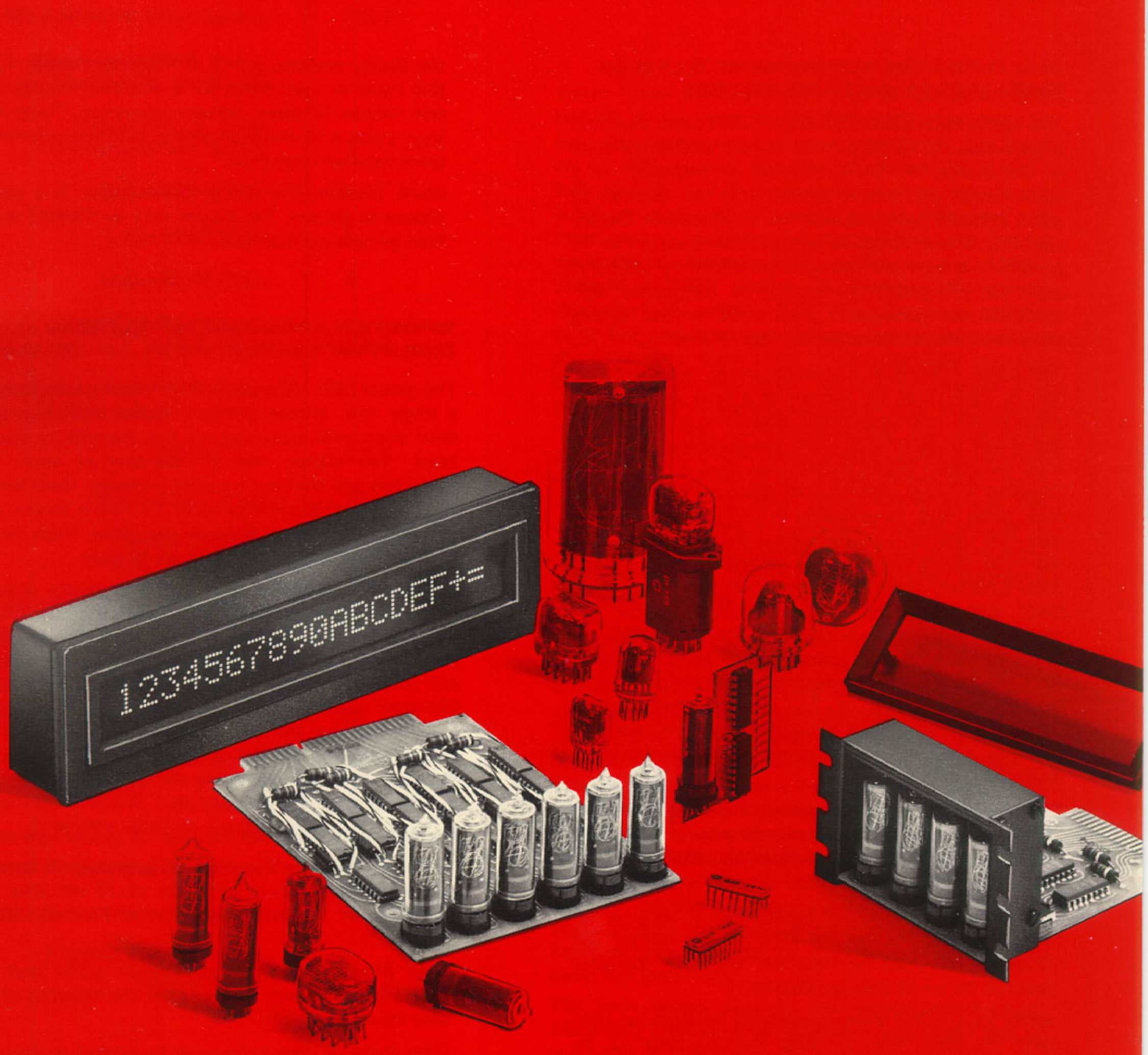
BULLETIN 1061K (SUPERSEDES BULLETIN 1061J)

BURROUGHS SPECIFYING GUIDE

ELECTRONIC COMPONENTS AND SYSTEMS





SELF-SCAN™ PANEL DISPLAY

The SELF-SCAN panel display is a significant advance in readout technology. Available with or without memory SELF-SCAN panel displays are available in alphanumeric and numeric models. The formed characters and flicker-free, high-contrast display make it easily readable in bright light or dark shadows. And because electronic drive circuitry has been reduced by as much as 90%, SELF-SCAN panel displays are the most economical displays for readouts with 8 to 400 characters of alphanumeric display.

16 or 18-POSITION ALPHANUMERIC SELF-SCAN PANEL DISPLAY MODEL SSD 1000-0030

The model SSD 1000-0030 SELF-SCAN panel display is a single row, 16 or 18-position display with a repertoire of 64 characters. Each character is displayed in a five-by-seven dot matrix format with two columns of space between each character on a 16 position display and one column of space between characters on an 18 position display. Each character is defined by a positive logic six bit code. The display is completely self-contained and packaged in a one piece, molded housing which encloses and supports the display panel.

The panel operates in a scanning mode, scanning from left to right, one full column at a time. Six or seven clock pulses must be provided, depending on the level of the count control input. The appropriate six bit code must be present during the first five clock pulses of each character position. After the last character is displayed, a reset pulse must be generated to initiate a new scan. A new scan may be initiated before the last character, at any time during the scan, by generating a reset pulse. This, however, must be done only on a low duty cycle basis. Generating the reset pulse prior to the last character position increases the duty cycle of the positions used, thereby changing their aging characteristics. When operating in this mode, the reset pulse must be held a minimum of $2t_1$ us. The recommended method of displaying a reduced number of character positions is to supply the appropriate level to the blank disable input.

The following signals are required for proper operation:

Data Inputs—A six bit code must be present at the data input terminals during the first five clock pulses of each character position.

Clock Input—Seven clock pulses must be supplied for each character position for a 16 position display. Six clock pulses must be supplied for each character position for an 18 position display.

Reset Input—One reset pulse must be supplied after each complete scan or after the character to be displayed.

Count Control Input—This input determines whether the display operates in a 16 or 18 position mode. Tying this input to V_{SS} yields an 18 character display with one column of space between characters. Tying it to V_{CC} yields a 16 character display with two columns of space between characters.

Blank Disable—The blank disable input is a switch closure to ground. The display may be blanked at any time by opening this input.

16-POSITION ALPHANUMERIC SELF-SCAN PANEL DISPLAY WITH MEMORY MODEL SSD 1000-0040

The model SSD 1000-0040 SELF-SCAN panel display is a single row, sixteen position display with associated drive electronics, packaged in a housing with an integral bezel. The display has a repertoire of sixty four characters and contains a refresh memory. Each character is displayed in a five-by-seven dot matrix format with two columns of space between characters. Each character is defined by a positive logic six bit code.

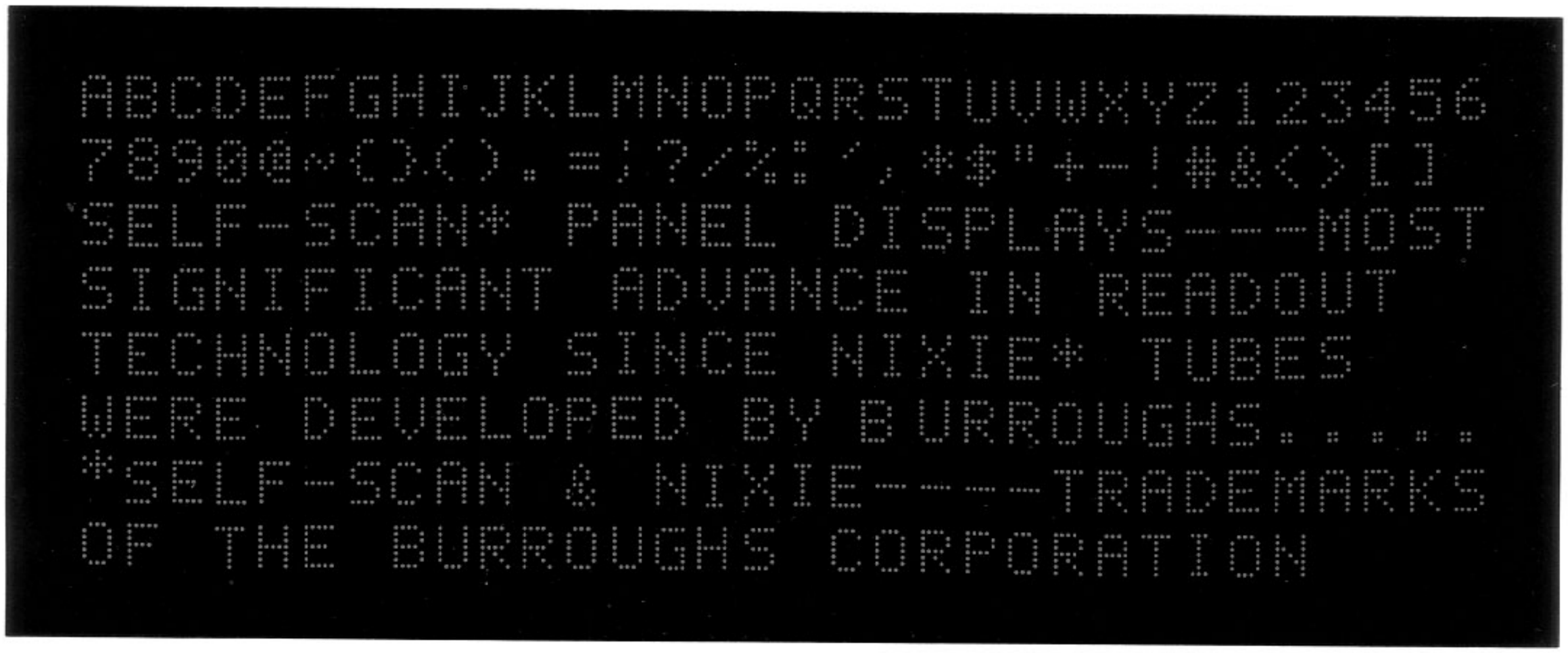
The display operates in a scanning mode entering characters from left to right. The characters are entered sequentially. The appropriate six bit code must be present one full scan time for each entry. The display will continue in order, entering a total of 16 characters. Character number 17 will be entered in the display such that it replaces the first character on the left. The display may be cleared at any time during the 16 character cycle be presenting the appropriate signal at the clear line for one scan period.

The following signals are required for proper operation:

Data Inputs—A six bit code must be present at the data input terminal for a minimum of 20 ms after the initiation of the data present pulse for each display position.

Data Present Pulse—A data present pulse must be generated coincident with, or after the initiation of the data inputs.

Clear Pulse—A clear pulse must be present at the clear input and held for a minimum of 20 ms to clear the display.



16 POSITION NUMERIC SELF-SCAN PANEL DISPLAY WITH MEMORY MODEL SSD 1000-0020

The SSD1000-0020 SELF-SCAN panel display offers all the features of the numeric SSD1000-0010 panel plus includes a refresh memory. The unit requires the following signals for proper operation.

DATA INPUTS—A four bit code must be present at the data input terminal for at least 20ms after the initiation of the data present pulse.

DATA PRESENT PULSE—A data present pulse must be generated coincident with, or after the initiation of data inputs for each character position.

CLEAR PULSE—A clear pulse must be present at the clear input and held for 20 ms to clear the display.

The panel may be used to display less than the full sixteen characters by supplying a blank code for the undesired positions.

