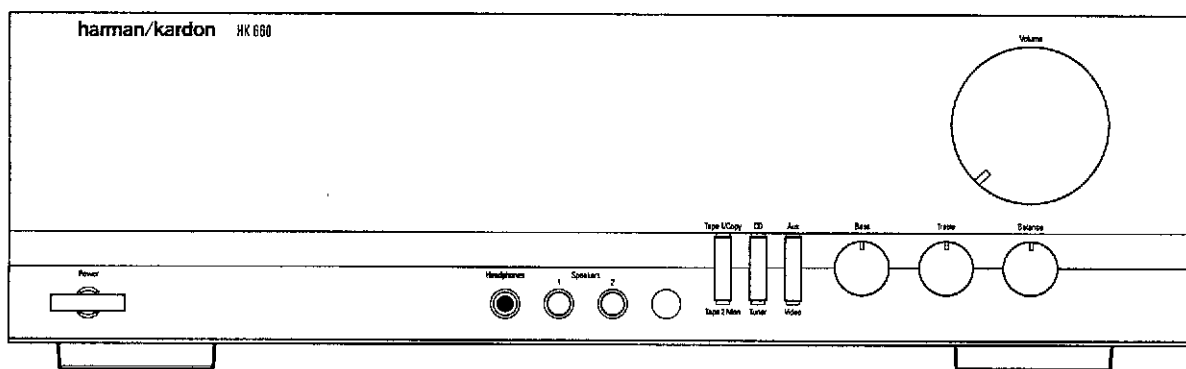


The Harman Kardon Model HK640/HK660 INTEGRATED AMPLIFIER

Manual 198A

Technical Manual



The following marks found in the parts list of this manual identify the models as follows:

- HK640/HK660 **IB** : International model Black version
- HK640/HK660 **I** : International model
- HK640 **WB** : Asia/Oceania model Black version

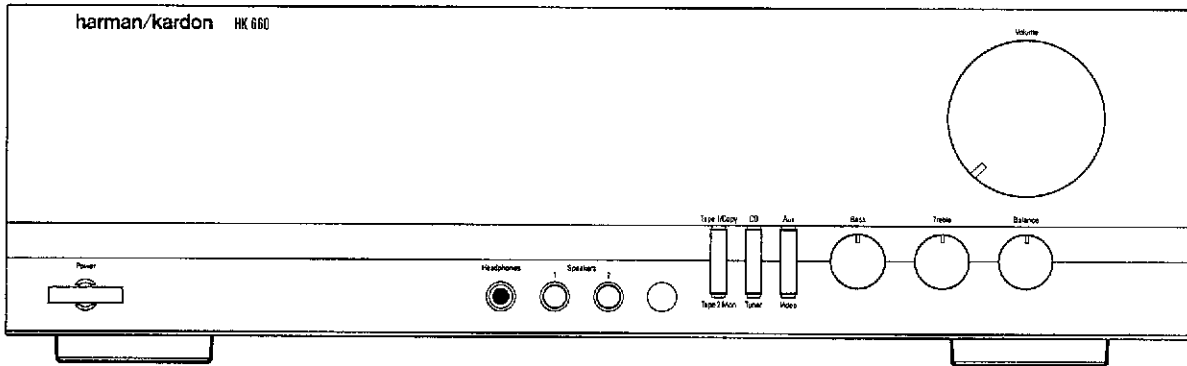
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harman/kardon

Parts and Service Office
80 Crossways Park West, Woodbury, N.Y. 11797
1112-HK640-A A9502 300 Printed in Japan

CONTROLS AND FUNCTIONS



Power Switch

Press to turn the unit on and off.

Headphone Jack

Plug in headphones if desired. (With both Speakers 1 and 2 switches in Off position, output is supplied only to headphones.)

Speakers Switches

Push in to select either of two sets of speakers, or both, or neither (headphone output only).

Function Selector Buttons

Select desired input source by pressing the corresponding button.

Bass Control

Turn to increase or decrease the proportion of low frequency sound.

Treble Control

Turn to increase or decrease the proportion of high frequency sound.

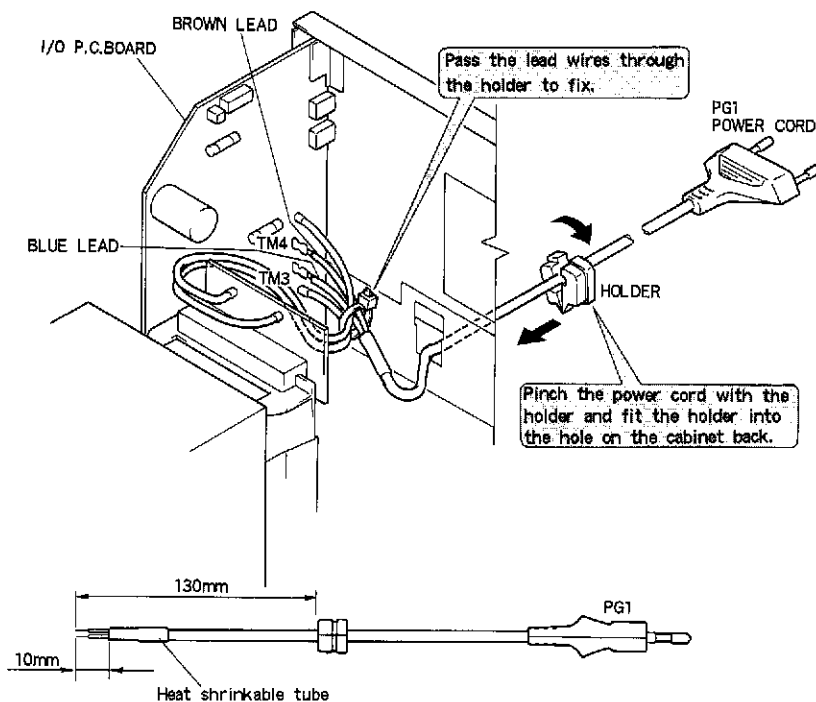
Balance Control

Turn to adjust relative output level of left and right speakers.

Volume Control

Turn to raise or lower output volume.

POWER CORD REPLACEMENT



ALIGNMENT PROCEDURES (REFER TO PAGES 6,7AND18)

- **Conditions :**
- Set the Function selector to the "CD" position.
 - Set the Volume control to minimum.
 - Make the adjustment at a room temperature of 77°F (25°C).

■ DC BALANCE CONFIRMATION

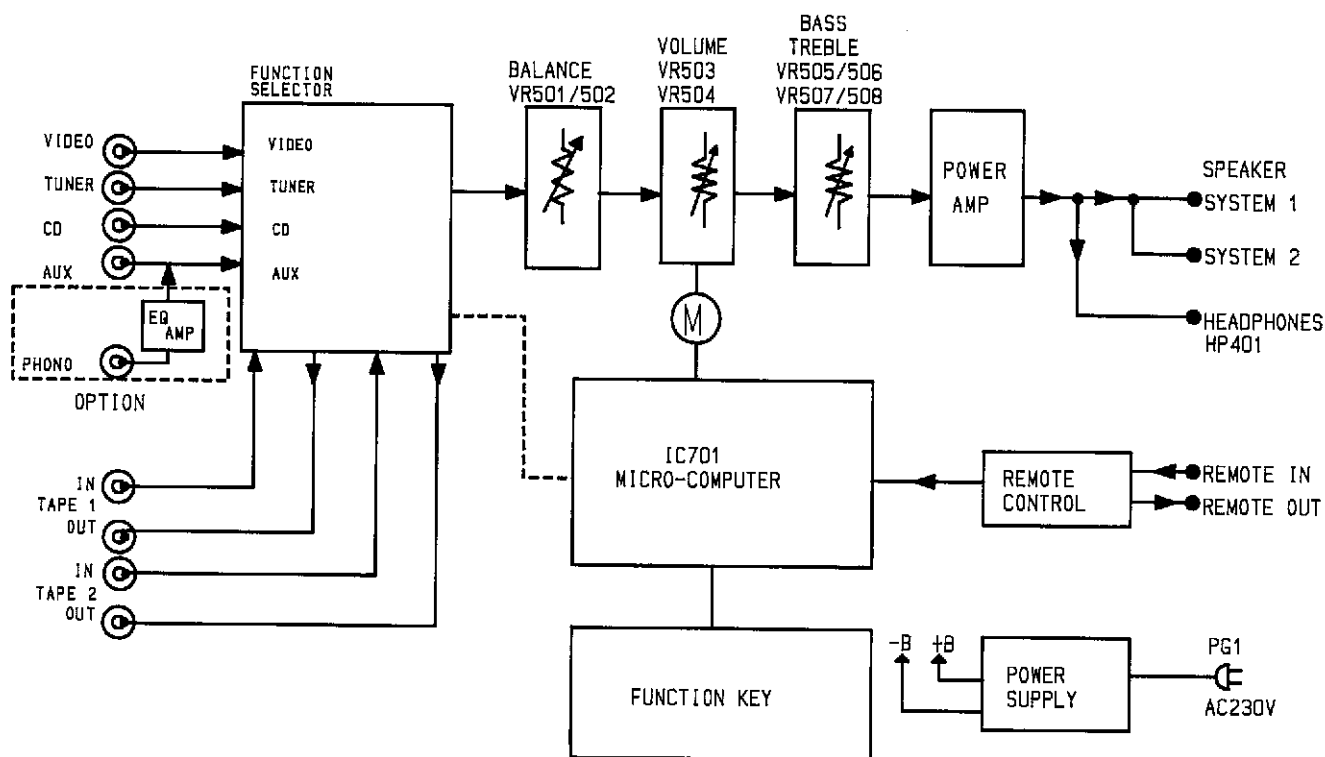
| Step | Connection Equipments | Adjustment | For |
|------|--|------------|---------------------|
| 1 | Connect the Digital Volt Meter to Speaker output (L ch). | | $0 \pm 60\text{mV}$ |
| 2 | Connect the Digital Volt Meter to Speaker output (R ch). | | $0 \pm 60\text{mV}$ |

■ IDLING CURRENT ADJUSTMENT

| Step | Connection Equipments | Adjustment | For |
|------|--|------------|------------------------------|
| 1 | Connect the Digital Volt Meter to TP401 and TP403. | VR401 | $33\text{mV} \pm 2\text{mV}$ |
| 2 | Connect the Digital Volt Meter to TP402 and TP404. | VR402 | $33\text{mV} \pm 2\text{mV}$ |

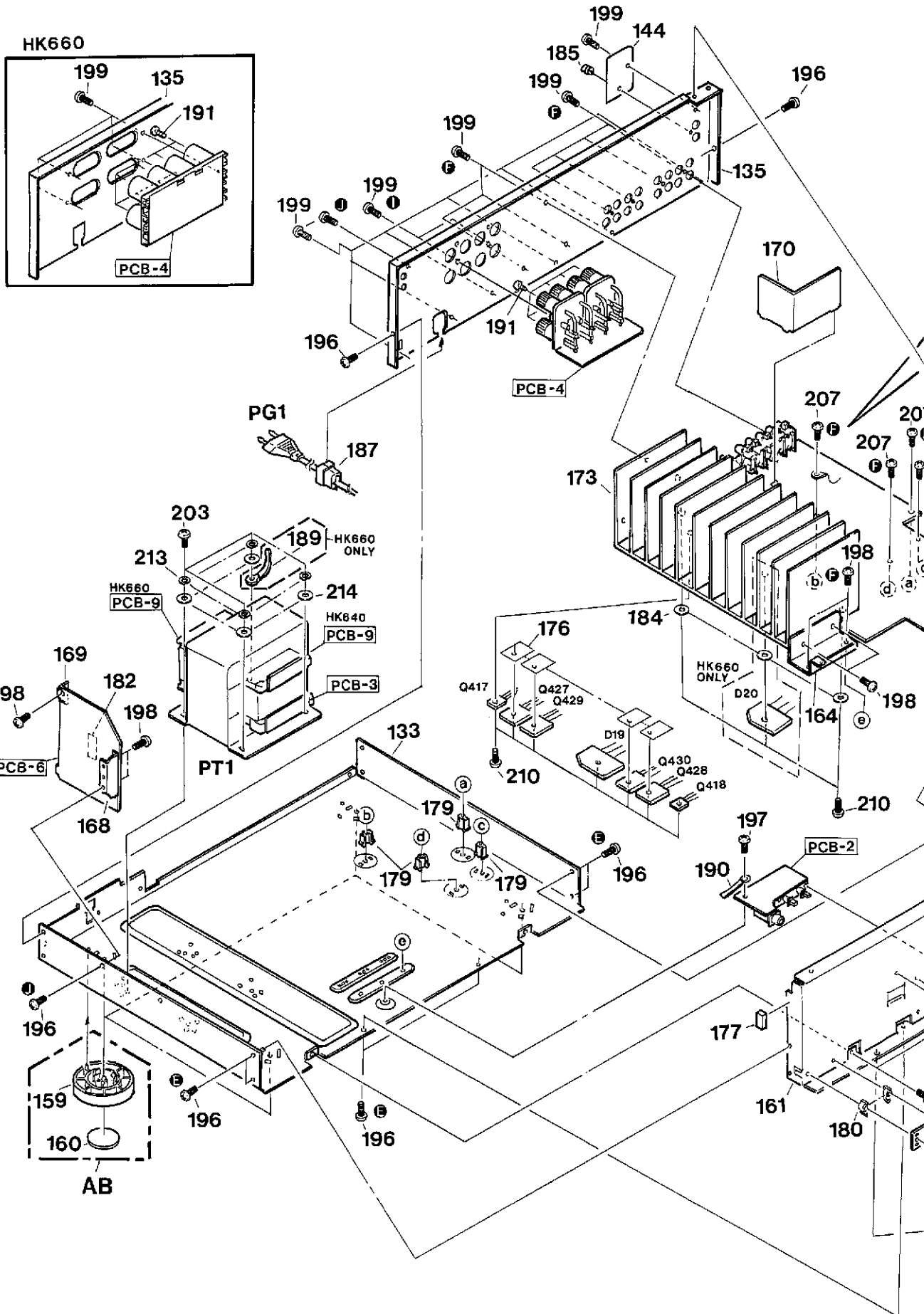
- After the above adjustment, leave the unit with its power on for longer than 15 minutes and then repeat the same adjustment.

BLOCK DIAGRAM



GENERAL UNIT
EXPLODED VIEW

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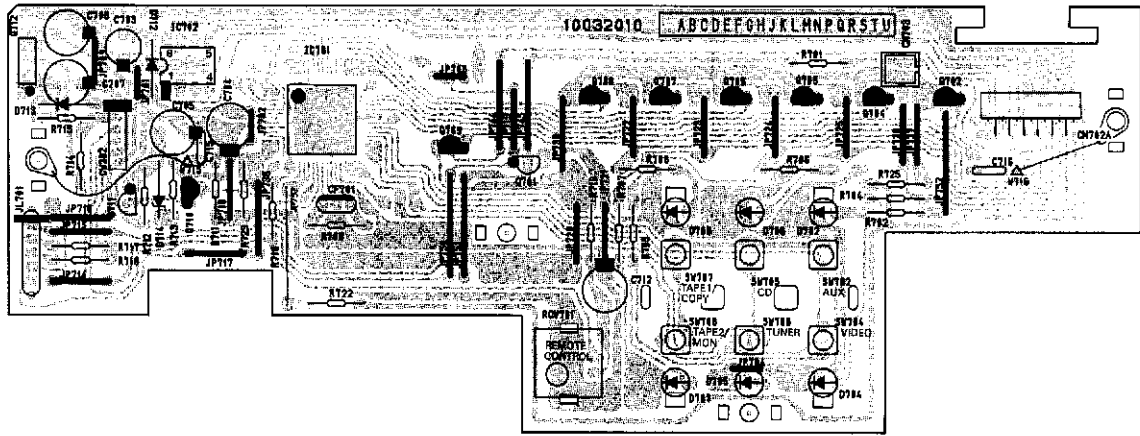
GENERAL UNIT PARTS LIST

| Ref. No. | Part No. | Description | Ref. No. | Part No. | Description |
|----------|--------------|---|----------|---------------|--|
| AA | A443-HK6440A | FRONT PANEL ASSEMBLY (Model: HK640) IB WB | 176 | 2224-7134 | INSULATOR, POWER Tr (x4) (Model: HK640) |
| AA | A443-HK6440B | FRONT PANEL ASSEMBLY (Model: HK640) I | 176 | 2224-7148 | INSULATOR, POWER Tr (x4) (Model: HK660) |
| AA | A443-HK6660A | FRONT PANEL ASSEMBLY (Model: HK660) IB | 177 | 2112-11809 | SPONGE, CHASSIS SIDE (x2) |
| AA | A443-HK6660B | FRONT PANEL ASSEMBLY (Model: HK660) I | 178 | 2112-11806 | SPONGE, MAIN PCB C17, C19 |
| AB | A319-HK6440A | LEG ASSEMBLY | 179 | 2360-7017 | BOSS, SPE, PCB (x4) |
| 131 | 1414-17601 | CABINET TOP | 180 | 2360-7026 | BOSS, SPE (x6) |
| 133 | 1424-38201 | CABINET BACK, BOTTOM | 182 | 1756-R01TL101 | LABEL, FUSE LABEL (Model: HK660) |
| 135 | 1424-38301 | CABINET BACK, REAR (Model: HK640) IB I | 184 | 2402-0374 | WASHER, PLASTIC (x2) (Model: HK640) |
| 135 | 1424-38302 | CABINET BACK, REAR (Model: HK640) WB | 184 | 2402-0374 | WASHER, PLASTIC (x3) (Model: HK660) |
| 135 | 1424-38401 | CABINET BACK, REAR (Model: HK660) | 185 | 2459-3003511 | RIVET, PLASTIC |
| 137 | 1443-15001 | FRONT PANEL (Model: HK640) IB WB | 187 | 2240-364 | HOLDER, AC CORD |
| 137 | 1443-15002 | FRONT PANEL (Model: HK640) I | 188 | 2240-R0101 | HOLDER, WIRING (x18) |
| 137 | 1443-15003 | FRONT PANEL (Model: HK660) IB | 189 | 2218-7011 | BRACKET, FIX (Model: HK660) |
| 137 | 1443-15004 | FRONT PANEL (Model: HK660) I | 190 | 2218-R0130 | BRACKET, FIX (x2) |
| 140 | 1562-09602 | FRAME, L (Model: HK640) IB WB | 191 | 2459-3004511 | RIVET, PLASTIC (x8) |
| 140 | 1562-09601 | FRAME, L (Model: HK640/660) I | 193 | 2327-R0130062 | SCREW, BND+ (3x6 mm) (x2) |
| 141 | 1562-09702 | FRAME, R (Model: HK640) IB WB | 196 | 2347-R0130062 | SCREW, BND T+ (3x6 mm) (x11) |
| 141 | 1562-09701 | FRAME, R (Model: HK640/660) I | 197 | 2347-R0130062 | SCREW, BND T+ (3x6 mm) (x10) |
| 143 | 1532-22801 | WINDOW, REMOTE SENSOR | 198 | 2347-R0130062 | SCREW, BND T+ (3x6 mm) (x7) |
| 144 | 1511-23601 | PLATE, EQ | 199 | 2347-R0130084 | SCREW, BND T+ (3x8 mm) (x19) |
| 146 | 1662-67202 | PUSH BUTTON, SPEAKERS (x2) (Model: HK640) IB WB | 202 | 2347-R0130084 | SCREW, BND T+ (3x8 mm) (x21) (Model: HK640) |
| 146 | 1662-67201 | PUSH BUTTON, SPEAKERS (x2) (Model: HK640/660) I | 203 | 2347-R0130102 | SCREW, BND T+ (3x10 mm) (x7) (Model: HK660) |
| 147 | 1660-02302 | PUSH BUTTON, POWER BUTTON/INDICATOR (Model: HK640) IB WB | 204 | 2347-401027 | SCREW, BND T+ (4x10 mm) (x4) |
| 147 | 1660-02301 | PUSH BUTTON, POWER BUTTON/INDICATOR (Model: HK640/660) I | 204 | 2347-R0140064 | SCREW, BND T+ (4x6 mm) (x4) |
| 148 | 1662-71902 | PUSH BUTTON, TAPE 1/COPY/TAPE 2 MON/CD/TUNER/AUX/VIDEO (Model: HK640) IB WB | 206 | 2347-R0126082 | SCREW, BND T+ (2.6x8 mm) |
| 148 | 1662-71901 | PUSH BUTTON, TAPE 1/COPY/TAPE 2 MON/CD/TUNER/AUX/VIDEO (Model: HK640/660) I | 207 | 2347-R0130162 | SCREW, BND T+ (3x16 mm) (x4) |
| 150 | 1630-05002 | ROTARY KNOB, VOLUME (Model: HK640) IB WB | 210 | 2557-F301426 | SCREW, B SPW+ (3x14 mm) (x9) (Model: HK640) |
| 150 | 1630-05001 | ROTARY KNOB, VOLUME (Model: HK640/660) I | 210 | 2557-F301426 | SCREW, B SPW+ (3x14 mm) (x10) (Model: HK660) |
| 151 | 1632-20702 | ROTARY KNOB, BASS, TREBLE, BALANCE (x3) (Model: HK640) IB WB | 213 | 2412-4022 | WASHER, SPRG (x4) |
| 151 | 1632-20701 | ROTARY KNOB, BASS, TREBLE, BALANCE (x3) (Model: HK640/660) I | 214 | 2401-0472 | WASHER, METAL (x4) |
| 154 | 1732-09801 | INDICATOR, TAPE1/COPY, CD, AUX (x3) | | | |
| 155 | 1732-09901 | INDICATOR, TAPE2 MON, TUNER, VIDEO (x3) | | | |
| 157 | 1742-09402 | ORNAMENT, SPEAKERS 1/2 BUTTON (Model: HK640) IB WB | | | |
| 157 | 1742-09401 | ORNAMENT, SPEAKERS 1/2 BUTTON (Model: HK660) IB | | | |
| 159 | 1319-04303 | LEG (x4) | | | |
| 160 | 1319-04601 | LEG, SPONGE (x4) | | | |
| 161 | 2211-7330 | CHASSIS | | | |
| 164 | 2219-8422 | METAL FITTG, HEAT SINK | | | |
| 166 | 2219-8424 | METAL FITTG, R SIDE TOP | | | |
| 168 | 2219-8349 | METAL FITTG, POWER IN SIDE | | | |
| 169 | 2219-8390 | METAL FITTG, POWER IN | | | |
| 170 | 2216-7210 | SHIELD PLATE | | | |
| 173 | 2222-7342 | HEAT SINK (Model: HK640) | | | |
| 173 | 2222-7341 | HEAT SINK (Model: HK660) | | | |
| 175 | 2224-146 | INSULATOR, TOP COVER (x2) | | | |

