Expansion Unit

type 5765

for use with Digital Frequency Analyzer Type 2131

FEATURES:

- Expands 2131 analysis range by nine 1/3 octave channels
- Averaging time selectable from 1/16 s, 1/4 s, 1 s or 16 s
- Two additional channels can be added as an option
- Simple connection to 2131

USES:

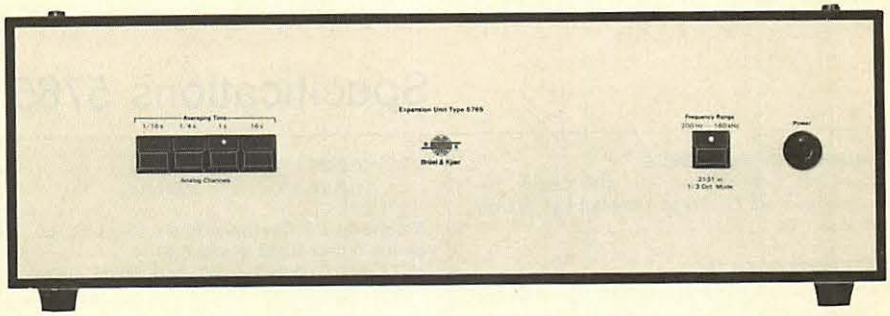
- Extension of 2131 1/3 octave frequency range to 160 kHz

Introduction

The Expansion Unit Type 5765 is an auxiliary unit used with the Digital Frequency Analyzer Type 2131 to increase the 1/3 octave real-time analysis range beyond the 20 kHz limit of the standard analyzer. In its standard version, the 5765 contains nine 1/3 octave channels with center frequencies from 25 kHz to 160 kHz. The 2131/5765 combination covers the frequency range between 1,6 Hz and 160 kHz, i.e. 51 1/3 octave channels. A further two channels of analysis may be added to the 5765 as an option. These two channels might then be used to measure A, B, or C weighted signal levels, or linear weighted signals up to 40 kHz (limited due to residual noise considerations). Also, on special request, other filters may be built into the 5765 replacing some or all of the 1/3 octave filters.

Unlike the 2131, operation of the 5765 is based on analog rather than digital filtering. This is because the sampling frequencies required for digital filtering to 160 kHz are inconsistent with those used in the 2131. Analog detection is also employed to give exponentional averaging of the filter outputs with selectable averaging times of 1/16 s, 1/4 s, 1 s or 16 s. (Note that linear averaging as found on the 2131 is not available in the 5765 channels.)

The nine extra channels provided by the 5765 are displayed in channels 44 to 52 in the 2131 display, to the right of the 20 kHz column. The channels may be displayed by pressing the Frequency Range pushkey on the 5765, and their levels and frequencies may be read using the 2131 channel selector. In an analog or digital readout, the nine channels are output after the 20 kHz channel. An analog readout requires that the Frequency



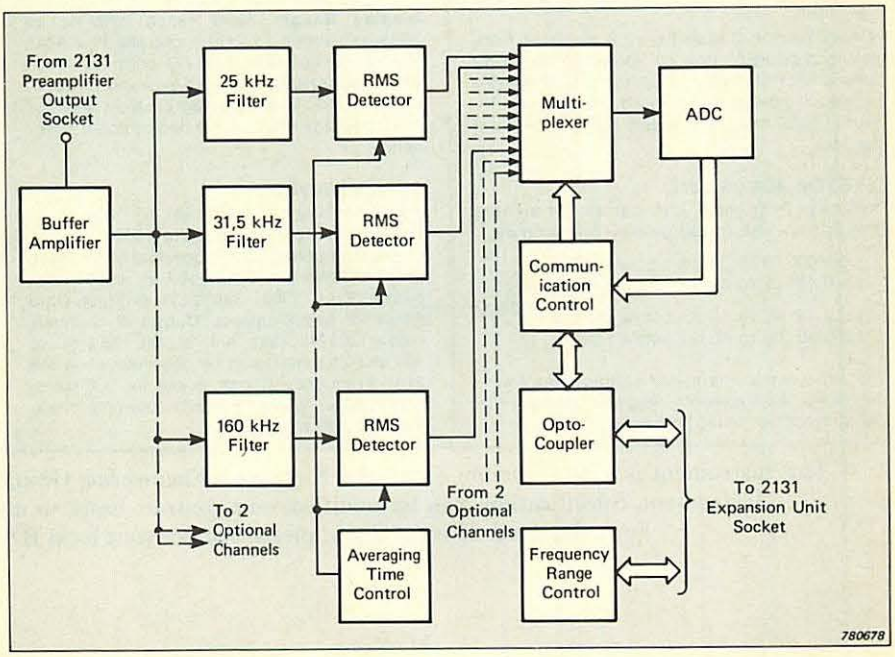


Fig. 1. Block diagram of the Type 5765 Expansion Unit

Range be set to "200 Hz to 160 kHz", meaning that the data in channels below 200 Hz are not output. A digital read-out always contains the entire spectrum from 1,6 Hz to 160 kHz.

When used, the two optional channels appear in channels 53 and 54 in the 2131 display and are always displayed and included in analog and digital read-outs as the last two channels of the spectrum.

Description

A simplfied block diagram of the 5765 is given in Fig. 1. This shows the nine (or eleven when the two optional channels are used) parallel channels of filtering and detection. The input to each channel is taken, via a Buffer Amplifier, from the Preamplifier Output of the 2131. The output of each channel is then multiplexed into a 10-bit analog-to-digital converter. The digitized values are then transmitted to the 2131 via an Opto-Coupler system to avoid ground loop problems.

