

Stereo FM / AM Radio Receiver

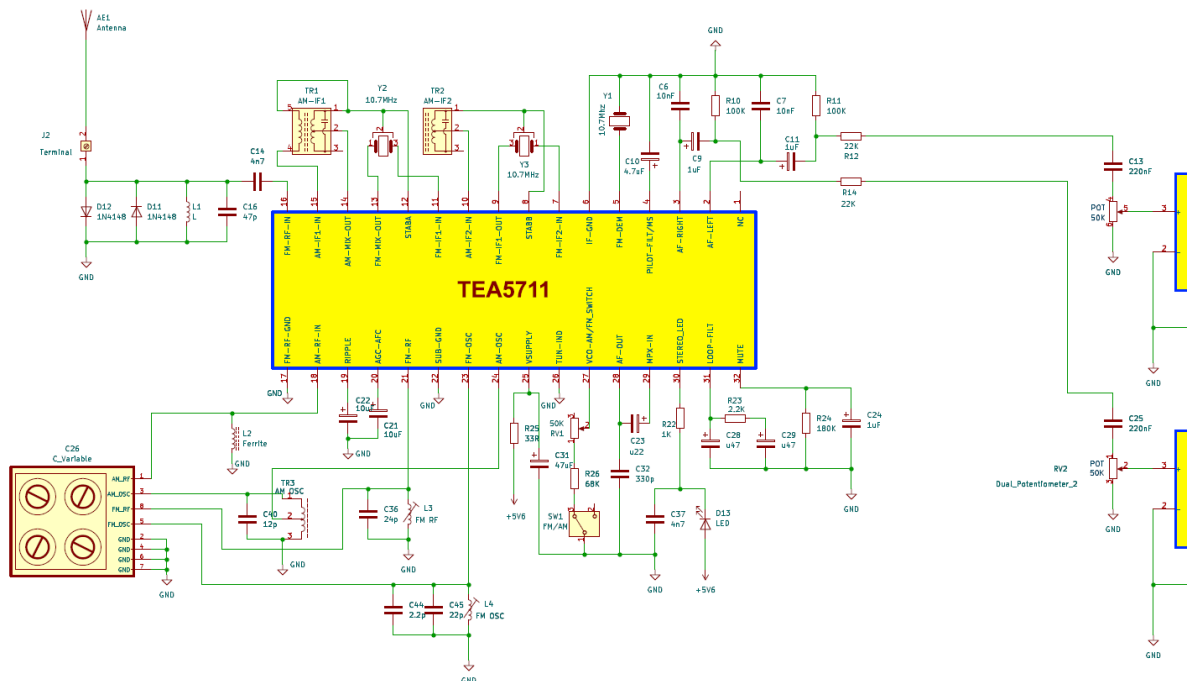
 **Implementation Support:** All technical data provided in this guide is based on a personally tested and successfully assembled prototype.

Click here for the build video: youtu.be/hSCuRKkPxRc

1. Radio Module Section - TEA5711

This section includes the core unit of the device that processes FM/AM signals.

