Planar Glossary of Technical Terms, Business Abbreviations, and TLAs

**ACTFEL** Alternating Current Thin Film Electroluminescent, sometimes called TFEL. One of the three major flat panel technologies, the one Planar makes. See also TFEL, LCD, and Plasma.

**Active Area** The entire area of the display where the pixels are located. See Fill Factor.

**Active Matrix** A high speed, high performance type of LCD. Usually color and very costly. Has a TFT under each pixel. See TFT.

**ALE** 1) Atomic Layer Epitaxy, the patented process Planar International uses to deposit thin films on their EL glass panels, functionality equal to Planar System's Leybold machine. See Leybold and Thin Films. 2) A strong beer.

**AMEL** Active Matrix Electroluminescent.

**AMLCD** Active matrix LCD.

**Analog** Electrical signals that can have infinitely different intensities or voltages. See Digital.

**ANSI** (Say an-see). American National Standards Institute, a group that sets standards in the USA.

**Anti-glare** A coating on the front of the display which reduces glare from ambient or room light. Also called AG. See Filter.

**Anti-reflective** A coating on the front of an optical filter which reduces reflections from ambient or room light. Also called AR. See Filter.

**ASIC** (Say ay-sik). Application-specific integrated circuit, a low cost controller we use for high-volume displays.

**ASP** Average selling price.

**Backlight** The light source behind a transmissive LCD. See Transreflective.

**Backplate** The glass cover that is glued to the back of an EL panel to protect the thin films. See Seal.

**Beta Site or Beta Testing** The first versions of a new product are put in customer's hands for field testing. This is called Beta Testing. The customer locations performing the testing are Beta Sites.
**Bezel** Usually refers to the metal frame around our display that is used to hold the EL glass and controller circuit board together. It protects the display and allows easy mounting.

**BIOS** (Say **bye-ose**). Basic Input-Output System, the most basic instructions in a computer that tell the microprocessor how to work with a keyboard, how to put information on a display, etc.

**BOM** Bill Of Materials, the list of items that make up an assembly.

**Burn-In** Turning on a new piece of EL glass and running it at a high frame rate for up to 48 hours. This quickly ages the thin film so it won't change brightness later and also reveals any faults in the EL glass. See **Frame Rate**.

**Burn Out** When an individual pixel on a display fails to light up due to being electrically or mechanically damaged. Also called Latent Image.

**Bus, Microprocessor** The group of wires used by components in a computer to connect to the microprocessor and communicate with it. Video interface cards often plug into the bus.

**B-V Curve** A graph of Brightness versus Voltage, shows how the EL phosphor brightness changes as voltage is varied. See Saturation and Threshold.

**CAD** Computer Aided Design, a way of making engineering design drawings on a computer instead of with a pencil on a drawing board.

**cd/m²** Candelas per square meter, a measure of brightness of a display. 1 footLambert = 3.4 cd/m². 1 cd/m² = 0.295 ftL. See footLambert.

**CGA** Means 640x200 pixel format. See also EGA, VGA, SVGA, and XGA.

**Clean Room** A specially constructed air-filtered room used for the fabrication of EL glass panels in a dust-free environment. See **CHA** and **Leybold**.

**Clock** The electrical timing signal sent to a display which makes sure that the video data is written on the proper pixel. Also called dot clock or pixel clock. See **VSync**, **HSync**, and **Video Data**.

**COG** Chip On Glass, a system of attaching the row and column driver integrated circuit chips around the edge of the EL glass panel instead of soldering them on the controller circuit board. See **Controller** and **FSOG**.

**ColorBrite** The Planar product line of AMLCD full-color displays.

**Connectors** The plug and socket combination that allows wires run between one piece of electrical equipment and another to be easily disconnected.

**Contrast Ratio** The ratio of the brightness of an ON pixel to an OFF Pixel.

**Controller** 1) The circuit board containing the row and column driver chips and ASIC or Xilinx chip, located behind the glass on a display 2) Also an interface card. See ASIC, Interface Card, and Xilinx.

**CP** Circularly Polarized, a type of optical filter. See Filter.

**CRT** Cathode ray tube, the kind of display used in most TV's and computer monitors, a fat panel display.
**CRT Controller Chip** A special integrated circuit which takes information from a microprocessor bus and formats it to drive a CRT or other display such as EL. See Bus and Interface.

**CSA** Canadian Standards Association, a Canadian government testing department that certifies that electrical equipment is safe and meets certain standards. See TUV and UL.

**Cycle Testing** Testing performed on a display by running it at high temperature to make sure that it won’t fail soon. Electronic failures usually show up quickly so if it runs for a few hours without failing, it is much more likely to run for a long time.

**DB-15** One of three connectors on a VGA card, the one where a CRT or Planar’s ELM-VGA monitor connects and which supplies analog signals to the display. See VGA Card.

**DC/DC Converter** A power supply which converts +5 volts and +12 volts DC to the proper high DC voltages for the EL display.

**DCEL** Direct-Current EL. See Thick film EL.

**DI** Diagnostic Inventory, where broken ECAs and displays go to get repaired. See ECA.

**Dielectric Layer** An electrically insulating layer, one of the types of thin films in an EL panel. See Thin Films.

**Digital** Electrical signals that can only be either on or off, usually represented by ones and zeros. See Analog

**DIN** A series of German industrial standards, often used to describe a size of instrument front panel (192 mm square) and hence the size of display that might fit in it. A 1/2 DIN size is 96 x 192 mm and 1/4 DIN is 96 mm square.

**Display** EL glass + controller electronics + DC/DC Converter. See also Controller, DC/DC Converter, Monitor, OEM, and Terminal.

**Dithering** A process of checker-boarding pixels on and off in a pattern to give the appearance of gray scale or shades of gray. See Gray Scale.

**DPI** Dots Per Inch, the number of dots or pixels per inch on a display, some customers think in DPI, some in pixel pitch. See Pixel Pitch.

**Drivers** The high-voltage integrated circuits, usually mounted on the controller circuit board, that direct the voltages to the row and column electrodes to light the pixels. See Controller and Electrode.

**DSM** District Regional Manager, works under the RSM. See RSM.

**DTC** Design To Cost, making the cost of a new product a goal in the design.

**DVT** Design Verification Test, the group of tests that a new product is put through before production starts to prove that it really meets the design requirements. Usually includes tests of temperature, shock and vibration, MTBF, optical performance, etc. See ORT.

**EC** European Community.
**ECA** Etched Circuit Assembly, a completed printed circuit board with the electrical components on it.

**EGA** Means 640.350 (sometimes 640.400) format. See also CGA, VGA, Super VGA and XGA.

**ECN** Engineering Change Notice, what an ECR is called after it has been approved. See ECR and ECRB.

**ECR** Engineering Change Request, the formal request to change a drawing or specification. See ECN and ECRB.

**ECRB** Engineering Change Review Board, the group representing all departments which approves ECRs. See ECR and ECN.

**EL** Electroluminescence, the characteristic of some materials that makes them give off light in the presence of an electric field. See Phosphor.

**Electrode** Refers to the rows and columns on a matrix display that carry electricity to the pixel. See ITO and Matrix Display.

**Electroluminescent** See EL

**EMC** Electro Magnetic Compliance.

**EMI** Electro Magnetic Interference, i.e. static. See Emissions.

**Emissions** The static emitted from an electronic device. See EMI, FCC, and VDE.

**Emissive** A display that emits its own light and therefore does not need backlighting or ambient light. CRTs, EL and plasma displays are emissive. LCDs are non-emissive. See Backlight and Transflective.

**Emulation** To make one thing look like another. By careful design an EL display can be made to perform like or emulate a CRT or an LCD.

**End User** One who buys our displays for his own in-house use but not for resale. See also OEM.

**EPROM** See PROM.

**Ergonomics** The study of interaction between equipment and people, how people use equipment. See Pitch.

**ESD** Electro Static Discharge, the electric shock that can come from a person and which can silently damage or destroy sensitive electronics. Use of grounding straps and special packaging can prevent ESD damage.

**ETLA** Extended TLA, having more than three characters. See TLA.

**FCC** Federal Communications Commission, a US government agency which regulates electronic products for low emissions. See Emissions and VDE.

**FCOG** Flip Chip On Glass, an advanced type of COG with the chips glued on upside down so the contact pads on the chips connect directly with the traces (conductors) on the EL glass panel. See COG.
**Feature Connector**  One of three connectors found on a PC VGA card, the one where EL7768MS connects and which supplies digital signals to the display. See also Bus, DB-15, PC, and VGA Card.

**FG**  Finished Goods, an inventory location dedicated to finished products ready to ship.

**Fill Factor**  The percentage of the active area that actually lights up. The ratio of pixel size squared, divided by pixel pitch squared. The higher the fill factor, the brighter the EL panel and the more power it consumes.

**Filter**  A light-attenuating piece of transparent plastic or glass put in front of the display to improve or enhance contrast (makes off-pixels appear blacker). See CP, Anti-glare, and Anti-reflective.

**Flex**  Flexible printed circuit board.

**footLambert (FL)**  A measure of brightness of a display. One footLambert (FL) = 3.4 cd/m². One cd/m² = 0.295 FL. See cd/m².

**Footprint**  The space a display takes on a desk or on the front of an instrument.

**FQC**  Final Quality Check, our final test of products before shipment. We check 100% of our displays. See QC.

**Frame Buffer**  Part of the electrical interface circuit that allows a display to be updated at a different speed (frame rate) than the computer generates the video data. EL gets brighter as the frame rate is increased. A frame buffer is not required if the two rates are the same. See Frame Rate.

**Frame Rate**  The number of times per second that the image on a display is updated, typically 60 Hertz (times per second) or more for EL. If a frame rate is too low, the display appears to flicker. Also called Refresh Rate.

**FYE**  Fiscal Year Ending. Planar's fiscal year does not coincide with the calendar year but runs from Oct. 1 through the following Sept. FYE93 is the fiscal year that began on Oct. 1, 1992 and ends on Sept. 30, 1993.

**Glass**  1) Custom display glass without controller or other electronics, usually sold to military suppliers. 2) Thin films on a glass substrate. 3) LCD panel. See Controller and LCD.

**Gray Scale, Patterned**  A display which produces the perception of gray scale by lighting checkerboard patterns of on/off pixels. The EL7768MS display uses a combination of true and patterned gray scales. See also Dithering.

**Gray Scale, True**  A display that can produce several different brightnesses in a single pixel, common gray scales are 16-level, 64 level and 256 level. The EL640.480-A3 display is a 16-level true gray scale display.

**GS**  Glass Stock. The inventory location including the clean room and glass burn-in areas.

**GUI**  Graphical User Interface, a software system like Windows or a Macintosh that allows a computer user to work with graphical icons and a mouse rather than by typing commands.
**Half-life** The time it takes a display to decrease or burn down to half its brightness. Planar EL displays have no known half life. See Thick film EL.

**HCPO** Hard Copy of Purchase Order, as distinguished from a verbal order taken over the phone. See PO.

**House Account** A customer account handled directly by a Planar employee instead of through a manufacturer’s Rep. See RSM and Rep.

**H$ync** (HS) Horizontal Synchronization, the electrical timing signal sent to a display which tells it that it is time to start drawing a new row by writing video data on the next line down. See VSync, Clock, and Video Data.

**ICE** Integral Contrast Enhancement

**ICEBrite** One of our lines of EL products.

**IEC** International Electrotechnical Commission.

**I/O** Input/Output, the way electronic equipment communicates to the outside world. A keyboard is an input device, a display and a printer are output devices.

**Interconnects** The electrical connections between the EL glass panel and the controller board. Types include flex, lead frames, MOE, and TAB.

**Interface Card** The electrical circuitry needed to patch between a PC and a display.

**Interlaced** A type of display signal used with TV and CRTs where only half the screen is drawn at a time by drawing first only the odd numbered lines, then the even lines on the next frame. It lowers the cost of CRTs but tends to cause flicker. Planar EL displays are non-interlaced and draw the entire image on each frame.

**Inverted Structure** A way that PI makes EL color glass panels. The viewer looks at the film side instead of through the glass substrate.

**IPA** Isopropyl Alcohol, used as a cleaning solvent. No, you can’t drink it.

**ISO 9000** International Standards Organization, a strict European quality standard that companies can be certified to meet, the quality management system for the 1990s.

**ITO** Indium Tin Oxide, a transparent conductor of electricity used for the column electrodes on EL displays. See Electrode.

**L5** Assembly Floor Stock. The inventory location including the display assembly area.

**Latent Image (LI)** The ghost image on a display which can result from the differential aging of pixels. Every display technology has it to some extent. Also called LI. See Burn Out.

**LCD** Liquid Crystal Display, one of the 3 major flat panel technologies. Consists of crystals suspended in a liquid whose orientation can be changed by a voltage, like Venetian blinds. See also Active Matrix, ACTFEL and Plasma.

**Lead Frame** A type of interconnect where arrays of wires are soldered to the glass and to the controller board. See Interconnects and Controller board.

**Leybold** The in-line vacuum deposition machine used in Beaverton’s clean room to apply the thin films to make an EL glass panel. See Clean Room and Thin Films.
LI See Latent Image.

Matrix Display A display made up of an array of pixels, each individually controllable and capable of showing text and graphics. Pixels can be lit to form a pattern which is perceived as an image.

MB The inventory location for material that is nonconforming to specifications. See MRB.

Megahertz (MHz) Millions of cycles per second, a unit of frequency measurement. Typical clock frequencies and video data rates are 10 MHz to 30 MHz. See Clock.

MicroBrite Planar’s line of miniature AMEL displays.

MIS Management Information Systems, the department responsible for computers, networks, and data processing.

MOEs (Say moe). Metal-On-Elastomers, silicone rubber strips with tiny wires running through them used for interconnects in many displays. See Interconnects.

Monitor A display in an enclosure with AC power supply to connect to a PC, usually sold to end users. See also Display and Terminal.

Monochrome A display capable of only one color, sometimes with gray scales. Planar yellow displays are monochrome, but multi-color displays are not.

MPI Manufacturing Process Instructions.

MPS Master Production Schedule, a plan showing what products will be manufactured during a particular time period.

MRB Material Review Board, the group which decides the fate of materials in the MB stock location. See MB.

MRP Material Requirements Planning.

MTBF Mean Time Between Failures, a measure of reliability. Sometimes referred to as MTTF.

Multi-color A display capable of a partial range of colors but not full color. The EL640.350-DA1 is a multi-color display. See Monochrome, RG, RGB, and Sub-pixel.

Non-interlaced See Interlaced.

Non-volatile Memory Computer memory that won’t be lost when the power is turned off. Examples are PROM, floppy disks, and hard disks. See PROM.

NPI New Product Introduction, a process for managing new product ideas from conception through definition, design to production.

NRE Non Recurring Engineering, one-time charges made to a customer for designing a new customer-specific display.

NTSC National Television Standards Committee, a video signal format used in USA for television. Does not apply to computer monitors.
**OEM** Original Equipment Manufacturer, one who buys our displays and builds them into his own product for sale to others. See also End User.

**On-Off** A display capable of showing pixels that are only on or off, i.e. not gray scale. See Gray Scale.

**ORC** The initials of the ultraviolet (UV) exposure machine used in the photolab. See Photolab.

**ORT** Ongoing Reliability Test, tests that continue while a display is in production to verify that no hidden reliability problems have started. See DVT.

**PAm** Planar America. The US part of the Planar OEM Display Components group, located in Beaverton, Oregon.

**Passive LCD** The most common type of LCD having a thin film transistor controlling each pixel. See Active Matrix, Backlight, and TFT.

**PC** Personal Computer, usually refers to an IBM or IBM-compatible PC.

**Phosphor** The material that luminesces to produce the yellow light in our displays. On our standard displays, it is zinc sulfide mixed with manganese (ZnS:Mn). Different phosphors are used to make different colors.

**Photolab** A special clean room that has yellow lights and is used for processing photosensitive materials during the manufacture of EL glass panels. See ITI and ORC.

**Photo Mask** A chrome-plated glass mask used to make the pattern of rows and columns on an EL glass panel.

**PI** Planar International, Ltd. located in Espoo, Finland. See Planar and PSI.

**Pixel** Picture element, the smallest element of a picture.

**Pitch** The distance from one pixel to the next. 0.33 mm is a standard pitch for good ergonomics, which is the same as 72 dpi. See DPI and Ergonomics.

**Planar** 1) An adjective meaning flat or lying in one plane 2) The world's leading EL flat panel display manufacturer 3) The largest flat panel manufacturer in North America or Europe. See PI and PSI.

**Plasma** One of the three major flat panel technologies, usually red in color. Sometimes called gas plasma. See also Active Matrix, Emissive, Passive LCD, and ACTFEL.

**PO** Purchase Order, the contractual document used by our customers to order Planar products or by our materials buyers to order from our suppliers. See HCPO.

**Powdered EL** See DCEL and Thick-film EL.

**PROM** Programmable Read-Only Memory, a type of integrated circuit that is non-volatile. Sometimes called EPROM or electrically programmable read-only memory. See Non-volatile Memory.

**PSI** Planar Systems Inc. Located in Beaverton, Oregon. See Planar and PI.

**QA** 1) Quality Assurance 2) The inventory location for incoming material inspection.
**QC** Quality Control, the process of testing incoming parts, EL glass panels and displays and comparing the results to a specification. See FQC.

**QFD** Quality Function Deployment, a means of rating the items that the customer sees as contributing to the quality of a product.

**Quality** Conformance to specifications conformance to the customer's requirements. See QC and TQM.

**RAM** Random Access Memory. Volatile memory that forgets or erases completely when power is turned off. See Non-volatile.

**Refresh Rate** See Frame Rate.

**Rep** Abbreviation for manufacturer's representative, an independent salesperson who represents products from a number of different manufacturers. Planar sells its products primarily through Reps who are paid a commission on their sales. See RSM.

**Resolution** 1) The pixel matrix of a display i.e. 640:400 etc., or 2) The number of dots per inch. See DPI.

**RFI** Radio Frequency Interference. See Emissions and EMI.

**RFQ** Request For Quote. Issued to suppliers to get a cost estimate prior to issuing a PO.

**RG** Red-Green, the two primary sub-pixel colors produced by a multi-color display allowing a range of colors including red, green, yellow, and black. See Multi-color, RGB, and Sub-pixel.

**RGB** Red-Green-Blue, the three primary sub-pixel colors that are used in displays and TVs to make up full color images. See Multi-color, RG, and Sub-pixel.

**RMA** Returned Material Authorization, a tracking number assigned by Customer Service to any products being shipped back to Planar from a customer for any reason.

**RSM** Regional Sales Manager, a Planar employee in charge of sales in a geographic region. RSMs oversee a number of Reps as well as handle house accounts in their region. See Rep and House Account.

**RTV** 1) Return To Vendor 2) Room Temperature Vulcanizing, silicone rubber that cures at room temperature.

**SA** Sub Assembly, the inventory location for storage of completed custom display glass panels.

**Saturation** The point of diminishing returns where increasing the voltage on an EL panel no longer gives additional brightness. See B-V Curve and Threshold.

**SC** Salvage Clearing. The inventory location for rejected material to be returned to its vendor. See RTV.

**Screen** A general term meaning display or glass panel.

**Seal** The process of applying the backplate to an EL glass panel. See Backplate.

**SF or S/F** Sales Forecast, a monthly forecast of the projected sales of our products.
**SK**  Stock. The inventory location for storage of raw material stock.

**Software**  The instructions or programs that tell a microprocessor or computer what to do.

**Sub-pixel**  A portion of a pixel that is individually controllable, usually used in color displays which have red, green, and blue sub-pixels in each pixel. See Multicolor, Pixel, RG, and RGB.

**Substrate**  The base material (usually glass) to which thin films are applied to make an EL glass panel. See Thin Films.

**SVGA**  Super VGA. Usually means 1024.768 pixel format (sometimes means 800.600). See also CGA, EGA, VGA, and XGA.

**TAB**  Tape Automated Bonding, a type of interconnect. See Interconnect.

**Tab**  The portion of the display bezel used for mounting.

**Terminal**  A display in an enclosure with AC power supply with electronics to connect to a BIG computer, i.e. like ELT320, usually sold to end users. See also Display and Monitor.

**TFEL**  An ambiguous term which can mean either Thin-Film or Thick-Film EL. Thin-film EL is always AC and is what Planar makes, while thick-film is always DC and is used for LCD backlights. See ACTFEL and Thick-film EL.

**TFT**  Thin Film Transistor, the electronic switch that controls each pixel in an active matrix LCD. See Active Matrix.

**Thick film EL**  A low-tech kind of EL used in EL backlights for LCDs and by the now-defunct Cherry EL Displays. Thick-film EL loses brightness, rapidly becoming half as bright in as little as a few months. Many prospects may think that Planar's thin-film EL has this same aging problem but that is not true. Also called Powdered EL or DCEL. See Half-life and TFEL.

**Thin Films**  The various layers deposited on a glass substrate to make up an EL glass panel. See ALE and Leybold.

**Threshold**  The lowest voltage that will cause the EL phosphor to light up. See B-V Curve and Saturation

**TLA**  Three Letter Acronym, abbreviations used to shorten conversations and to confuse the uninitiated. See ETLA.

**Touch Panel**  A device placed in front of a display which senses touch by finger or stylus and sends that information to a computer. There are a number of ways of sensing touch such as infrared, resistive, capacitive, and surface acoustic wave (SAW).

**TQM**  Total Quality Management, the process of diffusing the concept of customer satisfaction throughout the company by understanding that every employee has customers (some internal, some external) and that it is necessary to continuously improve the level to which you meet their requirements. See Quality.

**Transflective**  A type of LCD which can operate in either the transmissive (backlit) mode or in the reflective (ambient light) mode. See Backlight.
**TUV**  Technischer Überwachungs-Verien Rheinland, Germany’s safety organization. See UL and CSA.

**UL**  Underwriters Lab, an independent testing company in the USA that certifies electrical equipment is safe and meets certain standards. See CSA and TUV.

**Upside**  An increase in the forecasted or planned production of a product or in a customer order.

**VDE**  A German agency which certifies electronic products for low emissions, equivalent to FCC in the US. See Emissions and FCC.

**VGA**  Means 640.480 pixel format. See also CGA, EGA, SVGA, and XGA.

**VGA Card**  An interface card for an PC-compatible computer which plugs into the bus and typically provides both analog (CRT-type) video outputs through a DB-15 connector and also digital video outputs through a feature connector. See Bus, DB-15, and Feature Connector.

**Video**  The electrical signals that tell the display what to show.

**Video Data**  The electrical signal sent to a display which tells it whether to turn each pixel on or off, or how bright in the case of a gray-scale display. The timing of video data is controlled by VSync, Hsync, and clock signals. See VSync, HSync, Gray Scale, and Clock.

**Viewing Angle**  How far to the side of a display you can move and still see what is on the screen. It is measured in degrees from side to side. EL viewing angle is greater than 160 degrees.

**VSync**  Vertical Synchronization, the electrical timing signal sent to a display which tells it that it is time to start drawing a new frame beginning with the video data for the top row. See HSync, Clock, and Video Data.

**WIP**  Work In Process, parts still in manufacturing that haven't been completed.

**XGA**  Means 1024.768 format. See also CGA, EGA, VGA and Super VGA.

**Xilinx**  Brand name for a special programmable integrated circuit used on the controller board to control many of Planar's displays. May be replaced by an ASIC on high-volume displays to reduce costs. See ASIC and Controller.

**Yield**  A term for how many good displays are produced out of the total number of displays started. Total Number Started minus Scrap equals Yield. A high yield, i.e. 80%-100%, means that you are efficient in making your product.

**ZIF**  Zero Insertion Force, a type of electrical connector that mates with little or no force required.
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