ORDER NO. MD9806119C2

Service Manual

AV Control Stereo Receiver

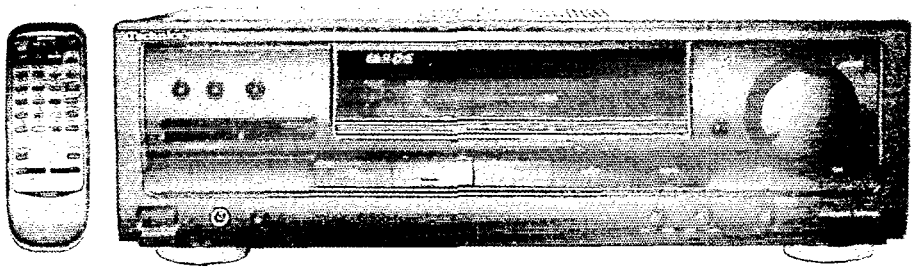
DOLBY SURROUND PRO • LOGIC *

Receiver

SA-EX120

Colour

(K) . . . . . Black Type



Area

Suffix for Model No.	Area	Colour
(E)	Europe	(K)
(EB)	Great Britain	
(EG)	Germany & Italy	

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■ Specifications

■ Amplifier Section

Power output (at 240V)
- **DIN 1 kHz (T.H.D. 1%)** 2 x 100 W (4 Ω)
- **40 Hz-20 kHz continuous power output both channels driven** 2 x 80 W (8 Ω)

Total harmonic distortion
- **rated power at 40 Hz-20 kHz** 0.5% (8 Ω)
- **half power at 1 kHz** 0.07% (8 Ω)

Frequency response
- **PHONO** RIAA standard curve (30 Hz-15 kHz) ±0.8 dB
- **CD, TAPE MONITOR, VCR** 10 Hz-40 kHz, ±3 dB

Input sensitivity and impedance
- **PHONO** 3mV/47 kΩ
- **CD, TAPE MONITOR, VCR** 200 mV/22 kΩ

S/N at rated power (8 Ω)
- **PHONO** 70 dB (IHF, A: 80 dB)
- **CD, TAPE MONITOR, VCR** 75 dB (IHF, A: 85 dB)

Tone controls
- **BASS** 50 Hz, +10 to -10 dB
- **TREBLE** 20 kHz, +10 to -10 dB

Output voltage
- **TAPE REC (OUT), VCR OUT** 200 mV

Channel balance (250 Hz-6.3 kHz) ±1 dB

Channel separation 55 dB

Headphones output level and impedance 430 mV/ 330 Ω

Total harmonic distortion
- **MONO** 0.2%
- **STEREO** 0.3%

S/N
- **MONO** 60 dB (73 dB, IHF)
- **STEREO** 58 dB (67 dB, IHF)

Frequency response 20 Hz-15 kHz +1 dB, -2 dB

Alternate channel selectivity
- **±400 kHz** 65 dB

Capture ratio 1.5 dB

Image rejection at 98 MHz 40 dB

IF rejection at 98 MHz 70 dB

Spurious response rejection at 98 MHz 70 dB

AM suppression 50 dB

Stereo separation
- **1 kHz** 40 dB

Carrier leak
- **19kHz** -30 dB (-35 dB, IHF)
- **38 kHz** -50 dB (-55 dB, IHF)

Channel balance (250 Hz-6.3 kHz) ±1.5 dB

Limitting point 1.2 μV

Bandwidth
- **IF amplifier** 180 kHz
- **FM demodulator** 1000 kHz

Antenna terminal 75 Ω (unbalanced)

■ FM TUNER Section

Frequency range 87.50 - 108.00 MHz

Sensitivity
- **S/N 30 dB** 1.5 μV/75 Ω
- **S/N 26dB** 1.3 μV/75 Ω
- **S/N 20 dB** 1.2 μV/75 Ω

IHF usable sensitivity 1.5 μV/75 Ω (IHF '58)

