I.R.T. ELECTRONICS PTY LTD
26 Hotham Parade, ARTARMON, N.S.W. 2064 Australia
Phone: (ISD Code 61) (02) 439 3744 Fax: (02) 439 7439 Telex: AA122130

VG-381

VIDEO DETECTOR

8Ø2454

Ø2-12-1987

DESIGNED AND MANUFACTURED
IN AUSTRALIA

VG-381

VIDEO DETECTOR

INSTRUCTION BOOK

W A R N I N G

OPERATION OF ELECTRONIC EQUIPMENT INVOLVES THE USE OF VOLTAGES AND CURRENTS WHICH MAY BE DANGEROUS TO HUMAN LIFE. OPERATING PERSONNEL SHOULD OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE COMPONENTS OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH POWER ON UNLESS PROPER PRECAUTIONS ARE OBSERVED. NOTE THAT UNDER CERTAIN CONDITIONS DANGEROUS POTENTIALS MAY EXIST IN SOME CIRCUITS EVEN THOUGH POWER CONTROLS ARE IN THE OFF POSITION.

GENERAL DESCRIPTION

The VG-381 Video Detector is designed to be used in control systems to indicate the presence of a video signal by detecting the horizontal and vertical sync components of the signal using tone decoder circuits tuned to H and V frequencies.

Two separate relay output circuits are provided, which are controlled via logic circuitry to give an indication of the presence of Horizontal, Vertical, or Horizontal and Vertical sync components of the input video signal. Double pole relays are used to provide isolation between control and supervisory circuits controlled by the VG-381.

Hysteresis of the switching action is provided by delaying the ON and OFF switching times of the H and V detector circuits. These delay times can be set by internal controls to provide maximum delays of 90 seconds.

The video input circuit is a bridging loop with BNC connectors on the rear assembly connector panel. Connections from the relay contacts are via a 20 pin solder terminal block on the rear panel.

Visual indication of the state of the relay circuits are provided on the front panel of the VG-381 by two LED indicators.

Power supply requirements are 240 volts AC or 24 volts DC (positive or negative ground). Provision is made in the circuitry for power to automatically switch to the DC supply (if present) upon failure of the AC supply.

The VG-381 is built in an IRT single width module mounting in a F-100D rack mounting frame with all connections via the RB-71 rear assembly supplied with the unit.

TECHNICAL DATA

Video Input Level	Ø.5 to 2 volt p-p composite video signal
Input Impedance	75 ohm bridging loop input Return loss >4ØdB at 4.4 MHz
Input Connectors	BNC
Outputs	Two relay circuits operated by internal control logic. Each relay having two contact sets with all contacts available
Output Connector	2Ø Pin solder terminal block
Power Requirements	24Ø volts AC at 3VA or 24 volts DC at 1ØØmA
Power Connectors	XL series LNE for 24Ø volts AC input Terminals on the 2Ø pin solder block for the 24 volts DC input
Mechanical	IRT single width plug in module mounting in a F-1ØØD rack mounting frame

Height	Width	Depth
118mm	41mm	326mm

CIRCUIT DESCRIPTION

The input circuit Q1 is an emitter to provide a high input impedance. Q2 is a sync separator, normally in saturation and switched off by the sync tips of the input signal. Tuned circuit L1,C11 constitutes a chroma reject filter, to prevent the chroma portion of the video signal interfering with the sync-separator action of Q2. Q3 inverts the signal from Q2 collector and drives the horizontal and vertical separator circuits of U3.

The vertical and horizontal components of the video signal are separated in the circuitry associated with U3. R14,C13 form an integrator circuit to separate the vertical component of sync, this signal together with D9,R15 and C15 pulse the input circuit of U3/11 to produce a symmetrical field rate signal at U3/12. This signal is coupled into U5 a phase locked loop circuit operating at 5ØHz. The output U5/8 is LOW when the PLL is locked to the incoming vertical rate signal.

The horizontal rate signal is produced at U3/1Ø by the action of D8,R13 and C14 together with the level threshold of U3/9. This signal is coupled into U4 a phase locked loop circuit operating at 15625Hz. The output U4/8 is LOW when the PLL is locked to the incoming horizontal rate signal.

To provide delay of the output signal from the PLL detectors to the logic circuitry of U7, U6 and associated components delay the rising and falling edges of the signals from U4 and U5. the delay circuits consist of RC networks in the input circuit of the CMOS inverters in U6. Adjustments of the "ON" and "OFF" delays are provided by RV4,5,6 and 7.