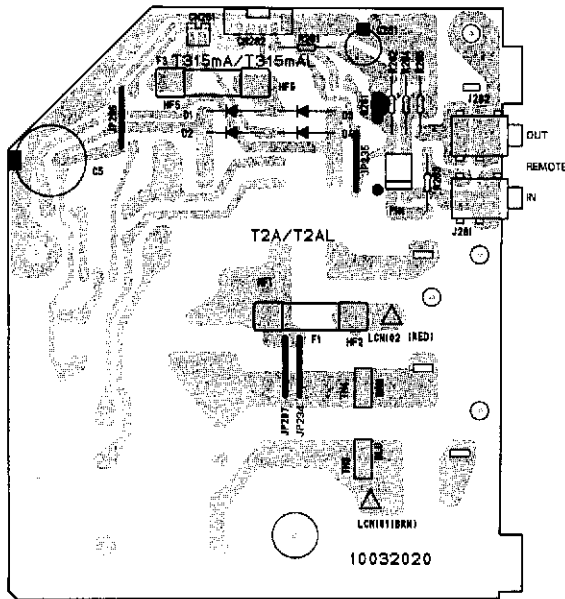
P.C. BOARDS

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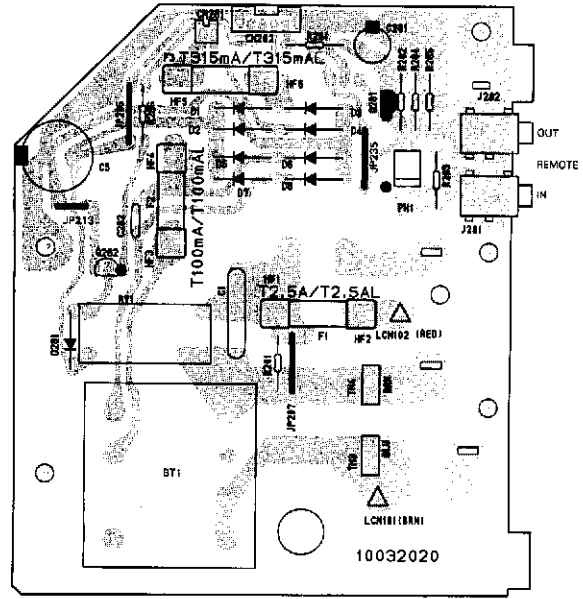
PCB-5 CPU P.C.BOARD



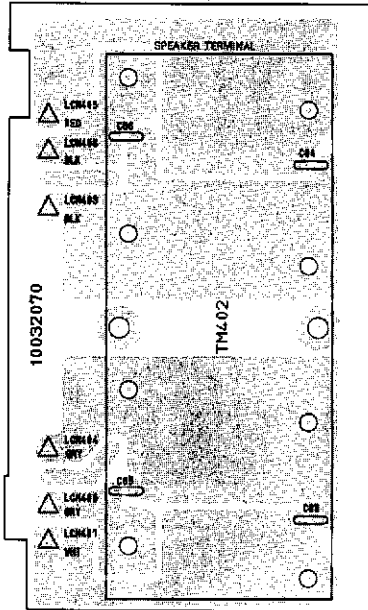
PCB-6 I/O P.C. BOARD (MODEL: HK640)



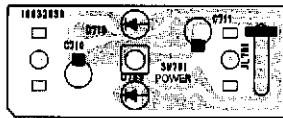
PCB-6 I/O P.C. BOARD (MODEL: HK660)



PCB-4 SP TERMINAL P.C. BOARD (MODEL: HK660)



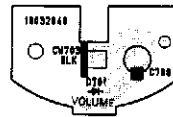
PCB-7 POWER INDICATOR P.C. BOARD



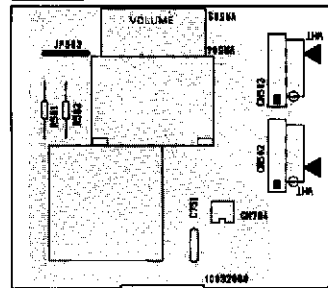
PCB-9 POWER TRANS P.C. BOARD (MODEL: HK640)



PCB-8 VOLUME INDICATOR P.C. BOARD

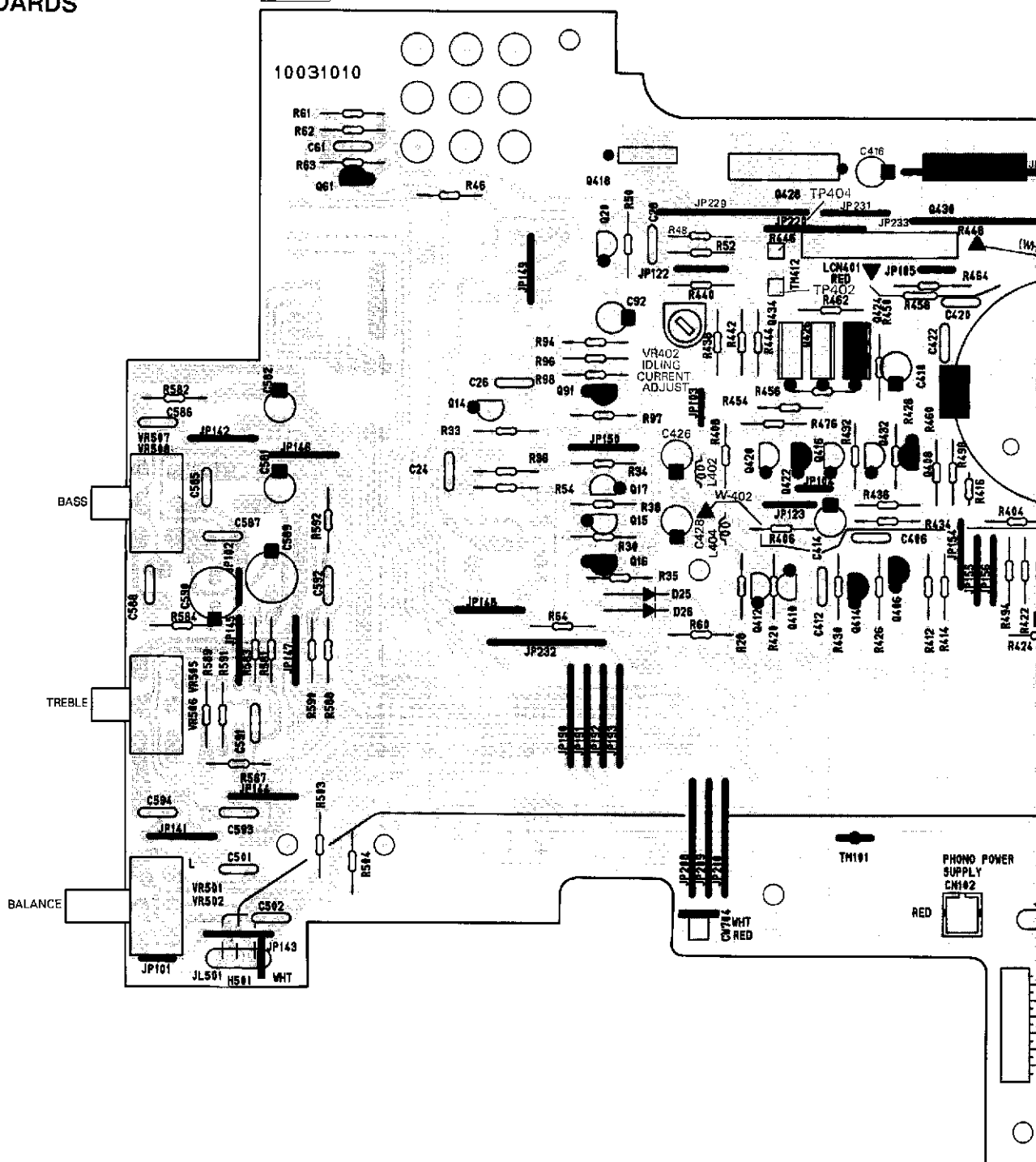


PCB-10 VOLUME P.C. BOARD

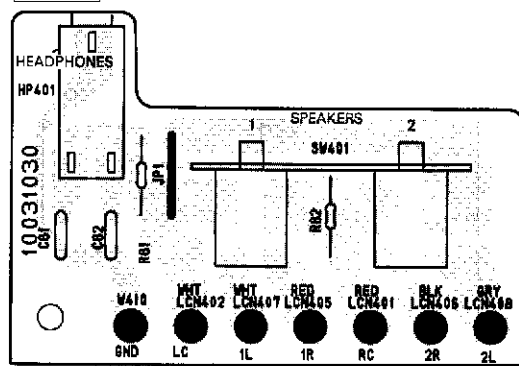


P.C. BOARDS

PCB-1 MAIN P.C. BOARD

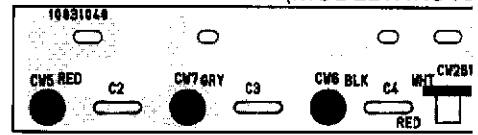


PCB-2 SP SW P.C. BOARD

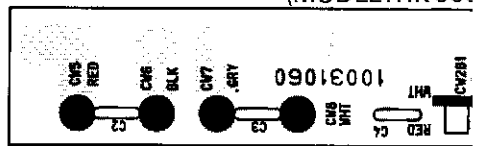


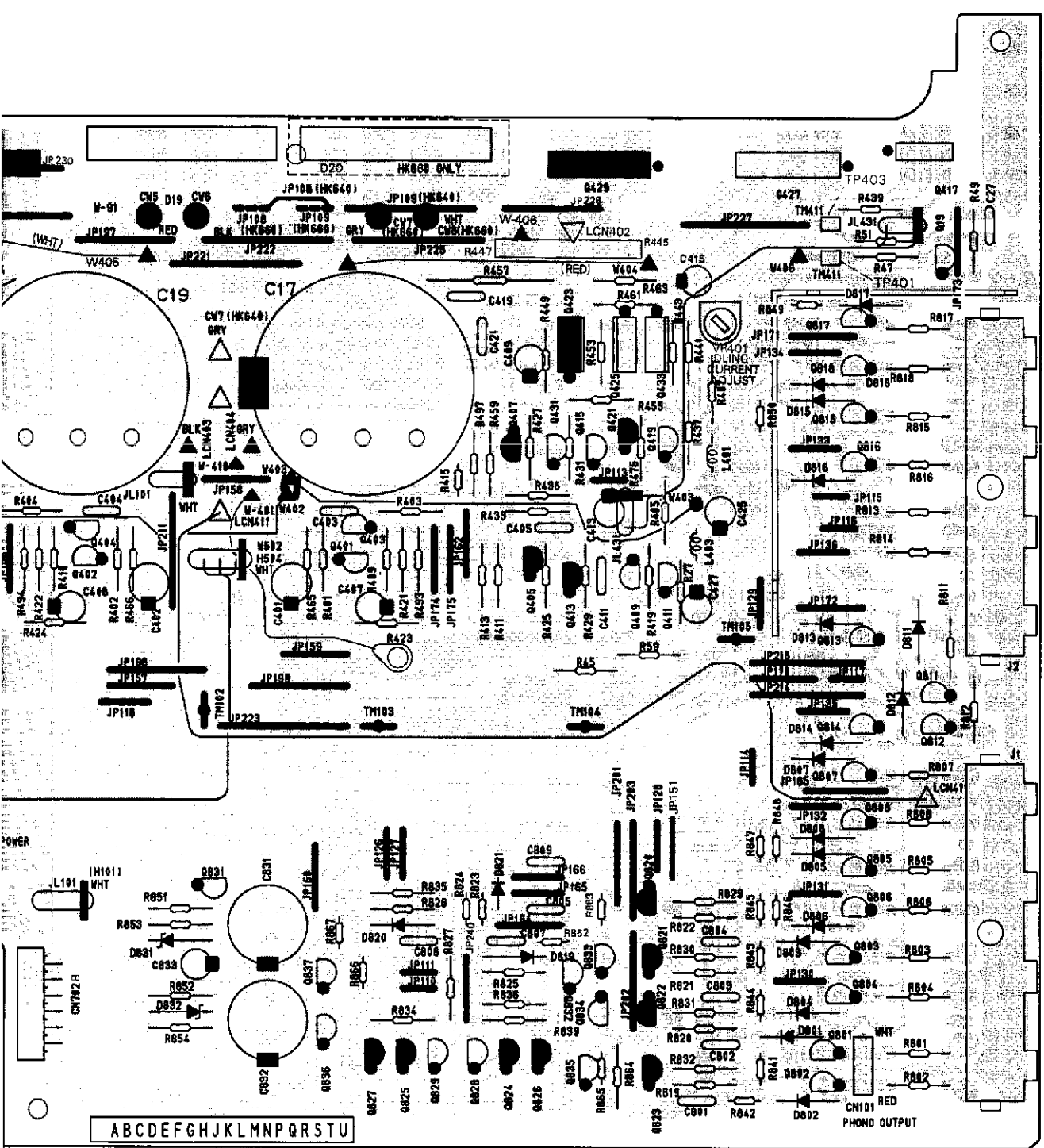
PCB-3 SECOND P.C. BOARD

(MODEL: HK640)



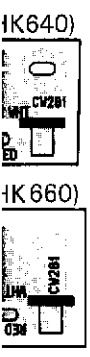
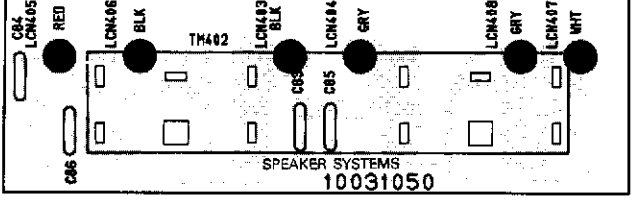
(MODEL: HK660)





OUT TAPE1
IN
OUT TAPE2
IN
CD
TUNER
VIDEO
AUX

PCB-4 SP TERMINAL P.C.BOARD (MODEL:HK640)



ELECTRICAL PARTS LIST

| Ser. No. | Ref. No. | Part No. | Description |
|------------------------------|----------|---------------|------------------------------------|
| PCB - MAIN P.C. BOARD | | | |
| CAPACITORS | | | |
| 724 | △ C17 | 5341-S45GM159 | CAP, ELE 15000U/63V (Model: HK640) |
| 724 | △ C17 | 5341-S45GM189 | CAP, ELE 18000U/63V (Model: HK660) |
| 724 | △ C19 | 5341-S45GM159 | CAP, ELE 15000U/63V (Model: HK640) |
| 724 | △ C19 | 5341-S45GM189 | CAP, ELE 18000U/63V (Model: HK660) |
| 691 | C24 | 5354-104593 | CAP, MYL .1U |
| 693 | C26 | 5354-104593 | CAP, MYL .1U |
| 692 | C27 | 5354-124593 | CAP, MYL .12U |
| 692 | C28 | 5354-124593 | CAP, MYL .12U |
| 701 | C61 | 5359-S010J332 | CAP, PPP 3300P |
| 694 | C92 | 5345-476F041 | CAP, MINI ELE 47U/50V |
| 601 | C401 | 5345-S29AM227 | CAP, MINI ELE 220U/6.3V |
| 601 | C402 | 5345-S29AM227 | CAP, MINI ELE 220U/6.3V |
| 610 | C403 | 5359-S010K221 | CAP, PPP 220P |
| 610 | C404 | 5359-S010K221 | CAP, PPP 220P |
| 602 | C405 | 5353-020933 | CAP, MCA 2P |
| 602 | C406 | 5353-020933 | CAP, MCA 2P |
| 603 | C407 | 5345-S29BM107 | CAP, MINI ELE 100U/10V |
| 603 | C408 | 5345-S29BM107 | CAP, MINI ELE 100U/10V |
| 607 | C409 | 5345-S29FM106 | CAP, MINI ELE 10U/50V |
| 607 | C410 | 5345-S29FM106 | CAP, MINI ELE 10U/50V |
| 606 | C411 | 5353-070933 | CAP, MCA 7P |
| 606 | C412 | 5353-070933 | CAP, MCA 7P |
| 604 | C413 | 5345-S29CM106 | CAP, MINI ELE 10U/16V |
| 604 | C414 | 5345-S29CM106 | CAP, MINI ELE 10U/16V |
| 609 | C415 | 5345-S25JM106 | CAP, MINI ELE 10U/100V |
| 609 | C416 | 5345-S25JM106 | CAP, MINI ELE 10U/100V |
| 605 | C419 | 5354-224593 | CAP, MYL .22U |
| 605 | C420 | 5354-224593 | CAP, MYL .22U |
| 605 | C421 | 5354-224593 | CAP, MYL .22U |
| 605 | C422 | 5354-224593 | CAP, MYL .22U |
| 608 | C425 | 5345-S29GM105 | CAP, MINI ELE 1U/63V |
| 608 | C426 | 5345-S29GM105 | CAP, MINI ELE 1U/63V |
| 608 | C427 | 5345-S29GM105 | CAP, MINI ELE 1U/63V |
| 608 | C428 | 5345-S29GM105 | CAP, MINI ELE 1U/63V |
| 670 | C501 | 5359-4715851 | CAP, PPP 470P |
| 670 | C502 | 5359-4715851 | CAP, PPP 470P |
| 661 | C581 | 5345-S29BM476 | CAP, MINI ELE 47U/10V |
| 661 | C582 | 5345-S29BM476 | CAP, MINI ELE 47U/10V |
| 669 | C585 | 5354-823593 | CAP, MYL .082U |
| 669 | C586 | 5354-823593 | CAP, MYL .082U |
| 663 | C587 | 5354-334593 | CAP, MYL .33U |
| 663 | C588 | 5354-334593 | CAP, MYL .33U |
| 664 | C589 | 5345-S29AM227 | CAP, MINI ELE 220U/6.3V |
| 664 | C590 | 5345-S29AM227 | CAP, MINI ELE 220U/6.3V |
| 666 | C591 | 5359-8225851 | CAP, PPP 8200P |
| 666 | C592 | 5359-8225851 | CAP, PPP 8200P |
| 668 | C593 | 5354-563593 | CAP, MYL .056U |
| 668 | C594 | 5354-563593 | CAP, MYL .056U |
| 877 | C801 | 5352-S110J104 | CAP, MTL .1U |
| 877 | C802 | 5352-S110J104 | CAP, MTL .1U |
| 877 | C803 | 5352-S110J104 | CAP, MTL .1U |
| 877 | C804 | 5352-S110J104 | CAP, MTL .1U |
| 879 | C805 | 5352-S110J224 | CAP, MTL .22U |
| 879 | C807 | 5352-S110J224 | CAP, MTL .22U |
| 879 | C808 | 5352-S110J224 | CAP, MTL .22U |
| 877 | C809 | 5352-S110J104 | CAP, MTL .1U |
| 880 | C831 | 5345-S25GM337 | CAP, MINI ELE 330U/63V |
| 880 | C832 | 5345-S25GM337 | CAP, MINI ELE 330U/63V |
| 878 | C833 | 5345-107D041 | CAP, MINI ELE 100U/25V |

| Ser. No. | Ref. No. | Part No. | Description |
|------------------|----------|---------------|--------------------|
| RESISTORS | | | |
| 702 | R27 | 5130-R030J104 | RES, CBN 1/2P 100K |
| 702 | R28 | 5130-R030J104 | RES, CBN 1/2P 100K |
| 706 | R30 | 5130-R030J683 | RES, CBN 1/2P 68K |
| 702 | R33 | 5130-R030J104 | RES, CBN 1/2P 100K |
| 704 | R34 | 5130-R030J472 | RES, CBN 1/2P 4.7K |
| 705 | R35 | 5130-R030J223 | RES, CBN 1/2P 22K |
| 705 | R36 | 5130-R030J223 | RES, CBN 1/2P 22K |
| 706 | R38 | 5130-R030J683 | RES, CBN 1/2P 68K |

| Ser. No. | Ref. No. | Part No. | Description |
|----------|----------|---------------|-----------------------------------|
| 709 | R45 | 5130-R030J682 | RES, CBN 1/2P 6.8K |
| 709 | R46 | 5130-R030J682 | RES, CBN 1/2P 6.8K |
| 710 | R47 | 5130-R030J222 | RES, CBN 1/2P 2.2K (Model: HK640) |
| 710 | R47 | 5130-R030J272 | RES, CBN 1/2P 2.7K (Model: HK660) |
| 710 | R48 | 5130-R030J222 | RES, CBN 1/2P 2.2K (Model: HK640) |
| 710 | R48 | 5130-R030J272 | RES, CBN 1/2P 2.7K (Model: HK660) |
| 711 | R49 | 5130-R030J821 | RES, CBN 1/2P 820 |
| 711 | R50 | 5130-R030J821 | RES, CBN 1/2P 820 |
| 710 | R51 | 5130-R030J222 | RES, CBN 1/2P 2.2K (Model: HK640) |
| 710 | R51 | 5130-R030J272 | RES, CBN 1/2P 2.7K (Model: HK660) |
| 710 | R52 | 5130-R030J222 | RES, CBN 1/2P 2.2K (Model: HK640) |
| 710 | R52 | 5130-R030J272 | RES, CBN 1/2P 2.7K (Model: HK660) |
| 705 | R54 | 5130-R030J223 | RES, CBN 1/2P 22K |
| 712 | R59 | 5130-R030J123 | RES, CBN 1/2P 12K |
| 712 | R60 | 5130-R030J123 | RES, CBN 1/2P 12K |
| 715 | R61 | 5130-R030J152 | RES, CBN 1/2P 1.5K |
| 716 | R62 | 5130-R030J473 | RES, CBN 1/2P 47K |
| 717 | R63 | 5130-R030J223 | RES, CBN 1/2P 22K |
| 718 | R64 | 5130-R030J103 | RES, CBN 1/2P 10K |
| 714 | R94 | 5130-R030J104 | RES, CBN 1/2P 100K |
| 704 | R96 | 5130-R030J472 | RES, CBN 1/2P 4.7K |
| 705 | R97 | 5130-R030J223 | RES, CBN 1/2P 22K |
| 713 | R98 | 5130-R030J333 | RES, CBN 1/2P 33K |
| 631 | R401 | 5130-R030J683 | RES, CBN 1/2P 68K |
| 631 | R402 | 5130-R030J683 | RES, CBN 1/2P 68K |
| 627 | R403 | 5130-R030J562 | RES, CBN 1/2P 5.6K |
| 627 | R404 | 5130-R030J562 | RES, CBN 1/2P 5.6K |
| 643 | △ R405 | 5102-3R35116 | RES, FUSE 3.3 |
| 643 | △ R406 | 5102-3R35116 | RES, FUSE 3.3 |
| 643 | △ R407 | 5102-3R35116 | RES, FUSE 3.3 |
| 643 | △ R408 | 5102-3R35116 | RES, FUSE 3.3 |
| 633 | R409 | 5130-R030J473 | RES, CBN 1/2P 47K |
| 633 | R410 | 5130-R030J473 | RES, CBN 1/2P 47K |
| 634 | △ R411 | 5102-1025116 | RES, FUSE 1K |
| 634 | △ R412 | 5102-1025116 | RES, FUSE 1K |
| 632 | △ R413 | 5102-1024715 | RES, FUSE 1K |
| 632 | △ R414 | 5102-1024715 | RES, FUSE 1K |
| 629 | △ R415 | 5102-S081J470 | RES, FUSE 47 |
| 629 | △ R416 | 5102-S081J470 | RES, FUSE 47 |
| 635 | R419 | 5130-R030J271 | RES, CBN 1/2P 270 |
| 635 | R420 | 5130-R030J271 | RES, CBN 1/2P 270 |
| 636 | R421 | 5130-R030J224 | RES, CBN 1/2P 220K |
| 636 | R422 | 5130-R030J224 | RES, CBN 1/2P 220K |
| 637 | R423 | 5130-R030J121 | RES, CBN 1/2P 120 (Model: HK640) |
| 637 | R423 | 5130-R030J111 | RES, CBN 1/2P 110 (Model: HK660) |
| 637 | R424 | 5130-R030J121 | RES, CBN 1/2P 120 (Model: HK640) |
| 637 | R424 | 5130-R030J111 | RES, CBN 1/2P 110 (Model: HK660) |
| 645 | △ R425 | 5102-8205116 | RES, FUSE 82 |
| 645 | △ R426 | 5102-8205116 | RES, FUSE 82 |
| 648 | △ R427 | 5102-6805116 | RES, FUSE 68 |
| 648 | △ R428 | 5102-6805116 | RES, FUSE 68 |
| 645 | △ R429 | 5102-8205116 | RES, FUSE 82 |
| 645 | △ R430 | 5102-8205116 | RES, FUSE 82 |
| 645 | △ R431 | 5102-8205116 | RES, FUSE 82 |
| 645 | △ R432 | 5102-8205116 | RES, FUSE 82 |
| 638 | R433 | 5130-R030J183 | RES, CBN 1/2P 18K |
| 638 | R434 | 5130-R030J183 | RES, CBN 1/2P 18K |
| 638 | R435 | 5130-R030J183 | RES, CBN 1/2P 18K |
| 638 | R436 | 5130-R030J183 | RES, CBN 1/2P 18K |
| 656 | R437 | 5130-R030J182 | RES, CBN 1/2P 1.8K |
| 656 | R438 | 5130-R030J182 | RES, CBN 1/2P 1.8K |
| 640 | R439 | 5130-R030J681 | RES, CBN 1/2P 680 |
| 640 | R440 | 5130-R030J681 | RES, CBN 1/2P 680 |
| 639 | R441 | 5130-R030J122 | RES, CBN 1/2P 1.2K |
| 639 | R442 | 5130-R030J122 | RES, CBN 1/2P 1.2K |
| 655 | R443 | 5130-R030J122 | RES, CBN 1/2P 1.2K |
| 655 | R444 | 5130-R030J122 | RES, CBN 1/2P 1.2K |
| 650 | R445 | 5275-S040JR22 | RES, CEM 5P .22 |
| 650 | R446 | 5275-S040JR22 | RES, CEM 5P .22 |
| 650 | R447 | 5275-S040JR22 | RES, CEM 5P .22 |
| 650 | R448 | 5275-S040JR22 | RES, CEM 5P .22 |
| 646 | △ R449 | 5102-2214715 | RES, FUSE 220 |
| 646 | △ R450 | 5102-2214715 | RES, FUSE 220 |

| Ser. No. | Ref. No. | Part No. | Description | Ser. No. | Ref. No. | Part No. | Description |
|----------|----------|---------------|--------------------|----------|----------|--------------------|-----------------------------------|
| 644 | △ R453 | 5102-1014715 | RES, FUSE 100 | 903 | △ R851 | 5102-2205116 | RES, FUSE 22 |
| 644 | △ R454 | 5102-1014715 | RES, FUSE 100 | 906 | R852 | 5130-R030J392 | RES, CBN 1/2P 3.9K (Model: HK640) |
| 644 | △ R455 | 5102-1014715 | RES, FUSE 100 | 906 | R852 | 5130-R030J472 | RES, CBN 1/2P 4.7K (Model: HK660) |
| 644 | △ R456 | 5102-1014715 | RES, FUSE 100 | 904 | R853 | 5130-R030J103 | RES, CBN 1/2P 10K |
| 652 | R457 | 5173-3R3583 | RES, MTL 2P 3.3 | 905 | R854 | 5130-R030J222 | RES, CBN 1/2P 2.2K |
| 652 | R458 | 5173-3R3583 | RES, MTL 2P 3.3 | 895 | R862 | 5130-R010J102 | RES, CBN 1/6P 1K |
| 641 | R459 | 5130-R030J332 | RES, CBN 1/2P 3.3K | 895 | R863 | 5130-R010J102 | RES, CBN 1/6P 1K |
| 641 | R460 | 5130-R030J332 | RES, CBN 1/2P 3.3K | 894 | R864 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 649 | △ R461 | 5102-4R75116 | RES, FUSE 4.7 | 895 | R865 | 5130-R010J102 | RES, CBN 1/6P 1K |
| 649 | △ R462 | 5102-4R75116 | RES, FUSE 4.7 | 895 | R866 | 5130-R010J102 | RES, CBN 1/6P 1K |
| 649 | △ R463 | 5102-4R75116 | RES, FUSE 4.7 | 895 | R867 | 5130-R010J102 | RES, CBN 1/6P 1K |
| 649 | △ R464 | 5102-4R75116 | RES, FUSE 4.7 | | | | |
| 642 | R465 | 5130-R030J331 | RES, CBN 1/2P 330 | | | TRANSISTORS | |
| 642 | R466 | 5130-R030J331 | RES, CBN 1/2P 330 | 696 | Q14 | 5613-1740S(S) | XISTOR, NPN R |
| 647 | △ R475 | 5102-3914715 | RES, FUSE 390 | 696 | Q15 | 5613-1740S(S) | XISTOR, NPN R |
| 647 | △ R476 | 5102-3914715 | RES, FUSE 390 | 697 | Q16 | 5611-933S(S) | XISTOR, PNP R |
| 642 | R493 | 5130-R030J331 | RES, CBN 1/2P 330 | 696 | Q17 | 5613-1740S(S) | XISTOR, NPN R |
| 642 | R494 | 5130-R030J331 | RES, CBN 1/2P 330 | 698 | Q19 | 5613-2240(BL) | XISTOR, NPN R |
| 633 | R497 | 5130-R030J473 | RES, CBN 1/2P 47K | 698 | Q20 | 5613-2240(BL) | XISTOR, NPN R |
| 633 | R498 | 5130-R030J473 | RES, CBN 1/2P 47K | 699 | Q61 | 5611-970(BL) | XISTOR, PNP R |
| 671 | R503 | 5130-R030J102 | RES, CBN 1/2P 1K | 697 | Q91 | 5611-933S(S) | XISTOR, PNP R |
| 671 | R504 | 5130-R030J102 | RES, CBN 1/2P 1K | 613 | Q401 | 5613-1775(F) | XISTOR, NPN R |
| 672 | R581 | 5130-R030J822 | RES, CBN 1/2P 8.2K | 613 | Q402 | 5613-1775(F) | XISTOR, NPN R |
| 672 | R582 | 5130-R030J822 | RES, CBN 1/2P 8.2K | 613 | Q403 | 5613-1775(F) | XISTOR, NPN R |
| 673 | R583 | 5130-R030J152 | RES, CBN 1/2P 1.5K | 613 | Q404 | 5613-1775(F) | XISTOR, NPN R |
| 673 | R584 | 5130-R030J152 | RES, CBN 1/2P 1.5K | 614 | Q405 | 5612-646A(C) | XISTOR, PNP A |
| 674 | R587 | 5130-R030J271 | RES, CBN 1/2P 270 | 614 | Q406 | 5612-646A(C) | XISTOR, PNP A |
| 674 | R588 | 5130-R030J271 | RES, CBN 1/2P 270 | 614 | Q407 | 5612-646A(C) | XISTOR, PNP A |
| 675 | R589 | 5130-R030J335 | RES, CBN 1/2P 3.3M | 614 | Q408 | 5612-646A(C) | XISTOR, PNP A |
| 675 | R590 | 5130-R030J335 | RES, CBN 1/2P 3.3M | 615 | Q409 | 5613-2240(BL) | XISTOR, NPN R |
| 676 | R591 | 5130-R030J122 | RES, CBN 1/2P 1.2K | 615 | Q410 | 5613-2240(BL) | XISTOR, NPN R |
| 676 | R592 | 5130-R030J122 | RES, CBN 1/2P 1.2K | 615 | Q411 | 5613-2240(BL) | XISTOR, NPN R |
| 896 | R801 | 5130-R030J102 | RES, CBN 1/2P 1K | 615 | Q412 | 5613-2240(BL) | XISTOR, NPN R |
| 896 | R802 | 5130-R030J102 | RES, CBN 1/2P 1K | 614 | Q413 | 5612-646A(C) | XISTOR, PNP A |
| 896 | R803 | 5130-R030J102 | RES, CBN 1/2P 1K | 614 | Q414 | 5612-646A(C) | XISTOR, PNP A |
| 896 | R804 | 5130-R030J102 | RES, CBN 1/2P 1K | 616 | Q415 | 5614-666A(C) | XISTOR, NPN A |
| 896 | R805 | 5130-R030J102 | RES, CBN 1/2P 1K | 616 | Q416 | 5614-666A(C) | XISTOR, NPN A |
| 896 | R806 | 5130-R030J102 | RES, CBN 1/2P 1K | 617 | Q417 | 5613-3423(Y) | XISTOR, NPN R |
| 896 | R807 | 5130-R030J102 | RES, CBN 1/2P 1K | 617 | Q418 | 5613-3423(Y) | XISTOR, NPN R |
| 896 | R808 | 5130-R030J102 | RES, CBN 1/2P 1K | 618 | Q419 | 5614-667A(C) | XISTOR, NPN A |
| 896 | R811 | 5130-R030J102 | RES, CBN 1/2P 1K | 618 | Q420 | 5614-667A(C) | XISTOR, NPN A |
| 896 | R812 | 5130-R030J102 | RES, CBN 1/2P 1K | 619 | Q421 | 5612-647A(C) | XISTOR, PNP A |
| 896 | R813 | 5130-R030J102 | RES, CBN 1/2P 1K | 619 | Q422 | 5612-647A(C) | XISTOR, PNP A |
| 897 | R814 | 5130-R030J102 | RES, CBN 1/2P 1K | 620 | Q423 | 5611-1837(Y) | XISTOR, PNP R |
| 897 | R815 | 5130-R030J102 | RES, CBN 1/2P 1K | 620 | Q424 | 5611-1837(Y) | XISTOR, PNP R |
| 897 | R816 | 5130-R030J102 | RES, CBN 1/2P 1K | 621 | Q425 | 5613-4793(Y) | XISTOR, NPN R |
| 897 | R817 | 5130-R030J102 | RES, CBN 1/2P 1K | 621 | Q426 | 5613-4793(Y) | XISTOR, NPN R |
| 897 | R818 | 5130-R030J102 | RES, CBN 1/2P 1K | 623 | Q427 | 5613-3907(O) | XISTOR, NPN R |
| 901 | R819 | 5130-R030J225 | RES, CBN 1/2P 2.2M | 623 | Q427 | 5613-3281(O) | XISTOR, NPN R |
| 901 | R820 | 5130-R030J225 | RES, CBN 1/2P 2.2M | 623 | Q428 | 5613-3907(O) | XISTOR, NPN R |
| 901 | R821 | 5130-R030J225 | RES, CBN 1/2P 2.2M | 623 | Q428 | 5613-3281(O) | XISTOR, NPN R |
| 901 | R822 | 5130-R030J225 | RES, CBN 1/2P 2.2M | 624 | Q429 | 5611-1516(O) | XISTOR, PNP R |
| 893 | R823 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 624 | Q429 | 5611-1302(O) | XISTOR, PNP R |
| 898 | R824 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 624 | Q430 | 5611-1516(O) | XISTOR, PNP R |
| 899 | R825 | 5130-R030J155 | RES, CBN 1/2P 1.5M | 624 | Q430 | 5611-1302(O) | XISTOR, PNP R |
| 899 | R826 | 5130-R030J155 | RES, CBN 1/2P 1.5M | 612 | Q431 | 5613-1775(F) | XISTOR, NPN R |
| 901 | R827 | 5130-R030J225 | RES, CBN 1/2P 2.2M | 612 | Q432 | 5613-1775(F) | XISTOR, NPN R |
| 900 | R829 | 5130-R030J104 | RES, CBN 1/2P 100K | 617 | Q433 | 5613-3423(Y) | XISTOR, NPN R |
| 900 | R830 | 5130-R030J104 | RES, CBN 1/2P 100K | 617 | Q434 | 5613-3423(Y) | XISTOR, NPN R |
| 900 | R831 | 5130-R030J104 | RES, CBN 1/2P 100K | 887 | Q801 | 5616-2SK364BL | FET, N-CH |
| 900 | R832 | 5130-R030J104 | RES, CBN 1/2P 100K | 887 | Q802 | 5616-2SK364BL | FET, N-CH |
| 900 | R834 | 5130-R030J104 | RES, CBN 1/2P 100K | 887 | Q803 | 5616-2SK364BL | FET, N-CH |
| 900 | R835 | 5130-R030J104 | RES, CBN 1/2P 100K | 887 | Q804 | 5616-2SK364BL | FET, N-CH |
| 900 | R836 | 5130-R030J104 | RES, CBN 1/2P 100K | 887 | Q805 | 5616-2SK364BL | FET, N-CH |
| 900 | R839 | 5130-R030J104 | RES, CBN 1/2P 100K | 887 | Q806 | 5616-2SK364BL | FET, N-CH |
| 902 | R841 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 887 | Q807 | 5616-2SK364BL | FET, N-CH |
| 902 | R842 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 887 | Q808 | 5616-2SK364BL | FET, N-CH |
| 902 | R843 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 887 | Q811 | 5616-2SK364BL | FET, N-CH |
| 902 | R844 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 887 | Q812 | 5616-2SK364BL | FET, N-CH |
| 902 | R845 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 889 | Q813 | 5616-2SK364(V) | FET, N-CH |
| 902 | R846 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 889 | Q814 | 5616-2SK364(V) | FET, N-CH |
| 902 | R847 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 887 | Q815 | 5616-2SK364BL | FET, N-CH |
| 902 | R848 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 888 | Q816 | 5616-2SK364BL | FET, N-CH |
| 902 | R849 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 888 | Q817 | 5616-2SK364BL | FET, N-CH |
| 902 | R850 | 5130-R010J225 | RES, CBN 1/6P 2.2M | 888 | Q818 | 5616-2SK364BL | FET, N-CH |

| Ser. No. | Ref. No. | Part No. | Description |
|--------------------------------|----------|---------------|--------------|
| PCB-3 SECOND P.C. BOARD | | | |
| CAPACITORS | | | |
| 721 | C2 | 5352-S060K104 | CAP, MTL .1U |
| 721 | C3 | 5352-S060K104 | CAP, MTL .1U |
| 722 | C4 | 5354-104593 | CAP, MYL .1U |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|----------------------|
| MISCELLANEOUS | | | |
| 790 | CW281 | 4163-S0202301 | CONNECTOR W/W, 2 PIN |

| Ser. No. | Ref. No. | Part No. | Description |
|-------------------------------------|----------|---------------|---------------|
| PCB-4 SP TERMINAL P.C. BOARD | | | |
| CAPACITORS | | | |
| 657 | C83 | 5359-S010K151 | CAP, PPP 150P |
| 657 | C84 | 5359-S010K151 | CAP, PPP 150P |
| 657 | C85 | 5359-S010K151 | CAP, PPP 150P |
| 657 | C86 | 5359-S010K151 | CAP, PPP 150P |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|----------|--|
| MISCELLANEOUS | | | |
| 812 | TM402 | 4214-239 | TERMINAL, SPEAKER SYSTEM 1/2 (Model: HK640) |
| 812 | TM402 | 4214-221 | TERMINAL, SPEAKER SYSTEM 1/2 (Model: HK660) |

| Ser. No. | Ref. No. | Part No. | Description |
|-----------------------------|----------|---------------|------------------------|
| PCB-5 CPU P.C. BOARD | | | |
| CAPACITORS | | | |
| 841 | C703 | 5345-S35BM107 | CAP, MINI ELE 100U/10V |
| 842 | C704 | 5345-S35BM107 | CAP, MINI ELE 100U/10V |
| 841 | C705 | 5345-S35BM107 | CAP, MINI ELE 100U/10V |
| 844 | C706 | 5345-S35BM227 | CAP, MINI ELE 220U/10V |
| 844 | C707 | 5345-S35BM227 | CAP, MINI ELE 220U/10V |
| 842 | C712 | 5345-S35BM107 | CAP, MINI ELE 100U/10V |
| 845 | C715 | 5354-104593 | CAP, MYL .1U |
| 845 | C716 | 5354-104593 | CAP, MYL .1U |

