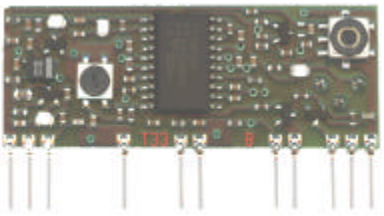
ABACOM TECHNOLOGIES

RX-FM AUDIO Superhet Receiver Module

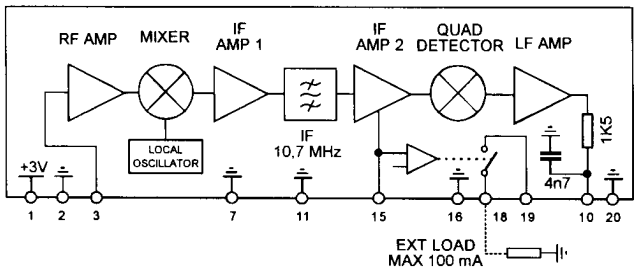
High quality FM superhet audio receiver module which is suitable for use with the companion **TX-FM AUDIO** transmitter module.The wide LF bandwidth and ability to be powered by a 3V lithium battery makes the RX-FM Audio Receiver Module an excellent solution for a HiFi quality receiver for portable applications such as one or two way radio, remote control (DTMF), security, telemetry etc.



Technical Specifications

- Superheterodyne receiver with SAW controlled local oscillator
- Working frequency : 433.8 MHz ± 200 Khz
- RF Input impedance : 50Ω
- RF sensitivity : -100 dBm
- LF bandwidth : 20 Hz to 20 Khz
- LF output level : 100 mV ± 20 % RMS (f=1 KHz) when transmitting with $\Delta f = \pm 75$ KHz
- Squelch threshold externally adjustable from -50 dBm up to -100 dBm
- Optional switching of an external load with 100mA max. current
- Possible connection to an external de-emphasis network for increased S/N and low AF response
- 3V single supply with consumption lower than 15 mA (13 mA typical)
- High-miniaturization SIL module
- ETS 300 220 compatible
- Dimensions : 50.8 x 20 x 4 mm. Pin pitch 2.54 mm

Block Diagram



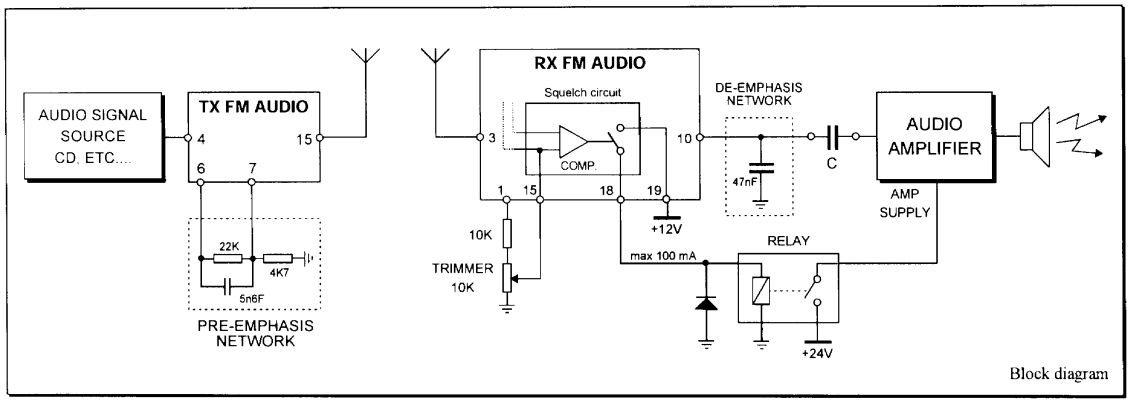
Pin Description

1. +3V Supply
2. Ground
3. RF Input.
7. Ground
10. Audio output
11. Ground
15. Squelch Level
16. Ground
18. Squelch Output (mute)
19. External Load Supply (3 to 25V)
20. Ground

Antenna

Attach a 1/4 wavelength (17cm) length of solid core hookup wire to the RF Input pin 3. Keep the end of the antenna free from conducting areas, particularly large metal surfaces areas. The best orientation for antenna is to extend straight up. If an off board ant. is to be used, take a 50Ω coaxial cable feed, such as RG174/U cable, from pin3 and GND on the RX-FM AUDIO module to the antenna to be used.

Audio signal TX-RX system



As shown In the block diagram above, the audio output (pin 10) of the RX FM AUDIO module is connected to a de-emphasis network, comprising of a 47nF capacitor connected to ground. This de-emphasis network together with the pre-emphasis network at the TX-FM AUDIO module end improves the linearity of the Low Frequency (audio) response and increases the related signal-to-noise ratio.

An audio power amplifier in series with the de-emphasis network, is used to drive a loudspeaker or acoustic box. There is a 1.2Vdc component superimposed on the true demodulated signal at the receiver audio output (pin 10) therefore it is necessary to use a power amplifier with an AC-coupled input.

