

# Service Manual

Portable Stereo CD System

Radio Cassette

**MASH\***  
multi-stage noise shaping

**COMPACT**  
**disc**  
DIGITAL AUDIO

## RX-ES50

Colour

(K) ... Black Type



Area

Suffix for Model No.	Area	Colour
(EB)	Great Britain	(K)
(EG)	Germany and Italy	
(GN)	Oceania	

\* MASH is a trademark of NTT.

**TAPE DECK : AR-2 MECHANISM SERIES**

**TRAVERSE DECK : RAE0150Z MECHANISM SERIES**

## ■ Specifications

### ■ RADIO

Frequency range

FM	87.5 – 108MHz
LW	144 – 288kHz ... (EB,EG)
MW	522 – 1611kHz ... (EB,EG)
AM	531 – 1602kHz (9kHz step) ... (GN) 530 – 1600kHz (10kHz step) ... (GN)

Intermediate Frequency

FM	10.7MHz
AM	459kHz ... (EB,EG) 450kHz ... (GN)

Sensitivity

FM	17dB/50mW ... (EB,EG) 18dB/50mW ... (GN)
LW	54dB/m/50mW ... (EB,EG)
MW	53dB/m/50mW ... (EB,EG)
AM	49dB/m/50mW ... (GN)

### ■ CD PLAYER

Sampling frequency	44.1kHz
Decoding	16 bit linear
Beam source	Semiconductor laser (wavelength 780nm)
No. of channels	2 channels, stereo
Digital Filter	8 fs
Wow and flutter	Less than possible measurement data
D/A converter	MASH (1 bit DAC)

### ■ TAPE RECORDING

Track system	Stereo
Recording system	AC bias (100kHz)
Erasing system	AC
Monitor system	Variable sound monitor
Frequency range	
Normal	50 – 16000Hz
High	50 – 17000Hz

### ■ GENERAL

Power requirement	230 – 240V, 50Hz
Power consumption	36W
Battery	12V (Eight R20/LR20, UM-1 batteries)
Memory back-up for computer/clock	6V (Four R6/LR6, UM-3 batteries)
Speakers	2 Woofers; 2.7Ω
Jacks	
Input	MIX MIC; 5mV (3kΩ)
Output	PHONES; 32Ω
Dimensions (W x H x D)	499 x 162 x 262mm
Weight	3.8kg without batteries

#### Notes :

Specifications are subject to change without notice.  
Weight and dimensions shown are approximate.

### ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

# Panasonic®

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# Schematic Diagrams

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

Note :

< for Servo circuit > (Page 16 - 17)

- S701 : Reset switch

< for Main circuit, Mechanism Control circuit, Cassette Eject circuit and Panel circuit > (Page 18 - 24)

- |                                 |                               |
|---------------------------------|-------------------------------|
| • S700 : Cassette open switch   | • S713 : Rev/skip switch      |
| • S701 : CD stop/clear switch   | • S714 : Time switch          |
| • S702 : CD record switch       | • S715 : Timer switch         |
| • S703 : Record/pause switch    | • S716 : EQ switch            |
| • S704 : Rewind switch          | • S717 : Tape FF switch       |
| • S705 : Tape stop switch       | • S718 : CD open/close switch |
| • S706 : Tape play switch       | • S719 : CD level switch      |
| • S707 : Power switch           | • S971 : Mode detect switch   |
| • S708 : Volume increase switch | • S972 : Tape detect switch   |
| • S709 : Volume decrease switch | • S973 : CrO2 detect switch   |
| • S710 : CD play/pause switch   | • S974 : Record detect switch |
| • S711 : FM/AM switch           | • S975 : Record detect switch |
| • S712 : FF/Skip switch         |                               |

< Power Supply circuit and Battery circuit > (Page 25)

- S901 : AC IN switch (JK901)

< General >










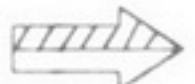
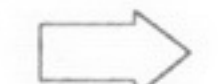
•Battery Current

Vol. min .....	230mA (FM ... GN)
	230mA (FM ... EB,EG)
	230mA (AM ... GN)
	230mA (AM ... EB,EG)
	320mA (Tape)
	440mA (CD)
Recording (Vol max).....	1.22A (GN)
	1.08A (EB,EG)

Vol. max .....	880mA (FM ... GN)
	940mA (FM ... EB,EG)
	640mA (AM ... GN)
	660mA (AM ... EB,EG)
	940mA (Tape)
	1510mA (CD)

Measurement condition:	
Radio	: FM 60 dB, 30%mod
	AM 74 dB/m, 30%mod
Tape	: 315 Hz, 0dB
CD	: 1kHz, 0dB

•Signal line


- |  |   |  |
|--|---|--|
|  : +B line            |  : Playback signal line |  : AM signal line     |
|  : FM OSC signal line |  : Record signal line   |  : AM OSC signal line |
|  : FM/AM signal line  |  : CD signal line       |  : MIC signal line    |
|  : Main signal line   |  : FM 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.

No mark : Playback      (( )) : CD      ( ) : AM      < > : FM

•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 !

