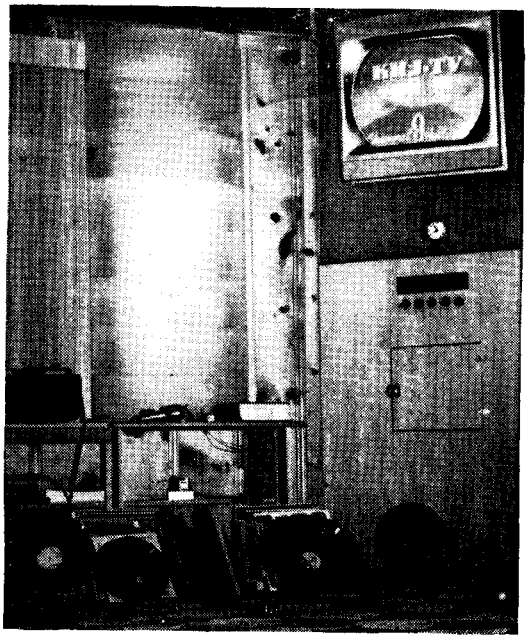
# MUSIC INTO LIGHT

By C. M. BRAINARD*



Lamps are mounted behind curved frosted glass.

WHILE touring one of our local aircraft plants, I noticed a group of men who did little with their time besides replacing spent fluorescent lamps. It seemed to me that a lot of time and money was being wasted. So I set about to develop a method of lighting seemingly dead lamps. I found many different types of devices which would do the trick. Among these were r.f. generators and high-voltage (neon) type transformers. These worked, but it cost approximately 50 times as much as it should to produce enough light to make it worth while.

During the process, I discovered that a standard fluorescent lamp, when connected in various ways across the output of an audio amplifier, would fire when certain frequencies were produced in sufficient strength. With further experimentation I found that all fluorescent lamps did not necessarily light on the same frequencies. Therefore, by connecting a large number of them in parallel, I found that a very unusual and almost hypnotizing transformation of sound into patterns of light could be achieved. The effect was further improved by the use of various colored lamps. They are available commercially in pink, green, blue, white, and "daylight" colors. They all appear white until lighted. The use of lamps with colored glass did not prove too practical because of the reduction of light intensity caused by the coloring of the glass. The length or number of tubes doesn't seem to make a great deal of difference.

We have made small models for the home with as few as 12 18-inch lamps or for giant commercial jobs using as many as 260 4-foot lamps. The arrangement of the lights is up to the builder. We found that mounting them parallel to each other and about one inch apart gives the best results. The tubes are covered with several panels of curved frosted glass mounted about 6 inches in front of the lamps.

Our largest model is located in the auditorium of the North Island Naval Air Station in San Diego, California. It is mounted across the top of the stage, and is 4 feet high and 52 feet long, containing 260 48-inch fluorescent lamps. It has been in use for 7 years, and none of the lamps have ever needed replacement. Since the gas inside these lamps is all that is used and since there are no elements or ballast transformers to worry about, their life, for all practical purposes, is infinite.

Since the efficiency of many things can be improved by a power source with a frequency considerably higher than 50 or 60 cycles, we feel that power for lighting homes in the future will be in the range of 1 to 10 kc. Of course this would completely eliminate the stroboscopic effect, so annoying with standard fluorescent installations. The intensity of the light will be controlled by the strength of the audio signal. However, for the present, we'll content ourselves with further details on what has come to be known as the "Light Organ".†

A few construction hints follow:

Wire all lamps in parallel as shown in Fig. 1. Wrap a fine wire (approximately No. 24) around each of them about ⅓ the distance from either end. Ground this wire to any good ground or the amplifier chassis. Connect one end of the parallel group through a 1-megohm potentiometer, to B minus. Connect the other end of the group through a 0.1-μf 600-volt capacitor to the plate of the output tube. If a conventional amplifier is used, load the secondary of the output transformer with a suitable resistance. Increased variation of light patterns may be obtained by reversing the lamps' terminal connections. The intensity of the light will be controlled by the potentiometer. The input to the output tube should be adjusted for the greatest variation in patterns. If too little volume is used the effect will be weak; if too much volume is used, the lights will fire simultaneously and little or no variation will be obtained

Do not attempt to run the Light Organ and a loudspeaker from the same output transformer because considerable distortion results from the discharge of the lamps. Fig. 2 shows the diagram of a typical amplifier that can be used to drive the organ. Transformer T1 may be an intercom input transformer or a high-impedance plate-to-voice coil output transformer connected in reverse. The low-impedance winding connects across the loudspeaker voice coil. This input connection loads the output transformer, so it should not be used with a high-quality system. Instead, remove T1 and substitute a 470,000-ohm grid resistor and a .02-μf coupling capacitor. Input can be tapped off at a suitable high-impedance point in the main amplifier.

The effect of the Light Organ, when used in the home for entertainment, is unusual. The startling potentials of creating light from sound are unlimited and provide a vast field for experimentation. **END**

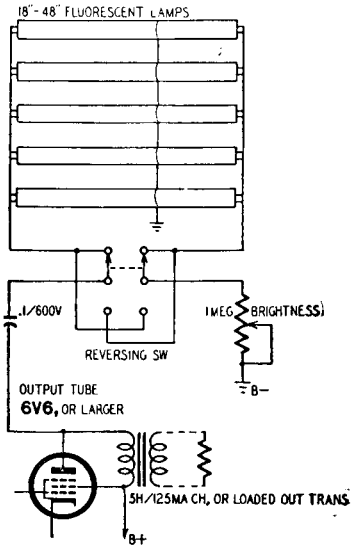



Fig. 1—Fluorescent circuit wiring.

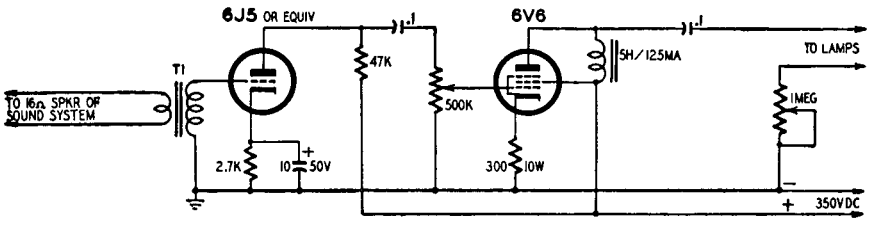



Fig. 2—Schematic diagram of a typical amplifier for driving the organ.

†The Light Organ—patented, 1948.

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