



Tait Electronics (Aust) Pty Ltd

A800-RW

T800 Series II

Rack Wiring System

(AM8-RW)

A800-RW Rack Wiring System

for T800 Series II

INTRODUCTION

This manual outlines the A800-RW T800 Series II Rack Wiring system. This rack wiring system replaces the conventional manual hard wiring system for T800 Series I. The A800-RW system can be used on T800 Series I or T800 Series II rack frames and with T800 Series I or Series II modules. Various new functions are provided by the A800-RW modules, including channel change and talk through repeater operation. For details on the various individual T800 modules, refer to the product service manual.

Please read through this manual in its entirety prior to installing or servicing this product.

OVERVIEW

The A800-RW system consists of various individual printed circuit boards. There are small PCB's that mount at the back of each T800 module. Each of these boards have a connector that has all of the major T800 module signals. Each of the small PCB's can then be connected via a ribbon cable to a central mediating PCB. These ribbon cable then form the T800 rack frame wiring.

The mediating PCB routes all of the signals to the appropriate places to provide standard base station functions. Some of these functions are talk-through repeater operation, 4 Wire E & M port, etc, Omnitronics 925/935 interfacing.

PRINTED CIRCUIT BOARDS

The printed circuit boards that can be fitted to the rack frame are:

A800-RW1 One each fitted to the transmitter and receiver modules 1st "D" Range. The board extends the 15 way "D" range plug to a Micromatch ribbon cable connector. Supply volts may be connected direct to the circuit board. Supply volts is normally connected to the transmitter only, with the receiver sourcing its supply via its ribbon cable.

A800-RW3 Similar to the RW1 board but no provision for external supply connection. This board offers a direct through link from the 15 way "D" range plug to the Micromatch ribbon cable connector. The board is fitted to the 2nd "D" range position of transmitter and receiver and to both connectors of a T802 Remote Diagnostics module (if used). Provision is made to fit a single in-line dip switch which is used for channel selection (no T802 module fitted). This provides local channel change at the rear of the rack.

A800-RW5 This is the central mediating board (1 per rack). All of the ribbon cables from the modules are connected to this board. This board allows for the connection of one receiver, one transmitter, one T802 Remote monitor, and one Omnitronics 925/935. The A800-RW5 has a DB25 4 Wire E & M port which provides external access to the base stations.

Links are provided on the PCB to setup the configuration of the base station. There is also an adjustment trimpot to control the base station talk-through level.

T802 REMOTE MONITOR

If a T802 monitor fitted audio is routed through the T802 unit. Links are provided on the RW5 board to change the audio routing when fitting or removing the T802 module. It is therefore possible to operate a repeater with the T802 diagnostics module removed by setting the links in the appropriate position.

There are 2 links on the RW5 board which route the audio as required.

	<u>Link 1</u>	<u>Link 2</u>
<u>T802 Fitted</u>	2 - 3	2 - 3
<u>T802 Removed</u>	1 - 2	1 - 2

CHANNEL SELECTION

The channel selection lines from the transmitter and receiver can be linked through the mediating board RW5, to a T802 remote diagnostics module. Alternatively channel selection dip-switch can be fitted to the RW3 board on the receiver and transmitter mounting frame.

T802 Monitor Fitted.

When a monitor is fitted the dip-switch on receiver RW3 board must be have switch positions set to:

Switch 1 - 3	Off
Switch 4 - 8	On

Channel selection will then be effected by operation of the T802 monitor.

No T802 Monitor Fitted. With no remote monitor unit fitted the required channel is selected by operation of the dip-switches fitted to the receiver and transmitter RW3 board.

PRESS-TO-TRANSMIT FUNCTION

There are 2 methods of activating PTT Function.

Opto-Key This is polarised key facility with a maximum key voltage of 55Volts. Links 8 and 9 allow the TX PTT Opto to be either pulled high or low respectively. This allows the opto to be used as either a Current Source input or a Current Sink input. Pins 5 & 6 of the 25 Way "D" Range socket mounted on the RW5 PCB interface the opto-key function. Refer to the A800-RW5 Link Settings Table on Page 8.

Tone Key If an Omnitronics 925T module is fitted, it can provide In-band Tone keying. The 925T module is mounted on the rear of the rack frame and interfaced to the RW5 mediating PCB via modular connectors. The 4 Wire E & M line ports transmit audio is routed through the 925T module where the In-band Tone is filtered prior to transmission. Modification to the 925T module to prevent audio distortion may be required, if the 4 Wire E & M line ports line levels are greater than -10dBm. The modification to the 925 are as follows:

- R5 Changed from 100K to 47K
- R13 Changed from 560ohms to zero ohm link

Links 3 and 4 on the RW5 board may be set to allow the transmit audio to by-pass the Omnitronics 925T module. Refer to the A800-RW5 Link Settings Table on Page 8.

RECEIVE GATE

Receive gate is offered as a voltage free relay contact at pins 7 & 8 of the D range socket on the A800-RW5 PCB. Link LK7 allows the common side of the relay to be reference to either +13.8V (via a 1K resistor) or to ground. The common side of the relay is the signal at the DB25 D Range S9 pin 8 and TB1 pin 6. Refer to the A800-RW5 Link Settings Table on Page 8.

POWER SUPPLY

Power for the A800-RW5 mediating PCB is normally provided via the ribbon cable from the transmitter/exciter modules A800-RW1 PCB. The A800-RW1 on the transmitter/exciter module Power is then provided from the A800-RW5 PCB via the ribbon cables, to the receiver module (and T802 module if fitted).

50 WATT PA CONNECTION

Provision is made on the A800-RW5 mediating PCB for the connection of a T800 50 Watt PA. These connection can be found on the bottom terminal block TB2. The lines to connect to a PA are TX Enable, Fwd Power, Rev Power, Fwd Alarm and Rev Alarm. To locate these signals, refer to the A800-RW5 [circuit diagram](#) and [overlay](#) at the rear of this manual. For details on the appropriate T800 50 Watt PA, refer to the relevant service manual.

SPEAKER

Provision is made on the A800-RW5 mediating PCB for the connection of a speaker. These connections can be found on the bottom terminal block TB2. To locate these signals, refer to the A800-RW5 circuit diagram and overlay elsewhere in this manual. For details on the speaker signal line, refer to the relevant service manual.

