

Multi-lead logic probe

PM8820/PM8821

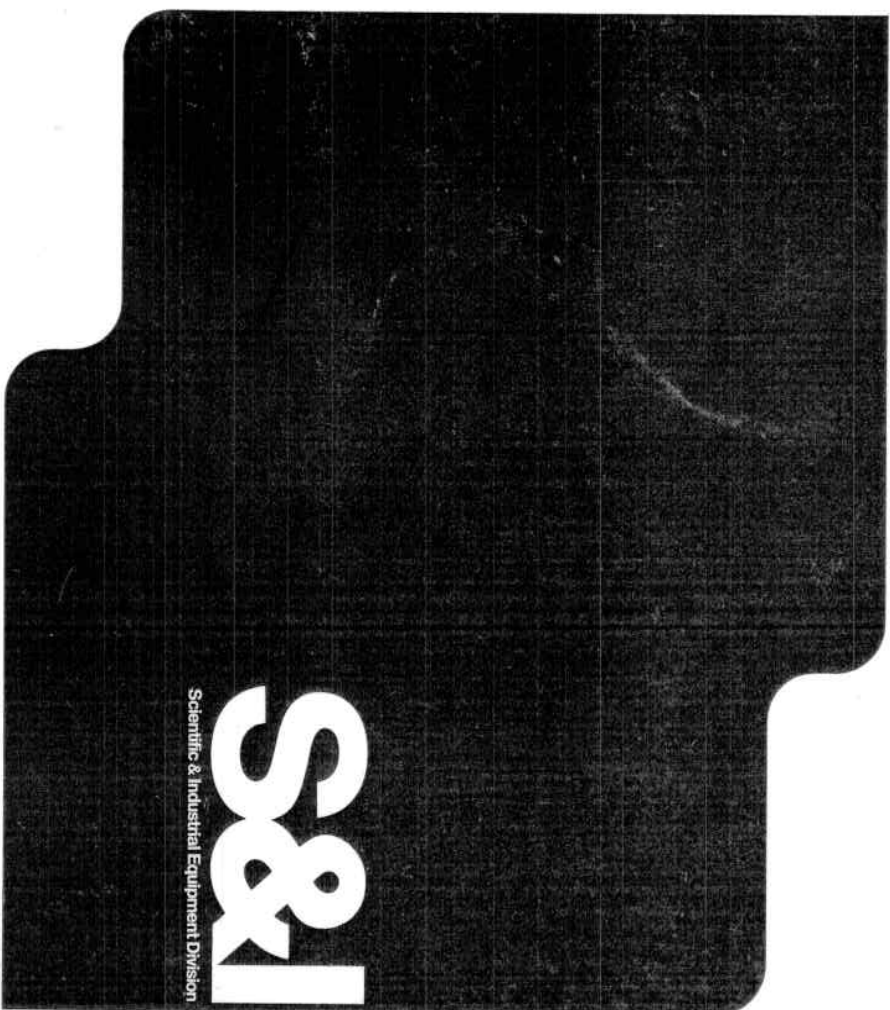
(9450 088 20000)

9450 088 21000

Instruction manual

9499 503 00701

801120



S&I
Scientific & Industrial Equipment Division



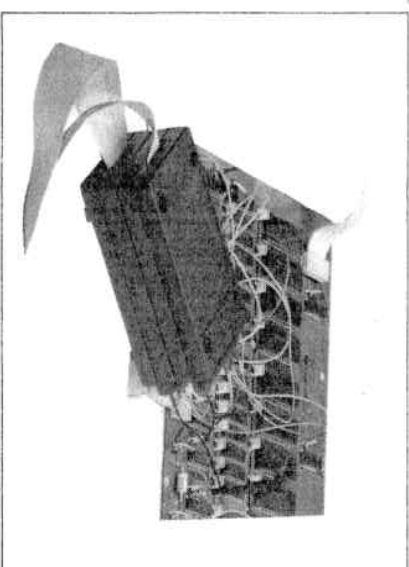
PHILIPS

Multi-lead logic probe
Mehrfach-Tastkopf
Multisonde logique

PM8820/PM8821

Instruction manual Gerätehandbuch Notice d'emploi et d'entretien

9499 503 00701
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PHILIPS

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1. INTRODUCTION

1.1. LOGIC POD PM 8820 / PM 8821 (ANALYZER PROBE)

The PM 8820 and PM 8821 universal, compact 8 bit logic Pods comprising 8 identical level detectors (contained in 4 high speed dual differential comparators/sense amps.) with a common wide range threshold, high input impedance and TTL compatible outputs. Power is derived from the unit the logic probe is being used with.

