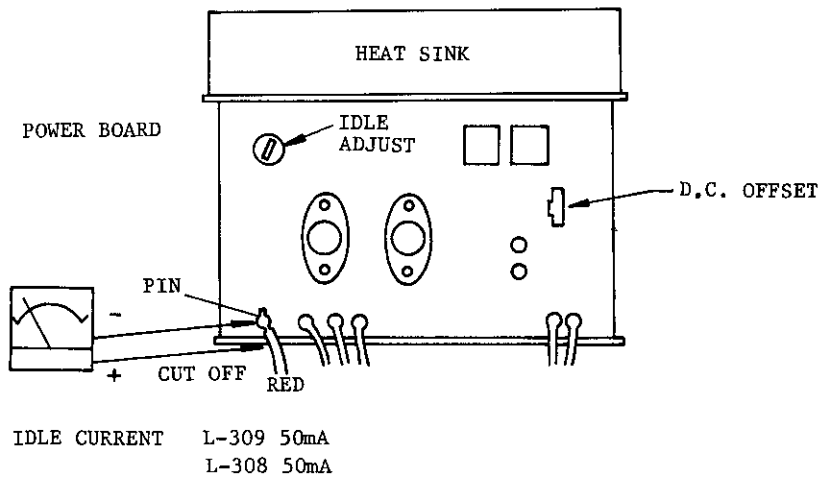


SOLID STATE INTEGRATED AMPLIFIER

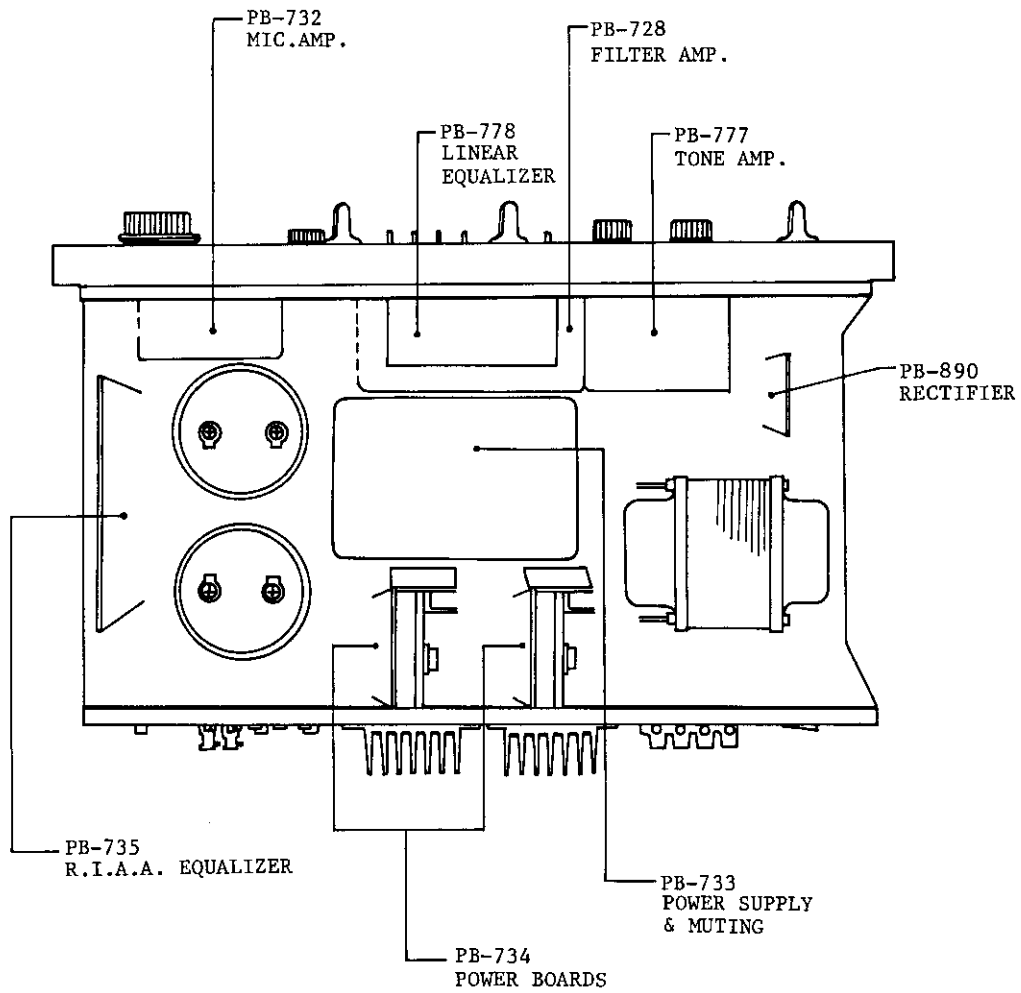
L-309

SERVICE MANUAL

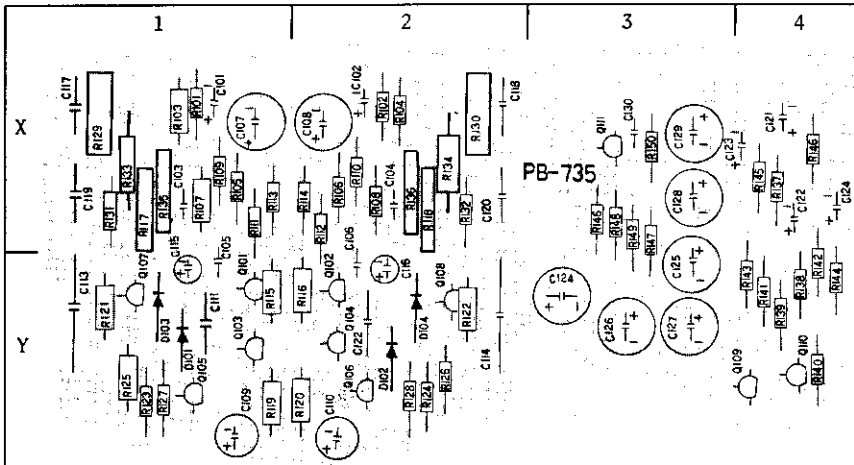
IDLE ADJUST & ZERO D.C. OFFSET



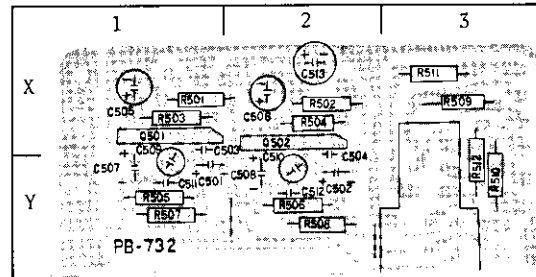
P.B. LOCATION



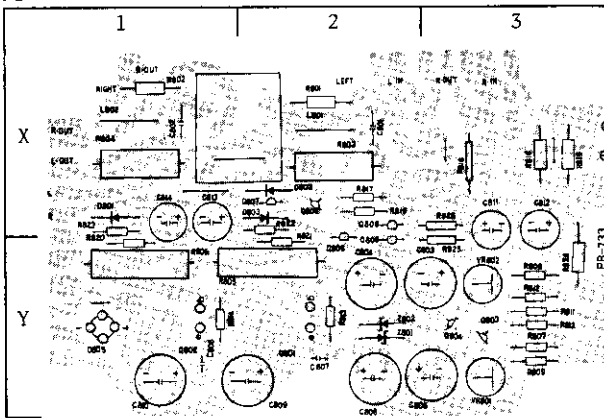
PB-735



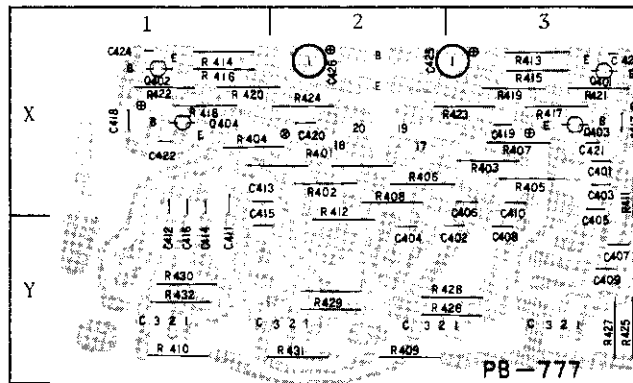
PB-732



PB-733



PB-777



MODEL: L-309 REPLACEMENT PARTS

PB-735

| | | | | | | | | |
|------|------|----|------|------|----|------|------|----|
| R101 | 120K | 1X | R118 | 33K | 2X | R135 | 1.2K | 1X |
| 102 | 120K | 2X | 119 | 2.2K | 1Y | 136 | 1.2K | 2X |
| 103 | 1M | 1X | 120 | 2.2K | 2Y | 137 | 8.2K | 4X |
| 104 | 1M | 2X | 121 | 33K | 1Y | 138 | 8.2K | 4Y |
| 105 | 560K | 1X | 122 | 33K | 2Y | 139 | 1M | 4Y |
| 106 | 560K | 2X | 123 | 330 | 1Y | 140 | 1M | 4Y |
| 107 | 12K | 1X | 124 | 330 | 2Y | 141 | 1M | 4Y |
| 108 | 12K | 2X | 125 | 330 | 1Y | 142 | 1M | 4Y |
| 109 | 3.9K | 1X | 126 | 330 | 2Y | 143 | 10K | 4Y |
| 110 | 3.9K | 2X | 127 | 560K | 1Y | 144 | 10K | 4Y |
| 111 | 180 | 1X | 128 | 560K | 2Y | 145 | 470K | 4X |
| 112 | 180 | 2X | 129 | 39K | 1X | 146 | 470K | 4X |
| 113 | 100K | 1X | 130 | 39K | 2X | 147 | 330 | 3Y |
| 114 | 100K | 2X | 131 | 1K | 1X | 148 | 4.7K | 3X |
| 115 | 47K | 1Y | 132 | 1K | 2X | 149 | 820 | 3X |
| 116 | 47K | 2Y | 133 | 2.2M | 1X | 150 | 10K | 3X |
| 117 | 33K | 1X | 134 | 2.2M | 2X | | | |

