

3 T850 VCO PCB

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T850 VCO PCB Parts List (IPN 220-01145-00)

How To Use This Parts List

The components listed in this parts list are divided into two main types: those with a circuit reference (e.g. C2, D1, R121, etc) and those without (miscellaneous and mechanical).

Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns: the circuit reference, variant (if applicable), IPN and description. An entry in the variant column indicates that this is a variant component which is fitted only to the T825 (RX) or T826/827 (TX).

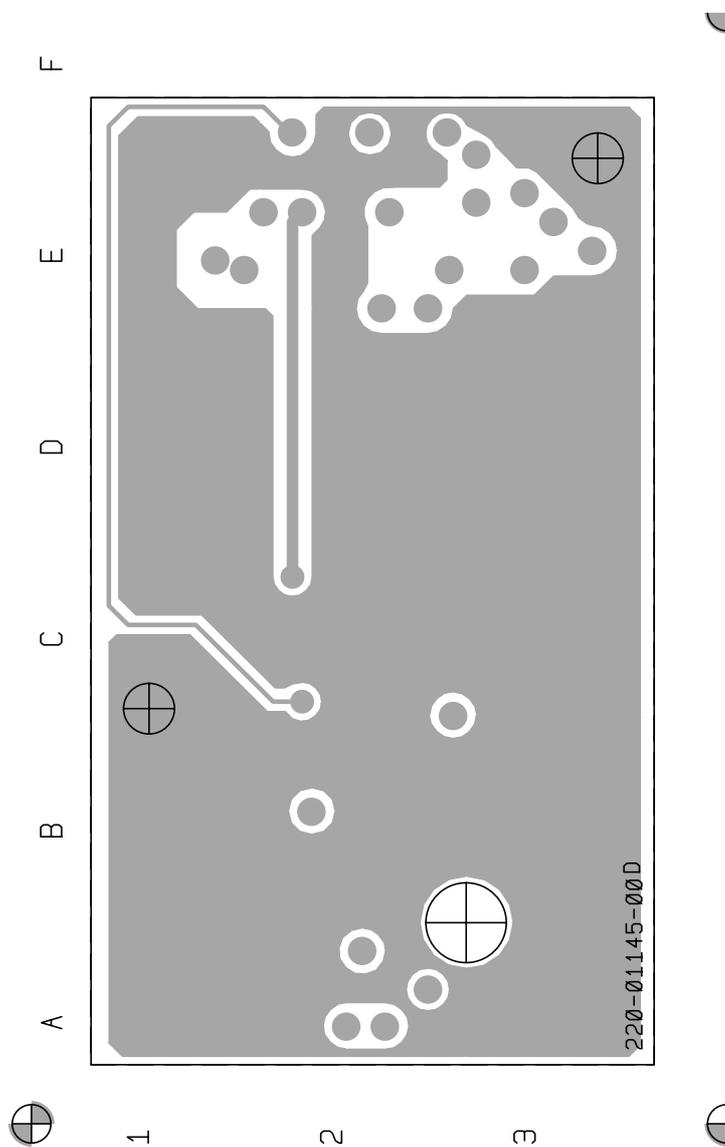
The miscellaneous and mechanical section lists the variant and common parts in IPN order.

Parts List Amendments

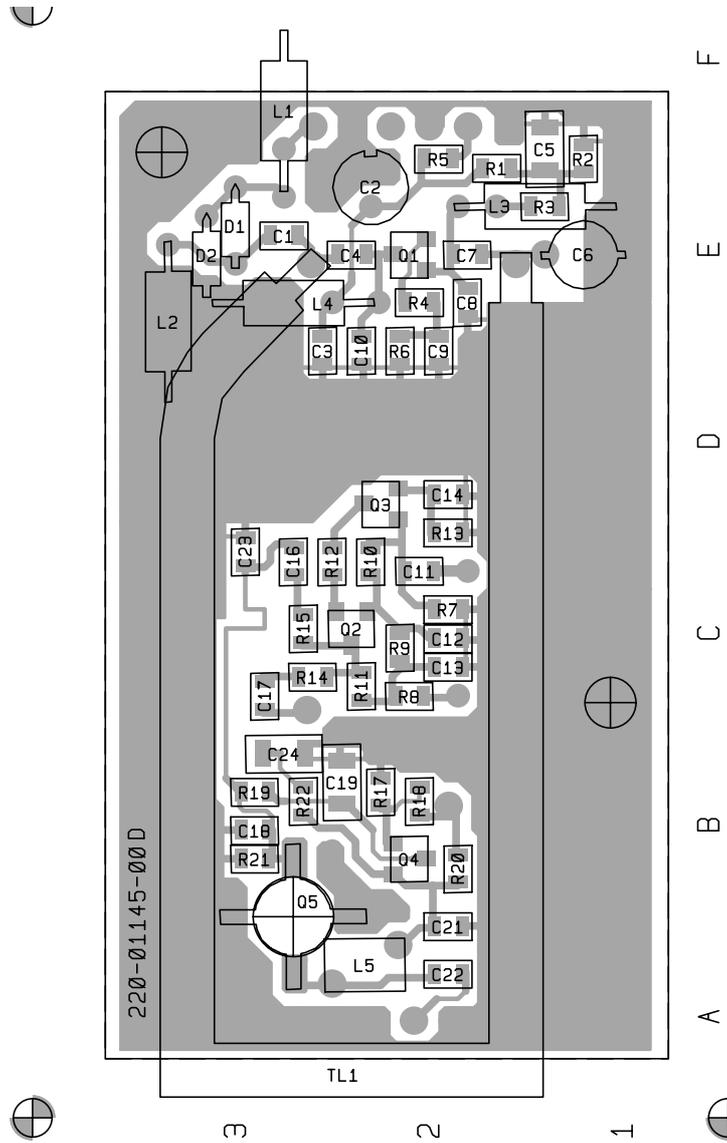
There were no amendments to the parts list at the time of publication.

Ref	Var	IPN	Description	Ref	Var	IPN	Description
C1	A	015-21150-01	CAP CER 0805 CHIP 1P5 +/-0.25P NPO 50V	R6	C	036-12820-00	RES M/F 0805 CHIP 82E 5%
C1	B	015-21180-01	CAP CER 0805 CHIP 1P8 +/-0.25 NPO 50V	R6	D	036-13120-00	RES M/F 0805 CHIP 120E 5%
C1	C	015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V	R7		036-14100-00	RES M/F 0805 CHIP 1K 5%
C1	D	015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V	R8		036-12220-00	RES M/F 0805 CHIP 22E 5%
C2		025-08100-02	CAP TANT BEAD 10M 10% 16V	R9		036-14270-00	RES M/F 0805 CHIP 2K7 5%
C3		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R10		036-14120-00	RES M/F 0805 CHIP 1K2 5%
C4		015-21100-01	CAP CER 0805 CHIP 1P0 +/-0.25P NPO 50V	R11		036-13150-00	RES M/F 0805 CHIP 150E 5%
C5		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R12		036-12100-00	RES M/F 0805 CHIP 10E 5%
C6		028-02100-08	CAP TRIM 2/10P CER 5MM TOP ADJ	R13		036-12560-00	RES M/F 0805 CHIP 56E 5%
C7	A	015-21680-01	CAP CER 0805 CHIP 6P8 +/-0.25P NPO 50V	R14		036-13330-00	RES M/F 0805 CHIP 330E 5%
C7	B	015-21470-01	CAP CER 0805 CHIP 4P7 +/-0.25P NPO 50V	R15		036-12100-00	RES M/F 0805 CHIP 10E 5%
C7	C	015-21680-01	CAP CER 0805 CHIP 6P8 +/-0.25P NPO 50V	R17		036-14680-00	RES M/F 0805 CHIP 6K8 5%
C7	D	015-21820-01	CAP CER 0805 CHIP 8P2 +/-0.25P NPO 50V	R18		036-14180-00	RES M/F 0805 CHIP 1K8 5%
C8	A	015-22270-01	CAP CER 0805 CHIP 27P 5% NPO 50V	R19		036-14100-00	RES M/F 0805 CHIP 1K 5%
C8	B	015-22270-01	CAP CER 0805 CHIP 27P 5% NPO 50V	R20		036-12180-00	RES M/F 0805 CHIP 18E 5%
C8	C	015-22330-01	CAP CER 0805 CHIP 33P 5% NPO 50V	R21		036-13330-00	RES M/F 0805 CHIP 330E 5%
C8	D	015-22330-01	CAP CER 0805 CHIP 33P 5% NPO 50V	R22		036-12100-00	RES M/F 0805 CHIP 10E 5%
C9		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C10		015-21180-01	CAP CER 0805 CHIP 1P8 +/-0.25 NPO 50V	TL1	A	051-00005-43	RESNTR TAIT NO 543 480-520MHZ T855/7
C11		015-21330-01	CAP CER 0805 CHIP 3P3 +/-0.25P NPO 50V	TL1	B	051-00005-42	RESNTR TAIT NO 542 435-480MHZ T855/7
C12		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	TL1	C	051-00005-41	RESNTR TAIT NO 541 395-440MHZ T855/7
C13		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	TL1	D	051-00005-40	RESNTR TAIT NO 540 355-395MHZ T855/7
C14		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C16		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C17		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V			065-00010-13	BEAD FERRITE 7D 1.9*0.9*3.8MM STACK POLE Place On Lead Of L4, Secure With Loctite 454-16 Gel
C18		015-22220-01	CAP CER 0805 CHIP 22P 5% NPO 50V				
C19		015-05470-08	CAP CER 1206 CHIP 47N 10% X7R 50V			220-01145-00	PCB T855/856/857 VCO
C21		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V			240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN
C22		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C23		015-21820-01	CAP CER 0805 CHIP 8P2 +/-0.25P NPO 50V			345-00040-10	SCREW M3*6MM PAN POZI ST BZ
C24		015-05470-08	CAP CER 1206 CHIP 47N 10% X7R 50V			350-00016-42	SPACER 5MM HI 8MM X M3 STUD 2.5MM X M3
D1		001-00012-63	(S) DIODE VARICAP BB809			353-00010-10	WASHER M3 FLAT 7MM*0.6MM ST BZ
D2		001-00012-63	(S) DIODE VARICAP BB809			353-00010-13	WASHER M3 SHAKEPROOF INT BZ
L1		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET				
L2		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET				
L3		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET				
L4		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET				
L5		052-08135-35	COIL A/W 3.5T/3.5MM HOR 0.8MM WIRE				
PL2		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
PL3		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
PL4		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
PL5		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
Q1		000-10057-10	(S) XSTR SMD MMBR571 NPN SOT-23 UHF LO PW				
Q2		000-10057-10	(S) XSTR SMD MMBR571 NPN SOT-23 UHF LO PW				
Q3		000-10057-10	(S) XSTR SMD MMBR571 NPN SOT-23 UHF LO PW				
Q4		000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23AF				
Q5		000-00032-47	(S) XSTR MRF559 NPN XPACK UHF PWR 0.5W				
R1		036-14390-00	RES M/F 0805 CHIP 3K9 5%				
R2		036-14100-00	RES M/F 0805 CHIP 1K 5%				
R3		036-13100-00	RES M/F 0805 CHIP 100E 5%				
R4		036-12220-00	RES M/F 0805 CHIP 22E 5%				
R5		036-12270-00	RES M/F 0805 CHIP 27E 5%				
R6	A	036-12820-00	RES M/F 0805 CHIP 82E 5%				
R6	B	036-12820-00	RES M/F 0805 CHIP 82E 5%				

