Westinghouse I.L.41-965,SUPPLEMENT NO.3

INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

Model 67 LEVEL IND

SIGNAL-LEVEL INDICATOR AND MONITOR

SPECIFICATIONS

SIGNAL-LEVEL INDICATOR

Input: Input-signal range is 0 to -6 Vdc, taken from the AGC-voltage output terminal of up to four Model 67 REC Wideband Receivers.

Range: ±10 dB from the center of the AGC range.

Accuracy: For an excursion of ±5 dB on the indicating meter the accuracy is within ±1 dB.

Output: Visual only, using a d'Arsonval meter. An output signal is provided for operating an external, remote meter.

SIGNAL-LEVEL MONITOR

Input Range: Signals in the range between +16 and -30 dBm can be monitored for failure below a preset level. The preset level can be adjusted between +16 and -24 dBm when the isolating transformer is used at the input; or it can be adjusted between +10 and -30 dBm when input signals are connected directly.

Outputs

Logic Level: Failure of input signal is indicated by a shift of logic output from approximately +11 to 0 Vdc.

Relay: Form C contacts shift to the deenergized position upon failure of signal. Relay output is optional.

Signal ON: Acceptable signal level is shown by illumination of an LED indicator lamp on the front panel. This extinguishes upon failure of signal.

BOTH CIRCUITS

Ambient Temperature Range: -20° to $+55^{\circ}$C

Power Requirements: Both plus and minus 12 Vdc, 30 mA from any Model 68 Power Supply.

Dimensions: One printed-circuit card 4.713 inches high by 8 inches deep, requires two one-half-inch module spaces in the Chassis.

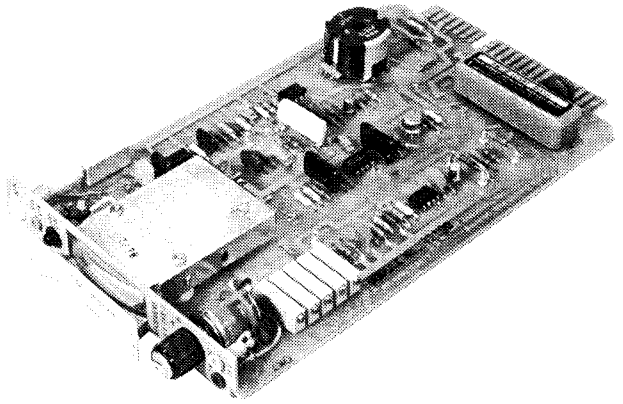

Figure 1. Model 67 LEVEL IND Signal-Level Indicator and Monitor.

DESCRIPTION

The Model 67 LEVEL IND is an optional element of the **DIT-1** Protective Relaying System. It contains two, separate, signal-processing circuits, namely: (a) A visual level indicator, using a d'Arsonval meter, to indicate departure of the level of an input signal from a preset reference level, over a range of ±10 dB. And (b) a non-visual level monitor, which announces failure of a signal below a preset limit by either (1) a change in a logic-level output or (2) movement of a set of Form-C relay contacts. Either output may be used to initiate visible or audible alarms.

The visual indicator is used only for visual surveillance of received-signal levels. The signal displayed is chosen, from four possible inputs, by setting a switch on the front panel.

The non-visual monitor may be used with either transmitter-output signals or receiver-input signals. The preset level at which the output for alarm is given may be set at any point within the range from +16 to -30 dBm.

A block diagram outlining the functional operation of both circuits is shown as Figure 2.

