

The Harman Kardon Model TU930 AM/FM STEREO TUNER

Manual A

Technical Manual

TU930



harman/kardon

Parts and Service Office

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SPECIFICATIONS

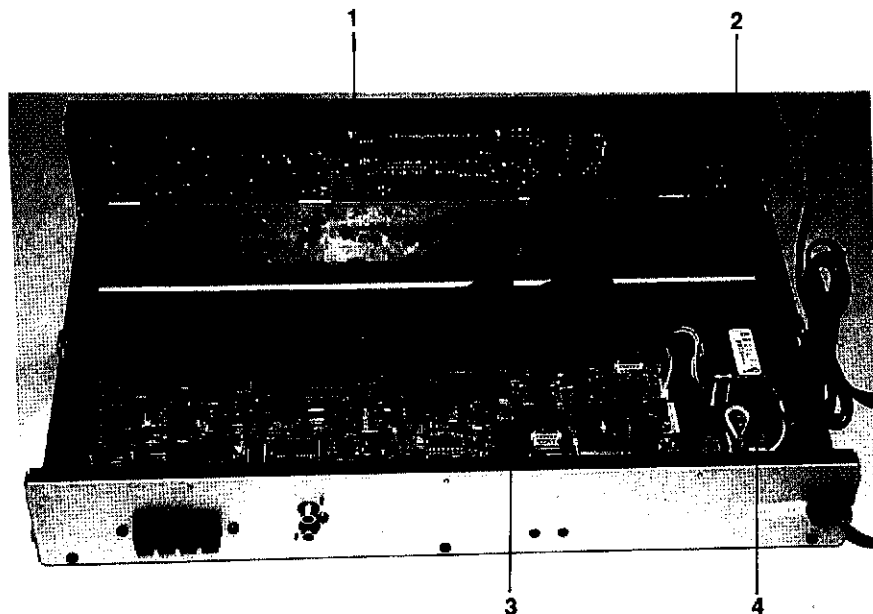
| | |
|--|---|
| <ul style="list-style-type: none"> • FM SECTION Tuning Range 87.5-108 MHz 30dB Quieting Sensitivity <ul style="list-style-type: none"> Mono 14dBf ≤ 20dBf Stereo 15.2dBf ≤ 19dBf Image Ratio 38dBf ≤ 41dBf <ul style="list-style-type: none"> (120 Volts version) 50dB ≥ 40dB (230 Volts version) 85dB ≤ 70dB IF Rejection 85dB ≥ 75dB Spurious Response Rejection 90dB Capture Ratio 2dB ≤ 4dB Alternate Channel Selectivity 65dB ≥ 55dB AM Rejection 50dB ≥ 45dB Signal to Noise Ratio <ul style="list-style-type: none"> Mono 70dB ≥ 65dB <ul style="list-style-type: none"> (120 Volts version) 65dB ≥ 60dB (230 Volts version) 65dB ≥ 55dB Stereo 60dB ≥ 55dB <ul style="list-style-type: none"> (120 Volts version) 60dB ≥ 55dB (230 Volts version) Total Harmonic Distortion <ul style="list-style-type: none"> Mono 0.1% ≤ 0.25% Stereo 0.25% ≤ 0.3% Stereo Separation at 1kHz 40dB ≥ 30dB Output Level 1.0V ± 2dB | <ul style="list-style-type: none"> • AM SECTION Tuning Range <ul style="list-style-type: none"> North America area model 530-1,720kHz Europe models 522-1,611kHz 20dB Quieting Sensitivity 800uV/m ≤ 1,600uV/m Selectivity 30dB ≥ 25dB Signal to Noise Ratio 50dB ≥ 40dB Image Rejection 35dB ≥ 30dB IF Rejection 45dB ≥ 30dB • DIMENSION 17-5/16" × 2-9/16" × 12-5/8" (W × H × D) (440 × 65 × 320 mm) • WEIGHT 7.48 lbs. (3.4kg) • POWER SUPPLIES <ul style="list-style-type: none"> North America area model AC 120V, 60Hz Europe Area AC 230V, 50Hz • POWER CONSUMPTION 8W |
|--|---|

These specifications are service target specs.

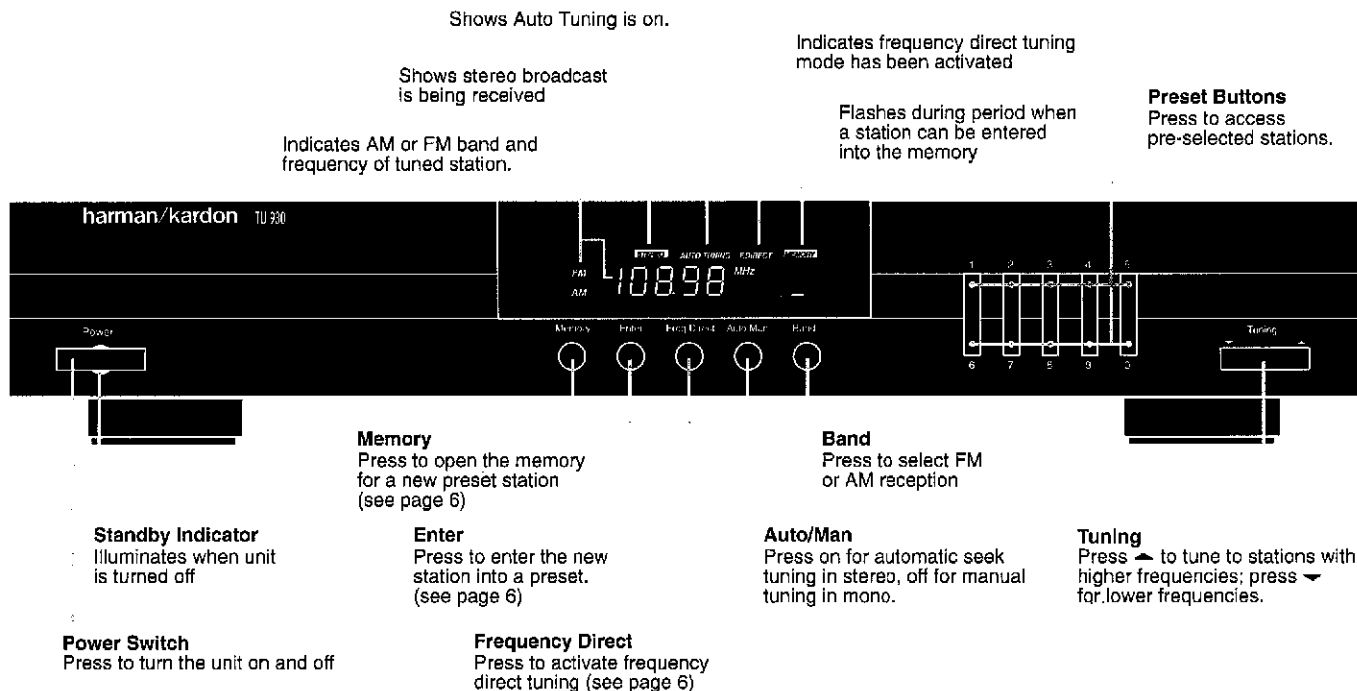
Specifications and components subject to change without notice. Overall performance will be maintained or improved.

INTERNAL VIEW

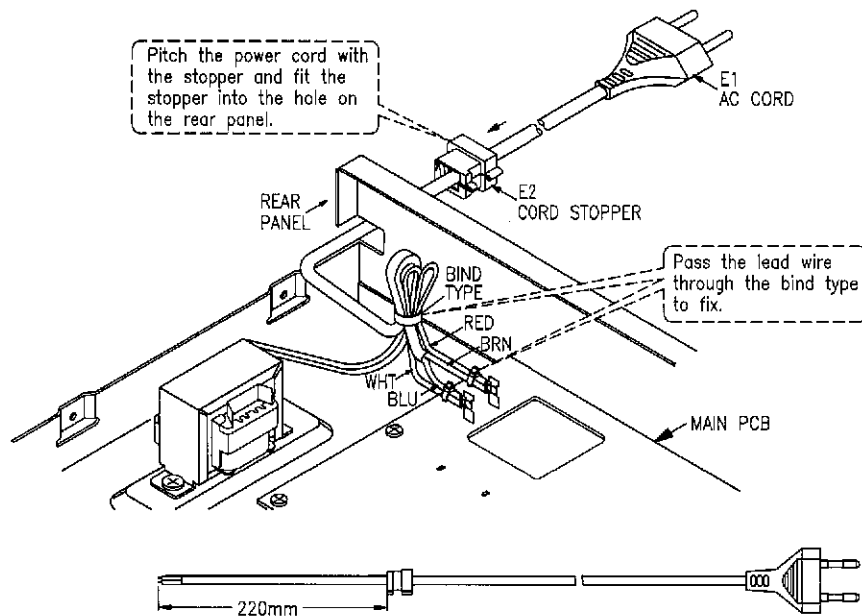
1. PCB-2 FRONT P.C. BOARD
2. PCB-3 POWER SWITCH P.C. BOARD
3. PCB-1 MAIN P.C. BOARD
4. POWER TRANSFORMER



COMPONENTS AND THEIR FUNCTIONS



AC CORD REPLACEMENT



DISASSEMBLY PROCEDURES (REAR TO PAGE 8,9 and 13)

❶ COVER TOP REMOVAL

Remove 7 screws (A) and then remove the Cover Top (M19).

❷ FRONT PANEL ASS'Y REMOVAL

1. Remove the Cover Top (M19), referring to the previous step ❶.
2. Remove 1 screw (B) and then remove the Power Switch P.C. Board (M13).
3. Remove 9 screws (C) and then remove the Front P.C. Board (M17).
4. Remove 6 screws (D) and then remove the Front Panel Ass'y (M1-M12).

❸ REAR PANEL REMOVAL

1. Remove the Cover Top (M19), referring to the previous step ❶.
2. Remove 8 screws (E) and then remove the Rear Panel (M29).

❹ MAIN P.C. BOARD REMOVAL

1. Remove the Cover Top (M19), referring to the previous step ❶.
2. Remove the Rear Panel (M29), referring to the previous step ❷.
3. Remove 6 screws (F) and then remove the Main P.C. Board (M25).

ALIGNMENT PROCEDURES (REFER TO PAGE 13 AND 15)

- Conditions:
- Make the adjustment at a room temperature of 77°F (25°C).
 - After the Power switch is pushed on, wait for 2 minutes before measuring to be sure of the most stable operation.

■ AM ADJUSTMENT

- Conditions:
- Set the AM mode by pressing the "AM" button.
 - Standard modulation of the AM Signal Generator is 1kHz at 30%.

