

**BPF205
Band Pass Filter
Module**



CONTENTS

- SECTION 1 - DESCRIPTION
- 2 - SPECIFICATIONS
- 3 - OPERATION
- 4 - MAINTENANCE
- 5 - SCHEMATIC DRAWING 9239
- 6 - WARRANTY



SPECIFICATION SUMMARY

MODEL BPF205 BAND-PASS FILTER

FOR THE MC1 MODULAR SYSTEM

1.0 DESCRIPTION

The BPF205 Band-Pass Filter is a plug-in module for the MC1 Signal-Conditioning System. It provides a selectable frequency pass-band from DC, 10, 20, 50, 100 or 200 Hz to 200, 500, 1K, 2K, or 10 kHz, with a 12 db rolloff at both the selected low-frequency and high-frequency ends. An attenuator is provided at the input to permit high-noise signals to be applied without exceeding the linear amplifier dynamic range limits of ± 10 V peak. The 0.1X, 1X attenuator is selectable by a front-panel switch. The output amplifier has an X1, X10 gain-selector switch mounted on the front panel. This allows the overall module gain to be normalized for unity.

The output amplifier is capable of 100 mA peak current at 10 volts peak output. The "B" output has provisions for attenuator resistors which allows a galvanometer damping resistor to be added by the user. The unit is normally provided with the "B" output jumpered to the "A" output. An optional 12 VDC output at 0.5 mA is available for supplying power to a piezo-electric accelerometer with an internal impedance converter.

The BPF205 can be plugged into any channel of the MC1 Case, which supplies the ± 15 VDC operating power. The signal input is connected to the transducer input connector on the rear panel of the MC1 Case, and the output taken from the XLR3 connector on the rear panel. This output can be connected by cable to the input of another module, such as the PA89 Vibration Amplifier or the AM49 Integrating Amplifier for further conditioning.

By selecting the DC high-pass position, the unit can be used as a low-gain DC buffer amplifier. A capacitively-coupled AC input is also available at the MC1 input connector, which allows operation at high DC bias levels. Pin-jacks are located on the front panel for monitoring the input and output signals.



2.0 SPECIFICATIONS

Input: Input Attenuator

	(X1)	(X0.1)	
AC/DC Signal, Pins 2 & 4 of MC1 input Input Bias, Max	7 VAC ±2 VDC	50 VAC ±20 VDC	DC or Band-pass Modes
Max Input Bias, AC input via Pins 3 & 4 of MC1 input	±20 VDC	±50 VDC	Frequency Res- ponse 8 Hz min.
Input Impedance	1 M Ω	90 K Ω	

Input Attenuator: X1 or X0.1 }
 Output Gain: X1 or X10 } selectable by front panel switches

<u>Frequency Response:</u>	<u>Low</u>	<u>High</u>
Selectable by front-panel switches	DC	200 Hz
	10 Hz	500 Hz
	20 Hz	1 kHz
	50 Hz	2 kHz
	100 Hz	5 kHz
	200 Hz	10 kHz

Output: 0-7 VAC RMS max, 0-100 ma peak;
 Pins 1 & 2 of MC1 outputs

Output Impedance: Less than 1.0 ohm, no damage
 from short circuit

Linearity: 0.1% F.S., DC Mode

Output Noise: 10 mv. RMS max

Excitation Output (Optional) 12 VDC at 0.5 ma

Temperature Range: 0-160⁰F, operating

Thermal Zero Shift: 0.005%/⁰F max } (DC Mode, X1 Gain)

Thermal Sensitivity Shift: 0.01%/⁰F max }

Power Required: ±15 VDC, supplied by MC1 Case

Size: 1-3/8" X 3-3/4" panel; plugs
 into single channel of MC1 Case



3.0 OPERATION

3.1 Connections

The BPF205 plugs into any slot in the MC1 series of module cases. Input and output connections are available on the rear panel of the MC1 case as follows:

Input (WK4-32S Connector):

- Pin 1 - N/C (+ 12 VDC if excitation option ordered)
- 2 - AC/DC Signal Input
- 3 - AC Signal with high DC bias
- 4 - Signal Input Return

Outputs (both XLR-3-32S Connectors):

- Pin 1 - Output Signal
- 2 - Output Common
- 3 - Chassis Ground

An interconnect cable, XLR-3-11C to WK-4-21C, is required to connect the output of the BPF205 to the input of another MC1 signal-conditioning module or to connect the output of another module to the input of the BPF205.

3.2 Operating Controls

The front panels controls handle the following functions:

High-Pass Selector Switch:

A six-position rotary switch for selecting the low-frequency end of the band-pass desired.

Low-Pass Selector Switch:

A six-position rotary switch for selecting the high-frequency end of the band-pass desired.