Both Pods the PM 8820 and PM 8821 are identical in construction, with the exception of the ribbon cables and connectors. The PM 8820 has a 20-way ribbon cable and connector, the PM 8821 has a 16-way cable and connector.

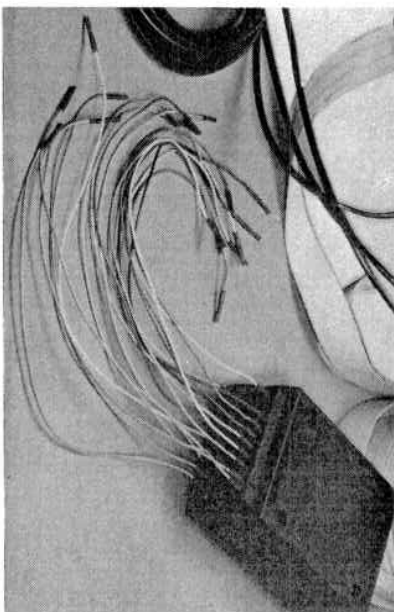


Fig. 1. PM 8820 / PM 8821

1.2. GENERAL

Unless otherwise stated, the following data applies only to the Pods PM 8820 and PM 8821, (excluding the possible effects of the instrument the Pod is being used with).

The data expressed in numerical values with tolerances stated is guaranteed by the manufacturer, values without tolerances are typical and represent the characteristics of an average unit.

All data is valid only after a 15 minute warm-up period.

2. CHARACTERISTICS

2.1. ELECTRICAL

Designation	Specification	Additional Information
Maximum ratings:		No damage to the PM 8820/PM 8821
Supply voltages*:	Min. Max. U_P 0 V +6 V U_{PP} 0 V +15 V U_n -6 V 0 V U_{nn} -15 V 0 V	All voltages with reference to common ground (\perp)
Reference voltage (U_{REF})	-50 V	+50 V
Input voltages (at D_i0 to D_i7)	-50 V	+50 V
Power:		To be supplied by an instrument the Pod is used with
Voltage*:	U_P +5 \pm 0.25 V U_{PP} +12 \pm 0.6 V U_n -5 \pm 0.25 V U_{nn} -12 \pm 0.6 V	
Current:	Min. Typical Max. drain from U_P +110 mA +200 mA drain from U_{PP} -110 mA -62 mA drain from U_n +16 mA +25 mA drain from U_{nn} -25 mA -16 mA	
Input:		D_i0 to D_i7
Voltage range:	-6 V to +18 V	Specifications valid within range
Impedance:	R_D static 4.7 \pm 0.1 M Ω R_D dynamic See curve Fig. 2 C_P 6 \pm 1 pF	Test leads excluded Input voltage within range, otherwise input impedance slightly lower
Bias Current	0.5 μ A	At threshold level.
Min. slew-rate	0.5 V/ μ S	Symmetrical around threshold centre
Max. frequency	20 MHz	
Min. pulse duration	20 ns	
Min. input signal swing	500 mV	

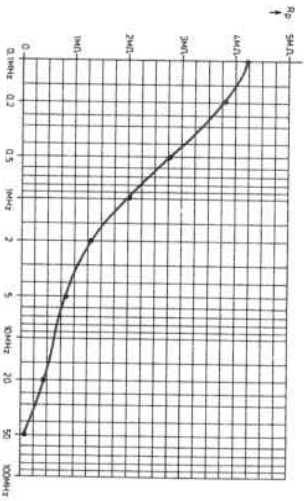


Fig. 2. Input resistance (R_P) versus frequency

* These voltages refer to circuit diagram Fig. 6 and 7 respectively

Designation	Specification	Additional Information
Output	$U_{D,out}$ = "LOW" $U_{D,out}$ = "HIGH"	D_i0 to D_i7 (D_i0 responds to D_i0 and D_i1 to D_i7 etc.)
Logic:	if $U_{D,in} < U_{Threshold}$ if $U_{D,in} > U_{Threshold}$	
Threshold	Threshold level (U_{Thr}) Reference range (U_{Ref}) Threshold hysteresis	$U_{Ref} \pm 22\% -50$ mV -3 V to +12 V 60 mV
Input resistance of U_{Ref} input	650 k Ω	U_{DO} = "LOW" Specification valid within range Static decrement of threshold when U_{DO} = "HIGH"
Bias current U_{Ref} input	3.5 μ A	Measured with 1 ns t_r of input pulse and U_{Thr} = $U_{D,in}$ "LOW" + $U_{D,in}$ "HIGH"
Propagation delay		2
HIGH	LOW transition	min. 19 n sec.
LOW	HIGH transition	max. 26 n sec.

