

Westinghouse I.L.41-965, SUPPLEMENT NO.4  
INSTALLATION • OPERATION • MAINTENANCE  
**INSTRUCTIONS**

**Model 67**  
**RELAY, GUARD, AND FLASHER**

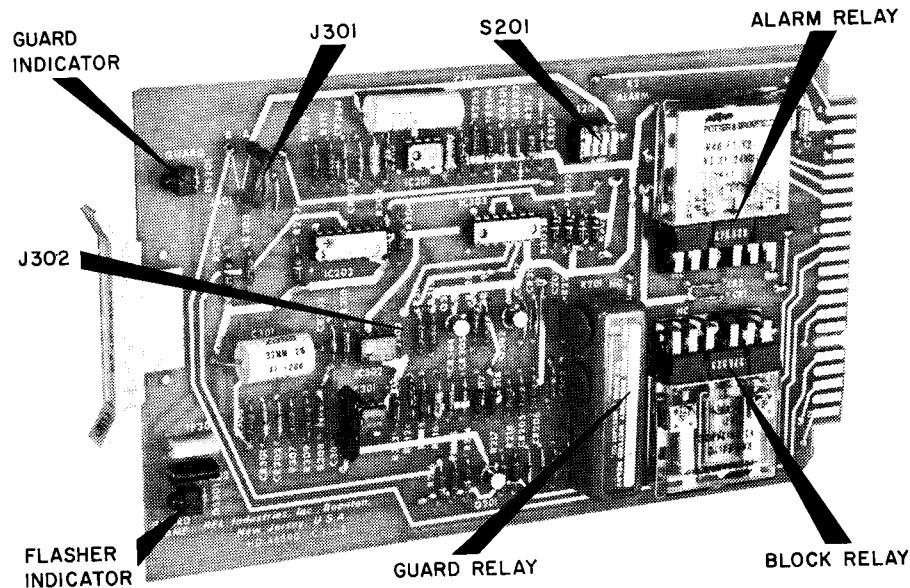


Figure 1. Model 67 Relay, Guard, and Flasher

## SPECIFICATIONS

### RELAY SECTION

Block and alarm relays each have two sets of Form C, silver, gold-diffused contacts, rated two amperes at 28 Vdc, 1.5 amperes at 50 Vdc, and 200 mA at 130 Vdc.

**Guard-Signal Input:** All necessary input signals are available from the Model 67 LOGIC Logic Card.

**Delay:** 4.5 ms.

**Hold:** Adjustable, 0-250 ms.

**Output:** Both relay output with Form C, mercury-wetted contacts, and solid-state output with a logic high at +12 volts, 10 mA.

### FLASHER SECTION

**Input:** All necessary input signals are available from the Model 67 TRANS Card.

**Period:** Alternately 25 ms for trip and guard. Other periods are available. The period of the guard signal, contained in the cycle of the flasher, must be approximately 25% greater than the period of the guard-before-trip timer as set in the Model 67 LOGIC Logic Card.

**Output:** Diode clamp to guard condition at transmitter's output.

### GENERAL

**Power:** Plus 12 Vdc, 40 mA, and minus 12 Vdc, 90 mA, both from the Series 6000 power supply used in the Series 6745 System.

**Temperature:** The equipment will operate in any ambient temperature between  $-20^{\circ}$  and  $+55^{\circ}$  C.

**Dimensions:** 1.0 inch wide, by 4.73 inches high, by 8 inches high. Requires two one-half-inch module spaces in the Chassis.

