4. CIRCUIT DESCRIPTION

4.1 PWM (Pulse Width Modulation) POWER SUPPLY

The PWM power supply is a circuit that maintains stable secondary voltage in a DC/DC converter, regardless of the voltage fluctuation and load fluctuation of the primary voltage.
In actual operation, the output voltage (Vout) expressed by formula (1) is maintained at a stable level. Consequently, when load fluctuation or fluctuation of the primary (battery) voltage occurs, the PWM circuit illustrated in Fig. 17 and 18 to control the pulse width of the gate voltage at A.

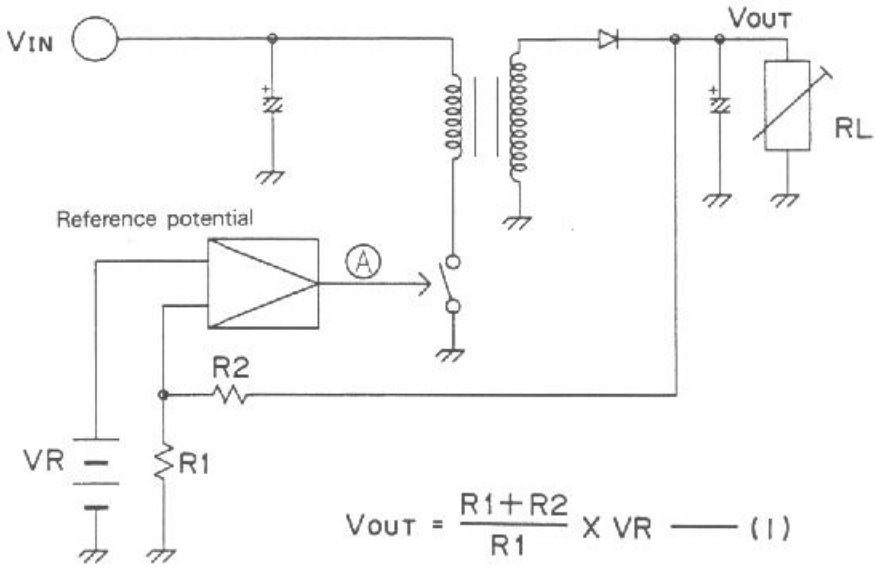


Fig. 16

- **Waveforms at point A (V: 10V/div, H: 10μS/div)**

No signal

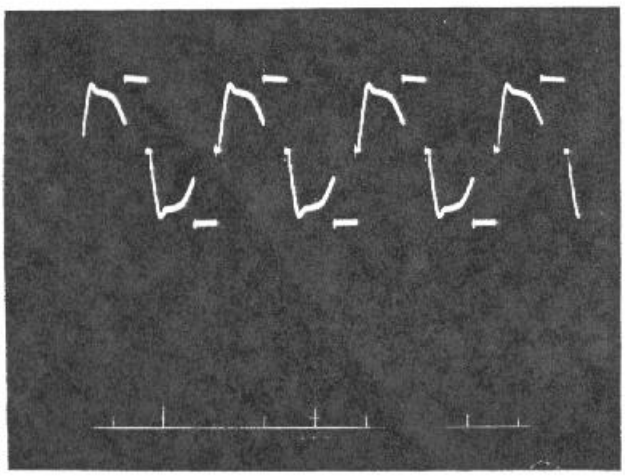


Fig. 17

Large output or drop in input voltage (VIN)

