

**BA112
Buffer Amplifier
Module**

SECTION I

GENERAL

1.1 DESCRIPTION

The BA112 is a signal-conditioning amplifier plug-in module to the MCI Multi-Channel Transducer System. The module provides a high impedance, differential input for AC and DC signals and a low impedance, single-ended output.

Overall gains of 10, 1.0 and 0.2 are obtained by a three-position toggle switch. Additionally, the gain may be varied from zero to 100% at each gain setting with a 10-turn Gain vernier control.

1.2 FUNCTIONAL BLOCK DIAGRAM

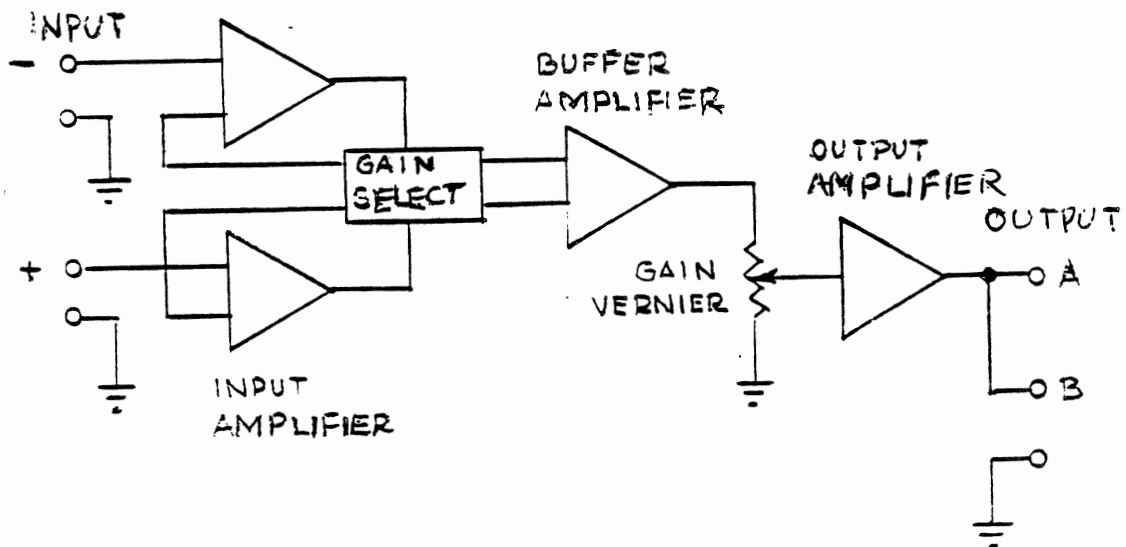


FIGURE 1

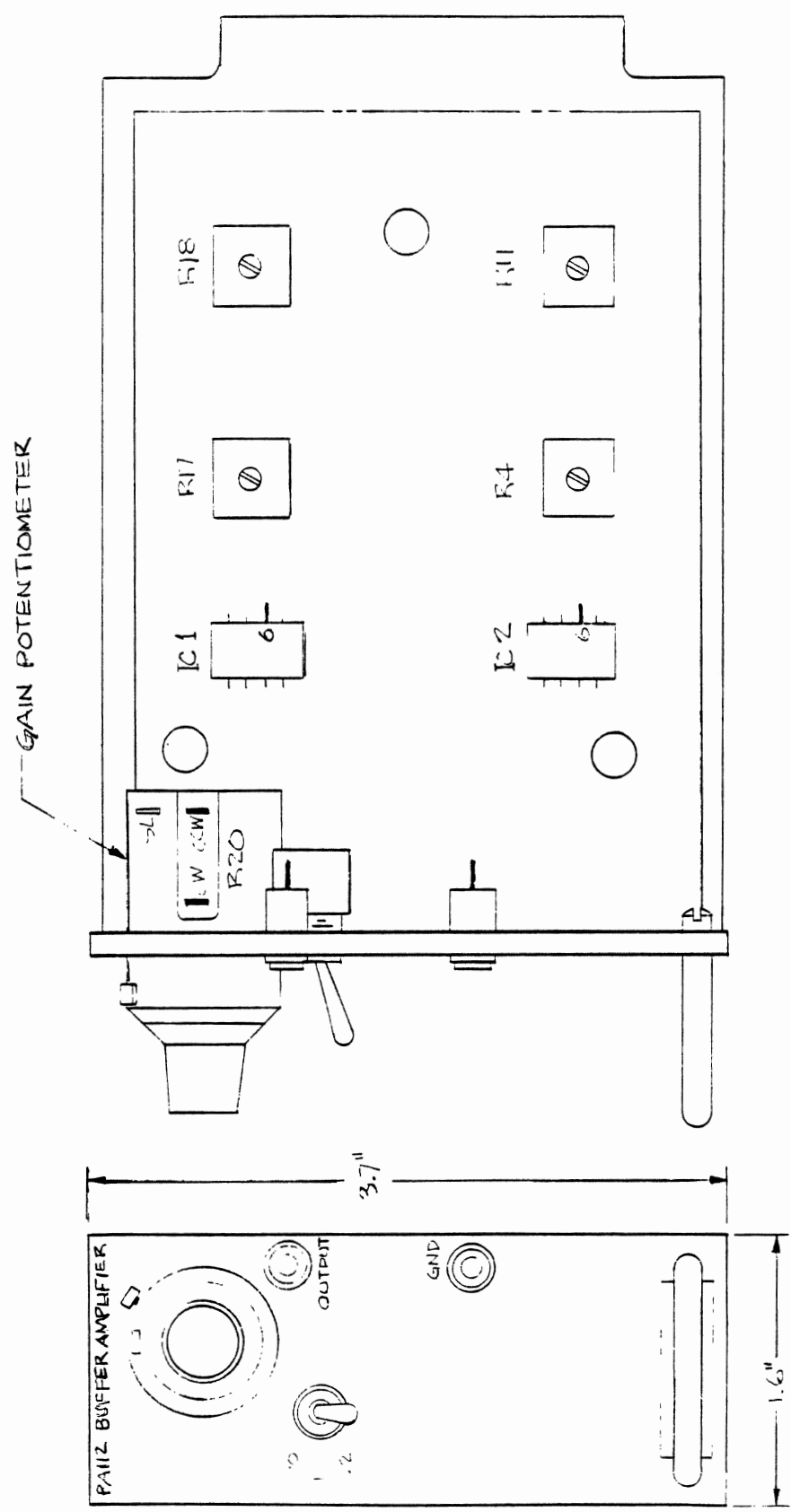
SECTION II SPECIFICATIONS

2.1 ELECTRICAL

Input:	GAIN	MAX + OR - INPUT TERMINAL VOLTAGE	MAX. DIFF. INPUT
	0.2	±12V	±20V
	1.0	±12V	±10V
	10.0	±6V	±1V
	Will not be damaged by momentary application of 115V		
Input Impedance:	22 meg ohms, each input to circuit ground		
Gain:	10, 1.0 and 0.2, switch-selectable		
Gain Vernier:	Provides 0 to 100% adjustment at each gain setting by 10-turn potentiometer with calibrated dial		
Output:	±10V at 10 ma max. No damage if output terminals shorted		
Output Impedance:	Less than 10 ohms		
Frequency Response:	Flat DC to 10 kHz		
Common Mode Rejection:	60 db typical, DC to 1 kHz. May be further increased by internal adjustment		
Zero Off-Set Voltage:	Nominally zero, possible small change with gain settings. Separate internal adjustment at each amplifier stage		