The 1/3 octave filters of the 5765 meet IEC 225, ANSI S1.11 Class III, and DIN 45652. A typical filter characteristic is shown in Fig. 2. The detectors are logarithmic RMS detectors with selectable 1/16 s, 1/4 s, 1 s and 16 s averaging times. The crest factor capability of each detector is 9 dB at full scale deflection, rising to 30 dB at 21 dB under FSD and below.

The 5765 output is not displayed when the 2131 is set to analyze in full octaves. It is also disabled when the 2131 is set to A-weighting, since the Preamplifier Output of the 2131 will still be unweighted, and analysis errors may otherwise result.

The 2131 must be modified slightly to use the 5765. This modification can easily be carried out in the field. Note that the use of the 5765 with a 2131 already containing the Two Channel Extension Unit WH 0490 requires a special controller, the WH 0333, to be mounted in the 2131, and that the two optional channels of the 5765 can no longer be used.

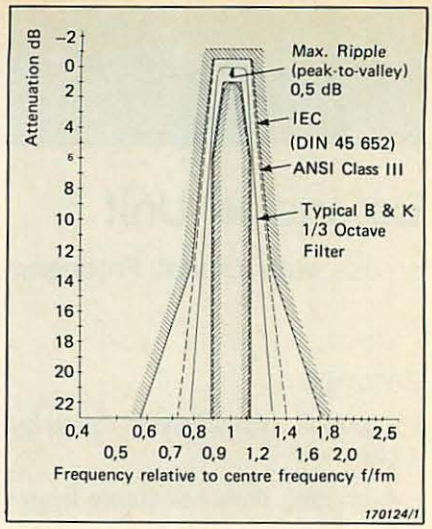


Fig. 2. Typical B&K 1/3 octave filter characteristic

Specifications 5765

NUMBER OF CHANNELS:
Nine 1/3 octave channels with center frequencies from 25 kHz to 160 kHz; two optional channels

1/3 OCTAVE FILTERS:
Meet IEC 225, ANSI S1.11 Class III, and DIN 45652. Peak-to-valley ripple in passband <0,5dB

RMS DETECTORS:
Detector Characteristic: Logarithmic true RMS detection
Dynamic Range: >60 dB
Averaging Times: 1/16 s, 1/4 s, 1 s, and 16 s, all ±10%
Crest Factor Capability: 2,8 (9dB) at FSD, rising proportionately to 30 (30 dB) at 21 dB below FSD. Detector accuracy not influenced by input signals with crest factors up to 15, but ±1 dB must be added for higher crest factors

SYSTEM ACCURACY:
With the 2131 input attenuators set so that the bottom line of the display reads 50 dB:

±0,5 dB	0 to 35 dB below FSD	at 25°C
±1,0 dB	35 to 45 dB below FSD	
±2,0 dB	45 to 55 dB below FSD	
±3,0 dB	55 to 60 dB below FSD	

For other input attenuator settings, the tolerances for the frequency response of the 2131 input amplifier must be added:
±0,2 dB f<100 kHz
±0,5 dB 100 kHz to 200 kHz

Temperature Coefficient: ±0,03 dB/°C between 0 and 50 dB below FSD
±0,1 dB/°C between 50 and 60 dB below FSD

DISPLAY OF CHANNELS:
Nine 1/3 octave channels in channels 44 to 52 of the 2131 display; two optional channels (when used) in channels 53 and 54 of the 2131 display. Display disabled when 2131 set to full octave analysis or A-weighting

Display Range: Third range "200 Hz to 160 kHz" added to 2131, controlled by 5765 but interlocked with the 2131 controls
Alphanumeric Read-out: Level and frequency from 2131 display using channel selector (no frequency read-out for two optional channels)

ANALOG OUTPUT:
When Frequency Range set to "200 Hz to 160 kHz", output of 200 Hz to 160 kHz range of spectrum plus the two optional channels to a Level Recorder Type 2307 or an X-Y Recorder Type 2308. See 2131 Product Data sheet for specifications. Output of channels below 200 Hz (but not of the 25 kHz to 160 kHz channels) can be obtained when the 2131 Frequency Range is set to "1,6 Hz to 1,25 kHz" or 25 Hz to 20 kHz; optional channels are still read out

DIGITAL OUTPUT:
Output of entire spectrum from 1,6 Hz to 160 kHz plus two optional channels over 2131 IEC interface. See 2131 Product Data sheet for specificatons

ENVIRONMENTAL:
Operating Temperature Range: 5°C to 40°C (+14°F to +104°F)
Humidity: up to 90% r.h. (non-condensing) at 30°C

POWER SUPPLY:
100, 115, 127, 220, 240 V AC ±10%, 50 to 60 Hz.
Complies with Safety Class I of IEC 348
Power Consumption: Approx. 38 VA

DIMENSIONS:
Height: 133 mm (5,25 in)
Width: 430 mm (17,0 in)
Depth: 320 mm (12,6 in)

WEIGHT:
8 kg (17,6 lb)

ACCESSORIES INCLUDED:

1 Mains Cable	WL 0251
1 Coaxial Cable	AO 0133
1 15-core Connection Cable	WL 0234
2 1/4-A Fuses	VF 0031
2 1/2-A Fuses	VF 0023

This instrument is a development of the B&K Systems Engineering Group and is not a standard production instrument. Specifications can be modified, on a contract basis, to meet individual requirements.
For prices and delivery times, please contact your local B&K representative.