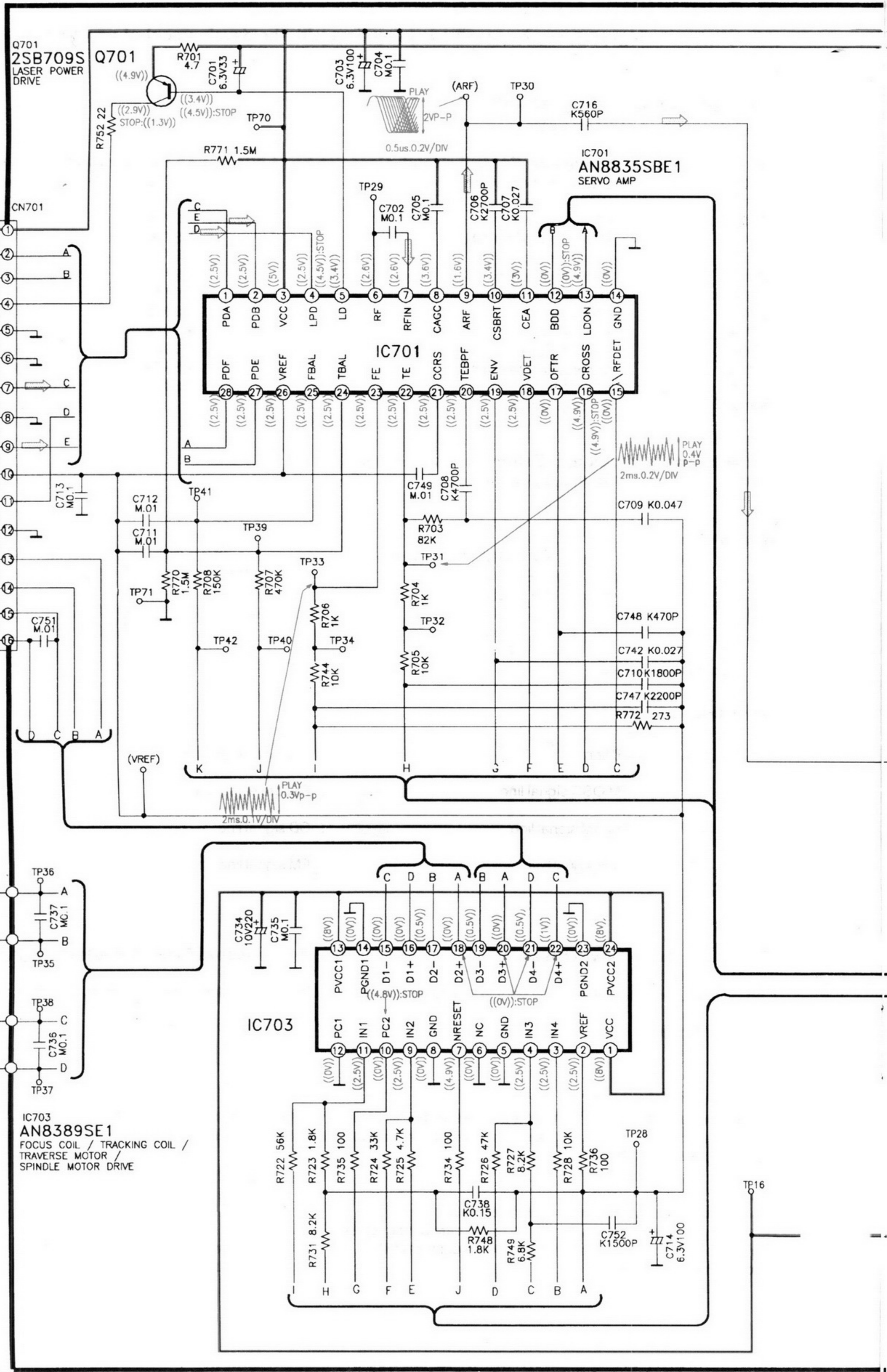
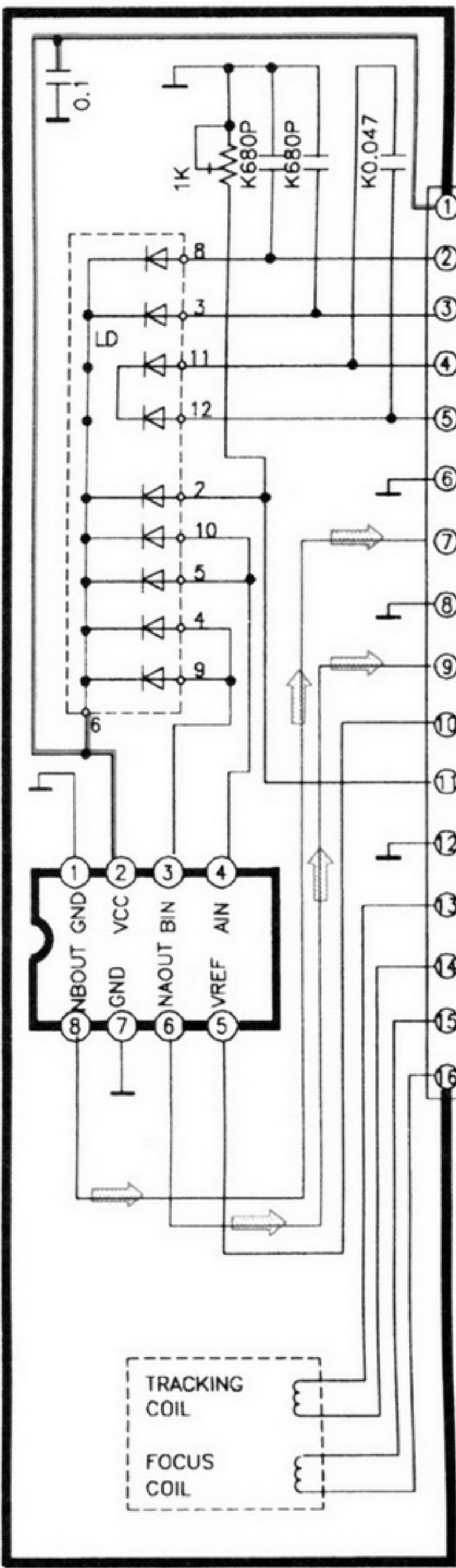
IC, LSI and VLSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.

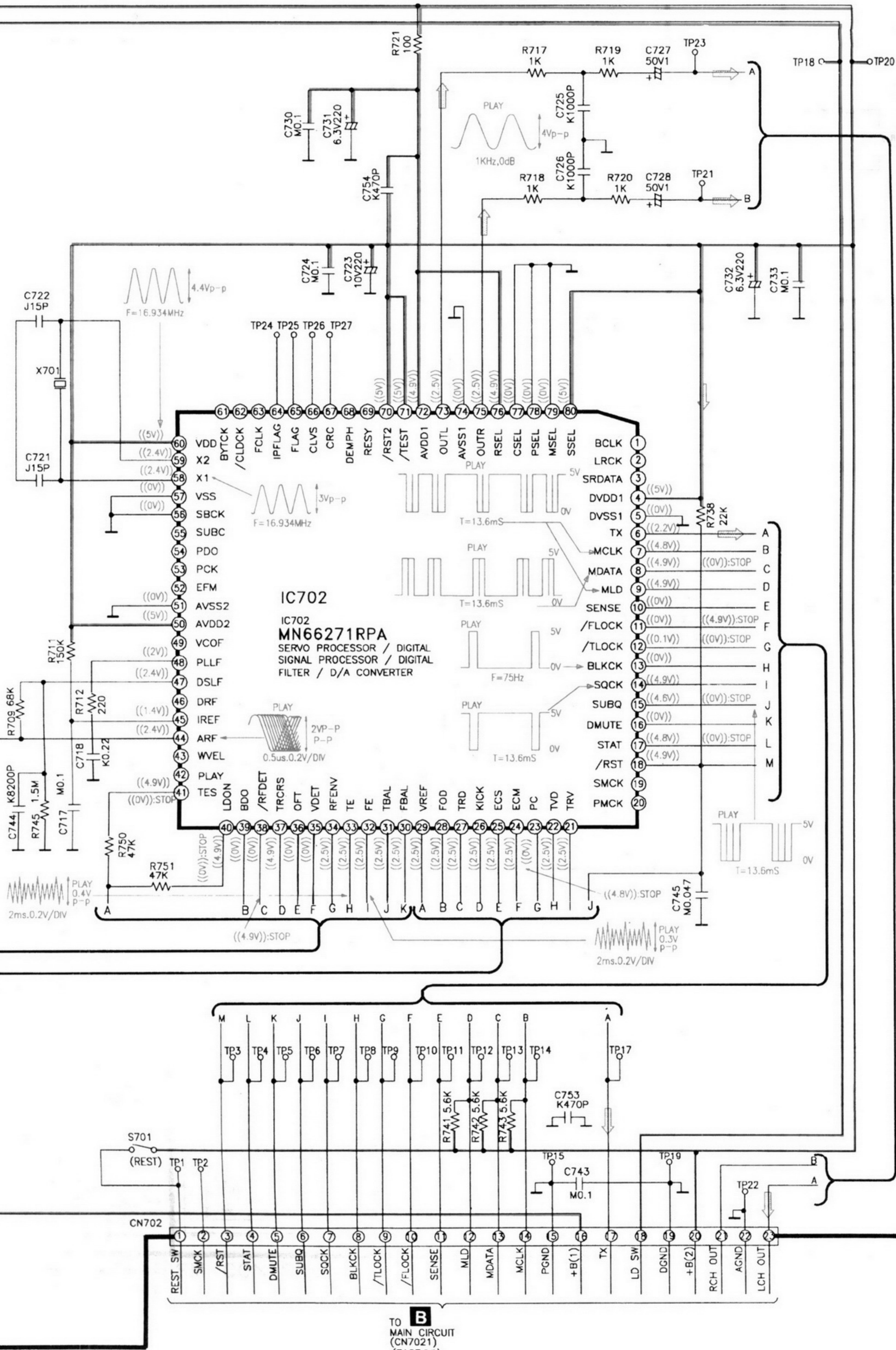
- Cover the parts boxes made of plastics with aluminium foil.
- Ground the soldering iron.

- Put a conductive mat on the work table.
- Do not touch the pins of IC, LSI or VLSI with fingers directly.

# A SERVO CIRCUIT

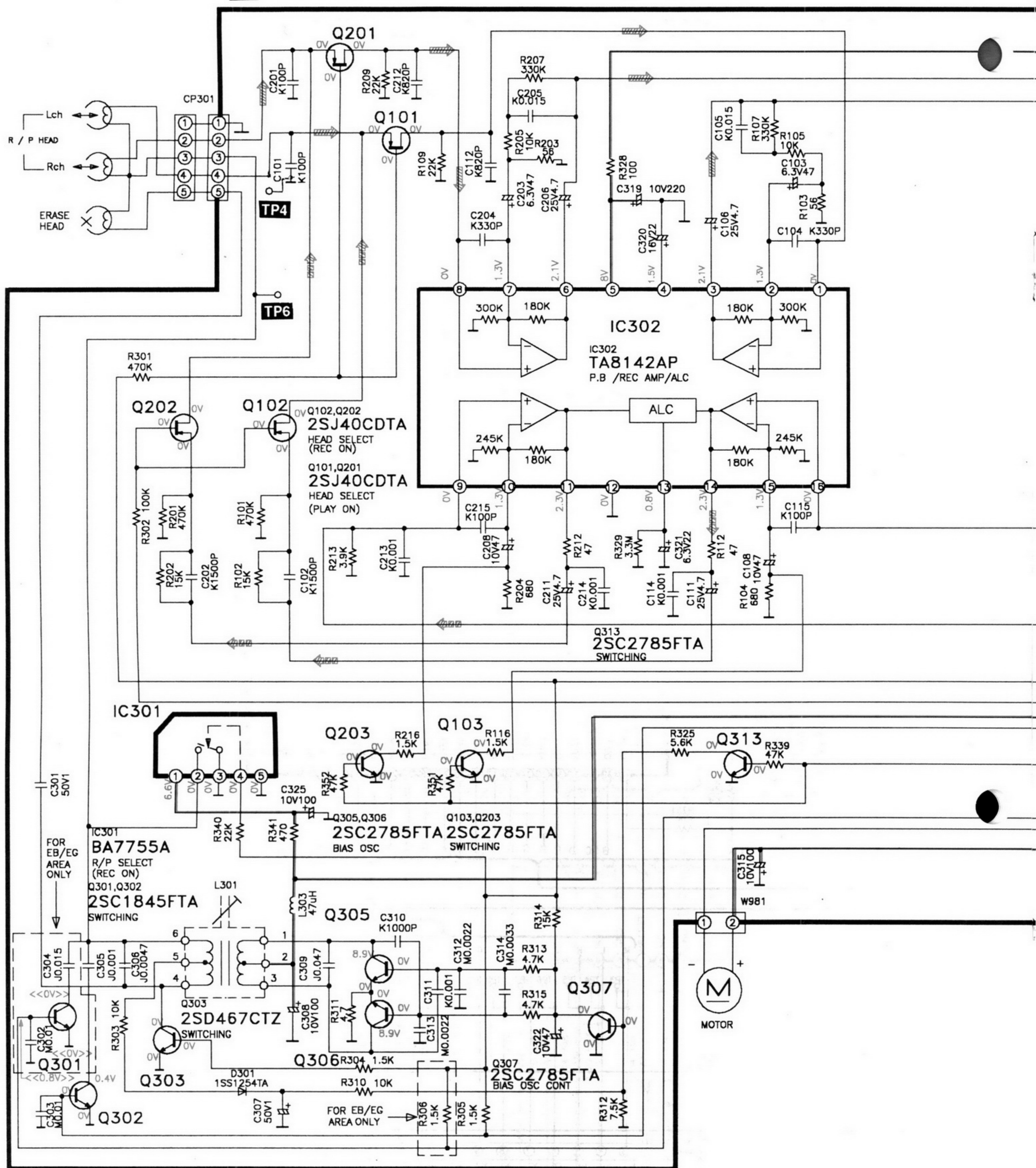
## OPTICAL PICKUP

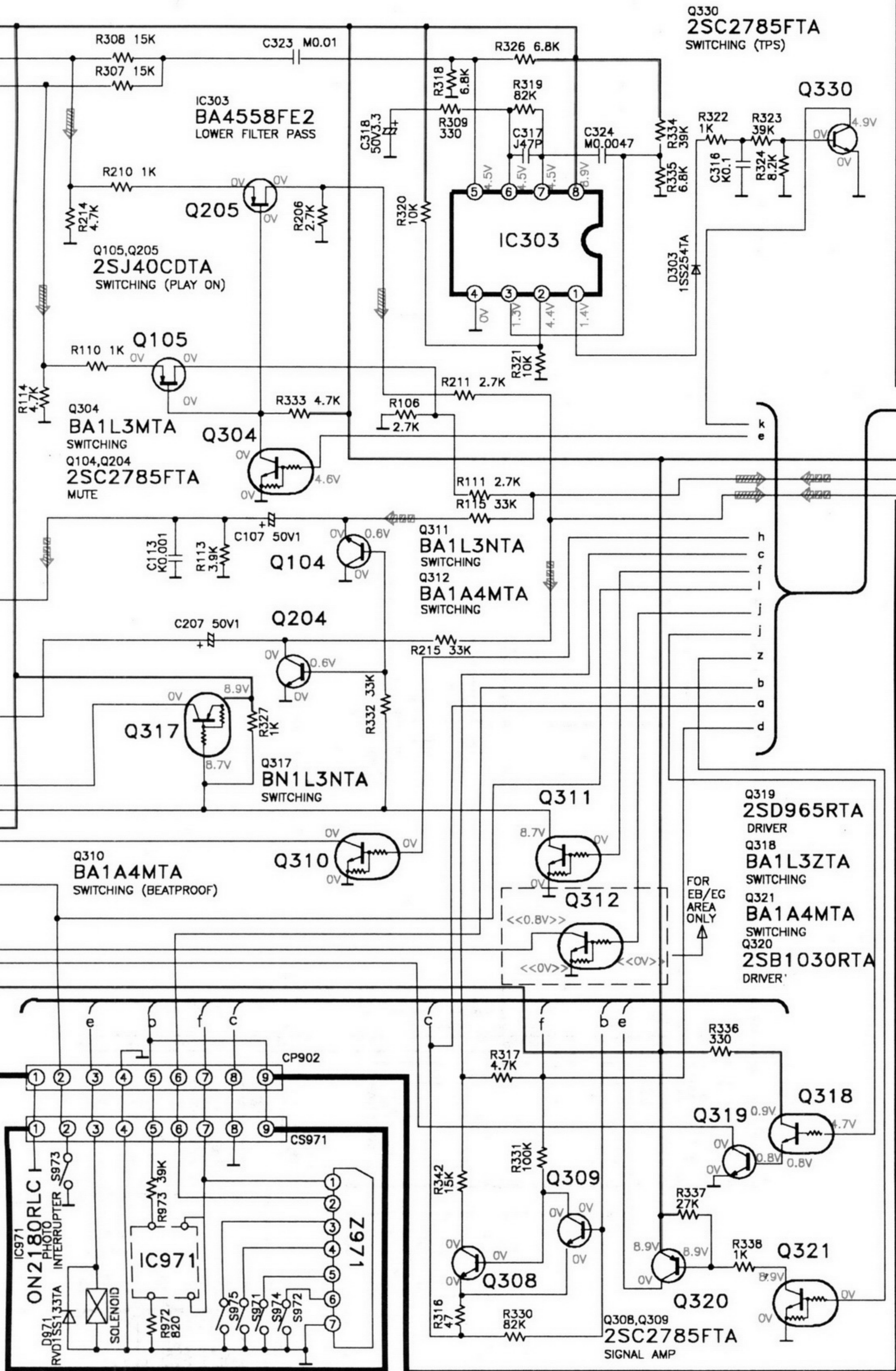




TO MAIN CIRCUIT (CN702) (PAGE 21)