IHF 46 dB stereo quieting sensitvity 22 μV/75 Ω

■ AM TUNER Section

Frequency range 522-1611 kHz

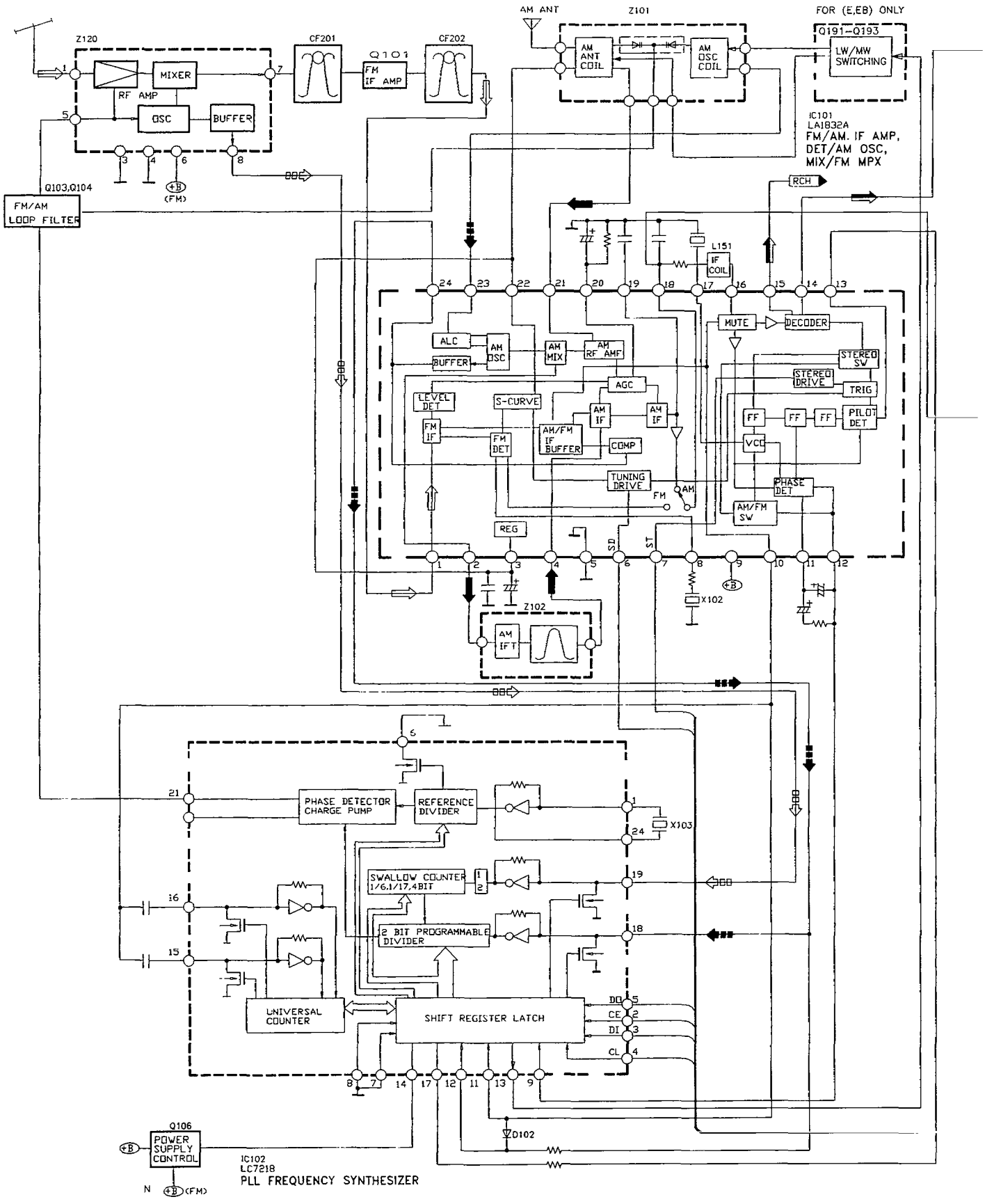
Sensitivity 20 μV, 330 μV/m

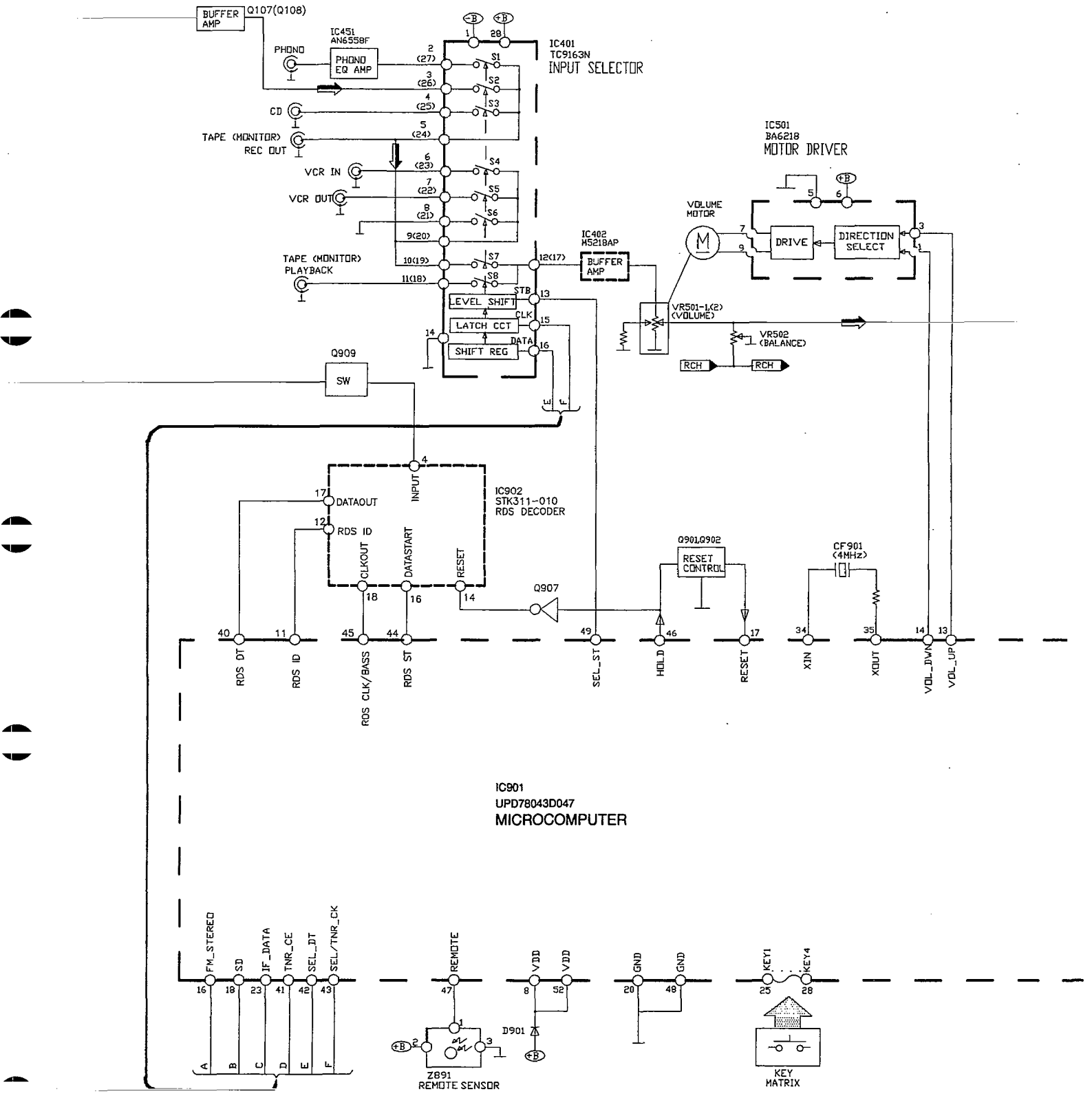
Selectivity
- **(at 999 kHz)** 55 dB

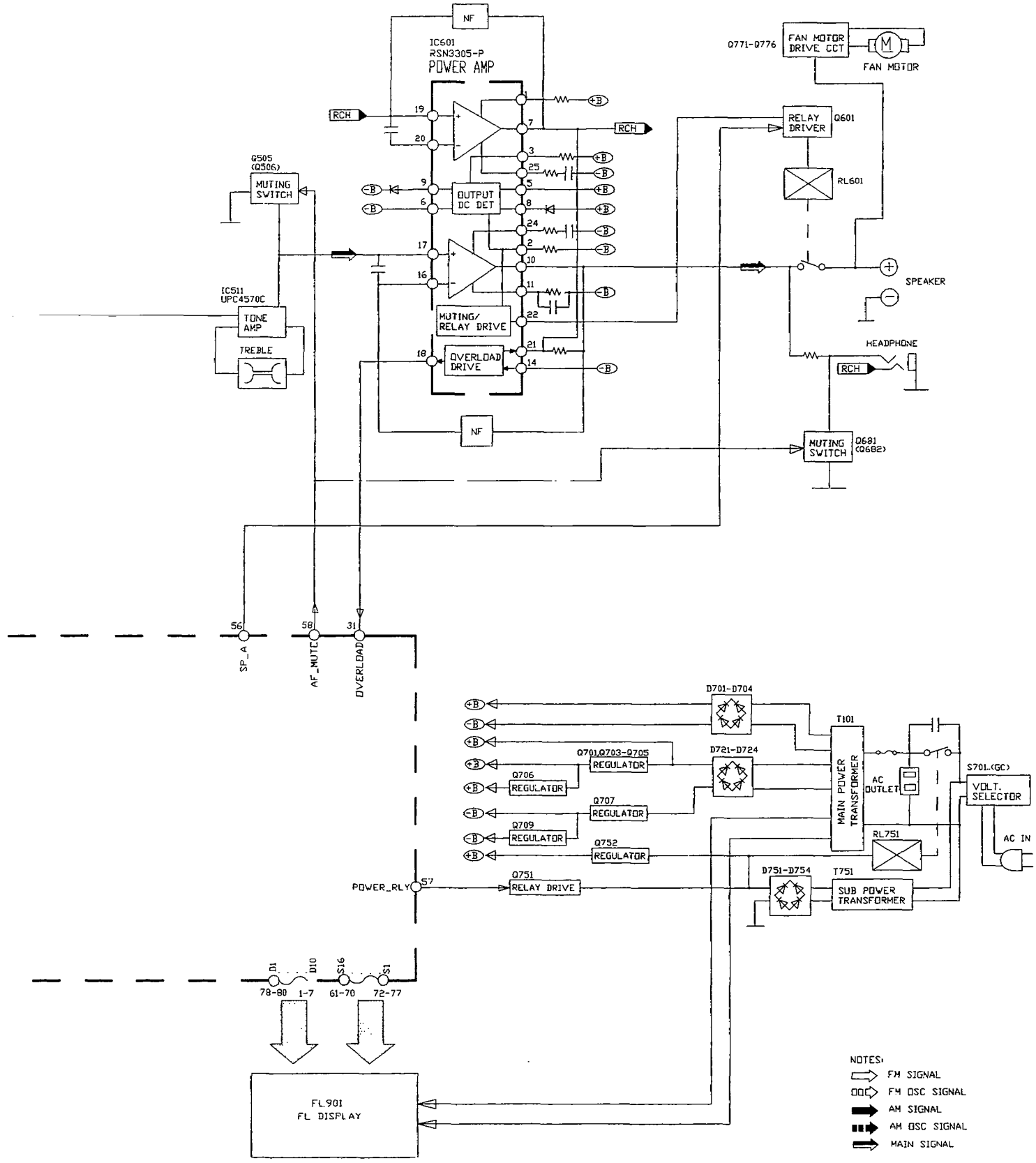
IF rejection
- **(at 999 kHz)** 50 dB

Technics®

■ Block Diagram




BUFFER AMP
Q107(Q108)
IC451
AN6558F
PHONO
PHONO EQ AMP
CD
TAPE (MONITOR) REC OUT
VCR IN
VCR OUT
TAPE (MONITOR) PLAYBACK
IC401
TC9163N
INPUT SELECTOR
S1
S2
S3
S4
S5
S6
S7
S8
LEVEL SHIFT
LATCH CCT
SHIFT REG
STB
CLK
DATA
IC402
M5218AP
BUFFER AMP
IC501
BA6218
MOTOR DRIVER
VOLUME MOTOR
DRIVE
DIRECTION SELECT
VR501-1,(2) (VOLUME)
VR502 (BALANCE)
RCH
Q909
SW
IC902
STK311-010
RDS DECODER
DATAOUT
RDS ID
INPUT
CLKOUT
DATASTART
RESET
Q907
Q901,Q902
RESET CONTROL
CF901 (4MHz)
RDS DT
RDS ID
RDS CLK/BASS
RDS ST
SEL_ST
HOLD
RESET
XIN
XOUT
VOL_DWN
VOL_UP
IC901
UPD78043D047
MICROCOMPUTER
FM_STEREO
SD
IF_DATA
TNR_CE
SEL_DT
SEL/TNR_CK
REMOTE
VDD
VDD
GND
GND
KEY1
KEY4
D901
Z891
REMOTE SENSOR
KEY MATRIX


NF
IC601
RSN3305-P
POWER AMP
RCH
RCH
+B
-B
OUTPUT
DC DET
MUTING/
RELAY DRIVE
OVERLOAD
DRIVE
NF
Q505
(Q506)
MUTING
SWITCH
IC511
UPC4570C
TONE
AMP
TREBLE
Q771-Q776
FAN MOTOR
DRIVE CCT
FAN MOTOR
RELAY
DRIVER
Q601
RL601
SPEAKER
HEADPHONE
RCH
MUTING
SWITCH
Q681
(Q682)
56
58
31
SP_A
AF_MUTE
OVERLOAD
D701-D704