The logic circuit U7 provides the following logic outputs.

"H" a HI signal whenever horizontal rate is present.

"V" a HI signal whenever vertical rate is present.

"P" a HI signal whenever horizontal ~~and~~ OR vertical rate signals are present.

"T" a HI signal whenever the vertical rate signal ~~and~~ OR "P" signal are present.

Relay driver circuits Q4,Q5 and Q6,Q7 can be driven from any of the four logic outputs by changing internal straps located on the PCB. The relays provide separate change-over contact sets as the control outputs of the VG-381. LED indicator lights on the front panel provide tally indication of the state of the relay action.

The power supply provides regulated +12 and +5 volts to operate the VG-381 circuitry. Power can be supplied from a 24Ø volts AC to 18 volts stepdown transformer and diode rectifier circuit D1-D4 and C1 or from an external DC source through steering diodes D5,D6 and D7.

INSTALLATION

The VG-381 is supplied with a slide tray, rear assembly and associated hardware, for mounting in a F-1ØØD frame.

Slide Tray

The slide is a shallow tray which supports the module in the frame. It is mounted on the front and rear cross members of the frame and is fixed in place with the steel clips (speed nut type) provided.

Rear Assembly

The rear assembly is mounted on the rear of the frame with the 4BA screws provided. Place the rear assembly on the frame and secure it loosely, using the screws provided with the rear assembly and the key provided with the F-1ØØD frame. Slide the equipment module into the frame using care to align the plug of the module and the socket of the rear assembly. The screws can now be tightened to secure the rear assembly in place, do not over tighten these screws, as excessive force will damage the thread in the mounting frame.

SIGNAL CONNECTIONS

AC power is connected to the unit via a XL series LNE connector provided with the rear assembly.

Video input signal is connected to a looping pair of BNC video connectors. If the signal is not looped onto another circuit, the unused connector must be terminated using a 75 ohm termination plug.

The connections from the relay contact sets are available on pins 1 through to 12 of the 2Ø pin solder terminal block as shown on the RB-71 circuit diagram

DC input power (if used) is connected to pins 18,19 and 17,16 of the 2Ø pin solder terminal block as shown on the RB-71 circuit diagram.

Check that the internal strapping of the logic outputs to the relay driver circuits is as required and adjust the "ON" and "OFF" time delays as required using RV4-RV7.

ALIGNMENT

The following constitutes the factory alignment of the VG-381

1. Apply a Ø.5 volt P-P video signal to the input of the unit and adjust RV1, whilst monitoring the SYNC test point on the front panel with a CRO probe, for correct sync-separator operation.