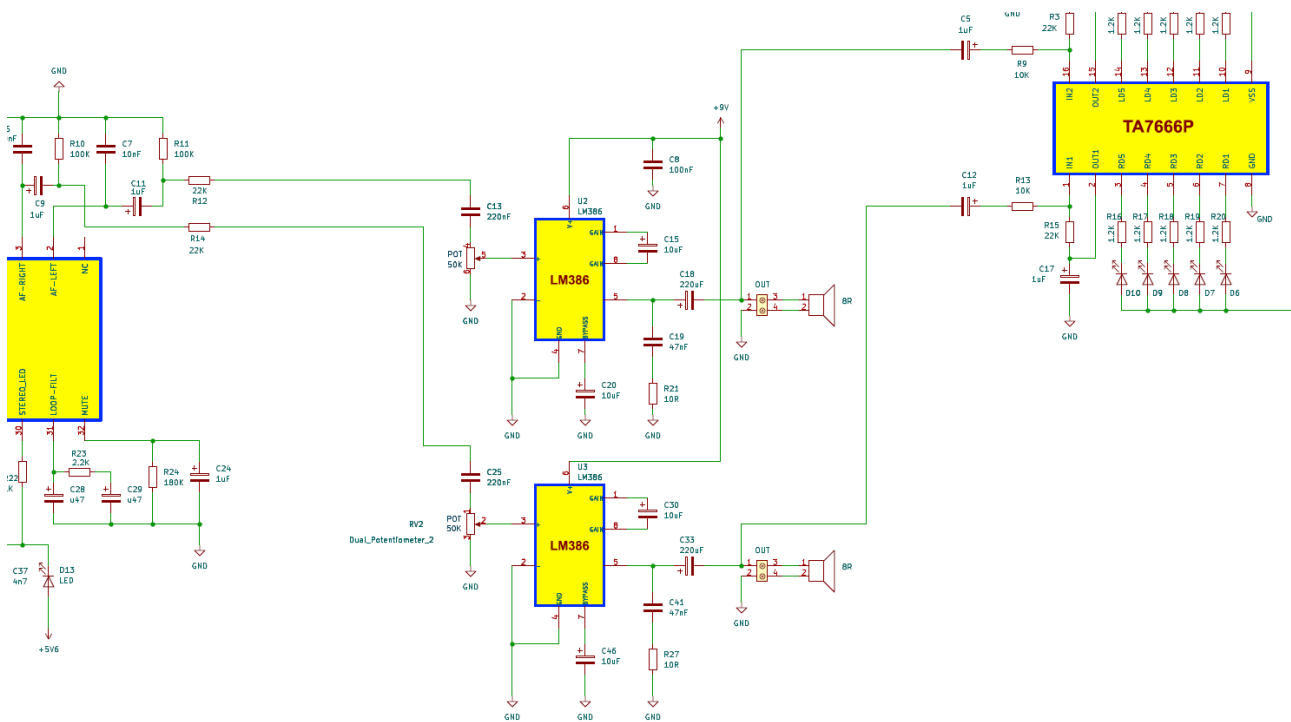
- **TEA5711 IC:** This high-performance integrated circuit provides FM stereo and AM receiver functions in a single package.
- **Tuning and Filtering:** The **Y2 and Y3 (10.7 MHz)** ceramic filters shown in the schematic ensure FM intermediate frequency (IF) selectivity.
- **Antenna Inputs:** There is a telescopic antenna (AE1) input for FM signals, while an **L2 Ferrite Rod Antenna** is used for AM signals.
- **Controls:** The **C26 variable capacitor (Tuning)** on the circuit allows for manual station searching.
- **Additional Info:** The TEA5711 is known for its high sensitivity even at low supply voltages. The **D11 and D12 (1N4148)** diodes in the schematic protect the antenna input against high static voltages.



2. Audio Module Section - 2xLM386

This is the stage where low-level stereo audio signals from the radio section are amplified to a power level sufficient to drive the speakers.

- **Stereo Structure:** Two **LM386** ICs are used in the circuit to provide independent amplification for the Right and Left channels.
- **Volume Control:** The **RV2 (50K)** dual potentiometer allows for simultaneous control of the volume for both channels.
- **Output Filters:** The **C19/R21** and **C41/R27** networks (Zobel Network) at the speaker outputs prevent high-frequency oscillations to ensure clear sound.
- **Additional Info:** Adding a **C15 (10uF)** capacitor between pins 1 and 8 of the LM386 increases the gain of the IC to its maximum level.



💡 Watch the Step-by-Step Build Video to see the correct soldering sequence and a live view of the sensitive PCB traces. [▶ Watch the Build Video here .](#)

3. VU Meter Section - TA7666P (KIA7666P)

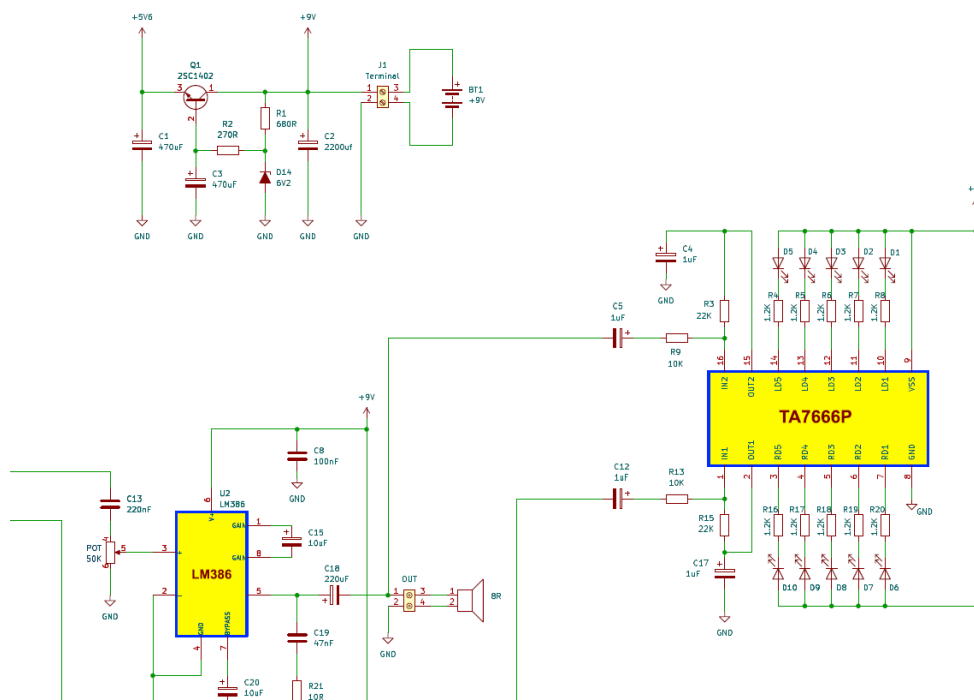
This is the indicator stage consisting of 10 LEDs used to visually monitor the audio levels.

