PIONEER
The Art of Entertainment

No.. SK49006
Date: JAN,25, 1995

SERVICE KNOWHOW

XR-P740M,740,640M,640,440M,440 340M,340
XR-J25M,22M,22,15M,11M,11
SX-J320,420,520,720
RX-P840,570,570S,J33,370
M-770

THE CIRCUIT OPERATION OF THE POWER AMP MODULE

Fig-1&2: THE BLOCK DIAGRAM OF POWER MODULE PROTECTION CIRCUIT

Page-1 : 1.THE PRECAUTION IN REPAIRING A SET
Page-2 : THE BLOCK DIAGRAM OF THE PROTECTION CIRCUIT
Page-3 : 2.THE CIRCUIT OPERATION OF THE DETECTORS
3.THE OPERATION OF THE FAN MOTOR
Page-4 : 4.TROUBLE SHOOTING
Page-6 : 5.HOW TO CHECK THE DETECTION CIRCUIT

1. PRECAUTION IN REPAIRING A SET

a. A heat sink for the power transistors should be isolated from the ground.
A collector of the transistor is directly connected to the heat sink.

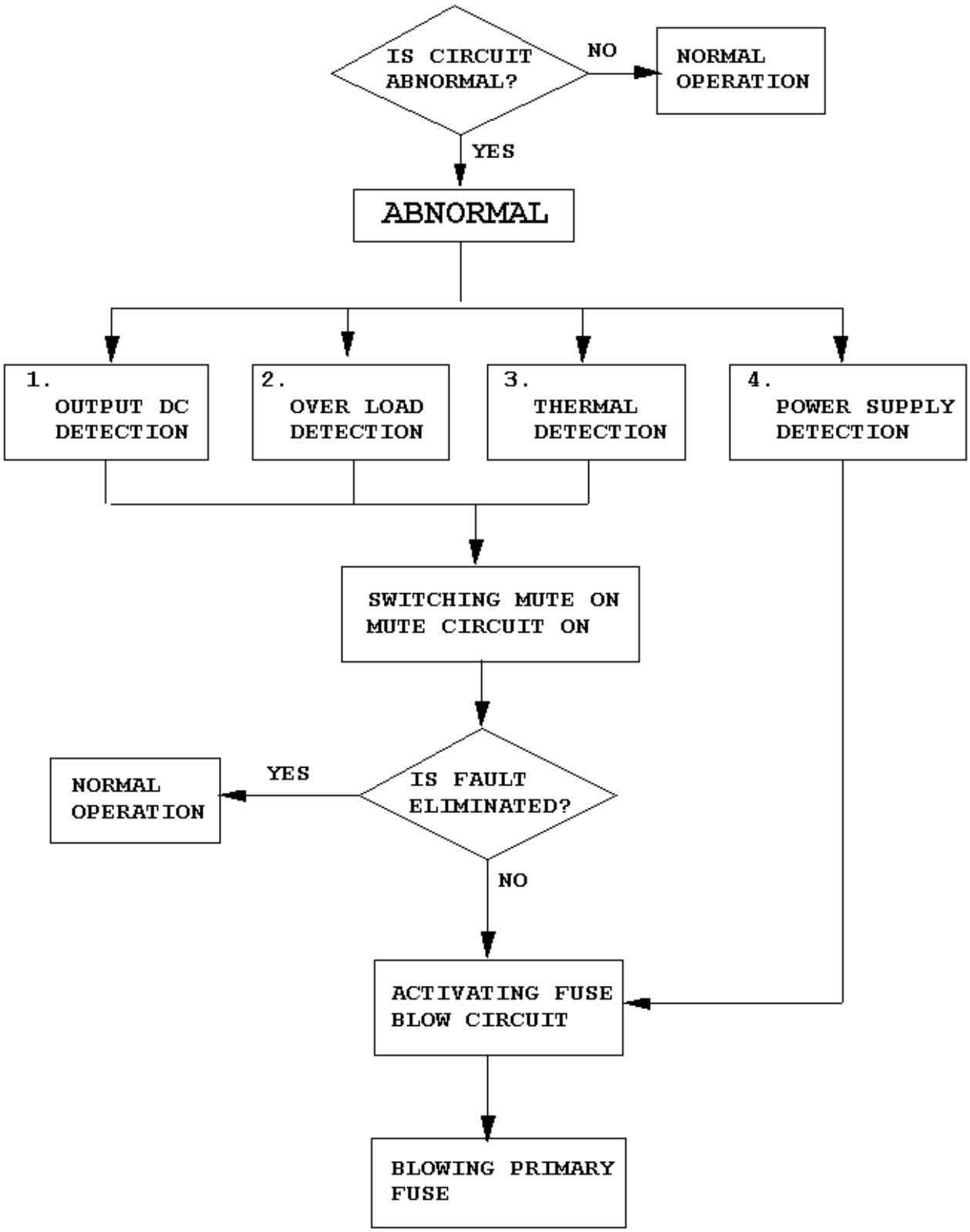
b. A heat sink should be firmly installed onto the power transistors when checking the circuit, otherwise the transistor will get damaged or burn out due to thermal runaway.