256 POSITION SELF-SCAN PANEL DISPLAY SUBSYSTEM

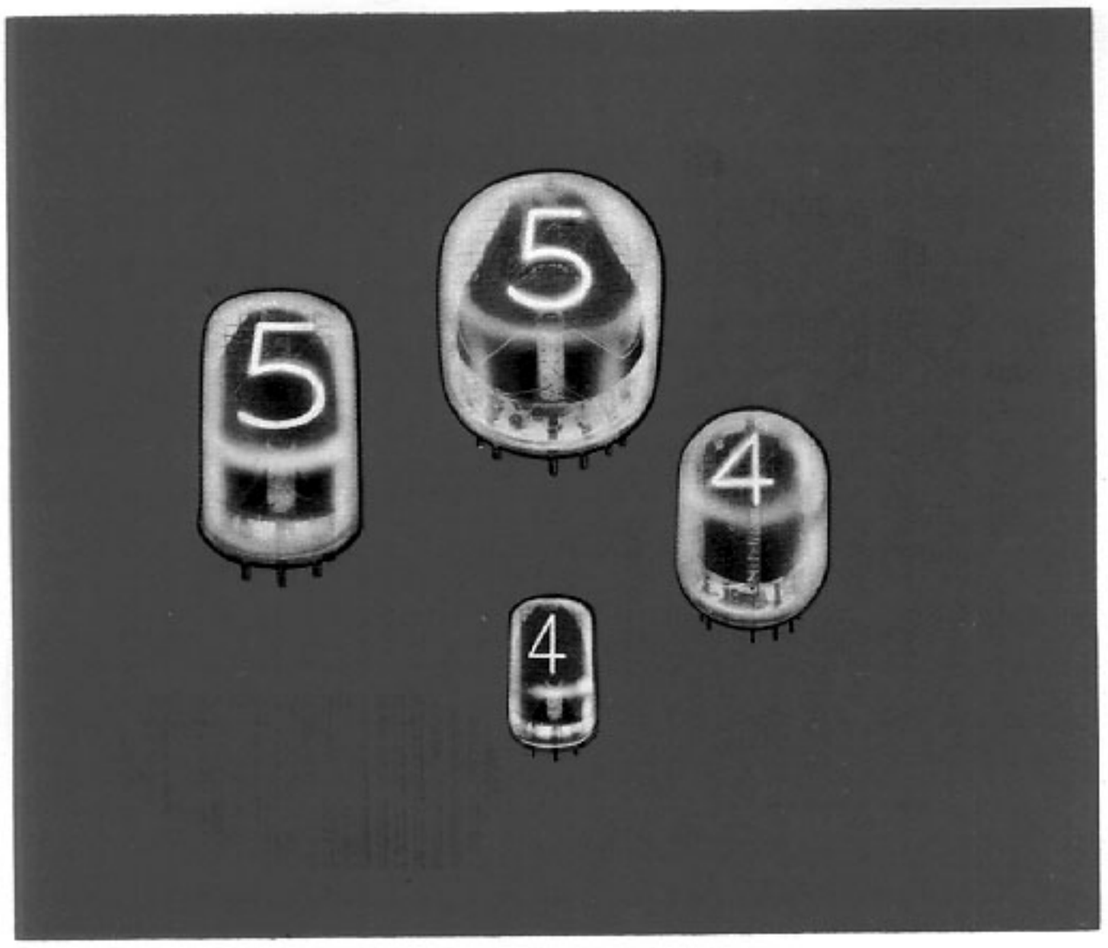
The Burroughs SELF-SCAN panel display system concept is unique in that it allows the user to construct custom-tailored stand-alone communication terminals from "off-the-shelf" components. The SSPD (SELF-SCAN panel display) subsystem, introduced by Burroughs in 1969, is the heart of a terminal system. This subsystem, can be purchased as a basic subsystem for integration into existing terminal system design; can be purchased as a complete, packaged, stand-alone system; or, can be purchased at any level of complexity between the basic subsystem and complete stand-alone unit with options.

The inherent features of the SELF-SCAN panel display make it the ideal readout for terminal applications. Reduced electronics and a display panel thickness of less than ½ inch allow packaging of the display, and therefore the terminal in a compact enclosure. The Burroughs design features a free-moving display head which can be lowered for convenient portability and even removed from the keyboard for wall or remote installations.

The character format of the SELF-SCAN panel display subsystem is the popular 5 x 7 dot matrix pattern shown above. There are two sizes of SSPD subsystems and systems. In the larger size the light emitting cavities that form the display matrix have a diameter of .024" and are on .040" centers, providing a character size of 0.18" wide by 0.26" tall. Two columns of dots (approximately 0.1") are employed as spacing between characters and three rows of dots separate the registers. The smaller panel display employs light emitting dots of 0.020" diameter on 0.030" centers. This arrangement provides a character 0.14" wide by 0.20" high. Like its companion panel this sybsystem uses two columns of dots between characters and three rows of dots between registers. Both the 0.030" and 0.040" displays are arranged in 8 registers of 32 characters per register. The bright neon-orange characters, contrasted against the dark background, provide a comfortable display which can be read easily from distances up to 20 feet for the .030" panel and 25 feet for the .040" panel. The Burroughs 256 character SSPD subsystem and SSPD system provide all the advantages of comparable CRT displays without the cumbersome bulk and massive electronics associated with the CRT device.

The keyboard employed in the SELF-SCAN panel display system is similar to a standard electric typewriter keyboard both in layout and key pressure. The shift provision allows use of the full 64 character ASCII code. The keyboard is electronically interlocked so that if two keys are simultaneously depressed no code is emitted. A two key roll over feature is also employed to provide for rapid input of data for display. Transmission of the second code however does require the release of the first key. The keyboard is designed to allow an input rate of at least 80 wpm without data loss. In addition to the standard keyboard which includes the cursor control keys, controls are provided for other normal terminal functions such as power on, local control, transmit, receive, and end of test.

The basic system uses the half duplex asynchronous (RS-232C) method of transmission. This means that at any point in time the system can either transmit or receive data, but not both. In the basic system the method of communication linking the terminal to the central processor is polling and selection.



MINIATURE NIXIE® INDICATOR TUBES

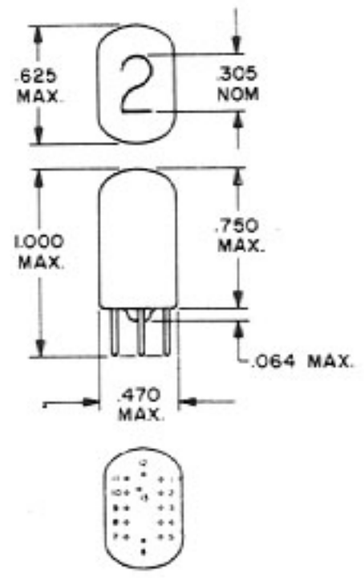
Available in rectangular and round configurations. Use for airborne and mobile equipment readouts and small lightweight instruments.

Character Size . . . . . 0.3″
Viewing Distance . . . . . 14.0′

STANDARD NIXIE INDICATOR TUBES

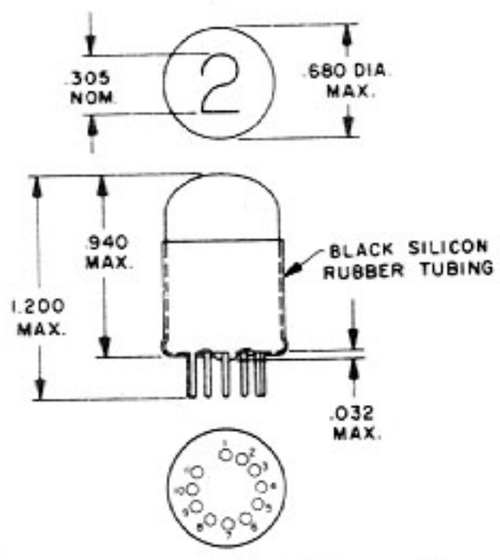
Available in round and rectangular configurations. Use for desk top displays and bench test equipment.

Character Size . . . . . 0.6″
Viewing Distance . . . . . 30.0′



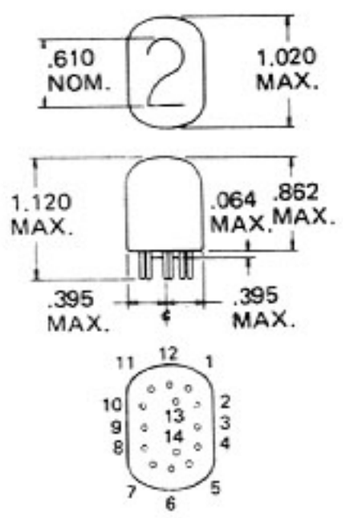
Type B4998 (Rectangular)
PIN CONNECTIONS

Pin No.	Numeral
1—	2
2—	3
3—	4
4—	5
5—	6
6—	IC
7—	7
8—	8
9—	9
10—	0
11—	anode
12—	1
13—	IC



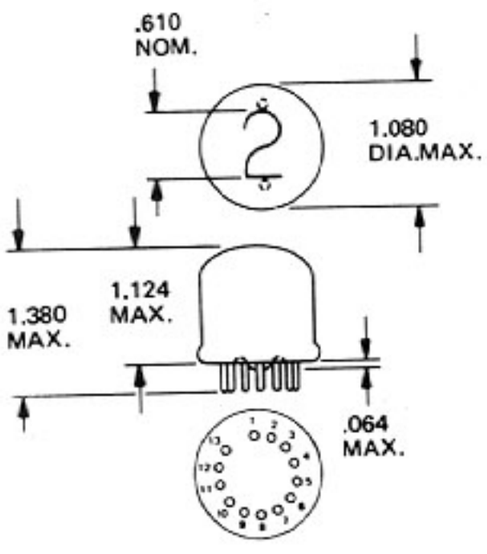
Type B4032 (7977) (round)
PIN CONNECTIONS

Pin No.	Numeral
1—	1
2—	2
3—	3
4—	4
5—	5
6—	6
7—	7
8—	8
9—	9
10—	0



Type B5991 (8422) (rectangular)
PIN CONNECTIONS

Pin No.	Numeral
1—	anode
2—	0
3—	9
4—	8
5—	7
6—	6
7—	5
8—	4
9—	3
10—	2
11—	1
12—	IC
13—	IC
14—	IC



Type B5092 (8421) (round)
PIN CONNECTIONS

Pin No.	Numeral
1—	IC
2—	anode
3—	0
4—	9
5—	8
6—	7
7—	6
8—	IC
9—	5
10—	4
11—	3
12—	2
13—	1

ELECTRICAL DATA/MINIATURE TUBES

(See Note 1) (See Notes 2 & 3)

	B4998 Rectangular	B4032 (7977) Round
Absolute Ratings		
Ionization Voltage (Max)	170 Vdc	170 Vdc
Supply Voltage (Min)	170 Vdc	170 Vdc
Cathode Current (Peak)	2.5 ma	2.0 ma
Test Conditions		
Supply Voltage	170 Vdc	170 Vdc
Series Resistor	15 K	15 K
Cathode Current		
(Min)	1.0 ma	0.7 ma
(Max)	2.0 ma	1.4 ma
Sockets		
Standard Wiring	SK176	SK116A
Printed Circuit	SK178	SK118A

ELECTRICAL DATA/STANDARD TUBES

(See Note 1) (See Notes 2 & 3)

	B5991 (8422) Rectangular	B5092 (8421) Round
Absolute Ratings		
Ionization Voltage (Max)	170 Vdc	170 Vdc
Supply Voltage (Min)	170 Vdc	170 Vdc
Cathode Current (Peak)	3.5 ma	3.5 ma
Test Conditions		
Supply Voltage	170 Vdc	170 Vdc
Series Resistor	8.2K	10K
Cathode Current		
(Min)	1.5 ma	1.5 ma
(Max)	3.0 ma	3.0 ma
Sockets		
Standard Wiring	SK169	SK112
Printed Circuit	SK144	SK130

NOTES

1. The minimum supply voltage should be +170 Vdc, however, the use of the highest voltage available with an appropriate series resistor is recommended to provide: 1) greater tolerance of B+ & Rp; 2) more uniform brightness; 3) more constant current operation; 4) improved operation with temperature and 5) improved life.
2. Special NIXIE tubes such as regular life wide angle types and weldable or tin dipped flying lead types are also available.
3. Special character NIXIE tubes such as + and — tubes, tubes with alphabet characters, and symbols (μ, mV) are also available.