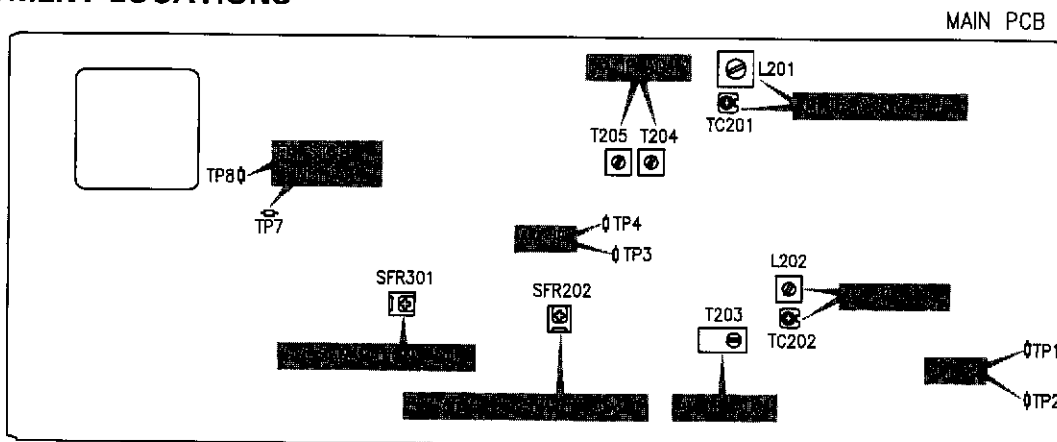
| | | | | | |
|--|--|----------------------|----------------------|-------|--|
| IF | • Connect the AM Test Loop Antenna cable into the output jack of AM Signal Generator (600kHz, 30% Mod.) | * 600kHz 603kHz | * 600kHz 603kHz | T203 | Maximum output level and symmetrical curve on scope. |
| VT | • Connect DC Meter to TP1 and TP2 (GND) | * 530kHz 522kHz | * 530kHz 522kHz | L202 | VT = 1-1.1V |
| | | * 1720kHz 1611kHz | * 1720kHz 1611kHz | TC202 | VT = 7.7-8V |
| Tracking | • Place AM Test Loop Antenna close enough to couple signal into the AM Loop Antenna. • Connect the VTVM and oscilloscope to the OUTPUT jacks. | * 1400kHz 1404kHz | * 1400kHz 1404kHz | L201 | Maximum output |
| | | * 600kHz 603kHz | * 600kHz 603kHz | TC201 | Maximum output |
| Repeat step 3 for optimum sensitivity. | | | | | |

■ FM ADJUSTMENT

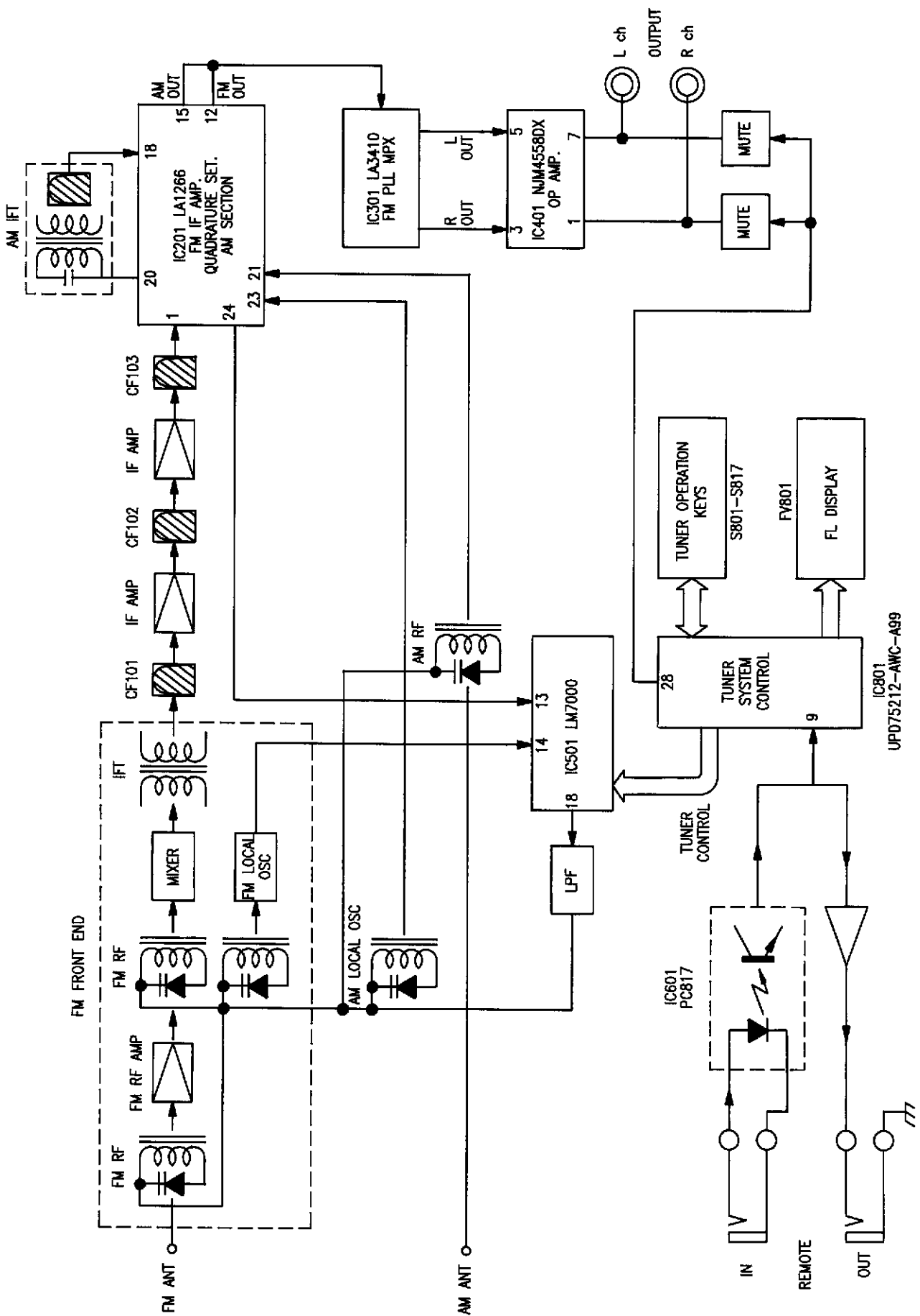
- Conditions:
- Set the FM mode by pressing the "FM" button.
 - During separation adjustment, pressing "Auto" button.

| | | | | | |
|------------------|--|-------|-------|--------|--------------------------------|
| IF | • FM Signal Generator set to 98MHz, 40kHz DEV. 60dB input from Antenna Terminal. • DC Meter connect to TP3 and TP4. • VTVM and Distortion Meter connect to Output Jacks. | 98MHz | 98MHz | T204 | 0V ± 50mV |
| | | | | T205 | Distortion to minimum (<0.25%) |
| Separation | • FM Signal Generator set to 67.5kHz, 7.5kHz DEV. (100% MOD.) input from Antenna Terminal. • VTVM connect to output jacks. | 98MHz | 98MHz | SFR301 | Separation to optimum (>30dB) |
| Stop Sensitivity | • FM Signal Generator set to 22.5kHz, DEV. 26dB Input from Antenna Terminal. • DC Meter connect to TP7 and TP8 (GND). | 98MHz | 98MHz | SFR202 | 6V |

ADJUSTMENT LOCATIONS



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

■ FM TUNER SECTION

The FM signal which has entered through the ant is high-frequency amplified in the front end unit FE101, mixed with the output of the local oscillator and converted into the 10.7MHz intermediate-frequency. The 10.7MHz signal is amplified in the intermediate-frequency amplifying section which consists of CF101, Q203, CF102, Q204 and CF103 and fed to pin 1 of IC201. In IC201, the signal is transmitted through the IF amp in two steps, and after being detected in the quadrature, it is transmitted through the post amplifier to pin 12 and then input to pin 2 of IC301. In IC301, the pilot signal is detected out of the signal which has been fed and 38kHz signal is produced.

The stereo signal is demodulated, out-put from pin 4 for the left channel and pin 7 for the right channel and then fed to the amplifier section.

■ AM TUNER SECTION

The AM signal which has entered through the antenna is transmitted through the tuning circuit consisting of L201 and TC201 to IC201. In IC201 it undergoes high-frequency amplification, intermediate-frequency amp-lification local oscillation, intermediate-frequency amp-lification and detection, and then output from pin 15. This signal is turned ON and OFF at Q505 and Q506 according to the signal from the input selector and fed to pin 2 of IC301.

■ MUTING CIRCUIT

If FM is received out of tuning or in a very weak field intensity, pin 38 of IC801 becomes high level. This is fed to the base of Q404, whose collector then becomes low level and the collector of Q403 high level. As a result, Q401 (L ch) and Q402 (R ch) are conducted to mute the output.

■ SYNTHESIZER SECTION

• FM

The local oscillation output at the front end is fed to pin 14 of IC501. Control output signal if fed from IC801, compared with the divided local oscillation output and output to pin 18. This voltage is level converted at Q501 and Q502, and fed to the front end.

• AM

The local oscillation output is fed from pin 24 of IC201 to pin 13 of IC501. In IC501 Control output signal is fed from IC801, compared with the local oscillation output and output to pin 18. This voltage is level converted at Q501 and Q502 and fed to the AM local oscillation section.

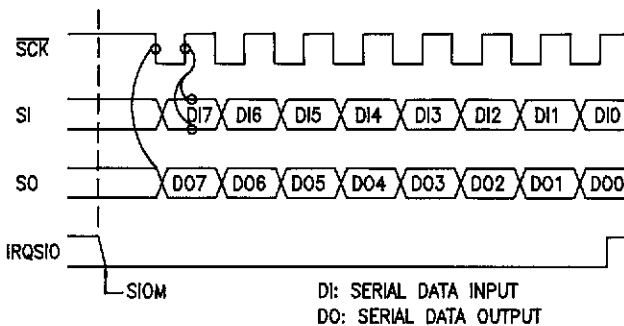
■ INDICATOR SECTION

• Frequency Display

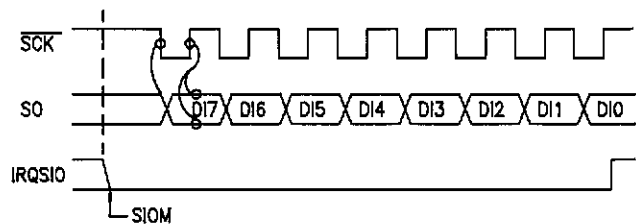
Output pins 40 to 47 and 51 to 63 of Display driver IC801 control Matrix display FV801.

