Signalite

APPLICATION NEWS

A DIVISION OF GENERAL INSTRUMENT

Vol. 9, No. 3

Signalite, 1933 Heck Avenue, Neptune, N. J. 07753

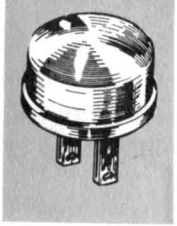
A LITTLE LIGHT CAN MAKE A BIG DIFFERENCE

By: Charles R. Dougherty
Signalite

Some appliances use pilot lights to indicate that the appliance is on. Others use lights to indicate some phase of operation. Still others indicate that the appliance is connected to a power source, although the unit is not operating. And others have lights for which only the designer knows the purpose.

Yet, with this plethora of lights on some appliances, there are some appliances that use no lights at all, which is somewhat surprising in view of two overwhelming reasons for using them. sales appeal and safety

In our highly electrified economy, most consumers have shown a tendency to prefer some indication that an appliance is working. As one of our correspondents put it, " . . I do enjoy seeing something positive happen when the preselector (for a communications receiver) is turned on." Faced with this sort of consumer attitude, the sales value of an indicator light takes on an important dimension. The manufacturer



Yours free . . . for telling us how you use or would like to use neon glow lamps

You can get a free Signalite Owl Eye Nite Lite simply by sending us an application for neon glow lamps a problem or solution on their use. Each reader will receive the Nite Lite whether or not his letter is used in the Application News. In addition we welcome longer articles for feature treatment which we will also place in a leading technical magazine in your name.

who can tell his prospective customers that they can tell at a glance whether or not the appliance is working, or working properly, certainly has a distinct sales advantage over the manufacturer who can merely say that it should work when plugged in.

On the matter of safety, there are many situations in which the addition of an indicator light would reduce the hazard from electrical shocks. Consider an electric knife which is picked up by someone not knowing that it was plugged into a live outlet. Or, consider an appliance cord which the housewife forgot to disconnect lying on a sink. Perhaps, if she is lucky, all that will happen will be a blown fuse when the female end drops into a sink full of water.

This matter of safety is extremely important and timely for the manufacturers of appliances. So far, the consumer groups have not levelled their big guns at the appliance industry for this. To avoid the unpleasantness from such an occurrence, especially from the over-reaction that invariably stems from such activity, it well behooves the appliance industry to take the first step—and the succeeding steps that would abort the situation before it develops.

The addition of an indicator lamp to appliance circuitry is neither complicated nor expensive. Either a neon lamp or an incandescent lamp may be used, the additional cost is comparable. But the neon has advantages on the basis that 1) it draws very little current and can be operated continually for pennies per year (a sales advantage), 2) the average lifetime of a neon is 25,000 hours or more so that maintenance and replacement present virtually no problem, and 3) it operates on standard AC line voltage.

There are many ways in which indicator lamps can be used with electrical appliances. Some of the more common ones are shown in Table I along with some typical applications. It might be noted that none of these conditions need be mutually exclusive. That is, by using more than one indicator, the conditions of power on-appliance off, and power on-appliance on, can be indicated on the same equipment.

The applications indicated in Table I are typical of many common household appliances. In addition to these are the myriad electrically-operated office machines such as copiers, typewriters, postal machines, addressing machines, teletype machines, etc. The same philosophy applies here, as well as the same simplicity and economy of adding indicator lights.

TYPICAL CIRCUITRY

Neon lamps may be used as indicators in circuits operating on 115 volts or 230 volts, alternating or direct current. When used in