SUPER NIXIE INDICATOR TUBES (B-6091)

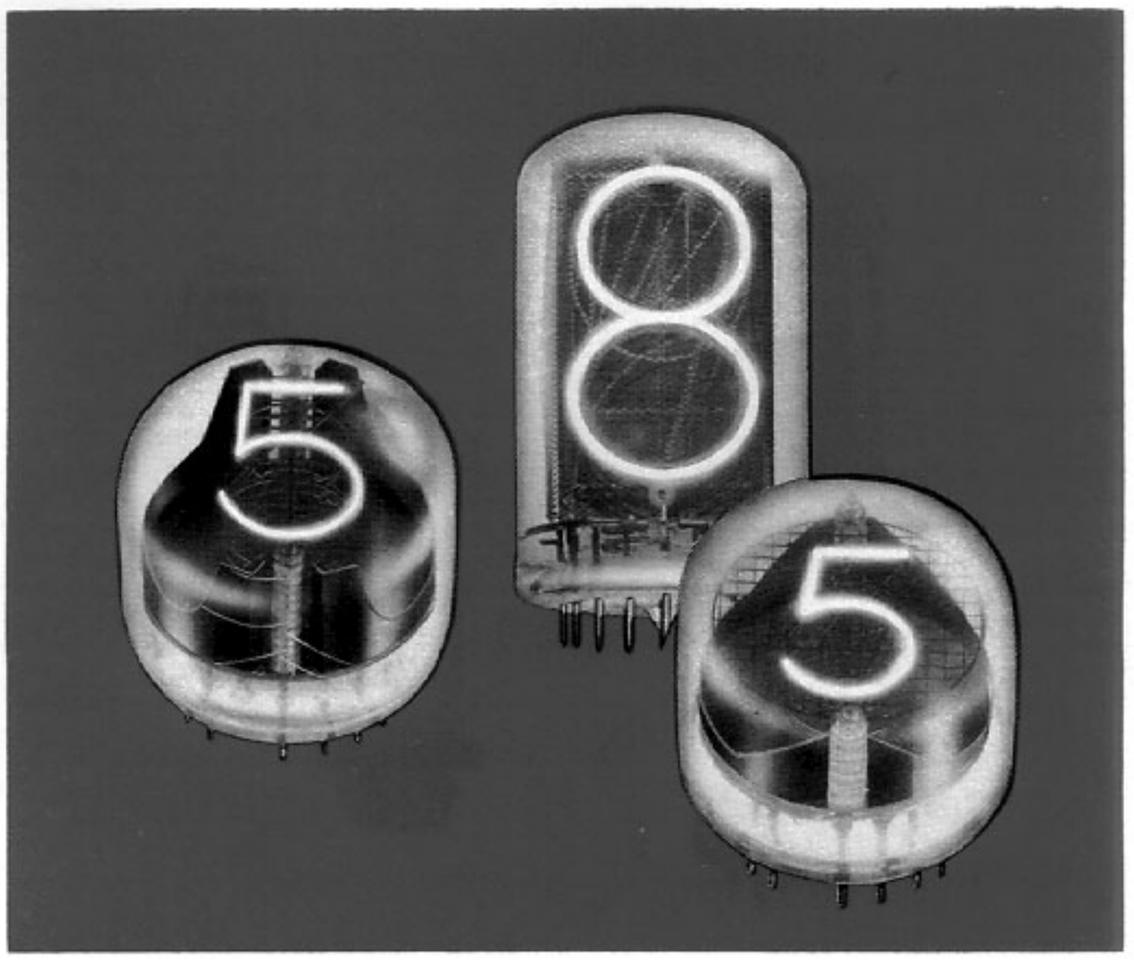
Designed for wide angle viewing. Use for desk top displays and bench test equipment.
Character Size . . . . . 0.8″
Viewing Distance . . . . . 38.0′

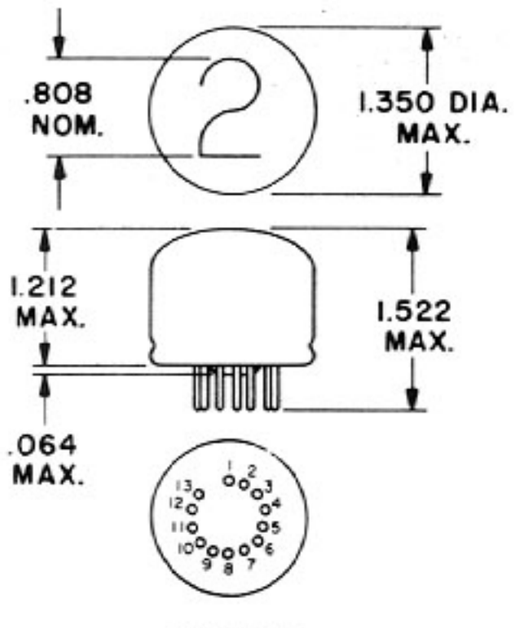
LARGE NIXIE INDICATOR TUBES (B-8091)

Designed for wide angle top viewing. Use for large audience displays and status boards.
Character Size . . . . . 1.4″
Viewing Distance . . . . . 65.0′

JUMBO NIXIE INDICATOR TUBES (B-7037)

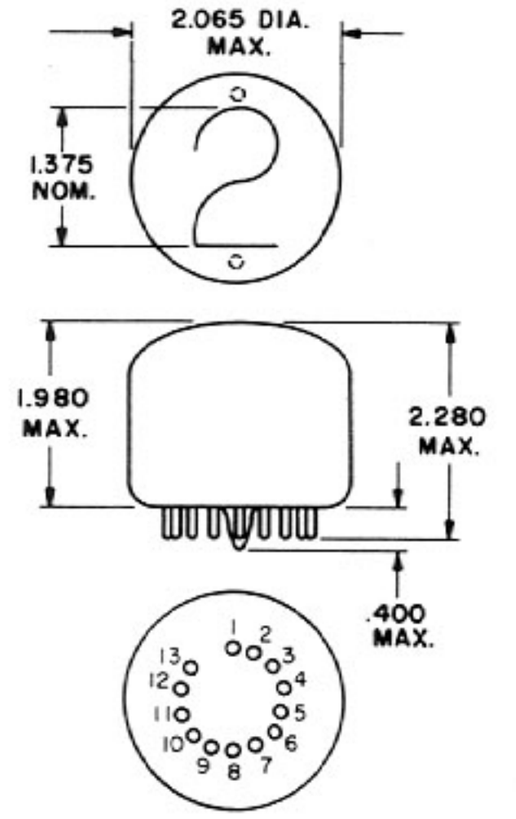
Designed for wide angle side viewing. Use for large audience displays and status boards.
Character Size . . . . . 2.0″
Viewing Distance . . . . . 100.0′





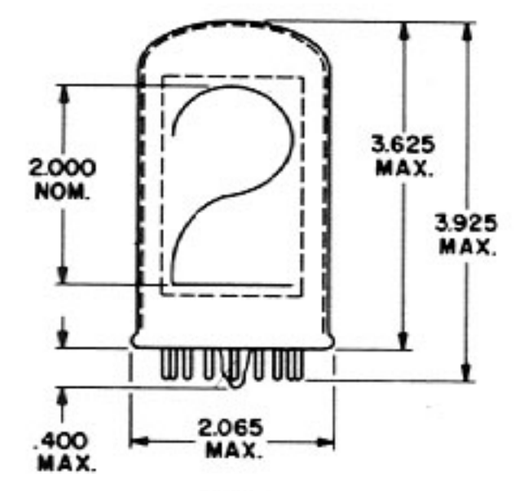
Type B-6091 (8423)
PIN CONNECTIONS

Pin No.	Numeral
1–	IC
2–	anode
3–	0
4–	9
5–	8
6–	7
7–	6
8–	IC
9–	5
10–	4
11–	3
12–	2
13–	1



Large Type B-8091
PIN CONNECTIONS

Pin No.	Numeral
1–	IC
2–	anode
3–	0
4–	9
5–	IC
6–	IC
7–	8
8–	7
9–	6
10–	IC
11–	IC
12–	5
13–	4
14–	3
15–	IC
16–	2
17–	1



Jumbo Type B-7037
PIN CONNECTIONS

Pin No.	Numeral
1–	IC
2–	Anode
3–	6
4–	0
5–	IC
6–	IC
7–	2
8–	4
9–	1
10–	IC
11–	IC
12–	8
13–	9
14–	5
15–	IC
16–	7
17–	3

ELECTRICAL DATA/SUPER
(See Note 1) (See Note 3)

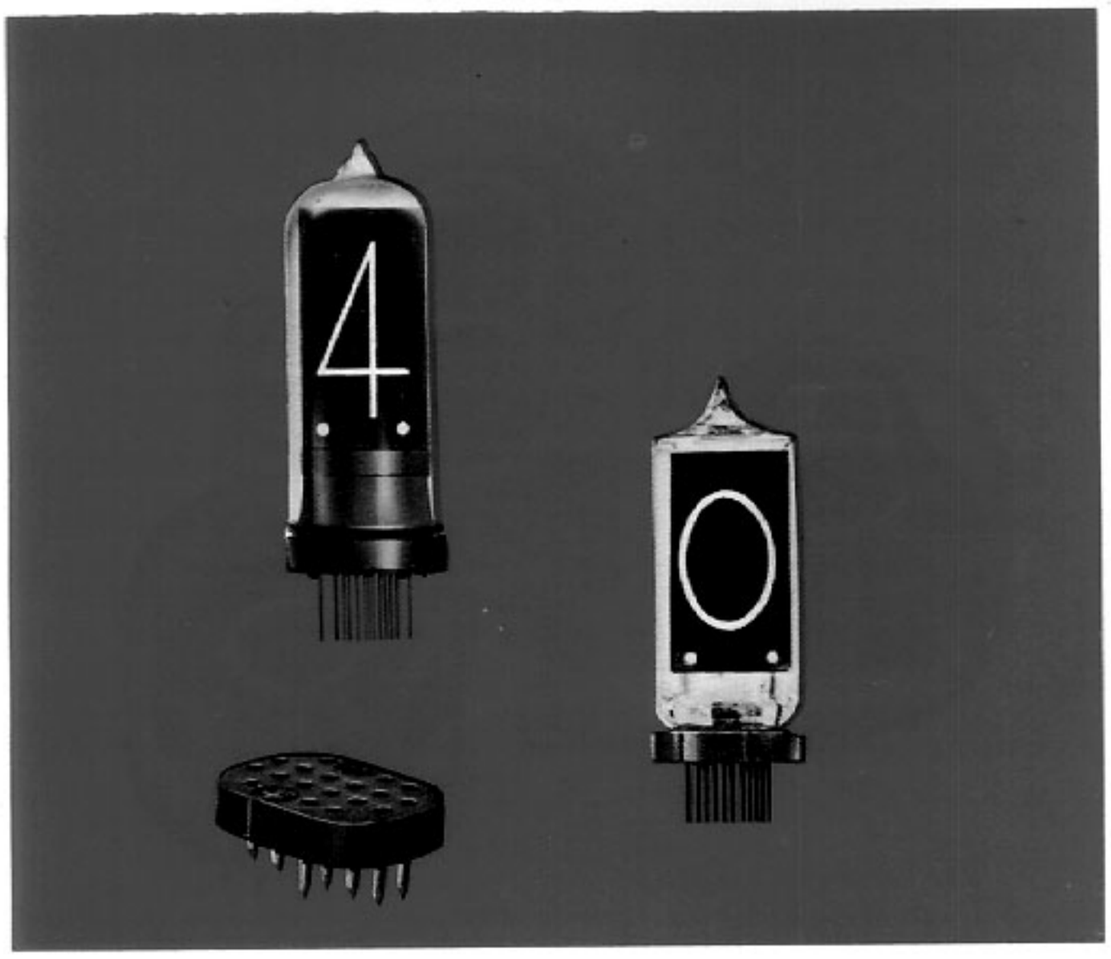
	B-6091 (8423) Wide Angle
Absolute Ratings	
Ionization Voltage (Max)	170 Vdc
Supply Voltage (Min)	170 Vdc
Cathode Current (Peak)	4.5 ma
Test Conditions	
Supply Voltage	170 Vdc
Series Resistor	6.8KΩ
Cathode Current	
(Min)	1.5 ma
(Max)	4.0 ma
Cathode Prebias Voltage	65 Vdc
Sockets	
Standard Wiring	SK112
Printed Circuit	SK130

ELECTRICAL DATA/LARGE
(See Note 1) (See Note 3)

	B-8091 Wide Angle
Absolute Ratings	
Ionization Voltage (Max)	170 Vdc
Supply Voltage (Min)	170 Vdc
Cathode Current (Peak)	6.5 ma
Test Conditions	
Supply Voltage	170 Vdc
Series Resistor	5.6KΩ
Cathode Current	
(Min)	3.0 ma
(Max)	6.0 ma
Cathode Prebias Voltage	65 Vdc
Sockets	
Wiring	SK137

ELECTRICAL DATA/JUMBO
(See Note 1) (See Note 3)

	B-7037 Wide Angle/Side View
Absolute Ratings	
Ionization Voltage (Max)	200 Vdc
Supply Voltage (Min)	200 Vdc
Cathode Current (Peak)	7.5 ma
Test Conditions	
Supply Voltage	200 Vdc
Series Resistor	9.1KΩ
Cathode Current	
(Min)	4.0 ma
(Max)	7.0 ma
Cathode Prebias Voltage	65 Vdc
Socket	
Wiring	SK137

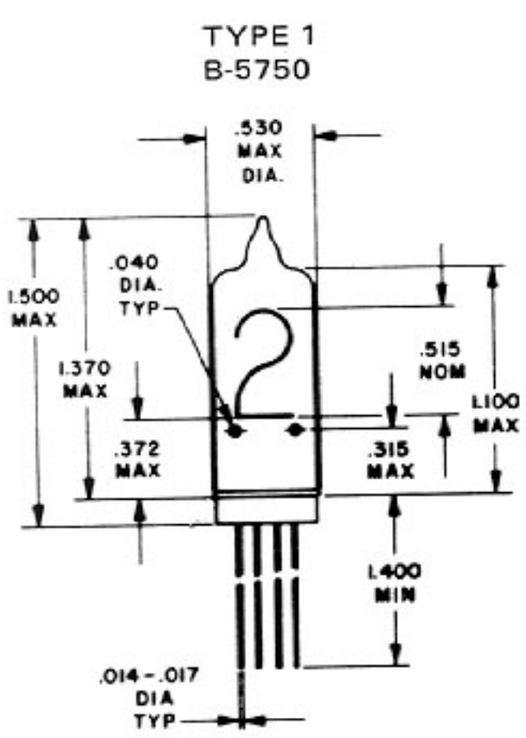


LOW PRICED SIDE-VIEWING
NIXIE INDICATOR TUBES

The low priced series NIXIE tubes are ultra-long life, high quality, cold-cathode indicator tubes having a common anode. They can display the numerals 0-9 and have two decimal points inside the tube (right and left of the numerals) which are independently operable. The numeral aspect ratio (height to width) has been designed to provide the optimum in readability and viewing distance. The small diameter of these tubes (0.530" max) permits 0.540" center-to-center mounting and their short seated height allows for minimal instrument panel dimensions. The B-5750 NIXIE tube is a low pressure device designed for d-c operation. It is not electrically interchangeable with the high pressure B-5755, B-5855, and B-5859 NIXIE tubes.

