

# **The Harman Kardon Model hk200xm**

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## **Stereo Cassette Deck**

# **Technical Manual**

**harman/kardon**

## PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.
4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.
7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

## ALIGNMENT PROCEDURES

### General Conditions (unless otherwise noted)

1. Tape Select Switch is LN position.
2. Dolby NR Switch is OFF position.
3. Dolby HX Switch is OFF position.
4. MPX Filter Switch is OFF position.
5. Input Selector Switch is LINE position.
6. Input Level Controls at maximum.
7. Output Level Control at maximum.
8. Bias Fine Trim Control at center.
9. Connect 10 k ohm (1/4W) carbon resistors across both left and right line output jacks.

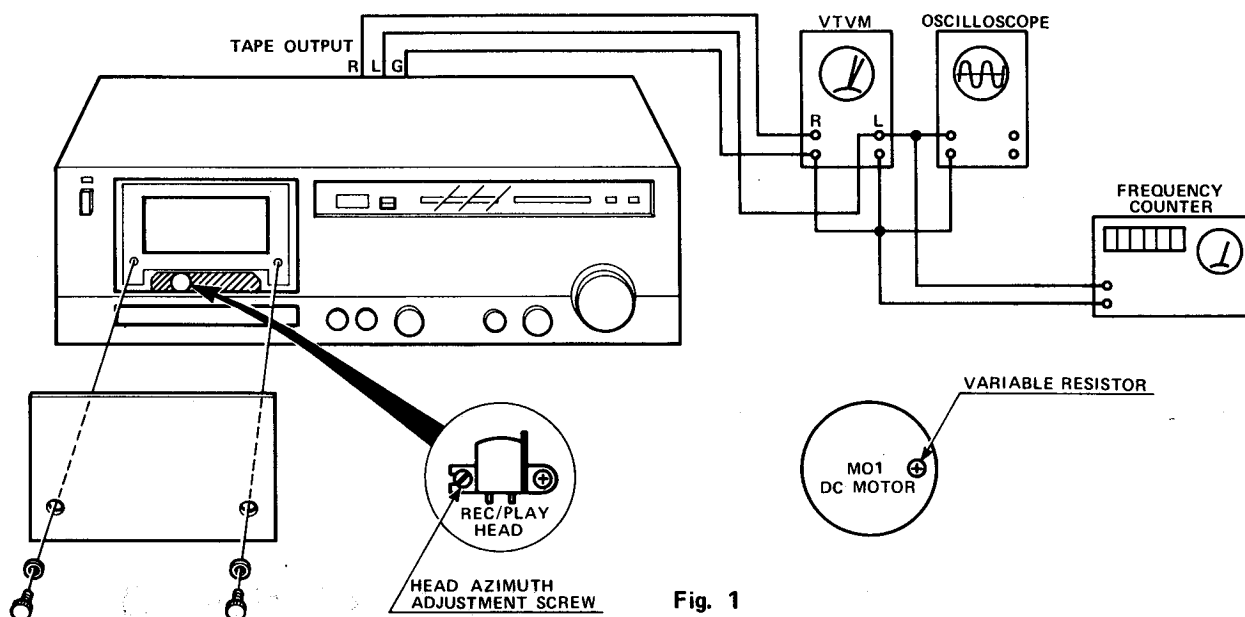


Fig. 1

Noise Reduction System and Headroom Extension System manufactured under license from Dolby Laboratories Licensing Corporation. Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

## ALIGNMENT PROCEDURES

### HEAD AZIMUTH ADJUSTMENT

**Equipment Required:** Dual Channel AC V.T.V.M. and 10 kHz Test Tape (TEAC MTT-114)

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Play back the "A" side of the test tape and adjust Head Azimuth Adjustment Screw so that the output indicated by the V.T.V.M. will be maximum and the difference of output between left and right becomes less than 1 dB.
3. Play back the "B" side of the test tape and adjust Head Azimuth Adjustment Screw for maximum output.
4. Repeat steps 2 and 3, and adjust Head Azimuth Adjustment Screw until the difference of outputs from side "A" and side "B" becomes less than 1 dB.

### TAPE SPEED ADJUSTMENT

**Equipment Required:** Frequency Counter and 3 kHz Test Tape (TEAC MTT-111D)

1. Connect frequency counter to TP3 (or TP2) and TP1 (ground).
2. Play back the test tape and adjust the variable resistor built in the DC motor for 3 kHz  $\pm 1\%$ .

### PLAYBACK AMP LEVEL ADJUSTMENT

**Equipment Required:** Dual Channel AC V.T.V.M. and Test Tape (TEAC MTT-150)

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Play back the test tape and adjust VR103 (left) and VR104 (right) so that the output will be 580 mV  $+0.5$  dB  $-0$  dB.

### PLAYBACK EQUALIZER FREQUENCY CHARACTERISTIC ADJUSTMENT

**Equipment Required:** Dual Channel AC V.T.V.M. and Test Tape (TEAC MTT-316)

1. Set tape select switch to FeCr position.
2. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
3. Play back the test tape and adjust VR101 (left), VR102 (right) so that the playback frequency response is within the range as shown in Fig. 2.

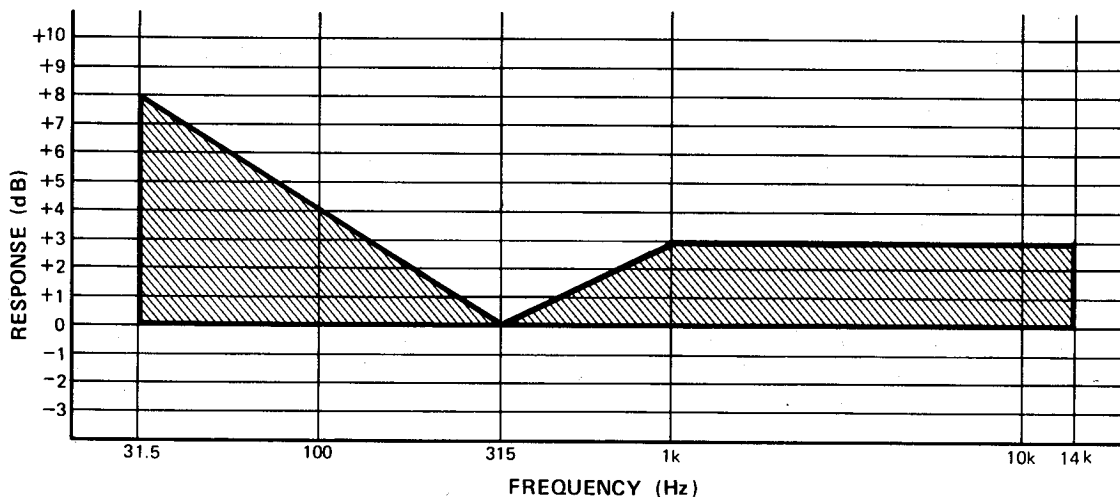


Fig. 2

## ALIGNMENT PROCEDURES

### RECORD BIAS TRAP ADJUSTMENT

**Equipment Required:** Frequency Counter and Dual Channel AC V.T.V.M.

1. Set tape select switch to METAL position.
2. Connect frequency counter and AC V.T.V.M. to TP9 and TP8 (ground).
3. Place unit in record mode.
4. Confirm that bias frequency is within the 105 kHz  $\pm$  5 kHz.
5. Connect dual channel AC V.T.V.M. to TP7 (left), TP6 (right) and TP8 (ground).
6. Place unit in record mode.
7. Adjust L303, L305 (left) and L304, L306 (right) so that the output becomes minimum.

### RECORD BIAS LEVEL ADJUSTMENT

**Equipment Required:** Audio Signal Generator, Distortion Meter, Two Dual Channel AC V.T.V.M. (1 and 2) and a Normal Blank Test Tape (TDK AC-222)

1. Connect dual channel AC V.T.V.M. 1 to TP5 (left), TP4 (right) and TP10 (ground), and connect dual channel AC V.T.V.M. 2 and distortion meter to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 1 kHz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. 2 of 580 mV.
3. Vary the bias level as read on the V.T.V.M. 1 of 42 mV, with VR601 and record on a blank test tape.
4. Play back the test tape and read the 1.3% on distortion meter.
5. If the above distortion is not obtained, adjust VR601 slightly. Repeat steps 3 and 4 until distortion on the distortion meter is adjusted 1.3%.
6. Keep note of the bias level on V.T.V.M. 1 at the time.
7. Place unit in record mode.
8. Set tape select switch to METAL position.
9. Adjust TC601 (left) and TC602 (right) so that the bias level becomes +8.8 dB of level obtained at step 6 on V.T.V.M. 1.
10. Set tape select switch to LN position.
11. Adjust VR601 so that the bias level becomes same level obtained at step 6 on V.T.V.M. 1.
12. Set tape select switch to FeCr position.
13. Adjust VR602 so that the bias level becomes +1.8 dB of level obtained at step 6.
14. Set tape select switch to CrO<sub>2</sub> position.
15. Adjust VR603 so that the bias level becomes +2.5 dB of level obtained at step 6.

### RECORD/PLAYBACK LEVEL ADJUSTMENT

**Equipment Required:** Audio Signal Generator, Dual Channel AC V.T.V.M. and a Normal (TDK AC-222), FeCr (SONY CS-30), CrO<sub>2</sub> (TDK AC-512) and Metal (SCOTCH M-1) Blank Test Tapes

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks.
3. Set tape select switch to METAL position.
4. Set the generator for a 400 Hz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV -10 dB.
5. Recording this signal on the metal blank test tape and playing it, adjust VR307 (left) and VR308 (right) by repeating record and playback so that the output on V.T.V.M. becomes 580 mV -10 dB  $\pm$  0.5 dB.
6. Adjust VR301 (left) and VR302 (right) for LN position as it is with METAL position by using normal test tape.
7. Adjust VR303 (left) and VR304 (right) for FeCr position as it is with METAL position by using FeCr test tape.
8. Adjust VR305 (left) and VR306 (right) for CrO<sub>2</sub> position as it is with METAL position by using CrO<sub>2</sub> test tape.

## ALIGNMENT PROCEDURES

### RECORD/PLAYBACK EQUALIZER FREQUENCY CHARACTERISTIC ADJUSTMENT

**Equipment Required:** Audio Signal Generator, Two Dual Channel AC V.T.V.M. (1 and 2) and a Normal, FeCr, CrO<sub>2</sub> and Metal Blank Test Tapes

1. Connect dual channel AC V.T.V.M. 1 to TP3 (left), TP2 (right) and TP1 (ground), and connect dual channel AC V.T.V.M. 2 to both left and right line output jacks.
2. Connect audio signal generator to both left and right line input jacks.
3. Set tape select switch to METAL position and Dolby NR switch to OFF position.
4. Adjust the generator input level for an output on V.T.V.M. 1 of 580 mV – 25 dB, when the unit is in recording mode.
5. Record the signal from generator on to a metal blank test tape varying the generator frequency from 20 Hz to 30 kHz.
6. Play back the metal tape recorded above, note the frequency response obtained on the V.T.V.M. 2 and compare to Fig. 3.
7. If the above frequency response is not within the shaded DOLBY-NR OFF area on Fig. 3, adjust VR315 (left), VR316 (right), L301 (left peaking) and L302 (right peaking) slightly. Repeat steps 5 and 6 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 3.
8. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 3, if not repeat DOLBY-NR OFF procedures.

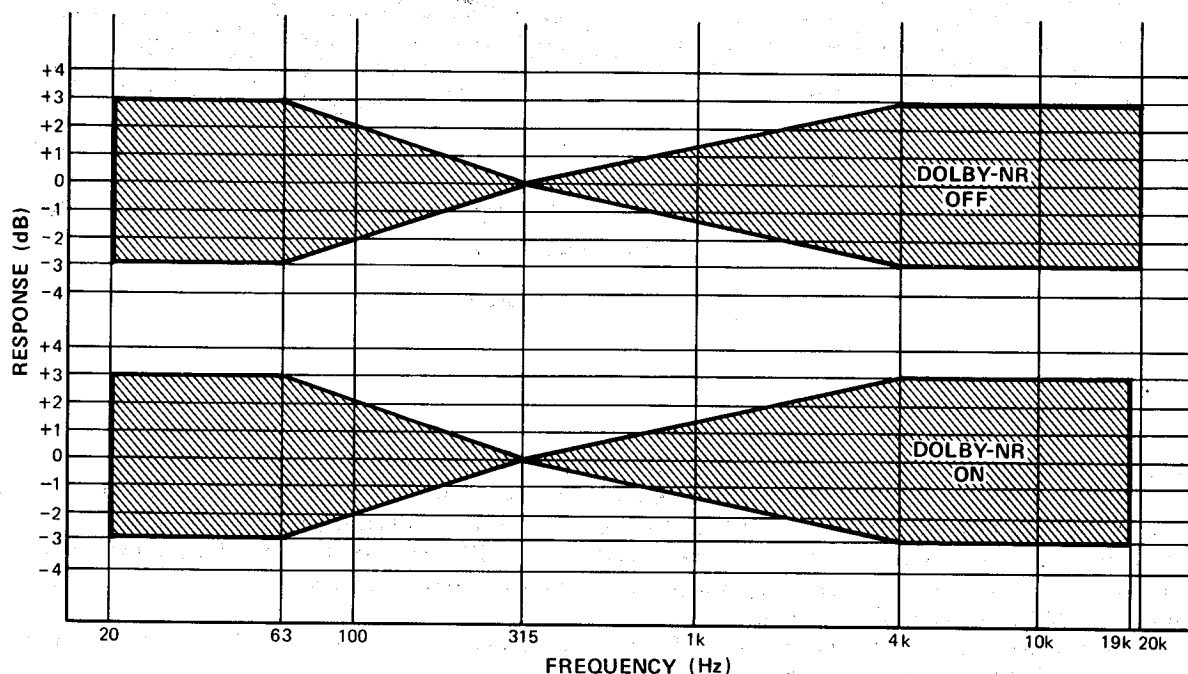


Fig. 3 – Metal

9. Set tape select switch to LN position and Dolby NR switch to OFF position.
10. Record the signal from generator on to a normal blank test tape varying the generator frequency from 20 Hz to 30 kHz.
11. Play back the normal tape recorded above and note the frequency response obtained on the V.T.V.M. 2.
12. If the above frequency response is not within the shaded DOLBY-NR OFF area of Fig. 4, adjust VR309 (left) and VR310 (right) slightly. Repeat steps 10 and 11 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 4.

## ALIGNMENT PROCEDURES

13. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 4, if not repeat DOLBY-NR OFF procedures.

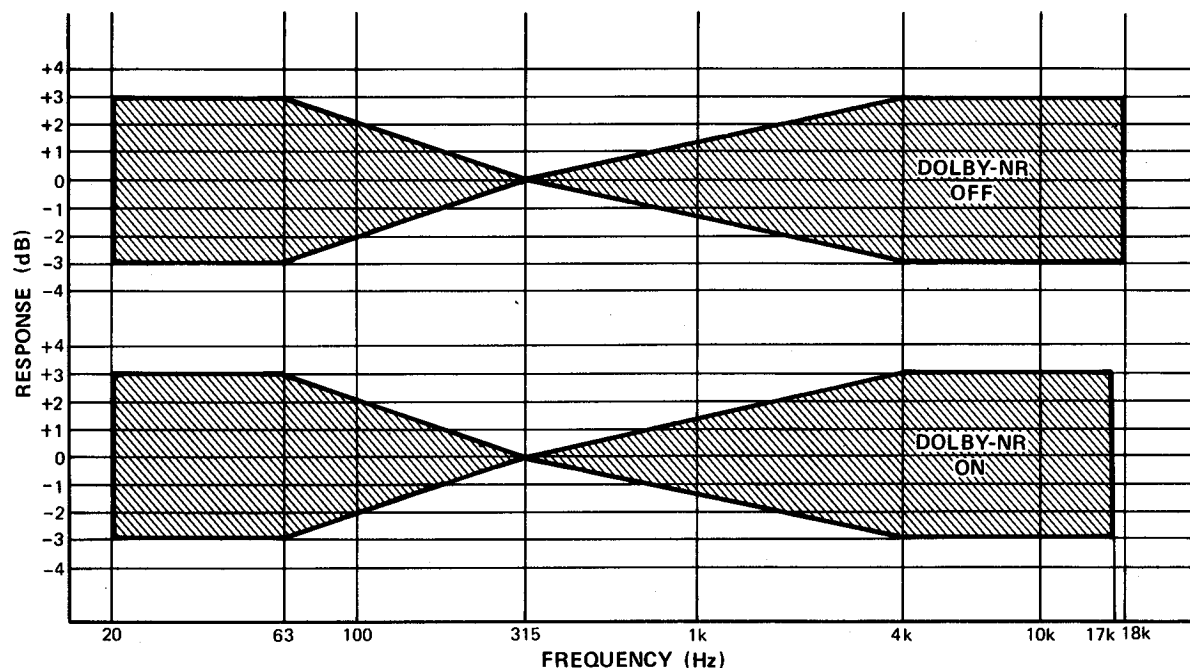


Fig. 4 – Low Noise

14. Set tape select switch to FeCr position and Dolby NR switch to OFF position.
15. Record the signal from generator on to a FeCr blank test tape varying the generator frequency from 20 Hz to 30 kHz.
16. Play back the FeCr tape recorded above and note the frequency response obtained on the V.T.V.M. 2.
17. If the above frequency response is not within the shaded DOLBY-NR OFF area of Fig. 5, adjust VR311 (left) and VR312 (right) slightly. Repeat steps 15 and 16 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 5.
18. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 5, if not repeat DOLBY-NR OFF procedures.
19. Set tape select switch to CrO<sub>2</sub> position and Dolby NR switch to OFF position.
20. Record the signal from generator on to a CrO<sub>2</sub> blank test tape varying the generator frequency from 20 Hz to 30 kHz.
21. Play back the CrO<sub>2</sub> tape recorded above and note the frequency response obtained on the V.T.V.M. 2.
22. If the above frequency response is not within the shaded DOLBY-NR OFF area of Fig. 5, adjust VR313 (left) and VR314 (right) slightly. Repeat steps 20 and 21 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 5.
23. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 5, if not repeat DOLBY-NR OFF procedures.

