NTP ELEKTRONIK A/S

Bar Graph peak programme meter

177-400

Technical specifications

177-40A11-A-3

## General specification

| | |
|---|---|
| Supply voltage | : 22-32V dc |
| Maximum ripple,20 Hz to 20kHz | : 0,1V pp |
| Current consumption | : approx. 150mA at 24V supply |
| Temperature range | : 0 to +45° C ambient temperature |

## Input

| | |
|---|---|
| Frequency range,0,5 dB point | : 20Hz to 16kHz |
| High frequency roll-off | : at 25kHz greater than 7dB |
| | at 40kHz greater than 20dB |
| Input impedance | : 22kOhm +/-15%,balanced,floating |
| Input common mode rejection ratio | : better than 60dB |
| Input voltage for 0dB reading | : 1,55V r.m.s. sine (+6dBu) |
| Input overload level | : 8,6V r.m.s. sine (+21dBu) |
| Dynamic measuring range | : 55dB |

## Measuring errors:

| | +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 in supply voltage | : +/- 0,2dB | +/- 0,2dB |
| Tracking between channels | : better than +/- 0,5dB | |

## Integration and 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 with | 3mSec for -4dB +/- 1dB |
| 5kHz tone bursts | 0,4mSec for -15dB +/- 2dB |
| Fall back time,linear scales | : 1,5 sec per 20dB |
| Fall back time with scale according to | : 1,5 sec for 0 to -20dB |
| DIN 45406.Conforms with IRT-ELA KE/Mr4.5.70 | 2,5 sec +/-0,1 sec for 0 to -40dB |

## Peak store:

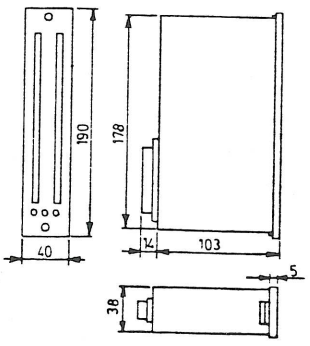
| | |
|---|---|
| Accuracy of peak storing (Memory) | |
| above -30dB reading | : +/- 1 neonsegment equal to +/- 0,5dB |
| below -30dB reading | : +2/-1 neonsegment equal to +/- 2dB |

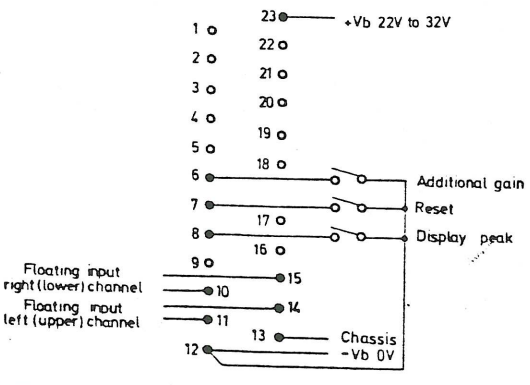
## Additional gain:

| | |
|---|---|
| Scales according to DIN 45406 | : +20dB +/- 0,5dB |
| Linear scales | : +40dB +/-1dB |

## General data:

| | |
|---|---|
| Total scale length | : 127 mm |
| Number of single elements in the scale | : 100 in each channel |
| Overload indication | : an eight times increase in light intensity in the overload range |
| Standard scales,available in horizontal or vertical versions | : +5dB to -50dB,DIN scale<br>+9dB to -36dB,Nordic scale |
| Mechanical outline,N-module,A1 size | : front 40x190mm,depth 103mm |
| Connector | : Amphenol-Tuchel 2700-000 |
| Weight | : approx. 0,9kg (1,9lb) |



General Description:

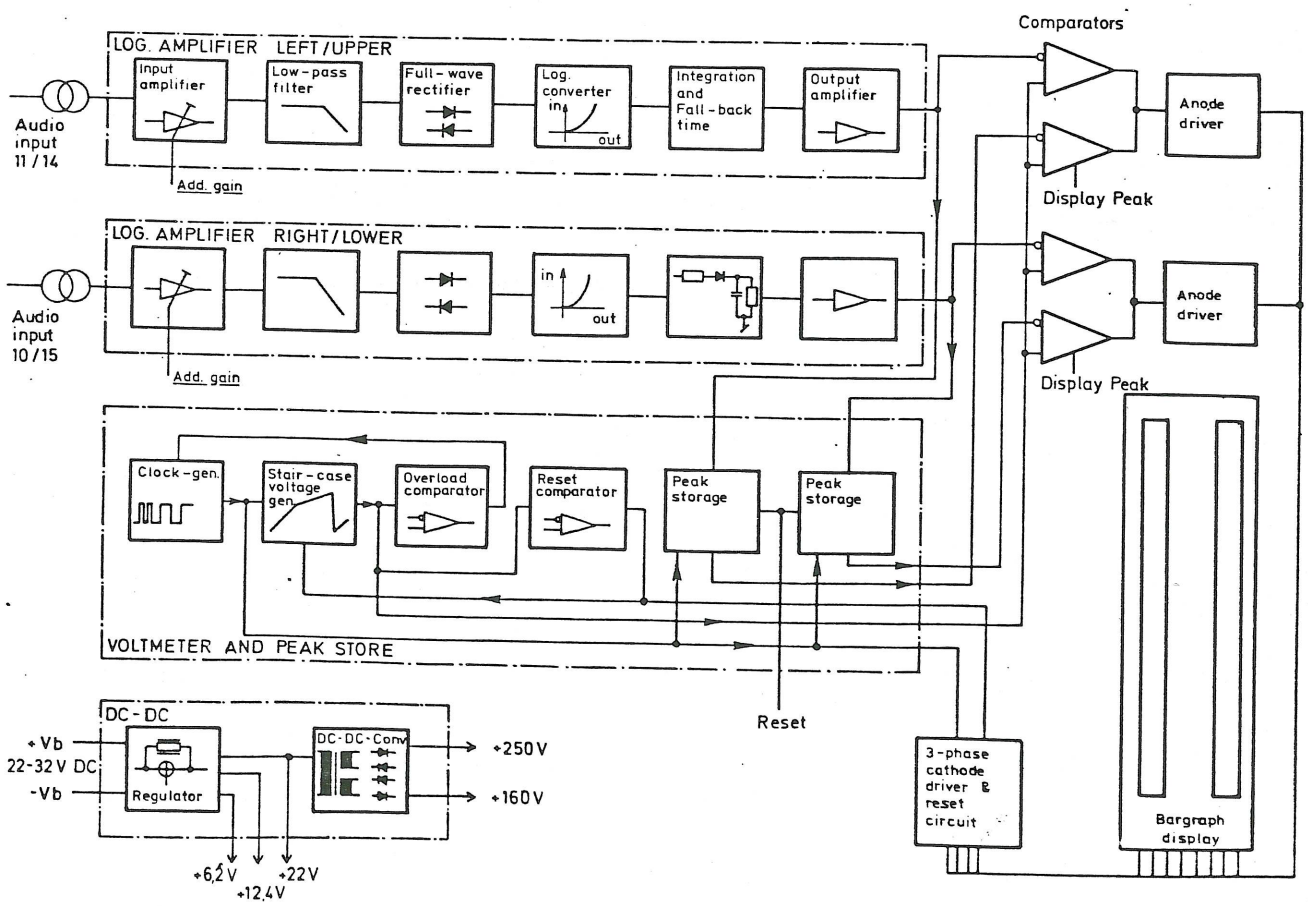
The stereo peak programme meter, type 177-400, which is a natural extension of the wide range of NTP meters is designed primarily for recording-and broadcasting studios operating in stereo. Besides the facilities usually expected from a high quality ppm, like high reliability and long-time stability without the need for future adjustment and calibration it features:

A very wide supply voltage range.
Extremely low current consumption.
High impedance belanced transformer inputs.
Push-button on the frontplate for switching in additional gain.
Very close tracking between the two channels and any number of idential ppm's.
A digitally memory for storing the highest peak values of the programme monitored. The reading of the stored value is initiated from a front panel bush-button.

The instrument is designed to fulfil the stringent international standards like DIN45406 and IEC 268-10. Strong emphasize has been put on the construction to give a stable and care-free unit.

Even including all these features type 177-400 is contained in a 40x190x100 mm plug-in unit compatibel to the well-known size of a standard fader.

177-400 makes use of Borroughs Bar Graph display BG 16101-2, which is a gas discharge indicator containing two separate bar graph displays each consisting of 101 orange "glowing" elements. The display segments are illuminated by using the glow transfer principle, where the glow is first established at the reset cathode and then transferred sequentially up to the desired point of the display. A 3-phase clock with a reset phase is used to control the transfer of glow along the panel.



