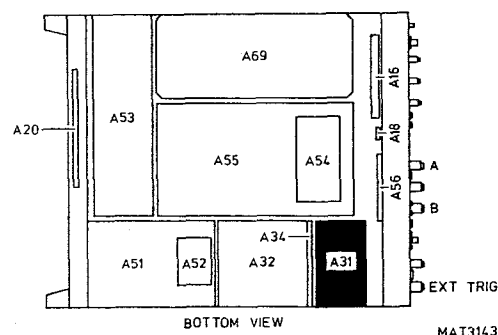


UNIT A31 - TRIGGER INPUT UNITCONTENTS

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## 8.31.1 General information

The Trigger Input unit amplifies the signals from both trigger pick offs and the external trigger signal. The trigger source selection is also performed on this unit. Finally the prescaler for the Count Down mode can be found on this unit.

This unit is built up with S.M.D. technology.

## 8.31.2 Circuit description

The PRE-AMPLIFIER/SELECTOR amplifies one of the two trigger pick off signals (TRPO-A or TRPO-B), depending on the position of relay K1301 and K1302.

The amplified signal at the output of N1302 has the same amplitude as the corresponding input signal of the oscilloscope.

Relay K1303 selects between an external trigger source or channel A or B.

All trigger signals are terminated with 50 ohm, when they are not used. The coils L1301 and L1302 filter low frequency resonances of the trigger pick offs, which might cause false triggers.

The AMPLIFIER X1/X10 amplifies the trigger signal 10 times in trigger sensitivity high mode. If relay K1304 is activated, the amplifier is bridged.

The PRESCALER, which is only active if relay K1305 is not activated, divides frequency of the trigger signal by 128. The output signal is a square wave. Because its frequency is much lower as the input signal, trigger level control on the edges results in a good trigger level range on the input signal.

It consists of a pre-amplifier (N1306 and N1307), followed by a 2 GHz divide-by-2 stage (D1301) and a 1 GHz divide-by-64 stage. Transistor V1313 buffers the output signal.

The TRIGGER AMPLITUDE DETECTOR detects if the selected trigger signal has a level, which is equivalent to 40 mV at the input of the oscilloscope, with the X1/X10 AMPLIFIER switched on.

The signal to diode V1308 is rectified by this diode. If the signal amplitude increases the voltage at the node V1308 and R1357 goes more negative. If the threshold level is passed, the signal TRADOT goes high. This signal is applied to the Trigger Control unit A34.

Now pin 3 of divider D1302 is pulled high inside D1302, which enables the divider. If the input signal of the oscilloscope is too small, the TRADOT signal is low and the divider is not enabled and so there is no output signal at pin 7 of D1302.

Nevertheless the signal may be sufficient in certain frequency ranges. Therefore the prescaler can be enabled by the ENPS--LT signal from the microprocessor.

The filter consisting of C1351, C1352 and L1312 adapts the detectors sensitivity to losses in the path between the instruments inputs and this detector.

- NOTES: - This board is made of a special material, which is suitable for very high frequencies. This material can be bended easily; so please handle carefully.
- IC D1301 is mounted topside down.
  - If the relays are switching with a frequency higher than about 2 Hz, which only happens if there is something wrong in the instrument, the freewheel diodes inside the relays burn out. In this case the flatcable to this unit has to be disconnected, after which the fault can be traced.
  - The relays can not be unsoldered. In case of a relay failure the board should be replaced.
  - In the circuit diagrams the relays are drawn in there quiescent position.
  - If an electrolytic capacitor in the coupling circuits between the various stages breaks down, the low pass cut off frequency rises significantly, which results in false triggers.
- If the board is OK the cut off frequency of the board itself is lower than 1 kHz. If one of the capacitors is broken this frequency rises to a frequency higher than 100 kHz.
- Above 1 GHz all amplification factors decrease.
  - Sometimes multiple parallel resistors are used to spread dissipation.