TABLE I

Condition	Typical Applications
Power Available — cord is connected to a live outlet	Separate appliance cords for: electric frying pans waffle irons coffee makers Lamps
Power on, Appliance off — equipment is connected to live outlet, but is not operating	Battery chargers Electric blankets Room switches Electric tools Vacuum cleaners Garbage disposers Air conditioners Electric shavers Electric toothbrushes Electric can openers Mixers Electric knives
Power on, Appliance on — equipment is connected to live outlet and is operating	Refrigerators Freezers Heaters Stereo and record players Tape recorders Radio receivers (standby) Toasters
Power on, Heater off equipment is connected to live outlet but is not using electricity (thermostat is open)	Coffee makers Waffle irons Electric heaters Irons Thermostatically-controlled heaters
Power on, Heater on — equipment is connected to live outlet and is drawing current (thermostat is closed)	Electric blanket Coffee makers Irons
Cycle status of Appliance — lamp indicates which phase of operation the equipment is in	Washers Dryers Dishwashers
Polarity of connection — to indicate that equipment has been connected with correct polarity	Television
Power off	Faulty fuse

direct current applications, operating life of the neon lamp is 60% that of an equivalent AC installation. In all cases the lamp should be placed in series with a current limiting resistor. Lamps may be purchased with one or more resistors butt welded to one or both leads. In the event that the manufacturer of the appliance prefers to attach the resistor himself, the value of the resistor for a given lamp in a given application can be obtained from the manufacturer of the lamp. Resistor values are a function of life and brightness requirements for the application.

To install a lamp on a power cord to indicate that power is available, i.e., that the cord is connected to a live outlet, the circuit shown in Figure 1 can be used. The lamp and resistor are connected across the two leads in front of the female connection, and can easily be installed

so that it can be seen in the plug. In this example the lamp will glow continually as long as the cord is connected to power

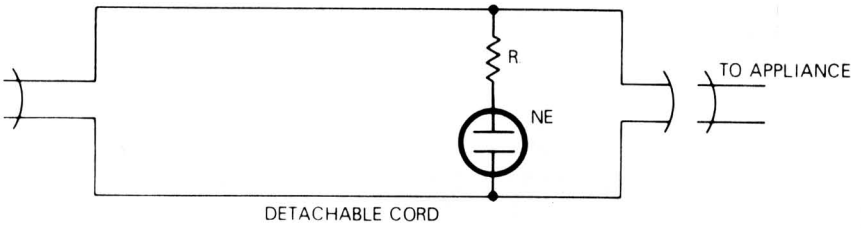


Figure 1

To indicate that power is available and the appliance is not operating or drawing current, the lamp and resistor may be connected across the appliance switch as shown in Figure 2. With the switch open, current flows through the resistor starting the lamp. Since the rated current for a lamp is approximately three milliamps, the amount of current through the appliance when off can be ignored. When the appliance switch is closed, the current path of least resistance is through the appliance and the lamp will extinguish.

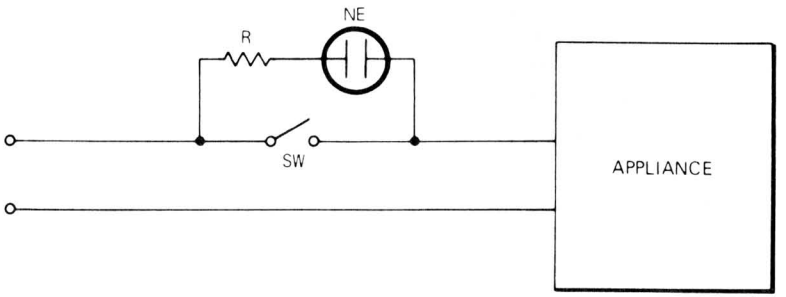


Figure 2

Figure 3 shows a typical installation of a lamp to indicate that the appliance is on. Here the lamp and resistor are connected across the leads between the switch and the appliance. Operation of the lamp has no effect on the operation of the appliance. By combining the circuits in Figures 1 and 3, that is, connecting one lamp across the leads before the switch and another across the leads between the switch and the appliance, one lamp will be on whether the appliance is on or not, and two will be on when the appliance is on. Combining Figures 2 and 3, one lamp will be on when the appliance is off, and another will start when the appliance is turned on. At this time, the first lamp will extinguish.

