

8.8 T2000-36 Selcall Kit

The T2000-36 Selcall PCB plugs into an options connector on the top side of the logic PCB, and provides selective tone calling (Selcall) facilities for T2010, T2015, T2020 or T2050 model T2000 Series II radios.

This option allows selective individual or group calls within a fleet of radios, on channels that have Selcall programmed. Selcall parameters and features are set up and enabled during programming. Both Sigtec and International group formats are supported by the T2000-36 PCB.

The following topics are covered in this Section:

Section	Title	Page
8.8.1	Components Required	8.8.2
8.8.2	Fitting	8.8.2
8.8.3	PCB Information	8.8.4

8.8.1 Components Required

The T2000-36 Selcall kit contains the following components:

Quantity	Description
1	T2000-36 PCB assembly
12mm	PVC foam tape

8.8.2 Fitting

- 1 Refer to Figure 8.8.1.

Remove the top cover of the radio by unscrewing the four cover screws, unscrew the logic PCB and fold-out.

Position the T2000-36 PCB as shown, and plug into the connector on the T2000 logic PCB:

Model	PCB IPN	Connector Circuit Reference
T2010 & T2015	220-01377-01	P1
T2020 & T2050	220-01344-02	#T3K44

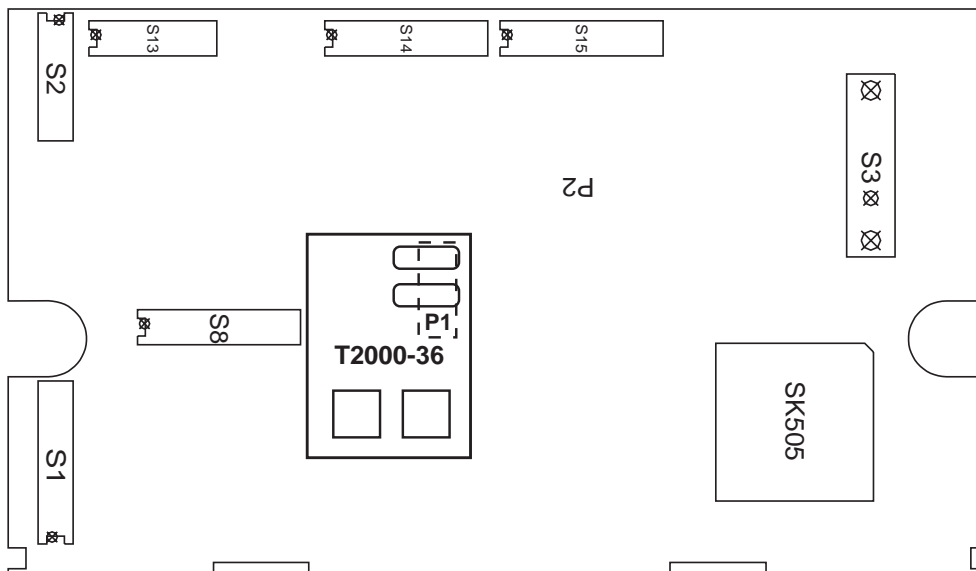


Figure 8.8.1 T2000-36 Selcall PCB Mounting

- 2 Position the foam tape provided on top of XL2, on the T2000-36 Selcall PCB.
- 3 Carefully fold the logic PCB back in position and secure using the three logic PCB retaining screws.
Refit the top cover.
- 4 Refer to the T2000 Programming Software User's Manual (IPN 439-22000-02, or later) for set-up information.

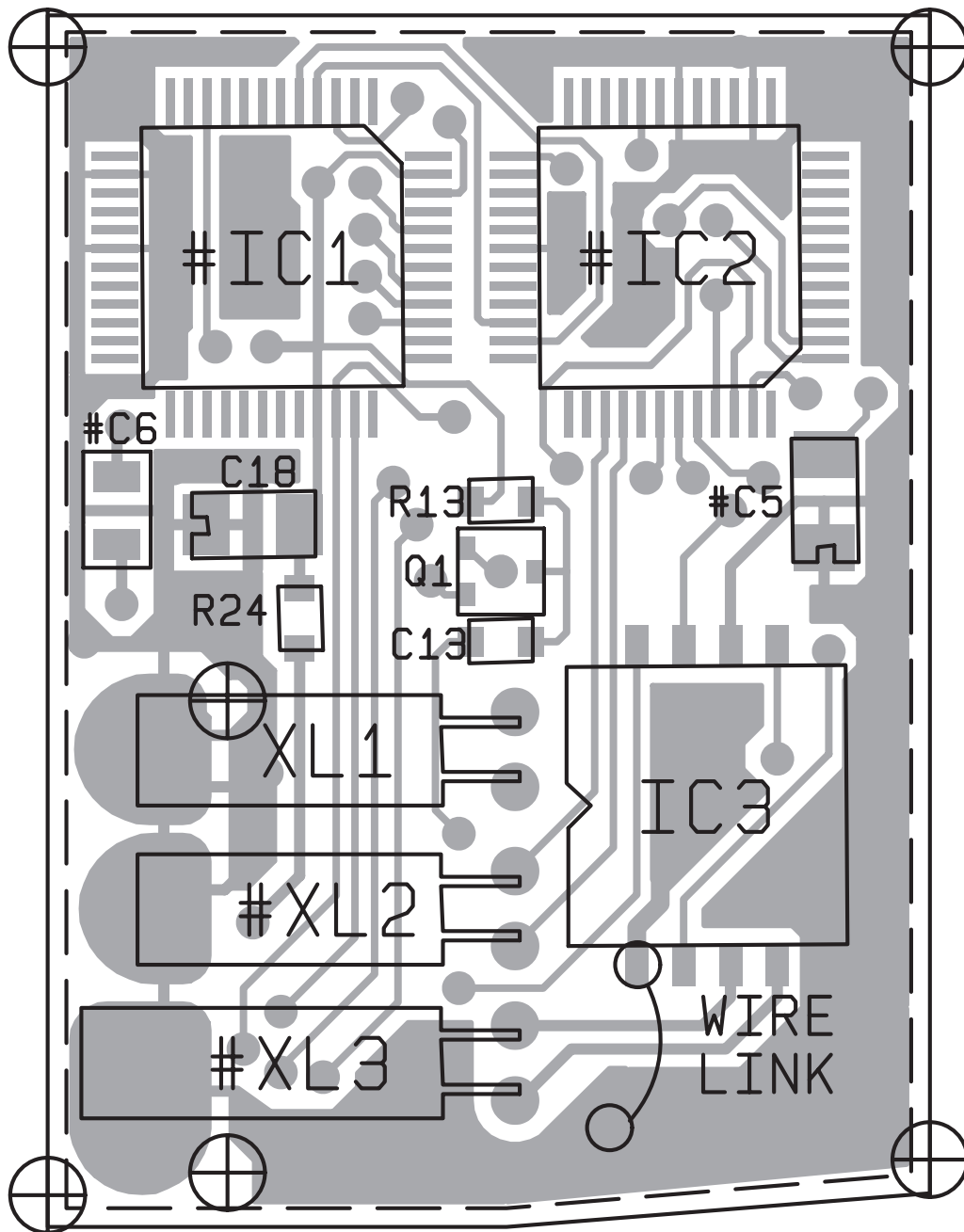
8.8.3 PCB Information

T2000-36 Parts List (IPN 220-01313-02)

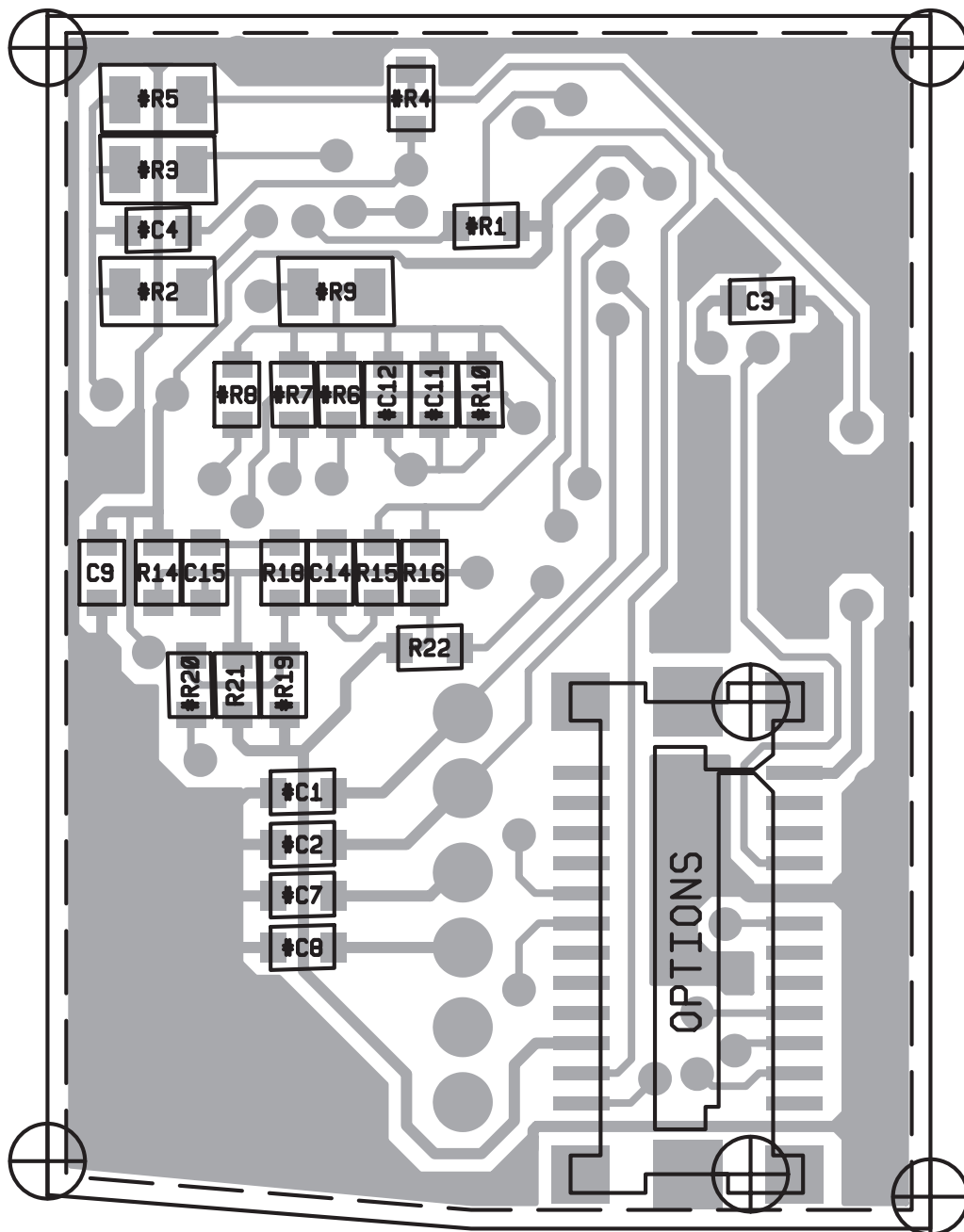
Ref	IPN	Description	Ref	IPN	Description
#C1	018-12330-00	CAP 0603 CHIP 33P 50V NPO +-5%			
#C2	018-12150-00	CAP 0603 CHIP 15P 50V NPO +-5&			
C3	018-15100-00	CAP 0603 CHIP 10N 50V X7R +-10%			
#C4	018-14100-00	CAP 0603 CHIP 1N 50V X7R +-10%			
#C5	014-06470-00	CAP TANT CHIP 470N 25V +-20% 6X3			
#C6	015-24220-08	CAP CER 0805 CHIP 2N2 10% X7R 50V			
#C7	018-12330-00	CAP 0603 CHIP 33P 50V NPO +-5%			
#C8	018-12150-00	CAP 0603 CHIP 15P 50V NPO +-5&			
C9	018-15100-00	CAP 0603 CHIP 10N 50V X7R +-10%			
#C11	018-15100-00	CAP 0603 CHIP 10N 50V X7R +-10%			
#C12	018-15100-00	CAP 0603 CHIP 10N 50V X7R +-10%			
C13	018-15100-00	CAP 0603 CHIP 10N 50V X7R +-10%			
C14	018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V 16V			
C15	018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V 16V			
C18	014-06470-00	CAP TANT CHIP 470N 25V +-20% 6X3.			
#IC1	002-10001-02	(L) IC SMD SIGTEC SD-12 SELCALL (PAI			
#IC2	002-10001-01	(L) IC SMD SIGTEC MD-09 SELCALL (PAI			
OPTSKT	240-10000-02	CONN SMD 24WAY (SKT/CAP)			
Q1	000-10084-81	(S) XSTR SMD BC848BW NPN SOT-323 S			
#R1	038-15470-00	RES 0603 CHIP 47K 1/16W +-5%			
#R2	036-15330-00	RES M/F 0805 CHIP 33K 5%			
#R3	036-16330-00	RES M/F 0805 CHIP 330K 5%			
#R4	038-15470-00	RES 0603 CHIP 47K 1/16W +-5%			
#R5	036-15820-00	RES M/F 0805 CHIP 82K 5%			
#R6	038-14220-00	RES 0603 CHIP 2K2 1/16W +-5%			
#R7	038-14470-00	RES 0603 CHIP 4K7 1/16W +-5%			
#R8	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%			
#R9	036-15220-00	RES M/F 0805 CHIP 22K 5%			
#R10	038-15470-00	RES 0603 CHIP 47K 1/16W +-5%			
R13	038-15150-00	RES 0603 CHIP 15K 1/16W +-5%			
R14	038-16100-00	RES 0603 CHIP 100K 1/16W +-5%			
R15	038-15470-00	RES 0603 CHIP 47K 1/16W +-5%			
R16	038-14220-00	RES 0603 CHIP 2K2 1/16W +-5%			
R18	038-13470-00	RES 0603 CHIP 470E 1/16W +-5%			
#R19	038-13470-00	RES 0603 CHIP 470E 1/16W +-5%			
R21	038-15270-00	RES 0603 CHIP 27K 1/16W +-5%			
R22	038-14330-00	RES 0603 CHIP 3K3 1/16W +-5%			
R24	038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%			
#XL1	274-01064-00	(L) XTAL 5.0125MHZ MINIATURE CYL			
#XL2	274-01065-00	(L) XTAL 8.00MHZ MINIATURE CYL			

Mechanical & Miscellaneous Parts

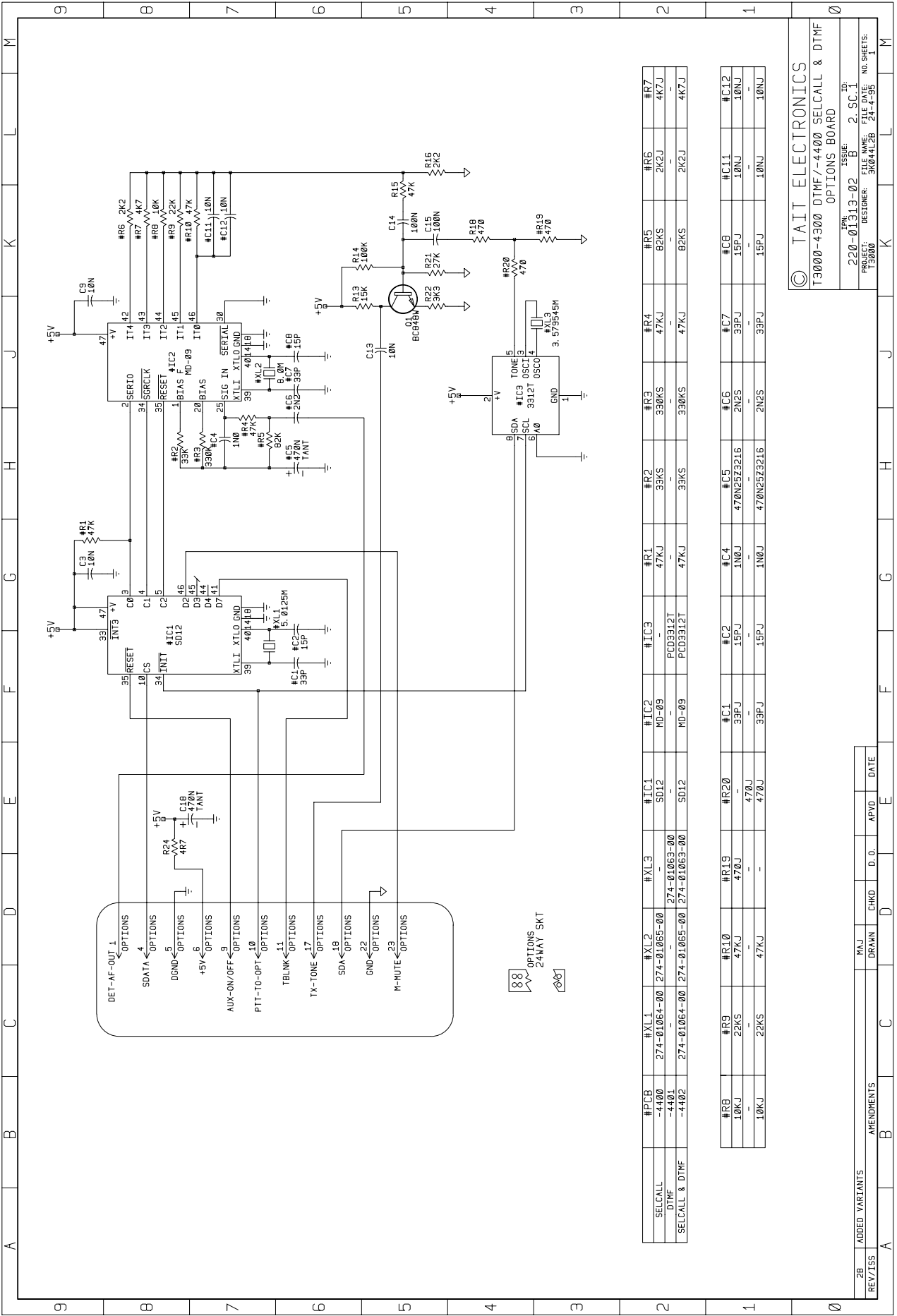
220-01313-02	PCB T3000-4400 SELCALL AND DTMF OPTION BOARD
369-00020-50	TAPE SA TESAMOLL 5*3



T2000-36 Selcall PCB (IPN 220-01313-02) - Top Side



T2000-36 Selcall PCB (IPN 220-01313-02) - Bottom Side



© TAIT ELECTRONICS
 T3000-4300 DTMF/-4400 SELCALL & DTMF
 OPTIONS BOARD
 IPN: 220-01313-02 B 2. SC.1
 PROJECT: DESIGNER: 5K044L2B 24-4-95
 ISSUE: FILE NAME: NO. SHEETS: 1

8.9 T2000-40 DTMF Kit

The T2000-40 DTMF kit provides DTMF dialling facilities for T2020 model T2000 Series II radios. It consists of a small module which is fitted to the control head PCB. Once installed, all parameters (such as tone durations and hold times) can be programmed as required.

8.9.1 Fitting

- 1 Remove the four screws from the back of the control head and remove the back cover, taking care not to lose the captive nuts.