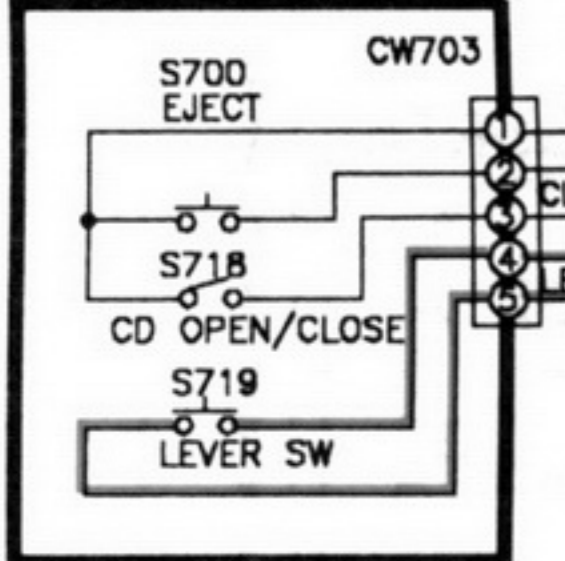
**B** MAIN CIRCUIT





**F** MECHANISM CONTROL CIRCUIT

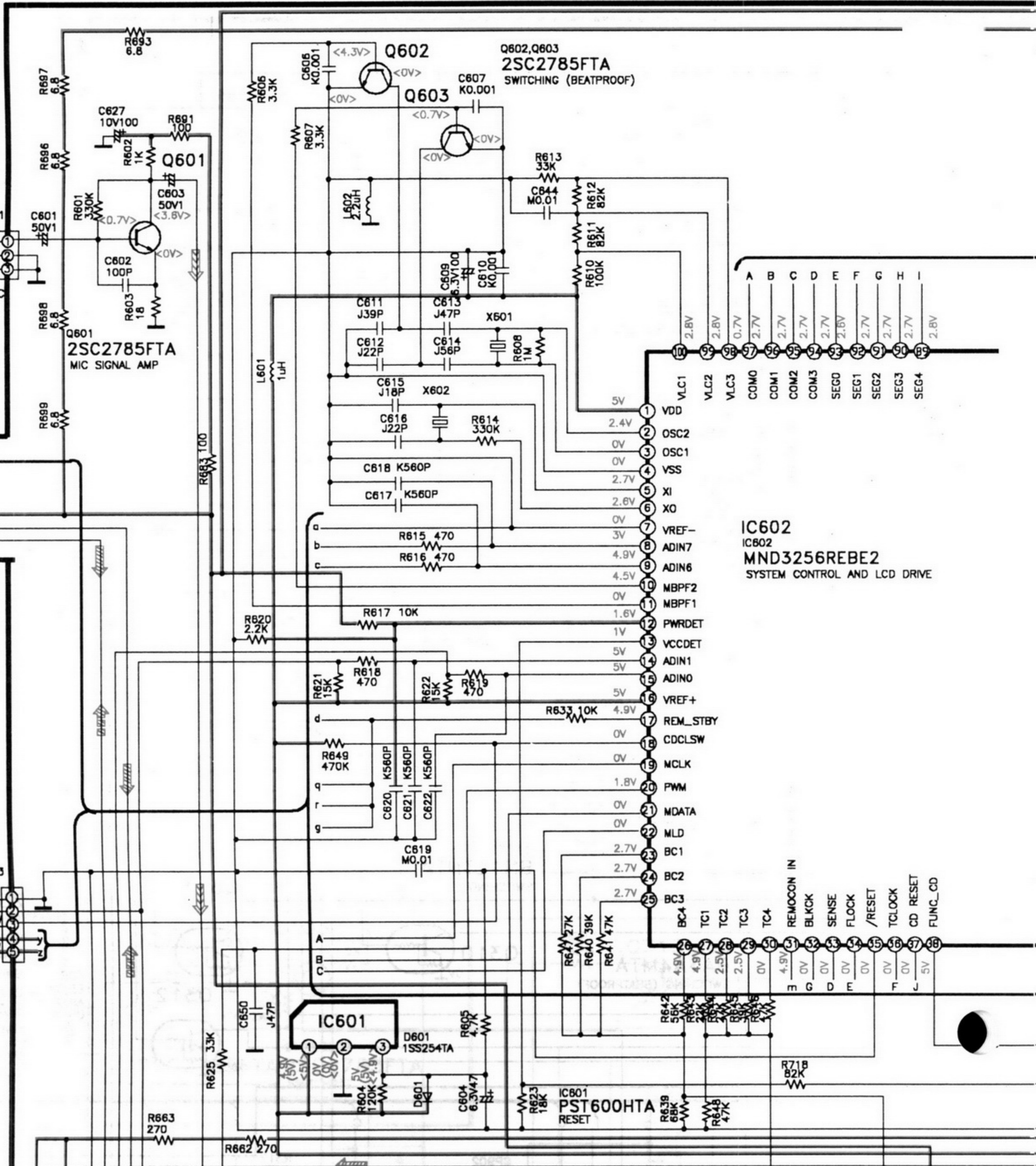
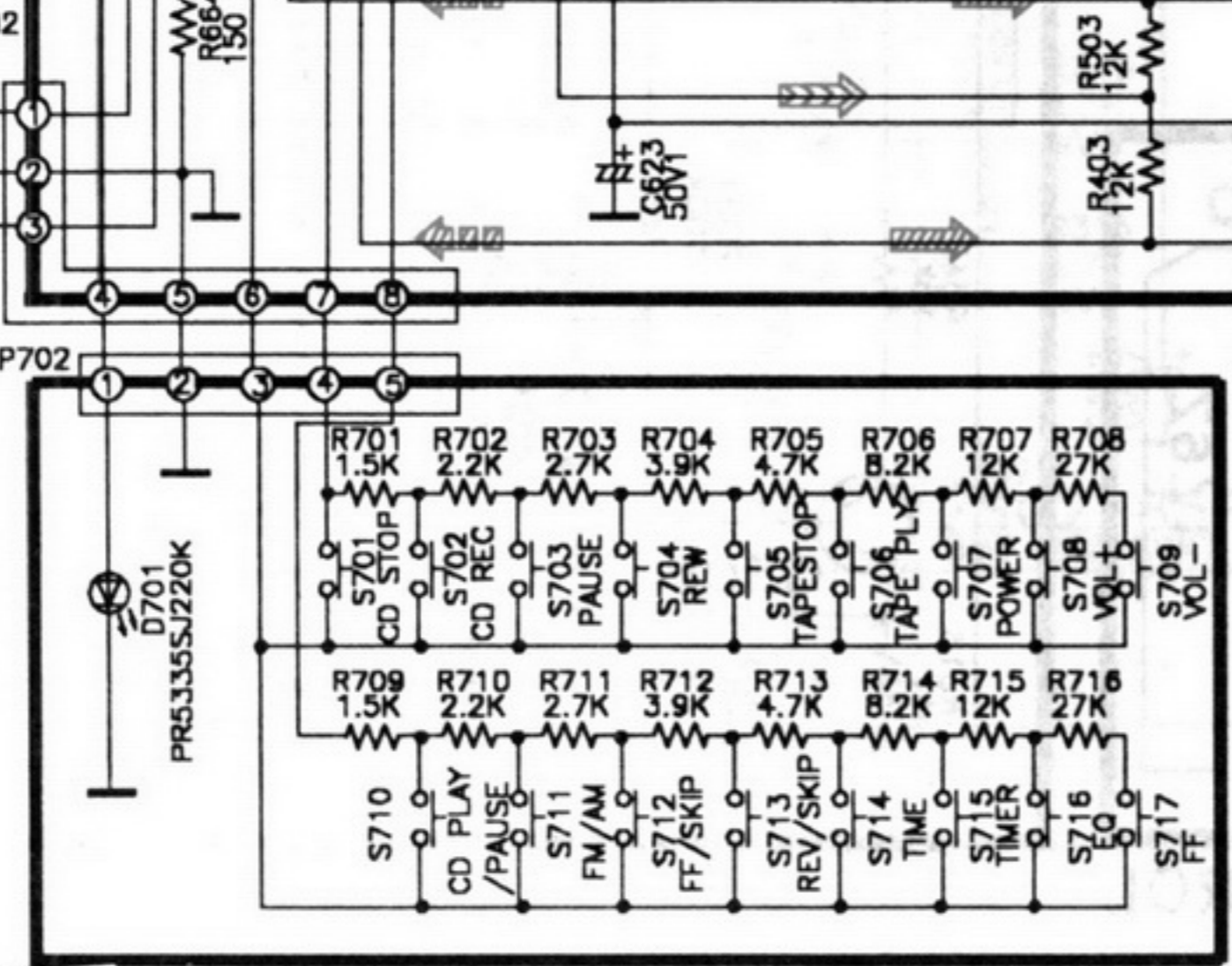
**D** CASSETTE EJECT CIRCUIT



