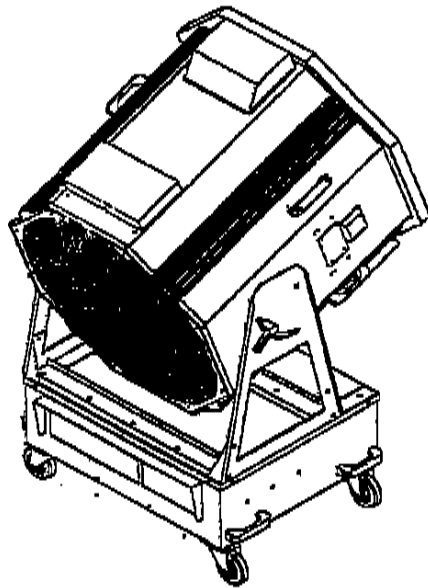


# TECHNICAL MANUAL



# IMPERIAL

GR0035

MT-035-EN  
Rev 25 Nov-97

# INDEX

## Par.

### 1.0 PACKING

### 2.0 INSTALLATION

#### 3.0 INSTALLATION

- 3.1 Mounting of lantern
- 3.2 Fitting lamp
- 3.3 Setting lamp
- 3.4 Mounting position
- 3.5 Electrical connection

#### 4.0 USE OF THE LANTERN

- 4.1 Control Panel
- 4.2 Function in manual mode
- 4.3 Function in automatic mode
- 4.4 Function in Synchro mode
- 4.5 Function in 0/10V mode
- 4.6 Function in DMX standard mode
- 4.7 Function with GRIVEN dedicated controller GR0176
- 4.8 Special functions
- 4.9 Switch-off the lantern

#### 5.0 MAINTENANCE

#### 6.0 TECHNICAL INFORMATION

#### 7.0 REPLACEMENT OF INTERNAL PARTS

- 7.1 How to take off the rotating mirror assembly
- 7.2 How to replace the ignitor
- 7.3 How to access the upper part base
- 7.4 How to replace the upper part transformer

#### 8.0 TROUBLESHOOTING

- 8.1 The lamp doesn't light while fan and rotating mechanism work
- 8.2 The lamp lights up for 5 sec. then switch off
- 8.3 The lamp lights up while the fan doesn't function
- 8.4 The lamp lights up, the rotating mechanism doesn't function
- 8.5 The projector works properly but after 20/25 min. the general switch automatically disconnect
- 8.6 General switch automatically disconnects as soon as it is activated
- 8.7 The lamp doesn't light up, the fans work properly but the ballast is noisy
- 8.8 Special setting of the ballast

#### 9.0 BALLAST GROUP OPERATION CONTROL

##### Exploded Diagrams

- Imperial - Ballast
- Imperial - Lamp unit (upper part)
- Imperial - Internal mechanisms

##### Electrical and electronics schematic diagrams

- Ballast electrical diagram
- Projector electrical diagram
- PCB electronic diagram
- PCB connection diagram
- Ballast electronic diagram

## 1.0 PACKING

Check carefully the content of the box and in case of damage contact immediately your forwarder.

The following items are included in the box:

### Box 1

- n° 1 instructions leaflet
- n° 1 IMPERIAL 4000 (upper part)
- n° 1 3 poles + neutral + earth Gewiss 16A socket
- n° 1 3 poles XLR plug + socket
- n° 2 fixing plates
- n° 1 jack plug

### Box 2

- n° 1 Ballast unit (lower part)

## 2.0 SAFETY

Even if this lantern is fitted with a safety micro-switch which automatically disconnects power as soon as the lamp cover is opened, we strongly suggest to disconnect the lanterns from mains supply before replacing the lamp.

- This projector has been designed for use in outside environments. For safety operation, max. ambient temperature must not exceed 50°C.

- Caution: the surface temperature of the projector can reach 200°C

- Caution: hot lamp; ensure that the lamp is cold before attempting to remove it (about 30 minutes)

- Caution: the xenon gas of the lamp, during functioning, can reach an internal pressure of 30 bars. Please take care while using the lamp and follow the relevant instructions.

- Caution: the luminance of the lamp can be higher than sun light; DO NOT look the lamp directly

## 3.0 INSTALLATION

### 3.1 Mounting of lantern

1) Position the upper part (box n. 1) on the ballast unit (box n. 2) as per drawing 1 and strongly fix it using the 4 screws supplied with the projector.

2) Connect the ballast unit to the upper part through the mains cable (C). Unscrew the two locking knobs of the panel and connect the two supply plugs. Ensure that the plugs are correctly connected and that the grey plug is safety closed by its clamp; close the panel (see fig. 2)

3) Fix the cable (C - fig. 2) to the upper part by the relevant fixing yoke (D - fig.2) to allow an easier movement to the upper part.

