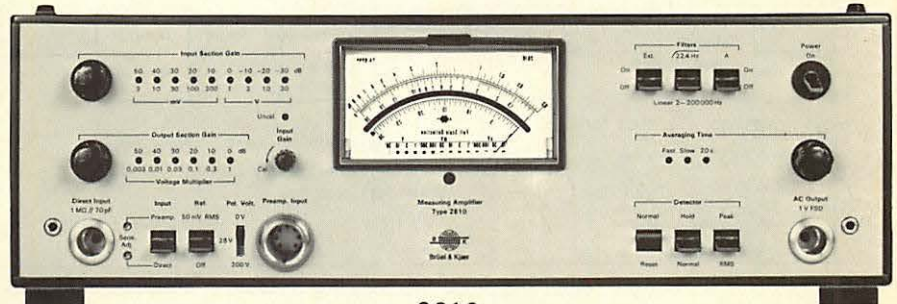


types 2610 and 2636

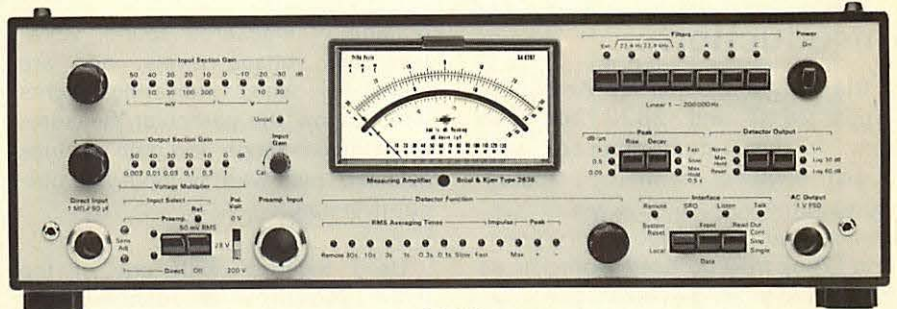
Wide Range Measuring Amplifiers

USES:

- Precision sound level meter. Fulfil Type 0 requirements of IEC R 651 with B & K 1/2 inch Condenser Microphones
- Versatile vibration meter with B & K piezoelectric accelerometers and other vibration transducers
- Wide range, high accuracy electronic voltmeter. Max. hold for capture and display of short duration levels
- Low noise amplifier with calibrated gain, selectable from -30 to $+100$ dB
- Frequency analysis with B & K Band Pass Filters



2610



2636

COMMON FEATURES:

- Overall frequency range from 1 Hz up to 200 kHz
- Measuring ranges from $10 \mu\text{V}$ to 30 V FSD (300 V with 10:1 input probe) selectable in 10 dB steps
- Interchangeable meter scales for sound, vibration and voltage measurements etc.
- Automatic indication of measurement mode, range, gain plus input and output overload
- Built in reference for calibration
- Direct, plus Mic. Preamp. Input with 0; 28 and 200 V microphone polarization
- Wide range analog AC and DC outputs for magnetic tape and graphic recording

FEATURES 2610:

- Accurate true RMS indication for AC signals with crest factors up to 10 (up to 20 below FSD)
- Selectable "Fast", "Slow" and "20 s" RMS averaging
- Accurate Max. Peak indication for signals of $25 \mu\text{s}$ or longer
- Max. Hold mode for RMS and Peak measurements
- Selectable 22,4 Hz high pass and "A" weighting networks

FEATURES 2636:

- Accurate true RMS and Impulse indications for AC signals with crest factors up to 10 (up to 50 below FSD)
- Selectable "Fast", "Slow" and 0,1 to 30 s RMS aver-

aging. Auto-control via Band Pass Filter Type 1617

- Accurate + Peak, -Peak and Max. Peak indication for signals of $8 \mu\text{s}$ or longer
- Selectable 5; 0,5 and 0,05 dB/ μs peak rise, plus "Fast", "Slow" and "0,5 s Hold" peak decay modes
- Max. Hold mode for RMS, Impulse and Peak measurements
- Log and Lin meter display and DC output modes
- Selectable 22,4 Hz high pass, 22,4 kHz low pass, plus "A", "B", "C" and "D" weighting networks
- IEC/IEEE compatible digital interface bus for digital read-out and control
- Basic check out mode for automatic self test of most analog functions of 2636

