

# **X2000 SERVICE GUIDE**

## **1. POWER SUPPLY SYSTEM**

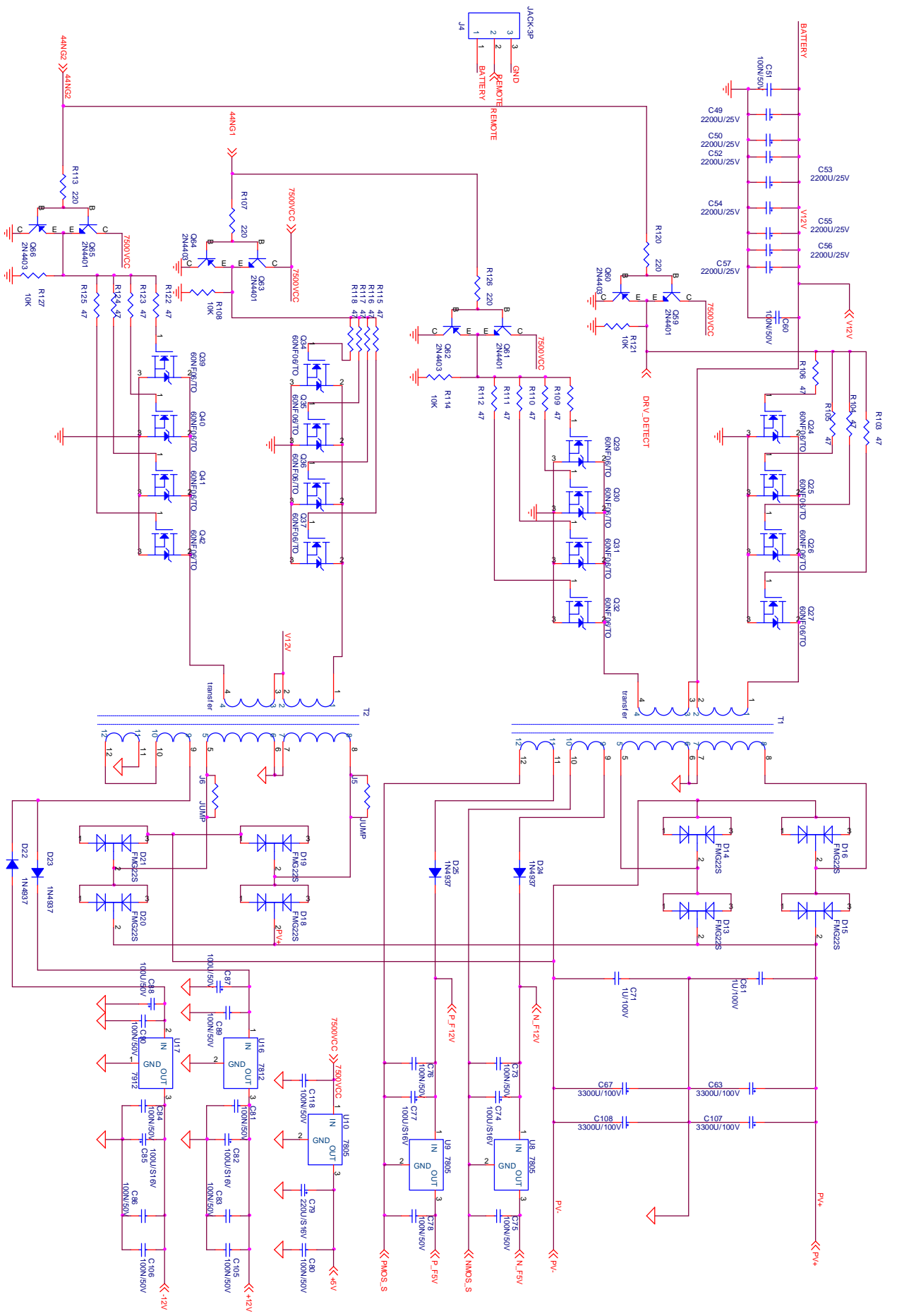
The power source of X2000 is +12v in car. Inside the amplifier, the +12v power is converted to +-66V, +-12V and +5V. The +-66V is the main power of the last state power amplifier, +-12V is the power of preamplifier and +5V is the power of Modulator daughter board.