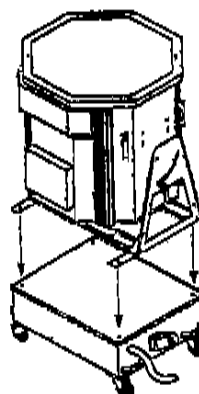


fig.1

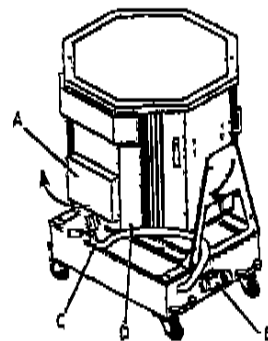


fig.2

### 3.2 Fitting lamp

1) Remove the glass located on the upper part of the lantern unscrewing the 4 fixing screws (fig. 3).

2) Temporarily disconnect the lamp's mains cable (a - fig. 4) located on the side of the reflecting mirror

3) Remove the fixing screw (b - fig. 4) from the supporting bracket of the lamp; turn the bracket to allow the vertical fitting of the lamp in the reflecting mirror (Fig. 4)

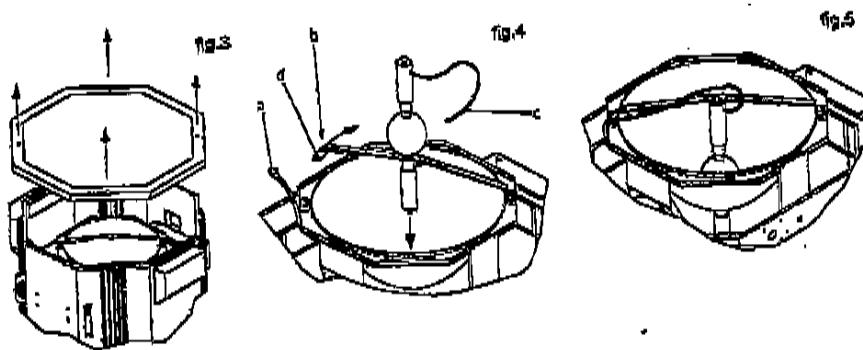
4) Clean the lamp with the cleaning towel and fit it carefully in the lamp holder.

- avoid to touch the lamp with fingers or dirty towels;

- do not shake the lamp;

5) Strongly fix the lamp to the lamp holder, repositioning the fixing bracket (fig. 5).

4) Close the lamp cover.



### 3.3 Setting lamp

The lamp holder is fixed to a teflon plate which is fitted with 4 holding spring screws (4 - fig. 5d). It's possible to modify the lamp position compared to the reflecting mirror by setting the 4 self-locking bolts.

a) Slightly screw the 4 bolts clockwise; the lamp will get close to the reflecting mirror and the beam angle will increase (fig. 5b).

b) Slightly unscrew the 4 bolts anti-clockwise; the lamp will get away from the reflecting mirror and the size beam angle will reduce.

**CAUTION: DO NOT** get away too much the lamp from the reflecting mirror; the beam could concentrate on the upper part of the socket and cause an excessive overheating that will shorten the lamp life (fig. 5c)

The lamp holder is factory set to obtain the best light output (fig. 5a)

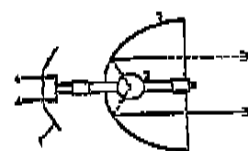


Fig. 5a

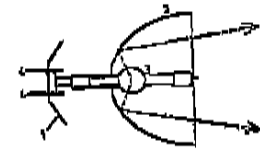


Fig. 5b

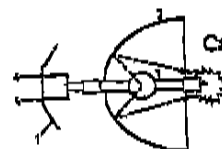


Fig. 5c

Caution!!

- |     |                                 |
|-----|---------------------------------|
| 1 - | Mirror support                  |
| 2 - | Reflecting mirror               |
| 3 - | Lamp                            |
| 4 - | Setting lamp self-locking knobs |

During lamp replacement it is necessary to set the lamp position compared to the reflecting mirror, in order to get it at the same axis, to obtain the maximum light output. Follow the instructions below:

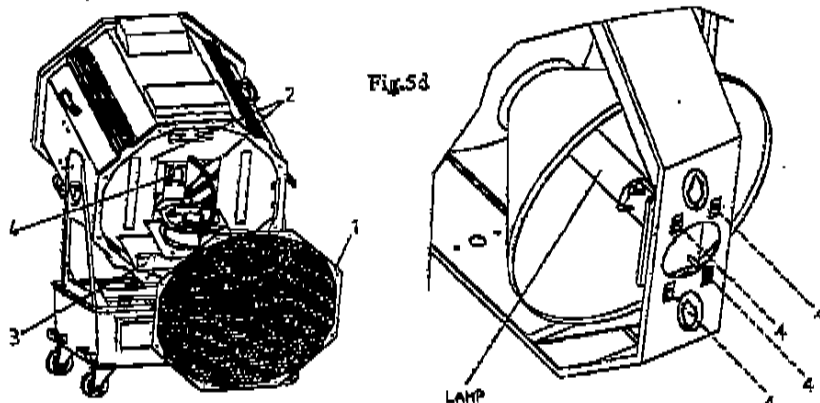


Fig. 5d

1) Untighten the side handles and rotate the upper part of the projector up to the maximum inclination.

