Instruction Manual

TTP216 Series
Multi-Frequency
Tone Termination Panel
1/2013

CPI Communications 941 Hensley Lane Wylie, Texas 75098
Phone (972)429-7160 (800)869-9128 Fax (972)429-7165 (888) 437-5360 www.cpicomm.com

TTP216 Specifications

Specifications: Subject to change without notice

Size:	5.5" wide 1.5" high 7.5" length
Weight:	1.6 lbs.
Connections:	modular and screw terminals to phone line (remote) modular and screw terminal to radio modular desk microphone connection
Input voltage:	+12 to +13.8 VDC @150mA (18 mA idle)
Line impendence:	600 ohms
Line output to phone line	+10 dBm max. preset to 0 dBm
Line output from phone line	-40 dBm to +10 dBm (function tone referenced)
RX input from radio:	70 mVrms or greater
Notch filter:	2175 down 50 dB from 1000 Hz reference
Control tones:	Guard tone = 2175 Hz for 40 mS Function tones F1 = 1950 Hz for 40 mS F2 = 1850 Hz for 40 mS F3 = 1750 Hz for 40 mS F4 = 1650 Hz for 40 mS F5 = 1550 Hz for 40 mS F6 = 1450 Hz for 40 mS F7 = 1350 Hz for 40 mS F8 = 1250 Hz for 40 mS F9 = 1150 Hz for 40 mS F10 = 1050 Hz for 40 mS F11 = 950 Hz for 40 mS F12 = 850 Hz for 40 mS F13 = 750 Hz for 40 mS F14 = 650 Hz for 40 mS F15 = 550 Hz for 40 mS F16 = 450 Hz for 40 mS Monitor = 2050 Hz for 40 mS Hold Tone = 2175 Hz for duration of PTT
Control function outputs:	PTT and Monitor selection are form "C" relay contacts. 1 amp @ 30 VDC F1/F2 are form "C" relay contact or open collector F3-F16 are open collector

I. Connectors

connector	location	function
J1	front panel	connects to local mic when modular interconnection configuration is used
J2	front panel	connects to radio when modular interconnection configuration is used
J3	back panel	connects to remotes
J4	board, rear	auxiliary 2-wire or 4-wire RX connection to remotes auxiliary 12 Volt D.C. supply connection
J5	board, rear	auxiliary 4-wire TX connection to remotes
J6, J7	board, front	connects to radio and local mic when hand-wired interconnection configuration is used

II. Connector Pinouts

pin	function
J1-1	n.c.
J1-2	n.c.
J1-3	Local Mic PTT output
J1-4	Local Mic Audio output
J1-5	ground
J1-6	Local Mic Monitor output
J1-7	n.c.
J1-8	n.c.

pin	function
J2-1	Radio RX Audio output
J2-2	n.c.
J2-3	Radio PTT input
J2-4	Radio TX Modulation input
J2-5	ground
J2-6	Radio Monitor input
J2-7	Radio F1/F2 input
J2-8	n.c.

pin	function
J3-1	n.c.
J3-2	4-Wire TX
J3-3	2-Wire; 4-Wire RX
J3-4	2-Wire; 4-Wire RX
J3-5	4-Wire TX
J3-6	n.c.

pin	function
J4-1	power supply ground
J4-2	+12 Volts D.C. input
J4-3	2-Wire; 4-Wire RX
J4-4	2-Wire; 4-Wire RX

pin	function
J5-1	4-Wire TX
J5-2	n.c.
J5-3	4-Wire TX

pin	function
J6-1	+12 Volts D.C. input
J6-2	power supply ground
J6-3	PTT output
J6-4	RX Audio input
J6-5	Monitor relay output common
J6-6	Monitor relay output normally open
J6-7	Monitor relay output normally closed
J6-8	TX Modulation output
J6-9	Local Mic Audio input
J6-10	Squelch Control input

pin	function
J7-1	+12 Volts D.C. input
J7-2	power supply ground
J7-3	F1/F2 relay output common
J7-4	F1/F2 relay output normally open
J7-5	F1/F2 relay output normally closed
J7-6	F1 open-collector output
J7-7	F2 open-collector output
J7-8	F3 open-collector output
J7-9	F4 open-collector output
J7-10	F5 open-collector output

III. Front Panel Indicators

indicator	color	function
PTT	red	PTT on
MON	green	Monitor on
F1	yellow	F1/BCD0 output on (open collector low)
F2	yellow	F2/BCD1 output on (open collector low)
F3	yellow	F3/BCD2 output on (open collector low)
F4	yellow	F4/BCD3 output on (open collector low)
F5	yellow	F5/BCD4 output on (open collector low)

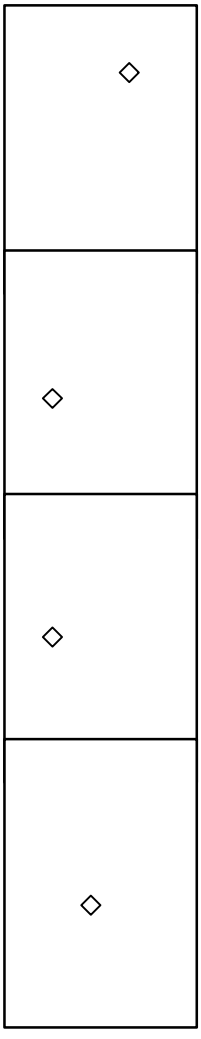
IV. Front Panel Adjustments

adjustment	trimpot	location	function
RX AUD	R105	front panel	adjusts radio RX audio output level to remotes
TX MOD	R106	front panel	adjusts remote audio level to radio TX modulation input *
MIC AUD	R107	front panel	adjusts local mic level to remotes
LINE AUD	R108	front panel	adjusts remote line audio level for all termination panel functions *
BALANCE	R104	circuit board	sets hybrid balance of remote line

* adjustment is affected by JP2 setting

V. Option Settings

Options are selected by setting jumpers. Pin 1 of each jumper group is toward the left side or the back of the board, depending upon its orientation in the layout. The following descriptions show the position of each jumper on the board when the board is positioned with the front to the bottom of the illustration.



JP1 2-Wire / 4-Wire Select

Selects remote line interface

1-2 (default) selects 2-wire interface

2-3 selects 4-wire interface

JP2 Line Audio Gain Mode

Selects Manual or Automatic Line Audio Gain

1-2 (default) selects automatic gain control

2-3 selects manual gain control -- use Line Aud (R108) to adjust.

JP3 Mod Out Source Impedance

Selects low or high Mod Out impedance

1-2 (default) selects low impedance (nominal 600 Ohms)

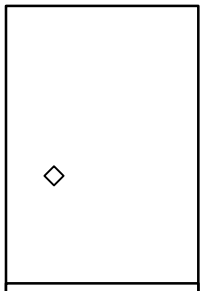
2-3 selects high impedance (47K Ohms)

JP4 Local Mic Audio Gain

Selects gain of the Local Mic amplifier

1-2 (default) selects low gain

2-3 selects high gain

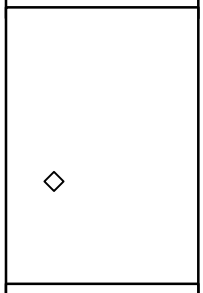


JP5 Squelch Control Mode

Selects Squelch Control input logic level

1-2 (default) mute RX Audio when input low

2-3 mute RX Audio when input high

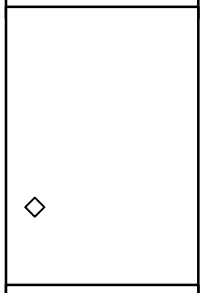


JP6 RX Audio Gain

Selects gain of the RX Audio amplifier

1-2 (default) selects low gain

2-3 selects high gain

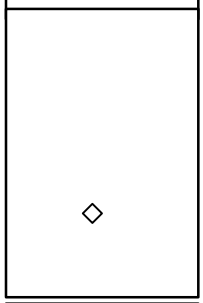


JP7 PTT Keying

Selects PTT Keying output

1-2 (default) key = ground; unkey = open

2-3 key = +12 Volts; unkey = open

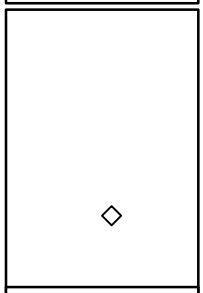


JP8 **Local Mic Audio Control**

Selects Local Mic Muting logic during remote PTT -- should be set the same as JP7

1-2 (default) key to ground

2-3 key to + voltage (≥ 5 Volts D.C.)