D721-D724
Q701,Q703-Q705
REGULATOR
Q706
REGULATOR
Q707
REGULATOR
Q709
REGULATOR
Q752
REGULATOR
T101
MAIN POWER
TRANSFORMER
AC
OUTLET
S701.(GC)
VOLT.
SELECTOR
AC IN
RL751
POWER_RLY
57
Q751
RELAY DRIVE
D751-D754
T751
SUB POWER
TRANSFORMER
D1
D10
S16
S1
78-80
1-7
61-70
72-77
FL901
FL DISPLAY
NOTES:
FM SIGNAL
FM OSC SIGNAL
AM SIGNAL
AM OSC SIGNAL
MAIN SIGNAL

■ Schematic Diagram

(All schematic diagrams may be modified at any time with the development of new technology)

Note :

• **S946**	:	Power switch	• **S964**	:	VCR switch
• **S947**	:	PHONO switch	• **S970**	:	Search switch
• **S948**	:	Muting switch	• **S971**	:	Eon switch
• **S950**	:	FM Mode switch	• **S972**	:	Pty select up switch
• **S951**	:	Band select switch	• **S973**	:	Pty select down switch
• **S952**	:	Tuning decrease switch	• **S974**	:	Display mode switch
• **S953**	:	Tuning increase switch	• **S976**	:	DVD 6CH switch
• **S955**	:	Memory switch	• **S980**	:	Speakers switch
• **S956**	:	CH/DOWN switch			
• **S957**	:	CH/UP switch	• **VR501**	:	Volume control
• **S960**	:	Tuner switch	• **VR502**	:	Balance control
• **S961**	:	CD switch	• **VR511**	:	Bass control
• **S962**	:	Tape switch	• **VR512**	:	Treble control

• **Signal line**

: +B line
: - B line
: FM/AM signal line
: AM signal line
: AM OSC signal line
: Main signal line
: FM signal line
: FM OSC signal line