| | | | | | | | |
|------|-------|------|----|------|--------|-----|----|
| C101 | 2.2uF | 10V | 1X | C116 | 33uF | 10V | 2Y |
| 102 | 2.2uF | 10V | 2X | 117 | 6200pF | | 1X |
| 103 | 47pF | | 1X | 118 | 6200pF | | 2X |
| 104 | 47pF | | 2X | 119 | 1800pF | | 1X |
| 105 | 100pF | | 1Y | 120 | 1800pF | | 2X |
| 106 | 100pF | | 2Y | 121 | 1uF | 35V | 4X |
| 107 | 220uF | 10V | 1X | 122 | 1uF | 35V | 4X |
| 108 | 220uF | 10V | 2X | 123 | 0.22uF | 35V | 4X |
| 109 | 47uF | 10V | 1Y | 124 | 0.22uF | 35V | 4X |
| 110 | 47uF | 10V | 2Y | 125 | 47uF | 50V | 3Y |
| 111 | 270pF | | 1Y | 126 | 47uF | 50V | 3Y |
| 112 | 270pF | | 2Y | 127 | 47uF | 50V | 3Y |
| 113 | 1uF | 250V | 1Y | 128 | 47uF | 50V | 3X |
| 114 | 1uF | 250V | 2Y | 129 | 47uF | 50V | 3X |
| 115 | 33uF | 10V | 1Y | 130 | 150pF | | 3X |

| | | | | | | | | |
|------|------------------|----|------|------------------|----|------|--------|----|
| Q101 | 2SC1222(2SC1345) | 1Y | Q106 | 2SC1222(2SC1345) | 2Y | Q111 | 2SC853 | 3X |
| 102 | 2SC1222(2SC1345) | 2Y | 107 | 2SA640 | 1Y | D101 | SV-03 | 1Y |
| 103 | 2SA640 | 1Y | 108 | 2SA640 | 2Y | 102 | SV-03 | 2Y |
| 104 | 2SA640 | 2Y | 109 | 2SC1222(2SC1345) | 4Y | 103 | KB-165 | 1Y |
| 105 | 2SC1222(2SC1345) | 1Y | 110 | 2SC1222(2SC1345) | 4Y | 104 | KB-165 | 2Y |

PB-732

SYMBOL NO. (RESISTORS; $\pm 5\%$ 1/4W)

| | | | | | | | | |
|------|------|----|------|------|----|------|------|----|
| R501 | 100K | X1 | R505 | 820K | Y1 | R509 | 8.2K | X3 |
| 502 | 100K | X2 | 506 | 820K | Y2 | 510 | 8.2K | Y3 |
| 503 | 150K | X1 | 507 | 68K | Y1 | 511 | 39K | X3 |
| 504 | 150K | X2 | 508 | 68K | Y2 | 512 | 39K | Y3 |

SYMBOL NO. (CAPACITORS)

| | | | | | | | | | |
|------|-------|-----|--------------------|----|------|-------|-----|--------------------|----|
| C501 | 2.2uF | 10V | tantalum | Y1 | C508 | 2.2uF | 35V | tantalum | Y2 |
| 502 | 2.2uF | 10V | " | Y2 | 509 | 22uF | 10V | electrolytic | Y1 |
| 503 | 47pF | 50V | $\pm 10\%$ ceramic | X1 | 510 | 22uF | 10V | " | Y2 |
| 504 | 47pF | 50V | " | Y2 | 511 | 22pF | 50V | $\pm 10\%$ ceramic | Y1 |
| 505 | 47uF | 10V | electrolytic | X1 | 512 | 22pF | 50V | " | Y2 |
| 506 | 47uF | 10V | " | X2 | 513 | 10uF | 50V | electrolytic | X2 |
| 507 | 2.2uF | 35V | tantalum | Y1 | | | | | |

SYMBOL NO. (IC's)

| | | | | | | | |
|------|----------|----------|----|------|----------|----------|----|
| Q501 | TA7122AP | Mic. amp | X1 | Q502 | TA7122AP | Mic. amp | X2 |
|------|----------|----------|----|------|----------|----------|----|