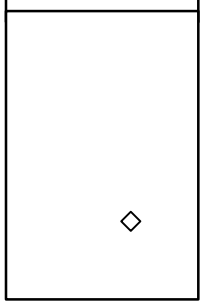


JP9 F1 / F2 Ground

Selects internal ground on F1 / F2 output

1-2 (default) internal ground disabled

2-3 internal ground enabled

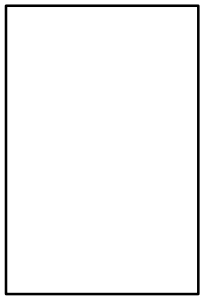


JP10 F1 / F2 Relay

Selects F1 / F2 output relay

1-2 (default) relay enabled -- use F1/F2 outputs at J2, J7

2-3 relay disabled -- use F1/BCD0 output at J7

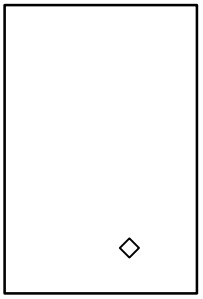


JP11 Monitor With PTT

Selects automatic Monitor with all remote PTT's

1-2 (default) automatic monitor disabled

2-3 automatic monitor enabled

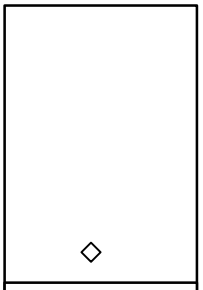


JP12 Monitor Mode

Selects duration of monitor output

1-2 (default) latched -- on with Monitor command; off with PTT

2-3 momentary on with Monitor command

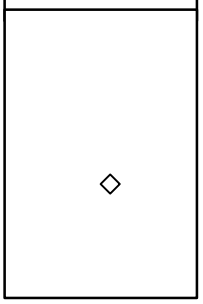


JP13 Monitor Ground

Selects internal ground on Monitor output

1-2 (default) internal ground disabled

2-3 internal ground enabled



JP14 Local Mic Termination

Selects Local Mic biasing and input resistance

1-3 (default) no termination

1-2 +12 Volt bias; R86 sets input resistance

3-4 input to ground; R86 sets resistance

VI. J1 and J2 Configuration Settings

Jumper groups E1-x and E2-x directly enable configuration of the J1 and J2 connectors. Alternatively, connectors E1 and E2 can be manually wired in any configuration.

jumper	jack	signal
E1-1	J1 - Local Mic	
E1-2	J1 - Local Mic	
E1-3	J1 - Local Mic	PTT
E1-4	J1 - Local Mic	Mic Audio
E1-5	J1 - Local Mic	Ground
E1-6	J1 - Local Mic	Monitor
E1-7	J1 - Local Mic	
E1-8	J1 - Local Mic	
E2-1	J2 - Radio	RX Audio
E2-2	J2 - Radio	
E2-3	J2 - Radio	PTT
E2-4	J2 - Radio	TX Mod
E2-5	J2 - Radio	Ground
E2-6	J2 - Radio	Monitor
E2-7	J2 - Radio	F1/F2
E2-8	J2 - Radio	

VII. Programming

A. Hardware

The programming hardware is located on the right-hand side of the circuit board, and consists of Tone Select pushbutton S1, eight-position DIP switch S2 and a row of twenty LED's, identified with the numbers 450 through 1950 (EIA Tone LED's) and the letters A through D (ABCD LED's). Functions of the individual S2 DIP switch sections are as follows:

OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
ON	ON	ON	ON	ON	ON	ON	ON
8	7	6	5	4	3	2	1
Y	X	F5	F4	F3	F2	F1	PROG

switch	function
S2-1	Program Mode Enable
S2-2	F1 select
S2-3	F2 select
S2-4	F3 select
S2-5	F4 select
S2-6	F5 select
S2-7	X
S2-8	Y

B. Options

The TTP200 is programmed by selecting a pre-programmed "EIA Tone-to-Output" assignment pattern, or "Pre-Set." Pre-Sets are available for several different output options:

1. Discrete 1 of 5 Outputs

Pre-Sets 1 through x assign the 16 standard EIA tones to activate one, and only one, of the "Fx" outputs at a time.

2. Discrete "Split" Outputs

Pre-Sets x though y split the five "Fx" outputs into two groups, one containing " 1 of 3" outputs F1 through F3 and the other containing "1 of 2" outputs F4 and F5.

3. Discrete "Wildcard" Outputs

Pre-Sets x though y establish outputs F1 through F4 as discrete outputs and use F5 as a "wild card" output that toggles independently of the other outputs.

4. BCD Output

Pre-Sets x through y produce a BCD output based on the 16 EIA tones.

5. Customized Output

Once a Pre-Set has been loaded, it can be customized by manually re-programming some or all of the individual EIA Tone-to-Output assignments. Blank Pre-Sets are provided for each of the four output types (three discrete and one binary) to facilitate building up custom EIA Tone-to-Output assignments "from scratch."

6. Inverted Output

Leaving S2-2 (F1) ON during normal operation inverts the "Fx" outputs.

C. Settings and Procedures

1. S2 Setting -- Normal Operation:

OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
8	7	6	5	4	3	2	1
Y	X	F5	F4	F3	F2	F1	PROG

2. S2 Setting -- Inverted Outputs:

OFF	OFF	OFF	OFF	OFF	OFF		OFF
						ON	
8	7	6	5	4	3	2	1
Y	X	F5	F4	F3	F2	F1	PROG

3. To Check the Existing Program:

OFF	OFF	OFF	OFF	OFF	OFF	OFF	
		ON	ON	ON	ON	ON	ON
8	7	6	5	4	3	2	1
Y	X	F5	F4	F3	F2	F1	PROG

a. Turn the PROG switch ON.

b. During the first three seconds, the ABCD LED's indicate the number of the currently loaded Pre-Set in binary form. This indication flashes if the PRE-Set has been customized.

c. After the ABCD LED's go out, switches F1 through F5 can be used to select a specific output to be checked.

d. The front panel LED's and the EIA Tone LED's indicate individual EIA Tone-to-Output assignment of the selected Output.

e. Normal operation resumes when all switches are returned to the OFF position. The existing settings are not modified.

4. To Load a Pre-Set:

OFF		OFF	OFF	OFF	OFF	OFF	
	ON						ON
8	7	6	5	4	3	2	1
Y	X	F5	F4	F3	F2	F1	PROG

a. Turn the X switch ON.

b. Turn the PROG switch ON.

c. The ABCD LED's indicate Pre-Set number in binary form, starting with 0001.

d. Use the Tone Select pushbutton to step through the Pre-Sets. Press and release the Tone Select pushbutton to advance to the next Pre-Set. Stop when the number of the desired Pre-Set is indicated in binary form on the ABCD LED's.

e. To complete loading of the Pre-Set:

i. Turn the X switch OFF.*

ii. Turn the PROG switch OFF.*

The TTP200 will then return to normal operation.

**Turning the PROG switch OFF before turning the X switch OFF exits the Load function without saving the new Pre-Set.*

Example: Loading Pre-Set #3

a. Turn the X switch ON.

b. Turn the PROG switch ON.

c. Press and release the Tone Select pushbutton until the ABCD LED's indicate the number "3" in binary form, that is,

LED A = ON
LED B = ON
LED C = OFF
LED D = OFF.

d. Turn the X switch OFF.

e. Turn the PROG switch OFF.

f. The TTP200 is now ready for use.

5. To Customize the Existing EIA Tone-to-Output Assignment:

	OFF	OFF	OFF	OFF	OFF	OFF	
ON		ON	ON	ON	ON	ON	ON
8	7	6	5	4	3	2	1
Y	X	F5	F4	F3	F2	F1	PROG

A customized EIA Tone-to-Output Assignment is created by first loading a standard Pre-Set, then re-assigning as many outputs as desired to new EIA Tone values. It is also possible to un-assign outputs from the loaded Pre-Set. Blank Pre-Sets are available for use in building a customized EIA Tone-to-Output pattern "from scratch."

a. Turn the Y switch ON.

b. Turn the PROG switch ON.

c. Use switches F1 through F5 to select a specific discrete output or binary pattern to be re-assigned or un-assigned.

d. The front panel LED's and the EIA Tone LED's indicate individual EIA Tone-to-Output assignments.