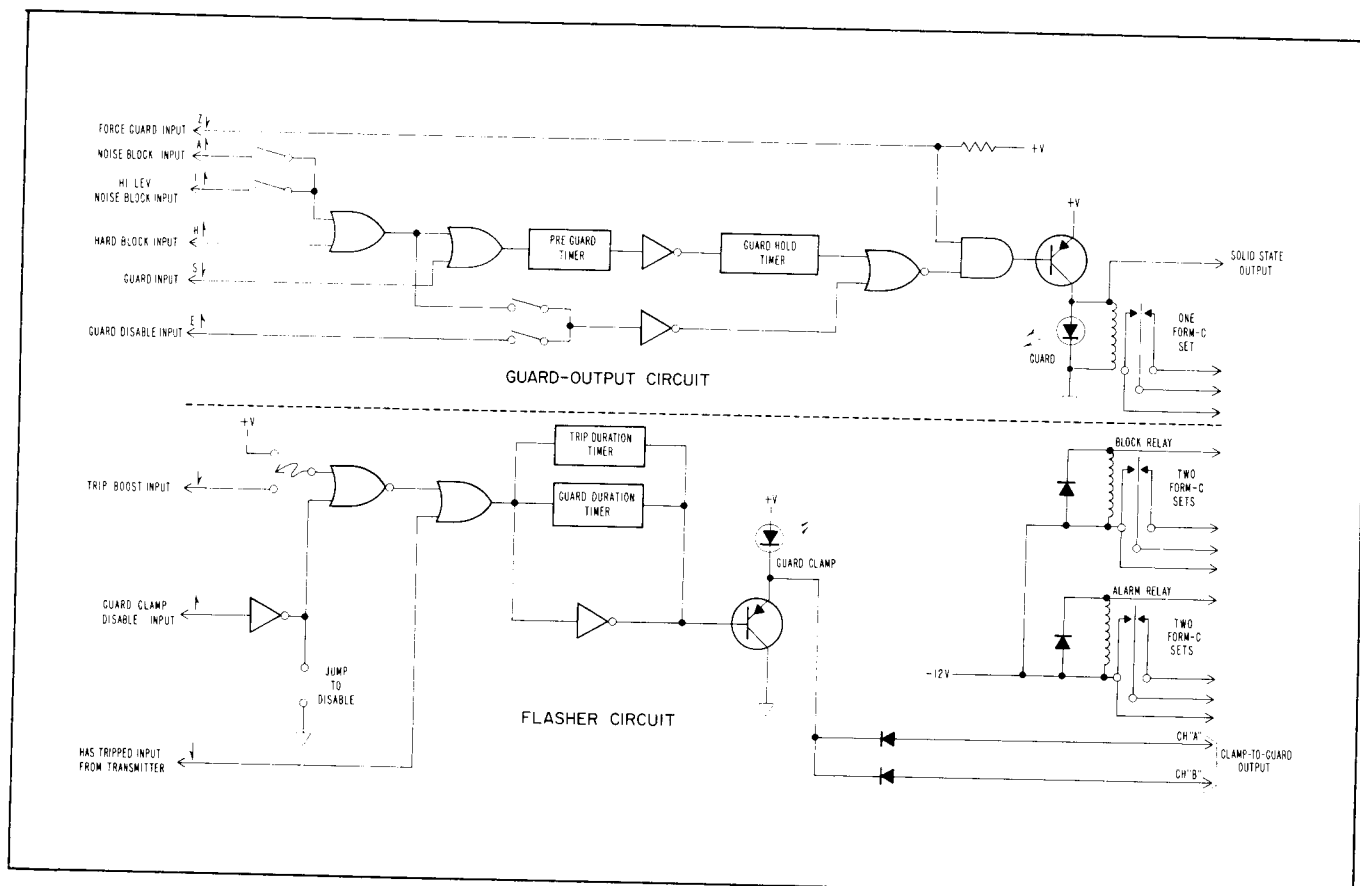


Figure 2. Block diagram of circuits of Model 67 Relay, Guard, and Flasher.

## DESCRIPTION

The circuits comprising the Model 67 Relay, Guard, and Flasher are outlined in the block diagram of Figure 2, which shows three basic sections, namely:

(a) A block and alarm relay section which is an exact duplicate of the Model 67 RELAY and the Model 67 RELAY-1. Edge-connector terminals are the same, so that this card may be plugged into any chassis wired previously for the former cards; and if other circuits are included on the Model 67 Relay, Guard, and Flasher then only appropriate additional connections need be made to the edge connector.