Input Attenuation Switch:

A toggle switch for selecting an input attenuation of X1 (none) or X.1 (input signal decreased by factor of 10). With this switch in the X1 position, the maximum input voltage is limited to 10 V peak. With this switch in the X.1 position, the maximum input voltage is limited to 100 V peak.

Output Gain Switch:

A toggle switch for selecting a gain of X1 or X10. In either position, the output voltage is limited to 12 VDC.



3.3 Preliminary Checkout:

Plug the BPF205 into the MC1 case, and connect a digital voltmeter between the output and ground test points on the front panel. Short the input and ground test points. Set the HIPASS selector switch to DC, the Input Attenuator Switch to X1, and the Output Gain Switch to X10. With power on, the output should read zero ± 25 mVDC. If higher, see Calibration Section for adjustment.

Set the Input Attenuator and Output Gain Switches to X1. Connect a source of 10.00 VDC to the input test points. The output should read 10.00 ± 0.05 VDC. Flip the Input Attenuator Switch to the X.1 position. The output should read 1.00 ± 0.05 VDC. If not, see Calibration Section for Attenuator adjustment. Any input voltage level can be used for this gain check as long as the output voltage at any combination of input attenuation and output does not exceed 10 VDC.

If the above checks are satisfactory, the unit is ready for use.

3.4 AC Input:

For an AC input up to 10 V peak with a high DC bias (up to ± 20 VDC with X1 input, attenuation or ± 50 VDC with X.1 input attenuation) the input can be capacity-coupled by using Pins 3 and 4 of the MC1 input connector.

3.5 Dual Outputs:

The BPF205 provides dual outputs which are available at the Output A and Output B connectors on the MC1 case. Bifurcated terminals are available on the circuit board for user installation of attenuation resistors to obtain a lower B Output, as shown in Figure 1. Unless otherwise specified, the unit is supplied with Outputs A and B the same (the R_A terminals jumpered and the R_B terminals open).

3.6 Optional DC Excitation Output:

For units equipped with this option, a 12 VDC output at 0.5 ma maximum is available between Pin 1 (+ 12 VDC) and Pin 4 (gnd) of the MC1 input connector. This output is intended for excitation of piezo-electric accelerometers equipped with internal impedance converters.



4.0 MAINTENANCE

4.1 Calibration Adjustments

The BPF205 has been factory-adjusted to the specified performance. If periodic calibration is required, the following procedure will allow readjustment of the input attenuation and output zero. As these adjustments are located internally on the circuit board and may not be readily accessible with the module plugged into the MC1 Case, a module extension cable may be required. If this is not available, the ± 15 VDC power, signal input, and output connections can be made to the circuit board terminals as designated on the schematic diagram.

As both the low and high-frequency cutoff points of the pass-band are determined by the values of fixed components, no frequency adjustments are available. If a frequency-response check is required, this can be done by using a sine-wave function generator to supply the input and an oscilloscope to read the output.

4.1.1 Attenuator Adjust

- (a) Apply ± 15 VDC power, connect digital voltmeter to output, set HIPASS switch to DC, set ATTEN switch to X.1, set GAIN switch to X1.
- (b) Apply 10.00 VDC to input; adjust R6 (screwdriver pot on circuit board; see Figure 1) for 1.00 ± 0.01 VDC output.

4.1.2 Output Zero Adjust

- (a) Apply ± 15 VDC power, connect digital voltmeter to output, set HIPASS switch to DC, set ATTEN switch to X1, set GAIN switch to X10.
- (b) Short the input; adjust R36 (screwdriver pot on circuit board; see Figure 1) for ± 0.1 VDC output.

4.2 Repair

In cases of malfunction which cannot be corrected by calibration or adjustment procedures, we recommend that the unit be returned to the factory, transportation prepaid, for evaluation and repair.

All returns must be accompanied by information giving the original purchase order number and date, plus the type of malfunction. If the unit is not within the standard warranty period, an estimate of the repair cost will be provided prior to commencement of work.