## ALIGNMENT PROCEDURES

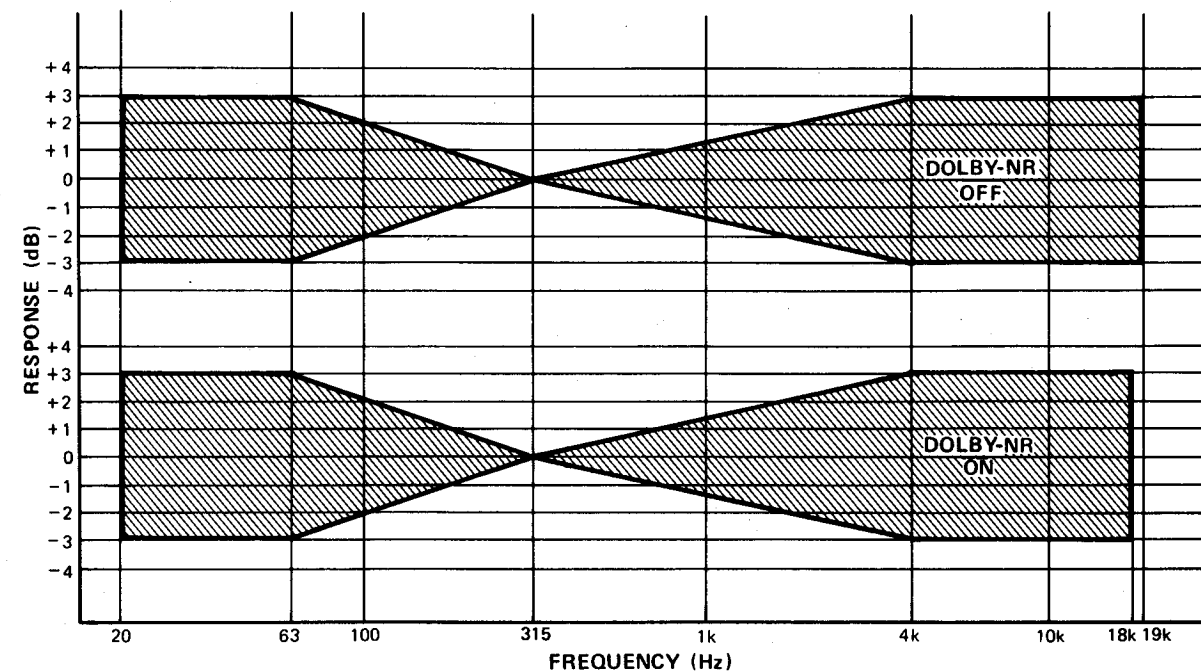


Fig. 5 – FeCr & CrO<sub>2</sub>

### DOLBY HX THRESHOLD ADJUSTMENT

**Equipment Required:** Audio Signal Generator and Two Dual Channel AC V.T.V.M. (1 and 2)

1. Connect dual channel AC V.T.V.M. 1 to TP5 (left), TP4 (right) and TP10 (ground), and connect dual channel AC V.T.V.M. 2 to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 3 kHz signal. Place unit in record mode. Adjust the generator input level for an output on V.T.V.M. 2 of 580 mV.
3. Setting Dolby HX switch to ON, adjust VR501 so that the output on V.T.V.M. 1 becomes -1.8 dB of bias level obtained at Record Bias Level Adjustment instructions.
4. Adjust VR502 for FeCr position as it is with LN position.
5. Adjust VR503 for CrO<sub>2</sub> position as it is with LN position.
6. Adjust VR504 for METAL position as it is with LN position.

### PEAK LEVEL DISPLAY SENSITIVITY ADJUSTMENT

**Equipment Required:** Audio Signal Generator and Dual Channel AC V.T.V.M.

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 400 Hz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV.
3. Adjust VR701 (left) and VR702 (right) so that the 0 dB LEDs will light.
4. Adjust generator input level for an output on the V.T.V.M. of 580 mV -20 dB.
5. Adjust VR703 (left) and VR704 (right) so that the -20 dB LEDs will light.
6. Repeat steps 3 and 5 for best sensitivity.

## ALIGNMENT PROCEDURES

### PINCH ROLLER TENSION ADJUSTMENT

Bend the adjustment point hooked by spring in the arrow directions so that the tension by pinch roller may be 390g  $\pm$  30g when keeping apart pinch roller from capstan (about 0.5 mm) and returning it to rotate. (Fig. 6)

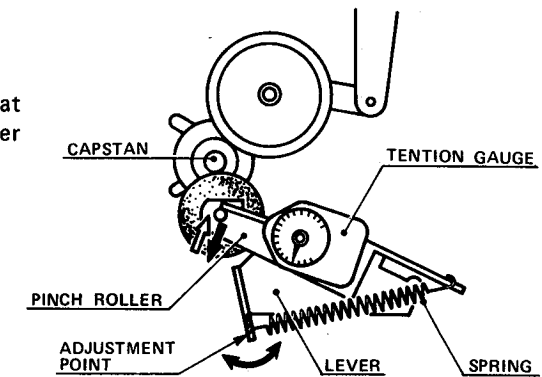


Fig. 6

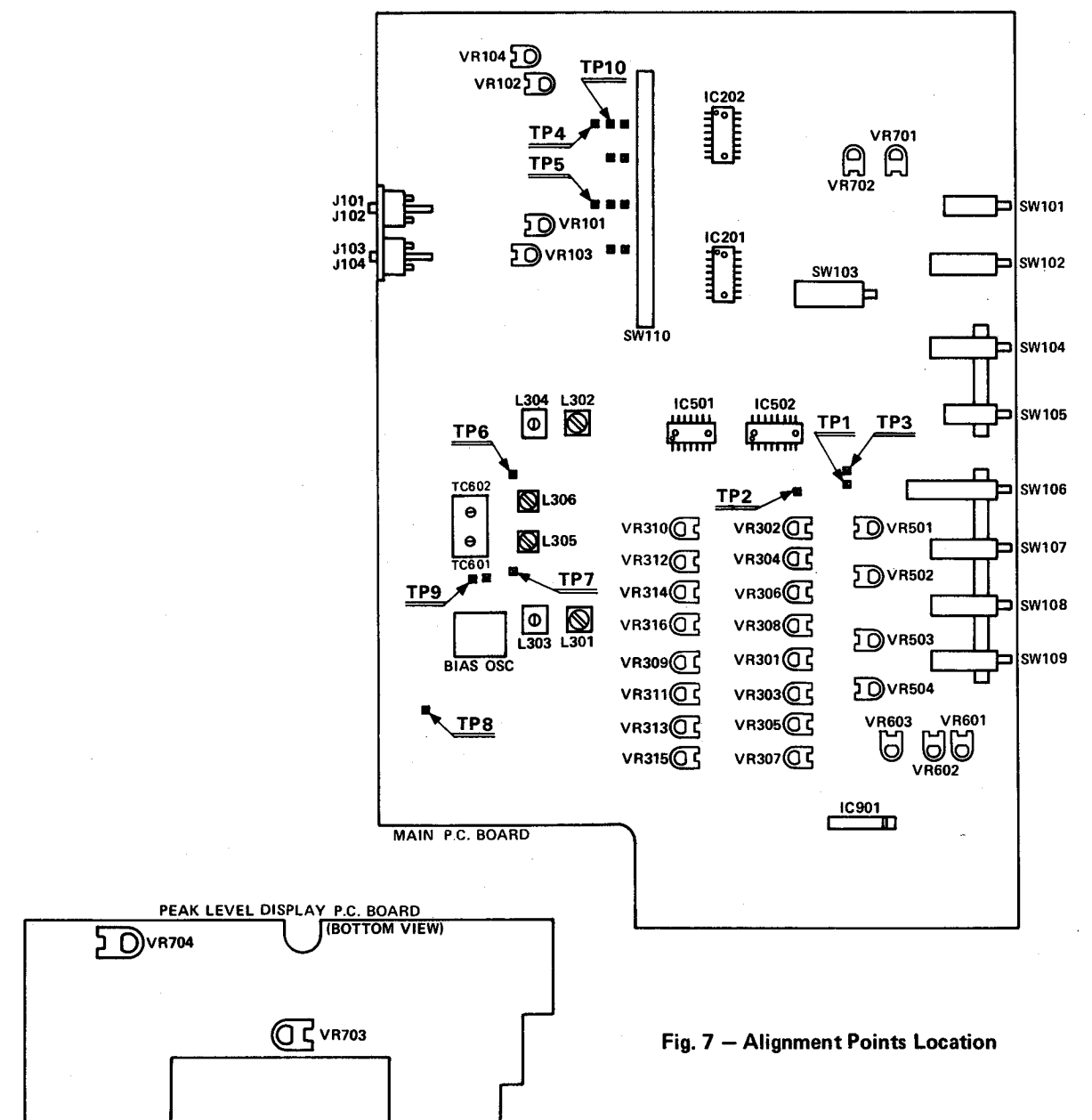


Fig. 7 – Alignment Points Location

## ALIGNMENT PROCEDURES

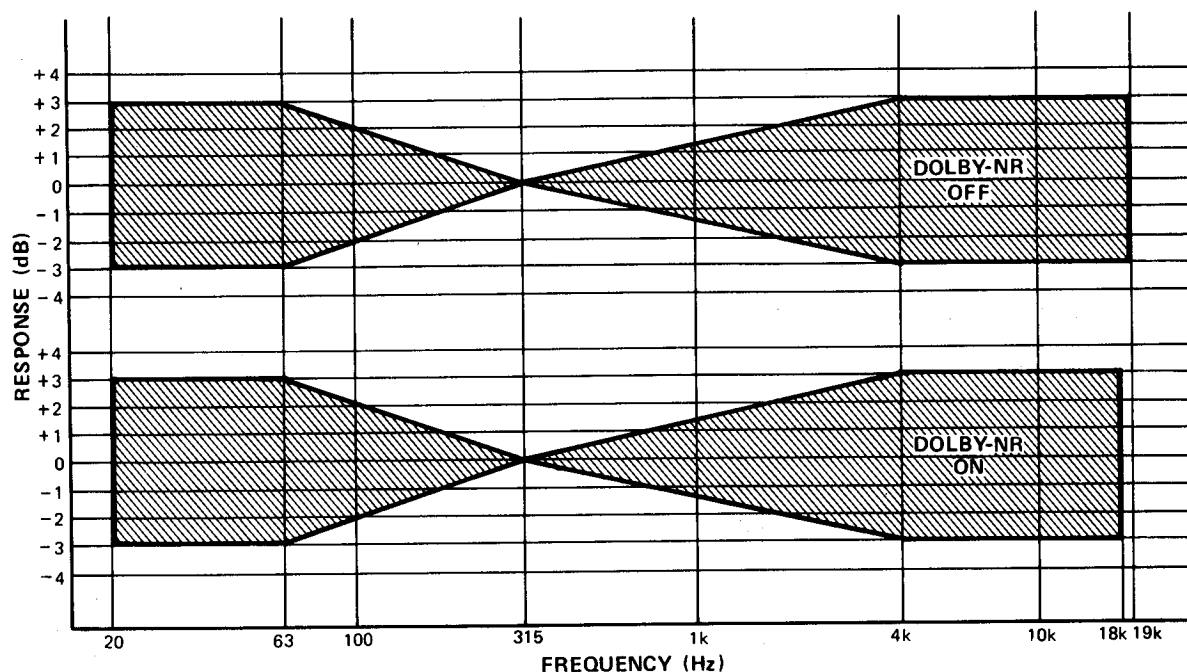


Fig. 5 — FeCr & CrO<sub>2</sub>

### DOLBY HX THRESHOLD ADJUSTMENT

**Equipment Required:** Audio Signal Generator and Two Dual Channel AC V.T.V.M. (1 and 2)

1. Connect dual channel AC V.T.V.M. 1 to TP5 (left), TP4 (right) and TP10 (ground), and connect dual channel AC V.T.V.M. 2 to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 3 kHz signal. Place unit in record mode. Adjust the generator input level for an output on V.T.V.M. 2 of 580 mV.
3. Setting Dolby HX switch to ON, adjust VR501 so that the output on V.T.V.M. 1 becomes -1.8 dB of bias level obtained at Record Bias Level Adjustment instructions.
4. Adjust VR502 for FeCr position as it is with LN position.
5. Adjust VR503 for CrO<sub>2</sub> position as it is with LN position.
6. Adjust VR504 for METAL position as it is with LN position.

### PEAK LEVEL DISPLAY SENSITIVITY ADJUSTMENT

**Equipment Required:** Audio Signal Generator and Dual Channel AC V.T.V.M.

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 400 Hz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV.
3. Adjust VR701 (left) and VR702 (right) so that the 0 dB LEDs will light.
4. Adjust generator input level for an output on the V.T.V.M. of 580 mV -20 dB.
5. Adjust VR703 (left) and VR704 (right) so that the -20 dB LEDs will light.
6. Repeat steps 3 and 5 for best sensitivity.

