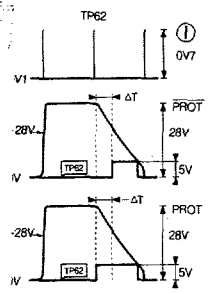


Frame deflection

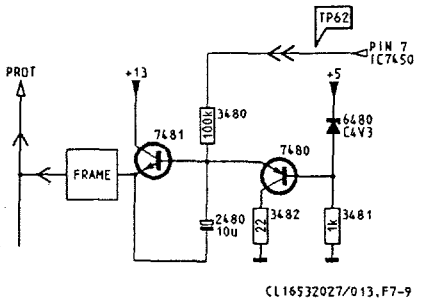


Fig. 7.9

At normal operation of the frame output stage pin 7-IC7450 is low, so that TS7481 blocks current.
If the frame deflection drops out, 7-IC7450 will go high, so that TS7481 starts to conduct and the protection is switched on.
At switch-off of the set, 7-IC7450 goes high. If the set is switched on and off very quickly, C2480 cannot discharge fast enough so that the protection becomes effective.
To avoid this, TS7480 has been added.
At switch-off, the +5 supply voltage drops out quickly, so that TS7480 starts to conduct and C2480 is discharged via this transistor.

Sound output stage

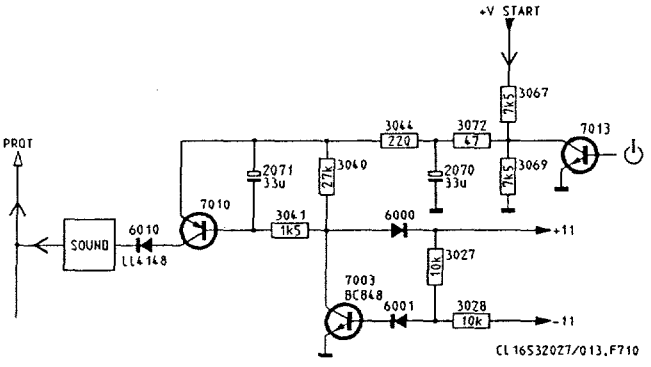
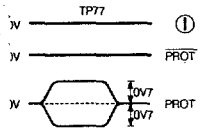


Fig. 7.10

Voltage division of the +16 and -16 results in a voltage of 0V at the junction of R3029 and R3007.
If the voltage at this junction exceeds 3,3V (D6002) + 0,6V (D6001) + 0,6V (be-TS7003) = 4,5V, TS7003 will start to conduct and the protection circuit will become effective via TS7010 and D6010.
If the voltage at the junction is less than -1.2V, TS7010 will also start to conduct.
If the +16 and the -16 are short-circuited with each other, TS7010 will be driven into conduction via D6000.
If the unit is set to standby, TS7013 will start to conduct, which means that no protection can be activated.

If, moreover, the average voltage supplied to one of the loudspeakers is not 0V, TS7003 or TS7004 will also be driven into conduction.



Fault detection

By fixing a measuring pin to a test point in one of the protected circuits, and then switching on the set, it can be checked whether that circuit activated the protective circuit.

7.2 The auxiliary supply (micro SOPS)

This power supply remains active when the set is in stand-by mode.

Block diagram

Primary
- blocking oscillator A
- switch-off circuit B
- switch-off accelerator F

Secondary
- variable load C
- voltage stabiliser D
- switch-on pulse generator E

The auxiliary supply is built up of 6 blocks:(Fig. 7.11)

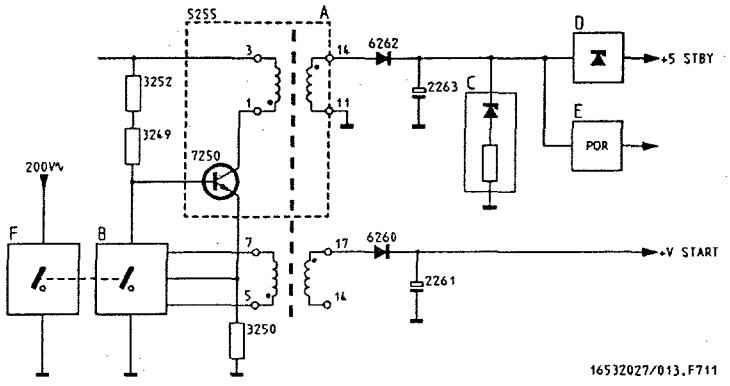
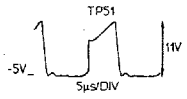


Fig. 7.11

Primary

Blocking oscillator
Transistor TS7250 receives it base voltage via R3252 and R3249 and starts conducting.
A linearly increasing current then starts flowing through winding 3-1 of T5255, TS7250 and R3250.



