

# **TRANTEC SYSTEMS**

## **OPERATING INSTRUCTIONS**

### ***S5000 SERIES***

(Incorporating S5000LTX with Digital Gain Control)

## **Introduction:**

Thank you for purchasing your Trantec S5000 system. The S5000L UHF System comprises of either the S5000MTX handheld transmitter or the S5000LTX backpack transmitter and the S5000RX true diversity receiver.

The set up procedure for each of these systems is detailed in these instructions and if followed will ensure your complete satisfaction with the product.

If you require additional copies of these instructions, they can be obtained from our web site, <http://www.trantec.co.uk>, along with other information about the Trantec range.

- **Background Information:**

The S5000 is a professional UHF diversity system. It boasts an easy to use microprocessor controlled synthesised receiver and transmitter which can operate on up to 64 different channels. The exact selection of channels available will depend on how your system has been programmed in the factory. The receiver provides instant access to up to 16 frequencies, but can be configured to work in one of 4 banks, giving the total of 64 frequencies. In some areas, licenses are not available for this many frequencies, so it is likely that several or all of the banks are the same. Backpack transmitters have access to the same set of 4 banks, but handheld transmitters only have access to 16 frequencies which will correspond with bank 1 of the receiver supplied with the handheld. The system can be manufactured to work on several different UHF TV channels. The particular channel will depend upon the factory configuration, although the standard for the UK is UHF TV channel 69. Active (S5000ADU) and passive (S5000PDU) antenna distribution units are available for use with multiple receiver systems, as is a PC based Windows system which allows the operator to fully control a multiple system from a PC with control over all parameter except the receiver's mute level. For computer control, an interface is required (S5000CP). Each interface will handle up to 16 receivers, and two interfaces can be linked to a PC, giving control of a maximum of 32 receivers from one computer.

- **General Radio Microphone Operating Guidelines:**

Always try to locate the receiver as close as possible to the transmitter, as this minimises the chance of there being any drop out. Although this is most unlikely with a diversity system, the greater the transmitting range, the greater the chance of problems. Always try to ensure a line of sight signal path between the transmitter and receiver - obstacles such as walls can significantly reduce the radio signal strength. Obviously the transmitter and receiver must be on the same channel. If you are using more than one system simultaneously, choose a set of intermodulation free frequencies. Please refer to the channel listings at the end of these instructions as a guide to finding a suitable set of frequencies. A license is required to operate UHF radio microphones in the UK. It is wise to avoid placing the receiver near to computer or mobile telephone equipment, as this can create unwanted radio interference. Always test a radio microphone system in the location where it is to be used by doing a 'walk test'. This is where the system is tested as the transmitter is walked around the area in which it is to be used. This will normally show up any problem areas, allowing you to try a new receiver location. The computer control system allows this process to be logged from the computer, significantly simplifying the set up. By adjusting the location of the receiver, or even just the alignment of its antennas, it should be possible to obtain trouble free operation over the desired area, provided that it is not too large to exceed the transmitter's range, which is typically around 100m.

- **Guarantee:**

All Trantec products are guaranteed for a period of one year from date of purchase against defects in materials and workmanship. In the event of a claim under guarantee the system should be returned to your dealer in its original packaging and with proof of purchase. Defects caused by modification, misuse or accident are not covered by the guarantee.

Due to our continual policy of research and development we reserve the right to alter specifications without prior notice.

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## ***S5000MTX Handheld Transmitter Operation:***

- Insert an Alkaline battery into the unit, following the polarity diagram. The compartment is revealed by sliding the body round and gently pulling it down. No harm will come to the unit if the battery is inserted incorrectly although, of course, the unit will not function. Once the battery is inserted, close the compartment and twist the body back round until it latches.
- Connect the supplied antenna to the connection on the base of the microphone.
- Switch the unit on with the power switch on the base of the microphone, the red power LED will illuminate. Note that this LED will flash when the battery is low.
- To alter the selected transmitting frequency locate the sixteen position rotary switch on the base and, with a screwdriver or trim tool, turn the switch until the desired channel number is selected. A listing of which frequency corresponds to which number can be found inside the body of the microphone on the rear of the battery compartment. To select the new channel switch the power switch off and then on again, the transmitter will now operate on the selected channel. Note that the S5000MTX is configured for only 16 frequencies rather than the full 64 available on the receiver - the 16 frequencies available in the S5000MTX will correspond with those in bank 1 of the receiver with which it is supplied.