TIMING CHART

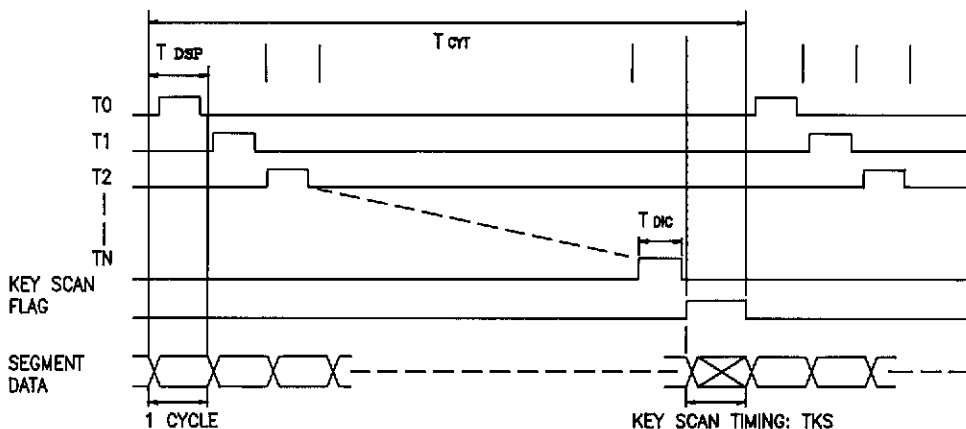
SERIAL INPUT/OUTPUT TIMING CHART



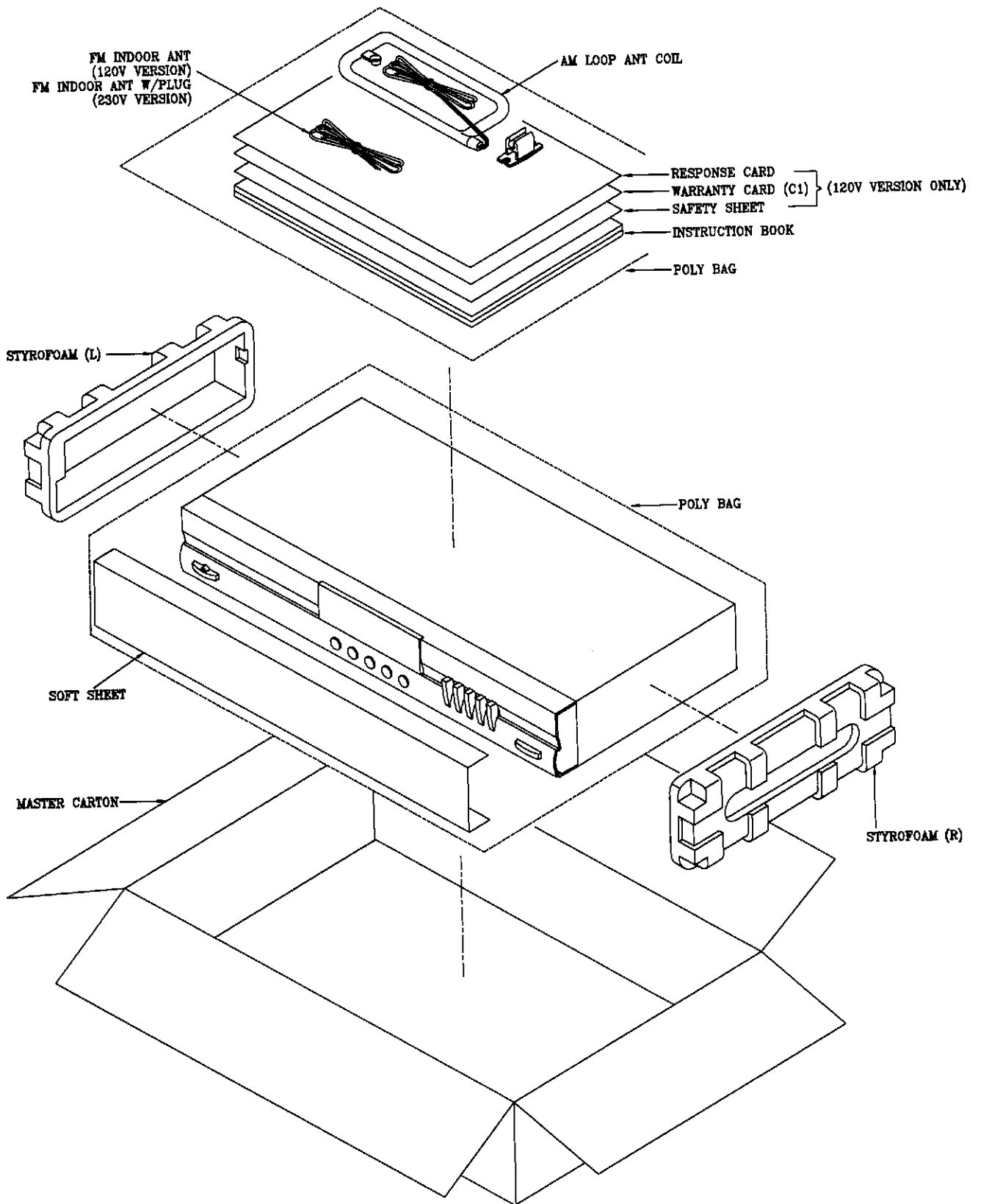
SERIAL/BUS MODE TIMING CHART



SERIAL INPUT/OUTPUT TIMING CHART



PACKAGE



MECHANICAL PARTS LIST

| Ref. No. | Part No. | Description | Ref. No. | Part No. | Description |
|----------|------------|--|----------|------------|--|
| M1 | 8942300800 | SCREW, 9-BID3008 ZN3K (× 9) | M22 | 200307910T | CHASSIS, BOTTOM |
| M2 | 200107910T | CHASSIS, FRONT | M23 | 8641400600 | SCREW, 6-BID4006 ZN3A (× 2) |
| M3 | 100407910T | WINDOW, FRONT | M24 | 2090079993 | SUPPORTER, SPACER (× 6) |
| M4 | 100707910T | KNOB, PREST (× 5) | M25 | C143239711 | PCB ASSEMBLY, MAIN (120 Volts version) |
| M5 | 200207910T | HOLDER, KNOB | M25 | C143239710 | PCB ASSEMBLY, MAIN (230 Volts version) |
| M6 | 100807910T | KNOB, TUNING | M26 | 2005079551 | WASHER, EARTH (× 3) (120 Volts version) |
| M7 | 8942300600 | SCREW, 9-BID3006 ZN3K (× 15) | M26 | 2005079551 | WASHER, EARTH (× 2) (230 Volts version) |
| M8 | 100307910T | PLATE, SIDE (R) | M27 | 8941301400 | SCREW, 9-BID3014 ZN3A (× 6) |
| M9 | 100107910T | PANEL, FRONT | M28 | 200507910T | COVER, SHIELD (120 Volts version) |
| M10 | 100207910T | PLATE, SIDE (L) | M28 | 201206145A | COVER, SHIELD (230 Volts version) |
| M11 | 100507910T | KNOB, POWER | M29 | 101107910T | PANEL, REAR (120 Volts version) |
| M12 | 100907910T | LENS, POWER LED | M29 | 101307910T | PANEL, REAR (230 Volts version) |
| M13 | C143239730 | PCB ASSEMBLY, POWER | M30 | 8742300800 | SCREW, 7-BID3008 ZN3A (× 9) |
| M14 | 8741301000 | SCREW, 7-BID3010 ZN3A | M31 | 201006145A | SINK, HEAT |
| M15 | 100607910T | KNOB, MEMORY | M32 | 8741300600 | SCREW, 9-BID3006 ZN3A |
| M16 | 200606145A | HOLDER, FL | | | |
| M17 | C143239721 | PCB ASSEMBLY, FRONT (120 Volts version) | | | |
| M17 | C143239720 | PCB ASSEMBLY, FRONT (230 Volts version) | | | |
| M18 | 8741300800 | SCREW, 7-BID3008 ZN3A (× 9) | | | |
| M19 | 101007910T | COVER, TOP | | | |
| M20 | JS27593800 | SHEET, FOOT (× 4) | | | |
| M21 | JS85047300 | FOOT, 55 (B) (× 4) | | | |

PARTS DESCRIPTION

405 **A** **B** **C** **D** **E** **F** **G**

405 : CARBON RESISTOR

A : POWER RATING (**01** = 1/6W)**C** **D** **E** : RATED RESISTANCE (UNIT : ohm)(**683** = 68K ohm)**F** : TOLERANCE (**5** = 5%)**G** : FORMING TYPE (**2** = HORIZONTAL)515 **A** **B** **C** **D** **E** **F** **G**

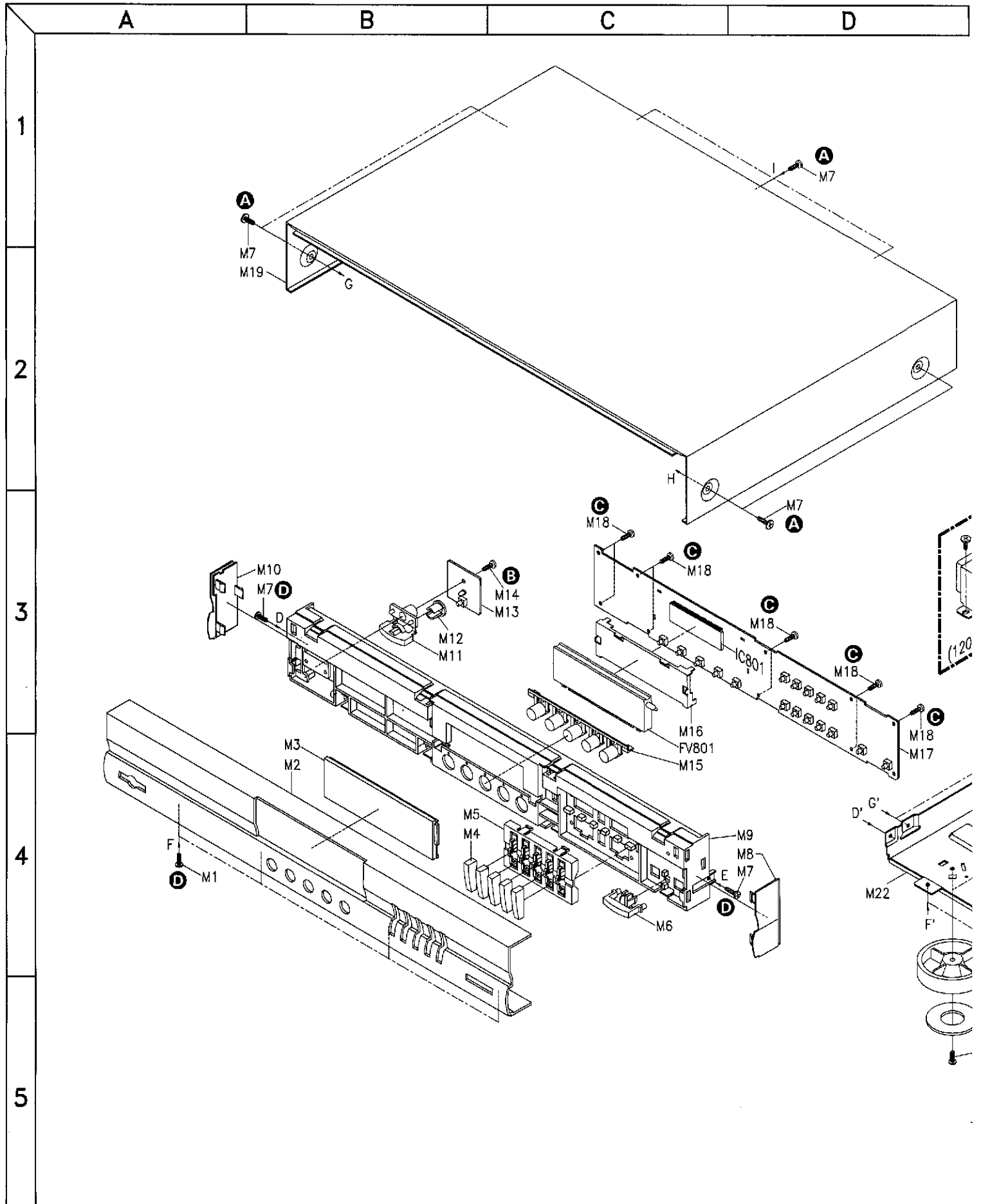
515 : ELECTROLYTIC CAPACITOR

A : FORMING TYPE (**4** = SHORT CUT FORMING (S))**B** **C** **D** : CAPACITANCE (UNIT : uF)(**1010** = 10uF)**E** : RATED TOLERANCE (**2** = ±20%)**F** **G** : RATED VOLTAGE (**10** = 10V)510 **A** **B** **C** **D** **E** **F** **G**