| Ser. No. | Ref. No. | Part No. | Description |
|------------------|----------|---------------|--------------------|
| RESISTORS | | | |
| 861 | R701 | 5130-R030J331 | RES, CBN 1/2P 330 |
| 862 | R702 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 862 | R704 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 862 | R705 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 862 | R706 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 863 | R707 | 5130-R030J561 | RES, CBN 1/2P 560 |
| 862 | R708 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 864 | R709 | 5130-R030J105 | RES, CBN 1/2P 1M |
| 866 | R711 | 5130-R030J103 | RES, CBN 1/2P 10K |
| 862 | R712 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 867 | R713 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 868 | R714 | 5102-4R75116 | RES, FUSE 4.7 |
| 869 | R715 | 5130-R030J392 | RES, CBN 1/2P 3.9K |
| 865 | R716 | 5130-R030J101 | RES, CBN 1/2P 100 |
| 862 | R717 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 862 | R718 | 5130-R030J471 | RES, CBN 1/2P 470 |
| 867 | R719 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 849 | R722 | 5130-R030J103 | RES, CBN 1/2P 10K |
| 866 | R723 | 5130-R030J103 | RES, CBN 1/2P 10K |
| 847 | R725 | 5130-R030J104 | RES, CBN 1/2P 100K |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------------|----------|---------------|-------------|
| INTEGRATED CIRCUITS | | | |
| 855 | IC701 | 5654-T7C2BF-1 | IC, DIGITAL |
| 856 | IC702 | 5653-LB1639 | IC, LINEAR |

| Ser. No. | Ref. No. | Part No. | Description |
|--------------------|----------|---------------|---|
| TRANSISTORS | | | |
| 850 | Q701 | 5613-R01D1000 | XISTOR, NPN R, RN1211 or DTC114TS or UN4215 |
| 857 | Q702 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |
| 857 | Q704 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |

| Ser. No. | Ref. No. | Part No. | Description |
|----------|----------|---------------|---|
| 857 | Q705 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |
| 857 | Q706 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |
| 857 | Q707 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |
| 857 | Q708 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |
| 857 | Q709 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |
| 858 | Q710 | 5611-R01D1010 | XISTOR, PNP R, RN2202 or DTA114ES or UN4111 |
| 859 | Q711 | 5613-1740S(S) | XISTOR, NPN R |
| 860 | Q712 | 5614-2012 | XISTOR, NPN A |

| Ser. No. | Ref. No. | Part No. | Description |
|---------------|----------|---------------|------------------|
| DIODES | | | |
| 832 | D702 | 5637-S2410E6A | LED, AUX |
| 831 | D704 | 5637-S2410E1A | LED, VIDEO |
| 831 | D705 | 5637-S2410E1A | LED, TUNER |
| 832 | D706 | 5637-S2410E6A | LED, CD |
| 833 | D707 | 5637-S2210S1 | LED, TAPE 2 MON |
| 832 | D708 | 5637-S2410E6A | LED, TAPE 1/COPY |
| 852 | D712 | 5631-1S2473 | DIODE, DET |
| 853 | D713 | 5635-HZ6A2L | DIODE, ZENER |
| 854 | D714 | 5635-HZ3B2 | DIODE, ZENER |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|------------------------------|
| MISCELLANEOUS | | | |
| 846 | CF701 | 5693-FC4004A4 | OSC, CER |
| 808 | CN702A | 4443-05401013 | CONNECTOR, 13 PIN |
| 807 | CN703 | 4443-0201140 | CONNECTOR, 2 PIN |
| 791 | CW282 | 4163-S0206451 | CONNECTOR W/W, 6 PIN |
| 802 | JL701 | 4242-R0505141 | JUMPER LEAD, 5 WIRE |
| 870 | RCV701 | 6143-00804 | RECEIVER UNIT, REMOTE SENSOR |
| 818 | SW702 | 4437-01301 | SWITCH, PU-TC, AUX |
| 818 | SW704 | 4437-01301 | SWITCH, PU-TC, VIDEO |
| 818 | SW705 | 4437-01301 | SWITCH, PU-TC, CD |
| 818 | SW706 | 4437-01301 | SWITCH, PU-TC, TUNER |
| 818 | SW707 | 4437-01301 | SWITCH, PU-TC, TAPE 1/COPY |
| 818 | SW708 | 4437-01301 | SWITCH, PU-TC, TAPE 1 MON |
| 851 | W715 | 4122-00220550 | WIRE, LUG (Model: HK640) |
| 851 | W715 | 4122-00270550 | WIRE, LUG (Model: HK660) |
| 851 | W716 | 4122-00220550 | WIRE, LUG (Model: HK640) |
| 851 | W716 | 4122-00270550 | WIRE, LUG (Model: HK660) |
| 840 | | 4211-4 | LUG, (W715, 716) (x2) |
| 871 | | 2240-Z052 | HOLDER, H701 |

PCB-6 I/O P.C. BOARD (MODEL: HK640)

| Ser. No. | Ref. No. | Part No. | Description |
|-------------------|----------|---------------|-------------------------|
| CAPACITORS | | | |
| 733 | C5 | 5345-S25DM108 | CAP, MINI ELE 1000U/25V |
| 739 | C281 | 5345-476D041 | CAP, MINI ELE 47U/25V |
| RESISTORS | | | |
| 747 | R281 | 5130-R030J470 | RES, CBN 1/2P 47 |
| 748 | R282 | 5130-R030J392 | RES, CBN 1/2P 3.9K |
| 749 | R283 | 5130-R030J271 | RES, CBN 1/2P 270 |
| 750 | R284 | 5130-R030J473 | RES, CBN 1/2P 47K |
| 747 | R285 | 5130-R030J470 | RES, CBN 1/2P 47 |

| Ser. No. | Ref. No. | Part No. | Description |
|-------------------|----------|---------------|---|
| TRANSISTOR | | | |
| 744 | Q281 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN411L |

| Ser. No. | Ref. No. | Part No. | Description |
|---------------|----------|-------------|-------------|
| DIODES | | | |
| 734 | △ D1 | 5632-S5566B | DIODE, RECT |
| 734 | △ D2 | 5632-S5566B | DIODE, RECT |
| 734 | △ D3 | 5632-S5566B | DIODE, RECT |
| 734 | △ D4 | 5632-S5566B | DIODE, RECT |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|---------------------|
| MISCELLANEOUS | | | |
| 803 | CN281 | 4443-0201140 | CONNECTOR, 2 PIN |
| 804 | CN282 | 4443-0601140 | CONNECTOR, 6 PIN |
| 727 | △ F1 | 5732-01601202 | FUSE, T2A/T2AL 250V |

| Ser. No. | Ref. No. | Part No. | Description |
|----------|----------|---------------|---------------------------|
| 728 | △ F3 | 5732-01601311 | FUSE, T315mA/T315mAL 250V |
| 729 | △ HF1 | 4472-04901 | HOLDER, FUSE, F1 |
| 729 | △ HF2 | 4472-04901 | HOLDER, FUSE, F1 |
| 729 | △ HF5 | 4472-04901 | HOLDER, FUSE, F3 |
| 729 | △ HF6 | 4472-04901 | HOLDER, FUSE, F3 |
| 814 | J281 | 4451-00184 | JACK, 1P, REMOTE IN |
| 814 | J282 | 4451-00184 | JACK, 1P, REMOTE OUT |
| 788 | LCN101 | 4163-S5101150 | CONNECTOR W/W, 1 PIN |
| 789 | LCN102 | 4163-S5201150 | CONNECTOR W/W, 1 PIN |
| 743 | PH1 | 5624-PC817 | PHOTO COUPLR |
| 785 | △ TM3 | 4214-245 | TERMINAL |
| 785 | △ TM4 | 4214-245 | TERMINAL |

PCB-6 I/O P.C. BOARD (MODEL: HK660)

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|---|
| CAPACITORS | | | |
| 730 | △ C1 | 5352-1030958 | CAP, MTL .01U |
| 733 | C5 | 5345-S25DM108 | CAP, MINI ELE 1000U/25V |
| 739 | C281 | 5345-476D041 | CAP, MINI ELE 47U/25V |
| 740 | C282 | 5354-104593 | CAP, MYL .1U |
| RESISTORS | | | |
| 732 | △ R201 | 5130-R030J335 | RES, CBN 1/2P 3.3M |
| 747 | R281 | 5130-R030J470 | RES, CBN 1/2P 47 |
| 748 | R282 | 5130-R030J392 | RES, CBN 1/2P 3.9K |
| 749 | R283 | 5130-R030J271 | RES, CBN 1/2P 270 |
| 750 | R284 | 5130-R030J473 | RES, CBN 1/2P 47K |
| 747 | R285 | 5130-R030J470 | RES, CBN 1/2P 47 |
| 751 | R286 | 5130-R030J102 | RES, CBN 1/2P 1K |
| TRANSISTORS | | | |
| 744 | Q281 | 5611-R01D0505 | XISTOR, PNP R, RN2201 or DTA143ES or UN4215 |
| 745 | Q282 | 5613-3246(H) | XISTOR, NPN R |
| DIODES | | | |
| 734 | △ D1 | 5632-S5566B | DIODE, RECT |
| 734 | △ D2 | 5632-S5566B | DIODE, RECT |
| 734 | △ D3 | 5632-S5566B | DIODE, RECT |
| 734 | △ D4 | 5632-S5566B | DIODE, RECT |
| 734 | △ D5 | 5632-S5566B | DIODE, RECT |
| 734 | △ D6 | 5632-S5566B | DIODE, RECT |
| 734 | △ D7 | 5632-S5566B | DIODE, RECT |
| 734 | △ D8 | 5632-S5566B | DIODE, RECT |
| 741 | D281 | 5631-1S2473 | DIODE, DET |
| MISCELLANEOUS | | | |
| 736 | △ BT1 | 5584-T1101 | XFORMER, SUB POWER |
| 803 | CN281 | 4443-0201140 | CONNECTOR, 2 PIN |
| 804 | CN282 | 4443-0601140 | CONNECTOR, 6 PIN |
| 727 | △ F1 | 5732-01601252 | FUSE, T2.5A/T2.5AL 250V |
| 726 | △ F2 | 5732-01601101 | FUSE, T100mA/T100mAL 250V |
| 728 | △ F3 | 5732-01601311 | FUSE, T315mA/T315mAL 250V |
| 729 | △ HF1 | 4472-04901 | HOLDER, FUSE, F1 |
| 729 | △ HF2 | 4472-04901 | HOLDER, FUSE, F1 |
| 729 | △ HF3 | 4472-04901 | HOLDER, FUSE, F2 |
| 729 | △ HF4 | 4472-04901 | HOLDER, FUSE, F2 |
| 729 | △ HF5 | 4472-04901 | HOLDER, FUSE, F3 |
| 729 | △ HF6 | 4472-04901 | HOLDER, FUSE, F3 |
| 814 | J281 | 4451-00184 | JACK, 1P, REMOTE IN |
| 814 | J282 | 4451-00184 | JACK, 1P, REMOTE OUT |
| 788 | △ LCN101 | 4163-S4901170 | CONNECTOR W/W, 1 PIN |
| 789 | △ LCN102 | 4163-S5001170 | CONNECTOR W/W, 1 PIN |
| 743 | PH1 | 5624-PC817 | PHOTO COUPLR |
| 731 | △ RY1 | 4331-02601 | RELAY, DC |
| 785 | △ TM3 | 4214-245 | TERMINAL |
| 785 | △ TM4 | 4214-245 | TERMINAL |

| Ser. No. | Ref. No. | Part No. | Description |
|-----------------------------------|----------|---------------|-----------------------|
| PCB-7 POWER IND P.C. BOARD | | | |
| CAPACITORS | | | |
| 848 | C710 | 5345-S35CM106 | CAP, MINI ELE 10U/16V |
| 848 | C711 | 5345-S35CM106 | CAP, MINI ELE 10U/16V |
| DIODES | | | |
| 837 | D709 | 5637-S2410E1A | LED, POWER |
| 837 | D710 | 5637-S2410E1A | LED, POWER |
| MISCELLANEOUS | | | |
| 816 | SW701 | 4437-00704 | SWITCH, PU-TC, POWER |

PCB-8 VR IND P.C. BOARD

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|-----------------------|
| CAPACITOR | | | |
| 843 | C708 | 5345-S35CM106 | CAP, MINI ELE 10U/16V |
| DIODE | | | |
| 835 | D701 | 5637-SLR33MC3 | LED, VOLUME |
| MISCELLANEOUS | | | |
| 786 | CW703 | 4163-01524002 | CONNECTOR W/W, 2 PIN |

PCB-10 VR P.C. BOARD

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|-----------|---------------|--------------------------------------|
| CAPACITOR | | | |
| 828 | C751 | 5354-104593 | CAP, MYL .1U |
| RESISTORS | | | |
| 830 | R501 | 5130-R030J152 | RES, CBN 1/2P 1.5K |
| 830 | R502 | 5130-R030J152 | RES, CBN 1/2P 1.5K |
| CONTROLS | | | |
| 826 | VR503/504 | 6161-00902 | VR BLOCK, 30K, VOLUME (MOTOR DRIVER) |
| MISCELLANEOUS | | | |
| 778 | CN502 | 4443-030185 | CONNECTOR, 3 PIN |
| 778 | CN503 | 4443-030185 | CONNECTOR, 3 PIN |
| 797 | CN704 | 4443-0201140 | CONNECTOR, 2 PIN |

CHASSIS MISCELLANEOUS

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|-------------------------------|
| MISCELLANEOUS | | | |
| 801 | JL702 | 4242-S0313251 | JUMPER LEAD, 13 WIRE |
| 811 | △ PG1 | 4161-09801192 | CORD W/PLUG |
| 723 | △ PT1 | 5584-T4403 | XFORMER, POWER (Model: HK640) |
| 723 | △ PT1 | 5584-T4504 | XFORMER, POWER (Model: HK660) |
| 924 | PCB-9 | 4551-10032050 | P.C. BOARD, PR |

PACKING PARTS LIST

| Ser. No. | Ref. No. | Part No. | Description |
|----------|----------|---------------|---------------------------------|
| 021 | | 1756-23601 | LABEL, (CH) LABEL, CARTON BOX |
| 108 | | 1111-1620J152 | OWNER GUIDE |
| 116 | | 1756-03108 | LABEL, (I) LABEL, CARTON |
| 116 | | 1756-03101 | LABEL, (W) LABEL, CARTON |
| 120 | | 1241-R0160601 | POLYETHY BAG, SET |
| 121 | | 1241-R0123351 | POLYETHY BAG, IB |
| 124 | | 1221-867167 | CARTON BOX (Model: HK640) |
| 124 | | 1221-857167 | CARTON BOX (Model: HK660) |
| 126 | | 1222-7331 | CUSHION, L |
| 127 | | 1222-7332 | CUSHION, R |
| 128 | | 1223-R0420055 | SOFT SHEET, SET |
| 909 | | 6142-08101 | CONT BLOCK, REMOTE CONTROL |
| 910 | | 4191-0355 | BATTERY, DRY |
| 911 | | 4161-08201102 | CORD W/PLUG, REMOTE IN/OUT (x3) |

ABBREVIATIONS IN PARTS LIST

CAPACITORS

CAP, MINI ELE : Electrolytic
CAP, CER : Ceramic
CAP, PPP : Polypropylene
CAP, MYL : Mylar
CAP, MCA : Mica
CAP, MINI BP : Bipolar
CAP, ELE BP : Electrolytic Bipolar
470U : 470 μ F
6800P : 6800pF
.047U : 0.047 μ F

RESISTORS

RES, CBN 1/6P : Carbon 1/6W
RES, FUSE : Fuse
RES, CEM 5P : Cement 5W
RES, MTL 1P : Metal 1W
2.2k : 2.2k Ω
220 : 220 Ω

TRANSISTORS

XISTOR : Transistor
FET : Field Effect Transistor

CONTROLS

RES, V CBN : Variable Carbon Resistor
RES, SEMI FIX : Semi-fixed Resistor

NOTE



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

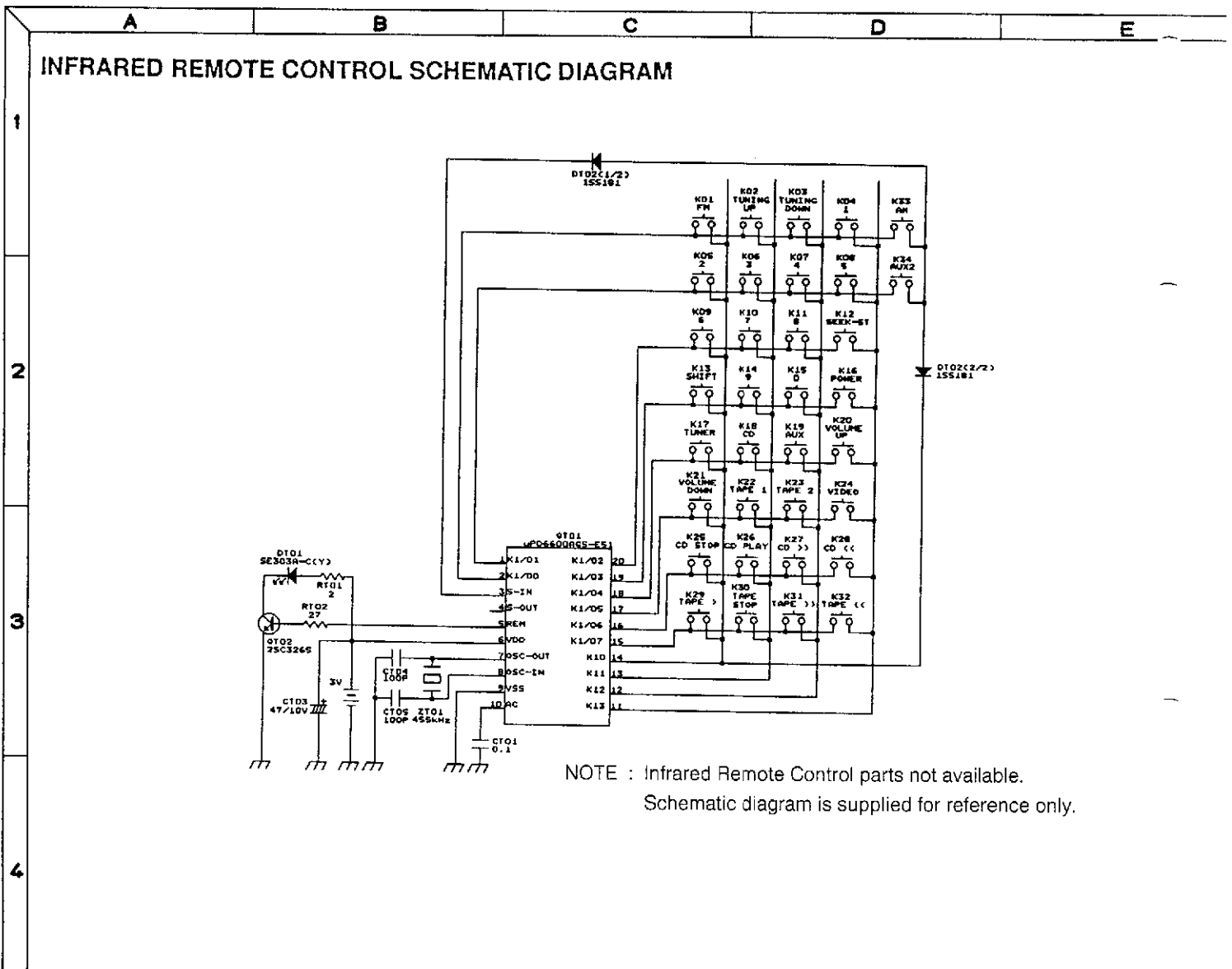
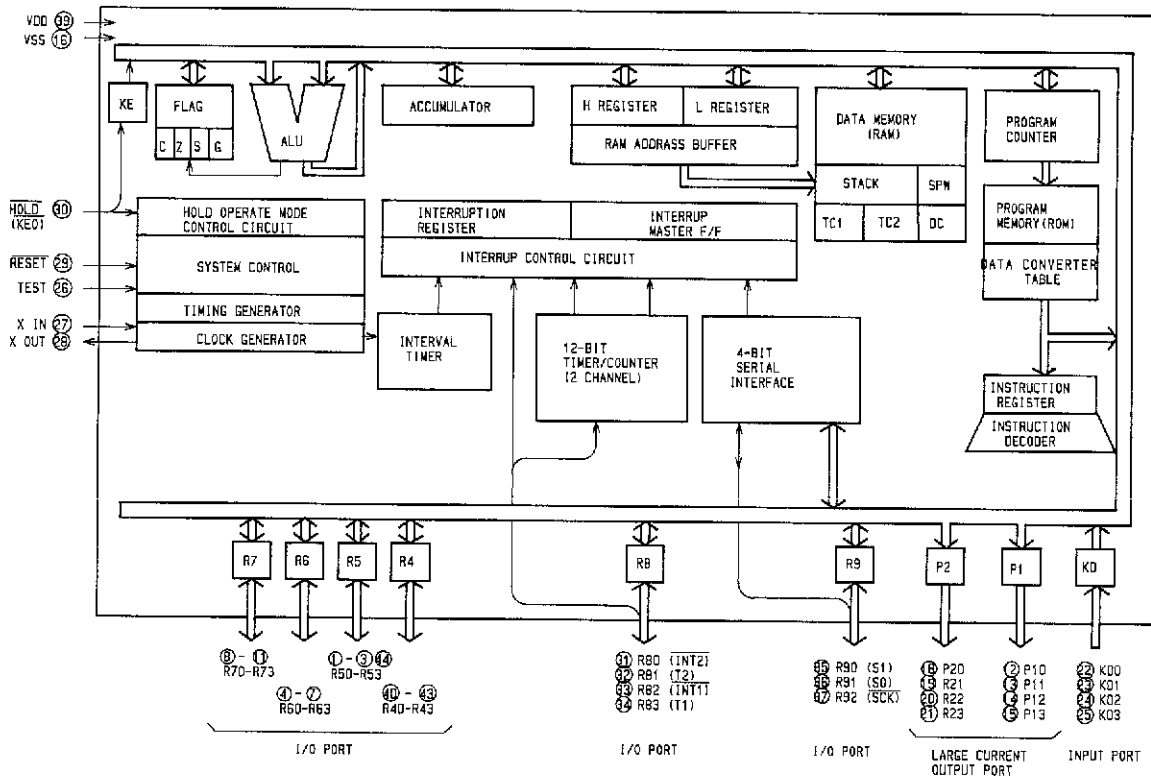
IC TERMINAL FUNCTION