When the EIA Tone LED for the selected Output lights, use the Tone Select pushbutton to step through the EIA Tones. Press and release the Tone Select pushbutton to advance the EIA Tone LED's to the next Tone. Stop when the desired Tone is indicated. (After the "450" EIA Tone is indicated, continued pressing of the Tone Select switch will continue with the "1950" Tone.)

A step is provided between EIA Tones "450" and "1950" in which no EIA LED's are lit. Stopping at this step un-assigns the selected Output from its EIA Tone. **While an output is unassigned, it will not respond to any of the EIA frequencies.**

The "Fx" pattern "00000" cannot be assigned an EIA Tone when using Discrete 1 of 5 or Discrete Split Pre-Sets.

When a Discrete Wildcard Pre-Set is used, a special condition exists for re-assigning the F5 "Wildcard" output. The "ON" EIA Tone LED for F5 lights when switch F5 is ON and switches F1 through F4 are OFF. The "OFF" EIA Tone LED for F5 lights when switches F1 through F5 are all OFF. To change the EIA Tone of either the ON or OFF function, press and release the Tone Select pushbutton while the appropriate F1 through F5 switch arrangement is set up. Stop when the desired new EIA Tone is reached. Output F5 cannot be unassigned when a Discrete Wildcard Pre-Set is used.

e. After re-assigning or un-assigning an Output, either return to step c. to select another discrete output or binary pattern, or save the newly the customized assignments by:

i. Turning the Y switch OFF.*

ii. Turning the PROG switch OFF.*

The TTP200 will then return to normal operation.

**Turning the PROG switch OFF before turning the Y switch OFF exits the Customize function without saving the new custom settings.*

Example1: Re-Assign A Discrete One-of-Five Output from One EIA Tone to Another EIA Tone

After loading Pre-Set #2:

a. Turn the Y switch ON.

b. Turn the PROG switch ON.

c. Turn the F1 switch (S2-2) ON and switches F2 through F5 (S2-3 through S2-6) OFF.

d. With the 1950 EIA Tone LED lit, press and release the Tone Select pushbutton until the 1650 EIA Tone LED lights.

e. Turn the Y switch OFF.

f. Turn the PROG switch OFF.

g. The Discrete Output F1 will now be switched ON upon reception of the 1650 EIA Tone instead of the 1950 EIA Tone.

Example2: Un-Assign A Discrete Split Output from Its EIA Tone

After loading Pre-Set #5:

a. Turn the Y switch ON.

b. Turn the PROG switch ON.

c. Turn the F2 switch (S2-3) ON and switches F1 (S2-2) and F3 through F5 (S2-4 through S2-6) OFF.

d. With the 1850 EIA Tone LED lit, press and release the Tone Select pushbutton until the "450" EIA Tone LED goes out and no other EIA Tone LED's are lit.

e. Turn the Y switch OFF.

f. Turn the PROG switch OFF.

g. The Discrete Split output F2 will now be unresopnsive to the reception of EIA Tones.

Example 3: Re-Assign the Discrete Wildcard F5 Output "OFF" Command from One EIA Tone to Another EIA Tone

After loading Pre-Set #8:

a. Turn the Y switch ON.

b. Turn the PROG switch ON.

c. Turn F1 through F5 (S2-2 through S2-6) OFF.

d. While the F5 "OFF" LED (1050) is lit, press and release the Tone Select pushbutton until the 1150 EIA Tone LED lights.

e. Turn the Y switch OFF.

f. Turn the PROG switch OFF.

g. The F5 Wildcard function will now switch OFF upon reception of the 1150 EIA Tone instead of the 1050 EIA Tone.

D. Pre-Set EIA Tone-to-Output Assignments

Discrete 1 of 5 Outputs - when an assigned EIA Tone is received, its output is turned ON and all other outputs are turned OFF:

Pre-Set Number	LED indication
1	A = on ! B = off # C = off # D = off #
Output Line	EIA Tone
F1	1950
F2	1850
F3	1350
F4	1250
F5	1150

Pre-Set Number	LED indication
2	A = off # B = on ! C = off # D = off #
Output Line	EIA Tone
F1	1950
F2	1850
F3	1350
F4	1250
F5	not assigned

Blank Pre-Set #4 is provided to facilitate building up a Discrete 1 of 5 Output set "from scratch":

Pre-Set Number	LED indication
3	A = on ! B = on ! C = off # D = off #
Output Line	EIA Tone
F1	1950
F2	1850
F3	1750
F4	1650
F5	1550

Pre-Set Number	LED indication
4	A = off # B = off # C = on ! D = off #
Output Line	EIA Tone
F1	not assigned
F2	not assigned
F3	not assigned
F4	not assigned
F5	not assigned

Discrete Split Outputs - Outputs are split into two groups. When an assigned EIA Tone in either group , its output is turned ON and all other outputs in that group are turned OFF:

Pre-Set Number	LED indication
5	A = on ! B = off # C = on ! D = off #
Output Line	EIA Tone
F1 - group a	1950
F2 - group a	1850
F3 - group a	not assigned
F4 - group b	1450
F5 - group b	1550

Pre-Set Number	LED indication
6	A = off # B = on ! C = on ! D = off #
Output Line	EIA Tone
F1 - group a	1950
F2 - group a	1850
F3 - group a	1750
F4 - group b	550
F5 - group b	450

Blank Pre-Set #7 is provided to facilitate building up a Discrete Split Output set “from scratch”:

Pre-Set Number	LED indication
7	A = on ! B = on ! C = on ! D = off #
Output Line	EIA Tone
F1 - group a	not assigned
F2 - group a	not assigned
F3 - group a	not assigned
F4 - group b	not assigned
F5 - group b	not assigned

Discrete Wildcard Outputs – When an EIA Tone assigned to F1 through F4 is received, its Output is turned ON and all other F1 through F4 outputs are turned OFF. Output F5 is turned ON by one EIA Tone and OFF by another EIA Tone:

Pre-Set Number	LED indication
8	A = off # B = off # C = off # D = on !
Output Line	EIA Tone
F1	1950
F2	1850
F3	1350
F4	1250
F5	1450 - on / 1550 - off

Pre-Set Number	LED indication
9	A = on ! B = off # C = off # D = on !
Output Line	EIA Tone
F1	1950
F2	1850
F3	not assigned
F4	not assigned
F5 - Wildcard	550 - on / 450 - off

Blank Pre-Set #10 is provided to facilitate building up a Discrete Split Output set “from scratch”:

Pre-Set Number	LED indication
10	A = off # B = on ! C = off # D = on !
Output Line	EIA Tone
F1	not assigned
F2	not assigned
F3	not assigned
F4	not assigned
F5	not assigned

Binary Four-Bit Outputs:

Pre-Set Number					LED indication
11					A = on ! B = on ! C = off # D = on !
Output Lines F1	F2	F3	F4	F5	EIA Tone
0	0	0	0	0	1950
1	0	0	0	0	1850
0	1	0	0	0	1750
1	1	0	0	0	1650
0	0	1	0	0	1550
1	0	1	0	0	1450
0	1	1	0	0	1350
1	1	1	0	0	1250
0	0	0	1	0	1150
1	0	0	1	0	1050
0	1	0	1	0	950
1	1	0	1	0	850
0	0	1	1	0	750
1	0	1	1	0	650
0	1	1	1	0	550
1	1	1	1	0	450

Pre-Set Number					LED indication
12					A = off # B = off # C = on ! D = on !
Output Lines F1	F2	F3	F4	F5	EIA Tone
1	0	0	0	0	1950
0	1	0	0	0	1850
1	1	0	0	0	1350
0	0	1	0	0	1250
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a
0	0	0	0	0	n/a

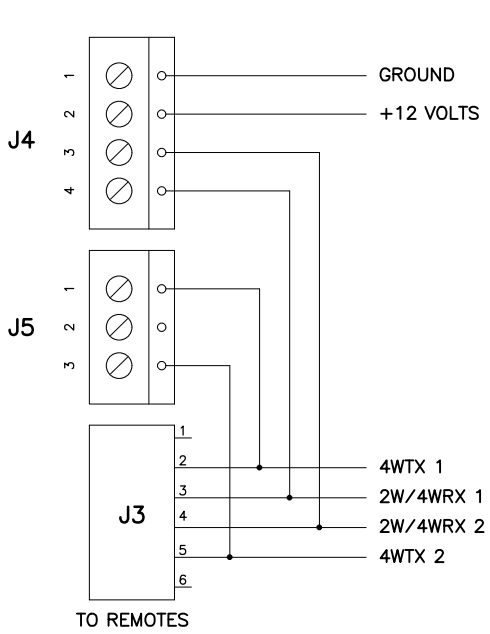
Binary Five-Bit Outputs:

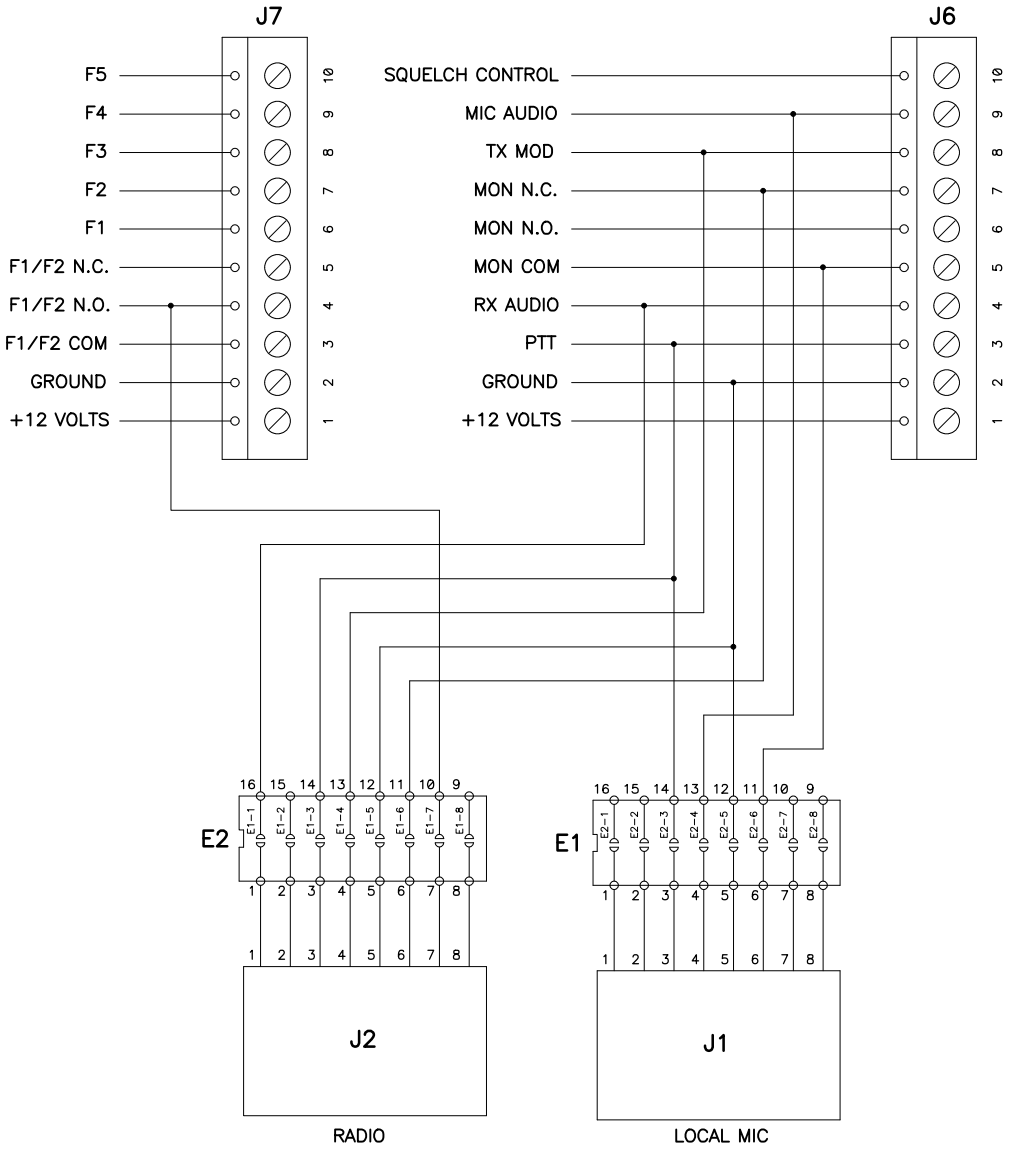
Pre-Set Number					LED indication
13					A = on ! B = off # C = on ! D = on !
Output Lines F1	F2	F3	F4	F5	EIA Tone
1	0	0	0	0	1950
0	1	0	0	0	1850
1	1	0	0	0	1750
0	0	1	0	0	1650
1	0	1	0	0	1550
0	1	1	0	0	1450
1	1	1	0	0	1350
0	0	0	1	0	1250
1	0	0	1	0	1150
0	1	0	1	0	1050
1	1	0	1	0	950
0	0	1	1	0	850
1	0	1	1	0	750
0	1	1	1	0	650
1	1	1	1	0	550
0	0	0	0	1	450

Pre-Set Number					LED indication
14					A = off # B = on ! C = on ! D = on !
Output Lines F1	F2	F3	F4	F5	EIA Tone
0	0	0	0	1	1950
1	1	1	1	0	1850
0	1	1	1	0	1750
1	0	1	1	0	1650
0	0	1	1	0	1550
1	1	0	1	0	1450
0	1	0	1	0	1350
1	0	0	1	0	1250
0	0	0	1	0	1150
1	1	1	0	0	1050
0	1	1	0	0	950
1	0	1	0	0	850
0	0	1	0	0	750
1	1	0	0	0	650
0	1	0	0	0	550
1	0	0	0	0	450

Blank Pre-Set #15 is provided to facilitate building up a Binary Output set “from scratch”:

Pre-Set Number					LED indication
15					A = on ! B = on ! C = on ! D = on !
Output Lines F1	F2	F3	F4	F5	EIA Tone
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned
0	0	0	0	0	not assigned





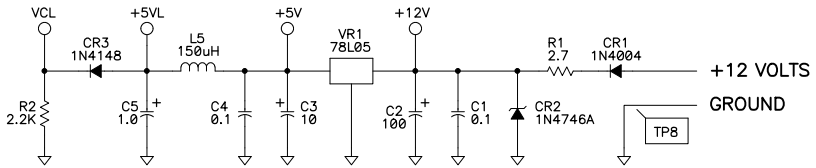
JUMPER SETTINGS

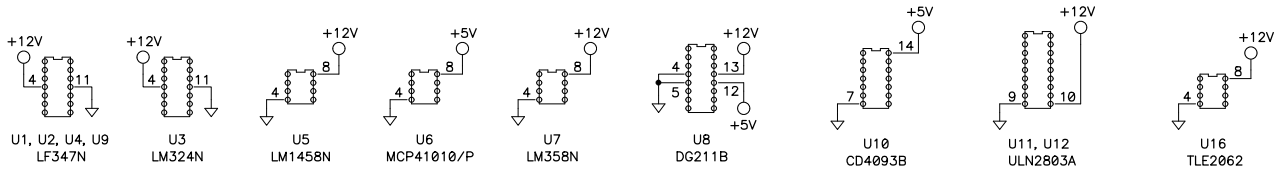
JUMPER	FUNCTION	1 TO 2	2 TO 3	
JP1	2 WIRE / 4 WIRE SELECT	2 WIRE	4 WIRE	
JP2	LINE LEVEL ADJUST	AUTO	MANUAL	
JP3	MOD OUT SOURCE Z	LOW	HIGH	
JP4	LOCAL MIC AUDIO GAIN	LOW GAIN	HIGH GAIN	
JP5	SQUELCH CONTROL MODE	LO MUTE	HI MUTE	
JP6	RX AUDIO GAIN	LOW GAIN	HIGH GAIN	
JP7	PTT KEYING	TO GROUND	TO +12 VOLTS	
JP8	LOCAL MIC AUDIO CONTROL	KEY TO GND	KEY TO + V	
JP9	F1 / F2 GROUND	DISABLED	ENABLED	
JP10	F1 / F2 RELAY	ENABLED	DISABLED	
JP11	MONITOR WITH PTT	DISABLED	ENABLED	
JP12	MONITOR MODE	LATCHED	MOMENTARY	
JP13	MONITOR GROUND	DISABLED	ENABLED	
JP14	LOCAL MIC TERMINATION	1 TO 3 NONE	1 TO 2 +12 VOLTS	3 TO 4 GROUND
E1	LOCAL MIC JACK JUMPERS	SEE MANUAL		
E2	RADIO JACK JUMPERS	SEE MANUAL		