## Technical Description

### DC-DC CONVERTER 177-40E40

The supply voltage is fed through a series regulator which is shunted by a power resistor. This regulator is adjusted for +22 V output voltage. The power consumption of the regulator circuit is divided between Q 1 and the shunt-resistor, i.e. the higher supply voltage the more power is dissipated in the resistor. If the supply voltage is lower than approx. 24 V, the regulator will act as a ripple-filter.

The two stabilized auxiliary voltages +6,2 V and +12,4 V are generated by the zener-diodes D2 and D16 followed by voltage followers (A 1).

The regulated voltage is lead to a 20 kHz push-pull dc-converter, whose switching-transistors are driven from an astable multivibrator (IC 1). Between the regulator and the dc-converter is inserted a filter which prevents current-peaks from the dc-converter getting back to the supply lines.

The two secondary-voltages of the transformer are full-wave rectified and stacked to achieve the voltages (+160V and +250V) to operate the bargraph tube. A VDR resistor across the +250 V prevents the voltage being too excessive, if the dc-converter runs un-unloaded (by error searching etc.).

### LOG. AMPLIFIER 177-40B40

The input stage consists of a current transformer followed by an inverting amplifier. By means of the transistor Q 1 which is controlled from theadditional-gain button, the gain in the amplifier can be altered. The shunt-capacitors of the feed-fack resistors give 6 dB/oct. roll-off at high frequencies. Together with the 12 dB/oct. low-pass filter that follows, the standard frequency response of PPM's is realized.

After input stage and filter follows a full-wave rectifier supplying current for the log.converter which through R 16/R 17 and Q 5 feeds back this current. Because of the logarithmic relations between the base-emitter voltage and the current through the transistor, the output voltage from this amplifier will be a dc voltage corresponding to the logarithm of the input signal.

This voltage charges C 10 through R 18 and Q 7. The current through Q 7 is most important, in case of a high voltage across Q 7, i.e. at the beginning of the charging-phase. This is necessary to keep the standardized integration-times. The discharge of C 10 takes place by means of a constant current through R 21. At PPMs with DIN-scales the discharge is made non-linear with R 32-33, as the discharge-time per dB must be shorter at the lower end of the scale.

The following amplifier serves more purposes. Firstly it acts as a buffer for C 10 and secondly by means of P 3 (low level) it allows the adjustment slope i.e. dB/V without influencing the reference-level adjustment. The amplifier furthermore drives the current-generator Q 13 which moves the reference of the output signal from +6,2 V to 0 V (-vb).

### VOLTMETER, PEAKSTORE and DISPLAY DRIVER 177-40D40 / 177-40F40.

The clock-oscillator IC4 is an astable multivibrator which normally oscillates on 12 kHz. When the first 82 cathodes of the bar-graph are lit, the frequency is changed by switching off Q 5. R 11 is then switched in series with R 10, and the frequency is decreased to approx. 2,5 kHz, and the light-intensity is thereby increased.

The clock-oscillator drives a staircase-voltage generator consisting of a pump-circuit Q1 - Q3 which charges capacitor C 4 approx. 30 mV each time it is clocked. Through this a staircase-voltage is built up across the capacitor. The clock-oscillator furthermore drives a four-bit binary counter IC3 which via a decoder IC 5 and the cathode drivers Q1-Q4 on the Display Driver p.c.b. supplies the bar-graph with a 3-phase clock plus a reset pulse.

The staircase-voltage is supplied to the overload- and reset-comparators. These are biased to change the frequency of the clock-oscillator, when cathode 83 is switched on and to supply the bar-graph tube with the necessary reset pulse, when all 101 cathodes are lit. Furthermore the reset pulse drives transistor Q6 "on", by means of which capacitor C4 is discharged and the sequence is repeated.

The output voltages from the log.amplifiers as well as the staircase-voltage are now supplied to two comparators, each operating one anode of the bar-graph tube. When the staircase-voltage is getting higher than the output voltages from the log.amplifiers, the anode drivers Q5 and Q6 on the Display Driver p.c.b. decreases the anode voltages, whereby lighting of further segments will stop.

The output voltages from the log.amplifiers are also coupled to two further comparators which controlls the input of clockimpulses for two seven-bit binary counters which together with the R-2R ladder networks forms two D/A converters, one for each channel. The outputs from the D/A converters are fed back to the comparators, and the result is that the D/A converters acts like memories for the highest voltage peaks supplied from the log. amplifiers. By activating the DISPLAY-PEAK button the voltages from the memories are shown on the bar-graph instead of the real time voltages from the log.amplifiers. The memories are reset to zero by pushing the RESET button.

