6241A.sch-1 - Wed Nov 27 18:46:14 2002

| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
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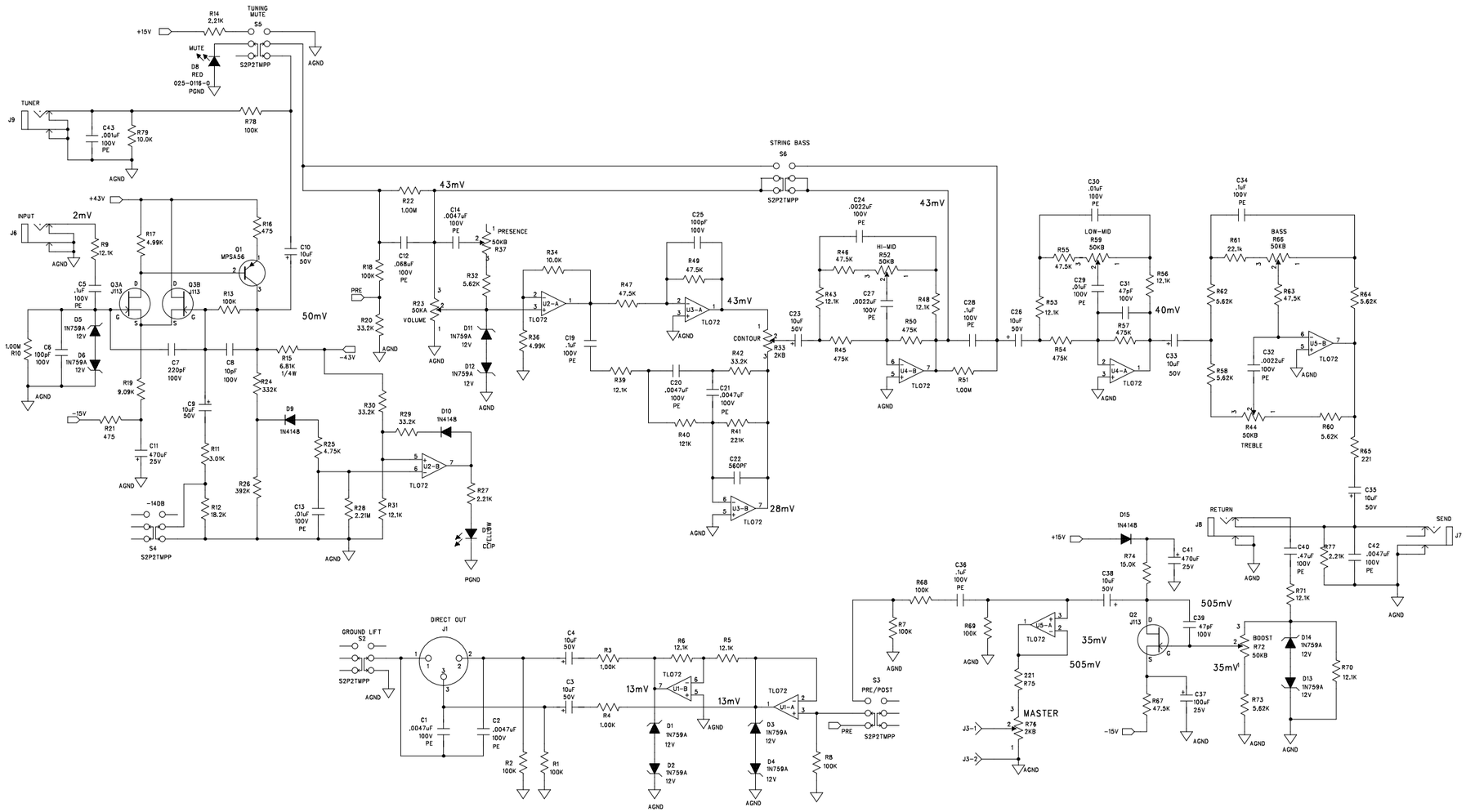



NOTES: UNLESS OTHERWISE SPECIFIED,

1. All test point voltages are in RMS, with 200 Hz, 2 mV (−53.9 dBV) sine wave input.
2. CONTOUR and PRESENCE on zero (off).

Switches out, all tones, boost and volume on 10

MH.125ND X1

NOT VALID UNLESS STAMP IS RED

1. UPDATE HOLE & PAD SIZE.
2. CHANGE BOARD # FROM 0120-E1 TO 0241-A.


gallien technology

2240 PARAGON DRIVE
SAN JOSE CA. 95131
VOICE: 408-441-8081
FAX: 408-441-8085


| APPROVALS | | |
|---|---|---|
| | INIT | DATE |
| DESIGNED: | R.A.G. | 5/19/99 |
| DRAWN: | R.A.G. | 11/27/02 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB-IV PREAMP

SIZE: B

DRAWING NO: 406-0241-A REV. A

PART NO: 206-0241-A

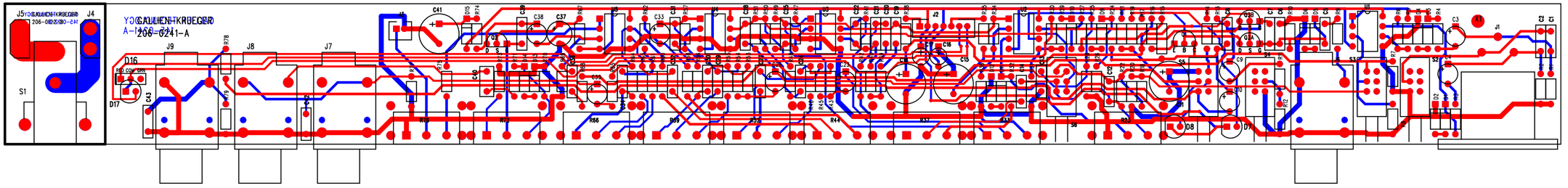
COMPANY: GALLIEN-KRUEGER

FILENAME: 6241A

GK GALLIEN-KRUEGER

**400RB-IV Preamp 206-0241-A**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. |
|---|---|---|---|---|
| | | | | |
| 001-1030-1 | U1-5 | TLO72CP, LOW NOISE JFET OPAMP | MOTOROLA | TL072CP |
| 010-1013-0 | Q1 | MPSA56 PNP 80V 500MA TO-92 | MOTOROLA | MPS-A56 |
| 010-2010-0 | Q2 Q3A Q3B | J113,N-JFET,35V,2MA,TO-92 | NATIONAL | J113 |
| 020-0120-0 | D1-6 D11-14 | 1N759A, ZENER,12V,5%,400MW, DO-35 | MOTOROLA | 1N759A |
| 020-1000-0 | D9-10 D15 | 1N4148, RECT-FAST, 200MA, 100V | MOTOROLA | 1N4148 |
| 025-0012-0 | D16 | LED,RED/GRN,5MM,630NM/560NM,15MCD/1 | STANLEY | VRPG5614S |
| 025-0023-0 | D7 | LED,YELLOW, 3MM, 585NM, 5MCD, 10MA | EVERLIGHT | EL204YD |
| 025-0030-2 | D17 | LED,BLUE, 10MA | LITEON | LTL-42B6 |
| 025-0116-0 | D8 | LED,RED, 3MM, 635NM, 6MCD, 10MA, 40DE | EVERLIGHT | EL2041D |
| 031-1107-0 | C37 | CAP,ELEC,RAD,107,20%,25V | UNITED CHEMI-CON | SMG25VB101M6X11LL |
| 031-1477-0 | C11 C41 | CAP, ELEC, RAD, 470uF, 20%, 25V | UNITED CHEMI-CON | SMG25VB471M10X12LL |
| 031-2106-0 | C3,4,9,10,23,26,33,35 | CAP,ELEC,RAD, 106, 20%, 50V | UNITED CHEMI-CON | SMG50VB10RM5X11LL |
| | C38 | | | |
| 031-2227-0 | C15 C18 | CAP, ELEC, 220uF, 20%, 50V | UNITED CHEMI-CON | SMG50VB221M10X12LL |
| 031-2335-0 | C16-17 | CAP,ELEC,RAD,335,20%,50V | UNITED CHEMI-CON | SMG50VB3R3M5X11LL |
| 032-4102-0 | C43 | CAP,PE,102,5%,100V, | PANASONIC | ECQB1102JF |
| 032-4103-0 | C13 C29-30 | CAP,PE,103,5%,100V, | PANASONIC | ECQV1103JM |
| 032-4104-0 | C5 C19 C28 C34 C36 | CAP,PE,104,5%,100V, | PANASONIC | ECQV1104JM |
| 032-4222-0 | C24 C27 C32 | CAP,PE,222,5%,100V, | PANASONIC | ECQB1222JF |
| 032-4472-0 | C1-2 C14 C20-21 C42 | CAP,PE,472,5%,100V, | PANASONIC | ECQB1472JF |
| 032-4474-0 | C40 | CAP,PE,474,5%,100V, | PANASONIC | ECQV1474JM |
| 032-4683-0 | C12 | CAP,PE,683,5%,100V, | PANASONIC | ECQV1683JM |
| 034-4100-0 | C8 | CAP, MCR,10pF,5%,100V,NPO | TAITRON | TMRS100J100NPOB |
| 034-4101-0 | C6 C25 | CAP,MCR,100pF,5%,100V, | TAITRON | TMRS101J100NPOB |
| 034-4221-0 | C7 | CAP,MCR,220pF,5%,100V, | TAITRON | TMRS221J100NPOB |
| 034-4470-0 | C31 C39 | CAP,MCR,47PF,5%,100V,NPO | TAITRON | TMRS470J100NPOB |
| 034-4561-0 | C22 | CAP,MCR,560pF,5%,100V, | TAITRON | TMRS561J100NPOB |
| 052-6812-0 | R15 | RES, METAL FILM, 6.81K, 1/4W, 1% | ECI | M2F1AK006.81 |
| 060-1002-0 | R3-4 | RES,METAL FILM, 1.00K, 1/8W, 1% | ECI | M1F1AK001.00 |
| 060-1003-0 | R34 R79 | RES,METAL FILM, 10.0K, 1/8W,1% | ECI | M1F1AK010.00 |
| 060-1004-0 | R1,2,7,8,13,18,68,69,78 | RES,METAL FILM, 100K, 1/8W, 1% | ECI | M1F1AK100.00 |
| 060-1005-0 | R10 R22 R51 | RES, METAL FILM, 1.00M, 1%,1/8W | ECI | M1F1AM001.00 |
| 060-1213-0 | R5,6,9,31,39,43,48,53 | RES,METAL FILM, 12.1K, 1/8W, 1% | ECI | M1F1AK012.10 |
| | R56,70,71 | | | |
| | | | | |
| 060-1214-0 | R40 | RES,METAL FILM, 121K, 1/8W, 1% | ECI | M1F1AK121.00 |
| 060-1503-0 | R74 | RES,METAL FILM, 15.0K, 1/8W, 1% | ECI | M1F1AK015.00 |
| 060-1823-0 | R12 | RES,METAL FILM, 18.2K, 1/8W, 1% | ECI | M1F1AK018.20 |
| 060-2211-0 | R65 R75 | RES,METAL FILM, 221, 1/8W, 1% | ECI | M1F1AJ221.00 |
| 060-2212-0 | R14 R27 R77 | RES,METAL FILM, 2.21K, 1/8W, 1% | ECI | M1F1AK002.21 |
| 060-2213-0 | R61 | RES,METAL FILM, 22.1K, 1/8W, 1% | ECI | M1F1AK022.10 |
| 060-2214-0 | R41 | RES,METAL FILM, 221K, 1/8W, 1% | ECI | M1F1AK221.00 |
| 060-2215-0 | R28 | RES, METAL FILM, 2.21M, 1/8W, 1% | ECI | M1F1AM002.21 |
| 060-3012-0 | R11 | RES,METAL FILM, 3.01K, 1/8W, 1% | ECI | M1F1AK003.01 |
| 060-3323-0 | R20 R29-30 R42 | RES,METAL FILM, 33.2K, 1/8W, 1% | ECI | M1F1AK033.20 |
| 060-3324-0 | R24 | RES,METAL FILM, 332K, 1/8W, 1% | ECI | M1F1AK332.00 |
| 060-3924-0 | R26 | RES,METAL FILM, 392K, 1/8W, 1% | ECI | M1F1AK392.00 |
| 060-4751-0 | R16 R21 R35 R38 | RES,METAL FILM, 475, 1/8W, 1% | ECI | M1F1AJ475.00 |
| 060-4752-0 | R25 | RES,METAL FILM, 4.75K, 1/8W, 1% | ECI | M1F1AK004.75 |
| 060-4753-0 | R46,47,49,55,63,67 | RES,METAL FILM, 47.5K, 1/8W, 1% | ECI | M1F1AK047.50 |
| 060-4754-0 | R45 R50 R54 R57 | RES,METAL FILM, 475K, 1/8W, 1% | ECI | M1F1AK475.00 |
| 060-4992-0 | R17 R36 | RES,METAL FILM, 4.99K, 1/8W, 1% | ECI | M1F1AK004.99 |
| 060-5622-0 | R32,58,60,62,64,73 | RES,METAL FILM, 5.62K, 1/8W, 1% | ECI | M1F1AK005.62 |
| 060-9092-0 | R19 | RES,METAL FILM, 9.09K, 1/8W, 1% | ECI | M1F1AK009.09 |
| 070-1513-0 | R23 | POT,50K-15A,7MM,KNURL,.1W | SONG HUEI | 16K1-A50K-L15KC |
| 070-1514-0 | R37,44,52,59,66,72 | POT,50KB,7MM,KNURL,.1W | SONG HUEI | 16K1-B50K-L15KC |
| 070-1522-0 | R33 R76 | POT,2KB,7MM,KNURL,.1W | SONG HUEI | 16K1-B2K-L15KC |
| 090-0007-0 | S1 | SWITCH, 8A/128A,250V,PP,PCB | TECX | KDC-A04-10-B, B2-F |
| 090-0012-0 | S2-6 | SWITCH,MIMI PP,DPDT,.1A BRK/MAKE | ELKECTRONIC COMP | MTH2UEE-1D911 |
| 092-0066-0 | J4-5 | FASTON, M, PC, .250" | KEYSTONE | 1021 |
| 092-0081-0 | J6-9 | JACK,1/4",MONO,PC,NON GROUNDING | NEUTRIK | S102-84 |
| 092-0084-0 | J1 | CON,XLR,MALE,PC,PL, SCREW MNT | NEUTRIK | X906-05 |
| 093-0051-0 | J3 | HDR, 2MMX2, VERT, LOCK | JST | B2B-PH-K-S |
| 093-2005-0 | J2 | HDR, 2MMX7, VERT, SHROUDED | JST | B7B-PH-K-S |
| | | | | |
| 145-0241-A | | 400RB-IV PREAMP RAW BOARD | | |
| | | | | |




PCB WORK INSTRUCTIONS

DWG #420-0241-A

## NOTES:

UNLESS OTHERWISE SPECIFIED:

1. SQUARE PADS ON THRU HOLE PARTS (ie: CONNECTORS, DIPS, SIPS, LEDS) DENOTE PIN 1.
2. ALL BOARDS REQUIRE A COMPLETE AND THOROUGH VISUAL INSPECTION.
3. ALL BOARDS MUST BE BARE BOARD TESTED.
4. ASSEMBLE AND SOLDER PER ANSI/IPC-A-610B.

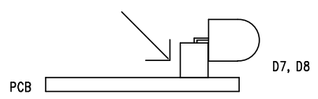
LOADING

5. CLIP BUSHING TABS OFF ON POTS R23, 33, 37, 44, 52, 59, 66, 72, 76
6. SEE DETAIL A FOR MOUNTING D7 AND 8
7. SEE DETAIL "B" FOR MOUNTING D16 AND D17

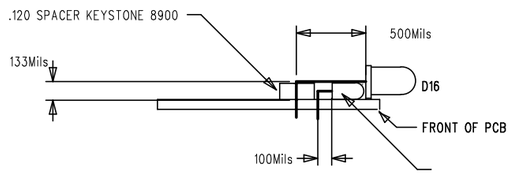
FINAL QA

8. CHECK TO SEE ALL POTS, JACKS, AND SWITCHES ARE MOUNTED FLUSH AND STRAIGHT

LED SPACER
GT PART# 100-0119-0




DETAIL "A"




DETAIL "B"

NOT VALID UNLESS STAMP IS RED

LAYER DESCRIPTION:
TOP SIDE SOLDER SCREEN

gallien technology

2240 PARAGON DRIVE
SAN JOSE CA. 95131
VOICE: 408-441-8081
FAX: 408-441-8085

| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 1/6/98 |
| DRAWN: | R.A.G. | 11/27/02 |
| ELEC: | | |
| MECH: | | |

GERBER FILE NAME: 5241a.pho

TITLE: 400RB-IV PRE-AMP BD

SIZE: B

DRAWING NO: 405-0241-A

PART NO: 145-0241-A

REV: A

COMPANY:

FILENAME: 5241A

# gallien technology

Engineering Change Order

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer Name: | Gallien-Krueger | Current Rev #: | A | New ECO Rev #: | | A1 |
| Model: | 400RB-IV | Distribute To: | | Page: | 1 | Of: 1 |
| Assembly Description: | Preamp | Originator: | RAG | | | |
| Assembly Numbers: | 206-0241-A1 | Approved by: | | | | |
| | | Effective Date: | 8/8/2003 | | | |

| Effective | | | | Document Update | | Date | Initials |
|---|---|---|---|---|---|---|---|
| ☐ | All in Process | ☒ | Next Buy | ☐ | Artwork | | |
| ☐ | All in Service | ☐ | Next Production Run | ☐ | Assembly Dwg. | | |
| ☐ | All in Stock | ☐ | | ☒ | Board Artwork | | |
| Beginning Serial Number: | | | | ☒ | BOM | | |
| | | | | ☐ | Control Form | | |
| | | | | ☐ | Costing | | |
| | | | | ☐ | Fab Drawing | | |
| | | | | ☒ | Inspection Proc. | | |
| | | | | ☒ | Part Master File | | |
| | | | | ☒ | Schematic | | |
| | | | | ☐ | Service Manual | | |
| | | | | ☒ | Test Procedure | | |
| | | | | ☐ | | | |

**Reason For Change**

Update boost and gain structure to match 800RB.

**Other Affected Assemblies**

290 Assembly, 302 Assembly (Head)

303 Assemblies (Combos)

☐ Continued on ECO Supplement Page

**Description Of Change**

Make changes as indicated below.

| Distribution | | Date | Initials |
|---|---|---|---|
| ☐ | Accounting | | |
| ☐ | Assembly | | |
| ☒ | Engineering | | |
| ☒ | Incoming Q.C. | | |
| ☒ | Production Eng. | | |
| ☒ | Purchasing | | |
| ☐ | Q.A. | | |
| ☐ | Service | | |
| ☒ | Test | | |
| ☐ | | | |

☐ Continued on Supplement Page ☐ Drawing(s) attached

| Part Number | Description | Parts Added | | Parts Deleted | |
|---|---|---|---|---|---|
| | | Qty | Ref. Designator | Qty | Ref. Designator |
| 060-1002-0 | 1K,1/8W,MF | 1 | R80 | | |
| 060-4752-0 | 4.75K,1/8W,MF | 1 | R74 | | |
| 060-1213-0 | 12.1K,1/8W,MF | 2 | R67,34A | | |
| 060-3012-0 | 3.01K,1/8W,MF | 1 | R70 | | |
| 060-2002-0 | 2.00K,1/8W,MF | 1 | R36 | | |
| 032-4222-0 | .0022uF/100V | 2 | C42,44 | | |
| 034-4101-0 | 100pF/100V | 1 | C39 | | |
| 032-4104-0 | .1uF/100V | 1 | C12 | | |
| 032-4103-0 | .01uF/100V | 1 | C14A | | |
| 020-1000-0 | 1N4148 | | | 1 | D15 |
| 060-1503-0 | 15K,1/8W | | | 1 | R74 |
| 060-4753-0 | 47.5K,1/8W | | | 1 | R67 |
| 060-1213-0 | 12.1K,1/8W,MF | | | 1 | R70 |
| 060-4992-0 | 4.99K,1/8W | | | 1 | R36 |
| 034-4470-0 | 47pF/100V | | | 1 | C39 |
| 032-4472-0 | .0047uF/100V | | | 1 | C42 |
| 020-0120-0 | 1N759A | | | 2 | D11,12 |
| 032-4683-0 | .068uF/100V | | | 1 | C12 |
| | | | | | |
| | | | | | |
| | | | | | |

6241A1.sch-1 - Thu Aug 07 16:13:50 2003

| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
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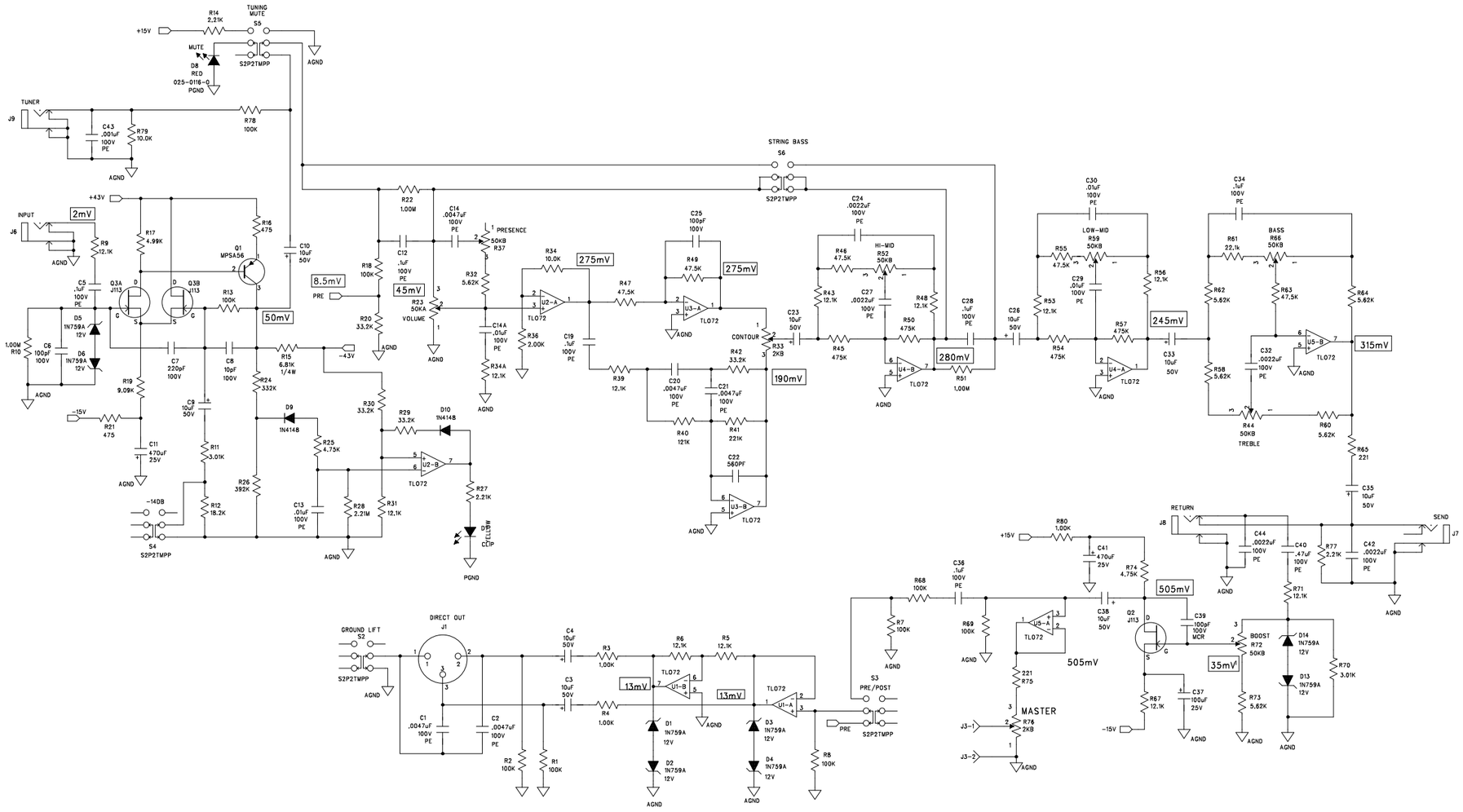