PB-733

SYMBOL NO. (RESISTORS; $\pm 5\%$ 1/4W unless noted otherwise)

| | | | | | | | | | | | | |
|------|-----|---------------|--|----|------|----------|--|----|------|----------|--|----|
| R801 | 10 | 1/2W | | X2 | R810 | 27K | | Y3 | R819 | 1K | | X2 |
| 802 | 10 | 1/2W | | X1 | 811 | 15K | | Y3 | 820 | 8.2K | | Y1 |
| 803 | 4.7 | 2W | | X2 | 812 | 15K | | Y3 | 821 | 1K | | Y2 |
| 804 | 4.7 | 2W | | X1 | 813 | 10K | | Y2 | 822 | 180K | | X2 |
| 805 | 150 | 3W wire wound | | Y2 | 814 | 10K | | Y1 | 823 | 2.2 | | X1 |
| 806 | 150 | 3W wire wound | | Y1 | 815 | 15K 1/2W | | X3 | 824 | 100 1/2W | | Y3 |
| 807 | 18K | | | Y3 | 816 | 15K 1/2W | | X3 | 825 | 3.3K | | Y3 |
| 808 | 18K | | | Y3 | 817 | 8.2K | | X2 | | | | |
| 809 | 27K | | | Y3 | 818 | 8.2K | | X3 | | | | |

SYMBOL NO. (CAPACITORS)

| | | | | | | | | | | | |
|------|---------|------|------------|--------------|----|------|---------|------|------------|--------------|----|
| C801 | 0.1uF | 50V | $\pm 10\%$ | mylar | X2 | C808 | 0.047uF | 50V | $\pm 10\%$ | mylar | Y1 |
| 802 | 0.1uF | 50V | " | " | X1 | 809 | 100uF | 100V | | electrolytic | Y2 |
| 803 | 100uF | 63V | | electrolytic | Y3 | 810 | 100uF | 100V | | " | Y1 |
| 804 | 100uF | 63V | | " | Y2 | 811 | 330uF | 10V | | " | X3 |
| 805 | 47uF | 100V | | " | Y3 | 812 | 330uF | 10V | | " | X3 |
| 806 | 47uF | 100V | | " | Y2 | 813 | 100uF | 10V | | " | X1 |
| 807 | 0.047uF | 50V | $\pm 10\%$ | mylar | Y2 | 814 | 22uF | 50V | | " | X1 |

SYMBOL NO. (TRANSISTORS)

| | | | | | | | | | |
|------|-------------|--------------------|--|----|------|-------------|--------------------|--|----|
| Q801 | 2SD382 (L) | power supply | | Y2 | Q806 | 2SC1345 (E) | protection circuit | | X2 |
| 802 | 2SB537 (L) | " | | Y1 | 807 | 2SC853 (L) | " | | X2 |
| 803 | 2SC1345 (E) | " | | Y3 | 808 | 2SC945 (P) | " | | X2 |
| 804 | 2SA640 (F) | " | | Y3 | 809 | 2SC1345 (E) | " | | Y2 |
| 805 | 2SA640 (F) | protection circuit | | Y2 | | | | | |

SYMBOL NO. (DIODES)

| | | | | | | | | | |
|------|------------|------------|--|----|------|--------|--------------------|----|----|
| D801 | IN4003 | rectifier | | X1 | D805 | W 04 | rectifier | Y1 | Y1 |
| 802 | 1K 188FM-1 | protection | | X2 | Z801 | WZ-290 | voltage stabilizer | | Y2 |
| 803 | IN4003 | protection | | X2 | Z802 | WZ-290 | voltage stabilizer | | Y2 |

SYMBOL No. (VARIABLE RESISTORS)

| | | | | | | | | | |
|-------|--------|------------------|--|----|-------|--------|------------------|--|----|
| VR801 | 4.7K-B | for power supply | | Y3 | VR802 | 4.7K-B | for power supply | | Y3 |
|-------|--------|------------------|--|----|-------|--------|------------------|--|----|

PB-777

SYMBOL NO. (RESISTORS; $\pm 5\%$ 1/4W)

| | | | | | | | | | | | | | |
|------|------|--|--|----|------|------|--|--|----|------|------|--|----|
| R401 | 1.5K | | | X2 | R412 | 3.3K | | | Y2 | R423 | 220K | | X3 |
| 402 | 1.5K | | | X2 | 413 | 47K | | | X3 | 424 | 220K | | X2 |
| 403 | 1.5K | | | X3 | 414 | 47K | | | X1 | 425 | 1M | | Y3 |
| 404 | 1.5K | | | X1 | 415 | 1K | | | X3 | 426 | 1M | | Y3 |
| 405 | 18K | | | X3 | 416 | 1K | | | X1 | 427 | 1M | | Y3 |
| 406 | 18K | | | X2 | 417 | 5.6K | | | X3 | 428 | 1M | | Y3 |
| 407 | 18K | | | X3 | 418 | 5.6K | | | X1 | 429 | 1M | | Y2 |
| 408 | 18K | | | X2 | 419 | 390 | | | X3 | 430 | 1M | | Y1 |
| 409 | 3.3K | | | Y2 | 420 | 390 | | | X1 | 431 | 1M | | Y2 |
| 410 | 3.3K | | | Y1 | 421 | 150K | | | X3 | 432 | 1M | | Y1 |
| 411 | 3.3K | | | X3 | 422 | 150K | | | X1 | | | | |