## ***S5000LTX Beltpack Transmitter Operation:***

- Insert an Alkaline battery into the unit by sliding open the cover and inserting the battery following the polarity diagram in the battery compartment. No harm will come to the unit if the battery is inserted incorrectly although, of course, the unit will not function.
- Connect the supplied antenna to the top panel socket.
- Plug a suitable microphone into the four pin Lemo connector. For pin connections please see later in these instructions.
- Switch the unit on by moving the power switch towards the green dot, the red power LED will illuminate and the selected transmitting frequency will be displayed on the LCD panel on the front face of the transmitter. Note that the red LED will flash when the battery is low.
- To alter the selected transmitting frequency locate the sixteen position rotary switch on the top face and, with a screwdriver or trim tool, turn the switch until the desired frequency is shown in the window. You will notice that in the bottom left hand corner of the LCD there is a small square, this shows that this channel is not yet selected. To select this channel switch the power switch off and then on again, the black square will have gone and the transmitter will now operate on the selected channel. Note that when changing the frequency, some low level noise may be heard at the receiver output - this is normal.
- Frequencies are arranged in 4 banks, with 16 frequencies in each bank, giving a total of 64 frequencies. To change bank, press the small recessed switch on the side (through the hole in the battery slide) with the tip of a pen. The bank number is shown at the bottom of the display. You will notice that in the bottom left hand corner of the LCD there is a small square, this shows that this bank is not yet selected. To select this bank switch the power switch off and then on again, the black square will have gone and the transmitter will now operate on the selected bank.
- The input gain to the transmitter may be adjusted by means of the rotary gain switch on the top face. This is marked with numbers from 0 to 14. Note that these do not relate to actual level and are purely a guide to indicate the setting of the switch. When the gain switch is turned, the actual input level in dBs is shown on the LCD. This will normally range from 0dB to -30dB in 2dB steps, although other arrangements can be factory configured if required. Whilst adjusting the input gain observe the yellow input overload LED. When the yellow overload LED is lit, distortion is likely. The gain should be adjusted so that for the loudest likely input, this LED lights up, and then the gain should be turned down slightly so that the LED should never light in normal operation. Taking time to adjust the gain will optimise the audio signal transmission level and will give you the best audio performance. Note that when adjusting the gain, some low level noise may be heard at the receiver output - this is normal.

## **S5000RX Receiver Operation:**

The receiver is switched on by the power button situated to the left hand side of the front panel. Upon powering up, the receiver will display a start-up message whilst the synthesiser is being loaded to the operating frequency. If no transmitter is switched on or the correct transmitting channel is not selected the display will show that the RF is muted, along with the chosen channel number, the frequency and the mute (squelch) setting. With a transmitter switched on and set to the same frequency as the receiver the display will show the default screen. One of either the RF A or RF B LED's will be illuminated as will the Channel Grip LED. If the transmitter is very close to the receiver, the RF Overload LED may illuminate - move the transmitter further away. The various functions are accessed by using the front panel buttons. Button 1 is the left hand button, button 2 is in the middle and button 3 is on the right. described below:

- **Default Screen (TX On):**

The default screen shows the channel and operating frequency on the left hand side. The audio level (AF) and the signal strength (RF) are shown on the right in the form of horizontal bar graphs.

- **Audio Level:**

By depressing button 2 the display changes to show the audio output both deviation and VU. A further push of button 2 returns the display to the default screen. This is useful when setting the gain of your system and for monitoring the level of the audio.

- **RF Level:**

By depressing button 3 the display changes to show the RF level for both channel A and channel B. The mute (squelch) level is also shown on the right hand side of the screen. A further push of button 3 returns the display to the default screen. The more segments lit, the better the signal. If very few segments are lit, then the RF signal is weak.

- **Audio Disable:**

By depressing button 1 for more than one second the audio output of the receiver is disabled. The display will clearly show the disabled state whilst also displaying the selected channel and frequency. By pressing button 1 again the disabled state is terminated and the display reverts to the previously selected screen. Whilst in the audio disabled state the receiver can still be monitored via the headphone jack. The level of the headphones may be adjusted by the gain pot situated to the left of the headphone jack.

