

**TN500 SR-39-1 Subrack**

The SR-39-1 subrack is designed to hold and interconnect the MT-3 and MT-4 series of receiver, transmitter and control modules on one universal motherboard. This Type 84 motherboard makes extensive use of cage jacks to interconnect the A and B systems supporting a number of field configurations. Additional auxiliary control connectors provide easy access to virtually all control and audio lines, simplifying many standard base / repeater configurations. Modules may be inserted in the subrack in many various configurations as shown in Figure 1. The Control 1 connector is used for the base or repeater control card or paging modulator. The Optional Control 2 card is for custom systems requiring specialized paging / data / audio interconnections and is not normally used. If the radio system is ordered with antenna relays, the system regulator with the relays is housed in a larger module that encompasses the area for the Control 2 module. The subrack has room for two transmitter and receiver pairs. The left side connectors are reserved for transmitter and receiver A (C in second subrack) respectively, while the right side connectors are reserved for transmitter and receiver B (D in second subrack). Although any transmitter and receiver can be placed in either of the respective slots, convention usually follows that the lower frequency radios will go in slots A and the higher in slots B to D.

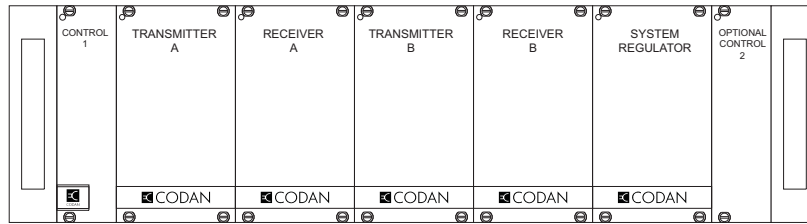


Figure 1: Standard Subrack

A quadruple system is shown in Figure 2 with A and B pairs in the first rack, and C and D pairs in the second rack. This system requires a multiple link controller and two system regulators.

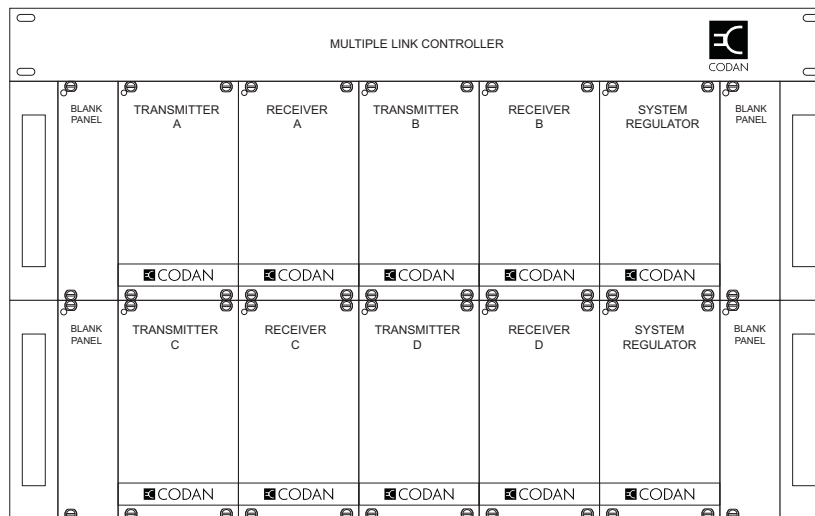


Figure 2: Dual Subracks for Multiple Link Configuration

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If a VHF or UHF power amplifier is installed, only one transmitter and receiver pair can be installed since the power amplifier takes up two slots, as shown in Figure 3.

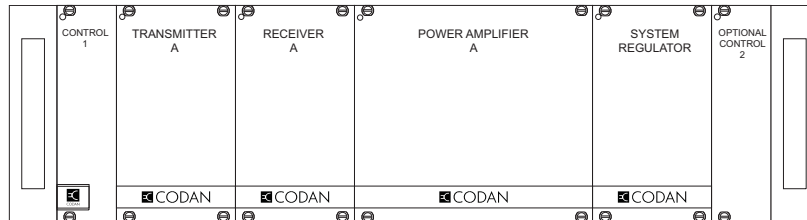


Figure 3: Subrack with Power Amplifier

If two transceivers are used with power amplifiers, the power amplifiers are normally installed in a second subrack as shown in Figure 4. This keeps all of the audio and control signal routing to a single subrack, simplifying the system. A second system regulator and the multiple link controller are not required for this configuration.