## ALIGNMENT PROCEDURES

### PINCH ROLLER TENSION ADJUSTMENT

Bend the adjustment point hooked by spring in the arrow directions so that the tension by pinch roller may be  $390g \pm 30g$  when keeping apart pinch roller from capstan (about 0.5 mm) and returning it to rotate. (Fig. 6)

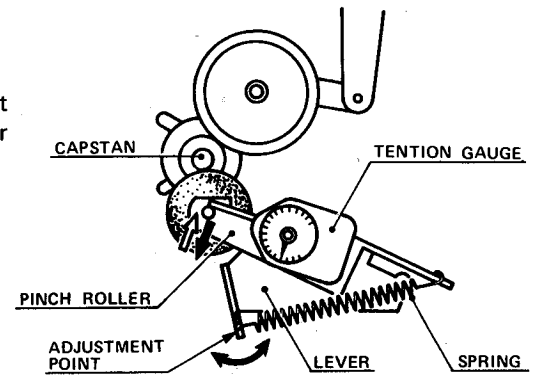


Fig. 6

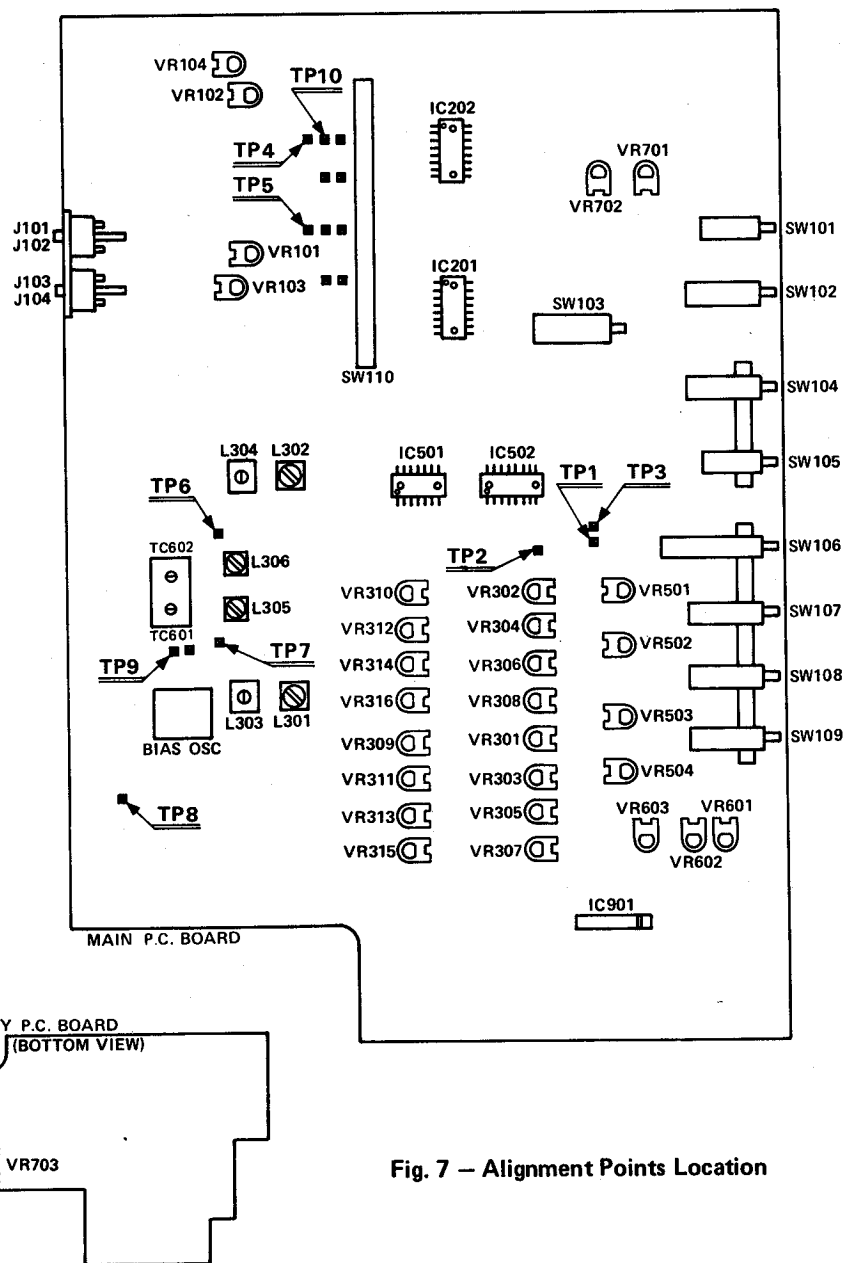
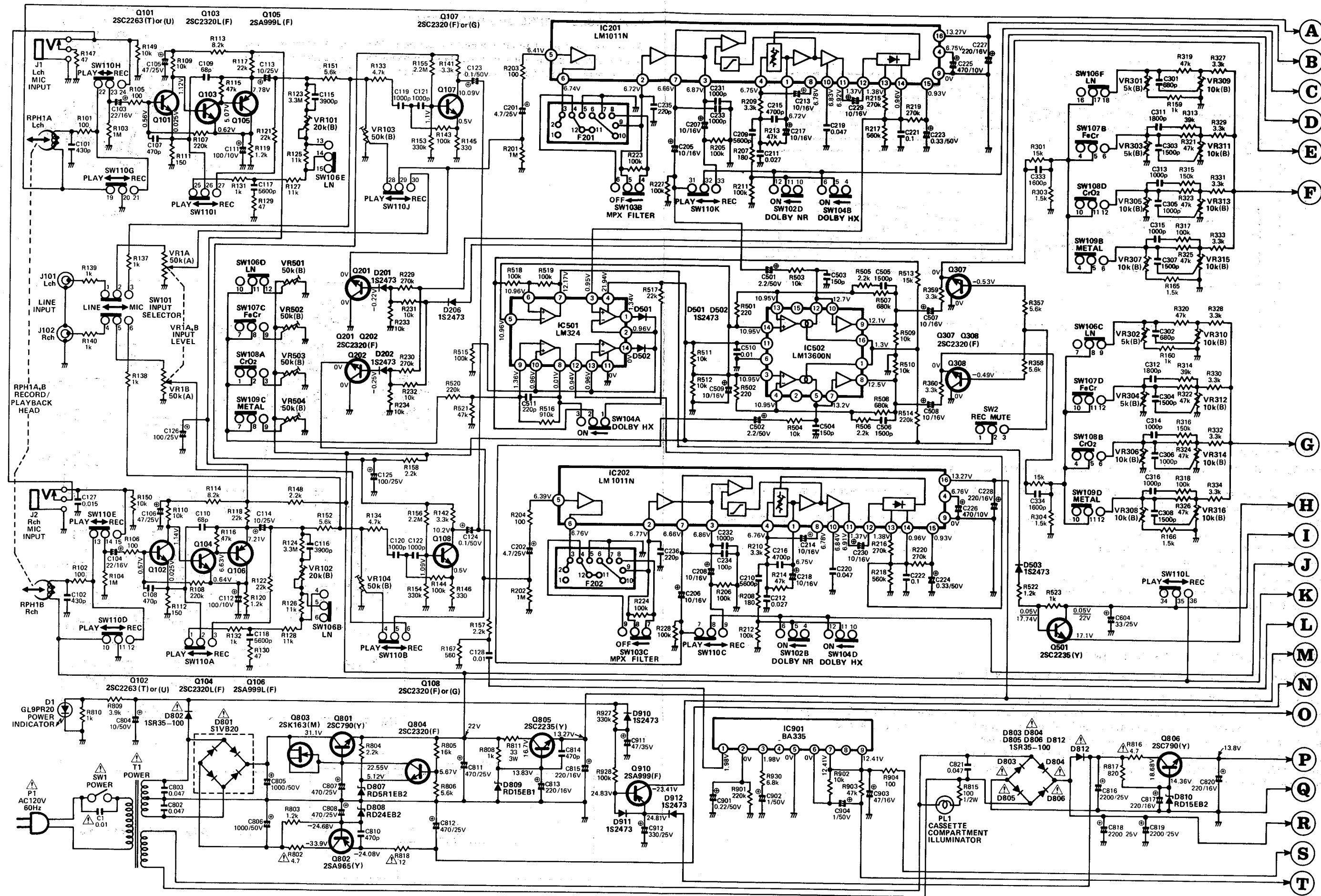
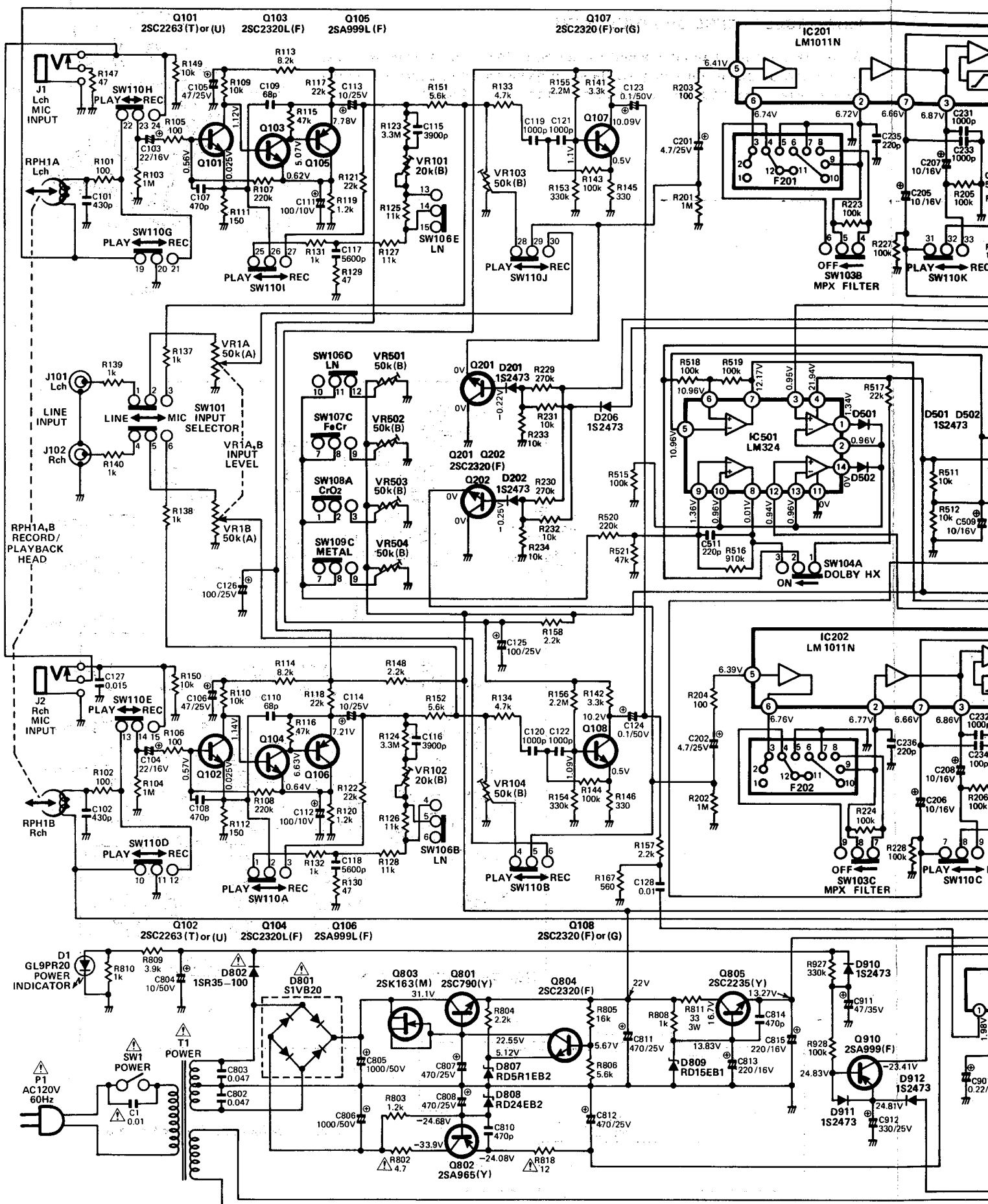


