



TECHNICAL NOTE TN-1088-AN-c

TB7100 Operation With a Co-Axial Relay

17th February 2006

Applicability

This application note applies to anyone who intends to operate a Coaxial relay (T800-09-xxxx) with a TB7100, operating as a Base Station, fitted with IPN: 220-02077-04 or later Systems Interface (SIF) board.

1. Introduction

The correct operation of the co-axial relay with a TB7100 is for it to be in the transmit (or active) state just before and just after the transmission of RF.

This will ensure that the Transmitter module of the TB7100 is not transmitting into an open circuit.

NOTE: Currently there is no solution that will enable the user to operate the coaxial relay correctly (as described within this technical note) with the TB7100 configured for PTT from both the 'TX-key' (on the SIF 25-way interface) and the MIC PTT (on the user interface). The current solution only provides for transmission from either the external TX-key or MIC PTT but not both.

A solution is currently being investigated that will enable the user to configure the TB7100 to PTT from either the MIC PTT or the external 'TX-Key'. This technical note will be updated once a solution has been found.

2. Set-up Details

External PTT only via 'TX Key' on the systems interface (SIF) 25-way socket

To achieve correct operation under all conditions the control signals and the programming parameters of the **transmitter** module's 'programmable I/O' fields will need to be set as follows:

- Set AUX_GPIO5 to:
 - **Direction** = Output
 - **Action** = Radio Transmission Status
 - **Active** = High
 - **Debounce** = None

This setting will activate AUX_GPIO5 whenever the transmitter is transmitting RF, whether initiated via an external key signal or from a function such as the transmission of a Reverse Tone Burst (RTB). This will prevent the relay from switching to the receiver state before the end of RF transmission.

- Set AUX_GPIO7 to:
 - **Direction** = Input
 - **Action** = External PTT
 - **Active** = High
 - **Debounce** = 60ms

These are default settings except for the duration of the de-bounce time, which has a default setting of 2ms. The increase to 60ms is to ensure that the relay has fully switched to the transmit state before RF transmission commences.

The signal for AUX_GPIO7 is derived via the SIF and is either from an external control such as 'TX Key', on the 25-way interface, or controlled via the RX Gate signal (For repeater operation).

NOTE: The use of a Coax relay will not be used when the TB7100 is operating in repeater mode.

Figure 1 shows the 'Programmable I/O' field of the 'TB7100 programming application' for the transmitter that shows these settings.

