STEREO
PEAK PROGRAMME METER
277-200

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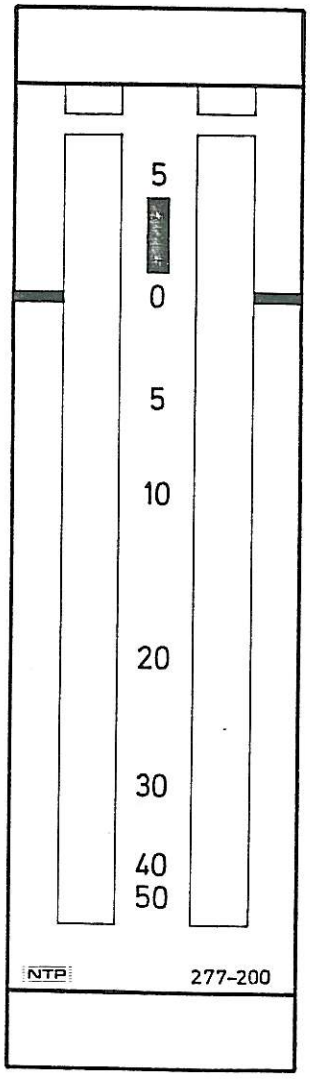
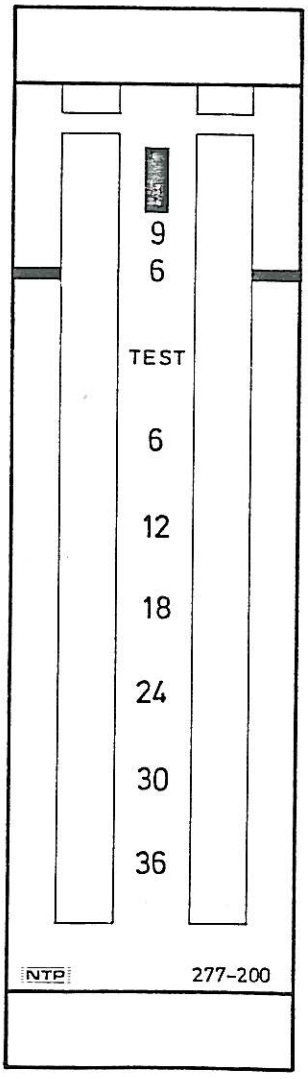
STEREO PEAK PROGRAMME METER 277-200 FRONTPLATE LAY-OUT

277-2009-A-4



DIN-scale



Nordic-scale

13.6.82. JS.

INTRODUCTION

The Stereo Peak Programme Meter, type 277-200, is designed primarily for recording and broadcasting studios.
The instrument which is designed to fulfil the stringest international standards such as DIN 45406 and IEC 268-10, features:

- High impedance balanced transformer inputs.
- Very close tracking between the two channels and any number of identical peak programme meters.
- A digital memory for storing the highest peak value of the programme monitored.

Futhermore the 277-200 has numerous extern functions:

- Additional gain.
- Display of stored peak value.
- Clearing of the memory.
- Fast integration time.
- Optional scale lines.
- Brightness control.
- Light Emitting Diode for overload indication.

These functions can be carried out by making connections on the two edge connectors placed on the rearside, to which also power supply and input signals are led.
(See drawing 277-2002-A-3)

CONSTRUCTION & MODE OF OPERATION

The Stereo Peak Programme Meter, housed in a cabinet 140 x 40 x 87.5mm, consists of three units named Input Board, Driver Board and Mother Board.
The 277-200 makes use of a bar graph display, which is a gas discharge indicator containing two separate bar graph each composed of 200 closely spaced segments, orange glowing, providing a 0.5% resolution.
The segments are illuminated by using the "glow transfer principle" in which the glow is first established at the reset cathode and then, by using a repetitive scan, the glow is transferred sequentially up to the desired point of the display.
Since the cathodes of both bars are connected together, a common drive circuit, consisting of a five-phase clock with a sixth reset phase, is used to control the transfer of glow along the panel.
The cathode drive circuit scans the entire array of 200 segments continuously and when the bar has reached the desired length, the anode voltage is turned off.
The signal from a ramp generator, starting from zero and reach its maximum at 200, is led to two comparators (one for each channel) whose outputs are connected to the anode drivers (one for each channel). The extern signals to be monitored are led to the other input on the comparator. When the ramp voltage reaches the level of the externally applied voltage, the anode driver will be turned off and the glow will extinguish.