The coil of each relay is held energized by circuits on the logic card, so long as no block or alarm condition occurs. If a block or an alarm condition arises, the logic circuits will interrupt the coil current and thus cause the contacts to fall to the de-energized position. Release of the contacts can be used for operating an annunciator, for automatic transfer to single-channel operation in a dual-channel system, and as an alarm-relay-contact function as required in certain TT-12 relays.

(b) A guard-signal circuit which gives both a relay-actuated signal and a solid-state-output signal signifying the presence or loss of guard signal.

(c) A flasher circuit which causes the output of the transmitter to alternate between trip and guard frequencies when a trip is commanded. The flasher is used in direct transfer-trip applications to overcome the guard-before-trip requirement in the event that a noise block should occur shortly after a trip-command transmission begins.

### Guard Circuit

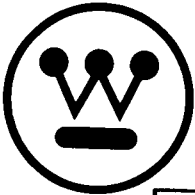
The guard circuit consists of a guard-input buffer, a buffer for block-input signals, two timers, and an output relay with mercury-wetted Form C contacts. The guard-input buffer is driven by the guard-output signal from the Model 67 LOGIC card. This buffer, in turn, drives a precision timer used to delay the output relay from operating until a predetermined period of time has elapsed, so that guard signal will not be acknowledged as valid until it has been present for a certain period.

The output of the timer is fed to a gating circuit so that guard-signal output may be blocked using an external signal, as by noise or for diagnostic purposes. The output circuit is a transistor which drives a relay and also produces a logic-high output of +12 volts. An illuminated indicator shows the presence of the guard signal.

# Table of Replaceable Parts

DIAGRAM SYMBOL	NAME OF PART AND DESCRIPTION	PART NO.
	<b>Model 67 Relay, Guard, and Flasher, (Assembly HB-41035)</b>	
	<b>Basic Circuit Board</b>	
C1, 2	Capacitor, tantalum, 1 $\mu$ F, 20%, 35V, Kemet T324A473M035AS, or eq.	H-1007-496
IC203	Quad, dual-input NAND gate, RCA CD4011AE, or eq.	H-0615-5
IC303	Quad, dual-input OR gate, RCA CD4071BE, or eq.	H-0615-24
R201, 202, 203, 207, 301, 302, 305	Resistor, fixed, composition, 220K, 5%, 1/4W, Allen Bradley CB, or eq.	H-1009-796
R303, 304	Resistor, fixed, composition, 10K, 5%, 1/4W, Allen Bradley CB, or eq.	H-1009-742
—	Schematic	H-41032
	<b>Block and Alarm Relays</b>	
K1, 2	Relay, two Form C contacts silver, gold diffused, 2 amp., P & B R40-E1-W2-800 Vdc, or eq.	HA-46592
CR1, 2	Diode, Type 1N914B	HA-26482
	<b>Flasher Assembly</b>	
C301	Capacitor, metallized mylar, 0.47 $\mu$ F, 2%, 200V, Wesco 32MM, or eq.	H-1007-1138
C302	Capacitor, dipped mica, 330 pF, 2%, 500 V, Electromotive DM19, or eq.	HA-16624
CR301-307	Diode, Type 1N914B	HA-26482
DS 301	Lamp, LED, Dialight 550-0102, or eq.	HA-39568
IC301, 302	Operational amplifier, National LM307N, or eq.	H-0620-93
Q301, 302	Transistor, NPN, Type 2N2222A	HA-37445
R306, 307, 308, 310, 314, 315, 319, 320, 321, 322, 323	Resistor, fixed, composition, 5%, 1/4W, value on schematic, Allen Bradley CB, or eq.	H-1009-(xxx)
R309, 311, 312, 313, 316, 317, 318	Resistor, metal-film, 1%, 1/8W, value on schematic, Type RN55D, RFL Spec HA-38301	H-1510-(xxx)
	<b>Guard-Output Assembly</b>	
C201	Capacitor, poly., 0.1 $\mu$ F, 2%, 100V, Wesco 32P, or eq.	H-5115-83
C202	Capacitor, 2%, 100V, capacitance determined by guard-hold time	—
C203, 204	Capacitor, ceramic disc, 0.01 $\mu$ F, 20%, 500V, Erie 811000Z5U0103M, or eq.	H-1007-83
CR201-207	Diode, Type 1N914B	HA-26482
DS 201	Lamp, LED, Dialight 550-0102, or eq.	HA-39568
IC201	Operational amplifier, National LM301AN, or eq.	H-0620-76
K201	Relay, mercury-wetted contacts, Adlake AWCB16541, or eq.	HA-24311
Q201	Transistor, PNP, Type 2N2907A	HA-37439
R204, 206, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221	Resistor, fixed, composition, 5%, 1/4W, value on schematic, Allen Bradley CB, or eq.	H-1009-(xxx)
R205, 208, 209	Resistor, metal-film, 1%, 1/8W, value on schematic, Type RN55D, Spec HA-38301	H-1510





