



TECHNICAL NOTE TN-1013-AN

Using the TB8100 Base Station in Tait QS² Simulcast Systems

9 March 2007

Applicability

TB8100 Base station.
T805 Simulcast Remote Site Unit (RSU).

1 Introduction

The TB8100 base station is suitable for use in simulcast systems with the Tait T805 RSU. This technical note aims to explain what you specifically need to do to use the TB8100 base station in a simulcast system: order the correct TB8100 equipment, make the necessary hardware connections, and configure the TB8100 base station (using the Service Kit application).

2 Related Documentation

The following documentation is related to this technical note:

- TB8100 Service Kit Users Manual or the on line help.
- TB8100 Installation and Operation Manual.
- TB8100 Specifications Manual.
- Taitnet QS² Simulcast System Manual.

3 Equipment Required

3.1 TB8100 PMU and Rackframe

If you intend to use the TB8100 base station in a simulcast system, make sure that you specify these options when you order the TB8100:

- TBA30xx-x100 PMU with internal 13.8 V DC 40 Watt auxiliary power supply. This is used to supply power to the external frequency reference and the RSU. Please refer to the TB8100 specifications manual for product code information.
- If the RF links are also using TB8100 system components, a TBA2520 dual channel rackframe should be used

3.2 T805-26-XY0Z

The last four numbers of the equipment specify the RSU equipment configuration.

X = 0, Grey/Beige front panel
8, Black front panel

Y = 1 to 4, Number of QS2 Channel Cards fitted

Z = 0, GPS receiver not fitted
= 1, GPS receiver fitted

4 Connecting the TB8100 to the T805 Equipment.

4.1 DB25 SIF Connections using TBA40xx-0B00 & TBA40xx-0C00 Reciters.

RSU J414 on T805		TB8100 SIF	
Function	Pin	Pin	Function
RX Audio +	1	1	RX Line Out +
RX Audio -	2	2	RX Line Out -
CTCSS Output	3	5	TX Audio In
TX Key	4	10	TX Key
Ground	5	4	Ground
RX Gate	6	9	RX Gate
TX Audio +	7	6	TX Line In +
TX Audio -	8	7	TX Line In -

4.2 TaitNet SIF Connections using TBA40xx-0K00, TBA40xx-0L00 or TBA40xx-0T00 Reciters.

RSU J414 on T805		TB8100 SIF	
Function	Pin	Pin	Function
RX Audio +	1	1	RX Line Out +
RX Audio -	2	2	RX Line Out -
CTCSS Output	3	6	TX Audio In
TX Key	4	5	TX Key
Ground	5	15	Ground
RX Gate	6	4	RX Gate
TX Audio +	7	7	TX Line In +
TX Audio -	8	8	TX Line In -