- **Frequency Selection:**

By depressing buttons 2 and 3 simultaneously the display shows the frequency selection mode, the receiver is automatically muted. The top line of the display (NOW) shows the currently selected frequency and channel number and alternative frequencies on the bottom line (NEW). By depressing either button 2 (down) or button 3 (up) the desired frequency can be selected as the display scrolls through the available channels. When the desired channel/frequency are displayed on the bottom line the receiver can be re-programmed to that frequency by pressing button 1. After selection the screen will return to the previously selected screen within a few seconds, a transmitter must of course also be programmed to this channel. This frequency information is now permanently stored until the next alteration. If, whilst in frequency selection mode, no buttons are depressed the system will revert to the original frequency and previously selected screen.

- **Bank Selection:**

The bank on which the unit is operating cannot be changed without powering down the unit, so it is not possible to accidentally change banks. To enter the bank selection mode, hold down button 3 whilst powering up the unit. You will then be requested to press button 1 (Audio Standby) twice as a confirmation. This will bring up a menu, where pressing button 1 will enable bank selection and button 2 will enable LCD contrast adjustment - press button 1. Now use button 2 (down) and button 3 (up) to select the desired bank. Note that the old bank is shown on the top line of the display (NOW). The bank you are selecting is shown on the bottom line (NEW). When you have made your selection press button 1, and the receiver will start with the new bank selected. In the UK, standard units will be shipped with all 4 banks containing the same frequencies. This will not be the case when special frequencies have been loaded.

- **Mute (Squelch) Setting:**

This is adjusted using the blue recessed knob. It should be adjusted so that the receiver is muted when the transmitter is off. If the receiver is not muted when the transmitter is off, then it is picking up local interference - turn up the mute knob to stop this. In every display, except for the frequency selection mode, alteration of the mute pot will make the current display instantly change to show the changing value of the mute threshold setting. Also shown are the RF A and RF B bar graphs to facilitate accurate mute level setting. The current setting of the mute threshold is also displayed in the high resolution RF display. When the mute level has been adjusted the display will revert to the previously selected screen.

- **Headphone Monitor Output:**

The receiver may be monitored, even when the audio has been disabled, via the monitor output jack and the level adjusted by the pot situated to the left of the output.

- **Transmitter Battery Low Warning:**

If the transmitter battery is nearing its end point the receiver display will flash alternately with the selected screen and the low transmitter battery screen informing the operator of this situation. Although it is not possible to be precise, due to the variations in batteries, the operator should normally then change the transmitter battery within one hour of this warning message appearing.

- **Connections:**

On the rear of the receiver will be found the various input and output connections together with a mic/line switch. There are two TNC connectors for the RF A and RF B antenna inputs. These inputs may be fed with the supplied antenna or preferably in larger installations with a dipole or ground plane antenna such as the TRANTEC S5000RD or the S5000GP respectively. In such installations, Trantec antenna distribution units would normally be used so that only two antennas are required for multiple receivers. There are two output connections, a balanced XLR and a balanced jack. They can be set for microphone or line level output using the adjacent switch. Power is supplied by a fused IEC connector. In the UK this will be at 220-240V AC. A four pin Lemo connector is situated to the far right which is used in conjunction with the computer interface system. - do not try to connect a lapel microphone to this connector!

- **LCD Contrast Adjustment:**

To adjust the LCD contrast, hold down button 3 when powering up the receiver. Then press button 1 twice, followed by button 2 (see Bank Selection for more details on this process). Now use buttons 2 and 3 to adjust the contrast and press button 1 when you are satisfied - the receiver will start with the new contrast setting. Be very careful not to set the contrast to a setting where it is not possible to read the display - it can be very difficult to work through the menus to turn the contrast back up when the display cannot be read!

- **Rack Mounting:**

Two receivers may be mounted side by side in 1u of rack space by utilising the S5000RK racking kit. There are also facilities on the rear of the chassis for fixing a rear support bracket for extra strength.

- **Multi User Mode (MUM):**

The multi-user Mode is incorporated in the receiver to allow the user to quickly change the receiver operating frequency between two previously selected frequencies. To change from one frequency to the next and back again it is only necessary to press button 3 once. In the MUM mode it is not possible to monitor deviation or VU and also the low transmitter warning is inoperative.

- **MUM Selection:**

To enter the Multi User Mode button 1 must be depressed throughout the powering up sequence. The screen will then show that the receiver is in the MUM mode. The screen shows the two selected frequencies, labelled 1 and 2, an arrow shows the currently selected frequency. By pressing button 3 the receiver changes to the second pre-selected frequency.