IC701: TMP47C200BF

| Pin No. | Pin Name | I/O | Function |
|---------|-----------|-----|---|
| 1 | R51 | I/O | 4-bit w/latch input/output port |
| 2 | R52 | I/O | 4-bit w/latch input/output port |
| 3 | R53 | I/O | 4-bit w/latch input/output port |
| 4 | R60 | I/O | 4-bit w/latch input/output port |
| 5 | R61 | I/O | 4-bit w/latch input/output port |
| 6 | R62 | I/O | 4-bit w/latch input/output port |
| 7 | R63 | I/O | 4-bit w/latch input/output port |
| 8 | R70 | I/O | 4-bit w/latch input/output port |
| 9 | R71 | I/O | 4-bit w/latch input/output port |
| 10 | R72 | I/O | 4-bit w/latch input/output port |
| 11 | R73 | I/O | 4-bit w/latch input/output port |
| 12 | P10 | O | 4-bit w/latch output port |
| 13 | P11 | O | 4-bit w/latch output port |
| 14 | P12 | O | 4-bit w/latch output port |
| 15 | P13 | O | 4-bit w/latch output port |
| 16 | VSS | I | 0V (GND) |
| 17 | N.C. | - | Non connect |
| 18 | P20 | O | 4-bit w/latch output port |
| 19 | P21 | O | 4-bit w/latch output port |
| 20 | P22 | O | 4-bit w/latch output port |
| 21 | P23 | O | 4-bit w/latch output port |
| 22 | K00 | I | 4-bit input port |
| 23 | K01 | I | 4-bit input port |
| 24 | K02 | I | 4-bit input port |
| 25 | K03 | I | 4-bit input port |
| 26 | TEST | I | Test point terminal |
| 27 | XIN | I | Crystal oscillator input |
| 28 | XOUT | O | Crystal oscillator output |
| 29 | RESET | I | Reset signal input |
| 30 | HOLD(KEO) | I | Sens input |
| 31 | R80(INT2) | I/O | External interruption 2 input |
| 32 | R81(T2) | I/O | Timer/counter 2 input |
| 33 | R82(INT1) | I/O | External interruption 1 input |
| 34 | R83(T1) | I/O | 4-bit w/latch input/output, timer/counter input |
| 35 | R90(SI) | I | Serial data input |
| 36 | R91(SO) | O | Serial data output |
| 37 | R92(SCK) | I/O | Serial clock input/output |
| 38 | N.C. | - | Non connect |
| 39 | VDD | I | +5V Power supply |
| 40 | R40 | I/O | 4-bit input/output port |
| 41 | R41 | I/O | 4-bit input/output port |
| 42 | R42 | I/O | 4-bit input/output port |
| 43 | R43 | I/O | 4-bit input/output port |
| 44 | R50 | I/O | 4-bit input/output port |

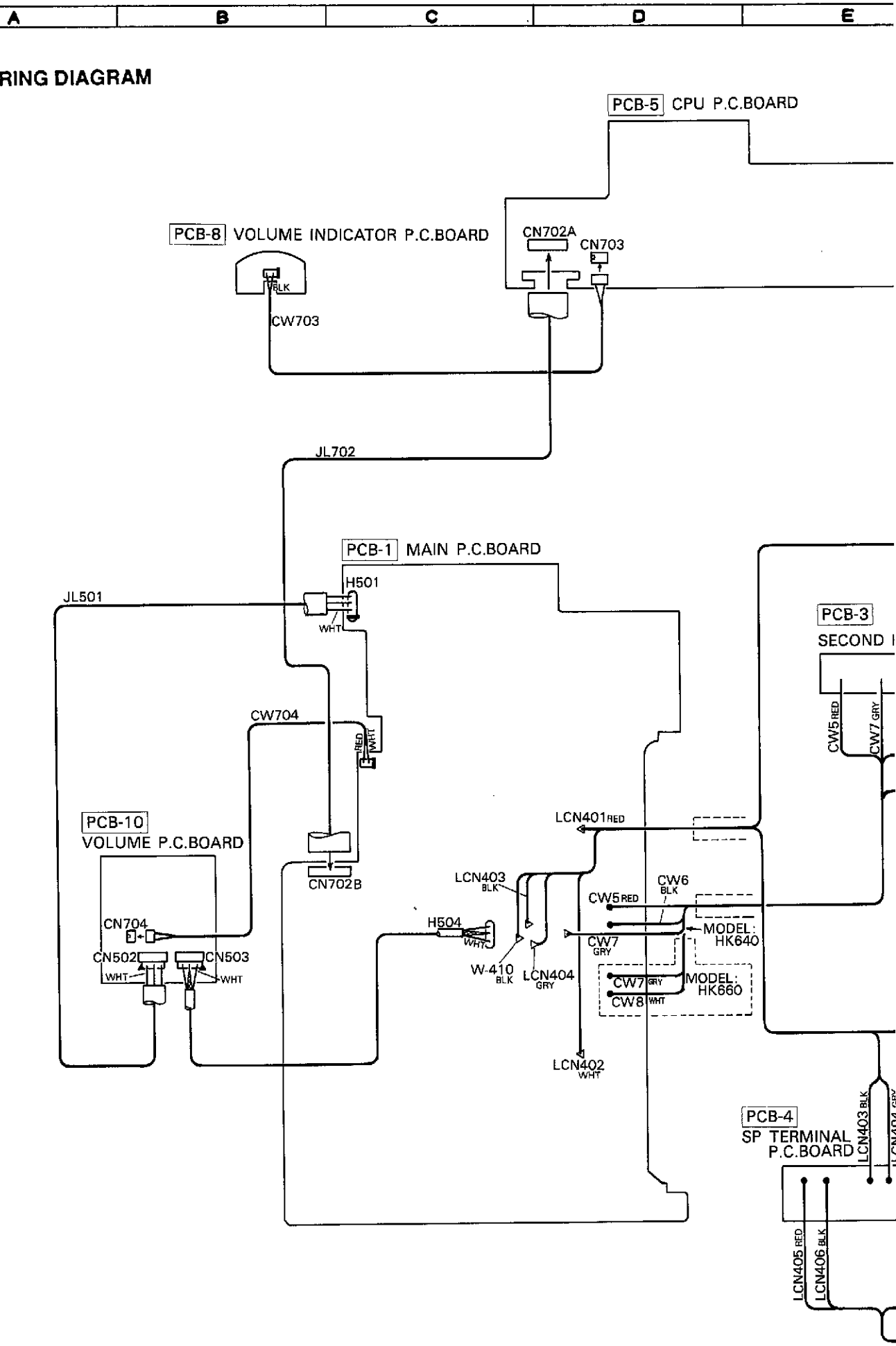
IC BLOCK DIAGRAM

IC701: TMP47C200BF



WIRING DIAGRAM

1
2
3
4
5
6
7



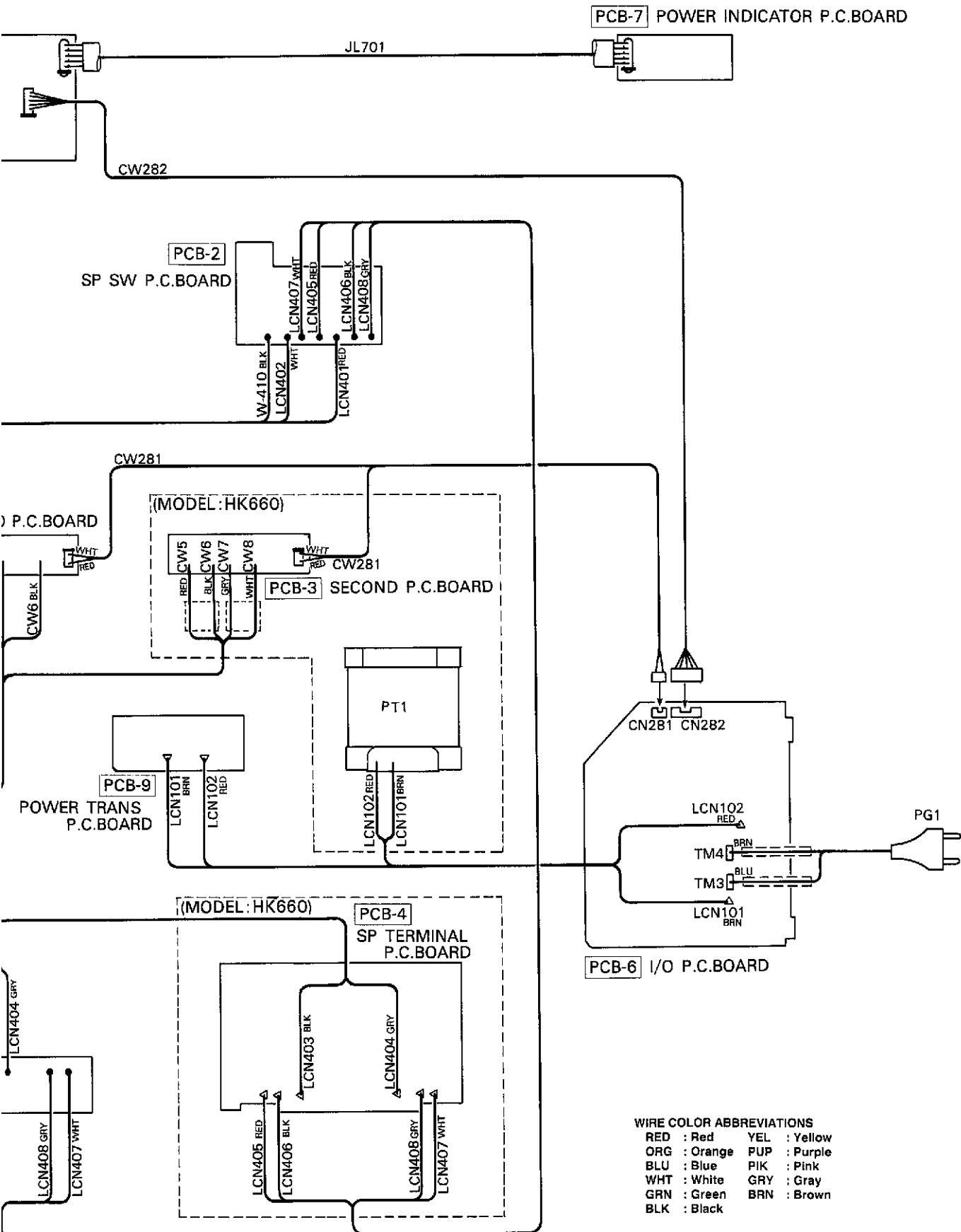
F

G

H

I

J



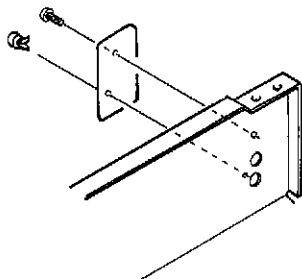
PH600 Phono PCB Option:

When this option is installed, MM or MC turntables can be connected to the RCA jacks on the Phono PCB. To use the Phono input, the function selector switch on the front panel must be set to the AUX position. Please note that when the Phono PCB option is installed, signal wires shall not be connected to the AUX RCA connectors. Signal applied to the AUX input with the Phono option installed, will be attenuated and may be distorted. Installation of Optional Phono PCB (PH600):

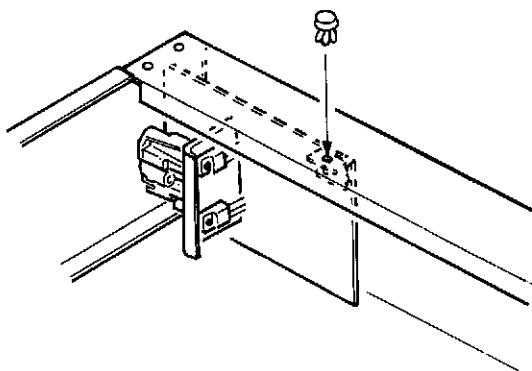
(Please re-print the information from information sheet you already prepared.)

HOW TO INSTALL

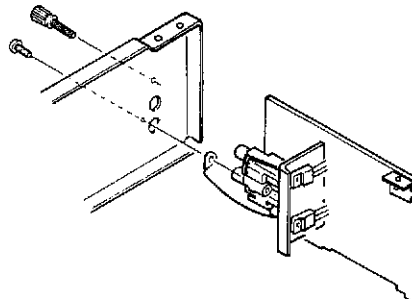
- ① Remove 6 screws and then remove the Top Cover.
- ② Remove a screw and a rivet and then remove the plate.



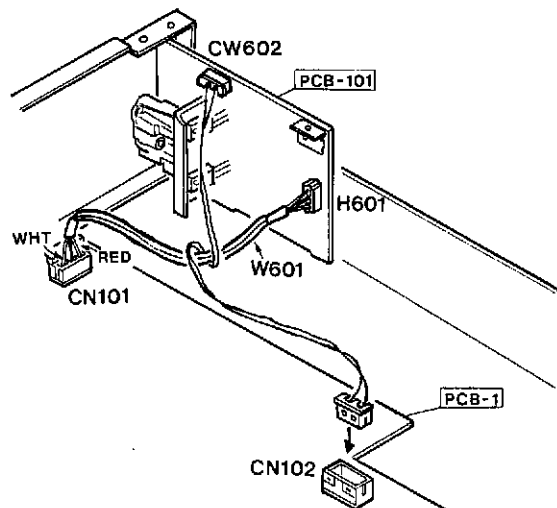
- ③ Secure PH600 with a rivet removed from the plate.



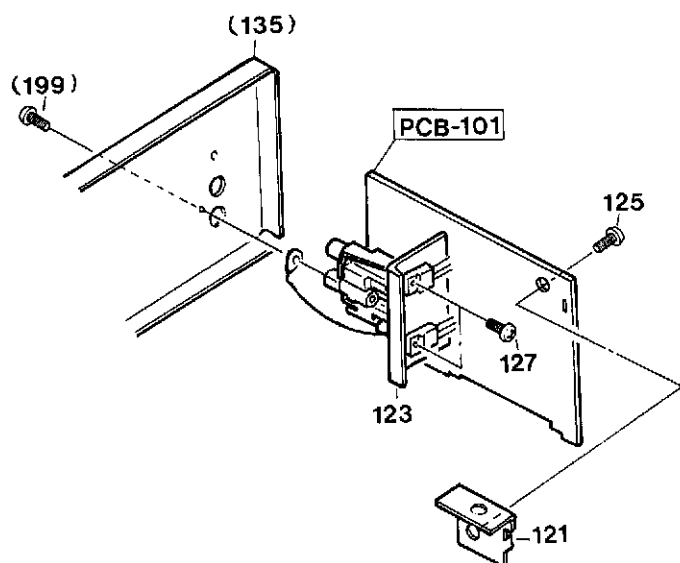
- ④ Secure the screw removed from the plate and the ground terminal screw (included).



- ⑤ Connect the 2 cables precisely as shown in the illustration.



GENERAL UNIT



GENERAL UNIT PARTS LIST

| Ser. No. | Ref. No. | Part No. | Description |
|----------|---------------|----------|-----------------------------|
| 121 | 2219-8350 | | METAL FITTING |
| 123 | 2222-7179 | | HEAT SINK |
| 125 | 2347-R0130062 | | SCREW, BND T+ (3×6 mm) |
| 127 | 2347-R0130082 | | SCREW, BND T+ (3×8 mm) (×2) |

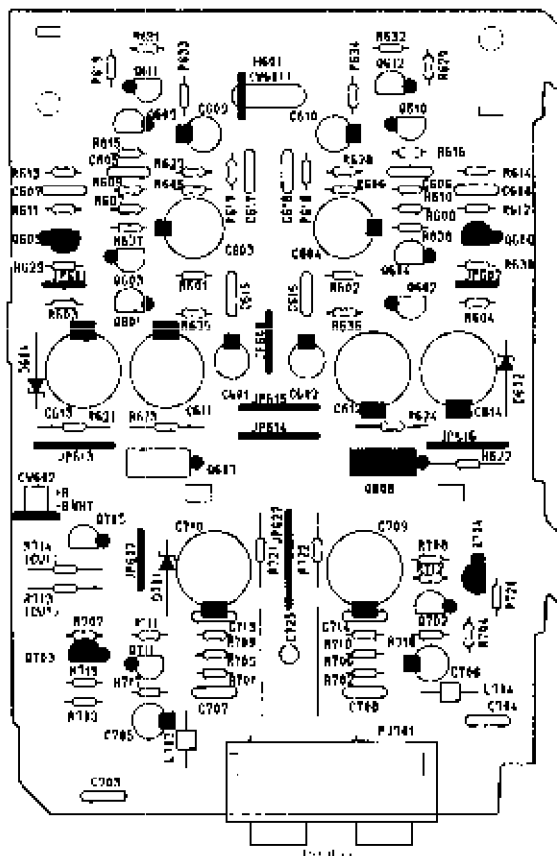
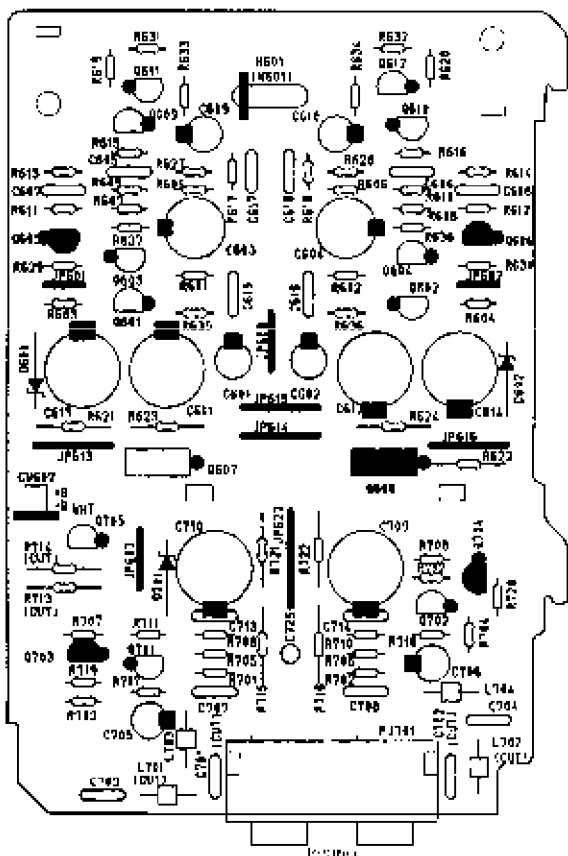
P.C. BOARD

The PH600 is set at the factory as a high gain MC EQ amplifier. It can easily be converted to a MM EQ amplifier by making these changes:

1. Remove L701 and L702 (bare wires with ferrite beads).
2. Remove C701 and C702 (0.022µF capacitors, marked 223J).
3. Remove R715 and R716 (1kΩ resistors), and
4. Add 2 jumper wires (JP) along the dotted lines on the circuit board (near the location of R715 and R716).

