

The roadie's best friend

The PAR can: lightweight, sturdy, cheap, and bright

By Katherine Shirek Doughtie

THE PARABOLIC aluminized reflector, universally referred to as the PAR or PAR can, is to stage lighting as the four-door family sedan is to transportation. It's not luxurious and it's not exactly a high-performance vehicle, but it's a reliable, functional and relatively cheap way to get you where you want to go.

The PAR can is the simplest and least expensive of lighting instruments. Its light source, the PAR lamp, is a sealed beam lamp made like car headlights used to be, back when they were round and the lamp, reflector, and lens were a single unit. It has a housing shaped like a coffee can with a yoke for hanging, and a power cord, and that's about it.

PAR cans can be configured in banks and used to create vibrant color washes. The lamps are easy to change, and some types are even available at your local hardware store.

PAR cans—which were invented, by the way, by Clarence Birdseye, better known for his work with frozen peas—first came into use in the 1970s with the advent of large rock and roll touring shows. PARs provide a very basic source of light. They do not have shutters, nor can the beam be adjusted except by changing out the lamp. You can add color by using gel, and you can shape the beam (sort of) with barn doors. That's about the extent of your ability to fine-tune the light output.

The PAR is, in short, unrefined and inelegant. But when you need a sturdy

instrument that produces a lot of light, can be focused quickly and efficiently, and makes it possible to hang a big palette of color on a thin budget, it is just what the doctor ordered.

How it works

PAR fixtures are very simple and efficient because the reflector, filament, and lens are all optically aligned and sealed into the lamp at the factory. The beam spread of a PAR is determined by the design of the lamp, not by the design of the fixture.

Beam angles depend on the diffusion characteristics of the lamp's lens. There are five common beam angles: extra wide flood, wide flood, medium flood, narrow spot, and very narrow spot.

The PAR's beam is rectangular and very bright. Sometimes you can see the filament casting a shadow across the beam.

The shape of the beam can be troublesome when you're trying to focus a smooth wash. In that instance you will make the only adjustment possible with a PAR can, rotating the axis of the lamp. It's a good practice to always align all of the PARs in a wash so they blend together. Access to the lamp is through the back of the housing.

The PAR is frugal with energy. A 1000-watt PAR lamp is extremely efficient at producing light, more so than an equivalent 1000-watt ellipsoidal or Fresnel fixture.

The PAR lamps used for stage and studio applications are typically 1000 watt PAR64s. Smaller PAR lamps, such as the PAR56 or PAR38, are used for display and architectural applications. The number included in the PAR's name is the lamp diameter expressed in eighths of an inch. Thus to determine the size of a PAR lamp in inches, divide the number designation by eight.

The rest of the PAR can is, well, a can. Most PAR fixtures are nothing but a cylindrical metal chassis open on one end and closed with a hemisphere on the other, combined with a yoke, C-clamp and power cord. The fixture is generally available in both steel and aluminum.

Because PARs are so lightweight, they are often rigged in groups of four, six, twelve or more instruments. They can be hung on trees positioned on the floor in circumstances where space is restricted, or for uplighting onto a cyc or flood lighting with very wide bulbs.

Pin spots

The pin spot is a variation on the PAR that can be useful for many stage and entertainment lighting applications. Pin spots are small, low voltage PAR lamps, in a basic can-type housing, with a very narrow beam spread, ranging from about 5 to 10 degrees.

On stage, pin spots can be very useful for providing accents, highlights, and specials. This low cost fixture produces

Simplicity with a power cord, the PAR is essentially a lamp in a can. For twenty-five years PARs have been the instrument of choice for lighting touring rock and roll (facing page), where they're used as a design element as well as a way to put a wash of colored backlight on the players.

an almost parallel beam of light (similar to a beam projector) and can be used to provide special very tight lighting on actors and objects.

All PAR lamps for pin spots are low voltage and operate on 5.5, 6, 12, 24 or 28 volts. All pin spots require transformers to step down the house voltage to the correct lamp operating voltage. Usually, the transformer is incorporated into the rear of the fixture. Most pin spots can be dimmed from conventional dimming systems and most have color frame clips.

Accessories

PARs do not have shutters like the ellipsoidal reflector spotlight, so to change the shape of the beam or light a smaller area, a *barn door* may be used. Barn doors consist of two to four hinged metal plates arranged into a square and fitted to the front of the instrument. The barn doors can be adjusted in and out to cut the light to the necessary size, but they're a pretty crude way to shape a beam of light. If you really need to fine tune the focus with some precision, you should be using an ERS rather than a PAR can.

PARs do accept gel color. The color frame for a PAR64 fixture is usually 10" x 10". Because the light produced by a PAR is very strong, it's well suited to saturated colors. However, watch out for deep colors, especially blues, as they burn out quickly at high intensity.

What are PARs used for?

Most professional theatres don't use a lot of PAR cans because they can afford not to, but for small companies and school theatres, PARs are a good way to get a lot of light on the stage cheaply and efficiently. The most common way of using them is as a stand-in for Fresnels and for broad color washes.

You won't want to use a PAR can when you need a sharp edge, when you need a very specific area lit, or when you need a round beam of light. You will want to use a PAR can when you need a lot of light,



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need washes of colors of light, and when weight or cost is a consideration.

PARs and Fresnels are very similar in functionality. Fresnels have the benefit of being able to spot in or flood out, and they have an even, circular beam projection. Because of the design of the Fresnel lens, the quality of the light itself tends to be smoother and richer than that of the PAR.