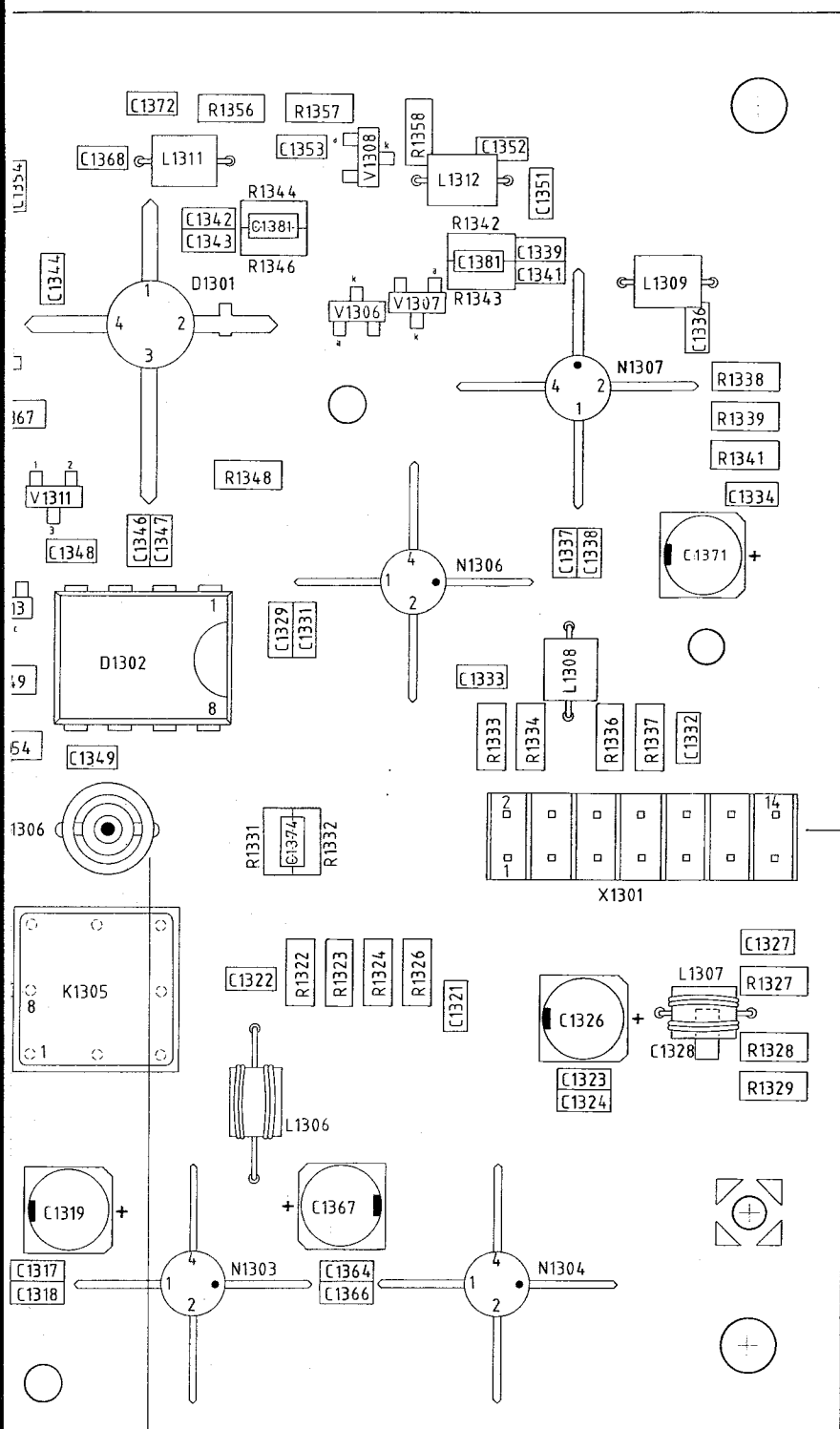
### 8.31.3 Signal name list

#### UNIT 31

Signal name	Description	Signal source	Signal destination(s)
CNDWMOLT	Count down mode	A34	-
ENPS--LT	Enable prescaler	A34	-
EXT	External trigger signal	A57	-
ETTR	External triggering	A34	-
TR-A	Triggering channel A	A34	-
TR-B	Triggering channel B	A34	-
TRADOT	Trigger amplitude detector output	A31	A34