• The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

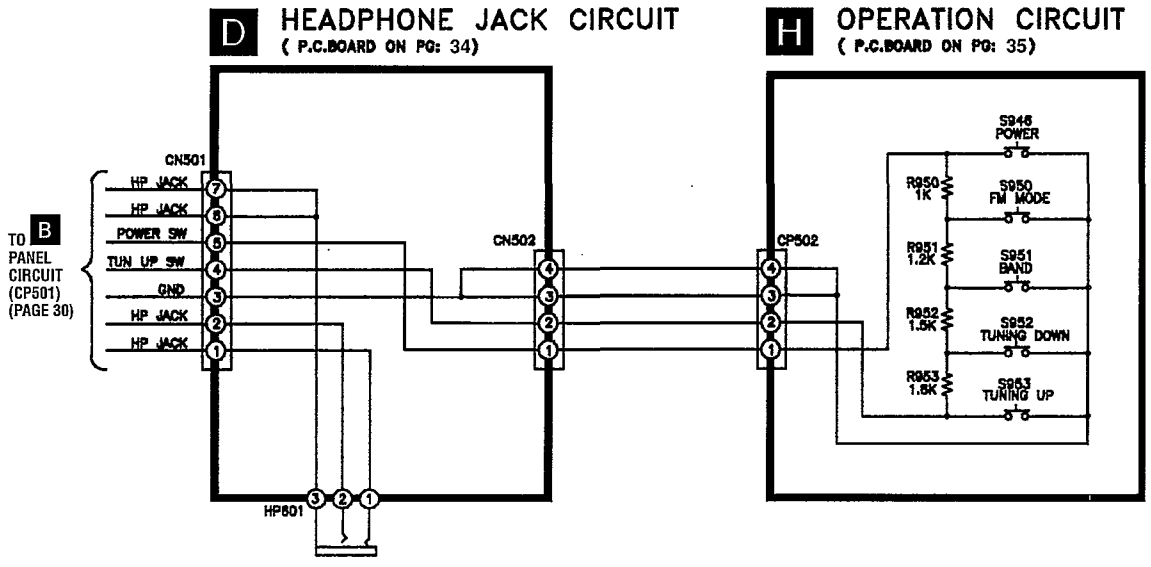
< > ..... FM NO MARK ..... TAPE ( ) ..... AM

• **Importance safety notice:**
Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

Caution !

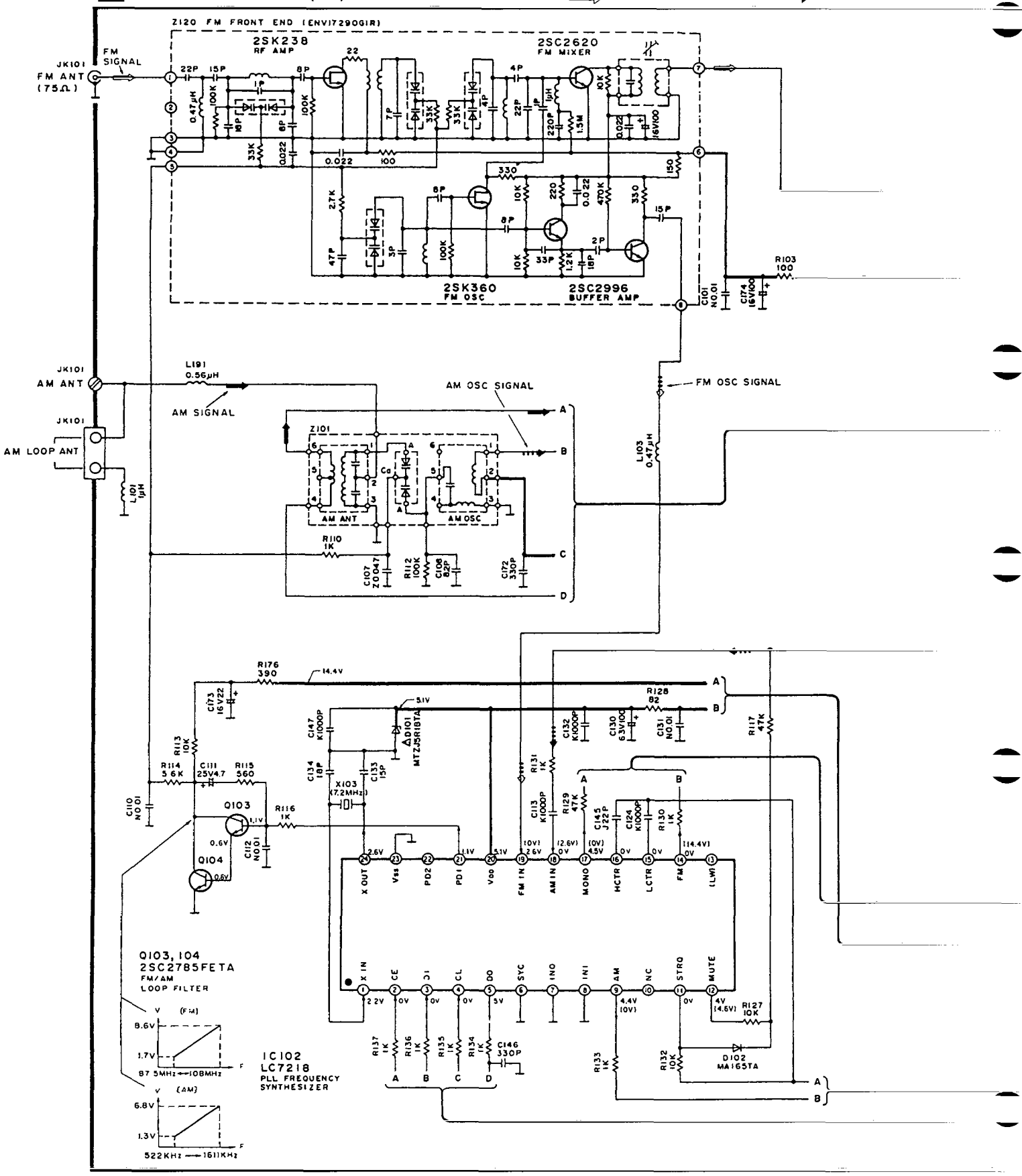
IC, LSI and VLSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