Unplug the connecting loom from the control head PCB, if required.

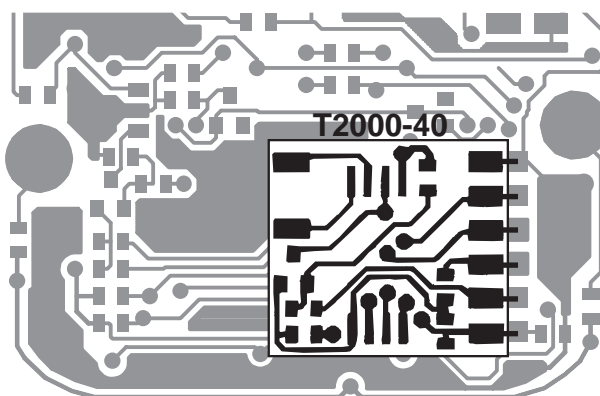
- 2 Refer to the diagram below.

Place the DTMF module flat on the control head PCB in location 'S20' with the component side facing upwards.

Solder in place, checking that each pin is correctly positioned over the appropriate pad.

- 3 Reconnect the loom (if plugged in step 1), refit the loom cable into the cable restraint in the back cover, and screw the cover back into place.

Ensure that the captive nuts are correctly located in the back cover before fitting.



T2000-40 DTMF Module Mounting - T2020 Control Head PCB (top side)

8.9.2 Programming



The radio must now be programmed with the various DTMF parameters. Refer to the manual supplied with the T2000-20 programming kit for details.

8.10 T2000-A450X CTCSS & Scrambler Kit

The T2000-A450X CTCSS and scrambler PCB plugs into an options connector on the top side of the T2000 Series II logic PCB, and can be configured in two ways:

Product Code	Option	T201X	T2020	T203X	T2040	T2050
T2000-A4500	CTCSS	x	x	✓	✓	x
T2000-A4502	Scrambler	✓	✓	✓	✓	✓

The CTCSS option is used in trunked radios, and has 38 independent receive and transmit tones, set by solder links on the T2000-A450X PCB.

The scrambler option can be used in either trunked or conventional radios, and is enabled/disabled by the auxiliary () key (conventional models) or function () key (trunked models). The scrambler uses a simple frequency inversion algorithm that prevents casual eavesdropping by other radio users. After descrambling, the recovered speech suffers from some degradation in clarity.

Note: The T2000-A4500 CTCSS kit is only compatible with the following radio and PGM software versions:

Radio	Radio Software Version	PGM Software Version
T2030	3.24 or later	later than 1.44
T2035	3.28 or later	
T2040	5.36 or later	later than 2.57

The following topics are covered in this Section:

Section	Title	Page
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8.10.2	Fitting	8.10.2
8.10.3	T2000-A450X Link Options	8.10.3
8.10.4	PCB Information	8.10.5

8.10.1 Components Required

The T2000-A450X kits contain the following components:

Quantity	Description
1	T2000-A450X PCB assembly
12mm	PVC foam tape

8.10.2 Fitting

- 1 Refer to Figure 8.10.1.

Remove the top cover of the radio by unscrewing the four cover screws, unscrew the logic PCB and fold out.

- 2 Select the T2000-A450X link options, as described in Section 8.10.3, "T2000-A450X Link Options".

Position the T2000-A450X PCB as shown, and plug into the connector on the T2000 logic PCB:

Model	PCB IPN	Connector Circuit Reference
T2010 & T2015	220-01377-01 or later	P2
T2020, T203X, T2040 & T2050	220-01344-02 or later	#T3K45

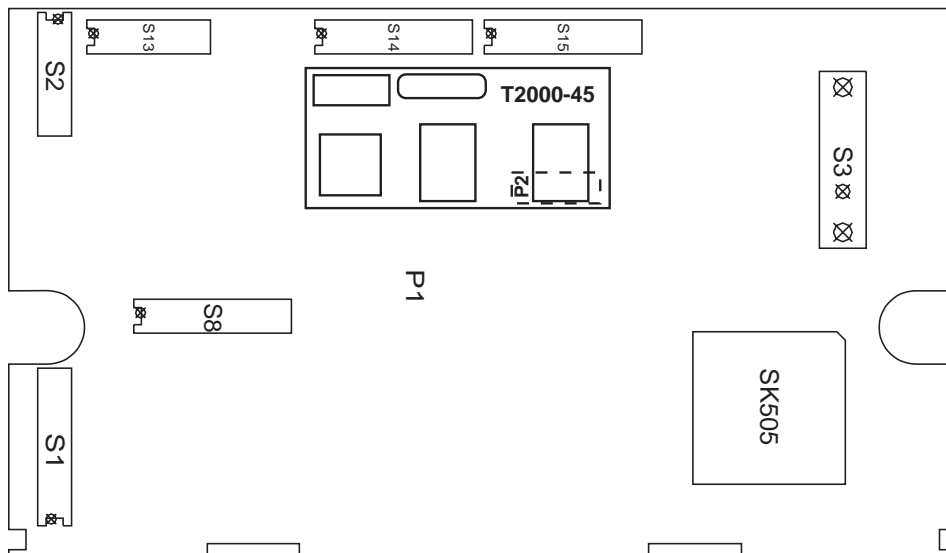


Figure 8.10.1 T2000-A450X PCB Mounting (T201X logic PCB shown)

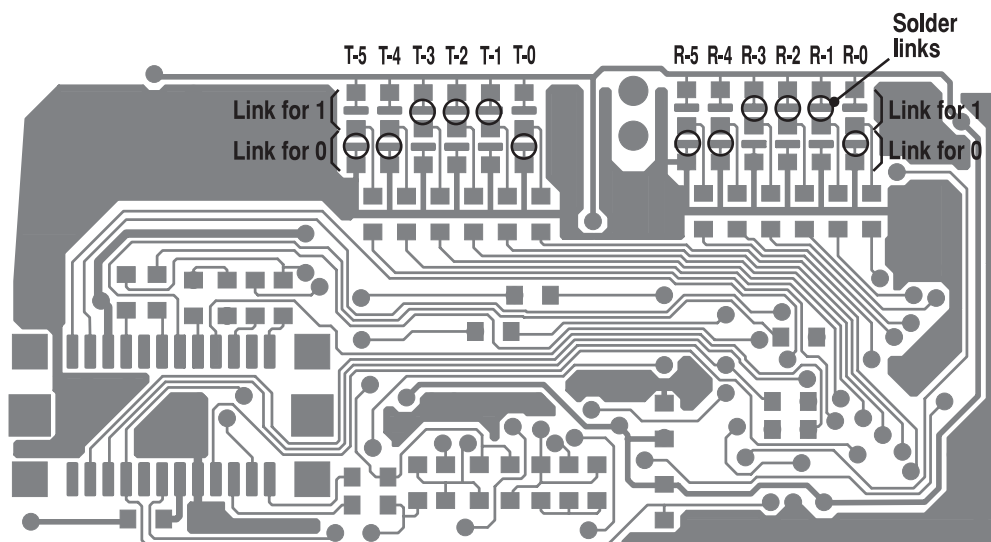
- 2 Position the foam tape provided on top of #IC5, on the T2000-A450X PCB.
- 3 Carefully fold the logic PCB back in position and secure using the three logic PCB retaining screws.
Refit the top cover.

8.10.3 T2000-A450X Link Options

There are 2 groups of links on the underside of the T2000-A4500 PCB, the receive (R) group and the transmit (T) group. Each group contains 6 bits that are pulled logic high or low, by either solder links or zero ohm resistors.

The receive settings are set by links R-0 to R-5 and the transmit settings by links T-0 to T-5. A short to the 5V line represents a '1', and a short to ground represents a '0'.

The following diagram shows the T2000-A450X PCB, with links indicated.



T2000-A450X PCB IPN 220-01335-04 (bottom side):
links for transmit & receive 110.9Hz CTCSS frequency shown.

T2000-A4500 CTCSS PCB Links

The following table gives the linking details for the 38 independent transmit and receive CTCSS frequencies.

Tone Number	R-5 T-5	R-4 T-4	R-3 T-3	R-2 T-2	R-1 T-1	R-0 T-0	CTCSS Frequency (Hz)
1	0	0	0	0	0	0	67
2	0	0	0	0	0	1	71.9
3	0	0	0	0	1	0	74.4
4	0	0	0	0	1	1	77
5	0	0	0	1	0	0	79.7
6	0	0	0	1	0	1	82.5
7	0	0	0	1	1	0	85.4
8	0	0	0	1	1	1	88.5
9	0	0	1	0	0	0	91.5
10	0	0	1	0	0	1	94.8
11	0	0	1	0	1	0	97.4
12	0	0	1	0	1	1	100
13	0	0	1	1	0	0	103.5
14	0	0	1	1	0	1	107.2
15	0	0	1	1	1	0	110.9

Tone Number	R-5 T-5	R-4 T-4	R-3 T-3	R-2 T-2	R-1 T-1	R-0 T-0	CTCSS Frequency (Hz)
16	0	0	1	1	1	1	114.8
17	0	1	0	0	0	0	118.8
18	0	1	0	0	0	1	123
19	0	1	0	0	1	0	127.3
20	0	1	0	0	1	1	131.8
21	0	1	0	1	0	0	136.5
22	0	1	0	1	0	1	141.3
23	0	1	0	1	1	0	146.2
24	0	1	0	1	1	1	151.4
25	0	1	1	0	0	0	156.7
26	0	1	1	0	0	1	162.2
27	0	1	1	0	1	0	167.9
28	0	1	1	0	1	1	173.8
29	0	1	1	1	0	0	179.9
30	0	1	1	1	0	1	186.2
31	0	1	1	1	1	0	192.8
32	0	1	1	1	1	1	203.5
33	1	0	0	0	0	0	210.7
34	1	0	0	0	0	1	218.1
35	1	0	0	0	1	0	225.7
36	1	0	0	0	1	1	233.6
37	1	0	0	1	0	0	241.8
38	1	0	0	1	0	1	250.3

T2000-A4502 Scrambler PCB Links

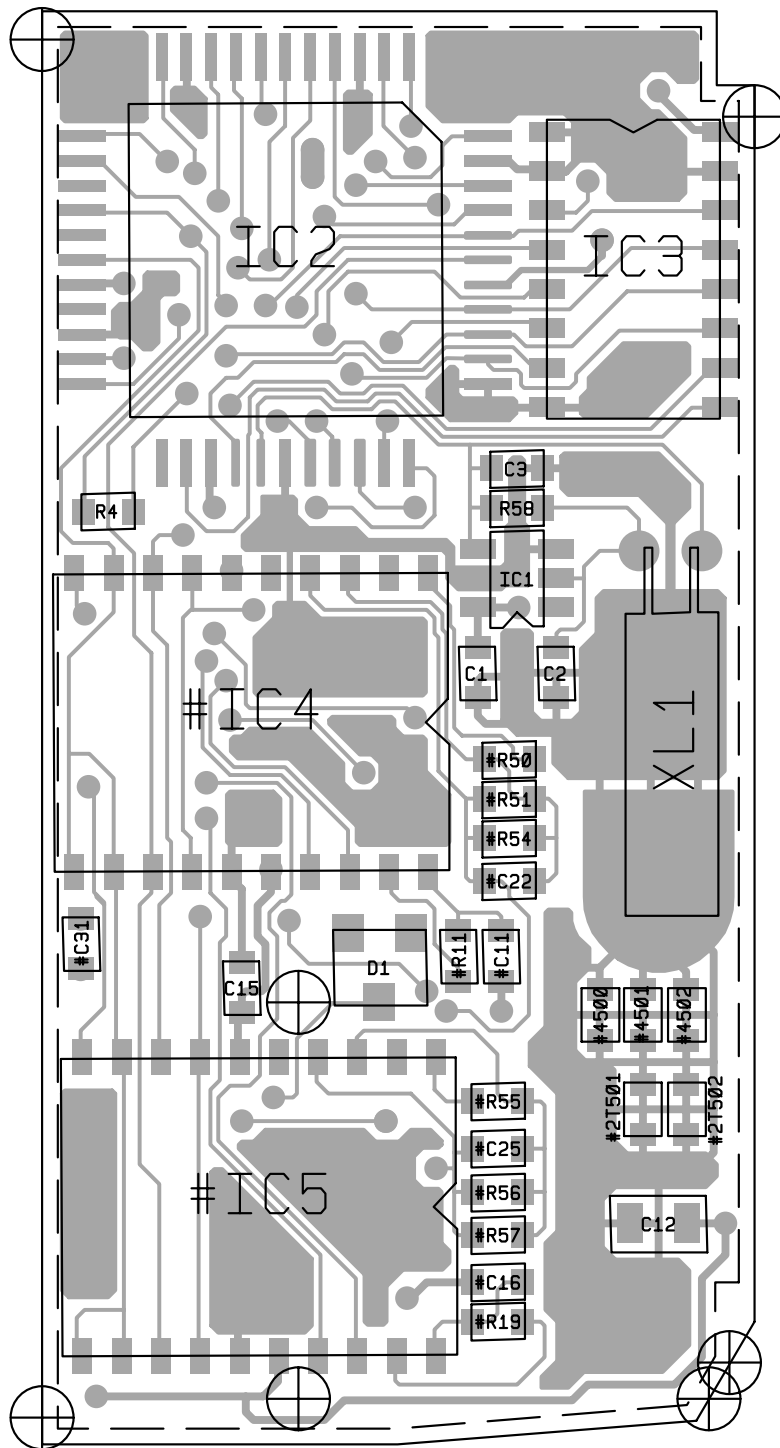
The T2000-A4502 has the following R settings linked during manufacture. The T settings have no effect.

R-5	R-4	R-3	R-2	R-1	R-0
1	1	1	1	1	1

8.10.4 PCB Information

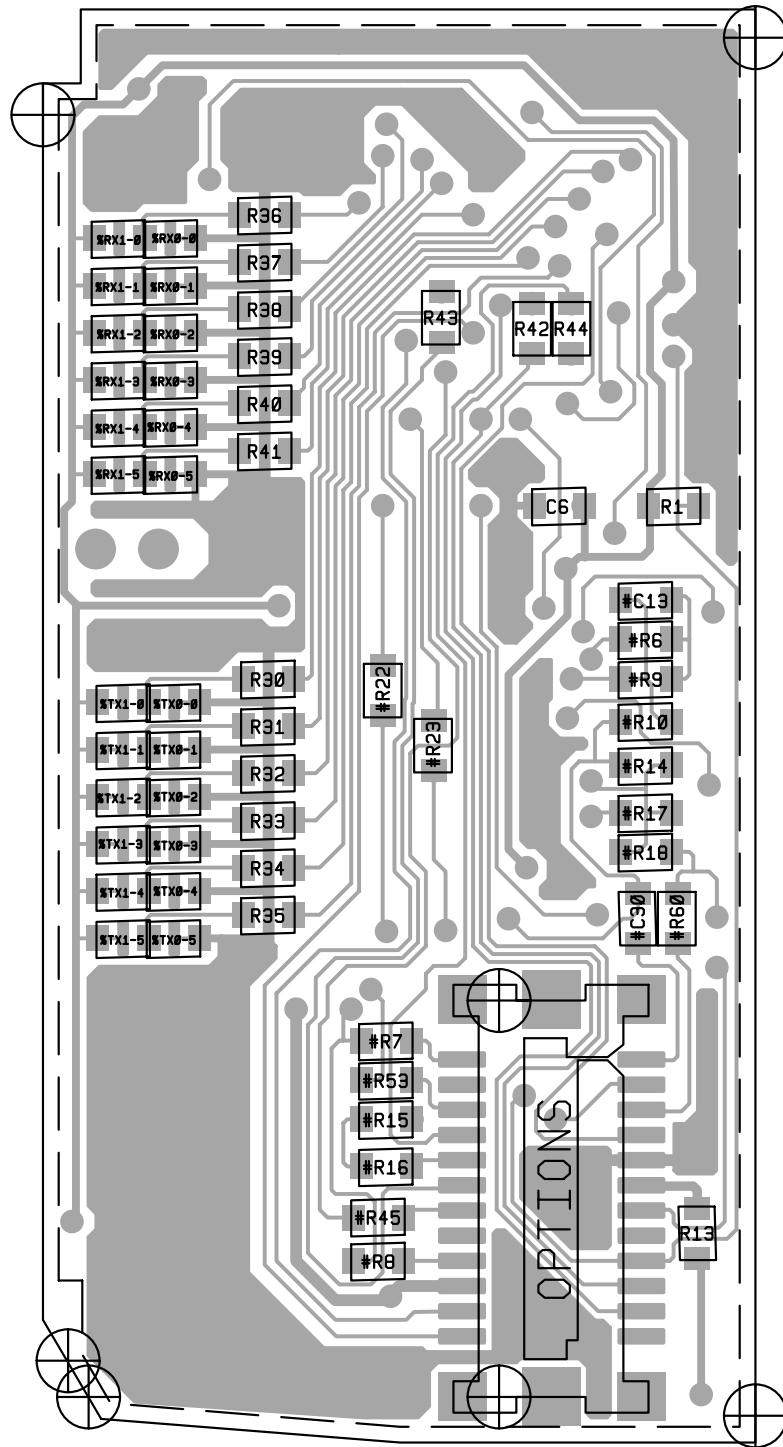
T2000-A450X Parts List (IPN 220-01335-04)