**C** PANEL CIRCUIT

RCH  
PM DYNAMIC  
SPEAKER  
8cm, 2.7 $\Omega$

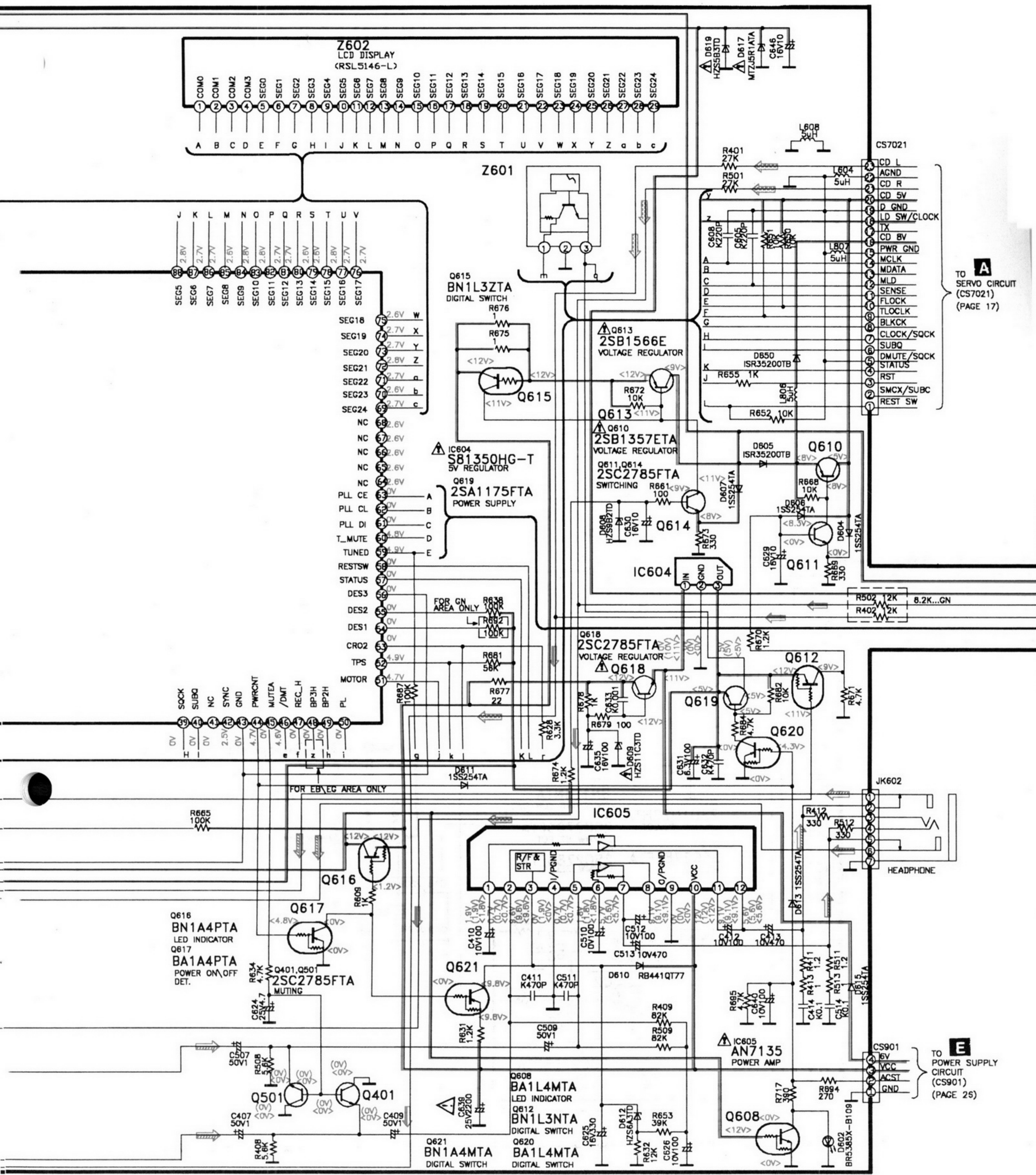
LCH  
PM DYNAMIC  
SPEAKER  
8cm, 2.7 $\Omega$