Character Size ..... 0.5"
Viewing Distance ..... 24.0'

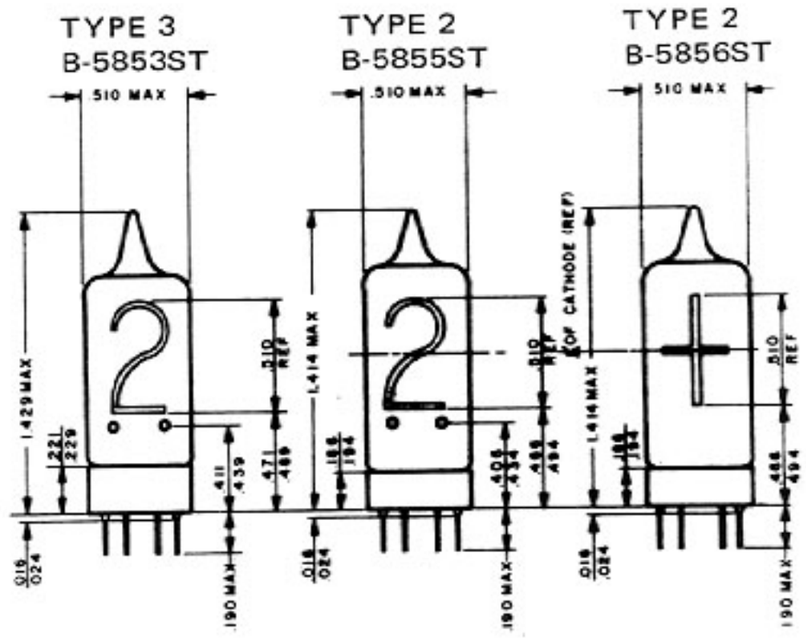
TYPE 1
B-5750



TYPE 3
B-5853ST

TYPE 2
B-5855ST

TYPE 2
B-5856ST



Tube Outline Dimension Chart

LOW COST SERIES NIXIE TUBES SPECIFICATIONS

CONDITION	B-5750	B-5853	B-5855
Absolute Ratings			
Ionization Voltage	170Vdc max	170Vdc max	170Vdc max
Supply Voltage	170Vdc min	170Vdc min	180Vdc min
Peak Anode Current	15ma max	17ma max	17ma max
Anode Current (D.C.)	4.5ma max	—	—
Decimal Point Current	0.3ma	3ma peak	3ma peak
Cathode Prebias	60Vdc to 120Vdc	—	—
Average Total Power Dissipation	0.5 watts	0.5 watts	0.5 watts
Typical Operating Conditions (Note 1)			
Supply Voltage	170Vdc (7.5 KΩ)	170Vdc	200Vdc nom
Peak Anode Current	2.6ma typ	14ma typ	14ma typ
Pulse Durations	—	100 μs	100 μs
Duty Cycle	—	5%	5%

CONDITION	B-5856	B-5859	B-5870
Absolute Ratings			
Ionization Voltage	170Vdc max	170Vdc max	170Vdc max
Supply Voltage	170Vdc min	170Vdc min	170Vdc min
Peak Anode Current	—	—	—
Anode Current (D.C.)	2.8ma max	5.0ma max	4.5ma max
Decimal Point Current	—	0.1ma to 0.5ma	—
Cathode Prebias	60Vdc to 110Vdc	60Vdc to 110Vdc	60Vdc to 110 Vdc
Average Total Power Dissipation	0.5 watts	0.5 watts	0.5 watts
Typical Operating Conditions (Note 1)			
Supply Voltage	170Vdc (15KΩ)	170Vdc (10KΩ)	170Vdc (7.5KΩ)
Anode Current (D.C.)	2.0ma typ	3.4ma typ	3.2ma typ
Pulse Durations	—	—	—
Duty Cycle	—	—	—

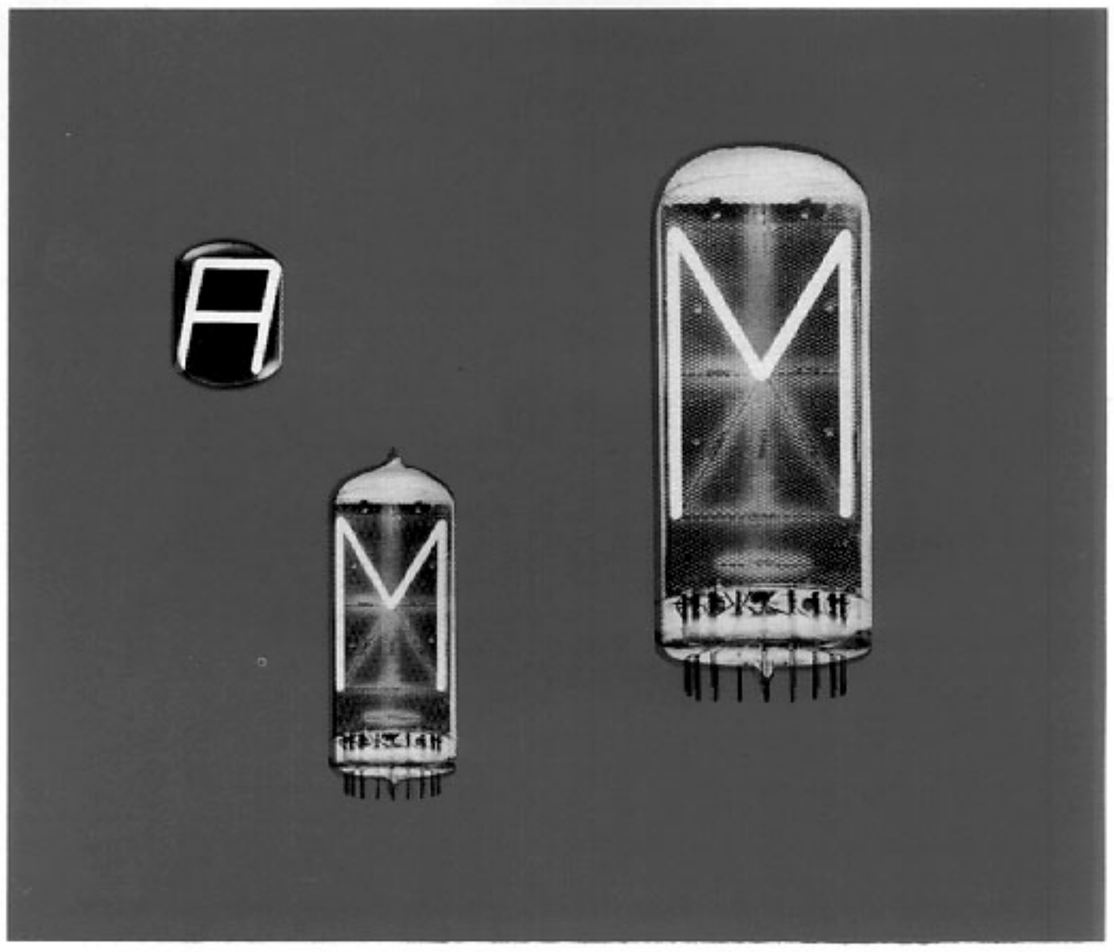
NOTE

1. The minimum supply voltage should be 170Vdc, however, the use of the highest voltage available with an appropriate series resistor is recommended. Typical load lines are 170Vdc-10KΩ, 200Vdc-22KΩ, 250Vdc-43KΩ, and 300Vdc-62KΩ, When choosing a load line other than the ones indicated, it should be chosen such that I_A is equal to or greater than the nominal operating current.

ALPHANUMERIC NIXIE INDICATOR TUBES

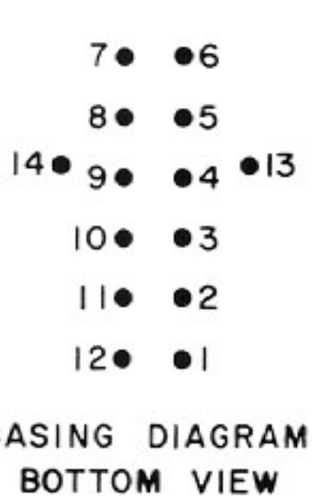
Available in three sizes, standard, medium and large, alphanumeric NIXIE tubes have the capability to display all letters of the alphabet, numerals 0-9 and special characters in a single tube.

	Standard	Medium	Large
Character Size	0.6"	1.4"	2.5"
Viewing Distance	30.0'	65.0'	100.0'



(continued from page 6)

PIN CONNECTIONS – B5750



BASING DIAGRAM
BOTTOM VIEW

PIN NO.	CONNECTION
1–	Numeral 1
2–	Numeral 2
3–	Numeral 3
4–	Numeral 4
5–	Numeral 5
6–	Numeral 6
7–	Anode
8–	Numeral 7
9–	Numeral 8
10–	Anode*
11–	Numeral 9
12–	Numeral 0
13–	Rt Dec Pt
14–	Lft Dec Pt

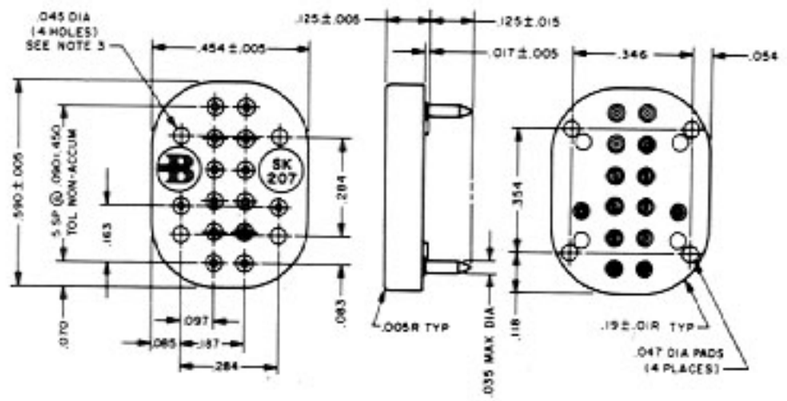
*Pin 10 removed from B-5850 Series.

TUBE DESCRIPTIONS

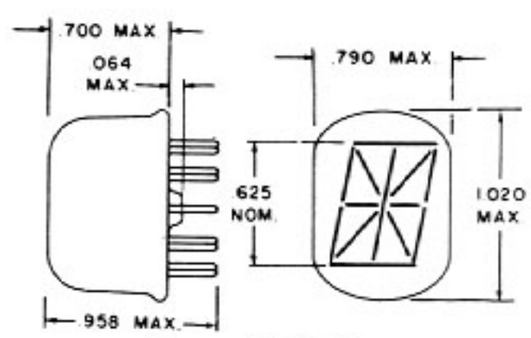
TYPE	PRESSURE	OPERATION	FORMAT	INTERCHANGE WITH
B-5750... I	Low..	D.C.	0-9 with d.p. on each side of numeral. ..	None
B-5755... I	High .	Pulsed	"	None
B-5853... III ..	High..	Pulsed	"	B-5855
B-5855.. II	High .	Pulsed	"	None
B-5859.. II	High .	D.C.	"	None
B-5870.. III ...	High .	D.C.	"	B-5859/ B-5870
B-5856 .. II ...	Low ..	D.C.	(±) plus/minus	None
B-5866 .. III...	Low ..	Pulsed/DC	(±) plus/minus	B-5856

The above tube type numbers are for long lead versions. For short lead versions, the following suffixes should be used.
S—tube with minimum thickness spacer (0.130" max) and leads cut to 0.190" max.
ST—tube with thick spacer that makes them mechanically interchangeable with B-5755S.