Validyne ENGINEERING CORPORATION

4.2 Repair (Continued)

Address all returns and correspondence to:

Validyne Engineering Corporation
8626 Wilbur Avenue
Northridge, California 91324

Attention: Customer Returns

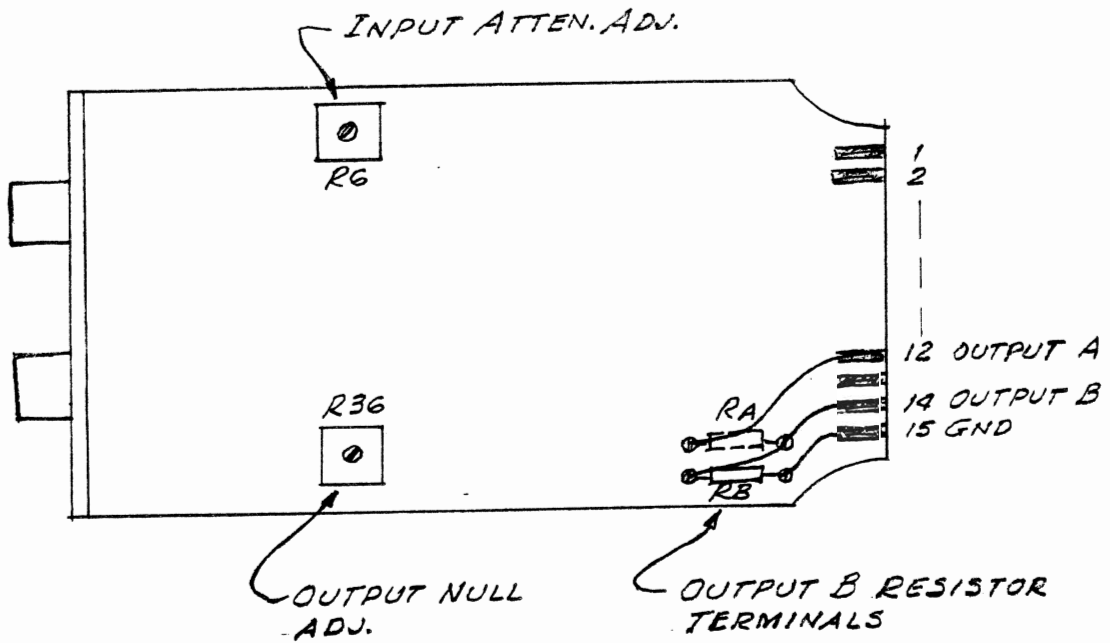
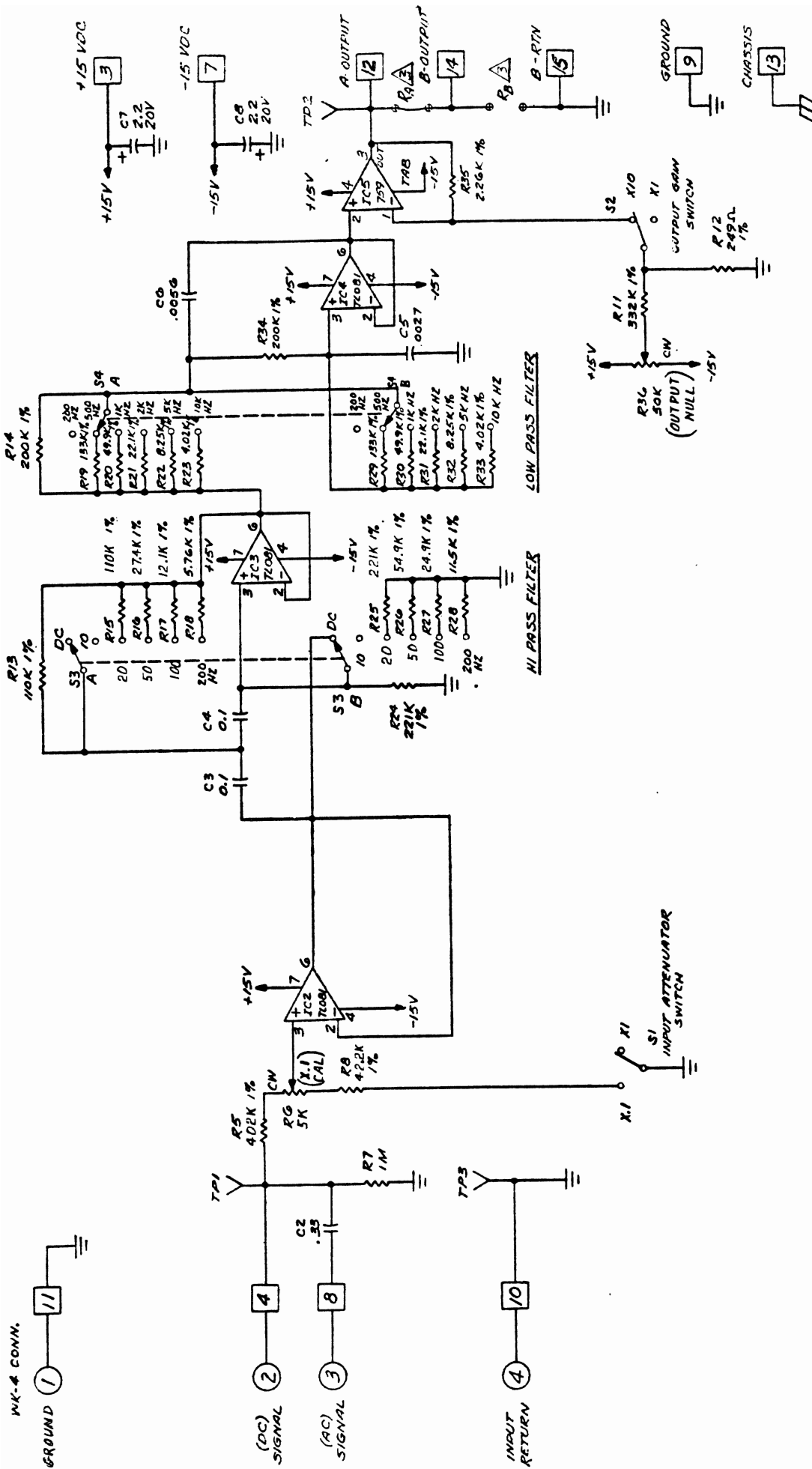


