Jan. 27, 1948. M. TURKAT 2,435,061

RADIO TRANSCEIVER

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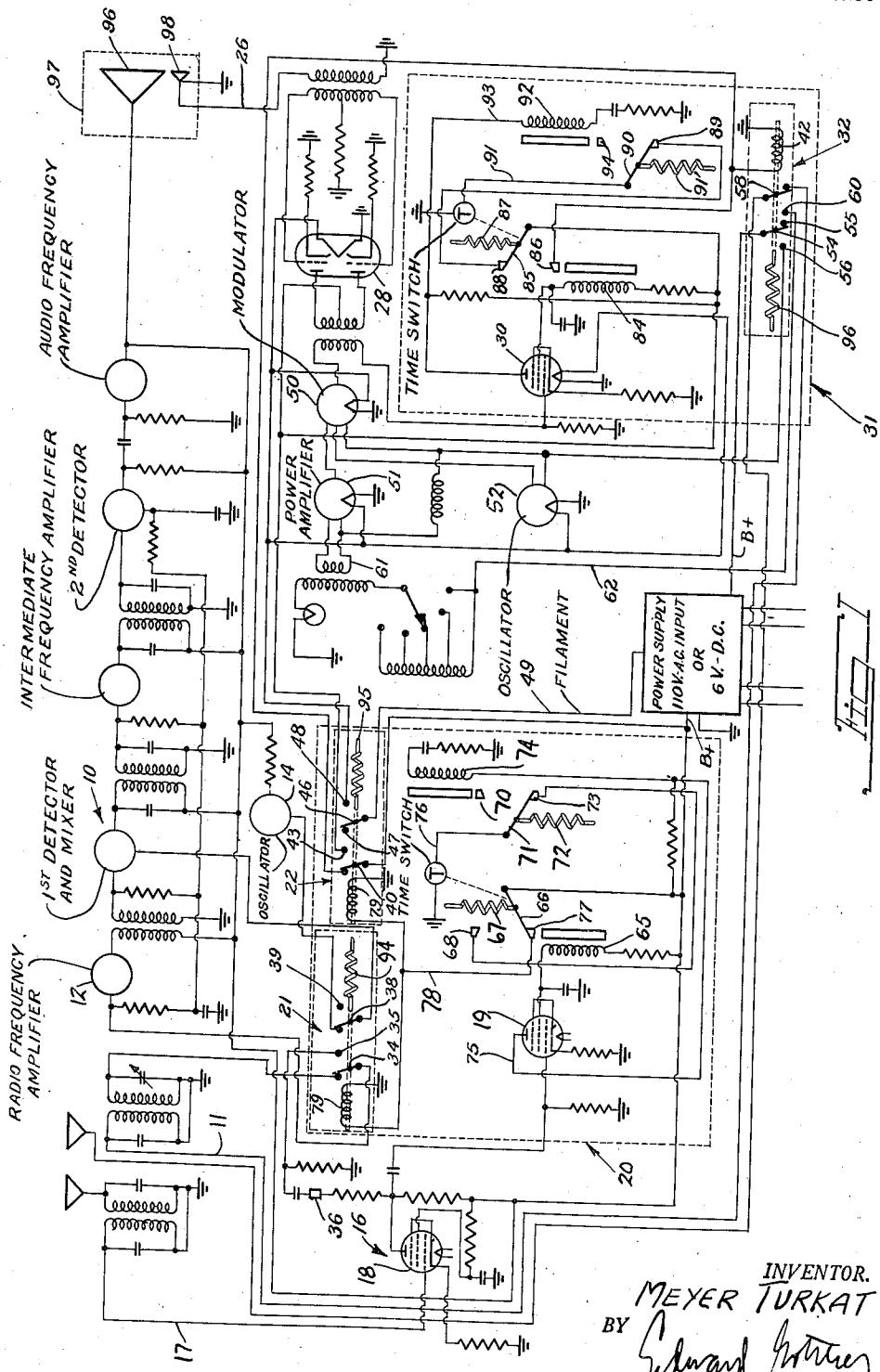