EXTERNAL INTERFACE

External functions are routed to the 25 Way “D” Range socket S9 on the mediating board A800-RW5. The Connections are as follows:

Pin	Label	Function
1	TX Line	Line Audio In, 600 Ohm Transformer Balanced
2	TX Line	Line Audio In, 600 Ohm Transformer Balanced
3	RX Line	Line Audio Out, 600 Ohm Transformer Balanced
4	RX Line	Line Audio Out, 600 Ohm Transformer Balanced
5	E IN +	PTT Function, +Ve leg. See Note 1 below.
6	E IN -	PTT Function, -Ve leg. See Note 1 below.
7	M OUT +	Rx Gate Function, Normally Open relay contact. See Note 1 below.
8	M OUT -	Rx Gate Function, Common relay contact. See Note 1 below.
9	Forward Power Alarm	Transmitter (PA) Forward Power Alarm signal. See Note 1 below.
10	Reverse Power Alarm	Transmitter (PA) Reverse Power Alarm signal. See Note 1 below.
11	Receiver RSSI	Receivers RSSI Signal (VHF or UHF if the option fitted). See Note 1 below.
12	Forward Power	Transmitter (PA) Forward Power signal. See Note 1 below.
13	Reverse Power	Transmitter (PA) Forward Power signal. See Note 1 below.
14 & 15	+13.8 Volts	+13.8V Output from the rack. 1A max output.
16	Serial Comm	Serial programming line for T800 Series II modules.
17-23	No Connection	Pins 12 to 24 have no connection.
24 & 25	Ground	System Ground

Note 1: These signals are routed to S9 directly from the associated T800 modules. For details and specification on these signals refer to the relevant T800 service manual.

INSTALLATION

To setup a T800 Series II rack frame with a A800-RW Rack Wiring System, complete the following steps.

1. The A800-RW5 mounts on its mounting bracket, at the rear of the rack. It is positioned at the vacant space adjacent to the PA (or transmitter if the PA is not used). Refer to the parts list "[Parts Packaged with A800-RW5](#)" section for a list of the various parts used.
2. The A800-RW1 PCB's are fitted to the transmitter/exciter and receiver rack frame guides, in place of the floating DB15F connectors. They are fitted to the 1st "D" Range positions. The A800-RW3 PCB's are fitted to the transmitter/exciter and receiver rack frame guides, in place of the floating DB15F connectors. They are fitted to the 2nd "D" Range positions.
3. Make up 16 Way ribbon cables with Micro-MaTch connectors at the appropriate length to connect the RW1 & RW3 boards up to the RW5 board. The length of these cables varies depending on the modules installed in the rack, and the position of the modules. Refer to the parts list "[Parts Packaged with A800-RW5](#)" section for a list of the various parts used.
4. Using figure 8 speaker cable, wire the A800-RW5 TB2 speaker terminals to the T800 speaker. Use cable ties and cable tie mounts were necessary.
5. Mount the two way terminal block at an appropriate position onto the rear of the T800 rack frame.
6. Wire the terminal block to the PA, transmitter/exciter using red and black 4.0 mm power cable. The power for the receiver, T802 and A800-RW5 will be source from the transmitter via the ribbon cables.
7. If a PA is fitted, wire up its associated signals to the A800-RW5 TB2 terminal block. To locate these signals, refer to the A800-RW5 [circuit diagram](#) and [overlay](#) at the rear of this manual. For details on the appropriate T800 50 Watt PA, refer to the relevant service manual

ADJUSTMENT

To setup a base station with an A800-RW rack wiring system is much the same as setting up a standard T800 rack, with the main exception being the talk-through level adjustment.

1. Setup the receiver, transmitter/exciter, and PA as per normal. For information on adjusting the T800 modules, refer to the relevant service manual.
2. Fit the various T800 modules fitted to the rack. Set the operating channel on the A800-RW3 dip switches. Refer to the T800 programming software for the dip switch setting.
3. Monitor the RX Audio lines at S9 pins 3 and 4. Set the receivers line level adjustment to the required line level. E.g. -10dBm line level for nominal system deviation (1KHz tone at 1.5KHz deviation [NB] or 3KHz [WB]. For information on adjusting the T800 receiver modules line level, refer to the relevant service manual.
4. Inject a 1KHz tone at the required line level, into the TX Audio lines at S9 pins 1 and 2. Adjust the transmitters line level adjustment to achieve the required nominal system deviation (1.5KHz deviation [NB] or 3KHz [WB]. For information on adjusting the T800 transmitter modules line level, refer to the relevant service manual.
5. To adjust the Talk-Through level, generate a 1KHz tone at the required nominal system deviation into the receiver (add a CTCSS tone if the receiver uses CTCSS decode). On the A800-RW5 PCB, adjust the trimpot VR1 to achieve the required nominal system deviation from the transmitter/exciter.

LINKS

The following table details the link setting on the A800-RW5 Mediating PCB. Refer to the [A800-RW5 Overlay](#) to locate each of these links.

	LK1	LK2	LK3	LK4	LK5	LK6	LK7	LK8	LK9
No T802	1-2	1-2							
T802 Fitted	2-3	2-3							
No 925T			1-2	1-2					
925T Fitted			2-3	2-3					
Talk-Through					1-2	1-2			
No Talk-Through					2-3	2-3			
TX OPTO Current Source								1-2	2-3
TX OPTO Current Sink								2-3	1-2
TX OPTO Floating								1-2	1-2
TX OPTO TX KEY ON								2-3	2-3

LK7 can be used to pull TB1/6 RX Gate relay line to +13.8 Volts (via a 1K Resistor) with LK7/1-2 or to ground with LK7/2-3.

LK10 and LK11 are not used. These links provide an optional external control of the transmitters encode CTCSS tone, by controlling the T800 Series II TX 2nd D Range Pin 10 "Encode Disable".

LK12 to LK15 are for the optional control of addition channel lines from the receiver and the transmitter into the T802. Additional channel lines must be used if the T802 is to control more that eight channels (including Channel 0).

LK16 is fitted if the T802 is required to key up either the local transmitter or the RX Gate line which then keys up the return link path. It may be required for the T802 to do this when it is replying to a remote poll from the T802 Monitoring Software. To allow the T802 to key the RX Gate Relay, a link is placed across D107 in the receiver module. Q4 on the A800-RW5 PCB is then able to activate the RX Gate relay in the receiver.

LK16 is fitted if the T802 is required to key up either the local transmitter or the RX Gate line which then keys up the return link path. It may be required for the T802 to do this when it is replying to a remote poll from the T802 Monitoring Software. To allow the T802 to key the RX Gate Relay, a link is placed across D107 in the receiver module. Q4 on the A800-RW5 PCB is then able to activate the RX Gate relay in the receiver.