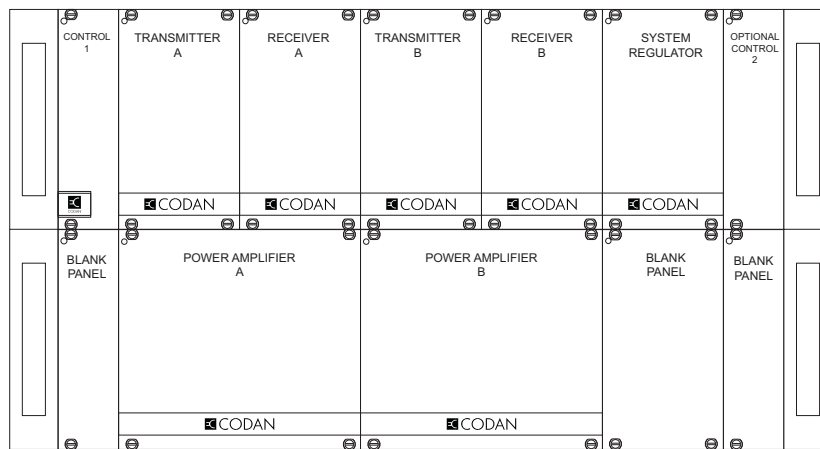


Figure 4: Dual Subracks with Two Power Amplifiers

The 96 pin auxiliary control connector, located on the back of the motherboard (facing rear of the subrack), has 96 pins and provides access to virtually all signal and power lines on the motherboard. Many repeater configurations can be implemented by interconnecting some of these lines through a mating 96 pin connector. Additionally, external equipment can also be connected to the repeater through the auxiliary control connector, allowing for more extensive radio control (i.e., DC remotes, tone remotes etc.). Note: The + and - DC lines from the auxiliary control connector are not fused. Use caution with these lines so that interconnect cables are not overloaded.

**DB25 Connector to CI-RC-4M-G2**

Connector J12 is a female DB25 connector which can be used for connecting audio, channel select and control signal lines to a CI-RC-4M-G2 (second generation) multiple link controller. When connecting to a CI-RC-4M-G2, a standard straight-through male-to-male DB25 cable can be used.

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**Power Input**

The main power input (+10 to +17 Vdc; +13.8 Vdc nominal) connector is located at the back of the subrack, on the motherboard. There is an identical +9.5 Vdc power output connector on the motherboard that is used to power other Codan equipment at +9.5 Vdc (the CI-RC-4M-G2 controller, for example).

**NOTE:** Do not connect the main power input to the +9.5 Vdc power output connector, as a transient suppressor (over voltage protection) will short to ground to protect the equipment.

Reverse voltage protection and over voltage protection (transient suppressor) is provided at the main power input as well as the +9.5 Vdc line. The main power input is protected with a standard fast-blow 15 amp fuse. These components may require replacing if the power supply is not connected properly, or even after a power surge or a lightning strike. The two transient suppressors have different voltage ratings for the main power input and +9.5 Vdc lines. Figure 5 shows the subrack / motherboard rear view.

**Antenna Relay Activation**

The motherboard on the subrack contains a set of jumpers that are used to activate the optional antenna relays in the System Regulator module from the Transmitter PTT IN and PTT OUT signal lines.

JU36	TXA PTT OUT activates Relay A	JU37	TXA PTT IN activates Relay A
JU39	TXA PTT OUT activates Relay B	JU40	TXA PTT IN activates Relay B
JU42	TXB PTT OUT activates Relay A	JU43	TXB PTT IN activates Relay A
JU45	TXB PTT OUT activates Relay B	JU46	TXB PTT IN activates Relay B

**Simplex Operation**

The motherboard on the subrack contains a set of jumpers that are enabled when the radio system is operated in simplex mode (simplex base station or simplex links). The jumper connects the Transmitter PTT OUT signal line to the RX MUTE. This jumper will cause the receiver to mute when the transmitter is keyed.

JU38	TXA PTT OUT mutes RXA	JU41	TXA PTT OUT mutes RXB
JU44	TXB PTT OUT mutes RXA	JU47	TXB PTT OUT mutes RXB

**DB25 Connector to DSP-223 and IP-223**

Connector J10 is a female DB25 connector which can be used for basic base connections. When connected to a Telex DSP-223 or IP-223, a standard straight-through male-to-male DB25 cable can be used with some motherboard jumper changes. The IP-223 also requires that 2 pins on the DB25 (PTT COM - pin2 and MON COM - pin 16) are wired to ground for proper operation. The DB25 can also be jumpered for Balanced Audio direct to / from the receiver / transmitter or Auxiliary Audio (recommended) through the controller.

**WARNING: JU108 must be configured correctly for DSP-223 or IP-223 or damage can occur.**

JU104	A = RX A Bal O/P2 or B = AUX 1 AUD O/P2	JU107	A = RX A Bal O/P1 or B = AUX AUD O/P1
JU105	A = TX A Bal I/P2 or B = AUX 1 AUD I/P2	JU108	A = DSP-223 / +13.8 V or B = IP-223 / RX A COR
JU106	A = TX A Bal I/P1 or B = AUX 1 AUD I/P1	JU109	TX A SEC / CLR I/P (installed to enable TX A SEC / CLR I/P)

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**Channel and Bank Select**

MT-4E radio modules are capable of 16 channel operation in 2 banks (32 channels total). The 16 channels are controlled via four CSEL signal lines connected to each receiver and transmitter module. The CSEL signal lines are set as either a 0 (0 Vdc) or a 1 (+9.5 Vdc).