Fig. 7 – Alignment Points Location

SCHEMATIC DIAGRAM

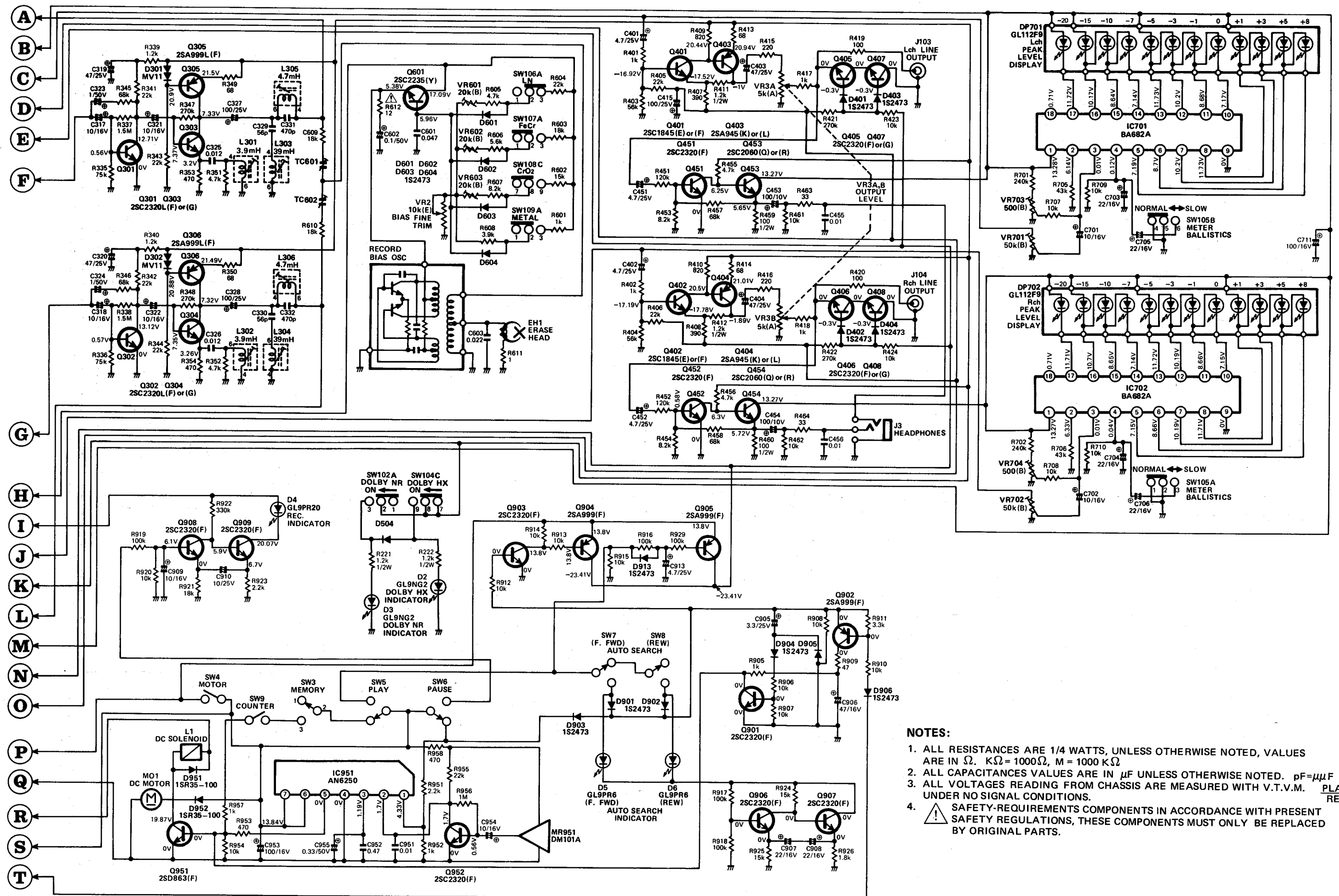


### SCHEMATIC DIAGRAM





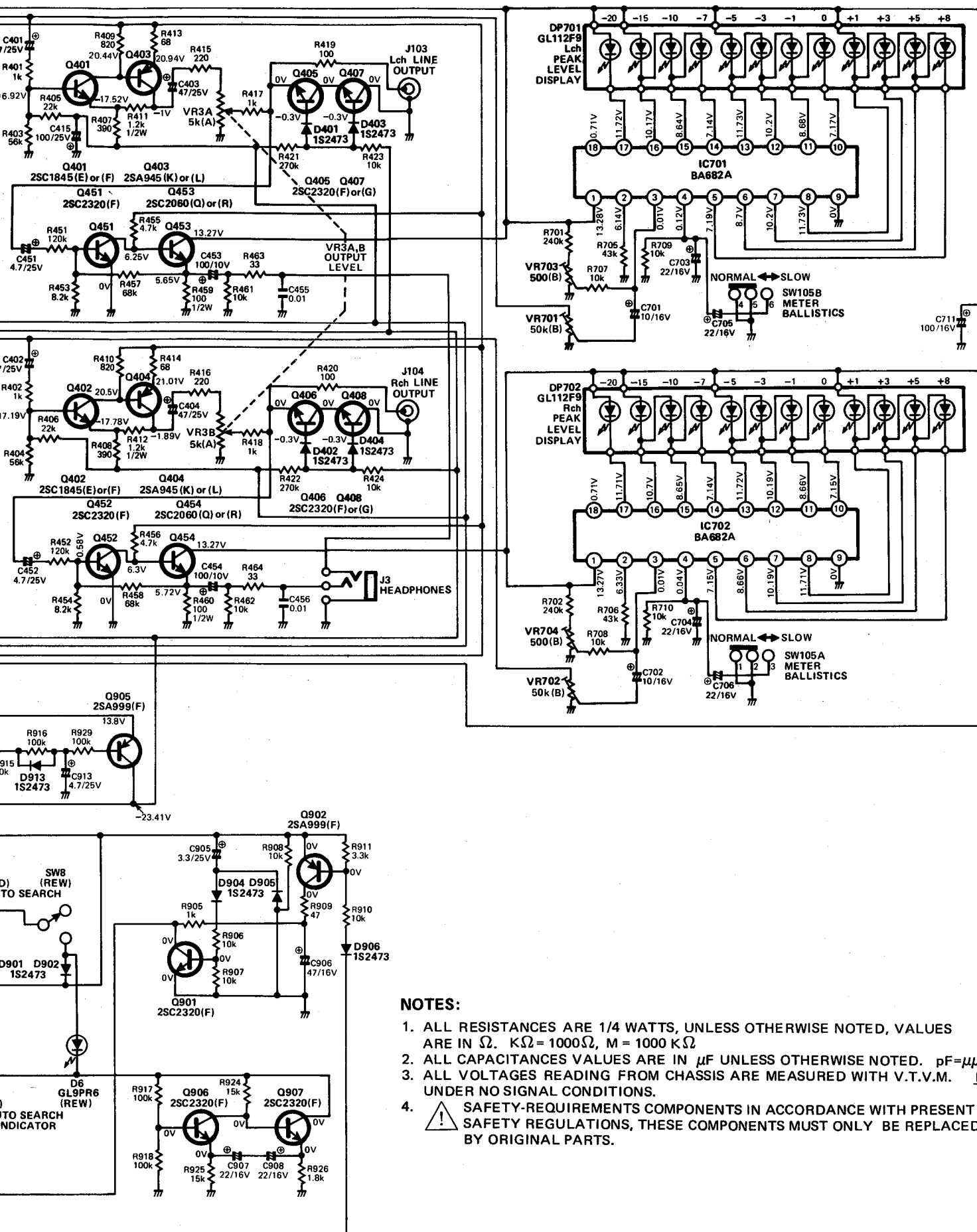
# SCHEMATIC DIAGRAM



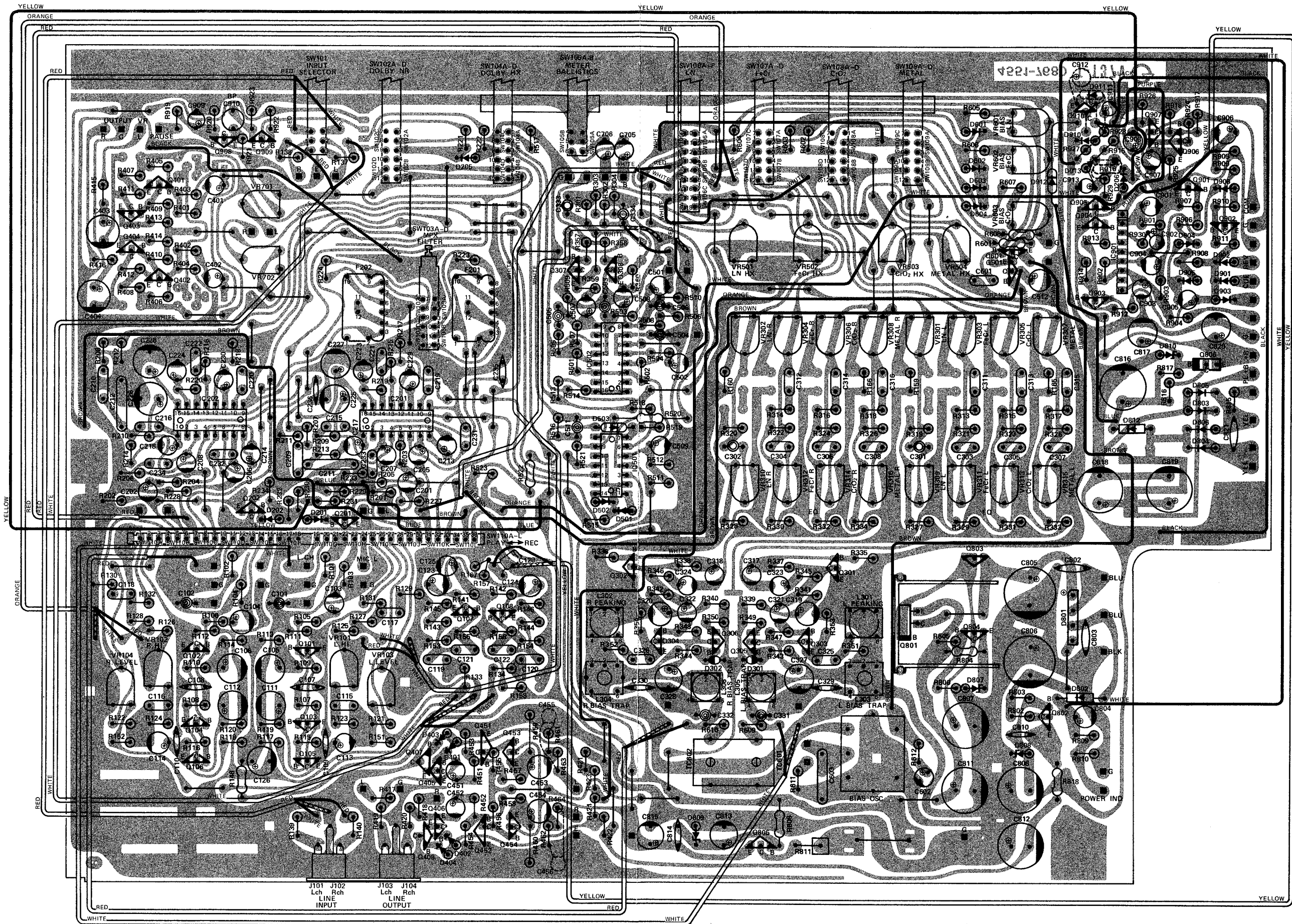
## NOTES:

1. ALL RESISTANCES ARE 1/4 WATTS, UNLESS OTHERWISE NOTED, VALUES ARE IN  $\Omega$ .  $K\Omega = 1000\Omega$ ,  $M = 1000 K\Omega$
2. ALL CAPACITANCES VALUES ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.  $pF = \mu\mu F$
3. ALL VOLTAGES READING FROM CHASSIS ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL CONDITIONS. PLAY  
REC
4. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

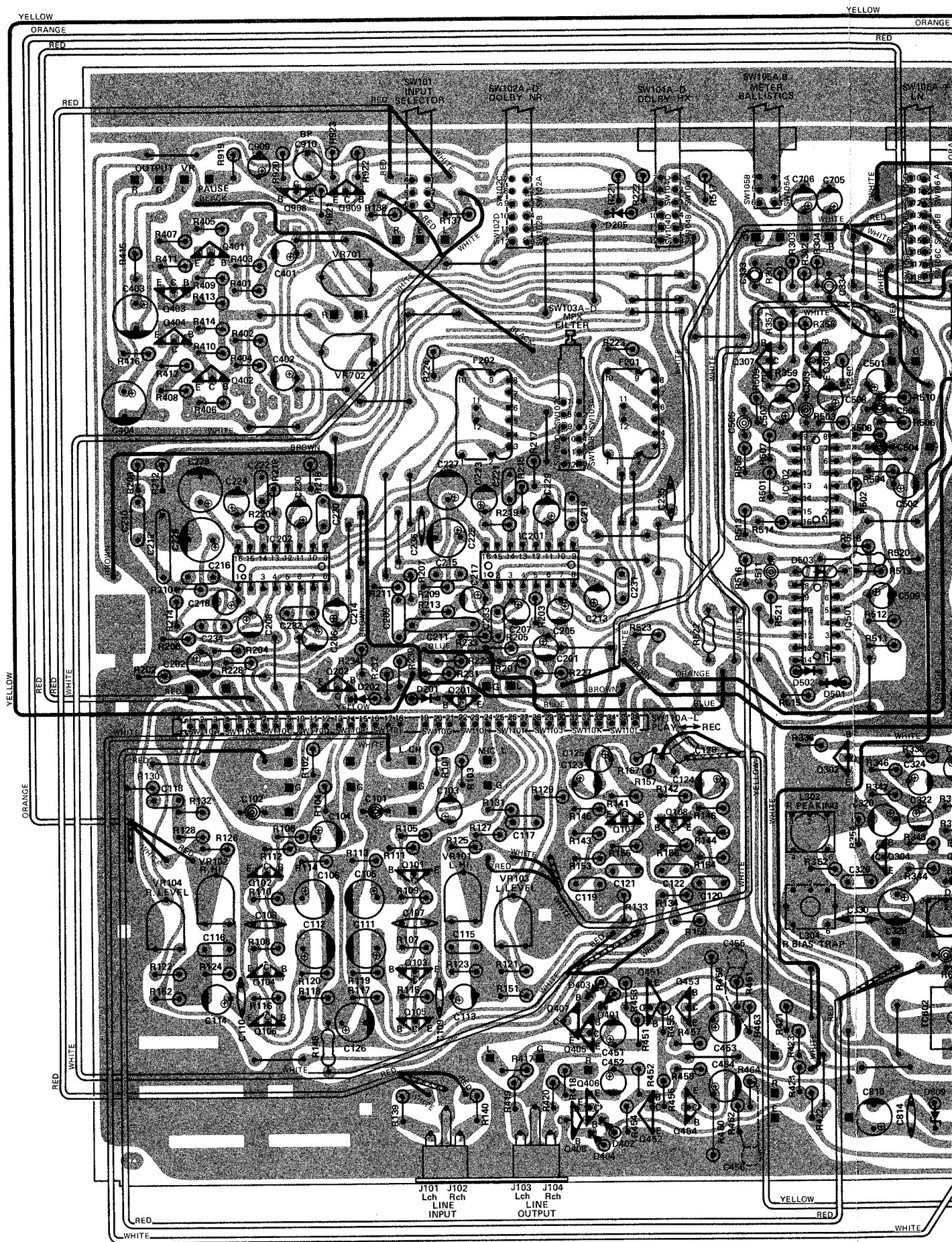




MAIN P.C. BOARD



MAIN P.C. BOARD





MAIN P.C. BOARD

| Ref. No.                                                              | Part No.      | Description                          |
|-----------------------------------------------------------------------|---------------|--------------------------------------|
| RESISTORS                                                             |               |                                      |
| R612, 818                                                             | 5102-1204713  | 12 ohm +2%—2% 1/4W Fuse              |
| R802, 816                                                             | 5102-4R74713  | 4.7 ohm +2%—2% 1/4W Fuse             |
| VR101, 102, 601, 602, 603                                             | 5101-20371913 | Variable Resistor, 20 k ohm          |
| VR103, 104, 501, 502, 503, 504, 701, 702                              | 5101-50371913 | Variable Resistor, 50 k ohm          |
| VR301, 302, 303, 304                                                  | 5101-50271913 | Variable Resistor, 5 k ohm           |
| VR305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316          | 5101-10371913 | Variable Resistor, 10 k ohm          |
| CAPACITORS, ELECTROLYTIC                                              |               |                                      |
| C103, 104, 705, 706                                                   | 5345-226C0212 | 22uF +20%—20% 16V                    |
| C105, 106, 319, 320, 403, 404                                         | 5345-476-25   | 47uF +50%—10% 25V                    |
| C111, 112, 453, 454                                                   | 5345-107-10   | 100uF +50%—10% 10V                   |
| C113, 114                                                             | 5345-106D0212 | 10uF +20%—20% 25V                    |
| C123, 124, 602                                                        | 5345-104F0212 | 0.1uF +20%—20% 50V                   |
| C125, 126                                                             | 5345-107-25   | 100uF +50%—10% 25V                   |
| C201, 202                                                             | 5345-475F0212 | 4.7uF +20%—20% 50V                   |
| C205, 206, 207, 208, 213, 214, 217, 218, 229, 230, 507, 508, 509, 909 | 5345-106-16   | 10uF +50%—10% 16V                    |
| C223, 224                                                             | 5345-334F0212 | 0.33uF +20%—20% 50V                  |
| C225, 226                                                             | 5345-477B041  | 470uF +50%—10% 10V                   |
| C227, 228, 813, 815, 817, 820                                         | 5345-227-16   | 220uF +50%—10% 16V                   |
| C317, 318, 321, 322                                                   | 5345-106C0212 | 10uF +20%—20% 16V                    |
| C323, 324, 902, 904                                                   | 5345-105-50   | 1uF +75%—10% 50V                     |
| C327, 328                                                             | 5345-107D0212 | 100uF +20%—20% 25V                   |
| C401, 402                                                             | 5345-475D0212 | 4.7uF +20%—20% 25V                   |
| C451, 452                                                             | 5345-475-25   | 4.7uF +50%—10% 25V                   |
| C501, 502                                                             | 5345-225F0212 | 2.2uF +20%—20% 50V                   |
| C604                                                                  | 5345-336-25   | 33uF +50%—10% 25V                    |
| C804                                                                  | 5345-106-50   | 10uF +50%—10% 50V                    |
| C805, 806                                                             | 5345-108-50   | 1000uF +50%—10% 50V                  |
| C807, 808, 811, 812                                                   | 5345-477D041  | 470uF +50%—10% 25V                   |
| C816, 818, 819                                                        | 5345-228-25   | 2200uF +50%—10% 25V                  |
| C901                                                                  | 5345-224F0212 | 0.22uF +20%—20% 50V                  |
| C903, 906                                                             | 5345-476-16   | 47uF +50%—10% 16V                    |
| C905                                                                  | 5345-335-25   | 3.3uF +75%—10% 25V                   |
| C907, 908                                                             | 5345-226C0211 | 22uF +20%—20% 16V                    |
| C910                                                                  | 5342-106D022  | 10uF +20%—20% 25V                    |
| C911                                                                  | 5345-476E0211 | 47uF +20%—20% 35V                    |
| C912                                                                  | 5345-337-25   | 330uF +50%—10% 25V                   |
| C913                                                                  | 5345-475D0211 | 4.7uF +20%—20% 25V                   |
| TC601, 602                                                            | 5372-61       | Trimmer Capacitor                    |
| INTEGRATED CIRCUITS                                                   |               |                                      |
| IC201, 202                                                            | 5652-LM1011N  | LM1011N Dolby NR Amp.                |
| IC501                                                                 | 5652-LM324    | LM324 Dolby HX Control               |
| IC502                                                                 | 5652-LM13600N | LM13600N Dolby HX Variable Equalizer |
| IC901                                                                 | 5654-BA335    | BA335 Signal Comparator              |
| TRANSISTORS                                                           |               |                                      |
| Q101, 102                                                             | 5613-2263(T)  | 2SC2263(T)or(U) Play Equalizer Amp.  |
| Q103, 104                                                             | 5613-2320L(F) | 2SC2320L(F) Play Equalizer Amp.      |
| Q105, 106                                                             | 5611-999L(F)  | 2SA999L(F) Play Equalizer Amp.       |
| Q107, 108                                                             | 5613-2320(F)  | 2SC2320(F)or(G) Auto Search Amp.     |
| Q201, 202                                                             | 5613-2320(F)  | 2SC2320(F) Muting                    |