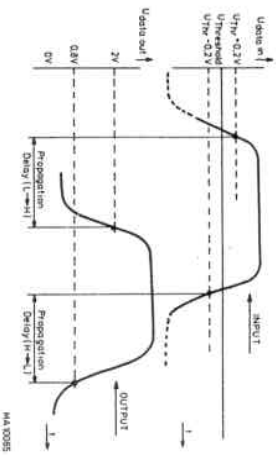


Fig. 3. Definition of Propagation delay

2.2. MECHANICAL

Designation	Specification	Additional Information
Dimensions		
Pod-body:	length 120 mm width 65 mm height 22 mm	feet included
Pod-cable:	length 1450 mm width 25 mm for PM 8820 20 mm for PM 8821	
Test-lead	length 265 mm	
Test hook:	length 48 mm diameter 7.5 mm	max.

Accessories supplied with PM 8820 / PM 8821 :

Test leads	9 Colour coded
Test hooks	9
Blank stickers	4
Pouch	1

See Fig. 4.

Optional accessories
(not supplied with PM 8820/
PM 8821)

PM 8819	Contains: 1 eight pin interface connector 9 test leads 9 test hooks 4 blank stickers
PM 8810	Trigger qualifier extension probe
PM 8820/10	45 test leads
PM 8820/20	35 testhooks

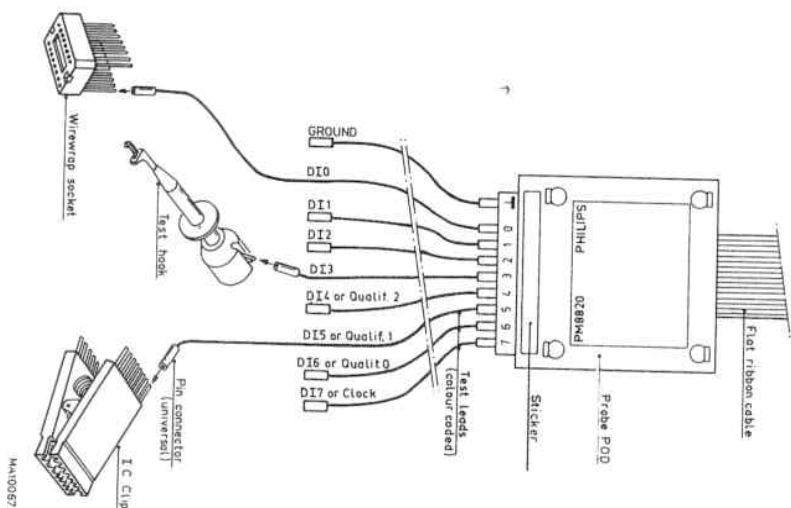


Fig. 4. Probing with Pod PM 8820 / PM 8821

2.3. ENVIRONMENTAL

These characteristics are valid only if the instrument is checked in accordance with the official checking procedure. Details of these procedures and failure criteria are supplied on request by the PHILIPS organisation in your country, or by N.V. PHILIPS' GLOEILAMPENFABRIEKEN, TEST AND MEASURING DEPARTMENT, EINDHOVEN, THE NETHERLANDS.

Designation	Specification	Additional information
Ambient temperature		
Rated range of use	+ 5 °C to +40 °C	Test procedure conforming to IEC 68, Ab & Bb
Limits of operation	-10 °C to +55 °C	
Storage and transport conditions	-40 °C to +70 °C	
Recovery time	1 hour	If temperature of the POD is raised from -40 °C to +20 °C at 60 % relative humidity
Humidity		
Probe withstands 21 cycles of damp heat test: temp. 25 °C to 45 °C, Rel. humidity 90 % to 100 %.		Test procedure conforming to IEC 68 Db
Cycle duration 24 hours.		
Altitude		
Limit of operation	5000 m (in open air)	Is 47,5 mbar or 47,5 kPa
Limit of transport	15000 m (in open air)	Is 100 mbar or 10,0 kPa
Bump		
PM 8820/PM 8821 withstands 1000 bumps of 100 m/S ² , 1/2 sine 6 ms duration in each of 3 directions.		In accordance with IEC 68 Fc
Vibration		
PM 8820/PM 8821 withstands in each of 3 direction, 30 min. vibration of 10-150 Hz, 0,7 mm peak to peak amplitude or 50 m/S ² acceleration, whichever is greater.		In accordance with IEC 68 Eb