- **MUM Default Screen:**

With a transmitter switched on, and on one of the selected frequencies, the screen may be changed, by pressing button 2, to show the MUM default screen. This screen shows the currently selected frequency and channel number, audio level and RF level. By pressing button 2 again the display reverts to the previous display from where the operator may select the second frequency.

- **MUM Frequency Selection:**

To change one or both of the frequencies the receiver must first be put into the audio disabled state by depressing button 1. Buttons 2 and 3 should then be depressed simultaneously to activate the frequency selection mode, the receiver is automatically muted. The display now shows the currently selected frequency on the top line (NOW1) and on the bottom line the operators choice of frequency (NEW1). By depressing either button 2 (down) or button 3 (up) the display will scroll through the available channels. To select the desired frequency press button 1. Once the first frequency has been selected the screen will change to enable the operator to select the second chosen frequency in the same manner as the first. When the frequency selection is completed press button 1 to re-enable the audio.

- **MUM Audio Disable**

The receiver may be put into the audio disabled state by depressing button 1. The display will indicate the audio disabled state as well as the current frequency selection and channel number. To re-activate the receiver depress button 1 again.

- **Summary of Receiver Button Operation:**

Button (Operational Mode):	Normal Mode:	Multi User Mode:
1.	Audio Disable	Audio Disable
2.	Deviation and VU	Default Screen
3.	Hi Res RF Display	Alternate Frequencies
Button (Frequency Selection Mode):		
1.	Selection of chosen frequency followed by escape from frequency selection mode.	Selection of chosen frequency followed by selection of second chosen frequency. Escape from frequency selection mode.
2.	Scroll down through possible choice of frequencies.	Scroll down through possible choice of frequencies.
3.	Scroll up through possible choice of frequencies	Scroll up through possible choice of frequencies.

## Frequency Guide:

The following set of frequencies are stored in standard UK units. Other frequency sets can be provided for special orders. This set has been calculated to be intermodulation free, so it should be possible to operate them all simultaneously, although other radio sources may cause interference that prevents this. A license is required to operate UHF radio microphones in the UK. This is also the case in most other countries - consult the relevant authorities in any country before using the system there.

Bank 1:	Bank 2:	Bank 3:	Bank 4:	TX Switch Location:
854.900	842.325	846.425	846.900	0
855.275	843.525	846.950	847.275	1
855.900	844.450	847.925	847.900	2
856.175	846.025	849.575	848.175	3
856.575	848.475	850.050	848.575	4
857.625	854.900	842.750	849.625	5
857.950	855.275	849.500	849.950	6
858.200	855.900	853.375	850.200	7
858.650	856.575	863.025	850.650	8
858.975	858.200	863.725	850.975	9
859.500	858.650	864.300	851.500	A
860.400	860.400	864.650	852.400	B
860.900	860.900	864.650	852.900	C
861.200	861.750	864.650	853.200	D
861.550	861.750	864.650	853.550	E
861.750	861.750	861.975	853.750	F

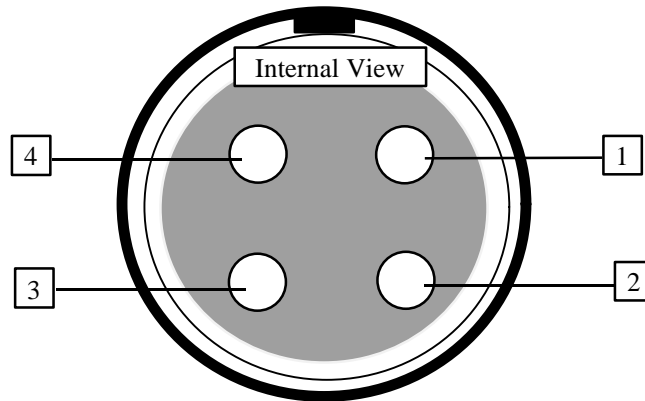
A UK license form is enclosed with your system. If you need an additional copy or have any enquiries regarding licensing then please contact:

JFMG Limited  
72 Upper Ground  
London  
SE1 9LT

Tel: (020) 7261 3797  
Fax: (020) 7737 8499

Web: [www.jfmg.co.uk](http://www.jfmg.co.uk)