DESCRIPTION OF THE BLOCK DIAGRAM

Since the block diagram to a large extent is selfexplanatory, the following remarks are intented as a guide to the use of the diagram.
The Input Board comprises two identical circuits, one for each channel, for which reason only one channel is shown.
The input signal is led to a input stage consisting of a current transformer followed by an amplifier in which the gain can be increased 20dB by connecting the wire "+20dB" to ground.
Then follows a low-pass filter which together with a third pole filter in the preceding stage provides a 18dB/octave roll-off at high frequencies.

The signal is then led through a full-wave rectifier supplying current for the log-converter which generates a DC-voltage corresponding to the logarithm of the input signal.
This voltage is fed to a circuit giving the standardized integration and fall-back time.
The integration time can be changed to a fast one by connecting the wire "Fast" to the supply voltage.
The output amplifier serves as buffer and gives the right slope dB/V and the reference of the output signal.
The output signal is led to a two position electronic switch. In its normal position the signal is led directly to the driver board. When the wire "Display peak" is connected to ground the switch changes position and the output signal is now fetched from the peak storage circuit.
The peak storage circuit consists of a comparator, a counter and 8-bit D/A-converter forming a memory for the highest voltage peaks supplied from the log.-amplifier.
When the wire "Reset" is connected to ground the memory is cleared.

The Driver Board comprises the power supply for the circuits in the instrument and the driver circuitry required for the bar graph display.
The power supply consists of three parts: A DC/DC-converter generating the high voltage for the anodes and two 3-terminal regulators supplying +12V DC and +5V DC.
The bar graph driver circuitry is controlled from the clock generator.
Each element in the bar graph represents a discrete, reproducible display step which causes that each segment of the display is directly relatable to a digital number.
To initiate a scan, the reset cathode is grounded by turning the transistor associated on.
As the counter advances the cathodes are sequentially grounded, causing the glow to transfer along the bar.
The intensified scale marks are stored in a Programmable Read Only Memory (PROM). This factory programmed memory may also contain alternative scale patterns. These can be selected by grounding one or more of the wires named " Scale Select"
In order to keep the current consumption of the instrument low, the supply voltage is only applied the PROM when read out is executed.
The two comparators control the anode drivers (one for each bar).
When the voltage from the ramp generator reaches the level of the voltage coming from the input board, the comparators will turn the anode voltage off causing the glow to extinguish.