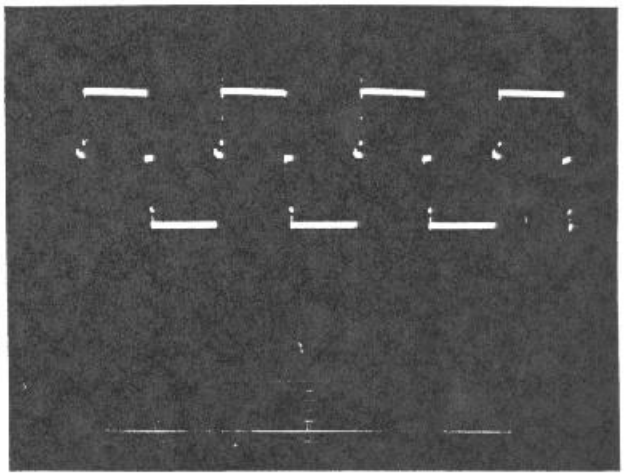
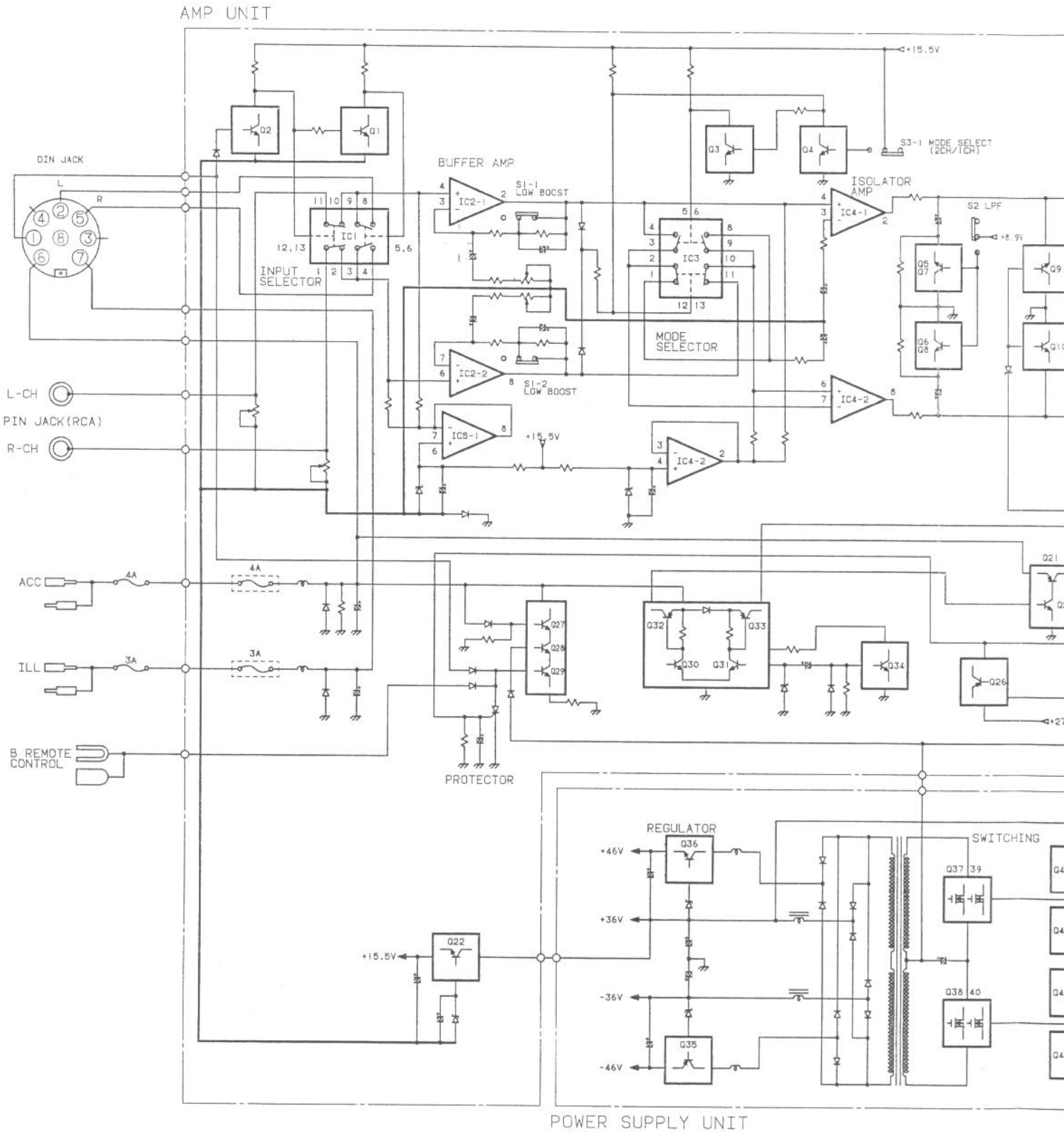