Ref	Var	IPN	Description	Ref	Var	IPN	Description
#4500	CTCSS	038-10000-00	RES 0603 CHIP ZERO OHM 1/16W +	R58		038-17100-00	RES 0603 CHIP 1M 1/16W +-5%
#2T502	SCRAM	038-10000-00	RES 0603 CHIP ZERO OHM 1/16W +	#R60	SCRAM	038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%
C1		018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V	XL1		274-01063-00	(L) XTAL 3.579545MHZ MINITURE CYLINDRICA
C2		018-12330-10	CAP 0603 CHIP 33P 50V NPO +-1%			220-01298-01	(L) PCB FLEXI T3000 OPTIONS LOOM
C3		018-12150-10	CAP 0603 CHIP 15P 50V NPO +-1%			220-01335-04	PCB T3000-4500 CTCSS OPTION BOARD
C6		018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V			365-00011-38	LABEL STATIC WARNING YELLOW A4A315
#C11	CTCSS	018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V			365-00011-54	LABEL WHITE RW1556/2 90*24MM SPECIAL AD
#C11	SCRAM	018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V 16V			369-00020-49	TAPE SA TESAMOLL 9*3 (25 M ROLLS)
C12		015-27100-10	CAP CER 0805 CHIP 1M +80-20% Y5V 16V			369-00020-50	TAPE SA TESAMOLL 6*3MM (25 M ROLLS)
#C13	CTCSS	018-15100-00	CAP 0603 CHIP 10N 50V X7R +-10%			399-00010-86	BAG STATIC SHIELDING 127X203MM
C15		018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V 16V			410-01064-01	PKG HEADER CARD (NEW TAIT LOGO)
#C16	SCRAM	018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V 16V			418-24500-00	FITTING INS T2000-45 SCRAMBLER KIT
#C22	CTCSS	018-13150-00	CAP 0603 CHIP 150P 50V NPO +-5%	Variants: CTCSS = CTCSS option SCRAM = Scrambler option			
#C22	SCRAM	018-13150-00	CAP 0603 CHIP 150P 50V NPO +-5%				
#C25	SCRAM	018-13150-00	CAP 0603 CHIP 150P 50V NPO +-5%				
#C30	CTCSS	018-16100-01	CAP 0603 CHIP 100N +80-20% Y5V 16V				
D1		001-10000-70	(S) DIODE SMD BAV70 DUAL SWITCH SOT-23				
IC1		002-74900-40	(LSH) IC SMD TC7S04F SINGLE INV GATE SO-				
IC2		002-18937-10	LSH) IC SMD Z89371-16FSC OTP DSP 44PIN Q				
IC3		002-74917-30	LSH) IC SMD 74HC173D 4BIT DTYPE REGISTE				
#IC4	CTCSS	002-11454-80	LSH) IC SMD MC145480DW PCM CODEC F				
#IC4	SCRAM	002-11454-80	LSH) IC SMD MC145480DW PCM CODEC F				
#IC5	SCRAM	002-11454-80	LSH) IC SMD MC145480DW PCM CODEC F				
OPTION		240-10000-09	CONN SMD 24WAY (SKT/CAP WITH MTG LUGS				
R1		038-15150-00	RES 0603 CHIP 15K 1/16W +-5%				
R4		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R6	CTCSS	038-15470-00	RES 0603 CHIP 47K 1/16W +-5%				
#R6	SCRAM	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R7	CTCSS	038-14330-00	RES 0603 CHIP 3K3 1/16W +-5%				
#R8	SCRAM	038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%				
#R9	CTCSS	038-16470-00	RES 0603 CHIP 470K 1/16W +-5%				
#R9	SCRAM	038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%				
#R10	CTCSS	038-14470-00	RES 0603 CHIP 4K7 1/16W +-5%				
#R10	SCRAM	038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%				
#R11	CTCSS	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R11	SCRAM	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R13		038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%				
#R15	SCRAM	038-11470-00	RES 0603 CHIP 4E7 1/16W +-5%				
#R17	SCRAM	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R18	SCRAM	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R19	SCRAM	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R22	CTCSS	038-15150-00	RES 0603 CHIP 15K 1/16W +-5%				
#R22	SCRAM	038-15150-00	RES 0603 CHIP 15K 1/16W +-5%				
#R23	SCRAM	038-15150-00	RES 0603 CHIP 15K 1/16W +-5%				
R30		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R31		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R32		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R33		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R34		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R35		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R36		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R37		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R38		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R39		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R40		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R41		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R42		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R43		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
R44		038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R50	CTCSS	038-16100-00	RES 0603 CHIP 100K 1/16W +-5%				
#R50	SCRAM	038-16100-00	RES 0603 CHIP 100K 1/16W +-5%				
#R51	CTCSS	038-16470-00	RES 0603 CHIP 470K 1/16W +-5%				
#R51	SCRAM	038-16100-00	RES 0603 CHIP 100K 1/16W +-5%				
#R53	SCRAM	038-15100-00	RES 0603 CHIP 10K 1/16W +-5%				
#R54	CTCSS	038-16220-00	RES 0603 CHIP 220K 1/16W +-5%				
#R55	SCRAM	038-16100-00	RES 0603 CHIP 100K 1/16W +-5%				
#R56	SCRAM	038-16100-00	RES 0603 CHIP 100K 1/16W +-5%				



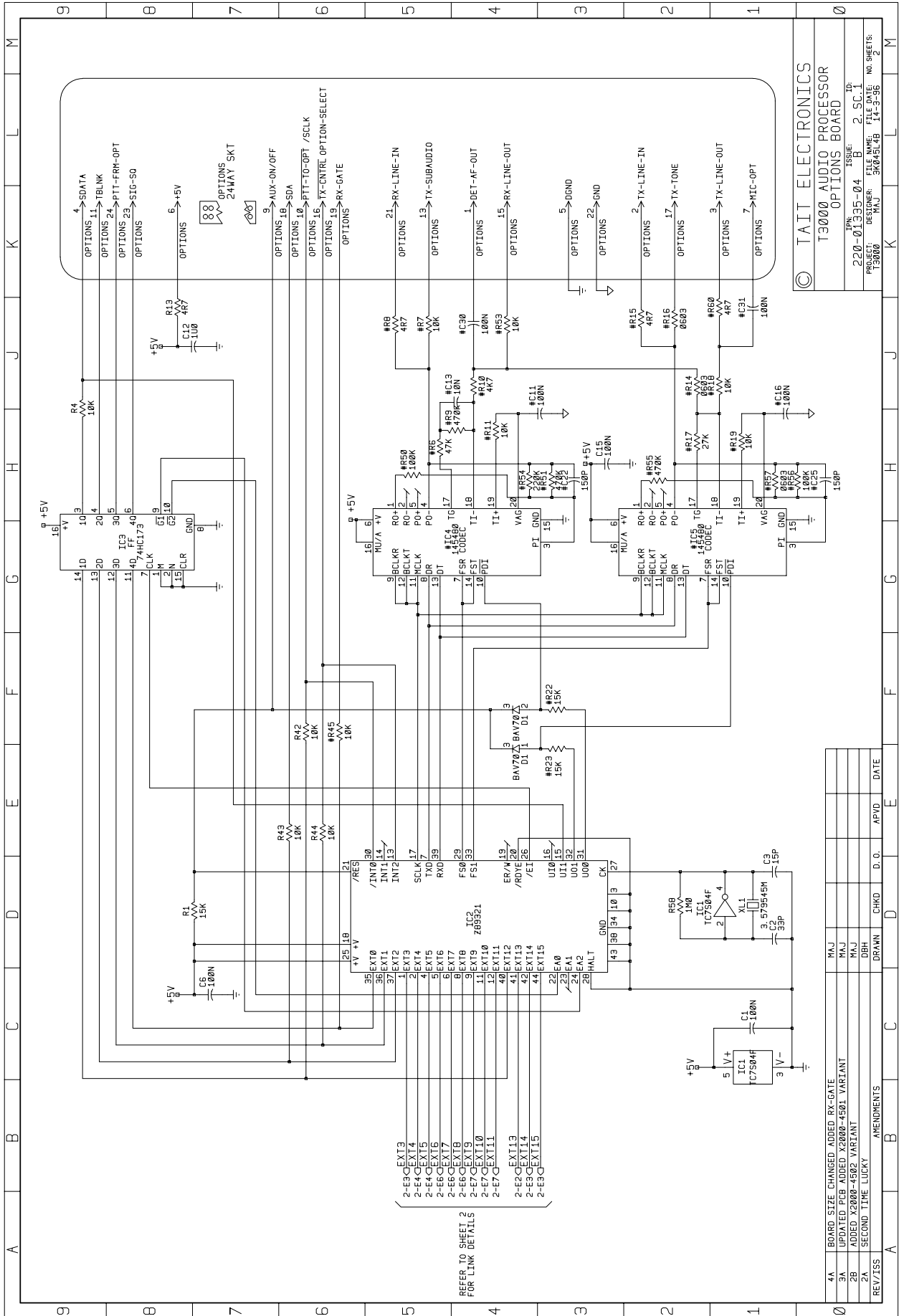
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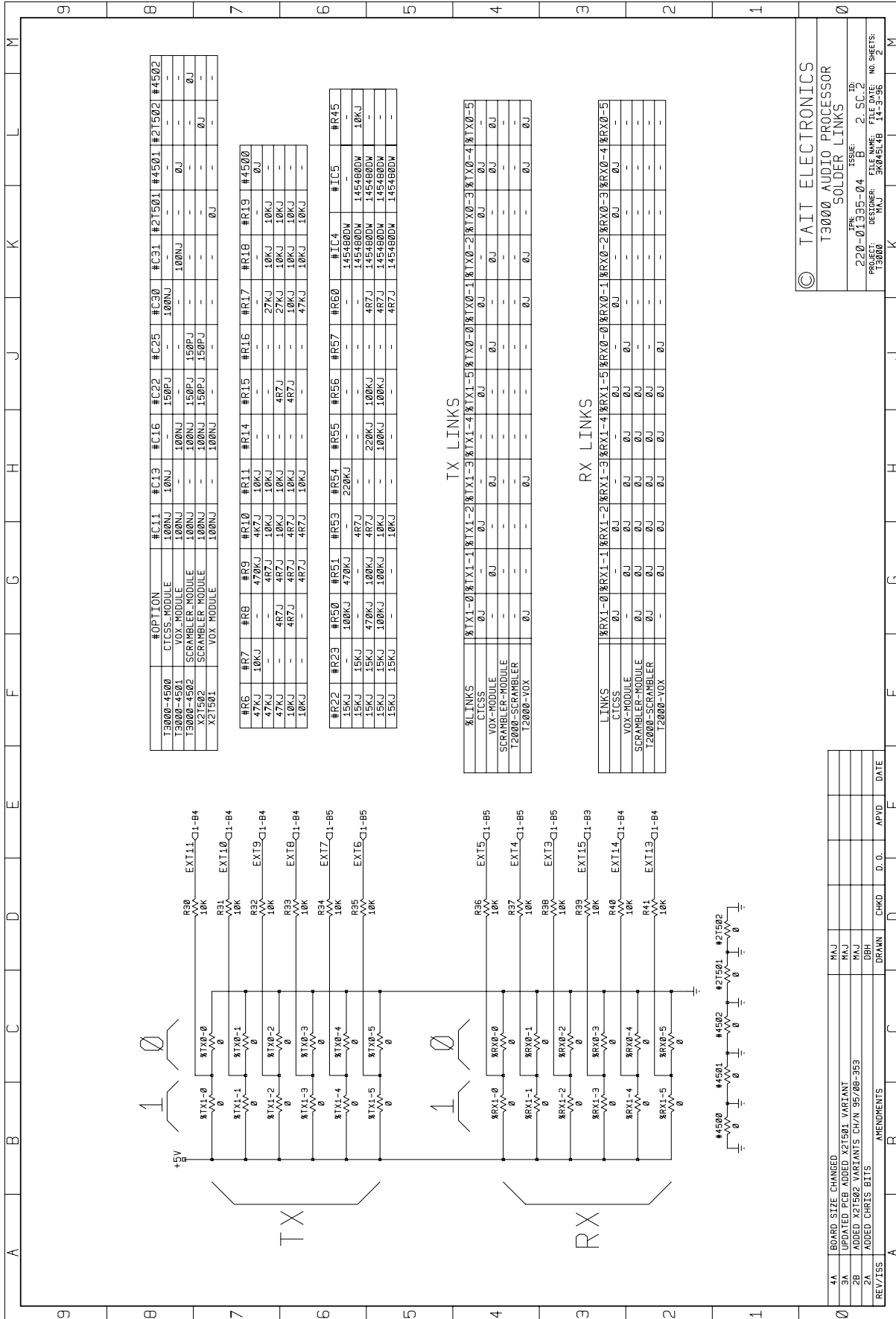
T2000-A450X PCB (IPN 220-01335-04) - Top Side



220-01335-04 A

T2000-A450X PCB (IPN 220-01335-04) - Bottom Side





OPTION	#C11	#C13	#C16	#C22	#C25	#C30	#C31	#21501	#4501	#21502	#4502
T3000-4500	CTCSS-MODULE	100NJ	10NJ	150PJ	150PJ	100NJ	100NJ	100NJ	100NJ	100NJ	100NJ
T3000-4501	VOX-MODULE	100NJ	100NJ	150PJ	150PJ	100NJ	100NJ	100NJ	100NJ	100NJ	100NJ
T3000-4502	SCRAMBLER-MODULE	100NJ	100NJ	150PJ	150PJ	100NJ	100NJ	100NJ	100NJ	100NJ	100NJ
X21502	SCRAMBLER-MODULE	100NJ	100NJ	150PJ	150PJ	100NJ	100NJ	100NJ	100NJ	100NJ	100NJ
X21501	VOX-MODULE	100NJ	100NJ	150PJ	150PJ	100NJ	100NJ	100NJ	100NJ	100NJ	100NJ

#R6	#R7	#R8	#R9	#R10	#R11	#R14	#R15	#R16	#R17	#R18	#R19	#4500
47KJ	10KJ	-	470KJ	47J	10KJ	-	-	-	-	-	-	0J
47KJ	-	-	47J	10KJ	10KJ	-	47J	27KJ	10KJ	10KJ	10KJ	10KJ
47KJ	-	47J	47J	10KJ	10KJ	-	47J	27KJ	10KJ	10KJ	10KJ	10KJ
10KJ	-	47J	47J	10KJ	10KJ	-	47J	27KJ	10KJ	10KJ	10KJ	10KJ

#R22	#R23	#R50	#R51	#R53	#R54	#R55	#R56	#R57	#R60	#IC4	#IC5	#R45
15KJ	15KJ	100KJ	470KJ	470KJ	220KJ	-	-	-	-	1454800N	1454800N	10KJ
15KJ	15KJ	100KJ	470KJ	470KJ	220KJ	-	-	-	-	1454800N	1454800N	10KJ
15KJ	15KJ	100KJ	470KJ	470KJ	220KJ	-	-	-	-	1454800N	1454800N	10KJ
15KJ	15KJ	100KJ	470KJ	470KJ	220KJ	-	-	-	-	1454800N	1454800N	10KJ

TX LINKS

LINKS	#TX1-0	#TX1-1	#TX1-2	#TX1-3	#TX1-4	#TX1-5	#TX0-0	#TX0-1	#TX0-2	#TX0-3	#TX0-4	#TX0-5
CTCSS	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J
VOX-MODULE	-	-	-	-	-	-	-	-	-	-	-	-
SCRAMBLER-MODULE	-	-	-	-	-	-	-	-	-	-	-	-
T2000-SCRAMBLER	-	-	-	-	-	-	-	-	-	-	-	-
T2000-VOX	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J

RX LINKS

LINKS	#RX1-0	#RX1-1	#RX1-2	#RX1-3	#RX1-4	#RX1-5	#RX0-0	#RX0-1	#RX0-2	#RX0-3	#RX0-4	#RX0-5
CTCSS	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J
VOX-MODULE	-	-	-	-	-	-	-	-	-	-	-	-
SCRAMBLER-MODULE	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J
T2000-SCRAMBLER	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J	0J
T2000-VOX	-	-	-	-	-	-	-	-	-	-	-	-

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 T3000 AUDIO PROCESSOR
 SOLDER LINKS
 PROJECT: 220-01395-04
 FILE NAME: 36065103
 FILE DATE: 14-3-98
 ISSUE: B
 2. SC.2
 NO. SHEETS: 2

REV/ISS	AMENDMENTS	CHKD	D.O.	APVD	DATE
1A	BOARD SIZE CHANGED				
1B	ADDED FEEDS ADDED X21501 VARIANT				
2A	ADDED X21502 VARIANTS CHN 55/08-953				
2B	ADDED X21502 VARIANTS CHN 55/08-953				
2C	ADDED X21502 VARIANTS CHN 55/08-953				
2D	ADDED X21502 VARIANTS CHN 55/08-953				
2E	ADDED X21502 VARIANTS CHN 55/08-953				
2F	ADDED X21502 VARIANTS CHN 55/08-953				
2G	ADDED X21502 VARIANTS CHN 55/08-953				
2H	ADDED X21502 VARIANTS CHN 55/08-953				
2I	ADDED X21502 VARIANTS CHN 55/08-953				
2J	ADDED X21502 VARIANTS CHN 55/08-953				
2K	ADDED X21502 VARIANTS CHN 55/08-953				
2L	ADDED X21502 VARIANTS CHN 55/08-953				
2M	ADDED X21502 VARIANTS CHN 55/08-953				
2N	ADDED X21502 VARIANTS CHN 55/08-953				
2O	ADDED X21502 VARIANTS CHN 55/08-953				
2P	ADDED X21502 VARIANTS CHN 55/08-953				
2Q	ADDED X21502 VARIANTS CHN 55/08-953				
2R	ADDED X21502 VARIANTS CHN 55/08-953				
2S	ADDED X21502 VARIANTS CHN 55/08-953				
2T	ADDED X21502 VARIANTS CHN 55/08-953				
2U	ADDED X21502 VARIANTS CHN 55/08-953				
2V	ADDED X21502 VARIANTS CHN 55/08-953				
2W	ADDED X21502 VARIANTS CHN 55/08-953				
2X	ADDED X21502 VARIANTS CHN 55/08-953				
2Y	ADDED X21502 VARIANTS CHN 55/08-953				
2Z	ADDED X21502 VARIANTS CHN 55/08-953				

8.11 T2000-50 Handsfree Kit

The T2000-50 handsfree kit is designed for use with all T2000 Series II mobiles, and allows communication through the normal PTT microphone, or 'handsfree' operation through a directional microphone.

When 'handsfree' operation is being used, the transmitter is activated either by the foot-switch (Manually Operated Transmit) or automatically, by detecting the sound of a voice. The latter is known as the Voice Operated Transmit (VOX) mode. VOX operation is only intended for use in quiet modern vehicles.

Note: With trunked radios, a call needs to be established before VOX or footswitch becomes operative. Normal handsfree operation can be used on a conventional channel.

The following topics are covered in this Section:

Section	Title	Page
8.11.1	Components Required	8.11.2
8.11.2	Fitting	8.11.2
8.11.3	Fitting The Complete Unit In The Vehicle	8.11.3
8.11.4	T2000-50 Set-Up	8.11.5
8.11.5	Signal Specifications	8.11.7
8.11.6	Specifications	8.11.8
8.11.7	Circuit Description	8.11.8
8.11.8	PCB Information	8.11.10

8.11.1 Components Required

The T2000-50 kit contains the following components:

Quantity	Description
1	T2000-50 PCB assembly
1	directional microphone (with optional sunvisor clip or tie clip)
1	footswitch
1	9 way D-range assembly with 2 in-line connectors & microphone socket attached
1	shroud (alternative shroud - not required for T2000 Series II radios)
1	2 way in-line connector
3	M3x8 pan Pozi Taptite screws
2	4-40x¼ pan Pozi Taptite screws (black)

8.11.2 Fitting

- 1 Refer to Figure 8.11.1.

Remove the top cover of the radio by unscrewing the four cover screws, unclip the D-range blanking plate in the rear of the T2000 radio, unscrew the logic PCB and fold-out.

Position the T2000-50 PCB as shown, and connect the Micromatch connectors P13 and P14 to S13 and S14 on the T2000 logic PCB.