TEST CONDITIONS:

1. All test point voltages are in RMS, with 200 Hz, 2 mV (−53.9 dBV) sine wave input.
2. CONTOUR and PRESENCE on zero (off). Switches out, all tones, boost and volume on 10

NOT VALID UNLESS STAMP IS RED

1. CHANGE BOARD # FROM 0241-A TO 0241-A1.
2. REPLACE D15 WITH R80-1K.
3. CHANGE R74-4.75K, R67-12.1K, C39-100pF.
4. CHANGE R70-3.01K, R36 TO 2.00K.
5. CHANGE C42 TO .0022uF, C12 TO .1uF.
6. ADD C44-.0022uF.
7. REPLACE D11 WITH C14A-.01uF.
8. REPLACE D12 WITH R34A-12.1K.


gallien technology

2234 INDUSTRIAL DRIVE
STOCKTON CA, 95206
VOICE: 209-234-7300
FAX: 209-234-8420

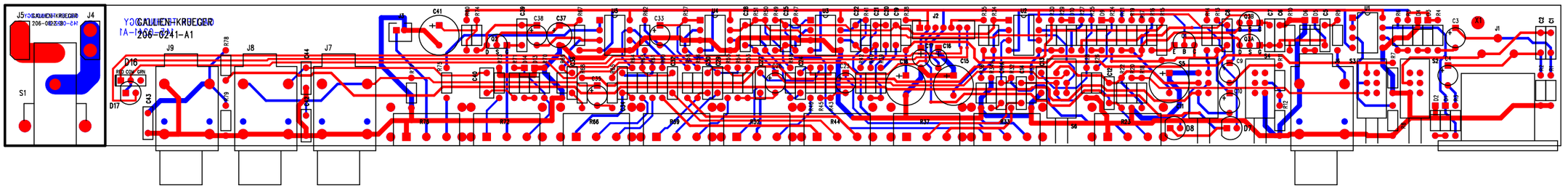

| APPROVALS | | |
|---|---|---|
| INIT | | DATE |
| DESIGNED: | R.A.G. | 5/19/99 |
| DRAWN: | R.A.G. | 8/05/03 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

| | | |
|---|---|---|
| TITLE: | 400RB-IV PREAMP | |
| SIZE: B | DRAWING NO: 406-0241-A1 | REV: A1 |
| | PART NO: 206-0241-A1 | |
| COMPANY: | GALLIEN-KRUEGER | |
| FILENAME: | 6241A1 | |

GK GALLIEN-KRUEGER

**400RB-IV Preamp 206-0241-A1**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. |
|---|---|---|---|---|
| 001-1030-1 | U1-5 | TLO72CP, LOW NOISE JFET OPAMP | MOTOROLA | TL072CP |
| 010-1013-0 | Q1 | MPSA56 PNP 80V 500MA TO-92 | MOTOROLA | MPS-A56 |
| 010-2010-0 | Q2 Q3A Q3B | J113,N-JFET,35V,2MA,TO-92 | NATIONAL | J113 |
| 020-0120-0 | D1-6 D13-14 | 1N759A, ZENER,12V,5%,400MW, DO-35 | MOTOROLA | 1N759A |
| 020-1000-0 | D9-10 | 1N4148, RECT-FAST, 200MA, 100V | MOTOROLA | 1N4148 |
| 025-0012-0 | D16 | LED,RED/GRN,5MM,630NM/560NM, | STANLEY | VRPG5614S |
| 025-0023-0 | D7 | LED,YELLOW, 3MM, 585NM, 5MCD, 10MA | EVERLIGHT | EL204YD |
| 025-0030-2 | D17 | LED,BLUE, 10MA | LITEON | LTL-42B6 |
| 025-0116-0 | D8 | LED,RED, 3MM, 635NM, 6MCD, 10MA, | EVERLIGHT | EL2041D |
| 031-1107-0 | C37 | CAP,ELEC,RAD,107,20%,25V | UNITED CHEMI-CON | SMG25VB101M6X11LL |
| 031-1477-0 | C11 C41 | CAP, ELEC, RAD, 470uF, 20%, 25V | UNITED CHEMI-CON | SMG25VB471M10X12LL |
| 031-2106-0 | C3,4,9,10,23,26,33 | CAP,ELEC,RAD, 106, 20%, 50V | UNITED CHEMI-CON | SMG50VB10RM5X11LL |
| | C35 C38 | | | |
| 031-2227-0 | C15 C18 | CAP, ELEC, 220uF, 20%, 50V | UNITED CHEMI-CON | SMG50VB221M10X12LL |
| 031-2335-0 | C16-17 | CAP,ELEC,RAD,335,20%,50V | UNITED CHEMI-CON | SMG50VB3R3M5X11LL |
| 032-4102-0 | C43 | CAP,PE,102,5%,100V, | PANASONIC | ECQB1102JF |
| 032-4103-0 | C13 C29-30 C14A | CAP,PE,103,5%,100V, | PANASONIC | ECQV1103JM |
| 032-4104-0 | C5,12,19,28,34,36 | CAP,PE,104,5%,100V, | PANASONIC | ECQV1104JM |
| 032-4222-0 | C24 C27 C32 C42 C44 | CAP,PE,222,5%,100V, | PANASONIC | ECQB1222JF |
| 032-4472-0 | C1-2 C14 C20-21 | CAP,PE,472,5%,100V, | PANASONIC | ECQB1472JF |
| 032-4474-0 | C40 | CAP,PE,474,5%,100V, | PANASONIC | ECQV1474JM |
| 034-4100-0 | C8 | CAP, MCR,10pF,5%,100V,NPO | TAITRON | TMRS100J100NPOB |
| 034-4101-0 | C6 C25 C39 | CAP,MCR,100pF,5%,100V, | TAITRON | TMRS101J100NPOB |
| 034-4221-0 | C7 | CAP,MCR,220pF,5%,100V, | TAITRON | TMRS221J100NPOB |
| 034-4561-0 | C22 | CAP,MCR,560pF,5%,100V, | TAITRON | TMRS561J100NPOB |
| 052-6812-0 | R15 | RES, METAL FILM, 6.81K, 1/4W, 1% | ECI | M2F1AK006.81 |
| 060-1002-0 | R3-4 R80 | RES,METAL FILM, 1.00K, 1/8W, 1% | ECI | M1F1AK001.00 |
| 060-1003-0 | R34 R79 | RES,METAL FILM, 10.0K, 1/8W,1% | ECI | M1F1AK010.00 |
| 060-1004-0 | R1-2 R7-8 R13 R18 | RES,METAL FILM, 100K, 1/8W, 1% | ECI | M1F1AK100.00 |
| | R68-69 R78 | | | |
| 060-1005-0 | R10 R22 R51 | RES, MF, 1.00M, 1%,1/8W, | ECI | M1F1AM001.00 |
| 060-1213-0 | R5,6,9,31,39,43,48,53 | RES,METAL FILM, 12.1K, 1/8W, 1% | ECI | M1F1AK012.10 |
| | R56,71,34A | | | |
| 060-1213-0 | R67 | RES,METAL FILM, 12.1K, 1/8W, 1% | ECI | M1F1AK012.10 |
| 060-1214-0 | R40 | RES,METAL FILM, 121K, 1/8W, 1% | ECI | M1F1AK121.00 |
| 060-1823-0 | R12 | RES,METAL FILM, 18.2K, 1/8W, 1% | ECI | M1F1AK018.20 |
| 060-2002-0 | R36 | RES,METAL FILM, 2.00K, 1/8W, 1% | ECI | M1F1AK002.00 |
| 060-2211-0 | R65 R75 | RES,METAL FILM, 221 ohm, 1/8W, 1% | ECI | M1F1AJ221.00 |
| 060-2212-0 | R14 R27 R77 | RES,METAL FILM, 2.21K, 1/8W, 1% | ECI | M1F1AK002.21 |
| 060-2213-0 | R61 | RES,METAL FILM, 22.1K, 1/8W, 1% | ECI | M1F1AK022.10 |
| 060-2214-0 | R41 | RES,METAL FILM, 221K, 1/8W, 1% | ECI | M1F1AK221.00 |
| 060-2215-0 | R28 | RES, METAL FILM, 2.21M, 1/8W, 1% | ECI | M1F1AM002.21 |
| 060-3012-0 | R11 R70 | RES,METAL FILM, 3.01K, 1/8W, 1% | ECI | M1F1AK003.01 |
| 060-3323-0 | R20 R29-30 R42 | RES,METAL FILM, 33.2K, 1/8W, 1% | ECI | M1F1AK033.20 |
| 060-3324-0 | R24 | RES,METAL FILM, 332K, 1/8W, 1% | ECI | M1F1AK332.00 |
| 060-3924-0 | R26 | RES,METAL FILM, 392K, 1/8W, 1% | ECI | M1F1AK392.00 |
| 060-4751-0 | R16 R21 R35 R38 | RES,METAL FILM, 475 ohm, 1/8W, 1% | ECI | M1F1AJ475.00 |
| 060-4752-0 | R25 R74 | RES,METAL FILM, 4.75K, 1/8W, 1% | ECI | M1F1AK004.75 |
| 060-4753-0 | R46-47 R49 R55 R63 | RES,METAL FILM, 47.5K, 1/8W, 1% | ECI | M1F1AK047.50 |
| 060-4754-0 | R45 R50 R54 R57 | RES,METAL FILM, 475K, 1/8W, 1% | ECI | M1F1AK475.00 |
| 060-4992-0 | R17 | RES,METAL FILM, 4.99K, 1/8W, 1% | ECI | M1F1AK004.99 |
| 060-5622-0 | R32,58,60,62,64,73 | RES,METAL FILM, 5.62K, 1/8W, 1% | ECI | M1F1AK005.62 |
| 060-9092-0 | R19 | RES,METAL FILM, 9.09K, 1/8W, 1% | ECI | M1F1AK009.09 |
| 070-1513-0 | R23 | POT,50K-15A,7MM,KNURL,.1W | SONG HUEI | 16K1-A50K-L15KC |
| 070-1514-0 | R37,44,52,59,66,72 | POT,50KB,7MM,KNURL,.1W | SONG HUEI | 16K1-B50K-L15KC |
| 070-1522-0 | R33 R76 | POT,2KB,7MM,KNURL,.1W | SONG HUEI | 16K1-B2K-L15KC |
| 090-0007-0 | S1 | SWITCH, 8A/128A,250V,PP,PCB | TECX | KDC-A04-10-B, B2-F |
| 090-0012-0 | S2-6 | SWITCH,MIMI PP,DPDT,.1A BRK/MAKE, | ELKECTRONIC COMP | MTH2UEE-1D911 |
| 092-0066-0 | J4-5 | FASTON, M, PC, .250" | KEYSTONE | 1021 |
| 092-0081-0 | J6-9 | JACK,1/4",MONO,PC,NON GROUNDING | NEUTRIK | S102-84 |
| 092-0084-0 | J1 | CON,XLR,MALE,PC,PL, SCREW MNT | NEUTRIK | X906-05 |
| 093-0051-0 | J3 | HDR, 2MMX2, VERT, LOCK | JST | B2B-PH-K-S |
| 093-2005-0 | J2 | HDR, 2MMX7, VERT, SHROUDED | JST | B7B-PH-K-S |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 145-0241-A | | 400RB-IV PREAMP RAW BOARD | | |
| | | | | |




PCB WORK INSTRUCTIONS

DWG #420-0241-A1

## NOTES:

UNLESS OTHERWISE SPECIFIED:

1. SQUARE PADS ON THRU HOLE PARTS (ie: CONNECTORS, DIPS, SIPS, LEDS) DENOTE PIN 1.
2. ALL BOARDS REQUIRE A COMPLETE AND THOROUGH VISUAL INSPECTION.
3. ALL BOARDS MUST BE BARE BOARD TESTED.
4. ASSEMBLE AND SOLDER PER ANSI/IPC-A-610B.

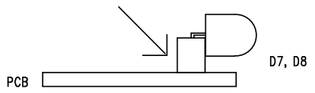
LOADING

5. CLIP BUSHING TABS OFF ON POTS R23, 33, 37, 44, 52, 59, 66, 72, 76
6. SEE DETAIL A FOR MOUNTING D7 AND 8
7. SEE DETAIL "B" FOR MOUNTING D16 AND D17

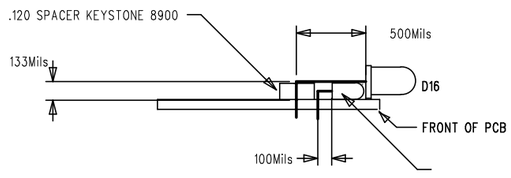
FINAL QA

8. CHECK TO SEE ALL POTS, JACKS, AND SWITCHES ARE MOUNTED FLUSH AND STRAIGHT

LED SPACER
GT PART# 100-0119-0




DETAIL "A"




DETAIL "B"

NOT VALID UNLESS STAMP IS RED

LAYER DESCRIPTION:
TOP SIDE SOLDERMASK SILKSCREEN

gallien technology

2234 INDUSTRIAL DRIVE
STOCKTON CA, 95206
VOICE: 209-234-7300
FAX: 209-234-8420

| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 1/6/98 |
| DRAWN: | R.A.G. | 8/06/03 |
| ELEC: | | |
| MECH: | | |

GERBER FILE NAME: 5241a1.pho

TITLE: 400RB-IV PRE-AMP BD

SIZE: B

DRAWING NO: 405-0241-A1

PART NO: 145-0241-A1

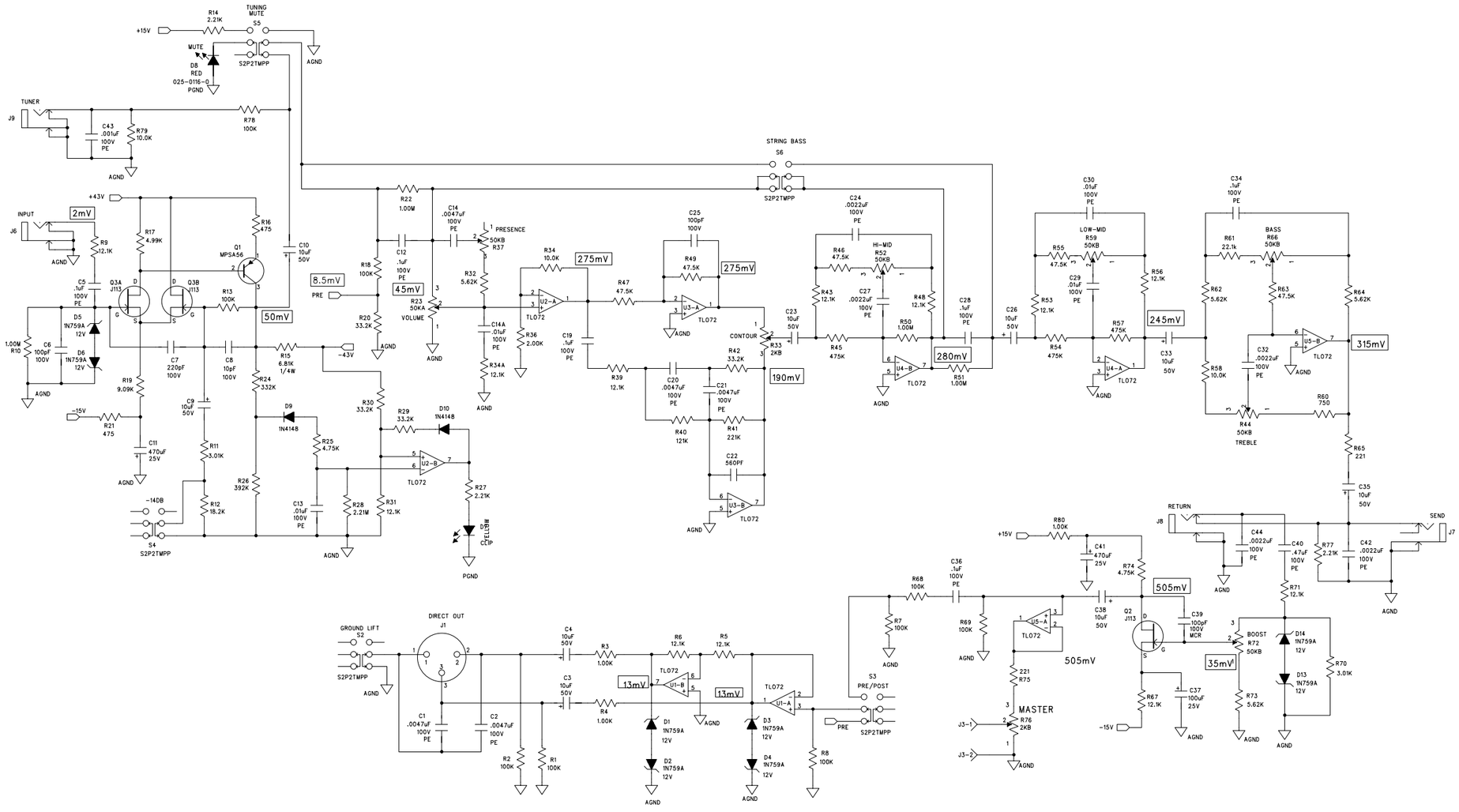
REV: A1

COMPANY:

FILENAME: 5241A1

| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |






TEST CONDITIONS:

1. All test point voltages are in RMS, with 200 Hz, 2 mV (−53.9 dBV) sine wave input.
2. CONTOUR and PRESENCE on zero (off). Switches out, all tones, boost and volume on 10

NOT VALID UNLESS STAMP IS RED

REV A2: PREAMP REVOICED.

1. CHANGE BOARD # FROM 0241-A1 TO 0241-A2.
2. CHANGE R50 TO 1M FROM 475K.
3. CHANGE R58 TO 10K FOM 5.62K .
4. CHANGE R60 TO 750 FROM 5.62K.

gallien technology
2234 INDUSTRIAL DRIVE
STOCKTON CA, 95206
VOICE: 209-234-7300
FAX: 209-234-8420

| APPROVALS | | |
|---|---|---|
| | INIT | DATE |
| DESIGNED: | R.A.G. | 5/19/99 |
| DRAWN: | Noli | 8/16/04 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB-IV PREAMP
SIZE: B
DRAWING NO: 406-0241-A2
REV: A2
PART NO: 206-0241-A2
COMPANY: GALLIEN-KRUEGER
FILENAME: 6241A2