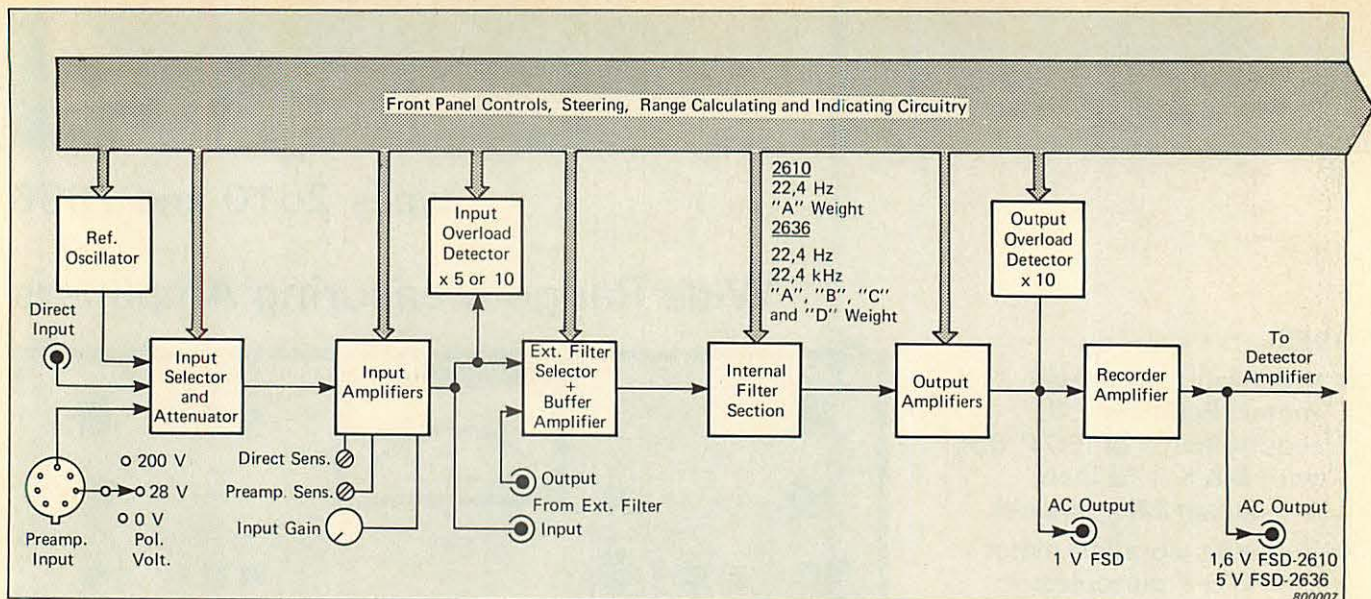


Fig.1. Input and Output AC Amplifier Sections of Measuring Amplifiers Types 2610 and 2636

Introduction

The B & K Measuring Amplifiers Types 2610 and 2636, are two easy to use, multi-purpose, calibrated amplifier-voltmeters, featuring extreme versatility, a wide measurement range and laboratory precision. They may be used alone, or as the basis around which numerous measurement and analysis set-ups may be built for comprehensive and detailed investigation of sound, vibration and voltage signals.

The two Measuring Amplifiers are essentially similar. However, Type 2636 has a variety of extra facilities including a digital interface bus, which greatly expand its useful range of measurement applications and uses. Both feature interchangeable meter scales permitting direct

reading of measured sound, vibration and voltage levels, and are equipped with indicating lights which show the particular measurement mode, range and gain settings selected, plus warn of input and output overload.

Used together with one of the B & K Condenser Microphones and Microphone Preamplifiers available, they serve as a precision sound level meter meeting the strictest international as well as national standards for precision sound level measuring instrumentation. Type 2610 conforms with IEC R 651 (Type 0), DIN 45633 (part 1) and ANSI S1 4-1971 (Type 1), whilst additionally Type 2636 conforms to "Impulse" sound measurement requirements of IEC and DIN.

Description

Operation and principle features of the 2610 and 2636 are discussed with reference to the simplified block diagram of the instruments shown in Figs.1 and 2.

Multi-Purpose Inputs

Types 2610 and 2636 are furnished with two alternative AC coupled signal inputs - a Direct Input which accepts standard B & K coaxial plugs and is used for voltage and vibration measurements etc., plus a Preamp. Input which accepts the 7 pin plug of B & K Microphone Preamplifiers for sound measurements. Both inputs have a high input impedance of 1M Ω and can withstand voltage overloads as high as 220V RMS (400V Peak including DC component) without damage.

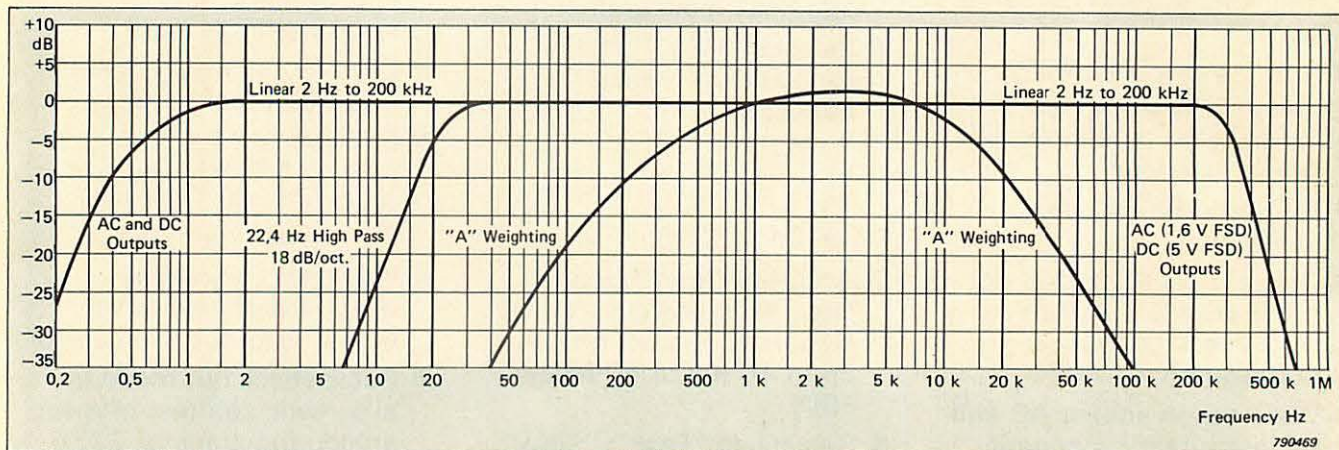


Fig.3. Typical overall frequency response of Measuring Amplifier Type 2610, with and without internal filter and weighting networks selected