Fig. 5. Printed circuit board of the PM 8820/PM 8821

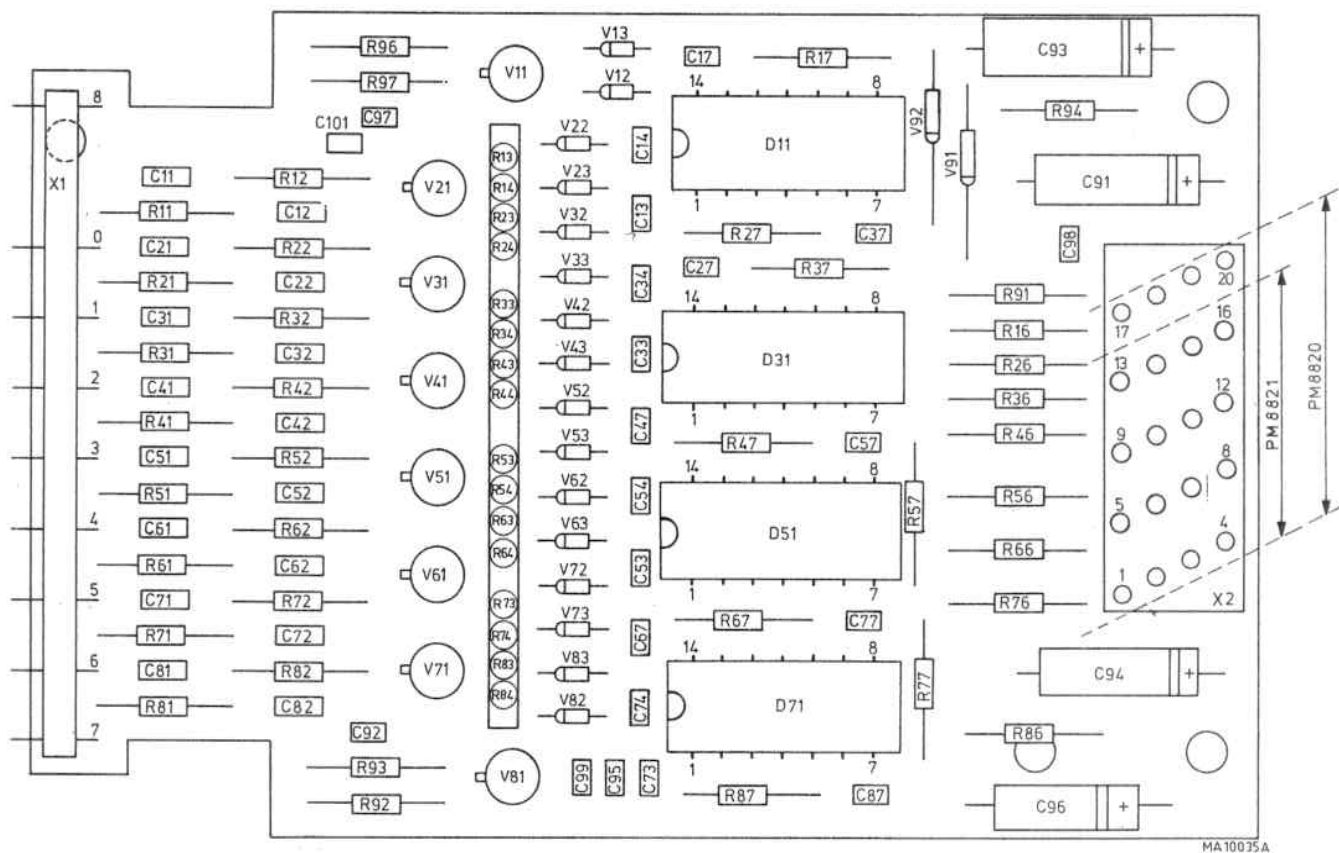


Fig. 6. Circuit diagram of the PM 8820