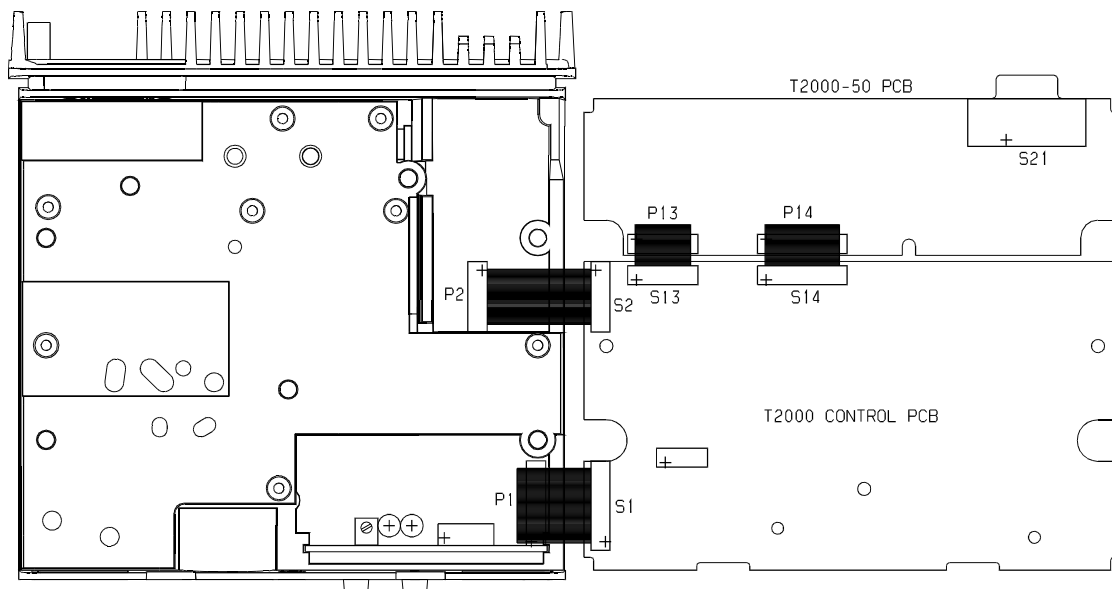


Figure 8.11.1 T2000-50 Handsfree PCB Mounting

- 2 **T2010 & T2015:** Remove R513 (0Ω resistor) on the logic PCB.

- 3 After manufacture, the T2000-50 PCB links are left open and will need to be customer selected. For details of optional links, refer to the Link Options Table in the circuit diagram.

Non-trunked radios: standard links are 4B and 5A.

- 4 Set up the T2000-50, as described in Section 8.11.4, "T2000-50 Set-Up".

A +5V logic signal is provided to indicate VOX activity (S21 pin 7). 'VOX' (violet wire) and 'ground' (grey wire) are both available from the D-range assembly red in-line connector.

A spare in-line connector is also included in the kit for interfacing to an appropriate visual indicator e.g. an LED.

- 5 Carefully fold the logic and T2000-50 PCBs back in position, guiding the D-range connector through the hole provided in the T2000 chassis.

Check that no electrolytic capacitors are touching the T2000 chassis (e.g. C21 or C51.)

- 6 Secure using the three logic PCB retaining screws and the three M3x8 screws provided and refit the top cover.

Plug the D-range assembly provided in the kit into the D-range connector (S21).

Note: Holes are provided in the T2000 chassis for the D-range plug locking screws. Use the two black 4-40x¼ Taptite screws provided in the kit to form the threads.

8.11.3 Fitting The Complete Unit In The Vehicle

Microphone Mounting

The handsfree directional microphone plugs into the T2000 via the D-range assembly microphone socket. The positioning of the microphone is important for correct operation of the handsfree unit and some experimentation may be necessary to obtain the best performance from the VOX.



- The microphone should be mounted in a position 20cm or less from the driver.
- The microphone location should be free from vibration.
- The microphone must face the driver.

Footswitch Mounting

The footswitch plugs into the D-range interface via the black 2 way in-line connector. It is recommended that the footswitch be screwed to the floor.

Note: The 3m lengths of the footswitch and microphone can be effectively extended by fitting a standard 9 way D-range extender cable between the radio and the D-range assembly. These extension cables are not included as standard but are available from most computer outlets.

Radio Programming

The radio may need reprogramming to accommodate the handsfree unit. The **auxiliary** key  for the T2010, T2015 and T2020 or the **function** key  for trunked radios must be programmed for latching if VOX mode is to be used. Refer to the T2000 programming manual.

For T203X and T2040 radios, the 'handsfree' option will also need to be selected under 'Specifications' (refer to the 'Specifications' section of the programming manual).

Vox Sensitivity

Although the VOX circuitry has been designed to operate in varying conditions, it may be necessary to change the minimum threshold for VOX operation.

Monitor TP5 without the directional microphone connected and adjust RV67. Turning RV67 clockwise increases sensitivity, and anticlockwise decreases sensitivity.

Note: For the majority of applications, it is recommended that the setting is left at the factory setting of 0.8V.

8.11.4 T2000-50 Set-Up

Test Equipment Required

Note: T2000-50 set-up should only be necessary after major repair.

- AF signal generator
- modulation analyser
- high impedance voltmeter (e.g. VTVM)
- oscilloscope
- power supply (+13.8V)
- RF power meter or load
- 30dB RF attenuator

The following diagram shows a typical test set-up.

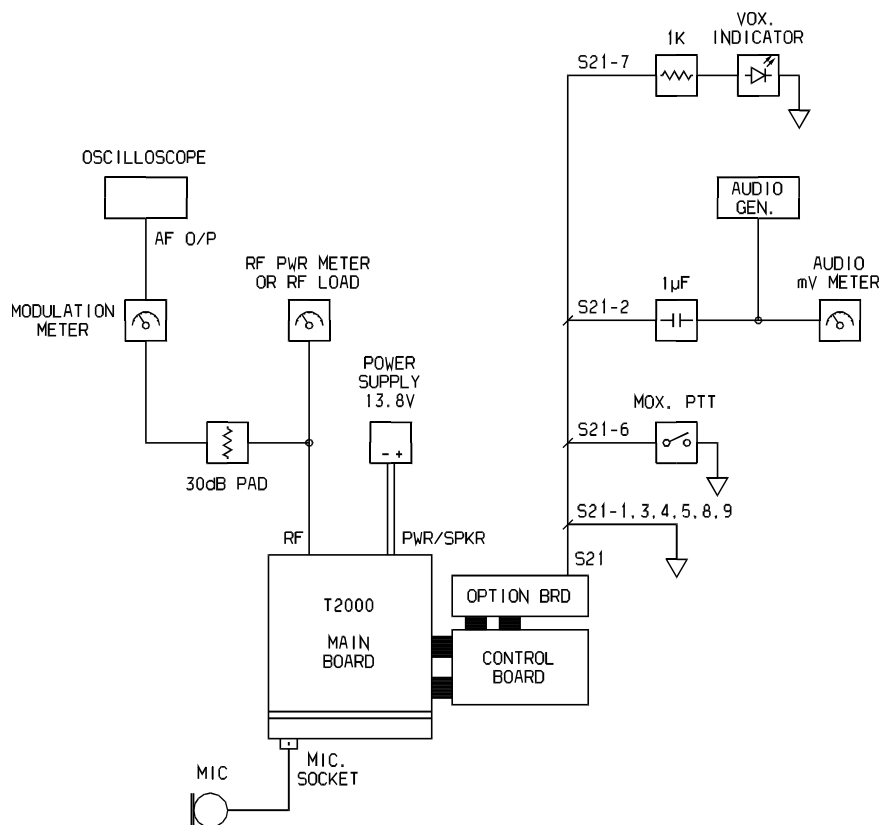


Figure 8.11.2 Test Equipment Set-Up

Test

- 1 Set up the equipment as shown in Figure 8.11.2, and set the audio generator to 1kHz at a level of 0.8mV.

Switch on the T2000 and check the increase in current with the T2000-50 fitted is less than 30mA.

- 2 Switch on the MOX (Manually Operated Transmit) PTT and check that the modulation is at approximately 60% of full system deviation. Check that no audio path is evident through the normal microphone.

Activate the PTT on the normal microphone and check that there is now an audio path through the microphone.

- 3 With no audio, adjust RV67 for 0.8V at TP5.

Remove the TCXO PCB to operate the /IN-LOCK signal and check that the DC level now goes to 6.5V \pm 0.5V. Replace the TCXO.

- 4 Increase the audio level by 10dB.

With all PTTs off, activate the **auxiliary** Ω or **function** F_n keys (radio is in VOX mode).

Sweep the audio generator slowly from 1kHz to 100Hz and back again and check that the transmitter keys between 700Hz \pm 70Hz and 250Hz \pm 25Hz.

When going from receive to transmit the radio should key instantly at these cut-offs. When going from transmit to receive check there is a delay of approximately 1.5 seconds.

Check that VOX transmit is inhibited if the channel is busy (assuming LINK4B is fitted).

- 5 Switch on the MOX PTT and set the audio generator to 1kHz at a level of -50dBm (3mV).

Monitor TP9 and check that the level on the scope is 1.2Vp-p \pm 0.2V.

Increase the audio level by 10dB and check that the level on the scope is about the same.

Decrease audio level by 20dB. After observing the charging action of the compressor, the level on the scope should be 0.4Vp-p \pm 0.1V.

Trunking only: The audio at TP9 should be there on an assigned channel, a non-trunked channel or in test mode. When the radio is on a control channel or hunting for a control channel, the audio should be muted.

- 6 A final system check can be done with the directional microphone and footswitch.

8.11.5 Signal Specifications

The following table describes S21 pin-outs, and relevant interface signals on S13 and S14 (T2000 logic PCB). S21 is the 9 way D-type connector mounted on the heatsink at the rear of the radio.

Pin No.	Signal	Description	Level
S21-1	GND		
S21-2	MIC	Input for directional mic. audio	
S21-3	GND		
S21-4	GND		
S21-5	GND		
S21-6	FT-SWITCH	Requests handsfree transmit.	
S21-7	VOX	Output signalling valid VOX operation.	
S21-8	GND		
S21-9	GND		
S13-6	TX-LINE-IN	Electret microphone audio switched in during handsfree transmit.	300mVp-p at 60% mod. 1kHz
S13-7	RX-GTD-AF	Used to provide VOX trunking inhibit for received speech.	110mVrms at 60% mod. 1kHz
S13-11	OPTIONS-GND	Provides the ground for the options circuitry.	
S14-1	+13.8V	Powers the +8V regulator used to supply audio circuitry	10.8V to 16V DC available current 200mA
S14-2	+5V	Used to supply power for the logic circuitry.	available current 150mA
S14-3	BUSY	Used to mute invalid audio when transmitter has been inhibited.	carrier detect 0V = busy
S14-5	/PTT-TO-OPT	Echoed to S14-6 for normal PTT request. Switches off S13-6.	5V pull-up 0V = Tx
S14-6	/PTT-FRM-OPT	Provides the signal for the radio to transmit.	5V CMOS 0V = Tx
S14-7	/IN-LOCK	Used to inhibit VOX Tx requests when the radio is out of lock.	synthesiser lock detect 0V = lock (lock-up time <20ms)
S14-11	CALL-SW	Used by trunking software to mute invalid audio.	5V CMOS 5V = mute

The following diagram shows the pin designations of S21, viewed from the rear of the radio.

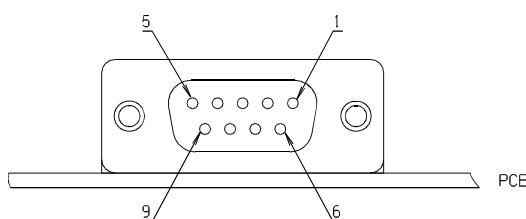


Figure 8.11.3 9 Way D-Range Connector (S21)

8.11.6 Specifications

Current	.. <30mA
Operating Temperature Range	.. -30 to +60°C ambient
Audio:	
Input For 60% Deviation	.. 1mVrms \pm 0.1mV (1kHz, 600 Ω)
Microphone	.. uni-directional electret
Microphone sensitivity	.. -67dB \pm 3db (0dB = 1V/ μ bar)
Distortion	.. <5%
Delay From Audio To PTT Request	.. 20ms (typical)

8.11.7 Circuit Description

Audio is fed into the preamplifier circuitry (Q1) from the electret microphone via pin 2 of the 9 way D-range (S21). The pre-amplified audio is then split and goes into the speech bandpass filter and the noise filter.

The speech bandpass filter consists of a 4th order 250Hz high pass filter (IC1) and a gain stage (IC1) with a 3kHz rolloff. Audio then goes into the compressor circuitry (IC1). When PTT is requested by the logic circuitry, IC2 switches and the audio is driven into the TX-LINE-IN at a low impedance. After the high pass filter, audio is tapped off into the speech VOX filter (IC4), which provides a low pass cutoff of 700Hz. This, combined with the previous high pass filter, gives the speech VOX filter cutoffs of 250Hz and 700Hz.

The second path of the audio after the preamplifier is to the noise filter (IC3). This consists of a 2nd order high pass filter below 100Hz.

After the gain adjusting stages (IC3 & IC4) each filter goes into a precision rectifier (IC3 & IC4), where their appropriate DC level is presented to a comparator (IC3 pins 12, 13 & 14). The negative input has a potentiometer (RV67) providing a DC offset, which is used to provide a minimum VOX threshold. This minimum threshold decreases with VOX activity to provide some hysteresis. The negative input is also held high via IC2, preventing the comparator switching until the synthesiser lock detect line (IN/LOCK) is low. The positive input has a zener diode to prevent VOX activating when both inputs are in saturation.

The switching circuitry after the comparator output has a slow decay provided by R69 and C31. IC5 will only allow a VOX PTT request if the AUX line has been taken high. Two NAND gates in IC5 allow a handsfree PTT request (VOX or MOX) to proceed unless the PTT-IN line has been taken low. A valid handsfree PTT request will mute the ordinary microphone and switch IC2, whereas a PTT-IN signal will be mirrored on the PTT line, without switching in the handsfree audio or muting the ordinary microphone.

The CALL line is used by trunking software to mute the handsfree audio when the audio path has been invalidly switched in (i.e. on a control channel). Similarly, the BUSY line is used to mute the audio if TX inhibit on busy is used.

Trunking Continuous Carrier Systems

Optional circuitry is provided by IC7 to inhibit the VOX signal from the received audio, instead of BUSY. LINK4 is removed to disable the BUSY inhibit and the RX-AUDIO inhibit is enabled by changing LINK5A to LINK5B.

Receiver gated audio is buffered by IC7 pins 12, 13 & 14 and split off to feed into the VOX noise path (IC3 pins 5, 6 & 7) and also to a precision rectifier formed around IC7, pins 1, 2 & 3. The rectified audio signal is compared by IC7 pins 5, 6 & 7, and operates the inhibit circuit, Q14.

8.11.8 PCB Information

T2000-50 Parts List (IPN 220-01210-03)

Ref	IPN	Description	Ref	IPN	Description
C1	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	IC1	002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
C2	015-25220-08	CAP CER 0805 CHIP 22N 10% X7R 50V	IC2	002-10040-53	(S) IC 4053 SMD TRIPLE 2CH MULTI-PLEXR
C2A	015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V	IC3	002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
C3	015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V			
C4	020-58470-05	CAP ELECT AI RDL 47M 16V 6.3X7MM	IC4	002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
C5	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	IC5	002-74900-00	(S) IC SMD 74HC00 QUAD 2 I/P NAND
C6	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	IC6	002-10078-08	(S) IC SMD 78L08 8V REG SO8
C7	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	IC7	002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
C8	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	IC8	002-00014-62	(S) IC 317L 100MA REG 3 TERMINAL TO-92
C9	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V			
C10	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	P13	240-00026-26	CONN PADLE BRD 12 WAY MICRO MATCH 1-215
C11	015-23680-08	CAP CER 0805 CHIP 680P 10% X7R 50V	P13A	240-00020-51	PLUG 12 WAY 2*6 FLAT CABLE TERMN
C12	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	P14	240-00026-24	CONN PADLE BRD 16 WAY MICRO MATCH 1-215
C13	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	P14A	240-00020-54	PLUG 16 WAY 2X8 FLAT CABLE TERMN MICROM
C14	015-21470-01	CAP CER 0805 CHIP 4P7 +/-0.25P NPO 50V			
C15	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q1	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C16	020-58470-05	CAP ELECT AI RDL 47M 16V 6.3X7MM	Q2	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C17	020-58470-05	CAP ELECT AI RDL 47M 16V 6.3X7MM	Q3	000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
C18	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q4	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C19	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q5	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C20	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q6	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C21	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	Q7	000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
C22	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q8	000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
C23	020-58470-05	CAP ELECT AI RDL 47M 16V 6.3X7MM	Q9	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C25	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	Q10	000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
C26	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	Q11	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C27	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q12	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C28	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	Q13	000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
C29	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	Q14	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A
C30	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR			
C31	020-58100-04	CAP ELECT AI RDL 10M 16V 4X7MM	R1	036-14470-00	RES M/F 0805 CHIP 4K7 5%
C32	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R2	036-14270-00	RES M/F 0805 CHIP 2K7 5%
C33	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	R3	036-14100-00	RES M/F 0805 CHIP 1K 5%
C34	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R4	036-14680-00	RES M/F 0805 CHIP 6K8 5%
C35	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	R5	036-14270-00	RES M/F 0805 CHIP 2K7 5%
C36	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R6	036-15100-00	RES M/F 0805 CHIP 10K 5%
C37	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R7	036-13220-00	RES M/F 0805 CHIP 220E 5%
C38	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R8	036-14220-00	RES M/F 0805 CHIP 2K2 5%
C39	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R9	036-15390-00	RES M/F 0805 CHIP 39K 5%
C40	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R10	036-15330-00	RES M/F 0805 CHIP 33K 5%
C40A	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R11	036-15470-00	RES M/F 0805 CHIP 47K 5%
C41	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R13	036-15100-00	RES M/F 0805 CHIP 1K 5%
C41A	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R14	036-15820-00	RES M/F 0805 CHIP 82K 5%
C42	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R15	036-15150-00	RES M/F 0805 CHIP 15K 5%
C43	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R16	036-14100-00	RES M/F 0805 CHIP 1K 5%
C44	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R17	036-16100-00	RES M/F 0805 CHIP 100K 5%
C45	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	R18	036-15100-00	RES M/F 0805 CHIP 10K 5%
C46	015-25150-08	CAP CER 0805 CHIP 15N 10% X7R 50V	R19	036-15100-00	RES M/F 0805 CHIP 10K 5%
C47	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R20	036-12100-00	RES M/F 0805 CHIP 10E 5%
C48	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R21	036-15100-00	RES M/F 0805 CHIP 10K 5%
C49	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R22	036-16100-00	RES M/F 0805 CHIP 100K 5%
C50	015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V	R23	036-15100-00	RES M/F 0805 CHIP 10K 5%
C51	020-57100-55	CAP ELECT AI RDL 1UF 50V 4X7MM	R24	036-15470-00	RES M/F 0805 CHIP 47K 5%
C52	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R25	036-15220-00	RES M/F 0805 CHIP 22K 5%
C53	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R26	036-17100-00	RES M/F 0805 CHIP 1M 5%
C54	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R27	036-17100-00	RES M/F 0805 CHIP 1M 5%
C55	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R28	036-17100-00	RES M/F 0805 CHIP 1M 5%
C56	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R29	036-15100-00	RES M/F 0805 CHIP 10K 5%
C57	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R30	036-14180-00	RES M/F 0805 CHIP 1K8 5%
C58	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R31	036-17100-00	RES M/F 0805 CHIP 1M 5%
C59	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R32	036-15100-00	RES M/F 0805 CHIP 10K 5%
C60	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R33	036-14270-00	RES M/F 0805 CHIP 2K7 5%
C61	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R34	036-14470-00	RES M/F 0805 CHIP 4K7 5%
C62	015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V	R35	036-10000-00	RES M/F 0805 CHIP ZERO OHM
C63	015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V	R36	036-16150-00	RES M/F 0805 CHIP 150K 5%
C64	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R37	036-14100-00	RES M/F 0805 CHIP 1K 5%
D1	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SINGLE SO	R38	036-16100-00	RES M/F 0805 CHIP 100K 5%
D2	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SINGLE SO	R39	036-16220-00	RES M/F 0805 CHIP 220K 5%
D3	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SINGLE SO	R40	036-17100-00	RES M/F 0805 CHIP 1M 5%
D4	001-10084-51	(S) DIODE ZENER SMD BZX84C5V1 SOT23	R41	036-14100-00	RES M/F 0805 CHIP 1K 5%
D5	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SINGLE SO	R42	036-15100-00	RES M/F 0805 CHIP 10K 5%
D6	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SINGLE SO	R43	036-16100-00	RES M/F 0805 CHIP 100K 5%
D7	001-10084-36	(S) DIODE ZENER SMD BZX84C3V6 SOT23	R44	036-15470-00	RES M/F 0805 CHIP 47K 5%
D8	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SINGLE SO	R45	036-14100-00	RES M/F 0805 CHIP 1K 5%
			R46	036-13470-00	RES M/F 0805 CHIP 470E 5%