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RADIO TRANSCEIVER

Filed Jan. 27, 1945 2 Sheets-Sheet 2

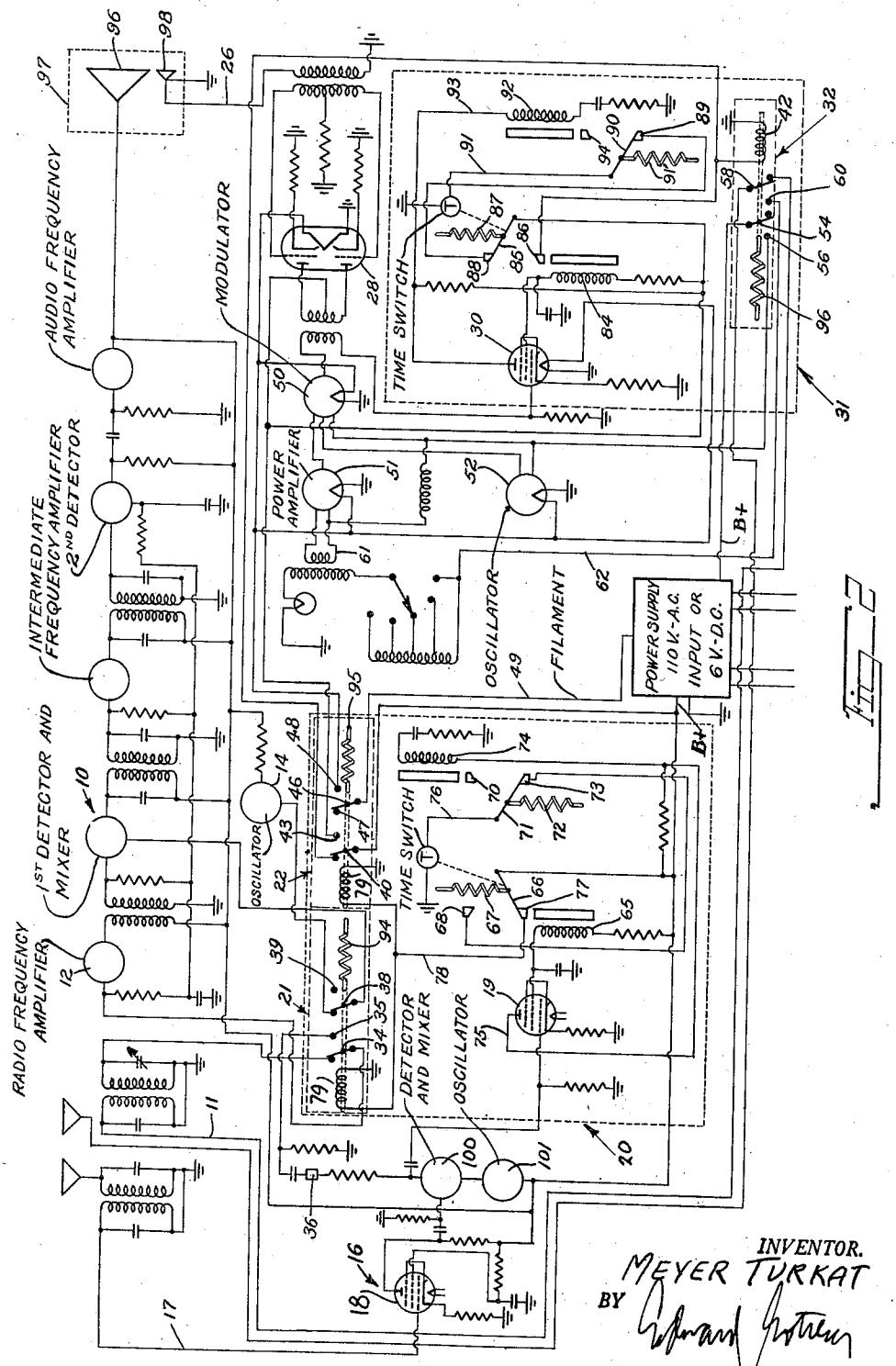


Fig. 2

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# UNITED STATES PATENT OFFICE

2,435,061

## RADIO TRANSCEIVER

Meyer Turkat, Brooklyn, N. Y.