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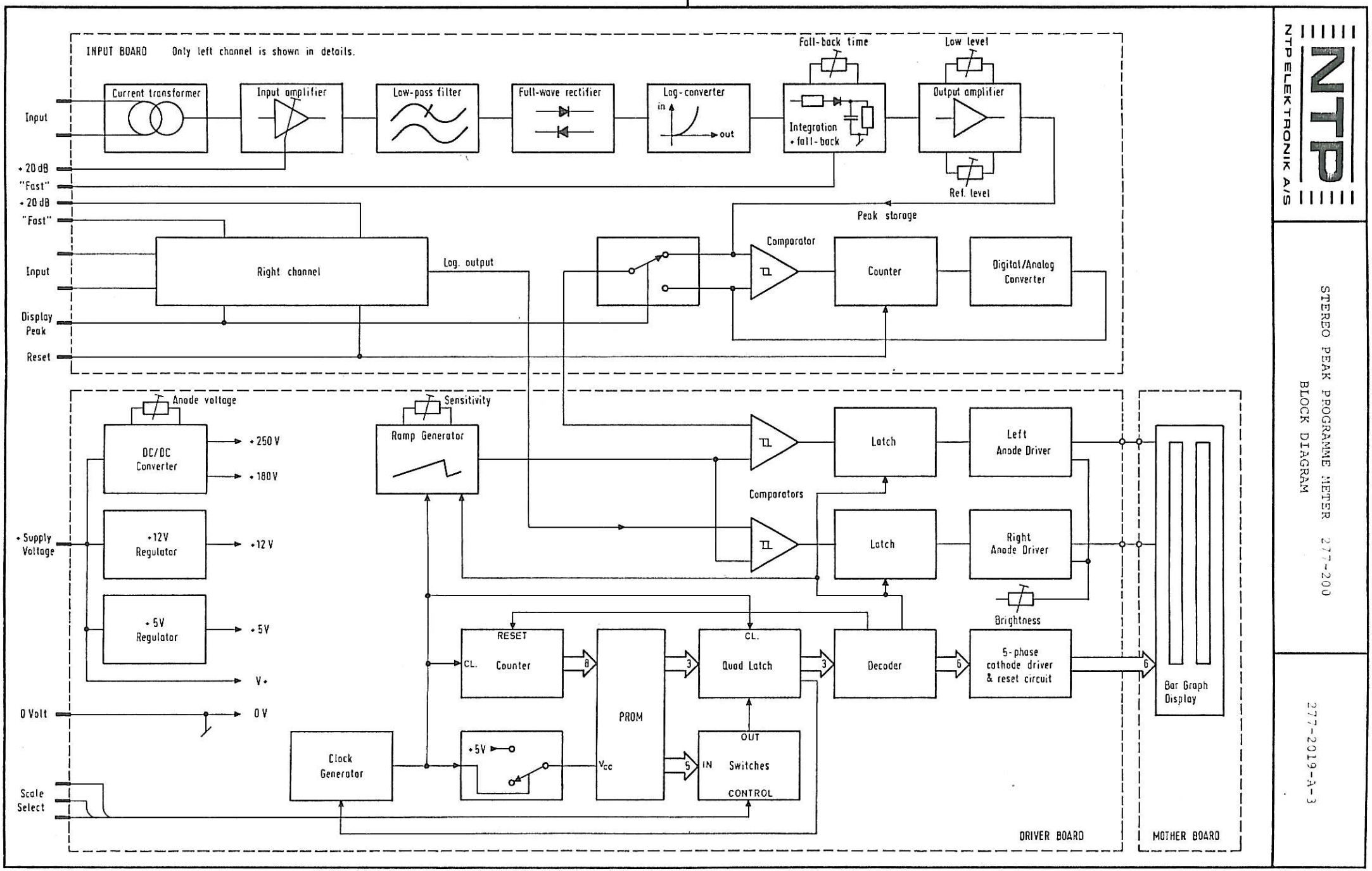

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STEREO PEAK PROGRAMME METER 277-200

BLOCK DIAGRAM

277-2019-A-3

GENERAL SPECIFICATION

Supply voltage	:	22-32V DC
Current consumption	:	approx. 130mA at 24V supply
Temperature range	:	0 to +45°C ambient temperature

INPUT

Frequency range, 0.5dB point	:	20Hz to 16kHz
High frequency roll-off	:	at 25kHz greater than 7dB at 40kHz greater than 20dB
Input impedance	:	20kOhm ±10%, balanced, floating
Input voltage for 0dB reading	:	1.55V rms sine (+6dBu)
Input overload level	:	8.6V rms sine (+21dBu)
Dynamic measuring range	:	55dB

MEASURING ERRORS

		at +5 to -10dB	below -10dB
1kHz steady signal, 25°C	:	±0.5dB	±1dB
Within full frequency range, 25°C	:	+0.5/-1dB	+0.5/-2dB
Within full temperature range, 1kHz	:	±1dB	±2dB
Polarity shift of unsymmetrical wave	:	±0.5dB	±1dB
10% change of supply voltage	:	±0.2dB	±0.2dB
Tracking between channels	:	better than ±0.5dB	

INTEGRATION & FALL-BACK TIME

Integration time	:	10msec. for -1dB ±0.5dB
Conforming to DIN 45406 and IEC 268-10		5msec. for -2dB ±1dB
Integration time is measured		3msec. for -4dB ±1dB
with 5kHz tonebursts		0.4msec. for -15dB ±2dB
Fall-back time, with linear scale	:	1.5sec. for 0 to -20dB
Fall-back time with scale according to DIN 45406. Conforms with IRT-ELA KE/Mr 4.5.70		