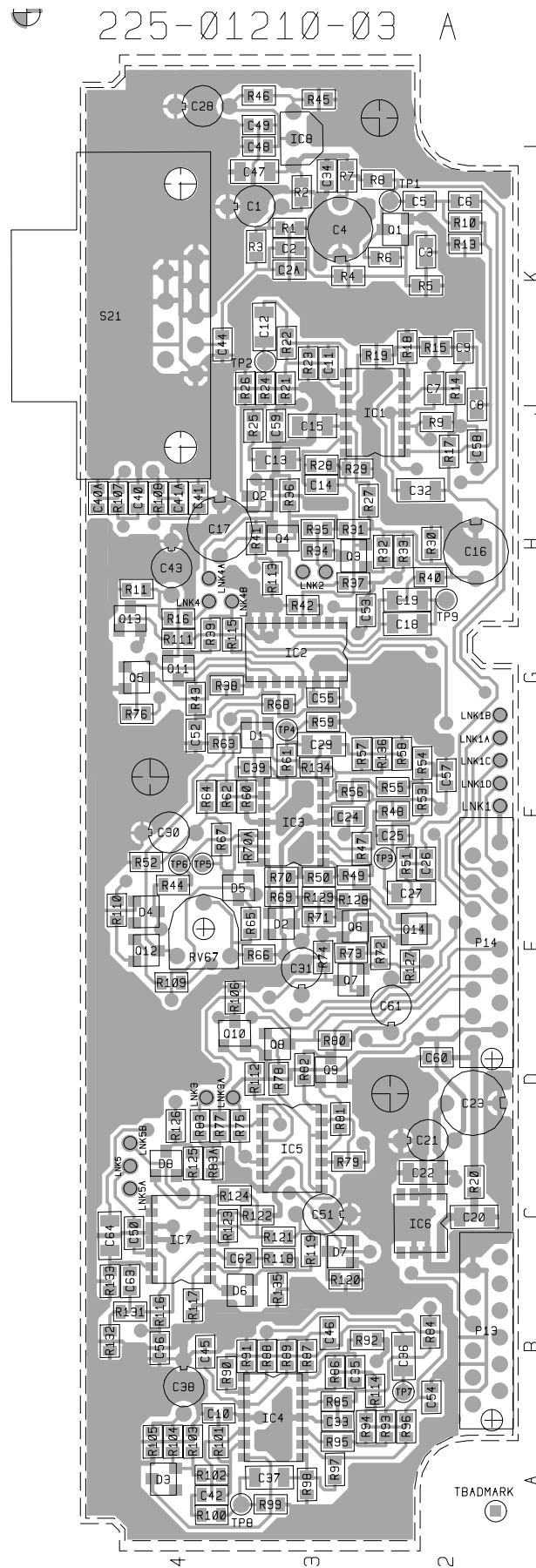
Ref	IPN	Description	Ref	IPN	Description
R47	036-15220-00	RES M/F 0805 CHIP 22K 5%	R129	036-14100-00	RES M/F 0805 CHIP 1K 5%
R48	036-16150-00	RES M/F 0805 CHIP 150K 5%	R131	036-15100-00	RES M/F 0805 CHIP 10K 5%
R49	036-15180-00	RES M/F 0805 CHIP 18K 5%	R132	036-16100-00	RES M/F 0805 CHIP 100K 5%
R50	036-15100-00	RES M/F 0805 CHIP 10K 5%	R133	036-15100-00	RES M/F 0805 CHIP 10K 5%
R51	036-16150-00	RES M/F 0805 CHIP 150K 5%	R134	036-16100-00	RES M/F 0805 CHIP 100K 5%
R52	036-15470-00	RES M/F 0805 CHIP 47K 5%	R135	036-16100-00	RES M/F 0805 CHIP 100K 5%
R53	036-15100-00	RES M/F 0805 CHIP 10K 5%	R136	036-16820-00	RES M/F 0805 CHIP 820K 5%
R54	036-17100-00	RES M/F 0805 CHIP 1M 5%			
R55	036-15100-00	RES M/F 0805 CHIP 10K 5%	S21	240-00010-45	SKT 9 WAY D RANGE RT ANGLE PCB MNT 82009-
R56	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R57	036-15820-00	RES M/F 0805 CHIP 82K 5%			
R58	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R59	036-16100-00	RES M/F 0805 CHIP 100K 5%			
R60	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R61	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R62	036-16330-00	RES M/F 0805 CHIP 330K 5%			
R63	036-16100-00	RES M/F 0805 CHIP 100K 5%			
R64	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R65	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R66	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R67	036-15470-00	RES M/F 0805 CHIP 47K 5%			
RV67	042-05100-06	RES PRESET 10K CARBON 6MM FLAT			
R68	036-14120-00	RES M/F 0805 CHIP 1K2 5%			
R69	036-16470-00	RES M/F 0805 CHIP 470K 5%			
R70	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R70A	036-18100-00	RES M/F 0805 CHIP 10M 10%			
R71	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R72	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R73	036-14470-00	RES M/F 0805 CHIP 4K7 5%			
R74	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R75	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R76	036-16220-00	RES M/F 0805 CHIP 220K 5%			
R77	036-10000-00	RES M/F 0805 CHIP ZERO OHM			
R78	036-14470-00	RES M/F 0805 CHIP 4K7 5%			
R79	036-10000-00	RES M/F 0805 CHIP ZERO OHM			
R80	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R81	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R82	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R83	036-14470-00	RES M/F 0805 CHIP 4K7 5%			
R83A	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R84	036-15220-00	RES M/F 0805 CHIP 22K 5%			
R85	036-15220-00	RES M/F 0805 CHIP 22K 5%			
R86	036-14270-00	RES M/F 0805 CHIP 2K7 5%			
R87	036-15220-00	RES M/F 0805 CHIP 22K 5%			
R88	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R89	036-15220-00	RES M/F 0805 CHIP 22K 5%			
R90	036-15120-00	RES M/F 0805 CHIP 12K 5%			
R91	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R92	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R93	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R94	036-16100-00	RES M/F 0805 CHIP 100K 5%			
R95	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R96	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R97	036-16330-00	RES M/F 0805 CHIP 330K 5%			
R98	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R99	036-16100-00	RES M/F 0805 CHIP 100K 5%			
R100	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R101	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R102	036-16330-00	RES M/F 0805 CHIP 330K 5%			
R103	036-16100-00	RES M/F 0805 CHIP 100K 5%			
R104	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R105	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R106	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R107	036-13100-00	RES M/F 0805 CHIP 100E 5%			
R108	036-13100-00	RES M/F 0805 CHIP 100E 5%			
R109	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R110	036-13560-00	RES M/F 0805 CHIP 560E 5%			
R111	036-14470-00	RES M/F 0805 CHIP 4K7 5%			
R112	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R113	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R114	036-15180-00	RES M/F 0805 CHIP 18K 5%			
R115	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R116	036-17100-00	RES M/F 0805 CHIP 1M 5%			
R117	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R118	036-16330-00	RES M/F 0805 CHIP 330K 5%			
R119	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R120	036-15470-00	RES M/F 0805 CHIP 47K 5%			
R121	036-14680-00	RES M/F 0805 CHIP 6K8 5%			
R122	036-14680-00	RES M/F 0805 CHIP 6K8 5%			
R123	036-15220-00	RES M/F 0805 CHIP 22K 5%			
R124	036-16470-00	RES M/F 0805 CHIP 470K 5%			
R125	036-16220-00	RES M/F 0805 CHIP 220K 5%			
R126	036-14100-00	RES M/F 0805 CHIP 1K 5%			
R127	036-15100-00	RES M/F 0805 CHIP 10K 5%			
R128	036-12100-00	RES M/F 0805 CHIP 10E 5%			

Mechanical & Miscellaneous Parts

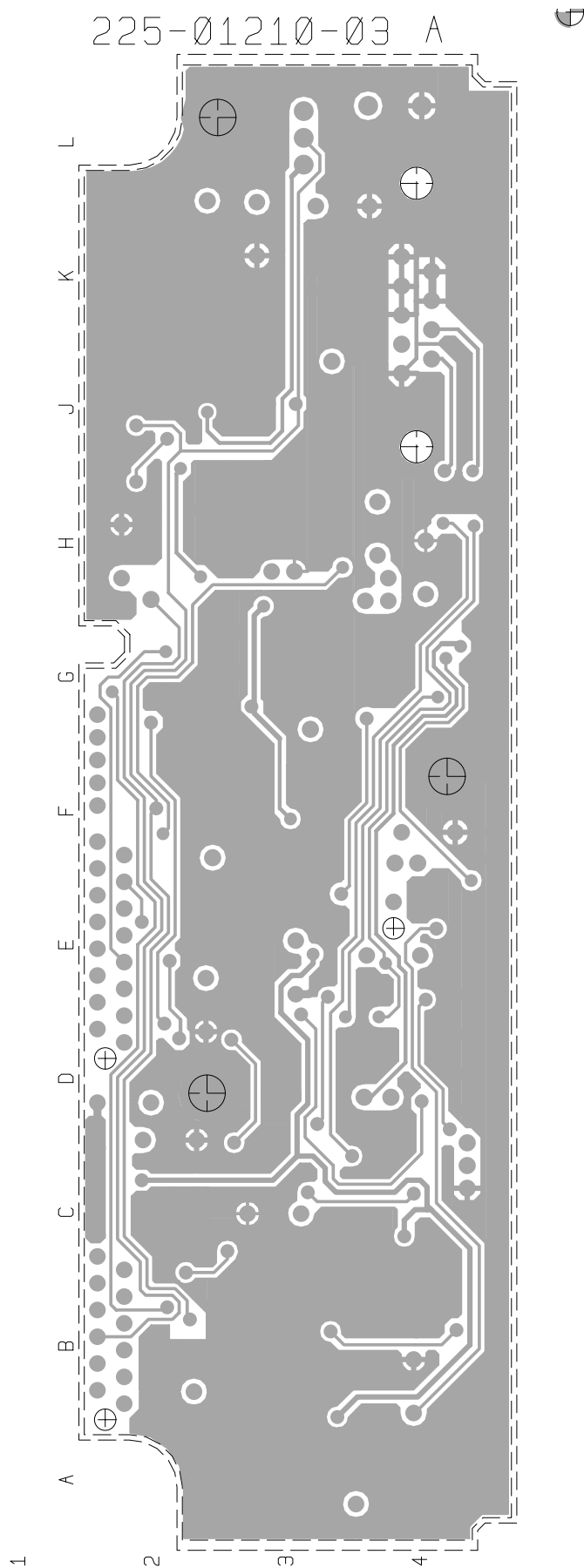
201-00030-01	WIRE #1 T/C WIRE 7/0.2MM PVC BROWN
201-00030-02	WIRE #1 T/C WIRE 7/0.2MM PVC RED
201-00030-03	WIRE #1 T/C WIRE 7/0.2MM PVC ORANGE
201-00030-06	WIRE #1 T/C WIRE 7/0.2MM PVC BLUE
201-00030-07	WIRE #1 T/C WIRE 7/0.2MM PVC VIOLET
201-00030-08	WIRE #1 T/C WIRE 7/0.2MM PVC GREY
205-00010-12	CABLE FLAT RBBN 16 CORE 16/7/0.1 GREY
225-01210-03	PCB T2000 HANDS FREE MIC
236-00000-10	SWITCH FOOT OPERATED WITH 3M TWIN CYCL
240-00010-40	PLUG 9 WAY DRANGE SUBMIN SOLDER CUP CO
240-02020-06	SKT 3.5MM INLINE MINIATURE JACK
240-04021-62	CONN 2WAY 22AWG (RED) INLINE HERMAPHRO
240-04021-63	CONN 2WAY 24AWG (BLACK) INLINE HER-
MAPHR	
240-06010-28	HOOD/COVER 9WAY DRANGE COMPACT NO LO
240-06010-29	HOOD/COVER 9WAY DRANGE LONG EAR THUM
252-00010-39	MIC EMC124U ELECTRET UNI-DIR VISOR MTG
349-00020-06	SCREW 4-40 X 1/4 PAN POZI TAPTITE BLK (TO TAP CHASSIS HOLES)
349-00020-32	SCREW TAPTITE M3X8MM PAN POZI BZ
365-00011-38	LABEL STATIC WARNING YELLOW A4A315
365-00011-54	LABEL WHITE RW1556/2 SPECIAL ADHESIVE
369-00010-13	TIE CABLE NYLON 175*5MM
399-00010-52	BAG PLASTIC 100*150MM
399-00010-88	BAG STATIC SHIELDING 152*254MM
408-20050-00	USER GUIDE T2000-50 HANDS FREE
410-00010-60	CARTON 150X112X56MM VICTOR
418-20050-02	FITTING INS T2000-50

T2000-50 Grid Reference Index (IPN 220-01210-03)

Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit
C1	1:L3	1-B9				Q7	1:E3	1-K5	R74	1:E3	1-K4
C2	1:K3	1-B8	IC1	1:J3	1-Q0	Q8	1:D3	1-P5	R75	1:D4	1-L5
C2A	1:K3	1-B8			1-E7	Q9	1:D3	1-Q5	R76	1:G4	1-M7
C3	1:K2	1-C7			1-F7	Q10	1:D4	1-K3	R77	1:D4	1-N2
C4	1:K3	1-B8			1-H8	Q11	1:G4	1-G6	R78	1:D3	1-N5
C5	1:L2	1-C8			1-K8	Q12	1:E4	1-C3	R79	1:C3	1-R5
C6	1:L2	1-D8	IC2	1:G3	1-P0	Q13	1:G4	1-R4	R80	1:D3	1-P4
C7	1:J2	1-C9			1-M9	Q14	1:E2	1-J3	R81	1:D3	1-Q5
C8	1:J2	1-E8			1-F6	R1	1:K3	1-A9	R82	1:D3	1-Q5
C9	1:K2	1-F8			1-E6	R2	1:L3	1-C9	R83	1:D4	1-L3
C10	1:B4	1-R1	IC3	1:F3	1-R0	R3	1:K3	1-B8	R83A	1:C4	1-L2
C11	1:J3	1-H8			1-B5	R4	1:K3	1-B8	R84	1:B2	1-K1
C12	1:K3	1-H8			1-C5	R5	1:K2	1-B7	R85	1:B3	1-K1
C13	1:J3	1-J8			1-E4	R6	1:K3	1-C8	R86	1:B3	1-J0
C14	1:H3	1-K9			1-G5	R7	1:L3	1-C9	R87	1:B3	1-H0
C15	1:J3	1-J7	IC4	1:B3	1-R0	R8	1:L3	1-C8	R88	1:B3	1-H1
C16	1:H2	1-K7			1-D0	R9	1:J2	1-D7	R89	1:B3	1-H0
C17	1:H4	1-K7			1-F1	R10	1:K2	1-E9	R90	1:B4	1-G1
C18	1:G2	1-N9			1-H1	R11	1:H4	1-P3	R91	1:B4	1-G0
C19	1:H2	1-N9			1-J0	R13	1:K2	1-E7	R92	1:B3	1-J0
C20	1:C2	1-L0	IC5	1:D3	1-S0	R14	1:J2	1-F7	R93	1:A3	1-F1
C21	1:D2	1-P5			1-L5	R15	1:K2	1-F9	R94	1:A3	1-F1
C22	1:C2	1-M0			1-M4	R16	1:G4	1-P4	R95	1:A3	1-F1
C23	1:D2	1-M0		1-N5		R17	1:J2	1-K2	R96	1:A2	1-F2
C24	1:F3	1-G6			1-P5	R18	1:K2	1-F7	R97	1:A3	1-E1
C25	1:F2	1-B6	IC6	1:C2	1-L0	R19	1:J3	1-G9	R98	1:A3	1-E0
C26	1:F2	1-B6	IC7	1:C4	1-Q0	R20	1:C2	1-L0	R99	1:A3	1-E0
C27	1:E2	1-C5			1-Q7	R21	1:J3	1-G7	R100	1:A4	1-D0
C28	1:L4	1-N1			1-N6	R22	1:K3	1-H8	R101	1:A4	1-D0
C29	1:G3	1-D5			1-P8	R23	1:J3	1-H7	R102	1:A4	1-C0
C30	1:F4	1-F4			1-N0	R24	1:J3	1-J8	R103	1:A4	1-C0
C31	1:E3	1-H4	IC8	1:L3	1-M2	R25	1:J3	1-J8	R104	1:A4	1-C0
C32	1:H2	1-K4	LNK1	1:F2	1-Q2	R26	1:J4	1-J7	R105	1:A4	1-B0
C33	1:A3	1-K0	LNK1A	1:G2	1-P2	R27	1:H3	1-K8	R106	1:E4	1-K2
C34	1:L3	1-L1	LNK1B	1:G2	1-Q2	R28	1:J3	1-K9	R107	1:H5	1-B2
C35	1:B3	1-H1	LNK1C	1:F2	1-Q2	R29	1:J3	1-K8	R108	1:H4	1-B3
C36	1:B2	1-G1	LNK1D	1:F2	1-Q2	R30	1:H2	1-K7	R109	1:E4	1-C3
C37	1:A3	1-E0	LNK2	1:H3	1-L7	R31	1:H3	1-K7	R110	1:E5	1-D3
C38	1:B4	1-B0	LNK2A	1:H3	1-L7	R32	1:H3	1-L8	R111	1:G4	1-R4
C39	1:F3	1-E5	LNK3	1:D4	1-M4	R33	1:H2	1-L9	R112	1:D3	1-L3
C40	1:H4	1-B2	LNK3A	1:D4	1-M4	R34	1:H3	1-L7	R113	1:H3	1-M3
C40A	1:H5	1-A2	LNK4	1:H4	1-N4	R35	1:H3	1-L7	R114	1:B3	1-J1
C41	1:H4	1-B3	LNK4A	1:H4	1-N4	R36	1:H3	1-L7	R115	1:G4	1-R4
C41A	1:H4	1-A3	LNK4B	1:H4	1-N4	R37	1:H3	1-M7	R116	1:B4	1-Q9
C42	1:A4	1-D0	LNK5	1:C4	1-Q8	R38	1:G4	1-M8	R117	1:B4	1-R6
C43	1:H4	1-P3	LNK5A	1:C4	1-Q8	R39	1:G4	1-H6	R118	1:C3	1-Q6
C44	1:K4	1-A8	LNK5B	1:D4	1-R8	R40	1:H2	1-M9	R119	1:C3	1-P7
C45	1:B4	1-H0	P13	1:B2	1-R9	R41	1:H3	1-M3	R120	1:C3	1-P6
C46	1:B3	1-G0			1-R8	R42	1:H3	1-M8	R121	1:C3	1-N7
C47	1:L3	1-L1			1-R8	R43	1:G4	1-G6	R122	1:C3	1-N6
C48	1:L3	1-M1			1-R9	R44	1:E4	1-G3	R123	1:C4	1-N7
C49	1:L3	1-N1			1-R7	R45	1:L3	1-M1	R124	1:C4	1-N7
C50	1:C4	1-Q8			1-R7	R46	1:L3	1-M2	R125	1:C4	1-M6
C51	1:C3	1-P6			1-R6	R47	1:F3	1-A6	R126	1:D4	1-K4
C52	1:G4	1-P7			1-R9	R48	1:F2	1-B6	R127	1:E2	1-J3
C53	1:H3	1-L8			1-R7	R49	1:F3	1-B4	R128	1:E3	1-J4
C54	1:B2	1-G1			1-R7	R50	1:F3	1-B4	R129	1:E3	1-H5
C55	1:G3	1-P0			1-R8	R51	1:F2	1-B5	R131	1:B4	1-R7
C56	1:B4	1-B6			1-R8	R52	1:F4	1-F4	R132	1:B5	1-Q7
C57	1:F2	1-C6	P14	1:D2	1-R6	R53	1:F2	1-C5	R133	1:C5	1-N8
C58	1:J2	1-H6			1-R6	R54	1:F2	1-C5	R134	1:F3	1-D6
C59	1:J3	1-Q9			1-R5	R55	1:F2	1-C5	R135	1:B3	1-P6
C60	1:D2	1-R6			1-R2	R56	1:F3	1-C6	R136	1:F3	1-D5
C61	1:E2	1-K3			1-R3	R57	1:F3	1-D5	S21	1:J4	1-A3
C62	1:C4	1-R7			1-R2	R58	1:F2	1-D4			1-A4
C63	1:C4	1-Q8			1-R5	R59	1:G3	1-E4			1-A2
C64	1:C5	1-N8			1-R3	R60	1:F4	1-E4			1-A9
					1-R3	R61	1:F3	1-E5			1-A7
D1	1:G3	1-F5			1-R2	R62	1:F4	1-E4			1-A2
		1-F5			1-R2	R63	1:G4	1-F4			1-A4
D2	1:E3	1-H5			1-R3	R64	1:F4	1-F5			1-A8
		1-H5			1-R4	R65	1:E4	1-D4			1-A2
D3	1:A4	1-C0			1-R4	R66	1:E3	1-C4	TP1	1:L2	1-C7
		1-C1			1-R5	R67	1:F4	1-G5	TP2	1:J3	1-J9
D4	1:E4	1-A0			1-R5	RV67	1:E4	1-C3	TP3	1:F3	1-C5
D5	1:E4	1-F4				R68	1:G3	1-D3	TP4	1:G3	1-D4
		1-E4	Q1	1:K2	1-C8	R69	1:E3	1-H5	TP5	1:F4	1-G4
D6	1:B4	1-Q7	Q2	1:H3	1-J8	R70	1:F3	1-H4	TP6	1:F4	1-G3
		1-Q7	Q3	1:H3	1-L8	R70A	1:F4	1-G4	TP7	1:B2	1-F0
D7	1:C3	1-P6	Q4	1:H3	1-M7	R71	1:E3	1-J5	TP8	1:A4	1-D1
D8	1:C4	1-N6	Q5	1:G4	1-M8	R72	1:E3	1-J5	TP9	1:H2	1-P9
		1-M6	Q6	1:E3	1-J5	R73	1:E3	1-K5			