Application January 27, 1945, Serial No. 574,907

8 Claims. (Cl. 250—13)

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This invention relates to new and useful improvements in a radio transceiver.

More particularly, the invention proposes a new and improved radio transceiver which is characterized by a receiver for broadcast reception, a transmitter for broadcasting, and an interceptor receiver for switching off said receiver and susbtituting itself in its place and simultaneously switching on said transmitter. With this arrangement the radio transceiver may normally be receiving broadcast reception. However, when a transceiver sending station, to which the radio transceiver is tuned, sends a message, the interceptor receiver will automatically receive this message, by silencing the broadcast reception which is being received, and substituting its message instead. It is only necessary to talk into the microphone of the tranmitter to answer back the intercepting message. The invention contemplates the use of a superheterodyne receiver for the broadcast reception. However it is feasible to use a tuned radio frequency receiver, if this is desired.

The invention furthermore contemplates using the new radio transceiver with a television receiver and a television broadcaster and with other electronic receivers such as frequency modulation, amplitude modulation, and phase modulatin sets. Thus meaning, it can be altered for these various forms of reception.

Still further the invention proposes to use time relays which have certain contact arms which close instantly and which open with delay, and which are arranged to keep the interceptor receiver and the transmitter on through brief pauses. It is possible to set the time relays so that the brief pauses may vary from a few seconds up to a half a minute, or more. With this arrangement the broadcast reception will not cut back until the interceptor message is completed, even though there is a short pause in the interceptor message.

The invention still further proposes to characterize the interceptor receiver by the fact that it includes a radio frequency amplifier electronic tube controlled by its antenna circuit, and controlling a relay tube which controls the time relay of the interceptor receiver which among other things connects said radio frequency amplifier tube with the radio amplifier tube of the receiver for broadcast reception so that the major portion of the receiver for broadcast then becomes a portion of the interceptor receiver and the intercepting message is heard over the loudspeaker which is used for the receiver for broadcast reception. It is furthermore proposed that the transmitter be provided with amplifier electronic tubes controlled by the microphone circuit of the transmitter and controlling the time relay of the transmitter for reasons which will become clear as this specification proceeds.

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The invention proposes to provide each of the time relays with a switch section, and a coil section for controlling the switch section. It is proposed that the switch sections do the necessary switching when the coil sections are energized and deenergized.

The invention also contemplates that each of the time relays includes two contact arms, one of which is used to control the coil of the relay and the other the time operation of the first contact arm.

Still further the invention proposes the construction of a radio transceiver as briefly described which will be reliable in action and which may be manufactured and sold at a relatively low cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a schematic diagram of a radio transceiver constructed in accordance with this invention.

Fig. 2 is a schematic diagram of a radio transceiver constructed in accordance with a modified form of this invention.

The radio transceiver, in accordance with that form of the invention disclosed in Fig. 1, includes a superheterodyne receiver 10 for broadcast reception, and having an antenna circuit 11 which may be tuned, a radio frequency amplifier tube 12 with the usual grid for connection with said antenna circuit 11, and a conversion oscillator 14. The other details of the superheterodyne receiver will not be given in this specification since they are not needed to understand the operation of this invention, and their construction would be well known by those skilled in the art. However, to facilitate a better understanding of the invention some of the details of the superheterodyne receiver have been schematically illustrated on the drawing and will be readily recognized.

