

**Discontinued**

## PANEL METER RANGE CHANGE KIT

Part No. RN-3100/4100

### PURPOSE

This kit contains all the components necessary to modify Murata panel meters such that they accept signal inputs other than the standard  $\pm 2.0\text{V}$  range. This kit will modify the following panel meter models:

DM-3100N-1	DM-3101-1	DM-4100D-1
DM-3100UI-1	DM-3100B-1	DM-4101D-1
DM-3100U2-1	DM-3100L-1	DM-4101N-1
DM-3100U3-1	DM-3100X -1	DM-4105-1
DM-31003-1	DM-3104 -1	DM-4200-1
		DM-4101L-1

Using the components in this kit, these panel meter models can be modified to accept any one of the following signal ranges:

- $\pm 200\text{mVdc}$
- $\pm 20\text{Vdc}$
- $\pm 200\text{Vdc}$
- $\pm 200\text{mA}$
- $\pm 20\text{mA}$
- $\pm 2\text{mA}$
- $\pm 200\mu\text{A}$

There is one exception: **4½ DIGIT PANEL METERS (ANY OF THE MODELS WHOSE SUFFIX BEGINS WITH A “4”) CANNOT BE MODIFIED FOR THE  $\pm 200\text{mV}$  RANGE.**

### MAKING THE MODIFICATION

Making a range change modification is a relatively simple procedure, however, familiarity with proper soldering techniques is required. When handling the panel meter printed circuit boards, care should be taken to avoid a discharge of static electricity which could damage the meter's sensitive CMOS circuits. A grounding wrist strap should be worn when handling the PC boards.

To make a range change modification, follow these steps:

1. Locate your panel meter model and the desired range in the tables below. Note that the 200mV range is the only range which requires different components depending on the meter model.

**TABLE 1: RANGE CHANGE MODIFICATIONS APPLICABLE TO ALL MODELS**

RANGE	MODIFICATION		
20V	R1=4.22M	R2=464K	SG1=OPEN*
200V	R1=4.22M	R2=42.2K	SG1=OPEN*
200mA	R2=10		
20mA	R2=100		
2mA	R2=1K		
200µA	R2=10K		

\*For DM-4105/4106, Open SG4 (Leave SG1 Closed).

**TABLE 2: 200mV RANGE CHANGE MODIFICATIONS**

MODEL	200mV RANGE MODIFICATION					
DM-3100N	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3100U1	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3100U2	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3100U3	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3101	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3100B	C3=0.47µF	C4=1.0µF	R7=46.4K	R9=6.65K	R10=50 pot.	R11=75
DM-3104	C3=0.47µF	C4=1.0µF	R7=46.4K	R9=6.65K	R10=50 pot.	R11=75
DM-3100L	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3103	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75
DM-3100X	C3=0.47µF	C4=1.0µF	R5=46.4K	R7=6.65K	R8=50 pot.	R9=75

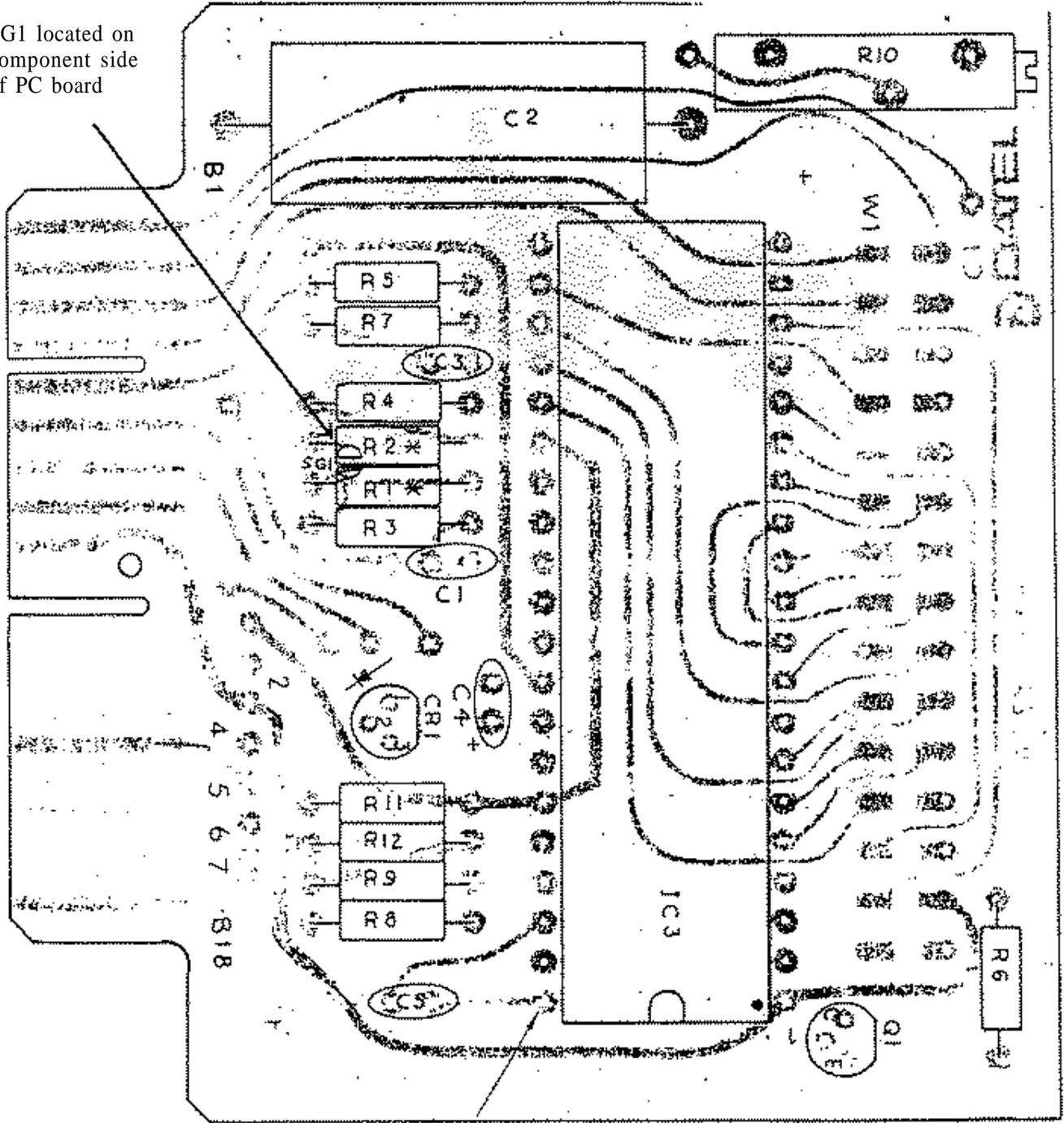
- 2) Locate the loose components in this kit which will be required to change your particular meter to the desired range. In the tables above, components prefaced with "C" are capacitors, resistors are listed with an "R" followed by the resistance value in Ohms, and potentiometers are indicated by the abbreviation "pot". Solder gaps are denoted by "SG".
- 3) Open the meter's case to gain access to the printed circuit board. Low profile models are opened by snapping off the rear panel, using a screwdriver to carefully depress the retaining tabs located on the sides of the meter. Access to short-depth models is achieved by removing the cotter pin at the rear of the meter, snapping off the front bezel, and sliding the PC board forward.
- 4) Compare the PC board to the assembly drawing for that model as given in this document. Locate the component and solder gap locations which pertain to the desired modification. Note that some component locations will have no component installed. For example, R1 and R2 locations for all models do not have components installed.
- 5) Remove and replace components as necessary to achieve the desired modification. **NOTE: WHEN MODIFYING UNITS TO THE 200V RANGE, IT IS RECOMMENDED THAT THE OPEN SOLDER GAP SG1 BE COVERED WITH CONFORMAL COATING.**
- 6) After reassembling the unit, you may need to recalibrate the meter. This procedure is described in each meter's data sheet. A generalized calibration procedure is as follows:
  - a) Power-on the meter and allow it to warm up for ten minutes.
  - b) Using a precision voltage source, provide a near full-scale positive signal to the meter's inputs.
  - c) Adjust the meter's gain potentiometer (located at the rear) until the display is correct.
  - d) Reverse the polarity of the signal input and check the meter's reading.