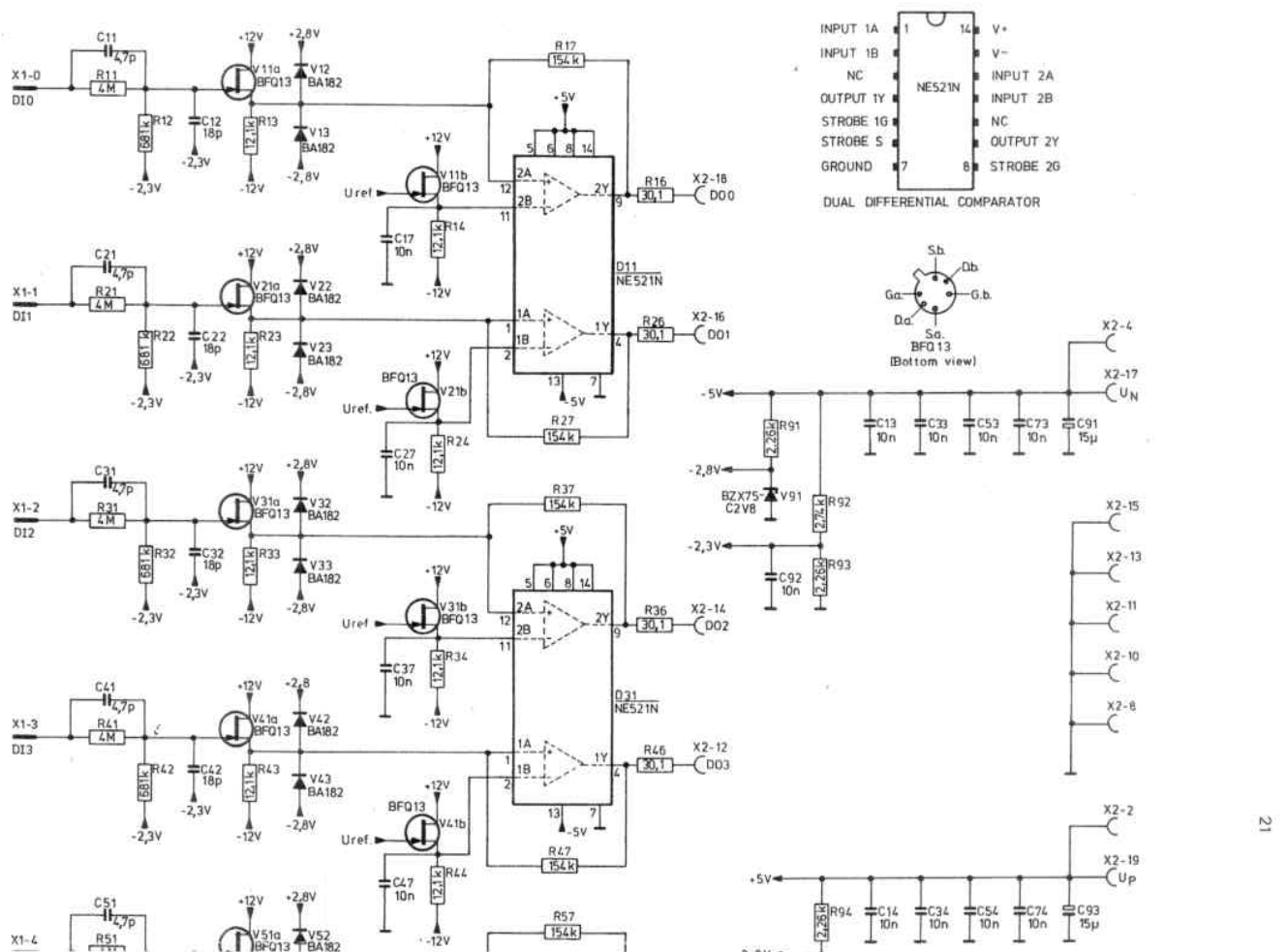


Fig. 6. Circuit diagram of the PM 8820

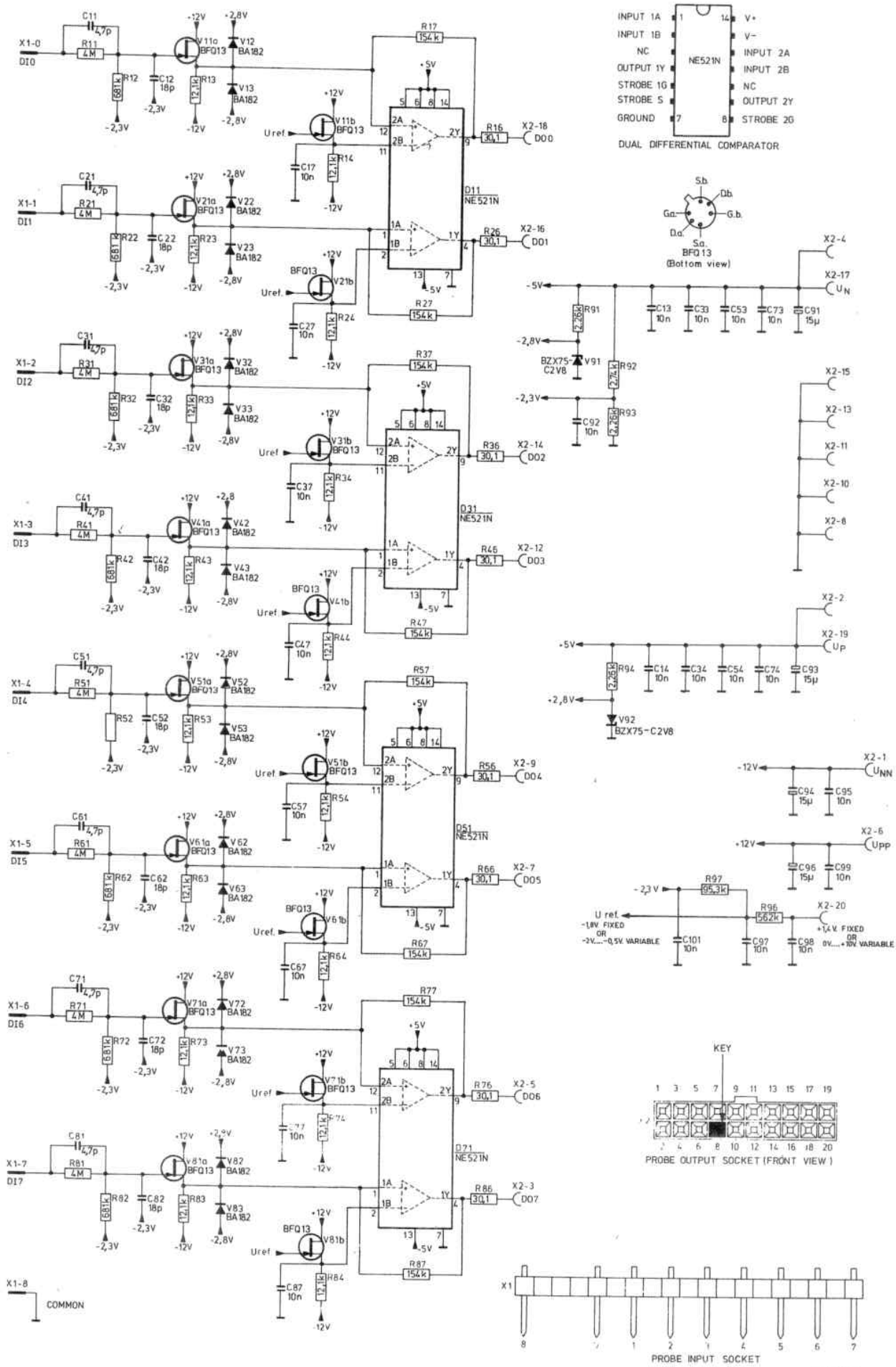
