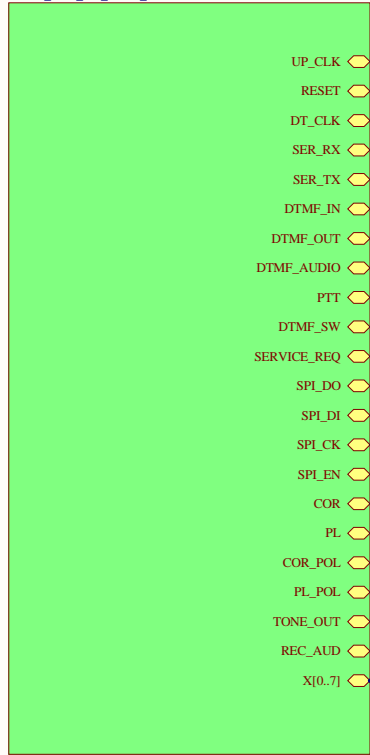
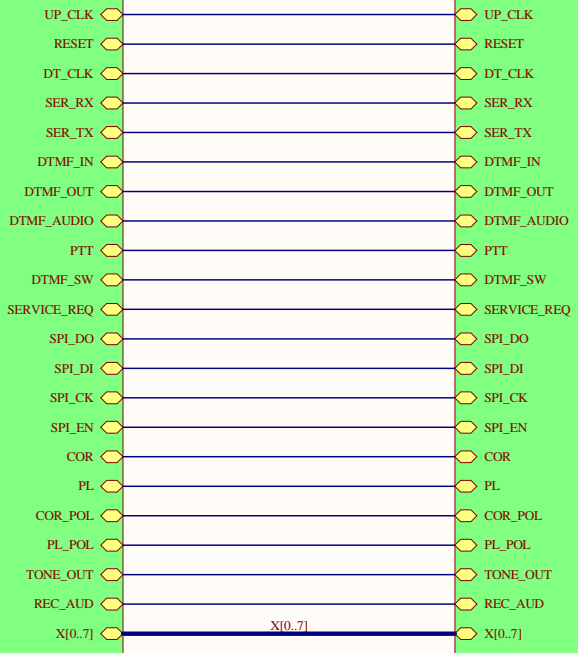
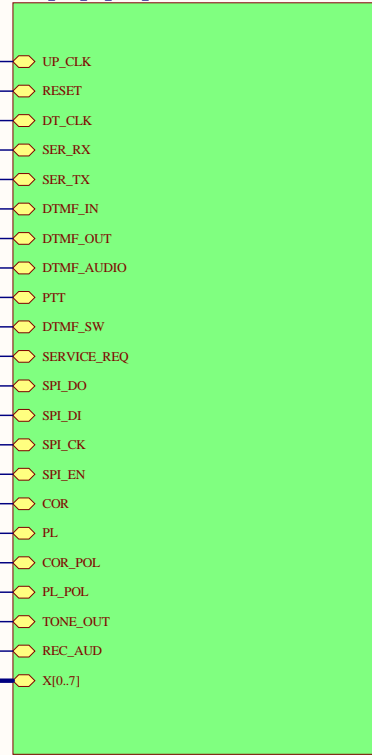