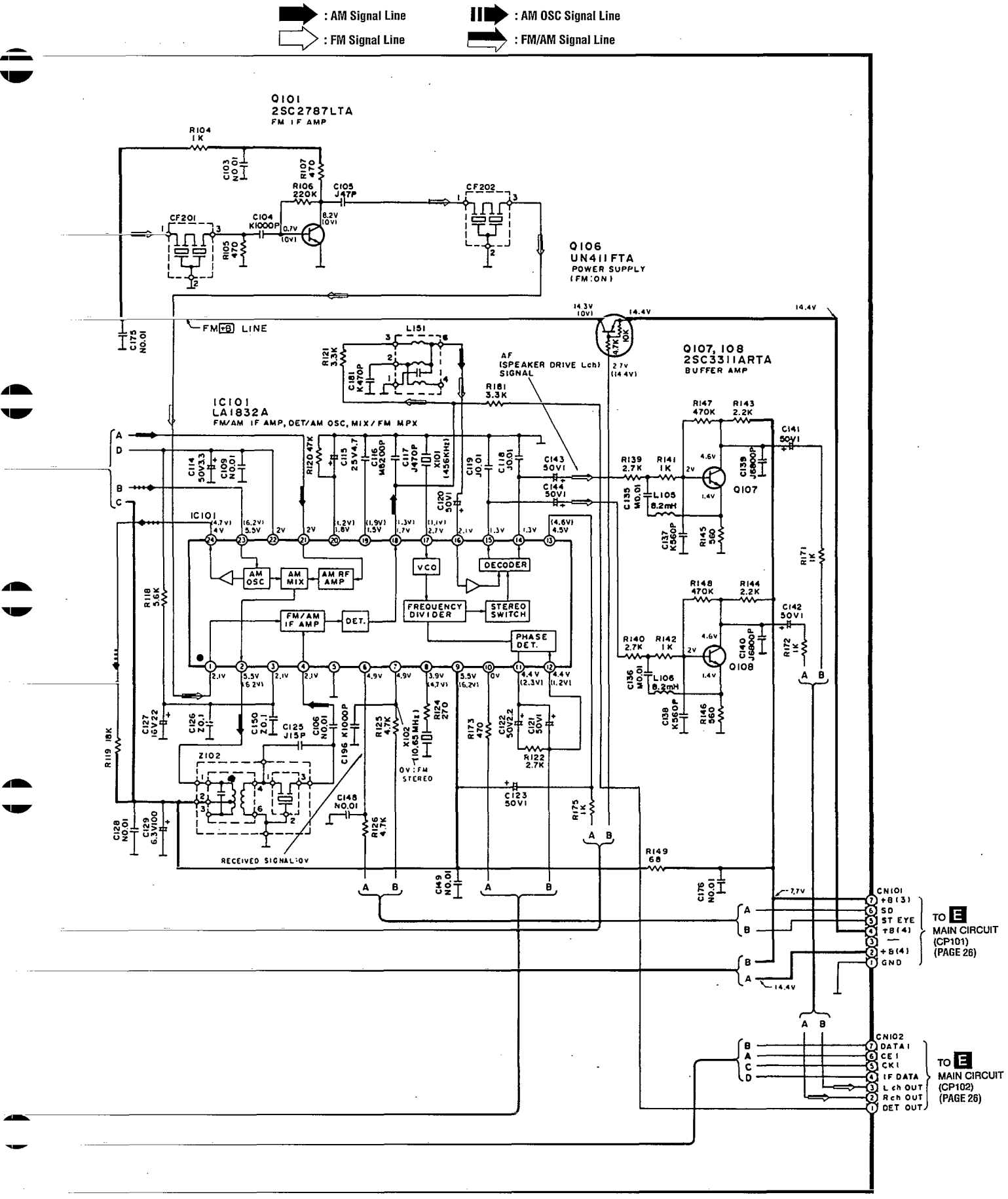
- Cover the parts boxes made of plastics with aluminium foil.
- Ground the soldering iron.
- Do not touch the pins of IC, LSI or VLSI with fingers directly.
- Put a conductive mat on the work table.



: FM OSC Signal Line
: FM Signal Line
: AM OSC Signal Line
: AM Signal Line

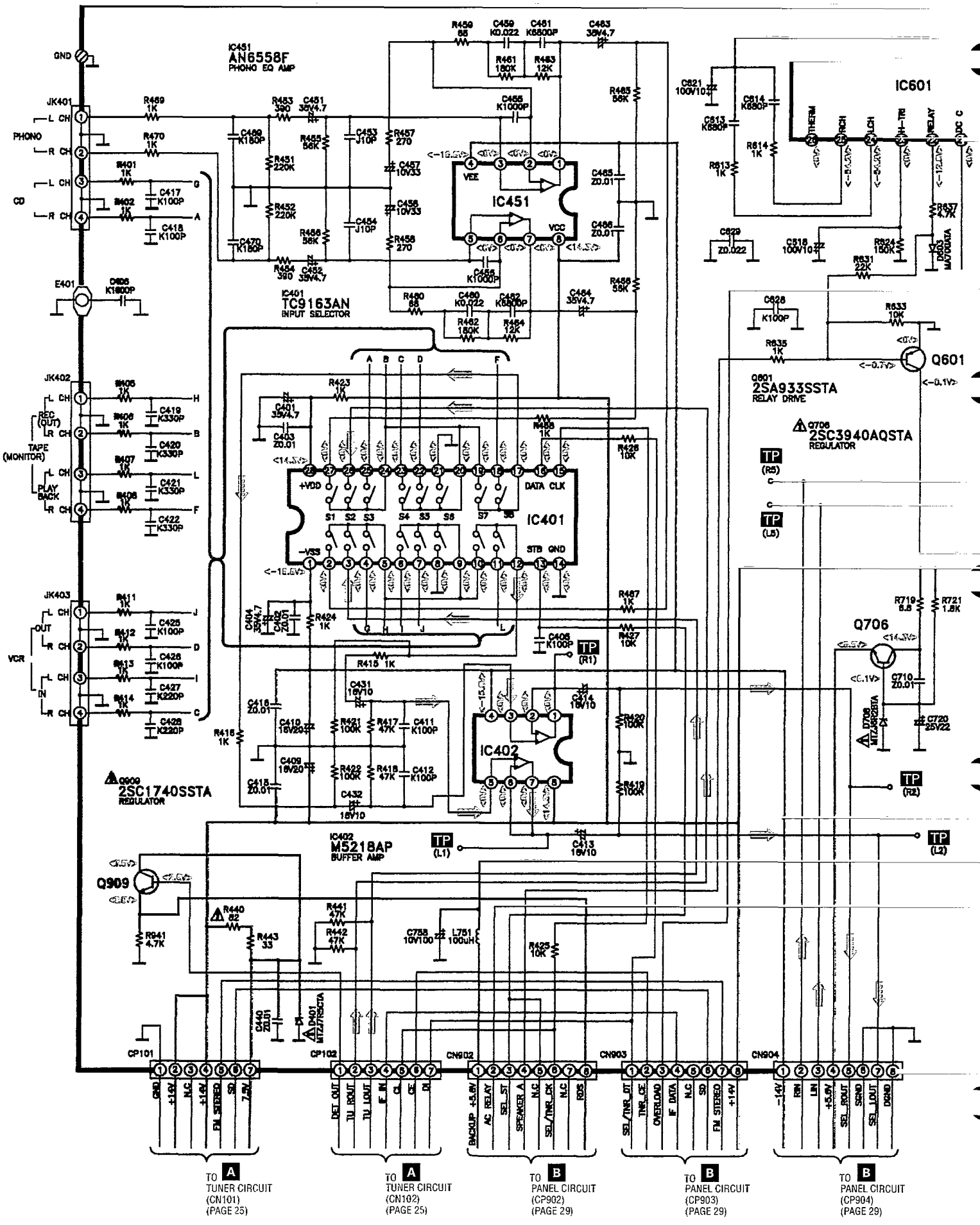
A TUNER CIRCUIT For (EG) area (P.C.BOARD ON PG: 36)