**IC602**  
MND3256REBE2  
SYSTEM CONTROL AND LCD DRIVE

**IC601**  
PST600HTA  
RESET

**IC603**  
BH3852FSE2  
ASP

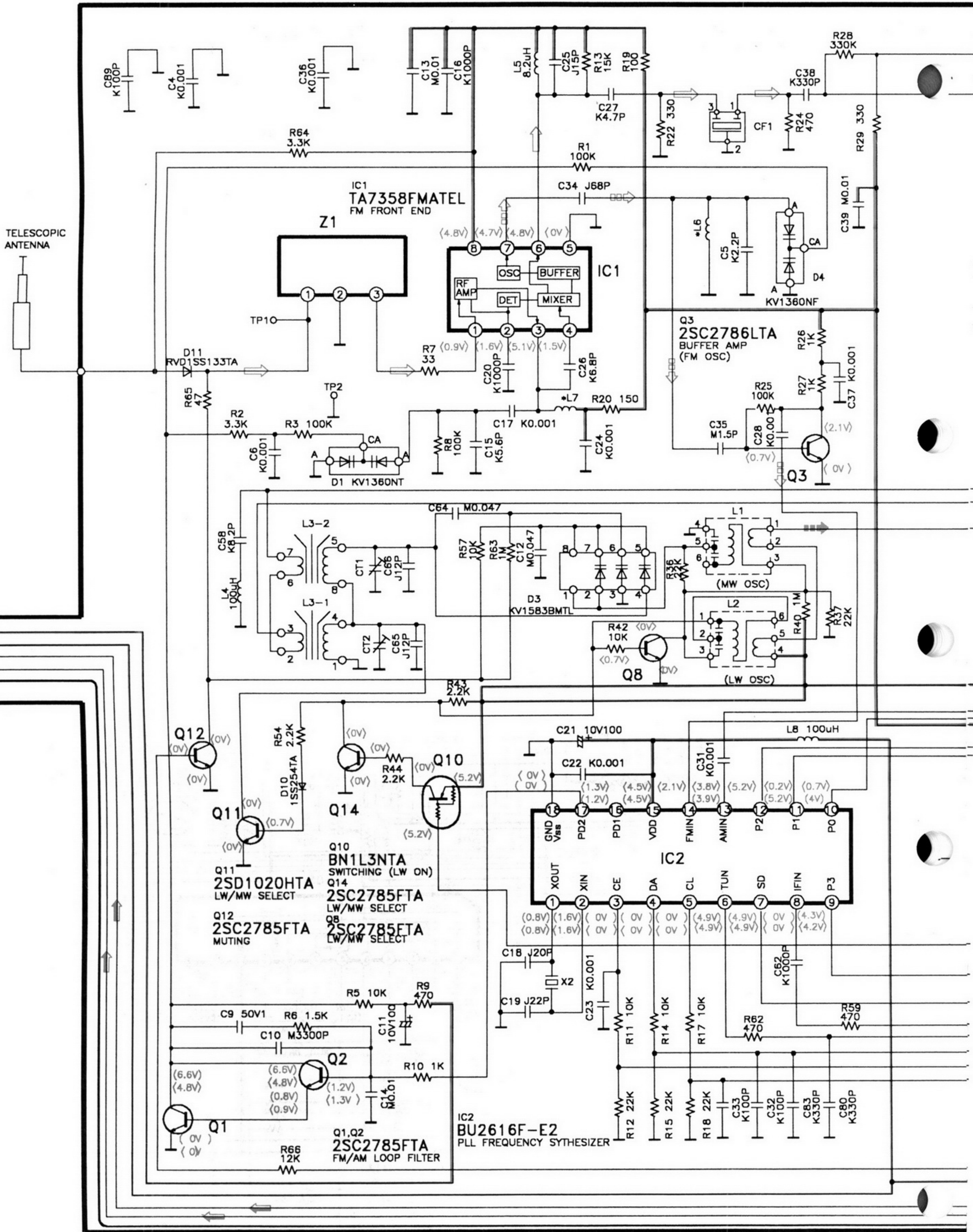


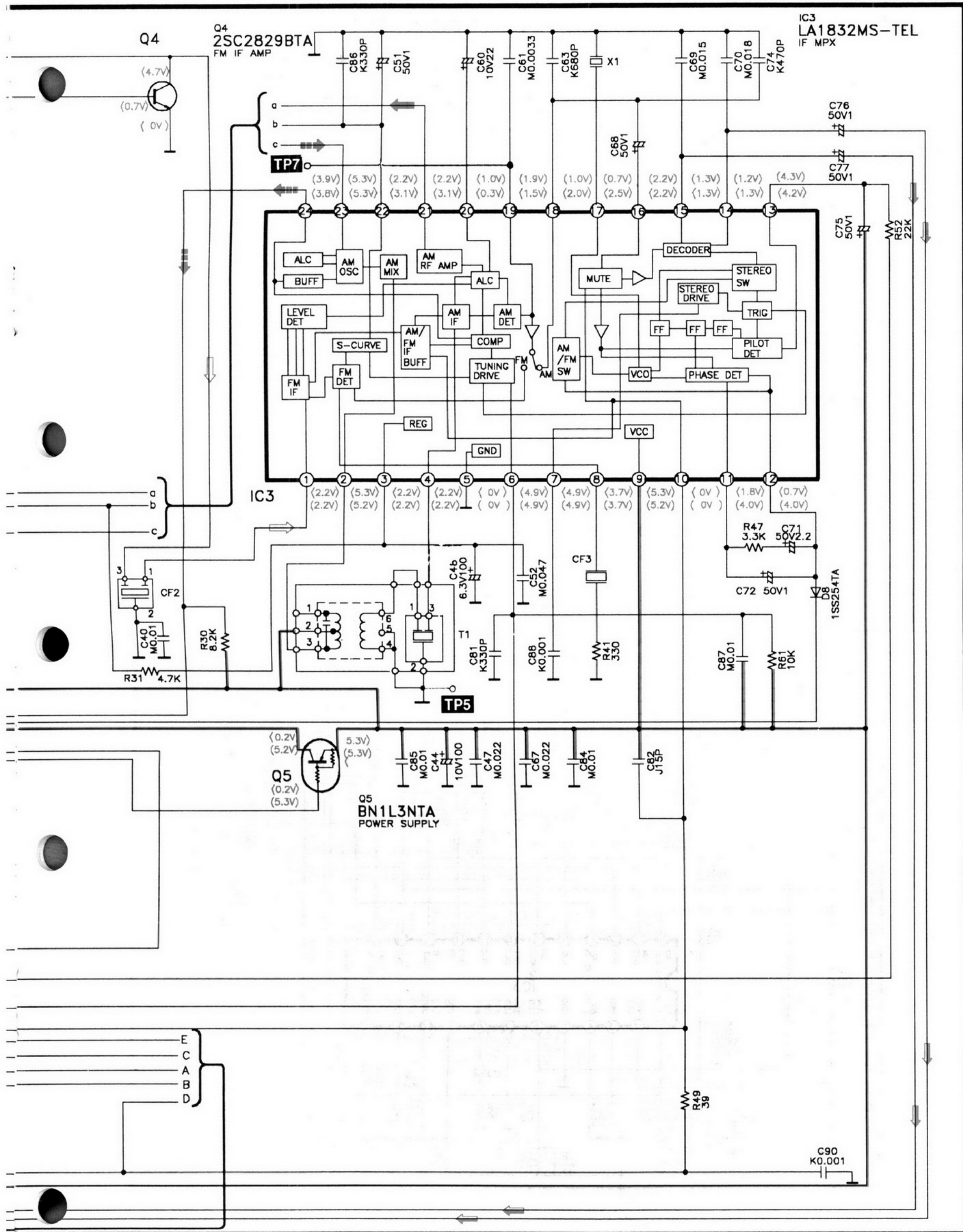
**A**  
TO SERVO CIRCUIT  
(CS7021)  
(PAGE 17)