Fig. 18

4.2 BLOCK DIAGRAM



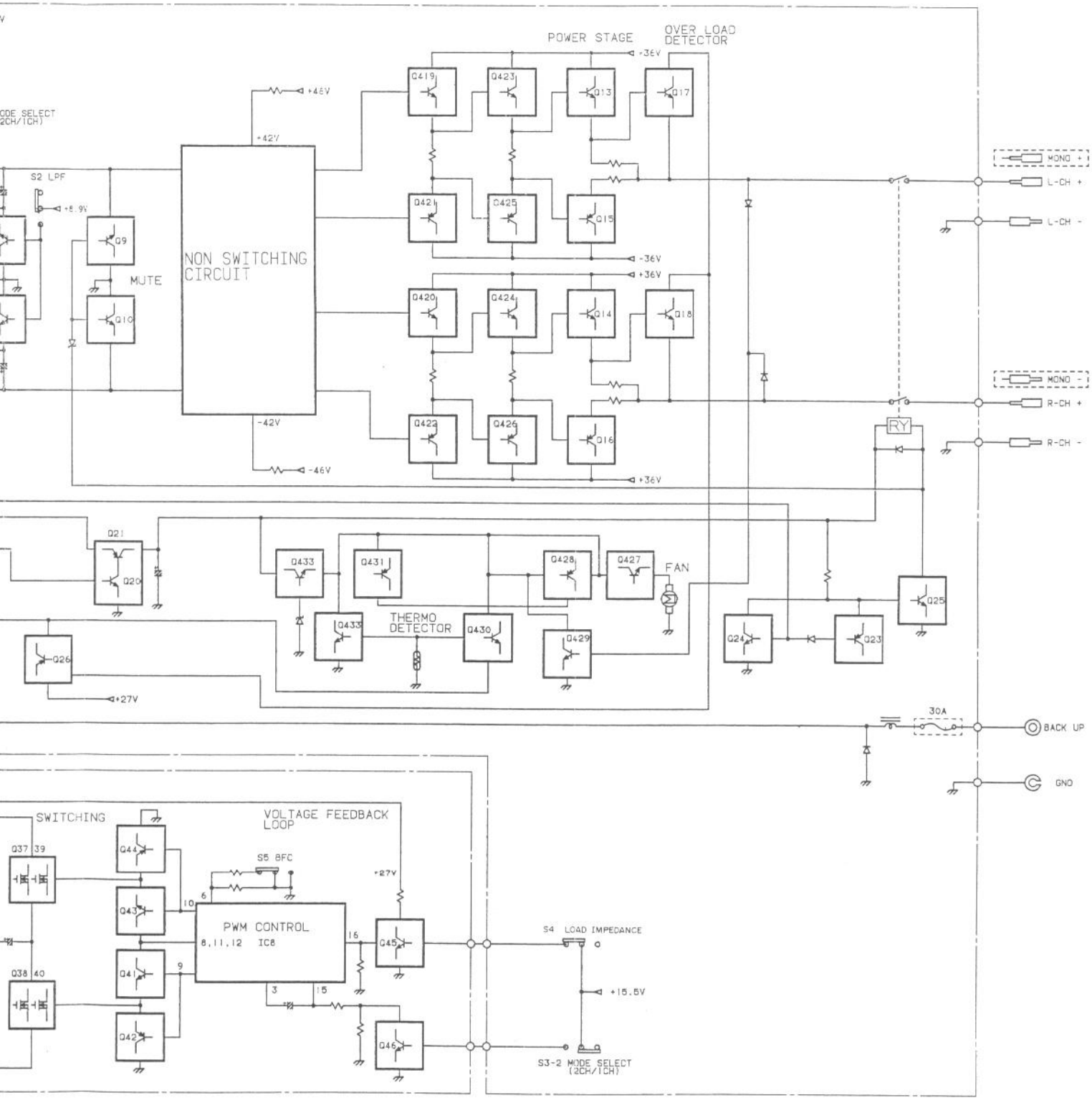

POWER STAGE
OVER LOAD DETECTOR
+36V
+48V
+42V
S2 LPF
+8.9V
MUTE
NON SWITCHING CIRCUIT
-42V
-48V
-36V
Q419
Q423
Q13
Q17
Q42
Q425
Q15
Q420
Q424
Q14
Q18
Q422
Q426
Q16
MONO +
L-CH +
L-CH -
MONO -
R-CH +
R-CH -
RY
Q21
Q20
Q26
+27V
Q433
Q431
Q428
Q427
FAN
Q432
THERMO DETECTOR
Q430
Q429
Q24
Q23
Q25
30A
BACK UP
GND
SWITCHING
VOLTAGE FEEDBACK LOOP
Q37 39
Q38 40
Q44
Q43
Q41
Q42
S5 BFC
PWM CONTROL
8,11,12 IC8
Q45
Q46
S4 LOAD IMPEDANCE
+15.5V
S3-2 MODE SELECT (2CH/1CH)