The power supply circuit is based on the DC-DC inverter. The main parts of the circuit are switching MOSFETs, transformer, rectifier and control IC.

For most familiar problem, Following is the service method.

### **A. MOSFETs defective.**

When the power supply MOSFET was blew out, It may caused by overload or unstable of the +12V power supply. Following is the circuit of transformer and MOSFET driver.



Remove all the MOSFETs for T1(Q24, Q25, Q26, Q27, Q29, Q30, Q31, Q32) or T2(Q34, Q35, Q36, Q37, Q39, Q40, Q41, Q42) and test the voltage of first pad of these MOSFET (Gate), the correct DC voltage should be about half of the +12V power supply. If the voltage is right, then replace the blow up MOSFET. Else if the DC voltage on the first Pin(Gate) is not half of power supply, please check the 47ohm resistor in serial with the MOSFET gate (R103, R104, R105, R106, R109, R110, R111, R112, R115, R116, R117, R118, R122, R123, R124, R125) and the driving transistor (Q59~Q66) first and then replace the blow resistor / transistor or MOSFET.

**B. No reaction when power up.**

The power supply circuits will power up when the remote is high. When the remote is high, the controlled +12V power inside the amplifier start work, following the remote power up circuit.

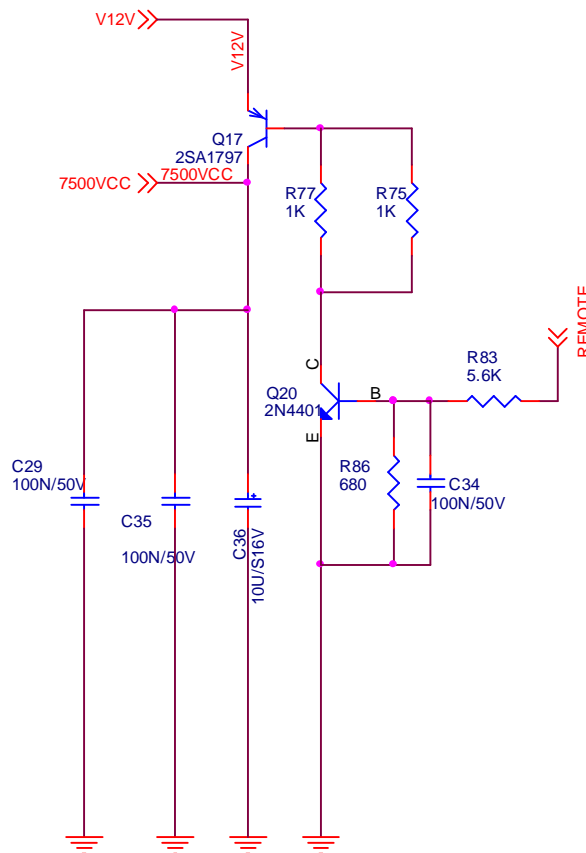


fig.1 controlled +12V power supply circuit

When REMOTE network (connected to the remote terminal) become high, the collector of Q20 should be pulled to ground, then Q17 is on, the 7500VCC network (controlled +12V power) become available. If 7500VCC network can't reach the power supply voltage when remote is high, check the two transistors and replace the defective one.

### **C. other supply voltage.**

There's also +-12V and +5V power supply in the circuit. Please check the attached power supply diagram for the detail. The +12V and -12V power come from the 7812 and 7912 regulator.

## **2. PWM digital amplifier circuits**

In X2000 amplifier, the audio signal was modulated to a PWM signal, after a PWM digital amplifier, the high power PWM wave is filtered by a LC filter and revert the original audio signal. Following diagram shows the circuits of the PWM digital amplifier circuits.

Q2~Q6 and Q8~Q12 are the main switching MOSFETs for the amplifier, Q70, Q72 is the driving transistor for Q2~Q6; Q77, Q80 is the driving transistor for Q8~Q12. For most familiar problems on this circuit, Q2~6 and or Q8~Q12 was blew up. In the same time Q70, Q72, Q77, Q80, and R35, R36, R37, R40~R43, R181, R182, R186 also may be blew up. If the amplifier is in protect status without any load, mostly Q2~Q6 and/or Q8~Q12 has one or more blow up. At the same time the driving transistors and resistors also may blow up. Check all the MOSFETs, transistors and resistors will be very useful before replace the blow up components

and power up again.