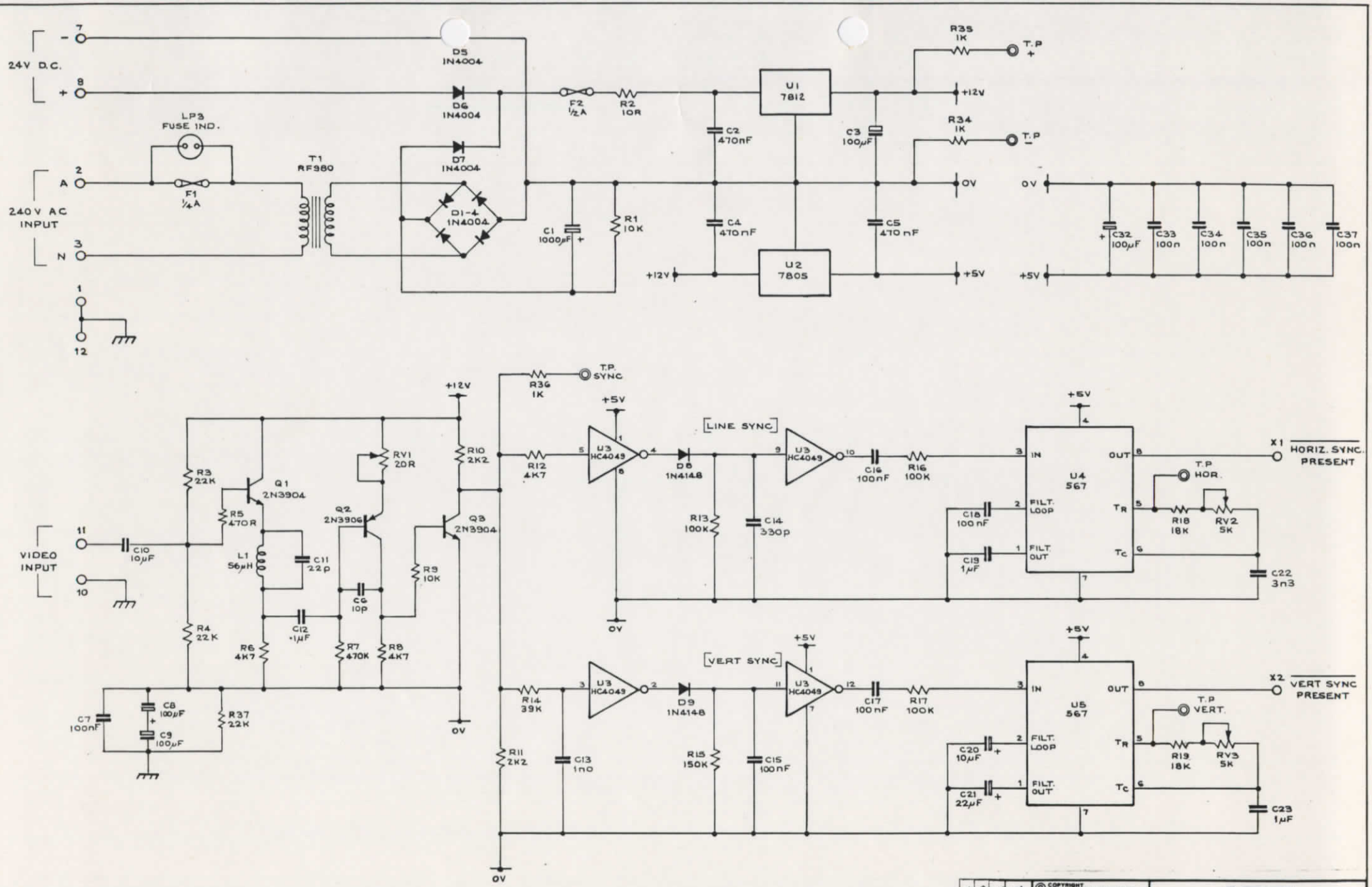
2. Move the CRO lead to the H test point on the circuit board increase the signal level to 1.Ø volt P-P and lock the CRO to external horizontal sync. Observe the frequency of operation of the PLL U4 remove the input signal and adjust RV2 (H FREQ) for minimum drift of the signal with respect to horizontal rate (or adjust for a pulse cycle length of 64 uS). Reconnect the input signal and observe the lock of the signal, this will have some jitter during the vertical interval period due to the 2H pulses present then.

3. Move the CRO lead to the V test point on the circuit board and lock the CRO to external vertical sync. Observe the frequency of operation of the PLL U5 remove the input signal and adjust RV3 (V FREQ) for minimum drift of the signal with respect to vertical rate (or adjust for a pulse cycle length of 2ØmS). Reconnect the input signal and check for a stable lock of the signal.

4. Check for connections of the terminals to the relay driver inputs, V to RL1 in and H to RL2 in. Adjust RV4,RV5,RV6 and RV7 to minumum (fully counterclock-wise). Apply signal to the VG-381 input, the relay tally lights LP1 and LP2 should come on within 2 seconds. Remove the signal, the relay tally lights LP1 and LP2 should turn off within 2 seconds.

Adjust RV6 and RV7 for maximum (fully clock-wise) reapply signal and check thaat the time taken for the relay circuits to operate is greater than 85 seconds. Use an ohm-meter to check the operation of the relay contacts to the test rear assembly.

ADjust RV4 and RV5 for maximum (fully clock-wise) remove the signal and check that the time taken for the relay circuits to turn off is greater than 85 seconds. Use an ohm-meter to check the operation of the relay contacts to the test rear assembly.



