



ADDITIONAL TRAINING NOTES FOR TOWER LIGHTPALETTE 90.

1.1 Obvious faults.

Never over look the obvious faults.

There are many faults which can be traced to very simple mistakes made by the customer. These must be checked tactfully over the phone.

The agent must also have a good understanding of the operation of the desk. There are many faults that can be traced to operator error.

1.1.1 Common installation faults

Cure

No outputs on stage

Switch the dimmers on.
Is the MUX connected to the correct output port.

No VDU output on one VDU

Swap VDU's and then swap VDU cables to check for faults.

Hand held remote does not work

Are the batteries flat.

Remote Submaster does not work
(Not available on Mini)

Submaster must be switched on at the same time or before the main console.

1.1.2 Common operator errors

Cure

No outputs on stage

Dimmers not assigned to MUX outputs.
Incorrect patch.
Incorrect dimmer profile.

Disc operation failed

On dual electronic desk the disk is in the wrong drive. (Not available on Mini)

AND MANY OTHER ERRORS.

1.2 External data cables - Connection and faults.

All main system cables are described in the "Installation" section of the operation handbook.

The cable from the Tower to the LP90 console is 9 way D type Male to 9 way D type Female (This is not a 1-1 cable). The cable from the LP90 to a remote submaster desk is Male to Male (This is a 1-1 cable). If a site has problems and the cables have been made by the customer it is wise to check the cables.

A faulty cable to the tower will result in the message "Trying to establish communications with the tower." appearing on the desk VDU.

A faulty cable to the remote submaster will result in the submaster not working.

1.3 Internal desk cables - Connection and faults.

The internal cables for data and power are different in every configuration of the desk. The internal layout diagrams should be used to trace the path of each cable inside the desk.

Each desk has a diagram of the cable position from above, from the back and the internal wiring of the power supply.

Drawings of the internal wiring of the Mini Lightpalette 90 are not yet available on A3 size drawings.

Check all cables inside the desk are secure and in the correct place.

In the desk all molex plugs and sockets must be gold plated and not tin plated.

Check that all IDC connectors used in the desk are fitted with the correct thickness of cable. On some old desks the cable thickness used was too large and the IDC connector was not cutting through the insulation. This could lead to poor contact and intermittent faults.

Check the quality of all crimp terminated power cables. Also check that the crimp used is correct size for the cable.

Any poor quality cable termination or connector contact may cause a voltage drop which will be detected by the watchdog chip. This can result in the desk intermittently going into reset.

1.4 Internal cables accessed from the front. - Connection and faults.

When you open the front door of the electronics tower you will see many different cables. The number of cables depend on whether the system is dual electronics and how many DPR (Dimmer Processor) cards are fitted

1.4.1 Power Distribution card connections.

This card provides all power distribution for the Lightpalette 90. It also contains the batteries for the battery backed memory in the Lightpalette 90.

- J1 Provides power to the serial transfer card on the front door of the tower (Always fitted)
- J2 Provides power to the first Dimmer transfer card for DPR 1 and DPR 2.
- J3 Provides power to the second Dimmer transfer card (When fitted) for DPR 3 and DPR 4.
- J4 Provides power to the third Dimmer transfer card (When fitted) for DPR 5 and DPR 6.
- J5 Provides power to the fourth Dimmer transfer card (When fitted) for DPR 7.
- J6 Connections to the keyswitches on the front of the tower.
- J7 This is the output to the large relay mounted on the back door of the tower. The relay is controlled by the ON/OFF switch on the tower or the desk.
- J8 This is the power input from the System A power supply mounted on the door. The inputs are 5v to charge the batteries and 12v to operate the relay on the main system. If the power supply is working and this connection is good then the +5 MEM LED and the +12 REL LED will be on.
- J9 This is the same connection as above except for system B.
- J10 This is a power input from the main system power supply A inside the back of the tower. This is only switched on when the key switch has turned on the main relay. This input is used to supply power for the transfer cards and also to switch on the +5, +12 and -12 LED's on system A.

- J11 This is the same connection as above except for system B.
- J12 This is the output of the battery circuit for system A. If the power is switched on the output is 5v. If the power is off the battery will supply 3.6v.

This connection must be on before switching on the power to the Lightpalette 90. If this connection is off then the memory will find an alternative source of 5v via a Bipolar Eprom on the DPR card. This will often result in damage to the Eprom.

- J13 This is the same connection as above except for system B.

1.4.2 Dimmer Processor (DPR) card connections.

Dimmer processor card can fit into any position in the electronics crate.