CPI Communications Inc.
941 Hensley Lane
Wylie, TX 75098

TTP200 TONE TERMINATION PANEL

A	186	TTP200_s01.sch	MAIN BOARD
DATE: 05-31-01		SHEET 1 OF 7	

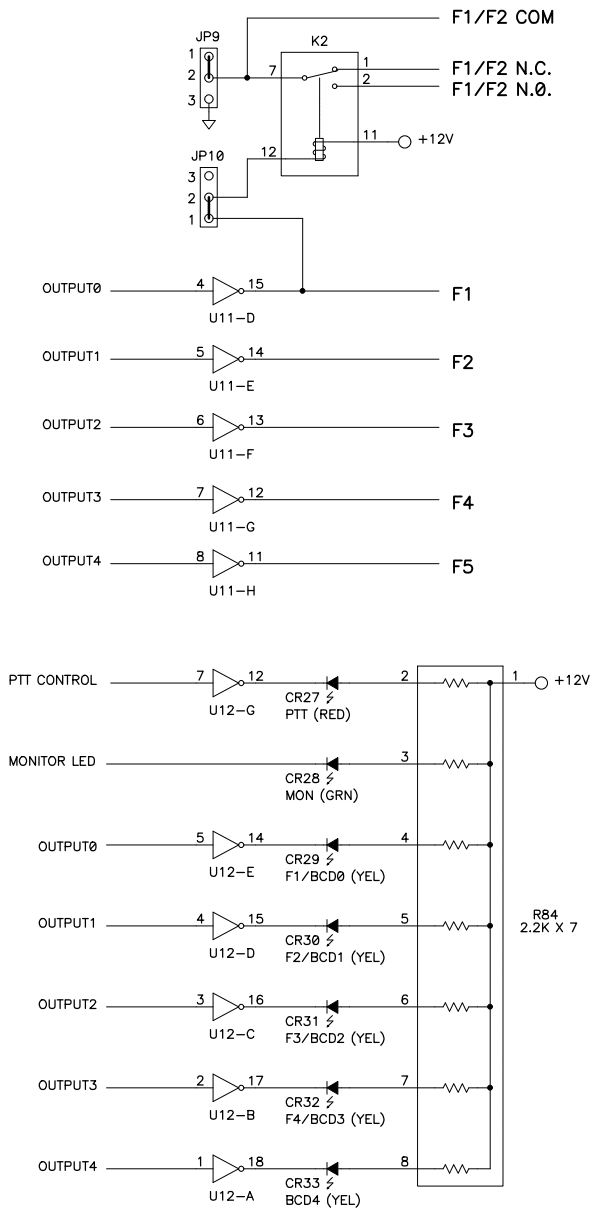


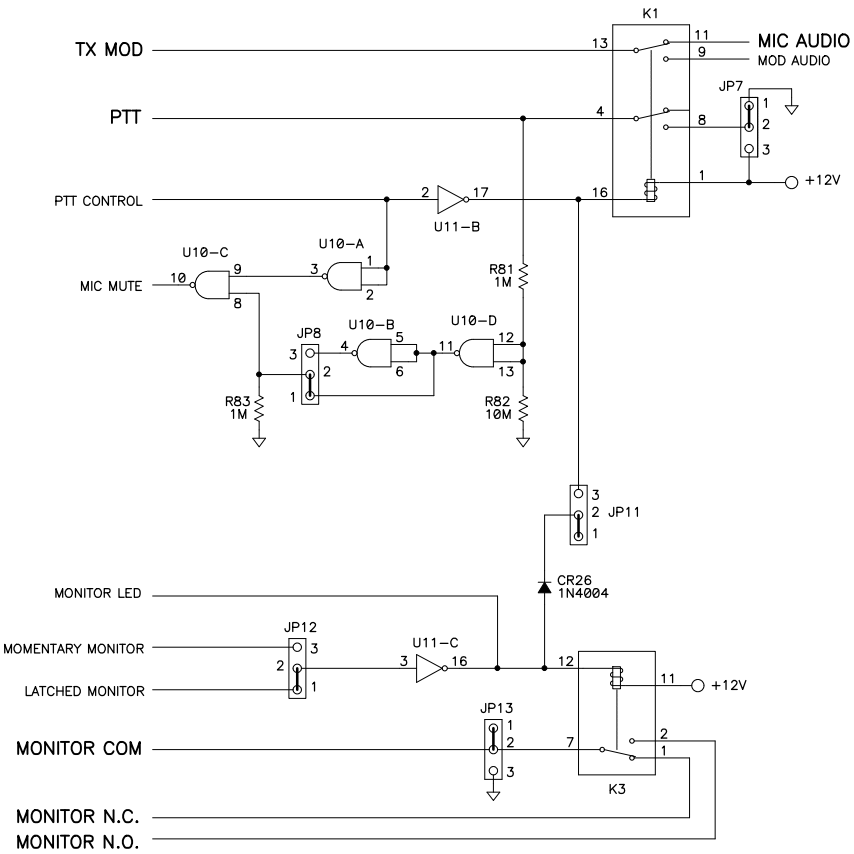


CPI Communications Inc.
941 Hensley Lane
Wylie, TX 75098

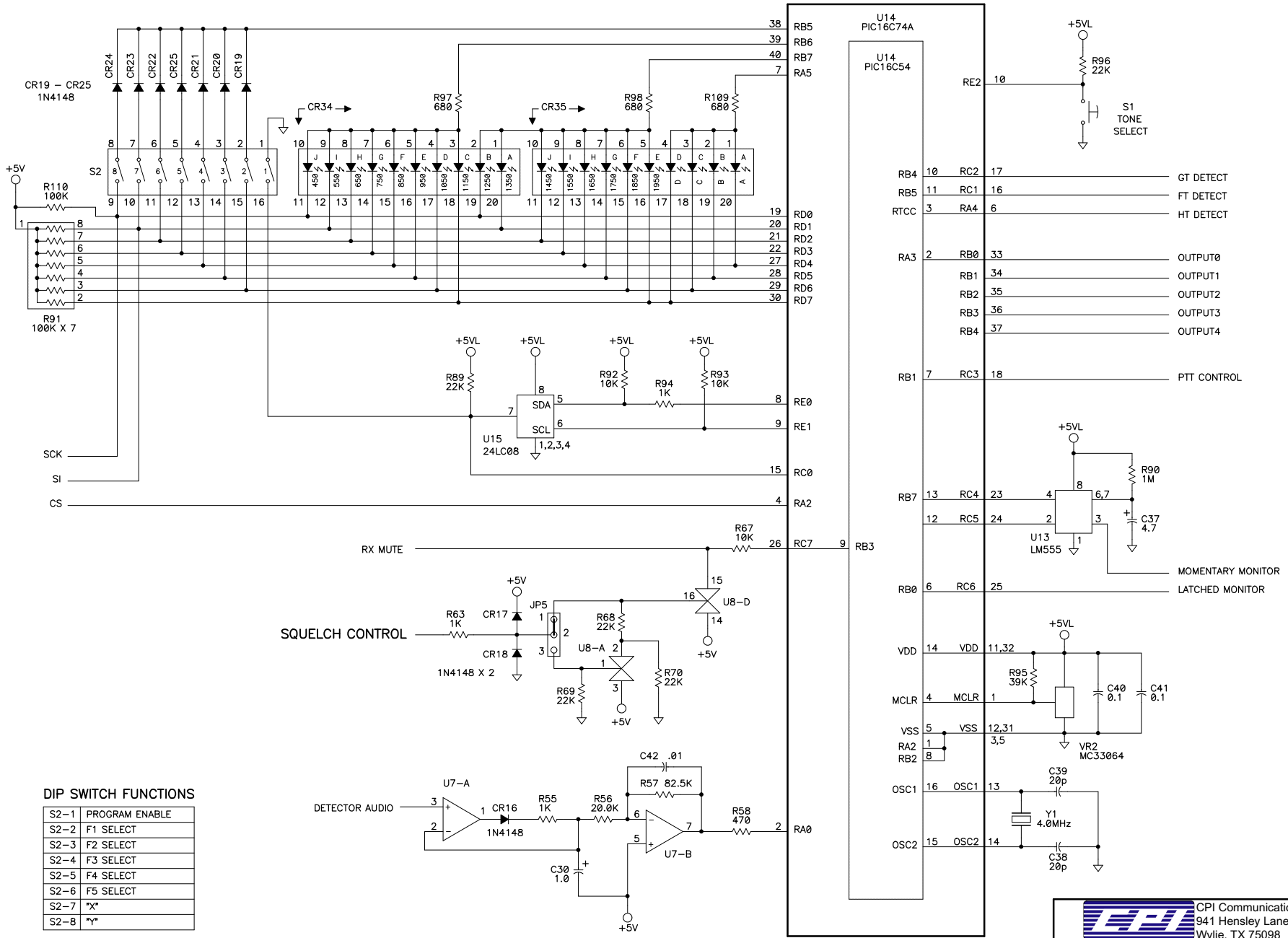
TTP200 TONE TERMINATION PANEL

A	186	TTP200_s02.sch	MAIN BOARD
DATE: 05-31-01		SHEET 2 OF 7	





CPI Communications Inc. 941 Hensley Lane Wylie, TX 75098			
TTP200 TONE TERMINATION PANEL			
A	186	TTP200_s03.sch	MAIN BOARD
DATE: 06-02-01		SHEET 3 OF 7	