c. If the AC socket remains plugged into the outlet and power is in STAND-BY mode,then B1±50V and B2 ±25v are still being supplied.

d. The potential at B1 and B2 on the power module circuit remains high although the AC socket is unplugged.
Discharge the potential by shorting smoother capacitors C1001 and C1002 on ±50V and C1005 and C1006 on ±25V lines if transistors and other components on the power module amp. are to be checked.

PIONEER ELECTRONIC CORPORATION
Issued by
Y.IMAMIZU, Manager
H.E Engineering Sect., Service Dev.

"BLOCK DIAGRAM OF THE PROTECTION CIRCUIT"



2.THE CIRCUIT OPERATION OF THE DETECTORS

a.DC detector: A circuit operates when neutral voltage at speaker output exceeds DC ±3V.

b.Over load detector : Power supply ±11V for the amp IC7501 is ceased and the signal is muted when speaker terminals are shorted.

*An over load detector does not blow a fuse. A circuit keeps muting on as long as speakers are shorted.

c.Thermal detector : A circuit operates when temperature on a heat sink exceeds 105 degree c.

d.Power supply : A fuse blow circuit operates when neutral point of the power supply voltage ±12V, ±25V, ±5.6V or ±12V line exceeds ±0.6V. A fuse is blown immediately without switching mute circuit on.

*In case of detecting DC voltage at speaker output, an over load current or excessive heat on a heat sink, the amp circuit is muted by stopping supply of ±11V for an amp IC7501 for two seconds.
If the detection signal is eliminated during muting on, the circuit resumes normal operation, but if the detection circuit keeps on, a fuse is immediately blown.

*In case of detecting abnormal power supply, a fuse is immediately blown.

3.THE OPERATION OF THE FAN MOTOR

a.Condition of the fan motor rotating at high speed.
1.A speaker output voltage exceeds 3.8V p-p regardless of loadi speakers or headphone.
*Position of the main volume is around 10 o'clock.

2.Temperature on heat sink exceeds 95 degree c.
*Rotating at high speed caused by detecting thermal detector hardly occurs.

b.Condition of the fan motor rotating at low speed.
1.Temperature on a heat sink exceeds 85 degree c.
2.Function is CD or DECK and in playing.