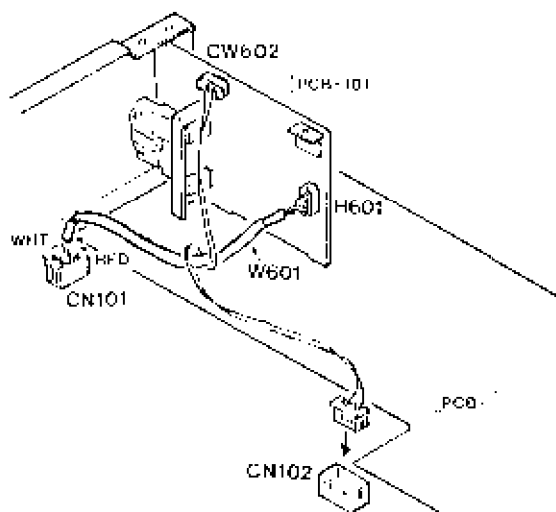
PCB-101 MC VERSION (Factory setting)

PCB-101 MM VERSION



- C701, L702 → Delete
- C703, C702 → Delete
- R715, R716 → Delete
- Add 2 jumper wires (JP) along dotted lines

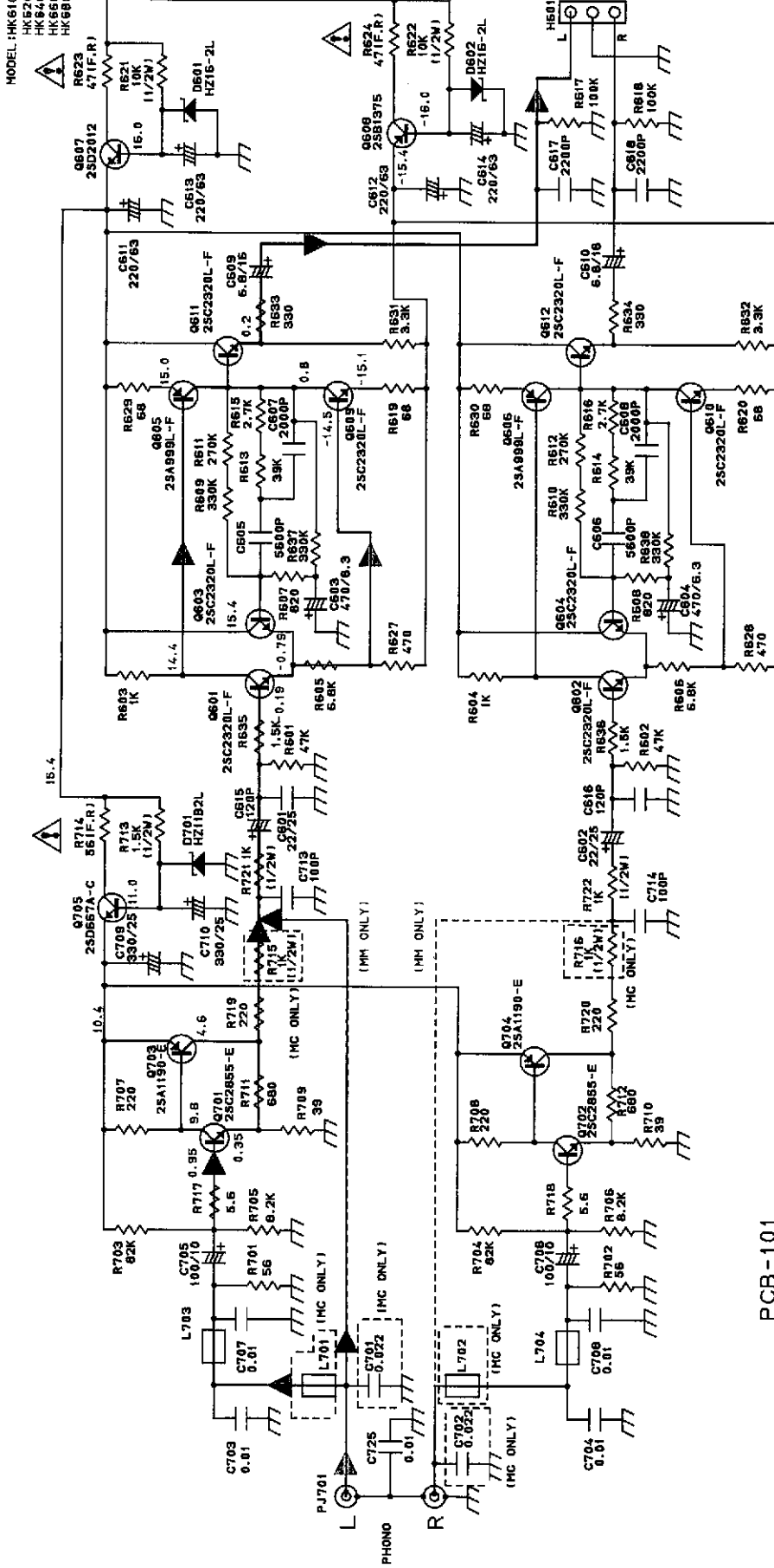
WIRING DIAGRAM



SCHEMATIC DIAGRAM

MODEL: HK610 -36.5V
 HK520 -36.4V
 HK840 -43.5V
 HK660 -46.5V
 HK680 -51.7V
 CV802

MODEL: HK610 -36.5V
 HK520 -36.4V
 HK840 -43.5V
 HK660 -46.5V
 HK680 -51.7V



PCB-101
PHONO P.C. BOARD

ELECTRICAL PARTS LIST

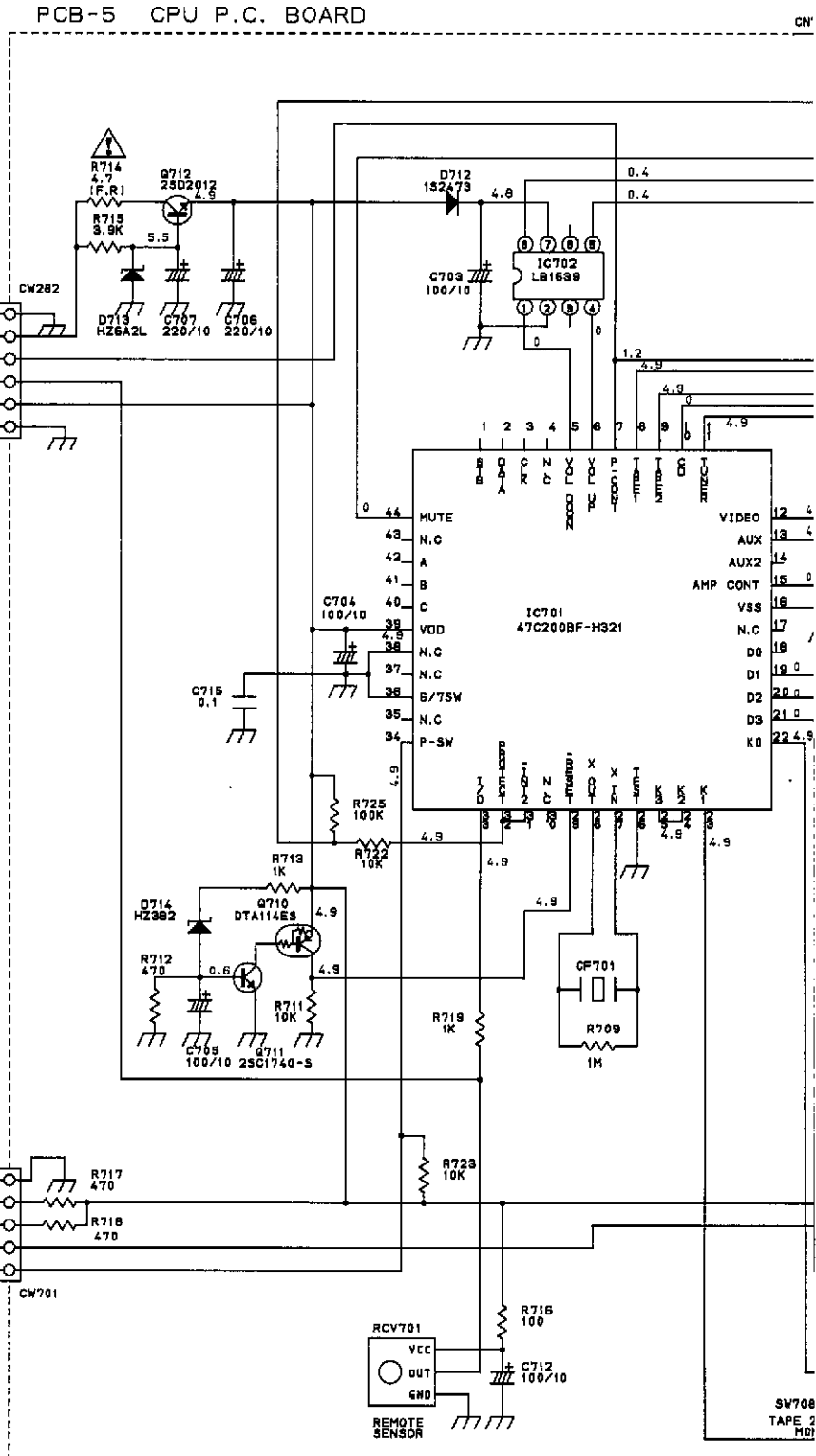
| Ser. No. | Ref. No. | Part No. | Description | Ser. No. | Ref. No. | Part No. | Description |
|---------------------------------|----------|---------------|-------------------------|--------------------------------|----------|---------------|-----------------------------|
| PCB-101 PHONO P.C. BOARD | | | | | | | |
| CAPACITORS | | | | | | | |
| 400 | C601 | 5345-S29DM226 | CAP, MINI ELE 22U/25V | 417 | R638 | 5178-334381 | RES, MTL 1/6P 330K |
| 400 | C602 | 5345-S29DM226 | CAP, MINI ELE 22U/25V | 450 | R701 | 5130-R010J560 | RES, CBN 1/6P 56 |
| 401 | C603 | 5345-S29AD477 | CAP, MINI ELE 470U/6.3V | 450 | R702 | 5130-R010J560 | RES, CBN 1/6P 56 |
| 401 | C604 | 5345-S29AD477 | CAP, MINI ELE 470U/6.3V | 456 | R703 | 5130-R010J823 | RES, CBN 1/6P 82K |
| 402 | C605 | 5359-5625851 | CAP, PPP 5600P | 456 | R704 | 5130-R010J823 | RES, CBN 1/6P 82K |
| 402 | C606 | 5359-5625851 | CAP, PPP 5600P | 451 | R705 | 5130-R010J822 | RES, CBN 1/6P 8.2K |
| 403 | C607 | 5359-2025851 | CAP, PPP 2000P | 451 | R706 | 5130-R010J822 | RES, CBN 1/6P 8.2K |
| 403 | C608 | 5359-2025851 | CAP, PPP 2000P | 458 | R707 | 5130-R010J221 | RES, CBN 1/6P 220 |
| 404 | C609 | 5345-685C0951 | CAP, MINI ELE 6.8U/16V | 458 | R708 | 5130-R010J221 | RES, CBN 1/6P 220 |
| 404 | C610 | 5345-685C0951 | CAP, MINI ELE 6.8U/16V | 452 | R709 | 5178-390381 | RES, MTL 1/6P 39 |
| 405 | C611 | 5345-S25GM227 | CAP, MINI ELE 220U/63V | 452 | R710 | 5178-390381 | RES, MTL 1/6P 39 |
| 405 | C612 | 5345-S25GM227 | CAP, MINI ELE 220U/63V | 453 | R711 | 5178-681381 | RES, MTL 1/6P 680 |
| 405 | C613 | 5345-S25GM227 | CAP, MINI ELE 220U/63V | 453 | R712 | 5178-681381 | RES, MTL 1/6P 680 |
| 405 | C614 | 5345-S25GM227 | CAP, MINI ELE 220U/63V | 454 | R713 | 5130-R030J152 | RES, CBN 1/2P 1.5K |
| 406 | C615 | 5359-1215851 | CAP, PPP 120P | 457 | △ R714 | 5102-5604713 | RES, FUSE 56 |
| 406 | C616 | 5359-1215851 | CAP, PPP 120P | 459 | R715 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 430 | C617 | 5359-2225851 | CAP, PPP 2200P | 459 | R716 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 430 | C618 | 5359-2225851 | CAP, PPP 2200P | 440 | R717 | 5130-R010J5R6 | RES, CBN 1/6P 5.6 |
| 441 | C701 | 5359-S010J223 | CAP, PPP .022U | 440 | R718 | 5130-R010J5R6 | RES, CBN 1/6P 5.6 |
| 441 | C702 | 5359-S010J223 | CAP, PPP .022U | 458 | R719 | 5130-R010J221 | RES, CBN 1/6P 220 |
| 442 | C703 | 5359-S010J103 | CAP, PPP .01U | 458 | R720 | 5130-R010J221 | RES, CBN 1/6P 220 |
| 442 | C704 | 5359-S010J103 | CAP, PPP .01U | 459 | R721 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 443 | C705 | 5345-S29BM107 | CAP, MINI ELE 100U/10V | 459 | R722 | 5130-R030J102 | RES, CBN 1/2P 1K |
| 443 | C706 | 5345-S29BM107 | CAP, MINI ELE 100U/10V | TRANSISTORS | | | |
| 442 | C707 | 5359-S010J103 | CAP, PPP .01U | 409 | Q601 | 5613-2320L(F) | XISTOR, NPN R |
| 442 | C708 | 5359-S010J103 | CAP, PPP .01U | 409 | Q602 | 5613-2320L(F) | XISTOR, NPN R |
| 444 | C709 | 5345-S25DM337 | CAP, MINI ELE 330U/25V | 409 | Q603 | 5613-2320L(F) | XISTOR, NPN R |
| 444 | C710 | 5345-S25DM337 | CAP, MINI ELE 330U/25V | 409 | Q604 | 5613-2320L(F) | XISTOR, NPN R |
| 438 | C713 | 5359-S010K101 | CAP, PPP 100P | 410 | Q605 | 5611-999L(F) | XISTOR, PNP R |
| 438 | C714 | 5359-S010K101 | CAP, PPP 100P | 410 | Q606 | 5611-999L(F) | XISTOR, PNP R |
| 439 | C725 | 5359-S010J103 | CAP, PPP .01U | 411 | Q607 | 5614-2012 | XISTOR, NPN A |
| RESISTORS | | | | | | | |
| 413 | R601 | 5130-R010J473 | RES, CBN 1/6P 47K | 412 | Q608 | 5612-1375 | XISTOR, PNP A |
| 413 | R602 | 5130-R010J473 | RES, CBN 1/6P 47K | 426 | Q609 | 5613-2320L(F) | XISTOR, NPN R |
| 414 | R603 | 5130-R010J102 | RES, CBN 1/6P 1K | 426 | Q610 | 5613-2320L(F) | XISTOR, NPN R |
| 414 | R604 | 5130-R010J102 | RES, CBN 1/6P 1K | 426 | Q611 | 5613-2320L(F) | XISTOR, NPN R |
| 415 | R605 | 5130-R010J682 | RES, CBN 1/6P 6.8K | 426 | Q612 | 5613-2320L(F) | XISTOR, NPN R |
| 415 | R606 | 5130-R010J682 | RES, CBN 1/6P 6.8K | 447 | Q701 | 5613-2855(E) | XISTOR, NPN R |
| 416 | R607 | 5178-821381 | RES, MTL 1/6P 820 | 447 | Q702 | 5613-2855(E) | XISTOR, NPN R |
| 416 | R608 | 5178-821381 | RES, MTL 1/6P 820 | 448 | Q703 | 5611-1190(E) | XISTOR, PNP R |
| 417 | R609 | 5178-334381 | RES, MTL 1/6P 330K | 448 | Q704 | 5611-1190(E) | XISTOR, PNP R |
| 417 | R610 | 5178-334381 | RES, MTL 1/6P 330K | 449 | Q705 | 5614-667A(C) | XISTOR, NPN A |
| 418 | R611 | 5178-274381 | RES, MTL 1/6P 270K | DIODES | | | |
| 418 | R612 | 5178-274381 | RES, MTL 1/6P 270K | 408 | D601 | 5635-HZ16-2L | DIODE, ZENER |
| 419 | R613 | 5178-393381 | RES, MTL 1/6P 39K | 408 | D602 | 5635-HZ16-2L | DIODE, ZENER |
| 419 | R614 | 5178-393381 | RES, MTL 1/6P 39K | 445 | D701 | 5635-HZ11B2L | DIODE, ZENER |
| 420 | R615 | 5178-272381 | RES, MTL 1/6P 2.7K | MISCELLANEOUS | | | |
| 420 | R616 | 5178-272381 | RES, MTL 1/6P 2.7K | 407 | CW602 | 4163-S0202201 | CONNECTOR W/W, 2 PIN |
| 421 | R617 | 5130-R010J104 | RES, CBN 1/6P 100K | 446 | PJ701 | 4489-04006002 | PIN JACK, MLT, PHONO |
| 421 | R618 | 5130-R010J104 | RES, CBN 1/6P 100K | 455 | L701 | 5597-3 | CORE, BEADS |
| 428 | R619 | 5130-R010J680 | RES, CBN 1/6P 68 | 455 | L702 | 5597-3 | CORE, BEADS |
| 428 | R620 | 5130-R010J680 | RES, CBN 1/6P 68 | 455 | L703 | 5597-3 | CORE, BEADS |
| 422 | R621 | 5130-R030J103 | RES, CBN 1/2P 10K | 455 | L704 | 5597-3 | CORE, BEADS |
| 422 | R622 | 5130-R030J103 | RES, CBN 1/2P 10K | 431 | W601 | 4142-00151241 | SHLD WIRE, 2C |
| 423 | △ R623 | 5102-4705116 | RES, FUSE 47 | 437 | | 4211-4 | LUG, C725 |
| 423 | △ R624 | 5102-4705116 | RES, FUSE 47 | 432 | | 2240-Z031 | HOLDER, H601(W601) |
| 429 | R627 | 5130-R010J471 | RES, CBN 1/6P 470 | CHASSIS MISCELLANEOUS | | | |
| 429 | R628 | 5130-R010J471 | RES, CBN 1/6P 470 | MISCELLANEOUS | | | |
| 428 | R629 | 5130-R010J680 | RES, CBN 1/6P 68 | 460 | | 4214-168 | TERMINAL, GND |
| 428 | R630 | 5130-R010J680 | RES, CBN 1/6P 68 | PACKING UNIT PARTS LIST | | | |
| 427 | R631 | 5130-R010J332 | RES, CBN 1/6P 3.3K | MISCELLANEOUS | | | |
| 427 | R632 | 5130-R010J332 | RES, CBN 1/6P 3.3K | 107 | | 1111-1780J152 | OWNER GUIDE |
| 424 | R633 | 5130-R010J331 | RES, CBN 1/6P 330 | 109 | | 1231-00401 | GIFT BOX |
| 424 | R634 | 5130-R010J331 | RES, CBN 1/6P 330 | 113 | | 1241-00501 | POLYETHY BAG, SET |
| 433 | R635 | 5130-R010J152 | RES, CBN 1/6P 1.5K | 115 | | 1756-00307 | LABEL, OPTIONAL PHONO BOARD |
| 433 | R636 | 5130-R010J152 | RES, CBN 1/6P 1.5K | | | | |
| 417 | R637 | 5178-334381 | RES, MTL 1/6P 330K | | | | |

SCHMATIC DIAGRAM (1)

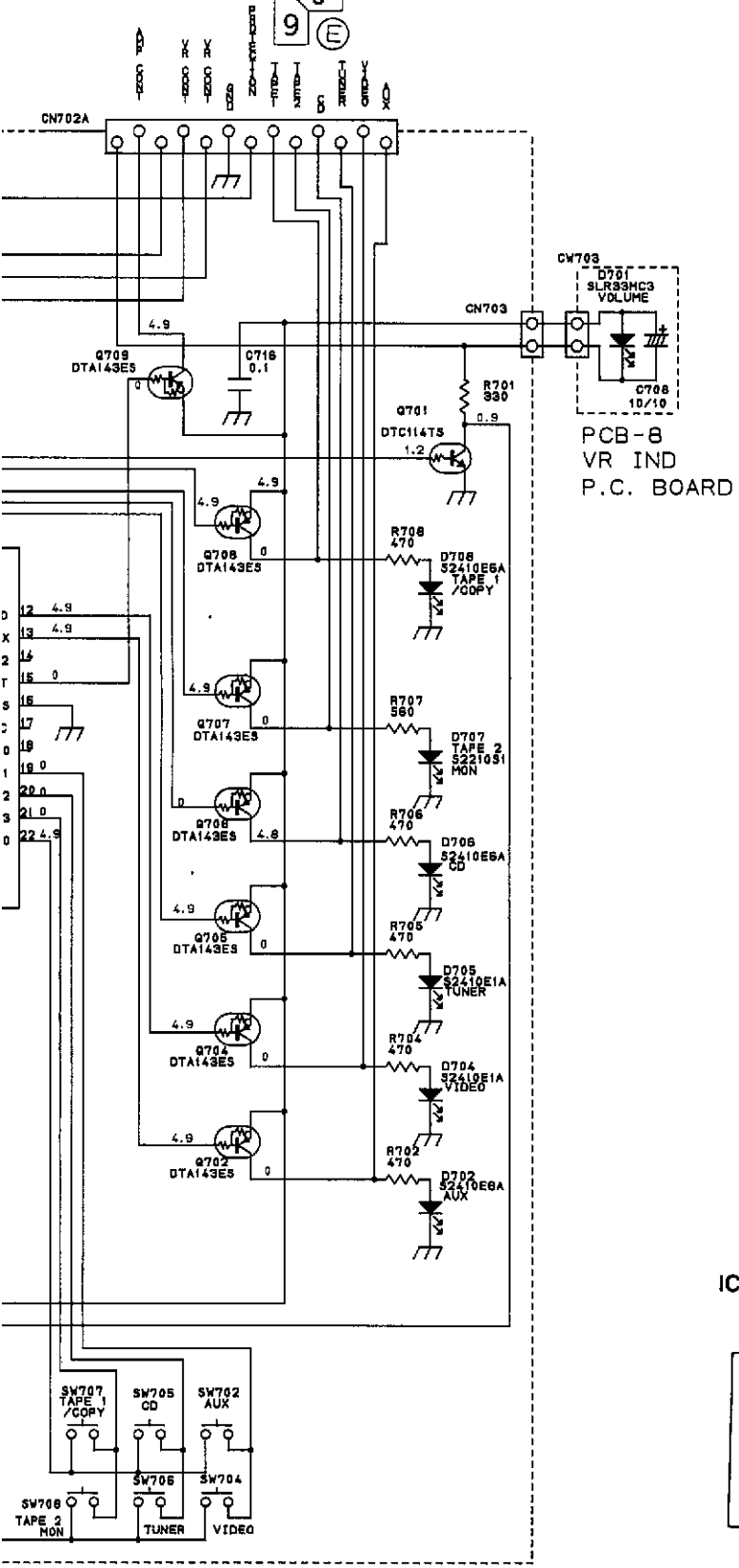
PCB-5 CPU P.C. BOARD

Page 17
and 18
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PCB-7
POWER IND
P.C. BOARD