MAIN P.C. BOARD

| Ref. No.                                                                                                                     | Part No.       | Description                                    |
|------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------|
| TRANSISTORS (continued)                                                                                                      |                |                                                |
| Q301, 302, 303, 304                                                                                                          | 5613-2320L(F)  | 2SC2320L(F)or(G) Rec. Equalizer Amp.           |
| Q305, 306                                                                                                                    | 5611-999L(F)   | 2SA999L(F) Rec. Equalizer Amp.                 |
| Q307, 308                                                                                                                    | 5613-2320(F)   | 2SC2320(F) Rec. Mute                           |
| Q401, 402                                                                                                                    | 5613-1845(E)   | 2SC1845(E)or(F) Line Output Amp.               |
| Q403, 404                                                                                                                    | 5611-954(K)    | 2SA954(K)or(L) Line Output Amp.                |
| Q405, 406, 407, 408                                                                                                          | 5613-2320(F)   | 2SC2320(F)or(G) Audio Muting                   |
| Q451, 452                                                                                                                    | 5613-2320(F)   | 2SC2320(F) Buffer Amp.                         |
| Q453, 454                                                                                                                    | 5613-2060(Q)   | 2SC2060(Q)or(R) Headphones Amp.                |
| Q501                                                                                                                         | 5613-2235(Y)   | 2SC2235(Y) Dolby HX Bias Control               |
| Q601                                                                                                                         | 5613-2235(Y)   | 2SC2235(Y) Bias Control                        |
| Q801, 806                                                                                                                    | 5613-790(Y)    | 2SC790(Y) Voltage Regulator                    |
| Q802                                                                                                                         | 5611-965(Y)    | 2SA965(Y) Voltage Regulator                    |
| Q803                                                                                                                         | 5616-2SK163(M) | F.E.T., 2SK163(M) Current Regulator            |
| Q804                                                                                                                         | 5613-2320(F)   | 2SC2320(F) Voltage Regulator                   |
| Q805                                                                                                                         | 5613-2235(Y)   | 2SC2235(Y) Voltage Regulator                   |
| Q901                                                                                                                         | 5613-2320(F)   | 2SC2320(F) Muting                              |
| Q902                                                                                                                         | 5611-999(F)    | 2SA999(F) Solenoid Pre-Driver                  |
| Q903                                                                                                                         | 5613-2320(F)   | 2SC2320(F) Muting Control                      |
| Q904, 905, 910                                                                                                               | 5611-999(F)    | 2SA999(F) Muting Control                       |
| Q906, 907                                                                                                                    | 5613-2320(F)   | 2SC2320(F) Auto Search Indicator Driver        |
| Q908, 909                                                                                                                    | 5613-2320(F)   | 2SC2320(F) Rec. Indicator Driver               |
| DIODES                                                                                                                       |                |                                                |
| D201, 202, 205, 206, 401, 402, 403, 404, 501, 502, 503, 601, 602, 603, 604, 901, 902, 903, 904, 905, 906, 910, 911, 912, 913 | 5631-1S2473    | 1S2473                                         |
| D301, 302                                                                                                                    | 5641-MV11      | Varistor, MV11                                 |
| D801                                                                                                                         | 5685-S1VB20    | Bridge Silicon, S1VB20                         |
| D802, 803, 804, 805, 806, 812                                                                                                | 5632-1SR35-10  | 1SR35-100                                      |
| D807                                                                                                                         | 5635-RD5R1EB2  | Zener, RD5R1EB2                                |
| D808                                                                                                                         | 5635-RD24EB2   | Zener, RD24EB2                                 |
| D809                                                                                                                         | 5635-RD15EB1   | Zener, RD15EB1                                 |
| D810                                                                                                                         | 5635-RD15EB2   | Zener, RD15EB2                                 |
| COILS                                                                                                                        |                |                                                |
| L301, 302                                                                                                                    | 5933-70316     | 3.9 mH Peaking                                 |
| L303, 304                                                                                                                    | 5633-70214     | 39 mH Bias Trap                                |
| L305, 306                                                                                                                    | 5933-70416     | 4.7 mH Bias Trap                               |
| MISCELLANEOUS                                                                                                                |                |                                                |
| F201, 202                                                                                                                    | 6171-0401      | Complex, Bias Oscillator                       |
| SW101                                                                                                                        | 5214-18        | LC Components, MPX Filter                      |
| SW102A-D, 103A-D                                                                                                             | 4431-01027194  | Push Switch, Input Selector                    |
| SW104A-D, 105A,B                                                                                                             | 4431-01047794  | Push Switch, Dolby NR, MPX Filter              |
| SW106A-F, 107A-D, 108A-D, 109A-D                                                                                             | 4431-02067157  | 2-Gang Push Switch, Dolby HX, Meter Ballistics |
| SW110A-L                                                                                                                     | 4431-04187157  | 4-Gang Push Switch, Tape Selector              |
| J101, 102, 103, 104                                                                                                          | 4421-122718    | Slide Switch, Record/Playback                  |
|                                                                                                                              | 4484-24        | 4-Pin Jack, Line Input & Line Output           |

# MAIN P.C. BOARD

| Ref. No.                                                           | Part No.      | Description                 |
|--------------------------------------------------------------------|---------------|-----------------------------|
| <b>RESISTORS</b>                                                   |               |                             |
| R612, 818                                                          | 5102-1204713  | 12 ohm +2%—2% 1/4W Fuse     |
| R802, 816                                                          | 5102-4R74713  | 4.7 ohm +2%—2% 1/4W Fuse    |
| VR101, 102, 601, 602,<br>603                                       | 5101-20371913 | Variable Resistor, 20 k ohm |
| VR103, 104, 501, 502,<br>503, 504, 701, 702                        | 5101-50371913 | Variable Resistor, 50 k ohm |
| VR301, 302, 303, 304                                               | 5101-50271913 | Variable Resistor, 5 k ohm  |
| VR305, 306, 307, 308,<br>309, 310, 311, 312,<br>313, 314, 315, 316 | 5101-10371913 | Variable Resistor, 10 k ohm |

|                                                                                |               |                     |
|--------------------------------------------------------------------------------|---------------|---------------------|
| <b>CAPACITORS, ELECTROLYTIC</b>                                                |               |                     |
| C103, 104, 705, 706                                                            | 5345-226C0212 | 22uF +20%—20% 16V   |
| C105, 106, 319, 320,<br>403, 404                                               | 5345-476-25   | 47uF +50%—10% 25V   |
| C111, 112, 453, 454                                                            | 5345-107-10   | 100uF +50%—10% 10V  |
| C113, 114                                                                      | 5345-106D0212 | 10uF +20%—20% 25V   |
| C123, 124, 602                                                                 | 5345-104F0212 | 0.1uF +20%—20% 50V  |
| C125, 126                                                                      | 5345-107-25   | 100uF +50%—10% 25V  |
| C201, 202                                                                      | 5345-475F0212 | 4.7uF +20%—20% 50V  |
| C205, 206, 207, 208,<br>213, 214, 217, 218,<br>229, 230, 507, 508,<br>509, 909 | 5345-106-16   | 10uF +50%—10% 16V   |
| C223, 224                                                                      | 5345-334F0212 | 0.33uF +20%—20% 50V |
| C225, 226                                                                      | 5345-477B041  | 470uF +50%—10% 10V  |
| C227, 228, 813, 815,<br>817, 820                                               | 5345-227-16   | 220uF +50%—10% 16V  |
| C317, 318, 321, 322                                                            | 5345-106C0212 | 10uF +20%—20% 16V   |
| C323, 324, 902, 904                                                            | 5345-105-50   | 1uF +75%—10% 50V    |
| C327, 328                                                                      | 5345-107D0212 | 100uF +20%—20% 25V  |
| C401, 402                                                                      | 5345-475D0212 | 4.7uF +20%—20% 25V  |
| C451, 452                                                                      | 5345-475-25   | 4.7uF +50%—10% 25V  |
| C501, 502                                                                      | 5345-225F0212 | 2.2uF +20%—20% 50V  |
| C604                                                                           | 5345-336-25   | 33uF +50%—10% 25V   |
| C804                                                                           | 5345-106-50   | 10uF +50%—10% 50V   |
| C805, 806                                                                      | 5345-108-50   | 1000uF +50%—10% 50V |
| C807, 808, 811, 812                                                            | 5345-477D041  | 470uF +50%—10% 25V  |
| C816, 818, 819                                                                 | 5345-228-25   | 2200uF +50%—10% 25V |
| C901                                                                           | 5345-224F0212 | 0.22uF +20%—20% 50V |
| C903, 906                                                                      | 5345-476-16   | 47uF +50%—10% 16V   |
| C905                                                                           | 5345-335-25   | 3.3uF +75%—10% 25V  |
| C907, 908                                                                      | 5345-226C0211 | 22uF +20%—20% 16V   |
| C910                                                                           | 5342-106D022  | 10uF +20%—20% 25V   |
| C911                                                                           | 5345-476E0211 | 47uF +20%—20% 35V   |
| C912                                                                           | 5345-337-25   | 330uF +50%—10% 25V  |
| C913                                                                           | 5345-475D0211 | 4.7uF +20%—20% 25V  |
| TC601, 602                                                                     | 5372-61       | Trimmer Capacitor   |

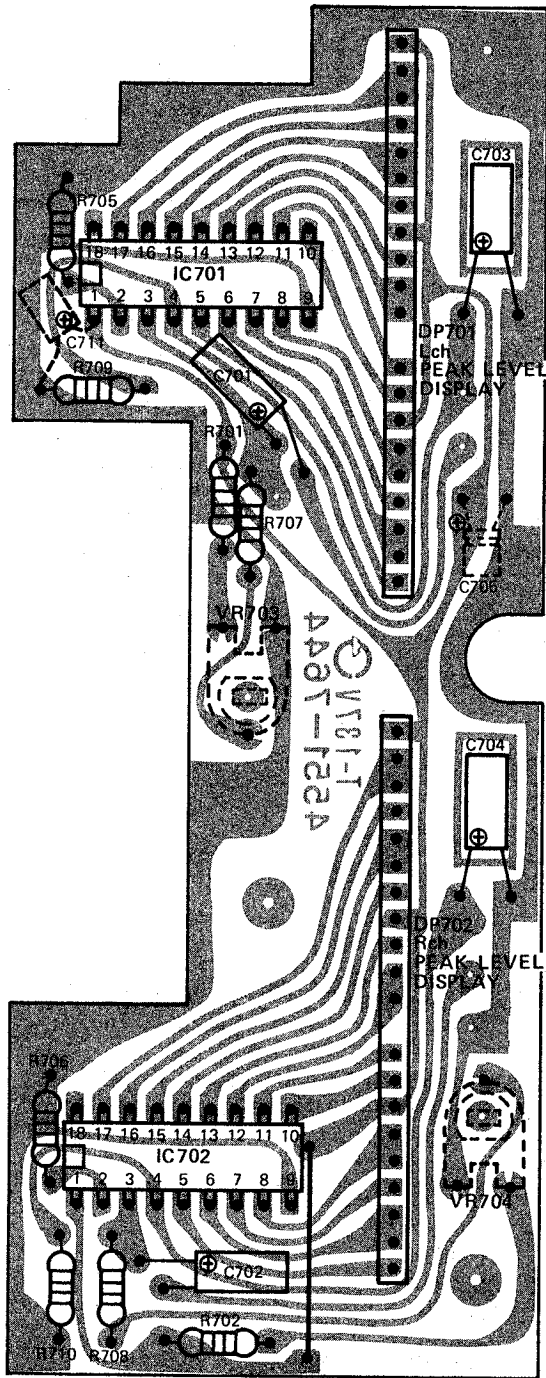
|                            |               |                                      |
|----------------------------|---------------|--------------------------------------|
| <b>INTEGRATED CIRCUITS</b> |               |                                      |
| IC201, 202                 | 5652-LM1011N  | LM1011N Dolby NR Amp.                |
| IC501                      | 5652-LM324    | LM324 Dolby HX Control               |
| IC502                      | 5652-LM13600N | LM13600N Dolby HX Variable Equalizer |
| IC901                      | 5654-BA335    | BA335 Signal Comparator              |

|                    |               |                                     |
|--------------------|---------------|-------------------------------------|
| <b>TRANSISTORS</b> |               |                                     |
| Q101, 102          | 5613-2263(T)  | 2SC2263(T)or(U) Play Equalizer Amp. |
| Q103, 104          | 5613-2320L(F) | 2SC2320L(F) Play Equalizer Amp.     |
| Q105, 106          | 5611-999L(F)  | 2SA999L(F) Play Equalizer Amp.      |
| Q107, 108          | 5613-2320(F)  | 2SC2320(F)or(G) Auto Search Amp.    |
| Q201, 202          | 5613-2320(F)  | 2SC2320(F) Muting                   |

# MAIN P.C. BOARD

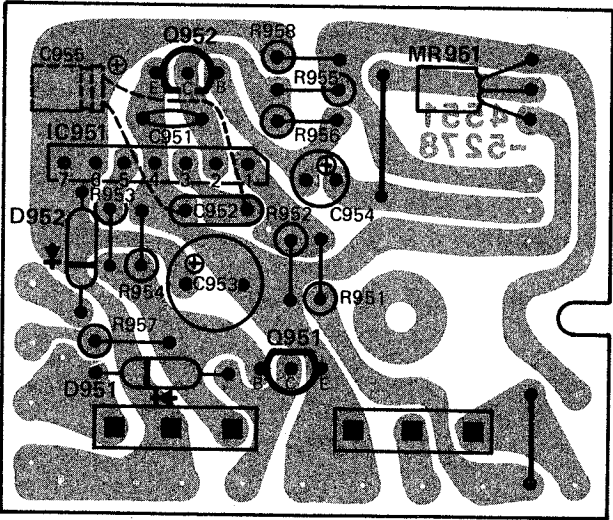
| Ref. No.                                                                                                                                       | Part No.       | Description                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------|
| <b>TRANSISTORS (continued)</b>                                                                                                                 |                |                                                |
| Q301, 302, 303, 304                                                                                                                            | 5613-2320L(F)  | 2SC2320L(F)or(G) Rec. Equalizer Amp.           |
| Q305, 306                                                                                                                                      | 5611-999L(F)   | 2SA999L(F) Rec. Equalizer Amp.                 |
| Q307, 308                                                                                                                                      | 5613-2320(F)   | 2SC2320(F) Rec. Mute                           |
| Q401, 402                                                                                                                                      | 5613-1845(E)   | 2SC1845(E)or(F) Line Output Amp.               |
| Q403, 404                                                                                                                                      | 5611-954(K)    | 2SA954(K)or(L) Line Output Amp.                |
| Q405, 406, 407, 408                                                                                                                            | 5613-2320(F)   | 2SC2320(F)or(G) Audio Muting                   |
| Q451, 452                                                                                                                                      | 5613-2320(F)   | 2SC2320(F) Buffer Amp.                         |
| Q453, 454                                                                                                                                      | 5613-2060(Q)   | 2SC2060(Q)or(R) Headphones Amp.                |
| Q501                                                                                                                                           | 5613-2235(Y)   | 2SC2235(Y) Dolby HX Bias Control               |
| Q601                                                                                                                                           | 5613-2235(Y)   | 2SC2235(Y) Bias Control                        |
| Q801, 806                                                                                                                                      | 5613-790(Y)    | 2SC790(Y) Voltage Regulator                    |
| Q802                                                                                                                                           | 5611-965(Y)    | 2SA965(Y) Voltage Regulator                    |
| Q803                                                                                                                                           | 5616-2SK163(M) | F.E.T., 2SK163(M) Current Regulator            |
| Q804                                                                                                                                           | 5613-2320(F)   | 2SC2320(F) Voltage Regulator                   |
| Q805                                                                                                                                           | 5613-2235(Y)   | 2SC2235(Y) Voltage Regulator                   |
| Q901                                                                                                                                           | 5613-2320(F)   | 2SC2320(F) Muting                              |
| Q902                                                                                                                                           | 5611-999(F)    | 2SA999(F) Solenoid Pre-Driver                  |
| Q903                                                                                                                                           | 5613-2320(F)   | 2SC2320(F) Muting Control                      |
| Q904, 905, 910                                                                                                                                 | 5611-999(F)    | 2SA999(F) Muting Control                       |
| Q906, 907                                                                                                                                      | 5613-2320(F)   | 2SC2320(F) Auto Search Indicator Driver        |
| Q908, 909                                                                                                                                      | 5613-2320(F)   | 2SC2320(F) Rec. Indicator Driver               |
| <b>DIODES</b>                                                                                                                                  |                |                                                |
| D201, 202, 205, 206,<br>401, 402, 403, 404,<br>501, 502, 503, 601,<br>602, 603, 604, 901,<br>902, 903, 904, 905,<br>906, 910, 911, 912,<br>913 | 5631-1S2473    | 1S2473                                         |
| D301, 302                                                                                                                                      | 5641-MV11      | Varistor, MV11                                 |
| D801                                                                                                                                           | 5685-S1VB20    | Bridge Silicon, S1VB20                         |
| D802, 803, 804, 805,<br>806, 812                                                                                                               | 5632-1SR35-10  | 1SR35-100                                      |
| D807                                                                                                                                           | 5635-RD5R1EB2  | Zener, RD5R1EB2                                |
| D808                                                                                                                                           | 5635-RD24EB2   | Zener, RD24EB2                                 |
| D809                                                                                                                                           | 5635-RD15EB1   | Zener, RD15EB1                                 |
| D810                                                                                                                                           | 5635-RD15EB2   | Zener, RD15EB2                                 |
| <b>COILS</b>                                                                                                                                   |                |                                                |
| L301, 302                                                                                                                                      | 5933-70316     | 3.9 mH Peaking                                 |
| L303, 304                                                                                                                                      | 5633-70214     | 39 mH Bias Trap                                |
| L305, 306                                                                                                                                      | 5933-70416     | 4.7 mH Bias Trap                               |
| <b>MISCELLANEOUS</b>                                                                                                                           |                |                                                |
| F201, 202                                                                                                                                      | 6171-0401      | Complex, Bias Oscillator                       |
| SW101                                                                                                                                          | 5214-18        | LC Components, MPX Filter                      |
| SW102A-D, 103A-D                                                                                                                               | 4431-01027194  | Push Switch, Input Selector                    |
| SW104A-D, 105A,B                                                                                                                               | 4431-01047794  | Push Switch, Dolby NR, MPX Filter              |
| SW106A-F, 107A-D,<br>108A-D, 109A-D                                                                                                            | 4431-02067157  | 2-Gang Push Switch, Dolby HX, Meter Ballistics |
| SW110A-L                                                                                                                                       | 4431-04187157  | 4-Gang Push Switch, Tape Selector              |
| J101, 102, 103, 104                                                                                                                            | 4421-122718    | Slide Switch, Record/Playback                  |
|                                                                                                                                                | 4484-24        | 4-Pin Jack, Line Input & Line Output           |