2) Set all the dip-switches to OFF position; switch on the lantern and turn the PAN, TILT, and SPEED knobs anti-clockwise; after the starting reset the beam will stop to centre position.

3) Remove the safety grid (1-fig. 5d) untightening the 8 fixing screws.

4) Remove the 2 fixing screws (2-fig. 5d) and gently lower the access cover (3-fig. 5d).

5) Now you can access the 2 exagonal

M6 screws, untighten them and adjust the plate to obtain the right beam of light, then tighten again the screws.

Caution: during lamp setting use protective glasses and gloves.

### 3.4 Mounting position

Position the IMPERIAL on a flat surface. To avoid unwanted movements of the base we suggest to brake the wheels. It's also possible to fix the projector to earth using the brackets supplied (fig. 6).

To install the projector on a roof it's possible to separate the upper part from the base using an extra cable, no longer than 15 m., with the following characteristics: 2x50 mmq+7x1.5 mmq.

### 3.5 Electrical connection

1) Cable the 16 Amps Gewiss plug to a mains cable 3x2,5mm +N+E

2) Connect the plug to the socket fitted on the projector (B) (fig. 2) and then to a mains supply of 210/240V - 50/60Hz.

3) Ensure that the mains cable is connected to earth; the thermoswitch must have the following electrical characteristics: rated for (In) 25A - sensitivity (Id) 0,03A.

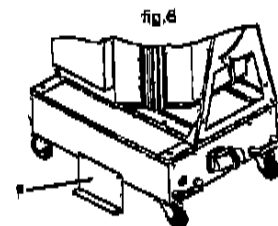
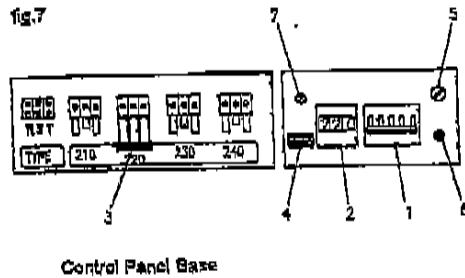


fig. 6

Depending on the value shown on the voltmeter, connect the plug (3-fig.7) to the relevant socket on the panel.  
**Caution:** before making the connection switch off the projector.

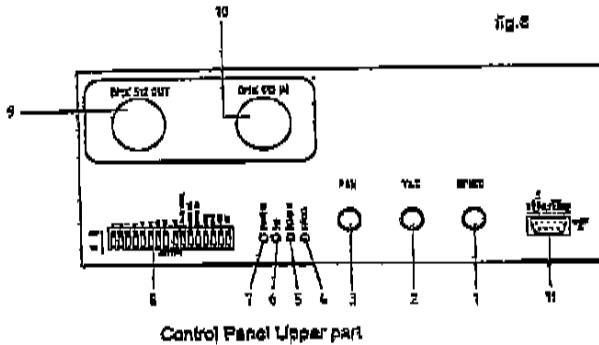


- 1 - Main switch
- 2 - Voltmeter
- 3 - Transformer supply plug
- 4 - Timer
- 5 - On/Off switch
- 6 - Remote lamp ignition socket
- 7 - Fuse

Control Panel Base

#### 4.0 USE OF THE LANTERN

##### 4.1 Control Panel



- 1 - Speed manual control
- 2 - TILT manual control
- 3 - PAN manual control
- 4 - Synchro mode led
- 5 - Defective IC led
- 6 - DMX signal reception led
- 7 - Projector On led
- 8 - Dip-switches
- 9 - XLR socket for connection to another IMPERIAL
- 10 - XLR socket for connection to a DMX controller
- 11 Socket for connection to a 0/10V controller

Control Panel Upper part

##### 4.2 Function in manual mode

Connect the projector to the mains required and switch on the main switch (1-fig.7) located on the rear side of the base; now the Imperial is ready to function in manual mode. The Dip-switches from 1 to 256 must be set on OFF position. The adjustment of the following functions is made by the relevant knobs:

- beam rotation speed (SPEED) (1-fig.8)
- TILT amplitude (2-fig.8)
- PAN amplitude (3-fig.8)

Remote ignition of the Imperial is possible connecting a jack mono plug to the relevant socket (6-fig.7) and to a separate switch. The ignition of the lamp should occur within about 4 seconds (5-fig.7). Should the ignition fails switch off the main switch and try again.