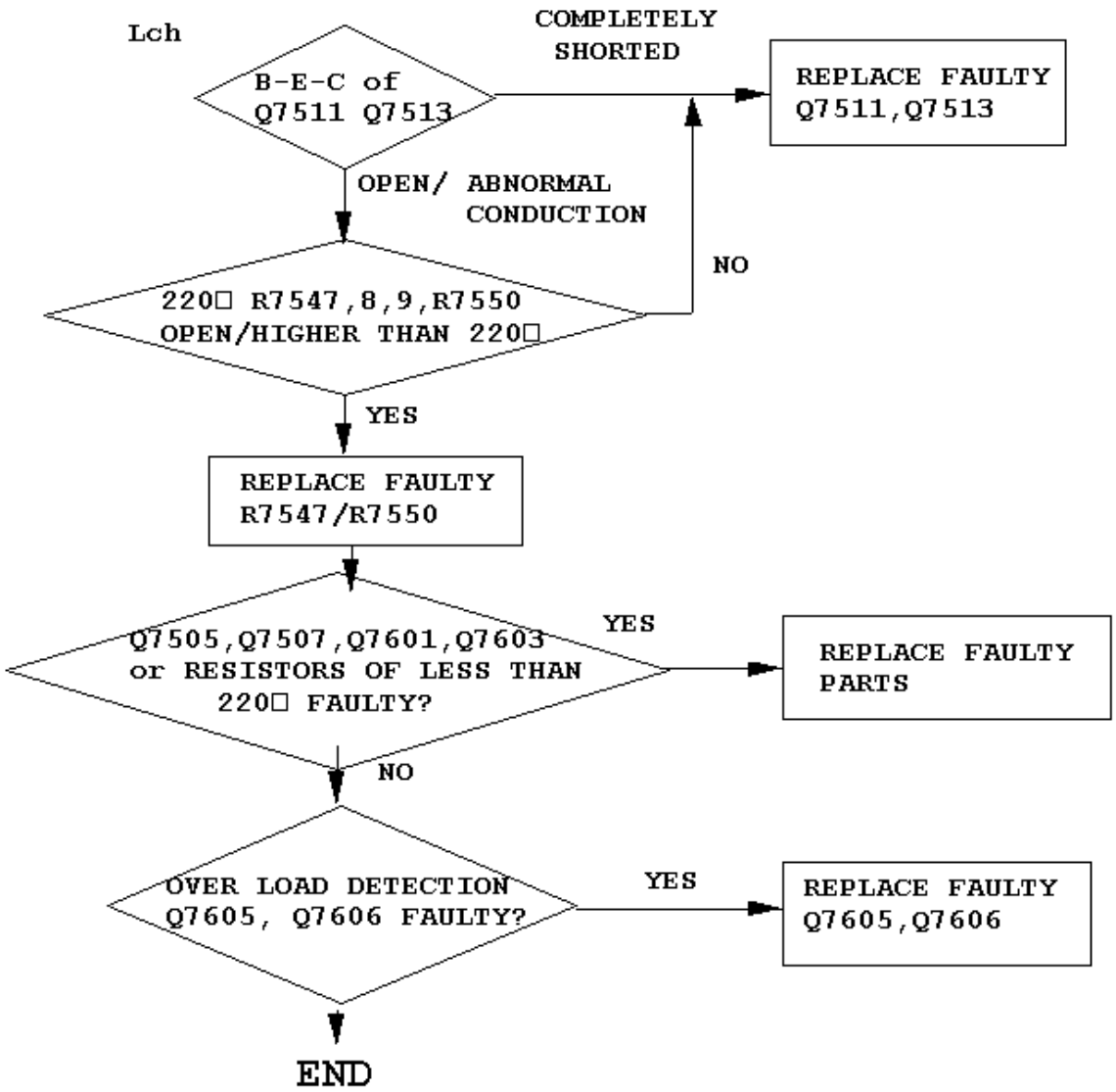
*The fan motor stops when temperature decreases to 75 degree c.

4.TROUBLE SHOOTING (In case of Lch,same as Rch)

a. SYMPTOM :Fuse is open.
   CAUSE :Fuse was simply opened.
   REMEDY :Check power transistors Q7511 Q7513 are OK.

b. SYMPTOM :Sound is muted.
   CAUSE :Speakers or cables are shorted.
   REMEDY :Check speaker terminals.

c. SYMPTOM :Fuse keeps blowing.
   CAUSE :Power transistors Q7511,Q7513,R7547,R7548,R7549,R7550
   220□ are faulty.
   REMEDY :As follows;



d. SYMPTOM :Fuse keeps blowing.
CAUSE :A primary fuse or a fuse and power transistors are blc
by a fuse-blow circuit.
High tolerance or resistance of the components used ir
power supply-detection circuit caused misoperation.
REMEDY :To minimise drift of potential at the neutal point, tl
type of resistors in power supply-detection are to be
changed from tolerance 5% to 1% and 0,5%.