## REPAIR RETURNS

When returning a modified meter to Murata for repair, the unit must be restored to its original  $\pm 2V$  input configuration prior to return. Damage to the meter caused by improper modification will void the unit's warranty.

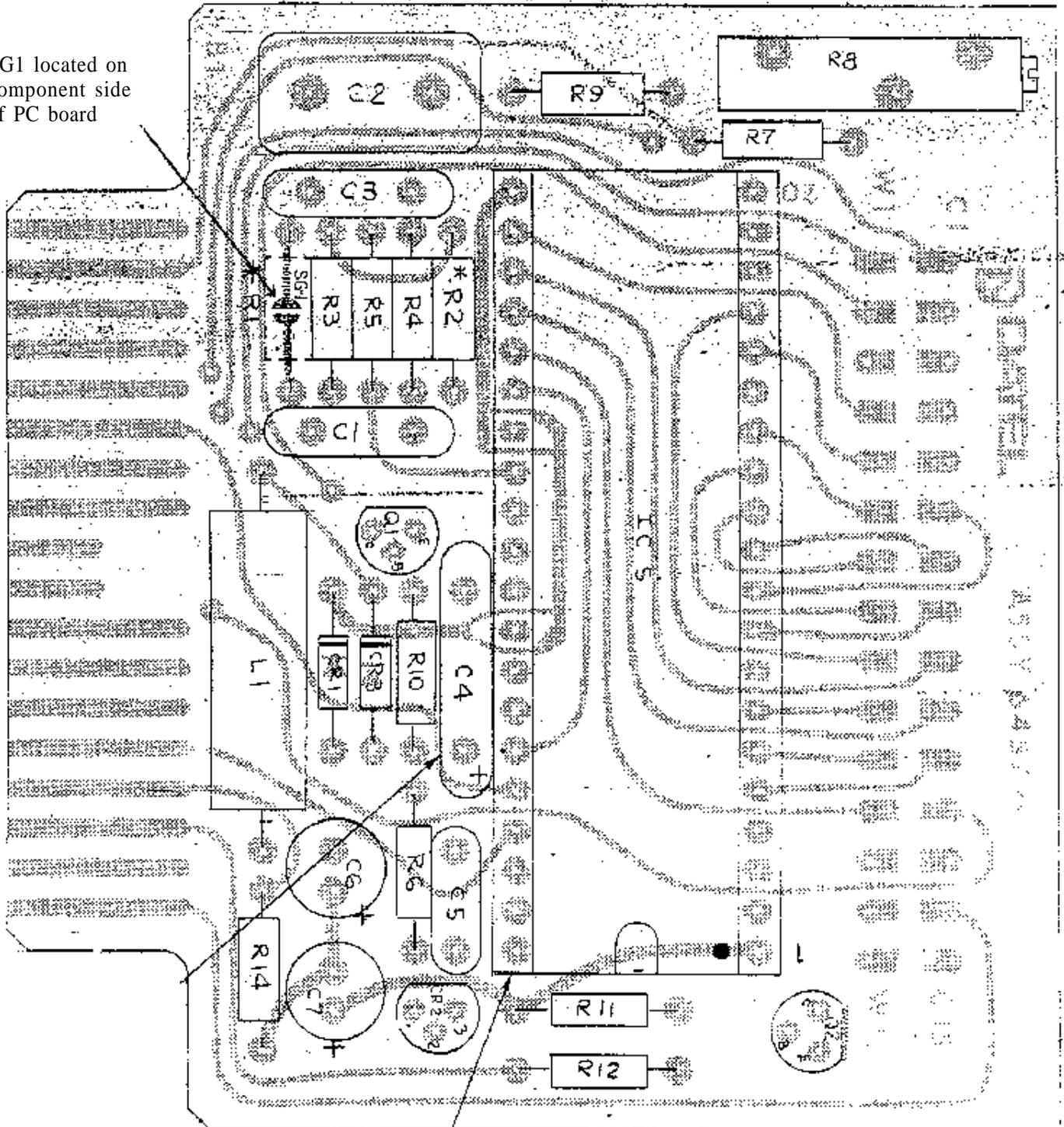
Murata P/N: DM-3100B/3104

SG1 located on component side of PC board

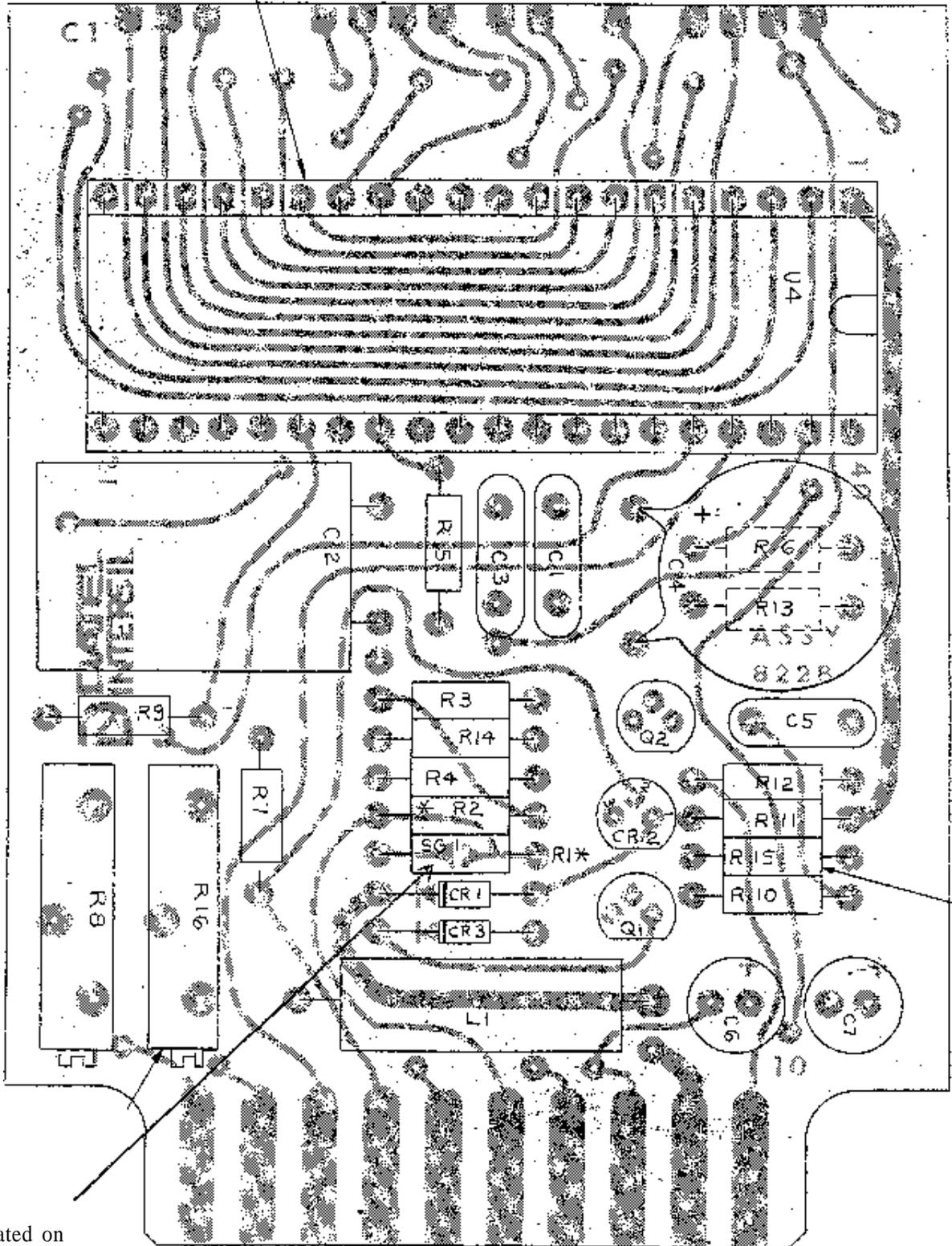


Murata P/N: DM-3100L/3103