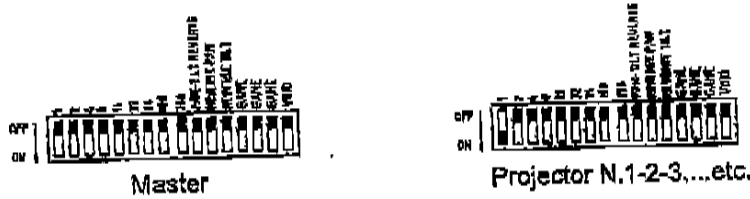
##### 4.3 Function in automatic mode

Position the 3 Dip-Switches GAME alternatively on ON position keeping all the other Dip-switches, from 1 to 256 on OFF position. It will be possible to obtain a sequence of pre-set games (5 different games + 1 in automatic mode). The 5 games will repeat in sequence.



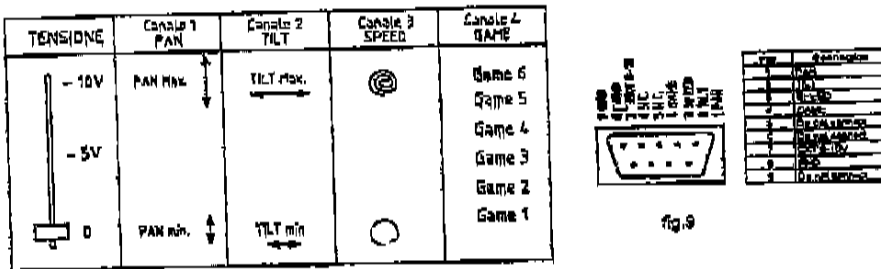
#### 4.4 Function in Synchro mode

In case of use of several Imperial in series, set one of the projector as Master with all the dip-switches of the Master on OFF position. The Master will control all the other projectors and all the sequences and games will run in perfect synchronism. All the Imperials connected to the Master will have the dip-switch n. 1 on ON position. The led (4-fig.8) on the control panel will show the synchro function of the Master.



#### 4.5 Function in 0/10V mode

To manually control the IMPERIAL by remote control, connect a 0/10V controller (4 Ch minimum) to the relevant plug on the control panel (11-fig.8). It is necessary to connect the pin 7 (EXT 0-10) and 8 (GND) as per fig. 9. Keep the dip-switches from 1 to 256 on OFF position.



#### 4.6 Function in DMX standard mode

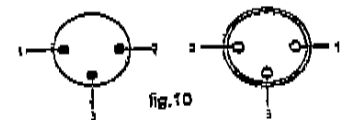
Set the DMX address for every single projector, as follows:

Address	dip-switches value	1	2	4	8	16	32	64	128	256
n. of Projectors	Ch number									
Projector 1	1-2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Projector 2	3-4	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Projector 3	5-6	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Projector 4	7-8	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
Projector 5	9-10	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
Projector 6	11-12	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF

#### 4.7 Given DMX controller GR0176

If one or more Imperial are connected to a Given DMX Controller GR0176 ensure to set the dip-switches as follows in order to control the PAN and TILT movement by Joystick):

Address	dip-switches value	1	2	4	8	16	32	64	128	256
n. of Projectors	Ch number									
Projector 1	5-6	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Projector 2	11-12	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
Projector 3	17-18	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
Projector 4	23-24	ON	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
Projector 5	29-30	ON	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
Projector 6	35-36	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF



The connection of 3 pins XLR plug must be made as follow:  
 pin 1 ———> function GND (SHIELD)  
 pin 2 ———> function SIGNAL -  
 pin 3 ———> function SIGNAL +

Check that the cable are correctly connected. Use a shielded cable.

#### 4.8 Special functions

Dip-switches from 1 to 256 are used to address the channels.

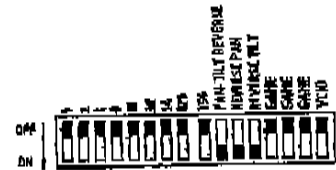
Remaining channels have the following functions:

PAN-TILT-REVERSE: to reverse the rotation axes

PAN with TILT REVERSE PAN: to reverse the rotation movement

PAN REVERSE TILT: to reverse the rotation movement

TILT GAME: to select the pre-set sequences (only function in automatic mode - 1/256 OFF)



#### 4.9 Switch-off the lantern

To switch off the Imperial follow this procedure;

1) Switch off the on/off switch 5-fig.7 (or the remote control)

2) The lamp will switch off

3) If the projector is still hot, the cooling fans and the rotation movement will stop after a while.