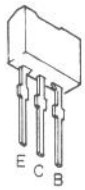
Fig. 19

• ICs and Transistor

2SA1048
2SC1740S
2SC2458
2SC3113

2SA992
2SA1145
2SC1845
2SC2705

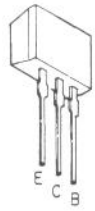
2SB1240
2SD1862



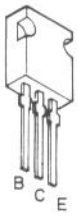
2SA1358
2SA1359
2SC3421
2SC3422

2SA9335
2SD1768S

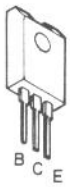
2SC3623A
2SC2787



2SB1357
2SD2037

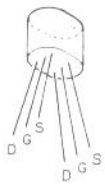


2SB1156
2SD1707

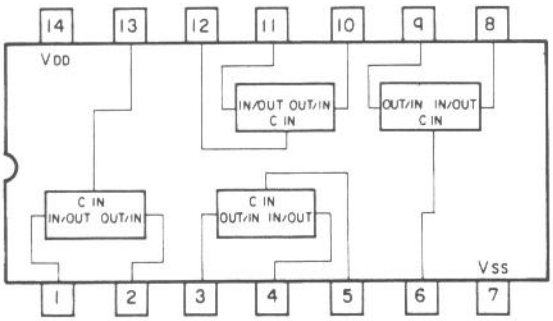


2SK1134

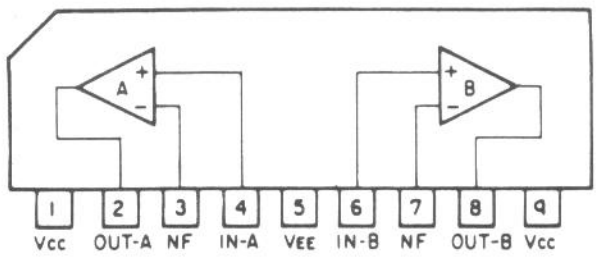
2SK129A



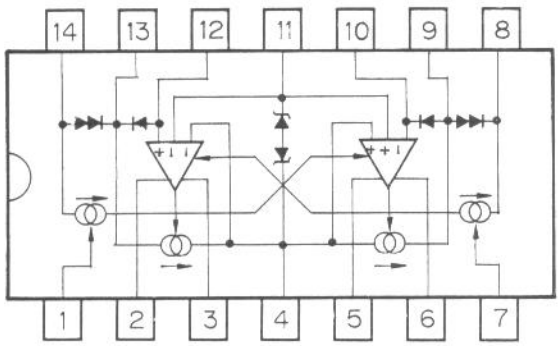
TC4066BP



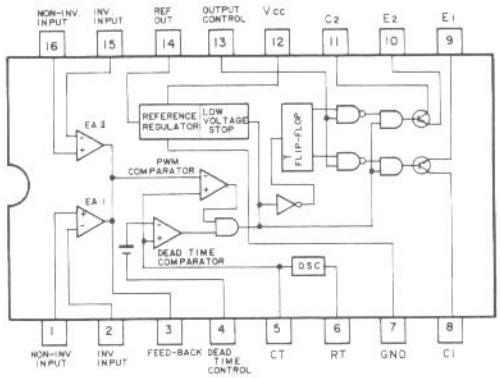