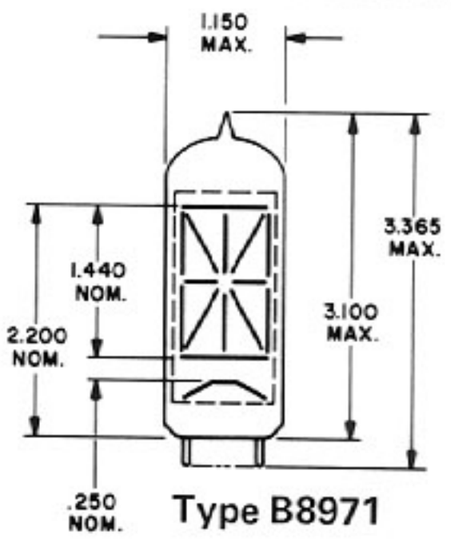
SK-207



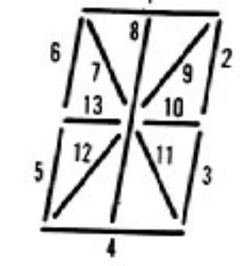
The SK-207 Sockets are intended for use with Burroughs B-5750S and B-5850S series NIXIE® tubes.



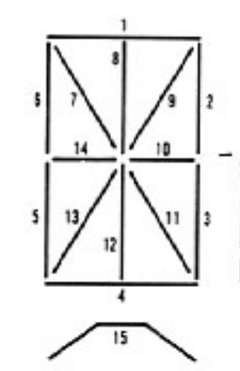
Type B5971



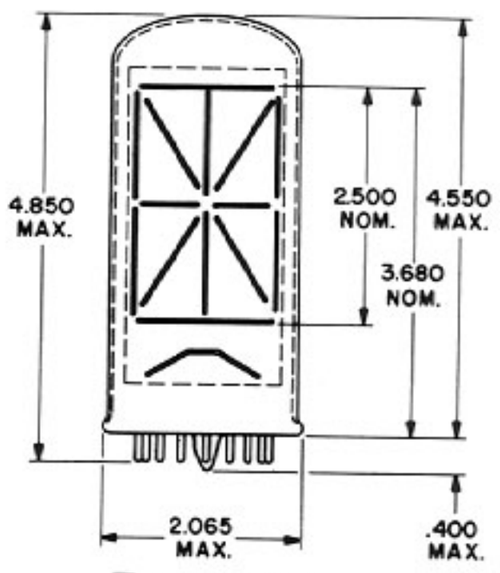
Type B8971



SEGMENT DESIGNATION B5971



SEGMENT DESIGNATION B8971 B7971

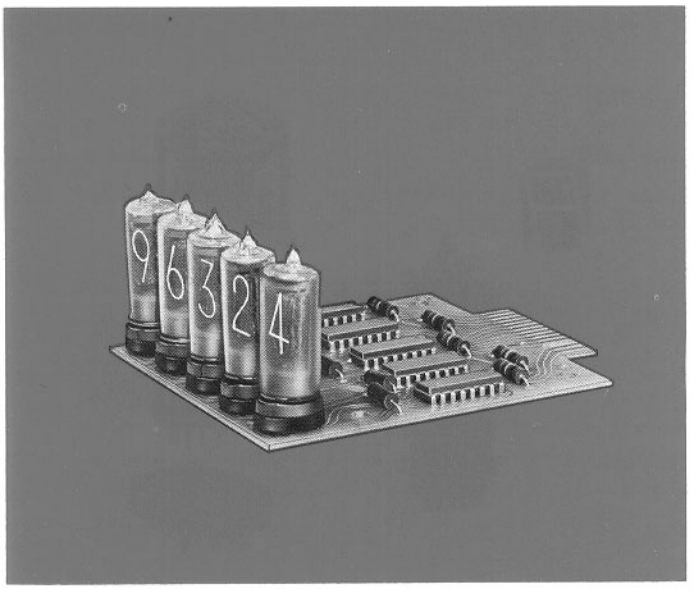


Type B7971

ELECTRICAL CHARACTERISTICS

	B5971
Absolute Ratings	
Supply Voltage (Ebb)	170 Vdc Min.
Cathode Current	
Ik (Total all cathodes)	12 ma max.
Ik (Individual cathodes, K1 through K12 – except K8, K10)	1.7 ma max.
Ik (Individual cathodes, K10, K13)	1.5 ma max.
Ik (Individual cathode, K8)	3.0 ma max.
Test Conditions	
Supply Voltage (Ebb)	170 Vdc
Series Anode Resistor (R_D)	6.8 K ±1%

Absolute Ratings	**B8971**	**B7971**
Supply Voltage (Ebb, Vdc min)	170	170
Individual Cathode Current (Ik, ma max)		
K1, K4, K15	6.0	6.0
K7, K9, K11, K13	5.0	5.5
K10, K14	3.5	4.0
K2, K3, K5, K6, K8, K12	4.5	5.0
Total All Cathodes	14.0	21.0
Test Conditions		
Supply Voltage, Ebb (Vdc)	170	170
Series Anode Resistor, R_D (Ohms)	4.3 K ±1%	1.8 K ±1%



C-2500 SERIES MODULES

The C2500 series units are the low cost answer to operating NIXIE tubes with BCD inputs, and to counting applications. Three basic configurations are available. A NIXIE tube BCD decoder driver, a NIXIE tube decoder driver with a memory; and a NIXIE tube decade counting unit with memory. The basic assemblies are designed to be grouped to provide any configuration between 3 and 15 digits. The units are available with an optional bezel assembly which allows front mounting behind a BWB bezel window.

C2502 DECODER DRIVER

The C2502 decoder driver accepts four line, positive logic, binary coded decimal (8-4-2-1) information from typical DTL or TTL inputs and provides visual readout of decimal numbers. A decimal point control line is available for each digit to light the decimal point located on the left side of the numeral (as viewed from the front). For greatest flexibility there is no circuitry on the control line. A B-5750S NIXIE tube is employed to display the readout. An integrally mounted SK-207 socket is used so the B-5750S NIXIE tube can be easily inserted or removed.

C2504 DECODER DRIVER WITH MEMORY

The C2504 decoder driver is functionally similar to the C2502 except that the memory function is included. The memory circuitry consists of one, four bit, strobed-latch circuit per digit with one, four bit, strobed-latch circuit per digit with one common strobe per assembly. Information present at the information input terminals is transferred to the outputs of the latch when the strobe is high, and the outputs will follow the information inputs as long as the strobe remains high. When the strobe goes low, the information present at the information inputs at the time the transition occurred is retained at the outputs until the strobe again goes high. The latch output terminals serve as inputs to the decoder portion of the assembly.

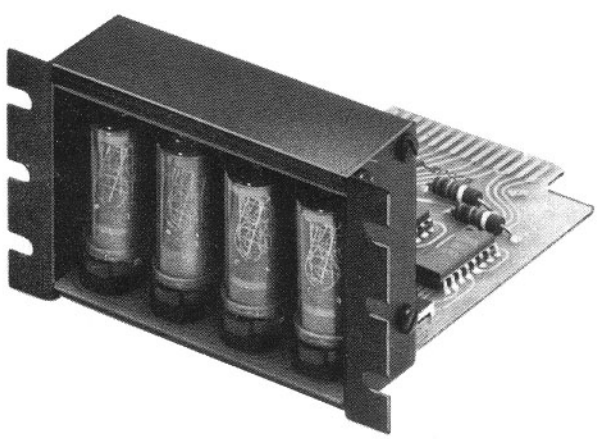
A decimal point control line is available for each digit to light the decimal point located on the left side of the numeral (as viewed from the front). For greatest flexibility there is no circuitry on the control line. A B-5750S NIXIE tube is employed to display the readout. An integrally mounted SK-207 socket is used so the B-5750S NIXIE tube can be easily inserted or removed.

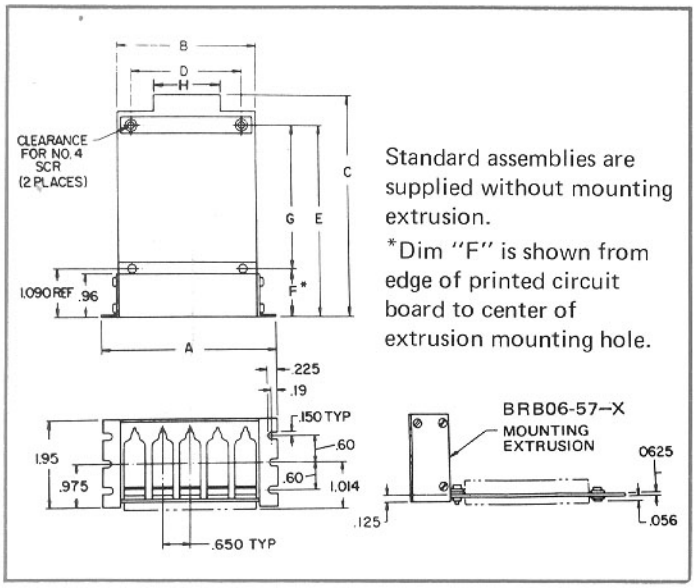
C2506 DECADE COUNTER WITH MEMORY

The C2506 decade counter contains one 20 MHz decade counter, a four-bit strobed latch circuit, a decoder driver, and a B-5750S NIXIE tube per digit. Its counter operates from typical DTL or TTL inputs.

The decade counter is a positive logic counter and changes state on the negative going edge of the clock pulse. When the reset input is brought to the low state the counter resets to zero. The counter binary coded decimal (8-4-2-1) outputs serve as inputs to the latch circuit.

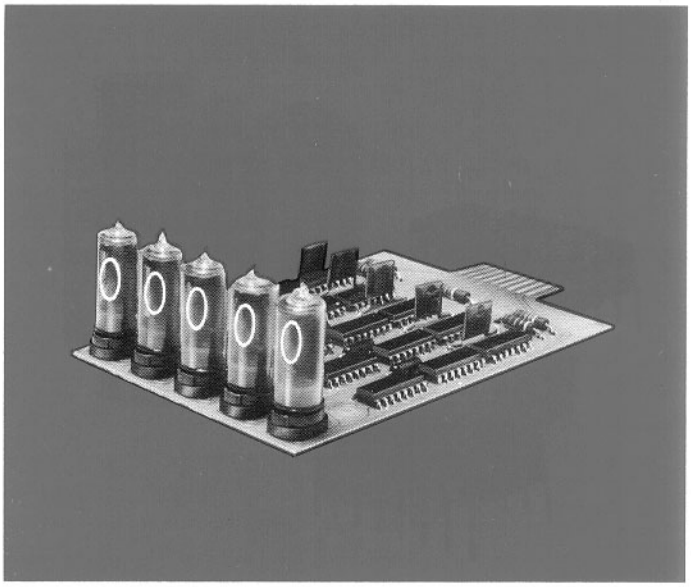
The latch circuit outputs are made available for use in external logic. The latch circuit outputs also serve as inputs to the positive logic four line, binary coded decimal (8-4-2-1) decoder driver. Outputs of the decoder driver are decimal outputs which drive the B-5750 NIXIE Indicator Tube.





Standard assemblies are supplied without mounting extrusion.

*Dim "F" is shown from edge of printed circuit board to center of extrusion mounting hole.