LK19 selects if DB25 connector S9 pin 16 Serial Comm line comes from the T800 modules 1st D Range or 2nd D Range. Set to 1 for the 1st D Range and set to 2 for the 2nd D Range.

LK24 & LK25 can be optionally used to connect the TX Key Opto lines to the TX Line transformer centre taps.

Links LK17, LK18, LK20 to LK23, LK26 and LK27 are not used.

PARTS LIST**A800-RW1 PCB**

Description	Part No.	Supplier	Qty
A800-RW1 PCB	A8-RW3-P1-02	OEM	1
Micro-MaTch 16 Way Socket PCB Connector, Female Top Entry	8-0215079-6	AMP	1
15 Way D Range with Flange	240-02010-54	Tait	1

A800-RW3 PCB

Description	Part No.	Supplier	Qty
A800-RW3 PCB	A8-RW3-P1-02	OEM	1
Micro-MaTch 16 Way Socket PCB Connector, Female Top Entry	8-0215079-6	AMP	1
15 Way D Range with Flange	240-02010-54	Tait	1
8 Way Dip Switch, Single In Line	665-124	RS	1

A800-RW5 Board

Ref. No.	Description	Part No.	Supplier	Qty
A800-RW5-P1-02	A800-RW5 PCB	A8-RW5-P1-02	Farnell	1
C1, C2, C4, C5, C6, C10, C11	100nF Ceramic Chip Cap	499-687	Farnell	7
C3, C7, C8, C9, C12	10uF Electro 6*4 SMD	556-257	Farnell	5
D1	BAW56.	517-033	Farnell	1
D2, D3	BAV70.	517-010	Farnell	2
D4	BZX84C5V6 Zener Diode 5.6 Volts SMD SOT-23	931-561	Farnell	1
IC1	TL074CD, SMD, SO-14	401-365	Farnell	1
IC2	SHF628A-2. Bi-directional Opto Coupler	464-582	Farnell	1
J1 to J6, J8 to J11	Header Jumpers	150-410	Farnell	10
LK 1 to 11	Pin Strip, one 36 way pin strip	528-419	Farnell	1
Q1, Q2, Q3, Q4, Q5, Q6	BC817-40 NPN Transistor.	506-308	Farnell	6
R1, R2, R37	33K Chip Resistor 1206 5% 0.25W	512-916	Farnell	3
R3	4K7 Chip Resistor 0805 5%.	109-316	Farnell	1
R4, R6, R7, R11, R12, R14, R17, R18, R20, R21	10K Chip Resistor 0805 5% .	109-318	Farnell	10
R10, R13, R24, R25, R28,R35	100K Chip Resistor 0805 5%.	109-324	Farnell	6
R8, R9, R34, R36	1K Chip Resistor 0805 5%.	109-312	Farnell	4
R15	68E Chip Resistor 0805 5%.	109-305	Farnell	1
R16	560E Chip Resistor 0805 5%.	515-152	Farnell	1
R19	3K3 Chip Resistor 0805 5%.	109-315	Farnell	1
R22, R23	270E Chip Resistor 0805 5%.	515-139	Farnell	2
R26, R27	1K2 Chip Resistor 0805 5%.	515-176	Farnell	2
R29	150K Chip Resistor 0805 5%.	109-325	Farnell	1
R30	18K Chip Resistor 0805 5%.	515-243	Farnell	1
R31	220K Chip Resistor 0805 5%	109-326	Farnell	1
R32	27K Chip Resistor 0805 5%.	515-255	Farnell	1
R33	39K Chip Resistor 0805 5%.	515-267	Farnell	1

A800-RW5 Board Cont.

Ref. No.	Description	Part No.	Supplier	Qty
S1, S2, S3, S4, S5, S6	16 Way Micro-MaTch™ PCB Mount Paddle Board Socket	8-0215079-6	AMP	6
S7	RJ45 PCB mount Socket. See Note 1 below.	473-327	Farnell	1
S8	RJ11 PCB mount Socket. See Note 1 below.	473-303	Farnell	1
S9	DB25/F Straight PCB Mount	147-972	Farnell	1
T1, T2	ETAL P2781 Transformer 600:600 Ohms SMD	523-100	Farnell	2
TB1- 1 to 12	Four Way Terminal Blocks, Straight, alt RS 426-109	RS 425-847	RS	3
TB2- 1 to 8	Four Way Terminal Blocks, 45 Degree.	RS 424-305	RS	2
VR1	10K Multi-Turn Trim Pot	349-008	Farnell	1

Misc. Parts

Description	Used For	Part No.	Supplier	Qty.
6mm Spacer, Aluminium (or Brass), for Mounting	For S9 25 Way D Range Mounting	146-322	Farnell	2
Screw Lock 4/40 x 14.5mm	For S9 25 Way D Range Mounting	257-801	Farnell	2
Board Pins	Test Pins	433-860	RS	6
Tait A3 One Piece Cover	Tait A3 One Piece Cover (Cardboard Binder) used for service manual.	TEA 002	Tait	1
Arnos No3 Paper Fastener	Arnos No3 Paper Fastener or Similar used for service manual binding.	ARNOSNO3	OEM	1
Small Ziplock Bag	Small Ziplock Bag for part packed with A800-RW5	-	OEM	1
Anti Static Bag 200mm x 150mm	Anti Static Bag for packaging.	-	OEM	1

