RESISTANCE (DIAG. 2.5)

Resistance measurement with the 7065 is accomplished by measuring the voltage developed across the unknown resistance when passing a known current through it. This section of board 5 is "area" coded 6.

CURRENT GENERATORS

The +REFERENCE and –REFERENCE are used by IC601 to define a current through R605 which is passed through R604 via TR601. The voltage generated across R604 is used by IC602 as a reference voltage to define the current through TR602 (ΩHi current).

Resistance ranges up to 1MΩ use two currents, 10μA and 1mA, which are controlled by RLD as follows:-

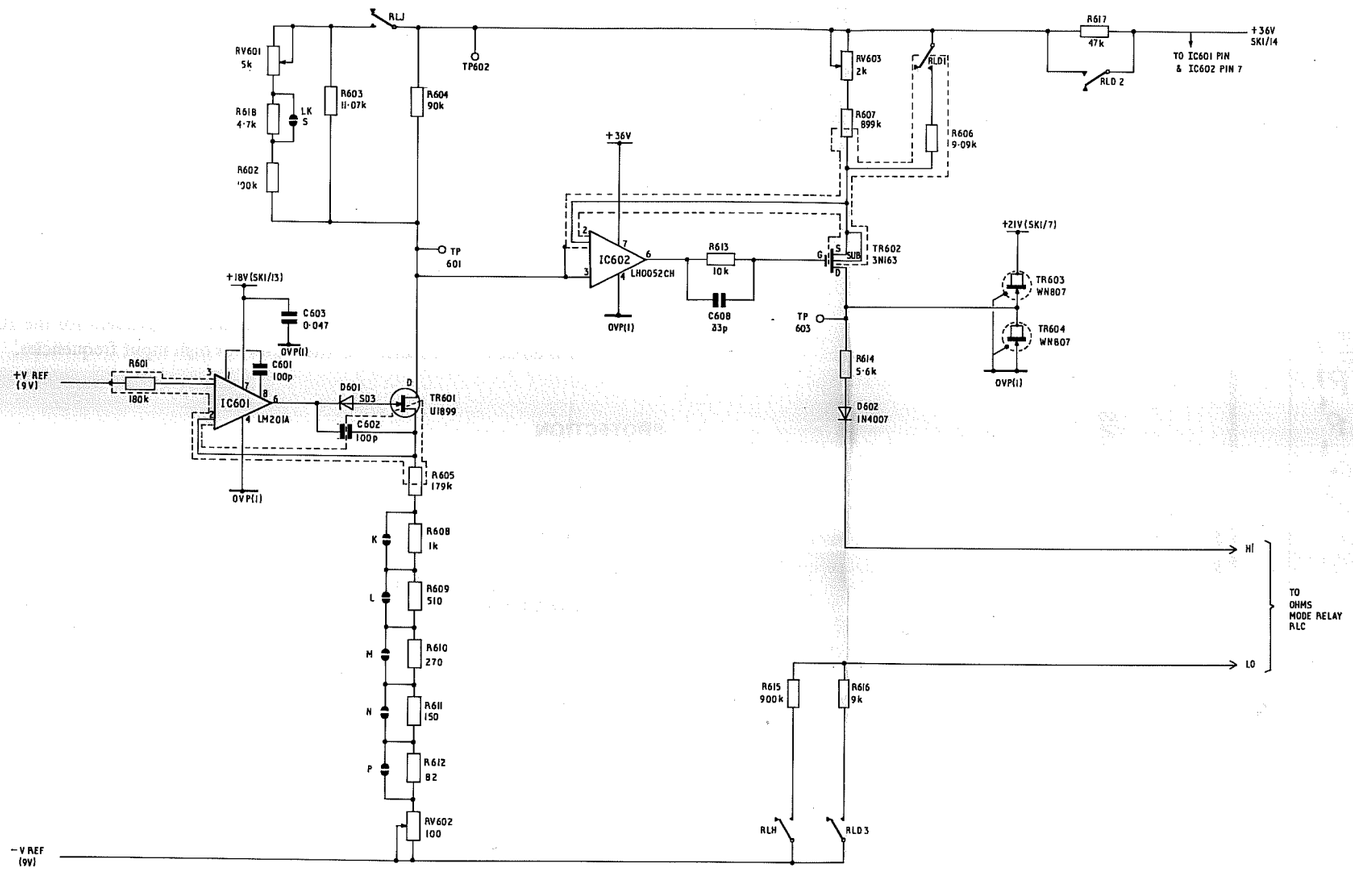
RLD–1	closed	1mA	10Ω,	100Ω,	1kΩ	10kΩ ranges
RLD–1	open	10μA	~~10kΩ~~,	100kΩ,	1MΩ	ranges