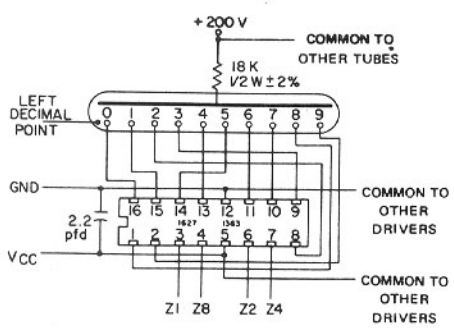


SPECIFICATIONS

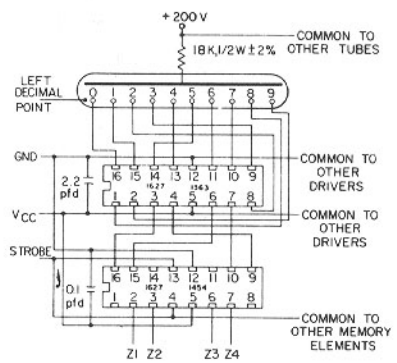
TYPE	CONNECTOR	EXTRUSION	BEZEL		DIMENSIONS A	B	C	D	E	F	G	H
C2502-3	SR123	BPB06-57-3	BWB	17	2.770	1.940	3.910	1.300	3.215	1.080	2.125	1.085±.007
-4	SR115	-4		18	3.420	2.590		1.950				1.585±.007
-5	SR115	-5		19	4.070	3.240		2.600				1.585±.007
C2504-3	SR123	-3		17	2.770	1.940	5.060	1.300	4.360		3.270	1.085±.007
-4	SR115	-4		18	3.420	2.590		1.950				1.585±.007
-5	SR115	-5		19	4.070	3.240		2.600				1.585±.007
C2506-3	SR115	-3		17	2.770	1.940	5.760	1.300	5.060		3.970	1.585±.007
-4	SR115	-4		18	3.420	2.590		1.950				1.585±.007
-5	SR124	-5		19	4.070	3.240		2.600				1.985±.007
-6	SR125	-6		20	4.720	3.890		3.250				2.685±.007
-7	SR125	-7		21	5.370	4.540		3.900				2.685±.007

ELECTRICAL CHARACTERISTICS

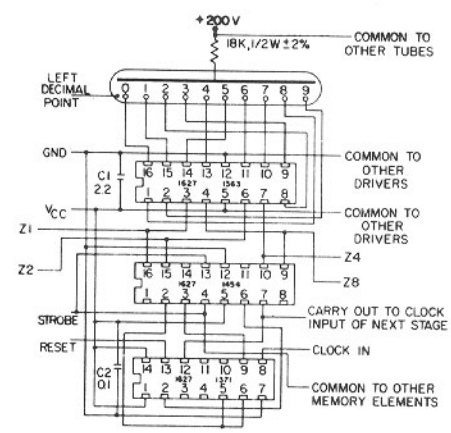
	C2502	C2504	C2506
Power Requirements			
V_{CCH}	190 to 210V (200V typ)	190 to 210V (200V typ)	190 to 210V (200V typ)
V_{CCL}	4.75 to 5.25V (5V typ)	4.75 to 5.25V (5V typ)	4.75 to 5.25V (5V typ)
I_{CCH}	2.6ma (typ)	2.6ma (typ)	2.6ma (typ)
I_{CCL}	20ma (max)	75ma (max)	112ma (max)
Operating Temperature Range	0 to +70° C		
Electrical Characteristics			
$V_{IN}(1)$ D	2.0V min	2.0V min	2.0V min
$V_{IN}(0)$ D	0.8V min	0.8V min	0.8V min
$V_{IN}(1)$ R (reset)	na	na	2.0V min
$V_{IN}(0)$ R (reset)	na	na	0.5V max
$V_{OUT}(1)$	na	na	2.4V min
$V_{OUT}(0)$	na	na	0.4V max



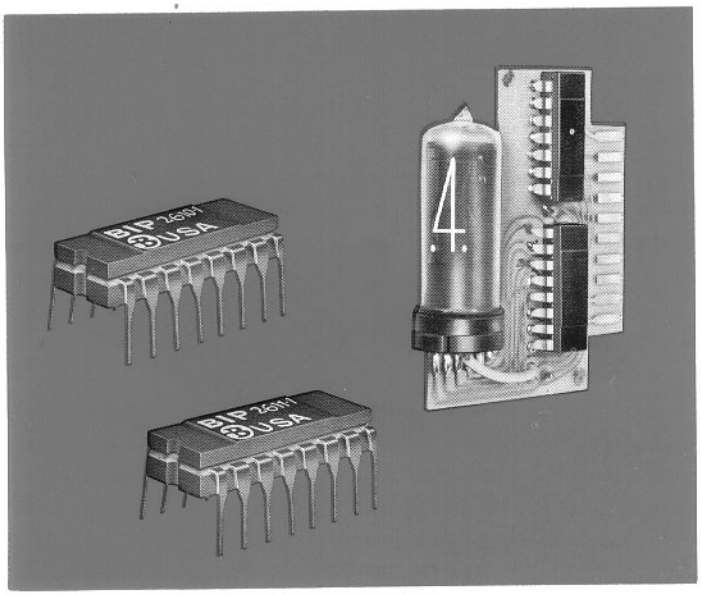
SCHEMATIC DIAGRAM C2502 SERIES



SCHEMATIC DIAGRAM C2504 SERIES



SCHEMATIC DIAGRAM C2506 SERIES



SIDE VIEWING DRIVER

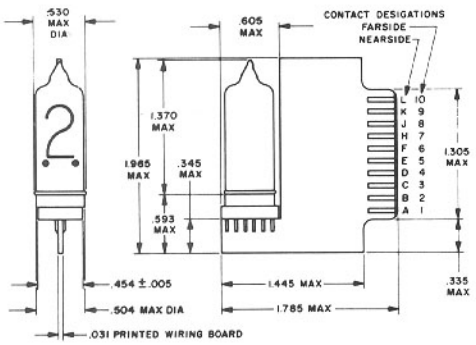
The BIP-8910-1 integrated circuit decoder/driver accepts 4-line, positive logic, 8-4-2-1 BCD inputs from DTL and TTL circuitry and provides readout on an integrally mounted NIXIE® tube. Type B-5750 which is a component of the module.

IC DECADE COUNTERS /NIXIE TUBE DRIVERS

The BIP-2610 is designed to operate as a resettable pulse counter with sufficient power to drive any standard, super or side view NIXIE indicator tube. The BIP-2611 is similar except it is not designed to drive NIXIE tube directly.

These modules are non-latching and require a continuously available BCD information input.

Mechanically the module is an open printed circuit board with the B-5750 NIXIE tube socket (SK-207) soldered and epoxied at the front. An edge connector with gold plated fingers is incorporated at the rear of the module, and both B-5750 decimal points are available at the PC terminal.



BIP-8910-1

ELECTRICAL SPECIFICATIONS

Input Requirements	4-line 8-4-2-1 positive BCD
Logic "0" (E_0)	−0.5V to +0.85V
Logic "1" (E_1)	+2.0V to +6.0V
Input Current	
Logic "0" present	1.5 ma max. @ −.45V
Logic "1" present	10 μa max. @ 4.0V
Power Requirements	
Positive High Voltage	+200 Vdc ±10V
Positive Low Voltage	5 Vdc ±0.25V
Current at +200 Vdc	2.6 ma typ.
Current at +5 Vdc	60 ma max.
Temperature	
Operating (Free Air)	0° to +75°
Non-operating	−55° to +85°

The BIP-2610 is a monolithic integrated circuit consisting of ten dual SCS (Silicon Controlled Switch) stages with reset and driving circuits.

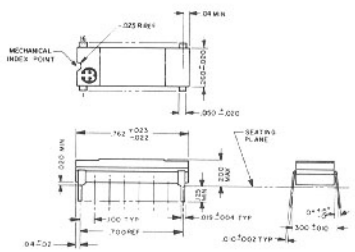
The counter is resettable to "0" and has the capability to act as a memory for a specific count without need of auxiliary circuitry.

The BIP-2610 has an operating frequency limit in excess of 300 KHz with a high degree of noise immunity — up to a 6 volt peak.

The BIP-2611 is identical except it does not drive NIXIE tubes directly.

The BIP-2610 and BIP-2611 offer the following features.

- Low Cost
- High Noise Immunity
- Hermetically sealed dual-in-line package
- Decimal Outputs
- Bi-Polar MSI
- Directly drives NIXIE tubes(BIP-2610 only)
- Preset inputs
- Resettable



BIP-2610/2611

Preliminary Information

ELECTRICAL CHARACTERISTICS AT 25°C

Parameter	Condition	BIP-2610-1	BIP-2611-1	Units	Tolerance
Output Breakdown Voltage .. V_{OH-0} thru V_{OH-9}	I_{OH-0} thru I_{OH-9}=100 uA	15	...	V	... Min
Output Saturation Voltage ... V_{OL-0} thru V_{OL-9}	V_{CC1}=14.5V ... I_{CC2}=3.0mA R_B=510Ω ±5%	3	3	V	.... Max
Carry Output Saturation ..... Voltage, V_{COL} (tenth count information transferring)	V_{CC1}=11.5V ... I_{CO}=3.0mA R_B=510Ω ± 5%	2.5 ...	2.5 ...	V	..... Max
Output Leakage Current, ... I_{OH-0} thru I_{OH-9}	V_{OH-0}thru ..... V_{OH-9}=50V (BIP-2610-1)	3		uA	... Max
	V_{OH-0}thru ..... V_{OH-9}=12V (BIP-2611-1)		10 ...	uA	... Max

ABSOLUTE MAXIMUM RATINGS AT 25°C

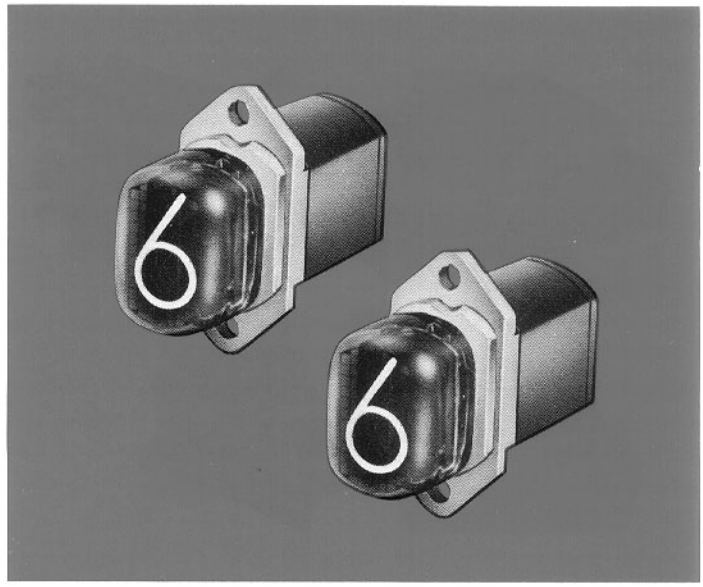
Parameter	BIP-2610-1	BIP-2611-1	Units	Notes
Supply Voltage, V_{CC1}	14.5	14.5	V	
Count Input Breakdown ..... Voltage, V_I	20.0	15.0	V	
Count Output Voltage, ... V_{O-0} thru V_{O-9}	55.0	15.0	V	..... 4, 10
Supply Current, I_{CC1}	40.0	40.0	mA	
Count Input Current, I_I	-2.5	-3.5	mA	
Count Output Current, ... I_{O-0} thru I_{O-9}	4.0	3.0	mA	... 2, 3
Count Pulse Repetition ..... Rate, P_{RR}	200	500	KHz	. 11
Power Dissipation, P_T @ 55°C ...	200	200	mW	
Operating Temperature Range, T_{OPT}	0 to 55	0 to 55	°C	
Storage Temperature Range, T_{STG}	-55 to +150	-55 to +150	°C	

NIXIE TUBE DECADE COUNTING UNITS

These modules are available in two models, the BIP-8820 with BCD output and the BIP-8821 with preset input. Both are positive logic TTL compatible modules which change state during the negative going edge of the clock pulse. A master reset input is also available on the modules to reset the counter to zero.

NIXIE TUBE DECODER/DRIVERS

BIP-8804 Series Decoder/Driver and the BIP-8806 Decoder/Driver with memory are integrated circuit decoder/drivers which accept 4-line positive logic 8-4-2-1 BCD inputs from DTL and TTL circuitry and provide decimal readout on integrally mounted NIXIE Tubes.



The BIP-8820 and BIP-8821 Modules are 20 MH_z Decade Counters with NIXIE tube readout. A decimal point control line is provided for the decimal point located on the left side of the numerals in the B-59956 NIXIE tube when the decimal point module is required. Control circuits are not provided for the decimal point line.

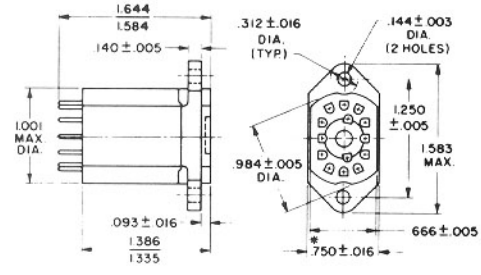
The BIP-8820 provides 4 line, parallel BCD outputs of the count for use in external coincidence detection circuits and other logic.

The BIP-8821 can be set to any predetermined number by 4-line parallel BCD inputs at the data input terminals when the strobe input goes to the low state. When the strobe is in the high state, the counter is unaffected by data on the input lines.

The BIP-8804 series modules are non-latching in that they require a continuously available BCD information input.

The BIP-8806 series modules have memory capability; they do not require a continuously available BCD information input.

The BIP-8804-1 and BIP-8806-1 modules drive a standard rectangular "0-9" NIXIE tube type 8422 (B-5991). The BIP-8804-2 and BIP-8806-2 modules drive the B-59956 standard rectangular NIXIE tube "0-9 with a decimal point." The NIXIE tube is supplied as part of the module and prices include both the module and the tube.



