नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्तांक
Marks Awarded :

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुदेशक के आद्यक्षर
Instructor Initial :

CASCADING ARRANGEMENT IN MULTIPLE ASPECT COLOUR LIGHT SIGNAL (3A/4A)

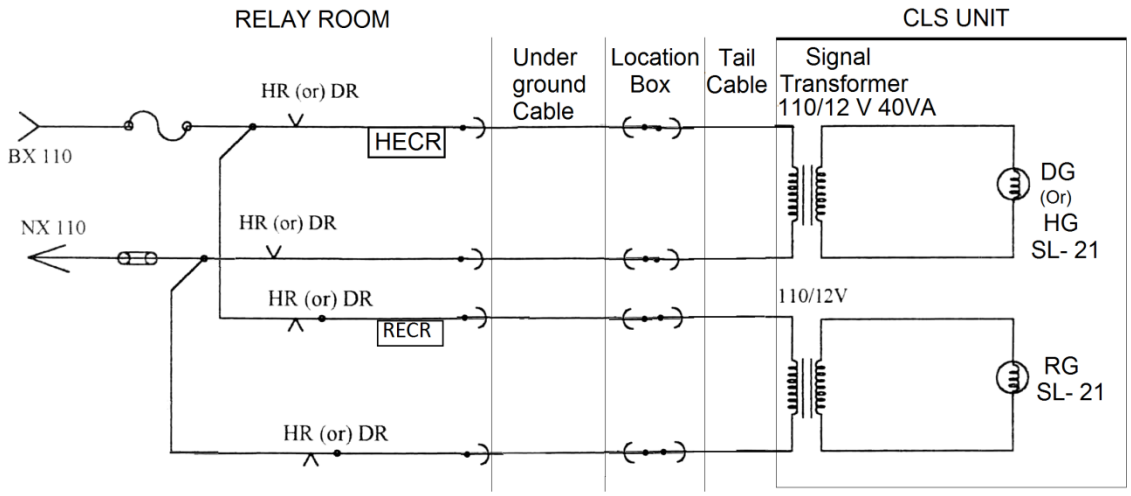
INTRODUCTIONS

Aspect control circuit

The Circuit designed to Control supply to various aspects of Colour Light signal is called Aspect Control circuit. This Circuit also contains ECR (Lamp Checking Relay) to prove / check the particular aspect is in lit condition at site, Thus if lamp of an aspect is in lit condition then ECR of that aspect will pickup and if lamp fuses then ECR drops.

Aspect Control Circuit of two aspect signal with common return

Aspect Control Circuit with common return is used in non-RE areas, as common return (NX 110) wire is provided from all the unit transformers of aspects to minimize usage of copper



Aspect Control Circuit of two aspect signal with separate return

Fig- 1

Aspect Control Circuit without common return is used in RE areas, each aspect control limb has a separate return wire to achieve RE requirement.

Above circuits has a drawback, whenever a lamp fuses the signal becomes blank, for example if DR is in pickup condition and DG lamp fuses then signal become blanks.