The superheterodyne receiver 10 is associated with an interceptor receiver 16 having an antenna

circuit 17, a radio frequency amplifier tube 18 with the usual grid connected with the interceptor antenna circuit 17, a relay control tube 19, in a time relay 20 controlled by said radio frequency tube 18, and a major portion of said superheterodyne receiver 10 including its loudspeaker. In other words the interceptor receiver 16 and superheterodyne receiver 10 have some parts in common. The time relay 20 has double throw switch sections 21 and 22. These switch sections 21 and 22 are normally closed in one direction by energization of coils 79 and are capable of closing into their other, or second direction, or position when a message is coming over the antenna circuit 17 of said interceptor receiver 16, by deenergization of the coils 79 and the action of springs 94 and 95. The switch sections 21 and 22 will close back to their normal positions after a short period of delay after said message is finished due to the action of the time relay 20.

The radio transceiver includes an electronic tube transmitter 25 having a microphone input relay section 26 and a remaining section 27. The microphone input relay section 26 includes an amplifier tube 28, a relay control tube 30 of a time relay 31 controlled by said amplifier tube 28. This time relay 31 has a double throw switch section 32 normally closed in one direction by energization of coil 42 and closing into its second direction or position when a message is coming into said microphone input relay section 26 due to deenergization of the coil 42 and the action of spring 96, and closing back to its normal position after a short period of delay after said message is finished due to reenergization of the coil 42.

The interceptor relay switch section 21 has a contact arm 34 normally connecting the antenna circuit 11 of said superheterodyne receiver 10 with the grid of the radio frequency amplifier 12 of said superheterodyne receiver 10. When this contact arm 34 is in its other direction or position it connects the radio frequency tube 18 of said interceptor receiver 16 with the grid of the radio frequency amplifier tube 12 of the superheterodyne receiver 10. The action of the contact arm 34 may be traced by noting that in its normal position, as illustrated in Fig. 1, it connects the antenna circuit 11 of the superheterodyne receiver 10 with the grid of the radio frequency amplifier tube 12. In its other direction, or position, that is its second direction, or position, the contact arm 34 will engage the contact 35. Now the grid of the radio frequency amplifier tube 12 will be controlled by the antenna circuit 17 of the interceptor receiver 16. Said grid circuit includes a crystal selector 36 which allows its own frequency to pass but rejects all other frequencies. This represents a fixed wave length, for the operation of the interceptor receiver 16. The crystal 36 is in the plate circuit of tube 18 and is connected with said contact 35.

At this point it may be best to point out that the drawings do not show all of the circuits of the tubes of the transceiver, only those circuits which will be generally understood by those skilled in the art.

The interceptor relay switch section 21 has another contact arm 38 which normally connects the conversion oscillator 14 into the circuit of said superheterodyne receiver 10, and when this contact arm 38 is in its other direction, or position, it disconnects said conversion oscillator 14 from said superheterodyne receiver 10. This may be understood by noting that the contact arm 38 in its normal position, as illustrated on the drawing, connects the conversion oscillator 14 with the first detector and mixer tube of the superheterodyne receiver 10. In its second position, the contact arm 38 will engage the contact 39 which is a dead contact and which has no connection with any circuits. For this reason the conversion oscillator 14 will be disconnected from the superheterodyne receiver 10.

The switch section 22 of the interceptor relay 20 includes a contact arm 40 supplying when in its second position B plus voltage to the microphone input relay section 26 of the transmitter 25. This contact arm 40 is illustrated in its first, or normal position. In this position it is supplying B plus voltage from the power supply 41 to the coil 42 of the relay switch section 32. When the contact arm 40 is moved to its second position it will engage upon the contact 43 and then it will supply B plus voltage to the tubes 28 and 30 of the microphone input section 26.