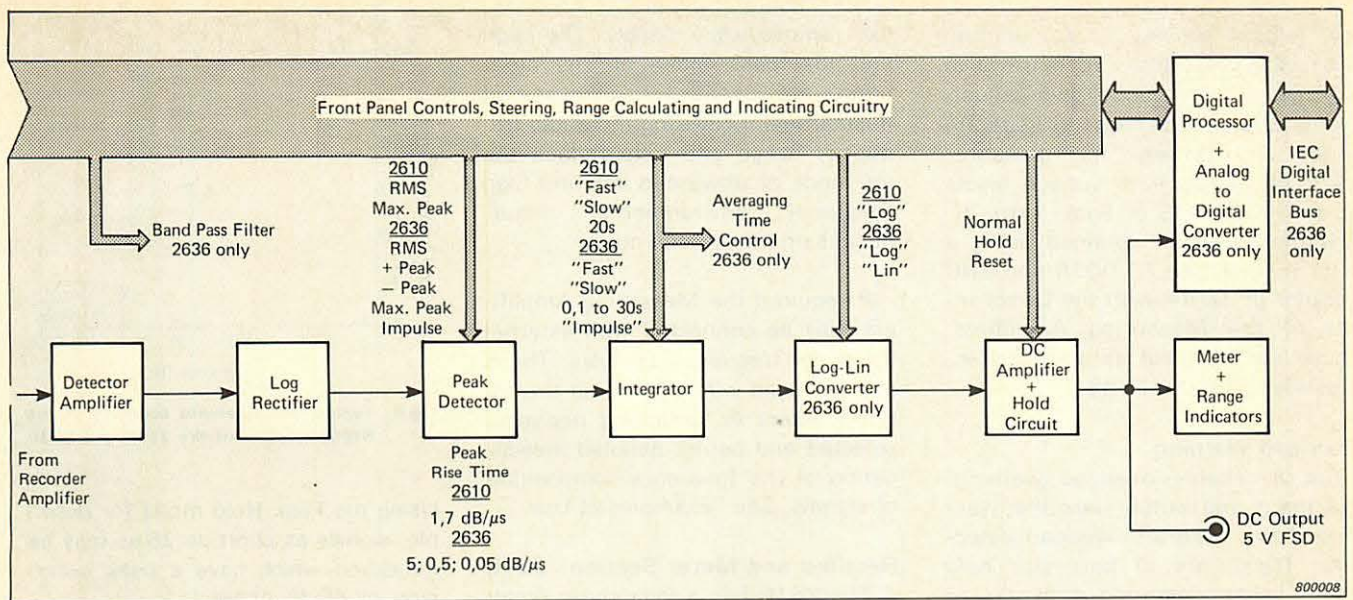


Fig.2. Rectifier and Meter Sections of Measuring Amplifier Type 2610, plus Digital Processing section of Measuring Amplifier Type 2636

Besides serving as a signal input, the Preamp. Input supplies stabilized voltages for powering B & K Microphone Preamplifiers. Furthermore it may be switched to provide + 28 and + 200 V polarization necessary for operation of condenser microphones and has a "0V" polarization setting needed for use with prepolarized types of microphone.

To facilitate use of a wide range of measurement transducers of different sensitivity, the Direct and Preamp. Inputs are each equipped with their own individual, screw-driver accessible, sensitivity adjustment. These adjust the gain of the input section amplifier and together with a built-in 50 mV, 1 kHz sinusoidal reference source, enable the Measuring Amplifiers to be quickly

and easily calibrated to give a direct meter reading for sound, vibration and voltage measurements etc. Apart from eliminating the need of using an external reference for calibration, the internal reference voltage is ideal for calibration of magnetic tape and graphic recording equipment which may be used with the Measuring Amplifiers.

Input and Output Amplifiers

The particular combination of cascaded amplifier and attenuator stages used with the input and output amplifier sections of the 2610 and 2636, gives them particularly good signal amplification linearity plus very low noise and distortion (see Common Specifications). Their nominal overall amplification and attenuation is from + 100 to -30 dB and may be

switched in accurate 10 dB steps to give voltage measurement ranges from 10 μ V to 30 V for full scale meter deflection. Three rows of indicator lamps, two beside the Input and Output Section Gain knobs and one at the bottom of the meter, automatically inform the user of which particular gain settings and measurement range have been selected.

As with most front panel control settings, the input and output section gain may be switched remotely. With the 2610 a remote switching arrangement may be connected via two multi-pin sockets inside the instrument, whilst with the 2636 switching may be conducted using a programmable desk top calculator or other digital instrument connected via the Digital Interface socket on the rear panel.

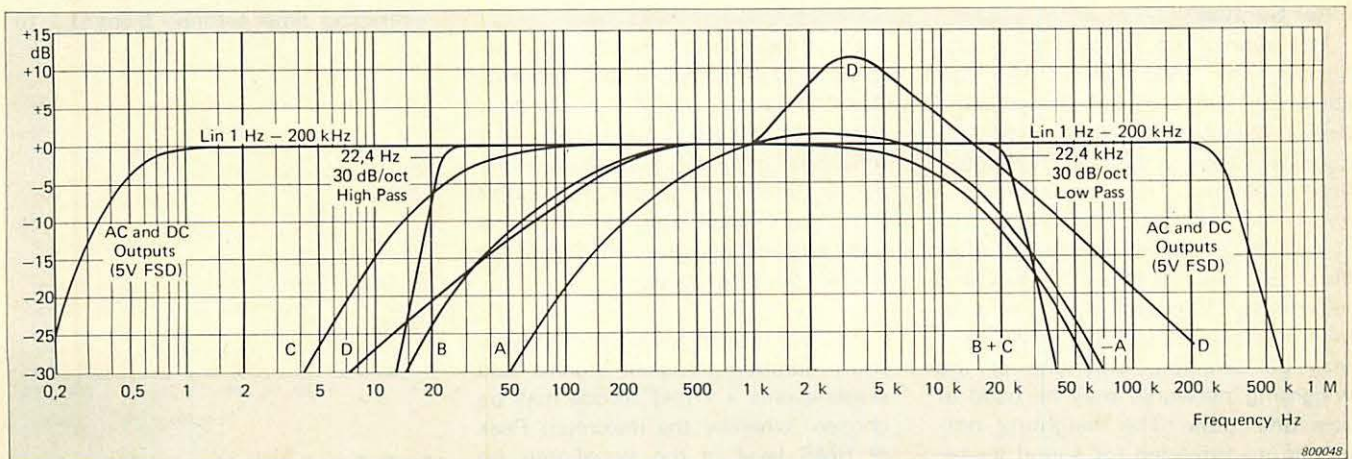


Fig.4. Typical overall frequency response of Measuring Amplifier Type 2636, with and without internal filter and weighting networks selected

To facilitate measurement of very low signal levels in conjunction with external filters, an extra 0 to +10 dB of continuous gain adjustment is available via a separate knob. Alternatively for measurement of signals with voltage levels up to 300 V RMS or Peak, extra attenuation may be obtained using a 10:1 Input Probe ZC 0016 and BNC Adaptor JP 0144 with the Direct Input of the Measuring Amplifiers. These are supplied as standard accessories with the 2636.