510 : CERAMIC CAPACITORS

A : TEMPERATURE CHARACTERISTICS(**1** = 560pF-0.0022uF)**B** **C** **D** : RATED CAPACITANCE(**681** = 680pF)**E** : TOLERANCE (**1** = ±10%)**F** : RATED VOLTAGE (**5** = 50V DC)**G** : FORMING TYPE (**2** = TAPING)

MECHANICAL EXPLODED VIEW

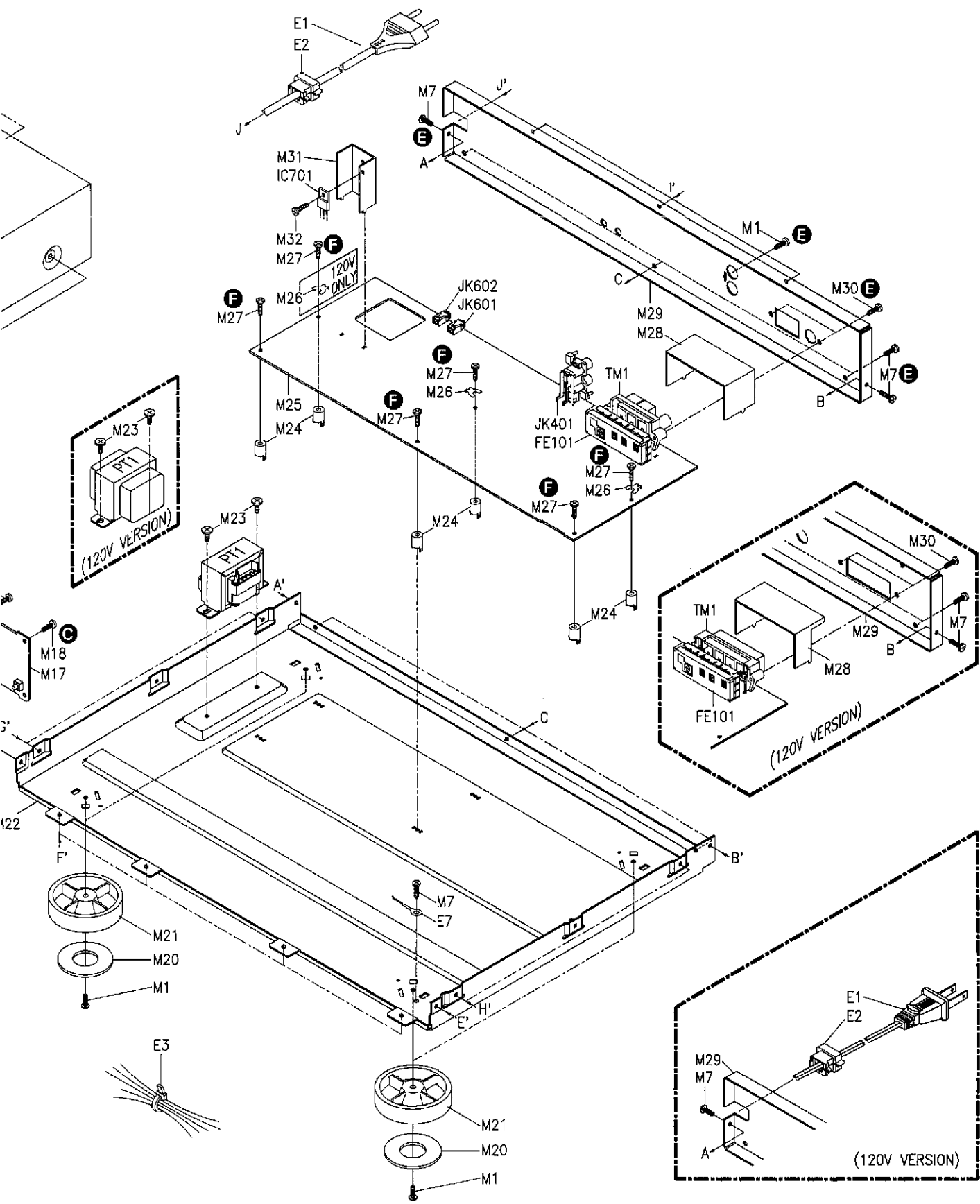


E

F

G

H



| Ref. No. | Part No. | Description | Ref. No. | Part No. | Description |
|----------------|---------------|---|----------|---|-------------------------------------|
| D713 Δ | 4138104002 | 1N4002L | C810 | 5150100225 | MINI ELE 10u/25V |
| D714 Δ | 4138104002 | 1N4002L | C811 | 7308622345 | MUL .022u/25V |
| | COILS | | C813 | 511C684550 | MSC .68u |
| L102 | 4325022093 | COIL, PEAKING 22uH | C814 | 2000001154 | BACK UP ELE .1F/5.5V or |
| L103 | 4325022093 | COIL, PEAKING 22uH | | 2000001014 | GOLD .1F/5.5V |
| L104 | 4300400720 | COIL, FM ANT (120V version) | C815 | 7307110315 | MUL .01u/16V |
| L201 | 4300102770 | COIL, AM ANT TWS-358-638 | | RESISTORS | |
| L202 | 4330101570 | COIL, AM OSC TWS-358-644 | R801 | 4050139155 | CBN 1/6W 390 |
| L203 | 4325027993 | COIL, PEAKING 2.7uH | R802 | 4050410055 | CBN 1/4W 10 |
| L301 | 4325027993 | COIL, PEAKING 2.7uH | R803 | 4050427155 | CBN 1/4W 270 |
| L701 | 4325022192 | COIL, PEAKING 220uH | R804 | 4050110455 | CBN 1/6W 100K |
| | TRANSFORMERS | | R805 | 4050110455 | CBN 1/6W 100K |
| T204 | 4340201300 | FM DET (A) TWS-358-636 | R808 | 4050122355 | CBN 1/6W 22K |
| T205 | 4340201310 | FM DET (B) TWS-358-637 | R809 | 4050110255 | CBN 1/6W 1K |
| | CONTROLS | | R810 | 4050147355 | CBN 1/6W 47K |
| SFR202 | 5226104T56 | RES, SEMI FIX 100KX VZ068TLT or | R811 | 4050147355 | CBN 1/6W 47K |
| | 5226104177 | RES, SEMI FIX 100KX | R812 | 4050133055 | CBN 1/6W 33 |
| SFR301 | 5226204T56 | RES, SEMI FIX 200KX VZ068TLT (120V version) | R813 | 4050110155 | CBN 1/6W 100 |
| | 5226104T56 | RES, SEMI FIX 100KX VZ068TLT or (230V version) | R814 | 4050447355 | CBN 1/4W 47K |
| TC201 | 5010300045 | TERMINAL 30P VCT51C537A or | R819 | 4050110455 | CBN 1/6W 100K |
| | 5010300055 | TERMINAL 30P | R820 | 4050147355 | CBN 1/6W 47K |
| TC202 | 5010300045 | TERMINAL 30P VCT51C537A or | | INTEGRATED CIRCUITS | |
| | 5010300055 | TERMINAL 30P | IC801 | UPD75212ACW-199 IC, FLDRIVER & PL CONTROL | |
| | MISCELLANEOUS | | IC802 | PST600D IC, RESET | |
| CF101 | 4160200194 | FILTER, CERAMIC (RED) SFE10.7MS3GH-A | | TRANSISTORS | |
| CF102 | 4160200194 | FILTER, CERAMIC (RED) SFE10.7MSGH-A | Q801 | DTC144ES | SWITCHING |
| CF103 | 4160200003 | FILTER, CERAMIC (RED) SFE10.7MA5 | Q802 | DTC144ES | SWITCHING |
| CF301 | 4160500161 | RESONATOR CSB456F11 | X801 | 4100941940 | X'TAL 4.194304M AT-49 |
| T203 | 4160500199 | FILTER, CERAMIC TWS-358-679 | | DIODES | |
| T206 | 4160700077 | FTZ L.P.F. 10FE01 (230V version) | D801 | 4121901760 | 1SS176 |
| T301 | 416910T0C6 | FILTER, MPX | D802 | 4121901760 | 1SS176 |
| T302 | 416910T0C6 | FILTER, MPX | D803 | 4121901760 | 1SS176 |
| BPF101 | 4160700100 | FILTER, BAND PASS SW-7G (230V version) | D804 | 4121141480 | 1N4148 |
| | | | D805 | 4121901760 | 1SS176 |
| | | | D806 | 4121141480 | 1N4148 |
| | | | D807 | 4121141480 | 1N4148 |
| | | | D808 | 4121901760 | 1SS176 |
| | | | D809 | 4121141480 | 1N4148 (230V version) |
| | | | D810 | 4121901760 | 1SS176 |
| | | | D811 | 4121141480 | 1N4148 |
| | | | D812 | 4121141480 | 1N4148 |
| | | | D813 | 4121901760 | 1SS176 |
| | | | D815 | 4121901760 | 1SS176 |
| | | | D816 | 4121901760 | 1SS176 |
| | | | | MISCELLANEOUS | |
| FE101 | 7161234086 | FM FRONT END FE417-G02 | S801 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| FS701 Δ | 5266125020 | FUSE UL/CSA T1.25A/125V (120V version) | S802 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S803 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| FS701 Δ | 5267125160 | FUSE SEMKO T1.25AL/250V (230V version) | S804 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S805 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S806 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| TP9 | 2000000843 | TERMINAL PIN "L" | S807 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| TP10 | 2000000843 | TERMINAL PIN "L" | S808 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| E4 | 4490600261 | HOLDER, WIRE 6P20 (x 3) | S809 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| E5 | 4490401002 | BASE, EH TOP 4P | S810 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| E8 | 4692000034 | HOLDER, FUSE PFC5000-0202T (x 2) | S811 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S812 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S813 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S814 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S815 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S816 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | S817 | 4400000160 | SWITCHING, TACT SKHVBL3720-CP |
| | | | FV801 | 4110540184 | DISPLAY, FLD FV569G |
| | | | E4 | 4490600261 | HOLDER, WIRE 6P20 (x 3) |
| | | | E6 | 4490400261 | HOLDER, WIRE 4P20 |
| | | | E7 | 4590100105 | TERMINAL ASSEMBLY, EARTH BLK-100 |
| | CAPACITORS | | | | |
| C801 | 7306610445 | MUL .1u/50V | | | |
| C802 | 5150109250 | MINI ELE 1u/50V | | | |
| C803 | 7306610445 | MUL .1u/50V | | | |
| C804 | 5150470216 | MINI ELE 4.7u/16V | | | |
| C805 | 7306610445 | MUL .1u/50V | | | |
| C806 | 5121300552 | CER CH 30p | | | |
| C807 | 5121300552 | CER CH 30p | | | |
| C808 | 7306610445 | MUL .1u/50V | | | |
| C809 | 7306610445 | MUL .1u/50V | | | |

| Ref. No. | Part No. | Description |
|----------|------------|--|
| PCB | | |
| LED809 | 4120639104 | LED 3Q SEL3910A (AMBER) or 41206264AT (AMBER) |
| S818 | 4400000160 | SWITCH, TACT SKHVBL3720-CP |
| E6 | 4490400261 | HOLDER, WIRE 4P20 |