Variant Code	Description	T855 (MHz)	T856/857 (MHz)
A	Tx High	-	480-520
B	Tx Mid/Rx High	480-530	440-480
C	Tx Low/Rx Mid	440-480	400-440
D	Rx Low	400-440	-

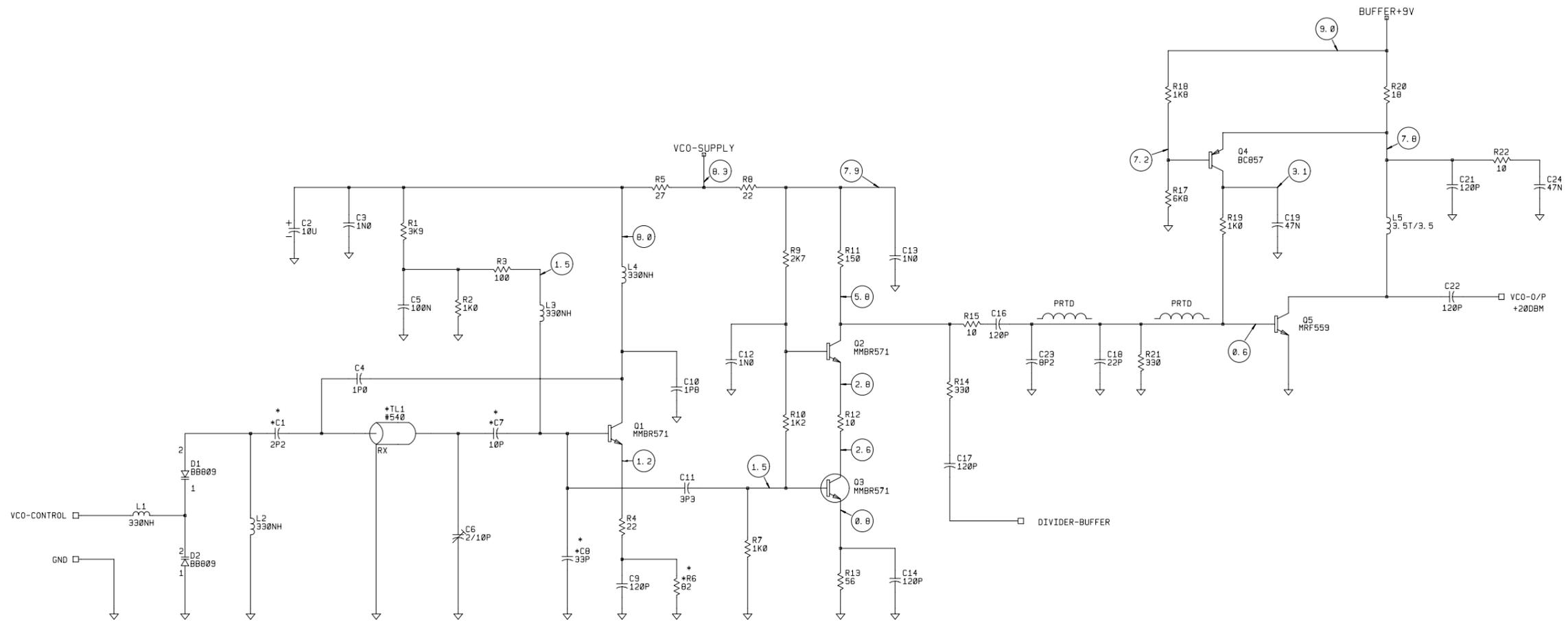


T850 VCO PCB (IPN 220-01145-00) - Bottom Side



T850 VCO PCB (IPN 220-01145-00) - Top Side

*FREQ	*TL1	*C1	*C7	*C8	*R6
480-520	543	1P5F	6P8F	27PF	82R
435-480	542	1P8F	4P7F	27PF	82R
395-440	541	2P2F	6P8F	33PF	100R
355-395	540	2P2F	10PF	33PF	100R



*-VALUE CHANGES FOR DIFFERENT OPTIONS

○ = D.C. CONDITIONS (VOLTS)
(USE HIGH IMPEDENCE PROBE)

OPTION	F MHZ	TL1 IPN NO.	TL1 LENGTH (MM)	C1	C7	C8	R6
TX HIGH	480-520	051-00005-43	100	1P5F	6P8F	27PF	82R
TX MID / RX HIGH	435-480	051-00005-42	120	1P8F	4P7F	27PF	82R
TX LOW / RX MID	395-440	051-00005-41	130	2P2F	6P8F	33PF	100R
RX LOW	355-395	051-00005-40	145	2P2F	10PF	33PF	100R

LAYOUT FOR RX LOW

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
0C	CAD-WANG COMPARISON.	MC				17/5/89
B	C/N 89/05-218	J.F.				
A		RH				
T99		RH				
PROT1		RH				

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T855/T857 BIPOLAR VCO	
IPN: 220-01145-00	ISSUE: 2 SC.1
PROJECT: DESTINER: B55VCL0C	FILE NAME: FILE DATE: NO. SHEETS: 1

T850 VCO Parts List (IPN 220-01145-02)

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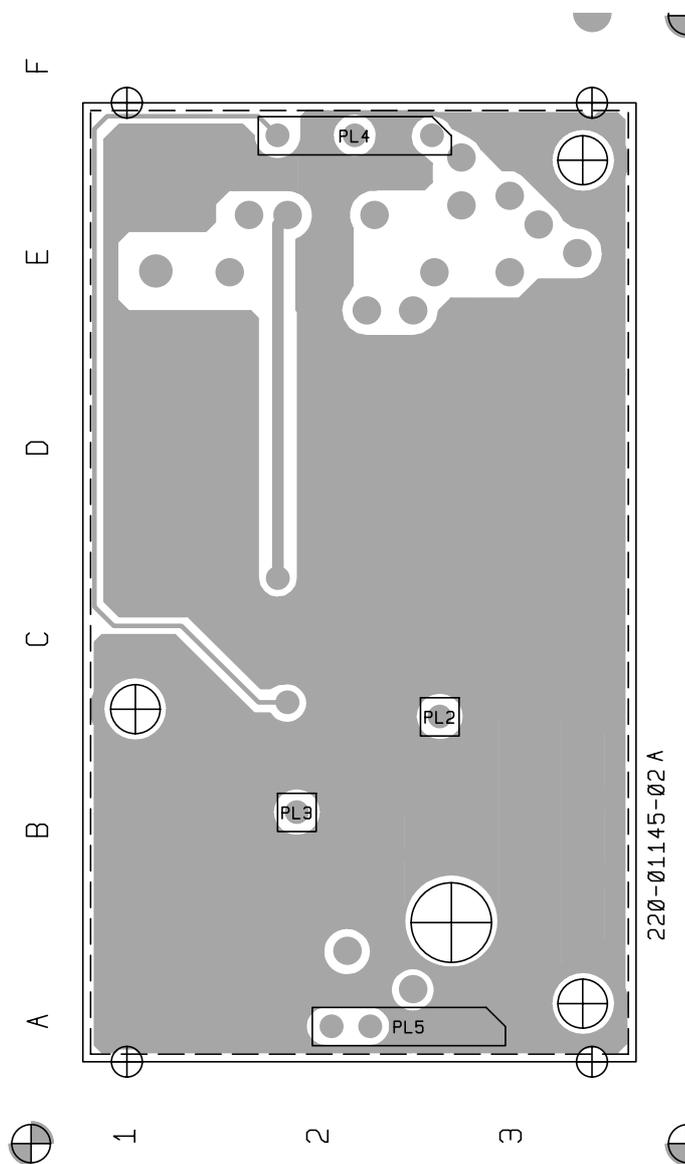
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Parts List Amendments