Parts Packaged with A800-RW5

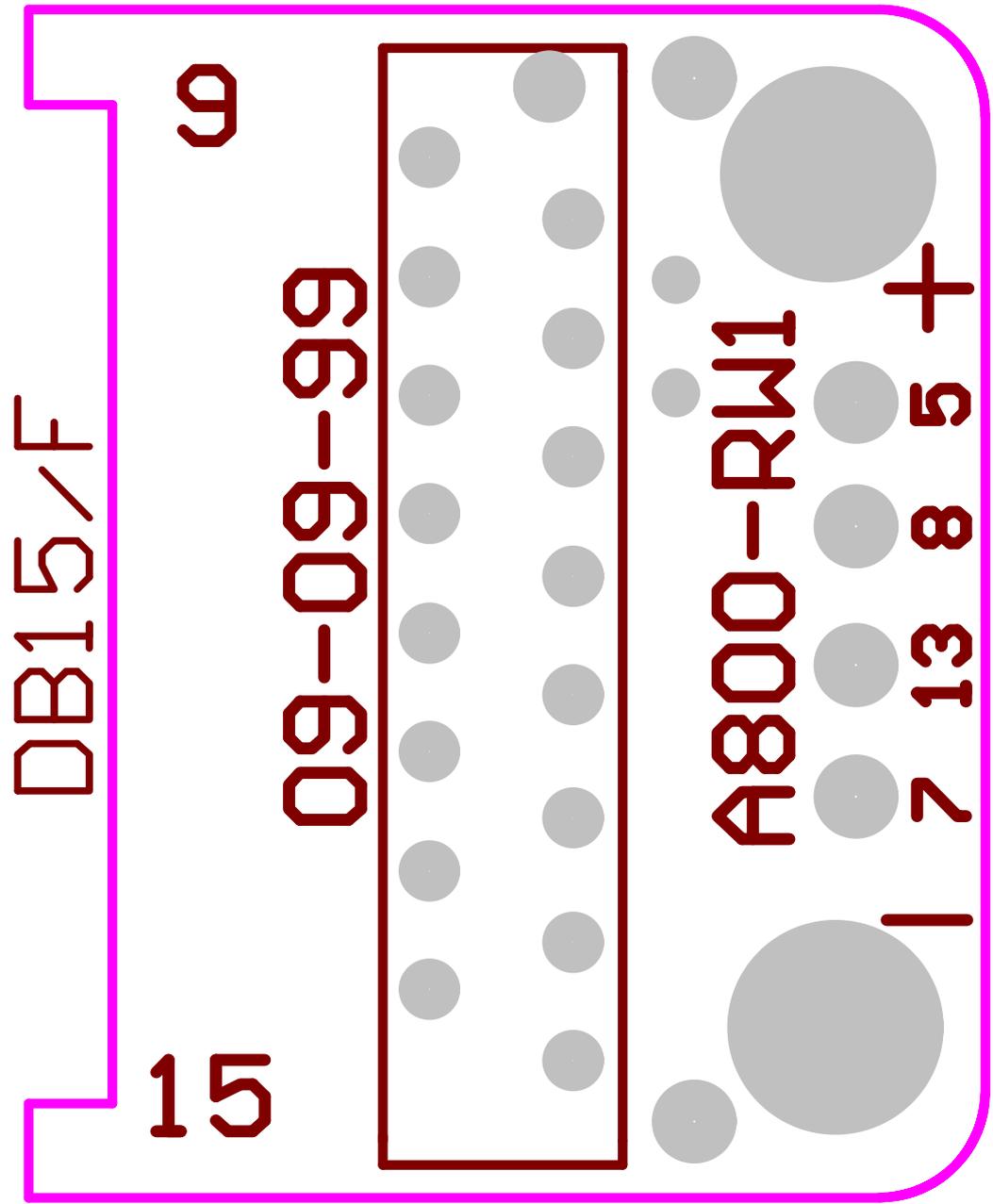
Description	Used For	Part No.	Supplier	Qty.
A800-RW1	A800-RW1 Board fully assembled. Refer to the A800-RW1 documentation	A800-RW1	OEM	2
A800-RW3	A800-RW3 Board fully assembled. Refer to the A800-RW1 documentation	A800-RW3	OEM	2
M3 x 6mm Silver Zinc Pan Pozi	A800-RW5 PCB Mounting to Bracket	-	OEM	4
M3 x 6mm Spacers, Brass, For Mounting	A800-RW5 Mounting to Bracket	517-628	Farnell	4
M3 Washer Spring	A800-RW5 Mounting to Bracket	-	OEM	4
Mounting Bracket A2M2642 Terminal	For A800-RW5 Mounting to the T800 Rack Frame	302-03014-00	Tait	1
M3 x 10 Screw Pan Pozi Silver Zinc	Mounting A800-RW5 Bracket to T800 Rack Frame	-	OEM	4
DB25 Male Solder Pot	Connection to S9	-	OEM	1
DB25 Cover Grey Plastic Screw Lock (not thumb screw locks)	Connection to S9	-	OEM	1
Micro-MaTch 16 Way Cable Mount Plug	RW1/3 to RW5 Interconnection	8-02010-54	AMP	8
16 Way Ribbon Cable	RW1/3 to RW5 Interconnection	N/A	OEM	1.2M
Red Power Wire 4.0mm	Red Power Wiring for TX/PA/EX	CAA26/.3H-RD	SECA	500mm
Black Power Wire 4.0mm	Red Power Wiring for TX/PA/EX	CAA26/.3H-BLK	SECA	500mm
Speaker Wire Figure 8, 1402	Speaker Wiring	N/A	OEM	1m
MK6/2 Two Way Terminal Block (equiv. To Tait T800 power terminal block)	DC Wiring	062042	Weidmuller	1
M3 x 25 Screw Pan Pozi Silver Zinc	Terminal Block Mounting	-	OEM	1
M3 Nut Zinc Cold Hex Form	Terminal Block Mounting	-	OEM	1
M3 Washer 0.5 x 9.5mm Silver Zinc	Terminal Block Mounting & A800-RW5 Bracket to T800 Rack Frame	-	OEM	5
M3 Internal Star	Terminal Block Mounting	-	OEM	1
Cable Tie Mount	Base Cable Tie Mount White S/AD 19mm Square	CAABMM4B WHITE	St Lucia	3
Cable Tie	Cable Tie Nylon White 100*2.6mm	CART350N	St Lucia	3

DRAWINGS**PCB Overlays**

A8-RW1-P1-01.pdf	A800-RW1 PCB Overlay
A8-RW1-P2-01.pdf	A800-RW1 PCB Tracks
A8-RW3-P1-01.pdf	A800-RW3 PCB Overlay
A8-RW3-P2-01.pdf	A800-RW3 PCB Tracks
A8-RW5-P1-01.pdf	A800-RW5 PCB Overlay
A8-RW5-P2-01.pdf	A800-RW5 PCB Tracks