5 Configuring the Reciter

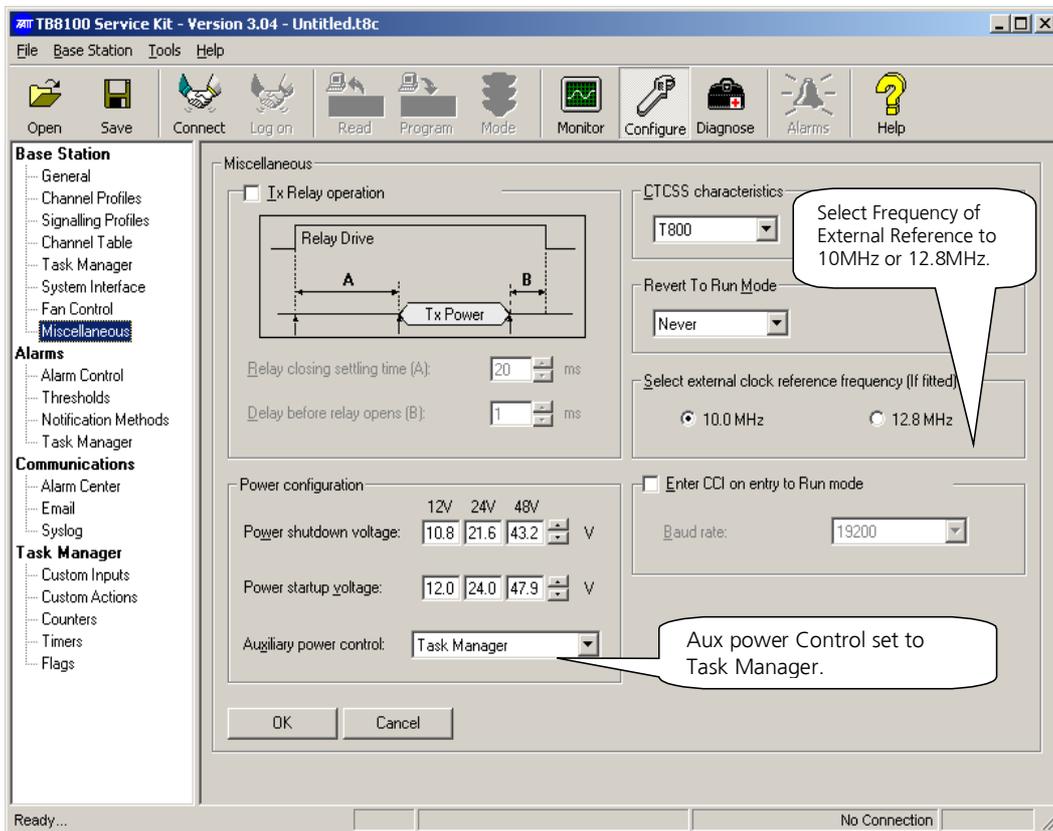
5.1 Configuring the Auxiliary Power Supply and External Reference.

Service Kit Menu Item (SK): Configure > Base Station > Miscellaneous

The specific changes that you will need to make to the TB8100 base station's configuration file (using the Service Kit application) are as follows. (For further information on using the Service Kit, please refer to the Service Kit User's Manual or the online help). The following procedure assumes the use of the default template, available in File > New and choose the default.t8t file.

Configure the following parameters.

1. Set auxiliary power supply to 'Task Manger '.
2. Select the relevant external reference frequency, either 10 MHz or 12.8 MHz.