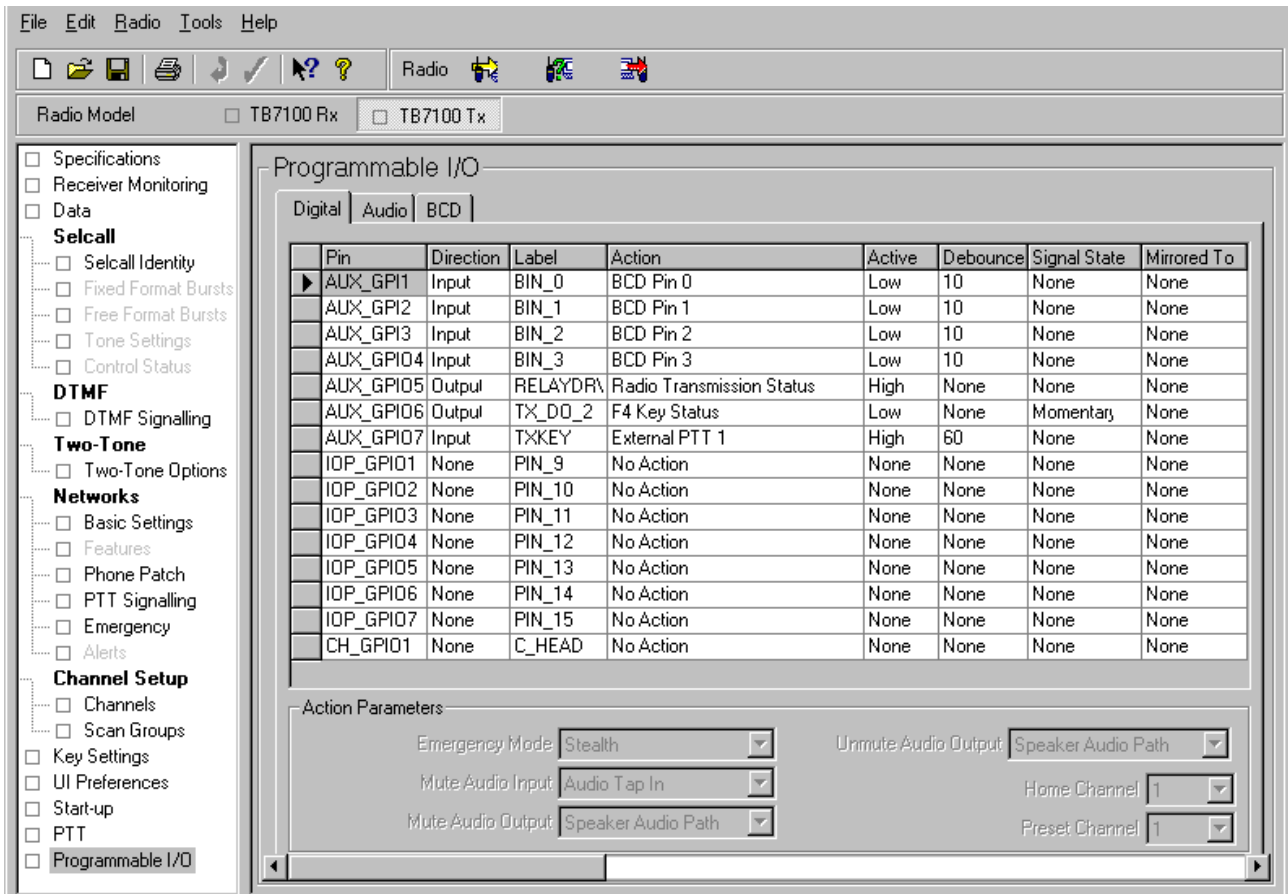


Figure 1

The signals from AUX_GPIO5 and to AUX_GPIO7 are logically OR'd on the SIF, such that the relay is in the TX position if either the TX key is active or if a transmit tail is present.

The output of this 'OR gate' drives the switching circuit of the relay. The logic of the OR gate is such that if one of its two inputs are active then the output will also be active thus switching the relay into an active state.

For the correct link settings of the SIF, for your system, refer to section 7 of the 'TB7100 base-station Installation and Operation Manual'.

NOTE: If AUX_GPIO5 is used for the purpose described, it will then be unavailable for any other function. Therefore TX_DIG_IO1 (pin 10 on the DB25 way connector) must be left unconnected.

MIC PTT only via the user interface (UI)

This configuration is to be used when MIC PTT only operation of the TB7100 is required.

The configuration of the TB7100 **transmitter** module is the same as for **EXT PTT only operation**, as described in the previous section, but with the exception of three additional programmable field settings and the fitting of a wire link.

The details of the additional programmable settings are:

- Set AUX_GPIO6 to:
 - **Direction** = Output
 - **Action** = Reflect PTT status
 - **Active** = Low
 - **Debounce** = None

When the PTT on the microphone is pressed, AUX_GPIO6 on the transmitter (TXDIG_OUT2 on pin 12 of the SIF) will go low. It will remain in this state until the PTT is released.

Figure 2 shows the 'Programmable I/O' field of the 'TB7100 programming application' for the transmitter that shows these settings.