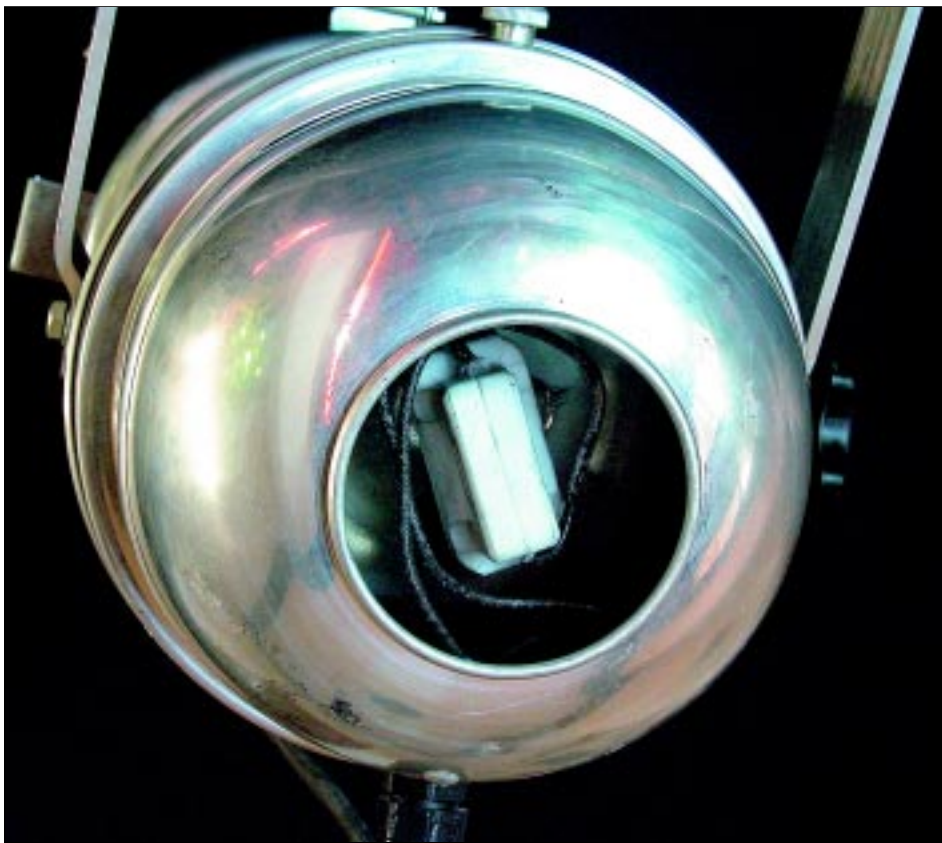
PARs, on the other hand, because they are so light and relatively inexpensive, can be used to splash a lot of different colors on the stage. They quickly became the instrument of choice for lighting touring rock and roll because

they're so effective as a scenic design element. Hung from a truss upstage of the band so the lenses are visible to the audience as bright gel-colored disks, PARs help frame the stage, put a soft backlight wash on the act to give dimension to the follow-spot front light, and produce a distinctive beam effect when used with smoke.

Quick and easy to hang and focus, PAR cans are a roadie's best friend—well, among the top five, anyway. You can hang them on trusses and load them out of a truck and onto the stage in preset formations. Because they are lightweight both on your rigging and on

Refinements

In recent years lighting manufacturers have been working on ways to improve the PAR. ETC's Source Four PAR, available in several configurations, delivers a smooth even field, and at 575 watts is comparable in output to a 1000-watt PAR64, using 40 percent less power. It comes with a set of four snap-in lenses that mount in a rotating ring. Altman makes a similar unit, called the Star-PAR. Both of these models are compact, meaning more lights can be mounted on a pipe or fit into a truck, nice when you're on the road. ETC's PARNel is a hybrid that combines Fresnel functionality with the performance of a Source Four PAR, producing a smooth, soft, symmetrical field that you can spot or flood like a Fresnel.



The only adjustment possible with a PAR is alignment of the rectangular shaped beam, which is done by rotating the ceramic lamp base, accessed through the back of the instrument.

your budget, they give you a nearly unlimited ability to use all the gel colors in your swatch book.

Focusing a PAR can

There's very little to do to focus a PAR can.

Loosen the C-clamp and the yoke until you are able to move the instrument horizontally and vertically. Point it where you want the light and lock it down.

If you want to add color to the instrument, you can put a gel in the holder at the front.

Adjust the orientation of the rectangular beam, if necessary, by rotating the lamp from the rear of the housing. Wearing a leather glove, reach through the opening in the back of the instrument to twist the ceramic lamp base.

To reduce light spill, you can add a barn door and adjust the flaps.

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This is the third article in an occasional series on the fundamentals of stage lighting. The first installment, in January 2002, covered the ellipsoidal reflector spotlight or ERS. The second, on the Fresnel, ran in November 2002.

What kind of instrument should I use?

Requirement	ERS (Leko)	Fresnel	PAR
Dramatic production	Useful for focusing around sets, producing intricate shapes	Good for washes	Good for back washes and down light
Live music lighting	Useful for tight spots or special effects (such as gobos)	Useful for washes but heavier than PAR cans	Lightweight and easy to use
Touring and handling	Delicate	Not as fragile	Sturdy and lightweight
Change shape of the light	Adjust using shutters	Crudely, with barn doors	Crudely, with barn doors
Create soft/hard edges	Adjust by focusing internal lenses	Beam edges always soft	Beam edges always soft
Add color	Use gel	Use gel	Use gel
Change size of beam	Adjust using shutters	Spot in or flood out	Change lamps
Gobos	Can produce patterned effects	Nope	Nope
Budget requirements	\$\$\$	\$\$	\$