SYMBOL NO. (CAPACITORS)

| | | | | | | | | | | | |
|------|---------|-----|------------|-------|----|------|--------|-----|------------|--------------|----|
| C401 | 1000pF | 50V | $\pm 10\%$ | mylar | X3 | C414 | 3900pF | 50V | $\pm 10\%$ | mylar | X1 |
| 402 | 1000pF | 50V | " | " | Y3 | 415 | 1200pF | 50V | " | " | Y1 |
| 403 | 1000pF | 50V | " | " | X3 | 416 | 1200pF | 50V | " | " | X1 |
| 404 | 1000pF | 50V | " | " | Y2 | 417 | 4.7uF | 10V | | tantalum | X3 |
| 405 | 0.015uF | 50V | " | " | X3 | 418 | 4.7uF | 10V | | " | X1 |
| 406 | 0.015uF | 50V | " | " | X3 | 419 | 1uF | 35V | | tantalum | X3 |
| 407 | 0.047uF | 50V | " | " | Y3 | 420 | 1uF | 35V | | " | X2 |
| 408 | 0.047uF | 50V | " | " | Y3 | 421 | 33pF | 50V | $\pm 10\%$ | ceramic | X3 |
| 409 | 0.015uF | 50V | " | " | Y3 | 422 | 33pF | 50V | " | " | X1 |
| 410 | 0.015uF | 50V | " | " | X3 | 423 | 4.7pF | 50V | $\pm 1\%$ | " | X3 |
| 411 | 1200pF | 50V | " | " | X1 | 424 | 4.7pF | 50V | " | " | X2 |
| 412 | 1200pF | 50V | " | " | X1 | 425 | 22uF | 50V | | electrolytic | X3 |
| 413 | 3900pF | 50V | " | " | X1 | 426 | 22uF | 50V | | " | X2 |

SYMBOL NO. (TRANSISTORS)

| | | | | | | | | | |
|------|---------------|----------|--|----|------|---------------|----------|--|----|
| Q401 | 2SC1345 (E,F) | tone amp | | X3 | Q403 | 2SC1345 (E,F) | tone amp | | X3 |
| 402 | 2SC1345 (E,F) | tone amp | | X1 | 404 | 2SC1345 (E,F) | tone amp | | X1 |

PB-778

SYMBOL NO. (RESISTORS; $\pm 5\%$ 1/4W)

| | | | | | | | | |
|------|------|----|------|------|----|------|------|----|
| R301 | 4.7K | X3 | R323 | 68K | X1 | R343 | 5.6K | X3 |
| 302 | 4.7K | Y3 | 324 | 68K | Y1 | 344 | 5.6K | Y3 |
| 303 | 470K | X3 | 325 | 56K | X2 | 345 | 1.5K | X2 |
| 304 | 470K | Y3 | 326 | 56K | Y2 | 346 | 1.5K | Y2 |
| 305 | 560K | X3 | 327 | 120K | X2 | 347 | 27K | X2 |
| 306 | 560K | Y3 | 328 | 120K | Y2 | 348 | 27K | Y2 |
| 307 | 47K | X3 | 329 | 100K | X2 | 349 | 18K | X3 |
| 308 | 47K | Y3 | 330 | 100K | Y2 | 350 | 18K | Y3 |
| 309 | 150K | X3 | 331 | 120K | X2 | 351 | 4.7K | X2 |
| 310 | 150K | Y3 | 332 | 120K | Y2 | 352 | 4.7K | Y2 |
| 311 | 100K | X3 | 333 | 82K | X1 | 353 | 3.9K | X3 |
| 312 | 100K | Y3 | 334 | 82K | Y1 | 354 | 3.9K | Y3 |
| 313 | 6.8K | X3 | 335 | 100K | X2 | 355 | 1M | X2 |
| 314 | 6.8K | Y3 | 336 | 100K | Y2 | 356 | 1M | Y2 |
| 315 | 390 | X3 | 337 | 1M | X1 | 357 | 1M | X2 |
| 316 | 390 | Y3 | 338 | 1M | Y1 | 358 | 1M | Y2 |
| 319 | 820K | X1 | 339 | 1M | X1 | 359 | 1.5M | X3 |
| 320 | 820K | Y1 | 340 | 1M | Y1 | 360 | 1.5M | Y3 |
| 321 | 330K | X1 | 341 | 3.9K | X2 | | | |
| 322 | 330K | Y1 | 342 | 3.9K | Y2 | | | |

