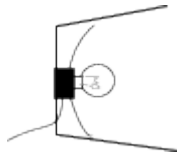


# TYPES OF LANTERN

The equipment that is used to produce light on a stage is known as a lantern (or instrument). There are broadly **five** types of lantern in the world of stage lighting.



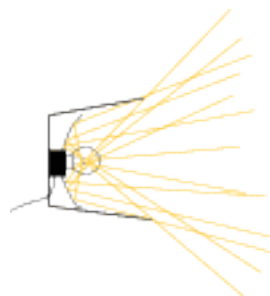
Strand Patt. 137  
Flood



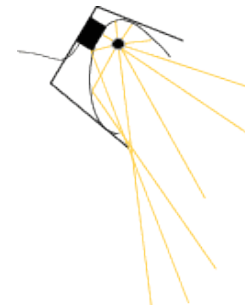
Symbol for a flood  
on a lighting plan

## 1) FLOOD

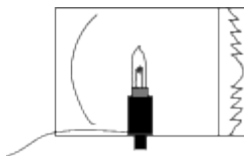
This is the simplest type of lantern, consisting of a lamp and a reflector in a box, with no lens. The reflector concentrates the light towards the opening in the box. There is no control over the focussing of a flood, other than its general direction. Some floods have an asymmetric / directional reflector and are designed to light cycloramas. Older type symmetrical floods use standard ES (Edison Screw) or GES (Giant Edison Screw) filament lamps. The newer asymmetrical reflector floods (often called **Cyc Floods**) use linear lamps (to ensure an even cover across the reflector).



Symmetrical reflector



Asymmetrical reflector



Strand Cadenza Fresnel



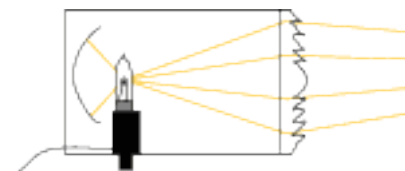
Symbol for a  
Fresnel on a lighting

## 2) FRESNEL

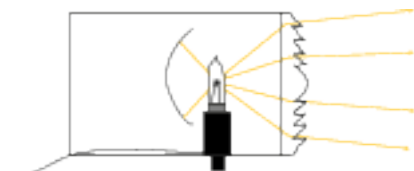
The Fresnel (pronounced "Frennel") is a soft-edged spotlight with more control over beam angle than floods, but less control than profiles.

The lens is a series of stepped concentric circles on the front and pebbled on the back and is named after its French inventor, Augustin-Jean Fresnel (1788-1827). He developed the lens for French lighthouses so that they could be seen further out to sea and could achieve a longer focal length with a lot less glass than a standard plano-convex lens. It was first used in stage lighting in the late 1920s.

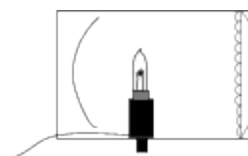
The size of the beam can be adjusted by moving the lamp and reflector closer to or farther from the lens, either by a screw mechanism or a simple slide. The beam can be shaped by the four barndoors attached to the front of the lantern.



Fresnel "spotted down"



Fresnel "flooded"



## PC

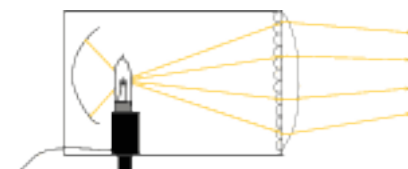
The PC is common in Europe, but is rarely seen in the US. The basic design of this lantern dates back to the first days of stage lighting, but the modern version has one important difference. This lantern uses a modified plano-convex lens with a pebbled effect on the plano (flat) side. The pebbled effect gives the beam its characteristic soft edge. The edge of the beam is slightly harder than a Fresnel, but is not hard edged. The pebble convex lens uses the efficiency of the plano convex lens and gives the light a softer edge. Like a Fresnel, there is one focussing knob to change the beam angle.



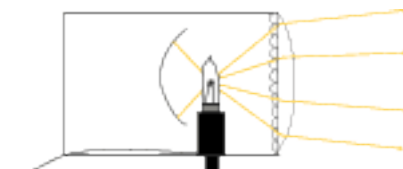
Strand Cantata PC



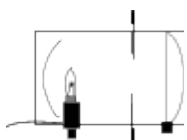
Symbol for a PC on a lighting plan



PC "spotted down"



PC "flooded"



## PROFILE

Profile lanterns produce clearly defined spots of light and are the most focusable and versatile of the lanterns. They have a lens (some have two lenses), a lamp and a reflector, and they also have shutters and a gate.

Profiles get their name from their ability to project the shape of anything placed in the gate of the lantern between the lamp and the lens. These shapes may be formed by the shutters, or they may be cut out of thin metal (a "gobo" – see diagram right). An **iris diaphragm** (usually known as an **iris**) can be inserted in the gate to allow the beam size to be reduced down to almost nothing, to achieve a very tight spotlight.

Some profiles with only one lens have two sets of shutters, one of which gives a hard edge to the beam, and one which gives a softer edge. These are known as **bifocal profiles**.

Profiles with two lenses (**zoom profiles**) are best for projecting gobos and other shapes, as the size and sharpness of the beam is fully adjustable throughout the beam angle range of the lantern.