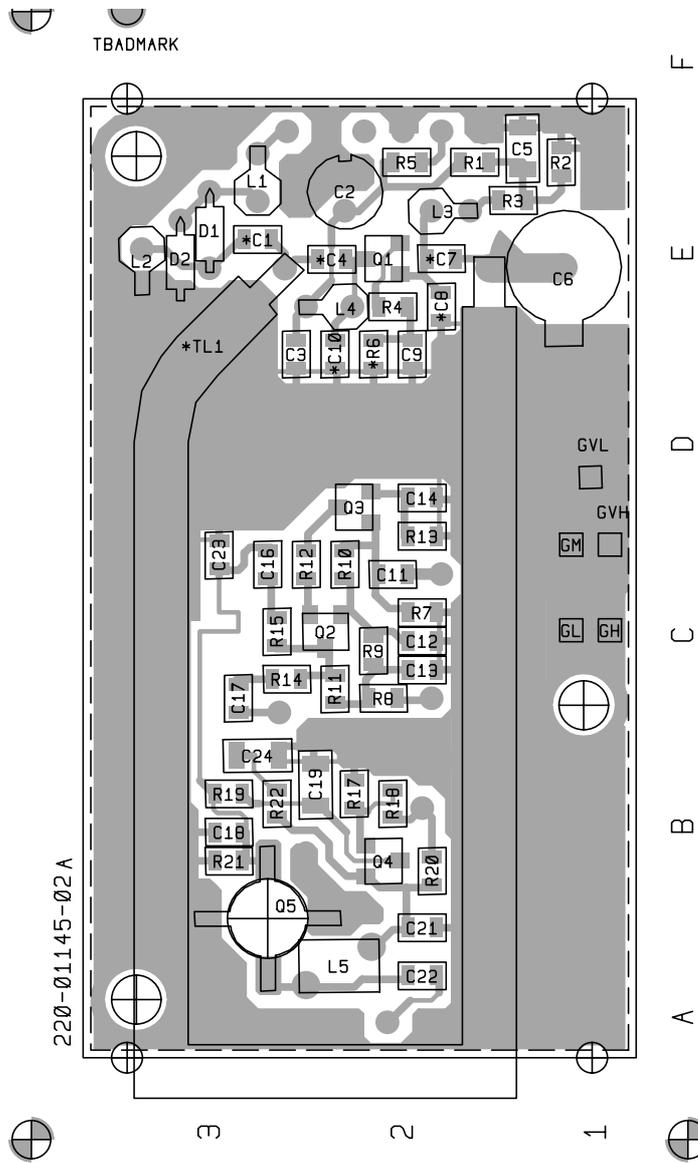
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C1	B	015-21180-01	CAP CER 0805 CHIP 1P8 +/-0.25 NPO 50V	R6	D	036-13120-00	RES M/F 0805 CHIP 120E 5%
C1	C	015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V	R7		036-14100-00	RES M/F 0805 CHIP 1K 5%
C1	D	015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V	R8		036-12220-00	RES M/F 0805 CHIP 22E 5%
C2		025-08100-02	CAP TANT BEAD 10M 10% 16V	R9		036-14270-00	RES M/F 0805 CHIP 2K7 5%
C3		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	R10		036-14120-00	RES M/F 0805 CHIP 1K2 5%
C4		015-21100-01	CAP CER 0805 CHIP 1P0 +/-0.25P NPO 50V	R11		036-13150-00	RES M/F 0805 CHIP 150E 5%
C5		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V	R12		036-12100-00	RES M/F 0805 CHIP 10E 5%
C6		028-02100-08	CAP TRIM 2/10P CER 5MM TOP ADJ	R13		036-12560-00	RES M/F 0805 CHIP 56E 5%
C7	A	015-21680-01	CAP CER 0805 CHIP 6P8 +/-0.25P NPO 50V	R14		036-13330-00	RES M/F 0805 CHIP 330E 5%
C7	B	015-21470-01	CAP CER 0805 CHIP 4P7 +/-0.25P NPO 50V	R15		036-12100-00	RES M/F 0805 CHIP 10E 5%
C7	C	015-21680-01	CAP CER 0805 CHIP 6P8 +/-0.25P NPO 50V	R17		036-14680-00	RES M/F 0805 CHIP 6K8 5%
C7	D	015-21820-01	CAP CER 0805 CHIP 8P2 +/-0.25P NPO 50V	R18		036-14180-00	RES M/F 0805 CHIP 1K8 5%
C8	A	015-22270-01	CAP CER 0805 CHIP 27P 5% NPO 50V	R19		036-14100-00	RES M/F 0805 CHIP 1K 5%
C8	B	015-22270-01	CAP CER 0805 CHIP 27P 5% NPO 50V	R20		036-12180-00	RES M/F 0805 CHIP 18E 5%
C8	C	015-22330-01	CAP CER 0805 CHIP 33P 5% NPO 50V	R21		036-13330-00	RES M/F 0805 CHIP 330E 5%
C8	D	015-22330-01	CAP CER 0805 CHIP 33P 5% NPO 50V	R22		036-12100-00	RES M/F 0805 CHIP 10E 5%
C9		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V	TL1	A	051-00005-43	RESNTR TAIT NO 543 480-520MHZ T855/7
C10		015-21180-01	CAP CER 0805 CHIP 1P8 +/-0.25 NPO 50V	TL1	B	051-00005-42	RESNTR TAIT NO 542 435-480MHZ T855/7
C11		015-21330-01	CAP CER 0805 CHIP 3P3 +/-0.25P NPO 50V	TL1	C	051-00005-41	RESNTR TAIT NO 541 395-440MHZ T855/7
C12		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V	TL1	D	051-00005-40	RESNTR TAIT NO 540 355-395MHZ T855/7
C13		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V				
C14		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C16		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C17		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V			065-00010-13	BEAD FERRITE 7D 1.9*0.9*3.8MM STACK POLE Place On Lead Of L4, Secure With Loctite 454-16 Gel
C18		015-22220-01	CAP CER 0805 CHIP 22P 5% NPO 50V				
C19		015-05470-08	CAP CER 1206 CHIP 47N 10% X7R 50V				
C21		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V			220-01145-00	PCB T855/856/857 VCO
C22		015-23120-01	CAP CER 0805 CHIP 120P 5% NPO 50V				
C23		015-21820-01	CAP CER 0805 CHIP 8P2 +/-0.25P NPO 50V			240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN
C24		015-05470-08	CAP CER 1206 CHIP 47N 10% X7R 50V				
						345-00040-10	SCREW M3*6MM PAN POZI ST BZ
D1		001-00012-63	(S) DIODE VARICAP BB809				
D2		001-00012-63	(S) DIODE VARICAP BB809			350-00016-42	SPACER 5MM HI 8MM X M3 STUD 2.5MM X M3
L1		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET				
L2		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET			353-00010-10	WASHER M3 FLAT 7MM*0.6MM ST BZ
L3		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET				
L4		056-00021-60	IND FXD 330NH 6.6X2.7MM AXIAL NON MAGNET			353-00010-13	WASHER M3 SHAKEPROOF INT BZ
L5		052-08135-35	COIL A/W 3.5T/3.5MM HOR 0.8MM WIRE				
PL2		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
PL3		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
PL4		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
PL5		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN				
Q1		000-10057-10	(S) XSTR SMD MMBR571 NPN SOT-23 UHF LO PW				
Q2		000-10057-10	(S) XSTR SMD MMBR571 NPN SOT-23 UHF LO PW				
Q3		000-10057-10	(S) XSTR SMD MMBR571 NPN SOT-23 UHF LO PW				
Q4		000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23AF				
Q5		000-00032-47	(S) XSTR MRF559 NPN XPACK UHF PWR 0.5W				
R1		036-14390-00	RES M/F 0805 CHIP 3K9 5%				
R2		036-14100-00	RES M/F 0805 CHIP 1K 5%				
R3		036-13100-00	RES M/F 0805 CHIP 100E 5%				
R4		036-12220-00	RES M/F 0805 CHIP 22E 5%				
R5		036-12270-00	RES M/F 0805 CHIP 27E 5%				
R6	A	036-12820-00	RES M/F 0805 CHIP 82E 5%				
R6	B	036-12820-00	RES M/F 0805 CHIP 82E 5%				

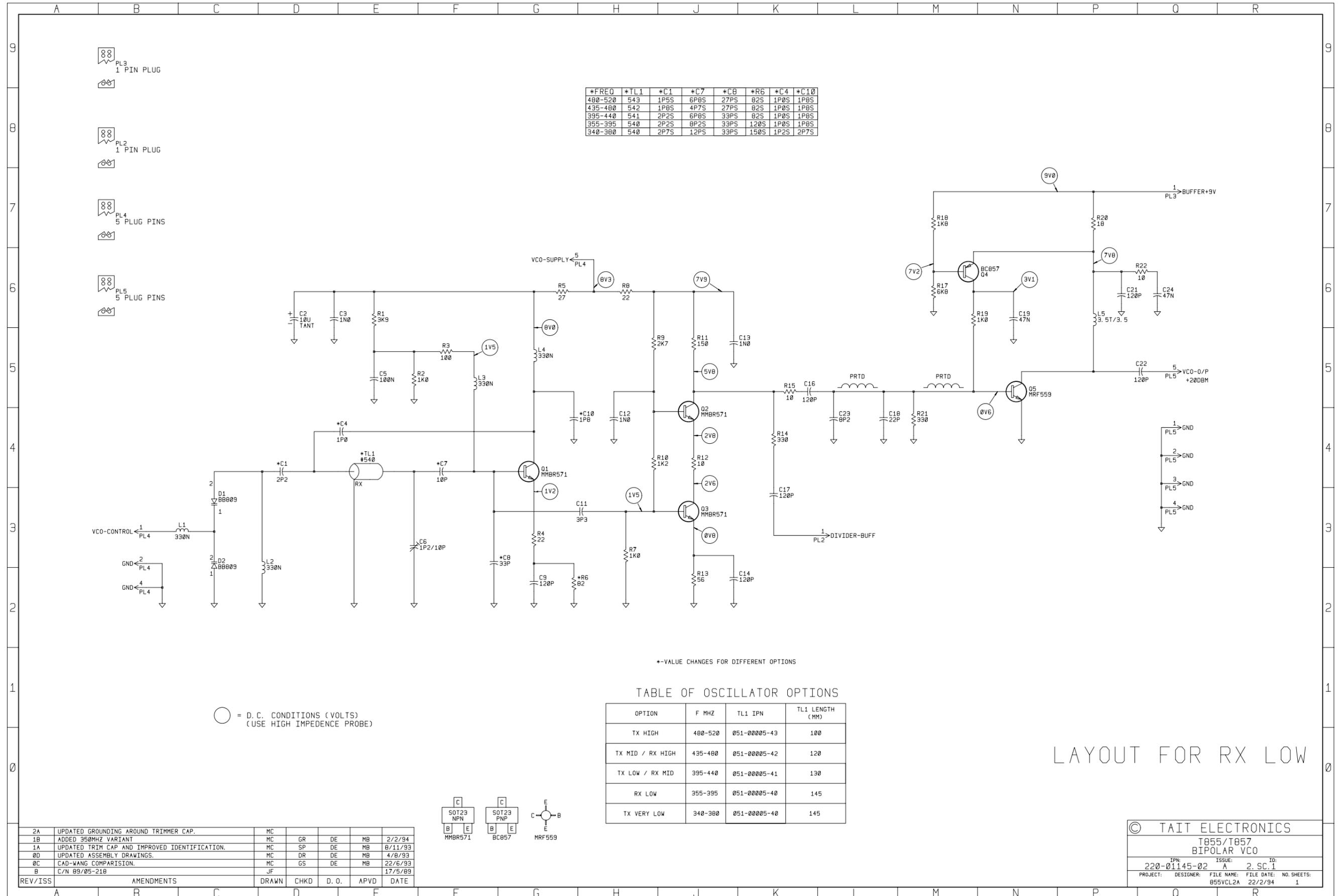
Variant Code	Description	T855 (MHz)	T856/857 (MHz)
A	Tx High	-	480-500
B	Tx Mid/Rx High	480-520	440-480
C	Tx Low/Rx Mid	440-480	400-440
D	Rx Low	400-440	-



T850 VCO PCB (IPN 220-01145-02) - Bottom Side



T850 VCO PCB (IPN 220-01145-02) - Top Side



LAYOUT FOR RX LOW

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 T855/T857
 BIPOLAR VCO
 IPN: 220-01145-02 ISSUE: A 2 SC. 1
 PROJECT: DESTONER: FILE NAME: FILE DATE: NO. SHEETS:
 B55VCL2A 22/2/94 1

Part F Installation

This part of the manual is divided into the sections listed below. These sections give a brief description of the basic rack mounting and wiring procedures for the T855 receiver, T856 transmitter, T857 exciter and T858/859 power amplifiers.