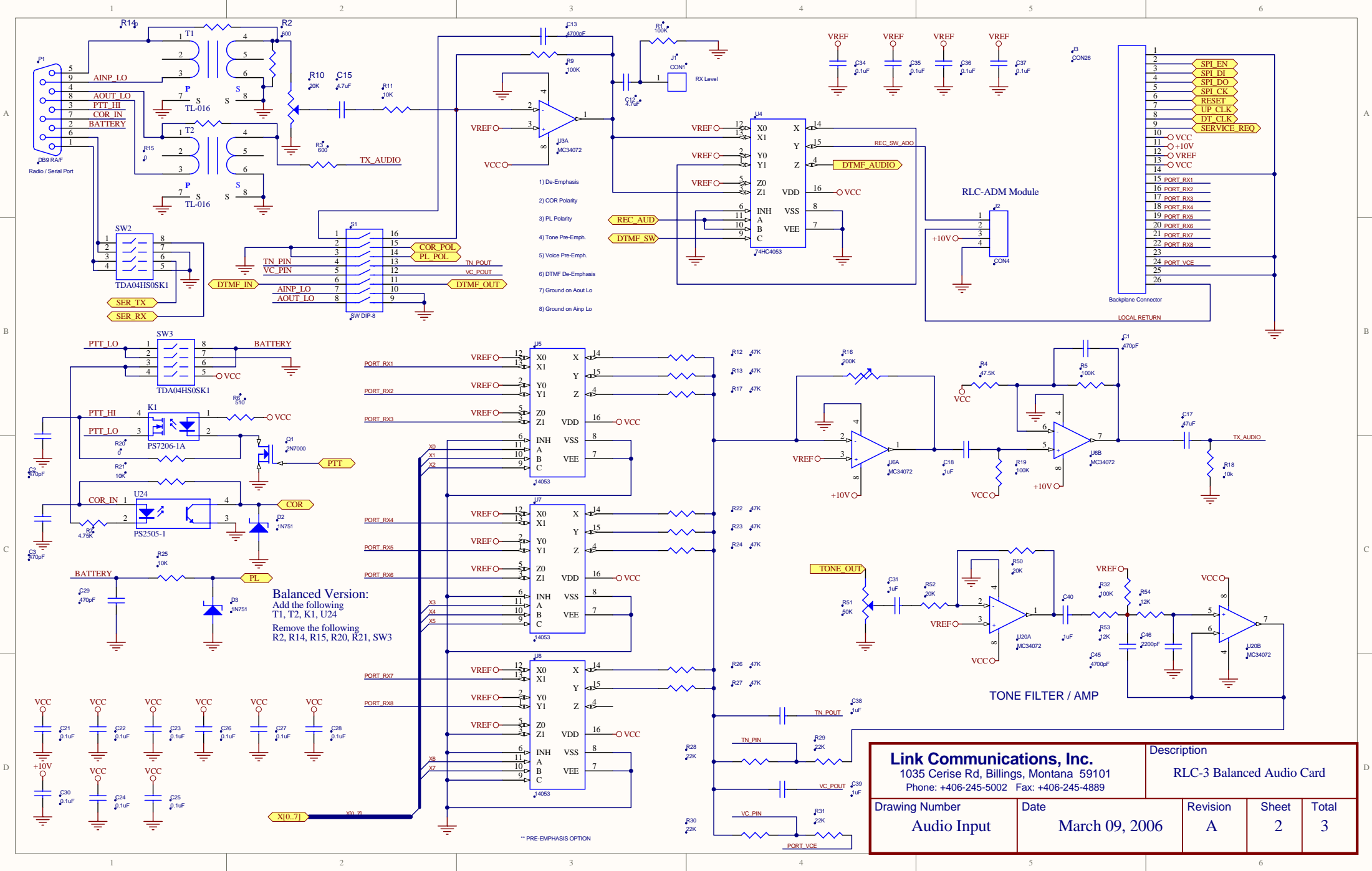
RLC-3 Balanced Audio
RLC-3_Card_Bal_Audio_A.SchDoc



RLC-3 Balanced Audio uProc
RLC-3_Card_Bal_uProc_A.SchDoc



| | | | | |
|--|------------------------|--|------------|------------|
| Link Communications, Inc. 1035 Cerise Rd, Billings, Montana 59101 Phone: +406-245-5002 Fax: +406-245-4889 | | Description RLC-3 Balanced Audio Card | | |
| Drawing Number uProcessor | Date Sept. 24, 2005 | Revision A | Sheet 1 | Total 3 |