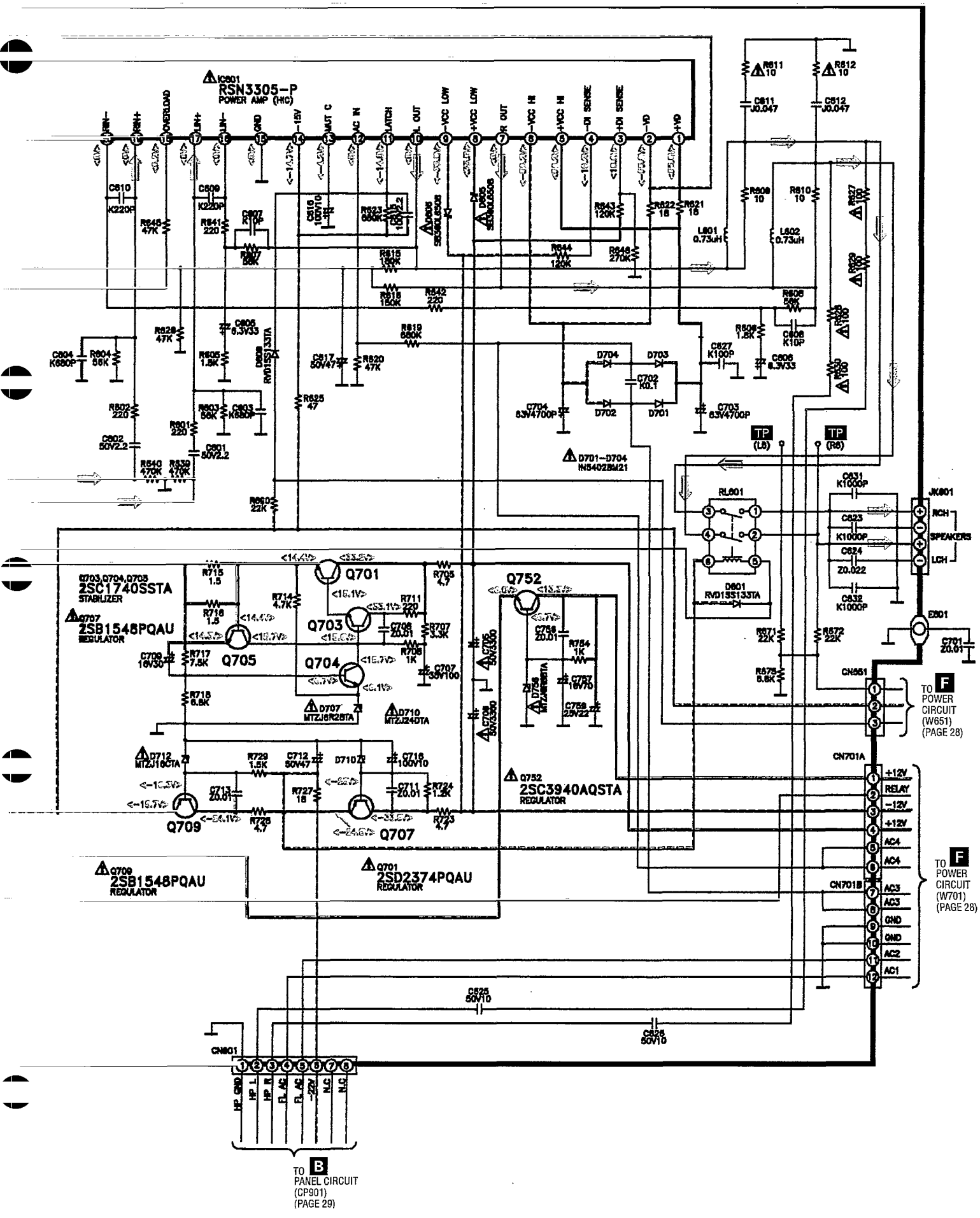

: AM Signal Line
: FM Signal Line
: AM OSC Signal Line
: FM/AM Signal Line
Q101
2SC2787LTA
FM I F AMP
Q106
UN411FTA
POWER SUPPLY
(FM:ON)
FM+B LINE
IC101
LA1832A
FM/AM IF AMP, DET/AM OSC, MIX/FM MPX
AM OSC
AM MIX
AM RF AMP
VCO
DECODER
FREQUENCY DIVIDER
STEREO SWITCH
FM/AM IF AMP
DET.
PHASE DET.
Q107, 108
2SC3311ARTA
BUFFER AMP
Q107
Q108
AF (SPEAKER DRIVE Lch) SIGNAL
RECEIVED SIGNAL:0V
X102 10.65MHz
0V:FM STEREO
CN101
+B(3)
SD
ST EYE
+B(4)
+B(4)
GND
TO E MAIN CIRCUIT (CP101) (PAGE 26)
CN102
DATA I
CE I
CK I
IF DATA
L ch OUT
R ch OUT
DET OUT
TO E MAIN CIRCUIT (CP102) (PAGE 26)

E MAIN CIRCUIT (P.C.BOARD ON PG:32)