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1 T855/856/857 Installation

1.1 Rack Mounting

The T855 receiver, T856 transmitter and T857 exciter are designed for use in a standard 483mm rack frame using a Tait T800 Series guide which locates and mates the rear D-range connectors (refer to Figure 1.1, Figure 1.2 and Figure 1.3).

A T800 Series guide is supplied with each unit. The guide is located in the rack frame with four screws, two at the rear and two at the front, and the T800 unit is secured into the guide with two front panel mounting screws.

A rear mounted N-type connector is used for RF input on the T855 receiver and RF output on the T856 transmitter, while the T857 exciter RF output is via the front panel SMC connector. All DC, audio and control connections are via the rear mounted D-range connector. An additional rear D-range connector (T800-03) is fitted when remote multichannel operation, or additional control or low frequency lines are required.

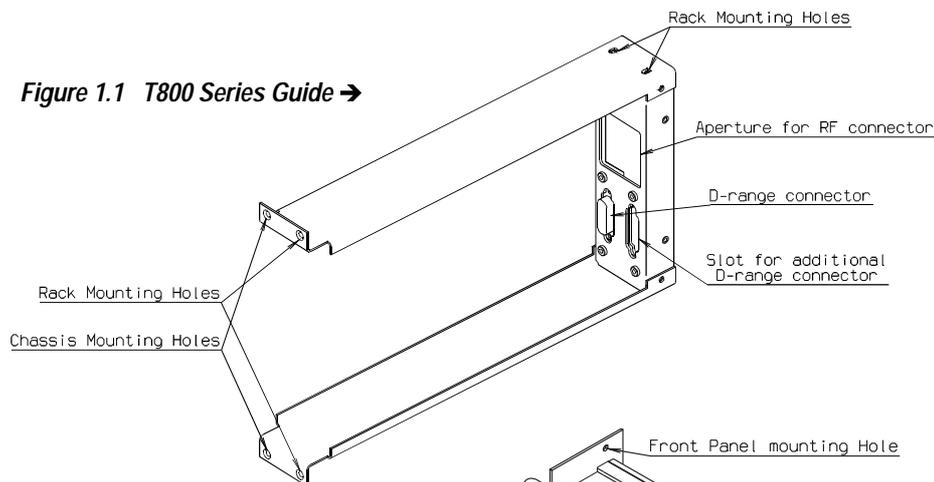
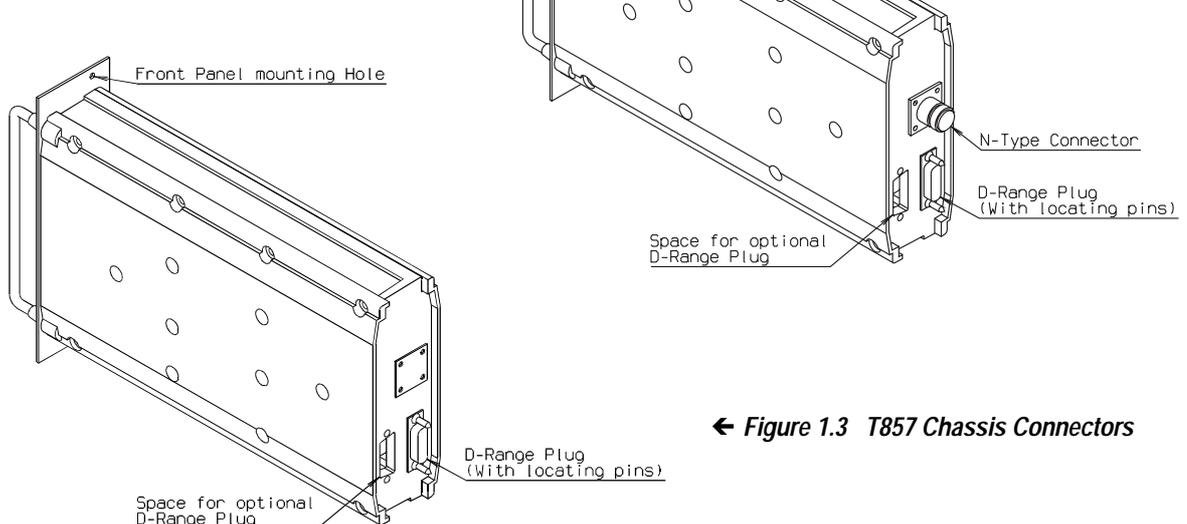


Figure 1.2 T855/856 Chassis Connectors →



← Figure 1.3 T857 Chassis Connectors

1.2 Rack Wiring

Wire the D-range connector as shown in Figure 1.4 or Figure 1.5. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

The RF coaxial cable to the N-type connector should be free from acute bends or twists. If access to the rear of the rack frame is restricted, the cable should be long enough to permit full withdrawal of the chassis from the guide.

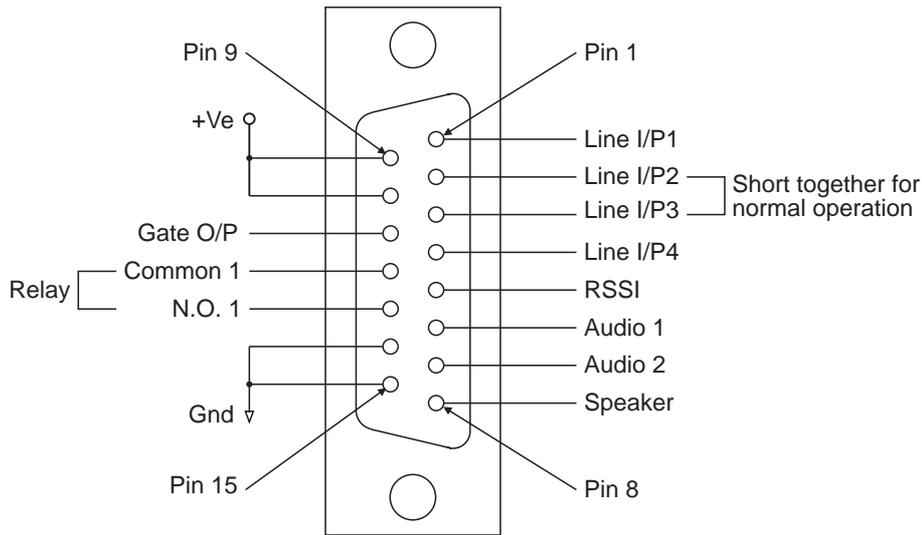


Figure 1.4 T855 D-Range Wiring - Rear View

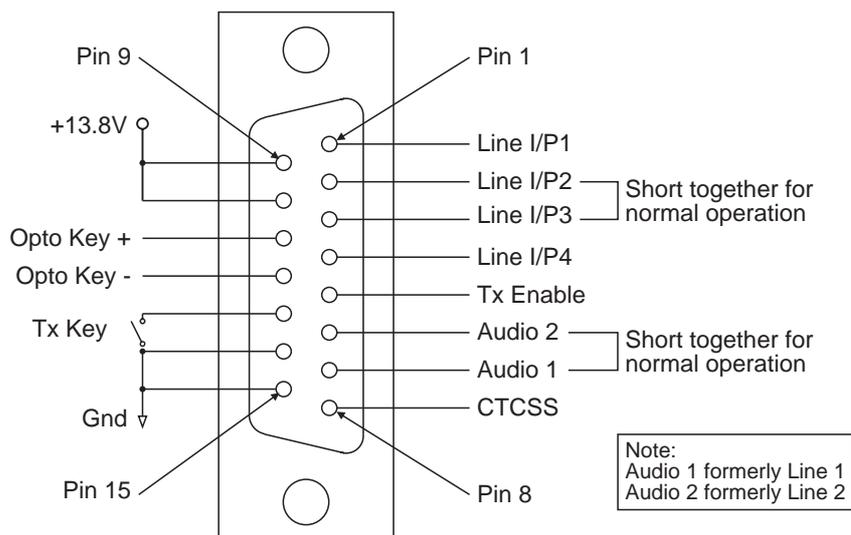


Figure 1.5 T856/857 D-Range Wiring - Rear View

1.3 T856/857 Non-standard D-Range Connections

(Refer to the audio processor circuit diagram and Figure 1.5.)

To enable non-standard connections to be made via the existing D-range connector, pins 2, 3, 11 and 12 have been provided with I/O pads and removable links in the form of zero ohm resistors (R132, R133, R134 and R135).

In the standard configuration pins 2 and 3 are shorted together externally. To make use of these pins, remove R134 and R135, then link "LINE-I/P-2" to "LINE-I/P-3" internally. Connections made to pads 101 and 102 will now be available at D-range pins 2 and 3 respectively. However, in this case, external access to the centre of the line transformer will be disabled.

Similarly, the removal of R132 and R133 will enable connections made to pads 104 and 105 to be available at D-range pins 11 and 12 respectively. However, in this case, external access to the optocoupler will be disabled.

1.4 Power Supply

If a power supply other than an appropriate Tait model is used, ensure that it is capable of providing enough current to drive the T800 system and is also free from excessive ripple or noise.

The system should be protected by the use of appropriately rated fuses in the power supply.

Note: It is particularly important when the prime power source is a battery that fuses be employed in all supply lines.

1.5 Reverse Polarity Protection

A shunt diode is fitted to all T855 receivers, T856 transmitters and T857 exciters for protection against connection to a power supply of incorrect polarity.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

2 T858/859 Installation

2.1 Rack Mounting

The T858 50W PA and T859 100W PA are designed for use in a standard 483mm rack frame using the supporting guide rails supplied with the units (refer to Figure 2.1).

The lower guide rail is located in the rack frame with three screws, two at the rear and one at the front. The short upper guide rail is located with just one screw. The PA is secured into the guide with two front panel mounting screws.

