for selecting a desired waveband in a dual mode radio receiver to be recalled by a corresponding pushbutton each time the latter is depressed. The unique construction of the memory tab in combination with the waveband slide plate and pushbutton as described herein enables one to alter the selection of a radio waveband while the pushbutton is in the withdrawn position, thereby making it unnecessary to first depress the pushbutton and thereafter change the position of the band selector plate prior to withdrawing the pushbutton a second time.

While a particular embodiment of the invention has been shown and described, it should be understood that the invention is not limited thereto since many modifications may be made. It is therefore contemplated to cover by the present application any and all such modifications as fall within the true spirit and scope of the appended claims.

We claim:

1. In a dual band radio receiver including frequency selector means positionable to a plurality of radio frequency settings and a plurality of pushbuttons, each operable by movement inwardly of said receiver to change the radio frequency setting of said frequency selector means to a predetermined radio frequency setting corresponding to said pushbutton and to a predetermined waveband, a waveband memory assembly comprising waveband selector means movable in a predetermined fashion with respect to the movement of said pushbutton to first and second positions representing the two wavebands, respectively, received by said radio receiver, a plurality of memory tabs, one of which is associated with each of said pushbuttons, mounted on said waveband selector means, each said memory tab having a pair of projections extending outwardly therefrom in opposite directions with a recess formed therebetween, and each said memory tab being mounted for pivotal movement on said waveband selector means to first and second positions representing said first and second wavebands, respectively, received by said radio receiver, finger means extending from each pushbutton selector for engaging said memory tab and being received in said recess between said projections upon withdrawing said pushbutton outwardly of said housing when selecting a predetermined radio frequency, said memory tab being movable to either of said first and second positions upon withdrawal of said pushbutton in accordance with the movement of said waveband selector means to a preselected waveband position, and a guide member on each said pushbutton for engagement with an associated memory tab to shift said waveband selector means upon inward movement of said pushbutton to a corresponding preselected position representing one of

said wavebands.

2. A dual band radio receiver as claimed in claim 1 wherein each said memory tab includes an elongated leg portion extending outwardly therefrom in a direction generally opposite from that of said projections, said leg portion being positioned for sliding engagement with the guide member on a corresponding pushbutton, whereby the waveband selector means is moved to a corresponding band setting.

3. A dual band radio receiver as claimed in claim 2 wherein said waveband selector means includes a plate member movable in a direction transverse the direction of movement of said pushbutton, said memory tabs being mounted on said plate member for pivotal movement thereon, each said tab being pivotal in opposite directions to said first and second positions, respectively, and wherein each of the projections on each said memory tab includes a cam surface for engagement with said finger means upon withdrawal of said pushbutton from said radio receiver, whereby when said plate member is in a position representing a first one of said wavebands, opposite from the position of said memory tab, said memory tab is pivoted by the movement of said pushbutton outwardly to move said memory tab to a position corresponding to the position of said slide plate.

4. A dual band radio receiver as claimed in claim 3 wherein said guide member is wedge-shaped for engagement with one of the opposite side surfaces of said leg portion upon inward movement of said pushbutton depending upon the position of said memory tab, to move said slide plate sidewise to a position corresponding to the preselected waveband setting determined by the position of said memory tab.

5. A dual band radio receiver as claimed in claim 3 wherein each of said pair of projections on said memory tab is wing-like, and extends outwardly generally in the direction of inward movement of said pushbuttons and wherein said guide member and finger means are spaced from each other along said pushbutton, so that said finger means is adjacent the wing-like projections and said guide member is adjacent said elongated leg portion for engagement thereof upon outward and inward movement, respectively, of said pushbutton.

6. A dual band radio receiver as claimed in claim 4 wherein said pushbutton is normally in an intermediate position between said inward and outward positions and wherein said elongated leg portion is sufficiently long to interfere with said guide member on said pushbutton when the latter is in said normal position, thereby to prevent a corresponding memory tab from being moved to the opposite waveband position inadvertently while said pushbutton is in said normal position.

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