ASTRONICS
TEST SYSTEMS

APPLICATION NOTE

Setting up Astronics R8x00 P25 Trunking Simulator for Motorola Radios

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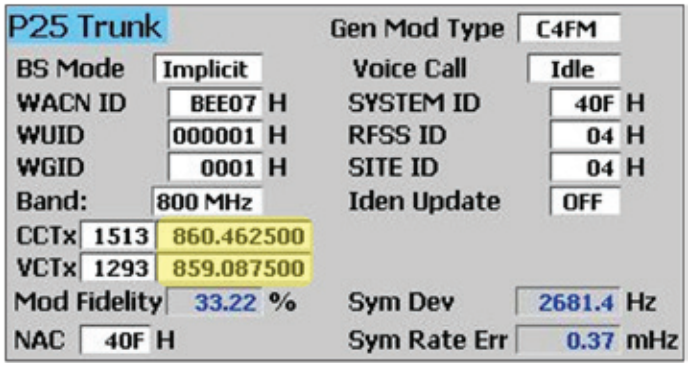
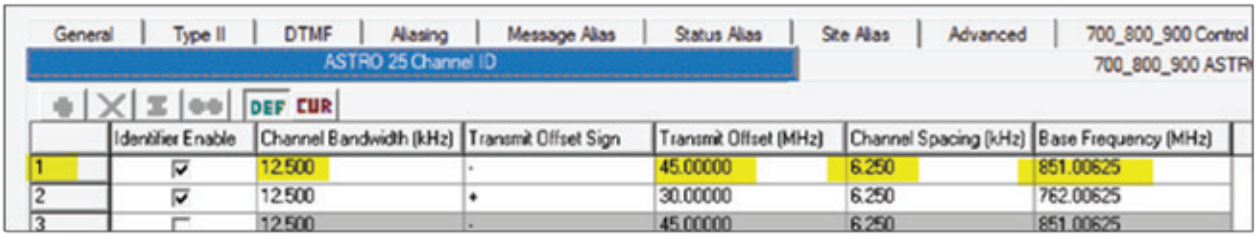
STEP 1 – BANDPLAN SETUP (THIS STEP APPLIES ONLY IF BS MODE SET TO IMPLICIT)

P25 Trunk Zone > More > More > Bandplan Table …



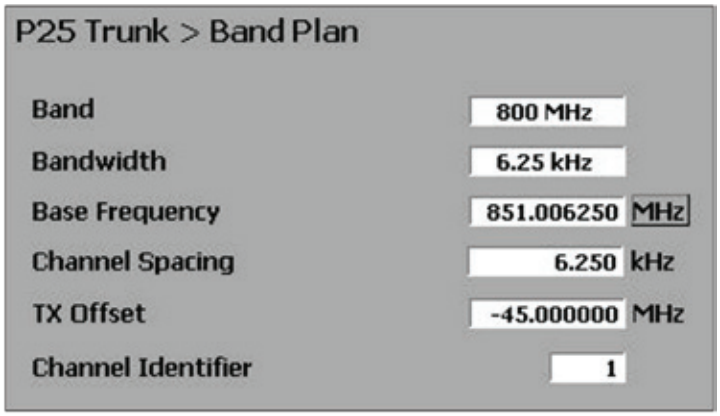
- **Band** – Select Band, then "**Set Band Plan to Defaults**"
- **Bandwidth**: CPS > Trunking System > Astro 25 Channel ID > Channel Bandwidth
- **Base Frequency**: CPS > Trunking System > Astro 25 Channel ID > Base Frequency
- **Channel Spacing**: CPS > Trunking System > Astro 25 Channel ID > Channel Spacing
- **TX Offset**: CPS > Trunking System > Astro 25 Channel ID > TX Offset
- **Channel ID**: CPS > Trunking System > Astro 25 Channel ID > **Position**: Channel ID #



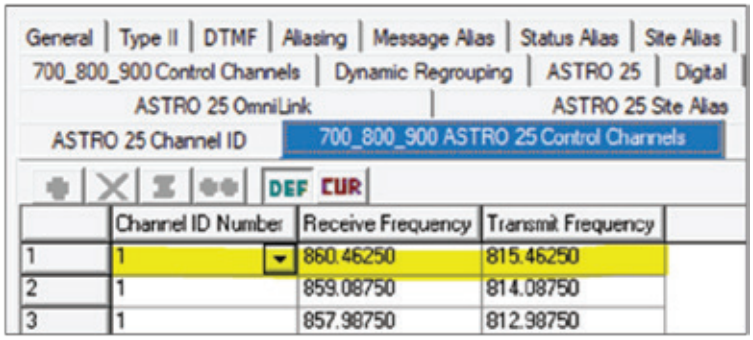
ESC key to exit Bandplan Table

STEP 2 – TX FREQUENCIES SETUP

Control Channel and Voice TX Frequencies (If BS Mode set to Explicit, setup RX frequencies as well).