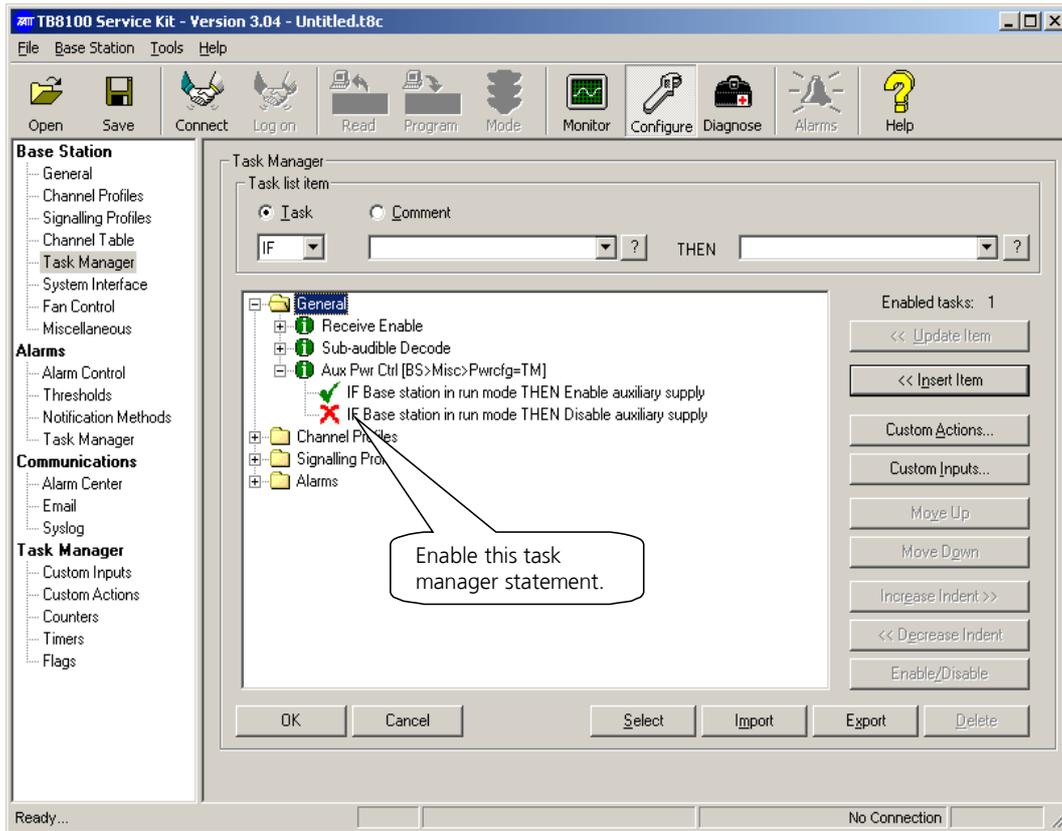


Configuring the Auxiliary Power Supply and External Reference continued.

SK: Configure > Base Station > Task Manager

Configure the following parameters.

1. Enable the If Base station in run mode Then Enable auxiliary supply statement. It is important that this supply remains on if powering the frequency reference as the reference can take some time to stabilise if power cycled. The Aux power supply will stay on even if the base station is switched to Standby mode.

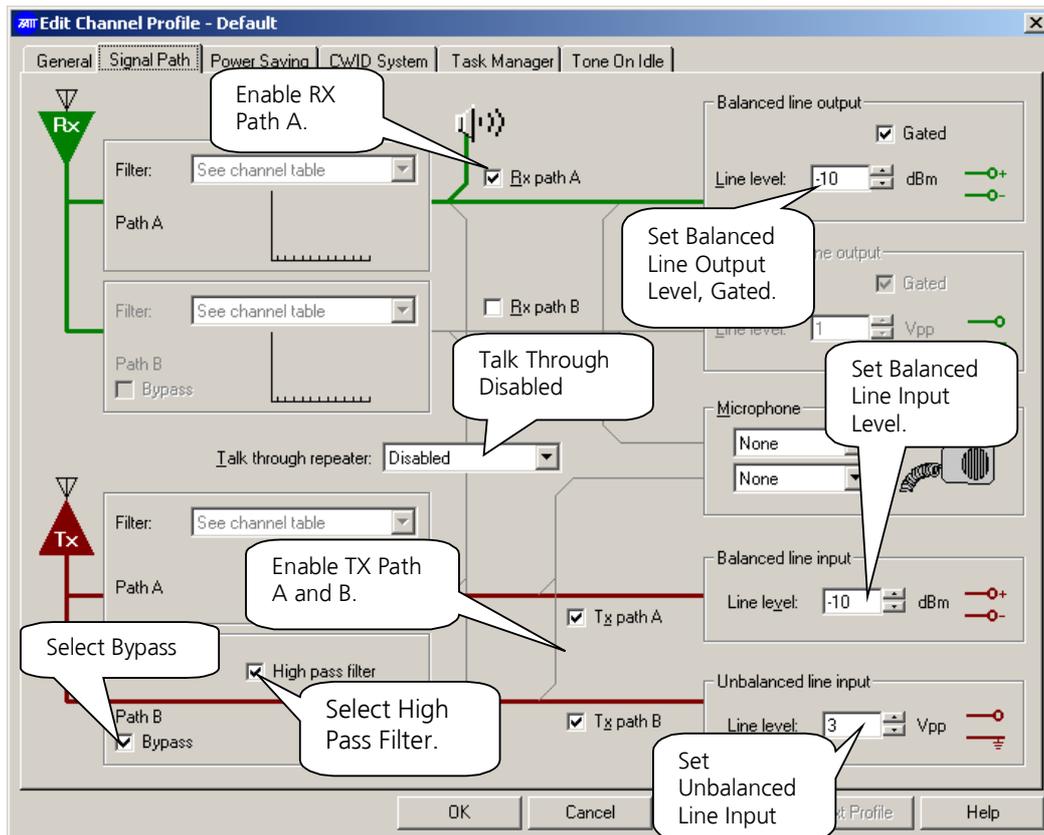


5.2 Configuring the Channel Profile.

SK: Configure > Base Station > Channel Profiles> Default > Signal Path Tab

Configure the following parameters.