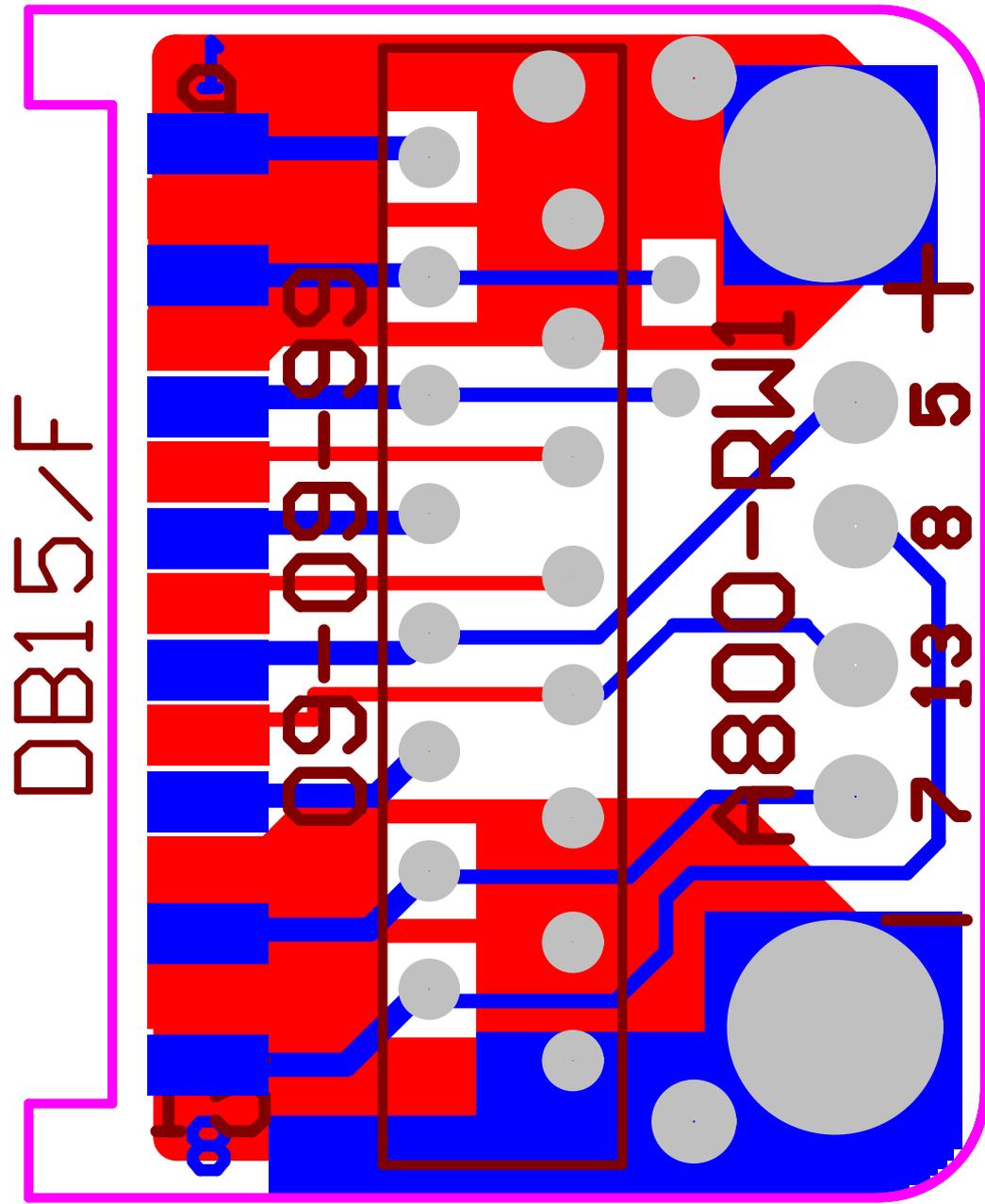
Circuit Diagrams

A8-RW1-C1-02.sch	A800-RW1 PCB Circuit
A8-RW3-C1-02.sch	A800-RW3 PCB Circuit
A8-RW5-C1-02.sch	A800-RW5 Circuit