T2000-50 Handsfree PCB (IPN 220-01210-03) - Top Side



T2000-50 Handsfree PCB (IPN 220-01210-03) - Bottom Side

8.12 T2000-60 Dual Port UART Kit

The T2000-60 dual port UART Interface Module (UIM) allows computer control of a T2020 or T2040 Series II radio. With full remote control, either semi or fully automatic communication systems can be developed.

Note: The UIM requires radio software Version 2.XX, and to program the UIM parameters, the programming software must be PGM2000 Release 7, or later.

The T2020 and T2040 use Tait's proprietary radio software protocol. For detailed information regarding this protocol, refer to the UART Applications Manual, or contact your local Tait dealer.

The following topics are covered in this Section:

Section	Title	Page
8.12.1	Components Required	8.12.2
8.12.2	Fitting	8.12.3
8.12.3	T2000-60 Link Options	8.12.4
8.12.4	T2000-60 Set-Up	8.12.5
8.12.5	Signal Specifications	8.12.7
8.12.6	PCB Information	8.12.9

8.12.1 Components Required

The T2000-60 kit contains the following components:

Quantity	Description
1	T2000-60 UART PCB assembly
1	15-way high density D-range plug
1	shroud (alternative shroud - not required for T2000 Series II radios)
3	M3x8 pan Pozi Taptite screws
2	4-40x¼ pan Pozi Taptite screws (black)

Associated Documents

T2000-60 Applications Manual IPN 408-20060-0X.

Common Abbreviations

UIM Uart Interface Module
CE Computer Equipment
AE Auxiliary Equipment

Refer to the Applications Manual for details on the interaction of CE to AE with the UIM.

8.12.2 Fitting

- 1 Refer to Figure 8.12.1.

Remove the top cover of the radio by unscrewing the four cover screws, remove the D-range blanking plate in the rear of the T2000 radio, unscrew the logic PCB and fold-out.

Position the UIM PCB as shown, and connect the Micromatch connectors P13, P14, P16, P17 and P18 to S13, S14, S16, S17 and S18 on the T2000 logic PCB.

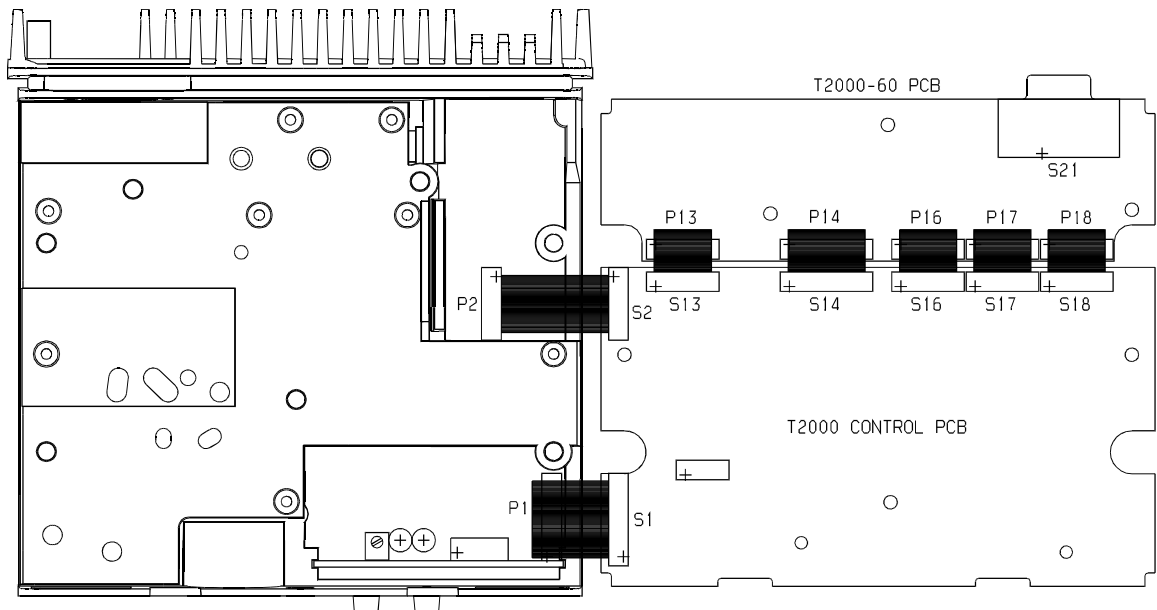


Figure 8.12.1 T2000-60 UART PCB Mounting

- 2 Set up the UIM, as described in Section 8.12.4.
- 3 Carefully fold the logic and UIM PCBs back in position, guiding the D-range connector through the hole provided in the T2000 chassis.

Secure using the three logic PCB retaining screws and the three M3x8 screws provided and refit the top cover.

Plug the D-range assembly provided in the kit into the D-range connector (S21).

Note: Holes are provided in the T2000 chassis for the D-range plug locking screws. Use the two black 4-40 Taptite screws provided in the kit to form the threads.

8.12.3 T2000-60 Link Options

Provision has been made on the T2000-60 PCB for different application requirements. The PCB links are either solder shorted or fitted with 0Ω SMD resistors.

The following table sets out the linking options on the T2000-60 UART PCB.

Note: This table refers only to T2000-60 issue 01 (i.e. PCB IPN 220-01251-01), or later. For a description of how to identify PCBs, refer to “PCB Identification”, on page 7.2

Link	Option	
	CE controlling radio with AE fitted*	CE controlling radio with no AE fitted
LINK1		
LINK3A	non-processed audio (DET-AF-OUT connected to RX-AUDIO)	
LINK3B	processed audio (de-emphasised) (RX-GTD-AF connected to RX-AUDIO2)	
LINK4A	processed audio (pre-emphasised) (TX-AUDIO connected to TX-LINE-IN)	
LINK4B	non-processed audio (TX-AUDIO connected to TX-SIG-IN)	
LINK5A		T2020 (SQLCH/HUSH to RX-GATE)
LINK5B		T2040 (SQLCH/HUSH connected to HUSH)
LINK6	no handshaking required	
LINK7	no handshaking required	
LINK8	normal operation (removal of this link disables the audio mute)	
LINK9	normal operation (this link provides a line termination resistor)	
LINK10	normal operation (removal of this link disables the audio mute)	

* The analogue signals provided by the UIM must be set up according to the requirements of the AE (bearing in mind the UIM maximum output levels).

8.12.4 T2000-60 Set-Up

Test Equipment Required

- AF signal generator
- modulation analyser
- high impedance voltmeter (e.g. VTVM)
- IBM[†] or compatible personal computer
- lead to connect radio to CE and AE, if required (refer to Figure 8.12.2 & Figure 8.12.3)
- oscilloscope
- power supply (+13.8V)
- RF signal generator
- 40dB RF attenuator

The following diagram shows a typical test set-up.

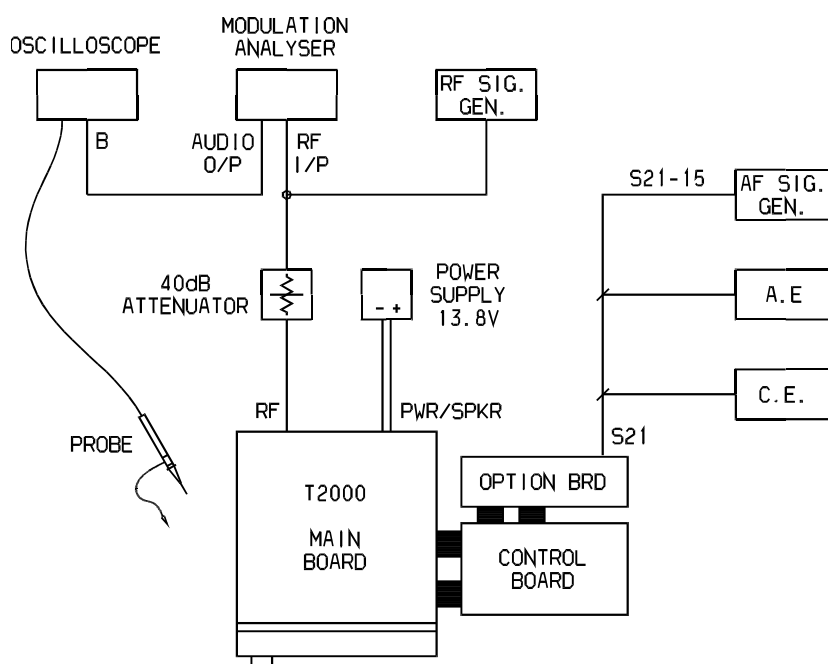


Figure 8.12.2 Test Equipment Set-Up

† IBM is the registered trademark of International Business Machines.

Rx Audio Level

- 1 Set up the test equipment as shown.
- 2 Ensure that pin 5 of S21 is loaded with the impedance normally presented by the AE (typically 600Ω).
- 3 Apply an RF signal at a level of -50dBm on an appropriate channel. Internal modulation at 1kHz should be enabled, with the deviation set to $\pm 1.5\text{kHz}$ for a narrow band radio and $\pm 3\text{kHz}$ for a wide band radio.

Note: If CTCSS or Selcall is enabled, ensure that the signalling mutes are overridden (for T2040 radios, refer to Section 5.8.5, "Test Facilities Available").

- 4 Connect the scope probe to pin 5 of S21, and adjust RV1 to the level required by the AE.

Tx Audio Level

- 1 Set up the test equipment as shown.
- 2 Connect a 600Ω impedance AF signal generator to pin 15 of S21. If the internal impedance of the AE is not 600Ω , either load the AF signal generator to get an internal impedance equivalent to the AE or alternatively, use the AE to provide the test signal (this is possible with most packet radio modems).
- 3 Apply an audio test signal to TX-AUDIO and set the radio to transmit (for T2040 radios, refer to Section 5.8.5, "Test Facilities Available").
- 4 Connect the scope probe to pin 15 of S21 and adjust the AF signal generator to a frequency of 1kHz at a level of 700mVp-p.

While the radio is transmitting, adjust RV2 to produce a deviation on the modulation analyser as stipulated by the AE.

If you are using the test signal from the AE instead of the AF signal generator, there will be some means of adjusting the signal level inside the AE.

8.12.5 Signal Specifications

The following table describes the electrical specification of all CCI interface signals. These signals are available at the 15 way high density D-type connector (S21) mounted on the heatsink at the rear of the radio.

All signals necessary to provide CE and modem connection may be routed via these pins. Some signals may be selected by links on the UART interface module for different characteristics (refer to the circuit diagram and Section 8.12.4).

S21 Pin No.	Signal	Description
1	CTSB	Clear to send in B Handshaking input for port B. This signal complies with the electrical requirements of the RS-232 specification.
2	DGND	Digital ground Ground reference for all digital signals.
3	TXDB	Transmit data out port B Data output from serial port B. This signal complies with the electrical requirements of the RS-232 specification.
4	+13.8V-SW	+13.8V supply out Switched supply voltage. Can supply power to the AE when the radio is switched on. Maximum current = 300mA.
5	RX-AUDIO	Receive audio out This output is link selectable between one of the following signals: 1. DET-AF-OUT (P13 pin 1) Receiver detected audio: unprocessed receiver audio. Output impedance = 600Ω Delivers 0 to 250mVrms (adjustable) into 600Ω at 1kHz (60% of full system deviation). 2. RX-GTD-AF (P13 pin 7) Receiver gated audio: de-emphasised receiver audio, gated by mute element. Delivers 0 to 250mVrms (adjustable) into 600Ω at 1kHz (60% of full system deviation).
6	RXDB	Receive data in port B Data input to serial port B. This signal complies with the electrical requirements of the RS-232 specification.
7	RXDA	Receive data in port A Data input to serial port A. This signal complies with the electrical requirements of the RS-232 specification.
8	TXDA	Transmit data out port A Data output from serial port A. This signal complies with the electrical requirements of the RS-232 specification.
9	DTRB	Data terminal ready out B Handshaking output for port B. This signal complies with the electrical requirements of the RS-232 specification.
10	OPTIONS-GND	Options ground Ground reference for all analogue signals.

