A.W. Communication Systems Limited

TC-2 Dual Bay - Base station Interface Panel

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TC-2 Connection Details

At the rear of the TC-2 module are connections for the incoming landline, the main base station, the standby base station and also a separate power supply if required.

Base Station Connector

The base station connector is a 25-pin D type male connector and has all the necessary connection to interface with a base station. Both main and standby base station connectors have the same pin outs.

The connection details are:-

Pin No.	Function	Notes
1	Receive 600 ohm audio 0	
2	Transmit 600 ohm audio 0	
3	Transmit key	Active Low
4	Talkthrough Select	Active Low
5	Squelch defeat output	Active Low
6	Channel 0 select output	Active Low
7	Channel 1 select output	Active Low
8	Channel 2 select output	Active Low
9	Channel 3 select output	Active Low
10	Channel 4 select output	Active Low
11	Channel 5 select output	Active Low
12	Channel 6 select output	Active Low
13	+12 volts supply input	
14	Receive 600 ohm audio 1	
15	Transmit 600 ohm audio 2	
16	Squelch state input	Active Low
17	RSSI Input	Positive going level
18	Alarm Input	Active Low
19	External Input 0	Active Low
20	External Input 1	Active Low
21	External Input 2	Active Low
22	External Input 3	Active Low
23	External Input 4	Active Low
24	External Input 5	Active Low
25	0 volts connection	

Line Connector

The line connector is an RJ 45 type and the pin out is as follows:-

Pin No.	Function
1	
2	
3	Outgoing 600 ohm audio 1 (RX Path)
4	Incoming 600 ohm audio 1 (TX Path)
5	Incoming 600 ohm audio 2 (TX Path
6	Outgoing 600 ohm audio 2 (RX Path)
7	
8	

Power Connector

The power connector has a centre pin connected to +12 volt supply and the outer connected to 0 volts. This is in diode connected to the power connections on the base station interface connectors.

TC-2 Switch Settings

There are two banks of switches located at the rear of the TC-2; these set the mode of operation of the unit.

Switch Bank A

This switch bank consists of 8 switches, the first three switches determine the type of emulation used by the TC-1: -

SW1	SW2	SW3	Emulation Mode
Off	Off	Off	DRC 2970
On	Off	Off	DRC2970
Off	On	Off	M80 Remote Supervisories
On	On	Off	M80 Local Supervisories
Off	Off	On	Motorola 2100 keytone
On	Off	On	Motorola 2175 keytone
Off	On	On	Motorola 2325 keytone
On	On	On	Motorola 2325 keytone

The remaining switches have discrete functions: -

Switch No.	Function	Comments
SW4	Channel Change Enable	When on the TC-2 will decode channel change messages and operate the channel change lines
SW5	Line Fail T/T Enable	When on the TC-2 will look for line confirmation messages, and if non are received in 60 seconds will automatically initiate talkthrough.
SW6	Vox Hold Time	Of the Vox is held for 2 seconds and on the Vox is held for 4 seconds
SW7	Squelch Defeat Enable	When On the TC-2 will decode squelch defeat messages and operate the squelch defeat line
SW8	T/T Enable	When on the TC-2 will decode talkthrough messages and operate the talkthrough facility

Switch Bank B

Each of the eight switches in switch bank B have a discrete function:-

Switch No.	Function	Comments
SW1	Not used	
SW2	External Talkthrough	With the switch Off talkthrough is carried out within the TC-2, with the switch on the talkthrough control on the base station connector is active
SW3	Both-way Monitor Control	On for Both-way monitor facility
SW4	Not used	
SW5	Not used	
SW6	Not used	
SW7	Not used	
SW8	Not used	

TC-1 Indicators and Level Settings

The front panel of the TC-2 has indicators to show the states of the unit:-

TX	-	Indicates that the base station is in transmit
1/0	-	Indicates that the power to the unit is on
T/T	-	Indicates that the unit is in Talkthrough
RX	-	Indicates that the base station mute is active and that audio is present
Local	-	Indicates that the base station select switch is locally controlled
Main	-	Indicates that the Main base station has been selected
S/By	-	indicates that the standby base station has been selected

Also available at the front panel are pots to adjust the levels into and out of the unit:-

TX A	-	Sets the level from the TC-2 to the main base station Transmitter
RX A	-	Sets the level from the main base station receiver into the TC-2
TX B	-	Sets the level from the TC-2 to the standby base station Transmitter
RX B	-	Sets the level from the standby base station receiver into the TC-2
Line Out	-	Sets the level from the TC-2 to the landline (RX Path)
Line In	-	Sets the level from the landline into the TC-2 (TX Path)

Following factory test all levels in and out are pre-set to - 10 dBm peak.