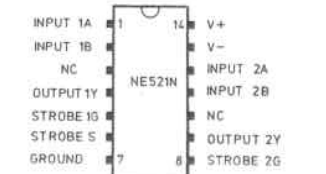
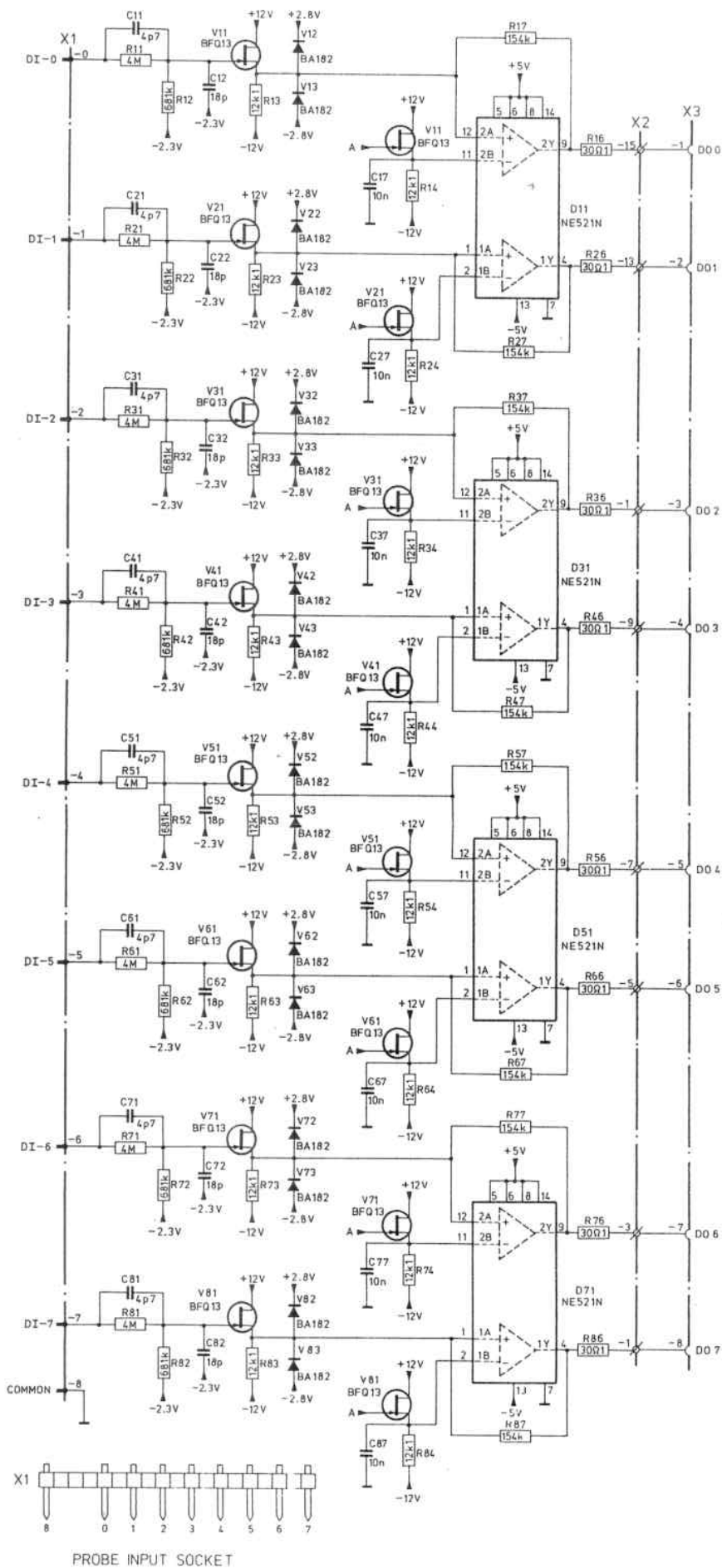
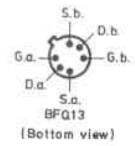