NEW INFORMATION

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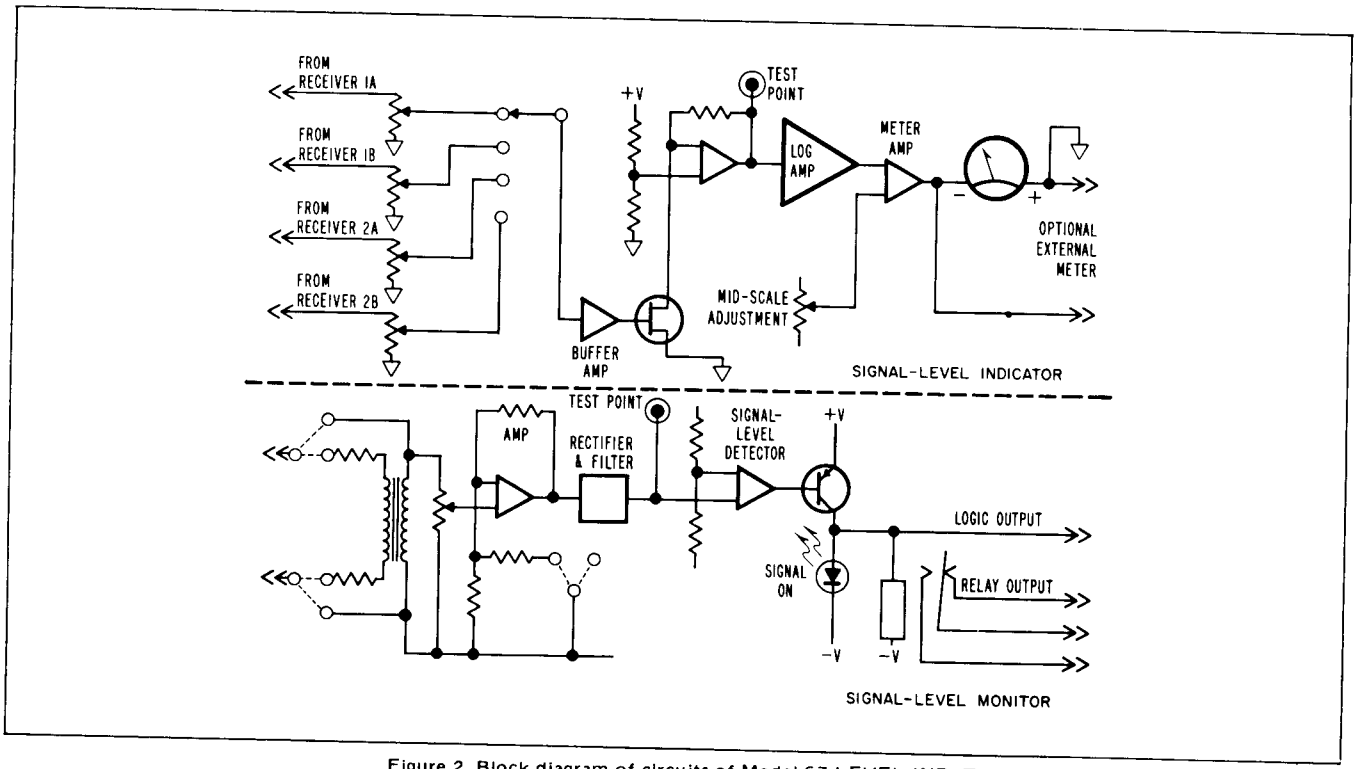


Figure 2. Block diagram of circuits of Model 67 LEVEL IND. The signal-indicator section is at the top, and the signal-level monitor is at the lower portion of the illustration.

INSTALLATION

When used as part of a system supplied by RFL, the Signal-Level Indicator and Monitor will be installed in its chassis and all interconnections with other units of the equipment, and all adjustments, will have been made. When installing it independently, the connection diagram of Figure 3 will be helpful. The 22-terminal mating connector used in the Chassis is TRW/Cinch P/N 250-22-30-210, or equal, Part Number HA-26120.

ADJUSTMENTS

Excepting for the unusual case where Q101 is replaced, the Mid-scale Adjustment is the first made. When Q101 is replaced, however, adjustment for its characteristics must precede all others. Locations of all adjustments and test points appear on Figure 4.

Adjusting Meter to Mid-scale

(1) Apply a dc input signal of between -2 and -3 Vdc at Terminal 17, one of the four input terminals, and turn S1 to Position A1. The signal may be taken from an external source or from a Model 67 REC Receiver.

(2) Connect a digital voltmeter between TP102 and COM, and adjust R101, marked RX A1, for a reading of -1.80 volts.

(3) With a reading of -1.80 volts at TP102, adjust R125, MID SCALE, until the meter's pointer is at center scale, the 0-dB mark. This completes the mid-scale adjustment.

Adjusting Meter to Match Receivers

(1) Supply a tone-frequency test signal with level in the center of the receiver's AGC range to the input of the receivers.

(2) Set switch S1 on the front panel to position A1, and adjust R102, marked RX A1, for a mid-scale deflection on the meter.

(3) Set S1 to position B1, and adjust R102 (RX B1) for a mid-scale reading on the meter.

(4) If there are two sets of receivers in the chassis, supply input signal to the second set and repeat the foregoing procedure for positions A2 and B2 of the input-selector switch.

It is essential, for each of these adjustments, that each receiver is supplied an input signal with level in the middle of its AGC range. The Signal-Level Indicator indicates only how much the incoming signal has deviated from the center of the AGC range. It does not indicate the absolute level of the signal received.