1. Enable Tx paths A and B
2. On Tx path B, select Bypass. This step is to ensure that, in the event high deviation demands on path A due to speech peaks, the sub-audible signal inserted on path B is not stripped off by the limiter.
3. On Tx path B, select the high pass filter. This step is to prevent a small frequency offset being applied, which could happen due to DC offsets. The filter cut-off frequency is approximately 0.8 Hz.
4. Set the Unbalanced line input level to $3 V_{pp}$. This is the level required to produce 60% deviation, so a signal of $500 mV_{pp}$ will produce 10% deviation.
5. Set the Balanced line input level to -10 dBm.
6. On the receive side, enable Path A.
7. Set the Balanced Line output level to -10 dBm.
8. On the Tone-On-Idle tab, ensure that Tone On Idle is disabled (Balanced Line Output and Unbalanced Line Output unchecked).



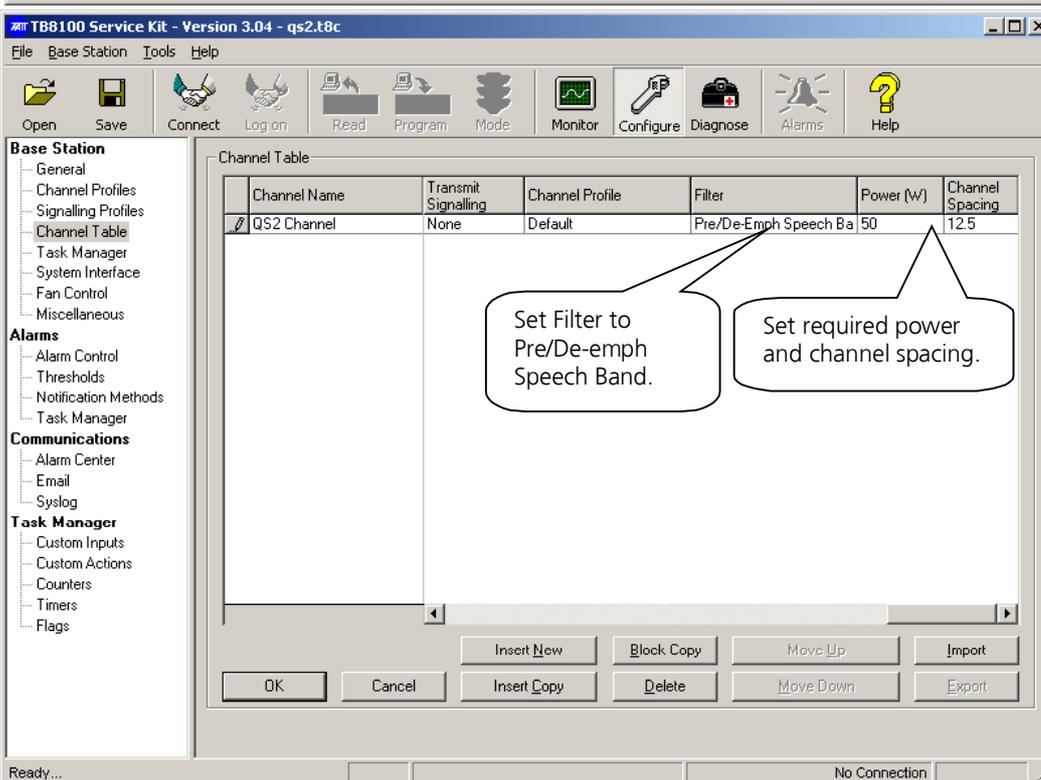
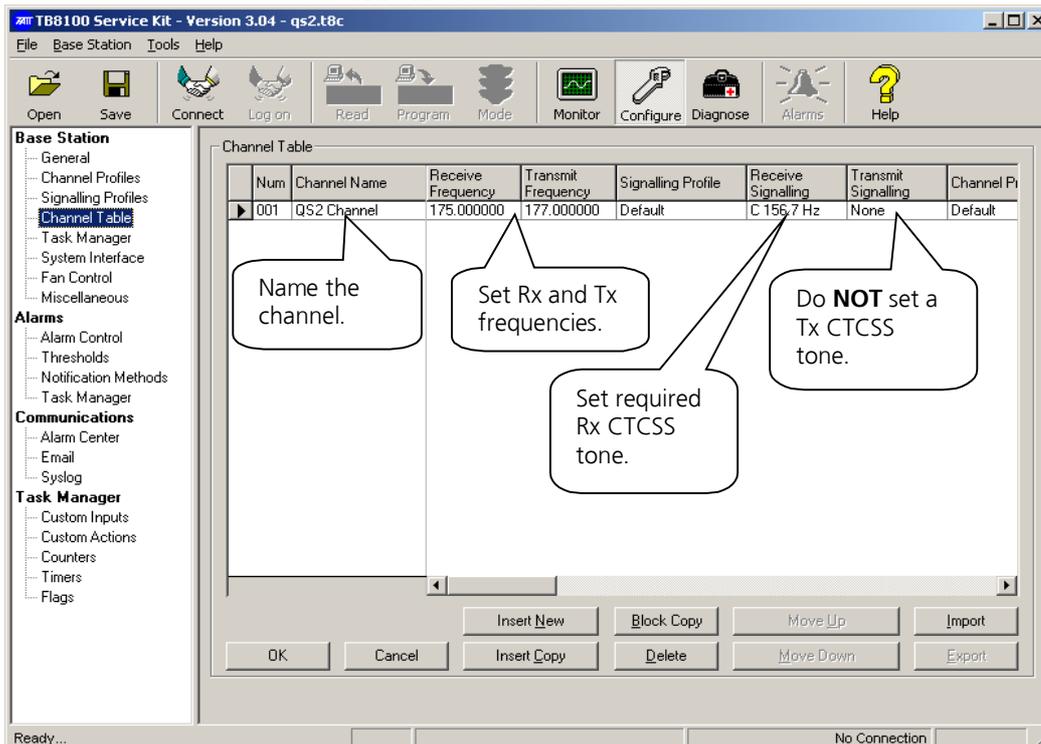
5.3 Configuring the Channel Table