TRPO-A	Trigger pick off A	A56	-
TRPO-B	Trigger pick off B	A56	-
TRSG	Trigger signal	A31	A32
TRSG1	Trigger signal 1	A31	A31
TRSG2	Trigger signal 2	A31	A31
TRSG3	Trigger signal 3	A31	A31
TRSVHILT	Trigger sensitivity high	A34	-



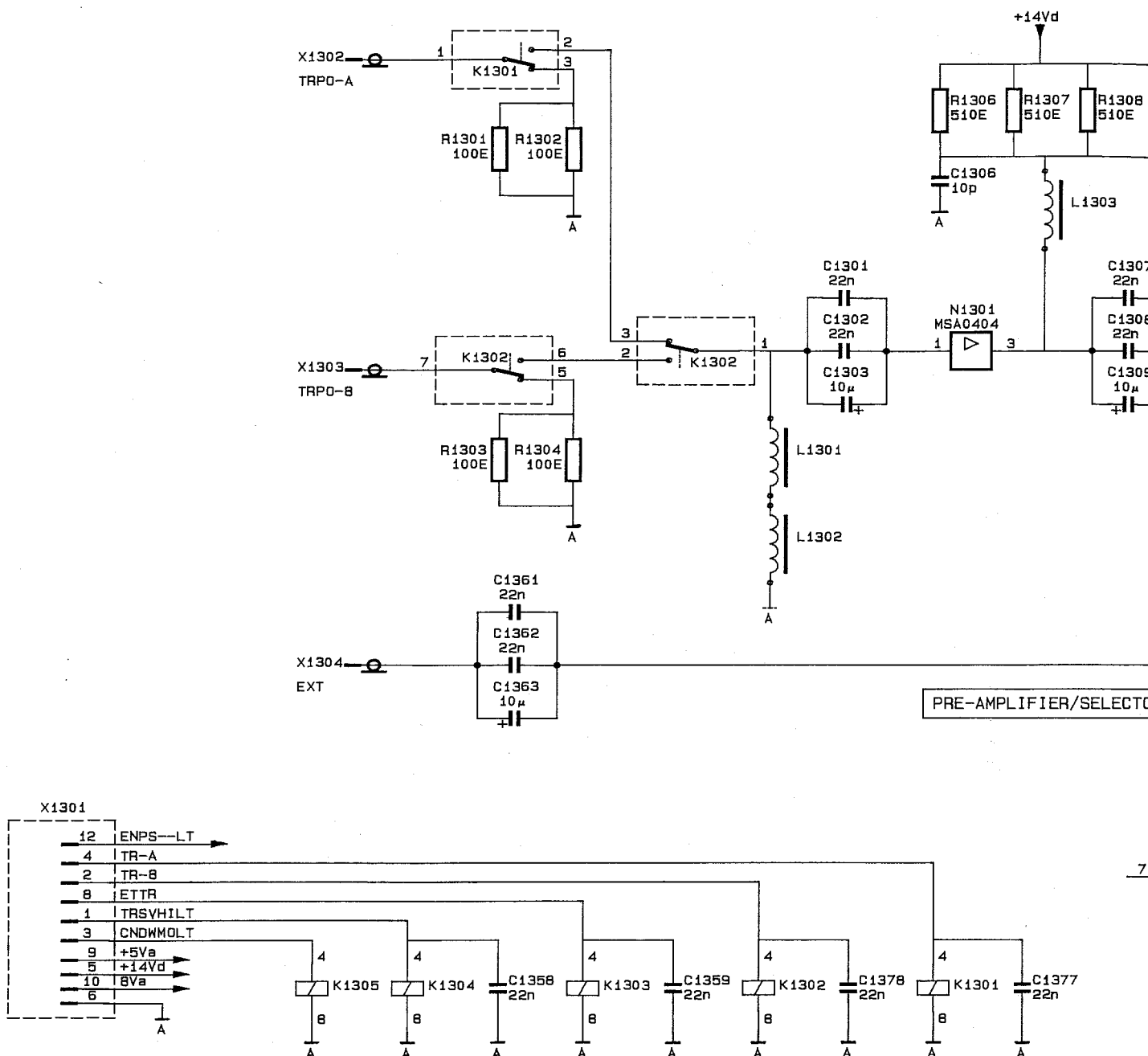
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TO X5206  
THREE STAGE  
TRIGGER UNIT A32