Overload Warning

For a reliable overload warning, the input and output amplifier sections have separate overload detectors. These are of particular help when using weighting networks or external filters with the Measuring Amplifiers, as overload by signals outside the filter pass band can sometimes produce a misleading meter indication, which without the benefit of overload detectors might not be interpreted as overload.

The two overload detectors respond to positive and negative going signal peaks as short as 200 μ s and once triggered cause the appropriate Input and (or) Output Section Gain lights to flash. The lights continue to flash for a minimum of 0,5 seconds, thus enabling very short duration overloads to be spotted. To suit different maximum input voltage requirements, the input overload trigger level may be switched so that it is equivalent to 5 or 10 times the particular voltage range selected for measurements. These correspond to a maximum input voltage rating of 5 or 10 V peak at the input of an external filter.

Filter Section

The overall frequency characteristics of the 2610 and 2636 are shown in Figs.3 and 4 respectively. Both Measuring Amplifiers are equipped with a 22,4 Hz high pass filter and an "A" weighting network. In addition the 2636 includes a 22,4 kHz low pass filter plus "B", "C" and "D" weighting networks. Whereas either one or both of the high and low pass filters may be selected, only one of the weighting networks may be used at any one time. The weighting networks are intended for sound measurements and comply with Type 0

requirements of IEC R 651 for precision sound level meters. The high and low pass filters on the other hand, are useful for all types of measurement covering the audio frequency range and help reduce the influence of unwanted low and high frequency environmental disturbances on measurements.

If required the Measuring Amplifiers may be connected with external filters for frequency analysis. These may be used with or without the internal filters or weighting networks selected and permit detailed investigation of the frequency composition of signals. See "Examples of Use".

Rectifier and Meter Section—2610

The 2610 has a logarithmic meter response with true RMS and Max. Peak indicating modes. All commonly encountered signals can be measured including those with complex waveforms. A wide range Log. Rectifier with dynamic range of 70 dB is used to perform the necessary signal rectification which with subsequent processing by a special integrator circuit provides a true RMS meter indication with overall accuracy of $\pm 0,5$ dB ($\pm 0,2$ dB typical — see Fig.5). Signals with crest factors up to 10 can be handled at full scale, increasing to 20 for lesser deflections.

The integrator has selectable time constants enabling "Fast" and "Slow" time weighting characteristics in accordance with Type 0 requirements of IEC R 651 for precision sound level meters to be selected. In addition a "20s" effective averaging time may be chosen which is beneficial for measurements and analysis using narrow band filters with the 2610.

For a peak indication, the Log rectified signal is applied to a separate Peak Detector, having a dynamic range of 60 dB. This detects the maximum peak value (positive or negative, whichever is the greatest) of the input signal and has a typical rise and decay rate of 1,7 dB/ μ s and 40 dB/s respectively.

To facilitate measurement of very short duration transient signals and single events a "Hold" mode may be chosen, whereby the maximum Peak or RMS level of the signal may be captured and displayed on the meter.

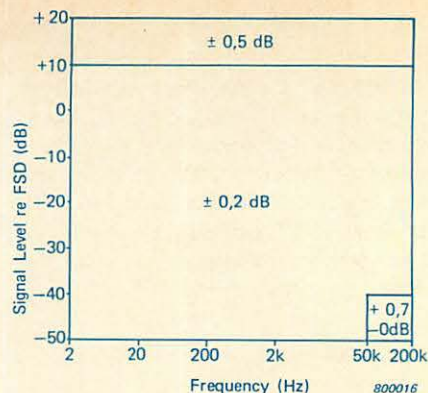


Fig.5. Typical measurement accuracy of the RMS Detector of the 2610 and 2636

Using the Peak Hold mode for example, signals as short as 25 μ s may be measured which have a peak excursion of 40 dB or less.

Rectifier and Meter Section - 2636

This is similar to that included in the 2610, but has a number of extra features, including a selectable Lin - Log response. For RMS measurements the same 70 dB dynamic range and $\pm 0,5$ dB overall ($\pm 0,2$ dB typical) indication accuracy are available, plus a crest factor allowance of 10 at full scale. With reduced meter deflections, however, signals with crest factors of more than 50 can be handled, in contrast to 20 with the 2610.

In addition to "Fast" and "Slow" time weighting functions there is an "Impulse" mode. This includes a 35 ms time constant and is for measurement of the maximum RMS level of impulsive sounds in accordance with IEC R 651. Also included for RMS measurements are a choice of time constants for precise averaging of signals when external filters are employed for frequency analysis. Six averaging time settings from 0,1 to

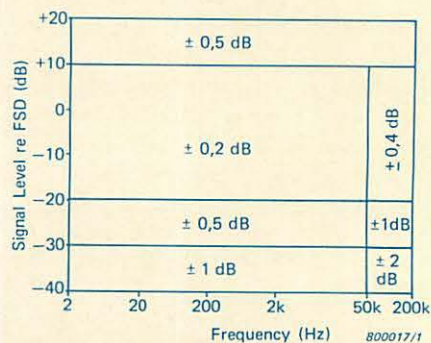


Fig.6. Typical measurement accuracy of the Peak Detector of the 2610 and 2636

30s are available, which if required may be selected remotely via the Averaging Time or Digital Interface sockets on the rear panel. This feature is of major benefit when using an Octave and Third Octave Band Pass Filter Type 1617, possibly together with a programmable calculator, with the 2636. See "Examples of Use".