PEAK STORE

Accuracy of peak storing ("Memory")		
in upper end of scale, above -30dB reading	:	±1 neonsegment or ±0.25dB
in lower end of scale, below -30dB reading	:	+2/-1 neonsegment or ±1dB (whatever is greatest)

EXTERNAL FUNCTIONS (available when making connections externally)

Additional gain, scales according to DIN 45406	:	+20dB ±0.5dB +40dB ±1dB for "Nordic" scales
"Display peak"	:	Displays peak storing
"Reset"	:	Clears the memory
"Fast" gives an integration time	:	100usec. for -1dB reading
Overload LED's	:	Light Emitting Diodes placed above the bar graphs
Brightness control		
Scale select	:	Optional scale lines

GENERAL DATA

Standard scales	:	DIN +5 to -50dB Nordic +9 to -36dB "BBC" 1 to 7 (4 = 0.775V)

All types are available for horisontal or vertical mounting

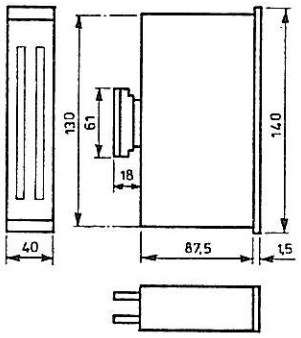
Number of single elements in the bar graph	:	200 in each channel
Overload and scale lines indication	:	4 times increase of light intensity
Connector	:	2 pcs. 10 pole edge connector

MECHANICAL DATA

The instrument is housed in a cabinet

Height	:	130mm
Weidth	:	40mm
Depth	:	87.5mm
Weight	:	0.4kg
Total scale length	:	100mm

Mechanical outline:



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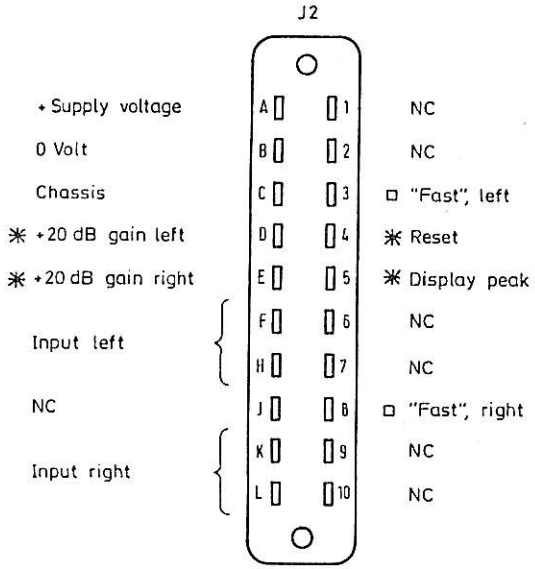
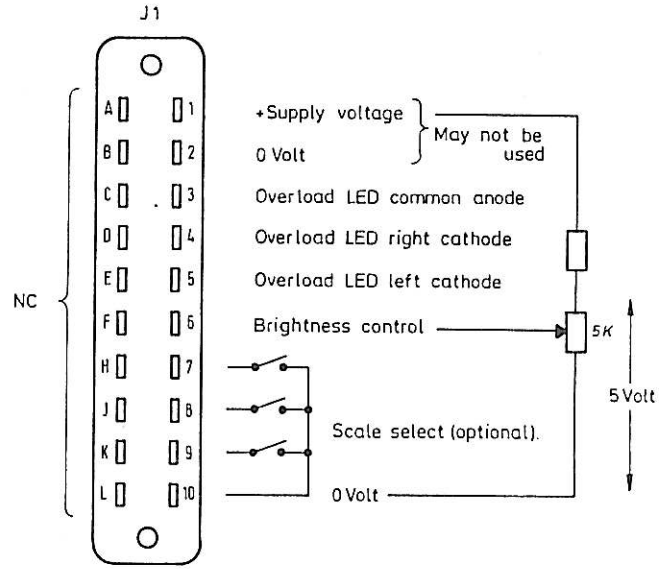
The two 20-pole connectors seen from the rearside (solderside).