3 ASPECT SIGNAL

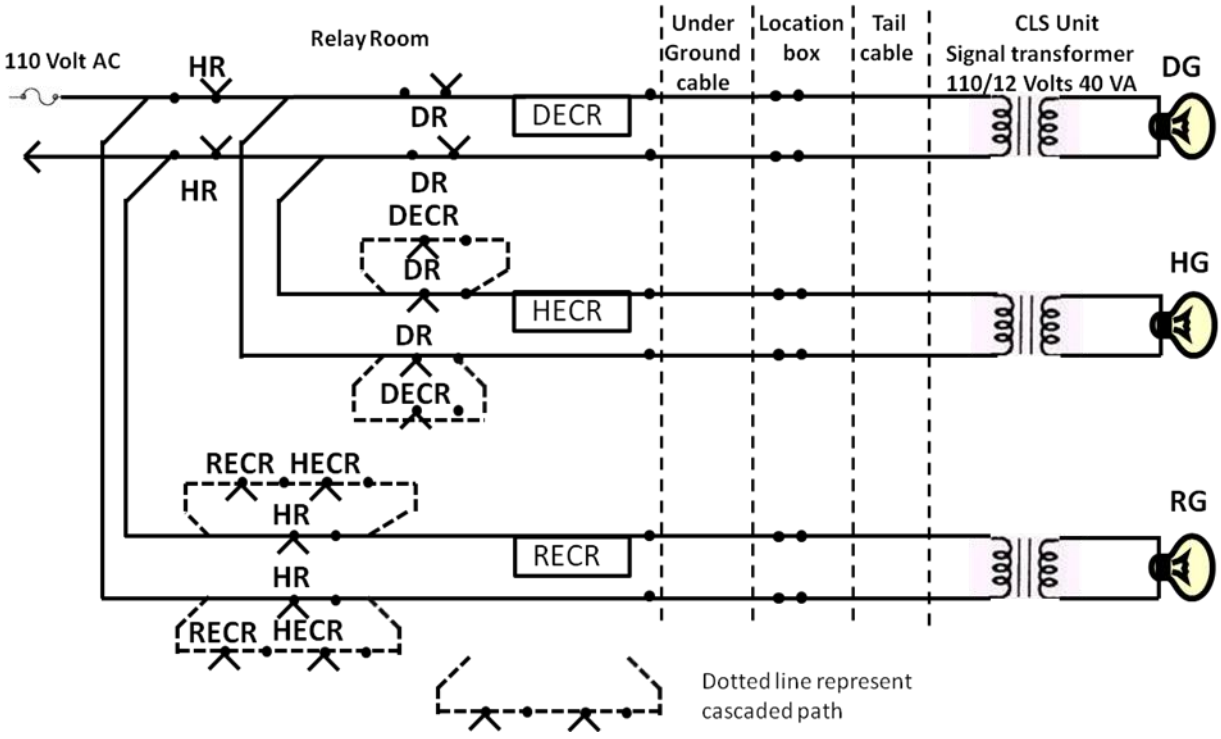
DESCRIPTION

The drawback stated above is overcome by adding the cascading arrangement in aspect control circuit.

Cascading – it is a circuitry arrangement provided in aspect control circuit to prevent blanking of signal in case OFF aspect lamp fuses, in such case next restrictive aspect lit automatically.

Generally this arrangement is provided in aspect control circuit of main stop signal and sometime also provided aspect control circuit of distant signal.

Cascading is achieved by **b**ypassing the controlling relay back contact in the limb of a particular in a aspect control circuit by ECR Relay back contact for example DR back contact in HG limb is Bypassed by DECR back contact .



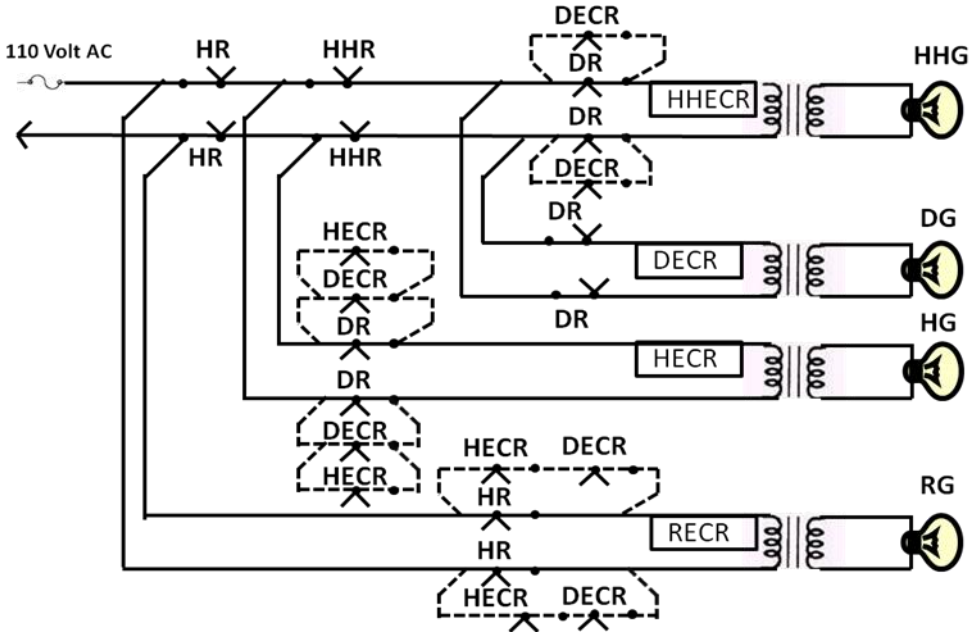
S.No	RELAY CONDITION	ASPECT
1	HR ↑ + DR ↑	DG
2	HR ↑ + DR ↓	HG
3	HR ↓	RG

Aspect control chart for three aspect signal

Fig- 2

Cascading arrangement in 4 ASPECT SIGNAL

Cascading is provided in automatic signalling territories also and may called as cutting in arrangement. There can be two types of aspect control circuits for four aspect signal and cascading is achieved in similar manner, as explain earlier.