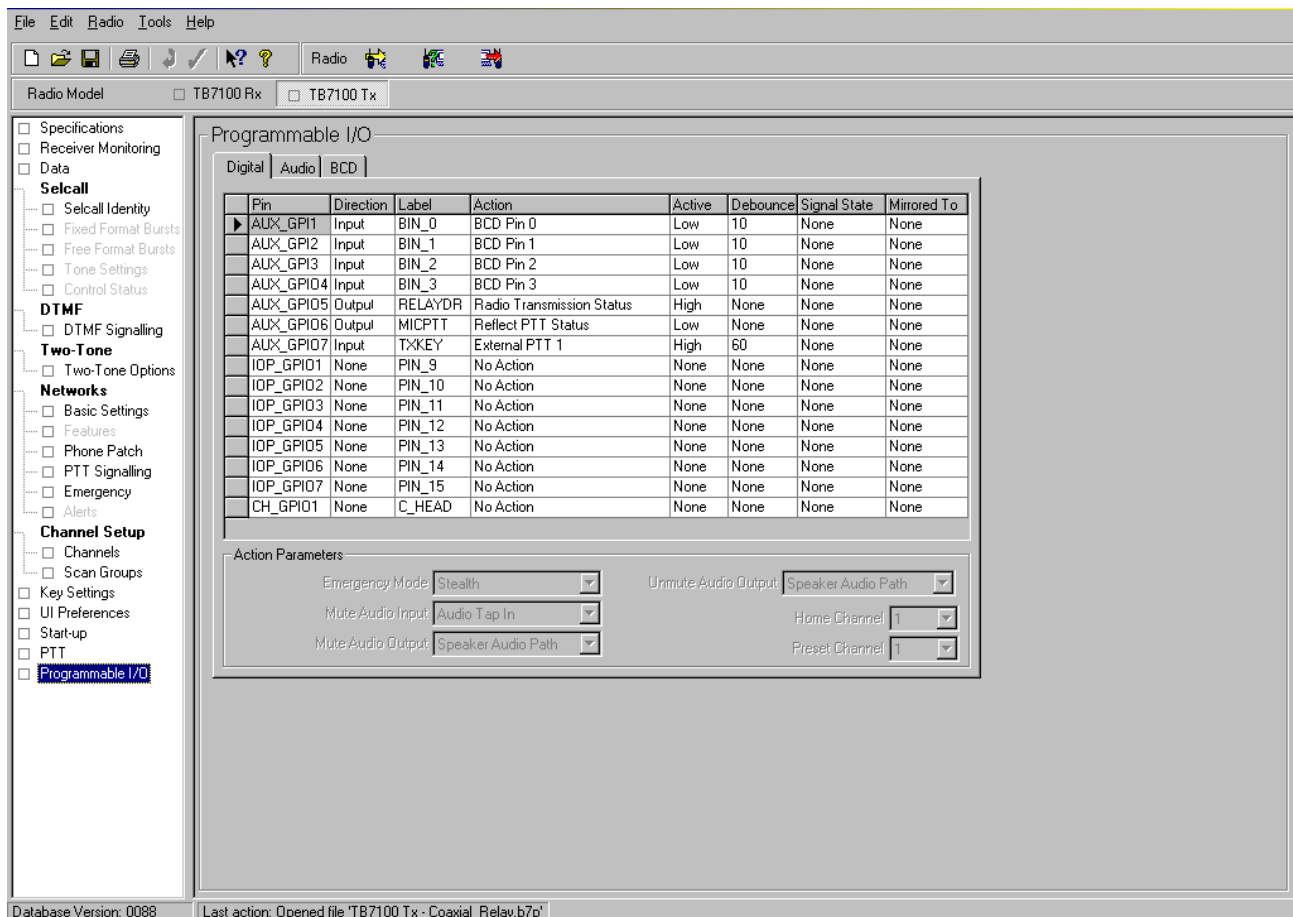


Figure 2

- Set Mic PTT in the transmitters 'PTT' field to:
 - **PTT transmission type** = none
 - **PTT state is reflected** = enabled

This will allow the current state of the mic PTT to be reflected on TXDIG_OUT2 on pin 12 of the SIF.

Figure 3 shows the 'mic PTT' field, of the 'TB7100 programming application' for the transmitter that shows these settings.