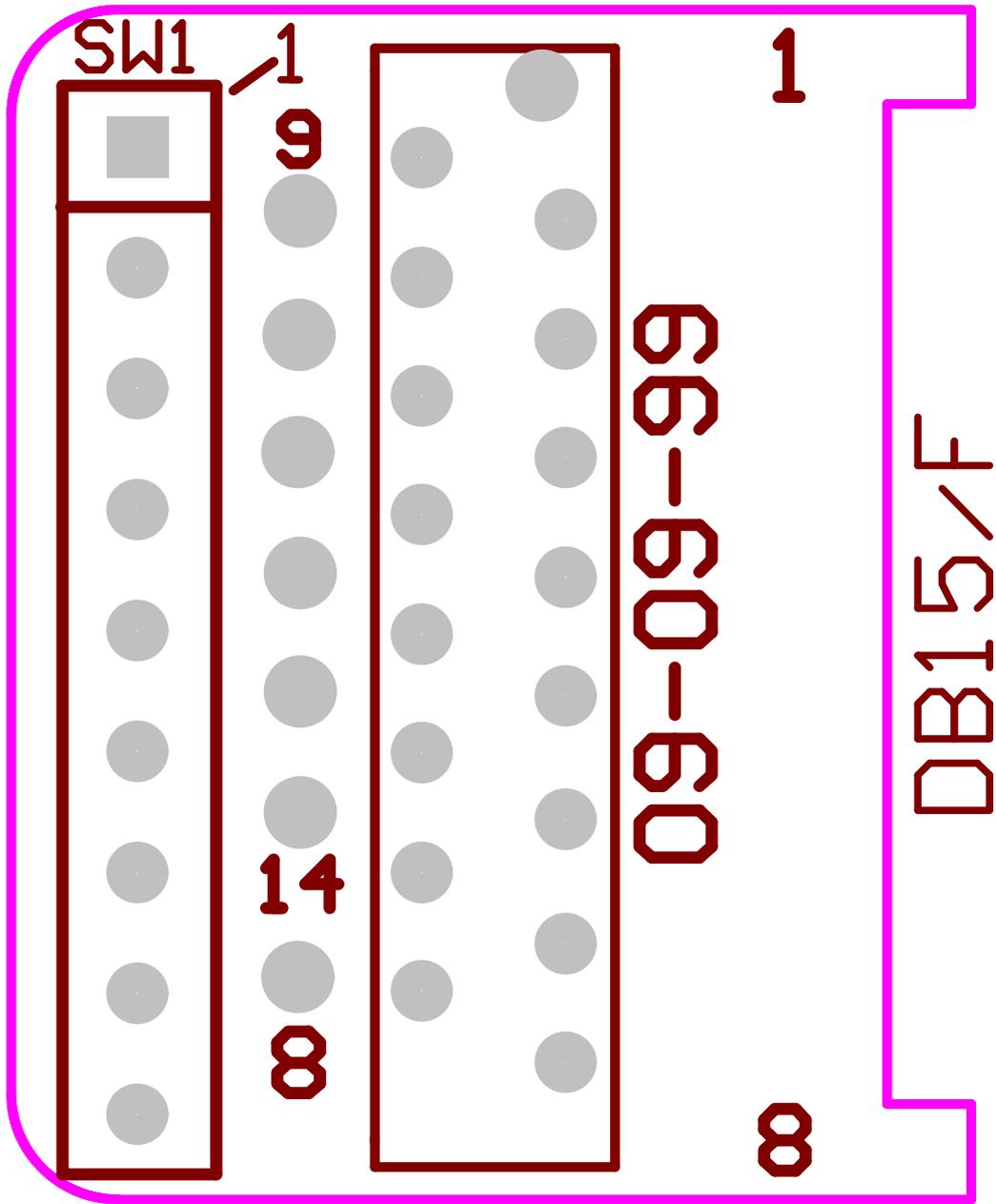


A800-RW1 PCB Layers

PCB 09-09-99

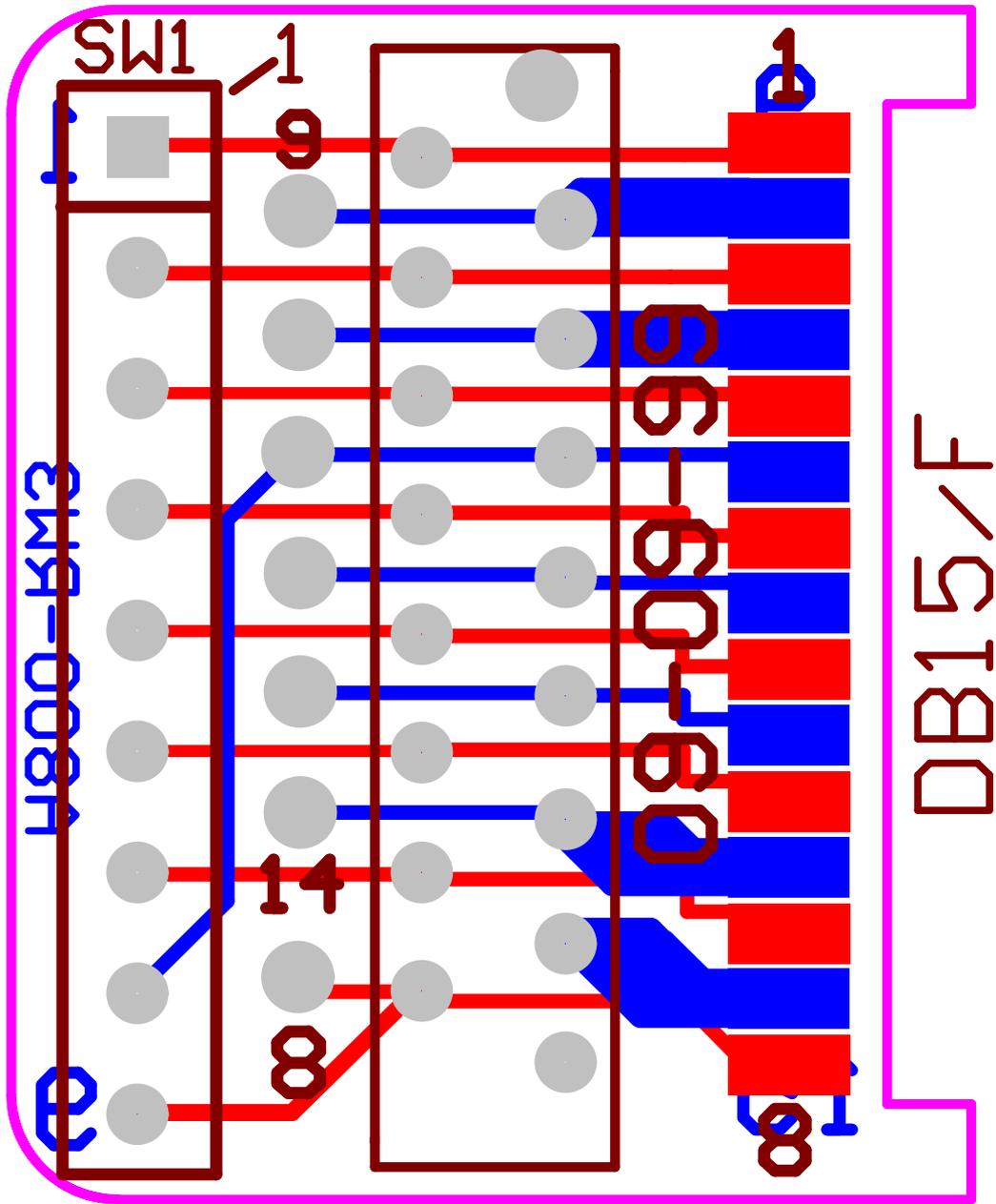


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PCB 09-09-99



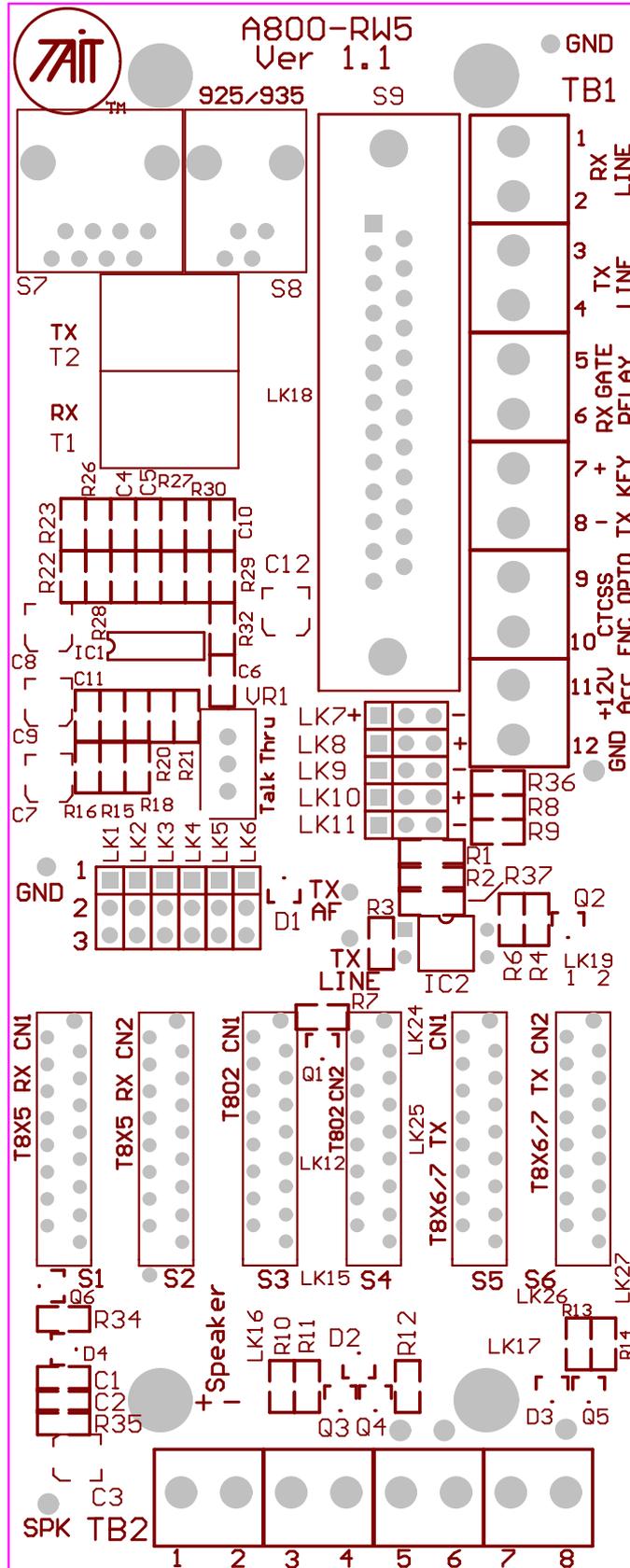
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PCB 09-09-99