# Westinghouse I.L.41-965,SUPPLEMENT NO.4 INSTALLATION • OPERATION • MAINTENANCE INSTRUCTIONS

## **Model 67** **RELAY, GUARD, AND FLASHER**

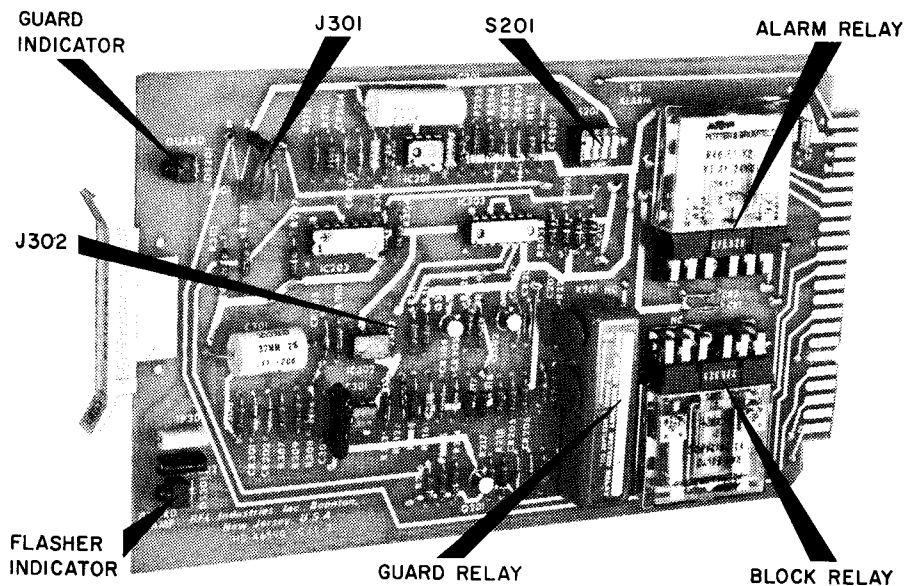


Figure 1. Model 67 Relay, Guard, and Flasher

## SPECIFICATIONS

### RELAY SECTION

Block and alarm relays each have two sets of Form C, silver, gold-diffused contacts, rated two amperes at 28 Vdc, 1.5 amperes at 50 Vdc, and 200 mA at 130 Vdc.

**Guard-Signal Input:** All necessary input signals are available from the Model 67 LOGIC Logic Card.

**Delay:** 4.5 ms.

**Hold:** Adjustable, 0-250 ms.

**Output:** Both relay output with Form C, mercury-wetted contacts, and solid-state output with a logic high at +12 volts, 10 mA.

**Period:** Alternately 25 ms for trip and guard. Other periods are available. The period of the guard signal, contained in the cycle of the flasher, must be approximately 25% greater than the period of the guard-before-trip timer as set in the Model 67 LOGIC Logic Card.

**Output:** Diode clamp to guard condition at transmitter's output.

### GENERAL

**Power:** Plus 12 Vdc, 40 mA, and minus 12 Vdc, 90 mA, both from the Series 6000 power supply used in the Series 6745 System.

**Temperature:** The equipment will operate in any ambient temperature between  $-20^{\circ}\text{C}$  and  $+55^{\circ}\text{C}$ .

**Dimensions:** 1.0 inch wide, by 4.73 inches high, by 8 inches high. Requires two one-half-inch module spaces in the Chassis.