PEAK LEVEL DISPLAY P.C. BOARD

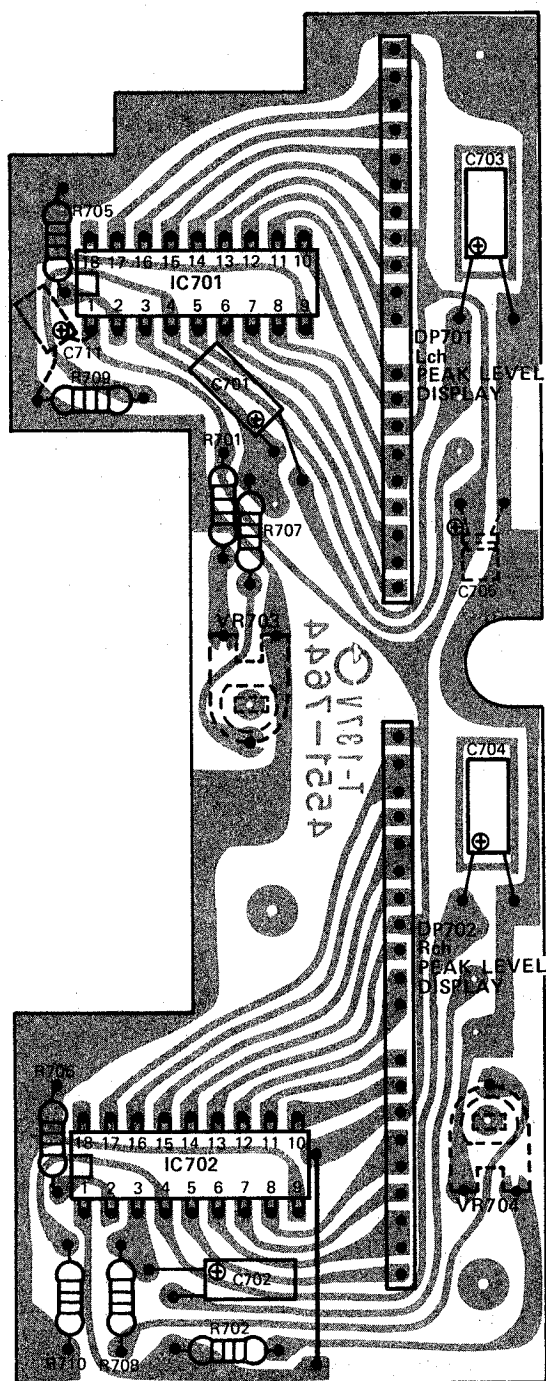


| Ref. No.   | Part No.      | Description                                          |
|------------|---------------|------------------------------------------------------|
| VR703, 704 | 5101-50171913 | Variable Resistor, 500 ohm                           |
| C701, 702  | 5345-106-16   | Capacitor, 10uF +50%—10% 16V Electrolytic            |
| C703, 704  | 5345-226C0211 | Capacitor, 22uF +20%—20% 16V Electrolytic            |
| C711       | 5345-107-16   | Capacitor, 100uF +50%—10% 16V Electrolytic           |
| IC701, 702 | 5652-BA682A   | Integrated Circuit, BA682A Peak Level Display Driver |
| DP701, 702 | 5623-GL112F9  | LED Display, Peak Level                              |

AUTO STOP P.C. BOARD

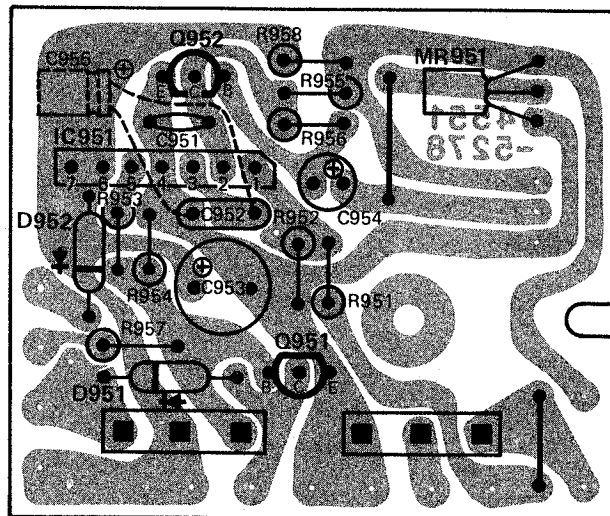


| Ref. No.                   | Part No.      | Description                     |
|----------------------------|---------------|---------------------------------|
| CAPACITORS, ELECTROLYTIC   |               |                                 |
| C953                       | 5345-107-16   | 100uF +50%—10% 16V              |
| C954                       | 5345-106-16   | 10uF +50%—10% 16V               |
| C955                       | 5345-334F0951 | 0.33uF +20%—20% 50V             |
| INTEGRATED CIRCUIT         |               |                                 |
| IC951                      | 5654-AN6250   | AN6250 Auto Stop Driver         |
| TRANSISTORS                |               |                                 |
| Q951                       | 5614-863(F)   | 2SD863(F) Solenoid Driver       |
| Q952                       | 5613-2320(F)  | 2SC2320(F) Auto Stop Pre-Driver |
| DIODES                     |               |                                 |
| D951, 952                  | 5632-1SR35-10 | 1SR35-100                       |
| MAGNETO-RESISTANCE ELEMENT |               |                                 |
| MR951                      | 5193-DM101A   | Auto Stop Sensor                |



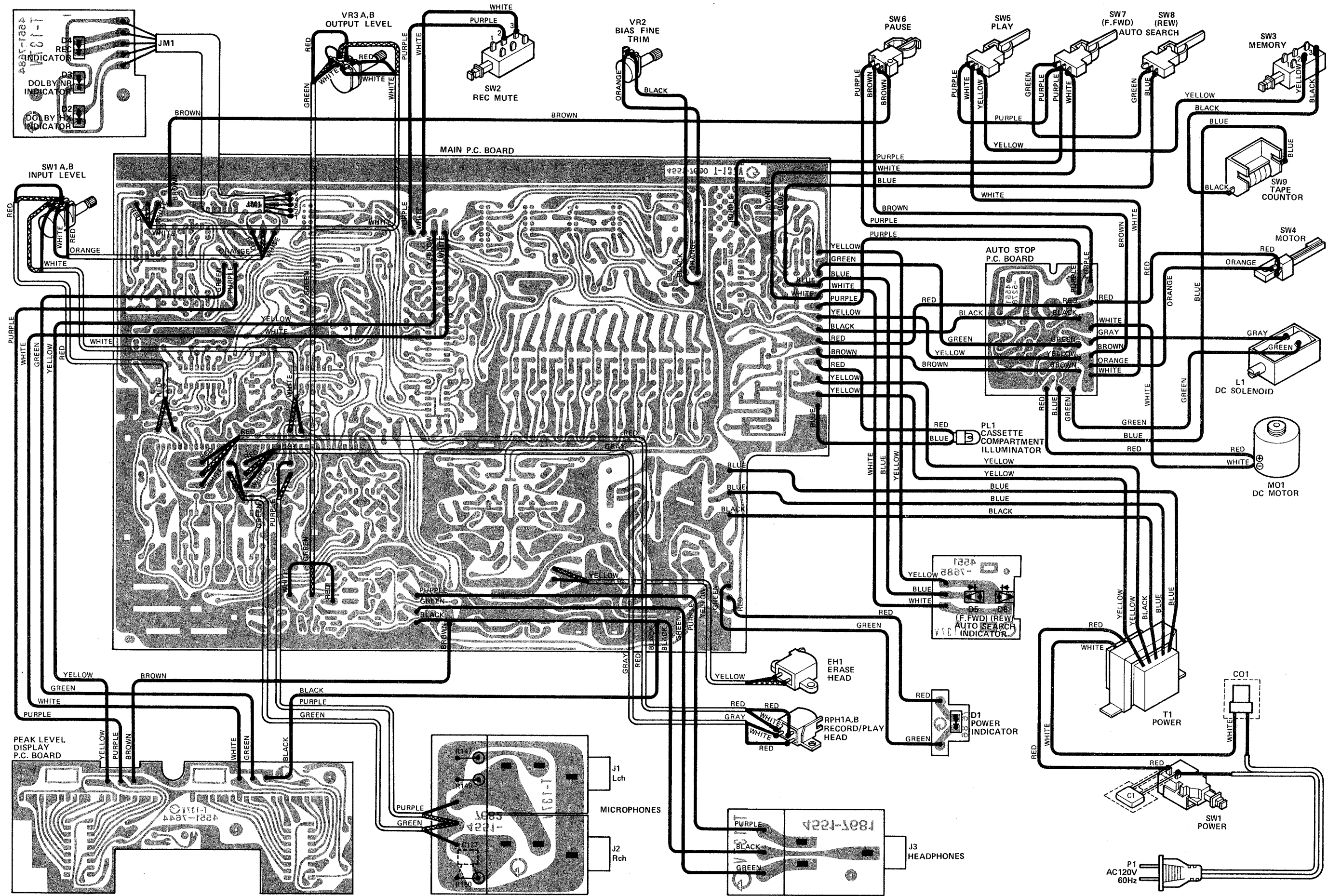
| Ref. No.   | Part No.      | Description                                          |
|------------|---------------|------------------------------------------------------|
| VR703, 704 | 5101-50171913 | Variable Resistor, 500 ohm                           |
| C701, 702  | 5345-106-16   | Capacitor, 10uF +50%—10% 16V Electrolytic            |
| C703, 704  | 5345-226C0211 | Capacitor, 22uF +20%—20% 16V Electrolytic            |
| C711       | 5345-107-16   | Capacitor, 100uF +50%—10% 16V Electrolytic           |
| IC701, 702 | 5652-BA682A   | Integrated Circuit, BA682A Peak Level Display Driver |
| DP701, 702 | 5623-GL112F9  | LED Display, Peak Level                              |

# AUTO STOP P.C. BOARD

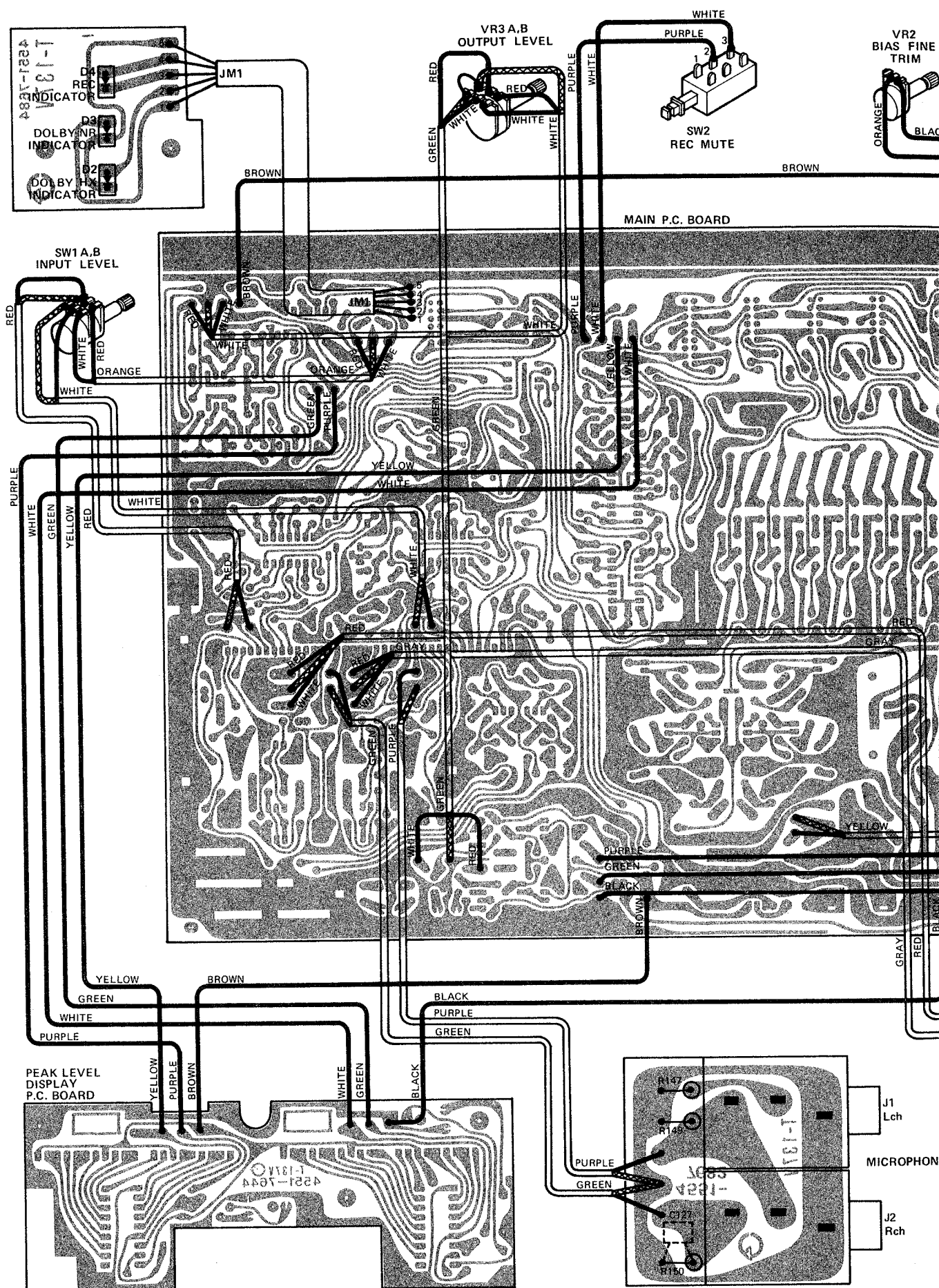


| Ref. No.                          | Part No.      | Description                     |
|-----------------------------------|---------------|---------------------------------|
| <b>CAPACITORS, ELECTROLYTIC</b>   |               |                                 |
| C953                              | 5345-107-16   | 100uF +50%—10% 16V              |
| C954                              | 5345-106-16   | 10uF +50%—10% 16V               |
| C955                              | 5345-334F0951 | 0.33uF +20%—20% 50V             |
| <b>INTEGRATED CIRCUIT</b>         |               |                                 |
| IC951                             | 5654-AN6250   | AN6250 Auto Stop Driver         |
| <b>TRANSISTORS</b>                |               |                                 |
| Q951                              | 5614-863(F)   | 2SD863(F) Solenoid Driver       |
| Q952                              | 5613-2320(F)  | 2SC2320(F) Auto Stop Pre-Driver |
| <b>DIODES</b>                     |               |                                 |
| D951, 952                         | 5632-1SR35-10 | 1SR35-100                       |
| <b>MAGNETO-RESISTANCE ELEMENT</b> |               |                                 |
| MR951                             | 5193-DM101A   | Auto Stop Sensor                |