✳ The function is established when the pin is connected to 0 Volt.

□ The function is established when the pin is connected to + Supply voltage.

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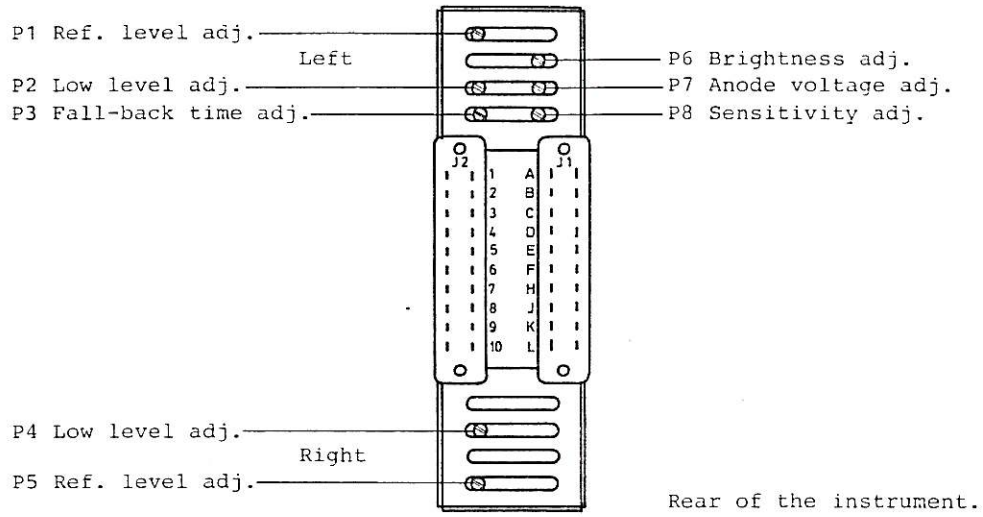
PEAK PROGRAMME METER 277-200
CONNECTIONS, REAR OF INSTRUMENT.

277-2002-A-3

Since the instrument is adjusted correctly on delivery, adjustment only has to be carried out in case of faulty mode of operation i.e. when a component has failed and has been replaced.



TEST SET-UP.

1. Connect +24V DC to pin A on J2 (0 Volt to pin B on J2).
2. Feed a signal e.g. 5 kHz sinusoidal to the input terminals for both channels i.e. pin F and H as left input and pin K and L as right input. Adjust the amplitude of the signal for max. reading on the display. (top of the scales).

ANODE VOLTAGE ADJUST.

1. Adjust P6 for max. brightness (max. CW).
2. Turn P7 slowly CCW, as far as possible without getting a flickering display.
3. Measure the current consumption.
4. Adjust P7 to obtain an increase in the current consumption of approx. 15 mA.

BRIGHTNESS ADJUSTMENT.

1. Turn P6 max. CCW (min. brightness) and then slowly CW in order to obtain a uniform glow in all segments.
2. Measure the current consumption.
3. Adjust P6 to obtain an increase in the current consumption of approx. 40 mA (or to desired brightness).

VOLTMETER SENSITIVITY ADJUSTMENT.

1. Remove the instrument from the cabinet by following the drawing 277-2020-A-3, "Disassembling".
   CAUTION! Become aware of that when the supply voltage is applied high voltage (250V DC) is on the circuits.
2. Connect a voltmeter to the wiper (center pin) on P8. The voltage should be 3V. If not, adjust P8.

LOW LEVEL & REF. LEVEL ADJUSTMENT.

1. Assembl the instrument and connect a signal of -40dB to the input terminals (F and H as left input, K and L as right input on J2).
2. Adjust P2 for left channel and P4 for right channel to obtain correct reading ("-40" on DIN-scale).
3. Change the signal to ref. level and adjust P1 for left channel and P5 for right channel to obtain correct reading ("0" on DIN-scale).
4. Repeat the adjustments 1 - 3.

FALL-BACK TIME ADJUSTMENT.

1. Connect a burst generator e.g. NTP type 507-100 to the input terminals (F and H is left input, K and L is right input).
2. Adjust P3 to obtain recommended fall-back time. (1.5 sec. from "0" to "-20" on DIN-scale).