* A DRAFT OF UP TO 0°30' PER SIDE INCREASING THE PACKAGE WIDTH AT THE PLUG END TO .775 MAX IS STANDARD.

BIP-8820/8821 BIP-8804/8806

BIP-8820/8821

TABLE 1 GENERAL CHARACTERISTICS

	Preset Input	BCD Output	Decimal Point
BIP-8820-1	No	Yes	No
BIP-8820-2	No	Yes	Yes
BIP-8821-1	Yes	No	No
BIP-8821-2	Yes	No	Yes

ABSOLUTE MAXIMUM RATINGS

Rating	Value
High Voltage Supply	300V Pulsed
V_{CCL} Low Voltage Supply	6V
V_{IN} (Logic 1)	6V
V_{IN} (Logic 0)	−0.5V
I_{OFF} Decimal Output Current (off)	1.5ma
I_{ON} Decimal Output Current (on)	15ma
Output Current at Counter Output Terminals	±100ma
Operating Temperature Range	0 to 75°C
Storage Temperature Range	−20 to +125°C

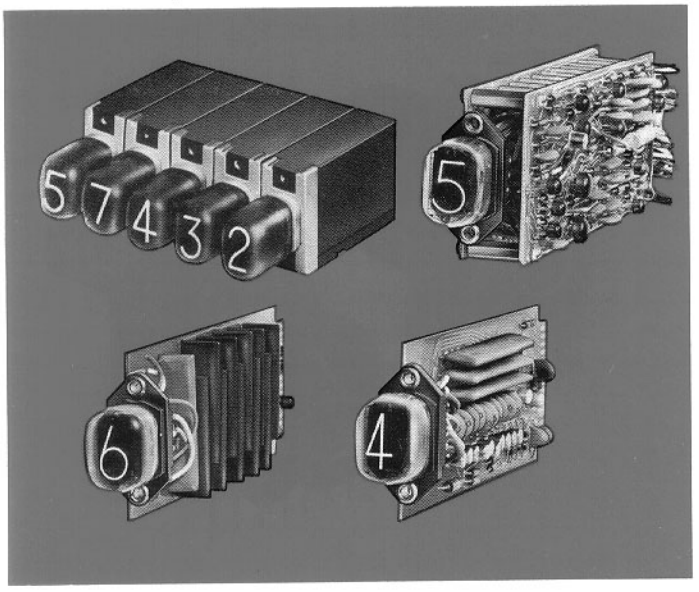
POWER REQUIREMENTS

V_{CCH} High Voltage Supply	190 to 210V (200V typ.)
V_{CCL} Low Voltage Supply	4.75 to 5.25V (5V typ.)
I_{CCH} High Voltage Supply Current B-59956	2.8ma typ. (4.0ma Max.)
I_{CCH} High Voltage Supply Current B-5991	2.3ma typ. (3.5ma Max.)
I_{CCL}	57ma Max. @ 5.25V

BIP-8804/8806

ELECTRICAL SPECIFICATIONS

	BIP-8804	BIP-8806
Input Requirements	4 line 8-4-2-1 BCD	4 lines 8-4-2-1 BCD
Logic "0" (E_0)	−0.5 to +0.85V	−1.0V to +1.0V
Logic "1" (E_1)	2.0V to 6.0V	2.1V to 4.0V
Input Current		
Logic "0" present	1.5 ma max.	−20 μa max.
Logic "1" present	10 μa max	200 μa max.
Power Requirements		
Positive High Voltage	+200 Vdc ±10V	200 Vdc ±10V
Positive Low Voltage	5 Vdc ±0.25V	5Vdc ±0.25V
Current at 200V	2.3 ma typ. (BIP-8804-1)	2.3 ma typ. (BIP-8806-1)
	2.8 ma typ. (BIP-8804-2)	2.8 ma typ (BIP-8806-2)
Current at 5.0V	60 ma max.	75 ma typ.
Temperature		
Operating (free air)	0°C to +75°C	0°C to +75°C
Non-operating	−55°C to +125°C	−55°C to +125°C



NIXIE TUBE DECODER/DRIVERS

The BIP-9800 series of modules are miniature integrated circuit decoder/drivers designed for military, mobile or airborne applications. They drive the B-4998 NIXIE tube which displays a 0.3" high number or character.

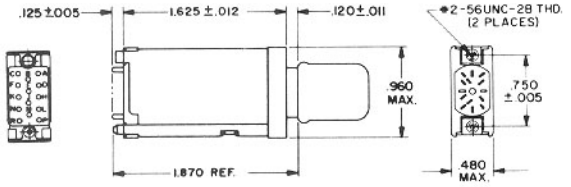
DECADE COUNTERS

The BIP-8054 and BIP-8701 are bi-directional decade counters and the BIP-8055 is a unidirectional decade counter. They are 10-position ring counters which utilize silicon controlled switches as the active element in the circuits. The counters are presettable and resettable, have plug-in printed circuit construction and have an integral NIXIE Tube readout. A carry output is provided to drive succeeding counters for cascaded multi-decade operation.

The modules accept 4-line, positive logic 8-4-2-1 BCD input from DTL and TTL circuitry. The BIP-9801 modules are approximately .85 inches shorter than the BIP-9802 and BIP-9806 modules shown in the outline drawing.

The individual characteristics of each module are described below. • BIP-9801-1 Miniature (4998) NIXIE tube decoder/driver • BIP-9801-2 Miniature +, – NIXIE tube decoder/driver • BIP-9802-1. Same electrically as BIP-9801-1 except features blanking, dimming and temperature range to +125°C • Bip-9806-1 Same as BIP-9802-1 except features memory.

The modules feature the use of integrated circuits for decoding and driving, and are potted in anodized sheet aluminum enclosures which can be mounted on 0.5" centers. A tantalum decoupling capacitor is used to bypass 5V power supply transients while a 2% metal glaze anode resistor is used to optimize performance.



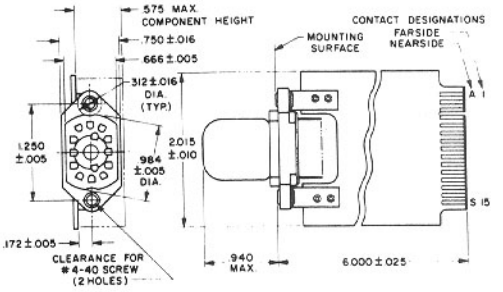
BIP-9800

ELECTRICAL SPECIFICATIONS

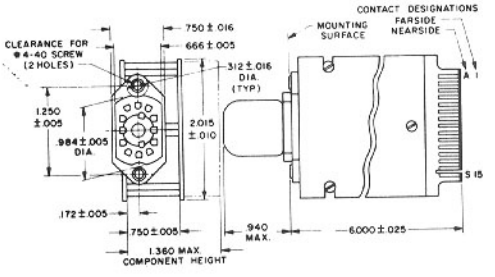
	BIP-9801-1 BIP-9801-2	BIP-9802-1	BIP-9806-1
Input Requirements	4 line 8-4-2-1 BCD		
Logic "0" (E_0)	–0.5V to +0.8V	–0.5V to +0.8V	–0.5V to +0.8V
Logic 1	+2.1V to +6.0V	+2.1V to +6.0V	+2.1V to +6.0V
Input Current			
Logic 0 present	1.6ma @ x. –.45V	1.6ma @ –.45V	1.6ma @ –.45V
Logic 1 present	5 μa @ 4.0V	5 μa @ 4.0V	5 μa @ 4.0V
Power Requirements			
Positive High Voltage	+200Vdc ±10V		
Positive Low Voltage	+5.0Vdc ±0.5V		
Current at +200Vdc	1.5ma typ.	2.0ma typ.	2.0ma typ.
Current at +5.0Vdc	60ma max.		135ma max.
Temperature			
Operating (Free Air)	–25°C to +100°C	–55°C to +125°C	–55°C to +125°C
Non-operating	–55°C to +125°C	–55°C to +125°C	–55°C to +125°C

Burroughs decade counters offer:

- Uni- or Bi-directional counting
- NIXIE tube visual readout
- Electrical Decimal outputs
- Preset and reset capabilities
- Support modules for complete accumulators: Preamplifier (BIP-8606, BIP-8617); polarity detector (BIP-8006); buffer amplifier (BIP-8611); preset/reset module (BIP-8609, BIP-8613)



BIP-8054/8055



BIP-8701

INPUT REQUIREMENTS	BI-DIRECTIONAL BIP-8701	BIP-8054	UNI-DIRECTIONAL BIP-8055
Maximum Frequency	500 KHZ	110 KHZ	150 KHZ
Pulse Amplitude	10.5 - 13 V (pos)	10.5 - 13 V (Pos)	6V to 12V (capacitor input)
Pulse Duration	0.5 μsec.	2.0 μsec.	2.0 μsec.

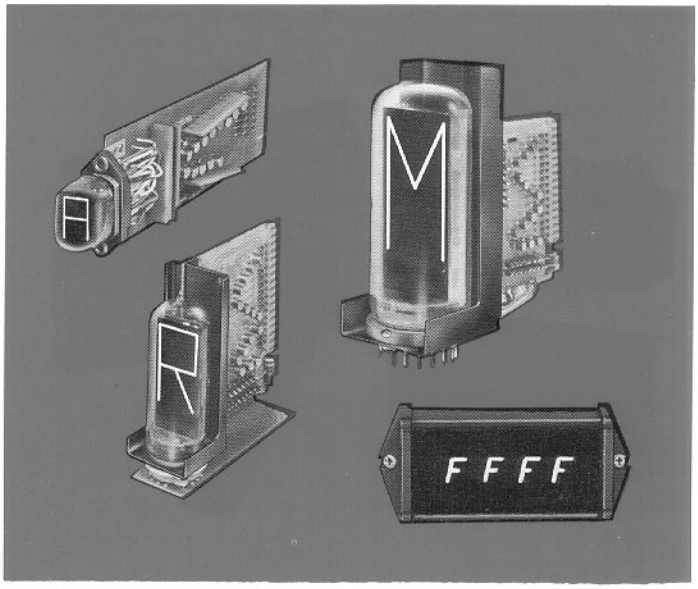
ALPHANUMERIC NIXIE TUBE DRIVERS

Silicon Controlled Switches (SCS) provide the memory function for these drivers. Upon application of an "erase/write" command pulse, the modules clear and then display the information which is present at the input terminals.

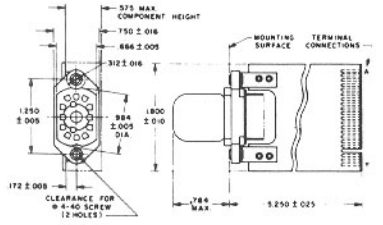
This latching storage makes it possible to sample the data presented electronically to the module and to hold it for visual display.

SPECIAL PURPOSE DISPLAY SYSTEMS

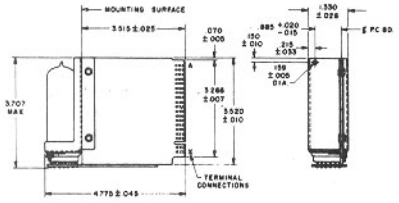
Application flexibility of NIXIE indicator tubes and SELF-SCAN panel displays is such that Burroughs is able to customize complete readout systems to your exact requirements.



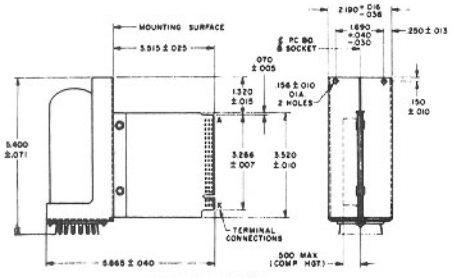
The BIP-8503 drives the standard size alphanumeric tube type B-5971; BIP-8510 drives the B-8971 medium size tube; and the BIP-8509 drives the large size tube, type B-7971.