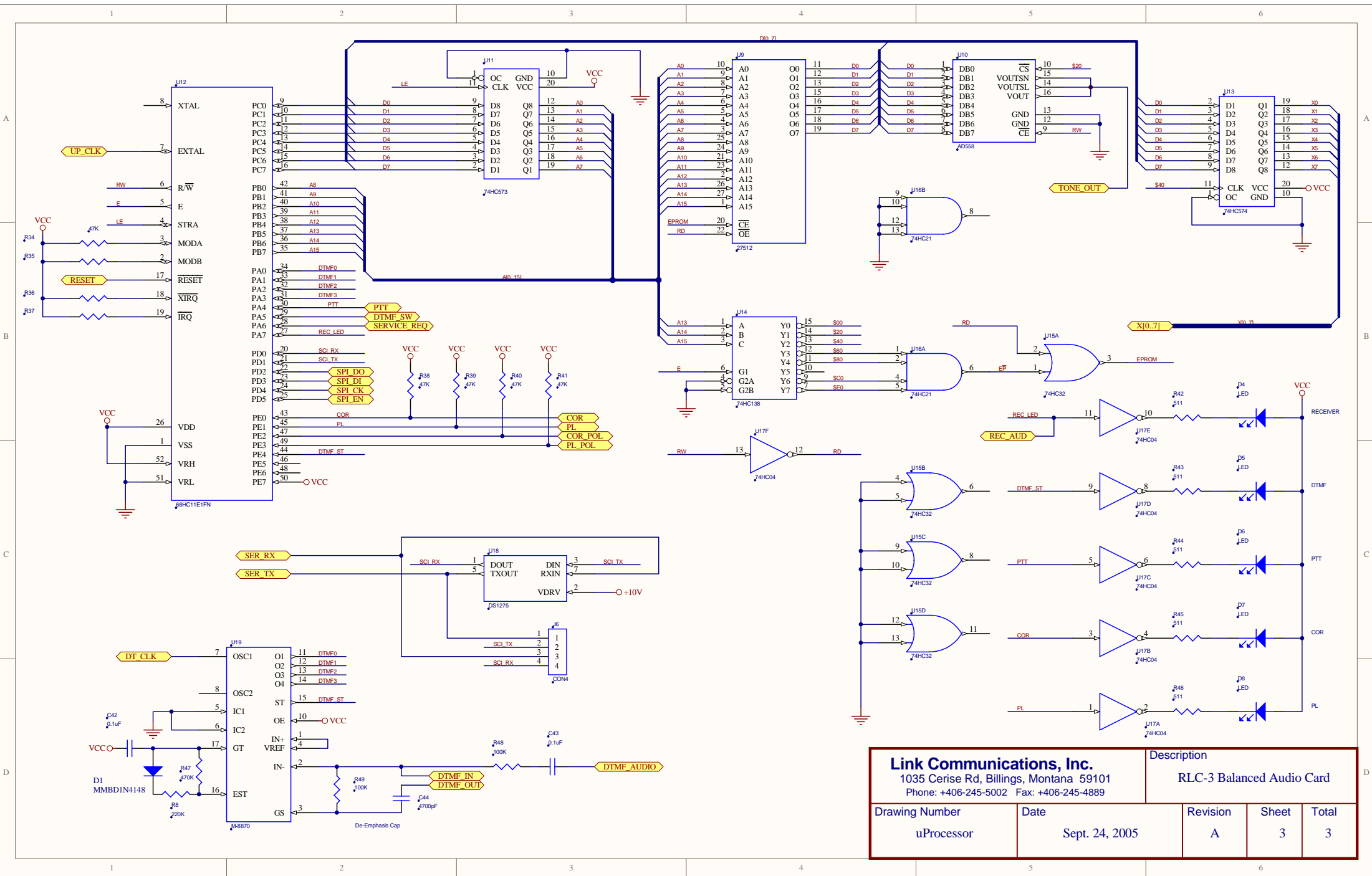


- 1) De-Emphasis
- 2) COR Polarity
- 3) PL Polarity
- 4) Tone Pre-Emph.
- 5) Voice Pre-Emph.
- 6) DTMF De-Emphasis
- 7) Ground on Aout Lo
- 8) Ground on Ainp Lo

Balanced Version:
 Add the following
 T1, T2, K1, U24
 Remove the following
 R2, R14, R15, R20, R21, SW3