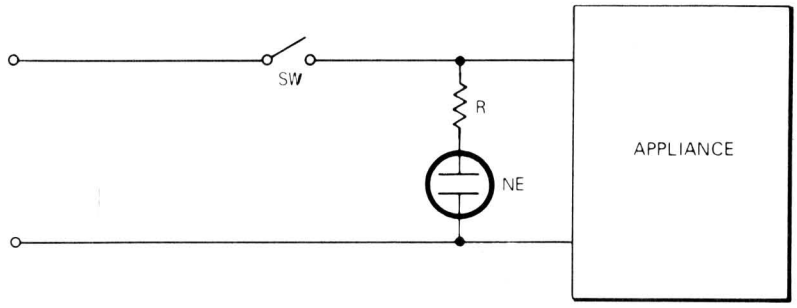


Figure 3

The circuits in Figure 4 show typical installations of neon lamps to indicate operation of a heater. Figure 4A illustrates how a lamp that would be on when the heater is off but connected to a live outlet would be installed across the thermostat. In Figure 4B the lamp is on when the heater is on. As noted above, Figures 4A and 4B could be combined to indicate the two conditions with two lamps, or Figure 1 could be combined with either Figure 4A or 4B to indicate that the appliance has power available.

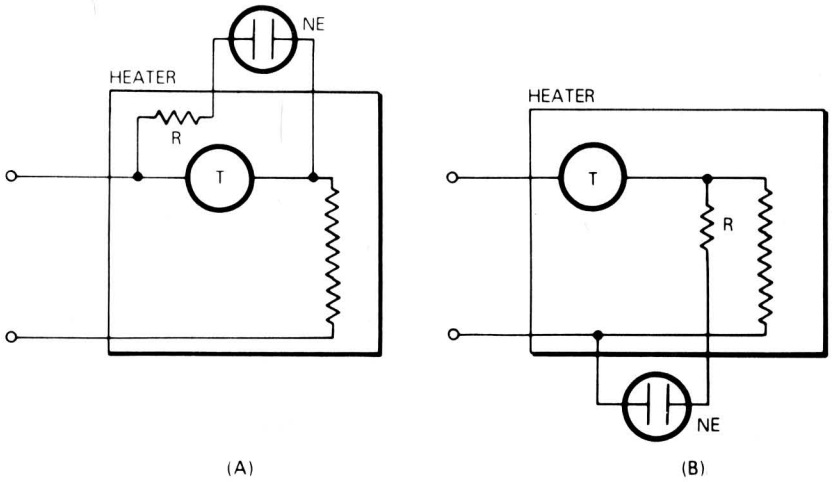


Figure 4

In some cases it may be desirable to have an indicator lamp that flashes. That is accomplished by connecting a capacitor of suitable value depending on the flashing rate desired across the neon lamp. Figure 5 shows how a lamp would be connected to provide a flashing light when the appliance is on and a steady light when the appliance is off.

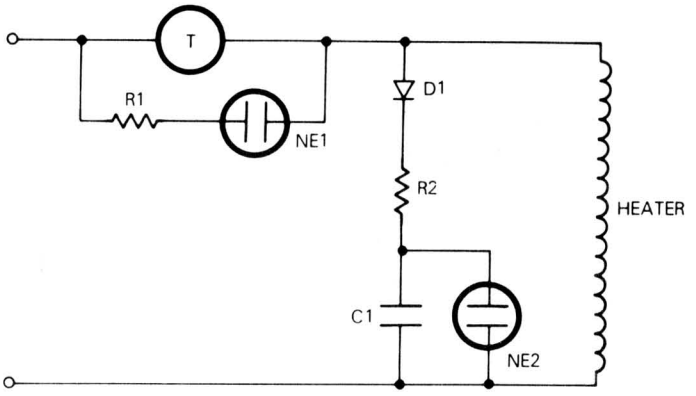


Figure 5

A number of circuits can be designed which use the flashing neon lamp as a warning of a failure or as an indicator of a fault in the appliance. Figure 6 shows one approach to indicating that a fuse has failed. The lamp is off until the failure at which time it flashes.