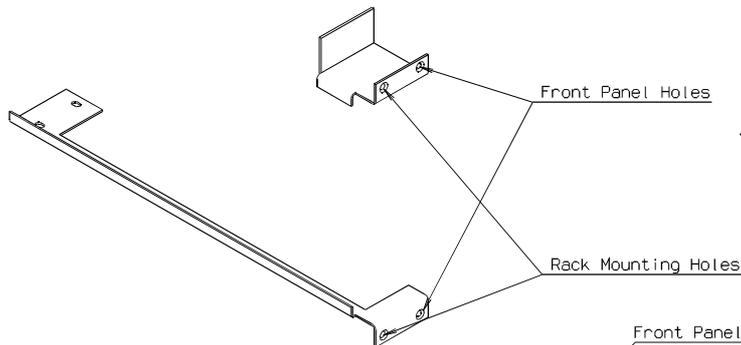
The RF input via the front panel SMC connector should be connected to an adjacent T857 exciter. The RF output is via the rear N-type connector, whilst all DC, audio and control connections are via the D-range connector.

The guide rails will allow the PA to be latched in the extended position (refer to Figure 2.4).



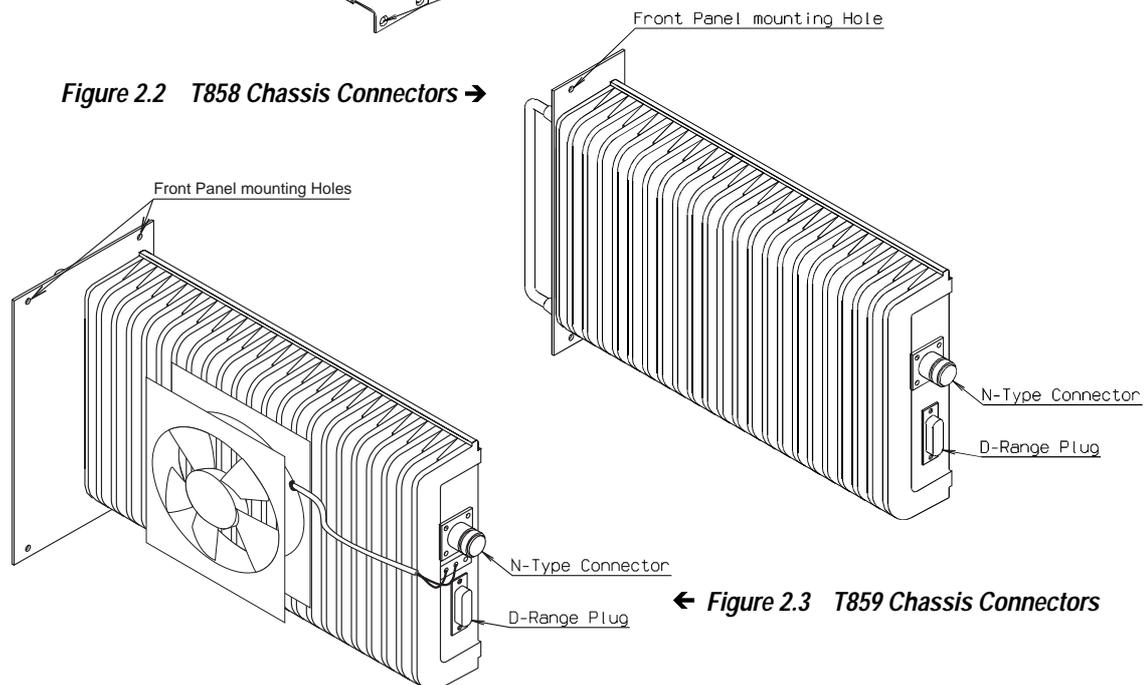
Caution:

If continuous operation of the T858 is required, the rack module position immediately adjacent to the finned heatsink should be left vacant. Adequate airflow over the fins should be maintained at all times.



← Figure 2.1 T858/859 Guide

Figure 2.2 T858 Chassis Connectors →



← Figure 2.3 T859 Chassis Connectors

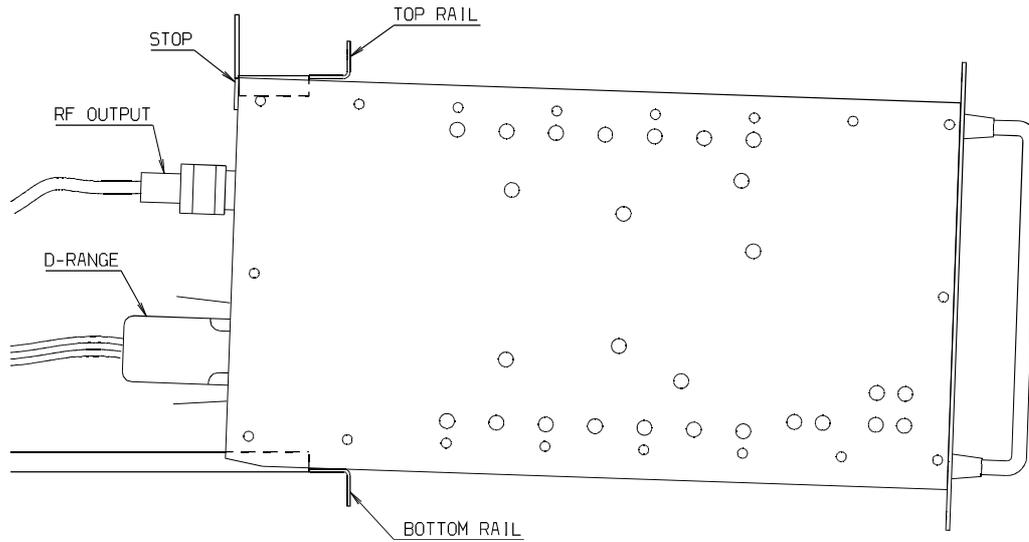


Figure 2.4 T858/859 Latched Position

2.2 Rack Wiring

Wire the D-range connector as shown in Figure 2.5. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

The RF coaxial cable to the N-type connector should be free from acute bends or twists. If access to the rear of the rack frame is restricted, the cable should be long enough to permit full withdrawal of the chassis from the guide.

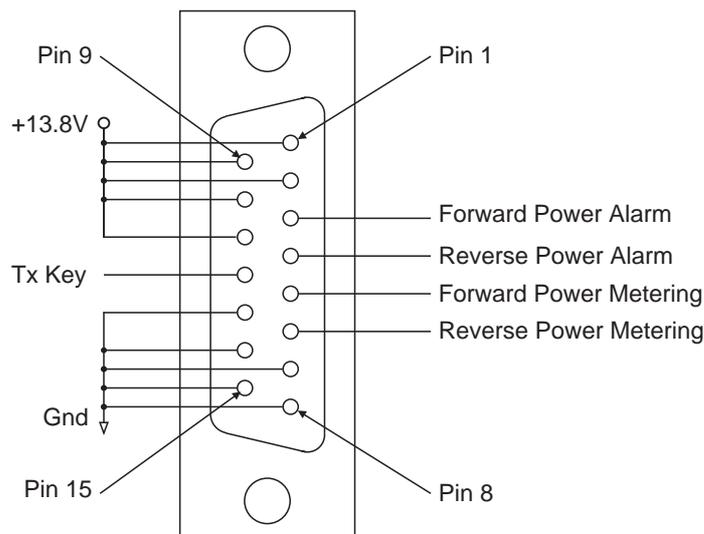


Figure 2.5 T858/859 D-Range Wiring - Rear View

2.3 Power Supply

If a power supply other than an appropriate Tait model is used, ensure that it is capable of providing enough current to drive the T800 system and is also free from excessive ripple or noise.

2.4 Reverse Polarity Protection

A shunt diode is fitted to all T858/859 power amplifiers for protection against connection to a power supply of incorrect polarity.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

Part G System Configurations

This part of the manual is divided into the sections listed below. These sections provide some brief information on basic system types and how to configure T850 equipment for use in them.

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1.2	Mute Relay Control	1.1
1.3	Mute Selection	1.1
1.4	Receiver Disable	1.1
1.5	CTCSS Configuration	1.2
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Figure	Title	Page
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4.3	4-Wire to 2-Wire Convertor	4.2
4.4	Receiver Disable Time vs Tail Time	4.2
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5.3	Isolated Loop Current Switch	5.2
5.4	Typical System	5.2

1 T855 Link Selectable Features

The T855 comes with a number of link selectable features which give added system flexibility

1.1 Flat Or De-emphasised Response

The links of PL101 and PL103 may be set to give either a flat or de-emphasised audio frequency response (refer to Section 3.3 in Part B for further details).

1.2 Mute Relay Control

A relay with undedicated contacts (RL100) is available in the audio processor circuit block for various switching applications. A link (PL102) is available for control of the relay from the mute circuit (refer to Section 3.3 in Part B). This makes the relay suitable for controlling the keying of a transmitter in repeater applications.

1.3 Mute Selection

Link PL104 may be set to operate with noise mute or carrier mute (refer to Section 3.3 in Part B).

1.4 Receiver Disable

The receiver audio can be disabled by pulling the "Rx disable" line low. When the circuit is pulled from low to high, the receiver audio cannot be re-enabled until the disable timer completes its operation. This time is variable from 15ms to 200ms by adjusting RV101 in the audio processor section.

If required, the operation of this circuit can be disabled by changing the link of PL100 from 1-2 to 2-3.

Typical applications of the receiver disable are as an extra mute for signalling purposes, or when the T855 is configured as a line controlled base station (refer to Section 4 in Part G).

1.5 CTCSS Configuration

Links PL105 & PL106 select various CTCSS options (refer to Section 3.3.2 in Part B).

1.6 300Hz High Pass Filter

Link PL105 also allows the insertion of this filter to improve hum and noise performance.

2 T856/857 Optional Features

2.1 Audio Processor

The T856 and T857 come with a number of link selectable features which give added system flexibility.

Refer to Section 3.3 in Part C for further details.

2.2 Line Transformer Inputs And Outputs

The line transformer (T100) is designed to provide a balanced interface to 600 ohm lines. For normal operation the two centre connections (LINE I/P 2, LINE I/P 3) are shorted together, and the 600 ohm line is connected between LINE I/P 1 and LINE I/P 4.

The secondary winding of the transformer is connected via a 1k resistor to pin 7 of the D-range connector and may be used to monitor audio on the line. It is normally shorted at the connector socket to pin 6 to route the audio signal back into the processor. If required, the audio path may be broken at this point for use with signalling options, e.g. CTCSS (refer to TI-346).

Note: Ultra-wide band versions of the T856 have a zero ohm resistor in the line to pin 7 of the D-range.

2.3 Opto Key

The keying circuitry may be completely isolated from the rest of the system by means of the optocoupler (IC100) connected between pins 11 and 12 of the D-range connector. A constant current source (Q106) allows keying voltages between 6 and 50V.

2.4 Relay Driver

A dedicated transistor (Q105) is provided for the purpose of switching an external (e.g. coaxial) relay. The output is open collector and is activated by the Tx-reg rail.