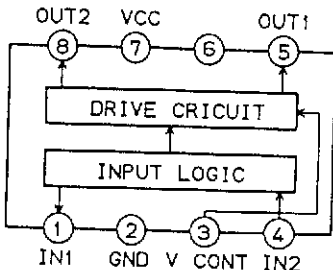


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PCB-8
VR IND
P.C. BOARD

IC702: LB1639 Volume Motor Driver



SCHEMATIC DIAGRAM (2)

MODEL:HK640

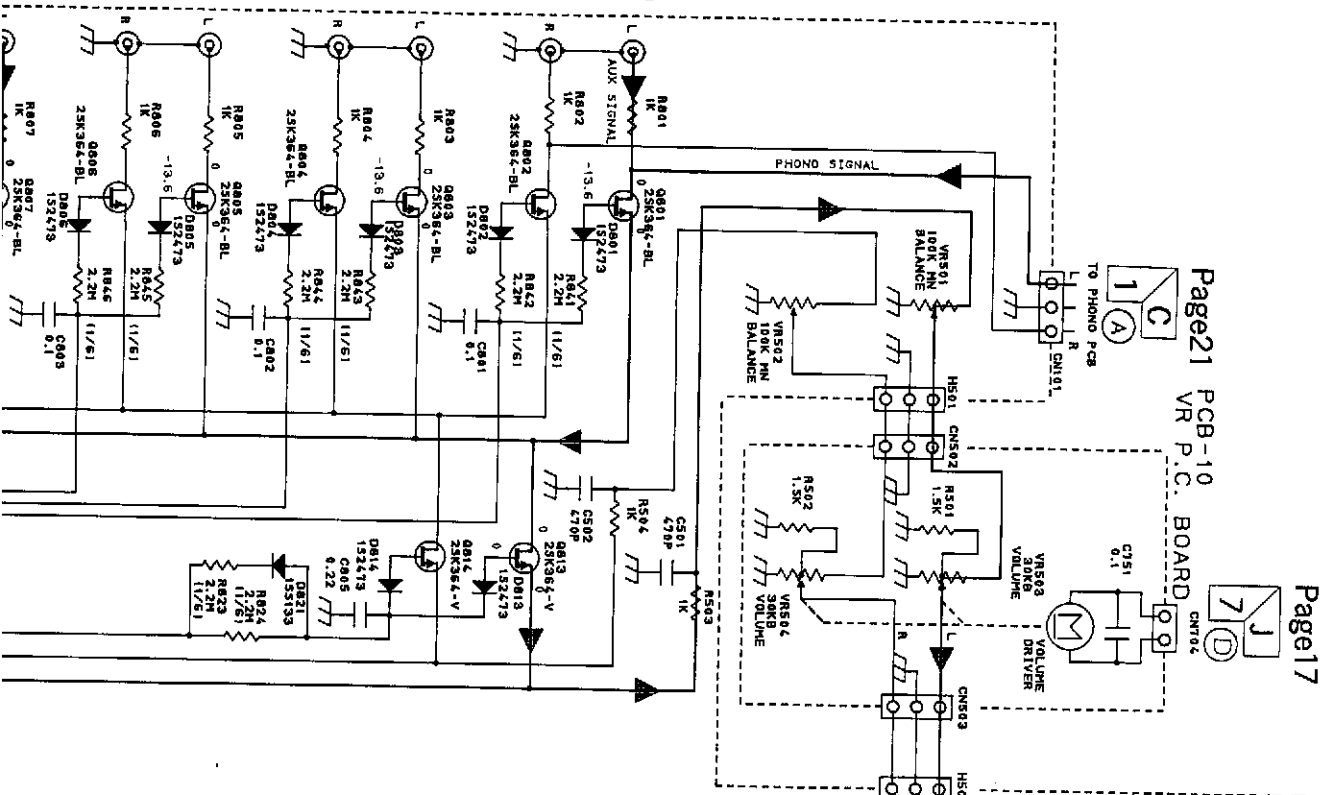
A B C D E F G

TUNER

VIDEO

AUX

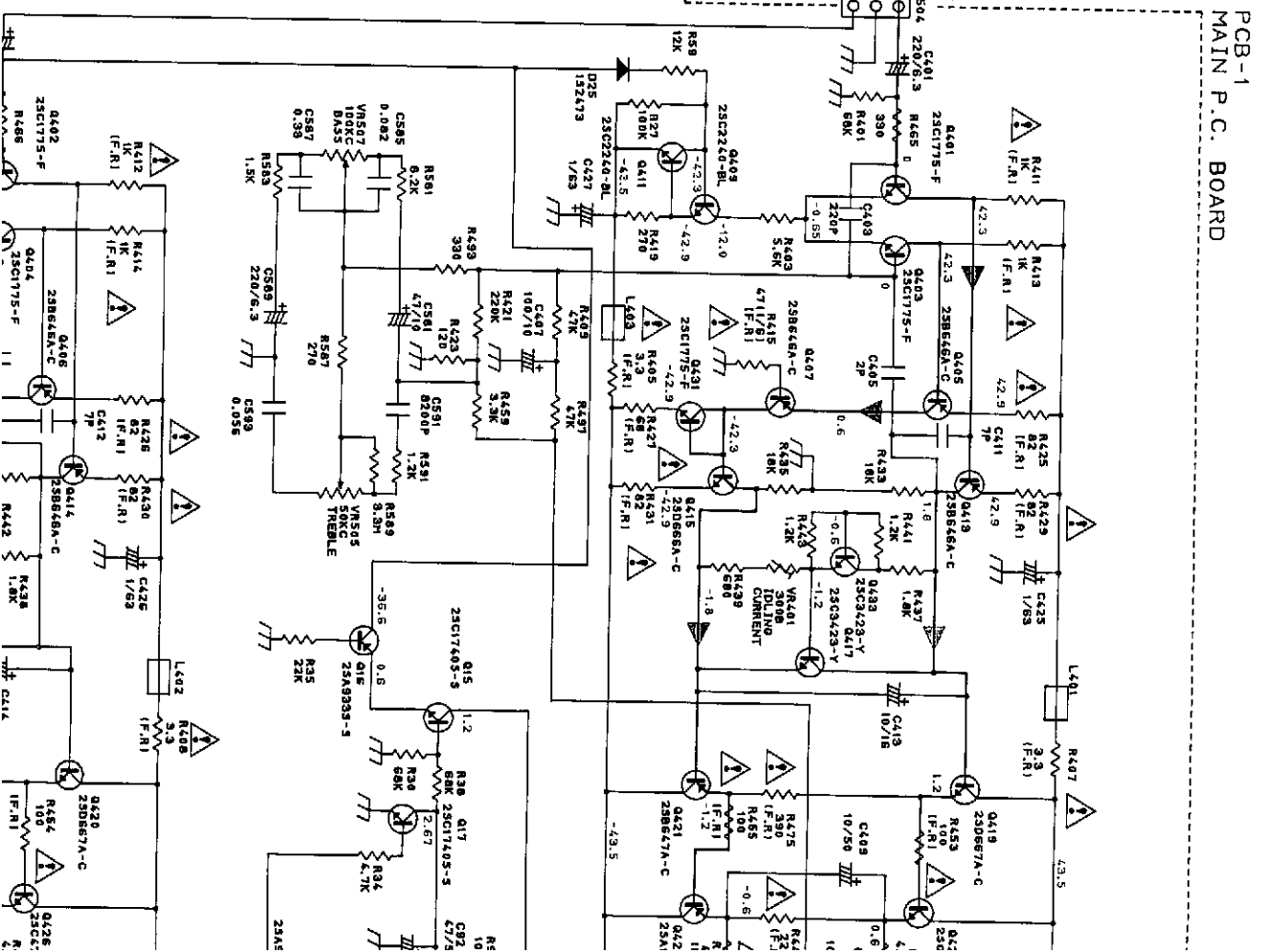
J1



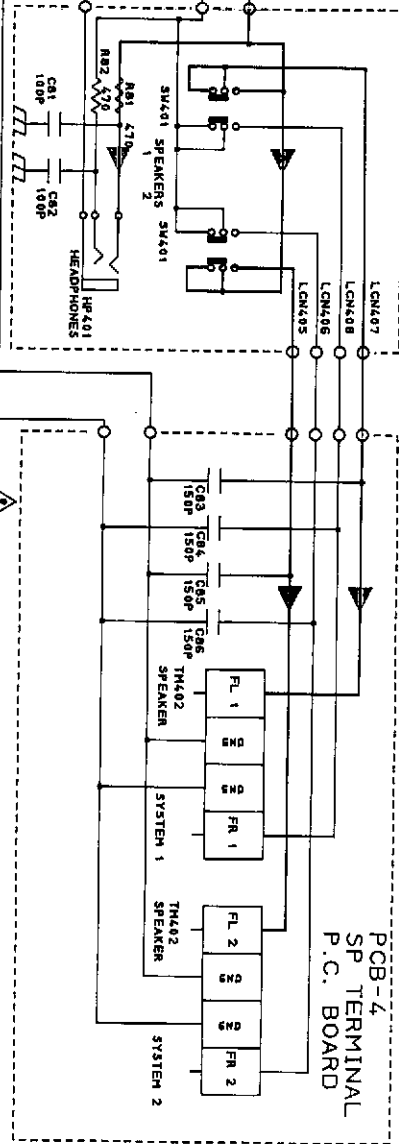
Page 21 PCB-10 VR P.C. BOARD

Page 17

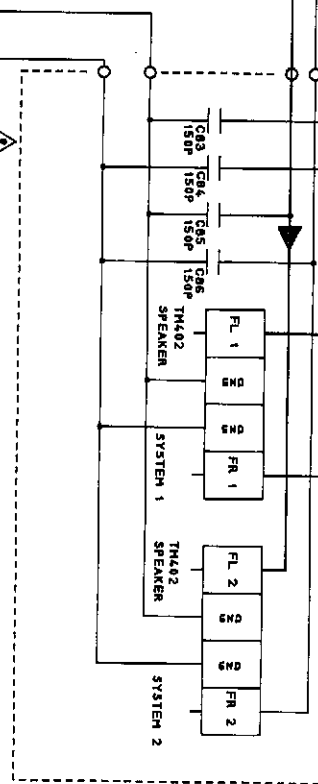
PCB-1 MAIN P.C. BOARD



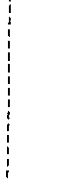
PCB-2
SP SW P.C. BOARD



PCB-4
SP TERMINAL
P.C. BOARD



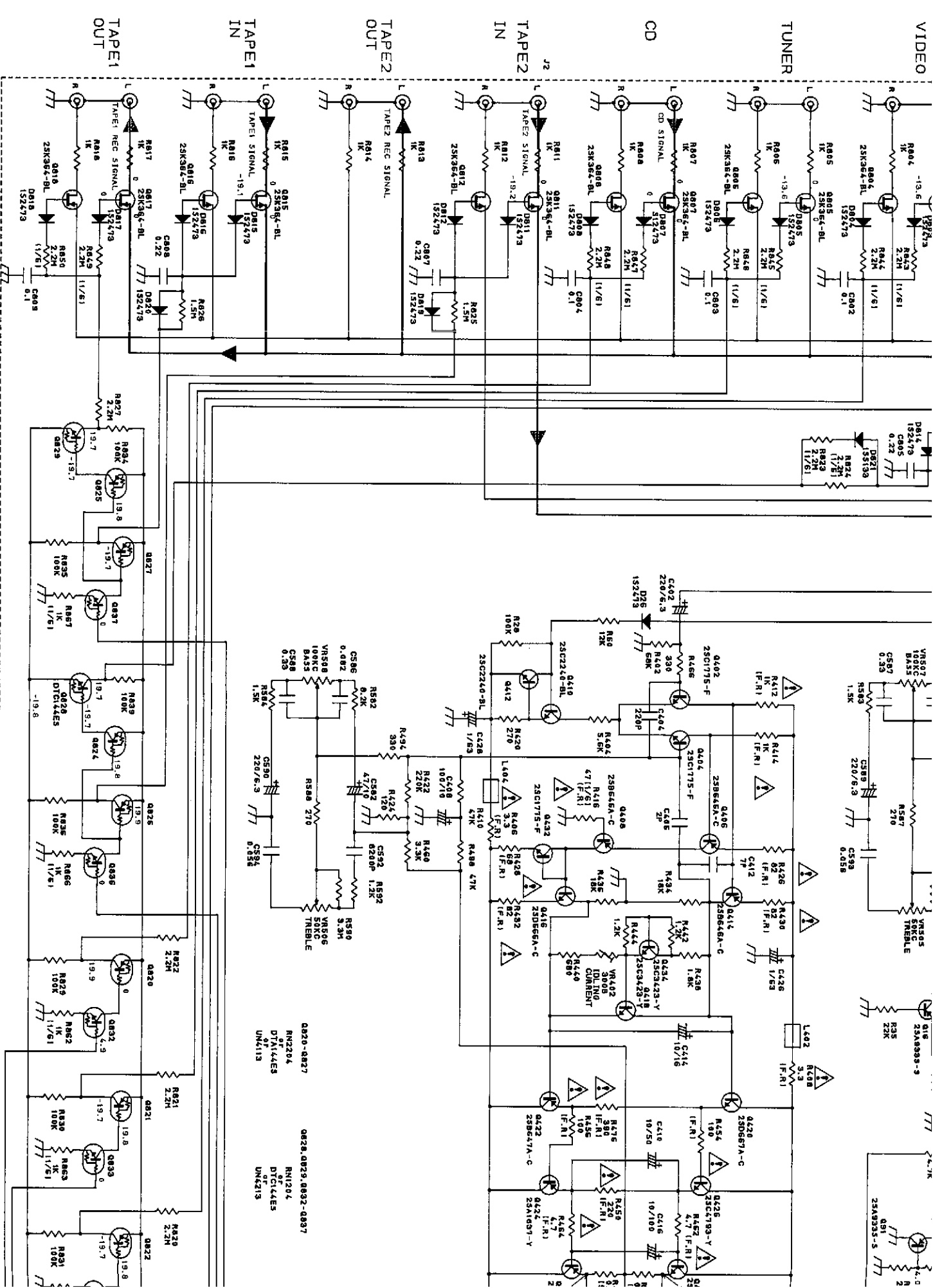
PCB-3
SECOND
P.C. BOARD

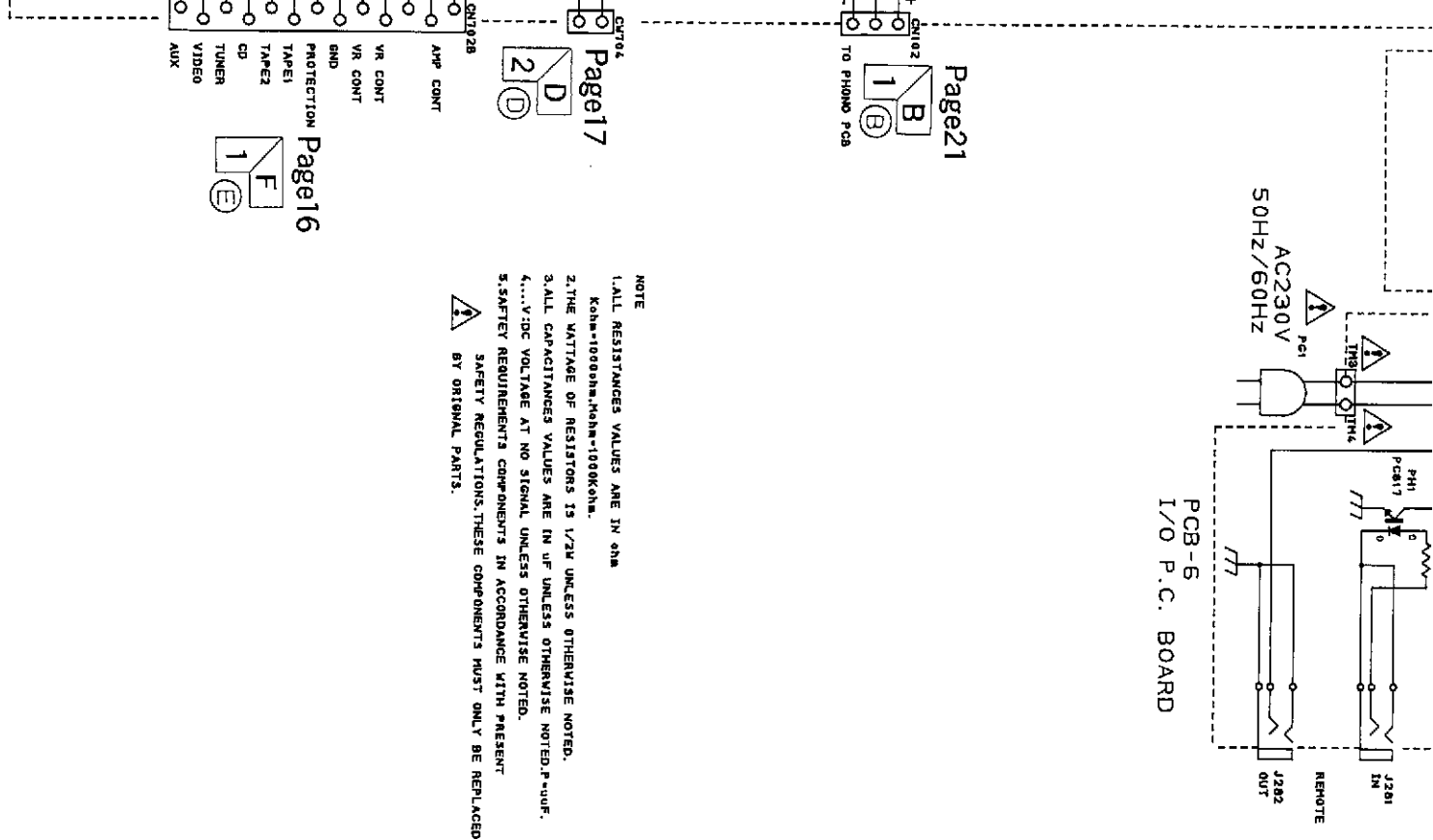
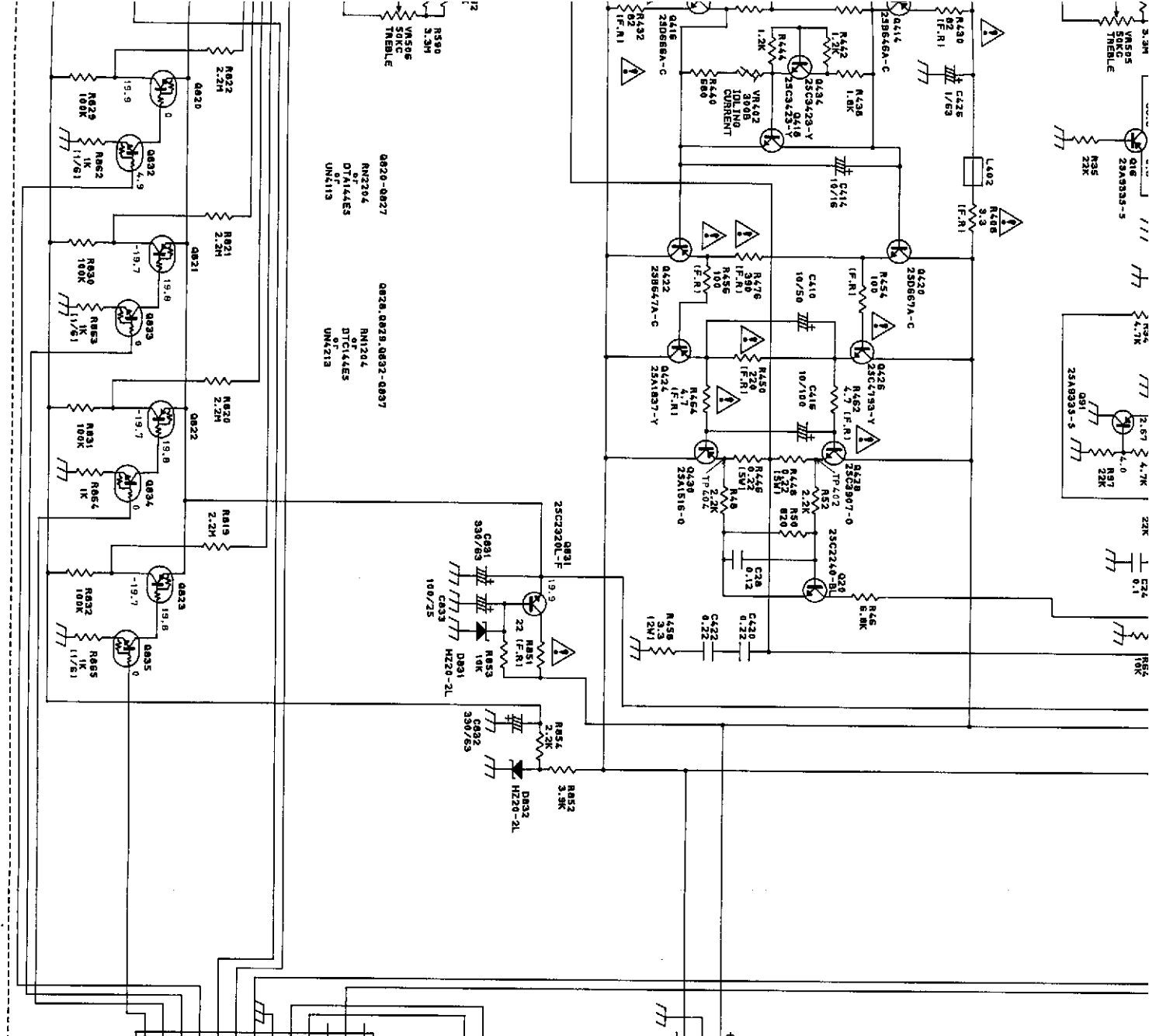