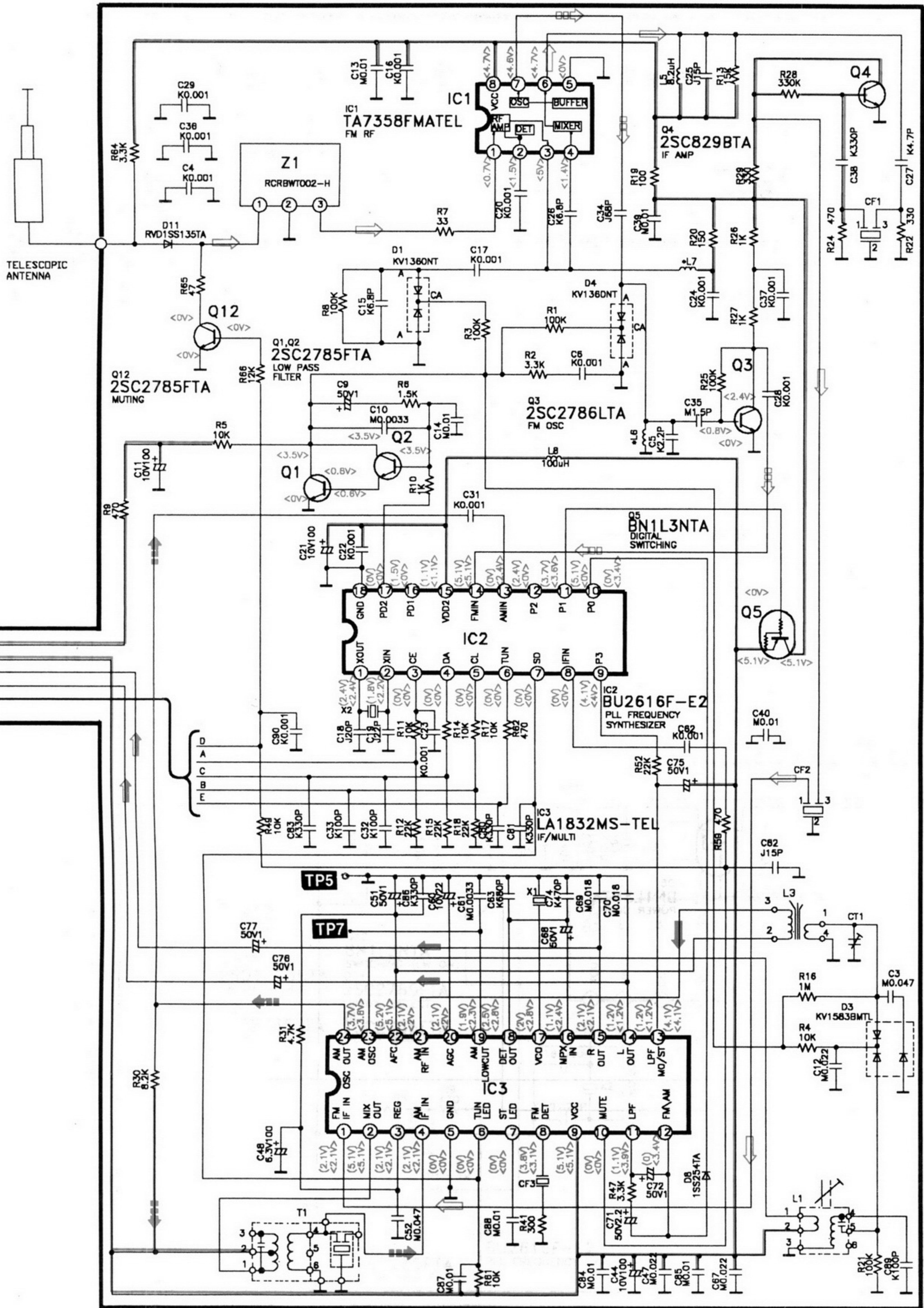
**E**  
TO POWER SUPPLY  
CIRCUIT  
(CS901)  
(PAGE 25)



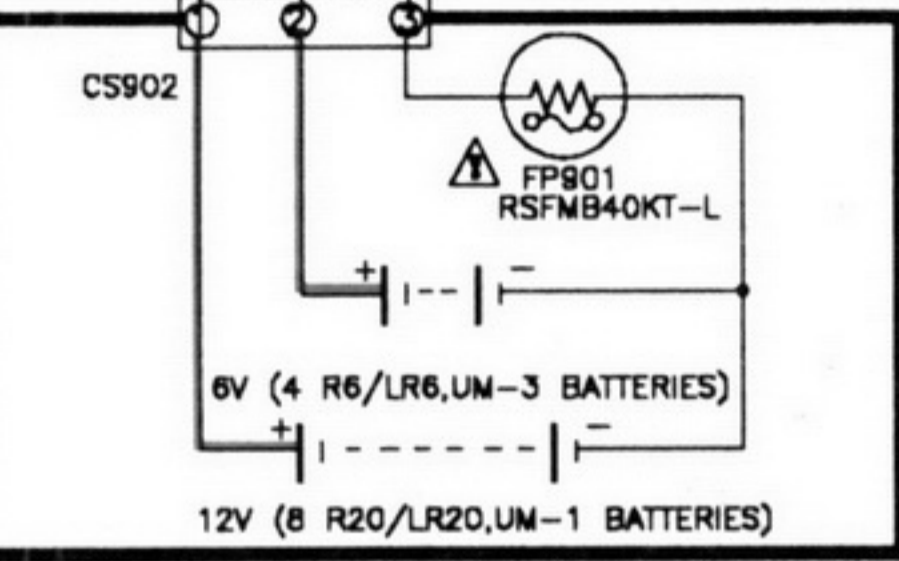
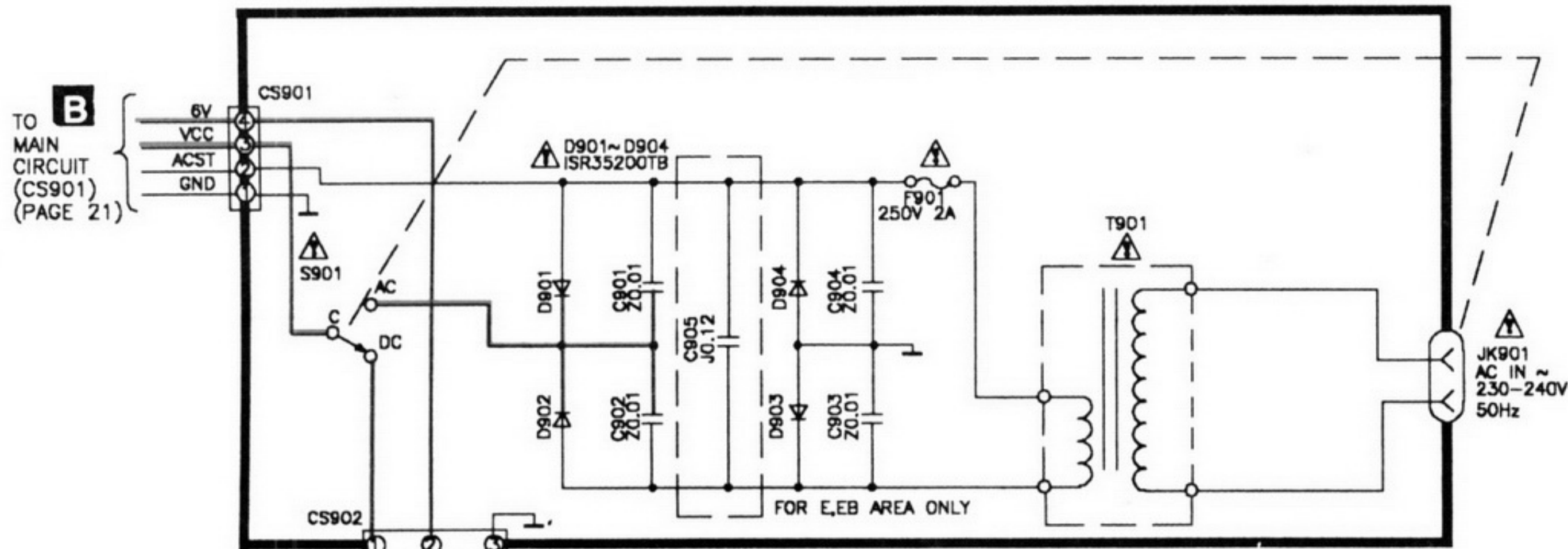
FOR EB,EG AREA