# GK GALLIEN-KRUEGER

**400RB-IV Preamp** **Bill Of Materia** **206-0241-A2**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. | Quan |
|---|---|---|---|---|---|
| 032-4102-0 | C43 | CAP,PE,102,5%,100V, | PANASONIC | ECQB1102JF | 1 |
| 032-4222-0 | C24 C27 C32 C42 C44 | CAP,PE,222,5%,100V, | PANASONIC | ECQB1222JF | 5 |
| 032-4472-0 | C1-2 C14 C20-21 | CAP,PE,472,5%,100V, | PANASONIC | ECQB1472JF | 5 |
| 032-4103-0 | C13 C29-30 C14A | CAP,PE,103,5%,100V, | PANASONIC | ECQV1103JM | 4 |
| 032-4104-0 | C5 C12 C19 C28 C34 C36 | CAP,PE,104,5%,100V, | PANASONIC | ECQV1104JM | 6 |
| 032-4474-0 | C40 | CAP,PE,474,5%,100V, | PANASONIC | ECQV1474JM | 1 |
| 034-4101-0 | C6 C25 C39 | CAP,MCR,100pF,5%,100V, | TAITRON | TMRS101J100NPOB | 3 |
| 031-1107-0 | C37 | CAP,ELEC,RAD,107,20%,25V | UNITED CHEMI-CON | SMG25VB101M6X11LL | 1 |
| 034-4100-0 | C8 | CAP, MCR,10pF,5%,100V,NPO | TAITRON | TMRS100J100NPOB | 1 |
| 031-2106-0 | C3-4 C9-10 C23 C26 C33 C35 C38 | CAP,ELEC,RAD, 106, 20%, 50V | UNITED CHEMI-CON | SMG50VB10RM5X11LL | 9 |
| 034-4221-0 | C7 | CAP,MCR,220pF,5%,100V, | TAITRON | TMRS221J100NPOB | 1 |
| 031-2227-0 | C15 C18 | CAP, ELEC, 220uF, 20%, 50V | UNITED CHEMI-CON | SMG50VB221M10X12LL | 2 |
| 031-2335-0 | C16-17 | CAP,ELEC,RAD,335,20%,50V | UNITED CHEMI-CON | SMG50VB3R3M5X11LL | 2 |
| 031-1477-0 | C11 C41 | CAP, ELEC, RAD, 470uF, 20%, 25V | UNITED CHEMI-CON | SMG25VB471M10X12LL | 2 |
| 034-4561-0 | C22 | CAP,MCR,560pF,5%,100V, | TAITRON | TMRS561J100NPOB | 1 |
| 092-0081-0 | J6-9 | JACK,1/4",MONO,PC,NON GROUNDING | NEUTRIK | S102-84 | 4 |
| 092-0066-0 | J4-5 | FASTON, M, PC, .250" | KEYSTONE | 1021 | 2 |
| 092-0084-0 | J1 | CON,XLR,MALE,PC,PL, SCREW MNT | NEUTRIK | X906-05 | 1 |
| 020-1000-0 | D9-10 | 1N4148, RECT-FAST, 200MA, 100V | MOTOROLA | 1N4148 | 2 |
| 020-0120-0 | D1-6 D13-14 | 1N759A, ZENER,12V,5%,400MW, DO-35 | MOTOROLA | 1N759A | 8 |
| 093-0051-0 | J3 | HDR, 2MMX2, VERT, LOCK | JST | B2B-PH-K-S | 1 |
| 093-2005-0 | J2 | HDR, 2MMX7, VERT, SHROUDED | JST | B7B-PH-K-S | 1 |
| 001-1030-1 | U1-5 | TLO72CP, LOW NOISE JFET OPAMP | MOTOROLA | TL072CP | 5 |
| 025-0030-2 | D17 | LED,BLUE, 10MA | LITEON | LTL-42B6 | 1 |
| 025-0012-0 | D16 | LED,RED/GRN,5MM,630NM/560NM,15MCD/15MCD | STANLEY | VRPG5614S | 1 |
| 025-0116-0 | D8 | LED,RED, 3MM, 635NM, 6MCD, 10MA, 40DEG | EVERLIGHT | EL2041D | 1 |
| 025-0023-0 | D7 | LED,YELLOW, 3MM, 585NM, 5MCD, 10MA | EVERLIGHT | EL204YD | 1 |
| 000-0000-0 | X1 | .125 HOLE, NON-PLATED | | | 1 |
| 070-1522-0 | R33 R76 | POT,2KB,7MM,KNURL,.1W | SONG HUEI | 16K1-B2K-L15KC | 2 |
| 070-1513-0 | R23 | POT,50K-15A,7MM,KNURL,.1W | SONG HUEI | 16K1-A50K-L15KC | 1 |
| 070-1514-0 | R37 R44 R52 R59 R66 R72 | POT,50KB,7MM,KNURL,.1W | SONG HUEI | 16K1-B50K-L15KC | 6 |
| 060-1002-0 | R3-4 R80 | RES,METAL FILM, 1.00K, 1/8W, 1% | ECI | M1F1AK001.00 | 3 |
| 060-1005-0 | R10 R22 R51 | RES, MF, 1.00M, 1%,1/8W, 060-1005-0 | ECI | M1F1AM001.00 | 3 |
| 060-1005-0 | R50 | RES, METAL FILM, 1.00M, 1/8W, 1% | ECI | M1F1AK475.00 | 1 |
| 060-1003-0 | R34 R79 | RES,METAL FILM, 10.0K, 1/8W,1% | ECI | M1F1AK010.00 | 2 |
| 060-1003-0 | R58 | RES,METAL FILM, 10.0K, 1/8W,1% | ECI | M1F1AK005.62 | 1 |
| 060-1004-0 | R1-2 R7-8 R13 R18 R68-69 R | 78 RES,METAL FILM, 100K, 1/8W, 1% | ECI | M1F1AK100.00 | 9 |
| 060-1213-0 | R5-6 R9 R31 R39 R43 R48 R5 R56 R71 R34A | 3 RES,METAL FILM, 12.1K OHM, 1/8W, 1% | ECI | M1F1AK012.10 | 11 |
| 060-1213-0 | R67 | RES,METAL FILM, 12.1K, 1/8W, 1% | ECI | M1F1AK012.10 | 1 |
| 060-1214-0 | R40 | RES,METAL FILM, 121K, 1/8W, 1% | ECI | M1F1AK121.00 | 1 |
| 060-1823-0 | R12 | RES,METAL FILM, 18.2K, 1/8W, 1% | ECI | M1F1AK018.20 | 1 |
| 060-2002-0 | R36 | RES,METAL FILM, 2.00K, 1/8W, 1% | ECI | M1F1AK002.00 | 1 |
| 060-2212-0 | R14 R27 R77 | RES,METAL FILM, 2.21K, 1/8W, 1% | ECI | M1F1AK002.21 | 3 |
| 060-2215-0 | R28 | RES, METAL FILM, 2.21M, 1/8W, 1% | ECI | M1F1AM002.21 | 1 |
| 060-2213-0 | R61 | RES,METAL FILM, 22.1K, 1/8W, 1% | ECI | M1F1AK022.10 | 1 |
| 060-2214-0 | R41 | RES,METAL FILM, 221K, 1/8W, 1% | ECI | M1F1AK221.00 | 1 |
| 060-2211-0 | R65 R75 | RES,METAL FILM, 221 ohm, 1/8W, 1% | ECI | M1F1AJ221.00 | 2 |
| 060-3012-0 | R11 R70 | RES,METAL FILM, 3.01K, 1/8W, 1% | ECI | M1F1AK003.01 | 2 |
| 060-3323-0 | R20 R29-30 R42 | RES,METAL FILM, 33.2K, 1/8W, 1% | ECI | M1F1AK033.20 | 4 |
| 060-3324-0 | R24 | RES,METAL FILM, 332K, 1/8W, 1% | ECI | M1F1AK332.00 | 1 |
| 060-3924-0 | R26 | RES,METAL FILM, 392K, 1/8W, 1% | ECI | M1F1AK392.00 | 1 |
| 060-4752-0 | R25 R74 | RES,METAL FILM, 4.75K, 1/8W, 1% | ECI | M1F1AK004.75 | 2 |
| 060-4992-0 | R17 | RES,METAL FILM, 4.99K, 1/8W, 1% | ECI | M1F1AK004.99 | 1 |
| 060-4753-0 | R46-47 R49 R55 R63 | RES,METAL FILM, 47.5K, 1/8W, 1% | ECI | M1F1AK047.50 | 5 |
| 060-4754-0 | R45 R54 R57 | RES,METAL FILM, 475K, 1/8W, 1% | ECI | M1F1AK475.00 | 3 |
| 060-4751-0 | R16 R21 R35 R38 | RES,METAL FILM, 475 ohm, 1/8W, 1% | ECI | M1F1AJ475.00 | 4 |
| 060-5622-0 | R32 R62 R64 R73 | RES,METAL FILM, 5.62K, 1/8W, 1% | ECI | M1F1AK005.62 | 4 |
| 052-6812-0 | R15 | RES, METAL FILM, 6.81K OHM, 1/4W, 1% | ECI | M2F1AK006.81 | 1 |
| 060-7501-0 | R60 | RES,METAL FILM, 750, 1/8W, 1% | ECI | M1F1AK005.62 | 1 |
| 060-9092-0 | R19 | RES,METAL FILM, 9.09K, 1/8W, 1% | ECI | M1F1AK009.09 | 1 |
| 090-0012-0 | S2-6 | SWITCH,MIMI PP,DPDT,.1A BRK/MAKE,PC TERM | ELKECTRONIC COMP | MTH2UEE-1D911 | 5 |
| 090-0007-0 | S1 | SWITCH, 8A/128A,250V,PP,PCB | TECX | KDC-A04-10-B, B2-F | 1 |
| 010-2010-0 | Q2 Q3A Q3B | J113,N-JFET,35V,2MA,TO-92 | NATIONAL | J113 | 3 |
| 010-1013-0 | Q1 | MPSA56 PNP 80V 500MA TO-92 | MOTOROLA | MPS-A56 | 1 |
| | | | | | |
| 145-0241-A | | 400RB-IV PREAMP RAW BOARD | | | 1.00 |

gallien technology

Engineering Change Order

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer Name: | Gallien-Krueger | Current Rev #: | A1 | New ECO Rev #: | | A2 |
| Model: | 400RB-IV | Distribute To: | | Page: 1 | Of: | 2 |
| Assembly Description: | Preamp | Originator: | Enrique Hernandez | | | |
| Assembly Numbers: | 206-0241-A | Approved by: | | | | |
| | | Effective Date: | 8/2/2004 | | | |

| Effective | | | | Document Update | | Date | Initials |
|---|---|---|---|---|---|---|---|
| [X] | All in Process | [X] | Next Buy | [ ] | Artwork | | |
| [ ] | All in Service | [ ] | Next Production Run | [ ] | Assembly Dwg. | | |
| [ ] | All in Stock | [ ] | | [ ] | Board Artwork | | |
| Beginning Serial Number: | | | | [X] | BOM | | Noli |
| | | | | [ ] | Control Form | | |
| | | | | [ ] | Costing | | |
| | | | | [ ] | Fab Drawing | | |
| | | | | [ ] | Inspection Proc. | | |
| | | | | [X] | Part Master File | | Noli |
| | | | | [X] | Schematic | 8/16/04 | Noli |
| | | | | [ ] | Service Manual | | |
| | | | | [X] | Test Procedure | | |
| | | | | [ ] | | | |
| | | | | [ ] | | | |

**Reason For Change**

**Re-voicing of the Pre-Amp:**

Resistors R50, R58, and R60 were replaced with different value resistors, as listed below, to reduce brightness, and increase low end bass efficiency of the amplifier.

**Other Affected Assemblies**

302 and 303 Assemblies

[ ] Continued on ECO Supplement Page

**Description Of Change**

Update BOM.

Update Part Master File.

| Distribution | | Date | Initials |
|---|---|---|---|
| [ ] | Accounting | | |
| [ ] | Assembly | | |
| [ ] | Customer | | |
| [X] | Engineering | | |
| [X] | Incoming Q.C. | | |
| [ ] | Planning | | |
| [X] | Production Eng. | | |
| [X] | Purchasing | | |
| [ ] | Q.A. | | |
| [ ] | Receiving | | |
| [ ] | Service | | |
| [X] | Test | | |
| [ ] | Vendor | | |
| [ ] | | | |
| [ ] | | | |

[ ] Continued on ECO Supplement Page

[ ] Drawing(s) attached

| Part Number | Description | Parts Added | | Parts Deleted | |
|---|---|---|---|---|---|
| | | Qty | Ref. Designator | Qty | Ref. Designator |
| 060-4754-0 | 475K, 1/8W, MF | | | 1 | R50 |
| 060-5622-0 | 5.62K, 1/8W, MF | | | 1 | R58 |
| 060-5622-0 | 5.62K, 1/8W, MF | | | 1 | R60 |
| 060-1005-0 | 1M, 1/8W, MF | 1 | R50 | | |
| 060-1003-0 | 10K, 1/8W, MF | 1 | R58 | | |
| 060-7501-0 | 750 ohm,1/8W,MF | 1 | R60 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

ECO FORM REV-I

| ZONE | Dim. | ECO# | Rev. | REVISIONS | Date |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

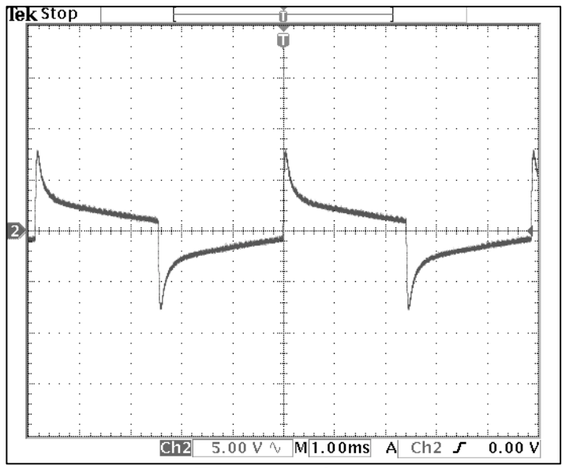



**Figure 1**
Tones center, Filters OFF

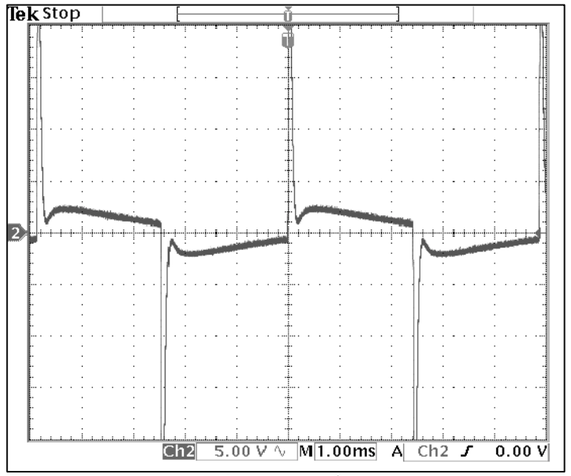



**Figure 2**
TREBLE to 10

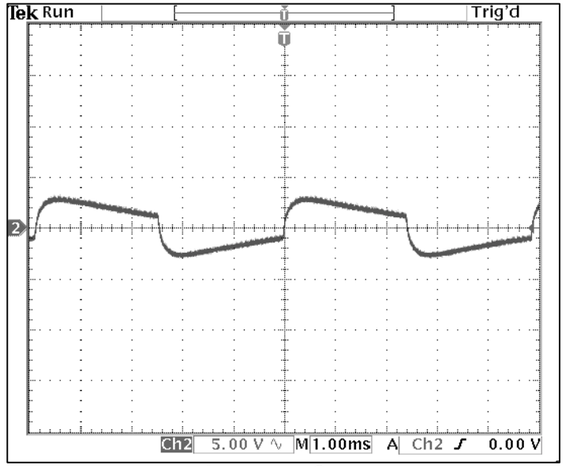



**Figure 3**
TREBLE to 0

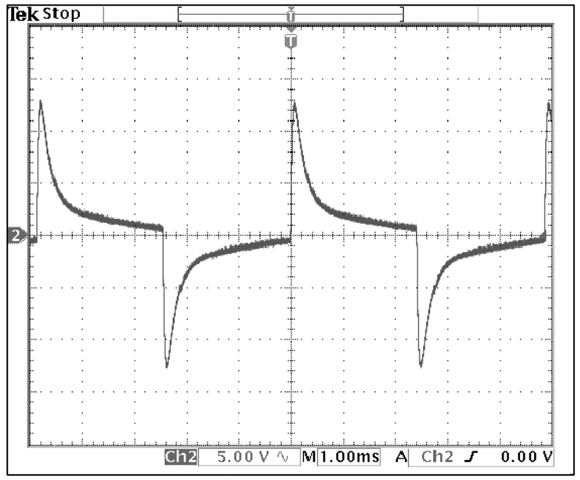



**Figure 4**
HI-MID to 10

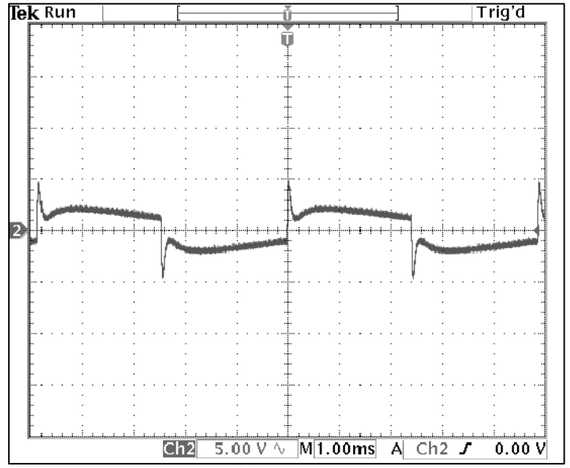



**Figure 5**
HI-MID to 0

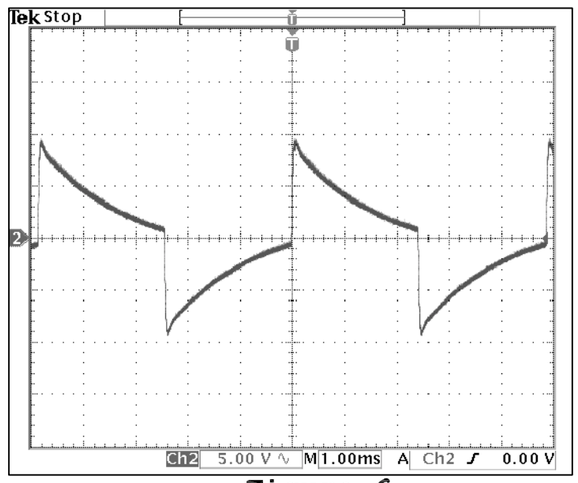



**Figure 6**
LO-MID to 10

**Set up:**

1. Apply signal into the input with 200Hz square wave @ -46dBV(5mVrms).
2. Set VOLUME, all ACTIVE EQ's, BOOST and MASTER to center(half way), CONTOUR and PRESENCE to 0.
3. Look at output with scope set on 1mS/div and 5V/div.

| QTY PER ASSY | PART NUMBER | DESCRIPTION | DESIGNATION(S) | ITEM NO. |
|---|---|---|---|---|
| | PARTS LIST | | | |



gallien technology
2234 INDUSTRIAL DRIVE
STOCKTON, CA 95206

UNLESS OTHERWISE INDICATED DIMENSIONS SHOWN ARE IN INCHES

TOLERANCES
FRACTION ±
ANGLES ±
.XX ± 0.01
.XXX ± 0.005

MATERIAL: (SEE NOTE 1)

FINISH: (SEE NOTE 1)

APPROVALS

| | INIT | DATE |
|---|---|---|
| MECH. DESIGN: | | |
| DRAWN BY: | ATM | 04/22/04 |
| ELEC: | | |
| PROJ. MGR.: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE:
# 400RB-IV
## PREAMP TEST WAVEFORMS

| SIZE | DRAWING NUMBER: | REVISION |
|---|---|---|
| B | PART NUMBER: 206-0241-A1 | A1 |

FILENAME:

SCALE: NOT TO SCALE | SHEET 1 OF 2

| ZONE | Dim. | ECO# | Rev. | REVISIONS | Date |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

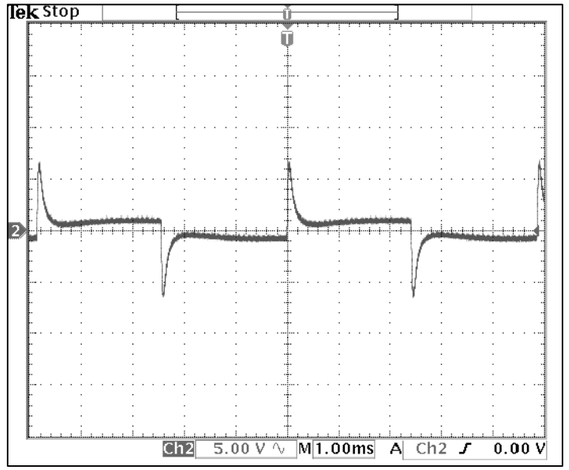



**Figure 7**
LO-MID to 0

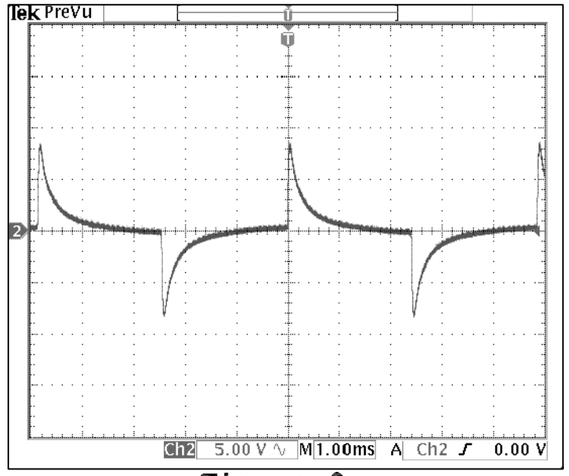



**Figure 9**
BASS to 0

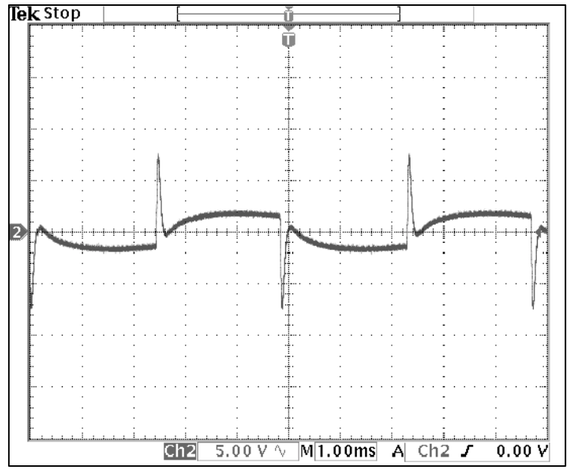



**Figure 11**
CONTOUR to 10

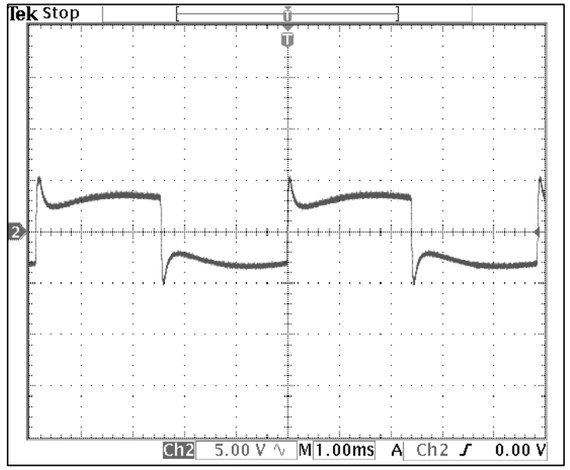



**Figure 8**
BASS to 10

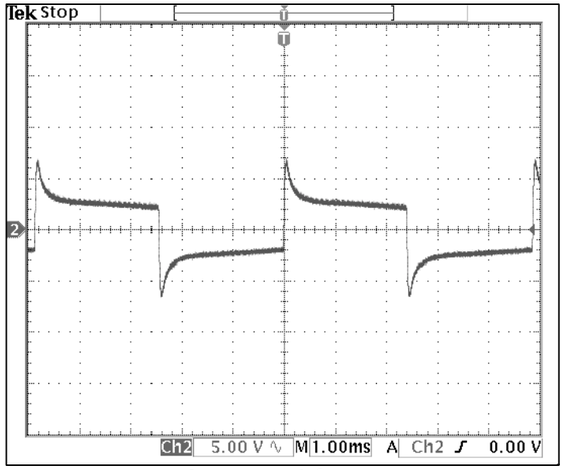



**Figure 10**
STRING BASS SWITCH IN

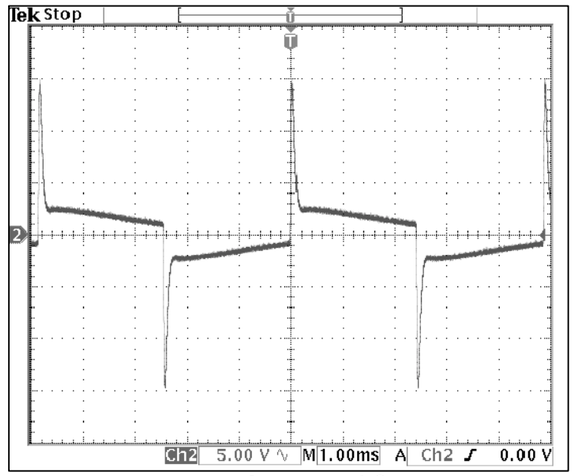



**Figure 12**
PRESENCE to 10

**Set up:**

1. Apply signal into the input with 200Hz square wave @ -46dBV(5mVrms).
2. Set VOLUME, all ACTIVE EQ's, BOOST and MASTER to center(half way), CONTOUR and PRESENCE to 0.
3. Look at output with scope set on 1mS/div and 5V/div.