This output is not normally connected to the standard D-range connector, and use of the relay driver will necessitate manual wiring to an additional D-range connector, as supplied with the T800-03 auxiliary D-range.

2.5 Local Microphone

Use of the local microphone (via the front panel stereo socket) will disable the audio input from the line. The audio switching occurs when the PTT switch is closed.

2.6 Keying With Option PCBs

If an option PCB (e.g. CTCSS) is fitted to the exciter, keying may then be accomplished via the TX-EN-OPT pad in the audio processor. The line must be pulled low to key.

2.7 Transmit Key Time

2.7.1 T856 Issue -03 & Later PCBs

- **Standard**

Leave LINK A open circuit.

- **Short**

Make LINK A.

2.7.2 T857 Issue -04 & Later PCBs

- **Standard**

Ensure that zero ohm resistor R78 is in circuit, and that solder links A & B in the synthesiser are **not** made.

The key time will be approximately 25ms.

- **Short**

Remove R78 and make solder links A & B.

The key time should now be <2ms.

In this configuration the standby spurious emission should be <-65dBm.

3 Talk Through Repeater

In this configuration the receiver directly keys the transmitter when the signal is received. The demodulated audio is fed via 600 ohm lines to the transmitter to modulate the carrier. The receiver and transmitter operate simultaneously and must therefore be on different frequencies. The minimum frequency separation depends on the duplexer used.

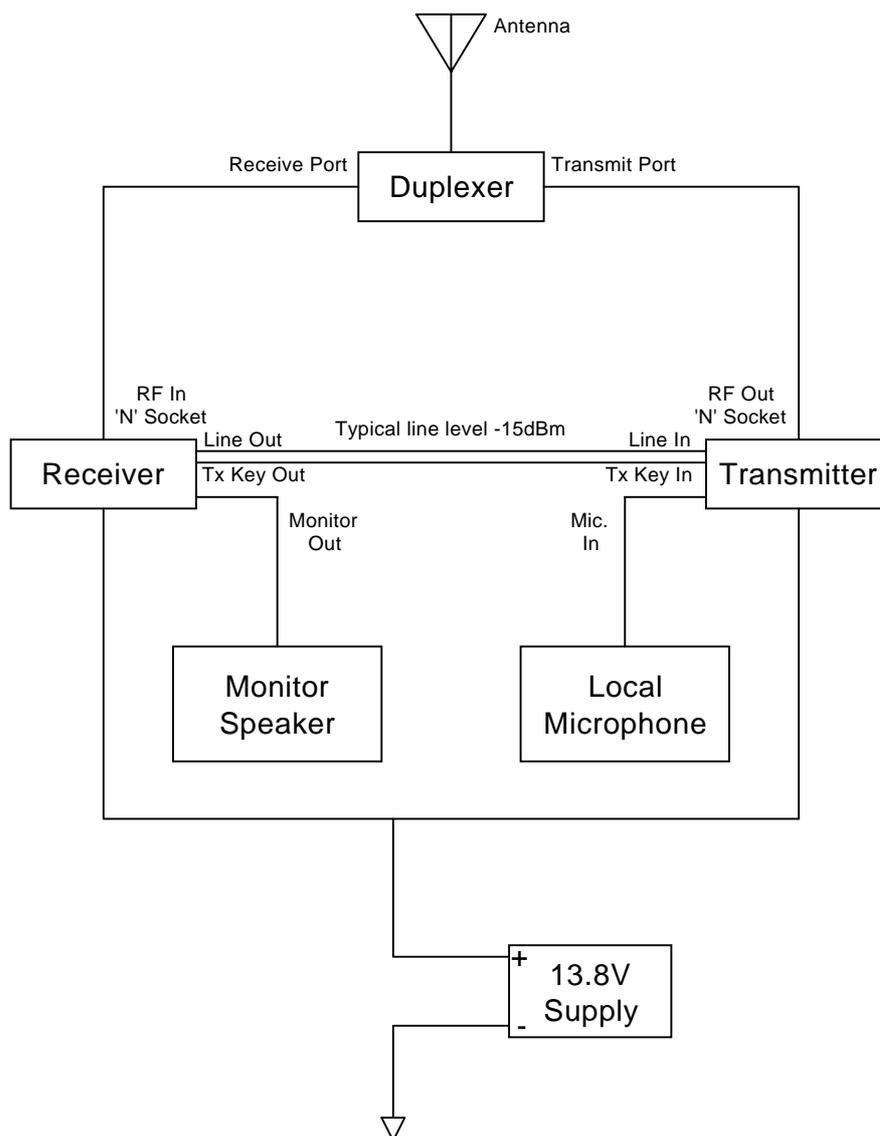


Figure 3.1 Talk Through Repeater

4 Line Controlled Base Without Talk Through

4.1 General

This installation contains a transmitter and receiver which may or may not be on the same frequency, thus simultaneous transmission and reception is not possible. When the transmitter is keyed, the coaxial relay is also energised. When the relay is in its rest position, signals from the aerial are passed to the receiver and the demodulated output is fed via 600 ohm lines to the RCU.

The receiver is disabled when the transmitter is energised to prevent the receiver mute opening from RF due to lack of isolation in the relay, direct radiation or the noise skirt of the dual frequency link.

Since the base station may be controlled via a 2-wire line and a 4-wire to 2-wire hybrid, there is a possibility of system oscillation if the receiver is not disabled during transmit. This occurs when the transmit energy enters the receiver and produces an audio response which can pass from the receive to the transmit audio part of the hybrid (impedance imbalance, etc).

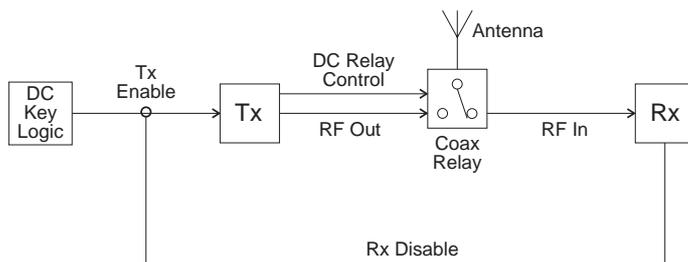


Figure 4.1 Basic Configuration

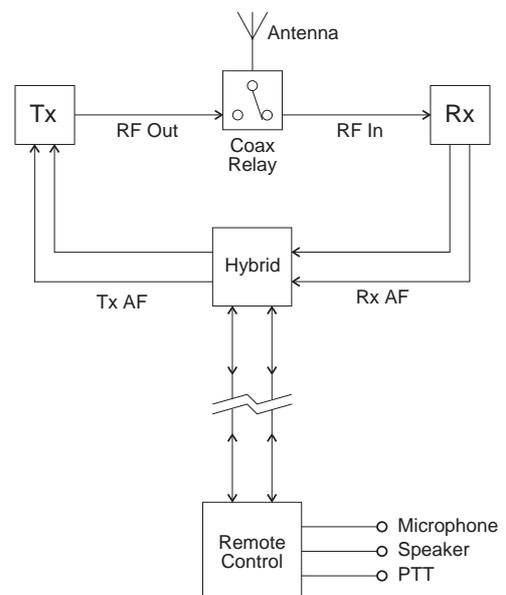


Figure 4.2 Remote Line Controlled Base Station

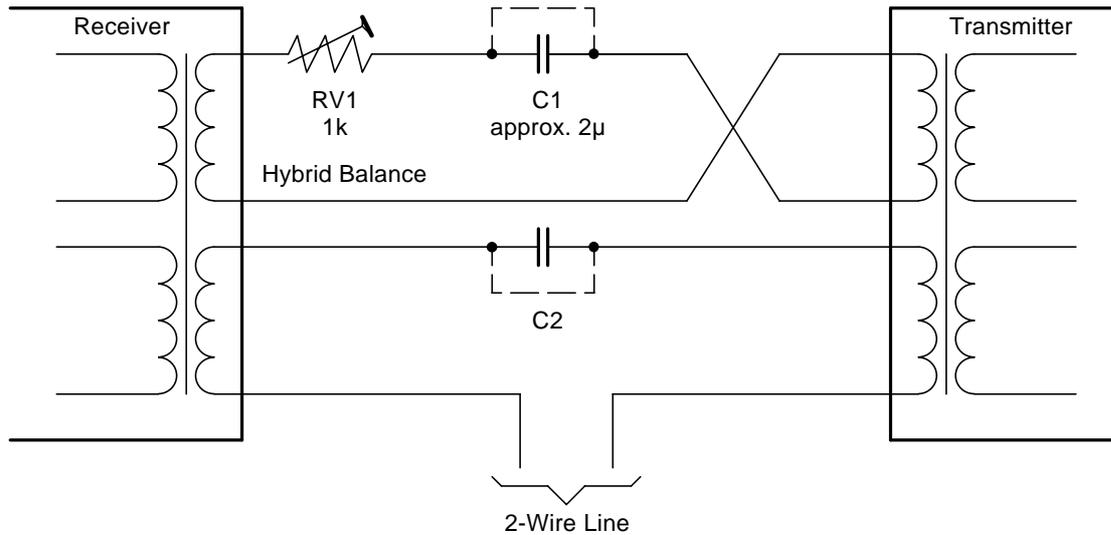


Figure 4.3 4-Wire to 2-Wire Converter

4.2 Transmitter Tail Timer

If the transmitter has a tail timer fitted:

- the receiver disable timer must be set so that $t_{Rx/Dis} > t_{Tx/Tail}$;

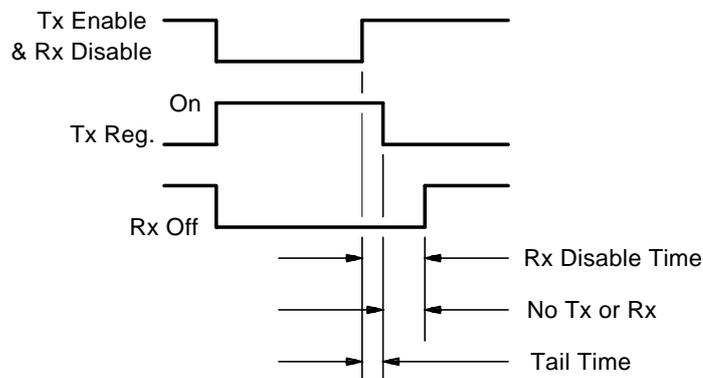


Figure 4.4 Receiver Disable Time vs Tail Time

- if the system configuration also uses an aerial changeover relay as well as the tail timer, the changeover relay must be driven from the relay driver (Q105) in the audio processor rather than by Tx key or Tx enable;
- depending on tail time requirements, it is possible for the transmitter tail time to exceed the receiver disable time capability; in this situation the receiver disable line should also be driven from relay driver Q105.