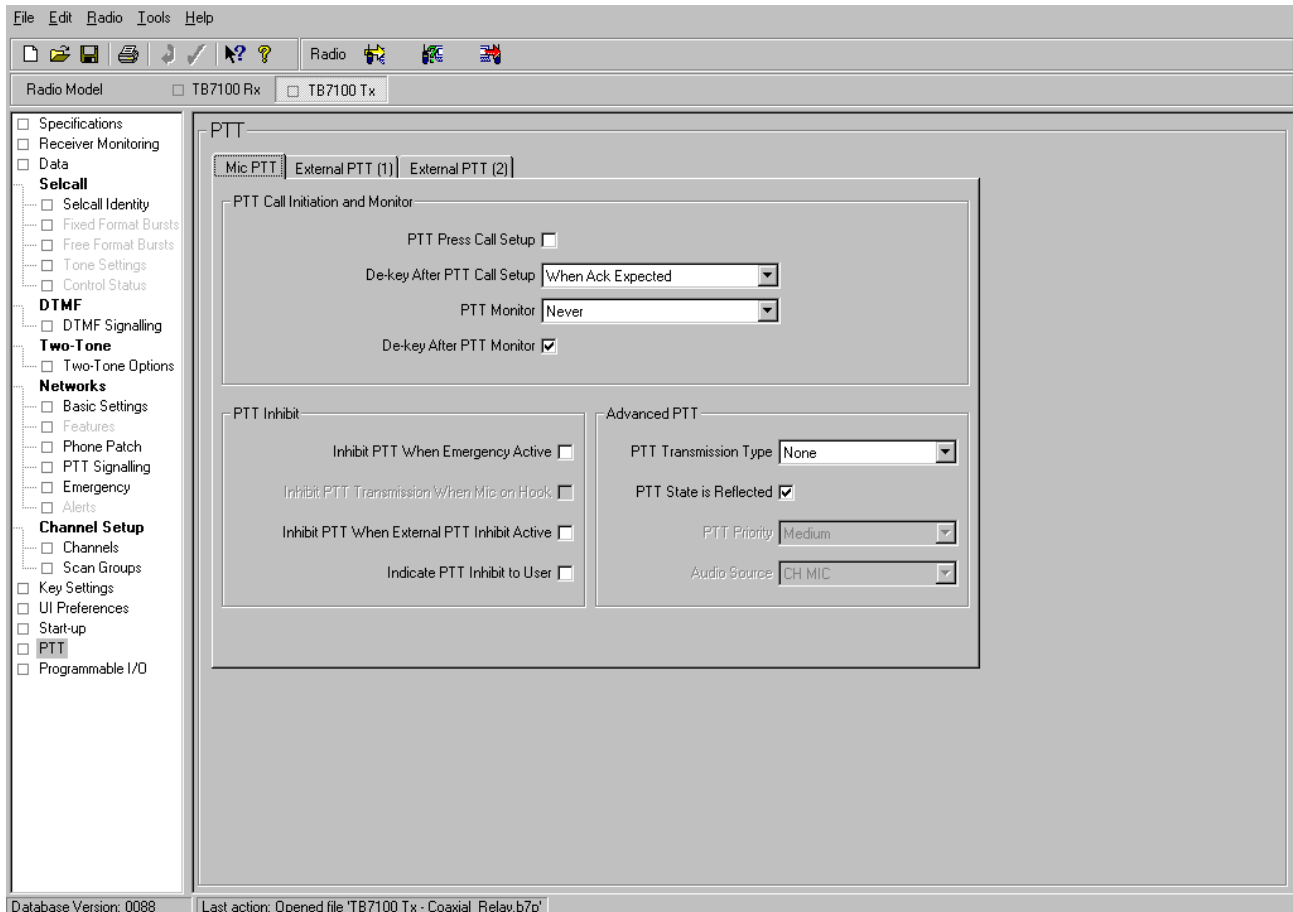


Figure 3

- Set 'external PTT 1' in the transmitter 'PTT' field to:
 - **PTT transmission type** = voice
 - **PTT state is reflected** = disabled
 - **PTT priority** = highest
 - **Audio source** = CH mic

Figure 4 shows the 'external PTT (1)' field, of the 'TB7100 programming application' for the transmitter, that shows these settings.