The Dimmer Processor card is a full height circuit board. It has one green LED which must be on in normal operation. There is a maximum of 7 DPR cards that can be fitted to each set of lightpalette electronics. The maximum recommended at this moment is three DPR cards.

The card has a single 16 way ribbon cable plug on the front. This is joined by a grey ribbon cable to the Dimmer transfer card on the front door of the tower.

VERY IMPORTANT.

On the Dimmer Transfer card the ribbon cable from System B DPR is connected above the ribbon cable from system A DPR.

On the first Dimmer transfer card system B DPR 1 is connected to J2 and system A DPR is connected to J3. System B DPR 2 is connected to J4 and system A DPR 2 is connected to J5.

In a dual electronic system this error may not be noticed until one system has a fault. All operations to the main system will result in lighting changes to the DPR's on the main system. The operation is tracked to the backup system and the backup DPR cards will also output the changes. The output of the backup system is sent to the dimmers.

If there is a fault in the backup system the desk will operate correctly on the main system but there will be no output to the dimmers, or an incorrect output to the dimmers.

The DPR number is selected using links on the DPR card.

1.4.3 Serial Input / Output (SIO) card connections.

The Serial Input / Output card can fit into any position in the electronics crate.

The Serial Input / Output card is a full height circuit board. It has four LED's which should all be on for normal operation. There can only be one SIO card in each set of Lightpalette electronics.

The card has a single 40 way ribbon cable plug on the front. A 40 way ribbon cable (Usually Blue) is connected to the Serial Transfer card on the front door.

The Top ribbon cable connector of the Serial transfer card J2 is connected to the SIO card in system A. The lower ribbon cable connector of the Serial transfer card J3 is connected to the SIO card in system B. Note. this is the reverse order to the dimmer transfer card.

1.4.4 J11 processor and Q Bus memory.

The J11 processor and the Q bus memory card are half height cards which are fitted together. The J11 processor is fitted above the memory card. These cards are fitted in the far left hand slot in the electronics crate.

There are no other connections to these two cards.

1.4.5 Serial transfer card.

This card fits into the left hand slot in the front door.

The connector J1 is the power input and the A or B system select from the power distribution card.

The connector J2 is the input from the SIO card in system A.
The connector J3 is the input from the SIO card in system B.

The output ports on the front of the tower are in the following order.

- | | | |
|---------|---------------------|---|
| Port 1. | Main desk. | |
| Port 2. | Remote desk 1. | |
| Port 3. | Remote desk 2. | |
| Port 4. | Spare. | (This port was designed for connecting a reserve system. This would upgrade a single electronic system to a system with tracking backup. This option is not available.) |
| Port 5. | Remote Q out. | This port is to connect the Lightpalette to an IBM computer which is running PALS software. |
| Port 6. | Serial Printer out. | |
| Port 7. | Hand held Remote 1. | |
| Port 8. | Hand held Remote 2. | |
| Port 9. | Hand held Remote 3. | |

1.4.6 Dimmer transfer card.

There are a maximum of four dimmer transfer card in each lightpalette 90 tower. Each transfer card provides the output connections for two dimmer processor cards (DPR).

On the first dimmer transfer card :-

The connector J1 is the power input to the serial transfer card and also the system A or system B selection input.

The connector J2 is the dimmer data from the first DPR card in system B.

The connector J3 is the dimmer data from the first DPR card in system A.

The connector J4 is the dimmer data from the second DPR card in system B.

The connector J5 is the dimmer data from the second DPR card in system A.

On the next dimmer transfer card the connections are identical except DPR 3 and 4 are being output. The next card outputs dimmer data from DPR 5 and 6. The last DPR outputs data from DPR 7 only.

The DPR number is selected by links on the DPR card.

1.5 Internal cables accessed from the rear. - Connection and faults.

The rear door can be opened by unscrewing the bolt on the door and releasing the two clips at the side of the door.

Inside the power supply area will be two power supply units for single electronics or four power supply units for the dual electronics.

The internal wiring has two versions. The old style wiring has a terminal block mounted at the top of the door. The new style has a smaller terminal block which is mounted at the bottom of the door.

Power enters via an IEC connector on the back of the door. This is then put through a simple 15Amp over current circuit breaker. From here the power is sent directly to the power supply on the door.

The power from the circuit breaker is also sent to the main relay on the door. When the keyswitch tells the system to switch on the relay sends power to the main power supplies in the back of the tower.

1.5.1 Old style terminal connection.

Top connections.