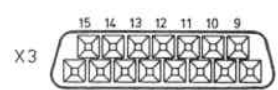
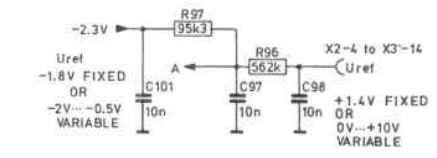
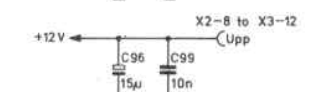
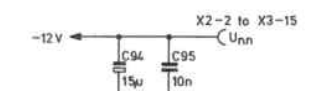
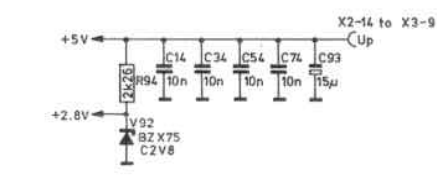
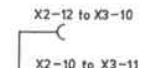
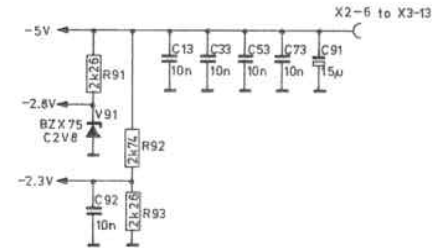
Fig. 7. Circuit diagram of the PM 8821