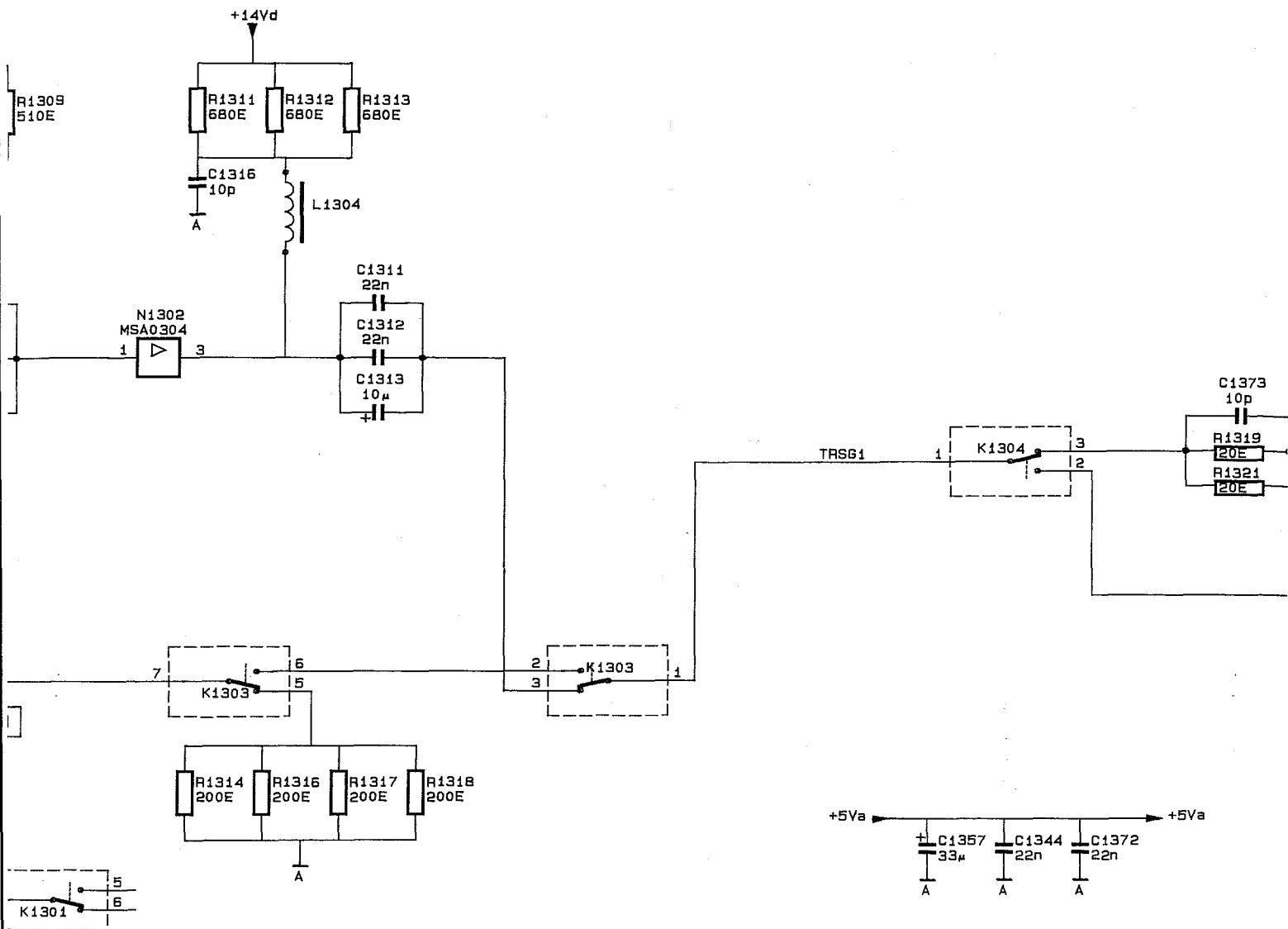
TO X2201  
TRIGGER CONTROL  
UNIT A34

MAT 3253



REF. NR.
N1301
