

Fig. 14-16. Parts layout for Searchlight Signal Driver (SSD) card

- **D1-D3[+]**. Install same as resistors but make sure that the banded end of each diode is oriented as shown in fig. 14-16.
- **S1[+]**. Making certain that you have all 14 pins properly in their respective holes with the correct orientation for pin 1, hold the socket tight against the board as you solder the pins. If you are not sure of the correct orientation for pin-1, see fig. 1-8 of the Second Edition book. As with any multi-pin part, solder only a couple pins first, those on opposite corners of the socket. Reheat as necessary to make certain that the socket is firmly against the board, then solder the remaining pins.
- **C1[+]**. Insert this capacitor standing perpendicular to the card. Make sure that the + lead goes into the + hole as shown in fig. 14-16. Incorrect polarity will damage this capacitor. Solder and trim leads.
- **C2**. Insert this capacitor standing perpendicular to the card, solder, and trim leads.
- **U1[+]**. Insert the LM324 IC making sure you have the correct pin-1 orientation and that all pins go into the socket. If unsure of the correct procedure for inserting, and extracting, ICs see fig. 1-7 of the Second Edition book.
- **P1**. Install this trim potentiometer as in fig. 14-16, push the three prongs all the way into the holes as you solder.

Table 14-12. Searchlight signal driver (SSD) parts list.
(In recommended order of assembly)

Qty.	Symbol	Description
4		4-40 nuts (Digi-Key H216)
4		4-40 x 1/2-long pan head machine screws (Digi-Key H142)
1	J1	Jumper, make from no. 24 uninsulated bus wire (Belden no. 8022)
3	R1-R3	100K Ω resistors [brown-black-yellow]
4	R4-R7	1.0K Ω resistors [brown-black-red]
1	R8	6.8K Ω resistors [blue-gray-red]
1	R9	15K Ω resistor [brown-green-orange]
1	R10	18K Ω resistor [brown-gray-orange]
2	R11	13K Ω resistor [brown-orange-orange]
3	D1-D3	1A, 100V fast recovery diodes (Digi-Key 1N4934CT)
1	S1	14-pin DIP socket (Digi-Key A9314)
1	C1	1.0 μ F, 35V tantalum capacitor (Jameco 33662)
1	C2	.1 μ F monolithic capacitor (JDR .1UFMONO)
1	P1*	50K Ω potentiometer (Digi-Key 3306F-503)
1	U1	LM324N quad op amp (Jameco 23683)

Select one of the following three options to complete card assembly:

If using circuit for 2-lead bi-color LED without separate red and green tweaking, install:

1	D4	Do not install, leave open circuit
1	D5	Install jumper in place of diode
1	R12	Do not install, leave open circuit
1	R13	390 Ω resistor [orange-white-brown]
1	R14	Install jumper in place of resistor

If using circuit for 2-lead bi-color LED with separate red and green tweaking, install:

2	D4, D5	1A, 100V fast recovery diodes (Digi-Key 1N4934CT)
1	R12	470 Ω resistor [yellow-violet-brown] (adjust to change red intensity)
1	R13	390 Ω resistor [orange-white-brown] (adjust to change green intensity)
1	R14	Install jumper in place of resistor

If using circuit for 3-lead bi-color LED, then install:

1	D4	Do not install, leave open circuit
1	D5	Install jumper in place of diode
1	R12	470 Ω resistor [yellow-violet-brown] (adjust to change red intensity)
1	R13	Do not install, leave open circuit
1	R14	390 Ω resistor [orange-white-brown] (adjust to change green intensity)

*Use potentiometer P1 to adjust the quality of yellow aspect.

Above quantities are per signal LED. Multiply by 12 to assemble total card (12 signal LEDs). Also, add in two additional nuts and screws, per card, for power supply connections.

Author's recommendations for suppliers given in parentheses above with part numbers where applicable. Equivalent parts may be substituted. Resistors are 1/4W, 5 percent with color codes given in brackets.

the yellow. In this case, you eliminate parts R12 and D4 and install jumpers in place of D5 and R14. Resistor R13 is selected to limit the current flowing in both direction through the LED.