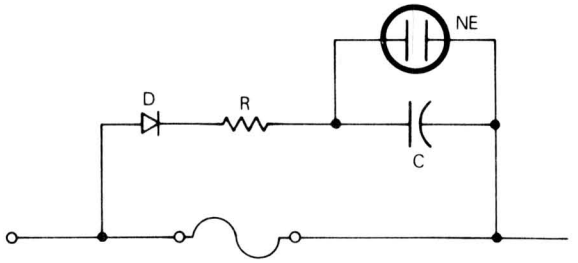


Figure 6

To indicate phase of operation or setting of an appliance, a circuit such as shown in Figure 7 may be used. The switch shown may be a mechanical switch, or a mechanical or electronic timer In each case the lamp will indicate which phase of operation is active.

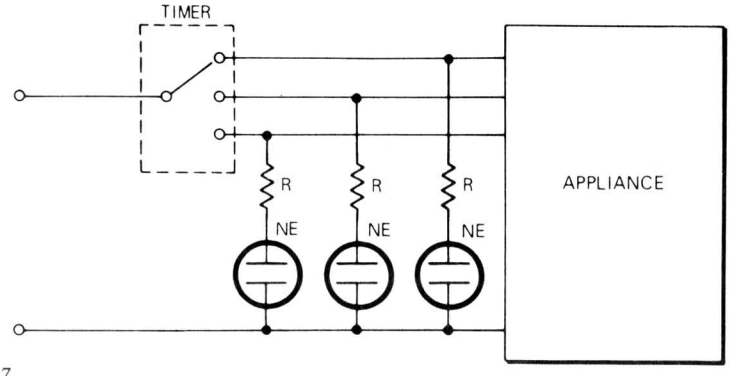


Figure 7

Indication of polarity of the power to the appliance is obtained by connecting a lamp and resistor between the negative side of the circuit and ground as in Figure 8. Although this is not necessary with most appliances, in those cases where it is advisable, a suitable legend, such as "Reverse Plug" can be imprinted on the lens over the lamp. This legend would be illuminated only when the connection has been incorrectly made.

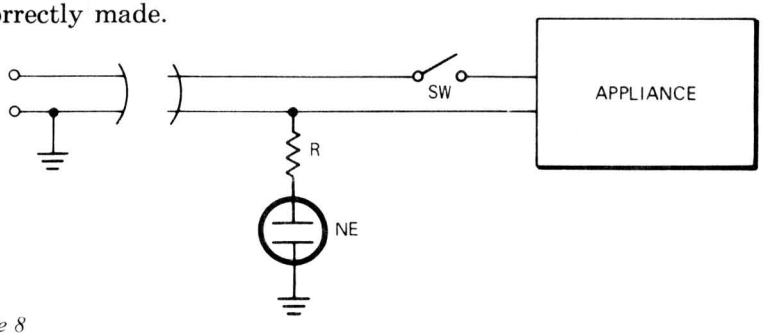


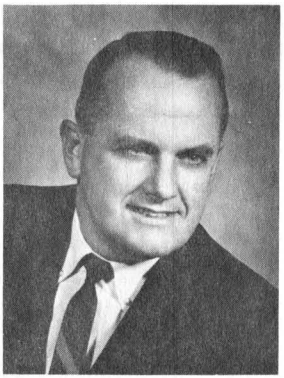
Figure 8

Since in all of the illustrations discussed here the neon lamp is meant to be seen under certain conditions, it should be mounted in the exterior of the cabinet or housing of the appliance and covered with a suitable lens or bezel. This serves the dual purpose of providing an esthetic appearance and of protecting the lamp from unnecessary movement which might disturb its connections.

In all indicator applications either a standard brightness lamp or a high brightness lamp may be used. There is no significant difference in installation or operation. The high brightness lamp has about ten times the brightness of standard brightness lamps and can be easily seen in ambient light. The standard brightness lamps may be preferred for applications where the indication will usually be viewed in a darkened area, such as might be the case with electric blankets.