CHASSIS MISCELLANEOUS

| | | | |
|-----|---|------------|---|
| PT1 | △ | 420C412204 | TRANSFORMER, POWER UL/CSA EI-41 (120V version) |
| PT1 | △ | 420C414205 | TRANSFORMER, POWER IEC-65 EI-41 (230V version) |
| E1 | △ | 463117L070 | CORD, AC UL/CSA 7FT BLK (120V version) |
| E1 | △ | 463221P070 | CORD, AC VDE 7F BLK2 (230V version) |
| E2 | | 4580000021 | STOPPER, CORD 2271 |
| E3 | | 2000000144 | BIND TYPE "A" (x4) |

| | | | |
|------|--|------------|---|
| L101 | | 4300103440 | COIL, AM LOOP ANT |
| A1 | | 900107910T | STYROFOAM (L) |
| A2 | | 900207910T | STYROFOAM (R) |
| A3 | | 900507910T | CARTON, MASTER (120V version) |
| A3 | | 900307910T | CARTON, MASTER (230V version) |
| A4 | | 900407910T | SHEET, SOFT |
| A5 | | 9906005041 | BAG, POLY (SET) |
| A6 | | 9010007440 | LABEL, SERIAL NO. (20x6) |
| A7 | | 5401300025 | ANTENNA, FM INDOOR (120V version) |
| A7 | | 5402150036 | ANTENNA, FM INDOOR W/PLUG (230V version) |
| A8 | | 9080021300 | BOOK, INSTRUCTION (E) |

| Ref. No. | Part No. | Description |
|----------|------------|--|
| A9 | 9030006630 | CARD, WARRANTY (120V version) |
| A10 | 9902304041 | BAG, POLY 23 x 40 (I/B) |
| A11 | 9030006650 | CARD, RESPONSE (120V version) |
| A12 | 9100019240 | UPC SERIAL NO. LABEL (120V version) |
| A12 | 9100019250 | UPC SERIAL NO. LABEL (230V version) |
| A13 | 9012000070 | DATA CODE LABEL 27 x 12 (120V version) |
| A14 | 9120003472 | SHEET, SAFETY (120V version) |
| A15 | 9020001130 | LABEL, CSA (CSA SUPPLY) (120V version) |

CAPACITORS

| | |
|--------|---|
| ELE | : Electrolytic |
| MUL | : Multi-Layer Ceramic |
| CER | : Ceramic |
| PPP | : Polypropylene |
| SEM | : Semi-Conductor |
| MYL | : Mylar |
| CER CH | : Ceramic CH |
| MSC | : Multi-Layer Metallized Polyester Film |
| 470u | : 470uF |
| 470p | : 470pF |
| .047u | : 0.047uF |

RESISTORS

| | |
|------|------------|
| CBN | : Carbon |
| 2.2K | : 2.2K ohm |
| 220 | : 220 ohm |

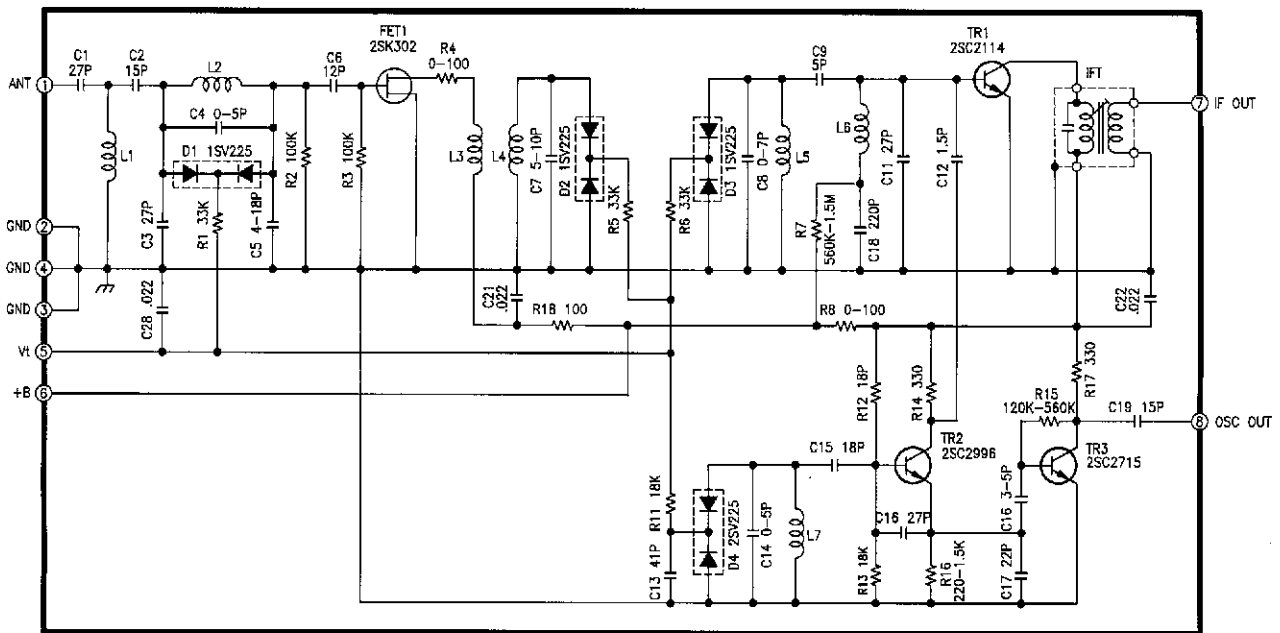
CONTROLS

RES, SEMI FIX : Semi-fixed Resistor

NOTE

△ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

FM FRONT END SECTION



NOTES:

1. TERMINAL NUMBER REFER TO OVERALL APPEARANCE.
2. RECEIVING FREQUENCY. 87.5 - 108MHz
3. INPUT IMPEDANCE. 75 OHM
4. OUTPUT IMPEDANCE. 300 OHM
5. SUPPLY VOLTAGE. +B 12V
6. TUNING VOLTAGE. Vt 1.2MIN - 9.2MAX V.

E

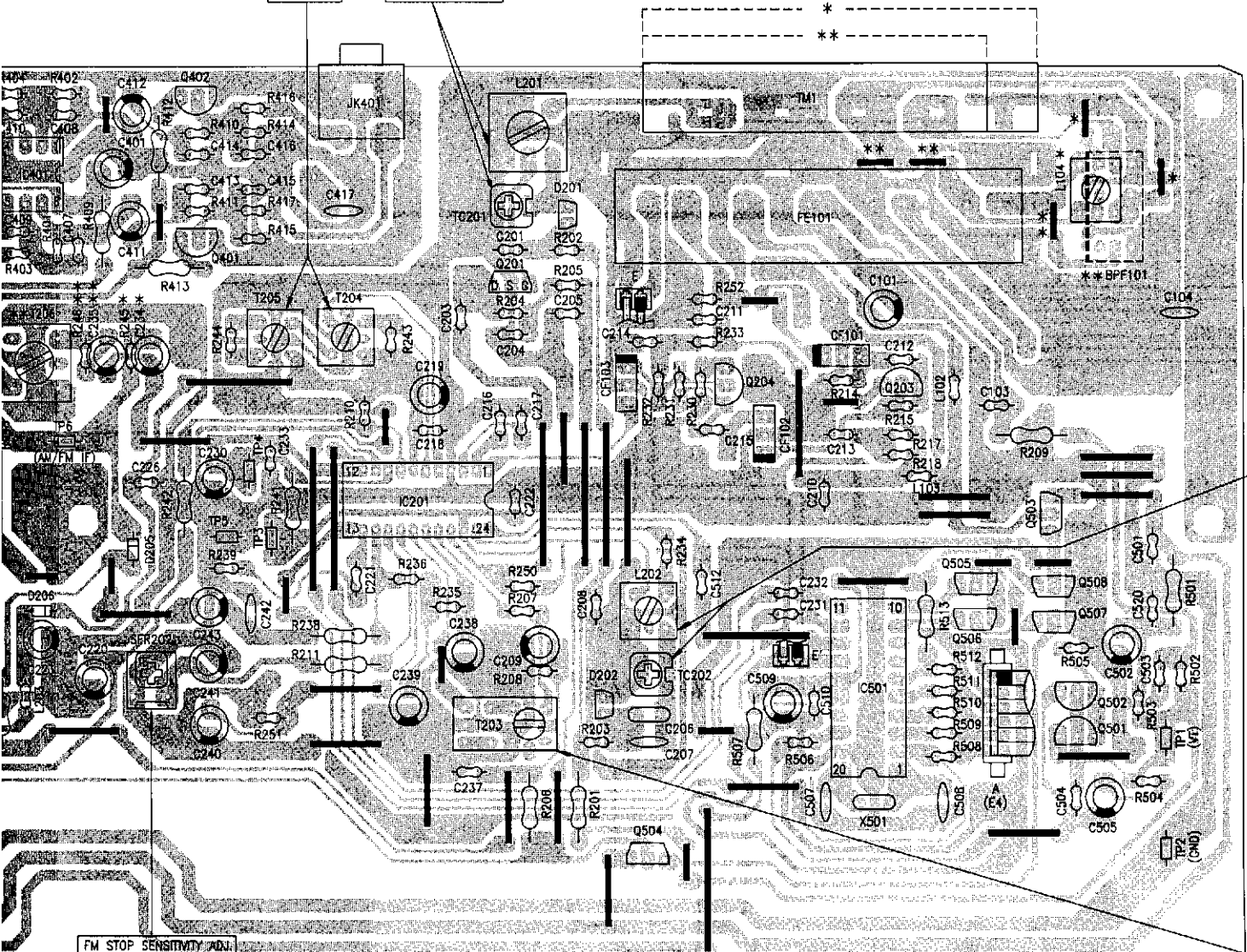
F

G

H

FM IF ADJ.