For comprehensive measurement of peak levels, "+Peak", "-Peak" and "Max. Peak" indicating modes are available with the 2636. To accommodate for different types of signal, independent selection of 5; 0,5 and 0,05 dB/ μ s rise rates plus "Fast", "Slow" and "0,5 s Hold" decay functions is possible, which if desired can be set to ignore unwanted high frequency noise spikes and overshoot components.

Like the 2610 there is a separate "Hold" mode whereby the maximum Peak, RMS or Impulse level of short duration signals and single events may be captured and displayed. However, in this case signal peaks as short as 8 μ s may be measured which have a peak excursion of 40 dB. For measurements over the full 60 dB dynamic range of the Peak Detector, signals as short as 12 μ s may be measured.

Indicating Meter

Both Measuring Amplifiers include a row of range indicating lights at the bottom of their meter and are supplied with interchangeable scales which are calibrated for direct reading of measured sound, vibration and voltage levels. With the 2610 the meter has a fixed 30 dB Log display range, whilst with the 2636 separate settings for selection of Lin, 30 dB Log and 60 dB Log display ranges are available, which are indicated by lights at the top of the meter.

Besides the meter scales supplied a variety of other interchangeable scales are available, including types for sound absorption and underwater sound measurements. Scales for sound measurements are furnished with a K factor range whereby the Measuring Amplifiers may be calibrated for different microphone sensitivities using their internal reference voltage. If required special scales can be made up using the

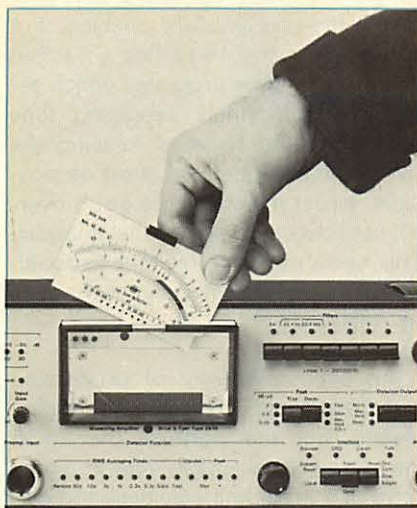


Fig.7. Insertion of interchangeable meter scale for direct reading of measured sound, vibration and voltage levels

Blank Scales SA 0082 (2610) and SA 0280 (2636) which are available, or alternatively they can be made to order. For a complete list of scales, ask for a separate data sheet.

Analog Outputs

For feeding magnetic tape as well as level and X-Y recording equipment, there are two AC and one DC calibrated signal outputs from the Measuring Amplifiers. The AC Outputs provide an amplified (and if connected filtered) version of the input signal, whilst the DC Output produces a rectified, time weighted, DC voltage proportional to the meter deflection on the Measuring Amplifiers. The maximum signal to noise ratio of the AC Outputs is 100 dB. Similarly for RMS and Impulse measurements the maximum dynamic range of the DC Output is approximately 70 dB, while for peak measurements it is 60 dB.

Digital Interface—2636

Supplementing the analog Outputs of the 2636 is a Digital Interface bus. This conforms with IEC 625-1 for programmable measuring apparatus and is for output of measurement results transmitted via a 10 bit A/D Converter in the instrument. Results can be sent at 10 ms intervals and are transmitted in printer or calculator format suitable for application to other digital equipment having an IEC or IEEE compatible interface such as the Graphics Recorder Type 2313, for example.

Besides output of measurement results, information can be sent of which front panel control settings are selected. If required these settings may be controlled remotely via a programmable desk top calculator, thus permitting fully automatic operation of the 2636. Control lights on the front panel of the Measuring Amplifier automatically show which particular control settings are chosen at any given instant.

Also shown by the control lights, is the status of the IEC interface. These indicate whether the 2636 is under remote control, requests service (SRQ) or is a Listener or Talker. When in Talk Only the Start and Stop of a read out can be controlled manually using the Read-Out switch of the instrument or may be controlled from the clock in a printer, for example.

In addition to a special program for automatic operation with the B & K Band Pass Filter Type 1617 (See "Examples of Use") plus read-out of measurement results and filter centre frequency to a printer etc., a program is provided for automatic self test of the 2636. This provides a basic check out of most analog functions available with the front panel control switches, testing the attenuator and detector linearity, filter thruput and noise, as well as the detector time constants. If a fault is detected, then a warning is provided and a print out of the fault can be obtained. The total check out time is approximately 3 minutes.

Examples of Use

Applications of the B & K Measuring Amplifiers are many. They may be used alone for accurate spot measurement of voltage signals, including very short duration types with high crest factors and fast slew rates; or as amplifiers where a wide choice of calibrated gain settings and high signal to noise ratio are required. They may also be used for comprehensive measurement in acoustics, electroacoustics and in shock and vibration investigations etc., for which B & K produce an extensive range of accessory equipment including transducers.

For detailed investigation of sound, vibration and voltage signals, the 2610 and 2636 may be coupled with an external filter, enabling discrete or swept frequency analysis to be performed. Suitable types of filter are shown in Fig.8. For AC or DC graphic recording of the analysis, a B & K Level or X-Y Recorder may be used, thereby enabling the analysis to be performed completely automatically with synchronous switching or tuning of the filter centre frequency.

An important advantage of DC recording is that averaging of the analyzed signal is performed by precise electrical R-C time constants in the Measuring Amplifiers. This is of particular value when using the 2636 Measuring Amplifier with the 1617 Octave and Third Octave Band Pass Filter, as with this combination analyses may be performed entirely automatically with the 1617 stepping the

Measuring Amplifier averaging time during the course of the analysis. For this purpose the 1617 has a number of averaging time programs which select the appropriate averaging time setting on the basis of keeping the overall analysis time as short as possible, whilst maintaining a good overall confidence level for the analysis. This saves considerable time especially when low frequency signals have to be analyzed.

An alternative way of processing and documenting results is by digital means. For this purpose the 2636 may be used to supply data in digital form to a programmable desk top calculator for example. Besides allowing large amounts of data to be quickly processed, a calculator may be used to control which particular measurement range, filter, detector, averaging time etc. is selected on the 2636, thus enabling a series of repetitive

measurements, frequency analyses and production line product performance checks to be carried out automatically. Furthermore, the calculating power of such an arrangement is virtually unlimited.

For documenting measurement results an Alphanumeric Printer Type 2312 or Graphics Recorder Type 2313 may be employed. With the latter a plug-in Application Package BZ 7005 should be fitted which is especially programmed for listing, plotting and storage of analysis results transmitted by the 2636 or stored on tape with the Digital Cassette Recorder Type 7400. In addition L_{eq} , difference spectrum as well as other types of statistical measurement based on stored and incoming data can be performed using the 2313.

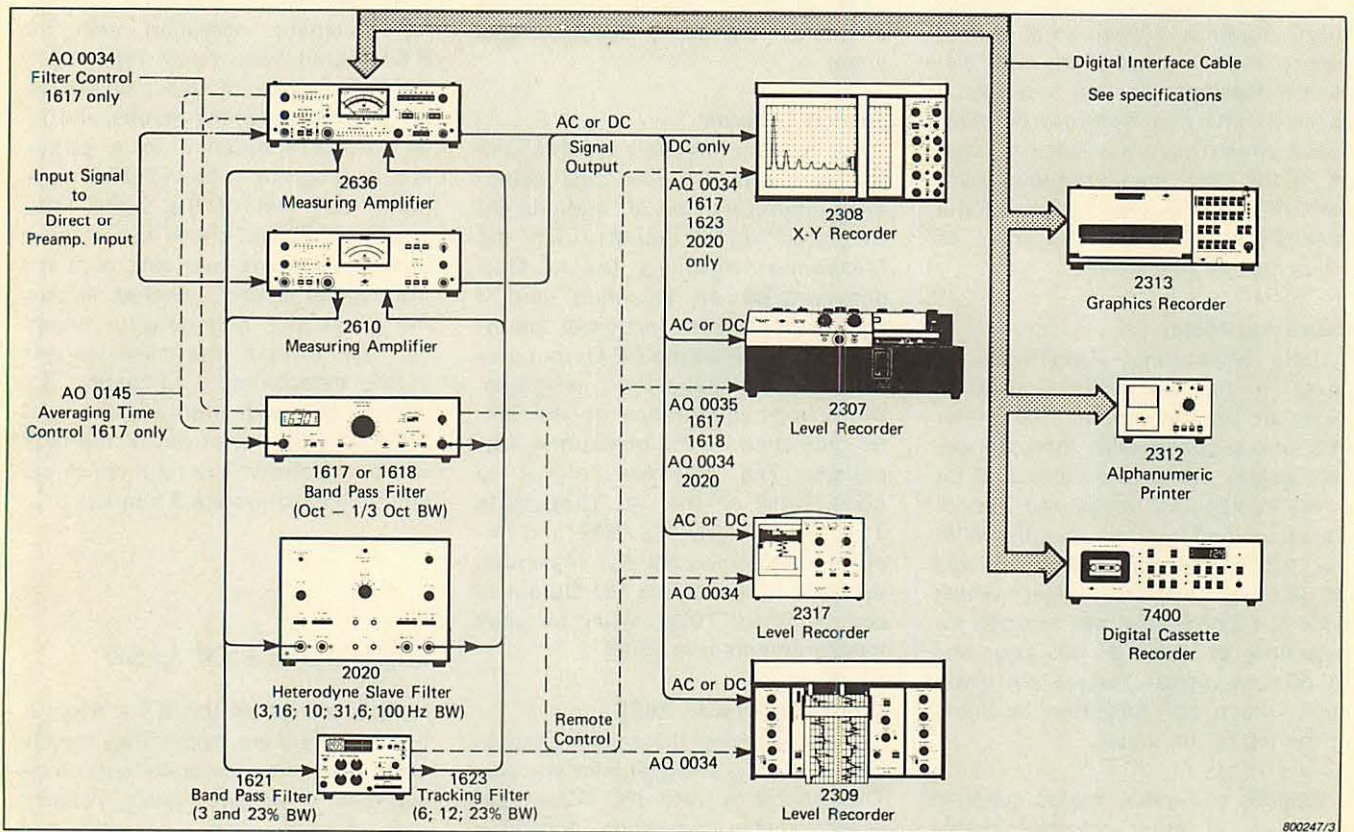


Fig.8. Analysis, recording and calculating instrumentation for use with the 2610 and 2636

Common Specification 2610 and 2636

Amplifier Response:

Measuring Ranges:

10 μ V to 30V FSD with LED indication of particular meter range selected.
100 μ V to 300V with 10:1 Attenuator Probe ZC 0016 supplied with 2636

Frequency Range (without filters):

2 Hz to 200 kHz ($\pm 0,5$ dB) — 2610 only
1 Hz to 200 kHz ($\pm 0,5$ dB) — 2636 only
10 Hz to 50 kHz ($\pm 0,2$ dB) — 2610:2636

Phase Deviation (without filters):

$\leq \pm 5^\circ$ between any two 2610's or 2636's in 20 Hz up to 20 kHz range

Overall Gain (for 1V FSD Output):

From -30 to $+100$ dB selectable in $10 \pm 0,05$ dB steps, plus extra 0 to 10 dB gain for continuous adjustment between steps. LED indication of particular gain setting selected

Direct Input:

Via standard B & K coaxial socket

Impedance: 1 M Ω || 70 pF (2610) or 1 M Ω || 90 pF (2636)

Max. Input Voltage: 42 V RMS in accordance with IEC 348, but can withstand up to 220 V RMS (50 to 60 Hz), 400 V peak including DC component

Preamp. Input:

Via standard B & K 7 pin microphone preamplifier socket. Supplies following

Microphone Polarization: 0; +28 and +200 V from 20 M Ω source

Preamplifier Voltage: +150 V (2 mA max.) 12 k Ω source

Heater Voltage: +6 V (at 200 mA) from 30 Ω source or +12 V (200 mA max.) from 100 m Ω source

Internal Reference:

Facilities calibration of 2610 and 2636 for sound, vibration and voltage measurements

Reference Signal: 50 mV RMS (~ 94 dB re 1 μ V), 1 kHz sine wave

Amplitude Stability: Better than 2% between +5 and 40°C (+41 and +104°F)

Ext. Filters:

Provision for connecting external filters

in series with internal filters and weighting networks via two BNC sockets on rear panel

To (Ext. Filter) Input: 1 V RMS nominal, 10 V peak max. output. Max. load 5 k Ω || 200 pF

From (Ext. Filter) Output: 1 V RMS nominal, 10 V peak max. input. Input impedance 1 M Ω || 50 pF

AC Outputs:

From Output Section Amplifier via standard B & K coaxial socket on front panel

1 V FSD Output: 10 V peak max. with max. load of 10 k Ω || 200 pF

Output Impedance: $\sim 100 \Omega$

From Recorder Amplifier via BNC socket on rear panel

1,6 V FSD Output (2610 only): 16 V peak max. with max. load of 10 k Ω || 200 pF

5 V FSD Output (2636 only): 50 V peak max. load of 10 k Ω || 200 pF

Output Impedance: $\sim 50 \Omega$

Overload Warning:

Gain indicators flash when Input and (or) Output Section is overloaded by positive or negative signal peaks of too high level

Input Overload Level: Equivalent to 5 or 10 times FSD on meter. Level selectable using switch on rear panel

Output Overload Level: Equivalent to 10 times FSD on meter

Min. Overload Duration: 200 μ s

Duration of Warning: 0,5 s or longer

Harmonic Distortion:

Input Section: $< 0,01\%$ at 1 kHz. $< 0,1\%$ at 50 kHz. Max. load 5 k Ω || 200 pF

Output Section: $< 0,1\%$ at 1 kHz. $< 0,3\%$ at 50 kHz. Max. load 10 k Ω || 200 pF

Noise Referred to Input:

Max. amplification with input shorted

Input Section Noise:

Lin 2 (or 22,4) Hz to 200 kHz $\leq 5 \mu$ V
Lin 2 (or 22,4) Hz to 22,4 kHz $\leq 1,5 \mu$ V
A, B and C Weighting $\leq 1,5 \mu$ V
D Weighting $\leq 2,5 \mu$ V

Output Section Noise:

Lin 2 Hz to 200 kHz $\leq 50 \mu$ V

Signal to Noise Ratio:

Approximately 100 dB in "100 mV" reference position

Influence of Magnetic Fields:

Input section with maximum gain and input short circuited $< 10 \mu$ V at 80 A/m 50 Hz

Electromagnetic Compatibility:

Comply with class B computing device of American FCC (Federal Communication Commission) Rules

Detector Temp. Stability:

$\pm 0,5$ dB from +5 to +40°C

Temperature Range:

Operation: +5 to +40°C (+41 to +104°F)

Storage: -25 to $+70^\circ$ C (-13 to $+158^\circ$ F)

Humidity:

0 to 90% RH non condensing

Power Requirements:

Complies with IEC 348 Safety Class II

Supply Voltage: 100; 115; 127; 200; 220; 240 V (50 - 60 Hz) $\pm 10\%$ AC

Power Consumption:
 ~ 25 VA nominal (2610 only)
 ~ 31 VA nominal (2636 only)

Cabinet:

Supplied as model A (light-weight metal cabinet), B (model A in mahogany case), or model C (as A but with flanges for standard 19 inch rack)

Dimensions:

Metal cabinet excluding knobs and feet
Height: 133 mm (5,2 in)
Width: 430 mm (16,9 in)
Depth: 200 mm (7,9 in)

Weight:

2610: 5,2 kg (11,5 lb)
2636: 6,5 kg (14,3 lb)

Additional Specifications 2610 Only

Filter Modes:

22,4 Hz: High pass filter with low frequency attenuation slope of 18 dB/octave (60 dB/decade)

A-Weighting: In accordance with IEC 651 (Type 0) for precision sound level meters

Ext.: See Common Specification

Meter Indication:

Moving coil meter with interchangeable meter scales and LED indication of particular measurement range selected

Measurement Range: 10 μ V to 30 V FSD selectable in accurate $10 \pm 0,05$ dB steps

Indicating Ranges: 0 to 10 and 1 to 30 logarithmic graduated amplitude ranges, plus 0 to 30 dB lin graduated range

Detector Characteristics:

For Meter and DC Output

RMS Mode:

Crest Factor Capability: 10 at full scale, 20 for lesser deflections

Dynamic Range: +20 to -50 dB re FSD
Accuracy: $\pm 0,2$ dB typ. $\pm 0,5$ dB overall
Averaging: "Fast" and "Slow" in accordance with IEC 651 (Type 0), plus 20 s effective averaging time

Max. (Positive or Negative) Peak Mode:
Dynamic Range: +20 to -40 dB re FSD
Accuracy: $\pm 0,2$ dB typ. See Fig. 6.

Rise Rate: 1,7 dB/ μ s corresponding to rise time of ~ 25 μ s for 40 dB change in signal level

Decay Rate: 40 dB/s

Max. Hold Mode: Meter and DC Output hold Max. RMS or Peak level of signal. Hold decay $< 0,2$ dB/minute at 25°C

Reset Mode: Meter and DC Output reset to zero with 0,3 s delay before meter indication and DC output voltage restored

DC Output:

From Detector Amplifier via BNC socket on rear panel

Output Voltage: 100 mV/dB; 5 V DC re FSD; 7 V (10 mA) max.