KEY NO		PARTS NO		NEW PARTS NO	TOLERANCE
R1014	FROM	RS1/10S223J	TO	RN1/10SE223D	0.5%
R1038		RS1/10S203J		RN1/10SE203D	"
R1010		RS1/10S203J		RN1/10SE203D	"
R1039		RS1/10S203J		RN1/10SE203D	"
R1011		RS1/10S103J		RN1/10SE103D	"
R1012		RS1/10S203J		RN1/10SE203D	"
R1009		RS1/10S303J		RN1/10SE303D	"
R1053		RS1/10S472J		RN1/10SE472D	"
R1054		RS1/10S472J		RN1/10SE472D	"
R1015		RD1/8PM223J		RN1/4PC2202F	1%
R1013		RD1/8PM562J		RN1/4PC5601F	"

THE ABOVE RESISTORS ARE LOCATED ON THE RIGHT SIDE OF THE CIRCUIT DIAGRAM FIG-2.

NOTE :THE SERVICE INFORMATION WILL BE ISSUED LATER ON.
THE ABOVE PARTS WILL BE SUPPLIED AS KIT.

5.HOW TO CHECK THE DETECTION CIRCUIT

If a fuse keeps blowing, take the following procedures to preve
the power transistors from damaging in repair.

a. Disconnect speakers.

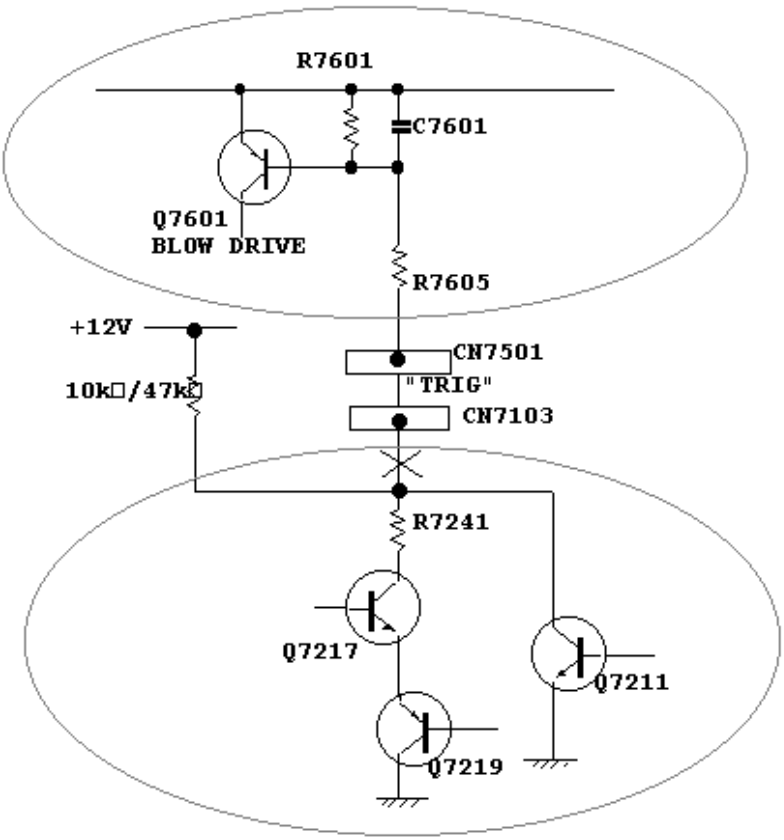
b. To isolate the fuse-blow-driver transistor Q7601, disconnect
the circuit by removing jumper wire between CN7103 and R7241

c. Connect 10K□/47K□ between +12V and R7241 to pull up Q7217.

d. Observe potential at R7241 with oscilloscope.
   1. If the potential is +12V, the detection circuit has no
      trouble. The detection circuit is off.