N1302

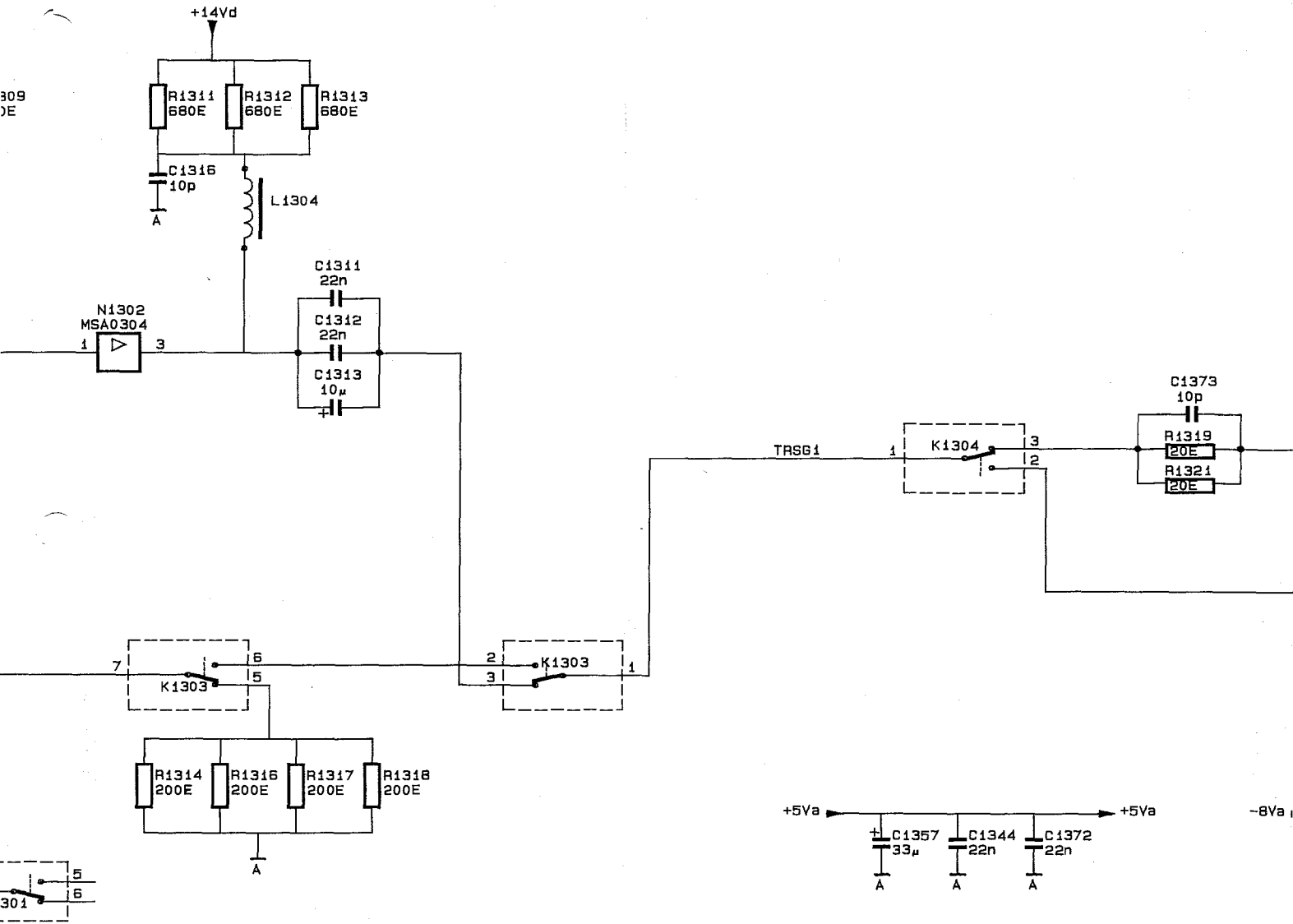
Figure 8.31.2 Unit A31 - TRIGGER INPUT UNIT - circuit diagram.