| QTY PER ASSY | PART NUMBER | DESCRIPTION | DESIGNATION(S) | ITEM NO. |
|---|---|---|---|---|
| | PARTS LIST | | | |



UNLESS OTHERWISE INDICATED DIMENSIONS SHOWN ARE IN INCHES

TOLERANCES
FRACTION ±
ANGLES ±
.XX ± 0.01
.XXX ± 0.005

MATERIAL: (SEE NOTE 1)

FINISH: (SEE NOTE 1)

| APPROVALS | INIT | DATE |
|---|---|---|
| MECH. DESIGN: | | |
| DRAWN BY: | ATM | 04/22/04 |
| ELEC: | | |
| PROJ. MGR.: | | |
| Q/A: | | |
| RELEASED: | | |

gallien technology
2234 INDUSTRIAL DRIVE
STOCKTON, CA 95206

TITLE:
# 400RB-IV
## PREAMP TEST WAVEFORMS

| SIZE | DRAWING NUMBER: | REVISION |
|---|---|---|
| B | PART NUMBER: 206-0241-A1 | A1 |

FILENAME:

SCALE: NOT TO SCALE | SHEET 2 OF 2

| ZONE | Dim. | ECO# | Rev. | REVISIONS | Date |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

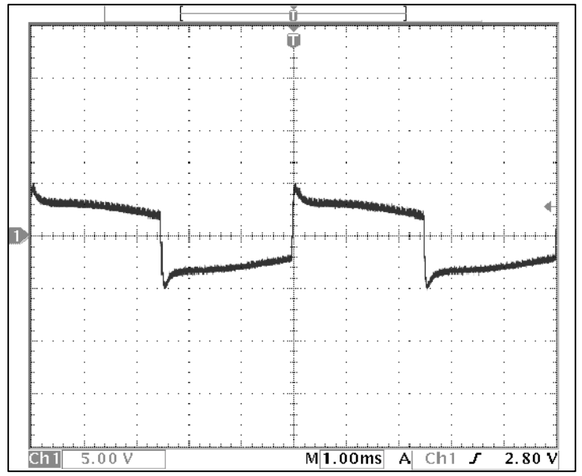



Figure 1
Tones center, Filters off

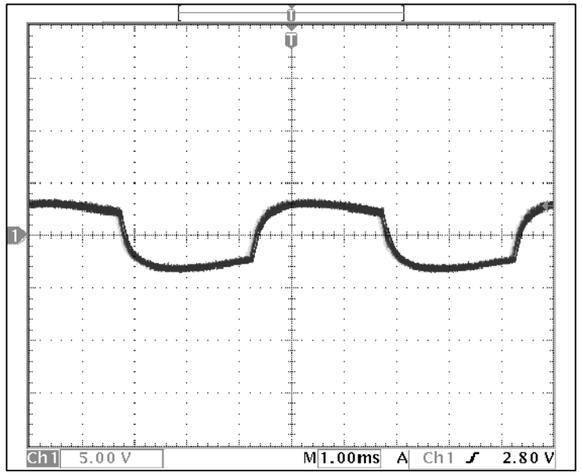



Figure 2
Treble to 0

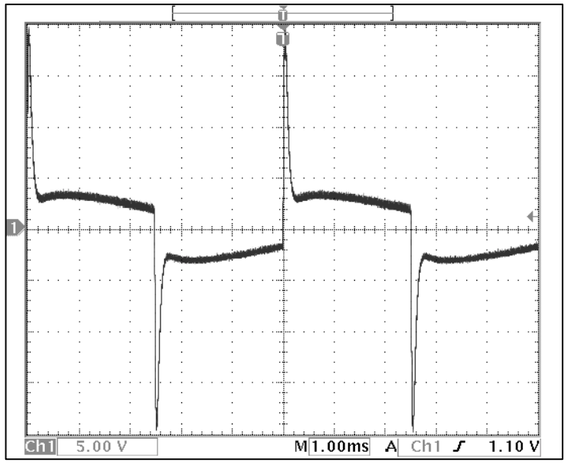



Figure 3
Treble to 10

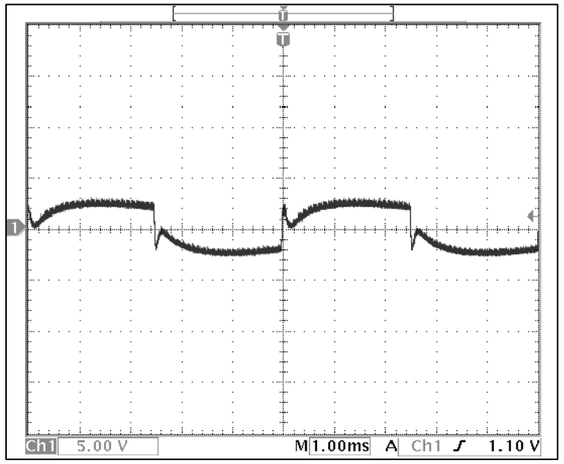



Figure 4
Hi-Mid to 0

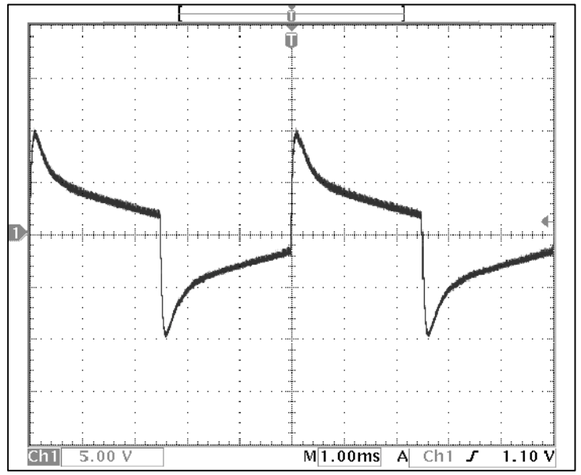



Figure 5
Hi-Mid to 10

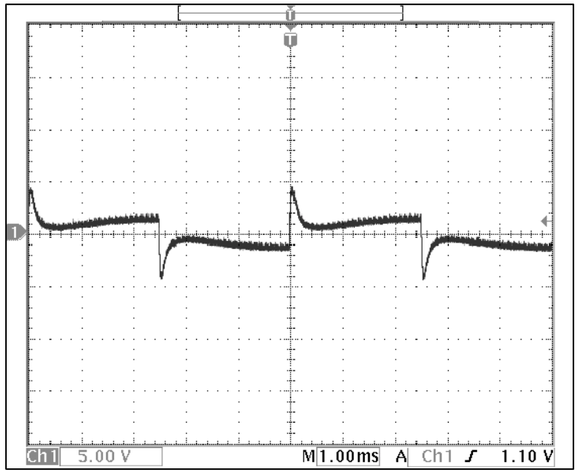



Figure 6
Lo-Mid to 0

1. Apply signal into the input with 200Hz square wave @ -46dBV(5mVrms).
2. Set Volume, all Active EQ's, Boost and Master to center(halfway), Contour and Presence to 0.
3. Look at output with scope set on 5V/div and 1ms/div.

| HOLE REFERENCE CHART | | |
|---|---|---|
| HOLE | DESCRIPTION | QTY. |
| | | |
| | | |
| | | |
| | | |

| QTY PER ASSY | PART NUMBER | DESCRIPTION | DESIGNATION(S) | ITEM NO. |
|---|---|---|---|---|
| | | PROPRIETARY PARTS LIST | | |



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2234 INDUSTRIAL DRIVE
STOCKTON, CA 95206

UNLESS OTHERWISE INDICATED DIMENSIONS SHOWN ARE IN INCHES

TOLERANCES
FRACTION ±
ANGLES ±
.XX ± 0.01
.XXX ± 0.005

MATERIAL: (SEE NOTE 1)

FINISH: (SEE NOTE 1)

| APPROVALS | INIT | DATE |
|---|---|---|
| MECH. DESIGN: | | |
| DRAWN BY: | EAH | 8/19/04 |
| ELEC: | | |
| PROJ. MGR.: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB-IV

SIZE B | DRAWING NUMBER: | REVISION A2

PART NUMBER: 206-0241-A2

FILENAME:

SCALE: NOT TO SCALE | SHEET 1 OF 2

| ZONE | Dim. | ECO# | Rev. | REVISIONS | Date |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

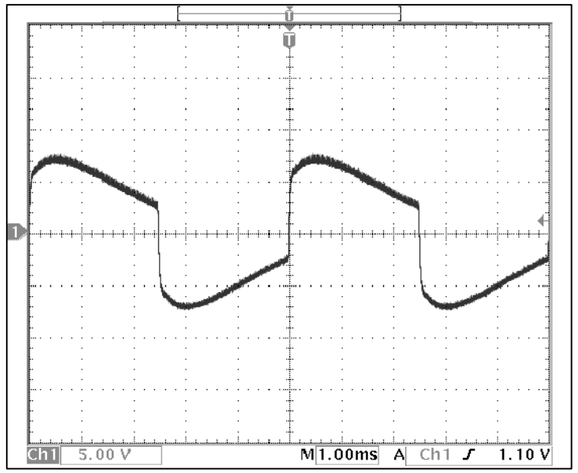



Figure 7
Lo-Mid to 10

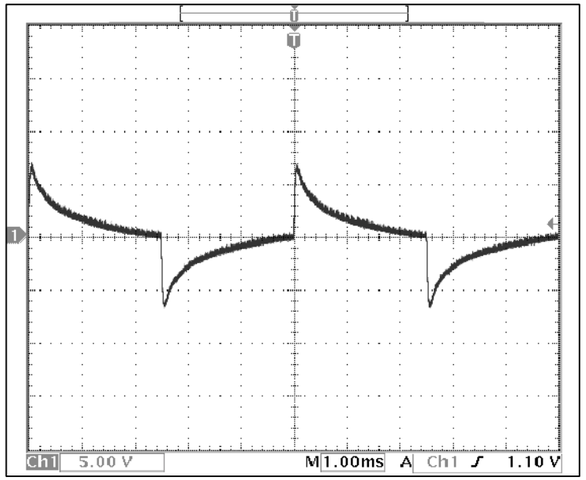



Figure 8
Bass to 0

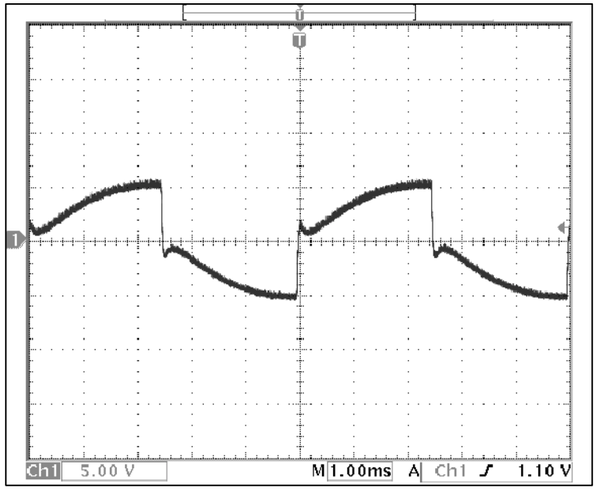



Figure 9
Bass to 10

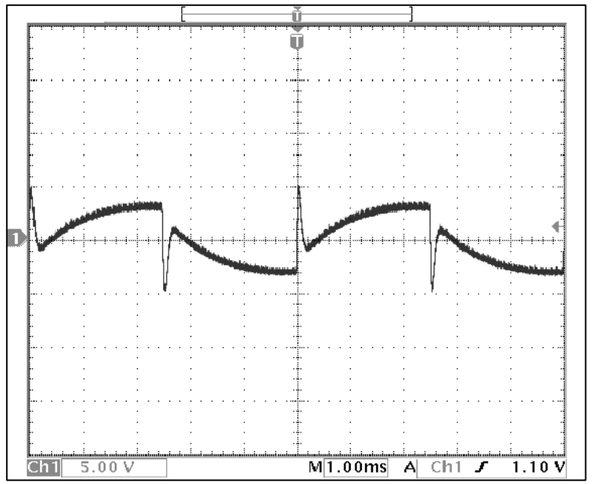



Figure 10
Contour to 10

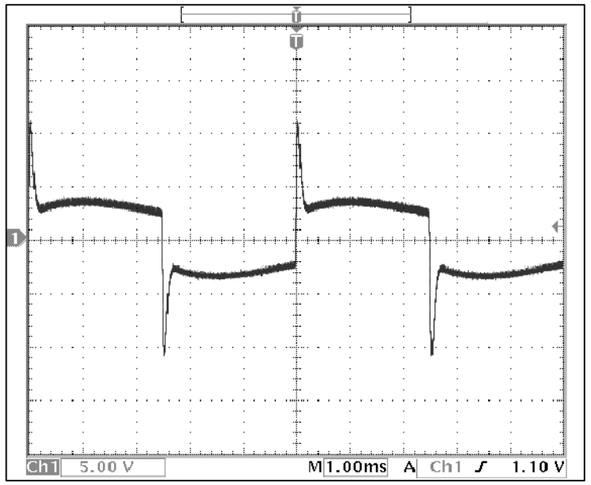



Figure 11
Presence to 10

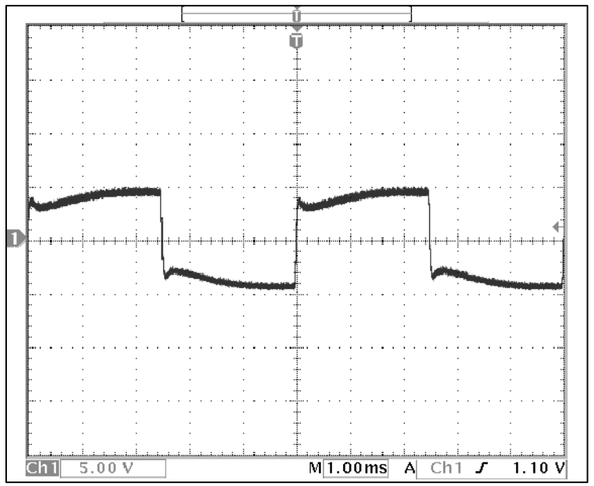



Figure 12
String Bass Switch In

1. Apply signal into the input with 200Hz square wave @ -46dBV(5mVrms).
2. Set Volume, all Active EQ's, Boost and Master to center(halfway), Contour and Presence to 0.
3. Look at output with scope set on 5V/div and 1ms/div.

| HOLE REFERENCE CHART | | |
|---|---|---|
| HOLE | DESCRIPTION | QTY. |
| | | |
| | | |
| | | |
| | | |

PART NUMBER

| QTY PER ASSY | DESCRIPTION | DESIGNATION(S) | ITEM NO. |
|---|---|---|---|
| PROPRIETARY | PARTS LIST | | |



gallien technology
2234 Industrial Drive
Stockton, CA 95206

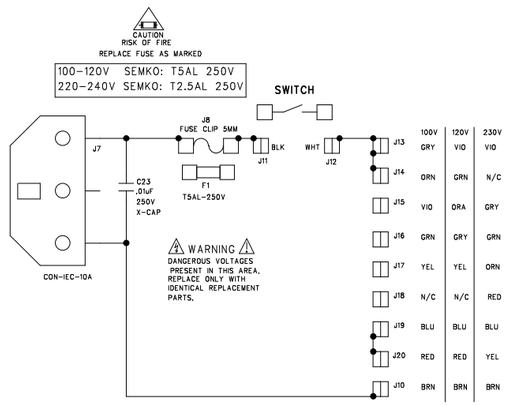
UNLESS OTHERWISE INDICATED DIMENSIONS SHOWN ARE IN INCHES
TOLERANCES
FRACTION ±
ANGLES ±
.XX ± 0.01
.XXX ± 0.005
MATERIAL: (SEE NOTE 1)
FINISH: (SEE NOTE 1)

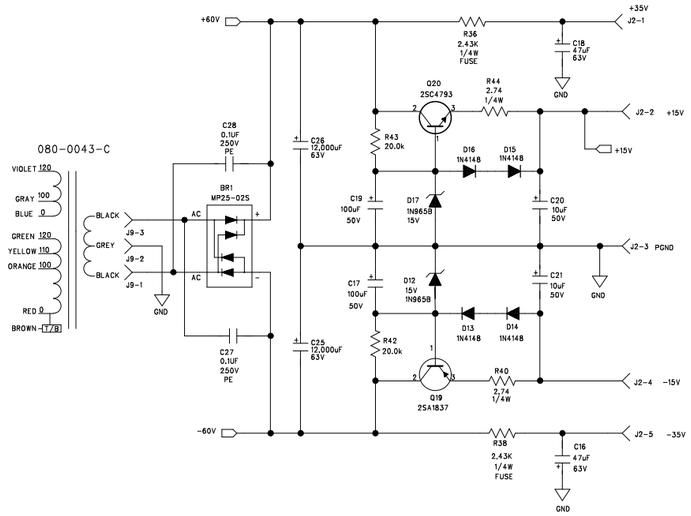
| APPROVALS | INIT | DATE |
|---|---|---|
| MECH. DESIGN: | | |
| DRAWN BY: | EAH | 8/19/04 |
| ELEC: | | |
| PROJ. MGR.: | | |
| Q/A: | | |
| RELEASED: | | |

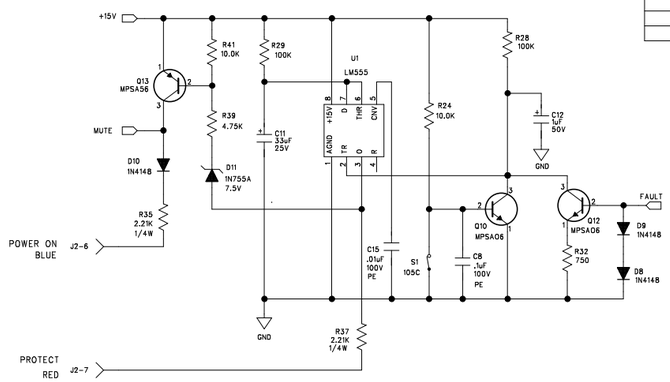
TITLE: 400RB-IV
SIZE: B
DRAWING NUMBER:
PART NUMBER: 206-0241-A2
REVISION: A2
FILENAME:
SCALE: NOT TO SCALE
SHEET 2 OF 2

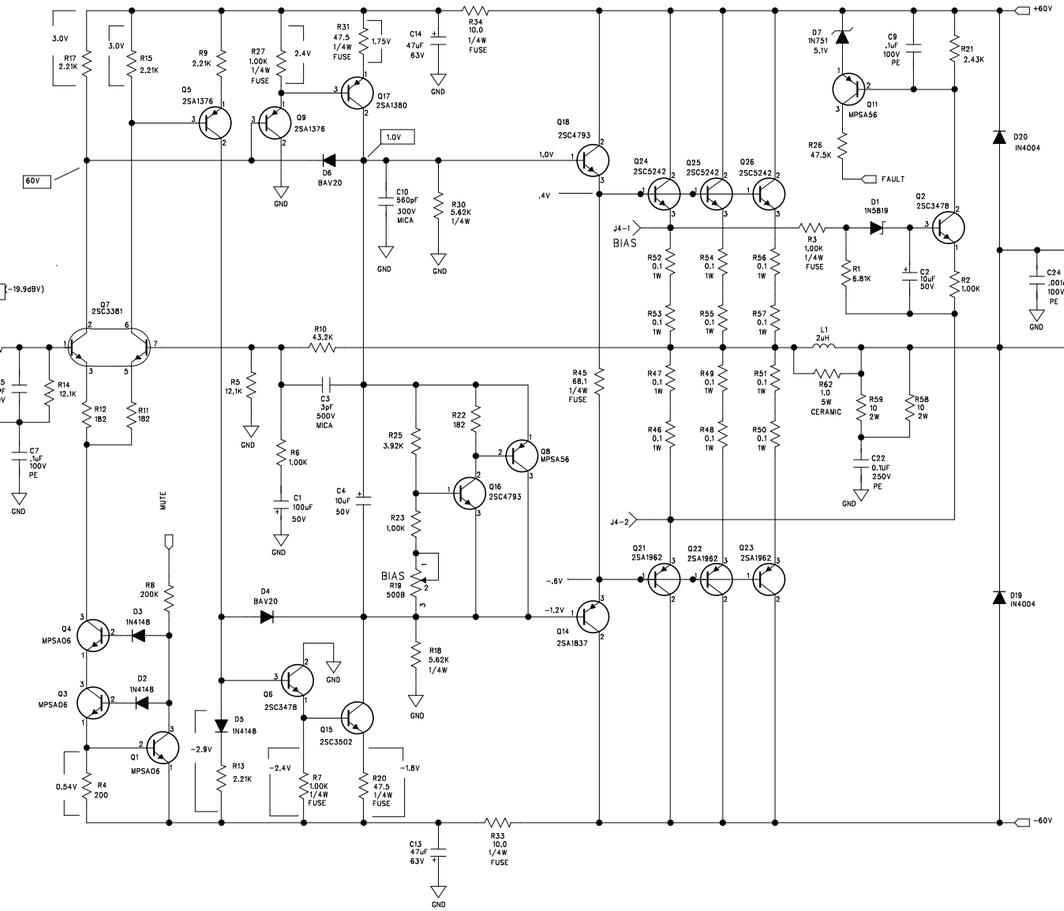
6240A.sch-1 - Wed Nov 27 16:07:06 2002

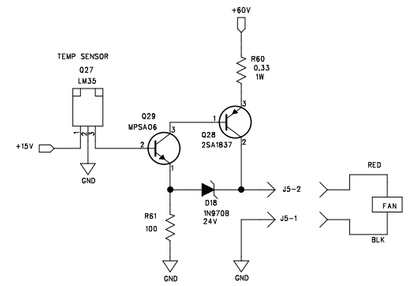
| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |




NOTES: UNLESS OTHERWISE SPECIFIED,

1. TEST CONDITIONS: 100mV 1kHz SINE, DIRECT INPUT (PRE–AMP BYPASSED) NO LOAD
2. [ ] DENOTES RMS AC VOLTAGE

BIAS ADJUSTMENT PROCEDURE:
WITH POWER OFF, ADJUST POT R21 TO FULL COUNTER–CLOCKWISE POSITION.
TURN ON POWER AND WAIT 5 SECONDS FOR TURN ON DELAY.
TURN R21 CLOCKWISE UNTIL VOLTAGE ACCROSS P3 READS 10 mVDC.