SYMBOL NO. (CAPACITORS)

| | | | | | | | | | | |
|------|---------|-----|--------------|---------|------|---------|---------|------------|--------------|----|
| C301 | 4.7uF | 10V | tantalum | X3 | C319 | 1000pF | 50V | $\pm 10\%$ | mylar | X1 |
| 302 | 4.7uF | 10V | " | Y3 | 320 | 1000pF | 50V | " | " | Y1 |
| 303 | 2.2uF | 35V | " | X3 | 321 | 5600pF | 50V | " | " | X1 |
| 304 | 2.2uF | 35V | " | Y3 | 322 | 5600pF | 50V | $\pm 10\%$ | " | Y1 |
| 305 | 33pF | 50V | $\pm 10\%$ | ceramic | X3 | 323 | 8200pF | 50V | " | X2 |
| 306 | 33pF | 50V | " | " | Y3 | 324 | 8200pF | 50V | " | Y2 |
| 307 | 47uF | 10V | electrolytic | X3 | 325 | 0.068uF | 50V | " | " | X2 |
| 308 | 47uF | 10V | " | Y3 | 326 | 0.068uF | 50V | " | " | Y2 |
| 309 | 10uF | 10V | tantalum | X3 | 327 | 3300pF | 50V | " | " | X2 |
| 310 | 10uF | 10V | " | Y3 | 328 | 3300pF | 50V | " | " | Y2 |
| 313 | 0.047uF | 50V | $\pm 10\%$ | mylar | X1 | 329 | 0.068uF | 50V | " | X3 |
| 314 | 0.047uF | 50V | " | Y1 | 330 | 0.068uF | 50V | " | " | Y3 |
| 315 | 330pF | 50V | " | ceramic | X1 | 331 | 1uF | 25V | electrolytic | X3 |
| 316 | 330pF | 50V | " | " | Y1 | 332 | 1uF | 25V | " | Y3 |
| 317 | 2700pF | 50V | " | mylar | X1 | 333 | 10uF | 50V | " | X1 |
| 318 | 2700pF | 50V | " | " | Y1 | 334 | 10uF | 50V | " | Y1 |

SYMBOL NO. (TRANSISTORS)

| | | | | | | | |
|------|---------------|------------------|----|------|------------|------------------|----|
| Q301 | 2SC1345 (E,F) | linear equalizer | X3 | Q303 | 2SA640 (F) | linear equalizer | X3 |
| 302 | 2SC1345 (E,F) | linear equalizer | Y3 | 304 | 2SA640 (F) | linear equalizer | Y3 |

PB-728

SYMBOL NO. (RESISTORS; $\pm 5\%$ 1/4W)

| | | | | | | | | |
|------|------|----|------|------|----|------|------|----|
| R201 | 220K | Y4 | R207 | 1M | Y3 | R213 | 6.8K | Y2 |
| 202 | 220K | Y3 | 208 | 1M | X3 | 214 | 6.8K | Y2 |
| 203 | 8.2K | Y4 | 209 | 560K | X3 | 215 | 1M | X2 |
| 204 | 8.2K | Y3 | 210 | 560K | X3 | 216 | 1M | X2 |
| 205 | 10K | Y4 | 211 | 470K | X3 | 217 | 1M | Y2 |
| 206 | 10K | X3 | 212 | 470K | X3 | 218 | 1M | X3 |

SYMBOL NO. (CAPACITORS)

| | | | | | | | | | | | |
|------|---------|------|-------------|----------|----|------|--------|-----|------------|--------------|----|
| C201 | 1uF | 250V | $\pm 0.5\%$ | mylar | X4 | C210 | 0.15uF | 50V | $\pm 10\%$ | mylar | Y2 |
| 202 | | 250V | " | " | X3 | 211 | 5600pF | 50V | " | " | Y2 |
| 203 | 2.2uF | 25V | " | tantalum | X3 | 212 | 5600pF | 50V | " | " | Y2 |
| 204 | 2.2uF | 25V | " | " | X3 | 213 | 3900pF | 50V | $\pm 10\%$ | " | Y2 |
| 205 | 2.2uF | 25V | " | " | X3 | 214 | 3900pF | 50V | " | " | Y2 |
| 206 | 2.2uF | 25V | " | " | X3 | 215 | 100pF | 50V | " | ceramic | Y4 |
| 207 | 0.068uF | 50V | $\pm 10\%$ | mylar | Y3 | 216 | 100pF | 50V | " | " | Y3 |
| 208 | 0.068uF | 50V | " | " | Y3 | 217 | 2.2uF | 50V | " | electrolytic | Y3 |
| 209 | 0.15uF | 50V | " | " | Y3 | | | | | | |