- **Dual Channel Display:** The **TA7666P** IC displays the audio intensity of both channels (L/R) via two groups of 5 LEDs (D1-D5 and D6-D10).
- **LED Driver:** To prevent the LEDs from drawing excessive current, **1.2K (R4-R8 and R16-R20)** resistors are connected in series to each one.
- **Sensitivity:** The **C5/R9** and **C12/R13** networks at the signal input determine the response speed of the VU meter to the audio signal

4. DC Supply and Voltage Step-Down Module

This is the power stage that provides the stable energy required for the consistent operation of the device.

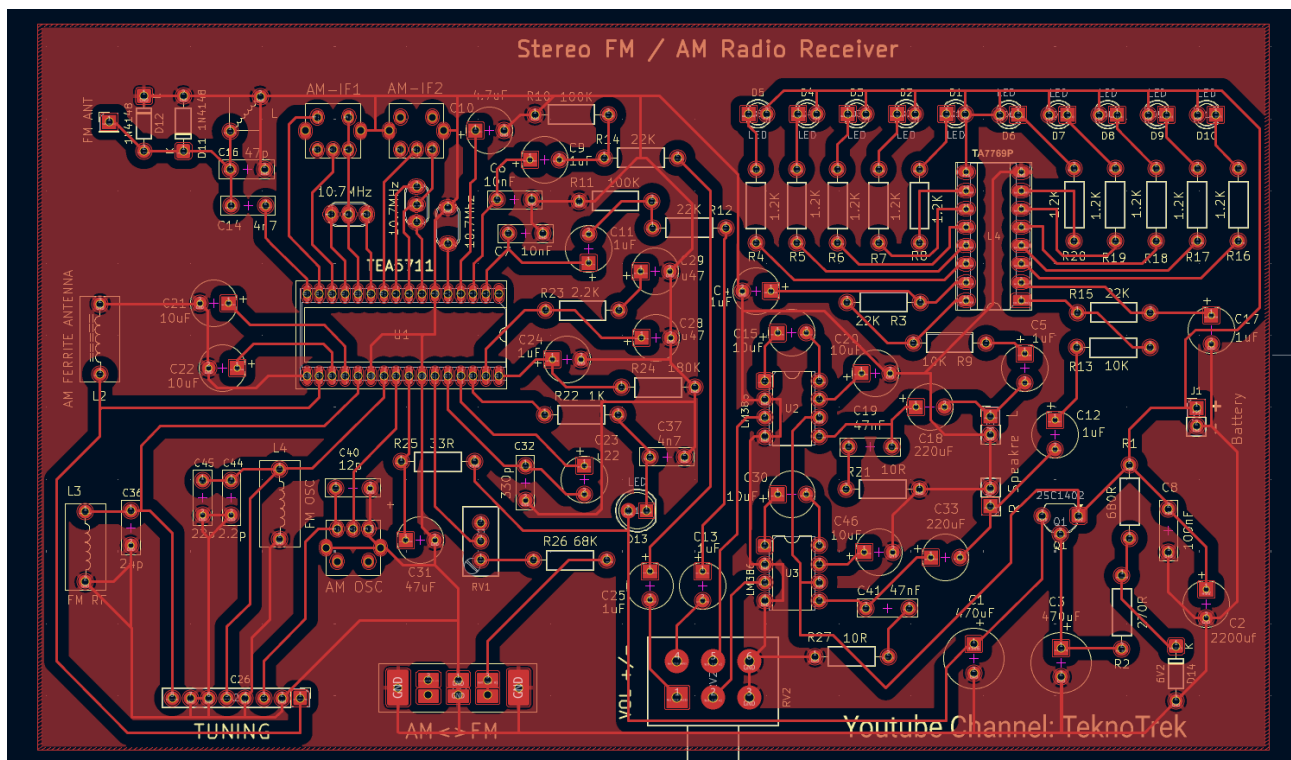
- **Input Voltage:** The circuit is powered by a 9V DC source (BT1 battery or terminal).
- **Voltage Regulation:** The regulation circuit, formed by the Q1 (2SC1402) transistor and D14 (6V2) Zener diode, produces the precise 5.6V (+5V6) required for the radio module.
- **Filtering:** High-capacity capacitors such as C2 (2200uF) and C1 (470uF) clean the noise (ripple) from the power supply to minimize background hum.



