[0146] Another preferred embodiment of a 1.25 inch diameter lens system **52** with a larger field of view is illustrated in **FIG. 5B**. Three lens elements **51**, **53** and **55** enlarge the image on the display **54**.

[0147] The lens **65** of **FIG. 5A** can be used in the alternative display assembly of **80** of **FIG. 5C**. In this embodiment, the display **82** is positioned between the backlight housing **84**, containing LED **86**, and the lens housing **88** that holds the lens **65** in a fixed position relative to the display **82**.

[0148] A microdisplay system **360** utilizing a folded optical path is illustrated in connection with **FIG. 5D**. In this embodiment, an LED array **362**, or other light source, illuminates the display within housing **364**. The display **366** directs an image along a first optical path **372** that is reflected by mirror **368** along a second other path **374** through the lens **370** as described previously.

[0149] Another preferred embodiment of the backlight system is illustrated in FIGS. 5E-5G. The backlight **375** includes a reflective bowl **376** with an inner concave surface **382** that reflects light emitted by the LEDs **380** onto the active matrix region of display **377**. The LEDs **380** are mounted on a circuit board **378** that is electrically connected to the timing circuit described previously. The system **375** can also include a heat sink **379** for applications requiring thermal isolation of the display circuit from the backlight circuit. The element **379** can be a silicon carbide, silicon, or aluminum nickel plate or wafer. The element **379** can be insulated from the display **377** with layer **381** such as an adhesive. The circuit board **378**, element **379** and optional layer **381** have openings that are aligned to provide an aperture **383**.

[0150] A preferred embodiment of printed circuit board **378** on which the LEDs are mounted is shown in **FIG. 5F**. In this embodiment **16** or **18** blue, green and red LEDs.**386** are positioned around opening **384**. Another preferred embodiment utilizing **8** LEDs **386** is illustrated in **FIG. 5G**. Fewer LEDs allow the circuit to operate at lower power. Additionally, for color sequential operation, where frame rates are relatively high, the LEDs are driven at higher rates to increase brightness.

[0151] Another preferred embodiment of a backlight is illustrated by the system **390** of **FIG. 5H**. In the embodiment the circuit board **395** on which the LEDs **396** are mounted is positioned underneath the reflective bowl **394** with the LEDs **396** mounted on a post **399** extending through opening **398**. Light is diffusely reflected by bowl through diffuser **392** onto display **391**.

[0152] **FIG. 5I** illustrates a backlight housing **84** with an aperture on one side through which light exits the housing and is directed through the display. The housing has a base and sides **135** in the folded opened view of **FIG. 5J**. The display is mounted onto plate **393**. The display **391** can be connected to external connectors **137** by flexible circuit boards **136** which wrap around the sides of the bowl. The backlight housing preferably has a volume of less than 0.5 cubic inches. The display module has a volume of less than 2 cubic inches and preferably less than 20 cm^3.

[0153] A system having a volume less than 15 cm^3 is illustrated in connection with FIGS. **5K-5O**. **FIG. 5K** is a perspective view of an assembled display module **470**. The exploded view of **FIG. 5L** shows the elements of system **470** in detail. The backlight reflector is positioned in back light housing **473** which can be adhered directly onto the display **475** with an epoxy adhesive or with an optional clip **474**. The display is held by a display holder **476** which can also serve to define the visual border for the active area of the display as seen by the user through transparent window **482**. The holder **476** is attached to holding panel **477** which retains ring **478** within the proximal end of housing element **471**. The ring can be manually or electrically actuated to rotate and thereby translate optics holder **472** along the optical axis **486**. A pin **479** can be used to couple the holder **472** to internal helical thread of ring **478**. The lens **480**, an optional second lens within the distal end of holder **472**, a color correction element **481** and window **482** can all be held within holder **472** which moves relative to the display to focus the image thereon.

[0154] Element **470** fits snugly within an external housing such as that shown in **FIG. 13**F, or within the other device housings as described herein.

[0155] An exploded view of a preferred embodiment of the backlight relative to the display **475** is shown in **FIG. 5M**. The display circuit and LED backlight are mounted on circuit board **483**. Preferably, two or three LEDs are used to provide two or three colors, respectively. Between the backlight housing **473** and the display **475**, a brightness enhancement film **484**, such as the "BEF" film available from **3M** Corporation can optionally be used along with a diffuser **485**. As seen in **FIGS. 5N and 5O**, the circuit board **483** mounted on a first side of housing **473** and the backlight active area is defined by the diffuser **485** on a second side of the housing **473**.

[0156] An exploded view of an alternative embodiment of the backlight is shown in **FIG. 5P**. A backlight housing **1473** has a plurality of compartments **1475**, four being shown in the Figure by way of example. The LED backlights are mounted on a circuit board **1483** in groups **1485** which compliment the compartments **1475** of the housing **1473**. Preferably, two or three LEDs are used per group to provide two or three colors, respectively. A brightness enhancement film **484**, such as the "BEF" film available from **3M** Corporation can optionally be used along with a diffuser **485** between the backlight housing **1473** and the display.

[0157] The color correction element **481** can be a transparent molded plastic kinoform having a contoured surface with circular steps that introduce phase corrections into the incident light. The configuration of a preferred embodiment of a single lens **480** positioned adjacent the kinoform **481** for a QVGA display **475** is illustrated in **FIG. 5Q** with dimensions in millimeters. The kinoform can be made of an acrylic material molded to form a concave surface **481***a* facing the lens. The suface **481***a* can have an antireflective coating thereon to increase the transmission. The concave surface is divided into a number of zones of different radii and width. Each zone is separated by a step in the surface. The QVGA display preferably has between 150 and 300 zones whereas a 640×480 display has between 500 and 1000 zones. For a kinoform having 196 zones, the first three zones with intervening steps **481***b* being illustrated in **FIG. 5R**, the zones dimensions, curvature and height are exemplified as follows: