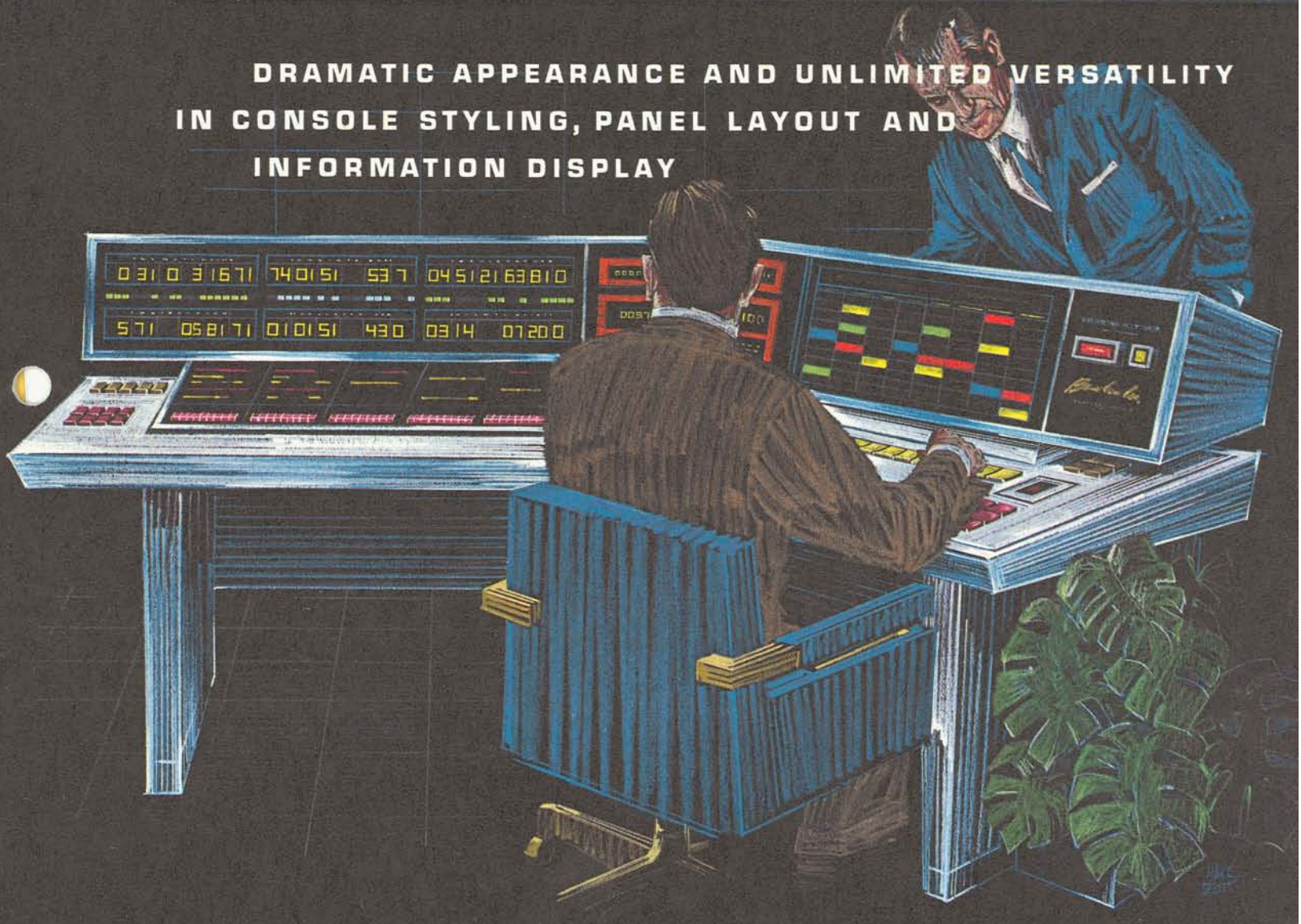
NEW

TEC LITE

DATA PANEL

DRAMATIC APPEARANCE AND UNLIMITED VERSATILITY IN CONSOLE STYLING, PANEL LAYOUT AND INFORMATION DISPLAY



THIS TOTALLY NEW CONCEPT IN DISPLAY GIVES YOU EXTREME FLEXIBILITY OF MESSAGE, ARRANGEMENT, COLOR, SIZE

TEC-LITE DATA•PANEL

DATA • PANEL is used in the console of Control Data Corporation's 3600 Computing System.

A NEW, LOW COST CONCEPT THAT COMBINES DISPLAY VERSATILITY AND OUTSTANDING APPEARANCE

Your console and panel design capabilities are vastly expanded with the unusual flexibility and beauty offered by DATA•PANEL. Only this new concept can give you such latitude in selecting size, shape, color and location for each message as well as degree of emphasis. DATA•PANEL completely eliminates the individual indicator, places displays *behind* the smooth, glare-free glass planes that form the "panel" of DATA•PANEL. Now your system's information display panels can have modern, individualized styling tailored to your design.

Cost? Far less than you would expect for a custom-built unit and usually less than the cost of conventional modular indicators alone. You actually get the vastly improved appearance of DATA•PANEL at no additional cost when compared with present-day indication methods.

Simply order your console or panel displays as you would like them to appear. Specify size, shape, color and messages, and place them anywhere on the panel—they will be *out of sight* until their message is called for. Industrial designers have discovered that DATA•PANEL allows them to design console panels and information displays with none of the restrictions imposed by modular indicators. They have discovered that the brilliantly colorful visual versatility of DATA•PANEL opens broad new avenues for effectively displaying space-age data. If you do not have industrial design service available, TEC-LITE DATA•PANEL industrial designers will provide design sketches for your consideration based on your description of information display requirements.

COMPLETE DISPLAY VERSATILITY

New photographic techniques are employed to create the information display areas of DATA•PANEL, therefore any artwork which can be photographically reproduced can be displayed. Any typeface can be specified for legend areas and numerical displays. In addition, pictorial displays representing generators, switches, pumps, valves, etc., which would be used for a wide variety of automated control systems can be reproduced. Corporate trademarks or other designs can similarly be displayed.

Each legend or symbol to be illuminated appears within an area called a DATA•Module. This module may be of any size and shape including square, rectangular, triangular, diamond, round or elliptical. Illuminated or permanently visible lines representing process or materials flow channels can be provided.

Incandescent lamps used in DATA•PANEL assemblies can be switched on and off in the conventional manner with lamp supply voltages, or these easily replaceable miniature lamps can be switched on and off by transistorized lamp control circuitry operating directly from the low level signals present in computers, control, guidance and other solid state systems.

Readout devices, including segmented and projection displays using incandescent lamps and readouts using neon display tubes, mount behind the glass panel. Transistorized circuitry controls lamps and decodes low level BCD or other input signals to digital display. Other options include straight binary input to octal display or 10 line (decimal) input to decimal display. All transistorized lamp control circuitry is mounted on printed circuit boards and forms an integral part of the DATA•PANEL assembly.

VISUAL VERSATILITY

There are no restrictions, within practical limits, to the size of DATA•PANEL or to the sizes, shapes, colors and location of information to be displayed. Not only does DATA•PANEL give you design freedom, but it also allows you to determine intensity or attention value of individual legends by selecting size, color and brightness of illuminated indications that appear behind its gray (Graphic Gray) glass panel.

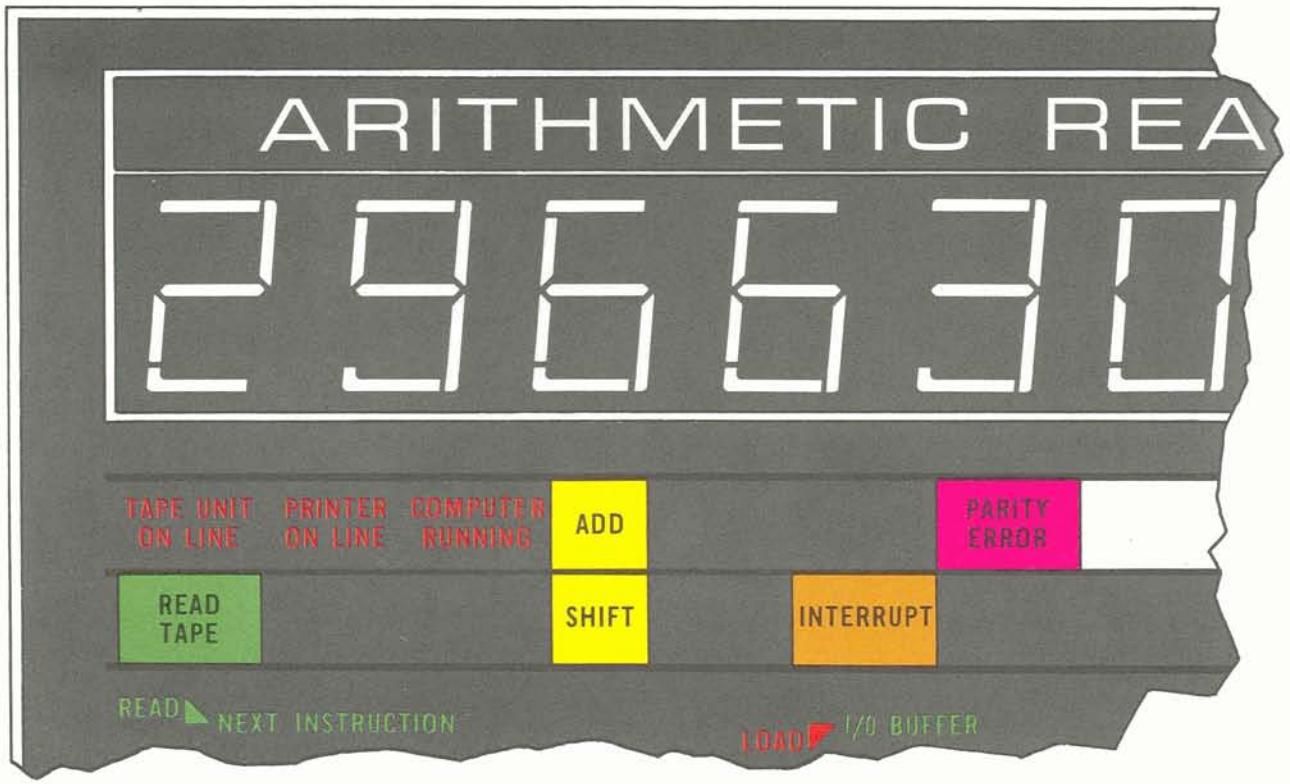
DATA•PANEL also offers totally visible, partially visible or invisible messages in the off condition. With totally invisible legends your panel is far less confusing to the operator. His eye is not distracted or confused by the visual presence of non-indicating indicators! He *sees only—concentrates only* on the important illuminated indications! On large panel areas, however, the operator may require visual reference to orient himself with the location of an indication. In this situation DATA•PANEL can provide any number of totally or partially visible legends, grid lines or other reference points.

COLOR VERSATILITY

Another unique and vital feature of TEC-LITE DATA•PANEL is its ability to display information not only in a variety of shapes and styles, but also in a wide range of colors. Basically, messages appear visually as illuminated white or colored characters on a Graphic Gray background. Various display options including visible, partially visible and invisible legends are shown on Page 4.

VERSATILITY OF APPLICATION

DATA•PANEL is designed for use wherever information must be displayed effectively, completely and with striking appearance. Already, designers and builders of large scale computers, guidance and industrial control systems have put DATA•PANEL to work as the modern solution to information display.



DATA•PANEL presents information with full color visual impact. In this example permanently visible white legend and border surround "Arithmetic Readout" digital display. Permanent black grid lines are provided in message display area.

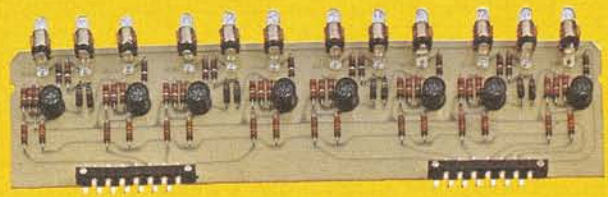
VERSATILITY OF VISUAL DISPLAY

This chart outlines the basic visual versatility of DATA•PANEL. DATA•Modules in square configuration are illustrated, but message areas may be larger, of various shapes and contain far more alpha-numeric information. Colors shown depict options and do not represent color fidelity.

If the OFF-ON visual color sequence you prefer is not illustrated, submit color sketches on TEC-LITE DATA•PANEL "Design" Specification Sheet, Number 338 enclosed in the pocket of this brochure.

Photographic processes developed by TEC-LITE engineers reproduce any typeface of any size as well as pictorial displays, symbols or other graphic information in full color to your panel layout specifications.

INDICATION OFF	INDICATION ON		
	1A	OFF: Message not visible on Graphic Gray background ON: Black message visible in illuminated white DATA•Module	OFF: Message visible on Graphic Gray background ON: Illuminated message visible on Graphic Gray background
2B	2B	OFF: Message partially visible on Graphic Gray background ON: Black message visible in illuminated white DATA•Module	OFF: Message not visible on Graphic Gray background ON: Message in illuminated colored DATA•Module
3C	3C	OFF: Message totally visible on Graphic Gray background ON: Black message visible in illuminated white DATA•Module	OFF: Message visible on Graphic Gray background ON: Message in illuminated colored DATA•Module
4D	4D	OFF: Black message visible in colored DATA•Module ON: Black message in illuminated colored DATA•Module	OFF: Message not visible on Graphic Gray background ON: Colored message on illuminated white DATA•Module
5E	5E	OFF: Colored message visible in colored DATA•Module ON: Colored message in illuminated colored DATA•Module	OFF: Colored message visible on Graphic Gray background ON: Colored message on illuminated white DATA•Module
6F		OFF: Message not visible on Graphic Gray background ON: Illuminated white message on Graphic Gray background	OFF: Message not visible in colored DATA•Module ON: Message in illuminated colored DATA•Module
7G		OFF: Message not visible on Graphic Gray background ON: Illuminated colored message on Graphic Gray background	OFF: Nothing visible on Graphic Gray background ON: White or colored illuminated DATA•Module
	8H		
	9J		
10K	10K		
	11L		
12M	12M		
	13N		



A non-transistorized DATA•PANEL. Common connection for one side of lamp supply simplifies hook up. Taper pin receptacle used for signal connection. Lamps are replaced by moving center contact aside.

TEC-LITE DATA•PANEL

MECHANICAL—ELECTRICAL VERSATILITY

TEC-LITE DATA•PANEL is uniquely flexible, not only in its unlimited display capabilities, but also in its mechanical and electrical options as well. Complete DATA•PANEL assemblies can be mounted in a variety of ways: flush with adjacent surfaces, recessed, at angles to surrounding planes or rack mounted. DATA•PANEL can be designed as an entire console surface or it may be provided in sections of varying sizes.

Electrically, DATA•PANEL is also completely versatile and adaptable to the signal and supply voltages and currents of any computer or control system. A wide range of incandescent and neon midget flange base lamps operating from their normal supply voltages are offered. Lamps can be replaced easily and quickly from behind the panel.

DATA•PANEL also offers transistor controlled incandescent lamps that operate with current drain in logic lines as low as 100 microamps . . . transistor controlled neon lamps that operate from a signal swing as small as 2 volts (for example, lamp ON at +1 volt, OFF at −1 volt). These lamps are designed to function in solid state systems where low level signals are typically present. In these systems it is desirable to keep high voltages and currents normally required for lamp operation out of sensitive logic areas. Neon lamps, due to their inherent color output and low illumination level, restrict the visual versatility of DATA•PANEL and limit color selection to amber, red and orange.

Several types of digital display or readout devices can be accommodated behind the glass panel of DATA•PANEL. Transistorized readouts offered include TEC-LITE TSR Series Segmented Display (using incandescent lamps) and TNR Series Digital Display (using a neon display tube). Projection display devices using incandescent lamps are also compatible with DATA•PANEL and may be transistor controlled through the use of TEC-LITE TPD Series Projection Display Drivers. All transistor-controlled readouts operate from low level decimal or coded input signals. All readouts are completely invisible on the panel when in the off condition.

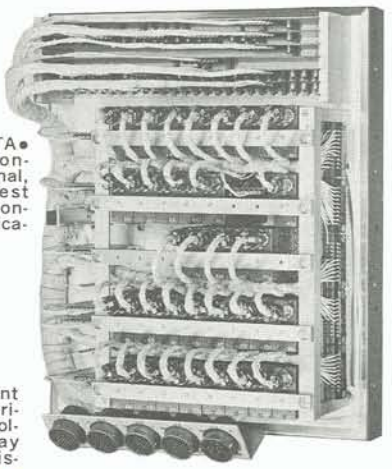
Transistor Electronics Corporation developed, patented and is the world's largest manufacturer of self-contained transistorized indicators. This unequalled design, engineering and production knowledge is applied to the transistorized lamp control circuits used in DATA•PANEL.

HOW DATA•PANEL SAVES YOU MONEY—DATA•PANEL can be delivered to you as a completely wired and tested display panel assembly that quickly mounts in place with standard hardware. All electrical connections can be brought out to a single connector, to common blocks or to individual taper pin receptacles.

While DATA•PANEL is built to your specific display requirements and offers many unique design advantages, its cost is usually less than groups of individual indicators mounted in your panel. DATA•PANEL eliminates the costs of indicator bodies, lenses and mounting hardware —provides substantial economies by placing many lamp control circuits on a single printed circuit board; by using common connections whenever possible and employing a simplified lamp mounting technique. Not only is DATA•PANEL less expensive initially, but it saves *you* these time consuming steps and costs:

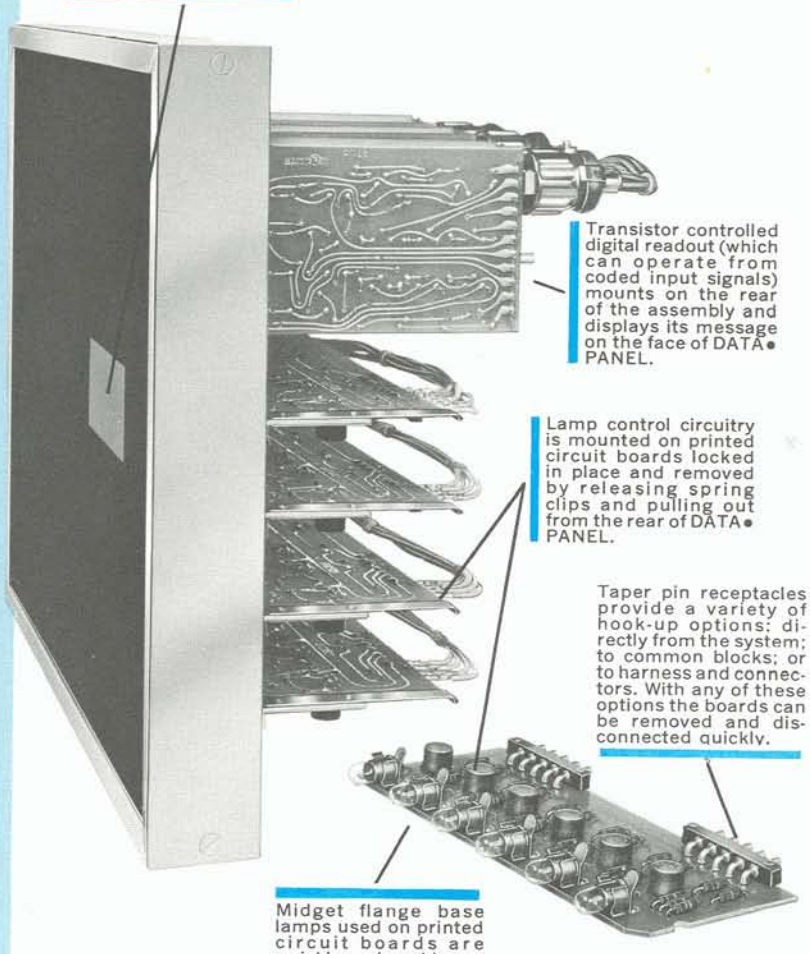
1. fabricating multi-hole panels to accurate tolerances
2. finishing the panel and engraving or anodizing legends.
3. installing individual indicators
4. making *all* of the connections to individual indicators—including commons (no wiring required if completely wired DATA•PANEL is ordered)
5. simplifies incoming inspection

Custom-built DATA•PANEL costs are kept at production-run levels because TEC-LITE engineers have developed mechanical production techniques and facilities that are adaptable to any DATA•PANEL order. Tooling, mechanical structure and component mounting techniques are standardized. Only charges for art preparation, photographic processes and tooling setup are unique to each order—and these charges are no more than the costs of panel fabrication and engraving, anodizing, hot stamping or silk screening processes used to label conventional panels.



Completely wired DATA•PANEL brings all connecting points for signal, supply, bias and test voltages out to five connectors in this application.

DATA•Modules present their messages in a variety of sizes, shapes, colors and visual display options. They are invisible when off.

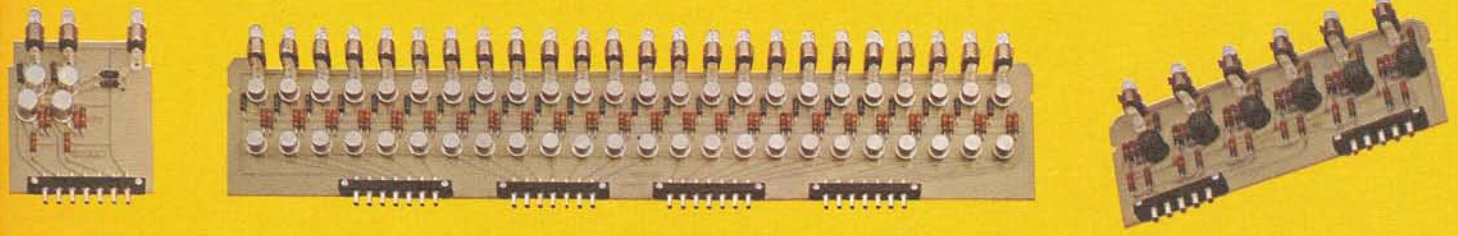


Transistor controlled digital readout (which can operate from coded input signals) mounts on the rear of the assembly and displays its message on the face of DATA•PANEL.

Lamp control circuitry is mounted on printed circuit boards locked in place and removed by releasing spring clips and pulling out from the rear of DATA•PANEL.

Taper pin receptacles provide a variety of hook-up options: directly from the system; to common blocks; or to harness and connectors. With any of these options the boards can be removed and disconnected quickly.

Midget flange base lamps used on printed circuit boards are quickly replaced by removing lamp from its holder without tools.



Printed circuit cards contain complete lamp control circuitry. Size varies with indication requirements.

MECHANICAL SPECIFICATIONS

DATA•PANEL SIZE (maximum single unit)

- Any practical size can be built. At extreme sizes limitations will be encountered in glass handling and mounting. Large displays, with many lamps illuminated at one time, may require blower cooling.

BACK PANEL DIMENSIONS

- Minimum dimension backpanel from the front surface of the DATA•PANEL is 1½" including lamp hardware, but without lamp control circuitry or digital displays.

RECOMMENDED MINIMUM SIZE OF DATA•Module

- Basic design is ½" x ½" square, however smaller sizes can be built to fit special requirements. No limit to maximum size.

SHAPES OF DATA•Module

- Square, rectangular, triangular, diamond, round—almost any geometric pattern or combinations of patterns in any size exceeding the minimum area required for lamps can be duplicated. Customer requirements determine size, shape and position of DATA•Module within the DATA•PANEL.

INFORMATION DISPLAYED

- Any number, series of numbers, letters, words or messages composed of series of words in any typeface can be displayed within DATA•Modules. Logotypes, trademarks and pictorial symbols such as generators, pumps, etc., can be duplicated. Messages may be in one line of any practical length or on several lines.

"OFF" APPEARANCE

- When no indication is required the DATA•Module and its message is completely invisible behind the Graphic Gray DATA•PANEL. If desired for operator orientation certain messages or grid lines can be made visible, in color, at all times on the DATA•PANEL face.

"ON" ILLUMINATION AND COLOR

- Vivid information display is achieved by illuminating the various DATA•Modules behind the legend areas. Page 4 shows the wide range of colored displays that can be achieved with DATA•PANEL. Standard colors for incandescent lamps are red, green, blue, yellow, orange and white. Other colors may be specified.

PANEL MATERIAL

- Graphic Gray or clear glare-free glass. Other transparent materials including Plexiglas may be specified but scratch-resistance of material must be considered.

MOUNTING

- DATA•PANEL can be installed as a complete, self-contained panel section on consoles or in equipment. It can be mounted flush with adjacent surfaces or recessed below and at various angles to surrounding surfaces. Rack mounting is also available.

PRINTED CIRCUIT BOARDS

- Lamp control printed circuit boards contain the lamps and slide into position behind the DATA•PANEL with the lamps projecting into the DATA•Modules. Spring clips hold boards in place.

TERMINAL OPTIONS

- Series "53" taper pin receptacles are standard. Other terminals may be specified on special order.

ELECTRICAL SPECIFICATIONS

NON-TRANSISTOR CONTROLLED LAMPS

- Midget flange base incandescent and neon lamps are used and can be selected to meet a wide range of supply voltages. See Lamp Specifications Sheet.

TRANSISTOR-CONTROLLED INCANDESCENT LAMPS

- High current drain typically encountered with incandescent lamps is solved by transistorized circuitry that switches lamps ON and OFF with low current level signals usually found in solid state systems. Midget flange base lamps can be selected to meet a variety of supply voltages and currents. See Lamp Specifications Sheet.

TRANSISTOR-CONTROLLED NEON LAMPS

- High voltage problems inherent in neon lamps are confined to the DATA•PANEL through the use of transistorized lamp control circuitry. This enables the neon lamp to be operated from the low level logic lines frequently present in solid state designs. Low candlepower and color output of neon lamps limit display color choices to amber, red and orange. See Lamp Specifications Sheet for supply requirements.

LAMP REPLACEABILITY

- All lamps, whether used in DATA•Modules or in digital readout devices, are easily replaceable from the rear of DATA•PANEL.

READOUT DEVICES

- DATA•PANEL permits integral installation of readout devices including TEC-LITE Digital Readout with NIXIE® tube (Alpha-numeric neon display tubes may also be specified), TNR Series; Transistorized Segmented Readout, TSR Series; and projection units with TEC-LITE Transistorized Projection Display Drivers and decoders, TPD Series. All readouts mount behind the glass face of DATA•PANEL. See separate data sheets on readouts for signal and supply voltage requirements.

ELECTRICAL CONNECTIONS

- All supply and signal voltages can be connected to DATA•PANEL by use of one or more connectors for fast accurate installation, or by taper pin receptacles.

TEC LITE

DATA•PANEL

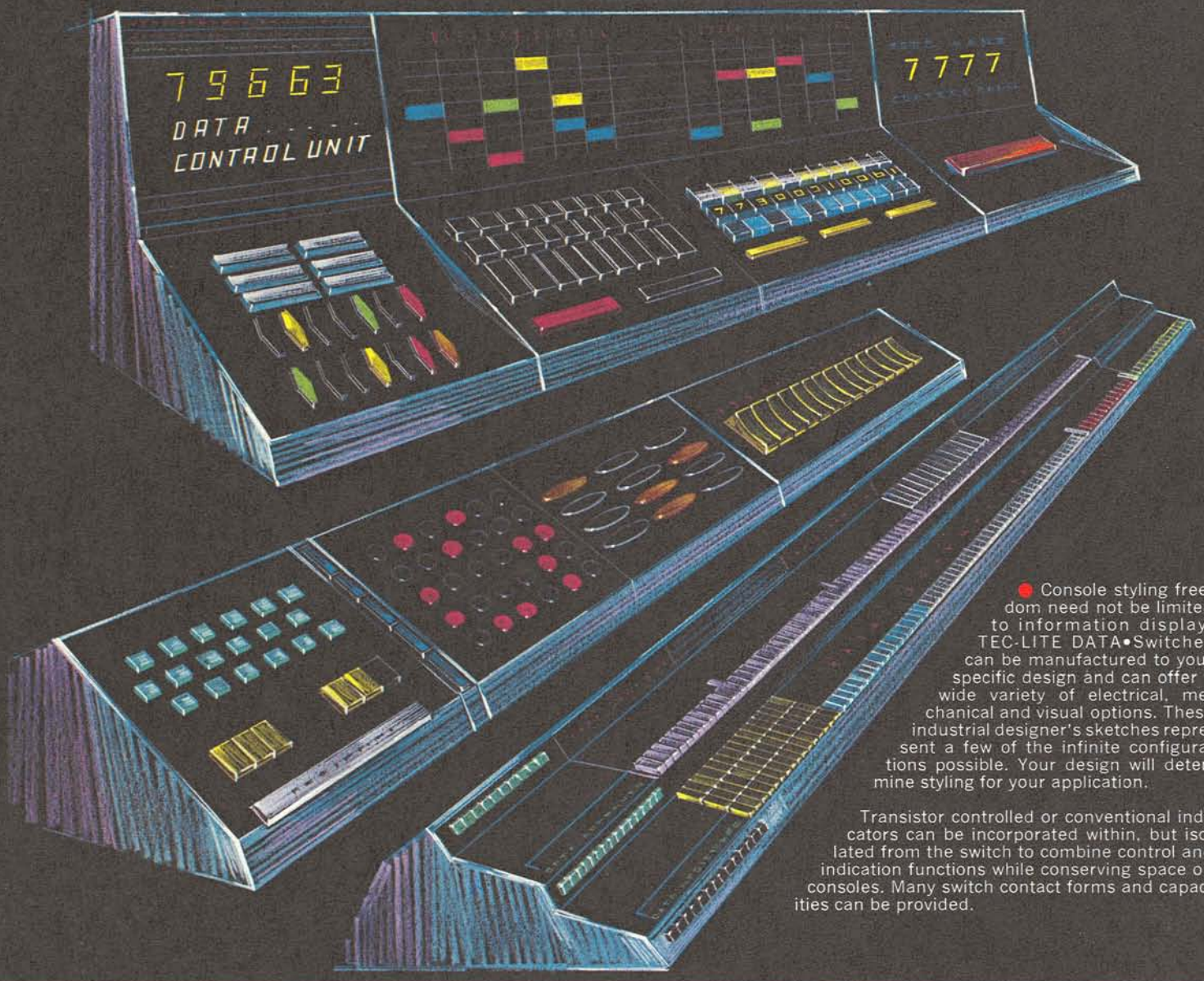
2

3

This new, ultra-modern facility was built specifically for the design and production of TEC-LITE Indicator Devices, Digital Readouts and precision electronic subassemblies. Here, DATA•PANEL was conceived and is now produced. Photos are: 1) view of 52,200 square foot fully climatized administrative offices and plant; 2) a production area with high level lighting and spacious, efficient layout; 3) TEC-LITE inspection area where specially built test instruments duplicate in-system electrical conditions.

SWITCHES CUSTOM BUILT TO YOUR DESIGN

COMPLEMENT DATA•PANEL CONSOLES



● Console styling freedom need not be limited to information display. TEC-LITE DATA•Switches can be manufactured to your specific design and can offer a wide variety of electrical, mechanical and visual options. These industrial designer's sketches represent a few of the infinite configurations possible. Your design will determine styling for your application.

Transistor controlled or conventional indicators can be incorporated within, but isolated from the switch to combine control and indication functions while conserving space on consoles. Many switch contact forms and capacities can be provided.

Drawings by Scharfenberg, Polivka and Logan, Industrial Design Consultants, Minneapolis, Minneso

COMPLETE CONSOLE STYLING SERVICE

If you wish to take full advantage of the design freedom offered by DATA• PANEL, but do not have industrial designers available, Transistor Electronics Corporation can provide complete console styling service. These sketches represent some of the console designs that can be built around the highly versatile, dramatically colorful DATA•PANEL concept. Your letter requesting further information on console styling service will receive prompt attention.

TEC LITE
INDICATING DEVICES

Transistor Electronics Corporation
Box 6191 • Minneapolis, Minnesota 55424 • Phone (612)-941-1100

355 1-64

Printed in U.S.A

CUSTOM DESIGNED

OR STANDARD

TEC LITE

INDICATING DEVICES

...give you precisely the indicator you need!

TEC originated and developed the concept of transistorized indicators and has pioneered the development of a wide range of modern indicating devices—both conventional and transistorized. Units in TEC's basic line are electrically designed to cover the most commonly used signal and supply voltages encountered in equipment using indicators. Some units are specifically tailored to meet battery and aircraft supply voltages, for example. Others meet the more complex requirements encountered in the broad range of signal and supply voltages available in computer, data processing or control systems.

However, design engineers frequently need an indicator designed specifically to meet unique circuitry requirements and high reliability levels for today's sophisticated semiconductor systems. TEC specializes in this area and has designed several hundreds of custom-designed indicators for specific applications. While these units are custom designed, their cost and delivery schedule usually remains very close to standard Tec-Lite Indicators. TEC achieves this design versatility at minimum cost because its unique design and production facilities have been set specifically for this purpose. Basic product designs as well as custom designs utilize similar components.

A majority of the TEC engineering staff comes from the computer industry and are thoroughly versed in the needs of this industry.

"Transistorized" DIGITAL READOUT
Offers Optional Decoder Functions

TNR SERIES

Compact readout using rectangular NIXIE® tube mounts on 1″ centers. Self contained transistorized drivers control numeral display from signals as small as two volts. Circuitry options include binary to decimal or octal converters, counter and memory. Optional bezel contains Polaroid® filter to increase readability. Popular terminal types available. Size 1″ w x 1¾″ high, less than 3″ deep.

®Burroughs Corp.
®Polaroid Corp.

"Transistorized" LOW VOLTAGE NEON INDICATOR LITE

LVN SERIES

Low voltage DC is stepped up *internally* to high voltage AC to fire both electrodes of the neon lamp. Provides a long life, low power drain neon operating from 3 to 24 VDC. Used where high voltage is not desired or available. May also be controlled with low signal voltage. Lite, 9/16″ in dia., mounts on ⅝″ centers—projects 1¾″ behind panel.

TRANSISTOR CONTROLLED INCANDESCENT LITE

With Replaceable Lamp

TIL SERIES

Replaceable incandescent lamp indicator is internally switched on and off by signal currents as low as .3 ma. Ten models operate from signal and supply voltages most commonly used. Available in watertight version also. Standard replaceable midget flange base lamps available from jobbers. Mounts from the rear in ⅜″ holes on centers as close as ⅝″. Projects back 1¾″.

select from . . .
a wide range of standard . . . . .

TEC LITE INDICATORS

transistorized or conventional

MTL SERIES

"Transistorized" **MINI-LITE INDICATOR**

Long life neon indicator is controlled from signals as small as two volts. Twenty basic models meet most signal and supply voltages commonly used. High voltages—to fire lamp—are confined to panel. Lamp and transistorized circuitry are contained in 9/16″ dia. body that mounts on ⅝″ centers. Body projects back 1⅛″.

TBL SERIES

BUTTON-LITE *(Transistorized)*

A transistor controlled neon lamp plus a momentary contact button switch are combined within the 9/16″ dia. body of this compact indicator. Operating from signals as small as two volts, 20 standard models, with A or B Form switch, fit most needs. Lites mount on ⅝″ centers—body projects 1¾″ behind panel.

PTL SERIES

With Replaceable Lamp

PRESS-TEST INDICATOR LITE

Mounting in ⅜″ holes on 9/16″ centers, this lite combines replaceable lamp and press-test feature in ½″ dia. body. Standard midget flange base neon and incandescent lamps are tested independent of circuit indicator signals by pressing lens. Lamps available from jobbers. Gold-plated terminals accept series "78" taper tab receptacles or solder connections. Back panel projection 1-7/32″.

RDL SERIES REPLACEABLE LAMP DISPLAY-LITE

Five basic models offer unique variety in appearance, lens style and mounting methods. RDL-A and B Series use standard midget base neon and incandescent lamps, RDL-C, D, and E Series, incandescent only. Lens unscrews for fast lamp replacement. Solder plated terminals accept series "78" taper tab receptacles or solder connections.

RDL-A Series mounts from the rear in a ⅜″ hole on 9/16″ centers. Body projects ⅝″ behind panel. Watertight version available.

RDL-B Series mounts from the front in a 15/32″ hole on 11/16″ centers. Body projects 27/32″ behind panel. Watertight version offered.

RDL-C, D and E Series front mount in a 15/32″ hole on 11/16″ centers. Body projects 17/32″ behind panel.

RLA SERIES

REPLACEABLE LAMP ASSEMBLY

Permits continuous mounting—horizontally and vertically—of replaceable flange base neon or incandescent lamp indicators on ⅜″, ½″, ¾″ and 1″ centers. Unlimited lengths and widths of display achieved with a combination of terminal strips and lamp sockets using standoffs or optional design that eliminates panel mounting screws. Projects 1¼″ back of panel.

MDL SERIES

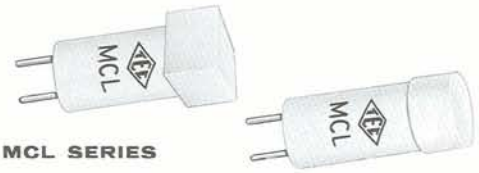
MINIATURE DISPLAY LITE

A variety of optional features . . . lens colors, styles, neon or incandescent lamps, internal resistor, body color, finishes and terminals . . . make this indicator extremely versatile. Body ½″ dia. mounts in ⅜″ hole on 9/16″ centers. Rear projection ¾″.

FML SERIES

FRONT MOUNTING LITE

Slip-in installation (no hardware required) of incandescent or neon lamp indicator is important when rear panel access is limited. Insert lens to lock flexible nylon collet body in place. Lite is insulated from panel and can contain ¼w resistor. Front mounts in .375 hole on ½″ centers in ⅛″ panel. Projects 13/16″ to rear.



MCL SERIES

MINIATURE CARTRIDGE LITE

One piece plastic lens-body contains neon or incandescent lamp. Square or round lens, internal series resistor, wire lead or .040 pin terminals offered. Lite clip mounts in .312 hole on ⅜″ centers. Rear projection ½″.

MBL SERIES

MINIATURE BUTTON-LITE

Combines neon or incandescent lamp indicator and independent switch in one unit to save panel space. Momentary contact switch (see MBS for life) offers A or B Forms. Internal lamp resistor optional. Body, ½″ in dia., mounts in ⅜″ hole on 9/16″ centers—projects ⅞″ back of panel.

MBS SERIES

MINIATURE BUTTON SWITCH

Momentary contact push button switch offers A, B, or AB Form contacts. Life of gold plated wiping action contacts exceeds 500,000 operations at 100 ma. current rating. Body, ½″ in dia., mounts in ⅜″ hole on 9/16″ centers—projects ⅞″ back of panel.

LPS SERIES

LITE POWER SUPPLY

Compact unit (3⅝″W x 6¼″L x 3½″H) is expressly designed to provide supply and bias voltages for TEC-LITE Transistorized Indicators and standard neon indicators. Drives several hundred lites from 105-130 VAC.

LENS COLOR:

1 — Translucent Red*
2 — Transparent Red
3 — Transparent Amber
4 — Translucent Yellow*
5 — Translucent Green*
6 — Translucent Blue*
7 — Clear
8 — Transparent White
9 — Translucent White*
11 — Translucent Orange*
12 — Transparent Green*
13 — Transparent Blue*

*For Incandescent Only

. . . . . or detail your requirements for CUSTOM DESIGNED TEC LITE INDICATORS here...

SPECIFICATIONS for NON-STANDARD* TEC-LITE INDICATORS

COMPANY ..... DATE .....

DIVISION OR DEPT. ..... PHONE ..... EXT .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

ENGINEER ..... BUYER .....

APPLICATION ..... MILITARY ☐ COMMERCIAL ☐

*This is a variation of a standard ..... Series TEC-LITE

ELECTRICAL SPECIFICATIONS

Supply Voltages Available AC ☐ DC ☐ .....V ±.....%; .....V ±.....%; .....V ±.....%; .....V ±.....%

Bias Voltages Available .....V ±.....%; .....V ±.....%; .....V ±.....%; .....V ±.....%; .....V ±.....%

Signal Voltage [Specify Polarity and Tolerance or Range]: ON ..... OFF .....

Signal Current [Specify Tolerance or Range]: ON ..... OFF .....

Input Impedance ..... Ohms

LAMP TYPE: Neon ..... Incandescent ..... Replaceable Yes ☐ No ☐

(Specify lamp number if type critical)

SWITCH FUNCTION (if applicable): Contacts Normally Open ☐ Normally Closed ☐ Other .....

(non-standard)

Other electrical requirements .....

(Sketch suggested schematic on reverse side)

MECHANICAL SPECIFICATIONS

LENSES

COLOR: See Catalog – Specify standard colors for neon or incandescent lamps – or indicate other non-standard color desired:

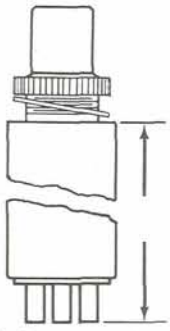
COLOR: .....

SHAPE: Flat Top ☐ Spherical ☐ Spherical not available in Button Lites

HOT STAMPED LEGENDS: Up to 3 characters can be embossed on flat top lens faces. Specify legends desired on prototype. See TEC-DATA Sheet 108.

Quantity.....Legend___; Quantity.....Legend___;
Quantity.....Legend___; Quantity.....Legend___.

Other Lens Style
(non-standard - sketch design)



Indicate maximum acceptable back panel length.

DIMENSIONAL DATA
(See drawing at left)

FOR PANEL THICKNESS: .....inch NOTE: Tooling setup for 1/16 inch to 1/8 inch and 9/64 to 3/16 inch panel thickness – others non-standard

MOUNTING HOLE DIAMETER: ..... inch NOTE: 3/8 inch and 15/32 inch diameter hole accomodates standard TEC-LITES.

MOUNTING HOLE CENTERS: ..... inch NOTE: 5/8 inch centers standard for 3/8 inch mtg. hole; 11/16 inch centers standard for 15/32 inch mtg hole.

(OVER)

TERMINALS

NUMBER PINS: .....

TYPE: ☐ Taper Pin ☐ Solder Lug/Taper Tab

☐ " Wire-Wrap " ☐ Other .....
(non-standard)

BODY – NUT

FINISH: Anodize ☐ Other .....
(non-standard)

COLOR: Black ☐ Other .....
(non-standard)

ENVIRONMENTAL SPECIFICATIONS

Operating and Storage Temperature -40°C to +65°C. If other, specify .....

Other requirements (indicate shock, vibration, acceleration factors if applicable) .....

.....

.....

MIL-FEDERAL SPECIFICATIONS

See Catalog – Specify any other required, but not listed in catalog .....

.....

.....

SAMPLE and ORDERING INFORMATION

Number Samples Required ..... Date Req'd .....

Prototype Quantity Required ..... Date Req'd .....

Production Quantity Required ..... Delivery Sched. Req'd .....

Send Quotation On
- Sample ☐ based on ..... pieces
- Prototype ☐ based on ..... pieces
- Production ☐ based on ..... pieces

Send Quote to: ☐ Engineer ☐ Buyer

Send Sample to: ☐ Engineer ☐ Buyer

.....

Signed by .....

USE THIS AREA FOR COMMENTS AND SCHEMATICS

ORIGINATOR OF PATENTED
TRANSISTORIZED INDICATORS
213 12-1-62

Transistor Electronics Corporation

TELEPHONE (612) 941-1100
BOX 6191 MINNEAPOLIS 24, MINN.
TELETYPE 612-292-4165

Printed in U.S.A.

TEC LITE DATA•PANEL

PRELIMINARY

DESIGN SPECIFICATIONS SHEET

How to use this DESIGN SPECIFICATIONS SHEET:

DATA•PANEL is uniquely flexible - - electrically, mechanically and visually - - therefore a variety of questions are asked in order that TEC-LITE DATA•PANEL engineers will have a clearer picture of your display requirements and so that accurate proposals can be made.

Please refer to the 8-page DATA•PANEL brochure when filling out this sheet.

COMPANY _____ DATE _____

DIVISION OR DEPT. _____ PHONE _____ EXT. _____

ADDRESS _____ M/S _____

CITY _____ STATE _____ ZIP CODE _____

ENGINEER _____ BUYER _____

APPLICATION _____ MILITARY / COMMERCIAL

PROTOTYPE QUANTITY REQUIRED _____ DATE REQUIRED _____

PRODUCTION QUANTITY REQUIRED _____ DELIVERY SCHED. REQ'D. _____

SEND QUOTATION ON PROTOTYPE ☐ BASED ON _____ PIECES
PRODUCTION ☐ BASED ON _____ PIECES

SEND QUOTE TO BUYER ☐ ENGINEER ☐

DATA•PANEL ELECTRICAL SPECIFICATIONS*

* Select supply and signal voltages and currents from "STANDARD ELECTRICAL SPECIFICATIONS" Sheet enclosed. Enter these below or, if other voltages or currents are required specify below.

FOR NON-TRANSISTORIZED LAMPS:

Supply Voltages Available: AC ☐ DC ☐ _____V± _____%; _____V± _____%; _____V± _____%; _____V± _____%.

Can one side of circuit be used as common? YES _____ NO _____

Lamp Type: Incandescent ____; Neon ____. NOTE: Neon Lamps not recommended due to inherent color output and low candlepower.

FOR TRANSISTOR CONTROLLED LAMPS:

Supply Voltages Available: AC ☐ DC ☐ _____V± _____%; _____V± _____%; _____V± _____%; _____V± _____%.

Bias Voltages Available: _____V_____ ± _____%; _____V_____ ± _____%; _____V_____ ± _____%; _____V_____ ± _____%.

Signal Voltage [Specify Polarity and Tolerance or Range] ON _____ OFF _____

Signal Current [Specify Tolerance or Range] ON _____ OFF _____

Minimum Input Impedance _____ OHMS.

Lamp Type: Incandescent ____; Neon ____. NOTE: Neon Lamps not recommended due to inherent color output and low candlepower.

DIGITAL READOUT OPTIONS are described on Page 5 of this sheet.

TEC LITE DATA•PANEL

VISUAL DISPLAY SPECIFICATIONS

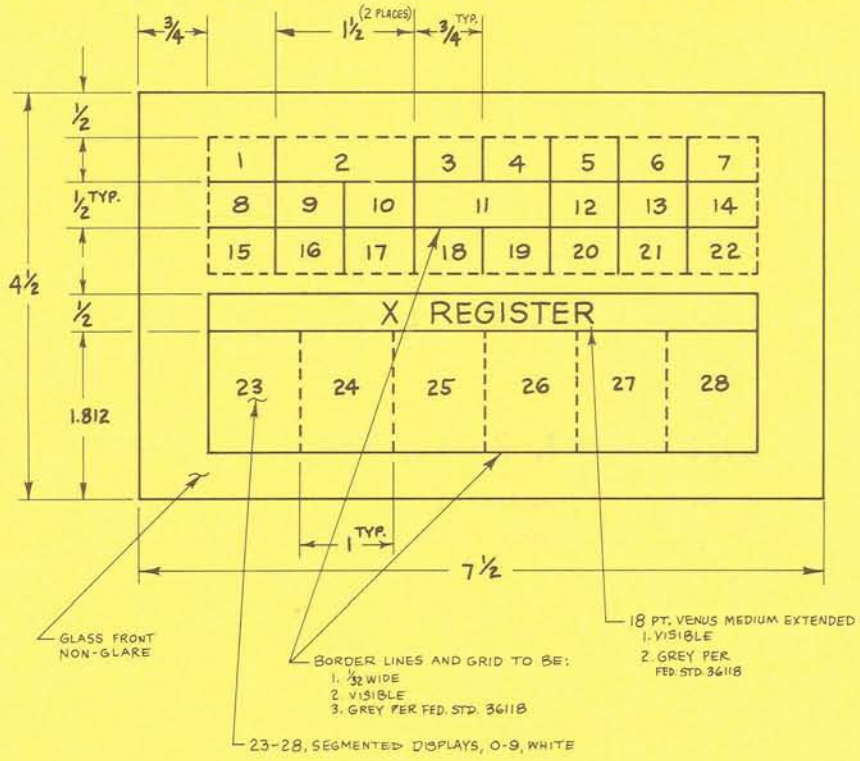
The sample drawing below illustrates the information needed to know your panel layout requirements - both visually and mechanically. Draw and dimension your panel as you visualize it on the grid at right. Note that the minimum size of DATA•Modules (the light confining area behind the legend) is ½"x½", but length and width may be increased to any practical size.

Itemize the content of each legend area (or DATA•Module) in the "Legend Tabulation Chart" provided below and as shown in the example immediately below.

Legends and background colors may be selected in a variety of OFF-ON combinations as shown on Page 4 of the DATA•PANEL Brochure. Specify the OFF-ON display appearance (not color) you desire by placing the number (1A, 4D, etc.) in the "Display Style" column. Colors available for incandescent lamps are red, green, blue, yellow, orange and white. (Neon lamps - amber, red, orange).

Refer to the DATA•PANEL Typeface chart to select type style and size (average character count per inch is given in order that you can determine type size).

NOTE: TEC-LITE DATA•PANEL engineers will determine the number of lamps required to properly illuminate legend areas.



DATA MODULE	LEGEND	DISPLAY STYLE (Pg 4 of Brochure)	TYPE FACE AND PT. SIZE	LEGEND COLOR	BACKGRD. COLOR
1	FAULTS	6F	14 POINT NEWS GOTHIC CONDENSED	WHITE	GRAPHIC GREY
2	1/0 BUFFER	6F		WHITE	
3	CYCLE	6F		WHITE	
4	WRITE	6F		WHITE	
5	CONDITION	7G		RED	GRAPHIC GREY
6	TAPE UNIT	9J		WHITE	RED
7	INDEX	9J		WHITE	AMBER
8	DIVIDE FAULT	6F		WHITE	GRAPHIC GREY
9	READ	6F		WHITE	
10	LOAD	7G		GREEN	
11	SECTION TEMP.	7G		RED	
12	STANDBY	7G		AMBER	
13	ON	7G		GREEN	
14	CHANNEL 1	6F		WHITE	
15	DECIMAL	6F		WHITE	
16	START	7G		GREEN	
17	STOP	7G		RED	
18	LOW	7G		GREEN	
19	HIGH	7G		RED	
20	PARITY ERROR	7G		RED	
21	OFF	7G		RED	
22	CHANNEL 2	6F		WHITE	GRAPHIC GREY

DATA Module	Legend	Display Style (Brochure pg. 4)	Type Face and Pt. Size	Legend Color	Background Color

DATA Module	Legend	Display Style (Brochure pg. 4)	Type Face and Pt. Size	Legend Color	Background Color

LAYOUT AND DIMENSION YOUR DATA•PANEL REQUIREMENTS B

LIST LEGEND REQUIREMENTS HERE

DATA Module	Legend	Display Style (Brochure pg. 4)	Type Face and Pt. Size	Legend Color	Background Color

DATA Module	Legend	Display Style (Brochure pg. 4)	Type Face and Pt. Size	Legend Color	Background Color

ELOW (Place legend tabulation in charts at bottom of sheet)

TA dule	Legend	Display Style (Brochure pg. 4)	Type Face and Pt. Size	Legend Color	Background Color

DATA Module	Legend	Display Style (Brochure pg. 4)	Type Face and Pt. Size	Legend Color	Background Color

TEC LITE DATA•PANEL

DIGITAL READOUT DESIGN SPECIFICATIONS

Segmented, neon display tube or projection type readouts (with or without self-contained transistor-control and decoder circuitry) can be mounted behind the glass panel of DATA•PANEL. Select readouts and their voltages and currents from "STANDARD ELECTRICAL SPECIFICATIONS" Sheet enclosed. Enter selected voltages and currents below, or if other voltages or currents are required, specify below.

READOUT TYPE PREFERRED

Segmented ☐ Neon Display Tube ☐ Projection ☐ *

*IEE 10000 or 120000 Series (Specify)

SIGNAL AND SUPPLY VOLTAGES

Supply Voltages Available ☐ Indicate AC or DC ☐ ___V± ___%; ___V± ___%; ___V± ___%; ___V± ___%; ___V± ___%.

Bias Voltages Available _____ V± ___%; ___V± ___%; ___V± ___%; ___V± ___%; ___V± ___%.

Signal Voltage [Specify Polarity and Tolerance or Range] ON or "1" _____ OFF or "0" _____.

Signal Current [Specify Tolerance or Range] ON or "1" _____ OFF or "0" _____.

Minimum Input Impedance _____ OHMS.

List desired character sequence (0 through 9, etc.) for Readouts as part of your panel layout sketch.

DECODER OPTIONS

Signal Logic

MODE:

- ☐ Decimal to Decimal
- ☒ Binary to Decimal
- ☐ Binary to Octal

Type of Input

- ☒ 10 Wire
- ☐ 8 Wire
- ☐ 6 Wire
- ☐ 4 Wire (Single Ended)
- ☐ 3 Wire (Single Ended)

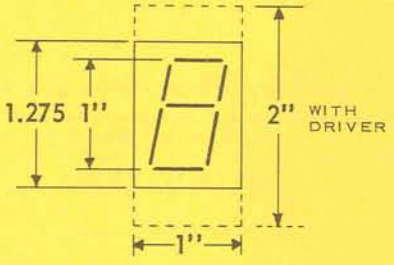
Other input codes such as 1, 2, 4, 2; 1, 2, 2, 4; XS-3; Gray (cyclic); XS-3 Gray, etc., can be accommodated on special order. Describe _____

MECHANICAL SPECIFICATIONS

(Use these dimensions to plan your DATA•PANEL layout)

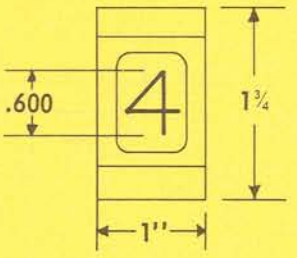
TEC-LITE TSR Series

Segmented Readout

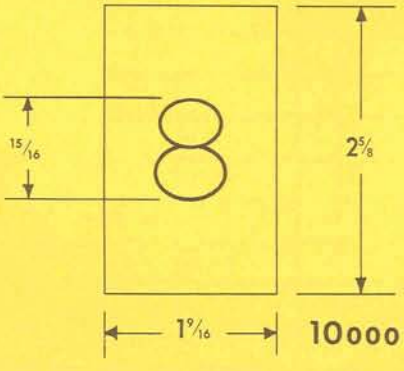


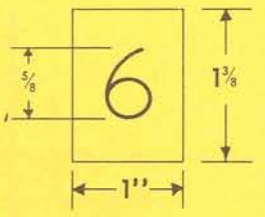
TEC-LITE TNR Series

Digital Readout



Projection Display with TEC-LITE TPD Series Projection Display Driver.

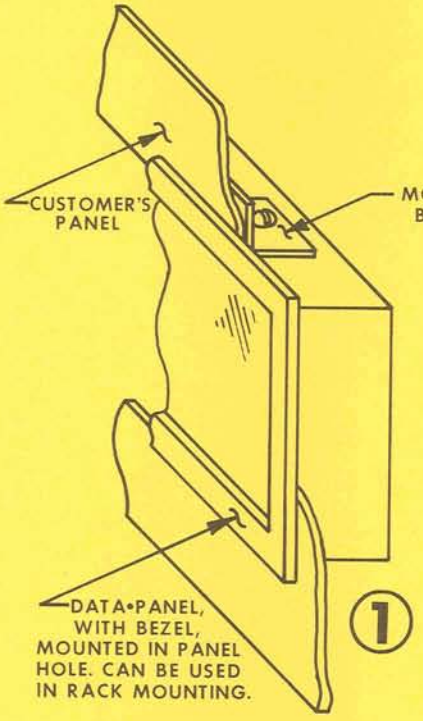


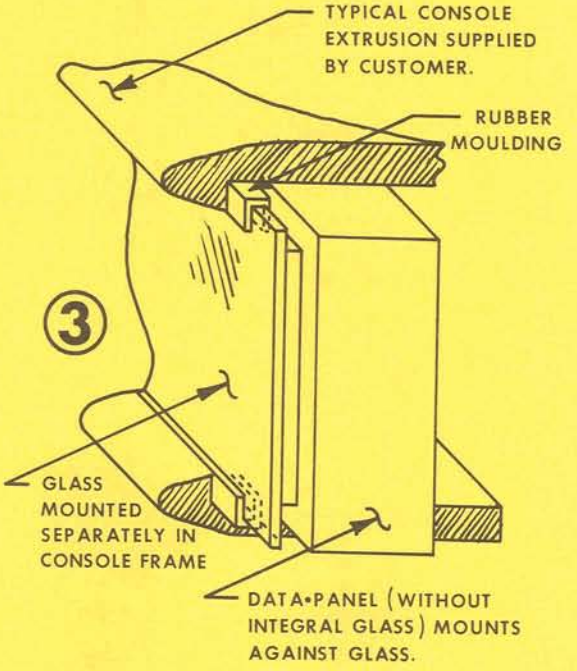


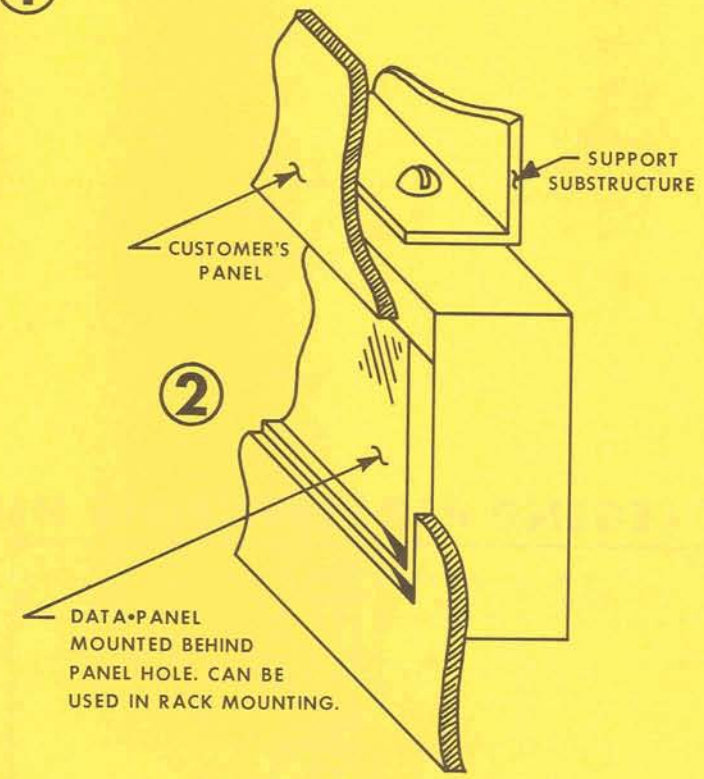
TEC LITE DATA•PANEL

MECHANICAL MOUNTING SPECIFICATIONS

DATA•PANEL may be mounted in a variety of ways. Three popular methods are illustrated below:







Which do you prefer? 1☐, 2☐, 3☐. Other: (Send sketch) ☐.

Please contact your TEC-REP or TEC directly if you require application assistance.

TEC LITE
INDICATING DEVICES

Transistor Electronics Corporation

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TEC LITE DATA•PANEL

TYPEFACE SPECIFICATIONS CHART

Virtually any type face can be specified for legend areas in DATA•PANEL. The type faces shown here are of a block or sans-serif style which have proved very legible in computer display applications. Height and average character count per inch are provided for design information. Type sizes both larger and smaller than those shown can be provided.

NEWS GOTHIC CONDENSED

10 pt. DATA • PANEL
(.100 high. Average 12 capital letters per inch.)

12 pt. DATA • PANEL
(.120 high. Average 10 capital letters per inch.)

14 pt. DATA • PANEL
(.140 high. Average 8 capital letters per inch.)

18 pt. DATA • PANEL
(.182 high. Average 6 capital letters per inch.)

24 pt. DATA • PANEL
(.245 high. Average 5 capital letters per inch.)

NEWS GOTHIC BOLD CONDENSED

10 pt. **DATA • PANEL**
(.100 high. Average 12 capital letters per inch.)

12 pt. **DATA • PANEL**
(.120 high. Average 10 capital letters per inch.)

14 pt. **DATA • PANEL**
(.140 high. Average 8 capital letters per inch.)

18 pt. **DATA • PANEL**
(.182 high. Average 6 capital letters per inch.)

24 pt. **DATA • PANEL**
(.245 high. Average 5 capital letters per inch.)

NEWS GOTHIC ITALIC and ***NEWS GOTHIC BOLD ITALIC*** are also available in the point sizes illustrated above.

TRADE GOTHIC EXTENDED is a typical type face used for identifying Registers, Addresses, etc., and is available in all point sizes.

Dozens of other type faces are suitable for DATA•PANEL legends. Your TEC-Rep has samples of these type faces, or write directly to:

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STANDARD ELECTRICAL SPECIFICATIONS

Indicator and Digital Readout supply and signal voltages listed in this sheet are typical and are generally compatible with those present in solid state system designs.

Variations in supply voltages, signal levels or signal swing can be easily accomodated, however, and should be requested if the standard electrical specifications listed do not meet your requirements.

INCANDESCENT LAMP SUPPLY VOLTAGES

Incandescent indicators - non-transistorized and transistor controlled - used in DATA• PANEL and TSR Series Transistorized Segmented Readouts require midget flange base lamps. Projection display readouts require either midget flange base or miniature bayonet base lamps depending upon model. Dual filament lamps or two-lamp installation can be provided for fail safe operation.

Midget Flange Base (S.C. Midg. Flg.)

LAMP TYPE	SUPPLY VOLTS	CURRENT RATING Amps.	MFGR'S APPROX. C.P. RTG.	AVER. LIFE (hrs.)[1]
331	1.35	.06	.006	500
338	2.7	.06	.04	500
345	6.0	.04	.04	1000
328[4]	6.0	.20	.34[3]	1000
380	6.3	.04	.02	50,000
350	6.3	.15	N.A.	3000
349[4]	6.3	.20	.55	3000
381	6.3	.20	.40	50,000
344	10.0	.014	.002	5000+
367	10.0	.04	N.A.	5000+
330[4]	14.0	.08	.5	750
382	14.0	.08	.30	50,000
370	18.0	.04	.15	1000
327[4]	28.0	.04	N.A.	1000

Miniature Bayonet Base (S.C. Min. Bay.)[2]

LAMP TYPE	SUPPLY VOLTS	CURRENT RATING Amps.	MFGR'S APPROX. C.P. RTG.	AVER. LIFE (hrs.)[1]
44	6.3	.25	N.A.	3000
47	6.3	.15	N.A.	3000
1815	14.0	.20	1.4	3000
1813	14.4	.10	.86	1000
1819	28.0	.04	.34	1000
1820	28.0	.10	1.6	1000
1829	28.0	.07	1.1	1000

[1]Operating incandescent lamps 5% to 10% below rated voltage will generally increase life 200% to 400%.

[2]Used in IEE 10000 Series Projection Displays.

[3]Candlepower at 5 volts.

[4]Recommended for IEE 120000 Series Projection Displays.

Supply Polarity: Non-Transistorized may be AC or DC; Transistor Controlled must be DC, + or −.

TYPICAL SIGNAL VOLTAGES FOR TRANSISTOR CONTROLLED INCANDESCENT LAMPS USED IN INDICATORS AND DIGITAL READOUTS

For Positive Supply

1) ON: +4 to +15 volts
   OFF: +.5 to −10 volts

3) ON: −.5 to +10 volts
   OFF: −4 to −10 volts

For Negative Supply

2) ON: −4 to −15 volts
   OFF: −.5 to +10 volts

4) ON: +.5 to −10 volts
   OFF: +4 to +10 volts

Nominal Input Impedance is 1000 ohms or more

FOR CODED INPUT (B.C.D.)

Use any ON-OFF signal pair above for logic "1" and logic "0" with + or − supply.

Example: Signal pair 2, above, used with + supply results in:

−4 to −15 volts = logic "1"
−.5 to +10 volts = logic "0"

or

−4 to −15 volts = logic "0"
−.5 to +10 volts = logic "1"

NEON LAMP SUPPLY VOLTAGES (Non-Transistorized)

Neon lamp indicators used in DATA•PANEL require replaceable midget flange base neon lamps (NE-2 type). Note: Use of neon lamps in DATA• PANEL should be restricted to those applications where the neon color is specifically desired. If used, restrict color selections to amber, red and orange. Other colors should be avoided due to the neon's low candlepower and inherent color output.

65VAC, or greater supply voltage.

85VDC, or greater supply voltage.

TEC-LITE DATA•PANEL

STANDARD ELECTRICAL SPECIFICATIONS

TYPICAL TRANSISTOR CONTROLLED NEON LAMP SUPPLY VOLTAGES

−100 ± 10 volts, +100 ± 10 volts
for neon lamp indicator circuits.

+170 to +190 volts for TNR Series Readouts with neon digital display tube.*

*NOTE: To avoid separate power supplies when TNR Series Readouts are used in DATA•PANEL, +170 to +190 VDC may be used to supply non-transistorized or transistor controlled lamps.

TYPICAL SIGNAL VOLTAGES FOR TRANSISTOR CONTROLLED NEON LAMPS AND NEON DIGITAL DISPLAY TUBES

ON: +4 to +10 volts	ON: −4 to −6 volts
OFF: +.5 to −3 volts	OFF: −.5 to +6 volts
ON: +.5 to −3 volts	ON: −.5 to +6 volts
OFF: +4 to +10 volts	OFF: −4 to −6 volts

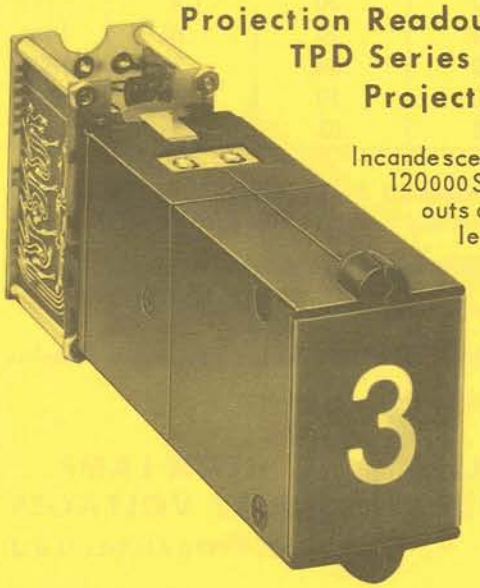
Nominal input impedance is 1000 ohms or more.

Any of these signal pairs may be used as Binary "1" and "0".

DIGITAL READOUT DEVICES FOR DATA•PANEL

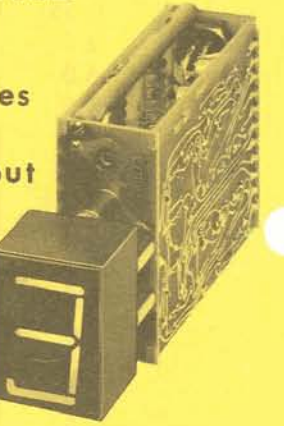
Three basic types of readout devices can be used behind the glass face of DATA•PANEL in conjunction with information display. Permanently visible borders or grid lines can be provided around readout areas as shown in the illustration on page 3 of the DATA•PANEL brochure.

Projection Readouts with TEC-LITE TPD Series Transistorized Projection Drivers

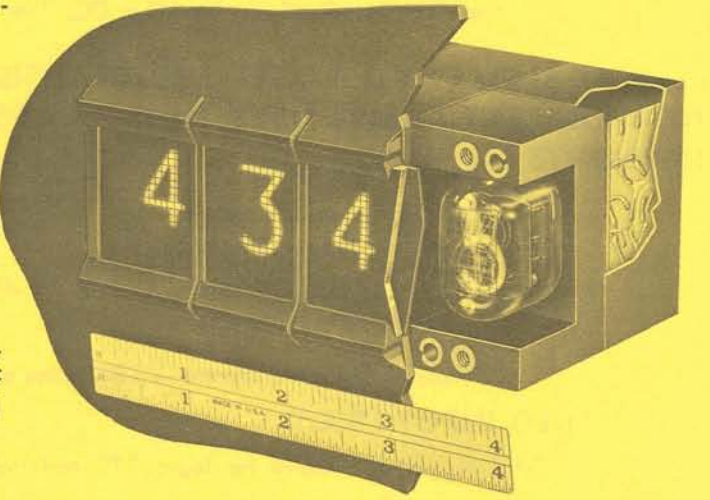


Incandescent lamps of 10000 and 120000 Series projection readouts are controlled from low level logic lines by TPD Series transistorized driver-decoder modules mounted on the rear of the readout. Complete decoder functions are available.

TEC-LITE TSR Series Transistorized Segmented Readout



Incandescent lamps, transistor controlled from low level signals, are used in this completely self-contained display. Full input signal decoder functions are available.



TEC-LITE TNR Series Digital Readout

This compact unit provides decimal readout from decimal or binary coded decimal input signals of low level. Elements of the rectangular neon display tube are controlled by internal transistorized circuitry. All decoder functions are offered.

For specific technical details on any of these digital readout devices see your TEC-LITE Indicator Devices catalog, contact your TEC-Rep, or write directly to:

TEC-LITE INDICATING DEVICES

Transistor Electronics Corporation

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