5. PCB Design and Layout (Copper and Top Layers)

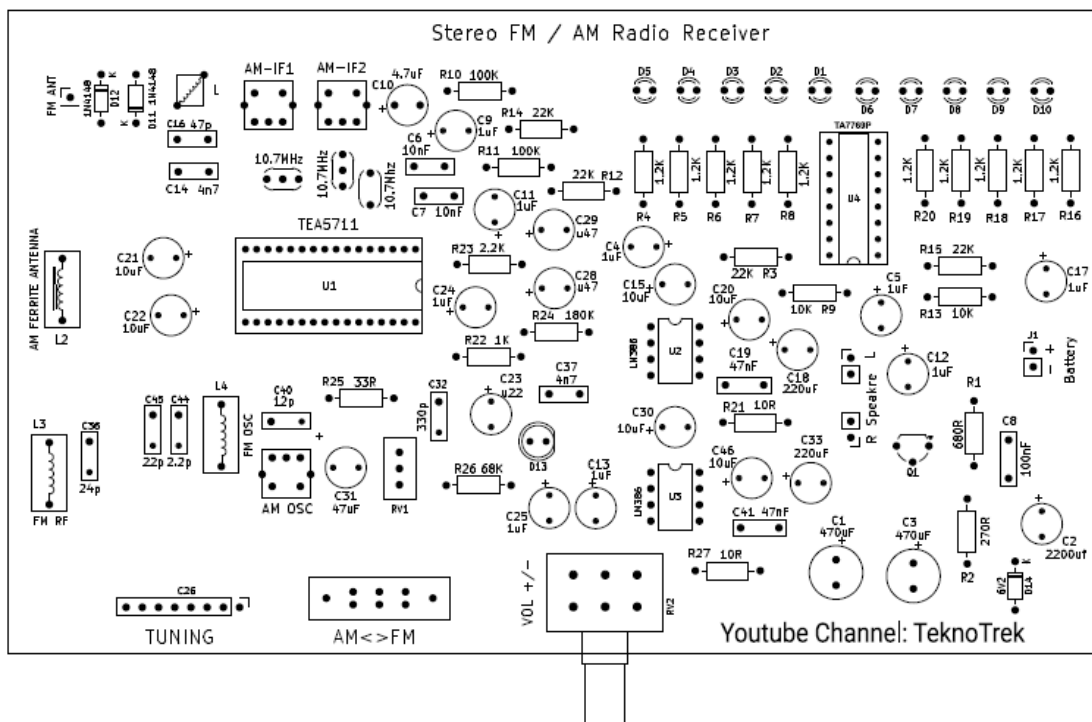
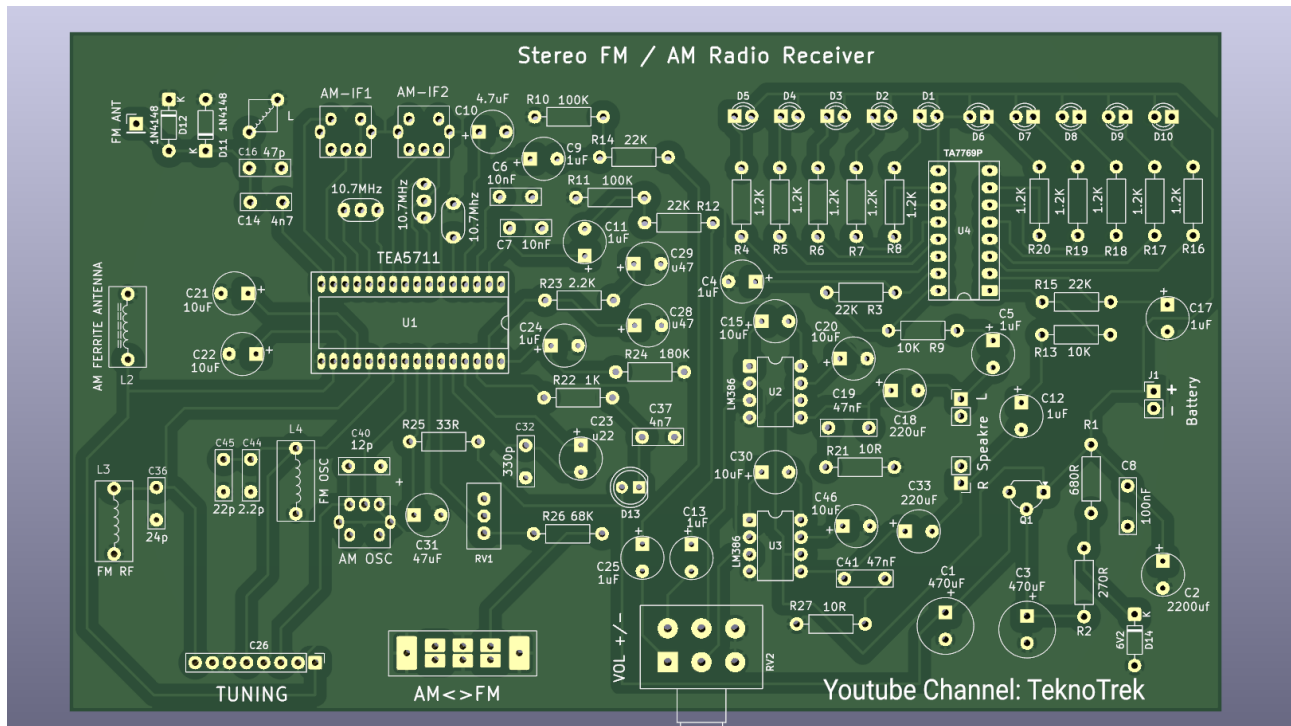
These are the Printed Circuit Board (PCB) details required to physically build the device.

- **Copper Side:** Keeping the tracks wide, especially the ground (GND) plane, reduces signal interference.
- **Placement Plan (Silk Screen):** Component names and values are clearly marked on the board. The positions of the **AM-IF1**, **AM-IF2** transformers and the **AM Ferrite Antenna** are strategically placed for sensitive adjustment.
- **Control Panel:** Controls for **TUNING**, **AM<>FM (Mode)**, and **VOL +/- (Volume)** are lined up at the bottom of the board for user access.



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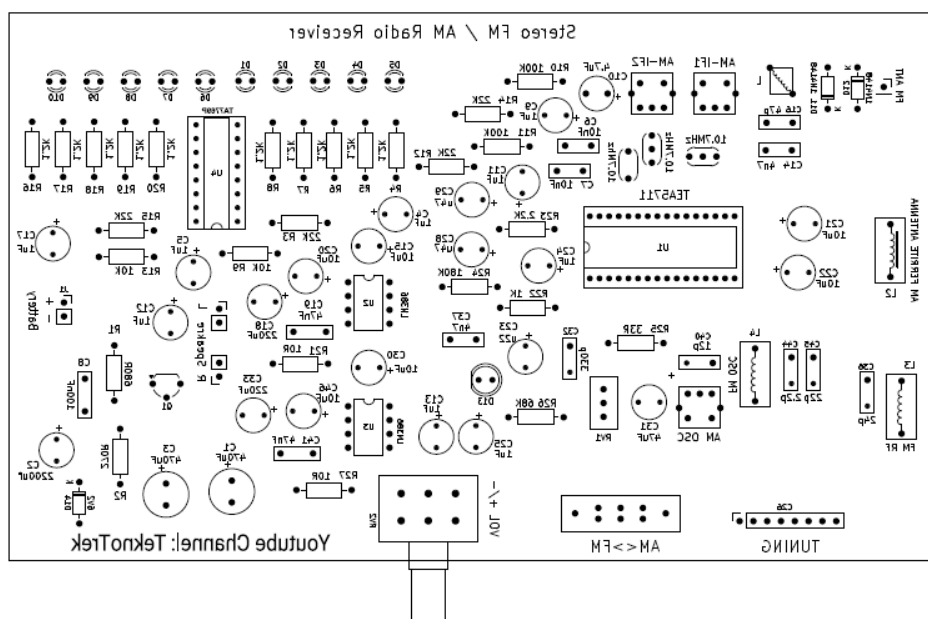
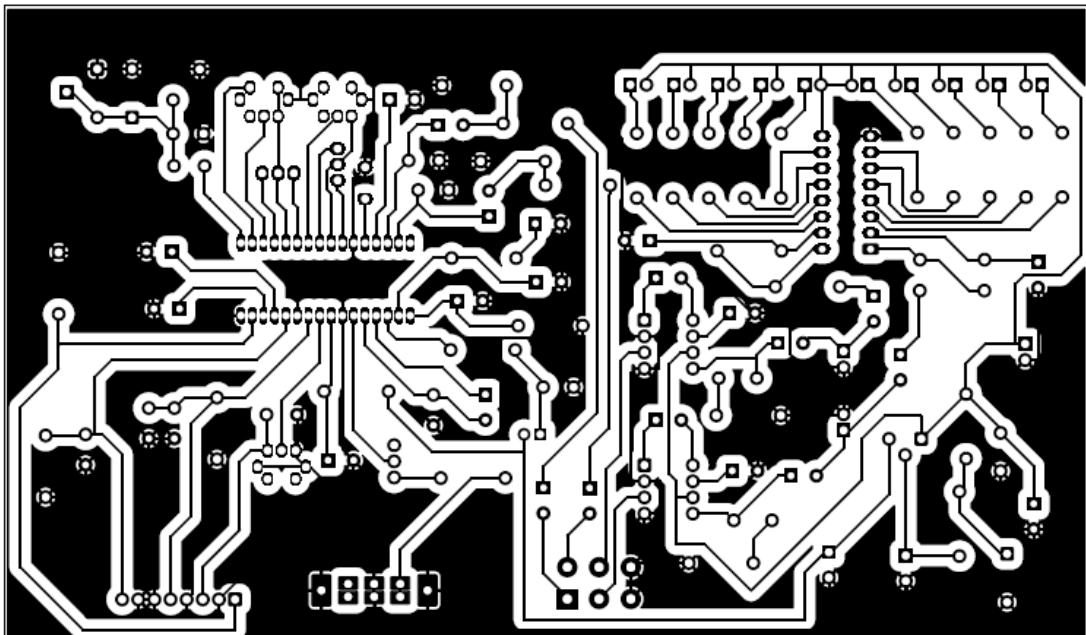
PCB Top Component Layout