SG1 located on component side of PC board

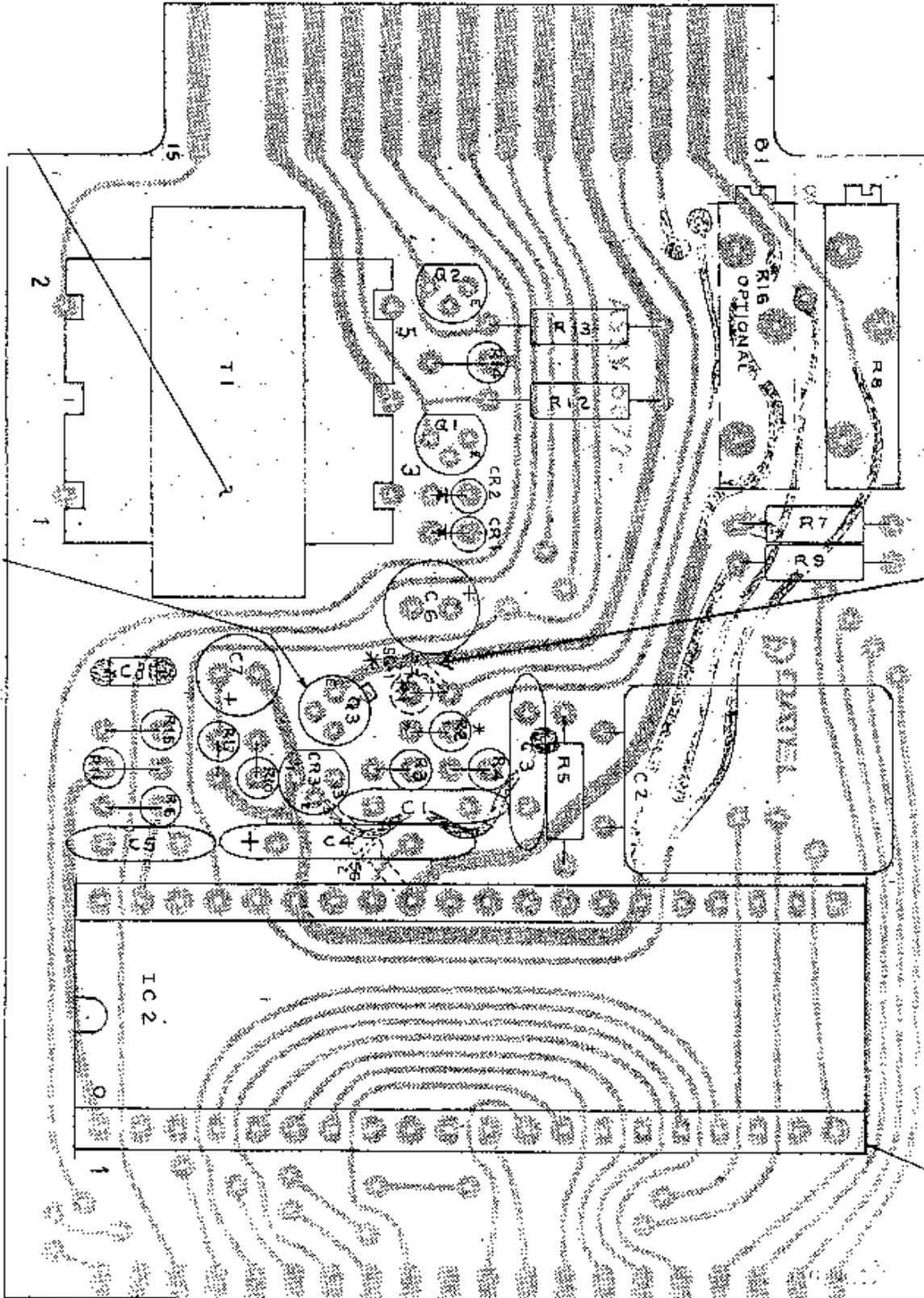


Murata P/N: DM-3100N/3101



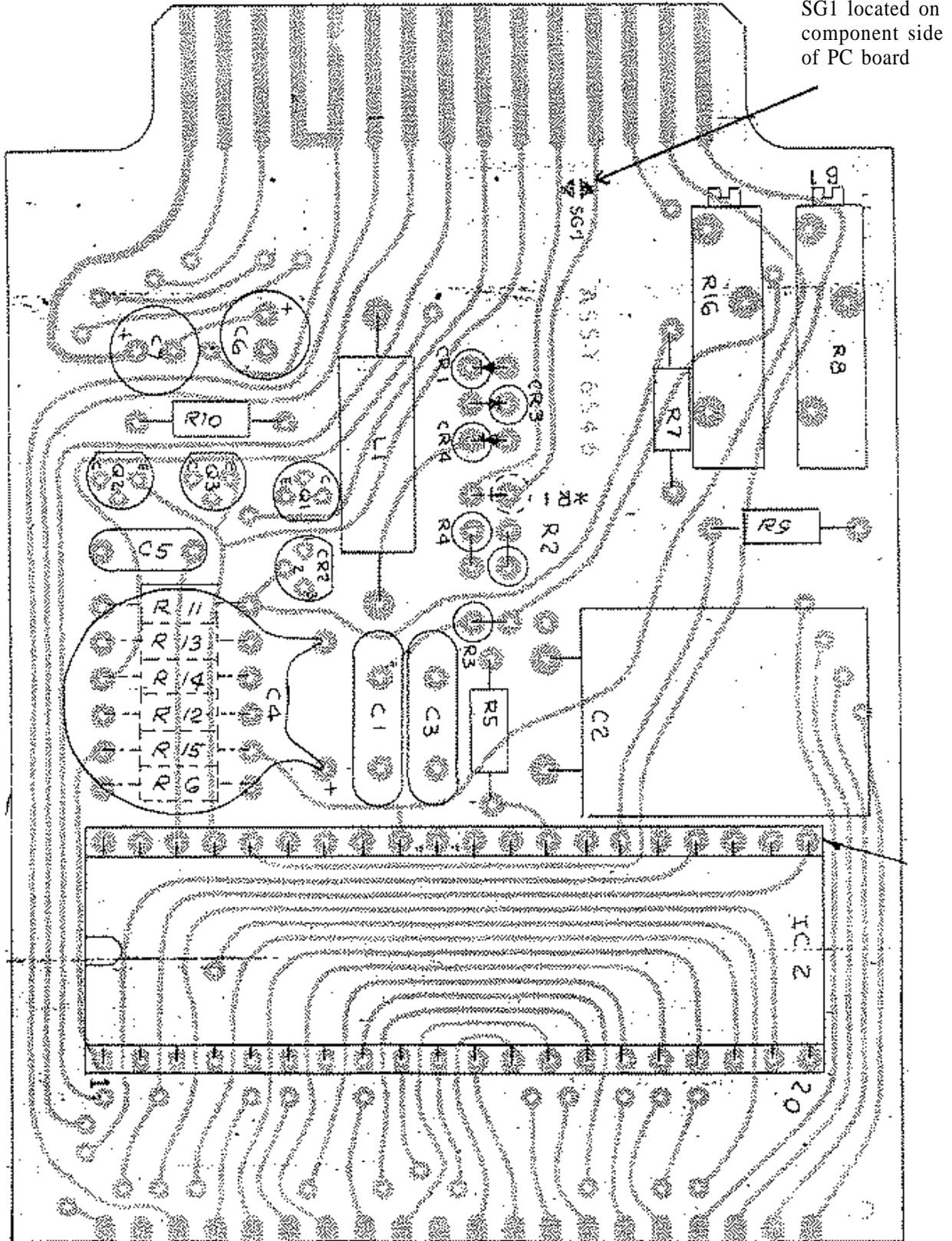
SG1 located on component side of PC board