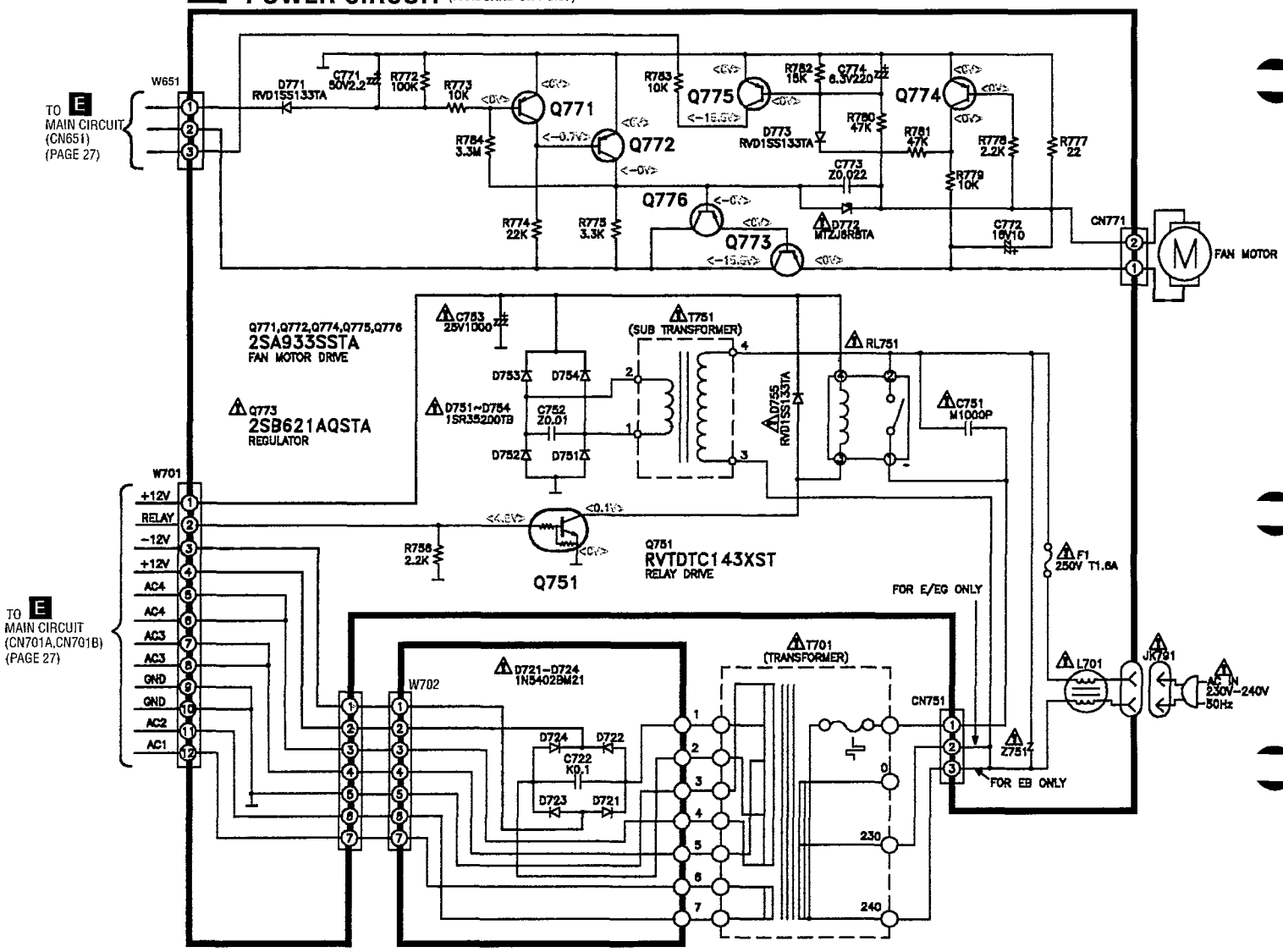
: Main Signal Line : FM/AM Signal Line



: Main Signal Line

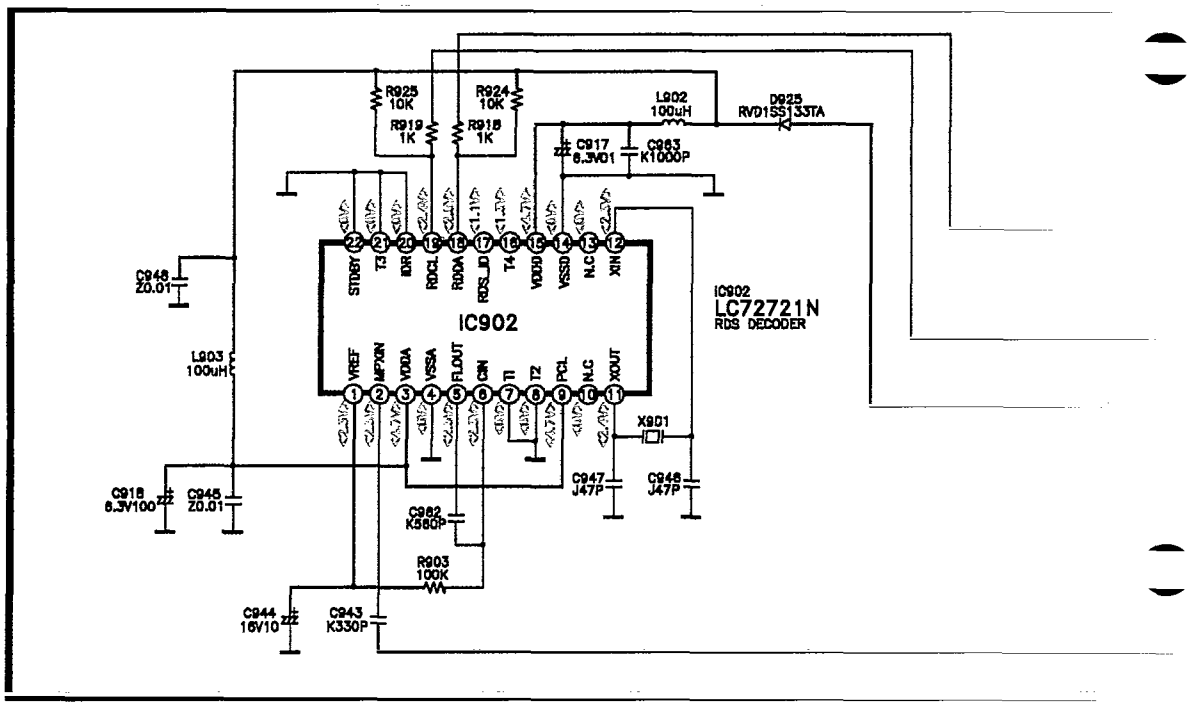


F POWER CIRCUIT (P.C.BOARD ON PG:37)