WIRING DIAGRAM

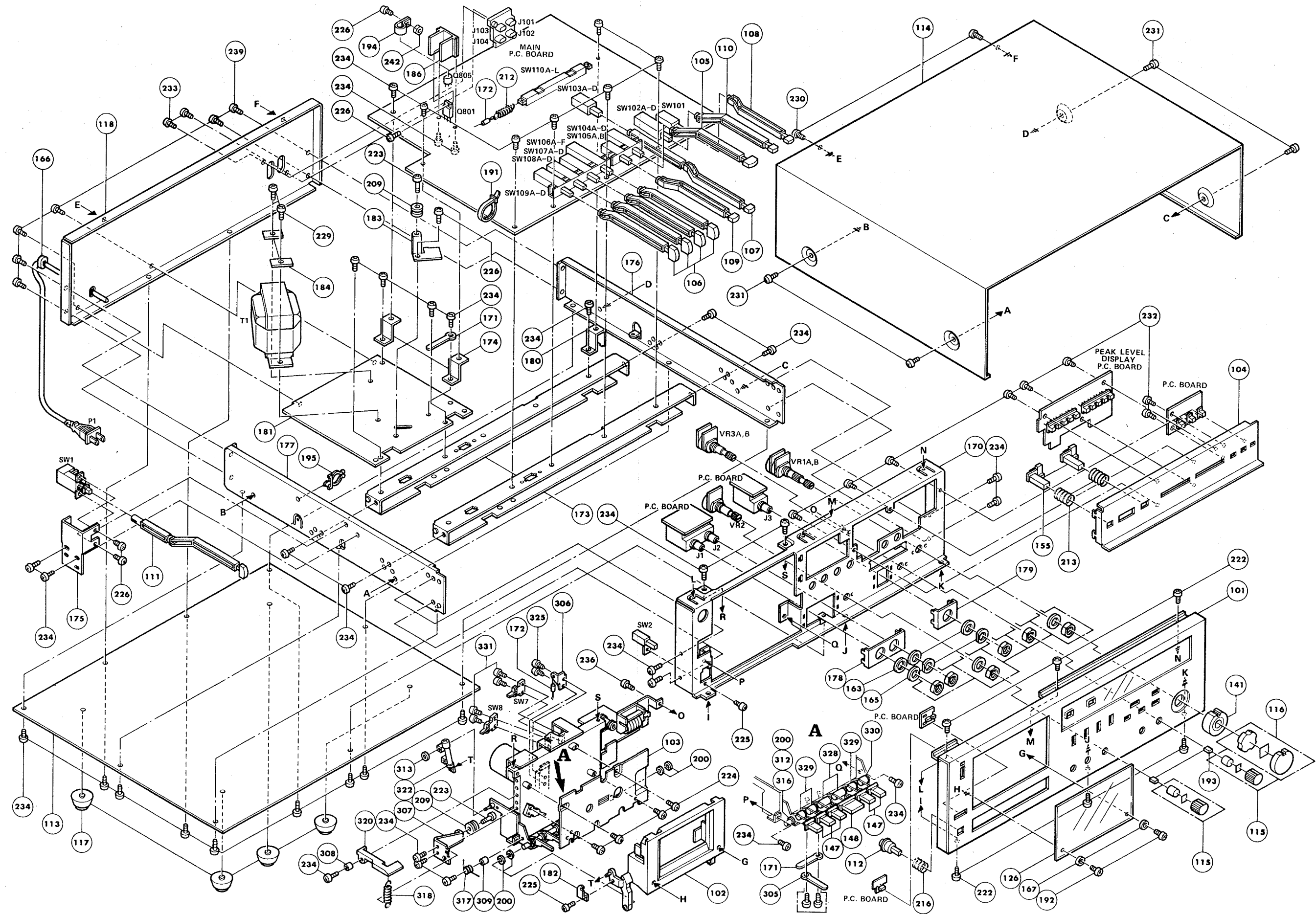


# WIRING DIAGRAM

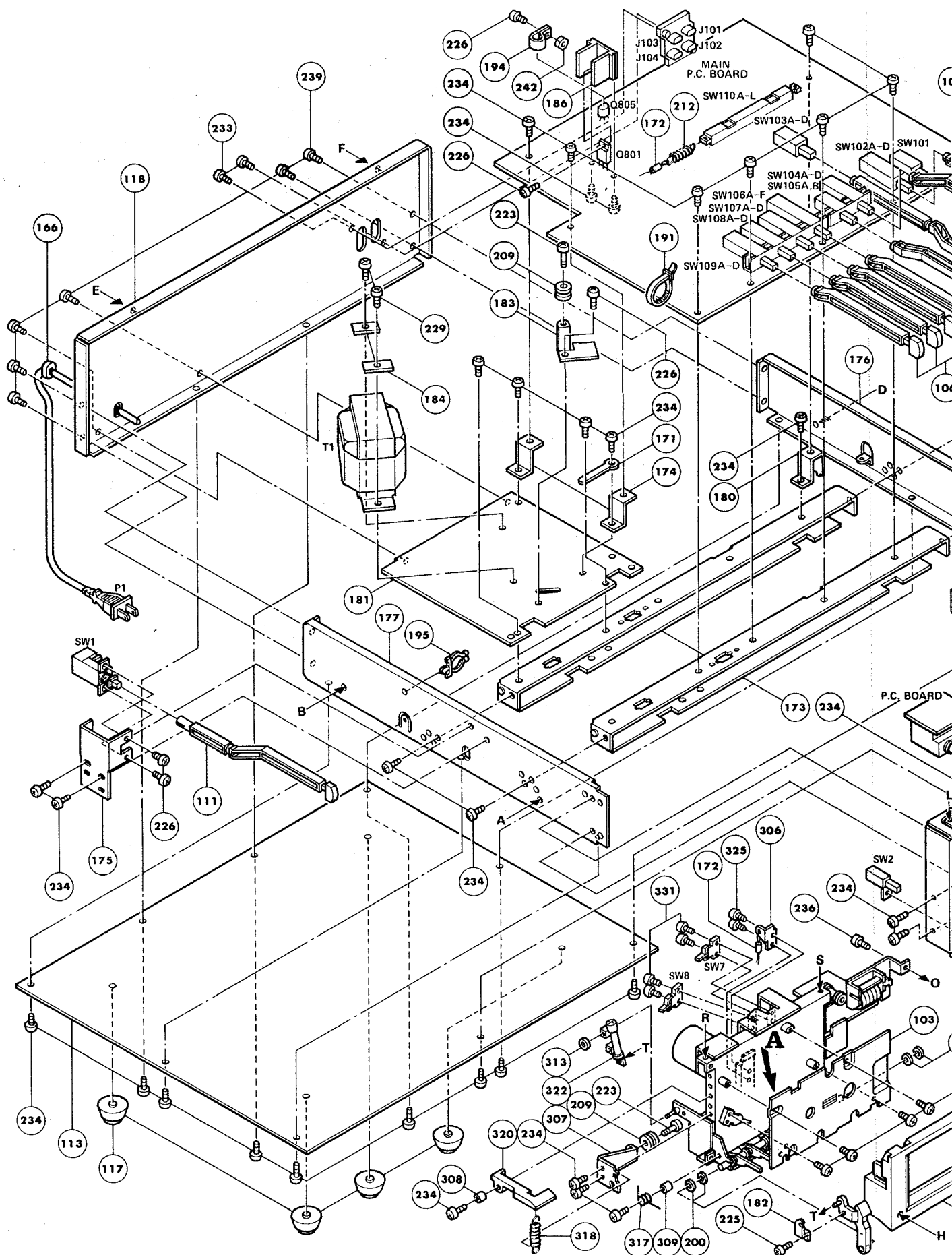




GENERAL UNIT EXPLODED VIEW

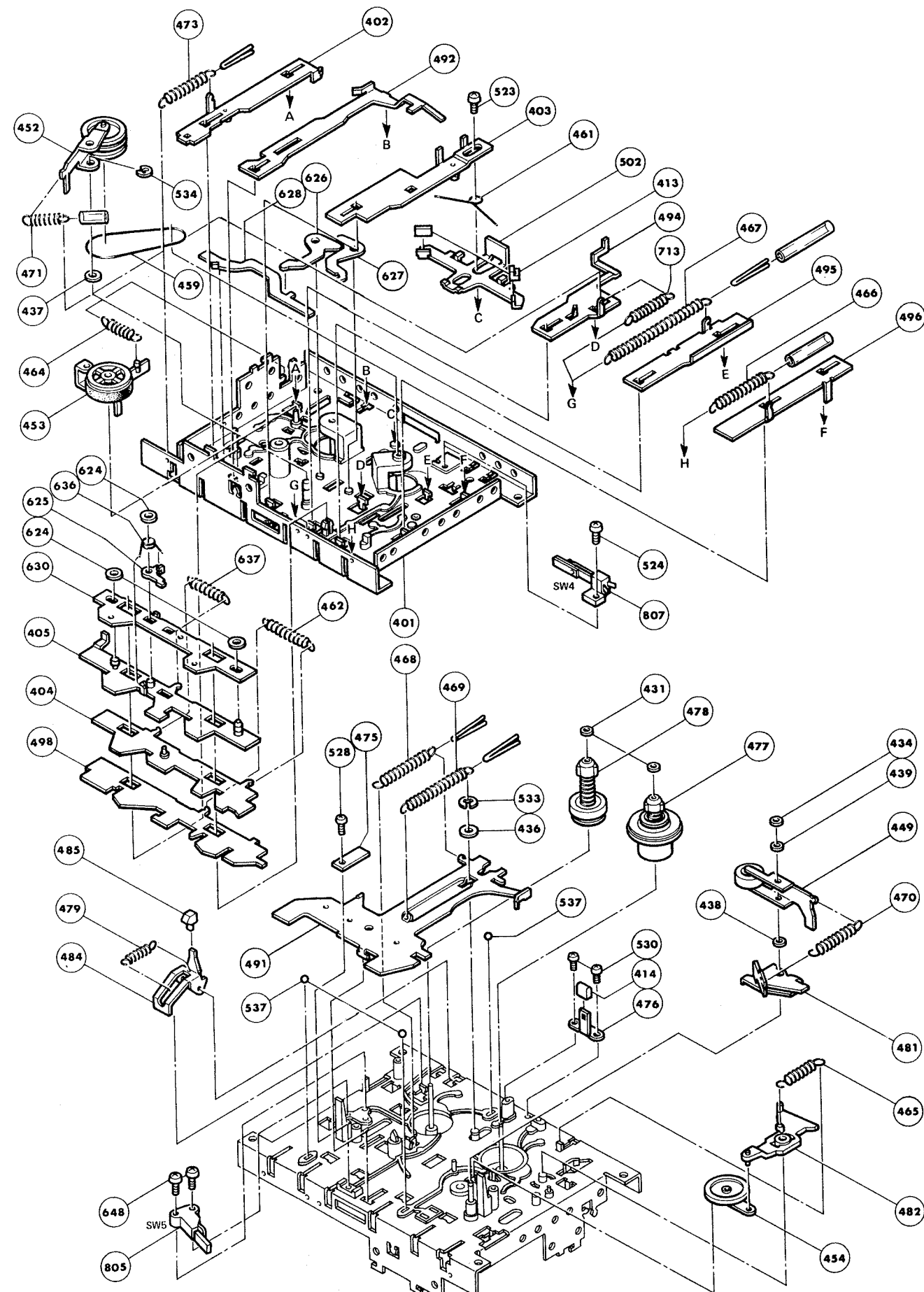


# GENERAL UNIT EXPLODED VIEW

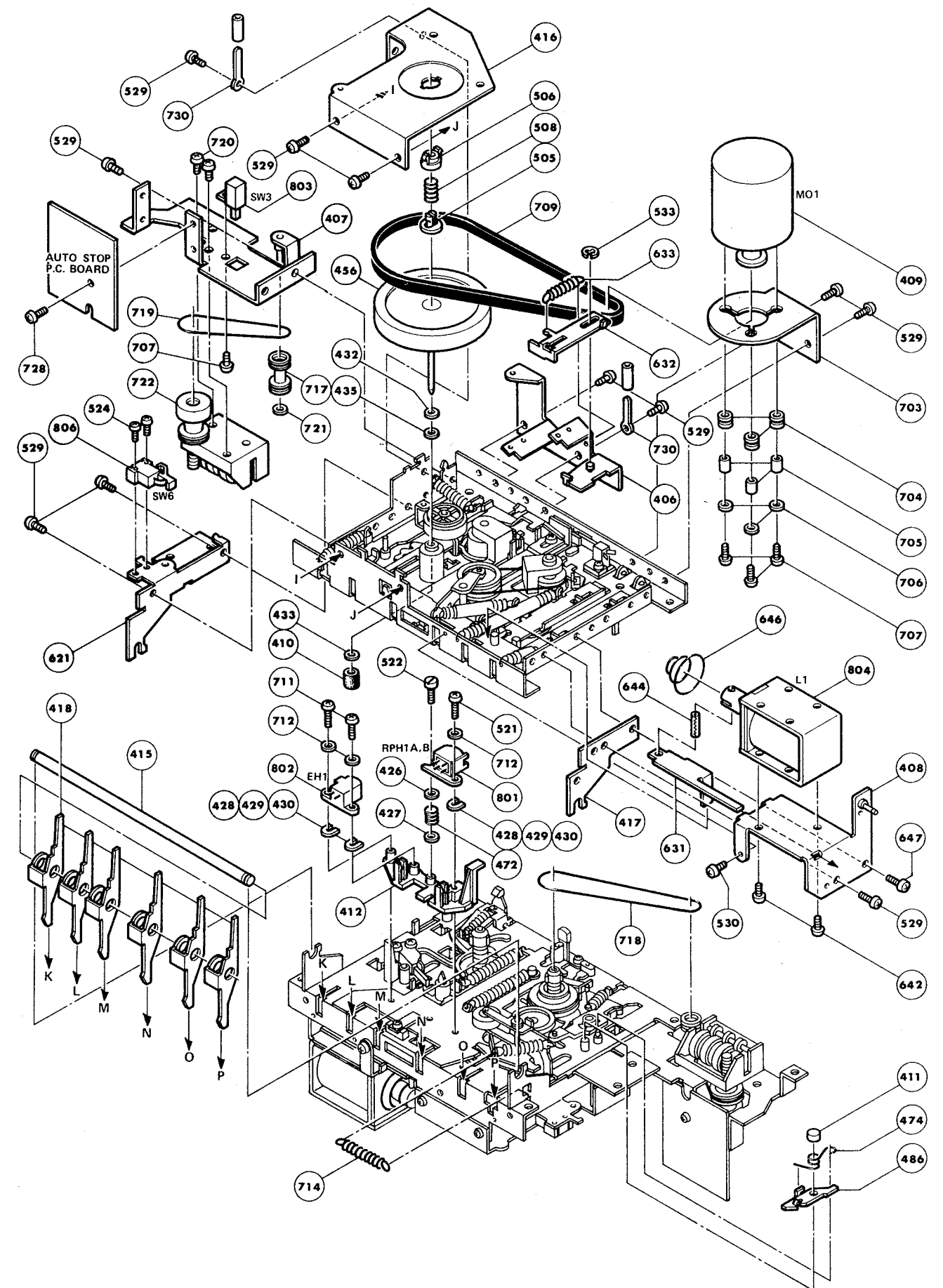




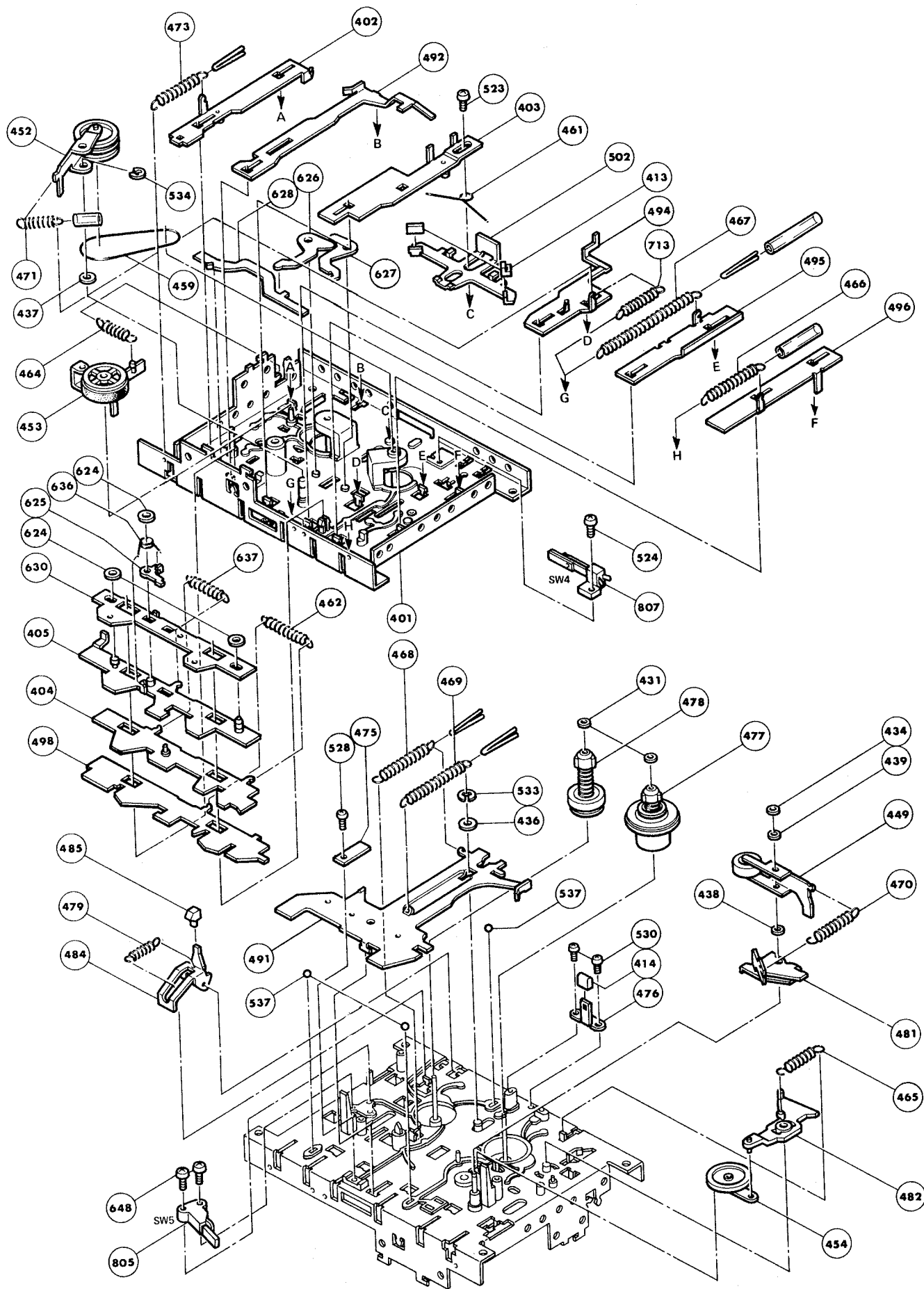
### CASSETTE TAPE RECORDER EXPLODED VIEW



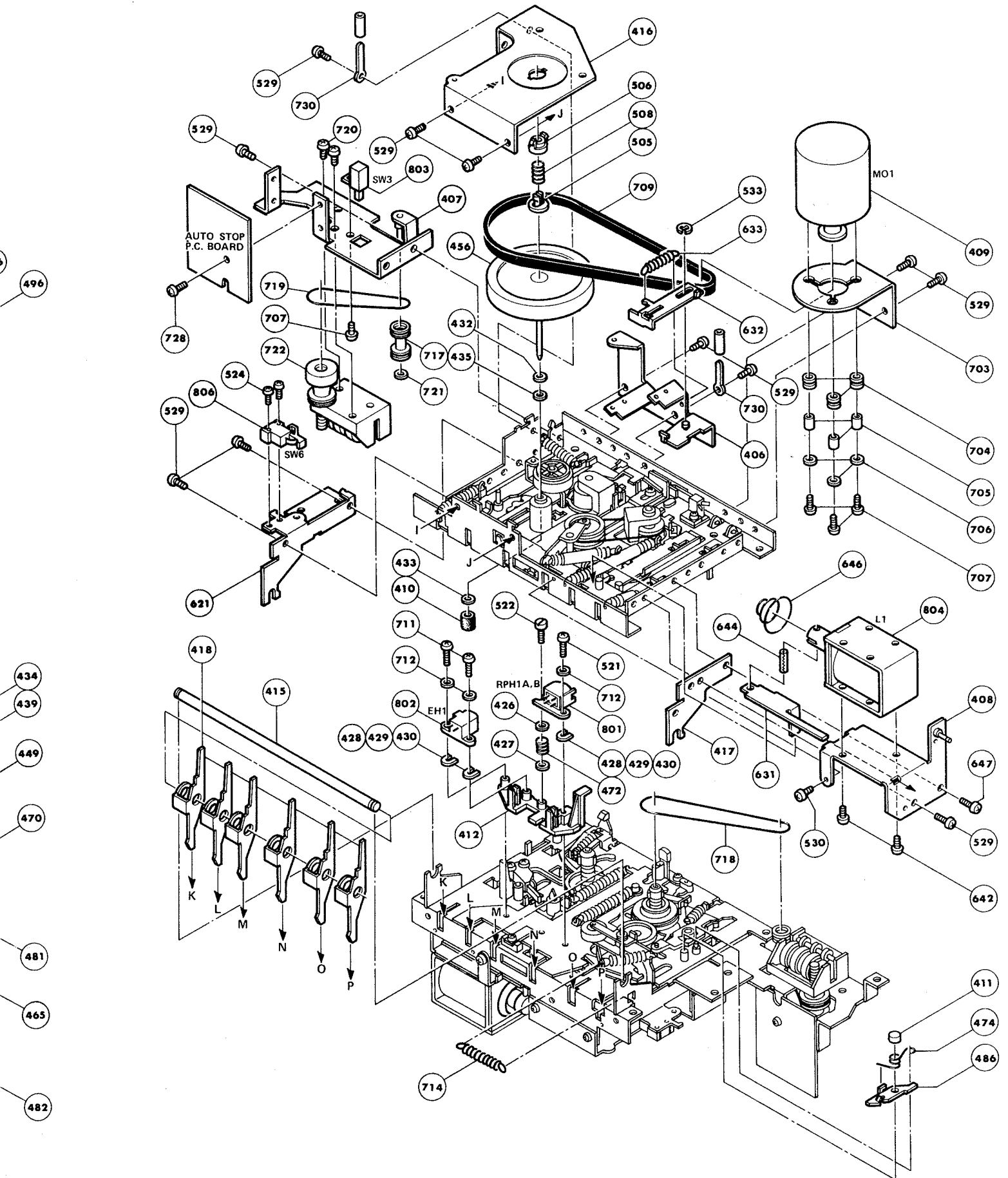
### CASSETTE TAPE RECORDER EXPLODED VIEW



# CASSETTE TAPE RECORDER EXPLODED VIEW



# CASSETTE TAPE RECORDER EXPLODED VIEW



CHASSIS PARTS LIST

| Ref. No.     | Part No.     | Description                                              |
|--------------|--------------|----------------------------------------------------------|
| GENERAL UNIT |              |                                                          |
| 101          | A443-HK200   | Front Panel Assembly                                     |
| 102          | A612-HK200   | Cassette Compartment Slot Assembly                       |
| 105          | A622-HK200-A | Push Button Assembly, Dolby HX                           |
| 106          | A662-HK200-B | Push Button Assembly, Metal, CrO <sub>2</sub> , FeCr, LN |
| 107          | A662-HK200-C | Push Button Assembly, MPX Filter                         |
| 108          | A662-HK200-D | Push Button Assembly, Input Selector                     |
| 109          | A662-HK200-E | Push Button Assembly, Meter Ballistics                   |
| 110          | A662-HK200-F | Push Button Assembly, Dolby NR                           |
| 111          | A662-HK200-G | Push Button Assembly, Power                              |
| 112          | A662-HK200-H | Push Button Assembly, Rec. Mute                          |
| 114          | A414-HK200   | Cabinet Top Assembly                                     |
| 115          | A634-HK200-A | Knob Assembly, Bias Fine Trim, Output Level              |
| 116          | A634-HK200-B | Knob Assembly, L ch. Input Level                         |
| 117          | 1319-0139    | Foot, Cabinet Bottom                                     |
| 118          | 1424-03802   | Cabinet Back                                             |
| 126          | 1532-04201   | Cassette Compartment Cover                               |
| 141          | 1630-01301   | Knob, R ch. Input Level                                  |
| 147          | 1652-02103VN | Push Button, Stop/Eject, Record, Rew., F.FWD, Pause      |
| 148          | 1652-02202VN | Push Button, Play                                        |
| 155          | 1662-05801VN | Push Button, Memory, Reset                               |
| 209          | 2612-52273   | Pulley, Record Cord                                      |
| 322          | 2692-2       | Damper, Eject                                            |

CASSETTE TAPE RECORDER

|                |               |                                        |
|----------------|---------------|----------------------------------------|
| 409 (MO1)      | D311-MR058MFA | DC Motor Assembly (w/Pulley)           |
| 449            | 2614-5025     | Pinch Roller                           |
| 452            | 2615-5032     | Idler, Rew.                            |
| 453            | 2662-5010     | Clutch, F. FWD                         |
| 454            | 2615-5019     | Idler, Play                            |
| 456            | 2617-5144     | Flywheel                               |
| 459            | 2642-01452    | Belt, Rew. Idler — Supply Reel Spindle |
| 477            | 2661-415029   | Take-Up Reel Spindle                   |
| 478            | 2661-415030   | Supply Reel Spindle                    |
| 709            | 2642-02410    | Belt, Motor — Flywheel                 |
| 718            | 2642-01454    | Belt, Take-Up Reel Spindle — Wheel     |
| 719            | 2642-01458    | Belt, Wheel — Tape Counter             |
| 722            | 3131-445006   | Tape Counter (w/SW9)                   |
| 801 (RPH1A, B) | 5874-1320     | Record/Playback Head                   |
| 802 (EH1)      | 5873-1217     | Erase Head                             |
| 803 (SW3)      | 4431-01027169 | Push Switch, Memory                    |
| 804 (L1)       | 4333-40312    | DC Solenoid                            |
| 805 (SW5)      | 4463-51       | Spring Switch, Play                    |
| 806 (SW6)      | 4463-50       | Spring Switch, Pause                   |
| 807 (SW4)      | 4463-53       | Spring Switch, Motor                   |

ELECTRICAL

|         |               |                                                    |
|---------|---------------|----------------------------------------------------|
| T1      | 5584-701318   | Power Transformer                                  |
| SW1     | 4431-01017358 | Push Switch, Power                                 |
| SW2     | 4431-01027195 | Push Switch, Rec. Mute                             |
| SW7, 8  | 4463-51       | Spring Switch, Auto Search (F. FWD, Rew.)          |
| J1, 2   | 4452-019      | 2-Pin Jack, Microphones                            |
| J3      | 4451-00107    | Headphones Jack                                    |
| P1      | 4161-0487     | AC Line Cord                                       |
| VR1A, B | 5113-5037282  | Variable Resistor, 50 k ohm Input Level Control    |
| VR2     | 5113-1037521  | Variable Resistor, 10 k ohm Bias Fine Trim Control |
| VR3A, B | 5113-5027G40  | Variable Resistor, 5 k ohm Output Level Control    |

CHASSIS PARTS LIST

| Ref. No.               | Part No.     | Description                                                         |
|------------------------|--------------|---------------------------------------------------------------------|
| ELECTRICAL (continued) |              |                                                                     |
| D1                     | 5637-GL9PR20 | Light Emitting Diode, GL9PR20 Power Indicator                       |
| D2, 3                  | 5637-GL9NG2  | Light Emitting Diode, GL9NG2 Dolby HX Indicator, Dolby NR Indicator |
| D4                     | 5637-GL9PR20 | Light Emitting Diode, GL9PR20 Rec. Indicator                        |
| D5, 6                  | 5637-GL9PR6  | Light Emitting Diode, GL9PR6 Auto Search Indicators                 |