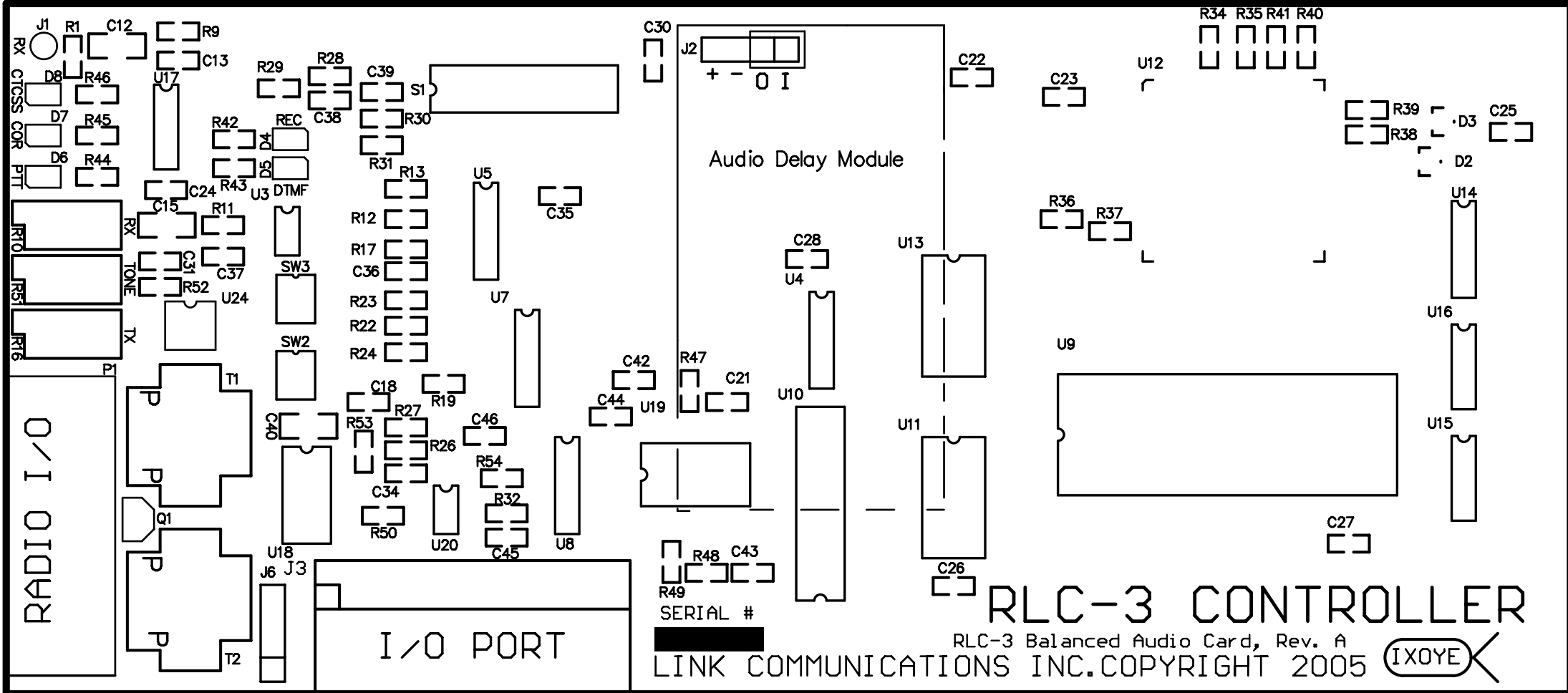
| | | | | |
|--|-------------------------------|---|-------------------|-------------------|
| Link Communications, Inc. 1035 Cerise Rd, Billings, Montana 59101 Phone: +406-245-5002 Fax: +406-245-4889 | | Description RLC-3 Balanced Audio Card | | |
| Drawing Number Audio Input | Date March 09, 2006 | Revision A | Sheet 2 | Total 3 |

*** PRE-EMPHASIS OPTION



| | | | | |
|--|-------------------------------|---|-------------------|-------------------|
| Link Communications, Inc. 1035 Cerise Rd, Billings, Montana 59101 Phone: +406-245-5002 Fax: +406-245-4889 | | Description RLC-3 Balanced Audio Card | | |
| Drawing Number uProcessor | Date Sept. 24, 2005 | Revision A | Sheet 3 | Total 3 |