Murata P/N: DM-3100U2/U3



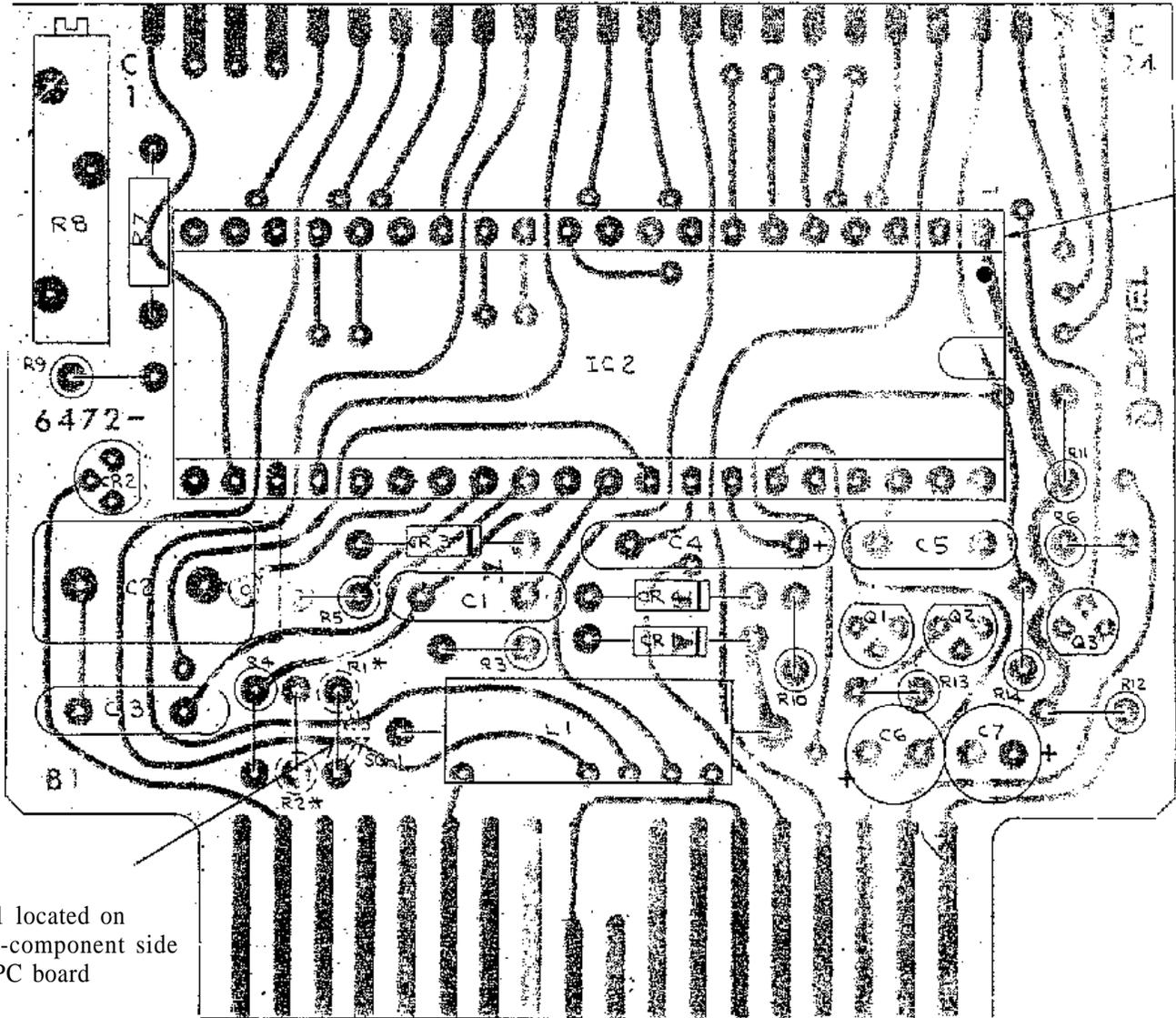
SG1 located on non-component side of PC board