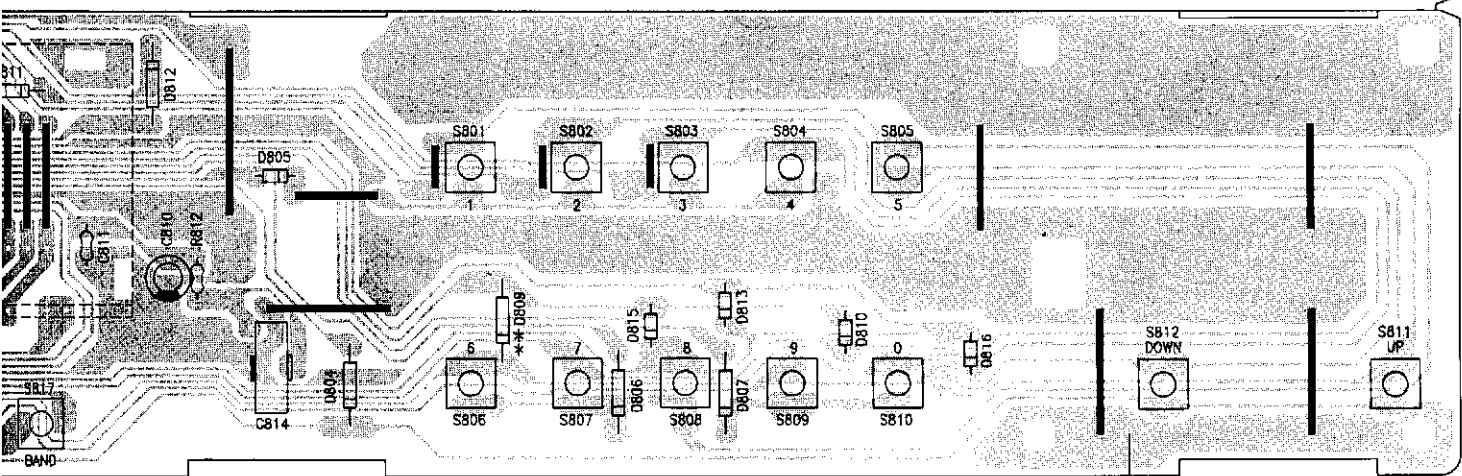
AM TRACKING ADJ.



AM VT ADJ.

AM IF ADJ.

FM STOP SENSITIVITY ADJ.



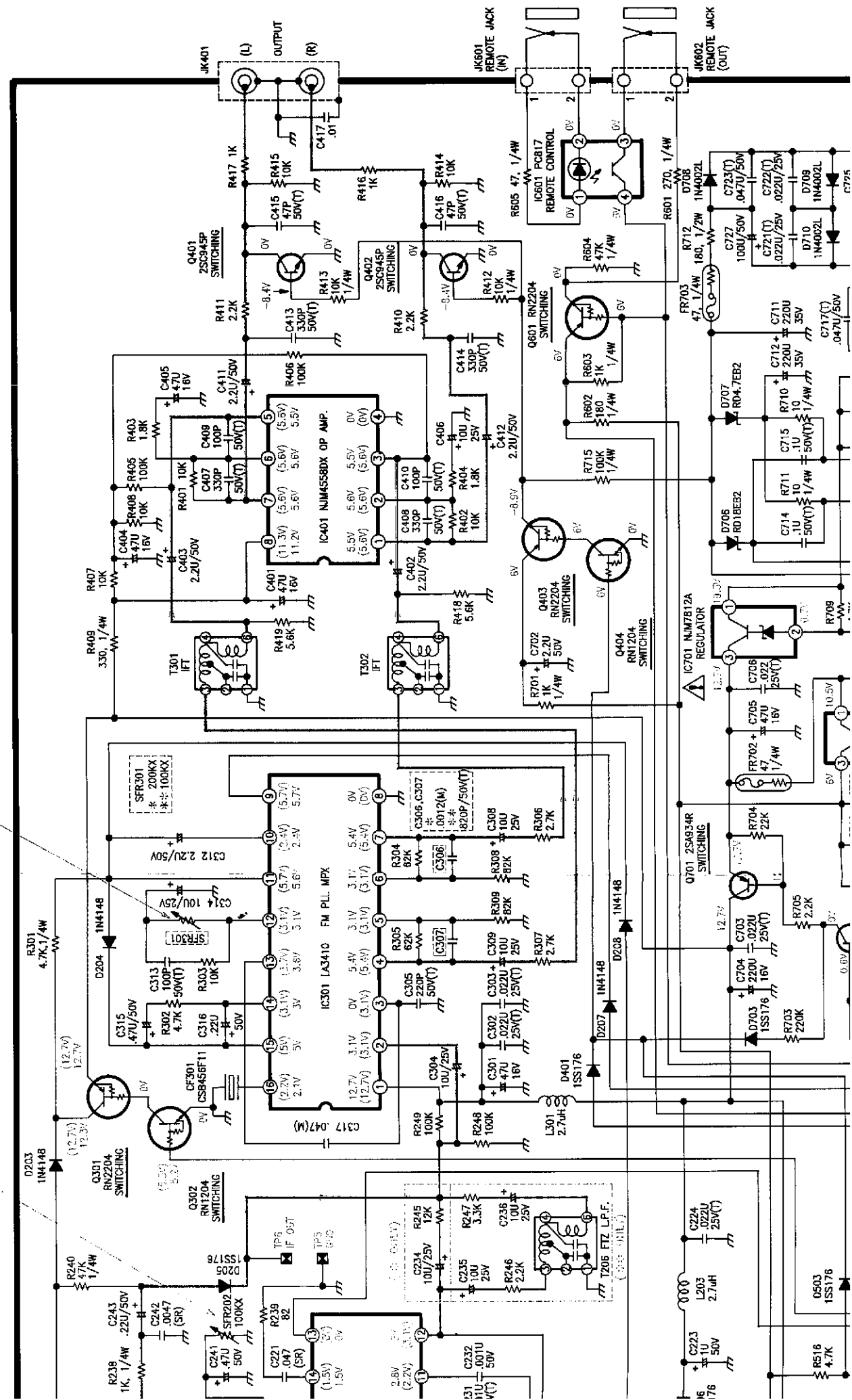
(E7) BLACK TO BOTTOM CHASSIS

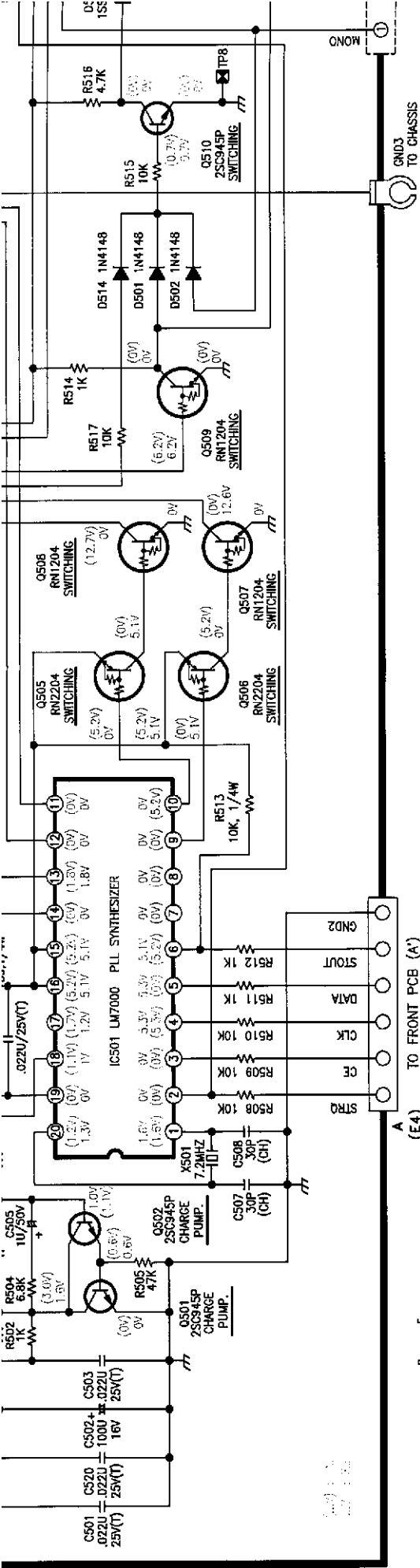
** : 230 Volts version
* : 120 Volts version

G H I J K

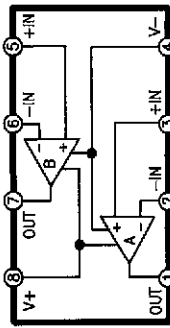
SEPARATION A.D.C.

GROUP SEPARATION A.D.C.



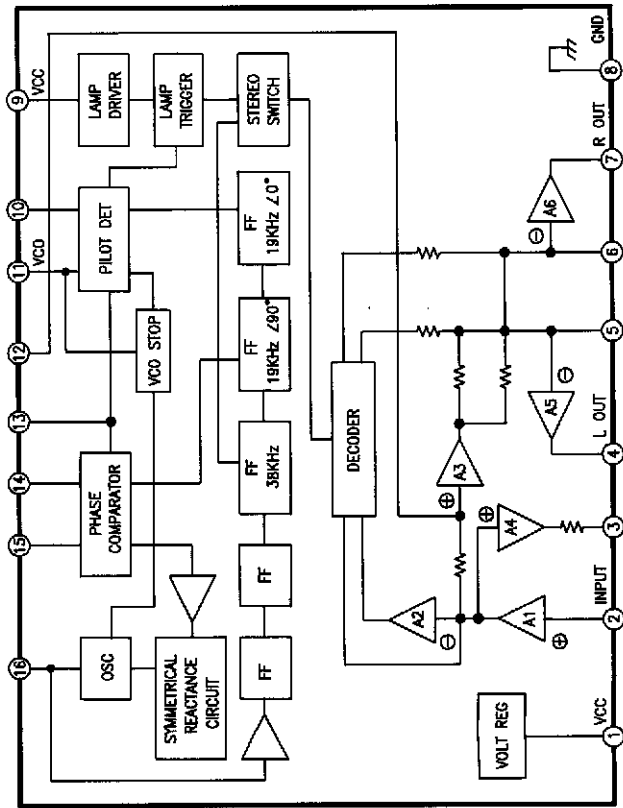
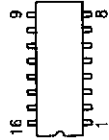


IC401 NJM4558DX
OP AMP.