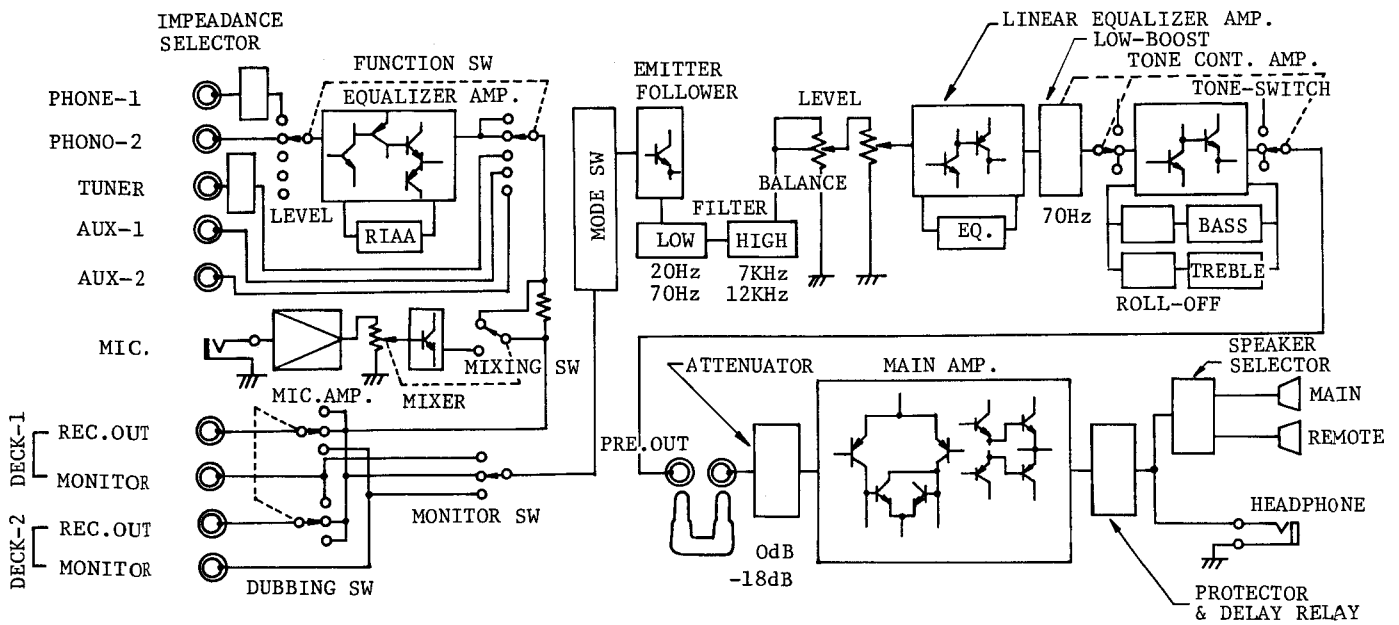
SYMBOL NO. (TRANSISTORS)