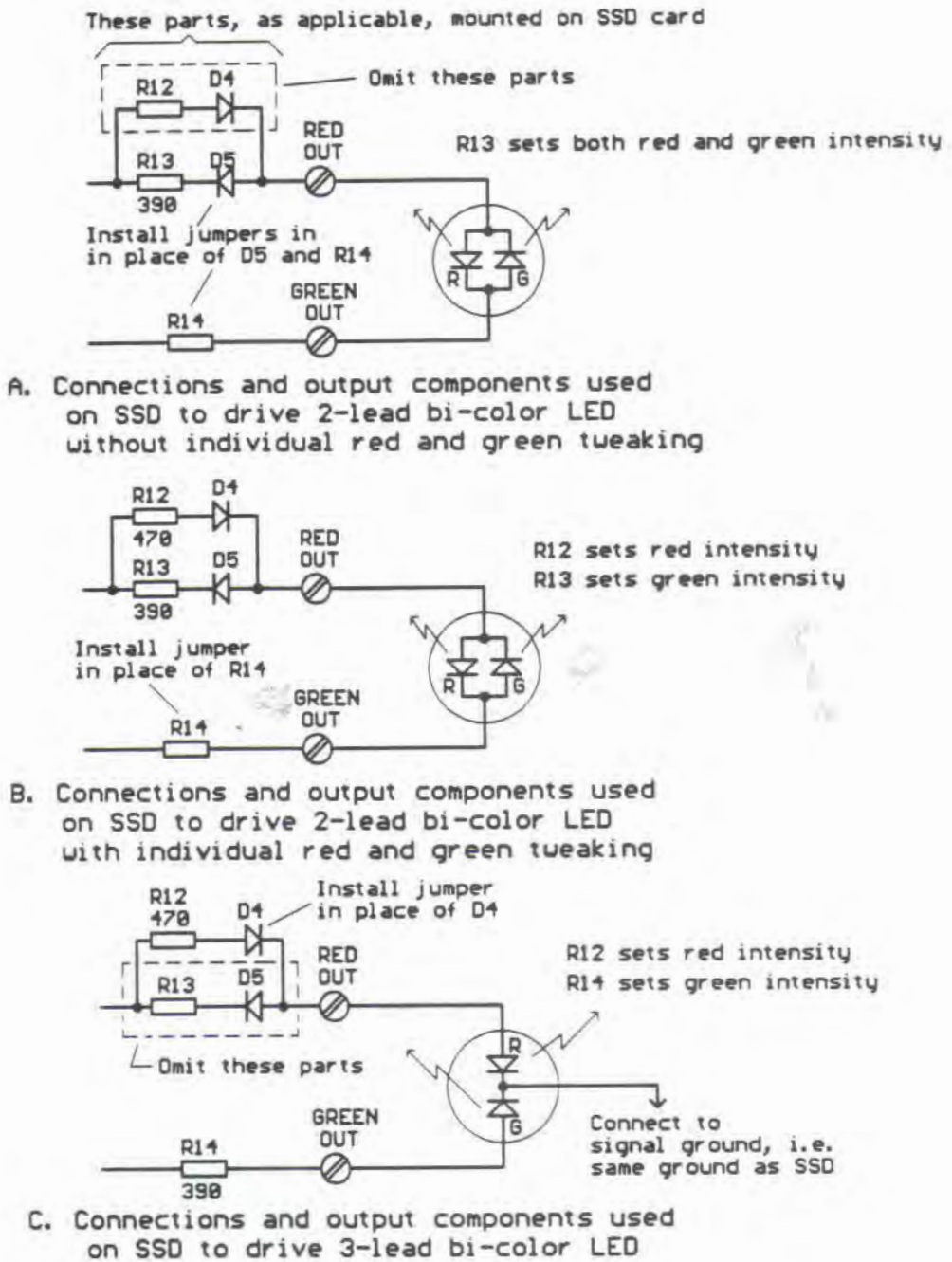


Fig. 14-15. Connecting LEDs and selecting output components for SSD

Fig. 14-15B shows the ultimate refinement case where you have separate control of the red and green intensities as well as control of the yellow. Resistor R14 is replaced with a jumper and select R12 to set the red intensity, R13 to set the green intensity. Then, once you have the red and green set the way you want, adjust P1 to optimize the yellow aspect.