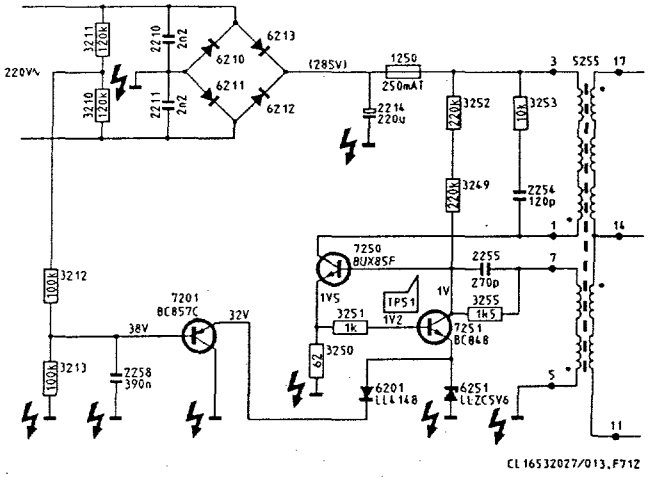


Fig. 7.12

Switch-off circuit

If the current increases, the voltage across R3250 increases as well. If this voltage exceeds the emitter voltage of TS7251, TS7251 will start conducting and TS7250 will be switched off. As the emitter voltage of TS7251 has been set at 5.6 V by D6251, the voltage across R3250 at that moment will be 6.2 Volts and the current approx. 90 mA. The polarity of the magnetic field in the transformer then is reversed and the voltage across winding 5-7 becomes negative. Transistor TS7250 is kept out of conduction via R3255/C2254 until all energy on the secondary side has been dissipated. Capacitor C2254 now constitutes an oscillator circuit with winding 3-1, so that an oscillation is formed. The polarity of the voltage across winding 7-5 is reversed via the magnetic coupling, thus causing a current to be delivered to the base of TS7250. This transistor starts conducting and the cycle above is repeated.

Switching off

The mains AC voltage is fed via R3210, R3211 and R3212 to the base of TS7201. If the mains voltage drops out (at switch-off), TS7201 will start conducting immediately and the voltage across zener diode D6251 will decrease. Consequently, the output voltages of the micro SOPS will decrease at once.

Secondary

On the secondary side 2 voltages are supplied:

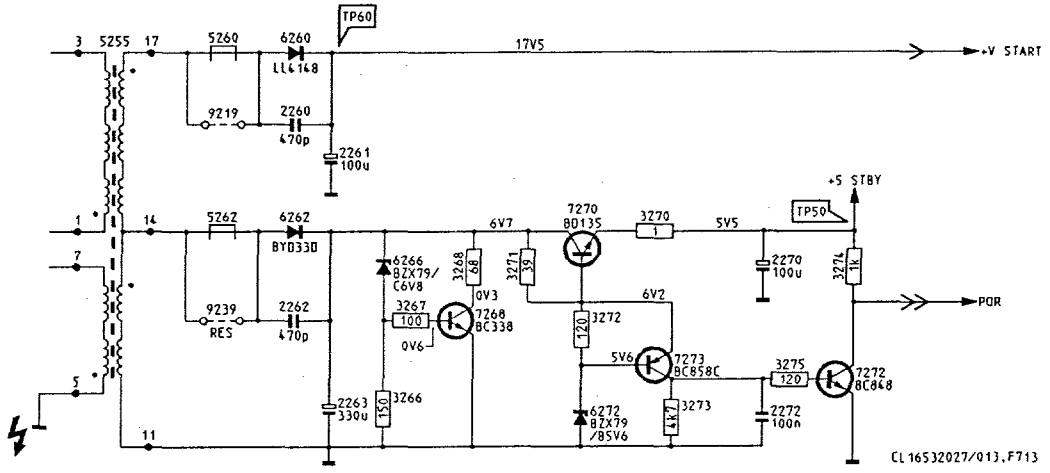
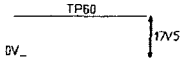


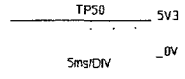
Fig. 7.13

+ Vstart



At pin 17 the Vstart voltage is supplied via D6260 across C2261. This voltage is used to activate the synchronisation IC and to let the main power supply know that the micro SOPS has been started up and that now the main SOPS may be started up as well.

+ 5 Stand-by



At pin 14 a voltage is supplied via D6262 across C2263 from which the +5-volt stand-by voltage is formed.
The +5-volt standby voltage is stabilised in 2 different ways.

Variable load

If the voltage across C2263 exceeds 6.9 volts, zener diode D6266 and TS7268 start conducting.
The power supply, then, is loaded extra by R3268, so that the voltage decreases more quickly.

Stabilisation

Series stabiliser TS7270 stabilises the output voltage at 5v6.

Switch-on pulse

At switch-on, the voltage across R3272 is lower than 0.7 volts. Transistor TS7273 is not conducting. If the +5-volt stand-by voltage is turned on, the POR signal is kept high via R3274. If the voltage across R3272 increases, TS7273 and thus also TS7272 start conducting and the POR signal is switched to a lower level by TS7272. Meanwhile the power supply has been started and a reset pulse has been supplied to the microcomputer.