## S5000LTX Transmitter Lemo Connector Details:



### Pin Connections:

Pin 1 Ground  
Pin 2 +9v  
Pin 3 Audio/+9v  
Pin 4 Audio

#### Trantec TS259:

Pin 1 Screen  
Pin 2 Not connected  
Pin 3 White  
Pin 4 Not Connected

#### Trantec TS33:

Pin 1 Screen  
Pin 2 Not Connected  
Pin 3 White and Red  
Pin 4 Not Connected

#### Trantec TS44:

Pin 1 Screen  
Pin 2 Red  
Pin 3 Not Connected  
Pin 4 White

#### Trantec TS55:

Pin 1 Screen  
Pin 2 Red  
Pin 3 Not Connected  
Pin 4 White

#### Trantec TS912:

Pin1 Screen  
Pin 2 Red  
Pin 3 Not Connected  
Pin 4 Yellow

#### Sennheiser MKE2:

Pin 1 Screen  
Pin 2 Not connected  
Pin 3 Red  
Pin 4 Not Connected

#### Sony ECM77:

Pin 1 Screen plus Clear  
Pin 2 Not Connected  
Pin 3 Red  
Pin 4 Not Connected

#### Sanken COS-11PT:

Pin 1 Screen  
Pin 2 Black  
Pin 3 Not Connected  
Pin 4 White

#### Beyer MCE5:

Pin 1 Screen  
Pin 2 Red  
Pin 3 Not Connected  
Pin 4 Blue

## **Technical Specifications:**

- **S5000RX:**

Frequency Range: 854-862MHz TV Channel 69 (Others available on request)  
Frequency Arrangement: 64 Frequencies arranged in 4 banks of 16 frequencies  
RF Sensitivity: 0.3 $\mu$ V for 12dB sinad  
Image Rejection: 1<sup>st</sup> IF > 85dB, 2<sup>nd</sup> IF > 70dB  
RF Input Impedance: 50 Ohms  
RF 1dB Compression Point: -8dBm  
Sensitivity: 0.5 $\mu$ V  
S/N Ratio: >100dB (A-Weighted) at Ue=50 $\mu$ V  
Squelch: Infinitely Adjustable up to 30 $\mu$ V  
AF Frequency Response: 70Hz-18kHz  
AF Output: 0dBm/-30dBm Switchable, XLR and jack, Transformer balanced  
Distortion: < 0.2%  
IF Bandwidth: 110kHz  
Frequency Stability: < 10kHz  
Dynamic Range: > 100dB (A) Weighted  
Operating Voltage: 220-240v AC, 50/60Hz, IEC Fused Input  
Dimensions: 217 by 275 by 44mm (Half Width 1U 19" Format)  
Meets the requirements of part 15, sub-part B of the FCC rules

- **S5000MTX:**

Frequency Range: 854-862MHz TV Channel 69 (Others available on request)  
Frequency Arrangement: 16 Frequencies  
Output Power: Typically 10mW  
Nominal Deviation: 22kHz  
RF Harmonic & Spurious Radiation: < -54dBm  
Frequency Stability: < 10kHz  
Power Consumption: 45mA, 9V MN1604 Alkaline Battery  
Battery End Point: 6.8v  
Operating Time: 12h (Typical)  
AF Frequency Response: 70Hz-18kHz  
Audio Limiter Range: 20dB (Typ)  
Dimensions: 200 by 32mm  
Weight: 355g  
Type Approval: 10902 (ch69H)

- **S5000LTX:**

Frequency Range: 854-862MHz TV Channel 69 (Others available on request)  
Frequency Arrangement: 64 Frequencies arranged in 4 banks of 16 frequencies  
Output Power: Typically 30mW  
Nominal Deviation: 15kHz  
RF Harmonic & Spurious Radiation: < -54dBm  
Frequency Stability: < 10kHz  
Power Consumption: 45mA, 9V MN1604 Alkaline Battery  
Battery End Point: 6.8v  
Operating Time: 12h (Typical)  
AF Frequency Response: 70Hz-18kHz  
Audio Input: LEMO FGG304, Pin 1 - 0v, Pin 2 - DC 9v Bias, Pin 3 - Audio + Plus, Pin 4 - AC Coupled Audio  
Input Voltage Range: -34dBm to -8dBm  
Dimensions: 80 by 54 by 20mm  
Weight: 157g  
Meets the requirements of part 74, sub-part H of the FCC rules  
Type Approval: 10902 (ch69L)