There is a wide variety of neon lamps to choose from when selecting an indicator for an appliance. All are small, some smaller than others. All are highly reliable and require very little current for operation. Increasing the current will increase the light output, but will also shorten the effective lifetime of the lamp. In any case the cost of adding an indicator is measured in pennies, and the results in terms of safety and sales appeal will provide a return far in excess of the added cost.

HUETTIG APPOINTED VICE PRESIDENT OF SIGNALITE



Fred R. Huettig has been appointed Vice-President and General Manager of the Signalite Division of General Instrument Corporation.

Mr Huettig was formerly with the Indiana General Division of Electronic Memories, Inc., with whom he had been affiliated since 1953. Starting as assistant superintendent, he became chief manufacturing engineer and in 1960 transferred to the Valparaiso, Indiana plant as manager of manufacturing. He returned to the Keasbey, New Jersey plant in 1965 as vice-president and general manager of the electronics division. Prior to this association, he was a product and development engineer with RCA and Emerson Radio Corporation.

Mr Huettig is a graduate of Rutgers University having earned his B.S. degree in Ceramic Engineering in 1950. He is a member of the Ceramic Association of New Jersey, serving as president in 1970-71, the American Ceramic Society, the National Institute of Ceramic Engineers, and the American Management Association, as well as the honorary engineering societies, Keramos and Tau Beta Pi.

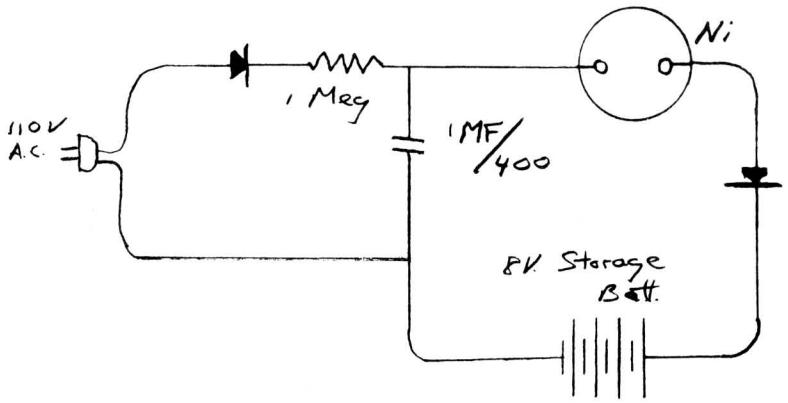
YOUR GLOW LAMP APPLICATION FORUM

It is Signalite's policy to publish letters based on their intrinsic interest only. We do not necessarily agree with all comments and suggested uses and will upon occasion wait for your reaction before taking editorial space for ours.

PULSE CHARGING BATTERIES

Dear Sirs:

I am enclosing a pulse charger circuit I am experimenting with. I have storage batteries connected to a burglar alarm system and my aim is to keep them "topped off" so that they will always be at full charge but not overcharged. I get roughly one pulse per second It may not be enough to keep a sensing battery (one that discharges a few M.A. through a closed circuit) fully charged, but may be enough



for keeping an open circuit battery "topped off" It is said that pulse-type charging is more beneficial to batteries than a steady current.

Sincerely

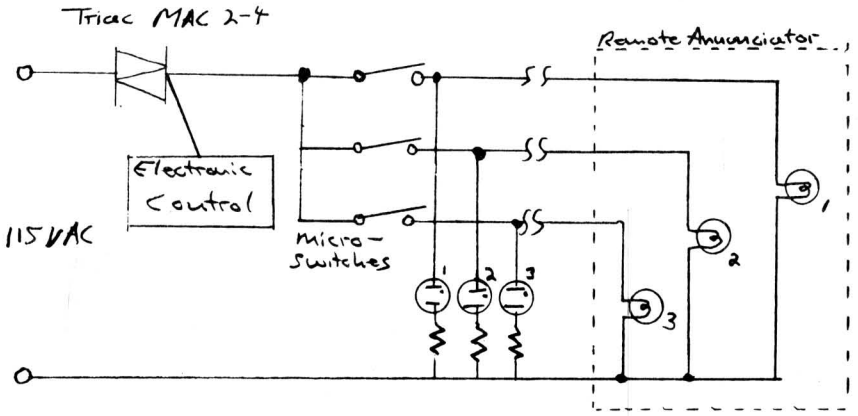
L. C. Breuer
Jackson Heights, N.Y

Ed. Note. Suggest N1 is a Signalite part No. A230 for good life in pulse mode.