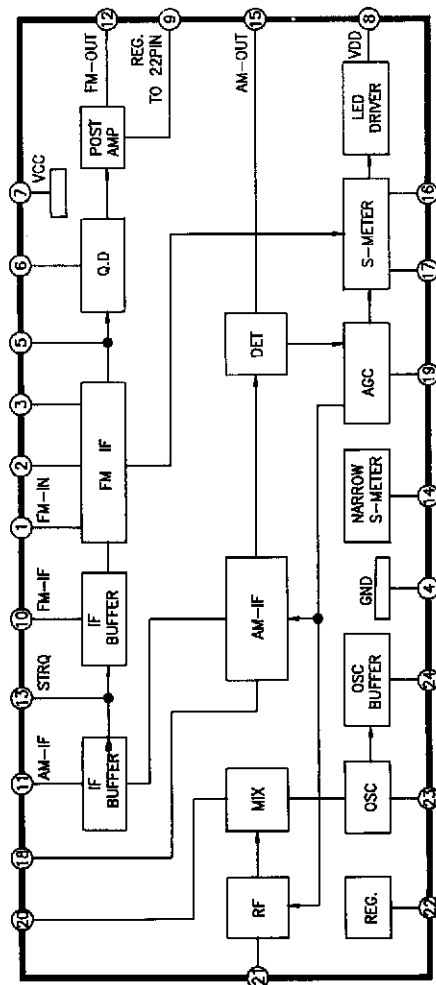
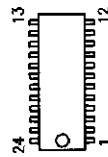


(E4) TO FRONT PCB (A')

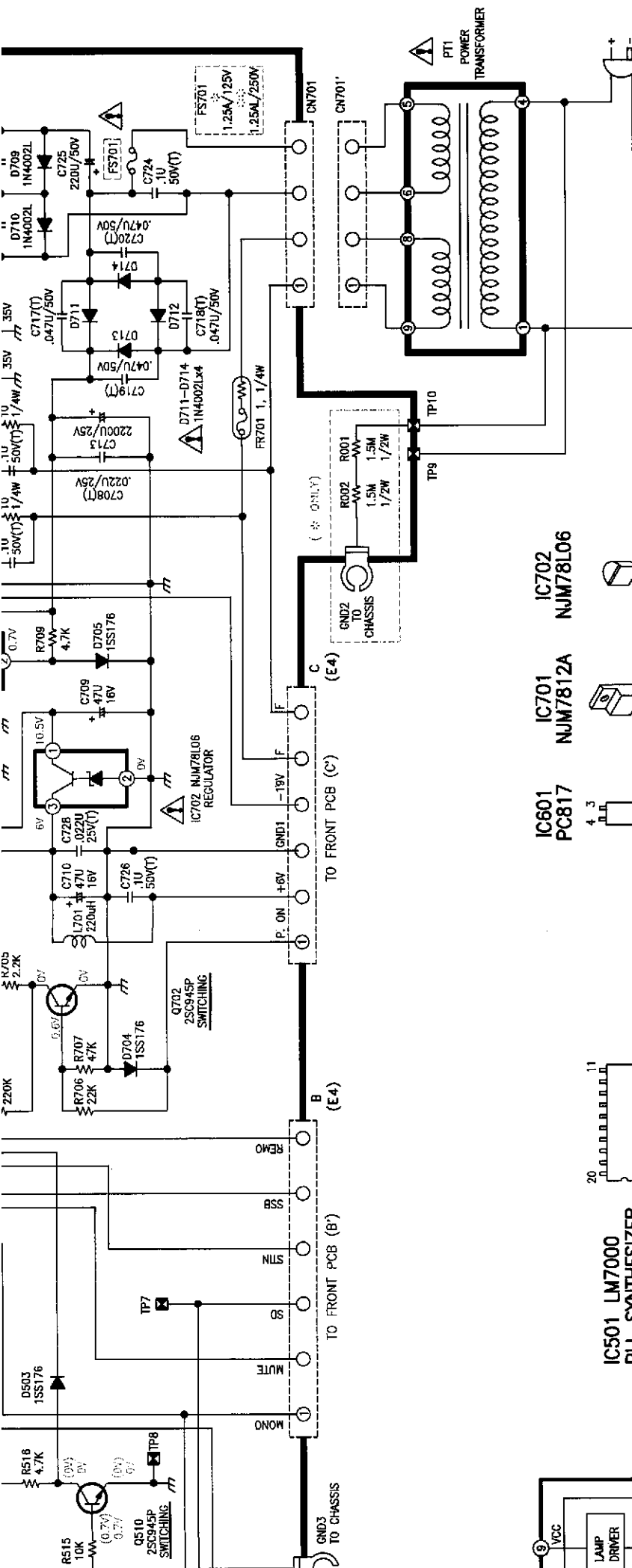
IC301 LA3410
FM PLL MPX



IC201 LA1266
AM/FM IF AMP.



57C
X IN
X OUT
FM IN
AM IN



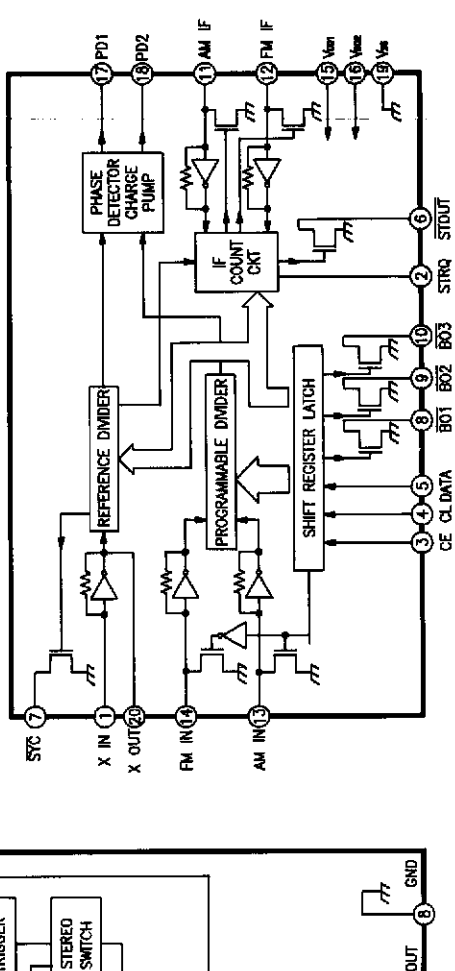
IC601 PC817
 IC701 NJM7812A
 IC702 NJM78L06
 IC501 LM7000 PLL SYNTHESIZER



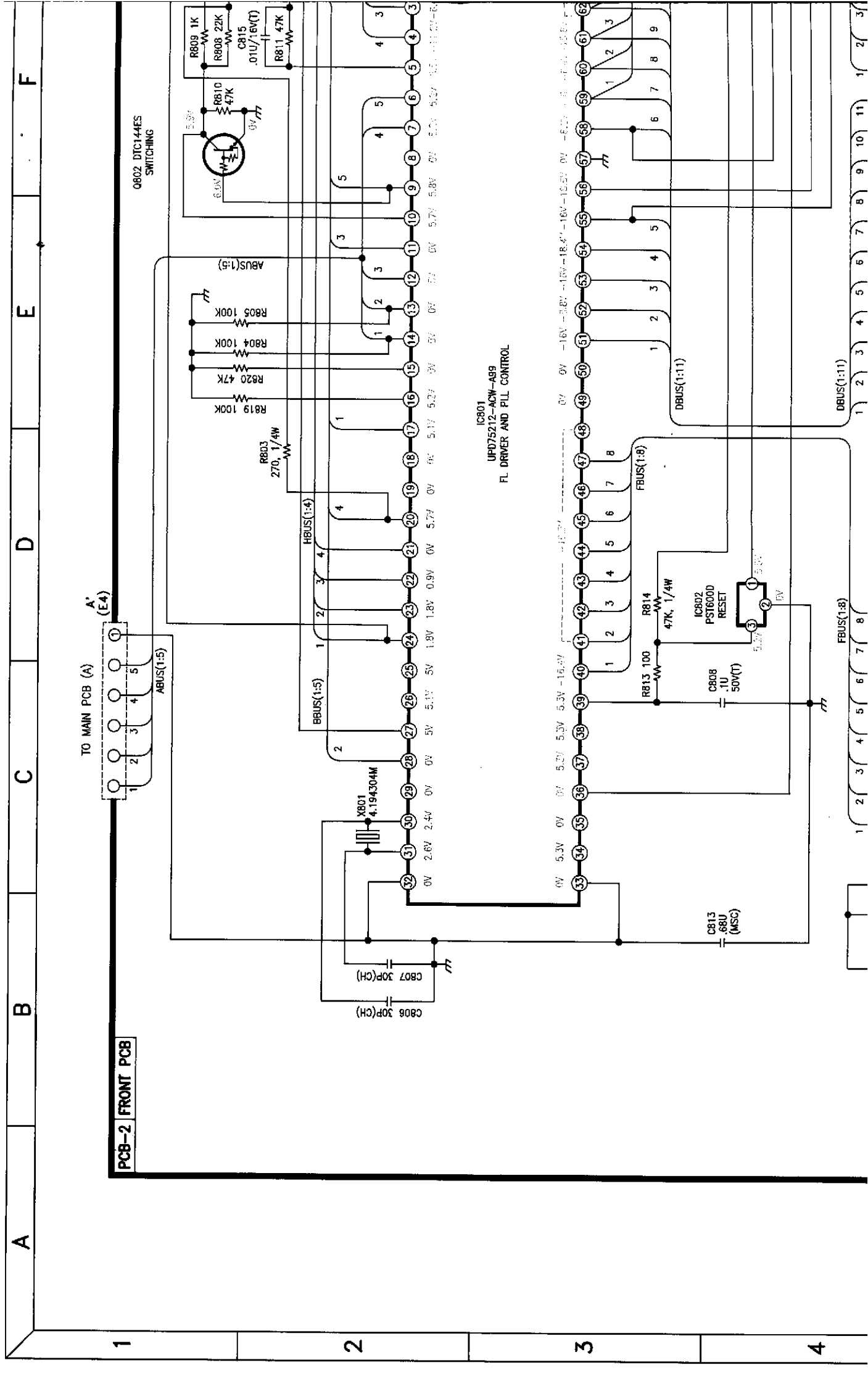
2SC945P
 2SA934R
 2SC1675L
 RN1204/DTC124ES
 RN2204/DTA124ES
 2SK192AY



NOTE:
 1. ALL RESISTANCE VALUES ARE IN Ω .
 K Ω =1000 Ω , M Ω =1000K Ω .
 2. THE WATTAGE OF RESISTORS IS 1/6W UNLESS OTHERWISE NOTED.
 3. ALL CAPACITANCE VALUES ARE IN μ F UNLESS OTHERWISE NOTED. P= μ uF.
 4. ...V-DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
 5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.