8.12.6 PCB Information

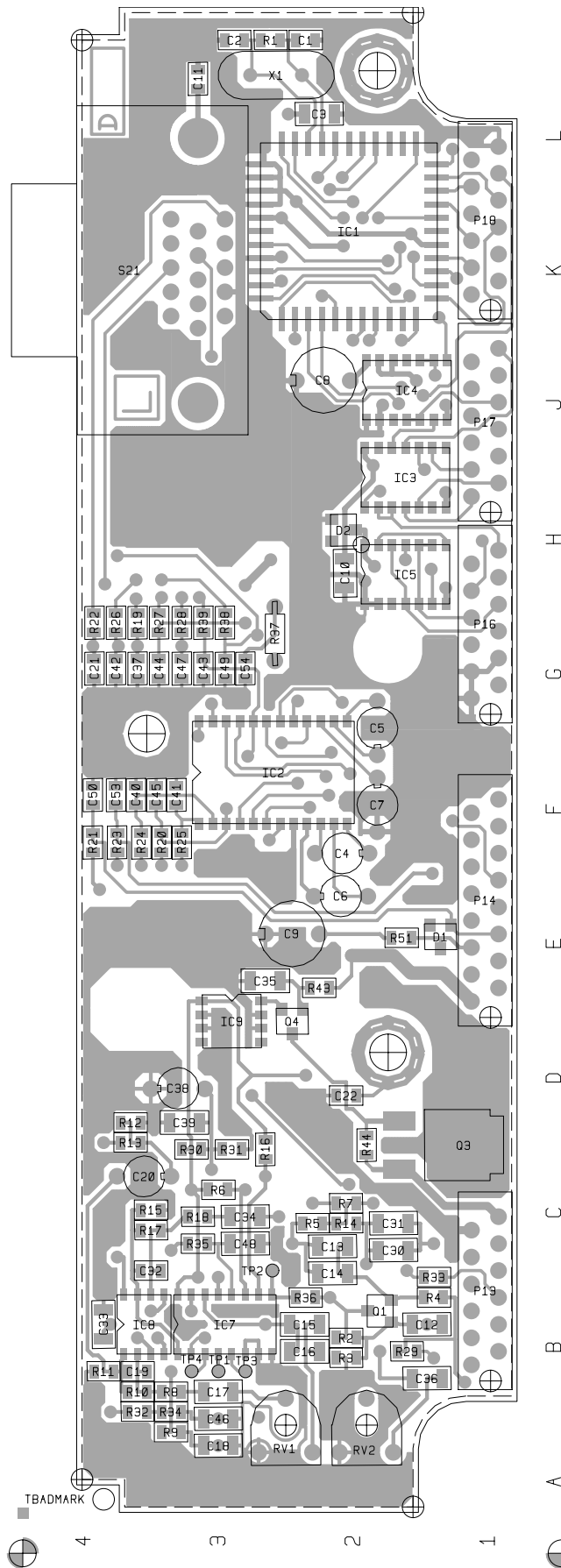
T2000-60 Parts List (IPN 220-01251-01)

Ref	IPN	Description	Ref	IPN	Description
C1	015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V	RV4	042-05470-07	RES PRESET 47K CARBON 6MM FLAT DUAL ADJ
C2	015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V	R10	036-15150-00	RES M/F 0805 CHIP 15K 5%
C3	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R11	036-14330-00	RES M/F 0805 CHIP 3K3 5%
C4	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R12	036-13560-00	RES M/F 0805 CHIP 560E 5%
C5	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R13	036-12470-00	RES M/F 0805 CHIP 47E 5%
C6	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R14	036-13560-00	RES M/F 0805 CHIP 560E 5%
C7	020-57470-10	CAP ELECT AI RDL 4U7 50V LO ESR	R15	036-15150-00	RES M/F 0805 CHIP 15K 5%
C8	020-08470-45	CAP ELECTR RADL 47UF 16V 6.3X6.5MM 5MM L/	R16	036-12470-00	RES M/F 0805 CHIP 47E 5%
C10	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R17	036-14330-00	RES M/F 0805 CHIP 3K3 5%
C20	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R18	036-15100-00	RES M/F 0805 CHIP 10K 5%
C21	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R19	036-13100-00	RES M/F 0805 CHIP 100E 5%
C22	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R20	036-13100-00	RES M/F 0805 CHIP 100E 5%
C23	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R21	036-13100-00	RES M/F 0805 CHIP 100E 5%
C24	020-57100-55	CAP ELECT AI RDL 1UF 50V 4X7MM	R22	036-13100-00	RES M/F 0805 CHIP 100E 5%
C25	020-57100-55	CAP ELECT AI RDL 1UF 50V 4X7MM	R23	036-13100-00	RES M/F 0805 CHIP 100E 5%
C26	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R24	036-13100-00	RES M/F 0805 CHIP 100E 5%
C27	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R25	036-13100-00	RES M/F 0805 CHIP 100E 5%
C28	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R26	036-13100-00	RES M/F 0805 CHIP 100E 5%
C29	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R27	036-13100-00	RES M/F 0805 CHIP 100E 5%
C30	020-57100-55	CAP ELECT AI RDL 1UF 50V 4X7MM	R28	036-13100-00	RES M/F 0805 CHIP 100E 5%
C35	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R29	036-15150-00	RES M/F 0805 CHIP 15K 5%
C40	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R30	036-15560-00	RES M/F 0805 CHIP 56K 5%
C41	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R31	036-15560-00	RES M/F 0805 CHIP 56K 5%
C42	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R32	036-15100-00	RES M/F 0805 CHIP 10K 5%
C43	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R33	036-15100-00	RES M/F 0805 CHIP 10K 5%
C44	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R34	036-15100-00	RES M/F 0805 CHIP 10K 5%
C45	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R35	036-13560-00	RES M/F 0805 CHIP 560E 5%
C47	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R36	036-15100-00	RES M/F 0805 CHIP 10K 5%
C49	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R37	036-14560-00	RES M/F 0805 CHIP 5K6 5%
C50	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R38	036-13100-00	RES M/F 0805 CHIP 100E 5%
C51	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R39	036-13100-00	RES M/F 0805 CHIP 100E 5%
C52	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R40	036-15100-00	RES M/F 0805 CHIP 10K 5%
C53	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R41	036-15100-00	RES M/F 0805 CHIP 10K 5%
C54	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R43	036-14150-00	RES M/F 0805 CHIP 1K5 5%
C55	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R44	036-12560-00	RES M/F 0805 CHIP 56E 5%
C56	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R46	036-16270-00	RES M/F 0805 CHIP 270K 5%
			R47	036-16220-00	RES M/F 0805 CHIP 220K 5%
D1	001-10000-99	(S) DIODE SMD BAV99 DUAL SWTCH SNGL INL	R48	036-16220-00	RES M/F 0805 CHIP 220K 5%
			R49	036-16270-00	RES M/F 0805 CHIP 270K 5%
IC1	002-20026-81	(S) IC SCN2681T DUAL ASYNC RX/TX PLCC	R51	036-15470-00	RES M/F 0805 CHIP 47K 5%
IC2	002-10002-38	(S) IC SMD MAX238EWG RS-232 DRIVER/RX			
IC3	002-74940-78	(S) IC SMD 74HC4078D 8 INPUT NOR/OR GATE S	S21	240-00010-58	SKT 15WAY D-RANGE HI-DENSITY RGT AG PCB
IC4	002-74900-00	(S) IC SMD 74HC00 QUAD 2 I/P NAND			
IC5	002-74600-00	(S) IC 74AC00SC SMD QUAD 2INPUT NAND GTE	X1	274-01056-00	XTAL 3.6864MHZ AT-51 HOLDER C/W TEFLON IN
IC7	002-10040-66	(S) IC MC14066BD DUAD BI-LAT SW SMD SO-14			
IC8	002-10003-58	(S) IC SMD LM358 DUAL OP AMP			
IC9	002-10078-05	(S) IC SMD 78L05 5V REG			
PL1	240-00020-51	PLUG 12 WAY 2*6 FLAT CABLE TERMN	205-00010-12	CABLE FLAT RBBN 16 CORE 16/7/0.1 GREY	
PL2	240-00020-51	PLUG 12 WAY 2*6 FLAT CABLE TERMN	220-01251-01	PCB T2000 DUART OPTION BOARD	
PL3	240-00020-51	PLUG 12 WAY 2*6 FLAT CABLE TERMN	240-00010-80	PLUG 15 WAY DRANGE HI-DENS SUBMIN SLDE	
PL4	240-00020-51	PLUG 12 WAY 2*6 FLAT CABLE TERMN	240-00020-54	PLUG 16 WAY 2X8 FLAT CABLE TERMN MICROM	
P13	240-00026-26	CONN PADLE BRD 12 WAY MICRO MATCH 1-215	240-00026-24	CONN PDL BRD 16 WAY MICRO MTCH 1-215570-P14	
P16	240-00026-26	CONN PADLE BRD 12 WAY MICRO MATCH 1-215			
P17	240-00026-26	CONN PADLE BRD 12 WAY MICRO MATCH 1-215	240-06010-28	HOOD/COVER 9WAY DRANGE COMPACT NO LO	
P18	240-00026-26	CONN PADLE BRD 12 WAY MICRO MATCH 1-215	349-00020-07	(L) SCREW 4-40 X 5/16 PAN POZI TAPTITE BLAC	
			349-00020-32	SCREW TAPTITE M3X8MM PAN POZI BZ	
Q1	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A			
Q2	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A			
Q3	000-10029-55	(S) XSTR SMD MJD2955 PWR PNP 10A 60V 20W			
Q4	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A			
Q5	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A			
Q6	000-10008-48	(S) XSTR SMD BCW60/BC848B215 NPN SOT23 A			
R1	036-17100-00	RES M/F 0805 CHIP 1M 5%			
RV1	042-05470-07	RES PRESET 47K CARBON 6MM FLAT DUAL ADJ			
RV2	042-05470-07	RES PRESET 47K CARBON 6MM FLAT DUAL ADJ			
RV3	042-05470-07	RES PRESET 47K CARBON 6MM FLAT DUAL ADJ			

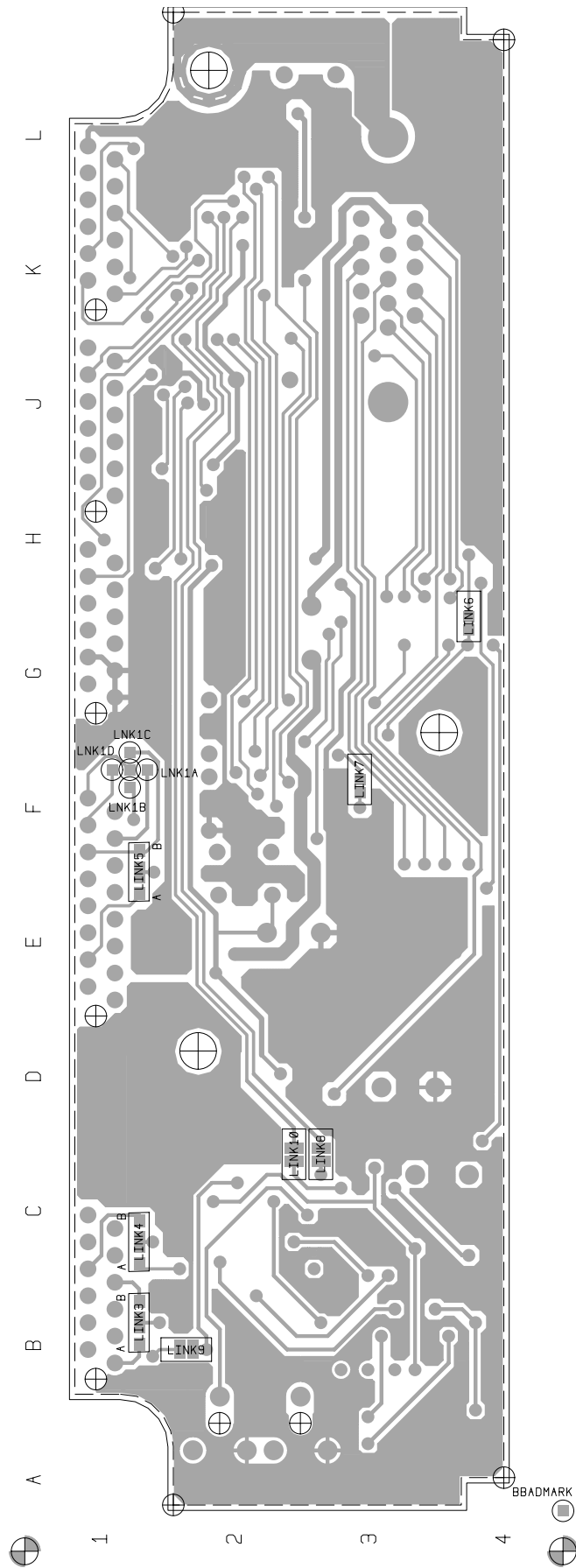
Mechanical & Miscellaneous Parts

T2000-60 Grid Reference Index (IPN 220-01251-01)

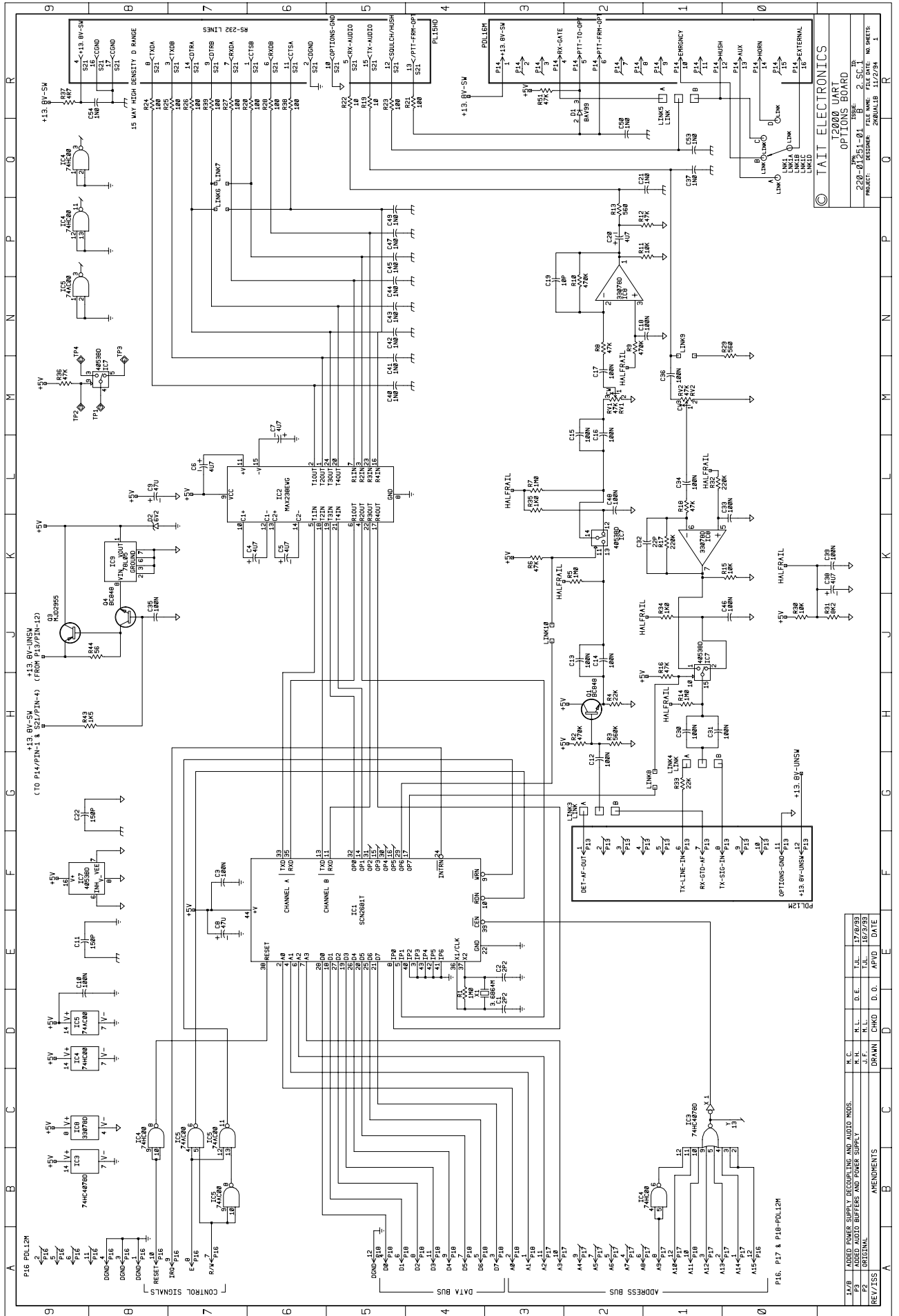
Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit
C1	1:M2	1-D3	LINK8	2:C3	1-G1	R8	1:B3	1-N2
C2	1:M3	1-E3	LINK9	2:B2	1-N1	R9	1:A3	1-N2
C3	1:L2	1-F7	LINK10	2:C3	1-J3	R10	1:B4	1-N2
C4	1:F2	1-K6				R11	1:B4	1-P1
C5	1:G2	1-K6	P13	1:B1	1-F0	R12	1:D4	1-P1
C6	1:E2	1-L7			1-F2	R13	1:D4	1-P2
C7	1:F2	1-L6			1-F2	R14	1:C2	1-H1
C8	1:J2	1-E7			1-F2	R15	1:C4	1-K0
C9	1:E3	1-L8			1-F0	R16	1:D3	1-H1
C10	1:H2	1-D9			1-F0	R17	1:C4	1-K1
C11	1:L3	1-E9			1-F1	R18	1:C3	1-L1
C12	1:B2	1-G2			1-F1	R19	1:G4	1-R5
C13	1:C2	1-J2			1-F1	R20	1:F3	1-R6
C14	1:C2	1-J2			1-F2	R21	1:F4	1-R4
C15	1:B2	1-M2			1-F0	R22	1:G4	1-R5
C16	1:B2	1-M2			1-F1	R23	1:F4	1-R5
C17	1:B3	1-M2	P14	1:E1	1-R3	R24	1:F4	1-R8
C18	1:A3	1-N1			1-R2	R25	1:F3	1-R7
C19	1:B4	1-N3			1-R3	R26	1:G4	1-R7
C20	1:C4	1-P2			1-R0	R27	1:G3	1-R7
C21	1:G4	1-Q1			1-R1	R28	1:G3	1-R6
C22	1:D2	1-G9			1-R2	R29	1:B2	1-N0
C30	1:C2	1-H1			1-R1	R30	1:D3	1-J0
C31	1:C2	1-H1			1-R3	R31	1:D3	1-J0
C32	1:C4	1-K1			1-R2	R32	1:B4	1-L1
C33	1:B4	1-K0			1-R0	R33	1:C1	1-G1
C34	1:C3	1-L1			1-R1	R34	1:B3	1-J1
C35	1:E3	1-J8			1-R0	R35	1:C3	1-L3
C36	1:B2	1-M1			1-R0	R36	1:B2	1-M9
C37	1:G4	1-Q1			1-R1	R37	1:G3	1-R9
C38	1:D3	1-K0			1-R2	R38	1:G3	1-R6
C39	1:D3	1-K0			1-R3	R39	1:G3	1-R7
C40	1:F4	1-M5	P16	1:G1	1-A8	R43	1:E2	1-H8
C41	1:F3	1-M5			1-A9	R44	1:D2	1-J8
C42	1:G4	1-N5			1-A9	R51	1:E2	1-R3
C43	1:G3	1-N5			1-A9			
C44	1:G3	1-N5			1-A0	S21	1:K3	1-R9
C45	1:F4	1-P5			1-A8			1-R4
C46	1:B3	1-J0			1-A8			1-R7
C47	1:G3	1-P5			1-A8			1-R6
C48	1:C3	1-L2			1-A7			1-R8
C49	1:G3	1-P5			1-A7			1-R8
C50	1:F4	1-Q2			1-A7			1-R6
C53	1:F4	1-Q1			1-A8			1-R6
C54	1:G3	1-R8	P17	1:H1	1-A2			1-R5
					1-A2			1-R7
D1	1:E1	1-R2			1-A2			1-R5
D2	1:H2	1-K8			1-A2			1-R7
					1-A2			1-R6
IC1	1:K2	1-E4			1-A1			1-R5
IC2	1:F3	1-K5			1-A1			1-R5
IC3	1:H2	1-B9			1-A1			1-R8
		1-C0			1-A0			1-R7
IC4	1:J2	1-D9			1-A3	TP1	1:B3	1-M8
		1-B1			1-A3	TP2	1:C3	1-M9
		1-C8			1-A1	TP3	1:B3	1-M8
		1-P9	P18	1:K1	1-A3	TP4	1:B3	1-M9
		1-Q9			1-A3			
IC5	1:H2	1-D9			1-A1	X1	1:L3	1-D4
		1-C7			1-A5			
		1-B7			1-A5			
		1-C7			1-A5			
		1-N9			1-A4			
IC7	1:B3	1-F8			1-A4			
		1-M8			1-A4			
		1-J1			1-A4			
		1-K2			1-A4			
IC8	1:B4	1-C9			1-A3			
		1-N2						
		1-K1	Q1	1:B2	1-H2			
IC9	1:D3	1-K8	Q3	1:D1	1-J9			
			Q4	1:D3	1-J8			
LNK1	2:F1	1-Q0						
LNK1A	2:F1	1-Q0	R1	1:M3	1-D4			
LNK1B	2:F1	1-Q0	RV1	1:A3	1-M2			
LNK1C	2:F1	1-Q0	RV2	1:A2	1-M1			
LNK1D	2:F1	1-Q0	R2	1:B2	1-H2			
LINK3	2:B1	1-G2	R3	1:B2	1-H2			
LINK4	2:C1	1-G1	R4	1:B1	1-H2			
LINK5	2:F1	1-R1	R5	1:C2	1-K2			
LINK6	2:G4	1-P7	R6	1:C3	1-K3			
LINK7	2:F3	1-Q7	R7	1:C2	1-L3			



T2000-60 UART PCB (IPN 220-01251-01) - Top Side



T2000-60 UART PCB (IPN 220-01251-01) - Bottom Side



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 T2000 UART
 OPTIONS BOARD
 220-00151-01
 PROJECT DESIGNER: 200/MALB 11/2/94
 NO. SHEETS: 1

REV/ISS	AMENDMENTS	DRN	CHKD	D.O.	APVD	DATE
1	1					17/01/93
2	2					16/2/93

8.13 T2000-A66 Single Port UART Kit

The T2000-A66 single port UART kit allows computer control of a T2030, T2035 or T2040 Series II radio. With full remote control, either semi or fully automatic communication systems can be developed.