Compensating the FET

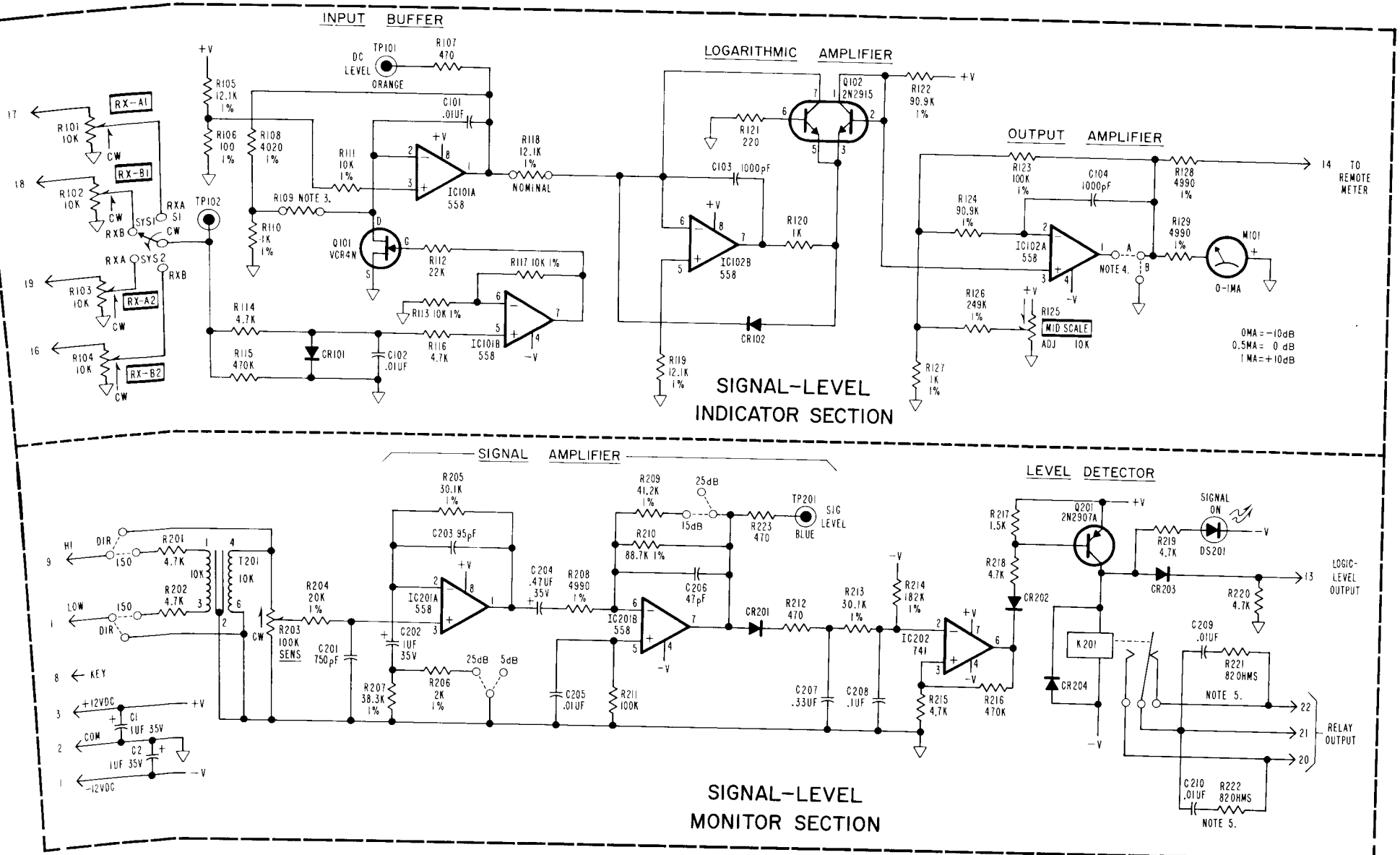
This adjustment will not be necessary unless Q101 is replaced. In that case, proceed as follows:

(1) Either turn S1 to an unused input position or, if all are used, disconnect any one of the four input-signal leads. Turn S1 to the open position.

(2) Apply power to the module.