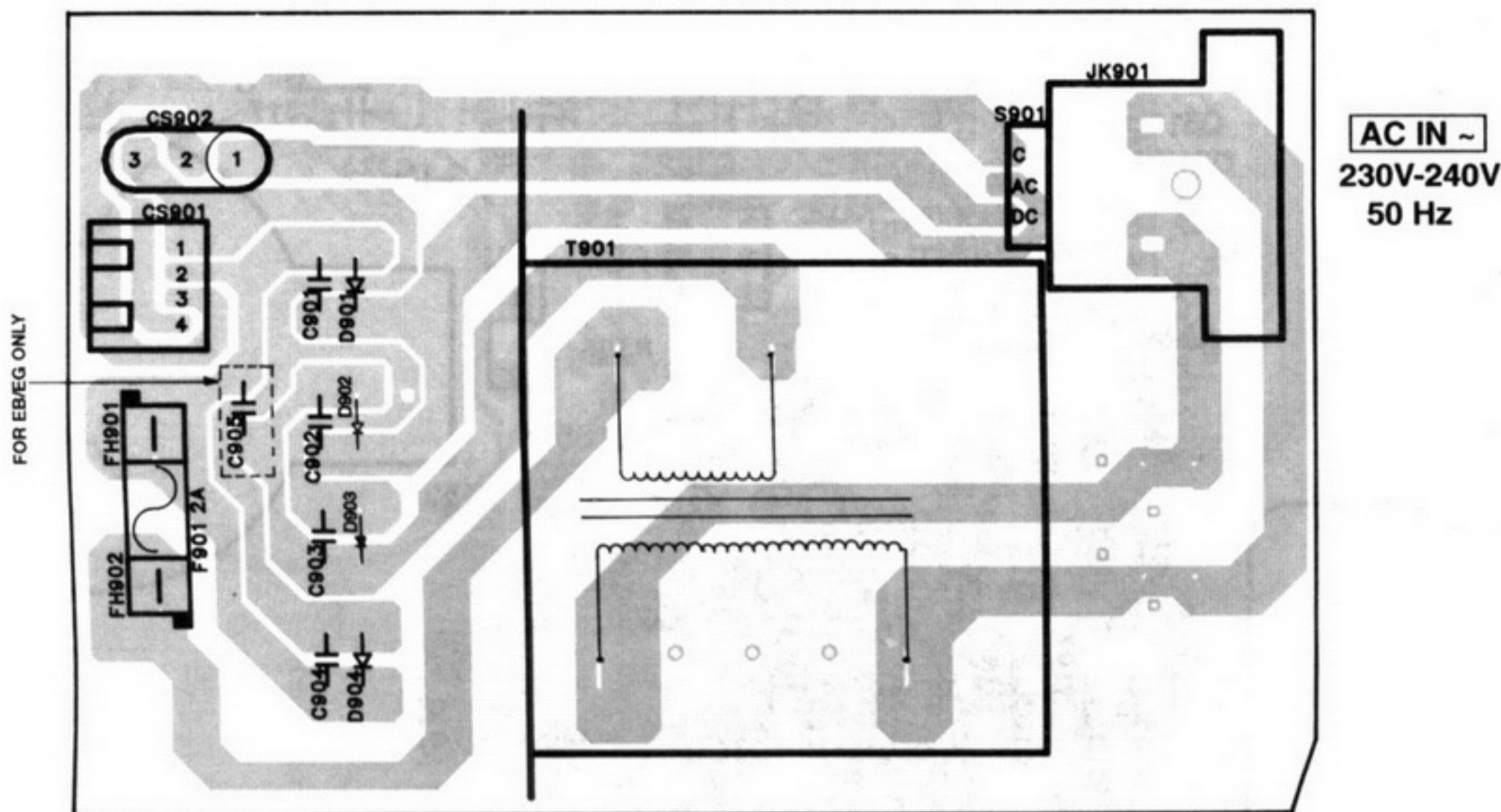
**E** POWER SUPPLY CIRCUIT



**G** BATTERY CIRCUIT

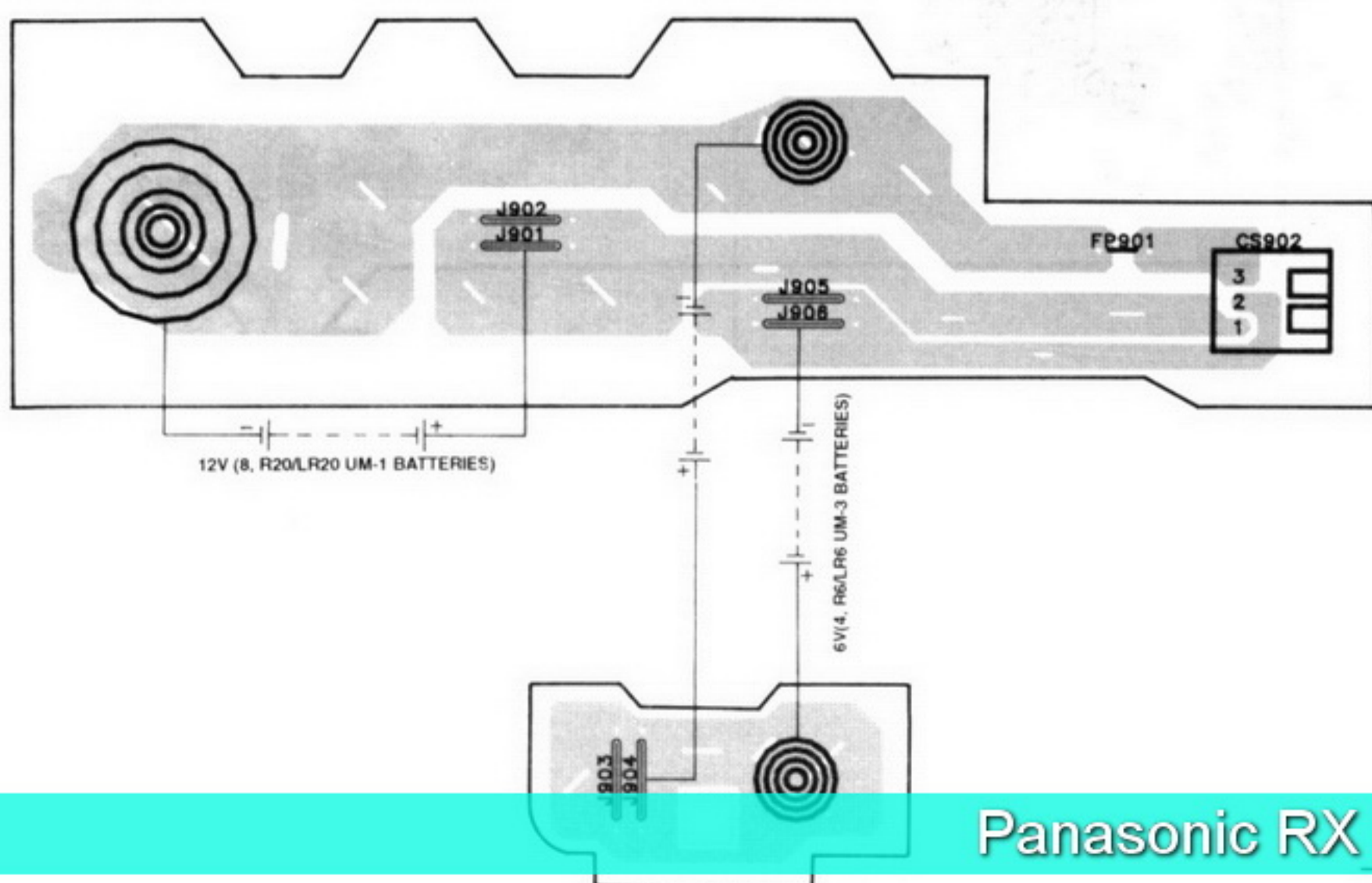
**Printed Circuit Board**

**E** POWER SUPPLY P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)



**CAUTION**  
RISK OF ELECTRIC SHOCK  
AC voltage line. Please do not touch this pcb.

**G** BATTERY P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)



**D** CASSETTE EJECT P.C.B. (REP2232E ... GN) (REP2232C ... EB,EG)