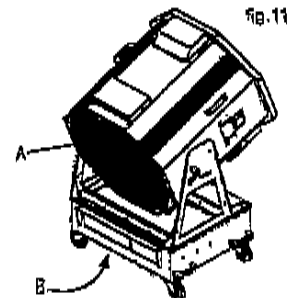
Caution: switching off the projector by the main switch

#### 5.0 MAINTENANCE

All lanterns require regular maintenance to ensure maximum performance and light output.

Please follow these instructions:

- clean the glass and the mirror once a week, as even a thin layer of dust can reduce the light output and scatter the beam;
- replace the lamp if it has become damaged or it's thermally deformed; to avoid problems we suggest to change the lamp after 1000 hours of use or if it has exceeded of 25% the limit indicated by the manufacturer
- replace the glass if it has become visibly damaged;
- carefully check the electrical connections, particularly the earth connection;
- replace all the damaged components
- clean regularly the grid (A and B-fig. 11) located on the base and on the upper part of the projector to avoid occlusions which can cause internal overheating and shorten the lamp life. High temperature activates the safety thermo-switch and consequently switch-off the main switch. Don't use screwdrivers or sharp objects which can damage the fans or the internal parts of the lantern.



#### 6.0 TECHNICAL INFORMATION

IMPERIAL		
Dimensions	mm	734x40x1350
Weight	kg	155
Body		Black painted 316 stainless steel
Operating voltage	V	210-240
Operating frequency	Hz	50/60
Amperage	A	16-18
Suggested lamp		XBO 4000 W/HB OFR QBRAM SFAK 30-8,5 beam SFA 30-B base
Optical system		High reflecting mirror
Fuse		10A
Electrical protection		Thermoprotec + manual + 25A automatic switch magnetothermic switch
Max working temperature	C	- 200 (on glass)
Max ambient temperature	C	50

5 m MINIMUM OPERATING DISTANCE

MINIMUM DISTANCE BETWEEN PROJECTOR AND FLAMMABLE SURFACES: 1 m

## 7.0 REPLACEMENT OF INTERNAL PARTS

**Caution:** Before attempting any maintenance operation we suggest to wait at least 30 minutes to enable the cooling of the lamp and metal parts and to disconnect the mains supply

**7.1 How to remove the rotating mirror assembly**  
To replace some of the internal part of the projector is necessary to remove the rotating mirror assembly. Please follow the instructions below:

- 1) Disconnect the 2 plugs (1 and 2-fig.A) from the ballast mains supply
- 2) Remove the glass holder unfastening the 4 fixing knobs (3-fig.A)
- 3) Remove the cover plate located on the right side of the projector (4-fig.A) unscrewing the 4 fixing screws then remove the motor fixing bracket screw (6-fig.A) and take off the bracket itself
- 4) Remove the fan's fixing screws (7-fig.A) then unscrew the electrical connection screws and remove the fan
- 5) Remove the fixing stripes of the thermal feeler which is located on the side of the cover of the upper part
- 6) Remove the fixing screws (8-fig.A) of the micro switch which is located on the side of the cover of the upper part
- 7) Unscrew the 4 self-tapping screws located on the base of the projector
- 8) It will be possible now, removing the 8 fixing screws (10-fig.A) to take off the rotating mirror assembly.