Murata P/N: DM-3100U1



SG1 located on component side of PC board

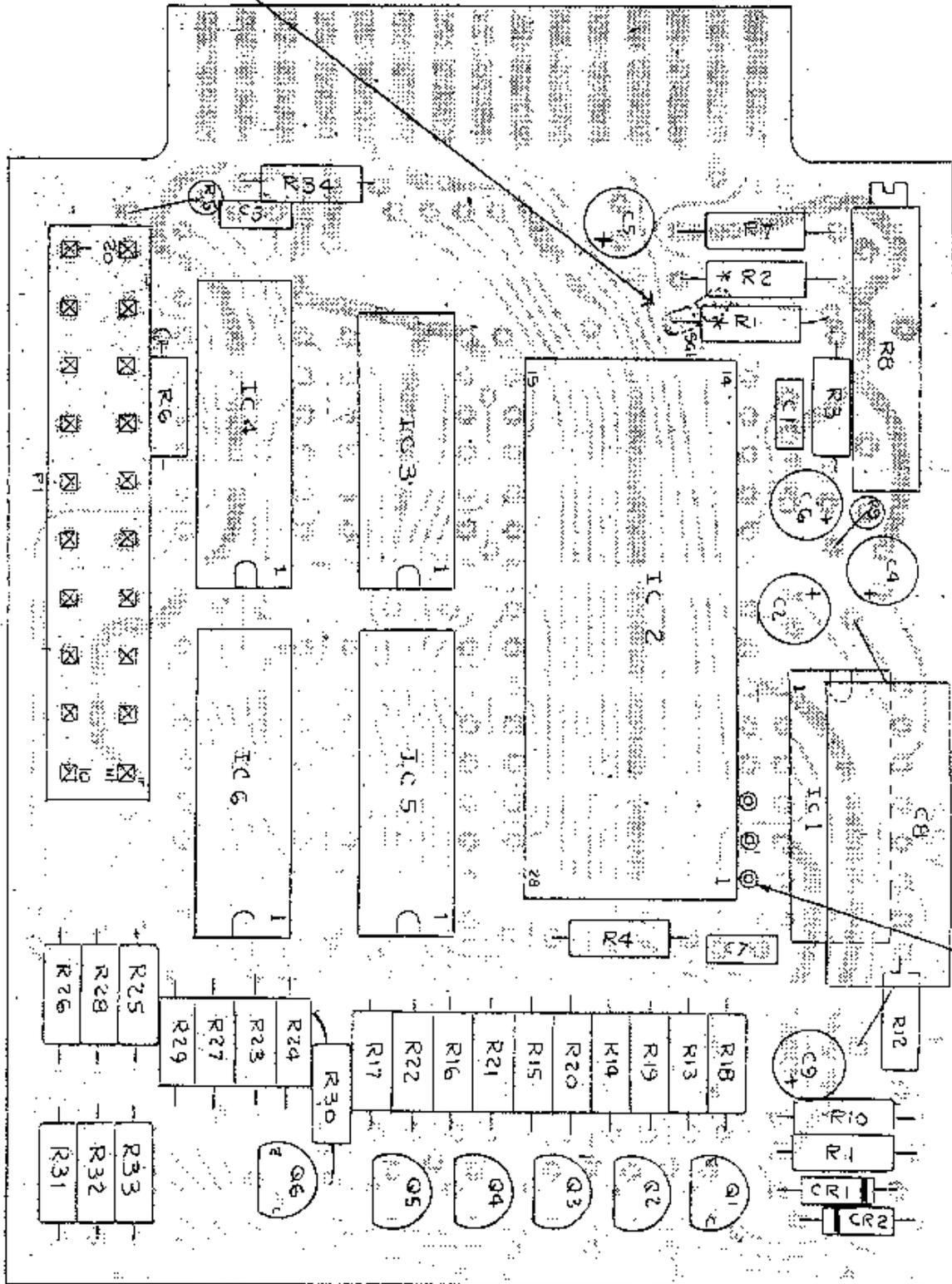
Murata P/N: DM-3100X



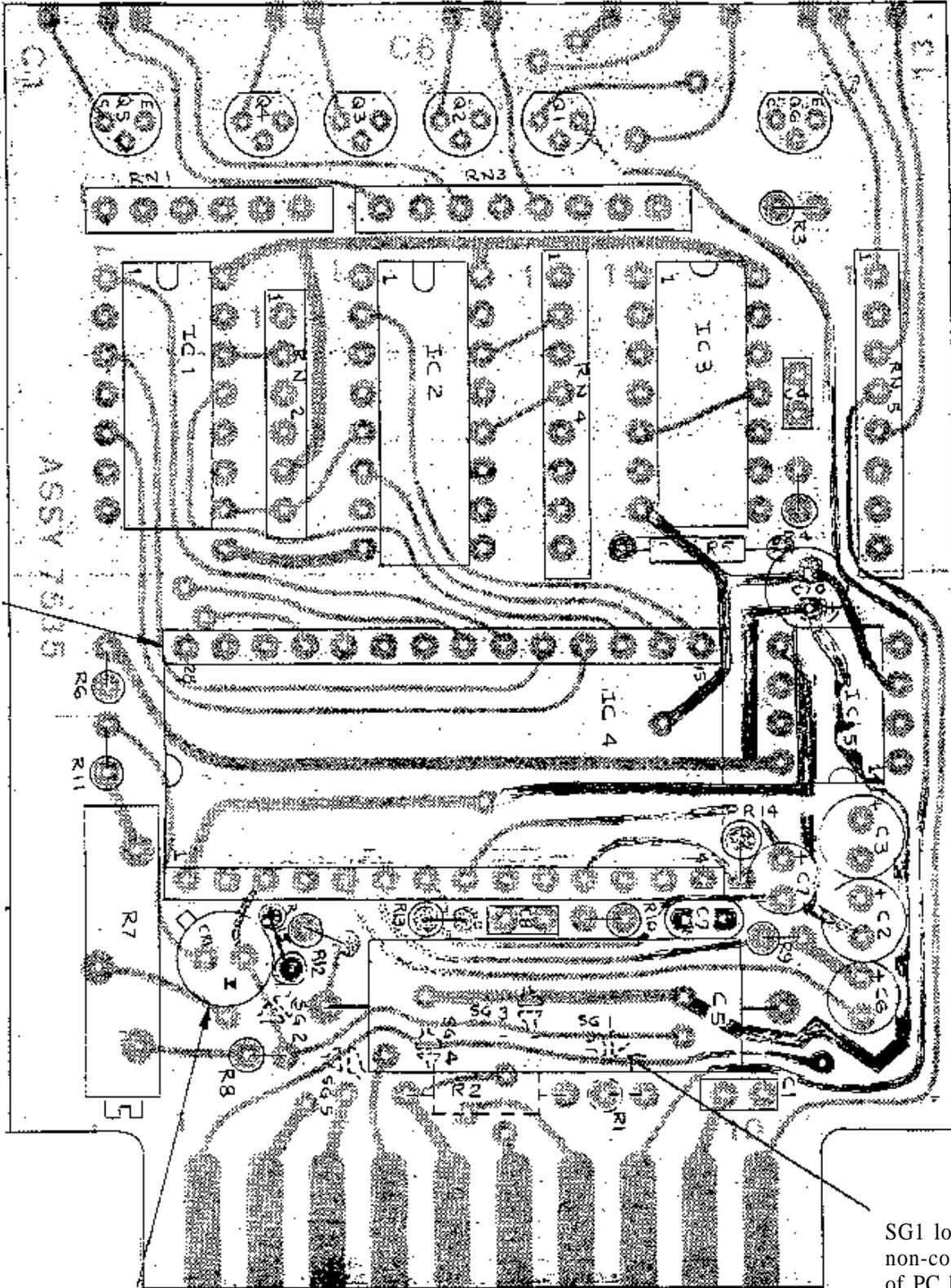
SG1 located on non-component side of PC board