| PL1                    | 5731-1404123 | Lamp, 14V 50mA Cassette Compartment Illuminator                     |

## CHASSIS PARTS LIST

| Ref. No.            | Part No.     | Description                                              |
|---------------------|--------------|----------------------------------------------------------|
| <b>GENERAL UNIT</b> |              |                                                          |
| 101                 | A443-HK200   | Front Panel Assembly                                     |
| 102                 | A612-HK200   | Cassette Compartment Slot Assembly                       |
| 105                 | A622-HK200-A | Push Button Assembly, Dolby HX                           |
| 106                 | A662-HK200-B | Push Button Assembly, Metal, CrO <sub>2</sub> , FeCr, LN |
| 107                 | A662-HK200-C | Push Button Assembly, MPX Filter                         |
| 108                 | A662-HK200-D | Push Button Assembly, Input Selector                     |
| 109                 | A662-HK200-E | Push Button Assembly, Meter Ballistics                   |
| 110                 | A662-HK200-F | Push Button Assembly, Dolby NR                           |
| 111                 | A662-HK200-G | Push Button Assembly, Power                              |
| 112                 | A662-HK200-H | Push Button Assembly, Rec. Mute                          |
| 114                 | A414-HK200   | Cabinet Top Assembly                                     |
| 115                 | A634-HK200-A | Knob Assembly, Bias Fine Trim, Output Level              |
| 116                 | A634-HK200-B | Knob Assembly, L ch. Input Level                         |
| 117                 | 1319-0139    | Foot, Cabinet Bottom                                     |
| 118                 | 1424-03802   | Cabinet Back                                             |
| 126                 | 1532-04201   | Cassette Compartment Cover                               |
| 141                 | 1630-01301   | Knob, R ch. Input Level                                  |
| 147                 | 1652-02103VN | Push Button, Stop/Eject, Record, Rew., F.FWD, Pause      |
| 148                 | 1652-02202VN | Push Button, Play                                        |
| 155                 | 1662-05801VN | Push Button, Memory, Reset                               |
| 209                 | 2612-52273   | Pulley, Record Cord                                      |
| 322                 | 2692-2       | Damper, Eject                                            |

### CASSETTE TAPE RECORDER

|               |               |                                        |
|---------------|---------------|----------------------------------------|
| 409 (MO1)     | D311-MR058MFA | DC Motor Assembly (w/Pulley)           |
| 449           | 2614-5025     | Pinch Roller                           |
| 452           | 2615-5032     | Idler, Rew.                            |
| 453           | 2662-5010     | Clutch, F. FWD                         |
| 454           | 2615-5019     | Idler, Play                            |
| 456           | 2617-5144     | Flywheel                               |
| 459           | 2642-01452    | Belt, Rew. Idler — Supply Reel Spindle |
| 477           | 2661-415029   | Take-Up Reel Spindle                   |
| 478           | 2661-415030   | Supply Reel Spindle                    |
| 709           | 2642-02410    | Belt, Motor — Flywheel                 |
| 718           | 2642-01454    | Belt, Take-Up Reel Spindle — Wheel     |
| 719           | 2642-01458    | Belt, Wheel — Tape Counter             |
| 722           | 3131-445006   | Tape Counter (w/SW9)                   |
| 801(RPH1A, B) | 5874-1320     | Record/Playback Head                   |
| 802(EH1)      | 5873-1217     | Erase Head                             |
| 803(SW3)      | 4431-01027169 | Push Switch, Memory                    |
| 804(L1)       | 4333-40312    | DC Solenoid                            |
| 805(SW5)      | 4463-51       | Spring Switch, Play                    |
| 806(SW6)      | 4463-50       | Spring Switch, Pause                   |
| 807(SW4)      | 4463-53       | Spring Switch, Motor                   |

### ELECTRICAL

|         |               |                                                    |
|---------|---------------|----------------------------------------------------|
| T1      | 5584-701318   | Power Transformer                                  |
| SW1     | 4431-01017358 | Push Switch, Power                                 |
| SW2     | 4431-01027195 | Push Switch, Rec. Mute                             |
| SW7, 8  | 4463-51       | Spring Switch, Auto Search (F. FWD, Rew.)          |
| J1, 2   | 4452-019      | 2-Pin Jack, Microphones                            |
| J3      | 4451-00107    | Headphones Jack                                    |
| P1      | 4161-0487     | AC Line Cord                                       |
| VR1A, B | 5113-5037282  | Variable Resistor, 50 k ohm Input Level Control    |
| VR2     | 5113-1037521  | Variable Resistor, 10 k ohm Bias Fine Trim Control |
| VR3A, B | 5113-5027G40  | Variable Resistor, 5 k ohm Output Level Control    |

## CHASSIS PARTS LIST

| Ref. No.                      | Part No.     | Description                                                            |
|-------------------------------|--------------|------------------------------------------------------------------------|
| <b>ELECTRICAL (continued)</b> |              |                                                                        |
| D1                            | 5637-GL9PR20 | Light Emitting Diode, GL9PR20 Power Indicator                          |
| D2, 3                         | 5637-GL9NG2  | Light Emitting Diode, GL9NG2 Dolby HX Indicator,<br>Dolby NR Indicator |
| D4                            | 5637-GL9PR20 | Light Emitting Diode, GL9PR20 Rec. Indicator                           |
| D5, 6                         | 5637-GL9PR6  | Light Emitting Diode, GL9PR6 Auto Search Indicators                    |
| PL1                           | 5731-1404123 | Lamp, 14V 50mA Cassette Compartment Illuminator                        |