MH.200V X6 MH.200V X5 MH.125/220 X7
MH.200V X4 MH.200V X3 MH.125/220 MH.125/220 X2 X1

NOT VALID UNLESS STAMP IS RED

gallien technology
2240 PARAGON DRIVE
SAN JOSE CA. 95131
VOICE: 408–441–8081
FAX: 408–441–8085

NOTES THIS REV:
1. TRANSFERED FROM 206–0121–E1, NEW SYSTEM
2. ADD 5.1V ZEN TO Q1–E.
3. REMOVE R1 FROM REV 0121–E1.

| APPROVALS | | |
|---|---|---|
| | INIT | DATE |
| DESIGNED: | R.A.G. | 11/9/99 |
| DRAWN: | R.A.G. | 11/26/02 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB–IV POWER AMP
SIZE: B
DRAWING NO: 406–0240–A
REV: A
PART NO: 206–0240–A
COMPANY: GALLIEN KRUEGER
FILENAME: 6240A.sch

GK GALLIEN-KRUEGER

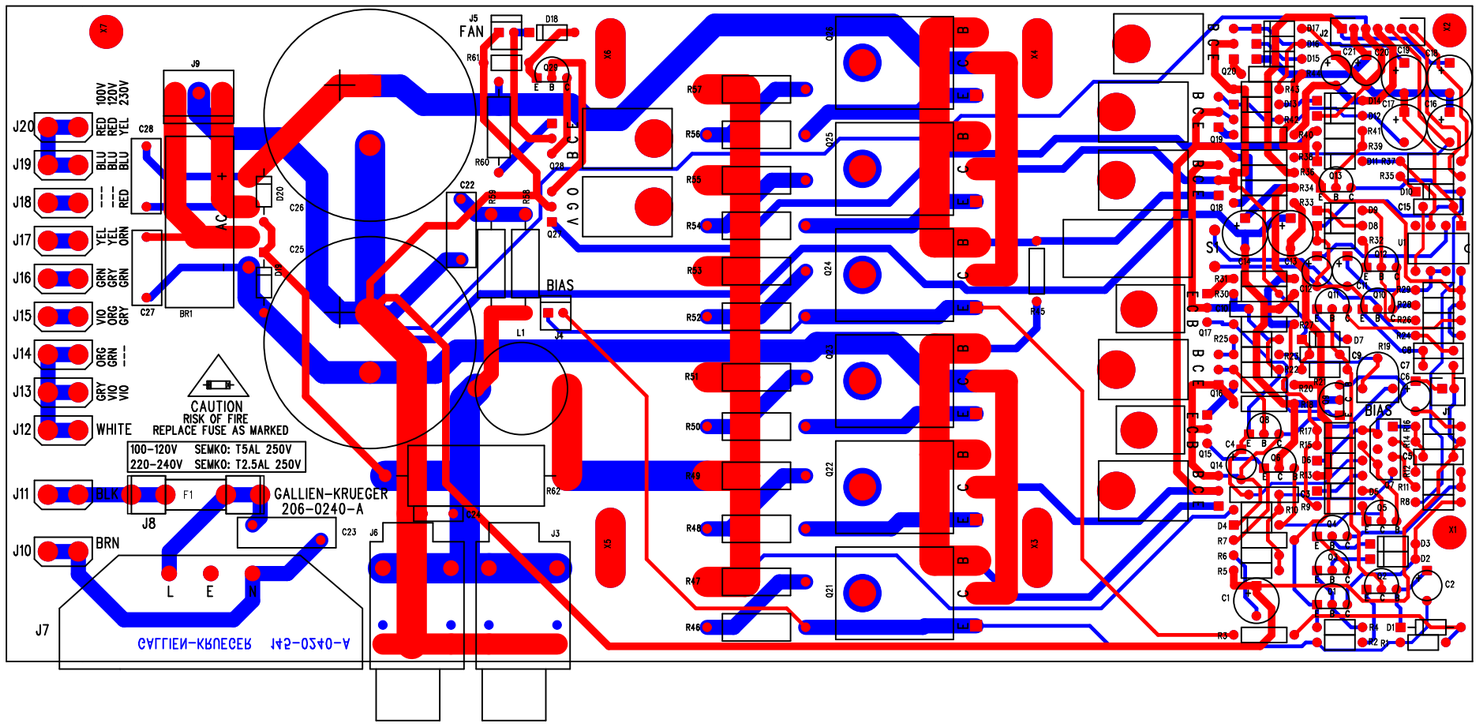
**400RB-IV Power Amp**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. |
|---|---|---|---|---|
| 001-2060-0 | U1 | LM555, TIMER | NATIONAL | LM555CN |
| 010-0000-0 | Q7 | 2SC3381BL,NPNX2,80V,100MA,2-10M1B | TOSHIBA | 2SC3281BL |
| 010-0001-0 | Q2 Q6 | 2SC3478, NPN,180V,100MA,TO-92 | NEC | 2SC3478-K |
| 010-0003-0 | Q15 | 2SC3502-F,NPN,200V,100MA,TO-126 | TOSHIBA | 2SC3502 |
| 010-0012-0 | Q1 Q3-4 Q10 Q12 Q29 | MPSAO6, NPN,80V,500MA,TO-92 | MOTOROLA | MPS-A06 |
| 010-0035-0 | Q27 | LM35DT, TEMPERATURE SENSOR, TO-220 | NATIONAL | LM35DT |
| 010-1002-0 | Q5 Q9 | 2SA1376, PNP,180V,100MA,TO-92 | NEC | 2SA1376-K |
| 010-1003-0 | Q17 | 2SA1380-F,PNP,200V,100MA,TO-126 | SANYO/TOSHIBA | 2SA1380-F/E |
| 010-1013-0 | Q8 Q11 Q13 | MPSA56 PNP 80V 500MA TO-92 | MOTOROLA | MPS-A56 |
| 012-0002-0 | Q16 Q18 Q20 | 2SC4793,NPN,200V,1.5A,2-10R1A | TOSHIBA | 2SC4793 |
| 012-0003-0 | Q24-26 | 2SC5242,NPN,230V,15A,2-16C1A | TOSHIBA | 2SC5242-O |
| 012-1002-0 | Q14 Q19 Q28 | 2SA1837,PNP,200V,1.5A,2-10R1A | TOSHIBA | 2SA1837 |
| 012-1003-0 | Q21-23 | 2SA1962,PNP,230V,15A,2-16C1A | TOSHIBA | 2SA1962 |
| 020-0004-0 | D11 | 1N755A, ZENER,7.5V,500MW ,D035 | TAITRON | 1N755A |
| 020-0050-0 | D7 | 1N751, ZENER,5.1V,10%,400MW,DO-35 | NATIONAL | 1N751 |
| 020-0150-0 | D12 D17 | 1N965B, ZENER, 15V, 5%, 500mW, DO-35 | TAITRON | 1N965B |
| 020-0240-0 | D18 | 1N970B, ZENER, 24V, 5%, 500MW, DO-35 | TAITRON | 1N970B |
| 020-1000-0 | D2-3 D5 D8-10 D13-16 | 1N4148, RECT-FAST, 200MA, 100V | MOTOROLA | 1N4148 |
| 020-1022-0 | D4 D6 | BAV20, RECT, 200V, DO-35 | NATIONAL | BAV20 |
| 020-1104-0 | D1 | SHOTTKY, 1A, 40V, 10NS, DO-41 | MOTOROLA | 1N5819 |
| 020-2106-0 | D19-20 | 1N4004,RECT,1A,400V,DO-41 | TAITRON | 1N4004 |
| 023-0112-0 | BR1 | BRIDGE, 25A, 200V, VERT, PC, MO25S-02 | CHENG-YI | MP25-02S |
| 031-1336-0 | C11 | CAP,ELEC,RAD,336,20%,25V | UNITED CHEMI-CON | SRG25VB33RM5X7LL |
| 031-2105-0 | C12 | CAP,ELEC,RAD, 105, 20%, 50V | UNITED CHEMI-CON | C440C105M5U5CA |
| 031-2106-0 | C2 C4 C6 C20-21 | CAP,ELEC,RAD, 106, 20%, 50V | UNITED CHEMI-CON | SMG50VB10RM5X11LL |
| 031-2107-0 | C1 C17 C19 | CAP,ELEC,RAD,107, 20%, 50V | UNITED CHEMI-CON | SMG50VB101M8X11LL |
| 031-3129-0 | C25-26 | CAP, ELEC, RAD, 129, 20%, 63V | UNITED CHEMI-CON | SMH63VN123M35X45T2 |
| 031-3476-0 | C13-14 C16 C18 | CAP,ELEC,RAD,476,20%,63V | UNITED CHEMI-CON | SMG63VB47RM6X11LL |
| 032-4102-0 | C24 | CAP,PE,102,5%,100V, | PANASONIC | ECQB1102JF |
| 032-4103-0 | C15 | CAP,PE,103,5%,100V, | PANASONIC | ECQV1103JM |
| 032-4104-0 | C7-9 | CAP,PE,104,5%,100V, | PANASONIC | ECQV1104JM |
| 032-7104-0 | C22 C27-28 | CAP,PE,104,10%, 250V | ILLINOIS CAPACITOR | 104MSR250K |
| 034-4471-0 | C5 | CAP,MCR,470pF,5%,100V, | TAITRON | TMRS471J100NPOB |
| 034-7103-0 | C23 | CAP, CERMIC DISK, 103, 10%, X-250V | PANASONIC | ECK-DRS103ZV |
| 035-8030-0 | C3 | CAP MICA AXIAL , 3pF, 10%, 500V | CORNELL | CD10CD030D03 |
| 035-8561-0 | C10 | CAP MICA RADIAL, 561, 5%, 300V | CORNELL | CD15FC561J103 |
| 052-2.74-0 | R40 R44 | RES,METAL FILM, 2.74, 1/4W, 1% | ECI | M2F1AJ002.74 |
| 052-2212-0 | R35 R37 | RES,METAL FILM,2.21k,1/4W,1% | ECI | M2F1AK002.21 |
| 052-5622-0 | R18 R30 | RES,METAL FILM,5.62K,1/4W,1% | ECI | M5F1AK005.62 |
| 054-.100-0 | R46-57 | RES, METAL OXIDE, 0.1 Ohm, 1W, 5% | ECI | MO10J3AJ000.10 |
| 054-.330-0 | R60 | RES, METAL OXIDE, 0.33 OHM, 1W, 5% | ECI | MO10J3AJ000.33 |
| 055-0101-0 | R58-59 | RES, METAL OXIDE, 10 OHM, 2W, 5% | ECI | MOM20J3AJ010.00 |
| 056-0100-0 | R62 | RES, CERAMIC WW, 1.0 OHM, 5W, 10% | ECI | WWC50J3AJ001.00 |
| 059-1000-0 | R33-34 | RES,MF,FUSE,10.0 OHM, 1/4W,1% | JUKN.OHM | FR25-10.0 |
| 059-1002-0 | R3 R7 R27 | RES,MF,FUSE,1.00K,1/4W,1% | JUKN.OHM | FR25-1.00K |
| 059-2432-0 | R36 R38 | RES,MF,FUSE,2.43K, 1/4W,1% | JUKN.OHM | FR25-2.43K |
| 059-4750-0 | R20 R31 | RES,MF,FUSE,47.5 OHM, 1/4W,1% | JUKN.OHM | FR25-47.5 |
| 059-6810-0 | R45 | RES,MF,FUSE,68.1 OHM, 1/4W,1% | JUKN.OHM | FR25-68.1 |
| 060-1001-0 | R61 | RES, METAL FILM, 100 OHM, 1/8W, 1% | ECI | M1F1AJ100.00 |
| 060-1002-0 | R2 R6 R16 R23 | RES,METAL FILM, 1.00K, 1/8W, 1% | ECI | M1F1AK001.00 |
| 060-1003-0 | R24 R41 | RES,METAL FILM, 10.0K, 1/8W,1% | ECI | M1F1AK010.00 |
| 060-1004-0 | R28-29 | RES,METAL FILM, 100K, 1/8W, 1% | ECI | M1F1AK100.00 |
| 060-1213-0 | R5 R14 | RES,METAL FILM, 12.1K OHM, 1/8W, 1% | ECI | M1F1AK012.10 |
| 060-1821-0 | R11-12 R22 | RES,METAL FILM, 182, 1/8W, 1% | ECI | M1F1AJ182.00 |
| 060-2001-0 | R4 | RES,METAL FILM, 200, 1/8W, 1% | ECI | M1F1AJ200.00 |
| 060-2003-0 | R42-43 | RES,METAL FILM, 20.0K, 1/8W, 1% | ECI | M1F1AK020.00 |
| 060-2004-0 | R8 | RES,METAL FILM, 200K, 1/8W, 1% | ECI | M1F1AK200.00 |
| 060-2212-0 | R9 R13 R15 R17 | RES,METAL FILM, 2.21K, 1/8W, 1% | ECI | M1F1AK002.21 |
| 060-2432-0 | R21 | RES,METAL FILM, 2.43K, 1/8W, 1% | ECI | M1F1AK002.43 |
| 060-3922-0 | R25 | RES,METAL FILM, 3.92K, 1/8W, 1% | ECI | M1F1AK003.92 |
| 060-4323-0 | R10 | RES,METAL FILM, 43.2K, 1/8W, 1% | ECI | M1F1AK043.20 |
| 060-4752-0 | R39 | RES,METAL FILM, 4.75K, 1/8W, 1% | ECI | M1F1AK004.75 |
| 060-4753-0 | R26 | RES,METAL FILM, 47.5K, 1/8W, 1% | ECI | M1F1AK047.50 |
| 060-6812-0 | R1 | RES,METAL FILM, 6.81K, 1/8W, 1% | ECI | M1F1AK006.81 |
| 060-7501-0 | R32 | RES,METAL FILM, 750 OHM, 1/8W, 1% | ECI | M1F1AJ750.00 |
| | | | | |
| | | | | |
| | | | | |

GK GALLIEN-KRUEGER

**400RB-IV Power Amp**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. |
|---|---|---|---|---|
| 070-0520-0 | R19 | POT,500B TRIM, 200mW | SONG HUEI | SH-655MCL-500B |
| 081-0055-0 | L1 | INDUCTOR,2UH,20A,AIR CORE | SCHONBERG | 081-0055-0 |
| 091-0019-0 | F1 | FUSE,5mm,T5AL,250V,SEMKO | LITTLE FUSE | 218-005 |
| 091-1002-0 | S1 | THRM BRKR, 105C +/-5,0-DIFF, PC | KLIXON | 7AM-028-A5 |
| 092-0001-0 | J7 | CON, IECX3, 10A, 250V, PC TERM | DIHTAIN | DTS-0045 |
| 092-0066-0 | J10-20 | FASTON, M, PC, .250" | KEYSTONE | 1021 |
| 092-0082-0 | J3 J6 | JACK,1/4",MONO,PC, GROUNDING | NEUTRIK | S102-84G |
| 093-0025-0 | J4-5 | HDR,.1X2,VERT,MALE,LOCK,GOLD | AMP | 641126-2 |
| 093-0051-0 | J1 | HDR, 2MMX2, VERT, LOCK | JST | B2B-PH-K-S |
| 093-0080-0 | J9 | HDR,.156X3,VERT,MALE,LOCKING | MOLEX | 26-60-4030 |
| 093-2005-0 | J2 | HDR, 2MMX7, VERT, SHROUDED | JST | B7B-PH-K-S |
| 094-0004-0 | J8 | FUSE CLIP, 5MM, 15A, P.C. | MOUSER | 44FH052 |
| | | | | |
| | | | | |
| 086-0000-0 | | FAN, 24VDC, 160MA, 80X80MM | ADDA | 08-24-HB-A70GL |
| 093-0506-0 | | HSG, .1X2, LOCKING, CRIMP 093-0909 | MOLEX | 22-01-3027 |
| 093-0909-0 | | TERM, CRIMP, .1, 22GA | MOLEX | 08-50-0113 |
| 095-0006-0 | | HEAT SHRINK 3/16" | | |
| 104-0003-0 | INDUCTOR | SPACER,NYLON,#4X.2X.2D | | |
| 105-0014-0 | | INSULATOR TAPE 4"X7MIL | THERMALOY | SILPAD 400AC |
| 117-0097-0 | TO-220 | BOLT, M3X9, M1,PHP/SW/PW, CH | | |
| 117-0127-0 | POWER TRAN | BOLT, M12X9, M1,PHP/SW/PW, CH | | |
| 117-0357-0 | FAN | BOLT, M35X9, M1,PHP/SW/PW, CH | | |
| 117-7002-1 | FAN | WASHER,M3,PLAIN, CHROME | | |
| 132-0024-E | HEATSINK | 700RB HEATSINK | | |
| 145-0240-A | | 400RB-IV POWER AMP RAW BOARD | | |
| 153-0105-0 | | LABLE, BLANK,.9"X.25" | | |
| 202-6000-A | CHASSIS GND | WIRE ASSY,14GA,GRN/YEL,4",GND | | |




# PCB WORK INSTRUCTIONS
# DWG 420-0240-A

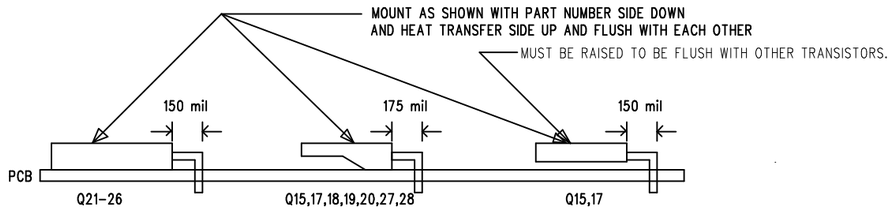
## NOTES:

UNLESS OTHERWISE SPECIFIED:

1. SQUARE PADS ON PARTS DENOTE PIN 1.
2. ALL BOARDS REQUIRE A COMPLETE VISUAL INSPECTION.
3. ALL BOARDS MUST BE BARE BOARD TESTED.
4. ASSEMBLE AND SOLDER PER ANSI/IPC-A-610B.

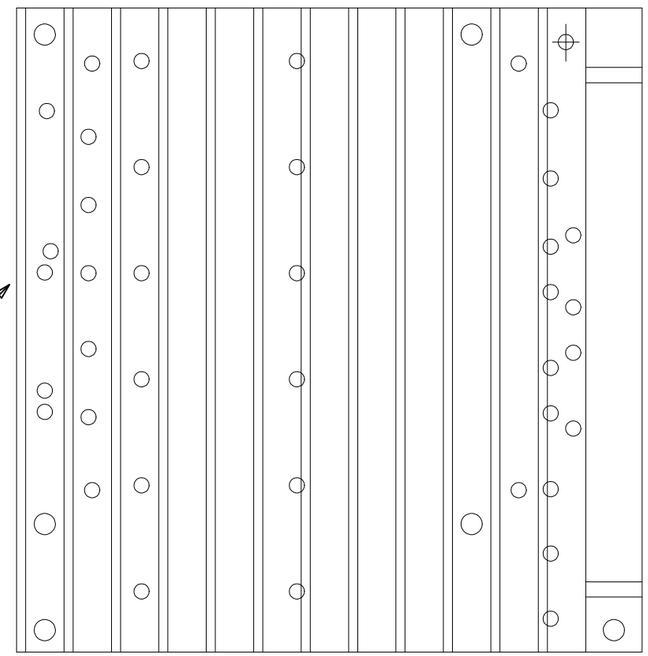
LOADING

5. SEE FORMING AND LOADING INSTRUCTIONS BELOW FOR INSTALLING SPECIFIED COMPONENTS.
6. CHECK THAT R45-56 ARE FULSH WITH PCB.
7. CHECK THAT J3, 6, 7, & S1 ARE FLUSH WITH PCB.
8. MAKE CERTAIN ALL POWER TRANSISTOR MOUNTING HOLES ARE PROPERLY ALIGNED FOR HEAT SINK.




PLACE SMALL DROP OF WHITE SILICON GREASE TO ALL TRANSISTOR MOUNTING SURFACES BEFORE MOUNTING HEATSINK.

APPLY THERMAL TAPE (105-0014-0)
AND ALIGN WITH THIS EDGE.



NOT VALID UNLESS STAMP IS RED

gallien technology

2240 PARAGON DRIVE
SAN JOSE CA. 95131
VOICE: 408-441-8081
FAX: 408-441-8085

| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 6/25/02 |
| DRAWN: | R.A.G. | 11/26/02 |
| ELEC: | | |
| MECH: | | |

TITLE: 400RB-IV POWER AMP

SIZE: B | DRAWING NO: 405-0240-A | REV: A

PART NO: 145-0240-A

COMPANY: GALLIEN-KRUEGER

FILENAME: 5240A.PCB

LAYER DESCRIPTION:
TOP SIDE SOLDERMASK
TOP SIDE SILKSCREEN

GERBER FILE NAME:
5240A.pho

# gallien technology

Engineering Change Order

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer Name: | Gallien-Krueger | Current Rev #: | A | New ECO Rev #: | | A1 |
| Model: | 400RB-IV | Distribute To: | | Page: | 1 | Of: 1 |
| Assembly Description: | Power Amp | Originator: | RAG | | | |
| Assembly Numbers: | 206-0240-A | Approved by: | | | | |
| | | Effective Date: | 5/30/2003 | | | |

| Effective | | | | Document Update | | Date | Initials |
|---|---|---|---|---|---|---|---|
| ☐ | All in Process | ☒ | Next Buy | ☐ | Artwork | | |
| ☐ | All in Service | ☐ | Next Production Run | ☐ | Assembly Dwg. | | |
| ☐ | All in Stock | ☐ | | ☒ | Board Artwork | | |
| Beginning Serial Number: | | | | ☒ | BOM | | |
| | | | | ☐ | Control Form | | |
| | | | | ☐ | Costing | | |
| | | | | ☐ | Fab Drawing | | |
| | | | | ☐ | Inspection Proc. | | |
| | | | | ☒ | Part Master File | | |
| | | | | ☒ | Schematic | | |
| | | | | ☒ | Service Manual | | |
| | | | | ☐ | Test Procedure | | |
| | | | | ☐ | | | |

**Reason For Change**

Update to incorporate CSA requirements.