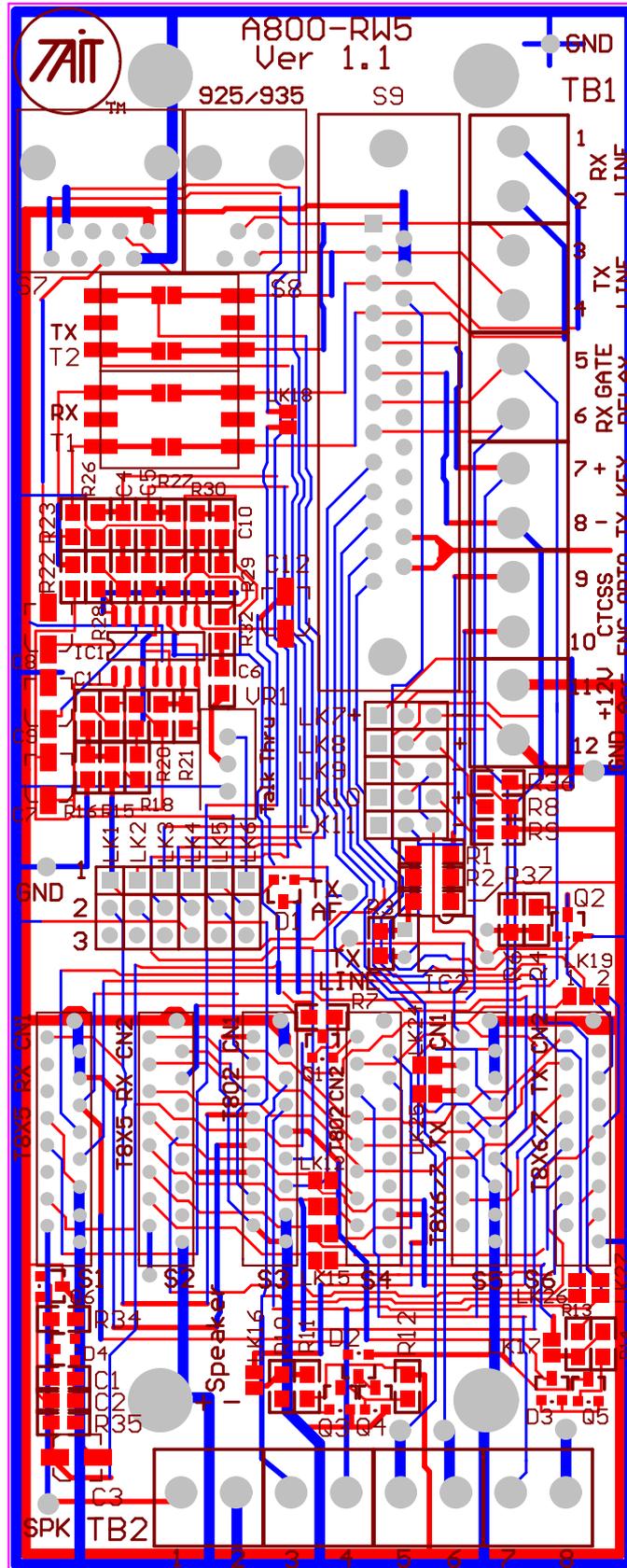


A800-RW3 PCB Layers

PCB 09-09-99



A800-RW5 PCB Layer s
 PCB Version 1.1
 09-09-99

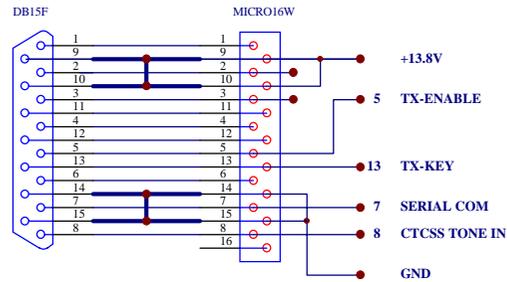


A800-RW5 PCB Layer s
 PCB Version 1.1
 09-09-99

A800-RW1

Transmitter/Receiver
Striaght Through

T800 MODULE
REAR CONNECTOR
SOLDERED DIRECTLY
TO THE A800-RW1 PCB



Note: MicroMaTch 16 Way connector is shown with a non standard pin layout to suit DB Connector pin pattern.