ANNUNCIATOR FAILURE NOTED

Gentlemen,

We recently used neon indicator lamps as shown in the attached sketch. As well as indicating a switch closure and application of power to a remote annunciator light (115 VAC, 100 W. incandescent), the neon lamp will fail to light if the remote light is burned out. Thus, a local indication of failure of the remote light to operate is given.



This scheme works because the triac, like an SCR, will not remain on unless a load is connected to cause a current to flow. Prior to ignition, the neon lamp appears as an open circuit; and if the annunciator light is burned out, there is no load applied to the triac.

In our application, the triac is gated by an electronic signal at an appropriate time; and the particular annunciator light is selected by a mechanical actuation of one of the microswitches.

Sincerely yours,

L. S. Trowsdale
Kerr-McGee Corporation

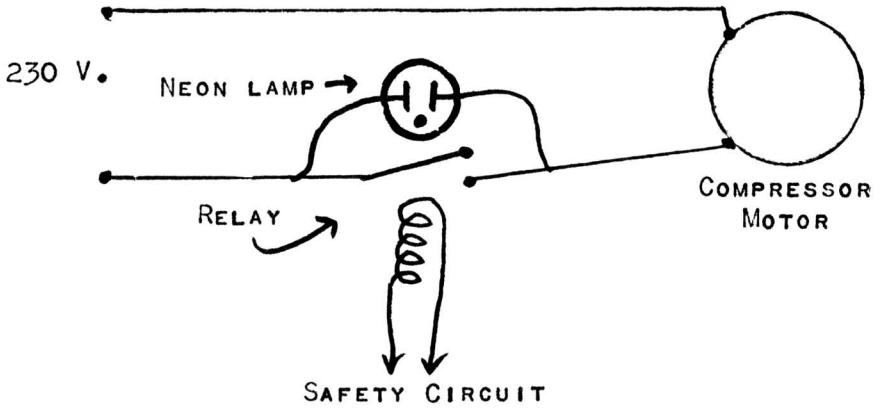
Ed. Note: Lamps can be LT2-24-2 with 30K ohm resistors. The low current drain of the lamps is insufficient to keep the triac latched in.

LIGHT BETTER THAN NOISE

Dear Editor,

I used a 2W., 230 V. Neon glow lamp as a warning signal in the following application:

The equipment in a certain critical application required a constant temperature ± 1 degree F There were two 5-ton air conditioners with water cooled condensers, one being used as a spare. Water pressure drop or water temperature rise caused a safety control relay to cut off the compressor in use. The constant noise caused by a continual air



circulating blower made it difficult for the personnel to hear the compressor stop. The large neon glow lamp (placed in a conspicuous spot) across the safety relay lighted up as soon as this relay opened. This alerted the personnel to (1) throw in the spare air conditioner, (2) call the service man, and (3) frequently check the equipment line-up

and calibration. The small bulb current was of course insufficient to run the compressor

Yours truly,

Ralph H. Steinberg
Sun City, Arizona

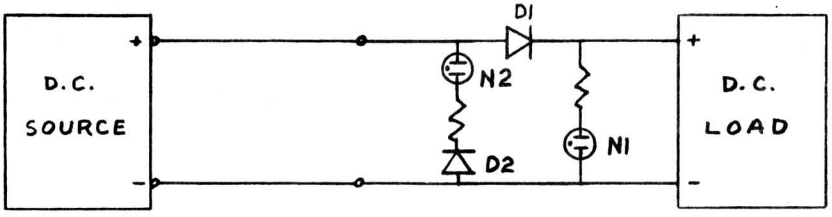
Ed. Note: Suggest NE-56 may be necessary to add some resistance in series with lamp if resistance of compressor motor is too low. See Signalite catalog.