### FLASHER SECTION

**Input:** All necessary input signals are available from the Model 67 TRANS Card.

EFFECTIVE APRIL 1977

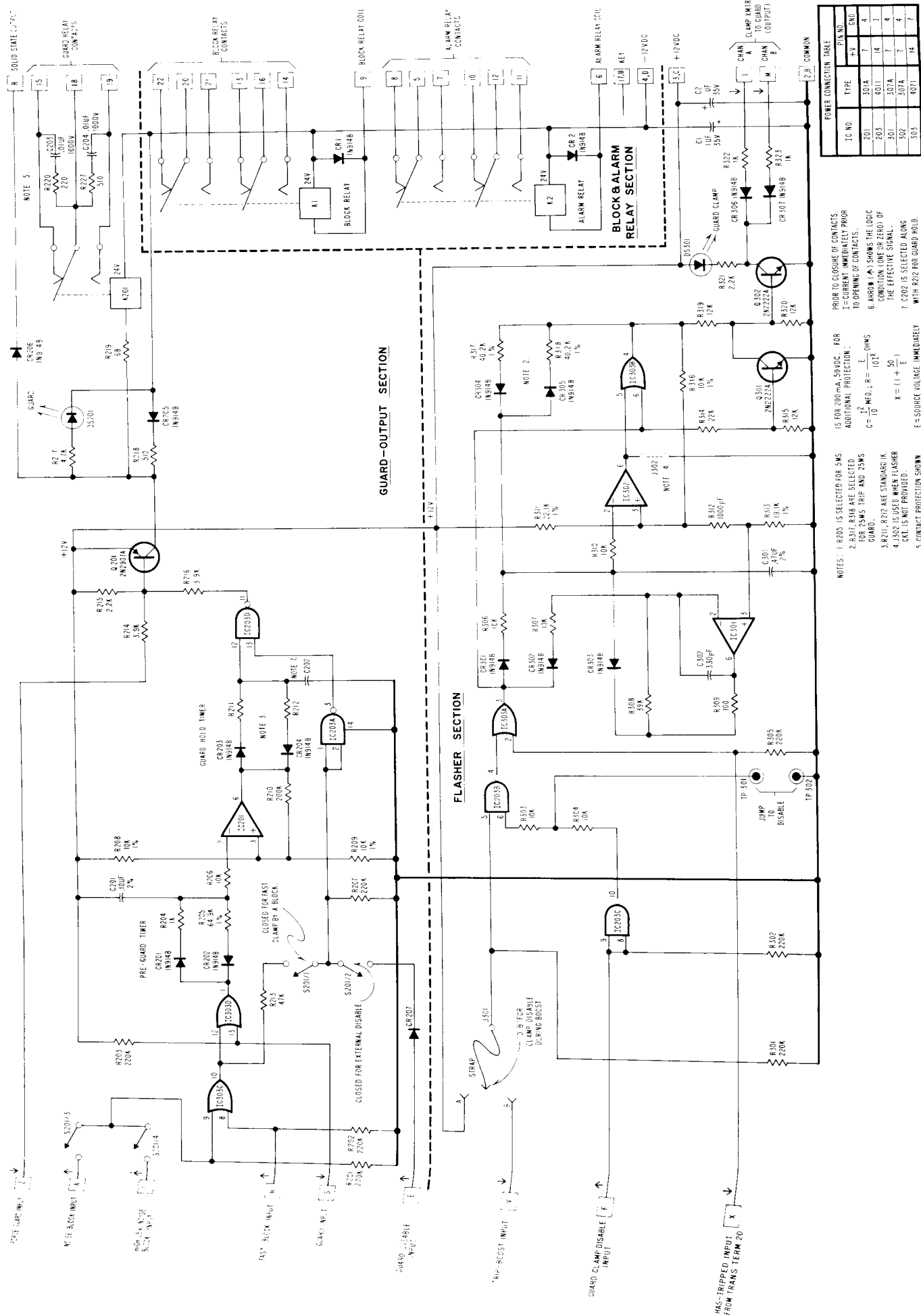


Figure 3. Schematic of circuit, Model 67 Relay, Guard, and Flasher.