SG1 located on non-component side of PC board

Murata P/N: DM-4100D

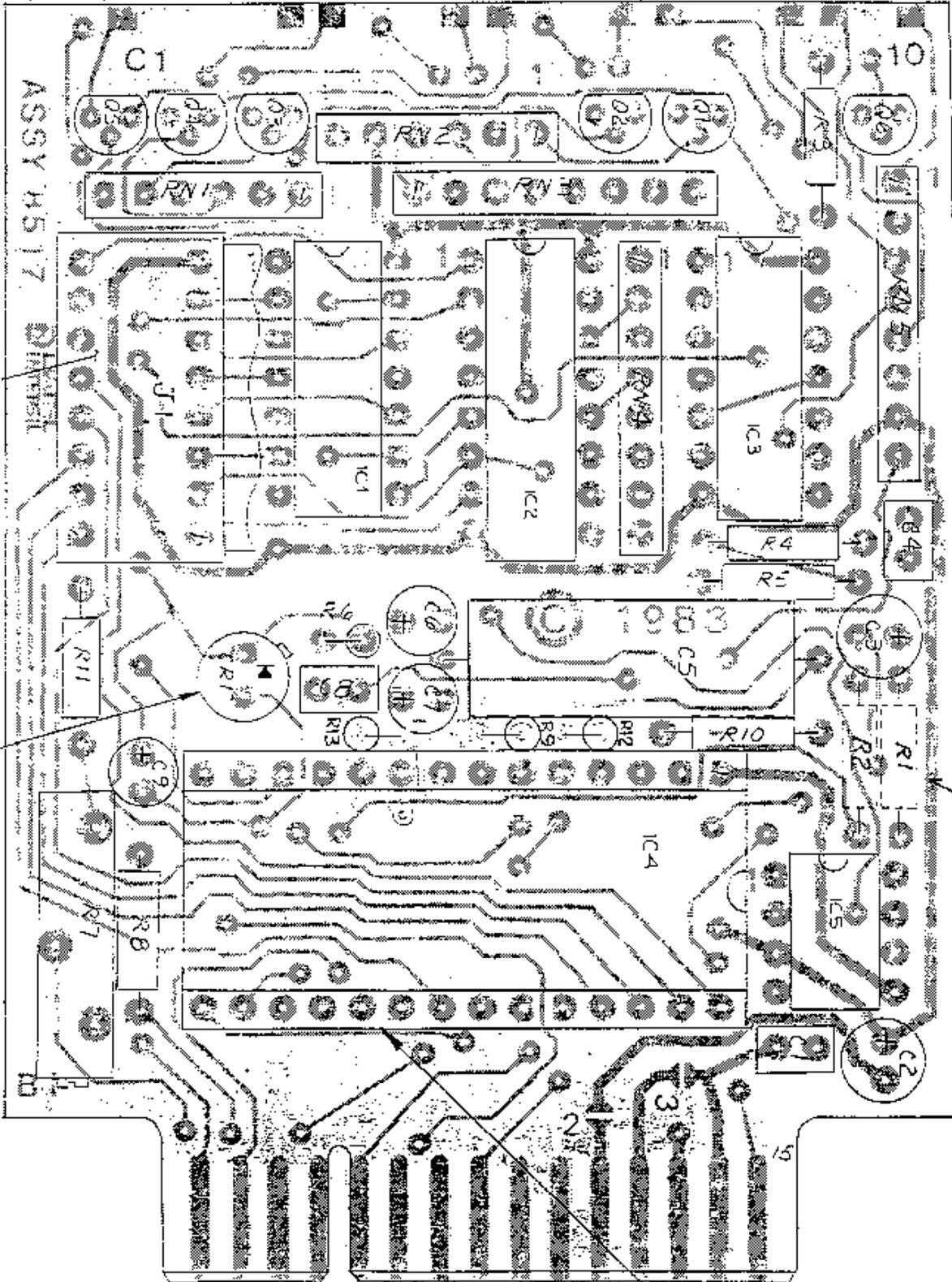


Murata P/N: DM-4101N



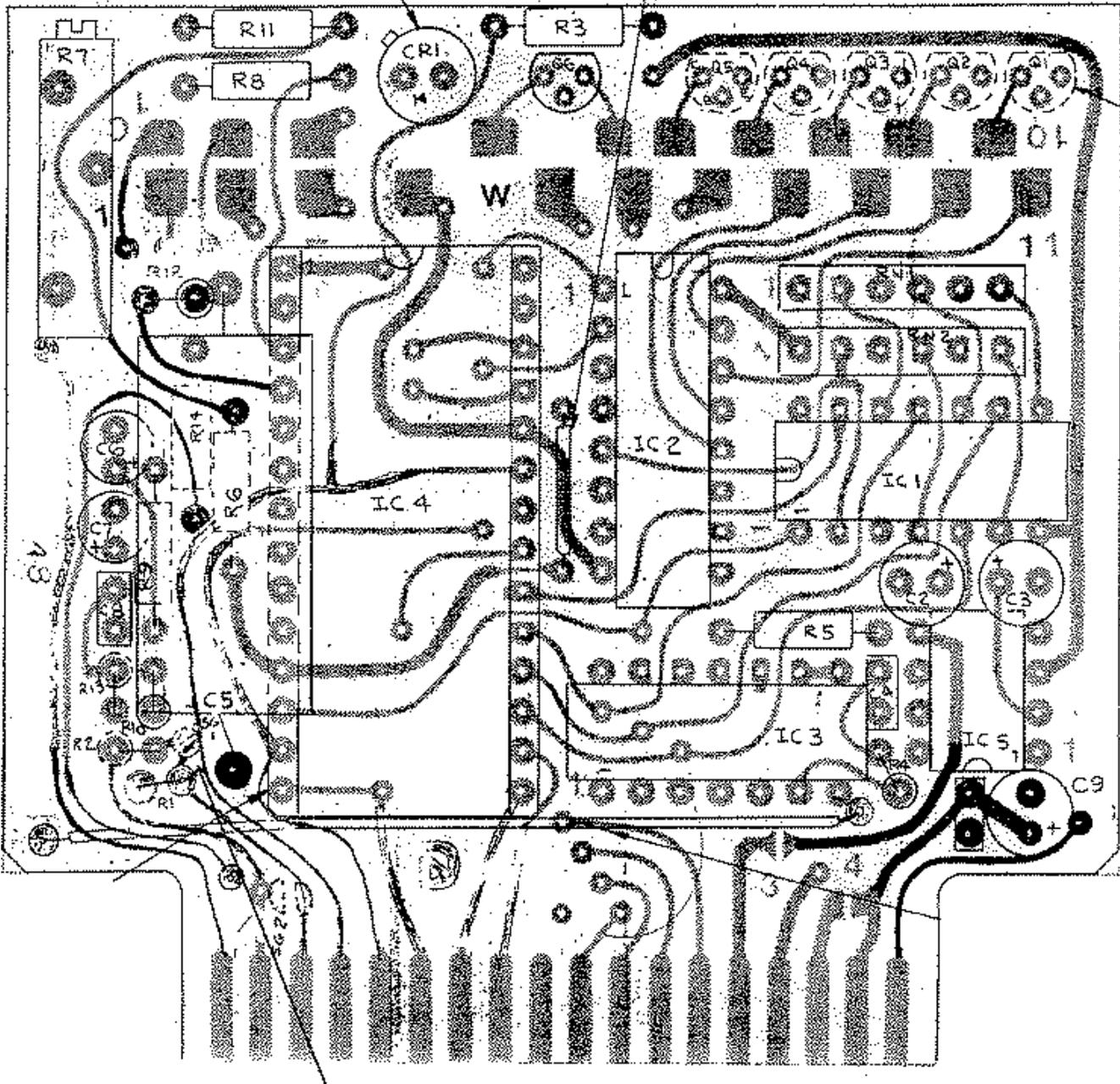
SG1 located on non-component side of PC board