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IRT

TITLE VG-381 VIDEO DETECTOR

SIZE A4 | SCALE

CONTRACT NO. 162

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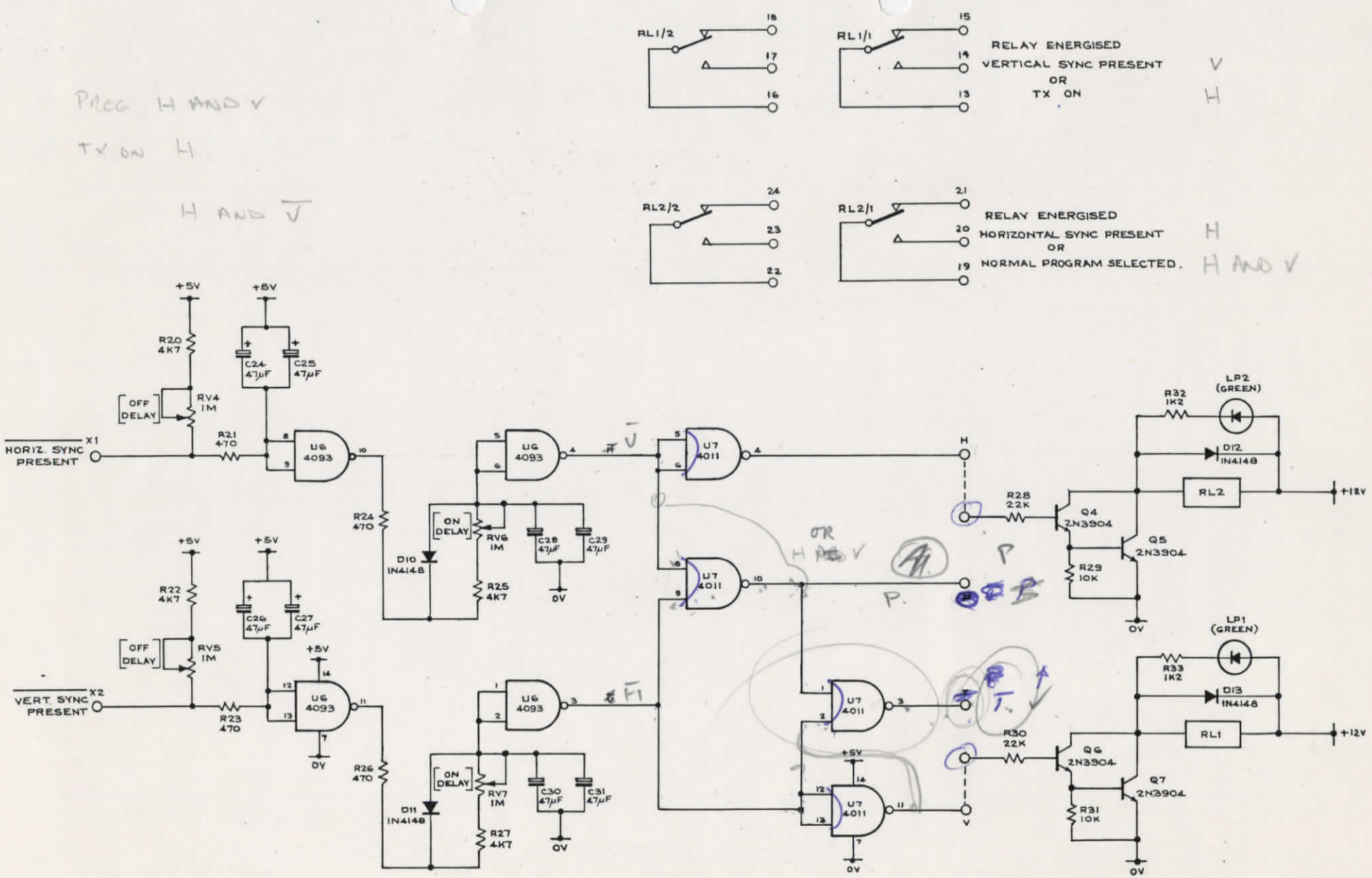