A zoom profile lantern is known by the range of its beam angle (e.g. Prelude 16/30, Cantata 18/32 are both zoom profiles from Strand Lighting's range).



Strand Pattern 23 (1951)



Strand Prelude 16/30



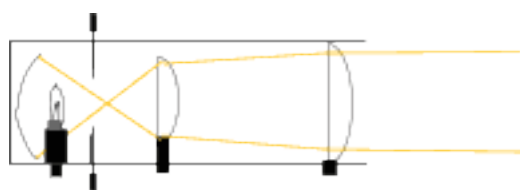
Strand Leko 40



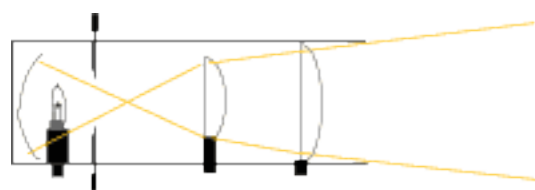
Ellipsoidal profile spots are sometimes known as **ERS** (Ellipsoidal Reflector Spots). A **followspot** is a special type of profile lantern with additional controls, extra handles, sights, built-in colour changer and iris, and is usually of much higher power.

One popular followspot for large shows and arena concerts is made by Strong International and is called the **Super Trouper** (see photo, left). You may recognise the name; whilst on tour, ABBA decided to write a song about their favourite bit of stage lighting equipment. Don't believe me? Check out the lyrics:

"Tonight the / Super Trouper lights are gonna find me / Shining like the sun / Smiling, having fun / Feeling like a number one"



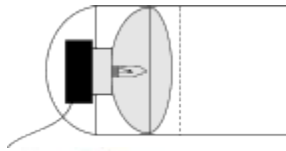
With the lenses far apart, the beam is narrow



With the lenses close together, the beam is wider.



Symbol for a profile on a lighting plan (derived from the shape of early profiles, like the Pattern 23 above)



Strand Parblazer 4



CP62  
MEDIUM

CP60  
VERY NARROW

CP61  
NARROW



Symbol for a paracan on a lighting plan



A Birdie made by James Thomas Engineering



MR16 lamp (GE Lighting)

## 5) PARCAN

This lantern first came into use in the 1970's in the Rock and Roll industry. It quickly found favour due to the relative cheapness of the lantern, the weight and the ease of focussing. The lantern itself is simply a "can" in which the PAR lamp is contained (hence "Parcan"). The PAR (Parabolic Aluminised Reflector) lamps are available in a range of beam angles (see table below), depending on the amount of diffusion on the front lens of the lamp. The lamp is a sealed beam unit consisting of a lamp, reflector and lens in one.

Because the light produced can be very intense, Parcans are especially suited to strong colours or for special effect. Be aware that deep colours can burn out quickly at full intensity.

The beam produced by a Parcan is an elliptical projection of the filament of the lamp, and this can sometimes be seen (as shadowed lines across the beam) in the Narrow lamps. The elliptical beam can be rotated simply by rotating the lamp. Access to the lamp is via the rear of the lantern.

### PARCAN BEAM ANGLES (Par 64)

UK/Europe lamps are in blue, US lamps in red

Name	1000W	500W	Volts	Beam Angle
Extra Wide Flood (Often known as EXG)	??		120	70°
Extra Wide Flood (Often known as EXG)	CP95	CP??	240	70 x 70°
Wide Flood	FFS/No.6		120	??°
Medium Flood	FFR/No.5		120	24°
Medium Flood	CP62	CP88	240	11 x 24°
Narrow Spot	FFP/No.2		120	14°
Narrow Spot	CP61	CP87	240	10 x 14°
Very Narrow Spot	FFN/No.1		120	10°
Very Narrow Spot	CP60	CP86	240	9 x 12°

Although the 240V lamps are most often used in the UK, 110V PAR lamps are often used in large UK venues or for touring due to the increased light output. Because the current is greater, the lower voltage lamps have smaller thicker filaments which give a more focussed beam than the thinner 240V filaments.

Standard parcan lamps have a GX16d cap.

## 5a) BIRDIE

A birdie is a miniature lantern that's ideal for hiding in small parts of a set or along the downstage edge of the stage. It provides a surprisingly bright soft-edged pool of light. Although the beam is sometimes unevenly spread, the benefits of having a punch of light where no normal lantern can go are massive.

Where does the name come from? Well, you see the birdie looks a little like a parcan, but is a lot smaller? You could say, it's "One under Par" – which, as every golfer knows, is called a "birdie".

The birdie is a uses a PAR16 lamp (i.e. the lamp is a reflector lamp which is 16 eighths of an inch across = 2 inches or 50mm).

In the UK, Birdies usually take MR16 lamps, which are 12 volts. Each birdie then has a transformer connected to it to feed it with the correct voltage.

In the USA, Birdies usually take 120 volt lamps.

The MR16 lamp has a dichroic reflector which does not reflect heat along with light – the heat dissipates through the reflector and out of the rear of the light fitting. This means the beam from a birdie is much cooler than that from a standard theatre lantern, making it much more suitable for sensitive areas (e.g. museums, old buildings).

There are a massive range of MR16 lamps available due to their widespread use in a lot of industries.