JU48	TX A Channel select lines +9.5 V pullup enable	JU49	RX A Channel select lines +9.5 V pullup enable
JU50	TX A CSEL 0	JU51	TX A CSEL 1
JU52	TX A CSEL 2	JU53	TX A CSEL 3
JU54	TX A Bank select A = Bank A, B = Bank B	JU55	RX A CSEL 0
JU56	RX A CSEL 1	JU57	RX A CSEL 2
JU58	RX A CSEL 3	JU59	RX A Bank select A = Bank A, B = Bank B
JU60	TX B Channel select lines +9.5 V pullup enable	JU61	RX B Channel select lines +9.5 V pullup enable
JU62	TX B CSEL 0	JU63	TX B CSEL 1
JU64	TX B CSEL 2	JU65	TX B CSEL 3
JU66	TX B Bank select A = Bank A, B = Bank B	JU67	RX B CSEL 0
JU68	RX B CSEL 1	JU69	RX B CSEL 2
JU70	RX B CSEL 3	JU71	RX B Bank select A = Bank A, B = Bank B

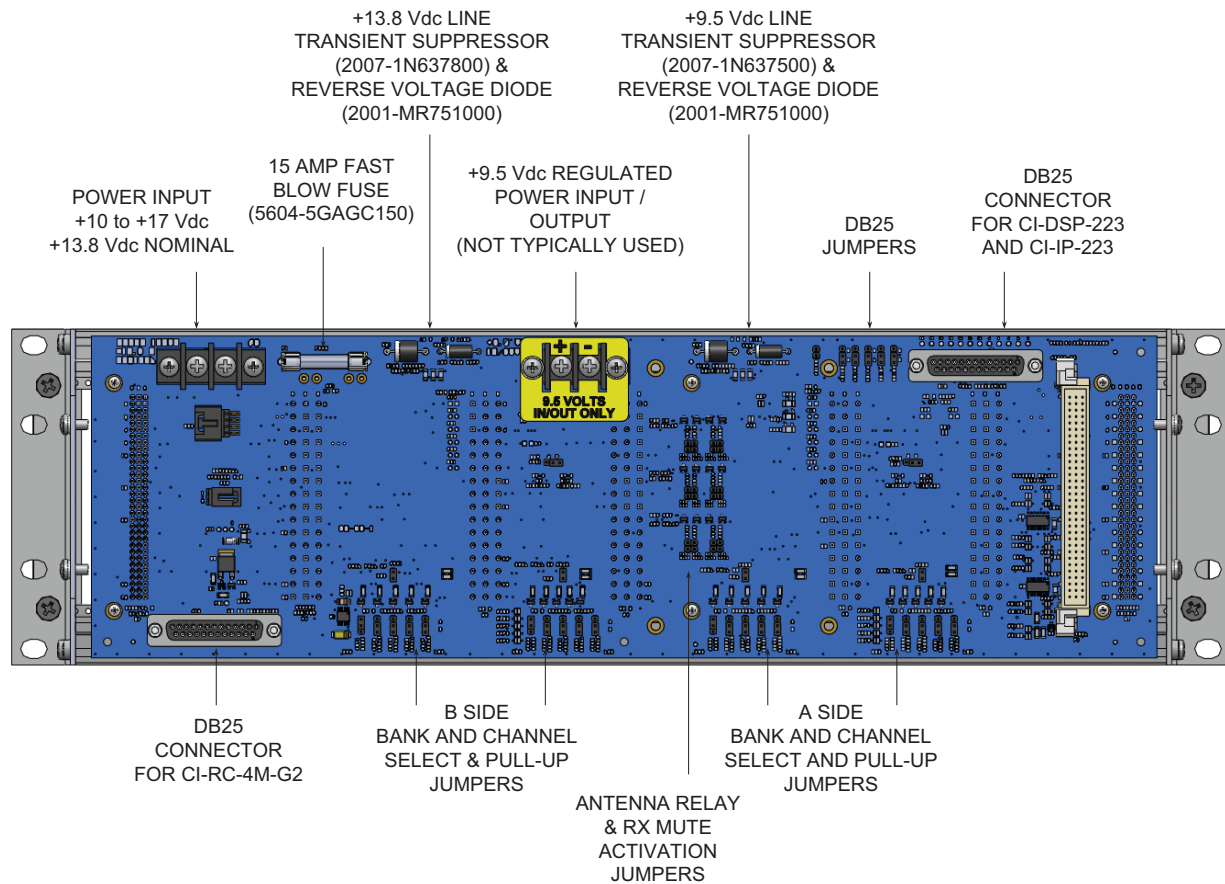


Figure 5: Rear View of Subrack

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