MAT 3254<sup>I</sup>

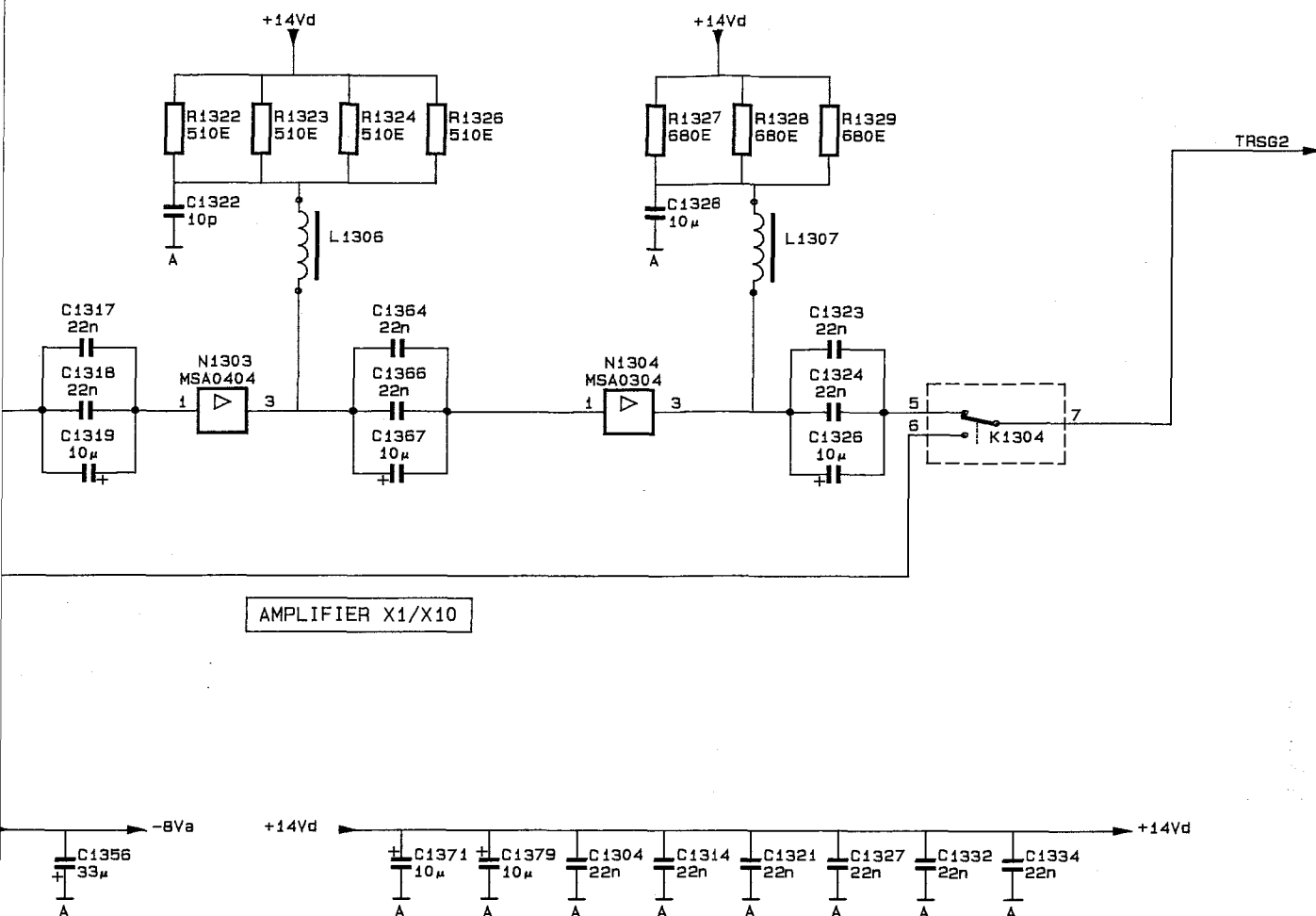
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MSA0304	2+4