6. Heat Transfer and Production Templates (Mirror Image)

These are mirrored images prepared for those using the iron-on transfer or similar methods during the production phase.

- **Print Preparation:** The **Mirror** images ensure that text and tracks face the correct direction when transferred onto the PCB.
- **Quality Control:** When printing, care must be taken to ensure a 1:1 scale; otherwise, the IC pins (DIP packages) will not fit the board.



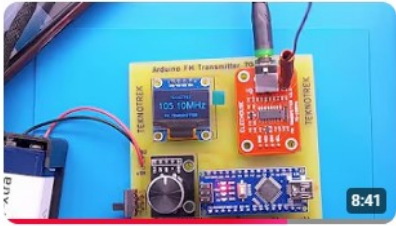
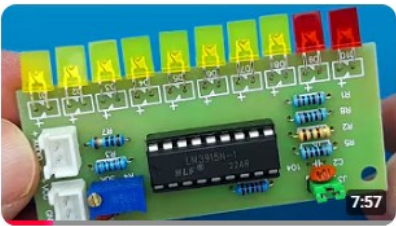
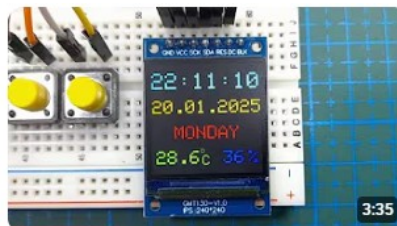
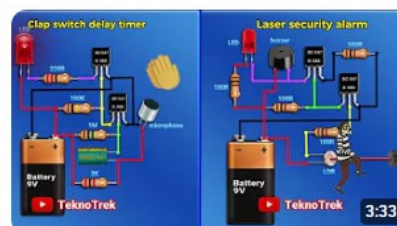