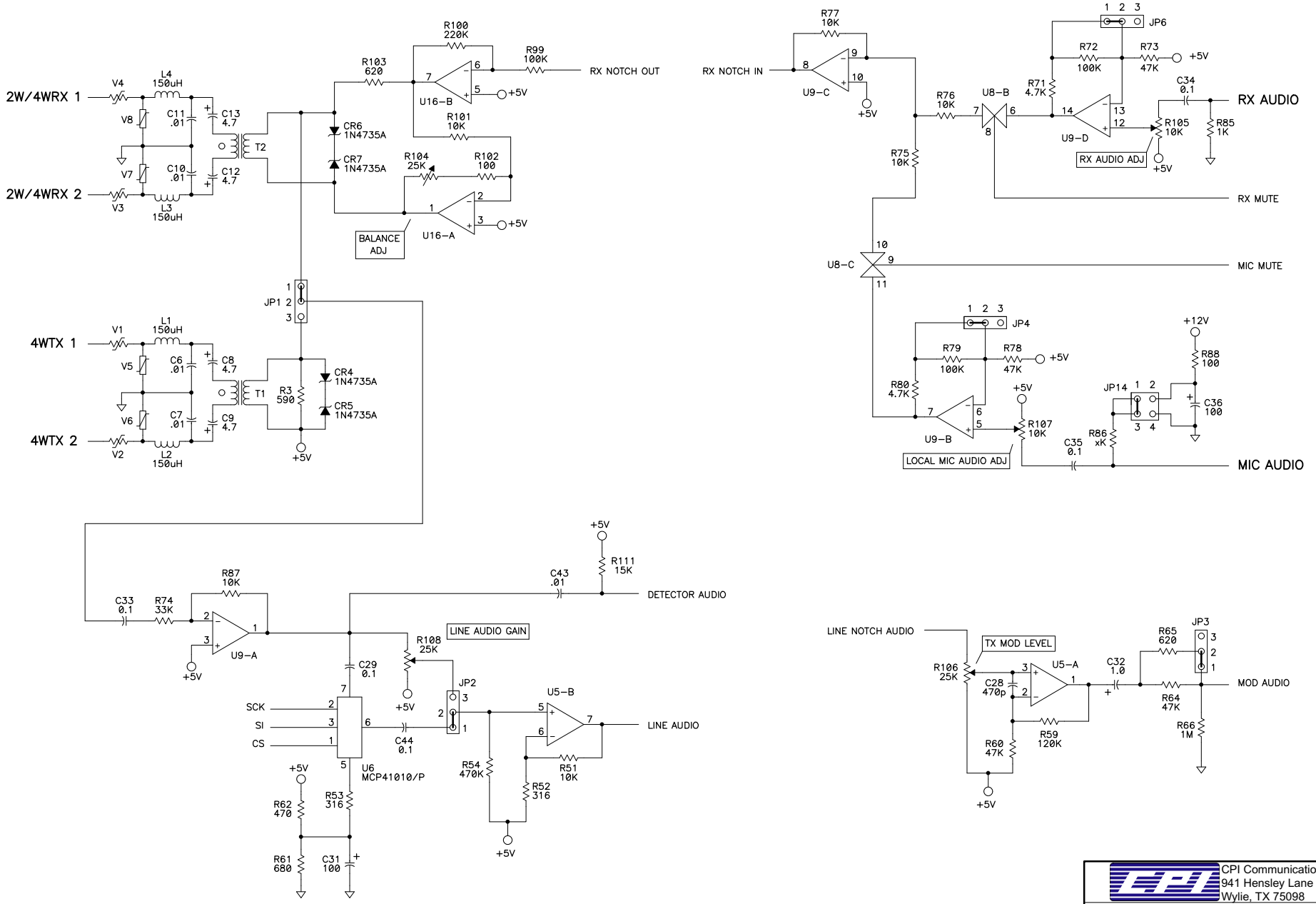
DIP SWITCH FUNCTIONS

S2–1	PROGRAM ENABLE
S2–2	F1 SELECT
S2–3	F2 SELECT
S2–4	F3 SELECT
S2–5	F4 SELECT
S2–6	F5 SELECT
S2–7	"X"
S2–8	"Y"

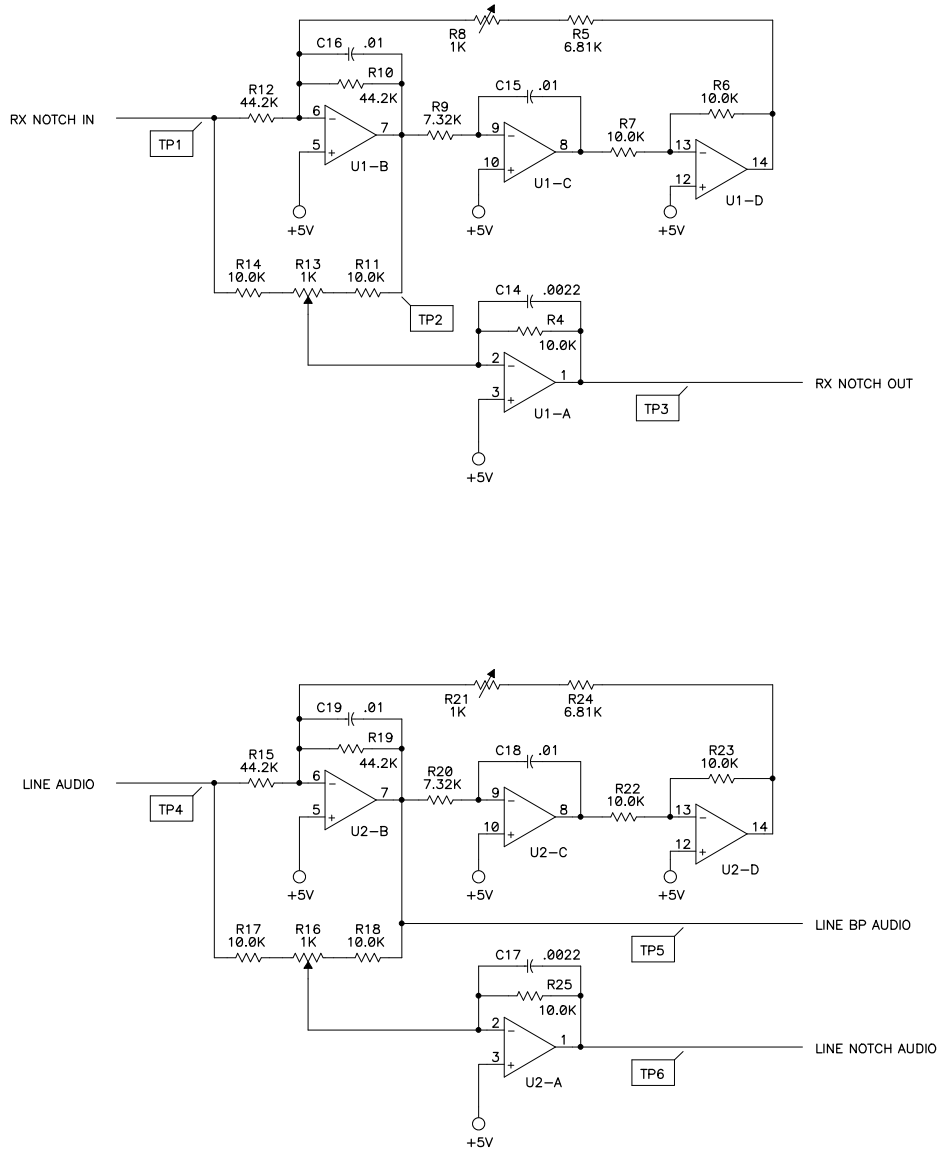
CPI Communications Inc.
941 Hensley Lane
Wylie, TX 75098