Table of Replaceable Parts

DIAGRAM SYMBOL	NAME OF PART AND DESCRIPTION	PART NO.
	Model 67 Signal-Level Indicator and Monitor Assembly HB-41100	
C1, 2, 202	Capacitor, tantalum, 1 μF, 20%, 35 V, Kemet T324B105M035AS, or eq.	H-1007-496
C101, 102, 205	Capacitor, ceramic disc, 0.01 μF, 20%, 100 V, Cornell-Dubilier MPG01, or eq.	H-1007-1261
C103, 104	Capacitor, dipped mica, 0.001 μF, 5%, 500 V, Electromotive DM-20, or eq.	H-1080-245
C201	Capacitor, dipped mica, 750 pF, 2%, 300 V, Electromotive DM-15, or eq.	H-1080-346
C203	Capacitor, dipped mica, 95 pF, 5%, 500 V, Electromotive DM-15, or eq.	H-1080-279
C204	Capacitor, tantalum, 0.47 μF, 10%, 35 V, Kemet T324A474K035AS, or eq.	H-1007-511
C206	Capacitor, dipped mica, 47 pF, 5%, 500 V, Electromotive DM-15, or eq.	HA-16515
C207	Capacitor, metallized poly., 0.33 μF, 10%, 250 V, Intl. Elec. Cp. SM-3300-2A	H1007-1158
C208	Capacitor, ceramic, 0.1 μF, +80 -20%, 25 V, Erie 5815-OOOY5U104Z, or eq.	H-1007-646
C209, 210	Capacitor, ceramic disc, 0.01 μF, 20%, 500 V, Erie 811OOOZ5U0103M, or eq.	H-1007-83
	Semiconductors	
CR101 thru 204	Diode, Type 1N914B	HA-26482
DS201	Light-emitting diode, Texas Inst. TIL 220, or eq.	HA-38939
IC101, 102, 201	Linear opamp, dual National LM1458N, or eq.	H-0620-51
IC202	Linear opamp, National LM741CN, or eq.	H-0620-52
Q101	Transistor, field-effect, Siliconix VCR4N, or eq.	HA-41008
Q102	Transistor, silicon, NPN, dual Motorola 2N2915, or eq.	HA-17128
Q201	Transistor, NPN, silicon, Type 2N2907A	HA-37439
	Resistors	
R107, 112, 114, R115, 116, 120, R121, 201, 202, R211, 212, R215 thru 223	Resistor, fixed, composition ¼ W, 5%, value on schematic, Allen Bradley CB, or eq.	H-1009-(xxx)
R105, 106, 108, R110, 111, 113, R117, 118, 119, R120, 122, 123, R124, 127, 128, R129, 204–210, R213–214	Resistor, metal-film, precision 1%, 1/8 W, value on schematic, Type RN55D, RFL Spec HA-38301	H-1510-(xxx)
R109	Same as R105, factory-selected value	H-1510-(xxx)
R101, 102, 103, R104, 125	Resistor, metal-film, variable 10K, 10%, 0.75 W, Helipot 79PR10K, or eq.	HA-39539
R203	Resistor, metal-film, variable 100K, 10%, 0.75 W, Helipot 79PR100K, or eq.	HA-47540
	Miscellaneous Components	
M101	Meter, edge, 1 mA, 32 ohms, HB-41106	HB-41106
T201	Transformer, isolation, HB-55567	HB-55567
	Bar, shorting	HA-42904
	Schematic	HE-41104
	Optional Relay	
K201	Relay, mercury-wetted, SPDT Adams & Westlake AWCB-16541, or eq.	HA-24311



NOTES: 1. ALL DIODES ARE TYPE IN914B UNLESS OTHERWISE NOTED.

2. ALL RESISTORS ARE 1/4W 5% UNLESS OTHERWISE NOTED.

3. R109 IS SELECTED TO MATCH Q101.

4. IF SIGNAL-LEVEL INDICATOR SECTION IS NOT BEING USED, REMOVE JUMPER "A" AND INSTALL JUMPER "B".

5. CONTACT PROTECTION SHOWN IS FOR 300MA 150VDC. SEE NOTE 6 FOR ADDITIONAL CONTACT PROTECTION.

6. $C = \frac{I^2}{10}$ MFD, $R = \frac{E}{10\,I^X}\,\Omega$, $X = (1 + \frac{50}{E})$

E = SOURCE VOLTAGE IMMEDIATELY PRIOR TO CLOSURE OF CONTACTS.

I = CURRENT IMMEDIATELY PRIOR TO OPENING OF CONTACTS.

Figure 5. Schematic of circuit, Model 67 Level IND.