FIG. 1 - BPF205 ADJUSTMENT LOCATIONS



BAND PASS FILTER

- 1. CUSTOMER INSTALLED OPTION.
 - 2. CAPACITOR VALUES ARE IN MICROFARADS.
 - 3. RESISTOR VALUES ARE IN OHMS ±5%, 1/4 WATT.
- NOTES: UNLESS OTHERWISE SPECIFIED



PCN NO. N/A

DATE October 24, 1991

SHEET 1 OF 1

PUBLICATION CHANGE NOTICE

This notice is issued to change or update this publication for Validyne Model MC1 Plug in signal conditioners

For all instruments, make changes in this publication as listed below:

For instruments having model dash number _____ make the following publication changes:

This PCN is to add input and output connector information for the following MC1 plug in signal conditioners:

PCN NO.

BA112	AD136	CD148	NI167
LPF162	LPF167	CD18	CD19
PM204	BPF205	EC209	PM212
FC236	TC243	CD257	
AM49	PT60	FC62	AL64
SG71	PA89	CD90	PE251
TC453			

WK4-236

1
2
3
4

PTO2A

A
B
C
D

TERMINAL STRIP

1
2
3
4

A XLR-3

1
2
3

A XLR-3

1
2
3

5
6
NONE

B XLR-3

1
2
3

B XLR 3

1
2
3

7
8
NONE

WARRANTY

VALIDYNE ENGINEERING CORPORATION warrants equipment of its own manufacture to be free from defects in material and workmanship under normal conditions of use and service.

VALIDYNE will rework or replace any item found to be defective on as return to VALIDYNE within the time specified below:

1. Pressure Transducers and Pressure Transmitters (including transducers supplied as part of Digital Manometer Systems) within three (3) years of its original purchase.
2. Electronics products (Transducer Indicators, Carrier Demodulators, plug-in SignalConditioners, Module Cases, etc.) within one (1) year of its original purchase.
3. OEM Transducers within one (1) year of its original purchase.

Buyer is requested to secure authorization of VALIDYNE, and to describe defect prior to return of equipment under warranty. Shipment to VALIDYNE shall be at Buyer's expense, with return at VALIDYNE's expense. NON-VERIFIED problems or malfunctions, whether warranty or not, are subject to a \$100.00 evaluation charge.

The warranty carries no liability, either expressed or implied, beyond our obligation to rework or replace, at VALIDYNE's option, the unit which carries the warranty to the original purchaser. Prices, specifications, and designs are subject to change without notice. This warranty is void if the product is subjected to misuse, accident, neglect, or improper application or operation.

Out of Warranty Rework

Units returned to VALIDYNE for rework which are out of warranty will be subject to the following conditions:

1. A description of the problem or malfunction shall accompany the unit returned for rework, or be communicated to VALIDYNE prior to shipment. Otherwise there will be a minimum evaluation and/or calibration charge of \$100.00.
2. Unit will be reworked automatically if the charge is less than 65% of current list price, unless other specific instructions are received. Above 65% VALIDYNE will request authorization by Buyer.
3. If a quotation is required before proceeding with rework, unit should be accompanied by a document so stating, or communicated to VALIDYNE prior to shipment. A \$100.00 evaluation charge will be invoiced for this service.
4. Shipping charges in both directions are the responsibility of the Buyer for all out of warranty returns.

Warranty on Rework

Warranty coverage on rework is 90 days on work done, or to the end of the original warranty period, whichever is longest.



8626 Wilbur Avenue - Northridge, CA - 91324
818-886-2057 - Toll Free 800-423-5851 - Automatic Fax 818-886-6512