THIS IS A ONE WAY STREET

Gentlemen,

Here is a circuit which utilizes neon lamps in conjunction with silicon diodes to indicate loss of D.C. and wrong polarity, and also protects electronic instruments, D.C. motors, etc. from reversed polarity connections.

When the D.C. source is properly connected to the load, diode D1 will conduct and neon N1 will indicate proper connection; D2 will not conduct, so warning lamp N2 will remain off



If the D.C. source is improperly connected to the load, D1 will not conduct, so N1 will remain off and the load will be protected against the reverse polarity; however, D2 will conduct and N2 will indicate a warning.

If neither light comes on when the D.C. supply is turned on, one can expect to find the trouble in either the supply or the connections to it, rather than the load.

Yours truly,

R. Mausser
National Research Council of Canada

Ed. Note. N1 and N2 can be NE2 or NE2H depending upon voltage available and desired light output. Refer to the Signalite catalog.

Return Postage Guaranteed

H. Ulmor
U INCORPORATED
P.O. Box 1007
Oceanside, Calif. 92054

BULK RATE
U.S. Postage
PAID
Dover N.J.
Permit No. 1

Signalite DIVISION OF GENERAL INSTRUMENT CORPORATION
1933 HECK AVENUE, NEPTUNE, NEW JERSEY 07753

Drop Us A Line

If you have an interesting application of neon glow lamps or high energy devices in your circuitry or a problem concerning the use of these components, drop us a note telling about it. Interesting letters will be published in a future issue of the *Application News* - and we will send you an Owl Eye Nite Lite for your interest.

Applications which in the opinion of Signalite have significant interest will also be brought to the attention of the editors of leading technical publications for consideration as articles and featurettes. If you would like help in preparing your material for publication, just send us the facts and data; we will put it in the correct form for publication. Your by-line and company credit will be given with your permission.

For immediate technical application or circuit design assistance, you may contact Signalite directly at:

TWX: 201-775-2255 *TEL. 201-775-2490*

● ● ● ●

For information about Signalite neon glow lamps, high energy devices, and other gas discharge products for circuit component and/or indicator applications, for specifications on Signalite components, or for general information about Signalite and its products, call us at any of the following telephone numbers:

Scottsdale, Arizona	(602) 947-4297	Kansas City, Missouri	(816) 763-3634
Los Altos, Calif.	(415) 948-7771	Albuquerque, N. Mex.	(505) 255-1638
Glendale, Calif.	(213) 247-6190	Neptune, New Jersey	(201) 775-2490
Denver, Colorado	(303) 388-4391	Rochester, New York	(716) 586-2030
Atlanta, Ga.	(404) 758-7496	Charlotte, N.C.	(704) 375-8958
Chicago, Illinois	(312) 593-0200	Cincinnati, Ohio	(513) 521-2290
Fort Wayne, Indiana	(219) 432-5591	Cleveland, Ohio	(216) 333-2585
Kokomo, Indiana	(317) 453-6868	Dayton, Ohio	(513) 298-9546
Indianapolis, Indiana	(317) 359-9283	Lafayette Hill, Pa.	(215) 825-3177
Louisville, Kentucky	(502) 893-7303	Pittsburgh, Pa.	(412) 242-0100
Baltimore, Maryland	(301) 484-3647	Bristol, Tenn.	(615) 968-4195
Newton, Mass.	(617) 444-8130	Dallas, Texas	(214) 528-6286
Grand Rapids, Mich.	(616) 451-8901	Houston, Texas	(713) 468-0232
St. Joseph, Mich	(616) 983-7337	Seattle, Washington	(206) 782-1600
Southfield, Mich.	(313) 358-2020	Waukesha, Wisc.	(414) 786-6330
Minneapolis, Minn.	(612) 854-4270	Scarborough, Ont. Can.	(416) 751-5980
St. Louis, Missouri	(314) 872-3183		

PRINTED IN U.S.A