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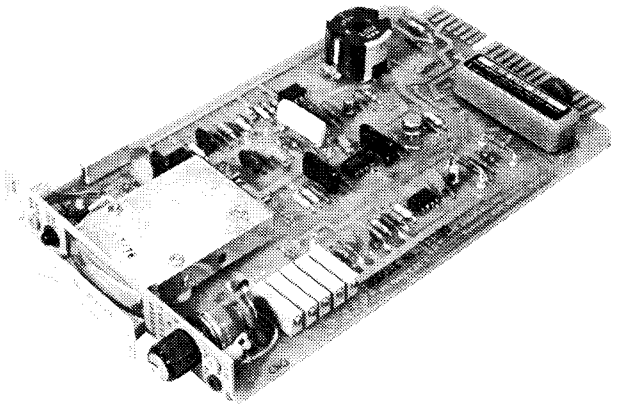

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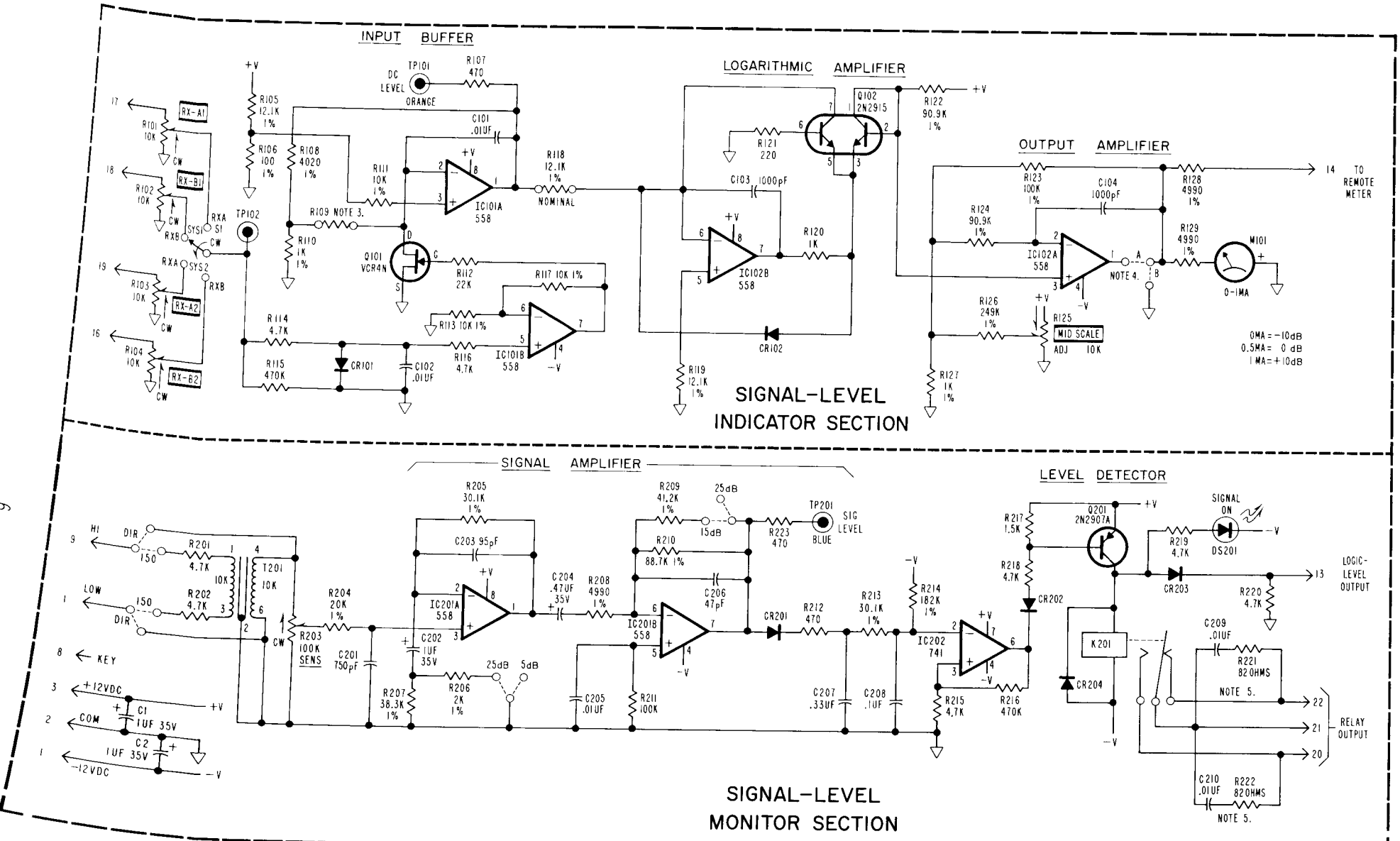

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