**Other Affected Assemblies**

290 Assemblies , 302 Assembly (Head)

303 Assemblies (Combo)

☐ Continued on ECO Supplement Page

| Description Of Change | | | Distribution | | Date | Initials |
|---|---|---|---|---|---|---|
| See changes listed below. | | | ☐ | Accounting | | |
| Update board rev to A1. | | | ☐ | Assembly | | |
| | | | ☒ | Engineering | | |
| | | | ☒ | Incoming Q.C. | | |
| | | | ☒ | Production Eng. | | |
| | | | ☒ | Purchasing | | |
| | | | ☐ | Q.A. | | |
| | | | ☐ | Service | | |
| | | | ☒ | Test | | |
| ☐ | Continued on Supplement Page | ☐ | Drawing(s) attached | ☐ | | | |

| Part Number | Description | Parts Added | | Parts Deleted | |
|---|---|---|---|---|---|
| | | Qty | Ref. Designator | Qty | Ref. Designator |
| 031-4475-0 | 4.7uF/100V | 1 | C4 | | |
| 091-0013-0 | Fuse,T6.3AL | 1 | F1 | | |
| 031-2106-0 | 10uF/50V | | | 1 | C4 |
| 091-0019-0 | Fuse,T5AL | | | 1 | F1 |

| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
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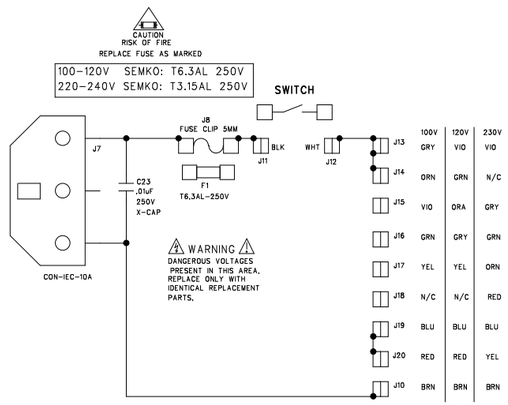
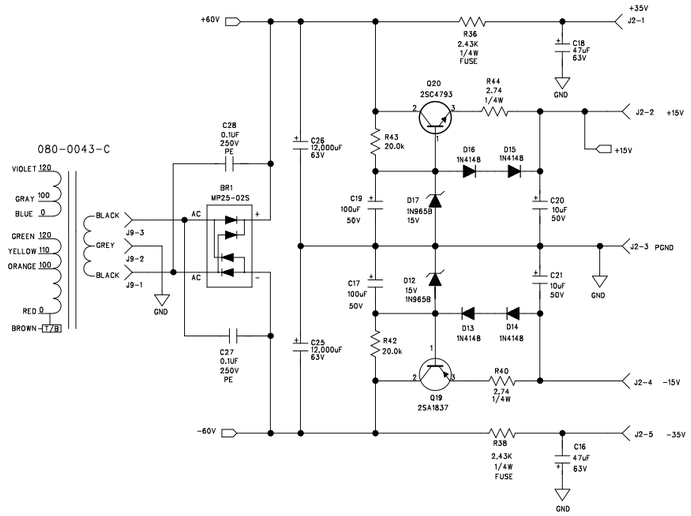
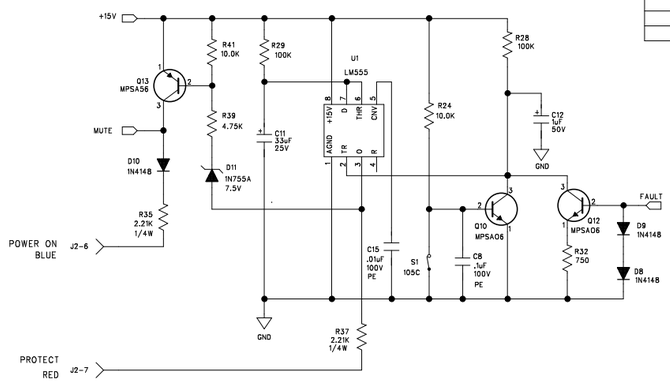
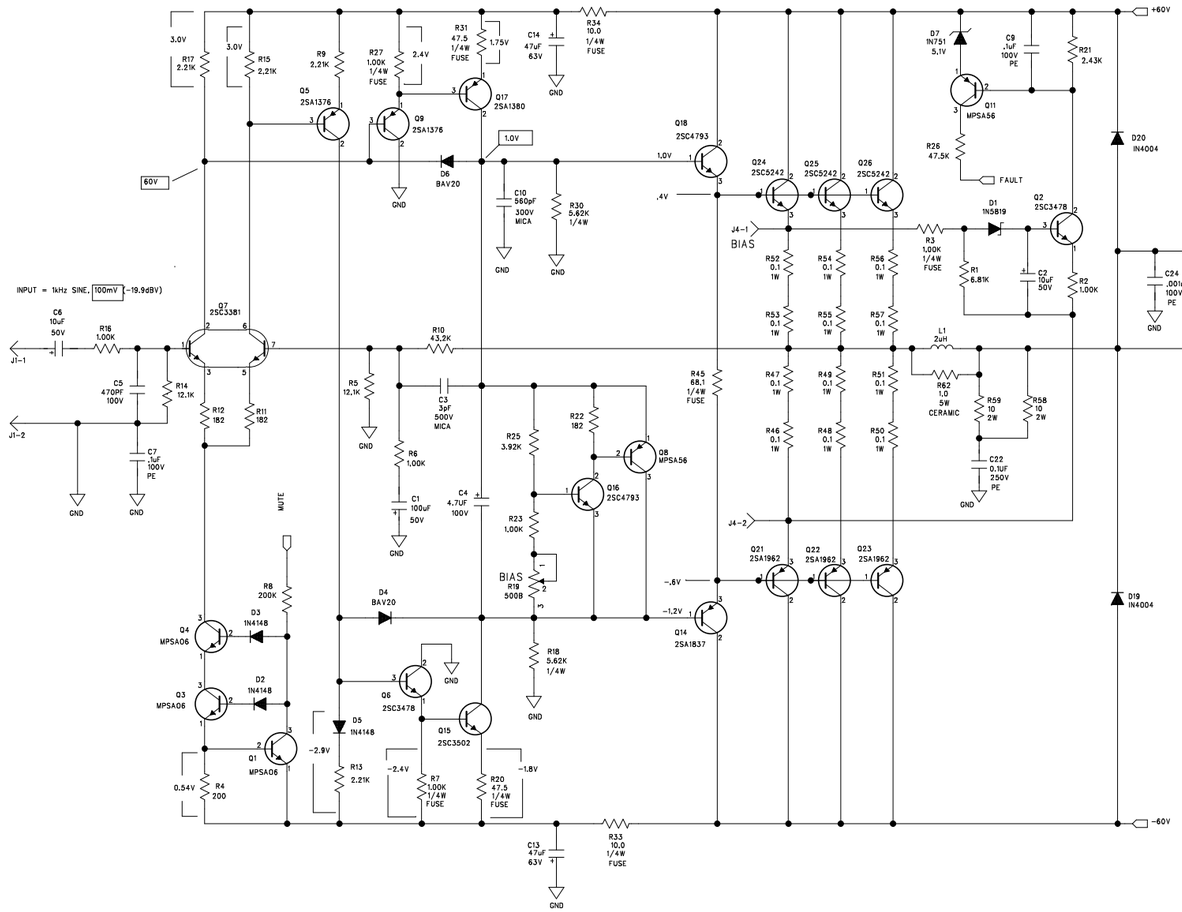
| | | | |







NOTES: UNLESS OTHERWISE SPECIFIED,

1. TEST CONDITIONS: 100mV 1kHz SINE, DIRECT INPUT (PRE-AMP BYPASSED) NO LOAD
2. [ ] DENOTES RMS AC VOLTAGE

BIAS ADJUSTMENT PROCEDURE:
WITH POWER OFF, ADJUST POT R21 TO FULL COUNTER-CLOCKWISE POSITION.
TURN ON POWER AND WAIT 5 SECONDS FOR TURN ON DELAY.
TURN R21 CLOCKWISE UNTIL VOLTAGE ACCROSS P3 READS 10 mVDC.

MH.200V X6 MH.200V X5 MH.125/220 X7
MH.200V X4 MH.200V X3 MH.125/220 MH.125/220 X2 X1

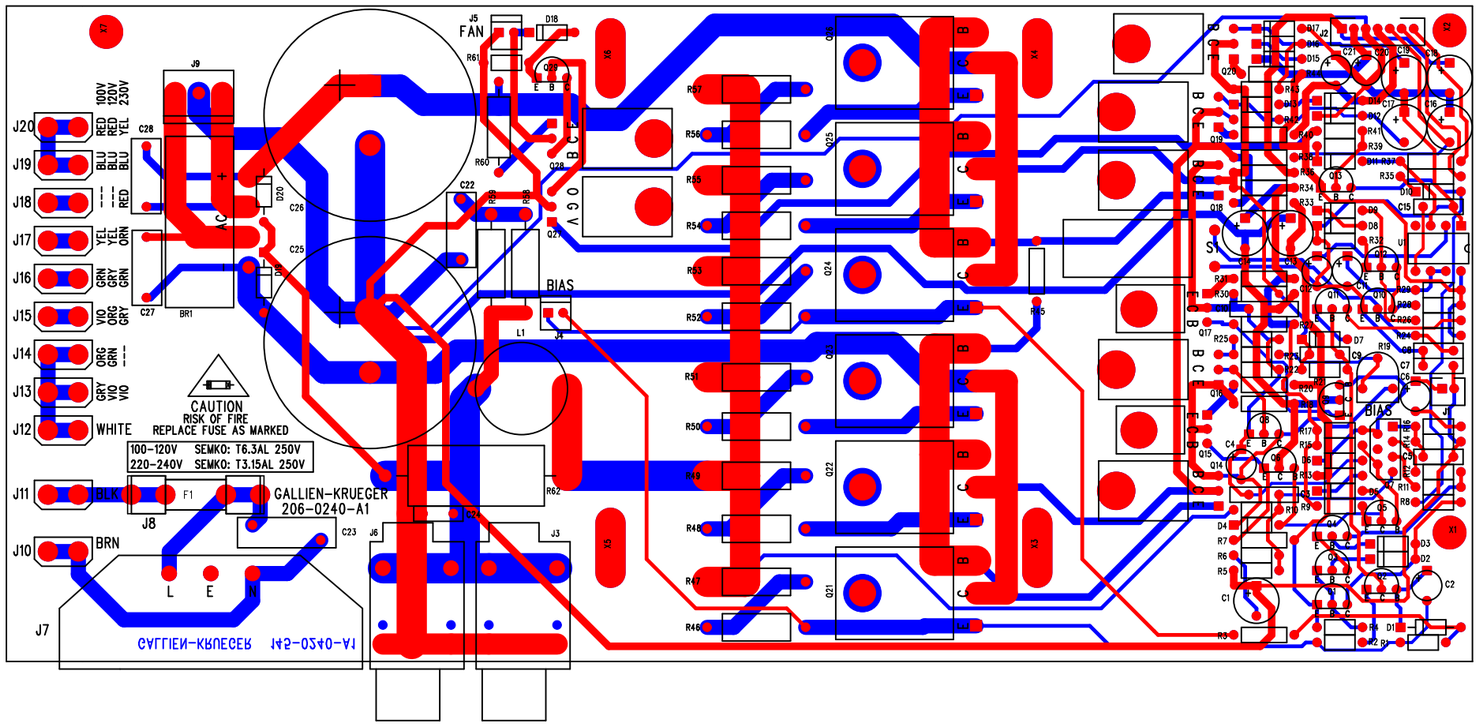
NOT VALID UNLESS STAMP IS RED

gallien technology
2234 INDUSTRIAL DRIVE
STOCKTON CA. 95206
VOICE: 209-234-7300
FAX: 209-234-8420

NOTES THIS REV:
1. CHANGED C4 TO 4.8uF/100V.
2. CHANGED F1 TO T6.3AL FOR 120V.
3. CHANGED F1 TO 3.15AL FOR 230V.
4. UPDATED REV TO A1.

| APPROVALS | | |
|---|---|---|
| | INIT | DATE |
| DESIGNED: | R.A.G. | 11/9/99 |
| DRAWN: | R.A.G. | 5/30/03 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB-IV POWER AMP
SIZE: B
DRAWING NO: 406-0240-A1
REV: A1
PART NO: 206-0240-A1
COMPANY: GALLIEN KRUEGER
FILENAME: 6240A1.sch




# PCB WORK INSTRUCTIONS
# DWG 420-0240-A1

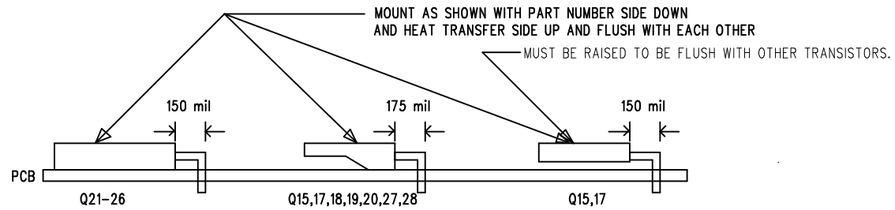
## NOTES:

UNLESS OTHERWISE SPECIFIED:

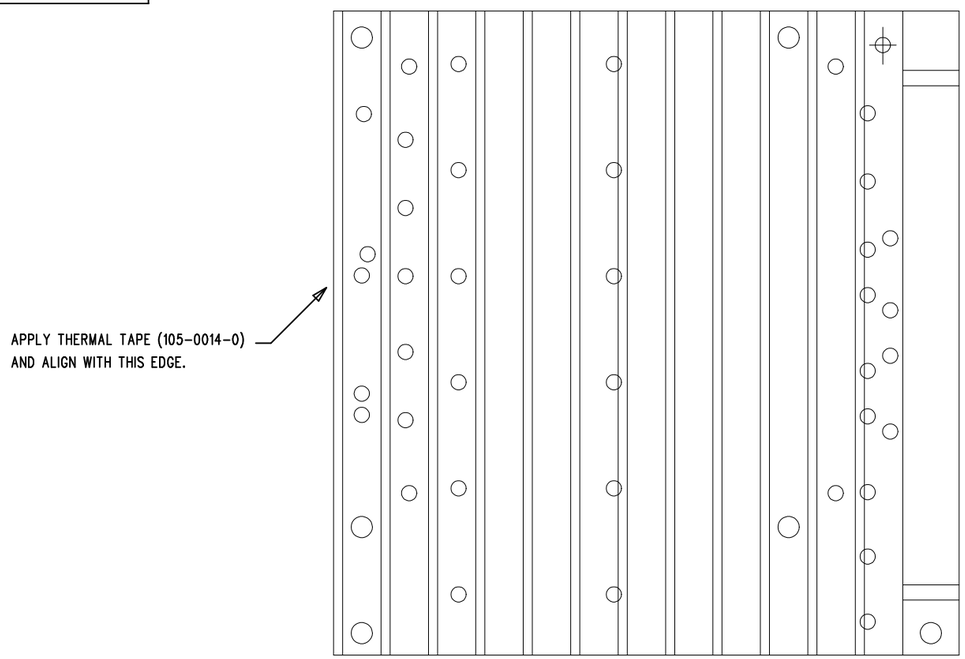
1. SQUARE PADS ON PARTS DENOTE PIN 1.
2. ALL BOARDS REQUIRE A COMPLETE VISUAL INSPECTION.
3. ALL BOARDS MUST BE BARE BOARD TESTED.
4. ASSEMBLE AND SOLDER PER ANSI/IPC-A-610B.

LOADING

5. SEE FORMING AND LOADING INSTRUCTIONS BELOW FOR INSTALLING SPECIFIED COMPONENTS.
6. CHECK THAT R45-56 ARE FULSH WITH PCB.
7. CHECK THAT J3, 6, 7, & S1 ARE FLUSH WITH PCB.
8. MAKE CERTAIN ALL POWER TRANSISTOR MOUNTING HOLES ARE PROPERLY ALIGNED FOR HEAT SINK.




PLACE SMALL DROP OF WHITE SILICON GREASE TO ALL TRANSISTOR MOUNTING SURFACES BEFORE MOUNTING HEATSINK.




NOT VALID UNLESS STAMP IS RED

gallien technology
2240 PARAGON DRIVE
SAN JOSE CA. 95131
VOICE: 408-441-8081
FAX: 408-441-8085

| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 6/25/02 |
| DRAWN: | R.A.G. | 6/02/03 |
| ELEC: | | |
| MECH: | | |

| | | |
|---|---|---|
| TITLE: | 400RB-IV POWER AMP | |
| SIZE: B | DRAWING NO: 405-0240-A1 | REV. A1 |
| | PART NO: 145-0240-A1 | |
| COMPANY: | GALLIEN-KRUEGER | |
| FILENAME: | 5240A1.PCB | |

LAYER DESCRIPTION:
TOP SIDE SOLDERSCREEN

GERBER FILE NAME:
sst0126pho

# gallien technology

Engineering Change Order

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer Name: | Gallien-Krueger | Current Rev #: | A1 | New ECO Rev #: | | A2 |
| Model: | 400RB-IV | Distribute To: | | Page: | 1 | Of: 1 |
| Assembly Description: | Power Amp | Originator: | RAG | | | |
| Assembly Numbers: | 206-0240-A | Approved by: | | | | |
| | 145-0240-A | Effective Date: | | | | |

| Effective | | | | Document Update | | Date | Initials |
|---|---|---|---|---|---|---|---|
| ☐ | All in Process | ☒ | Next Buy | ☐ | Artwork | | |
| ☐ | All in Service | ☐ | Next Production Run | ☐ | Assembly Dwg. | | |
| ☐ | All in Stock | ☐ | | ☒ | Board Artwork | | |
| Beginning Serial Number: | | | | ☒ | BOM | | |
| **Reason For Change** | | | | ☐ | Control Form | | |
| Add 240V supply table to board and schematic. | | | | ☐ | Costing | | |
| | | | | ☐ | Fab Drawing | | |
| | | | | ☐ | Inspection Proc. | | |
| | | | | ☒ | Part Master File | | |
| | | | | ☒ | Schematic | | |
| | | | | ☒ | Service Manual | | |
| | | | | ☐ | Test Procedure | | |
| | | | | ☐ | | | |
| | | | | **Other Affected Assemblies** | | | |
| | | | | 290 Assemblies , 302 Assembly (Head) | | | |
| ☐ | Continued on ECO Supplement Page | | | 303 Assemblies (Combo) | | | |

| Description Of Change | | | | Distribution | | Date | Initials |
|---|---|---|---|---|---|---|---|
| | | | | ☐ | Accounting | | |
| | | | | ☐ | Assembly | | |
| | | | | ☒ | Engineering | | |
| | | | | ☒ | Incoming Q.C. | | |
| | | | | ☒ | Production Eng. | | |
| | | | | ☒ | Purchasing | | |
| | | | | ☐ | Q.A. | | |
| | | | | ☐ | Service | | |
| | | | | ☒ | Test | | |
| ☐ | Continued on Supplement Page | ☐ | Drawing(s) attached | ☐ | | | |

| Part Number | Description | Parts Added | | Parts Deleted | |
|---|---|---|---|---|---|
| | | Qty | Ref. Designator | Qty | Ref. Designator |
| | | | | | |
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6240A2.sch-1 - Thu Nov 27 17:33:32 2003

| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

CAUTION
RISK OF FIRE
REPLACE FUSE AS MARKED

100–120V SEMKO: T6.3AL 250V
220–240V SEMKO: T3.15AL 250V

SWITCH

J8 FUSE CLIP 5MM
J7 J11 BLK WHT J12
F1 T6.3AL–250V
C23 .01uF 250V X-CAP
CON–IEC–10A

| | 100V | 120V | 220V | 230V | 240V |
|---|---|---|---|---|---|
| J13 | GRY | VIO | VIO | VIO | VIO |
| J14 | ORN | GRN | N/C | N/C | N/C |
| J15 | VIO | ORN | GRY | GRY | GRY |
| J16 | GRN | GRY | GRN | GRN | YEL |
| J17 | YEL | YEL | YEL | ORN | ORN |
| J18 | N/C | N/C | RED | RED | RED |
| J19 | BLU | BLU | BLU | BLU | BLU |
| J20 | RED | RED | ORN | YEL | GRN |
| J10 | BRN | BRN | BRN | BRN | BRN |

⚠ WARNING ⚠
DANGEROUS VOLTAGES PRESENT IN THIS AREA. REPLACE ONLY WITH IDENTICAL REPLACEMENT PARTS.

080–0043–C
VIOLET 120
GRAY 100
BLUE 0
GREEN 120
YELLOW 110
ORANGE 100
RED 0
BROWN (T/B)

BLACK J9–3
GREY J9–2
BLACK J9–1
BR1 MP25–025
C28 0.1UF 250V PE
C27 0.1UF 250V PE

+60V
R36 2.43K 1/4W FUSE
C18 47uF 63V
+35V J2–1
C26 12,000uF 63V
C25 12,000uF 63V
Q20 2SC4793
R44 2.74 1/4W
J2–2 +15V
R43 20.0k
D16 1N414B
D15 1N414B
C19 100uF 50V
D17 1N965B 15V
C20 10uF 50V
J2–3 PGND
C17 100uF 50V
D12 15V 1N965B
C21 10uF 50V
D13 1N414B
D14 1N414B
R42 20.0k
Q19 2SA1837
R40 2.74 1/4W
J2–4 –15V
–60V
R38 2.43K 1/4W FUSE
C16 47uF 63V
J2–5 –35V
GND

+15V
Q13 MPSA56
R41 10.0K
R29 100K
U1 LM555
R28 100K
MUTE
R39 4.75K
D10 1N414B
D11 1N755A 7.5V
R24 10.0K
C12 1uF 50V
R35 2.21K 1/4W
POWER ON BLUE J2–6
C11 33uF 25V
Q10 MPSA06 MPSA56
Q12
FAULT
D9 1N414B
D8 1N414B
C15 .01uF 100V PE
S1 105C
C8 .1uF 100V PE
R32 750
R37 2.21K 1/4W
PROTECT RED J2–7

3.0V
R17 2.21K
R15 2.21K
R9 2.21K
R27 1.00K 1/4W FUSE
2.4V
R31 47.5 1/4W FUSE
1.75V
C14 47uF 63V
R34 10.0 1/4W FUSE
Q5 2SA1376
Q9 2SA1376
Q17 2SA1380
1.0V
60V
D6 BAV20
C10 560pF 300V MICA
R30 5.62K 1/4W
Q18 2SC4793
1.0V
.4V
Q24 2SC5242
Q25 2SC5242
Q26 2SC5242
J4–1 BIAS
R52 0.1 1W
R54 0.1 1W
R56 0.1 1W
R53 0.1 1W
R55 0.1 1W
R57 0.1 1W
R45 68.1 1/4W FUSE
R47 0.1 1W
R49 0.1 1W
R51 0.1 1W
R46 0.1 1W
R48 0.1 1W
R50 0.1 1W
J4–2
D7 IN751 5.1V
C9 .1uF 100V PE
R21 2.43K
Q11 MPSA56
R26 47.5K
FAULT
D20 IN4004
D1 1N5819
Q2 2SC3478
R3 1.00K 1/4W FUSE
R1 6.81K
C2 10uF 50V
R2 1.00K
J3 1/4 MONO GND
C24 .001uF 100V PE
L1 2uH
R62 1.0 5W CERAMIC
R59 10 2W
R58 10 2W
C22 0.1uF 250V PE
J6 1/4 MONO GND
INPUT = 1kHz SINE, 100mV (–19.9dBV)
C6 10uF 50V
R16 1.00K
Q7 2SC3381
J1–1
J1–2
C5 470PF 100V
R14 12.1K
R12 182
R11 182
C7 .1uF 100V PE
R5 12.1K
C3 3pF 500V MICA
R10 43.2K
R6 1.00K
C1 100uF 50V
C4 4.7UF 100V
R25 3.92K
R22 182
Q8 MPSA56
Q16 2SC4793
R23 1.00K
BIAS
R19 500B
MUTE
R8 200K
D4 BAV20
D3 1N414B
Q4 MPSA06
D2 1N414B
Q3 MPSA06
Q6 2SC3478
D5 1N414B
Q15 2SC3502
Q1 MPSA06
0.54V
R4 200
R13 2.21K
–2.4V
R7 1.00K 1/4W FUSE
R20 47.5 1/4W FUSE
–1.8V
R18 5.62K 1/4W
–.6V
–1.2V
Q14 2SA1837
Q21 2SA1962
Q22 2SA1962
Q23 2SA1962
D19 IN4004
–60V
C13 47uF 63V
R33 10.0 1/4W FUSE
GND

TEMP SENSOR
Q27 LM35
+15V
GND
+60V
R60 0.33 1W
Q29
Q28 MPSA06
2SA1837
J5–2 RED
FAN
J5–1 BLK
D18 1N9708 24V
R61 100

NOTES: UNLESS OTHERWISE SPECIFIED,

1. TEST CONDITIONS: 100mV 1kHz SINE, DIRECT INPUT (PRE–AMP BYPASSED) NO LOAD
2. [ ] DENOTES RMS AC VOLTAGE

BIAS ADJUSTMENT PROCEDURE:
WITH POWER OFF, ADJUST POT R21 TO FULL COUNTER–CLOCKWISE POSITION.
TURN ON POWER AND WAIT 5 SECONDS FOR TURN ON DELAY.
TURN R21 CLOCKWISE UNTIL VOLTAGE ACCROSS P3 READS 10 mVDC.