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BAR GRAPH PEAK PROGRAMME METER 177-400

INSTRUCTION FOR ALIGNMENT

177-40A22-A-3

Supply voltage adjustment (Vcc adj.)

The instrument is supplied with a voltage of approx. 26 V dc. A dc-voltmeter is connected between -Vb and pin 13 on J6, and trimpotentiometer P1 on the DC-DC-converter p.c.b. is adjusted to 22 V on the voltmeter.

Calibration of staircase-voltage generator and adjustment of overload threshold

A 1 kHz sine signal is supplied to one of the inputs (left or right). The signal level is adjusted to obtain a dc-output voltage of exactly 3 V on terminal 5 of the jack J1a or J1b measured with a dc-voltmeter with respect to -Vb. The trimmer capacitor C 3 on the p.c.b. 177-40D40 ( voltmeter) is adjusted until cathode no. 101 of the bar-graph just ignites. Then trimpotentiometer P1 is adjusted to enable the highly lumenous area to start on cathoce no. 83 and centered.

AC-calibration.

Level adjustment.

Both log.amplifiers are supplied with a 1 kHz sine signal with a level corresponding to the desired reference level of the instrument. Trimpotentiometers P 2 (ref. level) are adjusted on both amplifiers until the reading is correct. Then the input signal is attenuated 30/40 dB, and trimpotentiometers P 3 (low level) are adjusted to correct low level reading, that is 30/40 dB below the ref. level. If necessary repeat the adjustment.

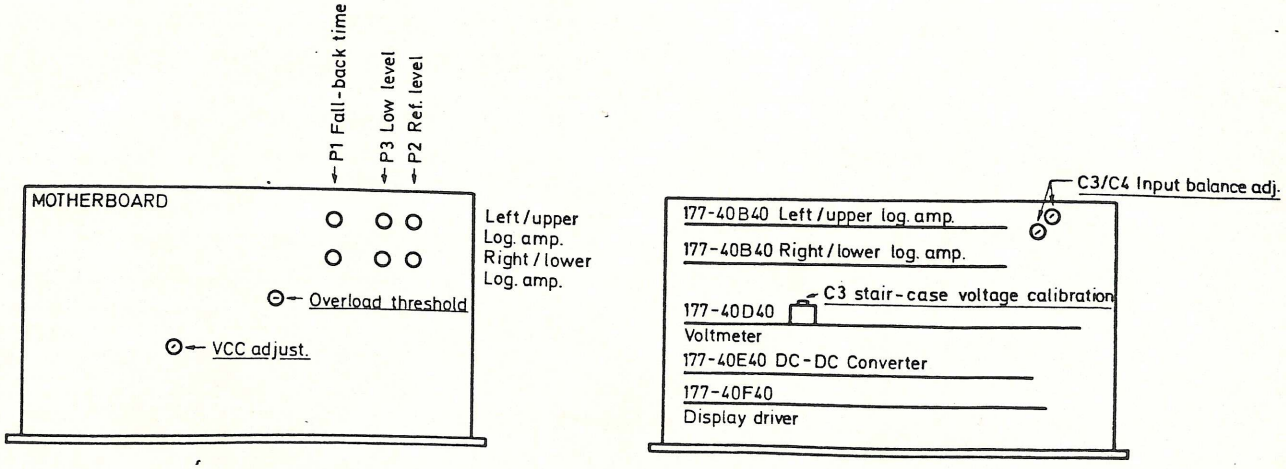
Fall-back time adjustment.

The easiest way to adjust the fall-back time is to interrupt the applied signal to tonebursts with 1.5 sec pauses, and adjust the trimpotentiometers P 1 (fall-back) until the reading just falls down to -20 dB before the next burst comes.

Input balance adjustment, (CMRR adj.)

The input terminals are shorted and a 15 kHz sine signal with a level which is 15 dB above the reference level is supplied between the inputs and -Vb. The additional gain button is activated, and the reading is adjusted to minimum by means of trimmer capacitors C 3 and C 4 on the motherboard. The difference between the applied level and the reading ( in dBu) less the additional gain added should be greater than 60 dB.

Example: The reference level of the instrument is +6 dBu (1,55 V rms) equal to 0 dB reading. Applied level +21 dBu. Additional gain button +20 dB activated. The reading on the scale must be below -25 dB (equal to -19 dBu signal).




Rettelser