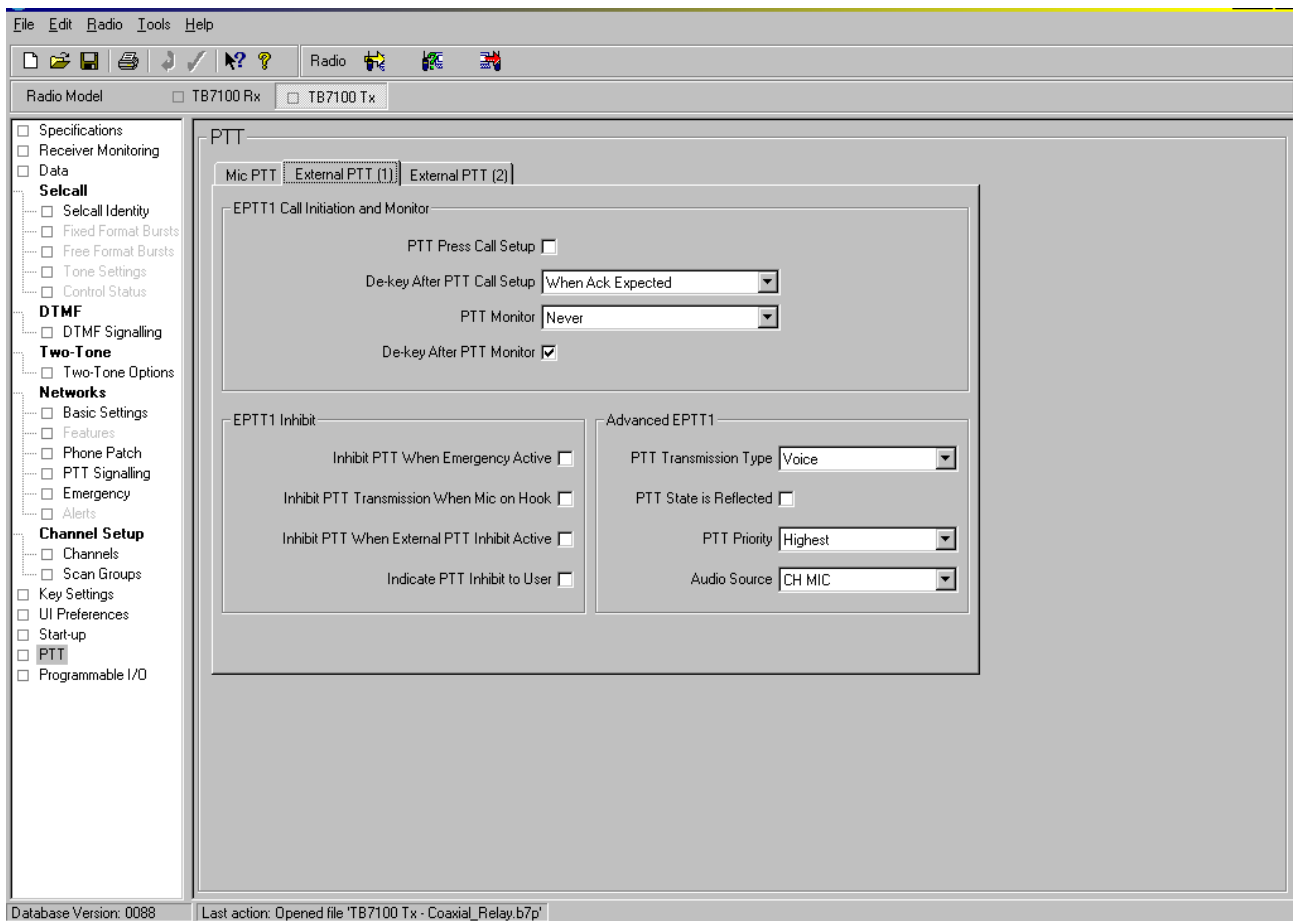


Figure 4

Required Hardware Modification

The following details a hardware modification to the SIF that will connect the 'reflect PTT status' (TXDIG_OUT2 on pin 12 of the SIF 25 way) to 'EXT PTT 1' (TX Key on pin 15 of the SIF 25 way). This will activate the transmitter on the TB7100 when the Mic PTT is pressed:

- Connect a wire link between pins 15 and 12 on the DB25 drange at the rear of the TB7100.

Fitting of R463 for -05 Revision PCB

Ensure that R463 is fitted with either a 0 ohm resistor (IPN: 038-10000-00) or a solder link. Refer to **figure 5** for the location details.