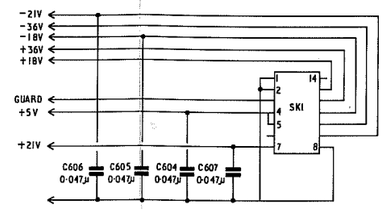
The current for the 10MΩ range is controlled by RLJ which, when closed, reduces the reference voltage supplied to IC602 to 10% of its original value. With RLD–1 open, the HiΩ current then becomes the 1μA required by the 10MΩ range.

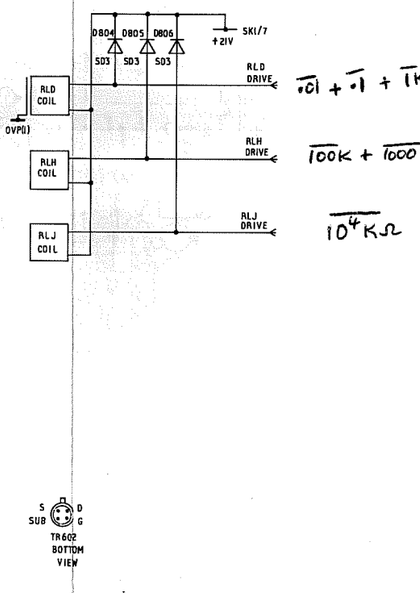
Relay contacts RLH and RLD–3 connect resistors from –REFERENCE to the ΩLo terminal, which provide the 10μA and 1mA current sink necessary to provide effective 4-terminal resistance measurement by minimising the current flowing down the Volts Lo lead. The two contacts are open on the 10MΩ range since the current of 1μA is sufficiently low to make it unnecessary to sink the current at the unknown resistance.

Links K to P and RV602 (SET 10kΩ 1mA), RV603 (SET 1MΩ 10μA) and link S, RV601 (SET 10^4kΩ 1μA) are adjusted during factory calibration to give the required ΩHi currents.

The current generator is protected from accidental overload inputs by D602, R614, TR603 and TR604. The two FET's connected in diode configuration, TR603 and TR604, limit the voltage at the drain of TR602 (TP603) to approx +22V and –1V respectively with R614 and D602 limiting the current.