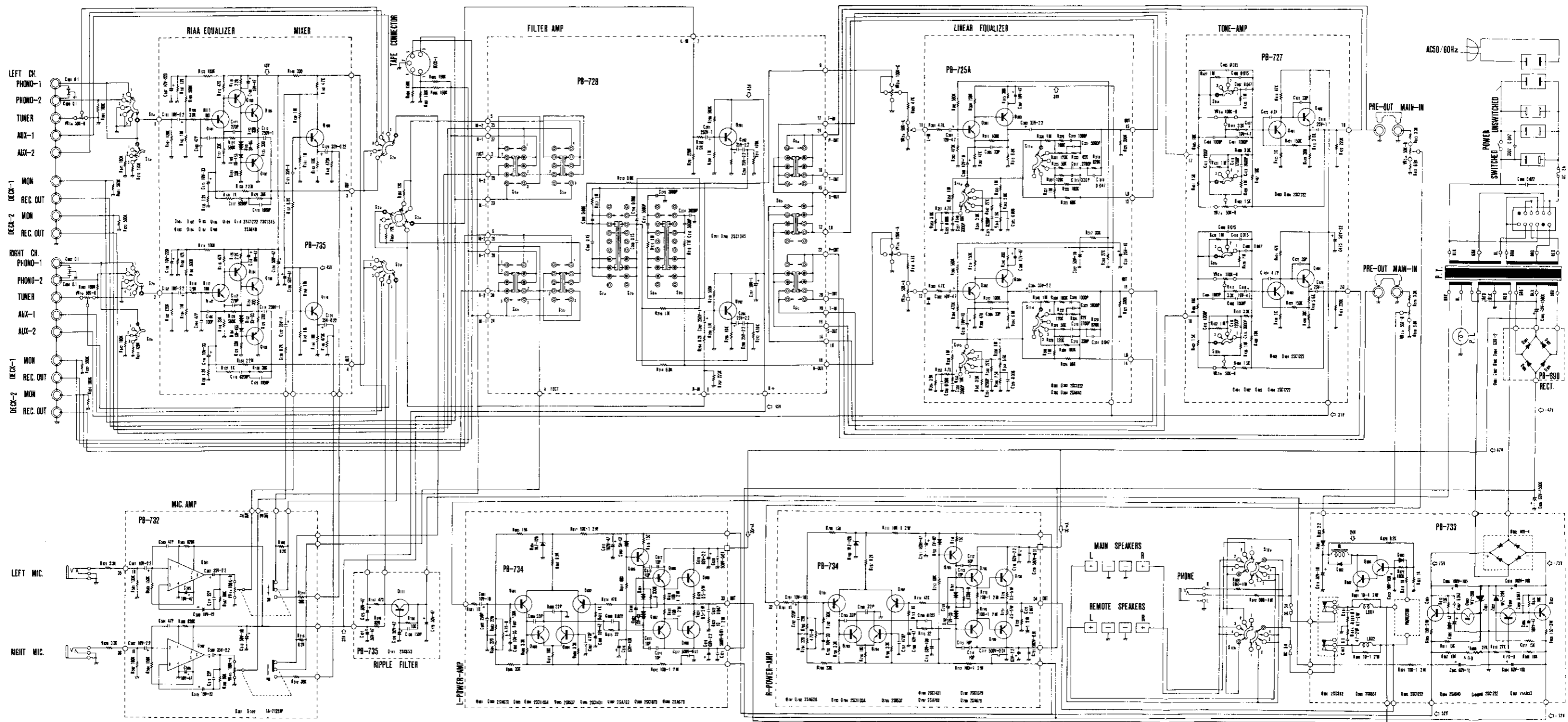
| | | | | | | | |
|------|---------------|------------|----|------|---------------|------------|----|
| Q201 | 2SC1345 (E,F) | filter amp | Y3 | Q202 | 2SC1345 (E,F) | filter amp | Y3 |
|------|---------------|------------|----|------|---------------|------------|----|

MISCELLANEOUS

| | | |
|--------|-----------------------|---------------------------|
| PB-723 | printed circuit board | for R.I.A.A. equalizer |
| 724 | " | power amp |
| 728A | " | filter amplifier |
| 729 | " | for fuse |
| 732 | " | microphone amp |
| 733 | " | power supply & protection |
| 777 | " | tone amplifier |
| 778 | " | Linear Equalizer |
| 890 | " | rectifier |
| P-1945 | power transformer | |

BLOCK DIAGRAM FOR MODEL L-309





NOTES

- S1a, S1b INPUT IMPEDANCE (PHONO-1) (1.90K Ω , 2.65K Ω , 3.50K Ω)
- S2a, S2b, S2c, S2d FUNCTION (1. PHONO-1, 2. PHONO-2, 3. TUNER, 4. AUX-1, 5. AUX-2)
- S3a, S3b MODE (1. L, 2. R, 3. MONO L+R, 4. STEREO, 5. STEREO-REVERSE)
- S4a, S4b DUBBING (1. 210, 2. SOURCE, 3. 170, 2)

- S5a, S5b MONITOR (1. DECK-2/4CH, 2. SOURCE, 3. DECK-1)
- S6a, S6b, S6c DEFEAT (1. DEFEAT, 2. NORMAL, 3. TONE + LOW BOOST)
- S7a, S7b LOW CUT (1. 20Hz, 2. NORMAL, 3. 70Hz)
- S8a, S8b HIGH CUT (1. 12KHz, 2. NORMAL, 3. 7KHz)

- S9a, S9b BASS (1. 150Hz, 2. 300Hz, 3. 600Hz)
- S10a, S10b TREBLE (1. 1.5KHz, 2. 3KHz, 3. 6KHz)
- S11a, S11b, S11c, S11d LINEAR EQUALIZER (1. 2. UP TILT, 3. FLAT, 4. 5. DOWN TILT)
- S12a, S12b SPEAKERS (1. OFF, 2. REMOTE, 3. MAIN, 4. MAIN & REMOTE)

- VR1a, VR1b TUNER LEVEL
- VR2a, VR2b VOLUME CONTROL
- VR3a, VR3b BALANCE CONTROL
- VR4a, VR4b MIC LEVEL (PULL ON)

- VR5a, VR5b ATTENUATOR
- VR6a, VR6b BASS CONTROL
- VR7a, VR7b TREBLE CONTROL

1. Unless otherwise specified, all resistors are in ohm 1/4 watt, all capacitors are in micro Farad (μ F)
2. Transistors, IC and diodes may be replaced with any types having comparable ratings.
3. There might be slight changes in the actual set.