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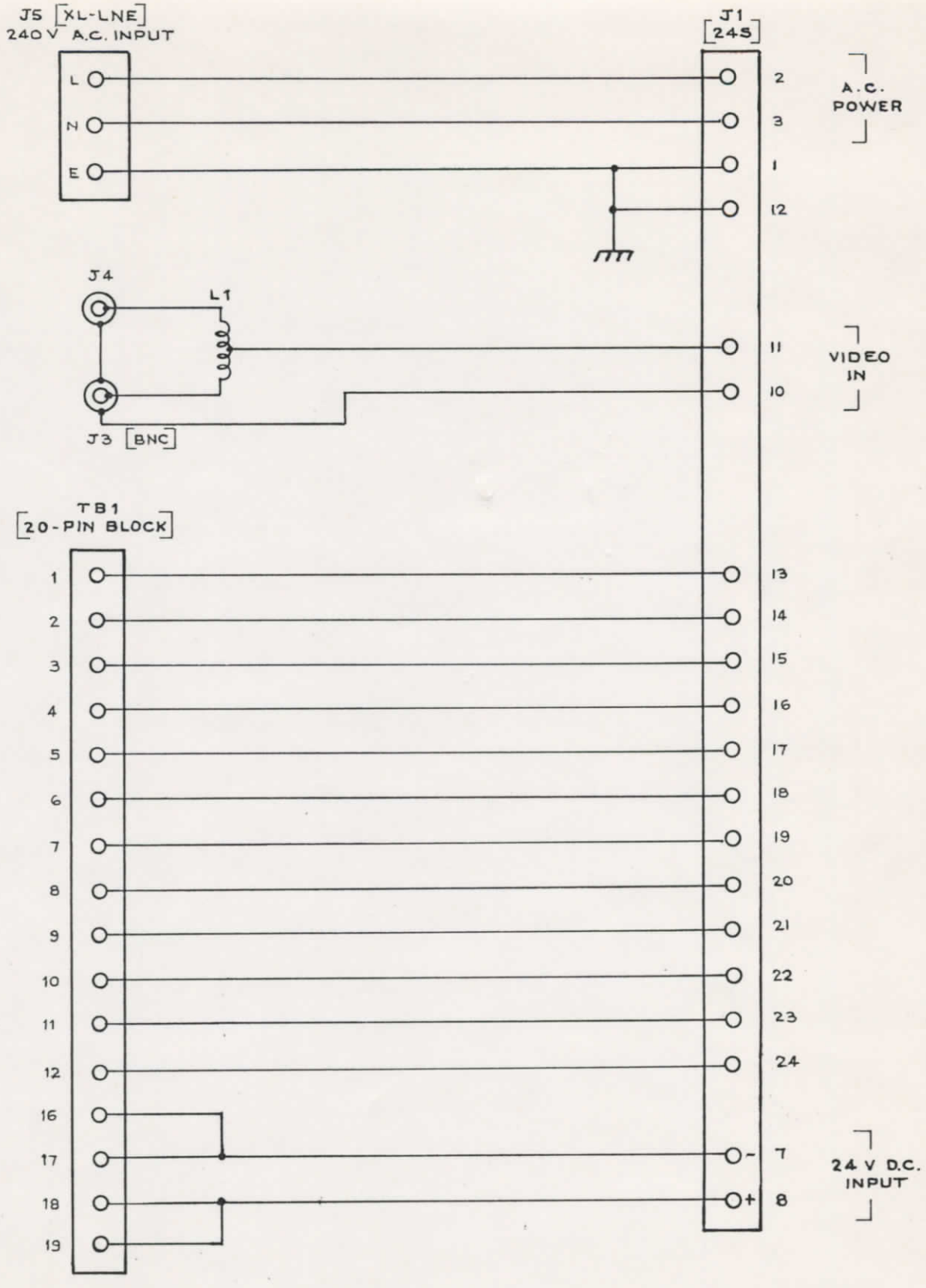

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RB-71
REAR ASSY

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Replacement Parts List **VG-381 VIDEO DETECTOR**

Part No.	Description.	Qty	Cct Ref.	Sup
802454	VG-381 ASSEMBLY	1		1
800030	S/W MODULE MOUNTING TRAY	1		26
SFR/106S/17/7B	SPEED NUTS 6BA	2		70
RB-71	REAR ASSEMBLY	1		1
NC-LNE-FC	NEUTRIK CONNECTOR	1		35
CARTON S/W		1		1

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Replacement Parts List **802454 VIDEO DETECTOR VG-381 ISSUE 4**