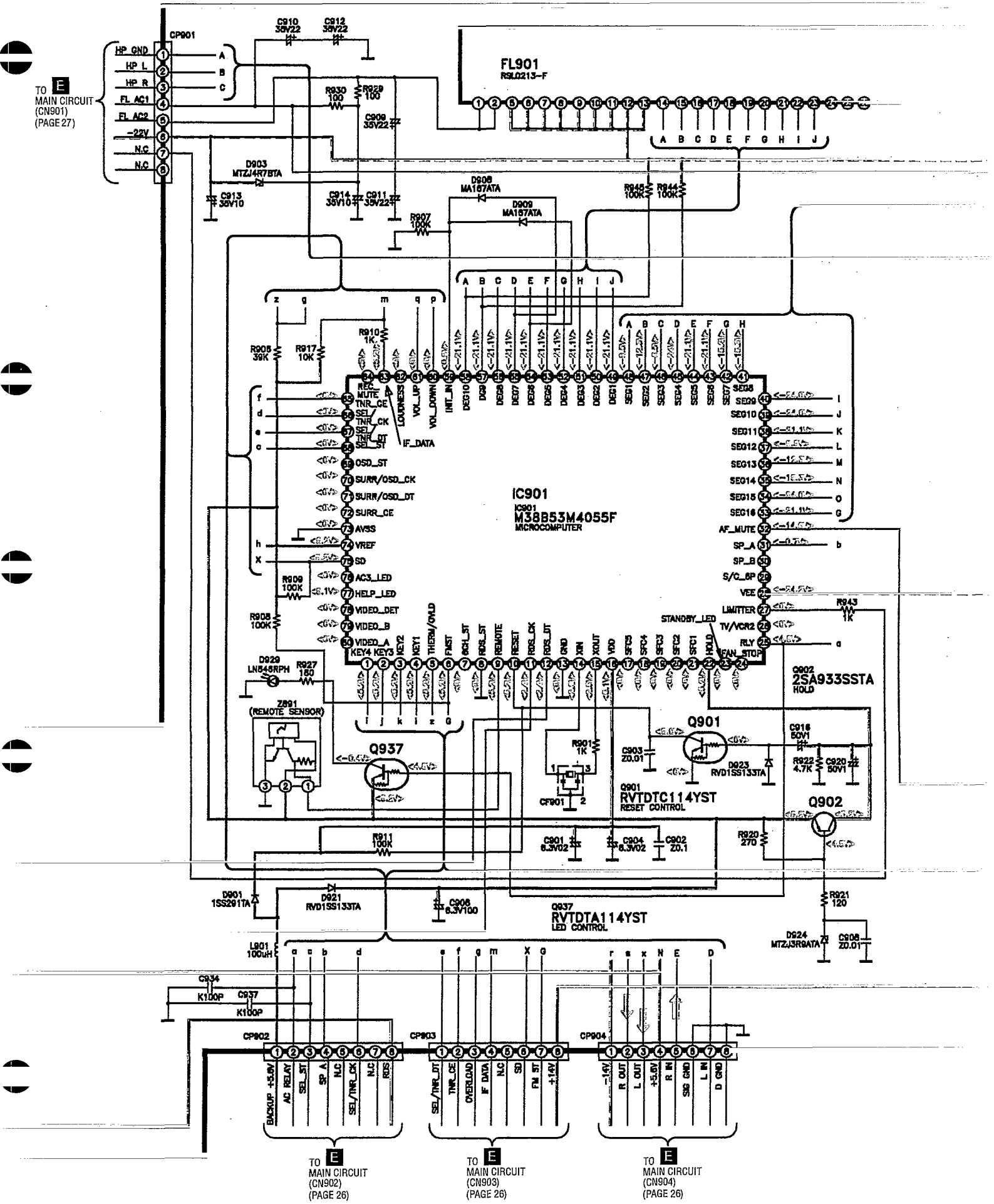
G TRANSFORMER CIRCUIT

(P.C.BOARD ON PG:37)



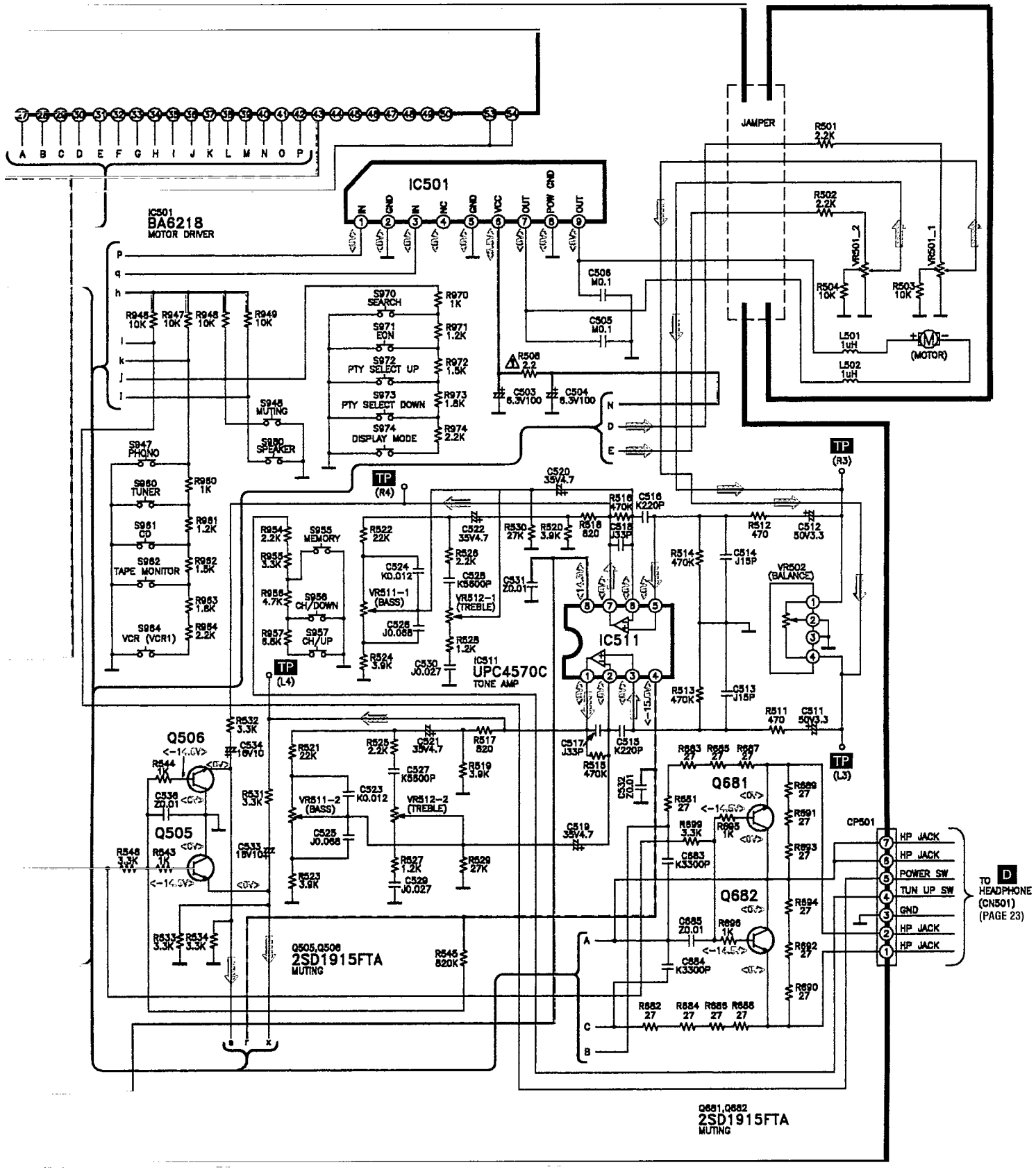
B PANEL CIRCUIT (P.C.BOARD ON PG 34)

: Main Signal Line



C VOLUME CIRCUIT
(P.C.BOARD ON PG:34)

: Main Signal Line



Wiring Connection Diagram