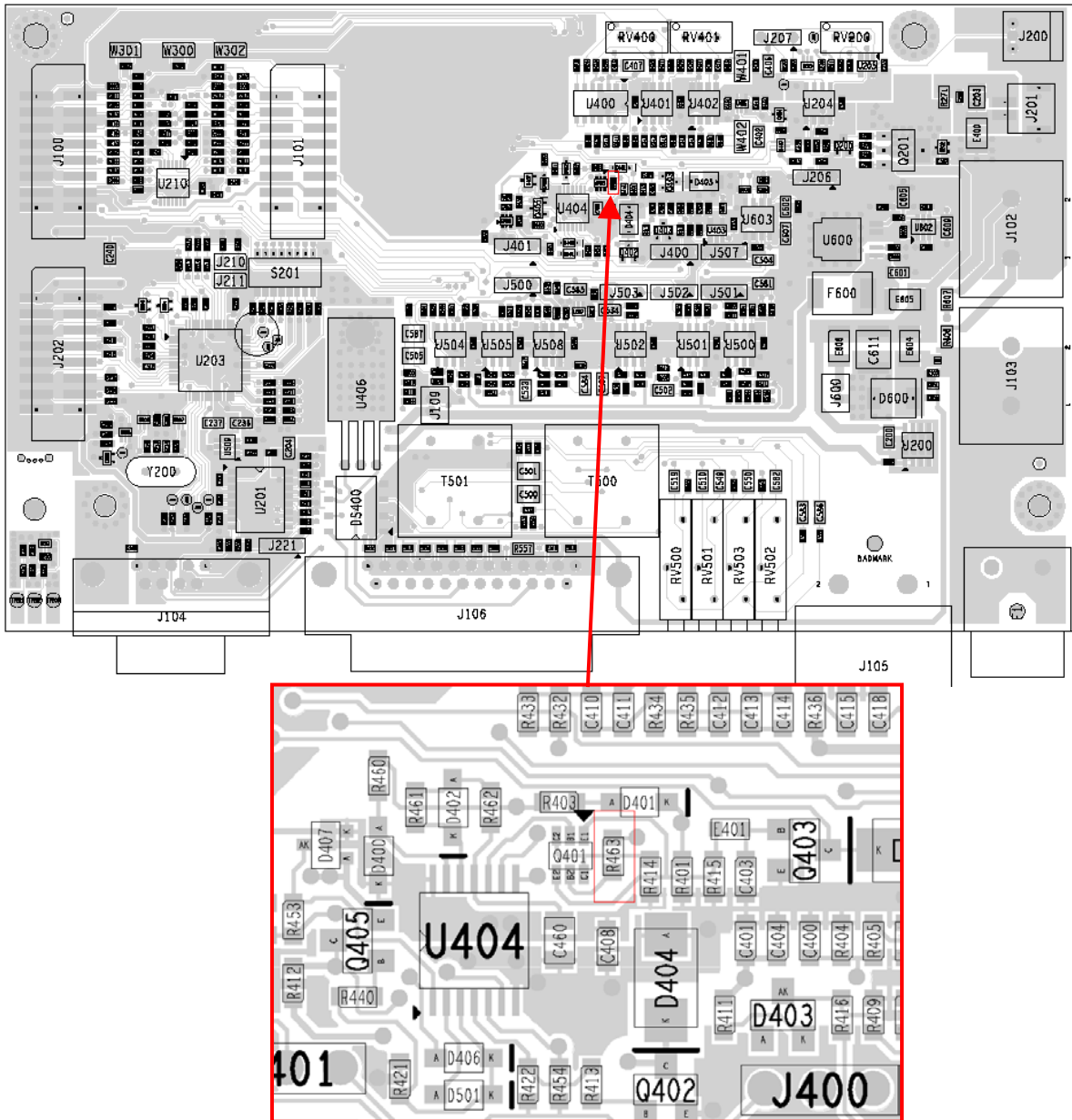


Figure 5

Compliance Issues None

CSO Instruction Please distribute to any customers or staff that intend to operate the TB7100 with a co-axial relay.

3. Issuing Authority

Name and Position of Issuing Officer Malcolm Brown
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Distribution Level Associate.

Document History	Original Release	28 th September 2005	MJB
	Added Mic PTT operation	14 th December 2005	MJB
	Added R463 details for –05 SIF	7 th February 2006	MJB