The switch section 22 of the interceptor relay 20 is also provided with another contact arm 46 for supplying filament voltage to the transmitter 25 when in its second position. In its normal, or first position, as illustrated on the drawing, the contact arm 46 engages a dead contact 47. In its second position it will engage the contact 48 which will supply filament voltage from the circuit 49 of the power supply 41 to the various filaments of the tubes contained in the transmitter 25. The various tubes just referred to include the tubes 28 and 30 of the microphone section 26 of the transmitter 25, as well as the tubes 50, 51 and 52 of the remaining section 27 of the transmitter 25. The tube 50 is the usual modulator tube, 51 is the power amplifier tube for supplying the final plate output, and tube 52 is the master oscillator tube.

The switch section 32 of the transmitter relay 31 includes a contact arm 54 for supplying B plus voltage to the remaining section 27 of the transmitter 25 when in its second position. In its normal, or first position, the contact arm 54 rests upon a dead contact 55. In this second position, it will engage upon the contact 56. In this latter position, the B plus voltage from the power supply 41 will now be connected with the tubes 50, 51 and 52.

The switch section 32 of the transmitter relay also includes a contact arm 58 normally connecting the antenna of the antenna circuit 11 with the superheterodyne receiver 10, and when in its second direction, or position connecting the antenna of the antenna circuit 11 with the output of the transmitter 25. The contact arm 58 is illustrated in its normal position, and in this position we may trace the antenna circuit 11 by starting at the antenna and following the lead through the contact arm 58 and back to the tuning parts of the antenna circuit 11. When the contact arm 58 is in its second position, it will rest upon a contact 60. Now we may trace from the antenna of the antenna circuit 11 through the arm 58 to the contact 60 and then to the output of the transmitter 25. The output may be recognized by noting the final plate output circuit 61 from the tube 51.

The time relay 20 includes a D. C. coil 65 which is connected in series with the screen circuit of the relay control tube 19. The coil 65 normally attracts the contact arm 66 of the time relay 20. This contact arm 66 is urged away from the coil 65 and from the contact 77 by the spring 67. When the current passing through the coil 65 falls below a predetermined amount, the spring 67 will move the contact arm 66 on to a contact 68. The contact 68 is connected with a contact

73 of the time relay 20. A contact arm 71 will rest on the contact 70 when a message is coming in through interceptor receiver 16 because the A. C. coil 74 will then be highly energized. When the message ceases there will be a fall in current through coil 74 and then spring 72 will place contact arm 71 onto contact 73, as illustrated on the drawing.

The contact 70 is a dead contact. The coil 74 is connected in the plate circuit 75 of the relay control tube 19. The contact arm 71 controls the timer circuit 76. The timer circuit 76 includes a time switch T, for example such as the time switch disclosed in the U. S. Letters Patent No. 2,175,865, granted on October 10, 1939, to C. L. Anderson. Said time switch T is connected with the contact arm 66 for locking the contact arm 66 on the contact 68 and for moving the contact arm 66 off the contact 68 and back to its normal position on said contact 77. The time switch T is so adjusted (described in the Anderson patent) that the instant that the contact arm 71 engages the contact 73 the timing operation starts provided that the contact arm 66 is on contact 68, and should the contact arm 71 leave the contact 73 before the timing operation is completed, the time switch T will revert back to its rest or starting position. The only time that the time switch T will move the contact arm 66 from the contact 68 to the contact 77, will be when the contact arm 71 remains on the contact 73 for a preselected period depending on the time setting of the switch T.

The contact 77 is connected in a circuit 78 which connects with the coils 79 of the switch sections 21 and 22 of the time relay 20. The coil 65 is so designed that when no message is coming in over the interceptor antenna circuit 17, the contact arm 66 will be kept upon the contact 77, due to a high energization of coil 65. However, as soon as a message comes in through the interceptor antenna circuit 17, there will be a fall in current through the coil 65, and the spring 67 then moves the contact arm 66 off the contact 77 and places it on the contact 68 and the time switch T will hold it on contact 68 until released as just explained.