5 DC Line Keying

Where the transmitter and receiver are separated by only a short distance and DC isolation is not required, DC loop keying may be employed.

A small DC current (usually less than 10mA) can be fed via the balanced 2-wire line to provide remote control of various functions.

In a duplex system the receiver mute is used to key a transmitter, provided there is a common earth between the two units (refer to Figure 5.1).

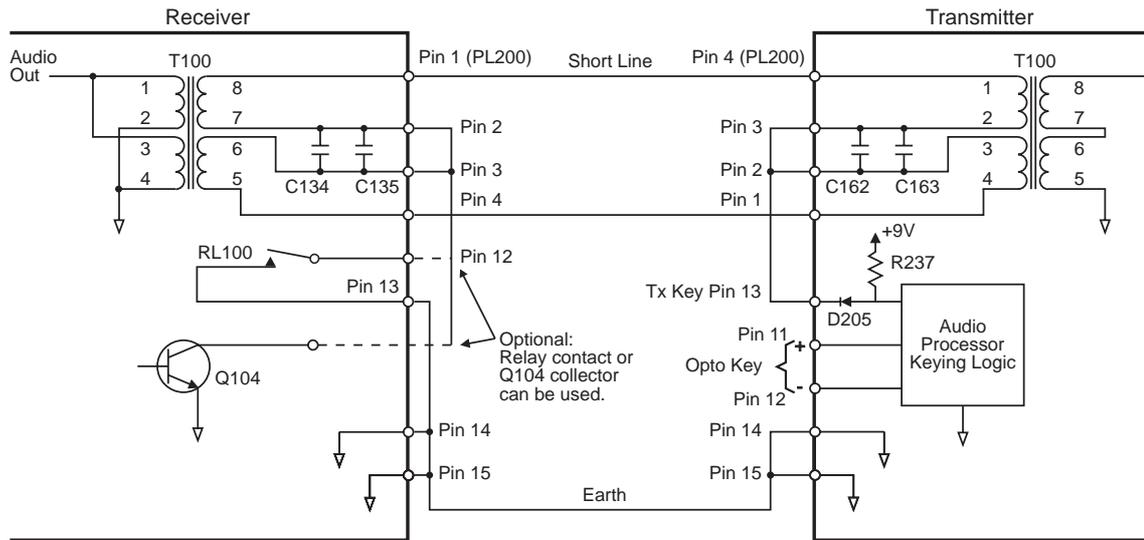


Figure 5.1 DC Loop Keying With Common Earth

Where the receiver and transmitter (or remote control) are distant, DC loop keying is provided by an isolated supply, driver and detector because an earth cannot be relied on (refer to Figure 5.2, Figure 5.3 & Figure 5.4).

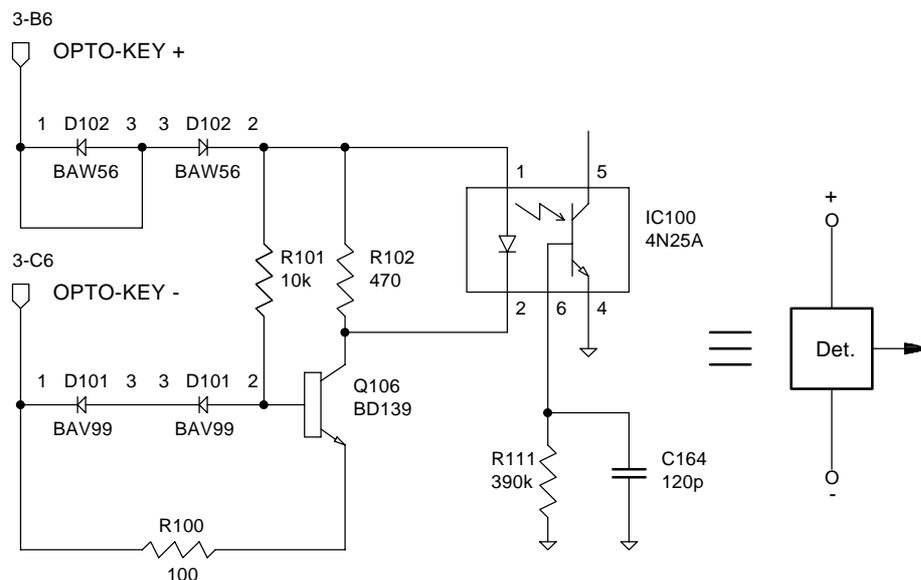


Figure 5.2 Isolated Constant Current Loop Current Detector (Opto-key input on T856 & T857)

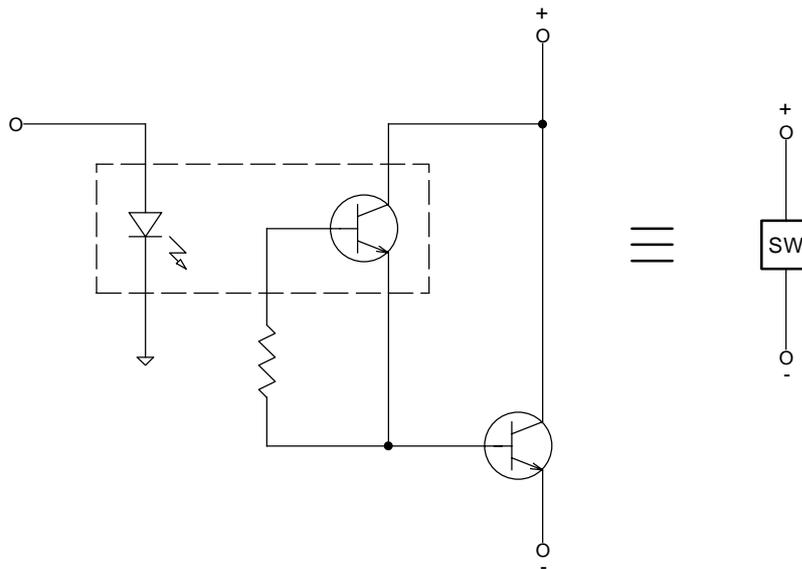


Figure 5.3 Isolated Loop Current Switch

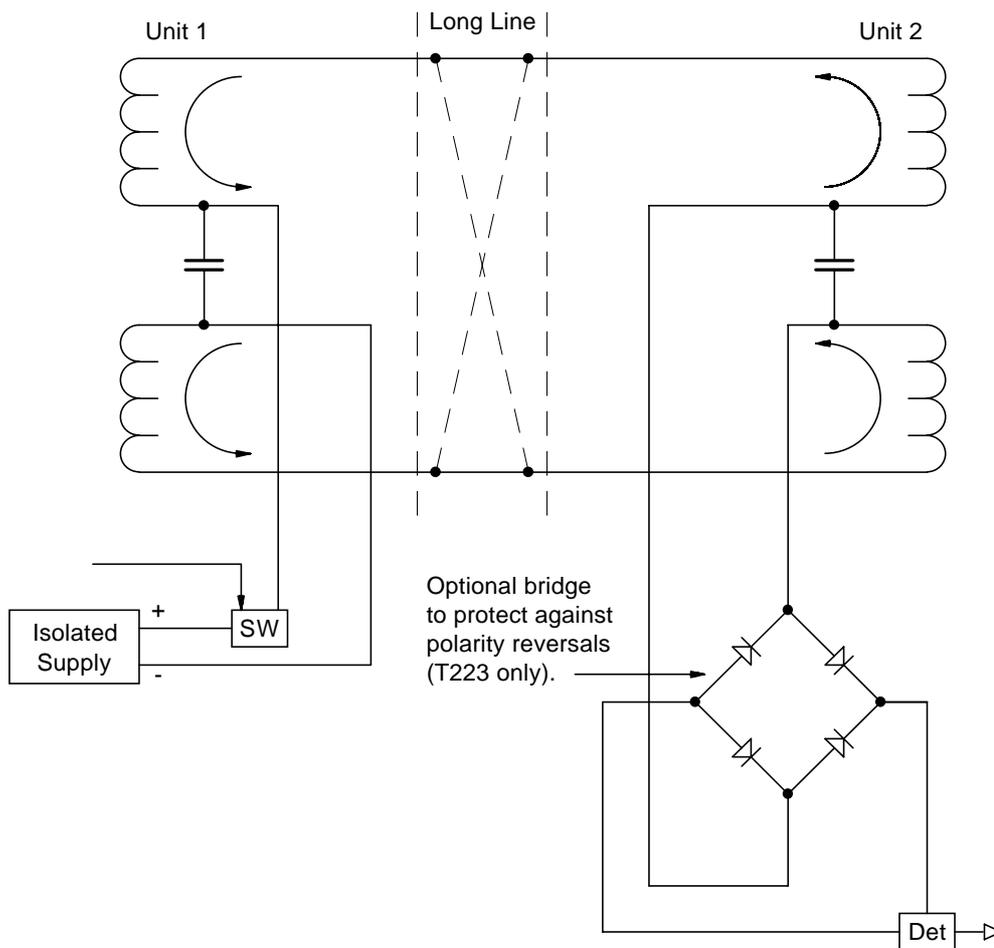


Figure 5.4 Typical System

Part H T800 Ancillary Equipment

This part of the manual gives a brief description of the ancillary equipment and accessory kits available for use with T800 series base station equipment.

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T318-02 Receiver/Transmitter Monitor	1
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T800 Ancillary Equipment

This Part of the manual features a brief description of the major ancillaries that may be used with T800 series equipment. For a comprehensive list of available ancillary equipment, please contact your nearest approved Tait Dealer or Service Centre.

T318-02 Receiver/Transmitter Monitor

The T318-02 is designed to monitor the basic operational functions of one T800 receiver and transmitter. The meter and selector switches for monitoring the required functions are mounted on the front panel, as is the monitor speaker which is driven by a built-in amplifier. An optional mute circuit may be used to silence the audio when no carrier is present.

Refer to M318-02.

T708-91/92 Mains Power Supplies

The T708-91/92 mains power supplies are designed to power the T800-60 Slimline Repeater and mount on the front panel instead of the options tray. Two versions are available:

- T708-91 230V/50Hz mains supply
- T708-92 120V/60Hz mains supply.

The units are electrically the same as (although mechanically different from) the T708-01 and T708-02 respectively.

Refer to M700-00 or M708-01.