NJM2068S
NJM4558S



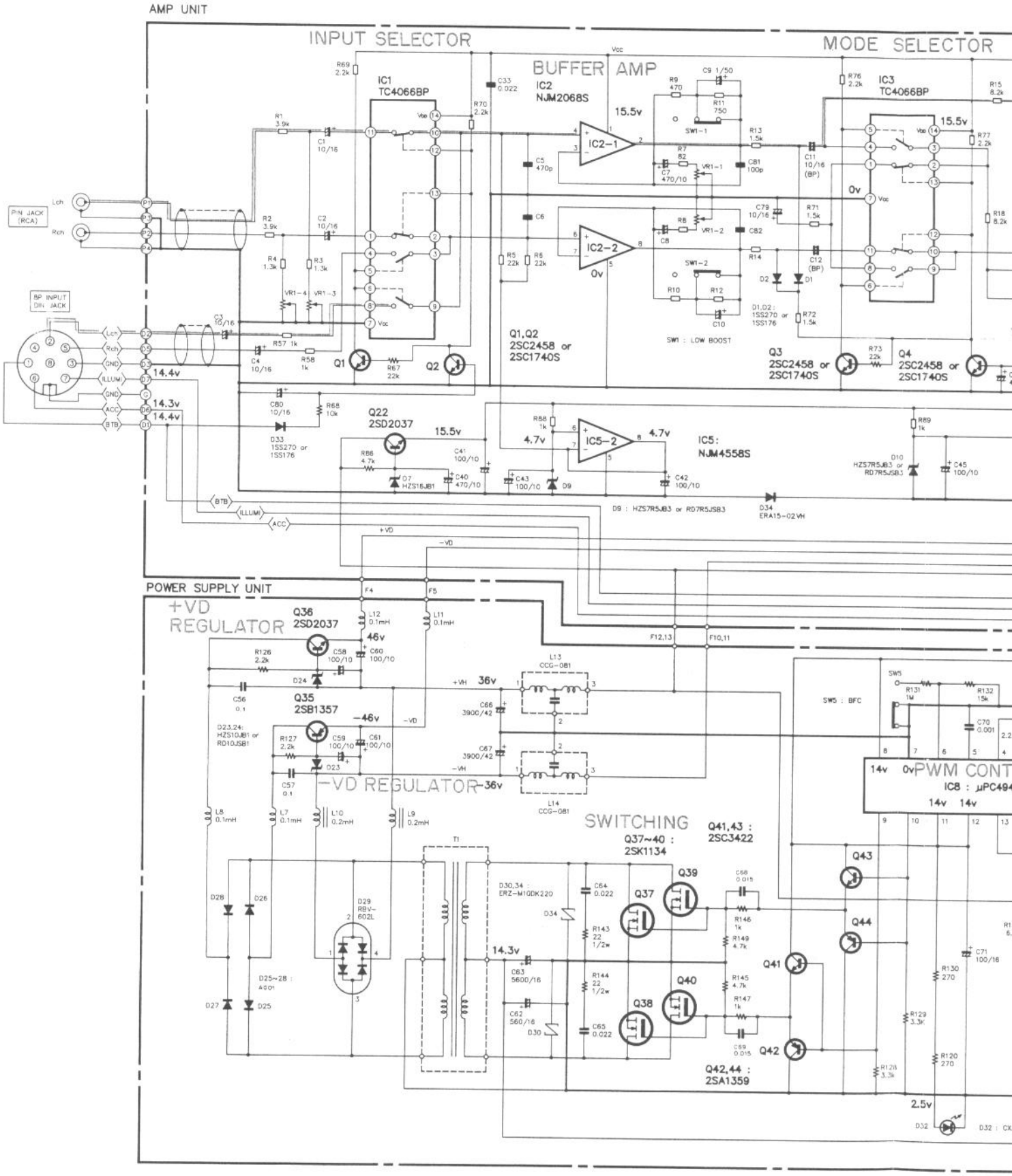
PA0016

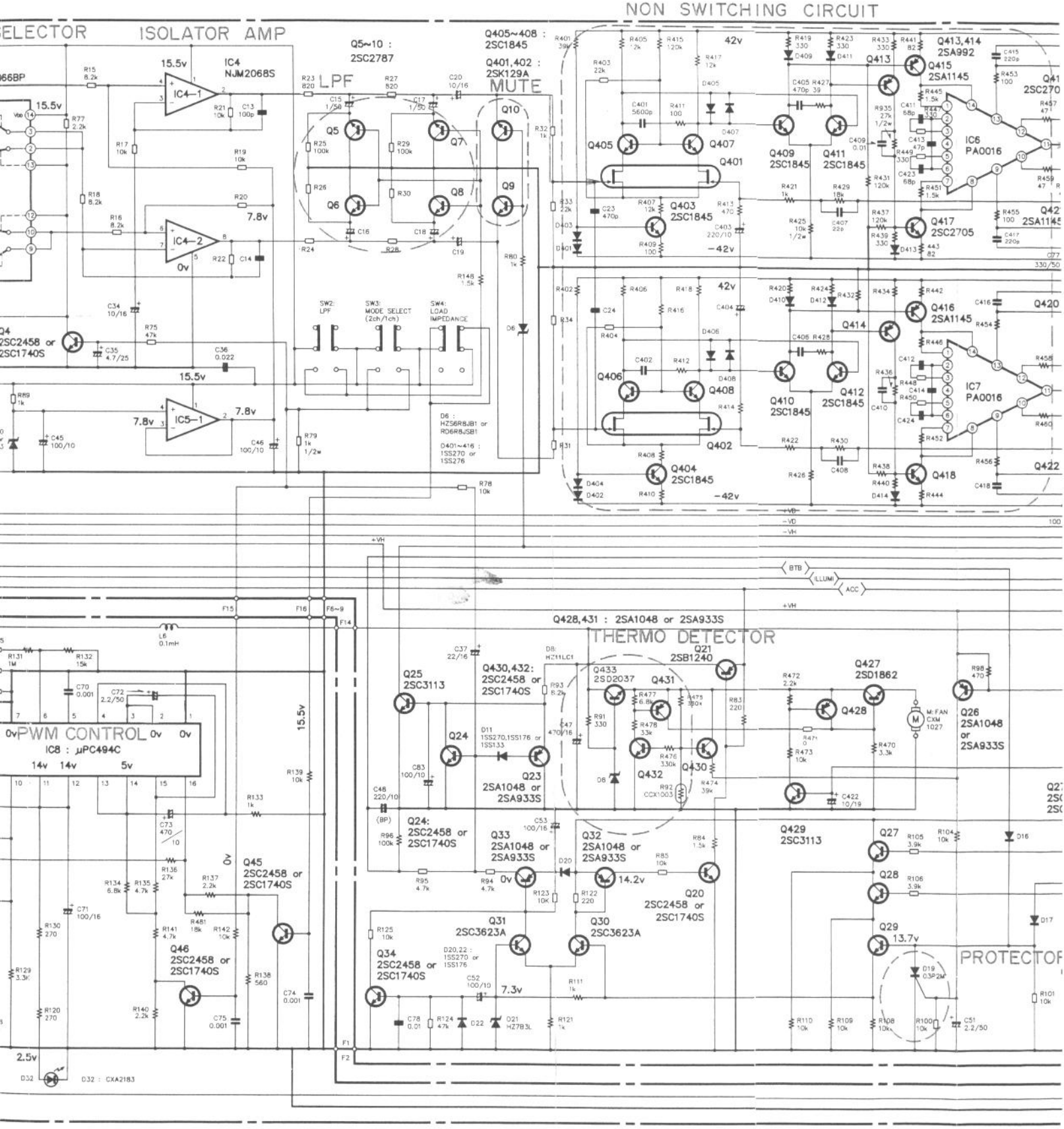


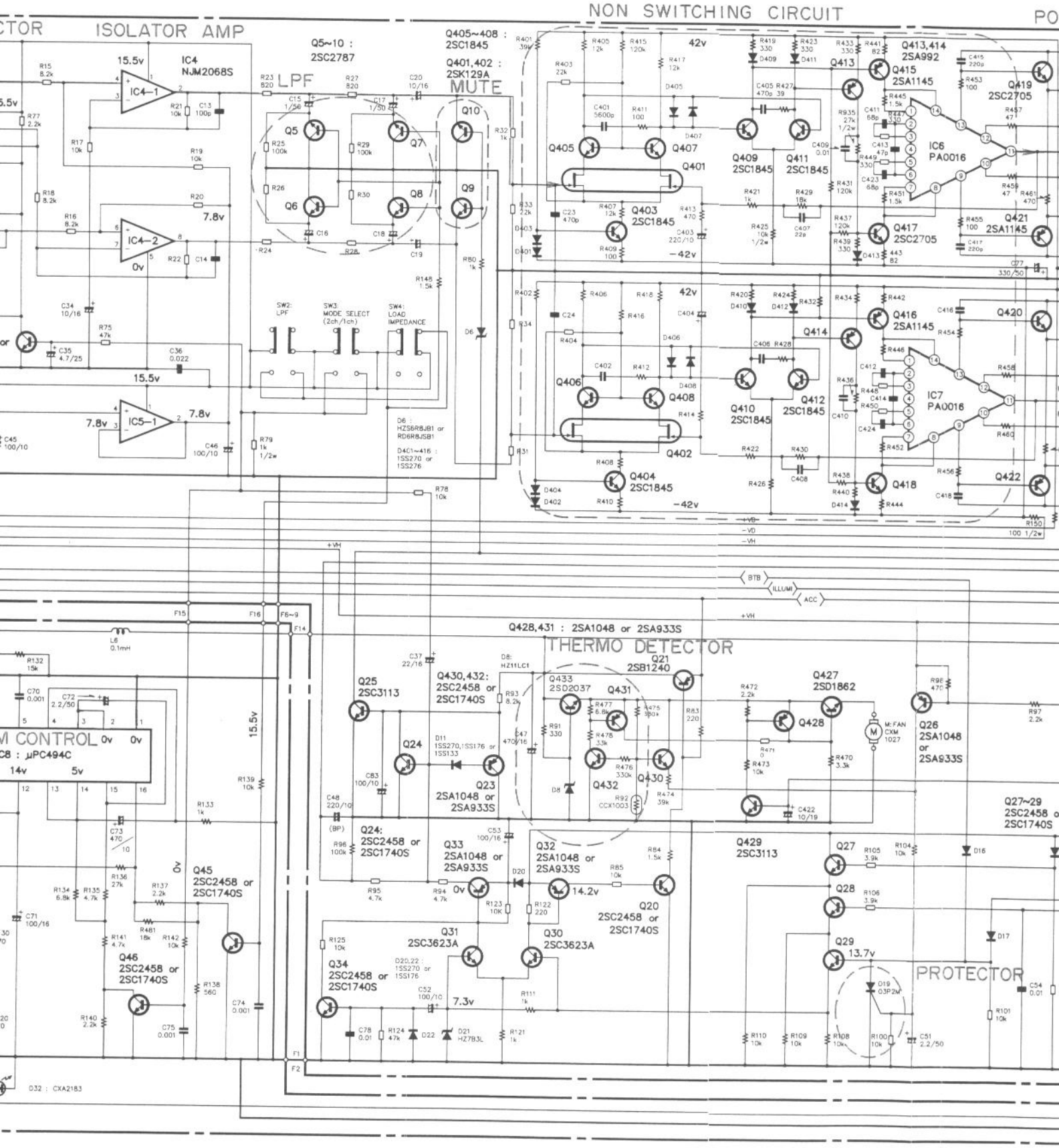
μPC494C

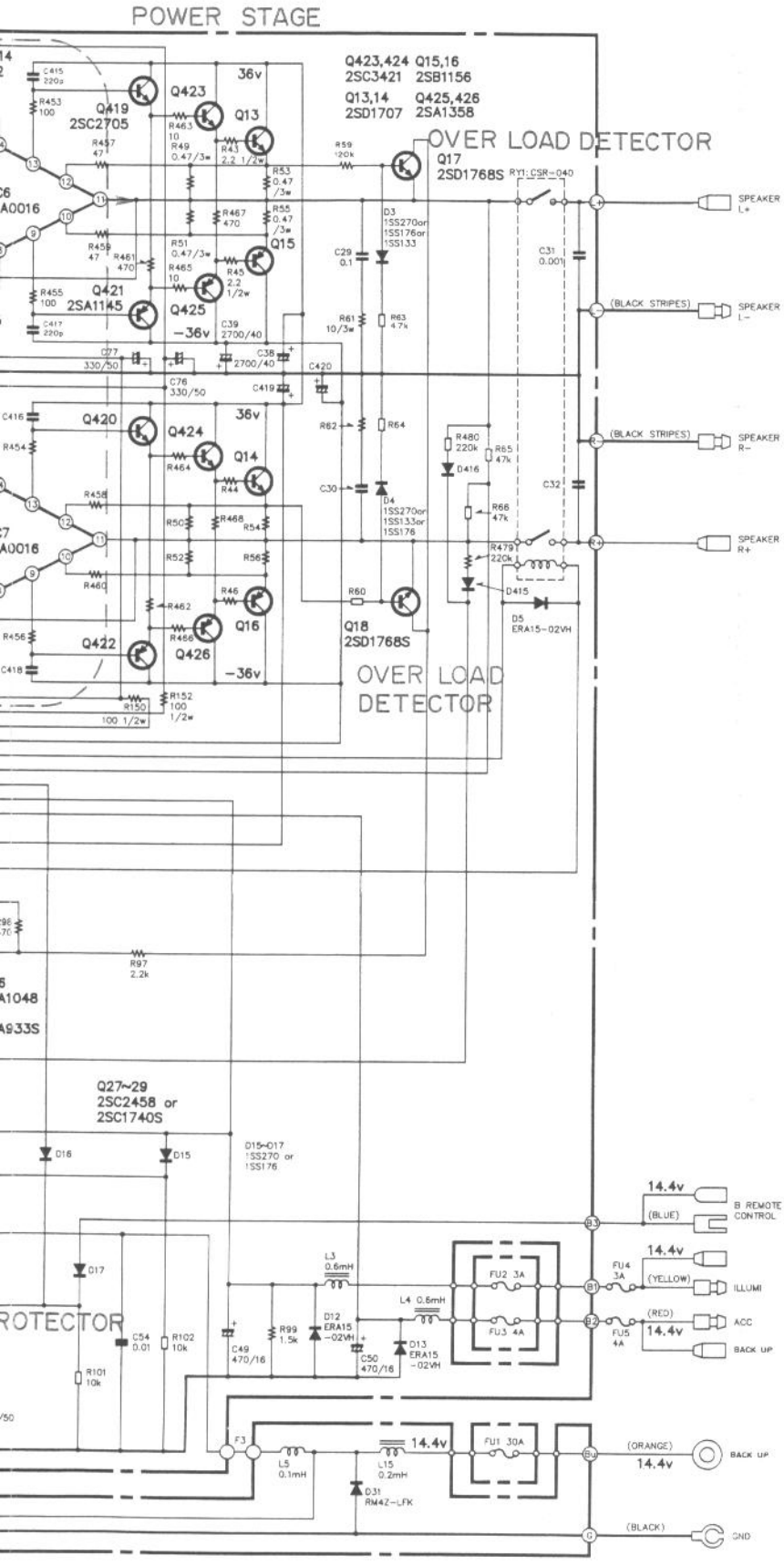


5. SCHEMATIC CIRCUIT DIAGRAM




NON SWITCHING CIRCUIT
ISOLATOR AMP
IC4 NJM2068S
LPF
MUTE
Q5~10 : 2SC2787
Q405~408 : 2SC1845
Q401,402 : 2SK129A
Q413,414 2SA992
Q415 2SA1145
IC6 PA0016
Q417 2SC2705
Q416 2SA1145
IC7 PA0016
Q418
Q409 2SC1845
Q411 2SC1845
Q410 2SC1845
Q412 2SC1845
Q403 2SC1845
Q404 2SC1845
Q401
Q402
Q405
Q406
Q407
Q408
Q414
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
D6 : HZS6R8JB1 or RD6R8JSB1
D401~416 : 1SS270 or 1SS276
42v
-42v
15.5v
7.8v
0v
BTB
ILLUMI
ACC
+VH
-VD
-VH
Q428,431 : 2SA1048 or 2SA933S
THERMO DETECTOR
Q21 2SB1240
Q433 2SD2037
Q430,432: 2SC2458 or 2SC1740S
Q25 2SC3113
Q24
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q30 2SC3623A
Q31 2SC3623A
Q34 2SC2458 or 2SC1740S
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
Q427 2SD1862
Q428
Q429 2SC3113
Q26 2SA1048 or 2SA933S
Q27
Q28
Q29
M: FAN CXM 1027
PWM CONTROL
IC8 : μPC494C
14v 14v 5v
14.2v
7.3v
13.7v
2.5v
PROTECTOR
D32 : CXA2183


NON SWITCHING CIRCUIT
ISOLATOR AMP
IC4
NJM2068S
IC4—1
IC4—2
IC5—1
15.5v
7.8v
0v
Q5~10 :
2SC2787
Q401,402 :
2SK129A
MUTE
LPF
Q405~408 :
2SC1845
Q401
Q413,414
2SA992
Q415
2SA1145
Q419
2SC2705
Q409
2SC1845
Q411
2SC1845
Q417
2SC2705
Q421
2SA1145
IC6
PA0016
42v
-42v
Q402
Q403
2SC1845
Q404
2SC1845
Q405
Q406
Q407
Q408
Q410
2SC1845
Q412
2SC1845
Q414
Q416
2SA1145
Q418
Q420
Q422
IC7
PA0016
SW2:
LPF
SW3:
MODE SELECT
(2ch/1ch)
SW4:
LOAD
IMPEDANCE
D6 :
HZS6R8JB1 or
RD6R8JSB1
D401~416 :
1SS270 or
1SS276
+VH
-VD
-VH
BTB
ILLUMI
ACC
THERMO DETECTOR
Q428,431 : 2SA1048 or 2SA933S
Q25
2SC3113
Q430,432:
2SC2458 or
2SC1740S
Q21
2SB1240
Q433
2SD2037
Q431
Q24
Q23
2SA1048 or
2SA933S
Q428
Q427
2SD1862
Q26
2SA1048
or
2SA933S
Q429
2SC3113
Q27~29
2SC2458 o
2SC1740S
Q24:
2SC2458 or
2SC1740S
Q33
2SA1048 or
2SA933S
Q32
2SA1048 or
2SA933S
Q20
2SC2458 or
2SC1740S
Q31
2SC3623A
Q30
2SC3623A
Q34
2SC2458 or
2SC1740S
Q45
2SC2458 or
2SC1740S
Q46
2SC2458 or
2SC1740S
Q27
Q28
Q29
13.7v
PROTECTOR
D19
03P2M
M:FAN
CXM
1027
14.2v
7.3v
CONTROL
C8 : μPC494C
D32 : CXA2183



SWITCHES

SW1: LOW BOOST SWITCH . . . . . ON—OFF
SW2: LPF SWITCH . . . . . ON—OFF
SW3: MODE SELECT SWITCH 1ch–2ch
SW4: LOAD IMPEDANCE SWITCH . . . . . 2 Ω–4 Ω
SW5: BFC SWITCH . . . . . LOW–HIGH

The underlined indicates the switch position.

Fig. 20