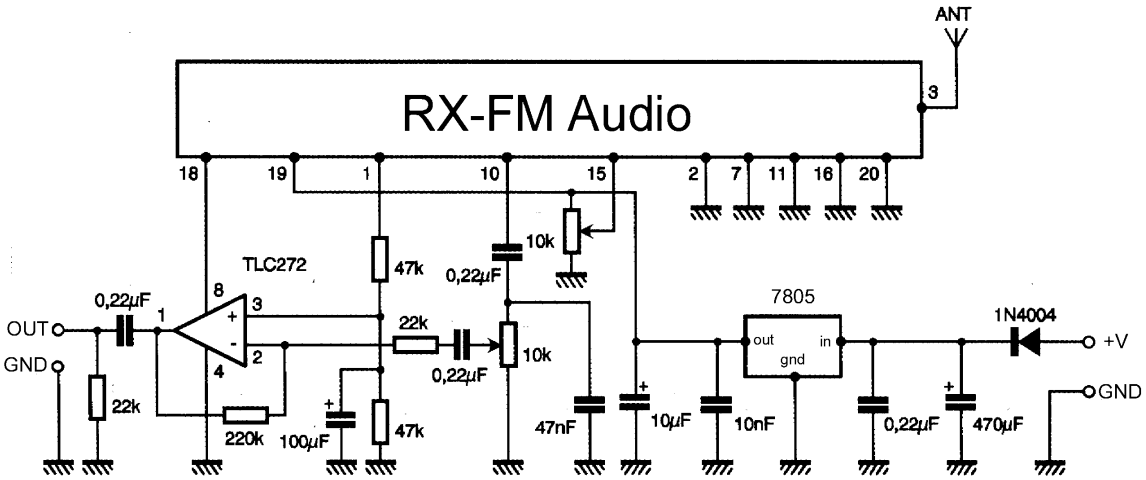
The audio amplifier supply, indicated here to be 24V, is taken through a relay driven by the squelch circuit of the RX FM AUDIO module: the maximum current which can be supplied from pin 18 (squelch output) is 100mA.

If the RF signal power is lower than the pre-set squelch threshold, the squelch circuit causes the relay to open thus removing power from amplifier and the loudspeaker is silenced.

The squelch threshold level is externally adjustable in order to meet specific requirements. Using a 10 KΩ trimmer connected to pin 15 as shown above allows adjustment of the receiver's sensitivity from about -50 dBrn to the maximum sensitivity of -100dBm.

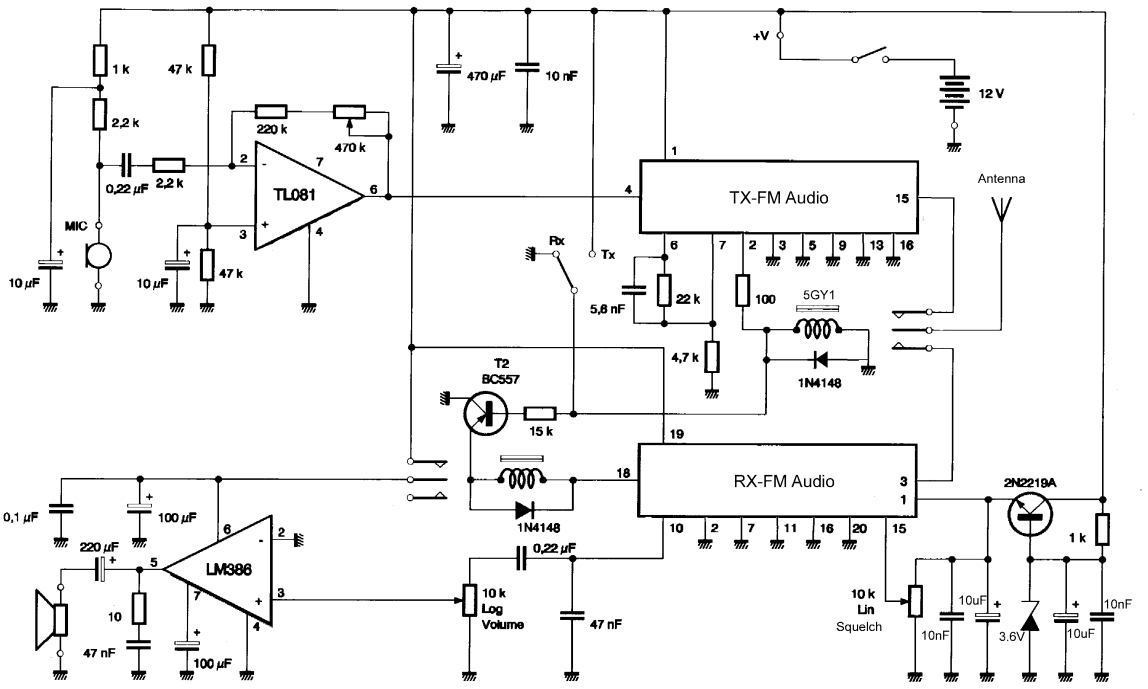
Application Schematics:

A.



The above schematic diagram together with the TX-FM AUDIO transmitter module (see TX-FM AUDIO application notes) provides an example of a simplex voice communication channel where the receiver output can be fed directly into an external audio power amplifier.

B



The schematic diagram above provides an application example using the RX-FM AUDIO receiver module together with the companion TX-FM AUDIO and interfacing components to make up a half duplex two-way radio or 'walkie talkie'.

End of app. note -Rev. 06/99- Information contained herein is provided in good faith. ABACOM Technologies will not be held responsible for any errors or omissions the may be resultant in this document.