**Caution:** Please take care that any part of the projectors don't damage the assembly during the taking off.

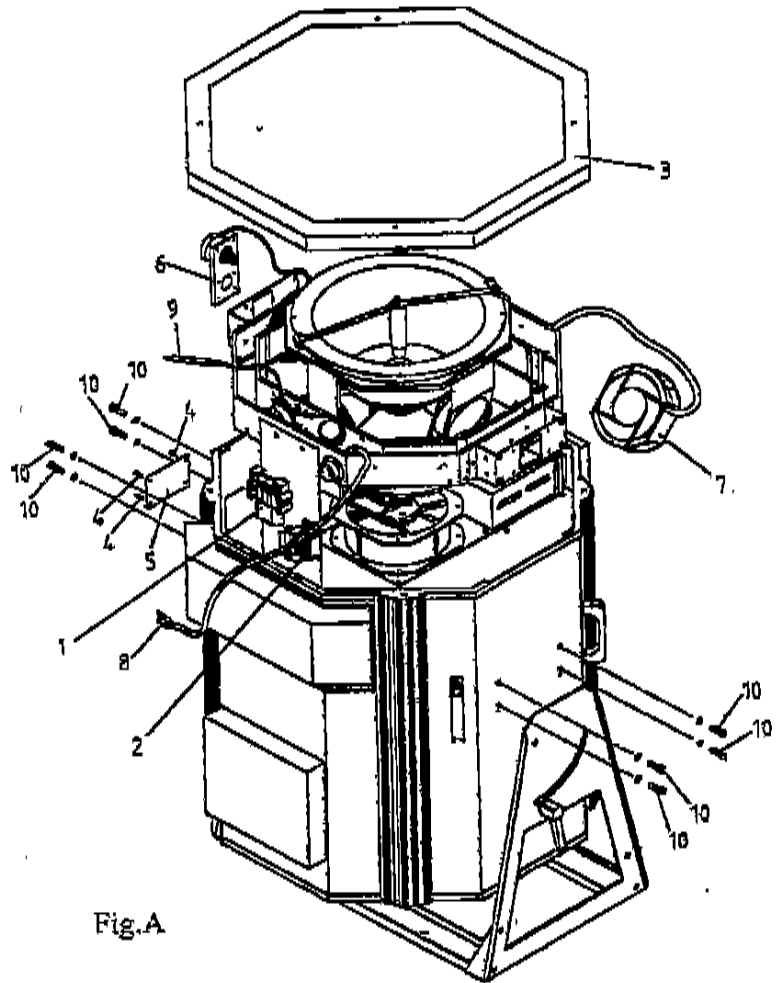


Fig.A

### 7.2 How to replace the ignitor

To replace the ignitor (pos.26-fig.3, Upper part exploded diagram) follow the instructions below:

- 1) Keep the upper part in vertical position; open the cover of the mains group (1-fig.B) by removing the fixing knobs
- 2) Remove the screws (2-fig.B) that fix the ignitor to internal the supporting bracket
- 3) Disconnect the mains from the ignitor carefully noting the position of the connector in order to be able to reposition them correctly
- 4) To remove the ignitor please refer to the following paragraph

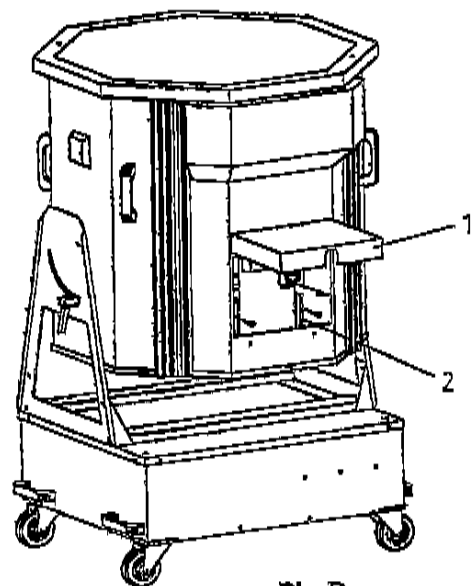


Fig.B

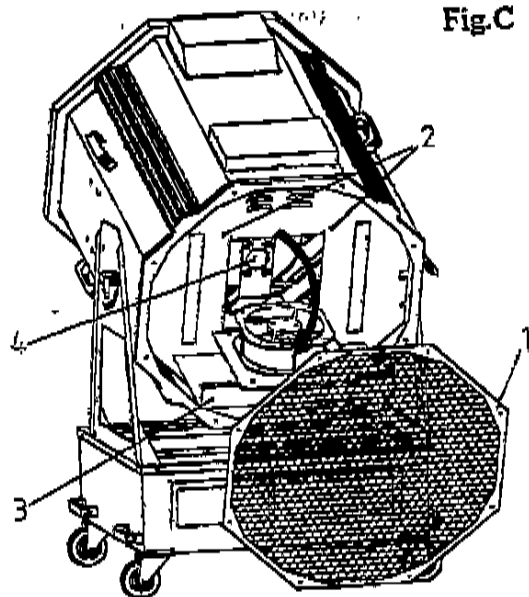
### 7.3 How to access the upper part base

Please follows the instructions below:

- 1) Untighten the side handles and rotate the upper part to reach the maximum inclination
- 2) Remove the safety grid (1-fig.C) unscrewing the fixing screws
- 3) Remove the fixing screws (2-fig.C) and gently lower the access cover

#### 7.4 How to replace the transformer (upper part)

To access the upper part transformer (pos.28-fig.3, Upper part exploded diagram) proceed as per instructions of paragraph 7.3  
Remove the fixing screws and replace the transformer



### 8.0 TROUBLESHOOTING

#### 8.1 The lamp doesn't light while fan and rotating mechanism work

- 1) Check that the mains connectors (black and grey) that connect the ballast to the upper part are correctly inserted
- 2) Check that the mains plug of the ballast's transformer (Ballast rear cover - see instructions leaflet pos. 3-fig-7) is correctly inserted
- 3) The ignitor is faulty. To check it follow the procedures below:
  - position the on/off switch (5-fig.7 instructions leaflet) on OFF position
  - switch on again positioning the switch on ON
  - open the Controls cover of the upper part: if within few seconds you don't hear the typical buzzing of the ignition (about 1 sec.) it means that the ignitor is faulty

To replace the ignitor refer to the paragraph 7.2

If the ignitor works properly please refer to the paragraph 9.0

- 4) The internal cables that supply the lamp, after long time can be damaged.