The select switch is a centre off switch and is used to locally force the selection of either the main or the standby base station. When in the local mode, remote bay change commands are ignored by the TC-2.

Remote change options

The TC2 can respond to one of a selection of commands from the remote controller. These are

Talkthrough command
Facility / Squelch defeat command
Channel 0 line
Channel 1 line]

And also the external input 5 line on the base station connectors can be used to trigger main/standby switching. The standby select link within the TC-2 allows the system engineer to select the trigger required.

Engineers Handset

When fitted there is an engineers handset option for the TC-2, this is located to the left of the units front panel and provides a socket for the handset, a three position switch to determine the mode of operation of the engineers handset, an earpiece volume control and a microphone level setting pot.

Handset mode

The handset mode switch is a three position switch which is normally used in the centre position the functions are:-

Line   -   The handset audio is biased towards the line and the engineer can talk down the line to the control point.

Mon   -   The normal mode of operation, the handset can monitor both line and base station audio but cannot talks on either path.

Radio -   The handset is biased towards the Base station and the engineer can cause the base station to transmit by the use of the handset PTT and can transmit and receive through the base station.

TC-2 Voting Encoder Option

The TC-2 can have a voting encoder module installed, which will allow the base station to operate within a receiver voting system.

The voter option board provides the necessary audio filtering and tone insertion required for RSSI based voting systems.

RSSI is conveyed to the central voting unit by in band tone signalling, with six discrete tones representing the squelch state (open or closed) and four adjustable RSSI thresholds.

Operation

Rotary switch settings

Position	Function
1	Learn threshold one
2	Learn threshold two
3	Learn threshold three
4	Learn threshold four
5	Not used
6	Not used
7	Not used
8	Normal voting with no squelch closed tone (Assort 2 type), squelch active low
9	Normal voting with no squelch closed tone (Assort 2 type), squelch active high
A	2970 Hz tone on squelch open, squelch active low
B	2970 Hz tone on squelch open, squelch active high
C	Not used
D	Not used
E	Voter output tones inhibited
F	Normal operation Squelch active low
0	Normal operation Squelch active high

Commissioning

Remove the top cover of the TC-2 by removing the four screws located on the base of the unit. This will expose the circuit board with the voting encoder board inserted into the main board. Apply power to the base station and ensure correct operation.

Set the voting unit rotary switch to position E, and readjust the Base station receive level to line for the required level.

Set the voting encoder rotary switch to position 0 and adjust the pot on the voting encoder to achieve the correct level of voting tone to line.

Set the voting encoder rotary switch to position 1, using a signal generator on the correct frequency adjust the RF input to the base station receiver to the correct level for the first voting threshold. Note that the LED on the voting encoder is flashing indicating that the unit is in the "learn" mode. Press the momentary switch on the voting encoder module and note that the LED stops flashing indicating that the level has been learnt.

Set the voting encoder rotary switch to position 2 and the signal generator to the second threshold, and press the switch to enable the unit to learn the second level.

Set the voting encoder rotary switch to position 3 and the signal generator to the third threshold, and press the switch to enable the unit to learn the third level.

Set the voting encoder rotary switch to position 4 and the signal generator to the fourth threshold, and press the switch to enable the unit to learn the fourth level.

Return the rotary switch to position F or 0 depending on the base station squelch operation (active high or active low), for the TC-2 the switch is placed in position F.

Check the operation of the voting unit ensuring that the correct tones are generated at the required RF signal levels.

Where the voting is to be used with older ASSORT 2 systems the rotary switch can be placed in position 8 or 9, which inhibits the squelch closed tone (8 for active low squelch, 9 for active high).

Voting tones used

Squelch closed tone	2707 Hz
Squelch open tone	2730 Hz
Threshold 1	2791 Hz
Threshold 2	2852 Hz
Threshold 3	2913 Hz
Threshold 4	2972 Hz

Use of the unit as a tone generator

When the unit is to be used as a 2970 Hz tone generator on receipt of an incoming call, it can be installed in the normal manner but it is not necessary to connect the RSSI input. With the rotary switch in position A or B the module will generate a 2970 Hz tone whenever the squelch is opened (A for active low squelch, B for active high).