Top Component Layer



RLC-3 CONTROLLER

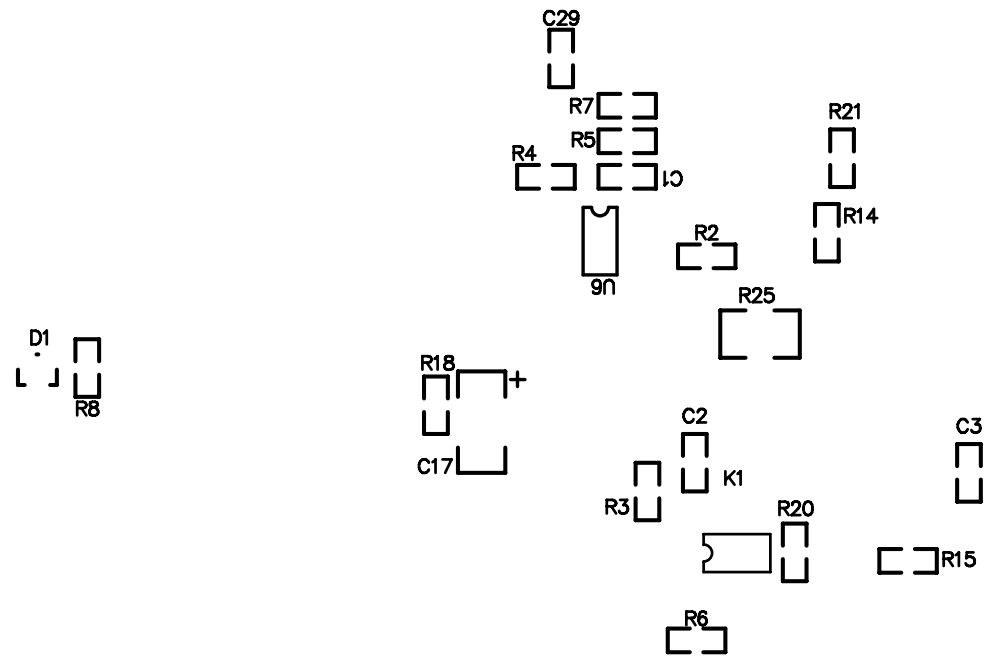
RLC-3 Balanced Audio Card, Rev. A

LINK COMMUNICATIONS INC. COPYRIGHT 2005



SERIAL #
[REDACTED]

Bottom Component Layer



Bill of Material for RLC-3_Card_Balanced_A1.PCBDOC

| Comment | Pattern | Quantity | Components |
|--------------|------------|----------|--|
| 0.1uF | 0805 | 15 | C21, C22, C23, C24, C25, C26 C27, C28, C30, C34, C35, C36 C37, C42, C43 |
| 0 | 0805 | 3 | R14, R15, R20 |
| 100K | 0805 | 7 | R1, R5, R9, R19, R32, R48 R49 |
| 10K | 1210 | 1 | R25 |
| 10K | 0805 | 3 | R11, R18, R21 |
| 12K | 0805 | 2 | R53, R54 |
| CD14053 | SO-16 | 3 | U5, U7, U8 |
| 1uF | 1206 | 1 | C40 |
| 1uF | 0805 | 4 | C18, C31, C38, C39 |
| 200K | VR5 | 1 | R16 |
| 20K | 0805 | 2 | R50, R52 |
| 20K | VR5 | 1 | R10 |
| 2200pF | 0805 | 1 | C46 |
| 220K | 0805 | 1 | R8 |
| 22K | 0805 | 4 | R28, R29, R30, R31 |
| 27C512-100 | DIP28 | 1 | U9 |
| 2N7000 | TO-92F | 1 | Q1 |
| 4.75K | 0805 | 1 | R7 |
| 4.7uF | 1206 | 2 | C12, C15 |
| 47.5K | 0805 | 1 | R4 |
| 4700pF | 0805 | 3 | C13, C44, C45 |
| 470K | 0805 | 1 | R47 |
| 470pF | 0805 | 4 | C1, C2, C3, C29 |
| 47K | 0805 | 16 | R12, R13, R17, R22, R23, R24 R26, R27, R34, R35, R36, R37 R38, R39, R40, R41 |
| 47uF | 2010 | 1 | C17 |
| 50K | VR5 | 1 | R51 |
| 511 | 0805 | 6 | R6, R42, R43, R44, R45, R46 |
| 600 | 0805 | 2 | R2, R3 |
| 68HC11E1FN | PJLCC52 | 1 | U12 |
| 74HC04DW | SO-14 | 1 | U17 |
| 74HC138DW | SO-16 | 1 | U14 |
| 74HC21DW | SO-14 | 1 | U16 |
| 74HC32DW | SO-14 | 1 | U15 |
| 74HC4053DW | SO-16 | 1 | U4 |
| 74HC573DW | SOL-20 | 1 | U11 |
| 74HC574DW | SOL-20 | 1 | U13 |
| AD558JN | DIP16 | 1 | U10 |
| CON1 | CON1 | 1 | J1 |
| CON26 | IDC26 | 1 | J3 |
| CON4 | SIP4 | 2 | J2, J6 |
| DB9 RA/F | DB9RA/F | 1 | P1 |
| DS1275 | DIP8 | 1 | U18 |
| LED | LEDSMD1 | 5 | D4, D5, D6, D7, D8 |
| M-8870 | SOL-18 | 1 | U19 |
| MC34072DW | SO-8 | 3 | U3, U6, U20 |
| MMBZX55-C5V1 | SOT-23D | 2 | D2, D3 |
| MMBD1N4148 | SOT-23D | 1 | D1 |
| PS2505-1 | DIP-4 | 1 | U24 |
| PS7206-1A | SOP-4 | 1 | K1 |
| SW DIP-8 | SMT SW 8 | 1 | S1 |
| TDA04HS0SK1 | TDA04H0SK1 | 2 | SW2, SW3 |
| TL-019 | XFORM | 2 | T1, T2 |