   2. If the potential is 0V, the detection circuit is active.
      Check the troubled points.

e. Put the circuit back as it was, after checking the above.



BLOCK DIAGRAM OF POWER MODULE PROTECTION CIRCUIT

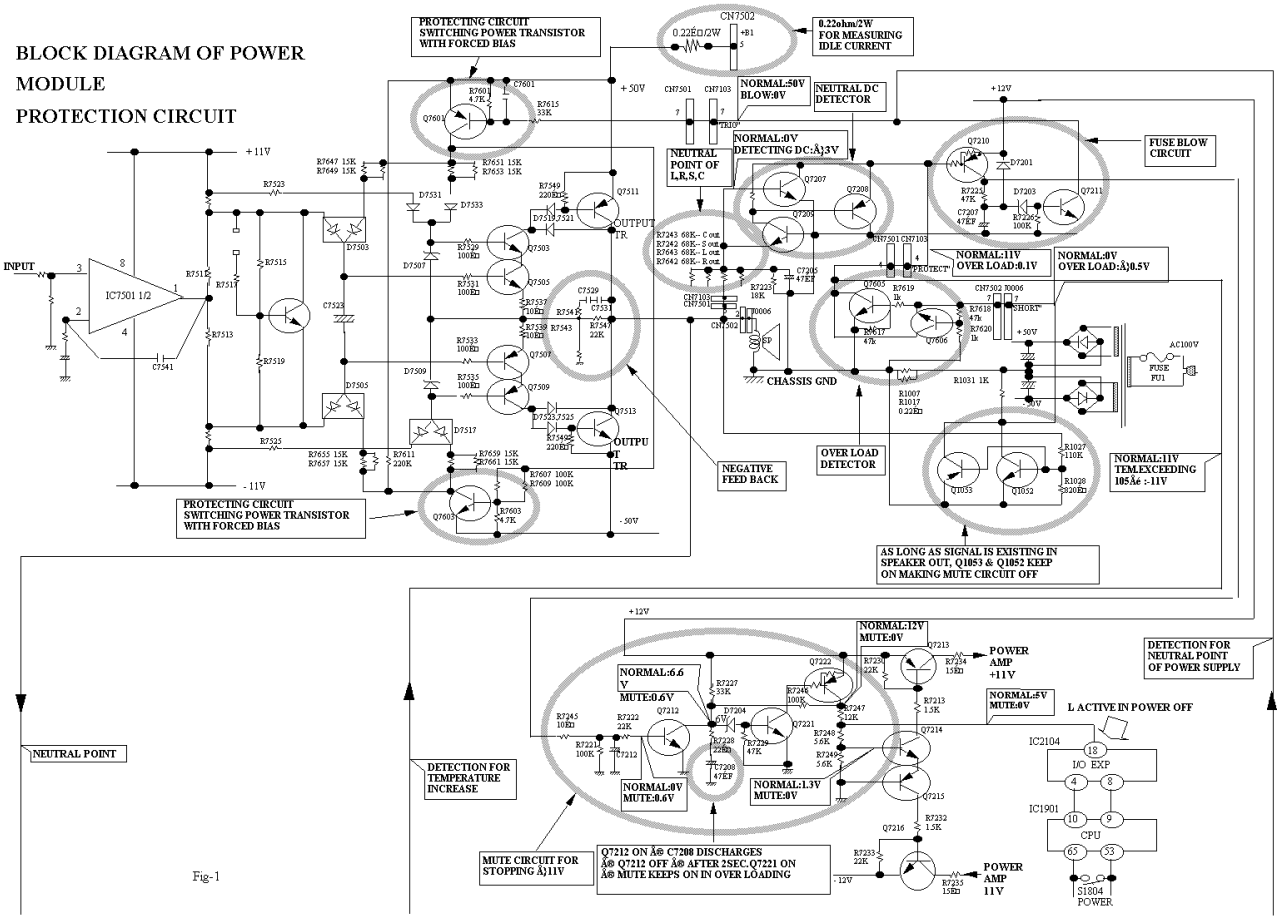


Fig-1

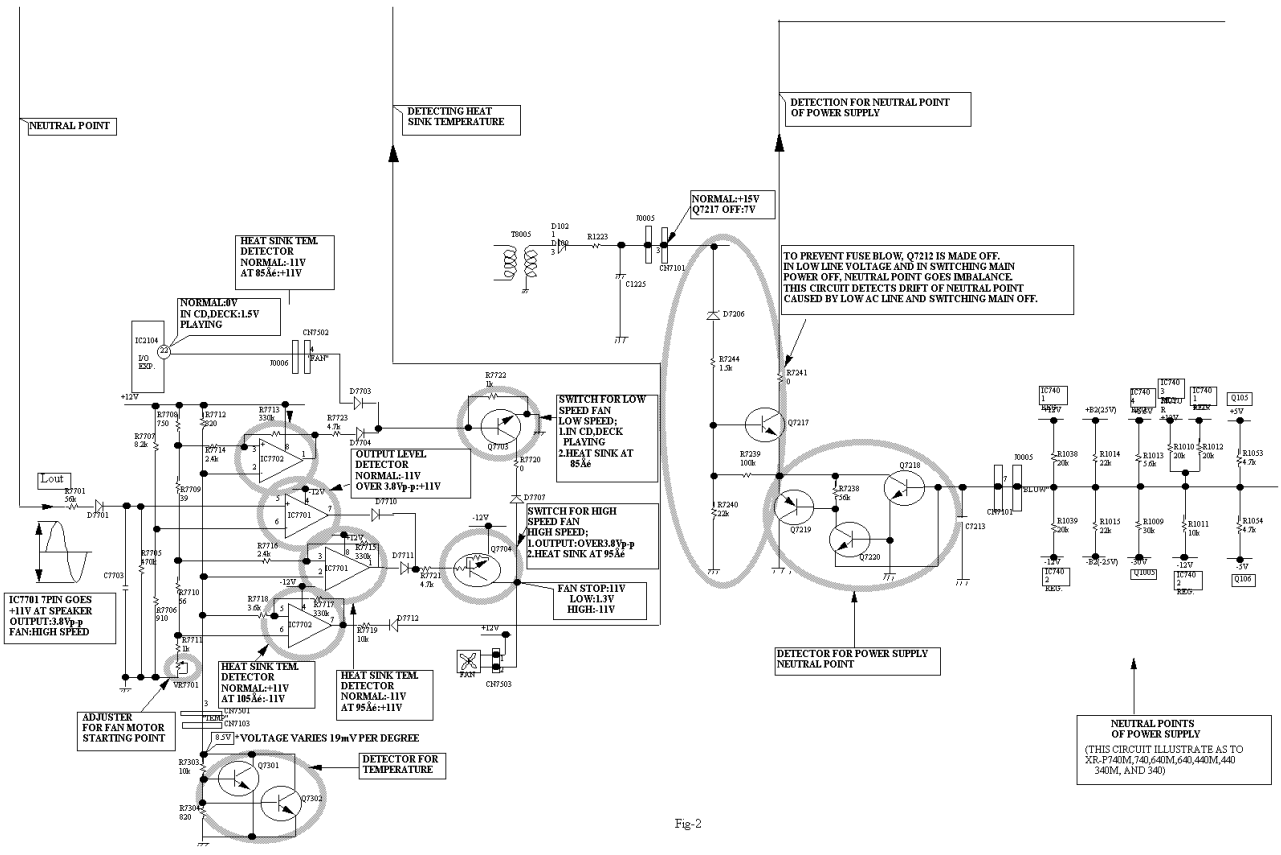


Fig-2