Output Impedance: ~ 50 Ω

Dynamic Range: See Detector Characteristics

Accessories Included:

1 Power Cable..... AN 0020
2 BNC Plugs JP 0035
2 B & K Coaxial Plugs JP 0101
2 Banana Plugs JB 0002
1 Preamp. Plug Adaptor..... DB 2609

Meter Scales Included:

Volts, dB (30 dB Log)..... SA 0238
dB SPL (28-89 mV/Pa)
(30 dB Log) SA 0252
dB SPL (5-16 mV/Pa)
(30 dB Log) SA 0253
 ms^{-2} universal (30 dB Log)..... SA 0250
See General Accessories Product Data for other scales available

Additional Specifications 2636 Only

Filter Modes:

22,4 Hz: High pass filter with low frequency attenuation slope of more than 30 dB/octave (100 dB/decade)

22,4 kHz: Low pass filter with high frequency attenuation slope more than 30 dB/octave (100 dB/decade)

A; B; C and D Weighting: In accordance with IEC 651 (Type 0) for precision sound level meters

Ext.: See Common Specification

Meter Indication:

Moving coil meter with interchangeable scales and LED indication of measurement and scale range selected

Measurement Ranges: 10 μ V to 30 V FSD selectable in accurate 10 $\pm 0,05$ dB steps. 100 μ V to 300 V FSD with 10:1 Attenuator Probe ZC 0016 supplied

Lin Mode Indicating Ranges: 0 to 10 and 0 to 31,6 Lin graduated amplitude ranges, plus $-\infty$ to +20 dB range

30 dB Log Mode Indicating Ranges: 0 to 10 and 1 to 30 Log graduated amplitude ranges, plus 0 to 30 dB Lin graduated range

60 dB Log Mode Indicating Ranges: 0,3 to 300 and 1 to 1000 Log graduated amplitude ranges, plus 0 to 60 dB Lin graduated range

Detector Characteristics:

For Meter and DC output

RMS Mode:

In accordance with IEC 651 Type 0 except for meter overswing with the Log 60 dB indicating mode

Crest Factor Capability: 10 at full scale; Up to 50 for lesser deflections

Dynamic Range: +20 to -50 dB re FSD
Accuracy: $\pm 0,2$ dB typ. $\pm 0,5$ dB overall
Averaging: "Fast" and "Slow" to IEC 651 (Type 0), plus 0,1; 0,3; 1; 3; 10 and 30 s averaging times

Positive, Negative and Max. Peak Modes:

Dynamic Range: +20 to -40 dB re FSD
Accuracy: $\pm 0,2$ dB typ. See Fig. 6.

Rise Rate: 5; 0,5 and 0,05 dB/ μ s corresponding to rise time of 8, 80 and 800 μ s for 40 dB change in signal level

Decay Rate: "Fast" (43,4 dB/s); "Slow" (4,34 dB/s) and 0,5 s Max. Hold

Impulse Mode: In accordance with IEC 651 (Type 0 impulse) for precision sound level meters

Max. Hold Mode: Meter and DC Output hold Max. RMS, Impulse and Peak Level of signal. Hold decay $< 0,2$ dB/minute at 25°C

Reset Mode: Meter and DC Output reset to zero with $\sim 0,3$ s delay before meter indication and DC output voltage restored

DC Output:

From Detector Amplifier via BNC socket on rear panel

Log. Mode Output: 100 mV/dB; 5 V DC re FSD; 7 V (10 mA) max

Lin. Mode Output: 5 V DC re FSD; 12 V (10 mA) max.

Digital Section:

Accuracy: $\pm 0,1$ dB (Log) at 25°C
 $\pm 0,3\%$ (Lin) of FSD

Gain Error: $\pm 0,2$ dB at FSD at 5 to 40°C

Conversion Time: 10 ms $\pm 0,1\%$

IEC Digital Interface:

Conforms to IEC 625-1, compatible with IEEE Std. 488 interface

IEC Functions Implemented: Source Handshake (SH 1), Acceptor Handshake (AH 1), Talker (T 5), Talk Only, Listener (L 4), Remote Local (RL 1), Service Request (SR 1)

Data: Format for calculator or printer may be selected. Data transmitted via A/D converter every 10 ms

Code: ISO 7 bit code (i.e. ASCII, but without parity bit)

Remote Control: Front panel settings selectable via standard interface

Special functions included:

1617-2636 Control: Program for automatic operation with 1617 Band Pass Filter and averaging time selection with 2636, plus readout of frequency and measurement results to printer

Self Test: Program for automatic self test and basic check out of 2636. Checks front panel switch functions, attenuator and detector linearity, detector time constants, filter attenuation and noise. Check out time approximately 3 minutes

Accessories Included:

1 Power Cable..... AN 0020
1 IEC Bus Connector Kit..... JA 0793
2 BNC Plugs JP 0035
2 B & K Coaxial Plugs JP 0101
2 Banana Plugs JP 0002
1 10:1 Attenuator Probe..... ZC 0016
1 B & K to BNC Adaptor..... JP 0144
1 Preamp. Plug Adaptor DB 2609
Various fuses and lamps

Accessories Available:

1617 Filter Control Cable..... AQ 0034
Averaging Time Control Cable.. AO 0145
IEC 625-1 Interface Cable
(2 m)..... AO 0194
IEC (male, slide-lock) to IEC
625-1 Interface Cable (2 m).... AO 0184
Adaptor for coupling into
IEEE 488 Interface System..... AO 0195
IEC 625-1 to IEEE 488 Inter-
face Cable (2 m)..... AO 0264

Meter Scales Included:

Volts, dB (Lin)..... SA 0259
Volts, dB (30 dB Log)..... SA 0260
Volts, dB (60 dB Log)..... SA 0261
dB SPL (28 - 89 mV/Pa)
(30 dB Log) SA 0262
dB SPL (5 - 16 mV/Pa)
(30 dB Log) SA 0263
dB re 1 μ V universal (Lin);
30 and 60 dB Log) SA 0267
 ms^{-2} universal (30 dB Log)..... SA 0270
See General Accessories Product Data for other scales available