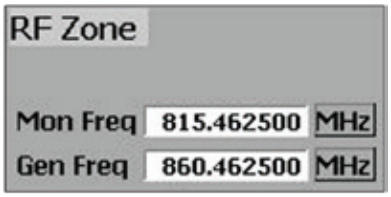
- **CCTX**: CPS > Trunking System > 700_800_900 ASTRO 25 Control Channels
- **VCTX**: CPS > Trunking System > 700_800_900 ASTRO 25 Control Channels or set to anything in bandplan



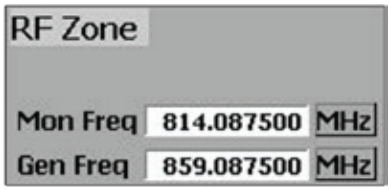
Once the TX frequencies are entered, the corresponding channel number is calculated. Alternately, you can enter the channel number and the frequency will be calculated. Remember the following formula:

Frequency = Base Frequency + (Channel Number X Channel Spacing)
Example: 860.4625 MHz = 851.00625 MHz + (1513 x 6.25 kHz)

Notice also that the Mon Freq and Gen Freq in the RF Zone have been automatically set. The simulator is generating the control channel signal @ Gen Freq and is listening for a radio to request affiliation @ Mon Freq. When the radio is keyed after the whole setup it complete, these frequencies will change to the Voice Channel for the duration of the call. You can also see this when an incoming Voice Call is manually started from the analyzer.



Control Channel

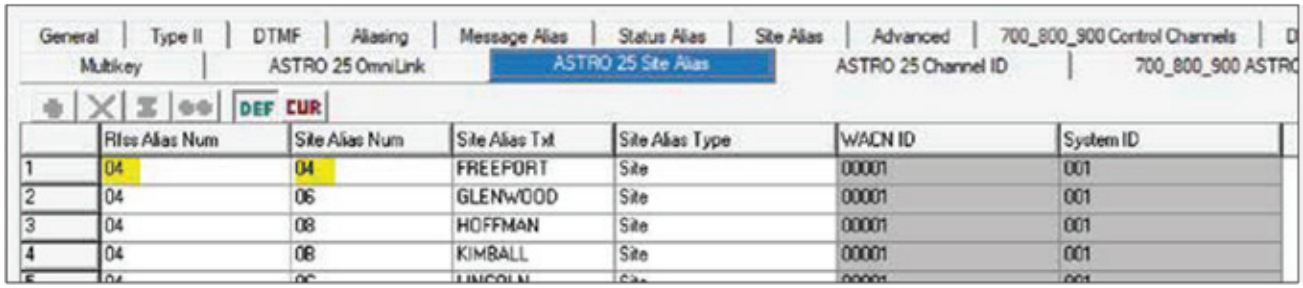


Voice Channel

STEP 3 – ID SETUP

- **System ID**: CPS > Trunking System > General > Home System ID
- **WACN ID**: CPS > Trunking System > General > Home WACN ID

- **NAC**: same as System ID (Motorola system)
- **RFSS ID**: CPS > Trunking System > ASTRO 25 Site Alias > Rfss Alias Num
- **SITE ID**: CPS > Trunking System > ASTRO 25 Site Alias > Site Alias Num



	Rfss Alias Num	Site Alias Num	Site Alias Txt	Site Alias Type	WACN ID	System ID
1	04	04	FREEPORT	Site	00001	001
2	04	06	GLENWOOD	Site	00001	001
3	04	08	HOFFMAN	Site	00001	001
4	04	08	KIMBALL	Site	00001	001

Once the analyzer is setup, you can see the status in the Meter Zone. '**Idle Control Chanel**' will be displayed until a radio attempts to affiliate. A rapid sequence of status messages will display. The radio's ID information will be displayed in the Meter Zone, such as the Unit ID and the Group ID. You may need to adjust the squelch level.

You can initiate a call alert to the radio or start/stop a voice call to the radio. You will hear a 1 kHz tone from the radio.

When you key the radio for several seconds, it will be taken to a voice channel and the signal will be recorded. Once the radio is unkeyed, the analyzer will transmit the signal back to the radio and you will hear your voice in the radio. This is the Voice Loopback functionality and will work even if the channel is encrypted. Once the call is over, the simulator will drop back to Idle Control Channel mode and wait for another call.

The analyzer can be configured to transmit one of three modulation types: *C4FM, LSM, and WCQPSK*. The latter two are used in simulcast systems.

Don't forget to save your configuration as a **PRESET** (Test > Presets) and share it with all the techs in your shop.

EXPLICIT MODE

When the channels of a P25 trunking system don't fit into a bandplan, radios must be pre-programmed with a list of channels since the frequencies can't be computed from a base frequency and offset multiplier. This is often the case for P25 trunking systems used in the VHF and UHF bands where available frequencies can be hard to find.

In order to simulate such a system, the analyzer's Base Station Mode must be set to Explicit and additional information must be setup. Since TX and RX frequencies can't be defined as offset pairs, the Control and Voice Channel RX frequencies must be supplied along with the TX frequencies.

By lowering the Output Level in the RF Zone, the radios can be tested in a weak signal environment to determine at what level they will affiliate with the system.