Part No.	Description.	Qty	Cct Ref.	Sup
PC802455	PCB VG-381	1		68
RMF255-10R	RESISTOR METAL FILM .25W 5%	1	R2	58
RMF255-470R	RESISTOR METAL FILM .25W 5%	5	R5,21,23,24,26	58
RMF255-1K	RESISTOR METAL FILM .25W 5%	3	R34-36	58
RMF255-1K2	RESISTOR METAL FILM .25W 5%	2	R32,33	58
RMF255-2K2	RESISTOR METAL FILM .25W 5%	2	R10,11	58
RMF255-4K7	RESISTOR METAL FILM .25W 5%	7	R6,8,12,20,22,25,27	58
RMF255-10K	RESISTOR METAL FILM .25W 5%	4	R1,9,29,31	58
RMF255-18K	RESISTOR METAL FILM .25W 5%	2	R18,19	58
RMF255-22K	RESISTOR METAL FILM .25W 5%	5	R3,4,28,30,37	58
RMF255-39K	RESISTOR METAL FILM .25W 5%	1	R14	58
RMF255-100K	RESISTOR METAL FILM .25W 5%	3	R13,16,17	58
RMF255-150K	RESISTOR METAL FILM .25W 5%	1	R15	58
RMF255-470K	RESISTOR METAL FILM .25W 5%	1	R7	58
63P200	RESISTOR VARIABLE 20R	1	RV1	69
63P502	RESISTOR VARIABLE 5K	2	RV2,3	69
63P105	RESISTOR VARIABLE 1M	4	RV4-7	69
1N4004	DIODE POWER 1A	7	D1-7	97
1N4148	DIODE 75V 100mA	6	D8-13	97
368 44104	CAPACITOR MKT .1uF 250v	4	C7,15-17	58
344 44105	CAPACITOR MKC 1uF 250v	1	C23	58
CC22P	CAPACITOR CERAMIC 22pF	1	C11	43
CC100P	CAPACITOR CERAMIC 100pF	1	C6	43
CC330P	CAPACITOR CERAMIC 330pF	1	C14	43
CC1N	CAPACITOR CERAMIC 1nF	1	C13	43
CC3N3	CAPACITOR CERAMIC 3.3nF (NPO)	1	C22	43
CC100N	CAPACITOR CERAMIC .1uF 50V	7	C12,18,33-37	43
CC0M47	CAPACITOR CERAMIC .47uF	3	C2,4,5	43

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Part No.	Description.	Qty	Cct Ref.	Sup
RB10/50	CAPACITOR ELECTRO RB 10uF 50V NON POL.	1	C10	81
RB100/25	CAPACITOR ELECTRO RB 100uF 25V	4	C3,8,9,32	81
RT1000/63	CAPACITOR ELECTRO RT 1000uF 63V	1	C1	81
TT1/16	CAPACITOR TAG TANT 1uF 16V	1	C19	67
TT10/16	CAPACITOR TAG TANT 10uF 16V	1	C20	67
TT22/16	CAPACITOR TAG TANT 22uF 16V	1	C21	67
TT47/16	CAPACITOR TAG TANT 47uF 16V	8	C24-31	67
2N3904	TRANSISTOR RF AMP TO-92 NPN	6	Q1,3-7	81
2N3906	TRANSISTOR RF AMP TO-92 PNP	1	Q2	81
6073BTH	HEATSISNK TO-220	1		81
7812	IC REGULATOR 12V 1A	1	U1	97
7805	IC REGULATOR 5V 1A	1	U2	97
74HC4049	HEX INV BUFFER	1	U3	58
LM567CN	IC	2	U4,5	
MC14011B	QUAD 2 I/P NAND GATE	1	U7	
MC14093B	QUAD 2 I/P SCHMITT NAND GATE	1	U6	
V23100W1112A104	RELAY DPDT 12V COIL	2	RL1,2	
L1426	FUSE HOLDER PCB MOUNT 20x5mm	1		94
20x5mm .5A	FUSE 20x5mm .5A	1	F2	43
20x5mm .25A	FUSE 20x5mm .25A 25V	1	F1	43
RF980	TRANSFORMER 240v/19v (or SDIE3457)	1	T1	75
CQY94	5mm ROUND GREEN LED	2	LP1,2	97
SL48	LED HOLDER T1 3/4	2		20
SL77	NEON LIGHT 240V	1	LP3	20
FH332	FUSE HOLDER CHASSIS MOUNT 20x5mm	1		20
105-1041-001	TEST POINTS WHITE	4		54

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Part No.	Description.	Qty	Cct Ref.	Sup
801567	HANDLE S/W	1		26
800028	COVER S/W CHASSIS	1		26
800029	FRAME S/W MODULE	1		26
E802456	ESCUTCHEON VG-381	1		62
26-4100-24P	CONNECTOR 24 PIN P	1		54
SNU/0520/17/4	"U" NUT	1		70
SBV1700/14/0016	BRASS STUD	1		70

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Replacement Parts List **802505 REAR ASSEMBLY RB-71 ISSUE 2**

Part No.	Description.	Qty	Cct Ref.	Sup
800320	REAR ASSEMBLY SIDE PLATE	1		26
800319	REAR ASSEMBLY PLATE	1		26
PC802701	PCB REAR PLATE	1		120
PC801957	PCB I/P LOOP COMP	1		120
26-4200-24S	CONNECTOR 24 PIN S	1	J1	54
AK20	CONNECTOR 20 PIN	1	J2	79
Q93179	JACK BHD BNC TAG	2	J3,4	61
NC-LNE-MP	NEUTRIK CONNECTOR	1	J5	35
CAP SCREW 4BA		2		4

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