The time relay 31 of the transmitter 25 includes a coil 84 which is connected in the screen circuit of the relay control tube 30. This coil 84 will attract the contact arm 85 when contact 40 engages contact 43 and the natural delay of relay 31 expires and will maintain it upon the contact 86 as long as no message is passing through the microphone circuit 26. The spring 87 tends to place the contact arm 85 upon a contact 88. This contact 88 is connected with a contact 89 which is engageable by a second contact arm 90. A spring 91' maintains the contact arm 90 on said contact 89. A coil 92 is connected with the plate circuit 93 of the relay control tube 30 and is capable of attracting the contact arm 90 and placing it upon the dead contact 94. The contact arm 90 is connected with a timing circuit 91 which includes a time switch T such as the switch shown by C. L. Anderson, supra. This time switch T is for the purpose of holding contact arm 85 on contact 88 and placing the contact arm 85 back on the contact 86 after a delay period, as will become clearer during the explanation of the operation.

The switch section 21 is normally urged to its second position by said spring 94. The switch section 22 is normally urged to its second position by said spring 95. The superheterodyne receiver



10 has a loud speaker 96 in a speaker housing 97. The microphone 98 of the transmitter 25 may be mounted in the speaker housing 97 provided it is suitably shielded, so as not to be affected by the radio broadcast coming from the loud speaker 96 otherwise it may be mounted elsewhere. With this arrangement it is merely necessary to speak into the microphone 98 to transmit a message.

The operation of the radio transceiver is as follows:

The superheterodyne receiver 10 is turned on in the usual way. This may be done by the usual switch controlling the power supply 41. When the power supply 41 is turned on, the tubes 18 and 19 will also receive power. The coil 65 will then attract the contact arm 66 and place it on the contact 77. The coil 74 will place contact arm 71 on contact 70 when a message is received. The B plus from the power supply 41 is connected through the contact arm 66, the contact 77, and the circuit 78 with the coils 79 of the switch sections 21 and 22. The switch sections are thereupon moved to their normal positions, the positions illustrated on the drawing. The contact arm 40 in its normal position supplies B plus voltage to the coil 42 of the switch section 32 of the time relay of the transmitter 25, which places the contact arms 54 and 58 into their normal, or first position, the position as illustrated. The receiver 10 is now receiving broadcast reception. It may be tuned in the usual way and its volume may be controlled as desired.

When a message is picked up by the interceptor circuit 17, and fed to the grid of the radio frequency tube 19 there will be a drop of current in the screen circuit of the tube which will cause a drop of current in the coil 65. The spring 67 immediately moves the contact arm 66 from the contact 77 and places it on the contact 68 where it is latched and held by the time circuit 76. When the contact arm 66 moves off the contact 77, the B plus voltage will be cut off from the circuit 78. The coils 79 will become deenergized and the springs 94 and 95 will move the contact arms 34, 38, 40 and 46, to their second positions. Simultaneously there is an increase of current through the coil 74 and the coil will move the contact arm 71 off of the contact 73 and place it on the contact 70. It will remain here as long as a message is coming over the interceptor antenna circuit 17. As soon as the message stops coming, the spring 72 will move the contact arm 71 off of the contact 70 and place it back on the contact 73. At this time the contact arm 66 will still be on the contact 68 and B plus voltage will now be flowing through the contact arm 71 and through the circuit 76 and the time switch T. If a certain preselected time period is now permitted to pass, the time switch T will move the contact arm 66 off of the contact 68 and will place it back on contact 77 which will then again connect the B plus voltage to the coils 79 of the relay switch sections 21 and 22 and the contact arms 34, 38, 40 and 46 will be moved back to their normal positions.

When the contact arms 34, 38, 40 and 46 of the relays switch sections 21 and 22 assumed their second positions, the contact 34 disconnected the superheterodyne antenna circuit 11 from the grid of the radio frequency amplifier tube 12 and in its place connected the output of tube 18 as limited as to its input frequency by crystal 36 to the grid of the radio frequency amplifier tube 12.