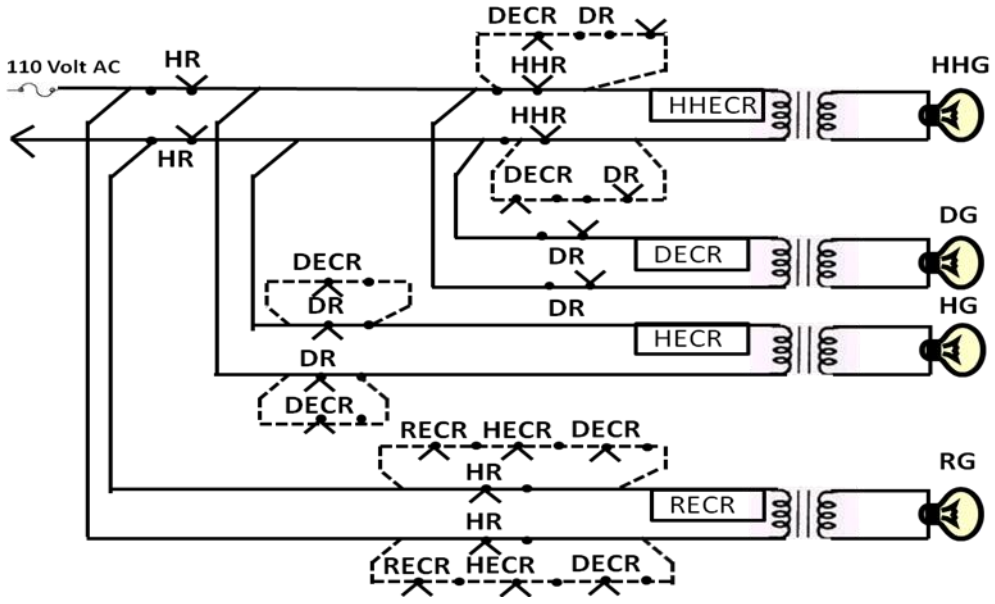


S.No	RELAY CONDITION	ASPECT
1	HR↑ HHR↑ DR↓	HHG
2	HR↑ HHR↑ DR↑	DG
3	HR↑ DR↓	HG
4	HR↓	RG

Aspect control table for four aspect signal

Fig- 3

Note:- for DG aspect only HR and DR pick up is require.



S.No	RELAY CONDITION	ASPECT
1	HR↑ HHR↑	HHG
2	HR↑ DR↑	DG
3	HR↑ DR↓	HG
4	HR↓	RG

Aspect control table for four aspect signal
Fig- 4

Note:- for DG aspect HR, HHR and DR pick up is require.

The following table indicate lamps to be used in cascaded and non-cascaded aspect of a signal.
Lamps to be used in cascaded & Non-cascade4d aspects are as follows

Reference:	Pins, Pole & filament & other	Main / Auxiliary filament Rating	Remarks
SL 18,	Three pin double pole & single filament	12V/24W	OFF Aspect (cascaded ckts)
SL 17	Three pin double pole & double filament	12v /16W/ 16v /12W	OFF Aspect(Non cascaded ckt)
SL –21		12V/24W 16V/12W	ON Aspect only
SL35A	Three pin triple pole & double filament	12V /24W 12V /24W	Cascaded OR non-cascaded CLS OFF Aspect
SL–35AL (Long life)		12V/24W 12 v/24w	
SL-35B		12V/33W 12V/33W	Cascaded OR non-cascaded CLS ON Aspect
SL-35BL (Long life)		12V/33W 12V/33W	
LED signal unit	NA	110 ±20%DC At 13 to 16 W	Cascaded OR non-cascaded CLS ON /OFF Aspect
	The jumper selection for blanking for cascaded and non-blanking (for non-cascaded aspect shall be done on current regulator)		

The table bellow indicates the various Electrical parameters of Signal Transformer and Lamp

Electrical parameters of Signal Transformer and Lamp			
Lamp glow volt.	2.3 Volt		
Lamp terminal voltage	10.8V or 90% of lamp's rated voltage		
Fuse rating	0.63 Amp for 110/12 aspect control circuit		
Signal transformer Rating & permitted	110v / 12v, 40VA	Primary tapping 0 & 110	Secondary tapping 0, 0.5 & 1 volts and 13,14.5 & 16 volts
No Load current	Should not be more than 05 ma		
Fuse rating	Shall be 2.5 times of normal working current of circuit		

No Load current

When an aspect is in lit up condition remove the lamp of that aspect and introduce amp-meter in series/ multi-meter in milliamp range and note down NO Load current of transformer

EXPERIMENT:

1. What is cascading?

2. Trace the cascading in circuit (Fig -3) with different colour/ arrow starting from fusing of DG lamp first and HG lamp next.

3. Write down the lamps to be used in cascaded OFF aspect.

4. Write down the ratings of signal transformer and Note down the no load current of signal transformer.

5. Write down the contact configuration and pick up and drop away current of ON , OFF ECR's.

6. Note down the different tapping available on the primary and secondary side of signal transformer.

7. Adjust the terminal voltage of the lamp to 90% of the rated voltage and write down adjusted voltage.

Date Signature of the Trainee