TTP200 TONE TERMINATION PANEL

A	186	TTP200_s04.sch	MAIN BOARD
DATE: 06-02-01		SHEET 4 OF 7	



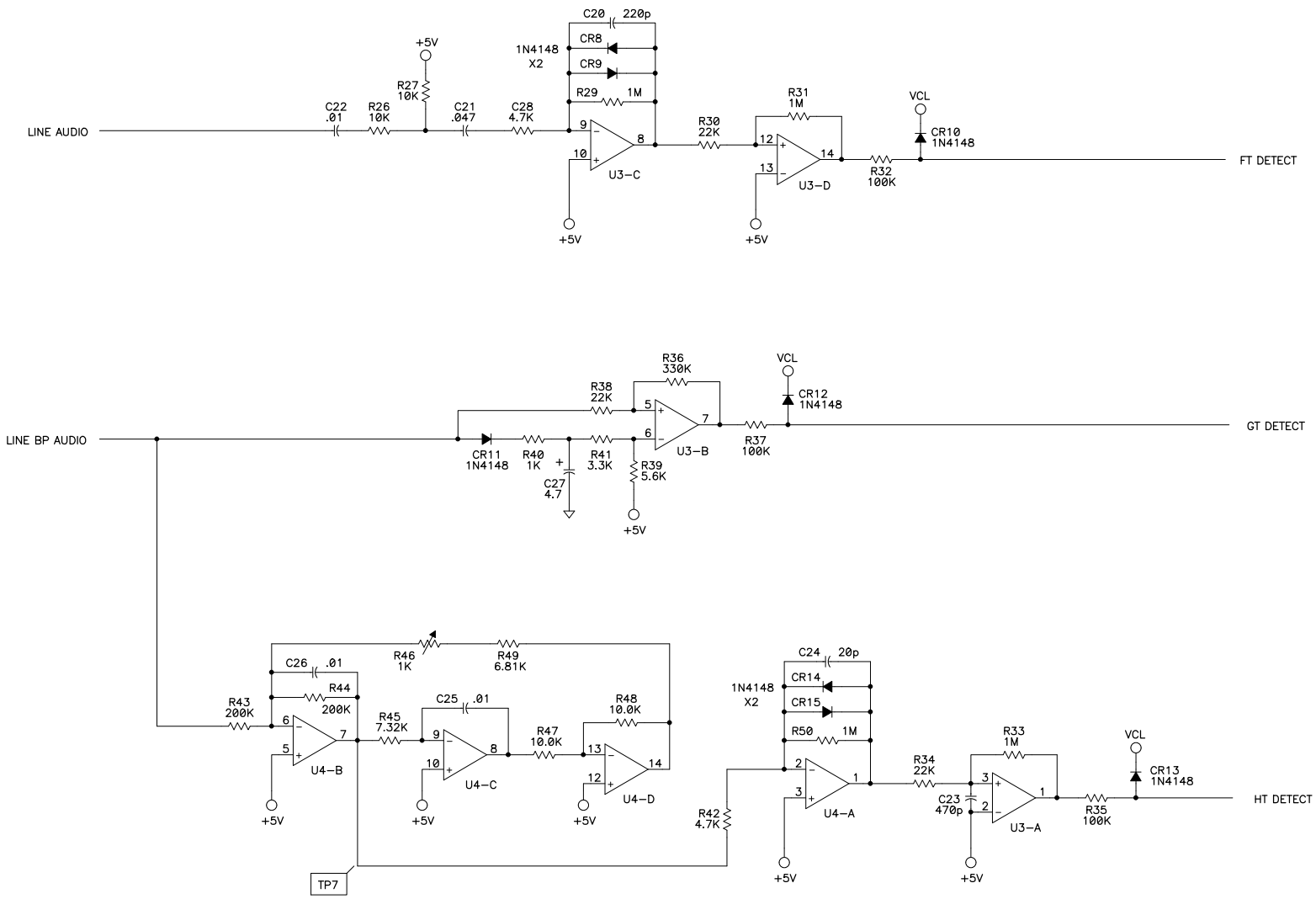
CPI Communications Inc. 941 Hensley Lane Wylie, TX 75098			
TTP200 TONE TERMINATION PANEL			
A	186	TTP200_s05.sch	MAIN BOARD
DATE: 06-02-01		SHEET 5 OF 7	



CPI Communications Inc.
941 Hensley Lane
Wylie, TX 75098

TTP200 TONE TERMINATION PANEL

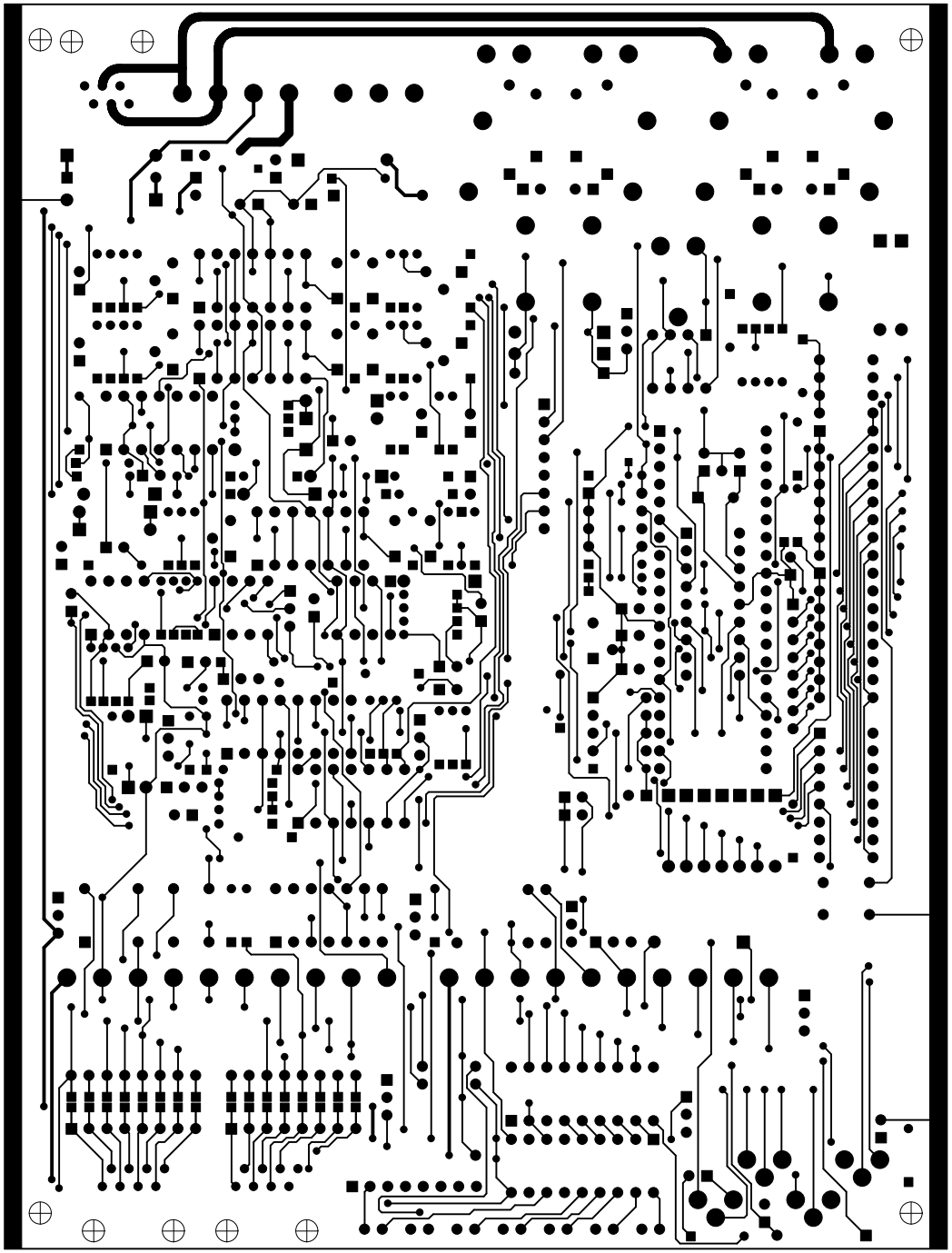
E	186	TTP200_s06.sch	SIGNAL PROCESSOR BOARD
DATE: 01–14–01		SHEET 6 OF 7	



CPI Communications Inc.
941 Hensley Lane
Wylie, TX 75098

TTP200 TONE TERMINATION PANEL

E	186	TTP200_s07.sch	SIGNAL PROCESSOR BOARD
DATE: 01-14-01		SHEET 7 OF 7	



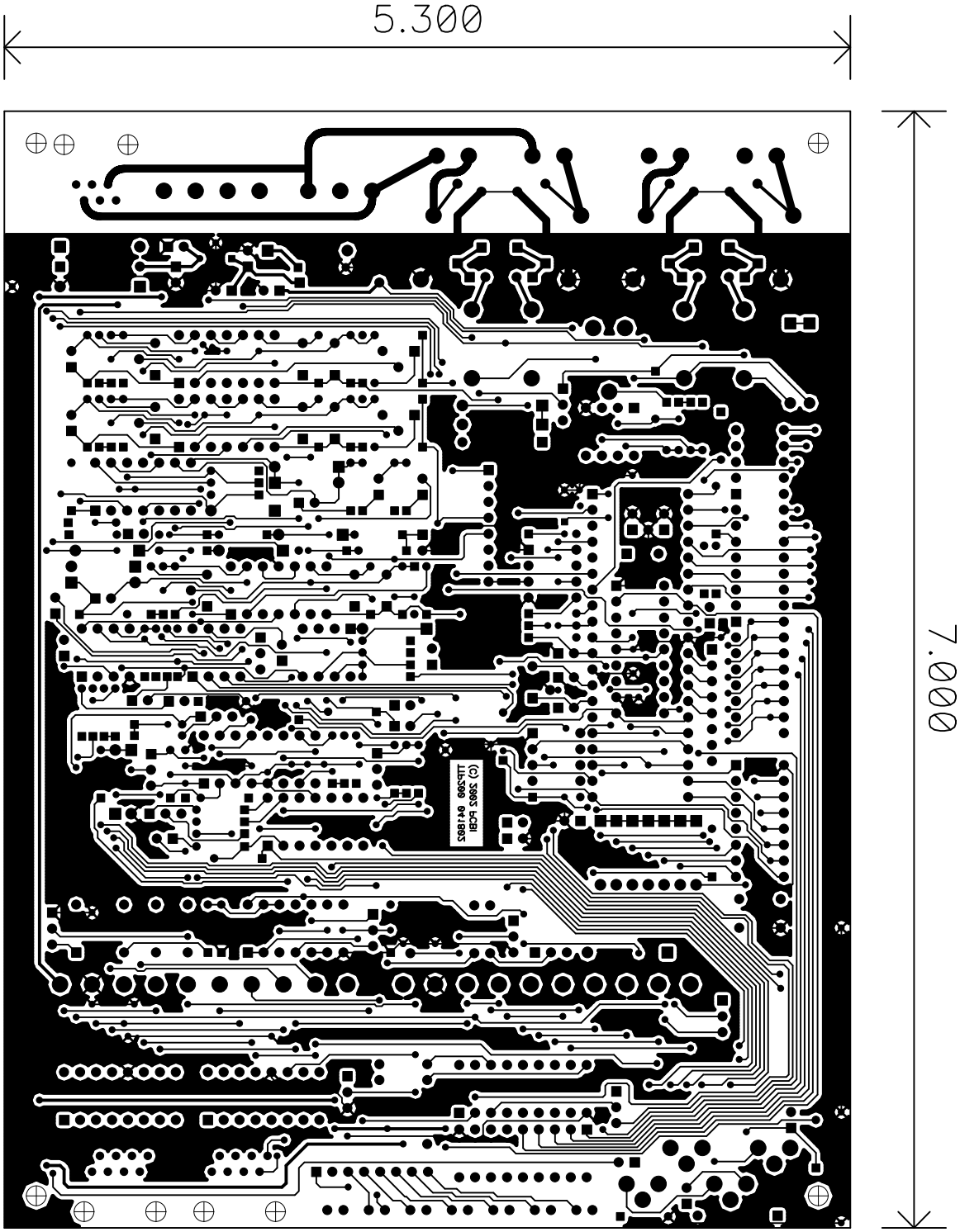
TTP200 TERMINATION PANEL

TTP200.PCB

REV B

04–18–02

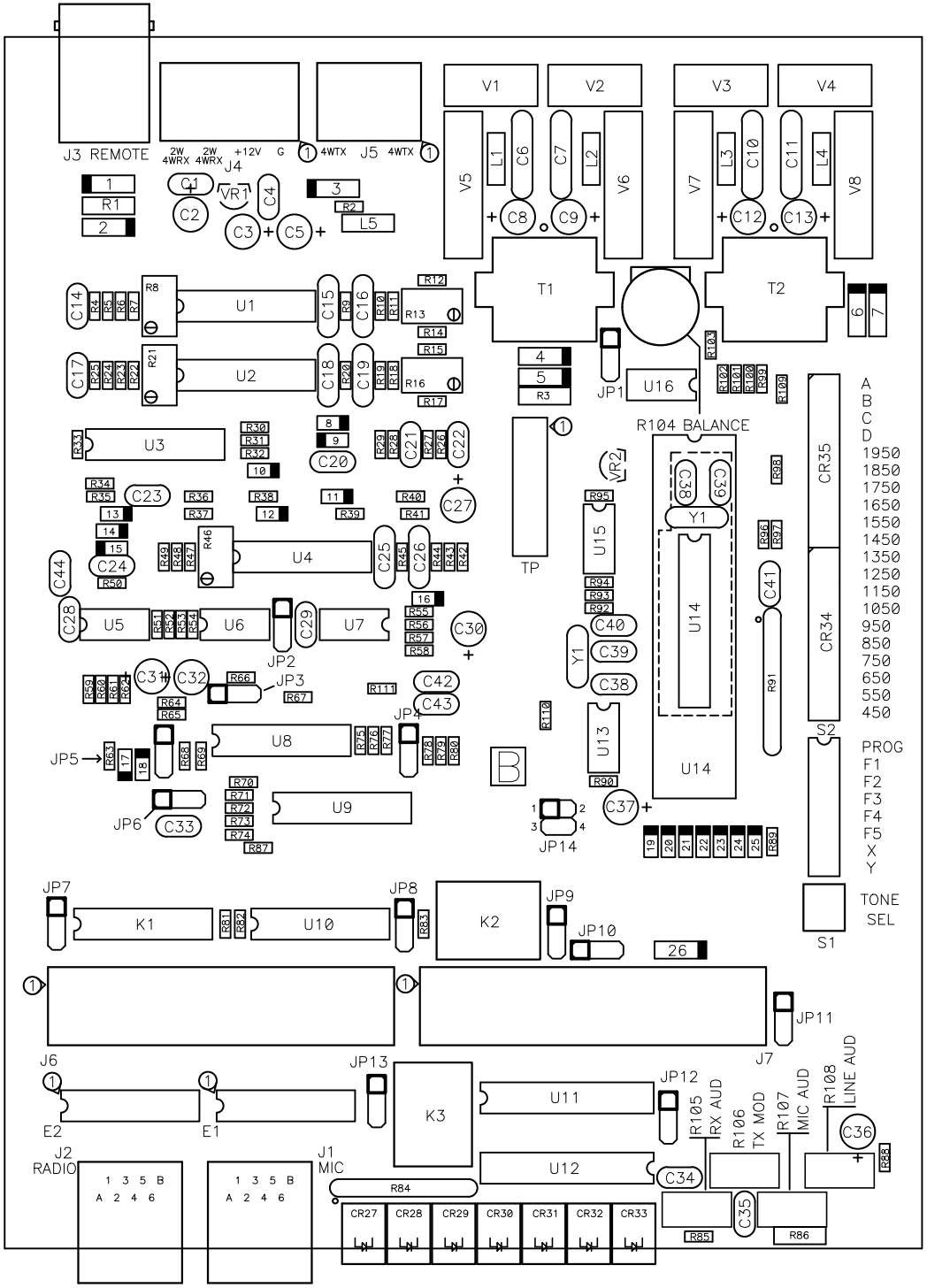
COMPONENT SIDE



TTP200 TERMINATION PANEL

TTP200.PCB
REV B
04-18-02

SOLDER SIDE



TTP200 TERMINATION PANEL

TTP200.PCB

REV B

04–18–02

COMPONENT LOCATIONS