When the contact arm 38 assumed its second position, it disconnected the conversion oscillator 14 from the superheterodyne receiver 10. In the first position of the contact arm 40, this contact arm 40 supplied B plus voltage through the coil 42 of the switch section 32 of the relay 31. When the contact arm 40 assumed its second position, upon the contact 43, the contact arm 40 connected the B plus voltage with the tubes 28 and 30 of the microphone input relay section 26 of the transmitter (25) and the contact arm 90 remained on the contact 89 and after a short delay the contact arm 85 assumes a position on contact 86. The contact arm 46 turned on the filament current to all of the filaments of the tubes in the transmitter (25), when it assumed its second position on the contact 48. The interceptor message is now coming in over the superheterodyne receiver 10 and may be heard through the loud speaker 96, and the transmitter is ready to broadcast an answer.

The person receiving the interceptor message may respond by merely talking into the microphone 98. This will immediately affect the tubes 28 and 30. The relay control tube 30 will respond accordingly. It will cause a drop in current, going through the coil 84. The spring 87 then moves the contact arm 85 onto the contact 88 and an increase of current in coil 92 places contact arm 90 upon the dead contact 94. When the contact arm 85 leaves the contact 86, the B plus voltage through the switch coil 42 is cut, so that the spring 96 is free to move the contact arms 54 and 58 to their second positions. The contact arm 54 will then connect the B plus voltage to the tubes 50, 51 and 52. The contact arm 58 will connect the antenna of the superheterodyne receiver 10 of the output circuit 62 of the transmitter 25.

The signal voltage from the plate circuit of the relay control tube 30 will energize the coil 92 which flips the contact arm 90 to the dead contact 94 as long as the transmitter 25 is broadcasting. As soon as the message ceases to go over the transmitter 25 the coil 92 will then reduce in signal current so that the spring 91' places the contact arm 90 on the contact 89. At this time the contact arm 85 is still on the contact 88 and B plus voltage will be supplied to the circuit 91 controlling the timing switch T. After a predetermined time, the switch T will operate to move the contact arm 85 back upon the contact 86. However, should the broadcaster again talk into the microphone 98, before the expiration of the time interval, as timed by the time switch T the contact arm 90 will leave contact 89 and the time switch T will revert to its rest or starting position. The time interval will start repeating when the contact arm 90 re-engages the contact 89.

When the interceptor message coming over the antenna circuit 17 stops, the interceptor receiver 16 will revert back to its original position after a time interval as controlled by the time switch T in relay 20. This causes the superheterodyne receiver 10 to revert back to receive the broadcast reception.

In Fig. 2 a modified form of the invention has been disclosed which is identical to the prior form distinguishing merely in the fact that two additional tubes 100 and 101 have been added to the interceptor receiver so that the interceptor receiver can be adjusted or designed to receive any frequency desired. The tube 101 is a conversion oscillator, while the tube 100 is a detector and mixer tube. These tubes are connected with the contact 35 so that the contact arm 34 may connect the interceptor receiver with the grid of the radio frequency amplifier tube 12 of the superheterodyne receiver 10.

In other respects this form of the invention is identical to the prior form and like parts may be recognized by the same reference numerals.

While I have illustrated and described the preferred embodimnts of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultanously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver.

2. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, said power supply to said relay being controlled with a contact arm, said time switch arresting operation of said contact arm for arresting operation of said relay.

3. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast re-

ceiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, said power supply to said relay being controlled with a contact arm, said time switch arresting operation of said contact arm for arresting operation of said relay, said contact arm being resiliently urged in one direction, and electromagnetic means responsive to said output circuit for urging said contact arm in the other direction for making or breaking said power supply to said relay.

4. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an input circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, including a time switch circuit for controlling said time switch, a contact arm for controlling said time switch circuit, resilient means urging said contact arm in one direction, and electromagnetic means responsive to said output circuit for urging said contact arm in the other direction for making or breaking said time switch circuit.

5. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, said transmitter having a microphone input section and a remaining section, and switch section acting to turn on and off said microphone input section, a relay having a switch section connected with said remaining section for switching it on and off, a power supply for said second named relay, a control tube for said second named relay, a power supply for said second named control tube, an input circuit connecting said microphone input section with said second named control tube for influencing the output of said second named tube, an output circuit for said second named tube for controlling said second named relay, a time switch in said second named output circuit for arresting operation of said second named relay for preset periods each time it switches on said remaining section, and means for resetting said second named time switch before the expiration of its said preset periods responsive to a message on said microphone input section.



6. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, said transmitter having a microphone input section and a remaining section, and switch section acting to turn on and off said microphone input section, a relay having a switch section connected with said remaining section for switching it on and off, a power supply for said second named relay, a control tube for said second named relay, a power supply for said second named control tube, an input circuit connecting said microphone input section with said second named control tube for influencing the output of said second named tube, an output circuit for said second named tube for controlling said second named relay, a time switch in said second named output circuit for arresting operation of said second named relay for preset periods each time it switches on said remaining section, and means for resetting said second named time switch before the expiration of its said preset periods responsive to a message on said microphone input section, said power supply to said second named relay being controlled with a contact arm, said second named time switch arresting operation of said second named contact arm for arresting operation of said second named relay.

7. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be

tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, said transmitter having a microphone input section and a remaining section, and switch section acting to turn on and off said microphone input section, a relay having a switch section connected with said remaining section for switching it on and off, a power supply for said second named relay, a control tube for said second named relay, a power supply for said second named control tube, an input circuit connecting said microphone input section with said second named control tube for influencing the output of said second named tube, an output circuit for said second named tube for controlling said second named relay, a time switch in said second named output circuit for arresting operation of said second named relay for preset periods each time it switches on said remaining section, and means for resetting said second named time switch before the expiration of its second preset periods responsive to a message on said microphone input section, said power supply to said second named relay being controlled with a contact arm, said second named time switch arresting operation of said second named contact arm for arresting operation of said second named relay, said second named contact arm being resiliently urged in one direction, and electromagnetic means responsive to said second named output circuit for making or breaking said power supply to said second named relay.

8. In a radio receiving and transmitting device, a receiver for broadcast reception adapted to be tuned to receive a number of different wave lengths, an interceptor receiver tuned to a certain wave length, a transmitter, a relay having a switch section connected with said broadcast receiver and transmitter for switching off said broadcast receiver and simultaneously switching



on said transmitter and for switching on said broadcast receiver and simultaneously switching off said transmitter, a power supply for said relay, a control tube for said relay, a power supply for said control tube, an input circuit connecting said interceptor receiver with said control tube for influencing the output of said tube, an output circuit for said control tube for controlling said relay, a time switch in said output circuit for arresting operation of said relay for preset periods each time it switches said broadcast receiver off and said transmitter on, and means for resetting said time switch before the expiration of said preset periods responsive to reception of an incoming message of said interceptor receiver, said transmitter having a microphone input section and a remaining section, and switch section acting to turn on and off said microphone input section, a relay having a switch section connected with said remaining section for switchng it on and off, a power supply for said second named relay, a control tube for said second named relay, a power supply for said second named control tube, an input circuit connecting said microphone input section with said second named control tube for influencing the output of said second named tube, an output circuit for said second named tube for controlling said second named relay, a time switch in said second named output circuit for arresting operation of said second named relay for preset periods each time it switches on said remaining section, and means for resetting said second named time switch before the expiration of its said preset periods responsive to a message on said microphone input section, including a time switch circuit for controllng said second named time switch, a contact arm for controlling said time switch circuit, resilient means urging said contact arm in one direction, and electromagnetic means responsive to said second named output circuit for urging said contact arm in the other direction for making or breaking said time switch circuit.

MEYER TURKAT.

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