Lumina-FHD

BOM:

Component	Model/Description	Key Specs	Cost (₹)
COB LED	Chanzon High Power LED Chip	100W, 6000–6500K, 3000 mA, 30–34 V	3,548
LCD Panel	Innolux N156HCA-EN1	15.6″ FHD (1920×1080), IPS, 30-pin eDP	7,500
Projection Lens	GLOBALIBAY F240 Triplet Lens	240 mm focal length	3,700
Liquid Cooler	Ant Value AV240 AIO	240 mm radiator	3,219
Cooling Fan	Noctua NF-A14 industrialPPC-2000	140 mm, 2000 RPM, PWM	2,949
Boost Converter	DC-DC Step-Up Module	12–35 V, up to 6 A	246
Buck Converter	LM2596 (Pack of 2)	3 A, adjustable	241
Power Supply	Electronic Spices SMPS	12 V, 10 A, 120 W	369
LCD Controller	HDMI → eDP Driver Board	1080p, 30-pin eDP	3,636
Fresnel Lenses (×2)	oddpod A3 Fresnel Sheets	A3 size	5,998
Condenser Optics	Chanzon Optical Glass + Holder	44 mm, 60°	1,537
Thermal Cut-Out (Safety)	KSD-9700 Automatic Reset Switch	NC, 85 °C, 250 V 10 A	300
TOTAL			**₹33,243**

Product Links:

Chanzon High Power Led Chip 100W White (6000K-6500K / 3000mA / DC 30V-34V / 100 Watt) Super Bright Intensity SMD COB Light Emitter Components Diode 100 W Bulb Lamp Beads DIY Lighting (₹3548)
https://www.amazon.in/dp/B01DBZHUXA/?coliid=I2BGKZ4LDH5T1X&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_T9T2RQN1H9MZ90V0MCZJ

Innolux N156HCA-EN1 15.6-inch FHD IPS LCD LED Laptop Screen Display (1920 x 1080, 30-Pin eDP (₹7500)
https://pctech.co.in/Innolux-N156HCA-EN1-15.6-FHD-Laptop-Screen?srsltid=AfmBOopZC2PnxyM53kGrcTss6It1zIkFCYimV5ZUjL7XvKJEHjplkJaG&utm_source=chatgpt.com

GLOBALIBAY F240 Triplet Projection Lens DIY Projector India (₹3700)
https://globalibay.com/products/globalibay-f240-triplet-projection-lens-diy-projector-india

Ant Value AV240 240mm CPU Liquid Cooler/AIO - Black | Static RGB| Support Intel - LGA115X/1200/1700/1851/1366/2011/2066, AMD - FM1/FM2/AM2//AM2+/AM3/AM3+/AM4/AM5 (₹3219)
https://www.amazon.in/dp/B0DVZC58F9/?coliid=I7CO7JGNH7PFP&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZHMD7GQTVBQ6150XM3S1

Noctua NF-A14 industrialPPC-2000 PWM Fan (140x140x25mm 4-pin PWM, 2000rpm max., IP52) (₹2949)
https://www.amazon.in/dp/B00KESSUDW/?coliid=IDWEHQPHJPASU&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZHMD7GQTVBQ6150XM3S1_1

150W Dc-Dc Boost Converter 12-35V/6A Step-Up Adjustable Power Supply (₹246)
https://www.amazon.in/dp/B0CFLXL3ZS/?coliid=IJ7TXPWV723NK&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZHMD7GQTVBQ6150XM3S1_3

Electronic spices Pack of 2 LM2596 DC-DC Step Down power supply module 3A voltage regulator 24V 12V 5V 3V 4.0-40 to 1.3-37V (₹241)
https://www.amazon.in/dp/B08WRNDMWD/?coliid=I30XH1ULI96JTA&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZHMD7GQTVBQ6150XM3S1_4

Electronic Spices 12V 10A 120W SMPS LED Driver Power Supply | AC 175–265V to DC Converter (₹369)
https://www.amazon.in/dp/B0FWJWS5Z4/?coliid=I3SLHLDJV4QWEQ&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZHMD7GQTVBQ6150XM3S1_5

HDMI Input Controller Board Kit LCD Driver Board for 11.6' 13.3' 14' 15.6' 1920x1080 30Pins edp LCD Screen (₹3636)
https://www.amazon.in/dp/B06W5DTGKC/?coliid=I1T6IQKRTVEP0Q&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZHMD7GQTVBQ6150XM3S1_6

oddpod Big Size A3 Fresnel Lens & Flexible Plastic 3X Magnifying Sheet/Full Page Oversized Magnifier - Large Fresnel Glass.l (2x) (2999*2 = ₹5998)
https://www.amazon.in/oddpodTM-Flexible-Magnifying-Oversized-Magnifier/dp/B0DT4H1JNM/ref=sr_1_5?sr=8-5