SK: Configure > Base Station > Channel Table

Configure the following parameters.

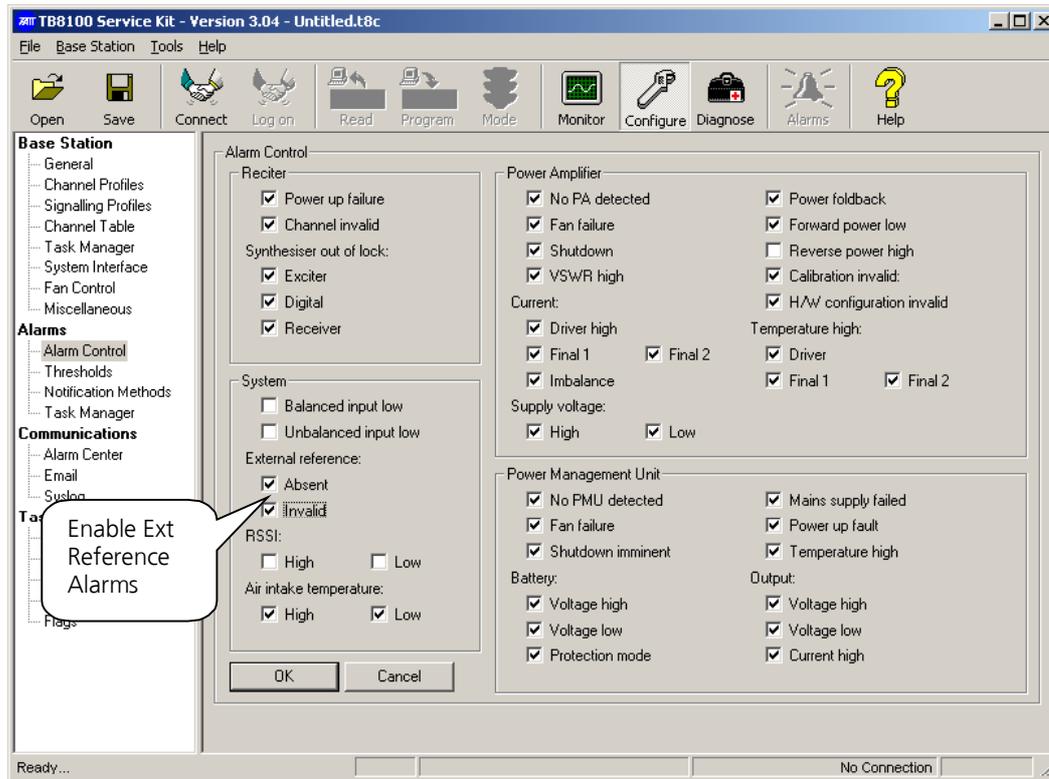
1. Set the Receive and Transmit frequencies.
2. Name the channel.
3. Set the receive CTCSS tone if used.
4. Ensure the channel profile is set to Default. Set the Filter to Pre/De-Emph Speech Band.

Note: If you are using the Advanced Profiles Software Feature Enabler, see the TB8100 Service Kit User Manual.



5.4 Configuring the Base Transmitter Alarms

SK: Configure > Alarms > Alarm Control



Configure the following parameters.

1. Switch on the External reference alarms "Absent" and "Invalid" (Configure>Alarm Control). This step will ensure that an alarm will be raised if the external frequency reference either fails, or is on the wrong frequency.

5.5 Reciter 2: Configured as a Second Simulcast Channel (Optional).

Configure the following parameters.

Set up Reciter 2 in the TB8100 subrack as you did Reciter 1. Reciter 2 cannot control any PMU settings or correctly detect PA and PMU fan alarms.

1. Disable the Power Amplifier fan failure alarm.
2. Disable the PMU fan failure alarm
3. Disable the No PMU detected alarm.
4. All other alarms enabled as in section 5.4.

To set up Reciter 2 as a link channel, see section 5.6.

5.6 Reciter 2: Configured as a Link Transmitter and Receiver

Configure the channel name, frequency, power and channel spacing as per section 5.3 with the following change:

Set the Filter to Flat Speech Band.

Set up the default channel profile as follows (refer section 5.2):

1. Enable Tx path A.
2. Set the Balanced Line output level to -10 dBm.
3. Enable Rx Path A.
4. Set the Balanced line input level to -10 dBm.
5. Disable Talk through Repeater
6. On the Tone-On-Idle tab, ensure that Tone On Idle is disabled (Balanced Line Output and Unbalanced Line Output unchecked).

6 Set up the T805 Remote Site Unit

This procedure assumes that the LEM card has been adjusted to provide the nominal level to line at the control site (1 kHz tone).

1. Adjust RV201 for a level of $98 \text{ mV}_{\text{RMS}} \pm 3 \text{ mV}$ at "link I/P Testpoint" (pin 6 of J406).
2. Set switch S303-7 to the OFF position.
3. Key the TX
4. Set RF test set filters to provide a 50 to 300 Hz BPF
5. Adjust RV202 for the desired CTCSS deviation ± 5 Hz.
6. Set switch S303-7 to the ON position.
7. Set switch S303-8 to the OFF position.
8. Set RF test set filters to provide a 300 to 3000 Hz BPF
9. Verify that deviation is $3.0 (1.5) \text{ kHz} \pm 0.2 (0.1) \text{ kHz}$
10. If the site is required to operate as a "Talk Through" repeater in the link fail condition:-
 - (A) Feed a carrier modulated at the nominal system level into the receiver of the base station at an RF level of -70 dBm.
 - (B) Configure TR1 on the RSU for the desired timeout period (refer to T805-26 manual)
 - (C) Remove the link input connector from J414 (RJ11).
 - (D) Allow timer TR1 to time out.
 - (E) Adjust RV200 to achieve the same level of deviation as measured in (9) above.
11. Set switch S303-8 to the ON position.
12. If Line Fail Talk Through is not required, set timer TR1 to zero (tr1,0)

7 Position and Layout of Equipment

During operation, the TB8100 base station can become hot. This is normal since it is designed to operate at high temperatures. (The power amplifier (PA) fan turns on when the PA temperature reaches 60° Celsius, this is adjustable via Configure>Basestation>Fancontrol)

Consequently, any equipment placed directly above the TB8100 base station will also become hot. It is therefore important that the layout and position of equipment is carefully considered.

8 Issuing Authority

Name and Position of Issuing Officer	Jeff Northcott Senior Technical Support Engineer
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