The following topics are covered in this Section:

Section	Title	Page
8.13.1	Components Required	8.13.2
8.13.2	Fitting	8.13.2
8.13.3	Signal Specifications	8.13.3
8.13.4	PCB Information	8.13.4

8.13.1 Components Required

The T2000-A66 kit contains the following components:

Quantity	Description
1	T2000-A66 UART PCB assembly
1	Data Interface Decoupling PCB assembly (refer to Section 7.17)
2	M2.5x10mm pan Pozi Taptite screws
2	M2.5 shakeproof washers
2	M2.5 nuts
1	locking screw kit (in plastic bag)
2	4-40x¼ pan Pozi Taptite screws (black)
20mm	foam tape

8.13.2 Fitting

Refer to Figure 8.13.1.

1 Remove the top cover of the radio by unscrewing the four cover screws, unclip the D-range blanking plate in the rear of the T2000 radio, unscrew the logic PCB and fold out.

2 T2000-A66 Mounting

Position the T2000-A66 PCB on the top side of the logic PCB, as shown, matching P1 on the bottom side of the T2000-A66 PCB to the pads labelled 'P1' on the logic PCB.

Use the two M2.5x10mm screws, nuts and shakeproof washers to secure in place.

Note: The screws are fitted from the *bottom* of the logic PCB, and secured with the nuts and washers on the *top* side of the UART PCB.

Torque the screws to 2.5in.lb. This ensures that the pressure connector, P1, makes contact with the corresponding pads on the logic PCB.

Caution: Over-tightening the screws will cause the T2000-A66 PCB to bend, resulting in possible track damage.

3 T2000 Data Interface Decoupling PCB Mounting

Fit the decoupling PCB to the T2000 chassis, guiding the PCB through the hole provided.

Holes are provided in the T2000 chassis for the D-range locking screws. Use the two black 4-40 Taptite screws provided in the kit to form threads.

Open the locking screw kit, discard the nuts, then secure the D-range using the two locking screws and spring washers.

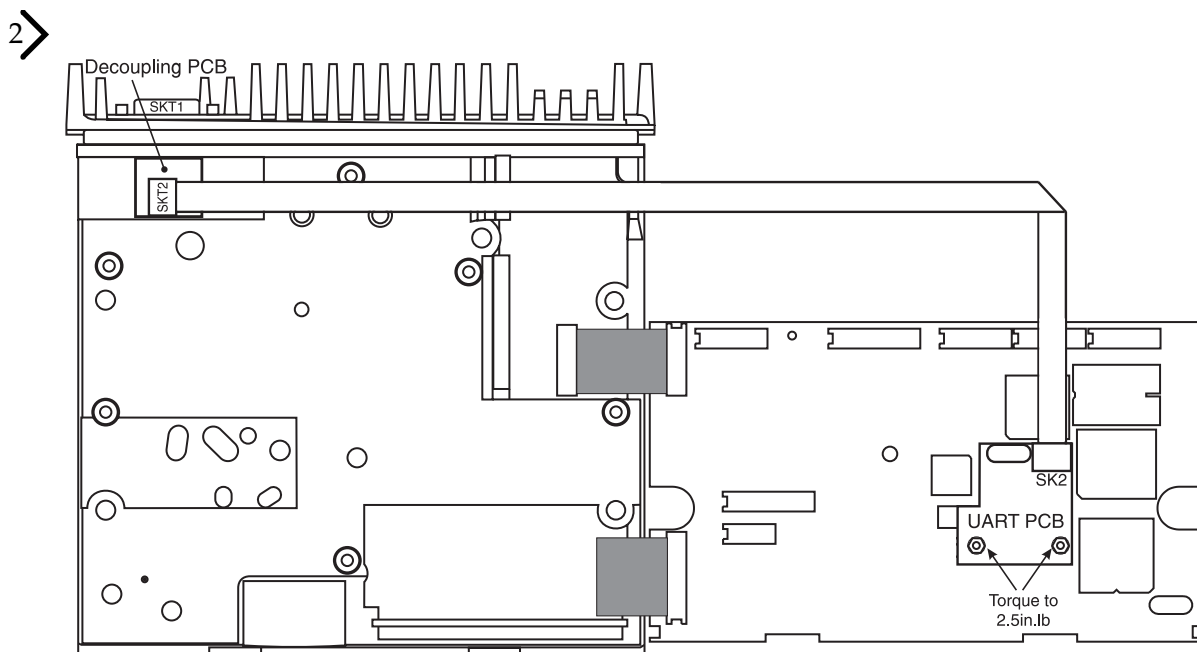


Figure 8.13.1 T2000-A66 Single Port UART PCB Mounting

- 4 Fold the T2000-A66 loom as shown, then plug into SKT2 on the decoupling PCB.
- 5 Fold the logic PCB back in position, and secure using the three logic PCB retaining screws and refit the top cover.

8.13.3 Signal Specifications

The following table describes the signals used on the decoupling PCB 9 way D-range connector (SKT1). The unused pins may be used for other signals, if required.

SKT1 Pin No.	Signal	Description
2	TXD	Transmit data: Serial data output from UART PCB. This signal complies with the electrical requirements of the RS-232 specification.
3	RXD	Receive data: Serial data input to UART PCB. This signal complies with the electrical requirements of the RS-232 specification.
5	DGND	Digital ground: Ground reference for all digital signals.

The following diagram shows the pin designations of SKT1, viewed from the rear of the radio.

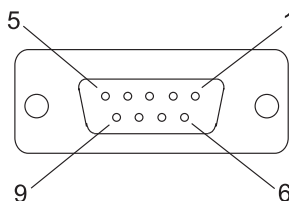
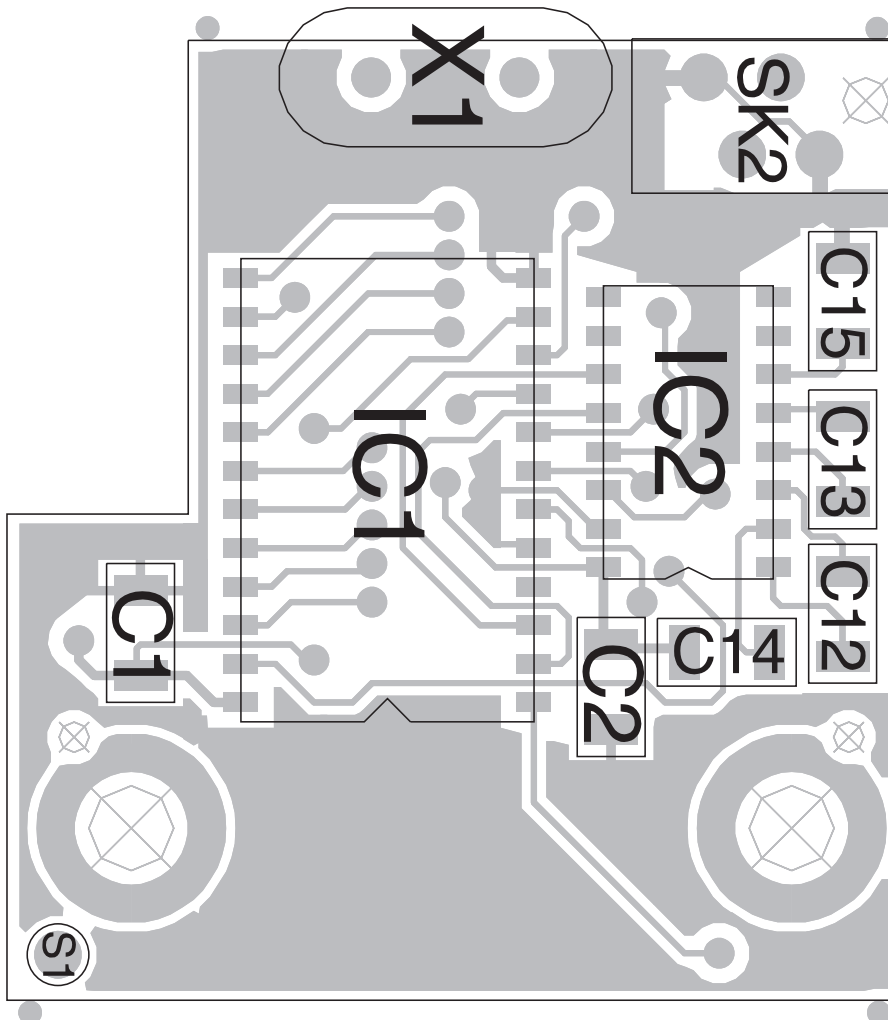


Figure 8.13.2 9 Way D-Range Connector (SKT1)

8.13.4 PCB Information

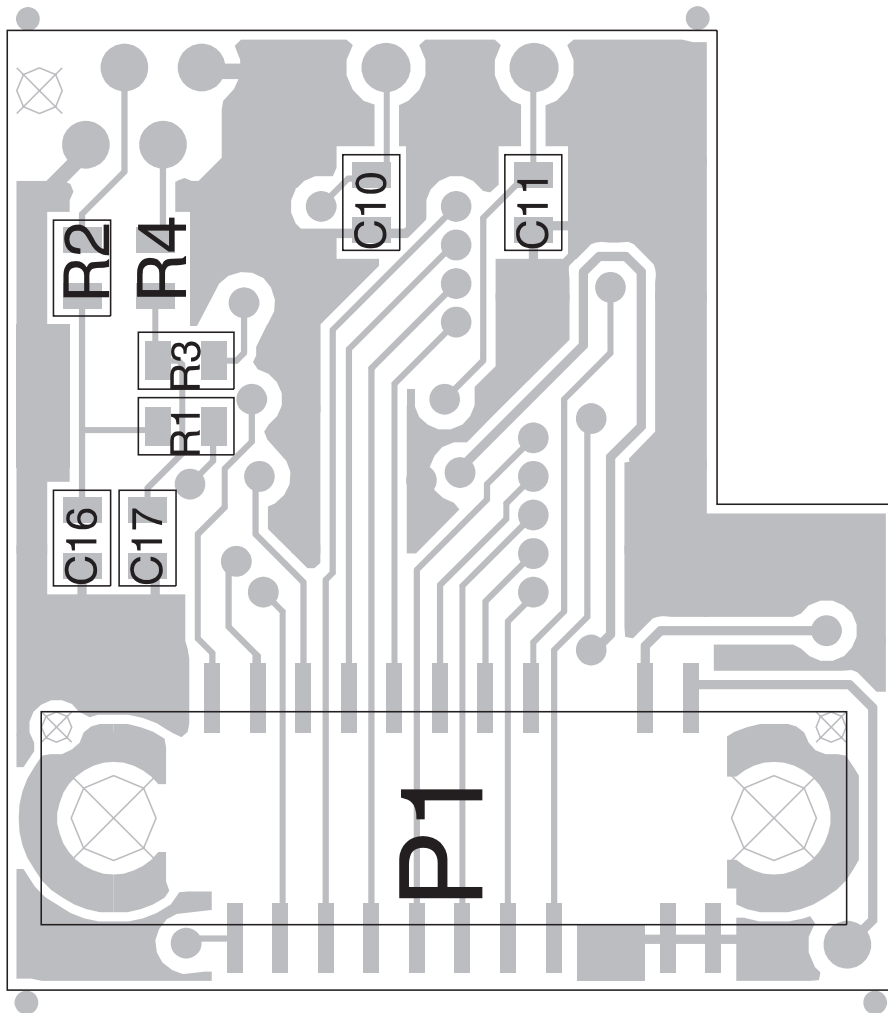
T2000-A66 Parts List (IPN 220-01348-04)

Ref	IPN	Description
C1	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C2	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C10	015-22220-01	CAP CER 0805 CHIP 22P 5% NPO 50V
C11	015-22220-01	CAP CER 0805 CHIP 22P 5% NPO 50V
C12	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C13	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C14	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C15	015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C16	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V
C17	015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V
IC1	002-10269-10	(LSH) IC SMD SCC2691 UART SOL24
IC2	002-10020-20	(LSH) IC SMD ADM202 RS-232 CONVERTOR SO-16
P1	240-10000-10	CONN SMD 20PIN SCREW DOWN PRICKLE CONTACT
R1	036-12560-00	RES M/F 0805 CHIP 56E 5%
R2	036-12560-00	RES M/F 0805 CHIP 56E 5%
R3	036-12560-00	RES M/F 0805 CHIP 56E 5%
R4	036-12560-00	RES M/F 0805 CHIP 56E 5%
SK2	240-00021-20	HEADER 4WAY PADDLE BRD STAGGERED PINS MICROMATC
X1	274-01056-00	XTAL 3.6864MHZ AT-51 HOLDER C/W TEFLON INS
	205-00010-53	CABLE FLAT RBBN 4 CRE 16/7/0.1 GREY (SCAP FRM 16C)
	220-01348-04	PCB T2000 SII UART
	240-00026-22	PLUG 4WAY 2ROW MICROMATCH IDC CABLE 0-215083-4
	345-00020-02	SCREW M2.5*10MM PAN POZI BZ
	349-00020-07	(L) SCREW 4-40 X 5/16 PAN POZI TAPTITE BLACK
	352-00010-04	NUT M2.5 MACH HEX ST BZ
	353-00010-04	WASHER M2.5/M2.6 SHAKEPROOF INT BZ
	354-01041-00	FASTENER SCREW LOCK KIT (4-40 THREAD FOR DRANGE)
	356-00010-05	TAG SOLDER 4MM LONG M MT
	369-00020-35	TAPE PVC FOAM 1 SIDE S/A 9*10MM INSEAL 5375 1x 20mm TOP SIDE PCB OVER IC1
	X2DC01	T2000 INT FACE DE-COUPPING BOARD

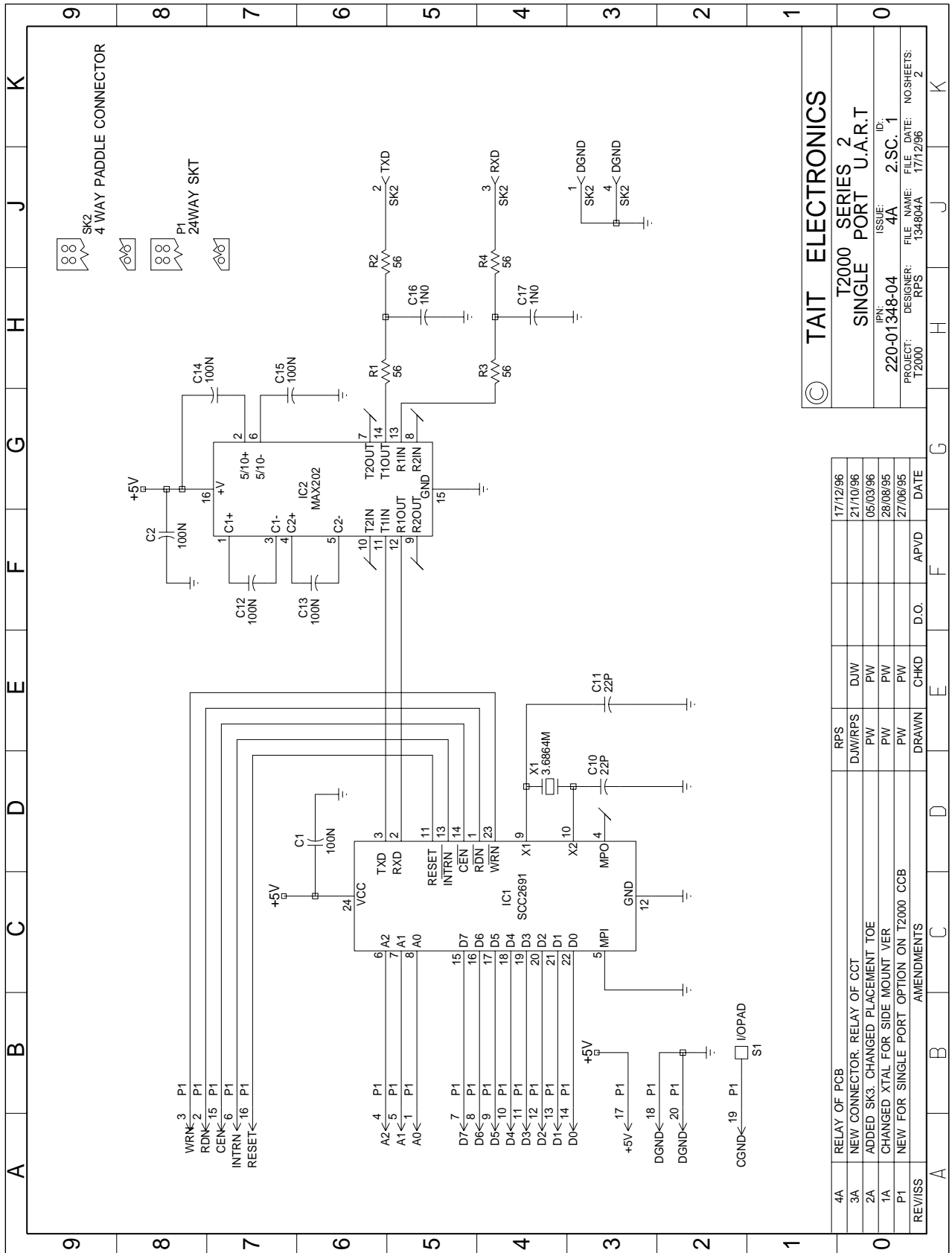


T2000-A66 Single Port UART PCB (IPN 220-01348-04) - Top Side

I



T2000-A66 Single Port UART PCB (IPN 220-01348-04) - Bottom Side



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T2000 SERIES 2	
SINGLE PORT U.A.R.T	
IPN:	ISSUE:
220-01348-04	4A
PROJECT:	DESIGNER:
T2000	RPS
FILE:	DATE:
134804A	17/12/96
NO. SHEETS:	2

REV/ISS	AMENDMENTS	DATE	APVD	CHKD	D.O.
4A	RELAY OF PCB	17/12/96			
3A	NEW CONNECTOR. RELAY OF CCT	21/10/96	DJW		
2A	ADDED SK3. CHANGED PLACEMENT TOE	05/03/96	PW	PW	
1A	CHANGED XTAL FOR SIDE MOUNT VER.	28/08/95	PW	PW	
P1	NEW FOR SINGLE PORT OPTION ON T2000 CCB	27/08/95	PW	PW	