				DEPT	ENG
				DRAWN	MOB
				CHKD	BV
3	Updated for T800 Series II	09-09-99	M.O.B.	SCALE	N/A
2	Imported to Advsch & updated.	15-06-99	M.O.B.	PRINT	A 3
1	ORIGINAL	17-01-97	R.V.		
ISSUE	ALTERATION	DATE	APPVD	SHEET 1 OF 1	

Tait Electronics (Aust) Pty Ltd

A800-RW1 T800 II RACK WIRING SYSTEM

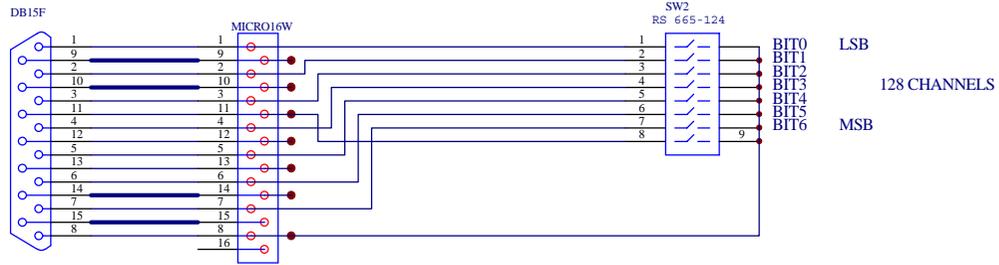
DRWG. NO:

A800-RW1-C1-02.sch

A800-RW3

Straight Through
Fitted to TX CN2

T800 MODULE
REAR CONNECTOR
SOLDERED DIRECTLY
TO THE A800-RW3 PCB



Note: MicroMaTch 16 Way connector is shown with a non standard pin layout to suit DB Connector pin pattern.

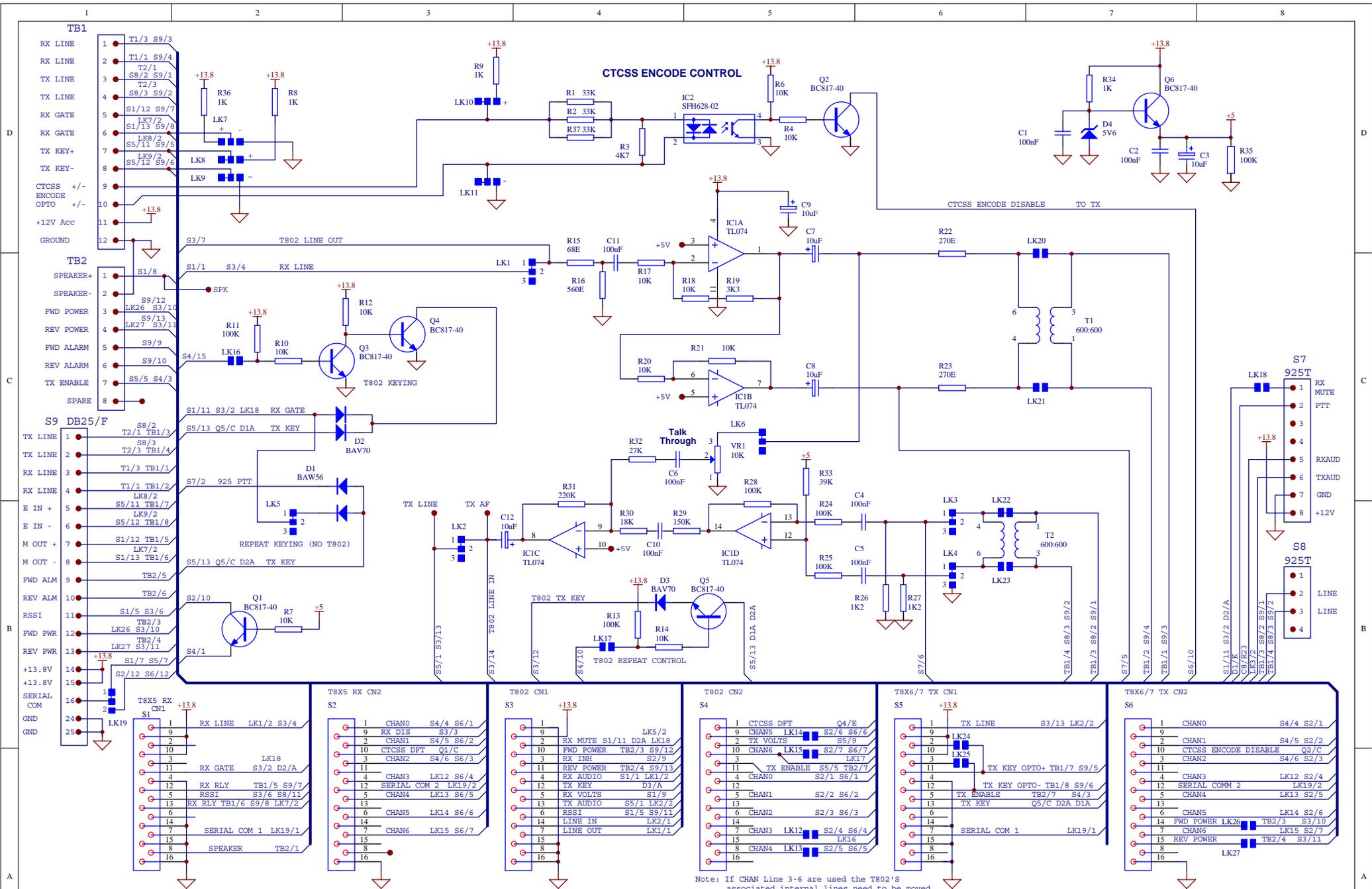
ISSUE	ALTERATION	DATE	APPVD	SHEET 1 OF 1
3	Updated for T800 Series II	09-09-99	C.S.	
2	Imported to Advsch & updated.	15-06-99	M.O.B.	
1	ORIGINAL	17-01-97	R.V.	

Tait Electronics (Aust) Pty Ltd

A800-RW3 T800 II RACK WIRING SYSTEM

DRWG. NO:

A800-RW3-C1-02.sch



Note: If CHAN Line 3-6 are used the T802'S associated internal lines need to be moved.

Note: MicroMaTch 16 Way connector is shown with a non standard pin layout to suit DB Connector pin pattern.

Indicates Not Always Fitted. All link shown in their default positions.

3	Updated to Version 1.1 for T800 Series II	09-09-99	C.S.	DEPT.	ENG					
3	Drawing imported to AdvSch & Updated	15-06-99	MOB	CHKD	D.W.					
2	R35 added and & change of R26 & R27	29-08-97	D.W.	SCALE	N/A	TITLE:				
1	Original	04-03-97	D.W.	PRINT	A4			Version	DRWG. No	
ISSUE	ALTERATION	DATE	APPV'D	SHEET	1 OF 1	Tait Electronics (Aust) Pty Ltd				
						A800-RW5 T800 II RACK WIRING PCB			V1.1	A8-RW5-C1-02.sch

Tait Electronics (Aust) Pty Ltd

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