Murata P/N: DM-4101D



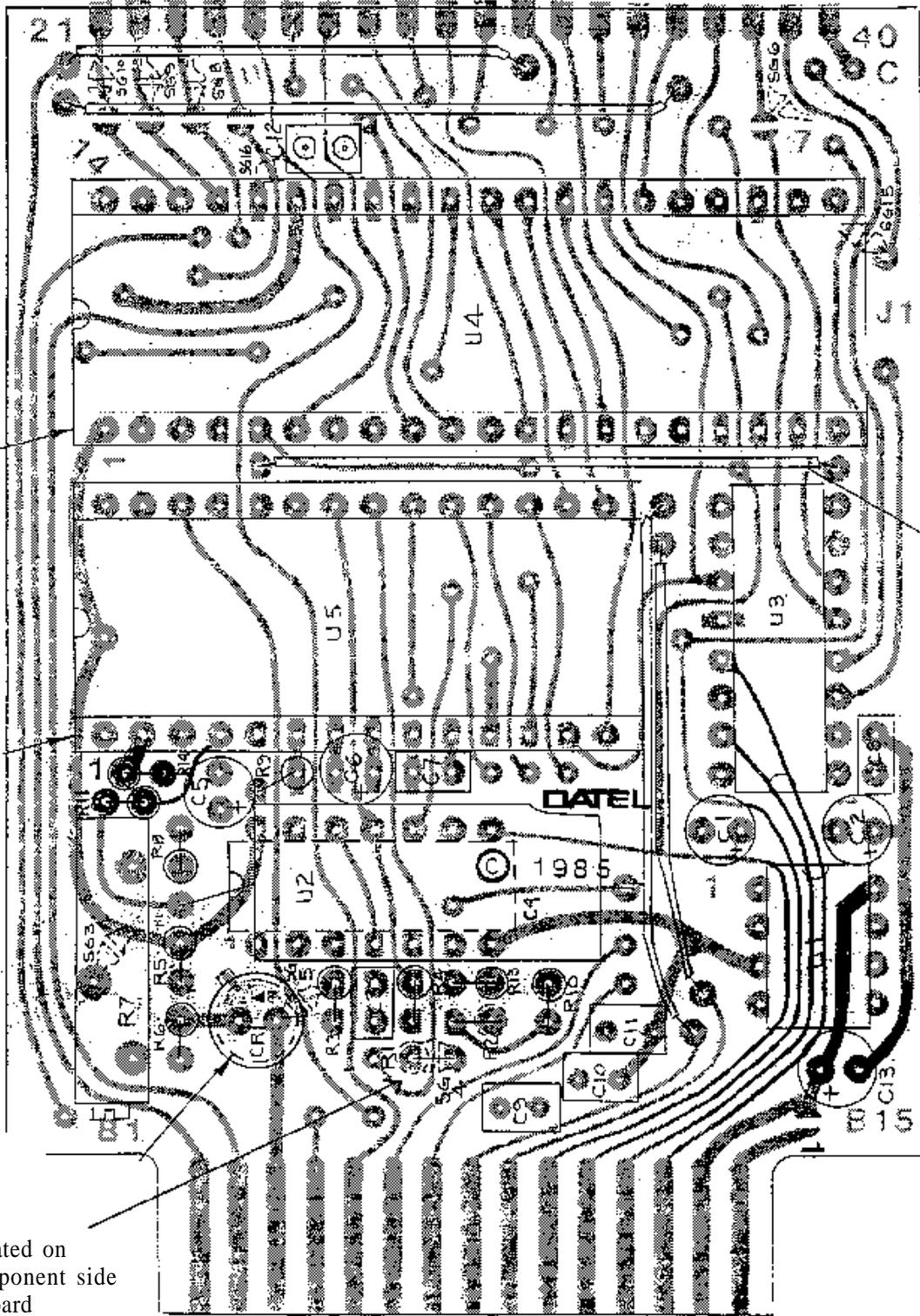
SG1 located on reverse side of board underneath R1

Murata P/N: DM-4101L



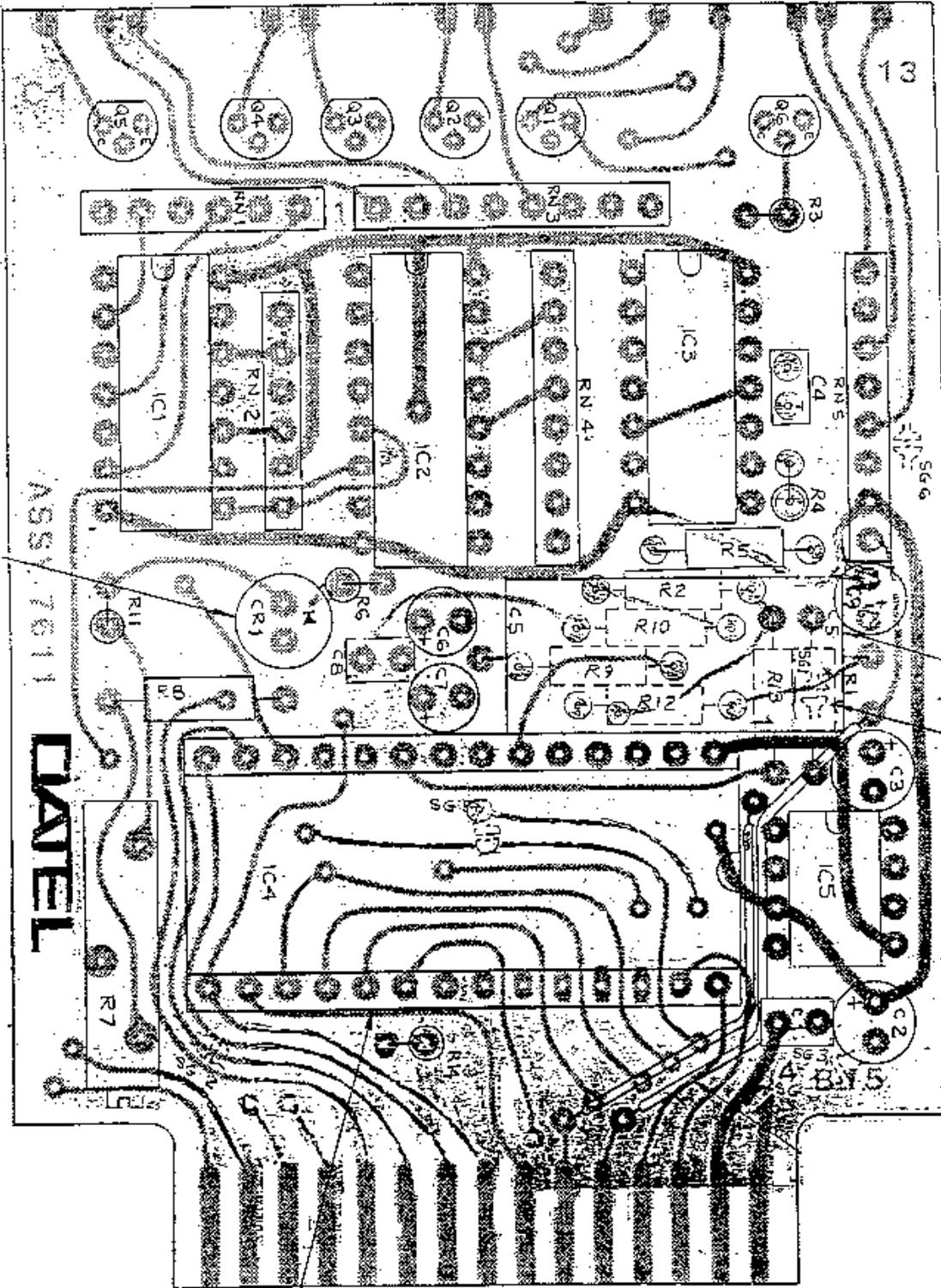
SG1 located on  
non-component side  
of PC board

Murata P/N: DM-4105/4106



SG4 located on non-component side of PC board

Murata P/N: DM-4200



SG1 located on non-component side of PC board