Optoisolator

DIP Switch

S1 Switch Settings for the RLC-3 Balanced Audio Card

1) De-Emphasis

Receiver De-Emphasis Circuit:
On - Discriminator Audio Feed
Off - Speaker Audio Feed (Default)

2) COR Polarity

Receiver COR Polarity:
ON - Active Low COR (Default)
Off - Active High COR

3) PL Polarity

Receiver PL Polarity:
ON - Active Low PL (Default)
Off - Active High PL

4) Tone Pre-Emph.

Tone Pre-Emphasis:
ON - Generated Tones are Pre-Emphasized
Off - Generated Tones are Flat (Default)

5) Voice Pre-Emph.

Voice Pre-Emphasis:
ON - Generated Voice is Pre-Emphasized
Off - Generated Voice is Flat (Default)

6) DTMF De-Emphasis

DTMF Decoder De-Emphasis:
ON - When running Discriminator audio
Off - When running Speaker Audio (Default)

7) Ground on Aout Lo

Ground on Audio Out Lo:
On - Grounds Pin 8 on DB-9 (Default)
Off - Isolates Pin 8 on DB-9

8) Ground on Ainp Lo

Ground on Audio Input Lo:
On - Grounds Pin 9 on DB-9 (Default)
Off - Isolates Pin 9 on DB-9

Switch SW2 controls the ports serial port

When not using the serial port, configure the switches as follows:

Switch 1 = Off
Switch 2 = On
Switch 3 = Off
Switch 4 = On

When using the serial port, configure the switches as follows:

Switch 1 = On
Switch 2 = Off
Switch 3 = On
Switch 4 = Off

Switch SW3 controls the balanced audio settings

When the card is configured for non-balanced audio, the switches are set as follows (If SW3 is loaded):

Switch 1 = Off
Switch 2 = Off
Switch 3 = Off
Switch 4 = Off

When the card is configured and built for balanced audio, transformers and SW3 will be loaded.

When configuring the balanced card for external battery input, the battery is connected to pin 2 on the DB-9 connector. Configure the switches as follows to battery reference the COR and PTT circuits.

Switch 1 = On
Switch 2 = Off
Switch 3 = On
Switch 4 = Off

When configuring the balanced card for RLC-3 controller voltage references configure the switches as follows:

Switch 1 = Off
Switch 2 = On
Switch 3 = Off
Switch 4 = On

If you need a higher voltage to reference the COR input opto-isolator, connect the higher voltage to DB-9 pin 2, and make the following switch changes. This change only effects the COR input.

Switch 3 = On
Switch 4 = Off