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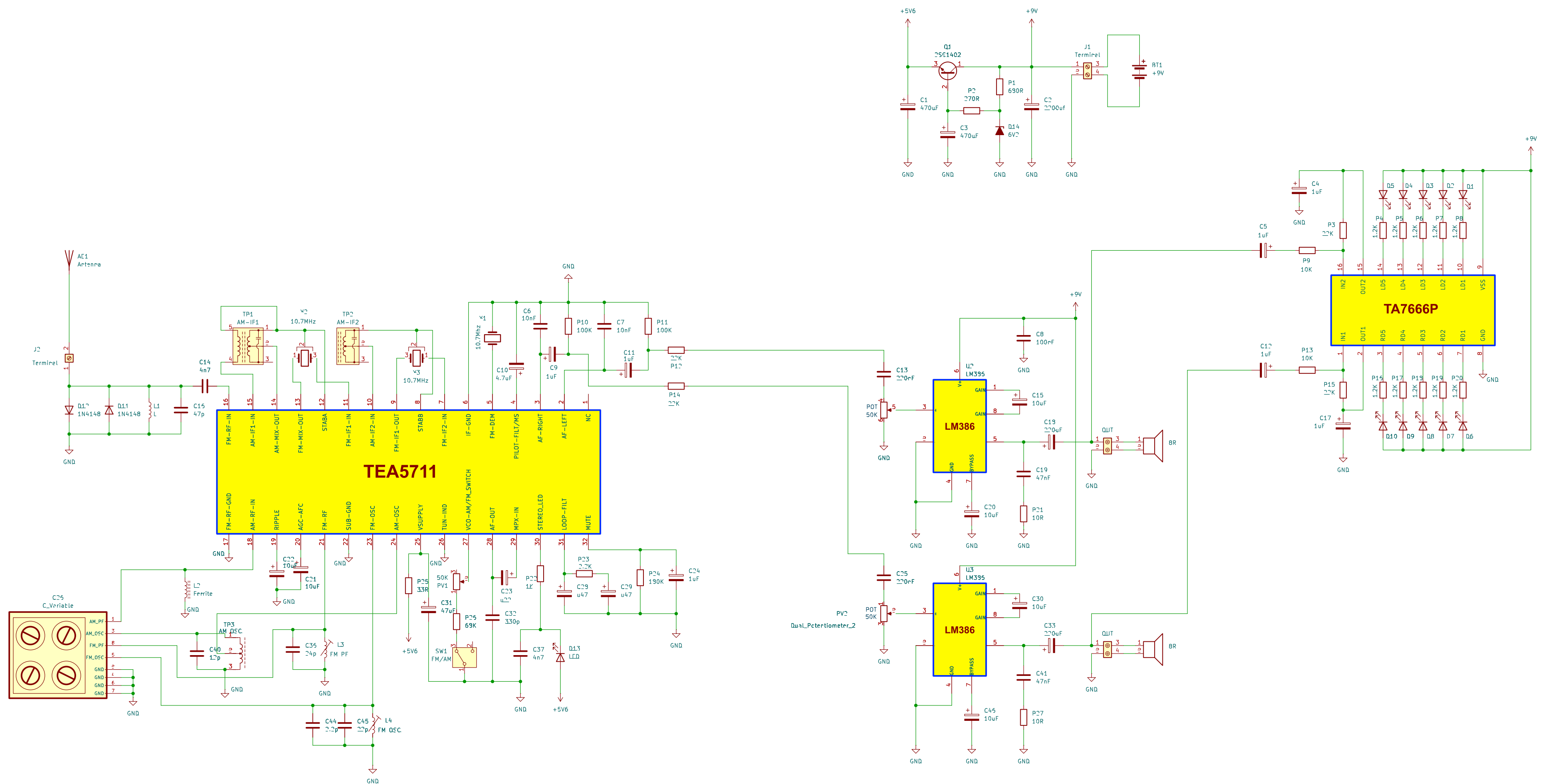
		