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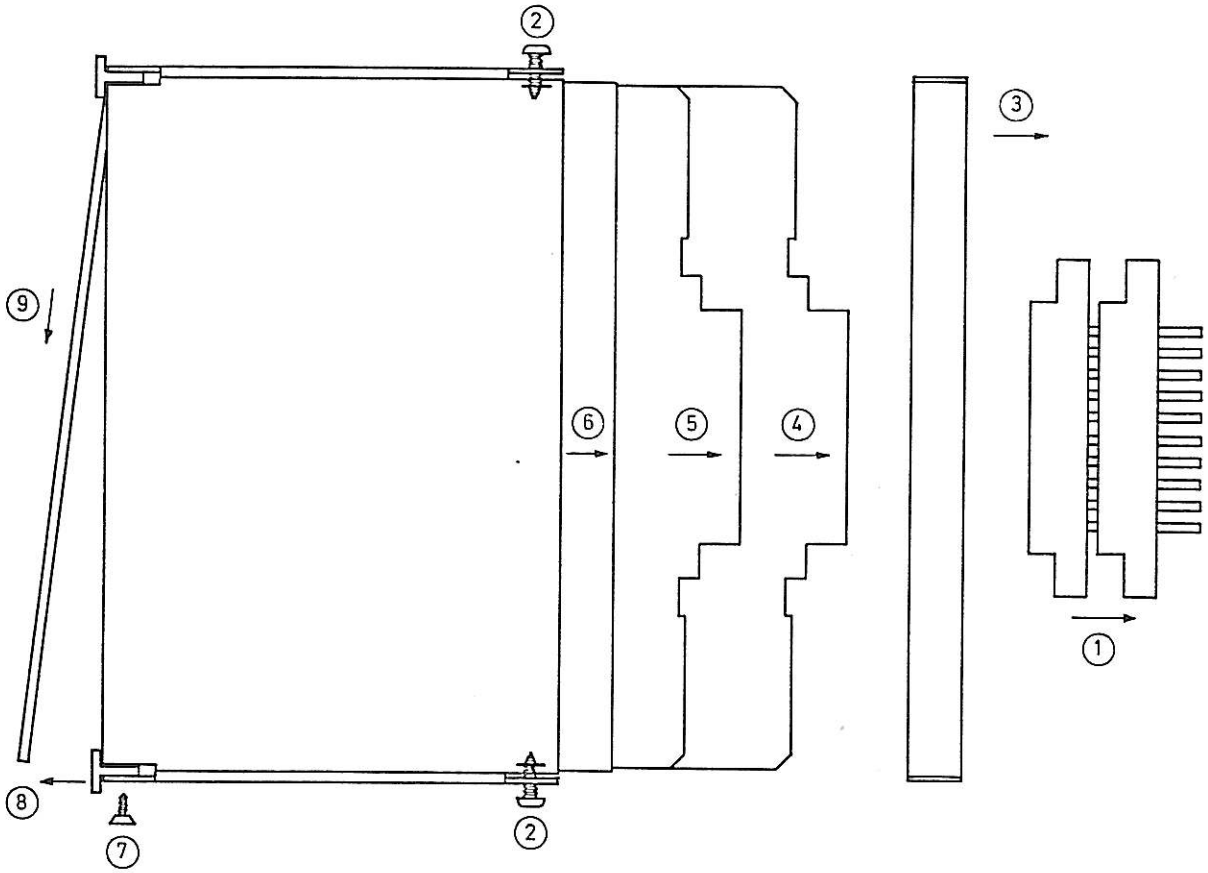
PEAK PROGRAMME METER 277-200
DISASSEMBLING

277-2020-A-3



DISASSEMBLING THE PPM 277-200.

1. Remove the two 20-pole connectors (1)
2. Loosen the two screws (2)
3. Remove the rearplate (3)
4. Remove the two screws (2) and the lockplates
5. Pull out the two PCB's (4) and (5)
6. Pull out the third PCB (Motherboard) (6)

   Or pull out all three PCB's together.

If the frontplate must be replaced:

1. Remove the two screws (7)
2. Pull out the front panel (8)
3. Remove the frontplate (9)