#### 8.2 The lamp lights up for 5 sec. then switch off

- 1) Check that the mains supply to the ballast (rear ballast trap) is correctly inserted.

#### 8.3 The lamp lights up and the fans don't function

- 1) Check the fuse (10A) near the Timer on the Control Panel of the base (7-fig.7 Instructions leaflet)
- 2) Using a tester check that all the phases 380V + neutral are supplied.

#### 8.4 The lamp lights up, the rotating mechanism stops in the middle

Check the Dip-switch setting on the Control Panel. Refer to the paragraph USE OF THE PROJECTOR on the Instructions leaflet.

#### 8.5 The projector works properly but after 20/25 min. the general switch automatically disconnect

The safety thermo-switch activates due to a overheating

- 1) Check that the safety grid are not obstructed
- 2) Check that all the cooling fans works properly

### 8.6 General switch automatically disconnects as soon as it is activated

- 1) The glass cover which activates the safety micro-switch, has not been correctly mounted (8-fig.A)
- 2) The micro-switch has not activated. Probably the metal wing are not correctly folded.

### 8.7 The lamp doesn't light up, the fans work properly but the ballast is noisy

There should be a short circuit on the photo-diode connection. (pos.2-fig.1; Ballast exploded diagram). To verify if there is a short circuit, check on the Ballast (Upper part must be disconnected) the current consumption (on 380V phase) using an Ammeter:

- 1) If the value is about 0.8A there is no short circuit
- 2) If the value is about 9/11A there is a short circuit; replace the photo-diode taking care of the polarities + and -

### 8.8 Special setting of the ballast

It is possible that after several ignitions, the scintillator (3-fig.G) inside the box of the ignitor must be adjusted. The scintillator is a small bulb fitted with 2 electro-diodes that after some time worn out so it is necessary to bring them near one to the other. To make this adjustment please follow the points below:

- Remove the ignitor (pos.26-fig.3) as per instructions of paragraph 7.2
- Remove the ignitor cover unscrewing the 4 fixing screws
- Unscrew the 2 external bolts (1-fig.G) that fix the scintillator
- Screw one of the diodes of about 0,5/1 mm and fix the bolt n. 2 (fig.G)
- Reposition the scintillator inside the ignitor
- Close the ignitor