MH.200V X6 MH.200V X5 MH.125/220 X7
MH.200V X4 MH.200V X3 MH.125/220 X2 MH.125/220 X1

NOT VALID UNLESS STAMP IS RED

NOTES REV A2:
1. ADD 240V SUPPLY TABLE TO LAYOUT.


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2234 INDUSTRIAL DRIVE
STOCKTON CA. 95206
VOICE: 209–234–7300
FAX: 209–234–8420


| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 11/9/99 |
| DRAWN: | R.A.G. | 11/19/03 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB–IV POWER AMP
SIZE: B
DRAWING NO: 406–0240–A2
REV: A2
PART NO: 206–0240–A2
COMPANY: GALLIEN KRUEGER
FILENAME: 6240A2.sch

GK GALLIEN-KRUEGER

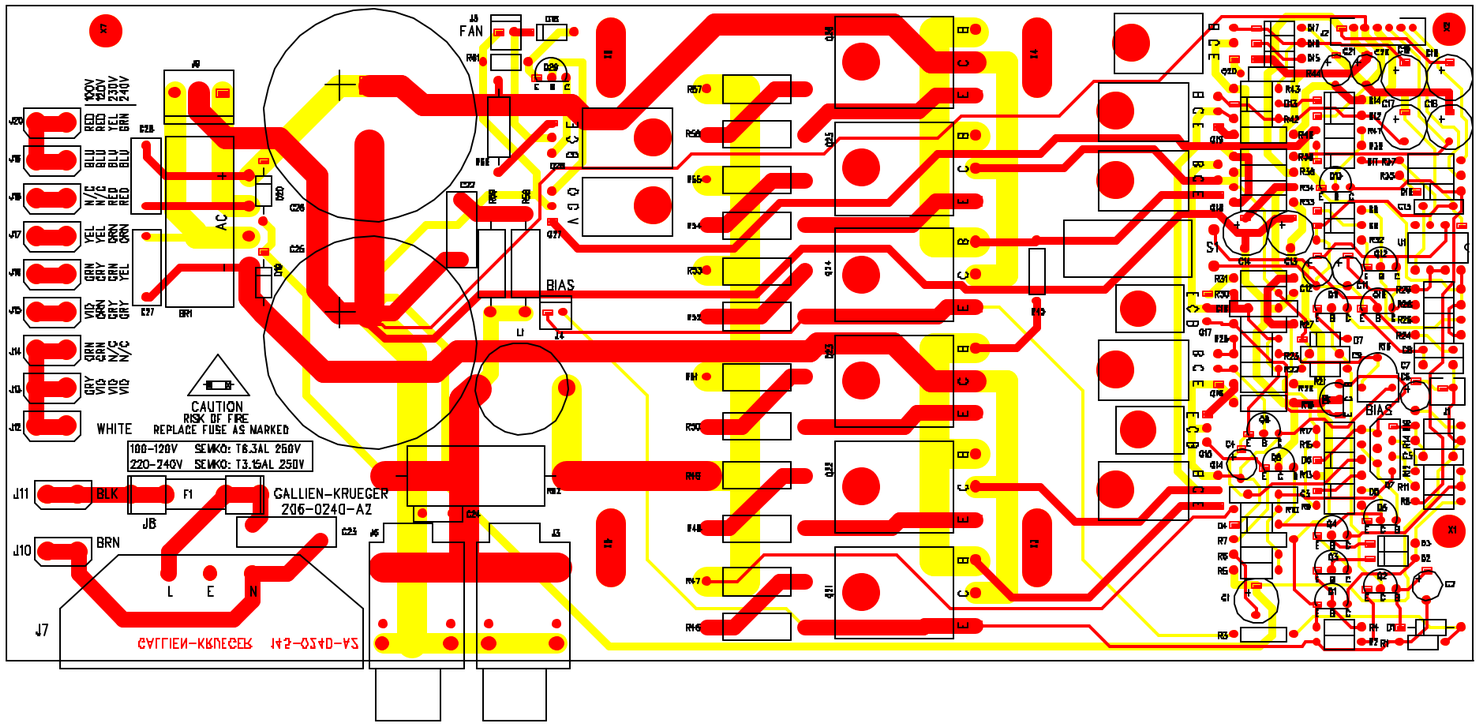
**400RB-IV Power Amp**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. |
|---|---|---|---|---|
| 001-2060-0 | U1 | LM555, TIMER | NATIONAL | LM555CN |
| 010-0000-0 | Q7 | 2SC3381BL,NPNX2,80V,100MA,2-10M1B | TOSHIBA | 2SC3281BL |
| 010-0001-0 | Q2 Q6 | 2SC3478, NPN,180V,100MA,TO-92 | NEC | 2SC3478-K |
| 010-0003-0 | Q15 | 2SC3502-F,NPN,200V,100MA,TO-126 | TOSHIBA | 2SC3502 |
| 010-0012-0 | Q1 Q3-4 Q10 Q12 Q29 | MPSAO6, NPN,80V,500MA,TO-92 | MOTOROLA | MPS-A06 |
| 010-0035-0 | Q27 | LM35DT, TEMPERATURE SENSOR, TO-220 | NATIONAL | LM35DT |
| 010-1002-0 | Q5 Q9 | 2SA1376, PNP,180V,100MA,TO-92 | NEC | 2SA1376-K |
| 010-1003-0 | Q17 | 2SA1380-F,PNP,200V,100MA,TO-126 | SANYO/TOSHIBA | 2SA1380-F/E |
| 010-1013-0 | Q8 Q11 Q13 | MPSA56 PNP 80V 500MA TO-92 | MOTOROLA | MPS-A56 |
| 012-0002-0 | Q16 Q18 Q20 | 2SC4793,NPN,200V,1.5A,2-10R1A | TOSHIBA | 2SC4793 |
| 012-0003-0 | Q24-26 | 2SC5242,NPN,230V,15A,2-16C1A | TOSHIBA | 2SC5242-O |
| 012-1002-0 | Q14 Q19 Q28 | 2SA1837,PNP,200V,1.5A,2-10R1A | TOSHIBA | 2SA1837 |
| 012-1003-0 | Q21-23 | 2SA1962,PNP,230V,15A,2-16C1A | TOSHIBA | 2SA1962 |
| 020-0004-0 | D11 | 1N755A, ZENER,7.5V,500MW ,D035 | TAITRON | 1N755A |
| 020-0050-0 | D7 | 1N751, ZENER,5.1V,10%,400MW,DO-35 | NATIONAL | 1N751 |
| 020-0150-0 | D12 D17 | 1N965B, ZENER, 15V, 5%, 500mW, DO-35 | TAITRON | 1N965B |
| 020-0240-0 | D18 | 1N970B, ZENER, 24V, 5%, 500MW, DO-35 | TAITRON | 1N970B |
| 020-1000-0 | D2-3 D5 D8-10 D13-16 | 1N4148, RECT-FAST, 200MA, 100V | MOTOROLA | 1N4148 |
| 020-1022-0 | D4 D6 | BAV20, RECT, 200V, DO-35 | NATIONAL | BAV20 |
| 020-1104-0 | D1 | SHOTTKY, 1A, 40V, 10NS, DO-41 | MOTOROLA | 1N5819 |
| 020-2106-0 | D19-20 | 1N4004,RECT,1A,400V,DO-41 | TAITRON | 1N4004 |
| 023-0112-0 | BR1 | BRIDGE, 25A, 200V, VERT, PC, MO25S-02 | CHENG-YI | MP25-02S |
| 031-1336-0 | C11 | CAP,ELEC,RAD,336,20%,25V | UNITED CHEMI-CON | SRG25VB33RM5X7LL |
| 031-2105-0 | C12 | CAP,ELEC,RAD, 105, 20%, 50V | UNITED CHEMI-CON | C440C105M5U5CA |
| 031-2106-0 | C2,6,20,21 | CAP,ELEC,RAD, 106, 20%, 50V | UNITED CHEMI-CON | SMG50VB10RM5X11LL |
| 031-2107-0 | C1 C17 C19 | CAP,ELEC,RAD,107, 20%, 50V | UNITED CHEMI-CON | SMG50VB101M8X11LL |
| 031-3129-0 | C25-26 | CAP, ELEC, RAD, 129, 20%, 63V | UNITED CHEMI-CON | SMH63VN123M35X45T2 |
| 031-3476-0 | C13-14 C16 C18 | CAP,ELEC,RAD,476,20%,63V | UNITED CHEMI-CON | SMG63VB47RM6X11LL |
| 031-4475-0 | C4 | CAP,ELEC,RAD, 475, 20%, 100V | UNITED CHEMI-CON | SMG100VB4R7M5X11LL |
| 032-4102-0 | C24 | CAP,PE,102,5%,100V, | PANASONIC | ECQB1102JF |
| 032-4103-0 | C15 | CAP,PE,103,5%,100V, | PANASONIC | ECQV1103JM |
| 032-4104-0 | C7-9 | CAP,PE,104,5%,100V, | PANASONIC | ECQV1104JM |
| 032-7104-0 | C22 C27-28 | CAP,PE,104,10%, 250V | ILLINOIS CAPACITOR | 104MSR250K |
| 034-4471-0 | C5 | CAP,MCR,470pF,5%,100V, | TAITRON | TMRS471J100NPOB |
| 034-7103-0 | C23 | CAP, CERMIC DISK, 103, 10%, X-250V | PANASONIC | ECK-DRS103ZV |
| 035-8030-0 | C3 | CAP MICA AXIAL , 3pF, 10%, 500V | CORNELL | CD10CD030D03 |
| 035-8561-0 | C10 | CAP MICA RADIAL, 561, 5%, 300V | CORNELL | CD15FC561J103 |
| 052-2.74-0 | R40 R44 | RES,METAL FILM, 2.74, 1/4W, 1% | ECI | M2F1AJ002.74 |
| 052-2212-0 | R35 R37 | RES,METAL FILM,2.21k,1/4W,1% | ECI | M2F1AK002.21 |
| 052-5622-0 | R18 R30 | RES,METAL FILM,5.62K,1/4W,1% | ECI | M5F1AK005.62 |
| 054-.100-0 | R46-57 | RES, METAL OXIDE, 0.1 Ohm, 1W, 5% | ECI | MO10J3AJ000.10 |
| 054-.330-0 | R60 | RES, METAL OXIDE, 0.33 OHM, 1W, 5% | ECI | MO10J3AJ000.33 |
| 055-0101-0 | R58-59 | RES, METAL OXIDE, 10 OHM, 2W, 5% | ECI | MOM20J3AJ010.00 |
| 056-0100-0 | R62 | RES, CERAMIC WW, 1.0 OHM, 5W, 10% | ECI | WWC50J3AJ001.00 |
| 059-1000-0 | R33-34 | RES,MF,FUSE,10.0 OHM, 1/4W,1% | JUKN.OHM | FR25-10.0 |
| 059-1002-0 | R3 R7 R27 | RES,MF,FUSE,1.00K,1/4W,1% | JUKN.OHM | FR25-1.00K |
| 059-2432-0 | R36 R38 | RES,MF,FUSE,2.43K, 1/4W,1% | JUKN.OHM | FR25-2.43K |
| 059-4750-0 | R20 R31 | RES,MF,FUSE,47.5 OHM, 1/4W,1% | JUKN.OHM | FR25-47.5 |
| 059-6810-0 | R45 | RES,MF,FUSE,68.1 OHM, 1/4W,1% | JUKN.OHM | FR25-68.1 |
| 060-1001-0 | R61 | RES, METAL FILM, 100 OHM, 1/8W, 1% | ECI | M1F1AJ100.00 |
| 060-1002-0 | R2 R6 R16 R23 | RES,METAL FILM, 1.00K, 1/8W, 1% | ECI | M1F1AK001.00 |
| 060-1003-0 | R24 R41 | RES,METAL FILM, 10.0K, 1/8W,1% | ECI | M1F1AK010.00 |
| 060-1004-0 | R28-29 | RES,METAL FILM, 100K, 1/8W, 1% | ECI | M1F1AK100.00 |
| 060-1213-0 | R5 R14 | RES,METAL FILM, 12.1K OHM, 1/8W, 1% | ECI | M1F1AK012.10 |
| 060-1821-0 | R11-12 R22 | RES,METAL FILM, 182, 1/8W, 1% | ECI | M1F1AJ182.00 |
| 060-2001-0 | R4 | RES,METAL FILM, 200, 1/8W, 1% | ECI | M1F1AJ200.00 |
| 060-2003-0 | R42-43 | RES,METAL FILM, 20.0K, 1/8W, 1% | ECI | M1F1AK020.00 |
| 060-2004-0 | R8 | RES,METAL FILM, 200K, 1/8W, 1% | ECI | M1F1AK200.00 |
| 060-2212-0 | R9 R13 R15 R17 | RES,METAL FILM, 2.21K, 1/8W, 1% | ECI | M1F1AK002.21 |
| 060-2432-0 | R21 | RES,METAL FILM, 2.43K, 1/8W, 1% | ECI | M1F1AK002.43 |
| 060-3922-0 | R25 | RES,METAL FILM, 3.92K, 1/8W, 1% | ECI | M1F1AK003.92 |
| 060-4323-0 | R10 | RES,METAL FILM, 43.2K, 1/8W, 1% | ECI | M1F1AK043.20 |
| 060-4752-0 | R39 | RES,METAL FILM, 4.75K, 1/8W, 1% | ECI | M1F1AK004.75 |
| 060-4753-0 | R26 | RES,METAL FILM, 47.5K, 1/8W, 1% | ECI | M1F1AK047.50 |
| 060-6812-0 | R1 | RES,METAL FILM, 6.81K, 1/8W, 1% | ECI | M1F1AK006.81 |
| 060-7501-0 | R32 | RES,METAL FILM, 750 OHM, 1/8W, 1% | ECI | M1F1AJ750.00 |
| | | | | |
| | | | | |

GK GALLIEN-KRUEGER

**400RB-IV Power Amp**

| Part No. | Reference | Description | Manufacturer | Mfr. Part No. |
|---|---|---|---|---|
| 070-0520-0 | R19 | POT,500B TRIM, 200mW | SONG HUEI | SH-655MCL-500B |
| 081-0055-0 | L1 | INDUCTOR,2UH,20A,AIR CORE | SCHONBERG | 081-0055-0 |
| 091-0013-0 | F1 | FUSE,5mm,T6.3AL,250V,SEMKO | LITTLE FUSE | 218-06.3 |
| 091-1002-0 | S1 | THRM BRKR, 105C +/-5,0-DIFF, PC | KLIXON | 7AM-028-A5 |
| 092-0001-0 | J7 | CON, IECX3, 10A, 250V, PC TERM | DIHTAIN | DTS-0045 |
| 092-0066-0 | J10-20 | FASTON, M, PC, .250" | KEYSTONE | 1021 |
| 092-0082-0 | J3 J6 | JACK,1/4",MONO,PC, GROUNDING | NEUTRIK | S102-84G |
| 093-0025-0 | J4-5 | HDR,.1X2,VERT,MALE,LOCK,GOLD | AMP | 641126-2 |
| 093-0051-0 | J1 | HDR, 2MMX2, VERT, LOCK | JST | B2B-PH-K-S |
| 093-0080-0 | J9 | HDR,.156X3,VERT,MALE,LOCKING | MOLEX | 26-60-4030 |
| 093-2005-0 | J2 | HDR, 2MMX7, VERT, SHROUDED | JST | B7B-PH-K-S |
| 094-0004-0 | J8 | FUSE CLIP, 5MM, 15A, P.C. | MOUSER | 44FH052 |
| | | | | |
| | | | | |
| 086-0000-0 | | FAN, 24VDC, 160MA, 80X80MM | ADDA | 08-24-HB-A70GL |
| 093-0506-0 | | HSG, .1X2, LOCKING, CRIMP 093-0909 | MOLEX | 22-01-3027 |
| 093-0909-0 | | TERM, CRIMP, .1, 22GA | MOLEX | 08-50-0113 |
| 095-0006-0 | | HEAT SHRINK 3/16" | | |
| 104-0003-0 | INDUCTOR | SPACER,NYLON,#4X.2X.2D | | |
| 105-0014-0 | | INSULATOR TAPE 4"X7MIL | THERMALOY | SILPAD 400AC |
| 117-0097-0 | TO-220 | BOLT, M3X9, M1,PHP/SW/PW, CH | | |
| 117-0127-0 | POWER TRAN | BOLT, M12X9, M1,PHP/SW/PW, CH | | |
| 117-0357-0 | FAN | BOLT, M35X9, M1,PHP/SW/PW, CH | | |
| 117-7002-1 | FAN | WASHER,M3,PLAIN, CHROME | | |
| 132-0024-E | HEATSINK | 700RB HEATSINK | | |
| 145-0240-A | | 400RB-IV POWER AMP RAW BOARD | | |
| 153-0105-0 | | LABLE, BLANK,.9"X.25" | | |
| 202-6000-A | CHASSIS GND | WIRE ASSY,14GA,GRN/YEL,4",GND | | |




# PCB WORK INSTRUCTIONS
# DWG 420-0240-A2

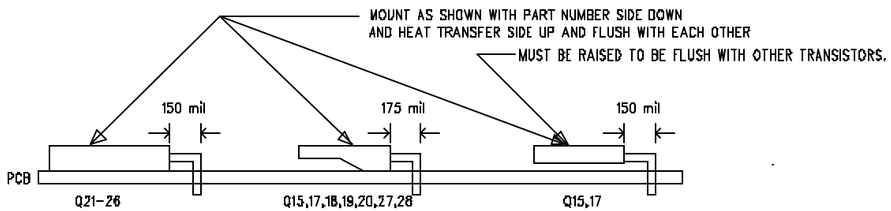
## NOTES:

UNLESS OTHERWISE SPECIFIED:

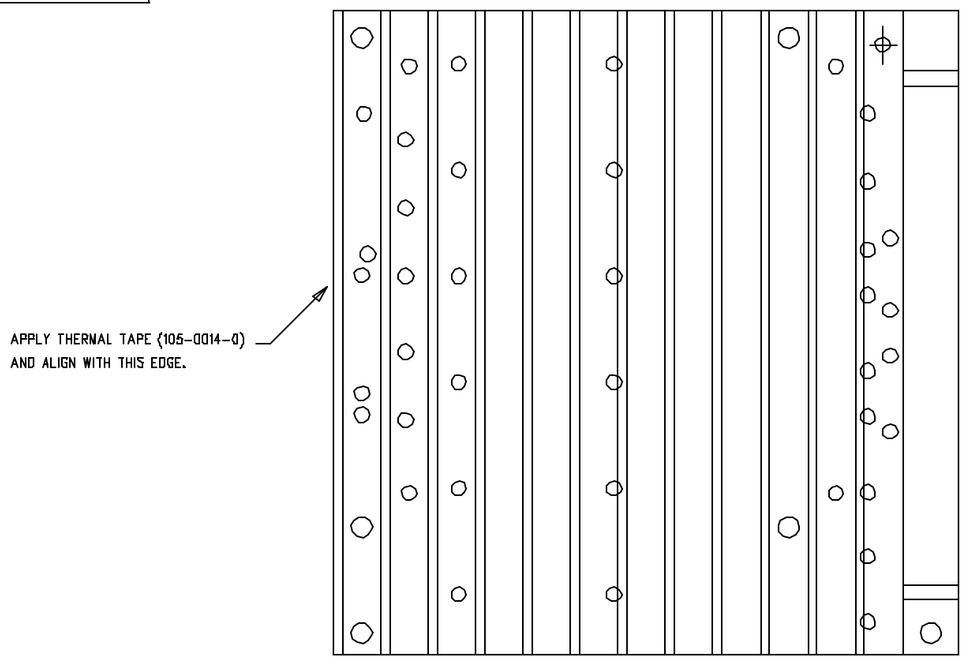
1. SQUARE PADS ON PARTS DENOTE PIN 1.
2. ALL BOARDS REQUIRE A COMPLETE VISUAL INSPECTION.
3. ALL BOARDS MUST BE BARE BOARD TESTED.
4. ASSEMBLE AND SOLDER PER ANSI/IPC-A-610B.

LOADING

5. SEE FORMING AND LOADING INSTRUCTIONS BELOW FOR INSTALLING SPECIFIED COMPONENTS.
6. CHECK THAT R45-56 ARE FULSH WITH PCB.
7. CHECK THAT J3, 6, 7, & S1 ARE FLUSH WITH PCB.
8. MAKE CERTAIN ALL POWER TRANSISTOR MOUNTING HOLES ARE PROPERLY ALIGNED FOR HEAT SINK.




PLACE SMALL DROP OF WHITE SILICON GREASE TO ALL TRANSISTOR MOUNTING SURFACES BEFORE MOUNTING HEATSINK.