SCHEMATIC DIAGRAMS II

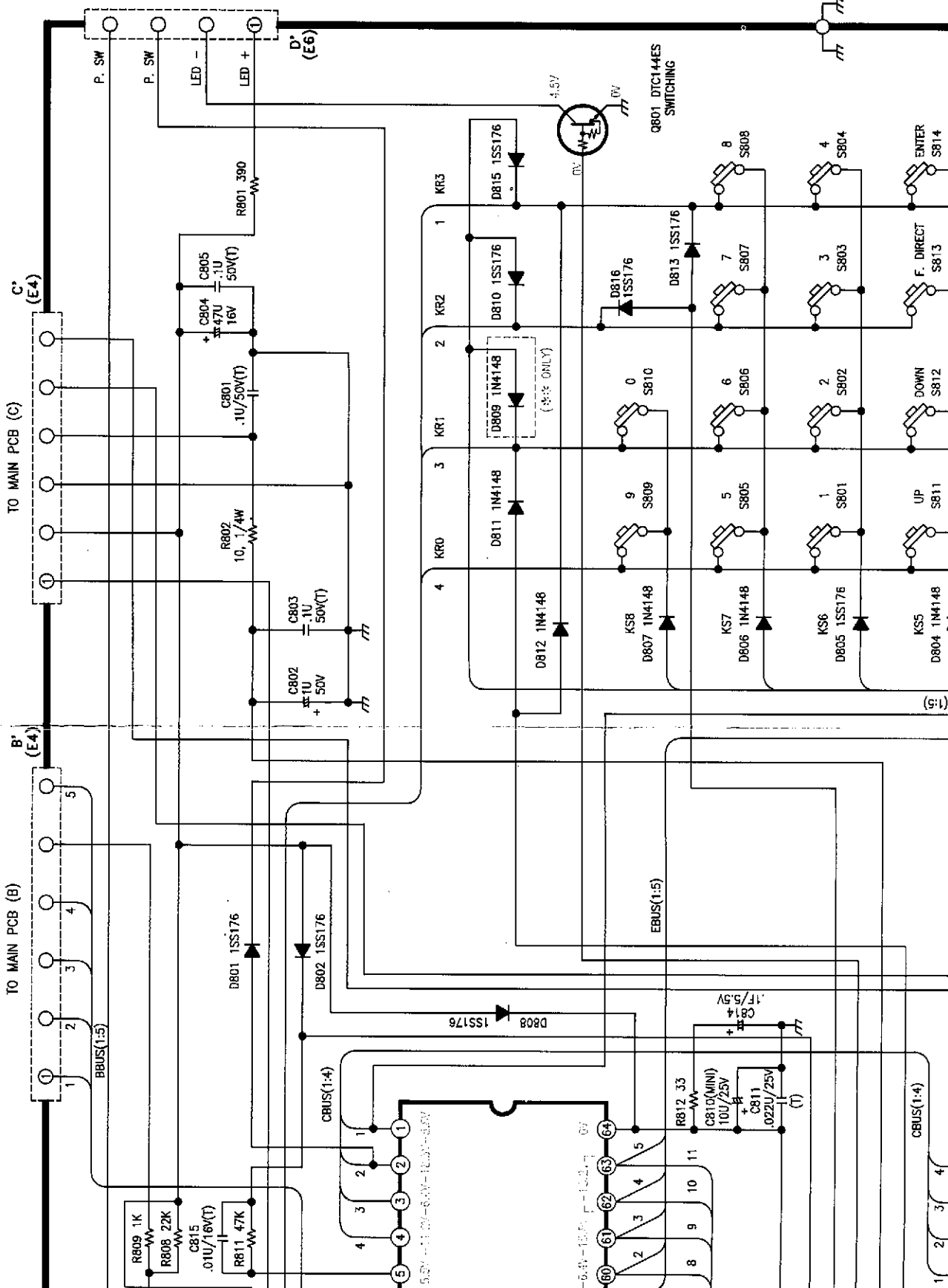
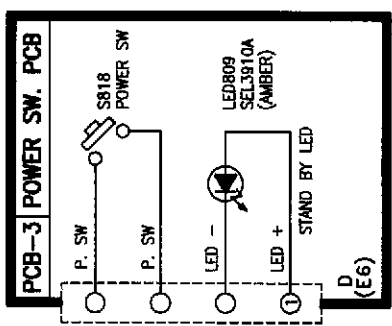


K

J

H

G



F

TO MAIN PCB (B)

TO MAIN PCB (C)

TO MAIN PCB (B)

TO MAIN PCB (B)

TO MAIN PCB (B)

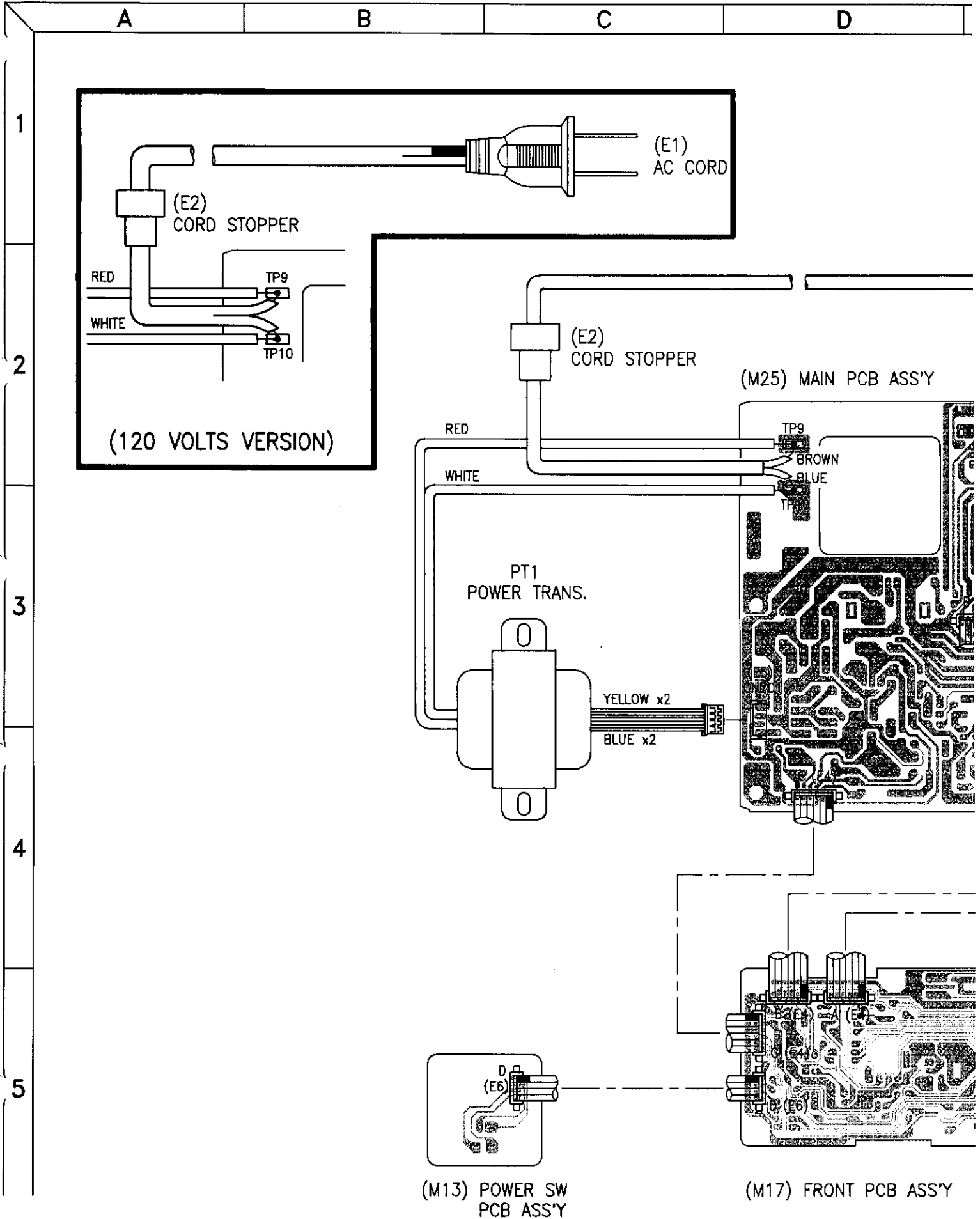
TO MAIN PCB (C)

TO MAIN PCB (B)

TO MAIN PCB (B)

F

WIRING DIAGRAM

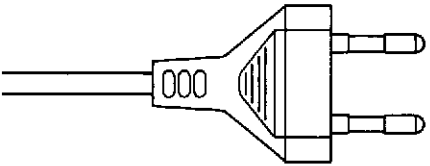


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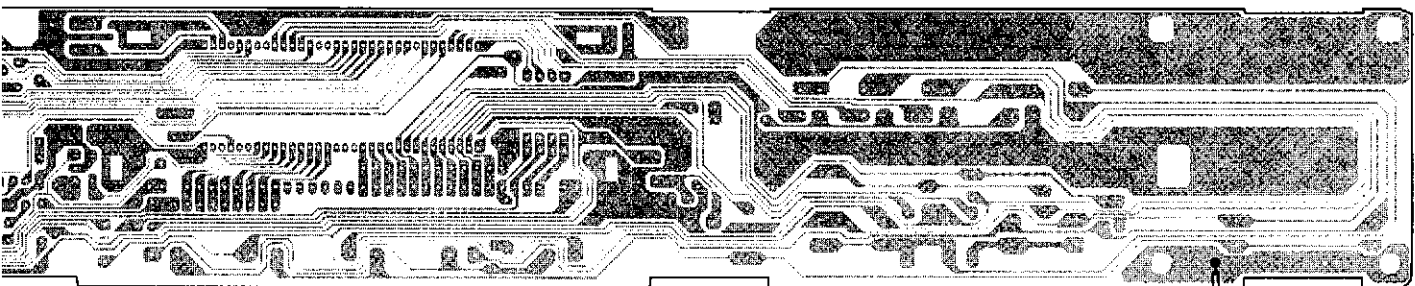
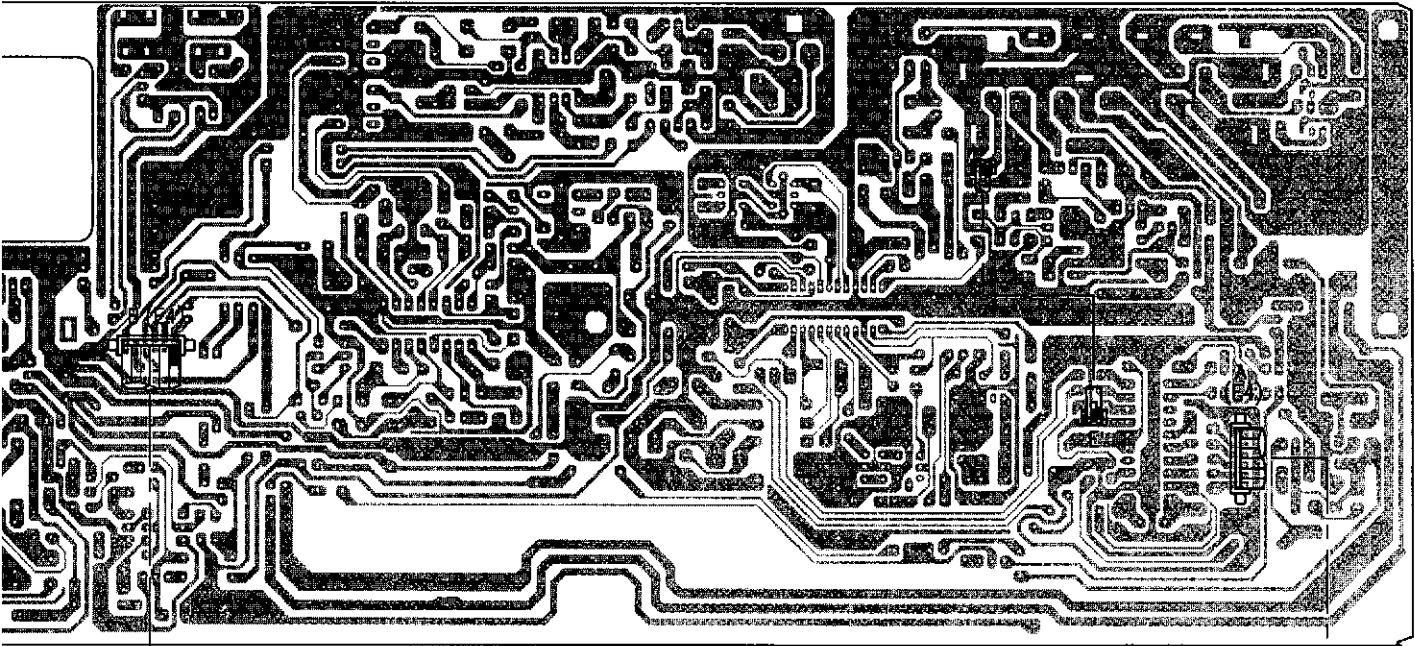
H



(E1)
AC CORD

ASS'Y

(M25) MAIN PCB ASS'Y



TO
BOTTOM
CHASSIS
BLACK

CB ASS'Y