309  
DE



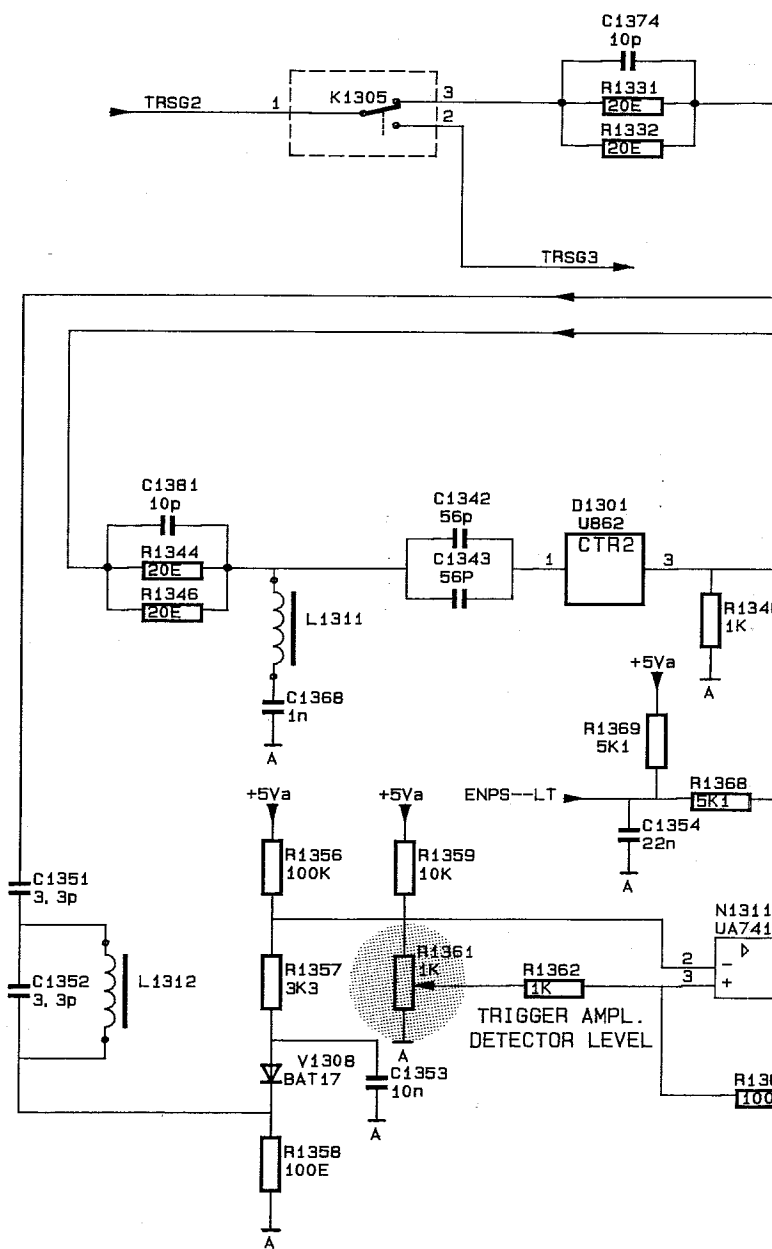
MAT 3254 I

DE	A
1404	2+4
1304	2+4

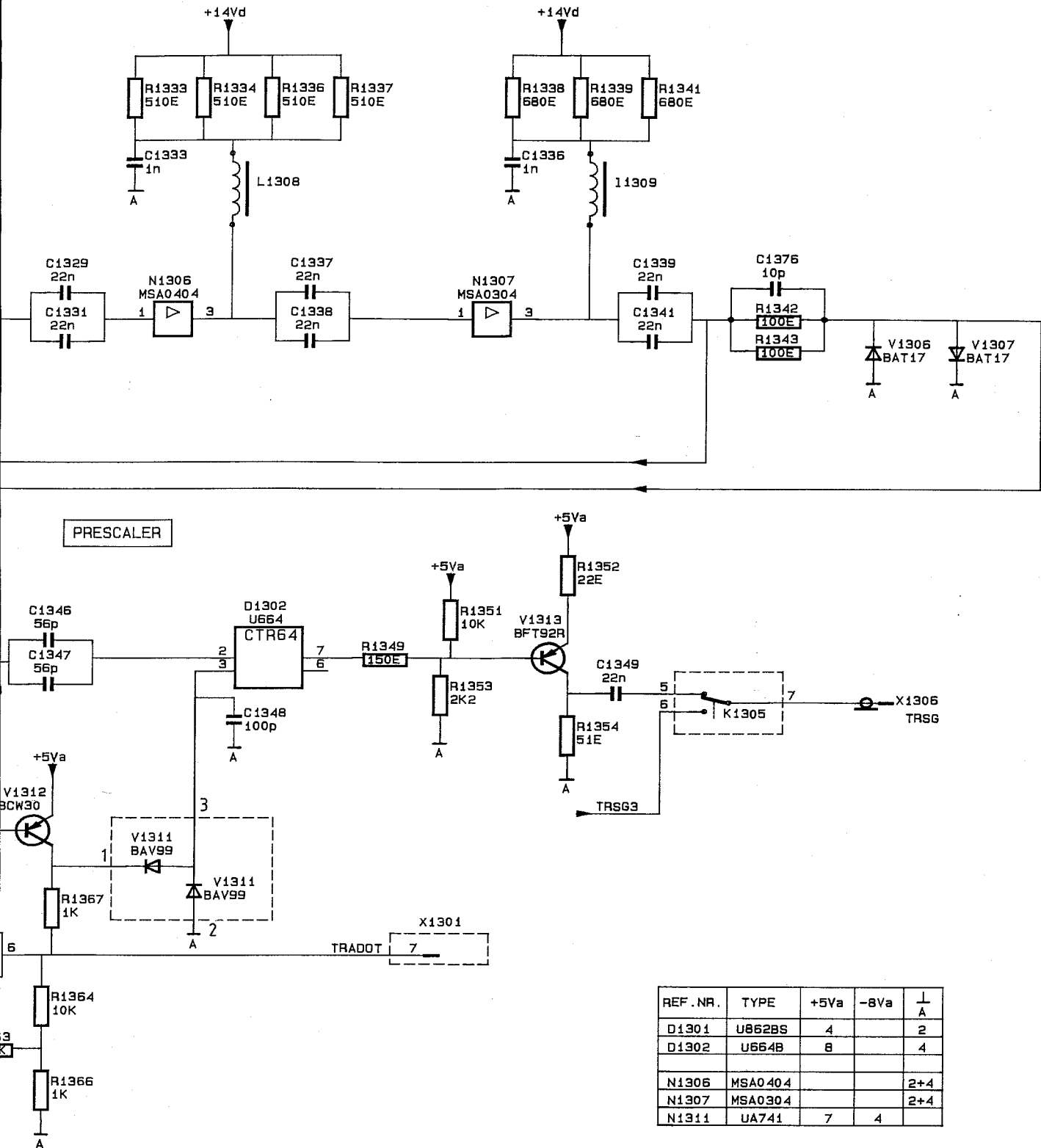


REF. NR.	TYPE	$\frac{1}{A}$
N1303	MSA0404	2+4
N1304	MSA0304	2+4





TRIGGER AMP



MAT 3255

Figure 8.31.3 Unit A31 - TRIGGER INPUT UNIT - circuit diagram.