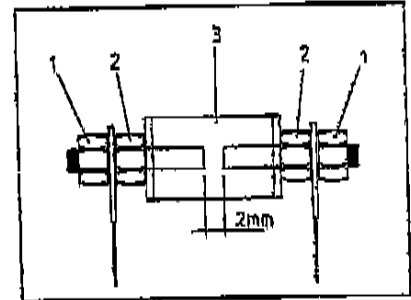


Fig.G

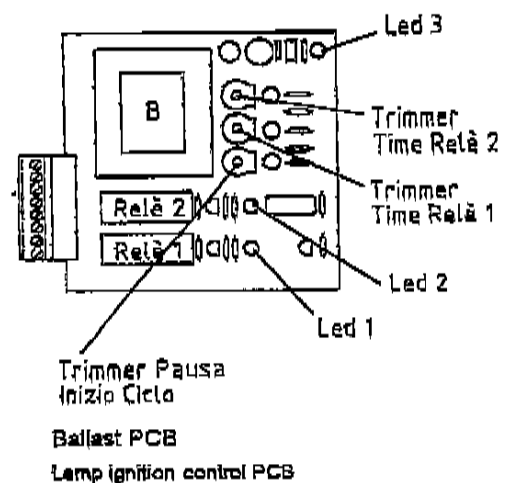
### 9.0 BALLAST GROUP OPERATION CONTROL

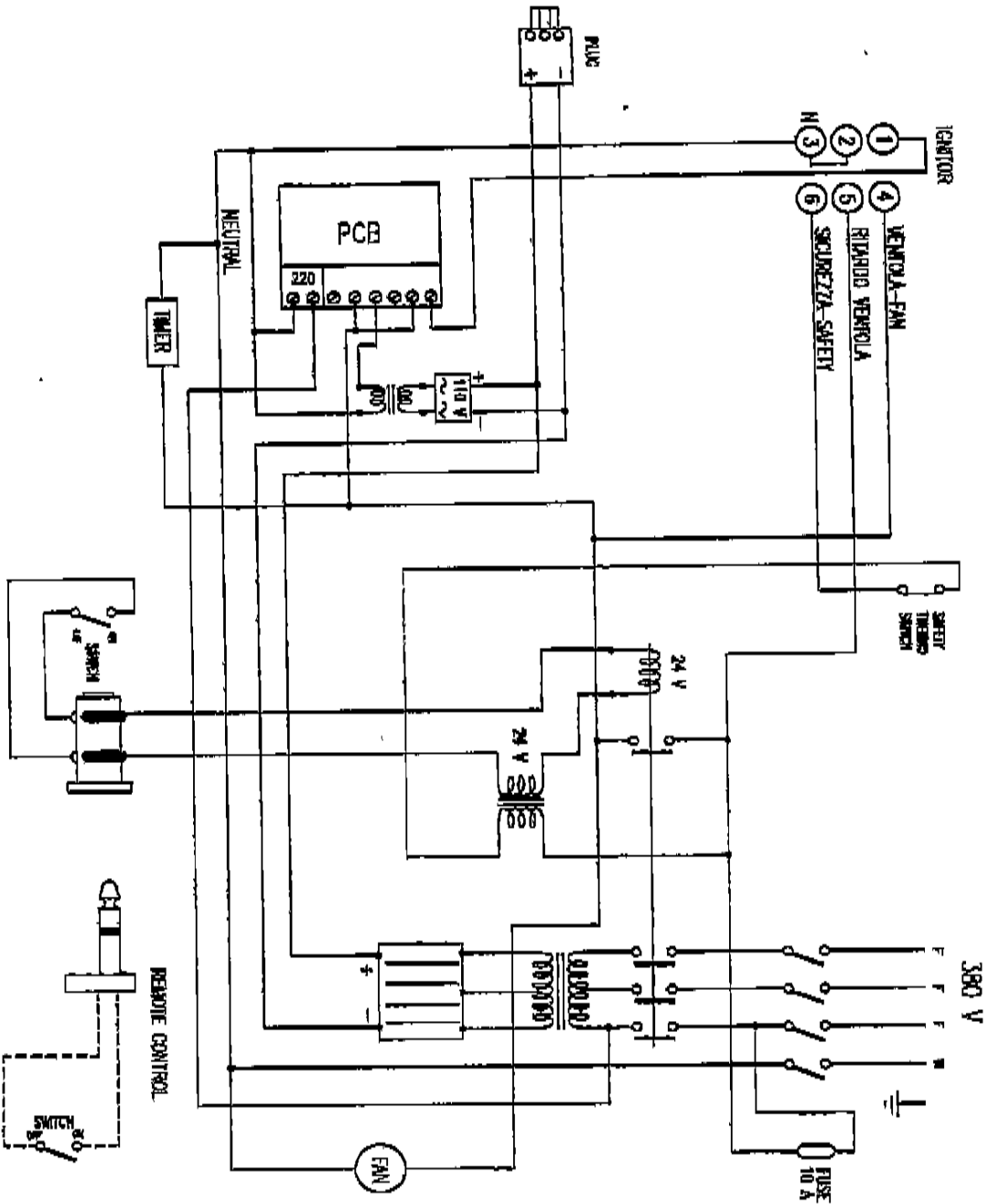
Caution: this control must be made only by expert technicians. All the parts of the projector, during operations, are under voltage

- 1) Disconnect the 2 mains connector from the Upper and Ballast assembly;
- 2) Remove the 4 fixing screws and separate the base from the upper part;
- 3) Remove the cover from the base unscrewing the 8 fixing screws;
- 4) First of all check that the electrical system inside the ballast unit is in good conditions (check that cables are not damaged, the screws well tighten ...)
- 5) Switch on the Main switch
- 6) Put the on/off switch on position ON
- 7) The contactor (pos.14-fig.1) will be excited
- 8) Check carefully the circuit board (pos.10-fig.1) that control the ignition of the lamp:
  - a) Simultaneously to the activation of the contactor the led 3 will light up
  - b) after 1 sec. the led 1 and relè 1 and 2 will light up
  - c) after 1 sec. led 1 and relè 1 will switch off, interrupting the mains to the ignitor that, in the mean time has sent to the lamp a discharge of 15000V
  - d) after 4 sec., led 2 and relè 2 will switch off, disactivating the transformer B that in the mean time has sent current to the lamp for 5 sec. at a supporting voltage of 110V DC

### SPARE PARTS

All components are available for the IMPERIAL and the exploded diagram and catalogue are available on request.





Nome	Rita della revisione		Data	Firma	Controllo
Autore	Disegnato	Verificato	Revisione	Approvato	Stampato
Modello	LAPORAIL		Rev.	1 di 2	
Schema elettrico funzionale circuito di bobine - SE-035-1					