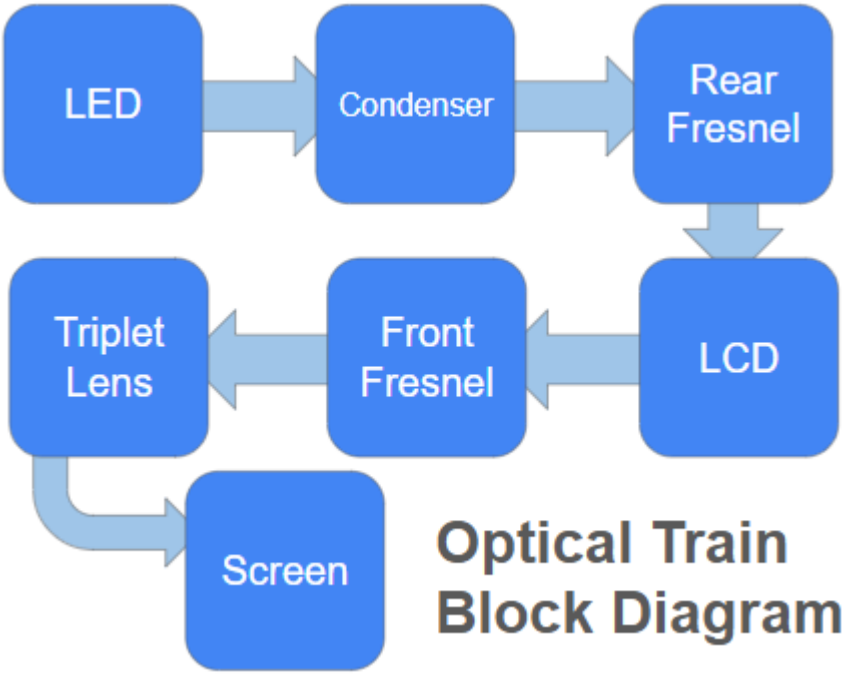
Chanzon LED Lens Optical Glass (44mm 60degree) + 50mm Reflector Collimator Housing + Fixed Bracket with Holder For 20W 30W 50W 80W 100W High Power Light SMD COB Chips Focus 20 50 100 W Watt 60 degree (₹1537)

https://www.amazon.in/dp/B06XKV9PWY/?coliid=IF5FYHTCYAM0U&colid=3P0O3BPEEMDID&psc=1&ref_=cm_sw_r_cp_ud_lstpd_ZJVNA9C6GMQWD71V094Q

KSD 9700 Automatic Reset Thermal Protector/Thermal Cut Out Switches 85° C Degree Max, 250V 10A, (NC) (₹300)
https://www.amazon.in/dp/B0CZNYGVQL/?coliid=I3Q3PI2JOCTMPE&colid=3P0O3BPEEMDID&psc=1&ref_=list_c_wl_lv_ov_lig_dp_it

Page 1 Snapshot:

- **Light Engine**: 100W COB LED (6500K)
- **Display**: Innolux N156HCA-EN1 15.6" FHD Panel
- **Cooling**: Ant Value AV240 Liquid Cooler + Noctua NF-A14 Fan
- **Optics**: F240 Triplet Projection Lens + 2x A3 Fresnel Lenses
- **Power**: 12V 10A SMPS with Boost and Step-Down Converters
- **Source**: HDMI input- laptop, media stick, etc.



Optical System Description:
The Lumina-FHD uses a high-flux LCD system that's based on a transmissive architecture. A 100 watt COB LED light source gets channeled through a 44mm aspheric glass condenser and pinched down to a 60 degree beam. This light is then spread out by a rear Fresnel lens - an A3 format one - before passing through a 15.6 inch Innolux FHD light modulator screen. The resulting image then gets concentrated by a front A3 Fresnel lens into an F240 triplet objective lens, which is tasked with projecting a sharp - 100 inch diagonal - image that is 2.6 meters away.

Design Freeze Status

The optical architecture, the display panel, the power rating of the light source, the thermal strategy, and the way I distribute the power are all good to go. I won't be making any big

changes to the architecture before I start building a prototype. Any cash I get will go towards buying all the parts I need and making sure they work as advertised.

What I Do Next After I Get Funding

- **Stage 1 -** Sorting out the Optical Bench: First I buy the Fresnel lenses, the condenser and the projection lens. Then I set up a basic test stand and check that everything is working together in a pretty line, and that the image is being projected out evenly.
- **Stage 2 -** Checking the Heat: I install the LED module with a liquid-cooling system attached, then run some temperature tests while it's under full load. Also a normally-closed thermal cut-out switch will be placed in series with the LED power path as a fail-safe in the event of cooling system failure.
- **Stage 3 -** Getting the Display Up and Running: Next I hook up the LCD panel and test out the HDMI controller with some test patterns.
- **Stage 4 -** Designing the Case: I don't design the case until I've figured out how air flows through it and how it handles heat - I want to get that right first.