NOT VALID UNLESS STAMP IS RED

gallien technology
2234 INDUSTRIAL DRIVE
STOCKTON CA. 95206
VOICE: 209-234-7300
FAX: 209-234-8420

| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 6/25/02 |
| DRAWN: | R.A.G. | 11/19/03 |
| ELEC: | | |
| MECH: | | |

TITLE: 400RB-IV POWER AMP

SIZE: B | DRAWING NO: 405-0240-A2 | REV: A2

PART NO: 145-0240-A2

COMPANY: GALLIEN-KRUEGER

FILENAME: 5240A2.PCB

LAYER DESCRIPTION: TOP SIDE SOLDERSCREEN

GERBER FILE NAME: 5240A2.pho

# gallien technology

Engineering Change Order

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer Name: | Gallien-Krueger | Current Rev #: | A2 | New ECO Rev #: | | A3 |
| Model: | 400RB-IV | Distribute To: | | Page: | 1 | Of: 1 |
| Assembly Description: | Power Amp | Originator: | RAG | | | |
| Assembly Numbers: | 206-0240-A | Approved by: | | | | |
| | 145-0240-A | Effective Date: | 12/14/2003 | | | |

| Effective | | | | Document Update | | Date | Initials |
|---|---|---|---|---|---|---|---|
| X | All in Process | X | Next Buy | | Artwork | | |
| | All in Service | | Next Production Run | | Assembly Dwg. | | |
| | All in Stock | | | X | Board Artwork | | |
| Beginning Serial Number: | | | | X | BOM | | |
| | | | | | Control Form | | |
| | | | | X | Costing | | |
| | | | | | Fab Drawing | | |
| | | | | | Inspection Proc. | | |
| | | | | X | Part Master File | | |
| | | | | X | Schematic | | |
| | | | | X | Service Manual | | |
| | | | | | Test Procedure | | |
| | | | | | | | |

**Reason For Change**

Prevent fuse failure due to inrush current at turn on. An improvement to A2 which was not put into production.

**Other Affected Assemblies**

290 Assemblies , 302 Assembly (Head)

303 Assemblies (Combo)

☐ Continued on ECO Supplement Page

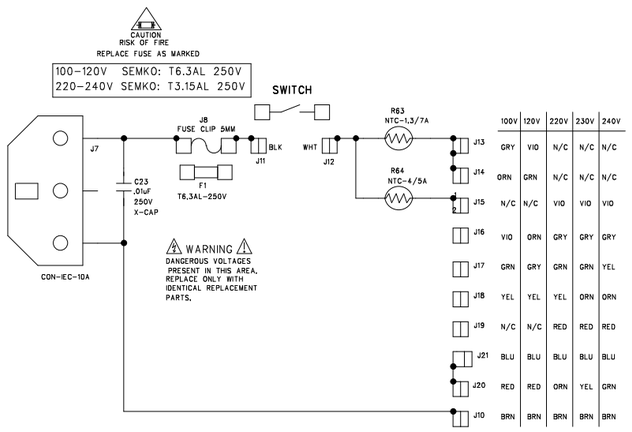
| Description Of Change | Distribution | | Date | Initials |
|---|---|---|---|---|
| Add NTC thermistors to the primary side of the transformer. One for 120V and another for 230V. An additional primary terminal is added to accommodate the wireing. For current production a thermistor of the proper value will be added to the bottom of the board. For 220V-240V use NTC-4R/5A. For 100V-120V use NTC-1.3R/7A. | | Accounting | | |
| | | Assembly | | |
| | X | Engineering | | |
| | X | Incoming Q.C. | | |
| | X | Production Eng. | | |
| | X | Purchasing | | |
| | | Q.A. | | |
| | | Service | | |
| | | Test | | |
| | | | | |

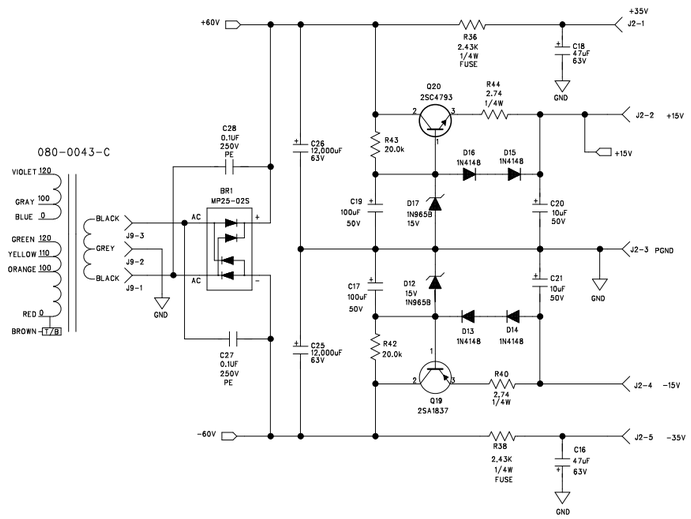
☐ Continued on Supplement Page ☐ Drawing(s) attached

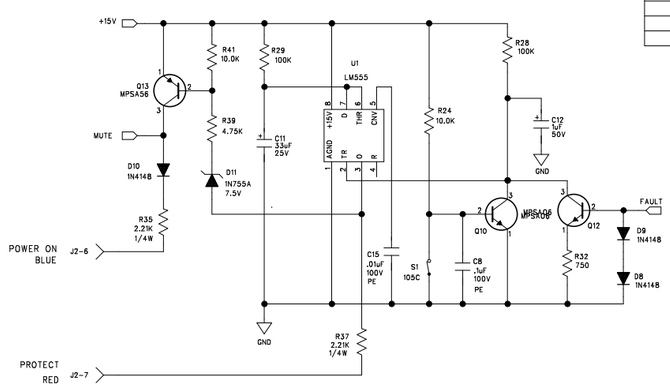
| Part Number | Description | Parts Added | | Parts Deleted | |
|---|---|---|---|---|---|
| | | Qty | Ref. Designator | Qty | Ref. Designator |
| 022-3003-0 | THR NTC-1.3R/7A | 1 | R63 | | |
| 022-3006-0 | THER NTC-4R/5A | 1 | R64 | | |
| 092-0066-0 | FASTON | 1 | J21 | | |

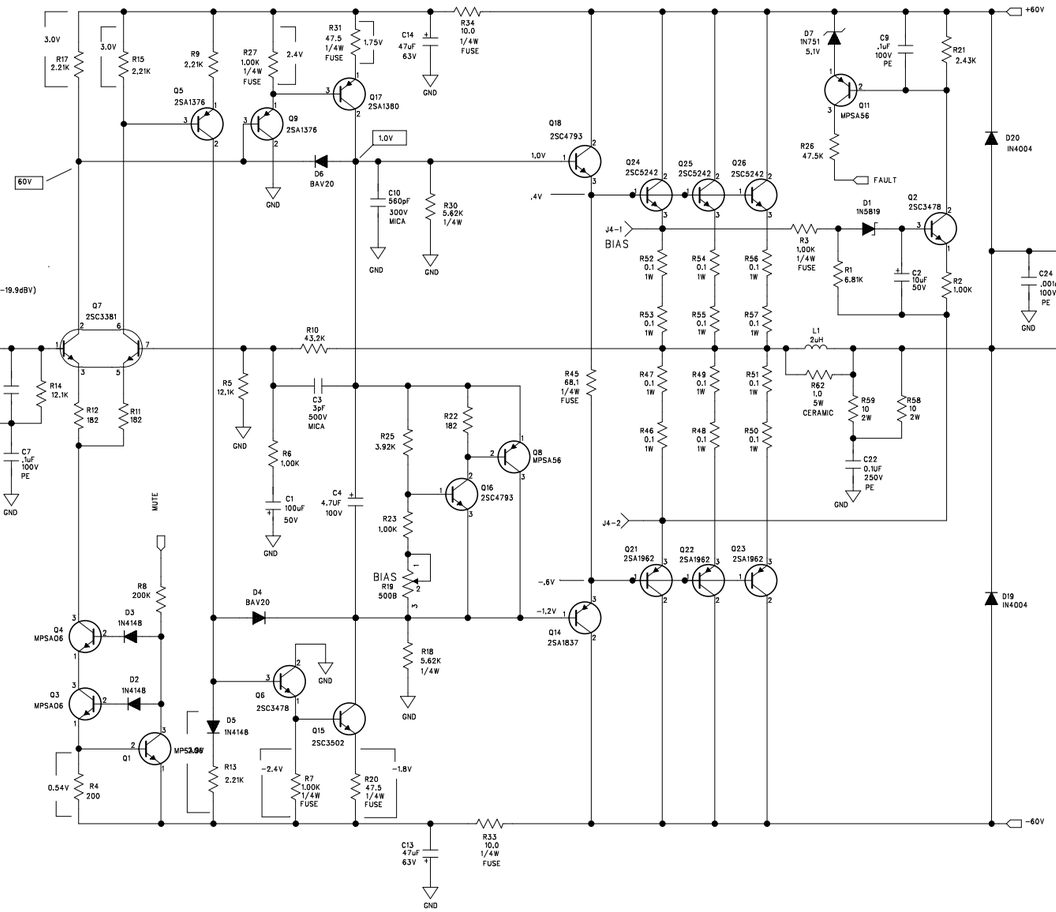
6240A3.sch-1 - Thu Jan 08 10:48:13 2004

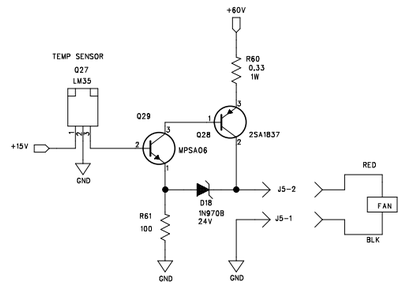
| REVISION RECORD | | | |
|---|---|---|---|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |




NOTES: UNLESS OTHERWISE SPECIFIED,

1. TEST CONDITIONS: 100mV 1kHz SINE, DIRECT INPUT (PRE-AMP BYPASSED) NO LOAD
2. [ ] DENOTES RMS AC VOLTAGE

BIAS ADJUSTMENT PROCEDURE:
WITH POWER OFF, ADJUST POT R21 TO FULL COUNTER-CLOCKWISE POSITION.
TURN ON POWER AND WAIT 5 SECONDS FOR TURN ON DELAY.
TURN R21 CLOCKWISE UNTIL VOLTAGE ACCROSS P3 READS 10 mVDC.

MH.200V X6 MH.200V X5 MH.125/220 X7
MH.200V X4 MH.200V X3 MH.125/220 X2 MH.125/220 X1

NOT VALID UNLESS STAMP IS RED

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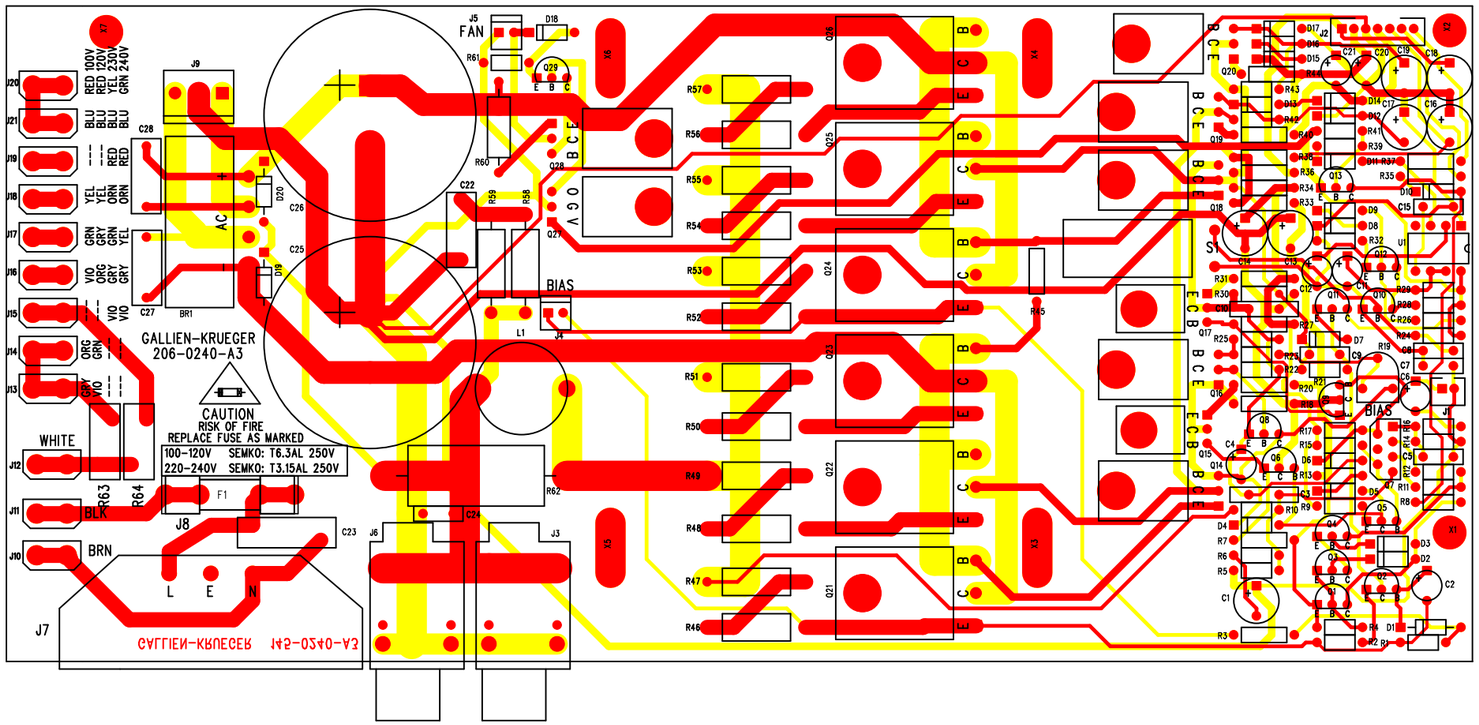
STOCKTON CA. 95206
VOICE: 209-234-7300
FAX: 209-234-8420

NOTES REV A3:
1. MODIFY SUPPLY TABLE FOR THERMISTORS
2. ADD THERMISTORS R63 AND R64.
3. ADD J15.

| APPROVALS | | |
|---|---|---|
| INIT | | DATE |
| DESIGNED: | R.A.G. | 11/9/99 |
| DRAWN: | R.A.G. | 12/10/03 |
| ELEC: | | |
| MECH: | | |
| Q/A: | | |
| RELEASED: | | |

TITLE: 400RB-IV POWER AMP
SIZE: B
DRAWING NO: 406-0240-A3
REV: A3
PART NO: 206-0240-A3
COMPANY: GALLIEN KRUEGER
FILENAME: 6240A3.sch




# PCB WORK INSTRUCTIONS
# DWG 420-0240-A3

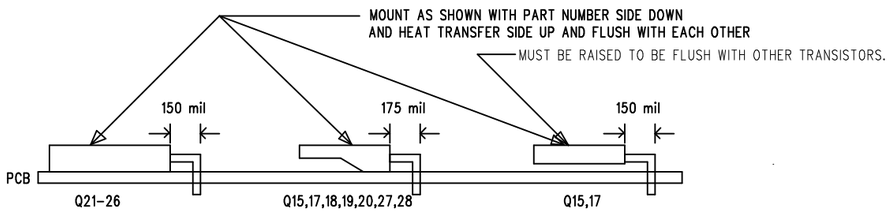
## NOTES:

UNLESS OTHERWISE SPECIFIED:

1. SQUARE PADS ON PARTS DENOTE PIN 1.
2. ALL BOARDS REQUIRE A COMPLETE VISUAL INSPECTION.
3. ALL BOARDS MUST BE BARE BOARD TESTED.
4. ASSEMBLE AND SOLDER PER ANSI/IPC-A-610B.

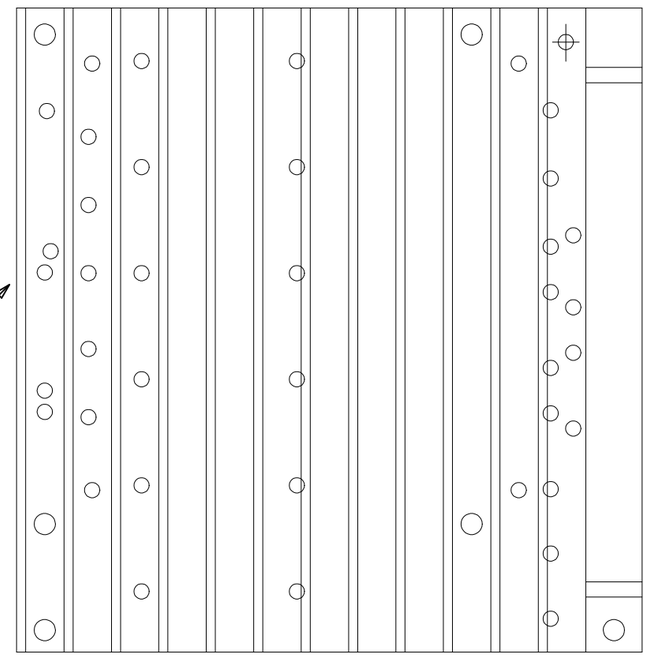
LOADING

5. SEE FORMING AND LOADING INSTRUCTIONS BELOW FOR INSTALLING SPECIFIED COMPONENTS.
6. CHECK THAT R45-56 ARE FULSH WITH PCB.
7. CHECK THAT J3, 6, 7, & S1 ARE FLUSH WITH PCB.
8. MAKE CERTAIN ALL POWER TRANSISTOR MOUNTING HOLES ARE PROPERLY ALIGNED FOR HEAT SINK.




PLACE SMALL DROP OF WHITE SILICON GREASE TO ALL TRANSISTOR MOUNTING SURFACES BEFORE MOUNTING HEATSINK.

APPLY THERMAL TAPE (105-0014-0)
AND ALIGN WITH THIS EDGE.



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gallien technology

2234 INDUSTRIAL DRIVE
STOCKTON CA. 95206
VOICE: 209-234-7300
FAX: 209-234-8420

| APPROVALS | INIT | DATE |
|---|---|---|
| DESIGNED: | R.A.G. | 6/25/02 |
| DRAWN: | R.A.G. | 12/10/03 |
| ELEC: | | |
| MECH: | | |

TITLE: 400RB-IV POWER AMP

SIZE: B | DRAWING NO: 405-0240-A3 | REV: A3

PART NO: 145-0240-A3

COMPANY: GALLIEN-KRUEGER

FILENAME: 5240A3.PCB

LAYER DESCRIPTION: TOP SIDE SOLDERSCREEN

GERBER FILE NAME: sst0126pho

This document is generated to address fuse failure due to excessive inrush current during turn on. It is applicable to 400RB-IV power amp boards with part number 206-0240-A1. To correct the problem, a thermistor with part number 022-3006-0 is soldered in series with the primary side of the transformer.

The following is a guideline on how to modify the unit with the thermistor :

STEP I:
If the unit is a head version of 400RB-IV, remove the top cover then remove the power amp board from the chassis assembly.
If the unit is a combo version of 400RB-IV, remove the chassis assembly from the cabinet, then remove the power amp board. Please see figure 1.


Chassis Assembly
**figure 1**

STEP II:
Locate J13 and J12 on the power amp board (figure 2a). Turn the power amp board over as per figure 2b.

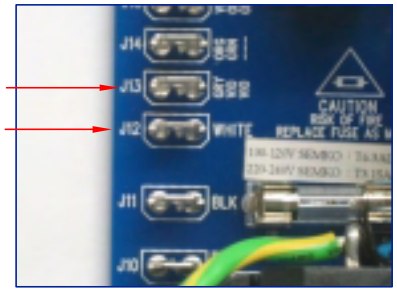
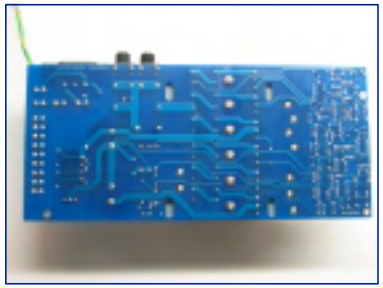



**figure 2a**



Power Amp Board
**figure 2b**

STEP III:
Locate J12 and J13 on the bottom/solder side of the board (figure 3a). Cut the trace between J12 and J13 as shown in figure 3b.

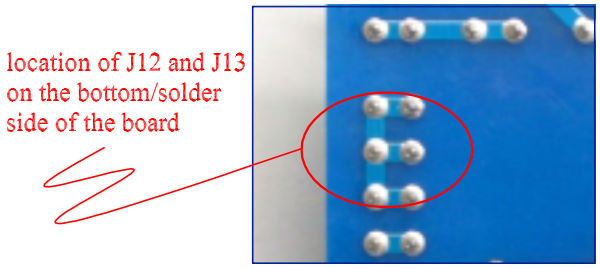



**figure 3a**

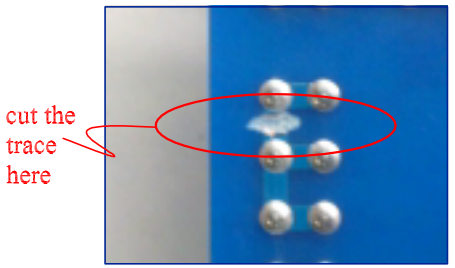



**figure 3b**

STEP IV:
Solder one lead of Thermistor (022-3006-0) to J12 and the other to J14 on the bottom/solder side of the power amp board, as shown in figure 4.

*Note: Make sure that no portion or part of the thermistor is touching any terminal on the board except terminals J12 and J14.*

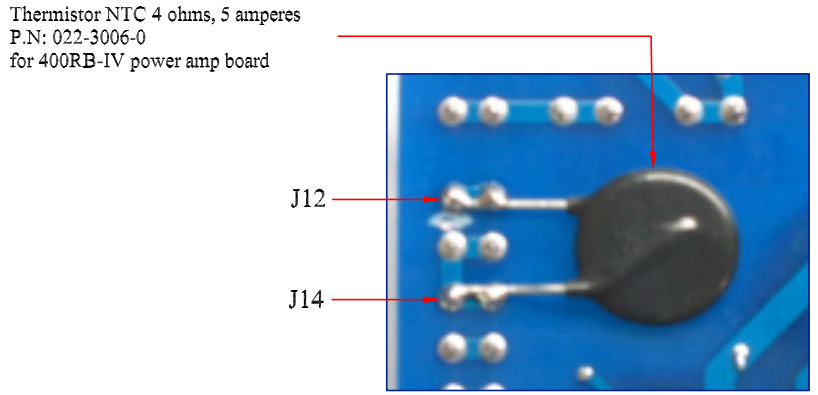



**figure 4**



APPROVAL

| DEPT. | INITIAL | DATE |
|---|---|---|
| PRODUCTION | NOLI VALDEZ | 12/18/2003 |
| | | |
| | | |
| | | |
| | | |

gallien technology
2234 INDUSTRIAL DRIVE
STOCKTON, CA, 95207

TITLE
THERMISTOR MODIFICATION

| FILE NAME | REV. |
|---|---|
| DOCUMENT NUMBER | SIZE |
| SCALE: NOT TO SCALE | SHEET: 1 OF 1 |