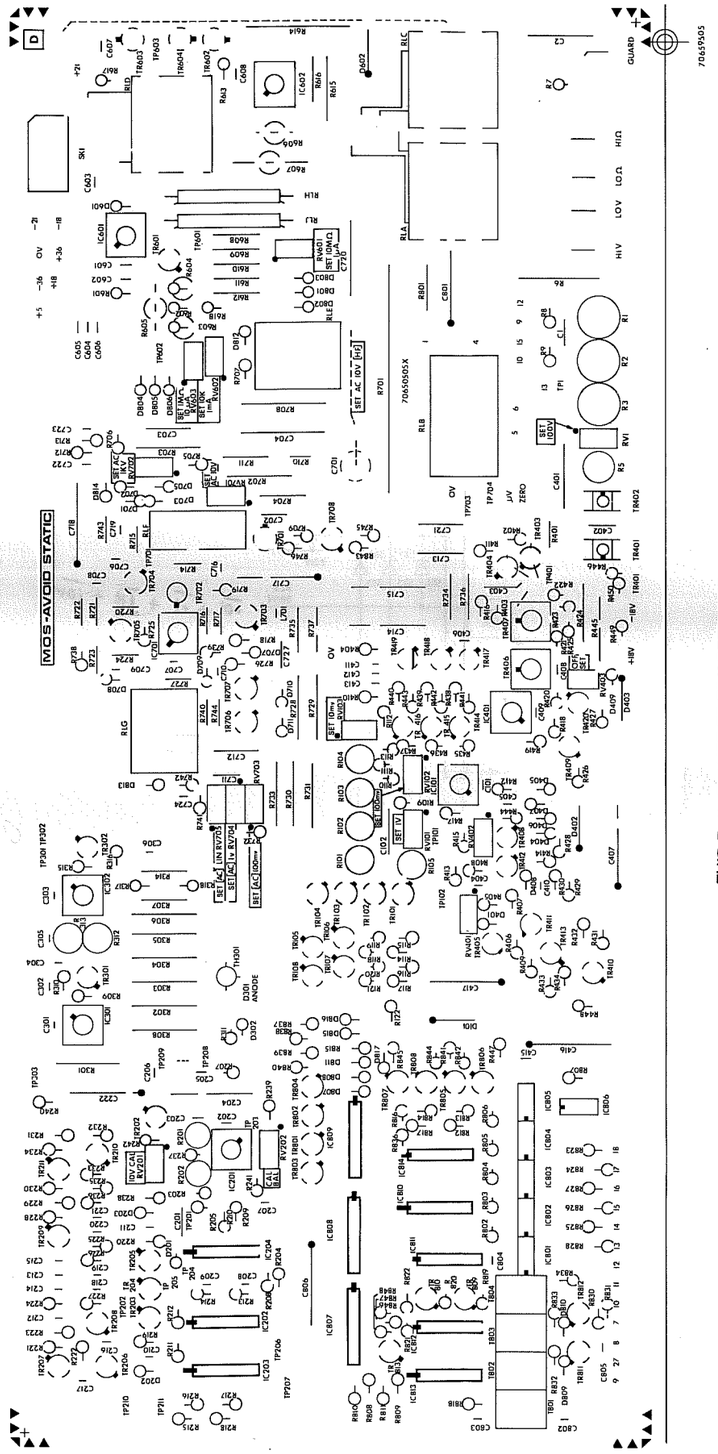


$\overline{\cdot 01} + \overline{\cdot 1} + \overline{1K} + \overline{10K}$

$\overline{100K} + \overline{1000K}$

$\overline{10^4 K\Omega}$

DIAG. 2.5 RESISTANCE



AC CONVERSION (DIAG. 2.6)

Diagram 2.6 illustrates the circuits concerned with processing an alternating input to produce an equivalent dc level. The dc signal thus obtained is fed to the input amplifier as described earlier in this part of the manual under **DC Measurement**. This circuit is "area" coded 7 on pcb 5.

AC ATTENUATOR

Three alternative signal paths provide attenuation as follows:

on the 1000V range 1:1000 via R701, R702, RLF

on the 10V, 100V ranges 1:100 via R701, TR701

other ranges no attenuation via RLE

The output from this stage is thereby scaled to a maximum of 2 volts. Relay drives for RLE and RLF and the gate drive for TR701 are derived from the AC DECODER circuit (DIAG. 2.7). Potentiometers RV701 and RV702 provide attenuator adjustment for the 10V and 1000V ranges while C701 is adjusted to balance the attenuator for high input frequencies.

PROTECTION

Diodes D701, 702, 705 and 706 prevent the voltage at TP701 from exceeding ± 10 volts with respect to 0 volts thereby protecting the AC Converter circuits. C704, R710 and R711 limit the current into this catching circuit when the attenuator is set to x1.

AC CONVERTER

The AC Converter combines the two functions of converter and buffer amplifier as it presents a high input impedance which does not significantly load the attenuator. Rectification is achieved having two feedback paths selected, one path for positive signals and one for negative signals. Outputs from the two paths are smoothed independently by the FILTER circuit to give positive and negative dc outputs which are fed to the DC Amplifier (DIAG. 2.2) via TR417 and TR418.

The AC Converter can operate with a gain of x1 or x10 switched by RLG whose drive is derived from IC809 (DIAG. 2.7). RLG, in addition to switching the feedback components which define the overall gain, also switches the forward gain of the converter amplifier to maintain the same accuracy on both ranges. As all the necessary AC range switching is included in these circuits (DIAG. 2.6), the DC input amplifier is set to x10 for all AC ranges.

◀ *PCB 5 NOTATIONS*