1. Live A to MEM and REL PSU.
2. Relay switched live A to main PSU.
3. Relay switched live A to Fan A.
4. Neutral A to main PSU and FAN.
5. Neutral A to MEM and REL PSU.
6. Earth A to main PSU.
7. Earth B to main PSU.
8. Live B to MEM and REL PSU.
9. Relay switched live B to main PSU.
10. Relay switched live B to Fan B.
11. Neutral B to main PSU and FAN B.
12. Neutral B to MEM and REL PSU.

Bottom connections.

1. Live A in and output to relay.
2. Relay switched live A in. Link to 3.
3. Link from 2.
4. Link from 5.
5. Neutral A in. Link to 4.
6. Earth A in. Link to 7.
7. Earth B in. Link to 6.
8. Live B in and output to relay.
9. Relay switched live B in. Link to 10.
10. Link from 9.
11. Link from 12.
12. Neutral B input. Link to 11.

1.6 Power Supply measurement.

1.6.1 Rear Door Power Supply.

Connections from left.

+5.4v 0v +12v 0v Not used. Not used.

The 5v is actually 5.4 because the two power supplies are joined using diodes. The voltage should be adjusted so that 5v can be measured across capacitor C2 on the DPR card (This is found next to U3 on the DPR).

The circuit diagram of the DPR card is incorrect as it shows C2 connected to Vcc instead of Vmem. When the power is switched off at the main circuit breaker the battery will prevent Vmem dropping below 3.6v .

Vmem can be also be measured on the Q Bus Memory card on capacitors C1 and C2. These are the two capacitors closest to the front of the card.

The +12v is used to switch the main relay on the back door. This voltage is sent to all the power key switches. If several desks are in use or the distance from the tower to the desk is very long then the voltage can drop. The red control wire is always at 12v. The orange control wire is normally at 12v but drops to 0v when the key is turned to the ON position. This latches the relay on. The yellow control wire is normally 12v and drops to 0v when the key is in the off position. This resets the relay off.

The voltages are adjusted by the potentiometers below the outputs of each part of the supply.

1.6.2 Main Power Supply.

Connections from left.

5v 5v Com Com N/U N/U +12v -12v PFD.

The 5v supply has a tolerance of +/- 2% giving an acceptable range of 4.9v to 5.1v. It can be measured on capacitor C1 of the DPR card. To adjust the 5v supply turn potentiometer R57.

The +12v and -12v supply is not as critical. These voltages can be adjusted from measurements taken from the output of the power supply. Both outputs are adjusted from potentiometer R21.

Do not adjust the potentiometer mounted on the piggy back card.

PFD (Power Fail Detect) is used to instruct the processor to store all data prior to power loss. This will ensure that the Lightpalette will power up in the state that was up when the power was switched off.

1.6.3 Console power supply.

	<u>Main Console</u>	<u>Connections from back.</u>
Pin	20 -	5v
	19 -	5v
	18 -	LED indicator +
	17 -	LED indicator -
	16 -	0v
	15 -	Not used.
	14 -	+ 12v (For Fan)
	13 -	0v (For Fan and Disc drive)
	12 -	Not used.
	11 -	Not used.
	10 -	0v
	9 -	Not used.
	8 -	0v
	7 -	Not used.
	6 -	Not used.
	5 -	Earth.
	4 -	Pin removed.
	3 -	Neutral.
	2 -	Pin removed.
	1 -	Live.

	<u>Remote Submaster console.</u>	<u>Connections from back.</u>
Pin	20 -	5v
	19 -	Not used.
	18 -	LED indicator +
	17 -	LED indicator -
	16 -	0v
	15 -	Not used.
	14 -	+ 12v (For Fan)
	13 -	0v (For Fan)
	12 -	Not used.
	11 -	Not used.
	10 -	Not used.
	9 -	Not used.
	8 -	Not used.
	7 -	Not used.
	6 -	Not used.
	5 -	Earth.
	4 -	Pin removed.
	3 -	Neutral.
	2 -	Pin removed.
	1 -	Live.

- Measure 5v on any TTL chip on the submaster processor card. Adjust R48.

On the main console measure the 5v on any TTL chip on the control panel processor card. On the Remote Submaster console measure the 5V on any TTL chip of the Submaster processor card. Adjust the 5v supply using potentiometer R48 on the power supply.

The new style console power supply is now fitted with a metal cover. The fitting of the cover is shown in the wiring diagrams provided with this document. The new style console also has a new wiring loom. The connections of this new style are the same as the old style console.