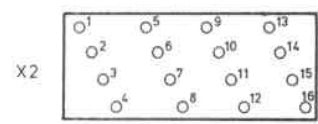
DUAL DIFFERENTIAL COMPARATOR



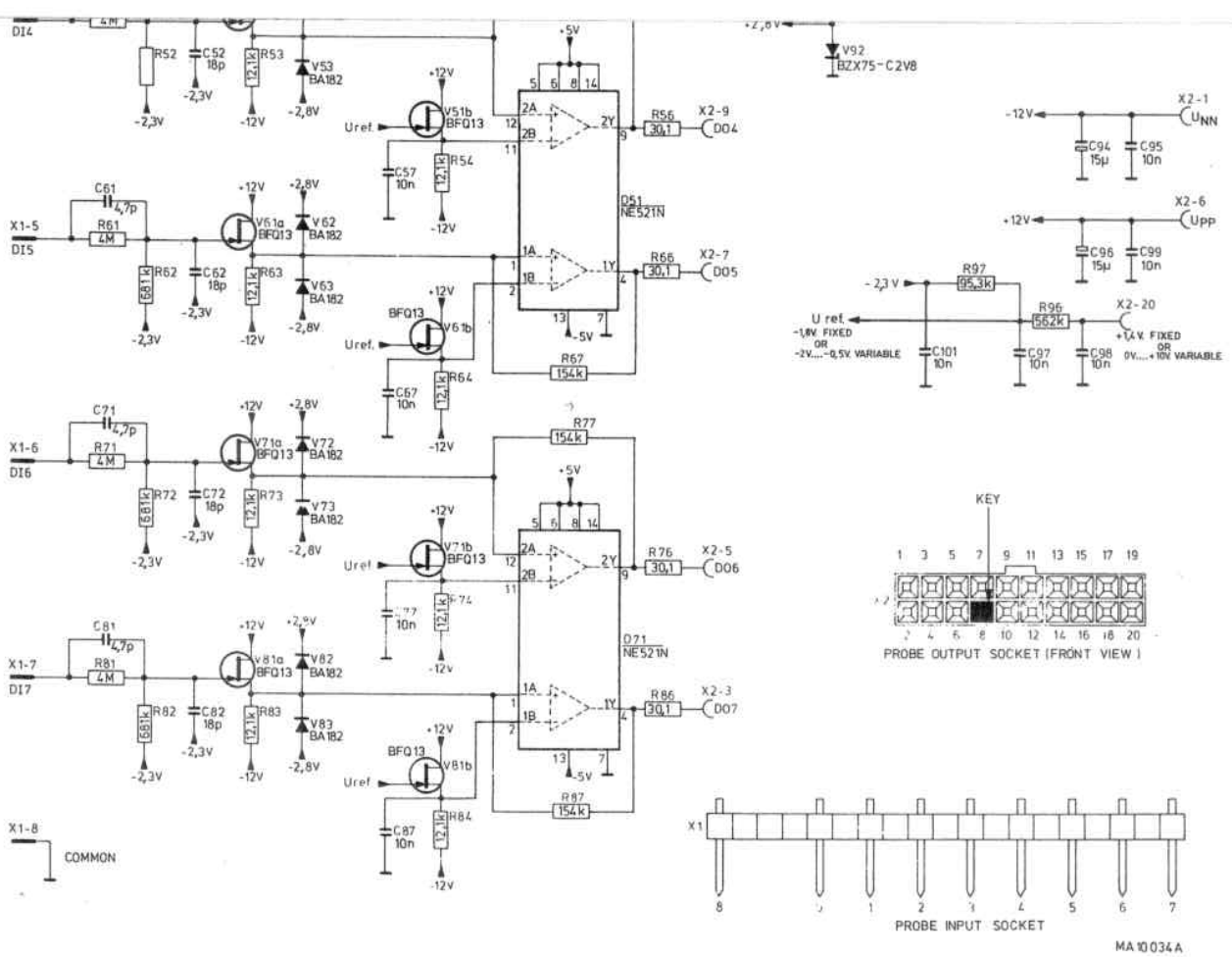
(Bottom view)



PROBE OUTPUT SOCKET (Front view)



PRINT CONNECTOR



MA 10 034 A

3. PARTS LIST

3.1. CAPACITORS

Ordering number	Value	Quantity
4822 122 31045	4.7 pF	8
4822 122 31061	18 pF	8
4822 122 30043	10 nF	22
4822 122 20687	15 μF	4

3.2. RESISTERS

5322 116 64025	4 MOhm	8
5322 116 55284	681 KOhm	8
5322 116 50904	30.1 Ohm	8
5322 116 54714	154 KOhm	8
5322 116 50675	2.26 KOhm	3
5322 116 50636	2.74 KOhm	1
4822 116 51189	562 KOhm	1
5322 116 50567	95.3 KOhm	1
5322 209 86217	12.1 KOhm array	1

3.3. SEMICONDUCTORS

5322 130 44404	BFO13	8
5322 130 30644	BA182	16
4822 130 34048	BZX75-C2V8	2

3.4. INTEGRATED CIRCUITS

5322 209 14441	NE521N	4
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3.5. MECHANICAL PARTS

3.5.1. PM 8820

5322 447 94587	Cabinet complete	
5322 323 54043	Flat cable 20 pins 1.5 mm	
5322 265 44103	probe input socket 9 pins	
5322 265 54059	probe output socket, 20 pins	
5322 401 14287	Pull relief bracket for output socket	
5322 268 34048	Interface connector cable/board socket, 20 pins	
5322 265 54058	Interface connector cable/board socket, 20 pins	
5322 310 34111	Wrap pin wire-set	
5322 395 84101	Test hook	

3.5.2. PM 8821

5322 447 64025	Cabinet complete	
5322 323 54049	Flat cable 15 pins 1.5 mm	
5322 265 44103	probe input socket, 9 pins	
5322 265 64115	probe output socket, 15 pins	
5322 265 44113	cable/board socket, 16 pins	
5322 268 34058	Interface connector	
5322 310 34111	Wrap pin wire-set (test leads)	
5322 395 84101	Test hook	