BIP-8503/Standard



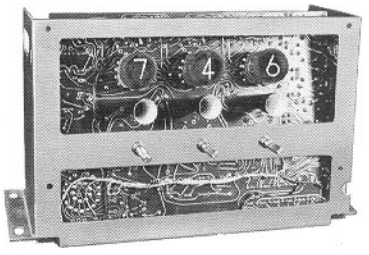
BIP-8510/Medium



BIP-8509/Large

ELECTRICAL SPECIFICATIONS

Information Input	
Logic Zero Voltage	−12V ±2V
Logic One Voltage	0 to −2.0V
Impedance	20 K typ.
Pulse Duration	10 μsec. min.
Logic Separation	−8V min.
Cycle Time	200 μsec. min.
Power Requirements	
Positive Low Voltage	12V typ.
Current at +12V	157 ma max. (BIP-8503) 407 ma max. (BIP-8509) 400 ma max. (BIP-8510)
Positive High Voltage	170 ±2V
Current at +170V	18 ma max. (BIP-8503) 23 ma max. (BIP-8509) 16 ma max. (BIP-8510)

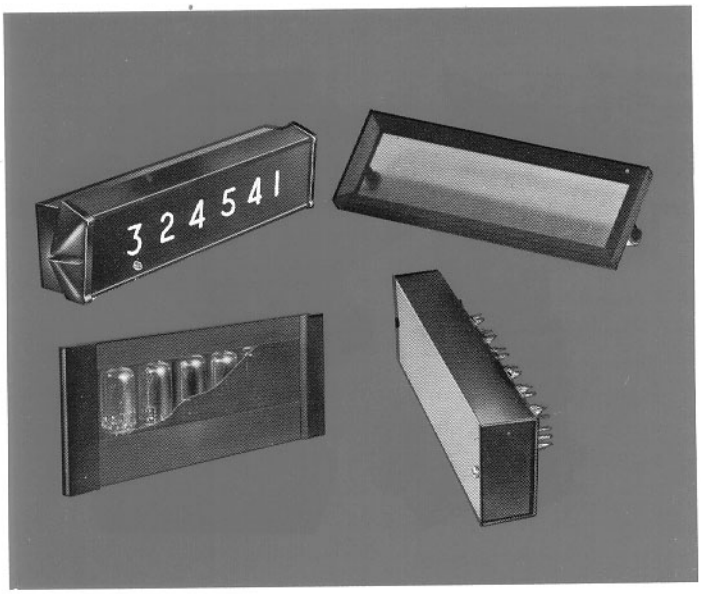




The electronic control and display unit shown above is produced by Burroughs for Xerox Corporation for their 2400 copier/duplicator. This compact Burroughs unit controls the number of copies being made and features a numerical display indicating both the number of copies made and the accumulated total. The unit stops the machine automatically when the proper number of copies has been made. Simultaneously, it computes the amount to be billed to the user on a sliding scale. The display portion of the unit incorporates Burroughs NIXIE indicator tubes, type B-5092.

The Coin Totalizer System shown above operates as an adjunct to the Sattley Coin Sorter/Counter to display total dollars and cents. The Sattley Coin Counter is an electro-mechanical device which separates any mix of change (pennies, nickels, dimes, quarters, and half dollars) and distributes them by denomination into separate bins.

The Hexidecimal Display Unit, produced by Burroughs for the Foxboro Company has the capability to display the numerals 0 through 9 and the letters A through F. This four place display utilizes B-5971 alphanumeric NIXIE tubes. The unit is used by the Foxboro Company on computer interface for a large scale process control system. The process is read out in four letter-number designations.

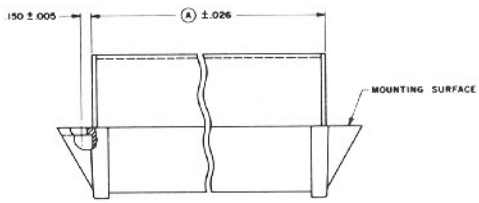


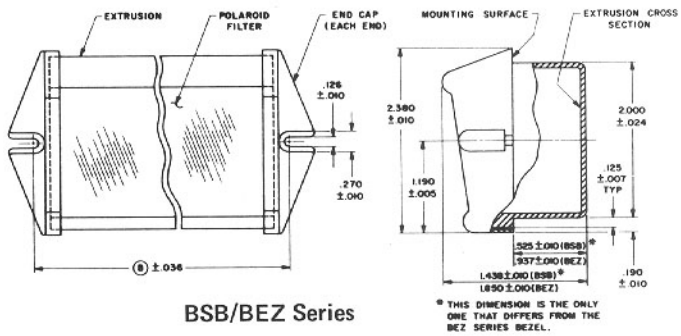
NIXIE TUBE BEZEL ASSEMBLIES

NIXIE tube bezel assemblies are the most efficient and attractive means of packaging NIXIE tubes, driver modules and sockets for multi-digit displays. These assemblies enhance the appearance of equipment, provide maximum readability and save production labor as well as electrical and mechanical design time. Assemblies are available for use with all Burroughs' tube series.

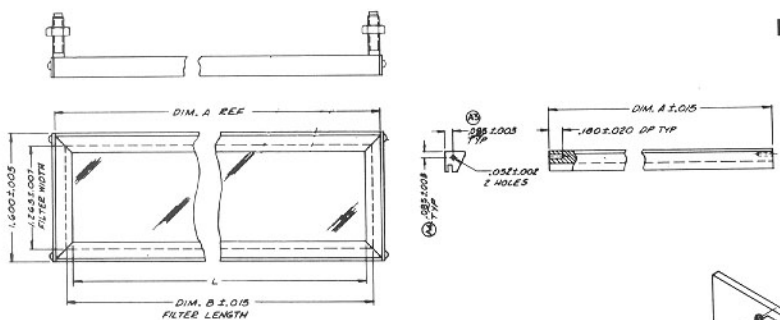
The bezels are available in the following configurations.

- BEZ series for round, end viewing, standard and super size tubes.
- BSB series for standard rectangular tubes.
- BFB series for miniature, standard and super end view and standard view series. This is a flat style bezel which takes up a minimum of front panel space.
- BFB Window series can be tailored to provide a finished window opening for any size NIXIE tube.
- BPB series is available for miniature and standard size tubes. It mounts entirely behind the front panel. Particularly useful with RFI shielded windows.
- BWB series bezel window designed for use with the low cost sideview series tubes. Provides an attractive method of dressing a panel cutout using minimum space.

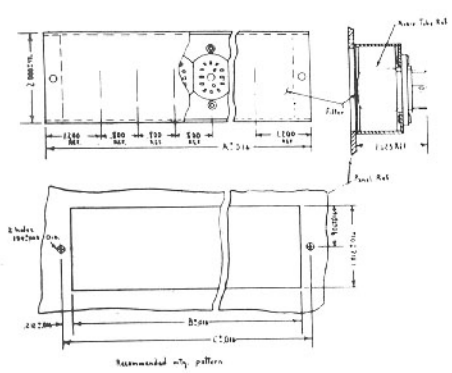




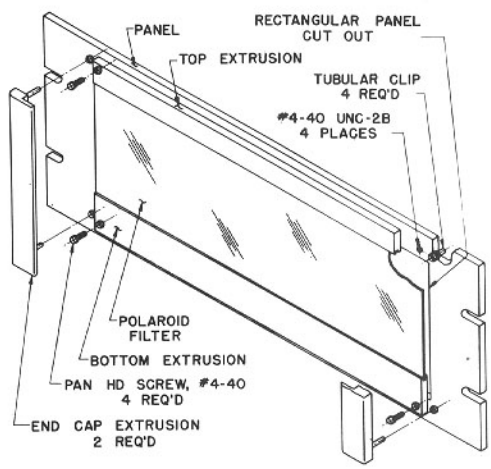
BSB/BEZ Series



BWB Series



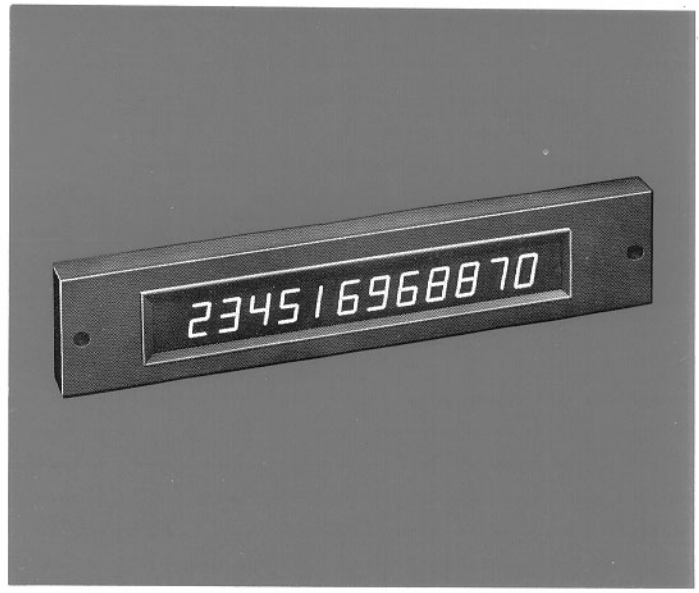
BPB Series



BFB Series

PANAPLEX
NUMERIC PANEL DISPLAY
BR16400

The BR16400 PANAPLEX panel display is a 16 character model in Burroughs new series of 9-segment, multi-character cold-cathode, gas discharge readout tubes. The nine cathode segments form numerals 0 thru 9, +, −. Decimal points are also included in the tube. The unique single envelope construction of this tube permits it to be priced at a per digit price less than that for any other comparable readout. Designed for the time-shared mode of operation, it offers additional cost savings by minimizing the necessary drive electronics. Other models of the PANAPLEX tube with as low as eight character positions are also available.



Advantages of the PANAPLEX panel display include:

- Low price
- Low cost drive circuitry
- Wide viewing angle
- High brightness
- Low power
- Minimum digit spacing
- Less than 2 connections per digit
- Inherent character alignment
- Streamlined, compact package

TYPICAL OPERATING CONDITIONS @ 25°C

	Units
Supply Voltage, E_{bb}	160 to 180 Vdc (170 Vdc typ)
Cathode Prebias Voltage, E_{pb}	115 Vdc typ
Anode Off Voltage, E_{os}	115 Vdc typ
Isolation Screen Current, i_{GSO}	.05X Total Cathode Current
Individual Cathode Peak Segment Current, ik_s	3.0 mA typ
Decimal Current, ik_d	1.0 mA typ
Timing Cycle, t_c	1.3 to 13.0 msec
Digit Duration, t_d	80 to 800 µsec (266 to 400 µsec typ)
Blanking Interval, t_{Kb}	20 to 100 µsec
Individual Cathode Segment Voltage Drop, E_{SD}	130 to 155 Vdc (143 Vdc typ)
Screen Bias	(See Bull. 1163)

ABSOLUTE MAXIMUM RATINGS @ 25°C

Parameter	Units
Anode Supply Voltage, E_{bb}	180 Vdc
Peak Cathode Current (number 8 displayed), Ik	25 mA
Peak Cathode Current (single segment), Ik	3.5 mA
Cathode Current (decimal point), I_{kd}	1.2 mA
Ambient Temperature, T_a	0 to +55°C
Storage Temperature (non-operating), T_{stg}	−40 to +75°C
Altitude	70,000 ft.

MECHANICAL CHARACTERISTICS

Color	Neon Red
Viewing Angle	120°
Segment Configuration and Pin Out	Figure 2
Character Size	Figure 2
Number of Pins	28
Package Outline Drawing	Figure 1

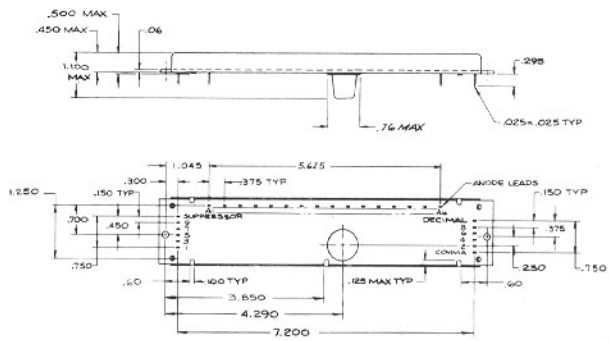


Figure 1 – Panel Outline Drawing

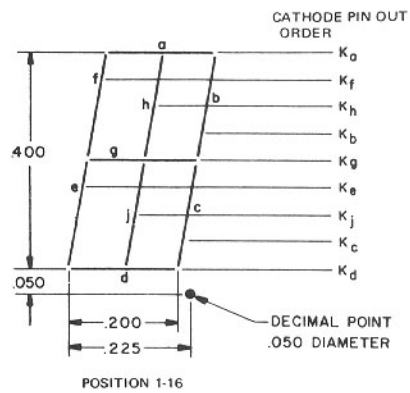


Figure 2 – Character Size And Configuration

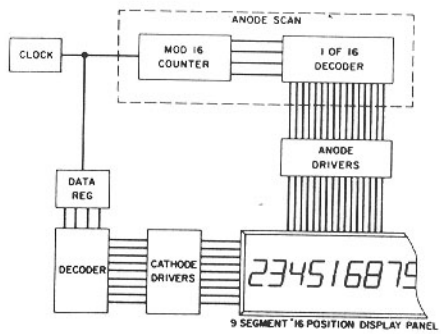


Figure 3 – PANAPLEX Panel Display Typical System

Burroughs

For further information contact your nearest Burroughs representative or sales engineer, or write: Burroughs Corporation, Electronic Components Division, Box 1226, Plainfield, New Jersey 07061. Tel: (201) 757-3400

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