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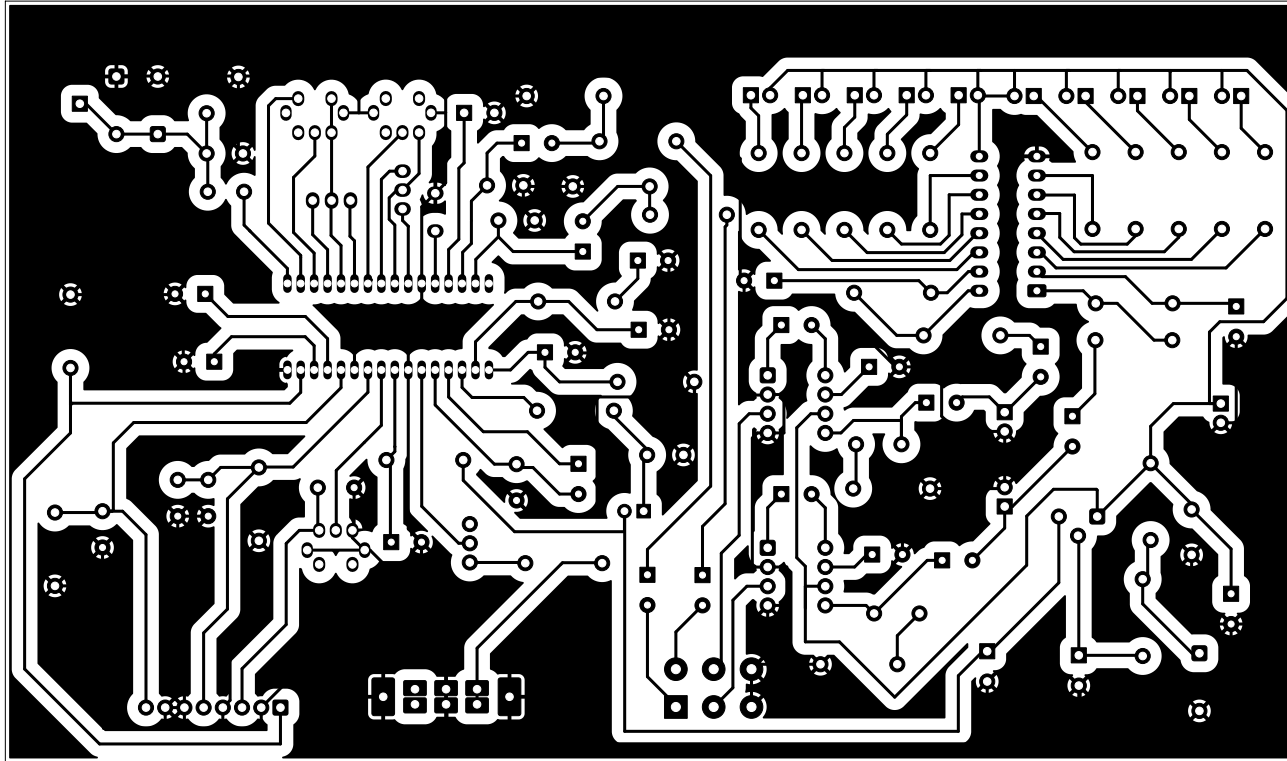
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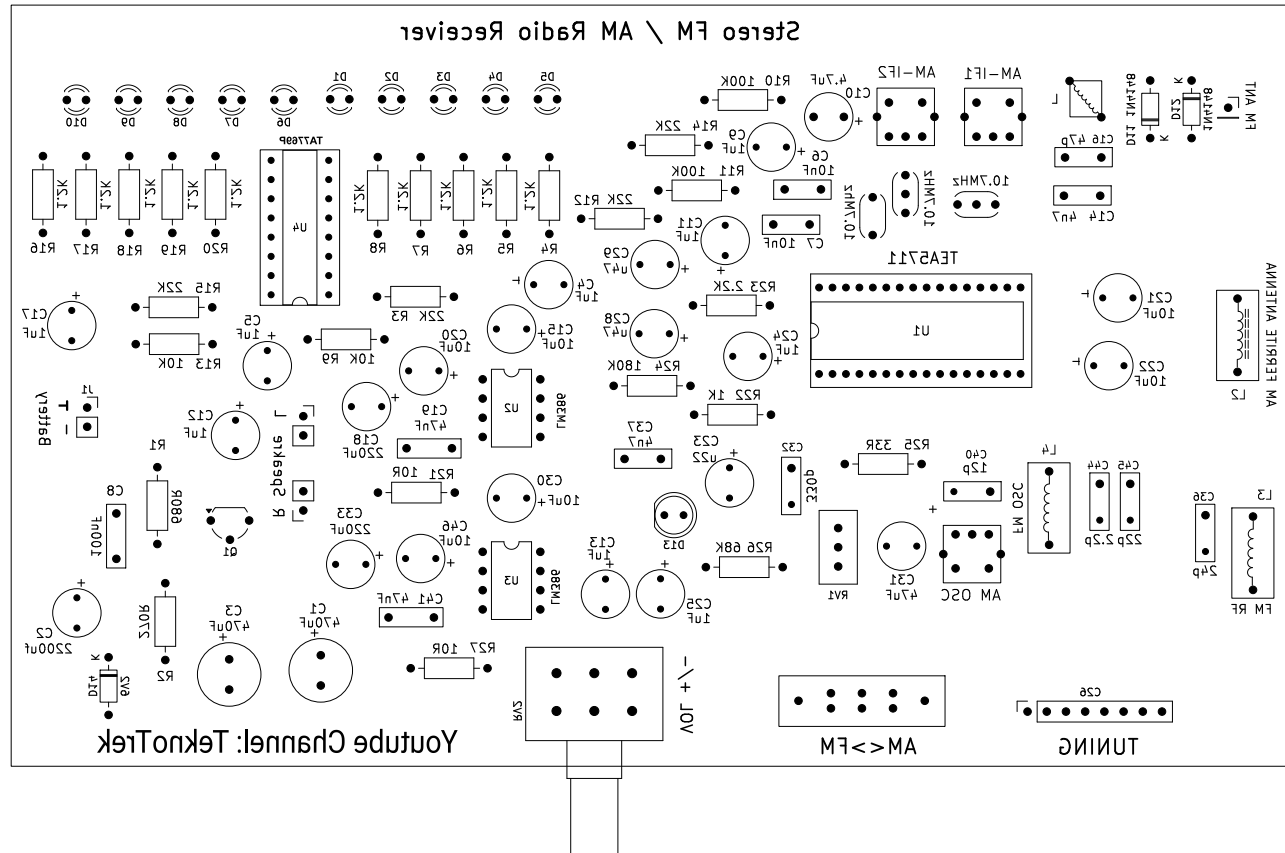


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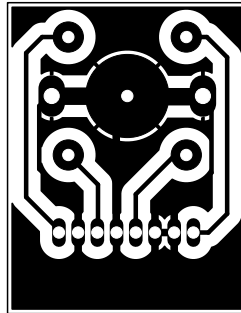
Production Template (Mirror Image for Transfer)

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