

TN110 Channel and Frequency Selection

MT-3 and MT-4 Channel and Bank Selection

Daniels MT-3 crystal controlled radio modules operating frequency is selected by the control module's fundamental crystal frequency. The channel select lines and internal BCD rotary switches are not used by the crystal control module.

Daniels MT-3 synthesized radio modules are capable of 16 channel operation.

Daniels 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). Table 1 shows the channel selected for the CSEL input settings.

Table 1: Channel Selection Settings

Channel	Decimal	CSEL3	CSEL2	CSEL1	CSEL0
1	0	0	0	0	0
2	1	0	0	0	1
3	2	0	0	1	0
4	3	0	0	1	1
5	4	0	1	0	0
6	5	0	1	0	1
7	6	0	1	1	0
8	7	0	1	1	1
9	8	1	0	0	0
10	9	1	0	0	1
11	10	1	0	1	0
12	11	1	0	1	1
13	12	1	1	0	0
14	13	1	1	0	1
15	14	1	1	1	0
16	15	1	1	1	1

The Receiver and Transmitter Bank A/B select lines are set as either a B (0 Vdc) or an A (+9.5 Vdc). The logic for the Bank A/B select lines is different from the CSEL signal lines. If the Bank A/B select line is pulled high (+9.5 Vdc), or left floating, Bank A is selected. If the Bank A/B select line is pulled low (0 Vdc), Bank B is selected.

On older motherboards (Serial # 123125 and earlier), the Receiver Bank A/B select line uses the same line as the MT-3 Receiver ISO COR K and the Transmitter Bank A/B select line uses the same line as the MT-3 Transmitter Standby. No jumpers are available for the Bank select.

TN110 Channel and Frequency Selection

There are 3 different ways to change the channel and bank of a transmitter / receiver module:

- 1 The user can set jumpers mounted on the motherboard for each Channel Select signal line (set of four for each Tx / Rx module) and Bank A/B select line. These jumpers can be used to permanently set a subrack slot at a specific channel and bank.
 - Jumpers can be set for 0 (0 Vdc) "down" or 1 (+9.5 Vdc) "up".
 - Pull-up resistor jumpers to +9.5 Vdc must be installed.
- 2 CSEL signal lines and Bank A/B select lines can be controlled externally by a tone remote adapter, a CI-RC-4M multiple link controller, or other third party devices.
- 3 Sixteen-position rotary select switches mounted on the CI-BC-4E base controller can control the CSEL lines and toggle switches can control the Bank A/B select line. Optionally the CI-RC-4L repeater controller or AC-3E control card can have a rotary switch added for control of the CSEL signal lines.

The Pull-up resistor jumpers to +9.5 Vdc must be removed and all channel select and bank select jumpers must be installed in the 1 or "up" position for both external control and rotary switch control of channel selection.

MT-3 Low Current / Enhanced Synthesizer Modules Frequency Selection

The MT-3 synthesizer modules operating frequency may be selected in standard channel increments through either four internal BCD rotary switches, or by the synthesizers' internal memory that can be programmed for 15 preset frequencies.

In order to set the desired frequency for each channel, a four digit code is used to represent each available frequency. The four digit code is used internally in the synthesizer to generate the desired RF frequency. This four digit code is found in the Channel Designation Tables that accompany the receiver or transmitter Instruction Manual. The Channel Designation Tables cross reference each frequency with a code number.

(1) If Channel 1 is selected the synthesizer will scan four BCD switches mounted on the main circuitboard of the receiver or transmitter module for the code number.

(2) If Channel 2 through 16 is selected, then the frequency is established by the preprogrammed entry in the synthesizer's internal memory. The internal memory is normally programmed at the factory, but can be field programmed using the CP-SC-3 synthesizer channel programmer module.

TN110 Channel and Frequency Selection

MT-3 Crystal Control Modules Frequency Selection

The MT-3 crystal controlled modules operating frequency is selected by the control module's fundamental crystal frequency. The channel select lines and internal BCD rotary switches are not used by the crystal control module.

Crystal modules use a fundamental crystal in an oscillator circuit to determine the operating frequency of the oscillator. The output frequency of a VHF crystal module is three times the frequency of the fundamental crystal oscillator circuit. Output frequency of a UHF crystal module is nine times that of the fundamental crystal oscillator circuit.

To maintain ± 1 ppm frequency tolerance the crystal oscillator circuitboard has an on-board digital board which provides temperature compensation information for each individual crystal element. To change the transmitter or receiver operating frequency, a new crystal oscillator board must be purchased.

MT-4 Modules Frequency Selection

The MT-4 modules operating frequency is selected in standard channel increments through the Radio Service Software (RSS). Frequencies can be directly entered or selected through the use of a spin button that cycles through valid frequencies.

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