T800-01-001 Programming Kit

The T800-01-001 kit is used for programming T800 series base station equipment and must be used in conjunction with a PC, an EPROM programming device and appropriate software capable of programming an EPROM from an Intel hex format or binary file.

The kit comprises the following items:

- PGM800Win programming software user's manual
- PGM800Win programming software on 3½" floppy discs.

T800-02 CTCSS Dencoder

The T800-02 CTCSS unit is designed to operate with the T800 range of receivers and transmitters. It will encode and decode CTCSS tone frequencies within the range 67 to 250.3Hz and is compatible with any other CTCSS unit which conforms to EIA RS220.

Refer to TI-346.

T800-03 Auxiliary D-Range

The T800-03 is an additional D-range kit comprising 1 D-range plug assembly, 1 D-range socket and 2 locating pins, nuts & washers.

T800-04 RSSI

The T800-04 RSSI option PCB plugs directly into the main PCB (support circuitry being fitted as standard). It is fitted to the T855, T875 and T885 whenever receiver signal strength monitoring is required, e.g. trunking or voting. Its function is to provide a DC voltage proportional to the signal level at the receiver input.

Refer to the appropriate service manual.

T800-05 Guide Rail

The standard T800 series guide with one D-range socket for mounting in the standard 483mm rack frame assembly.

T800-06 External Frequency Reference Kit

The T800-06 kit features an additional D-range plug which incorporates a miniature RF connector to carry an externally generated 12.8MHz reference signal into a T800 module. This enables the use of very high stability external reference oscillators for special applications.

T800-07 Multichannel Kit

The T800-07 is a plug-in multichannel memory PCB (supplied with connecting cable) which is intended as a substitute for the T800-10 memory PCB. Up to 128 channels may be addressed via the on-board DIP switch or remotely via the T800-03 D-range kit. CTCSS frequencies may also be stored alongside channel information within the EPROM.

Refer to TI-356.

T800-10 Memory Module

The T800-10 is the standard, plug-in T800 channel memory PCB.

T800-13 Extender Rail

The T800-13 extender rail allows a T800 unit to be operated out of the rack with the covers off for tuning purposes. It is fitted with two 15-way D-range connectors.

T800-14 Extender Rail

The T800-14 extender rail allows a T800 unit to be operated out of the rack with the covers off for tuning purposes. It is fitted with one 15-way D-range connector and one 11-way D-range incorporating a miniature RF connector for an externally generated reference signal.

T800-15 Speaker Panel

A 60mm speaker panel fitted with a 4 Ω speaker and complete with mounting hardware.

T800-16 Speaker Panel (formerly T359-01)

A 120mm speaker panel fitted with a 75mm x 125mm 4 Ω speaker and complete with mounting hardware.

T800-19 Rack Mounting Fan

The T800-19 kit features a rack mounting fan which is designed to fit into the base of any standard 483mm rack frame without affecting its ability to house 7 modules. The kit contains all mounting hardware.

T800-20 Pre-wired Rack

The T800-20 is a standard 5U high rack which is wired to accommodate one 25, 50 or 100W base station or repeater. It comes complete with a T800-15 speaker panel and T992-01 blank panel.

T800-21 Pre-wired Rack With Interface PCB

The T800-21 is a standard 5U high rack which is wired to accommodate one 25, 50 or 100W base station or repeater. It is also fitted with an interface PCB containing a 25-way D-range to allow the easy integration of OEM products into the base station or repeater configuration. The T800-21 comes complete with a T800-15 speaker panel and T992-01 blank panel.

T800-30 & T800-35 DFSK Modulators

The T800-30 and T800-35 are DFSK modulators for T800 transmitters, suitable for POC-SAG or similar paging data formats. Analogue transmissions (e.g. tone or speech) are still possible by disabling the data path via a control line. 512 or 1200 baud data rates are link selectable. The T800-35 is adapted for use with an external reference oscillator for simulcast transmission.

Refer to TI-373.

T800-60 Slimline Repeater Mounting Kit

The T800-60 Slimline Repeater kit enables one T800 receiver and one T800 transmitter to be mounted horizontally side-by-side in a standard 483mm rack frame. The kit contains a front panel complete with speaker, an options tray (for mounting a power supply, duplexer, etc.), and a wiring loom to connect the two T800 modules to the terminal blocks mounted on the rear of the options tray. The T708-91/92 mains power supplies (available separately) are designed for use with the T800-60. The rack height of the assembled unit is 2U.

T800-80 Local Microphone

A 600Ω microphone complete with 300mm cord terminated in a ¼" stereo plug.

T800-81 Narrow Band Conversion Kit

The T800-81 kit provides the components required to convert one T835 receiver from 25kHz channel spacing to 12.5kHz channel spacing for narrow band operation.

T800-82 Narrow Band Conversion Kit

The T800-82 kit provides the components required to convert one T836 transmitter **or** one T837 exciter from 5kHz deviation to 2.5kHz deviation for narrow band operation.

T800-83 Narrow Band Conversion Kit

The T800-83 kit provides the components required to convert one T855 receiver from 25kHz channel spacing to 12.5kHz channel spacing for narrow band operation.

T800-84 Narrow Band Conversion Kit

The T800-84 kit provides the components required to convert one T856 transmitter **or** one T857 exciter from 5kHz deviation to 2.5kHz deviation for narrow band operation.

T801 Frequency Reference Module

The T801 frequency reference module provides a high stability frequency source to which the synthesiser within a T800 base station can be locked. The master standard within the T801 is primarily intended to be rubidium, although high quality ovenised crystal oscillators can also be used in applications where more frequent readjustment of frequency is acceptable. The T801 converts the output frequency from its master standard to the 12.8MHz required by the T800 base station.

Refer to M801-00.

T801-10 OCXO Module

The T801-10 OCXO module provides a high stability frequency source to which the synthesiser within a T800 base station can be locked. This will provide T800 transmitters with the frequency stability required for simulcast transmission. The master standard within the T801-10 is a high quality ovenised crystal oscillator (OCXO). Three outputs are provided on the rear panel, which allows up to three T800 transmitters to be referenced to the source oscillator.

T802-00 Remote Monitor

The T802-00 is a microprocessor controlled remote monitor unit designed for use with Tait base station equipment. Each remote base requires one T802-00 which communicates via its integral modem with a centrally located PC based controller. The PC controller runs software to convert the raw data from the T802-00 into a user friendly form.

Refer to M802-00.

T802-10 RF Splitter

The T802-10 RF splitters are used to take attenuated RF from the transmitter to the T802-00 where it is mixed onto the receiver frequency by the shift mixer. This RF is then inserted via another splitter into the receiver. Each T802-10 kit contains 2 identical RF splitter modules.

Refer to M802-00.

T802-20 Modem & Programming Kit

The T802-20 kit provides a modem and the operating software for the T802-00 remote monitor PC controller and comprises the following items:

- a CCITT V.23 modem
- T802-00 PC software user's manual
- T802-00 PC software on a 5¼" floppy disc.

T802-21 Programming Kit

The T802-21 kit provides the operating software for the T802-00 remote monitor PC controller and comprises the following items:

- T802-00 PC software user's manual
- T802-00 PC software on a 5¼" floppy disc.

T802-22 Modem

A CCITT V.23 modem for use with the T802-00 PC controller.

T806 Mains Power Supply

The T806 is a power supply capable of supplying up to 6A at 11-14V DC and is available in 2 versions to suit a mains supply of either 230V/50Hz or 115V/60Hz (nominal values). The T806 is designed to power T800 series 25W transmitters (plus receivers, etc.) and comes complete with a guide to mount in a standard 60mm rack frame assembly.

Refer to M806-00.

T807 Mains Power Supply

The T807 is a switching power supply capable of supplying up to 15A at 11-14V DC. It requires a mains supply of 230V/50Hz or 115V/60Hz (nominal values) which can be internally selected with a switch or wire links. The T807 is designed to power T800 series 50W transmitters (plus receivers, etc.) and comes complete with a guide to mount in a standard 60mm rack frame assembly.

Refer to M807-00.

T808 Mains Power Supply

The T808 is a switching power supply capable of supplying up to 25A at 11-14V DC. It requires a mains supply of 230V/50Hz or 115V/60Hz (nominal values) which can be internally selected with a switch or wire links. The T808 is designed to power T800 series 100W transmitters (plus receivers, etc.) and comes complete with a guide to mount in a standard 60mm rack frame assembly.

Refer to M807-00.

T1500-50 Trunking Extra D-Range (formerly T800-50)

Trunking systems require additional outputs for flat audio (FFSK) and Rx line monitoring. This kit provides the components to connect these outputs via a second D-range.

T1500-51 Trunking Transmitter Interface (formerly T800-51)

When fitted to a T800 series transmitter, the T1500-51 trunking transmitter interface PCB allows the trunking system to switch the audio processor between FFSK and normal audio. The PCB comes complete with wires, sockets and screws, but a T800-03 auxiliary D-range kit will also be required.

KS820 Spares Kit

The KS820 spares kit contains all the parts on the T820 series recommended spares list and is intended to provide enough spares to maintain a single installation of up to ten channels. Included in the kit are electrical and mechanical parts that are either unique to Tait equipment, hard to obtain or susceptible to damage or wear and tear. All parts are securely packed in clearly labelled screw top containers in a handy plastic carry case.

Note: The kit does not contain standard chip capacitors or resistors.

KS830 Spares Kit

The KS830 spares kit contains all the parts on the T830 series recommended spares list and is intended to provide enough spares to maintain a single installation of up to ten channels. Included in the kit are electrical and mechanical parts that are either unique to Tait equipment, hard to obtain or susceptible to damage or wear and tear. All parts are securely packed in clearly labelled screw top containers in a handy plastic carry case.

Note: The kit does not contain standard chip capacitors or resistors.

KS850 Spares Kit

The KS850 spares kit contains all the parts on the T850 series recommended spares list and is intended to provide enough spares to maintain a single installation of up to ten channels. Included in the kit are electrical and mechanical parts that are either unique to Tait equipment, hard to obtain or susceptible to damage or wear and tear. All parts are securely packed in clearly labelled screw top containers in a handy plastic carry case.

Note: The kit does not contain standard chip capacitors or resistors.

KS880 Spares Kit

The KS880 spares kit contains all the parts on the T880 series recommended spares list and is intended to provide enough spares to maintain a single installation of up to ten channels. Included in the kit are electrical and mechanical parts that are either unique to Tait equipment, hard to obtain or susceptible to damage or wear and tear. All parts

are securely packed in clearly labelled screw top containers in a handy plastic carry case.

Note: The kit does not contain standard chip capacitors or resistors.