AC230V
50HZ/60HZ



PCB-6
I/O P.C. BOARD





Q820-Q827
R82204
of
DTIC144E3
UN74113

Q828, Q829, Q832-Q837
R81204
of
DTIC144E3
UN74213

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- NOTE
1. ALL RESISTANCE VALUES ARE IN OHMS
Kohm-1000ohm, Mohm-100Kohm.
 2. THE VOLTAGE OF RESISTORS IS 1/2W UNLESS OTHERWISE NOTED.
 3. ALL CAPACITANCE VALUES ARE IN uF UNLESS OTHERWISE NOTED. P=µUF.
 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.

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PROTECTION
TAPER1
TAPER2
CD
TUNER
VIDEO
AUX

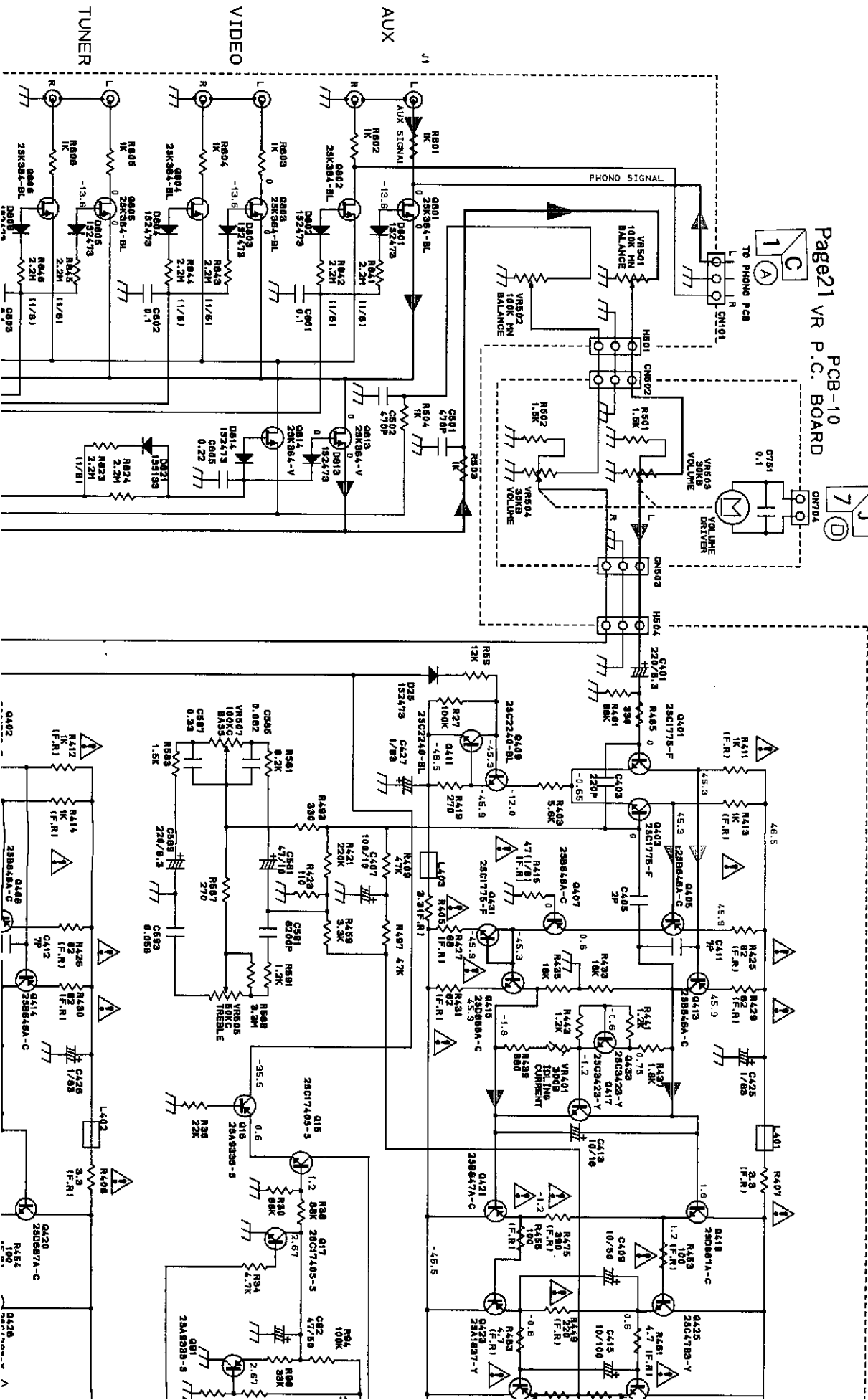
SCHEMATIC DIAGRAM (3)

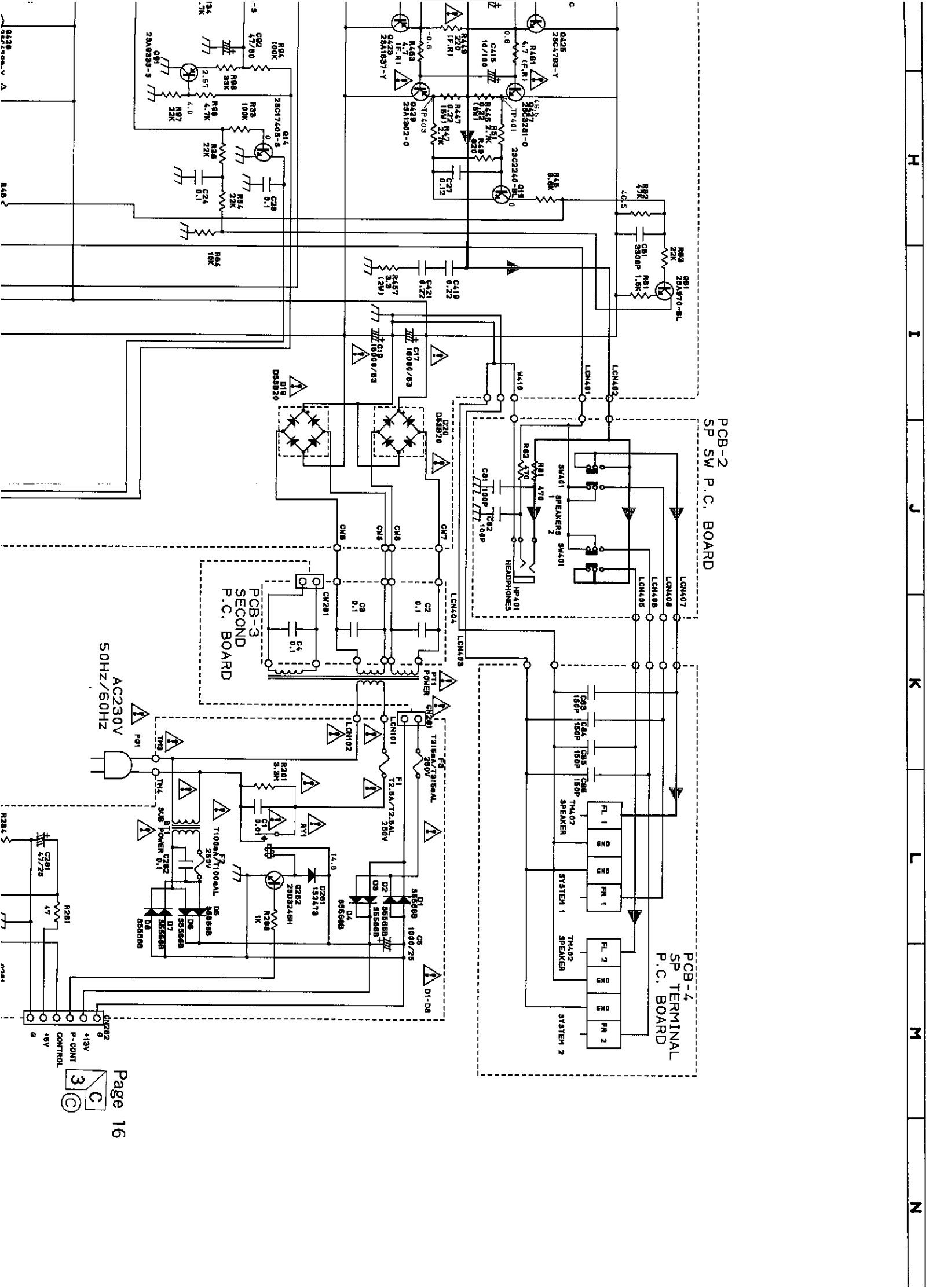
MODEL:HK660

PCB-1
MAIN P.C. BOARD

Page21 VR P.C. BOARD
PCB-10

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CMT04





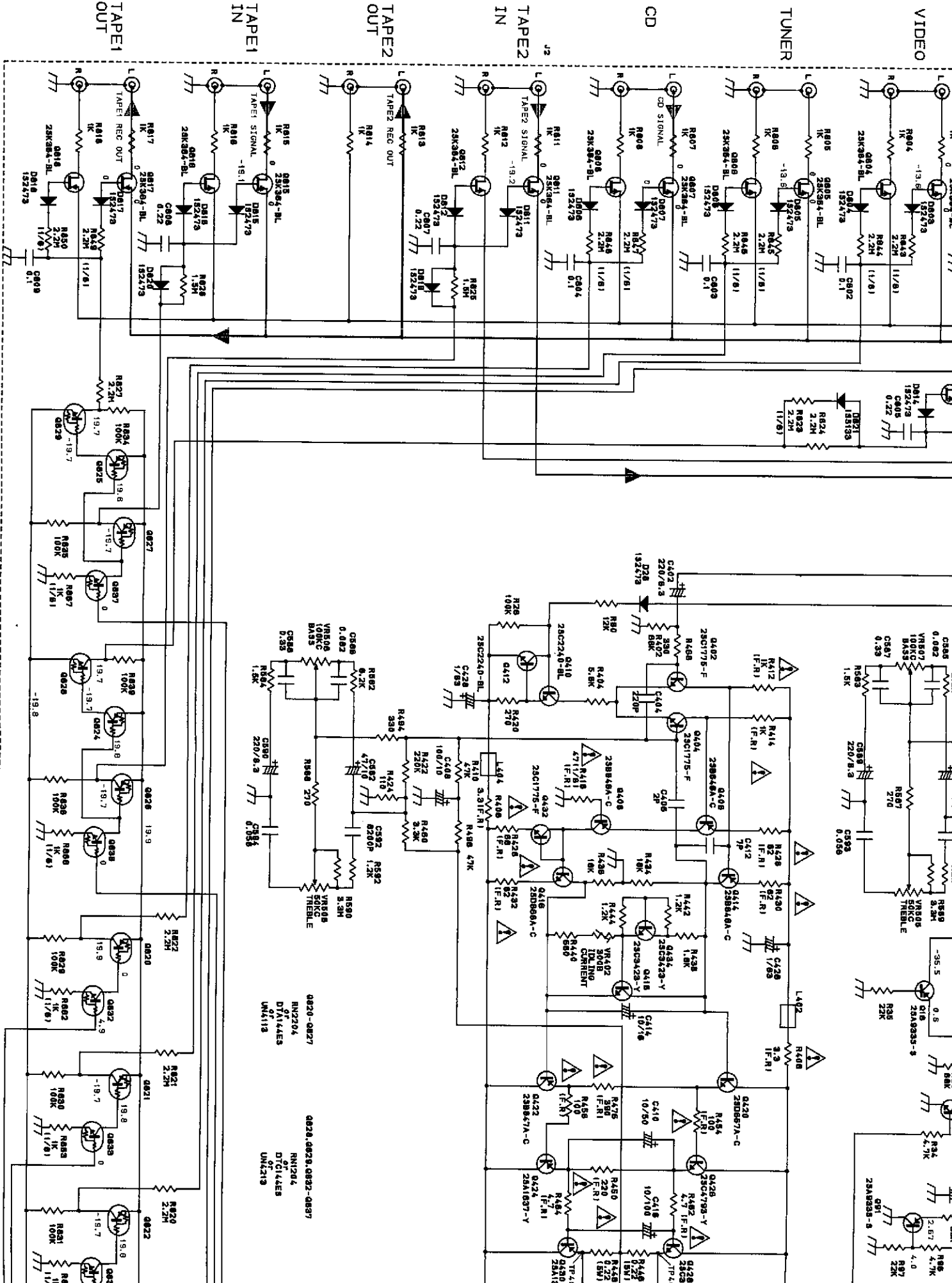
PCB-2
SP SW P.C. BOARD

PCB-3
SECOND
P.C. BOARD

PCB-4
SP TERMINAL
P.C. BOARD

AC230V
50HZ/60HZ





VIDEO

TUNER

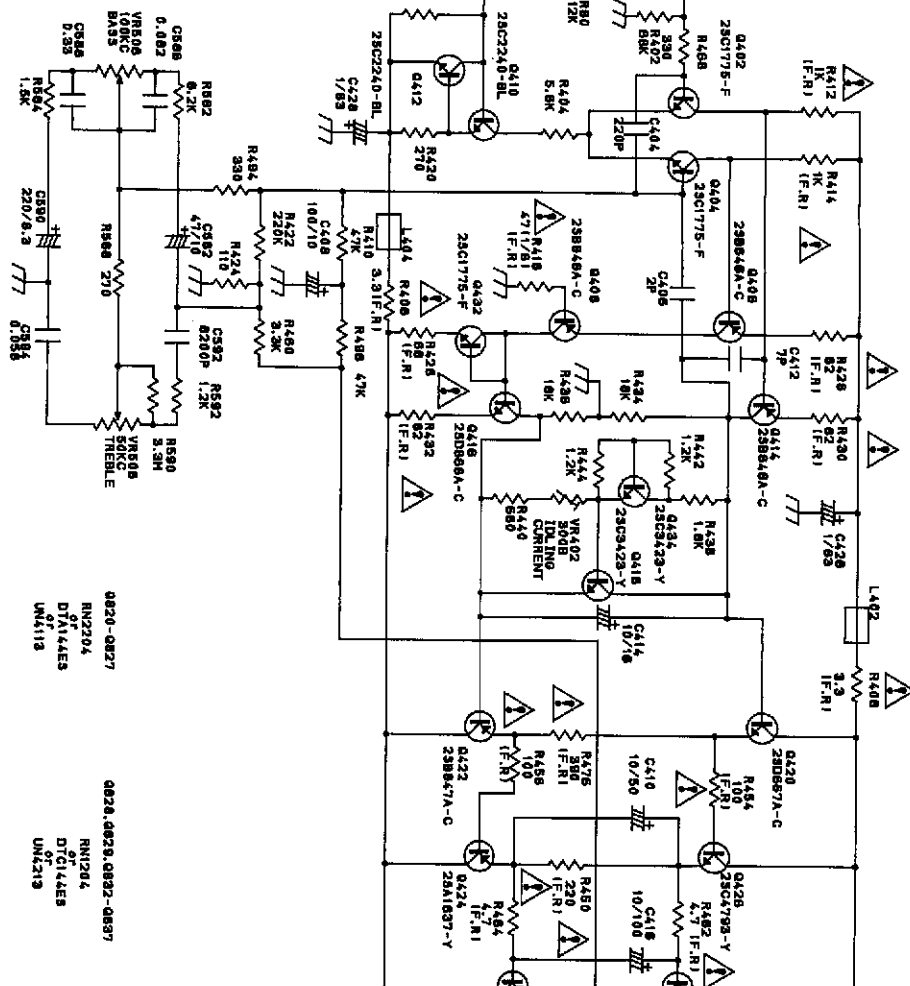
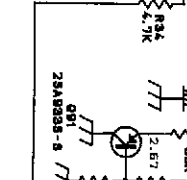
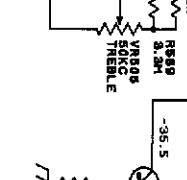
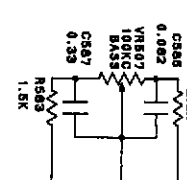
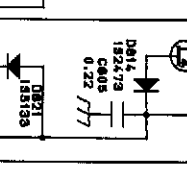
CD

TAPE2 IN

TAPE2 OUT

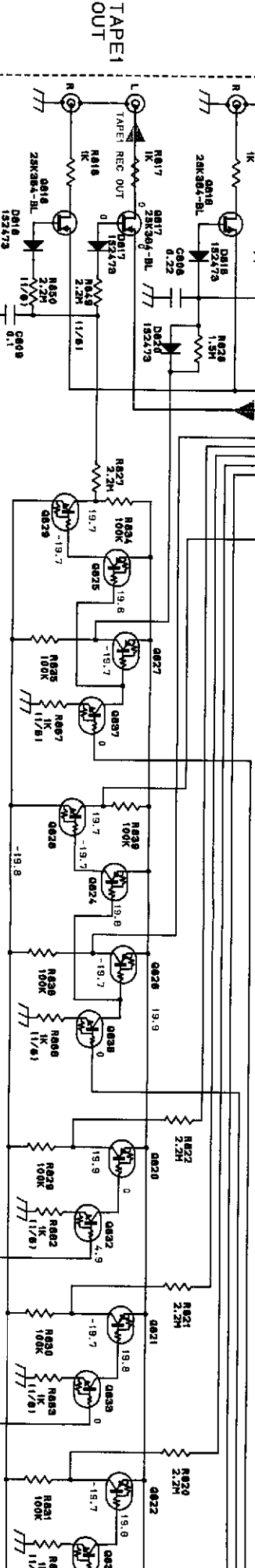
TAPE1 IN

TAPE1 OUT



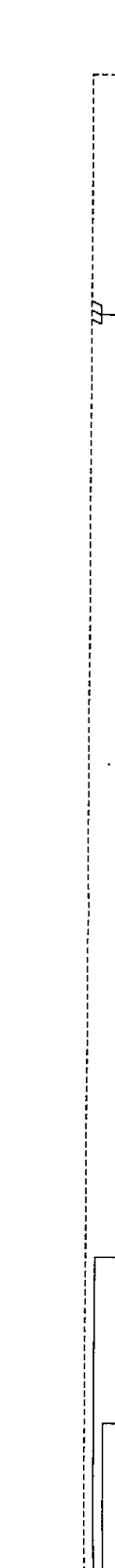
0820-0827
 RN204
 DT144ES
 of
 UN4118

0828-0829, 0832-0837
 RN204
 DT144ES
 of
 UN4219



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 RN204
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 UN4118

0828-0829, 0832-0837
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