Input Bias Current:	0.02 μ a typical, each output		
Temperature:	Range: 0°F to 160°F Zero Shift: ±20 μ V/°F referred to input Span Shift: 0.005%/°F		

2.2 MECHANICAL

(See Figure 2)



BA11Z COMPONENT LAYOUT
FIG. 2

SECTION III

OPERATION

3.1 INSTALLATION

The BA112 may be plugged into any available position in the MCl Module Case regardless of whether power is on and other channels are in operation. There will be no effect on adjacent channels.

3.2 INPUT/OUTPUT CONNECTIONS

3.2.1 Input to the BA112 is through the Cannon WK-4-32S receptacle marked "Transducer Input" on the back panel of the MCl Case, with the following Pin assignments:

<u>Differential Input</u>	<u>Single-Ended Signal</u>	
Pin 1 - System Ground	Pin 1 - System Ground	
Pin 2 - (+) Input	Pin 2 - (+) Input	---
Pin 3 - (-) Input	Pin 3 - (-) Input	---
Pin 4 - System Ground	Pin 4 - System Ground	--- } Jumper for Appropri- ate Input

The mating connector is a Cannon WK-4-21C, or equivalent.

3.2.2 Output from the BA112 is obtained from the two Cannon XLR-3-32S receptacles, marked "Output A" and "Output B", on the back panel of the MCl Case, with the following pin assignments for both:

- Pin 1 - Output
- Pin 2 - System Ground
- Pin 3 - Chassis Ground

The mating connector is XLR-3-11C, or equivalent.

3.3 DC OFF-SET ADJUSTMENT

Using a PC board extension cable, and referring to Figure 2, the DC off-set may be adjusted using the following procedure:

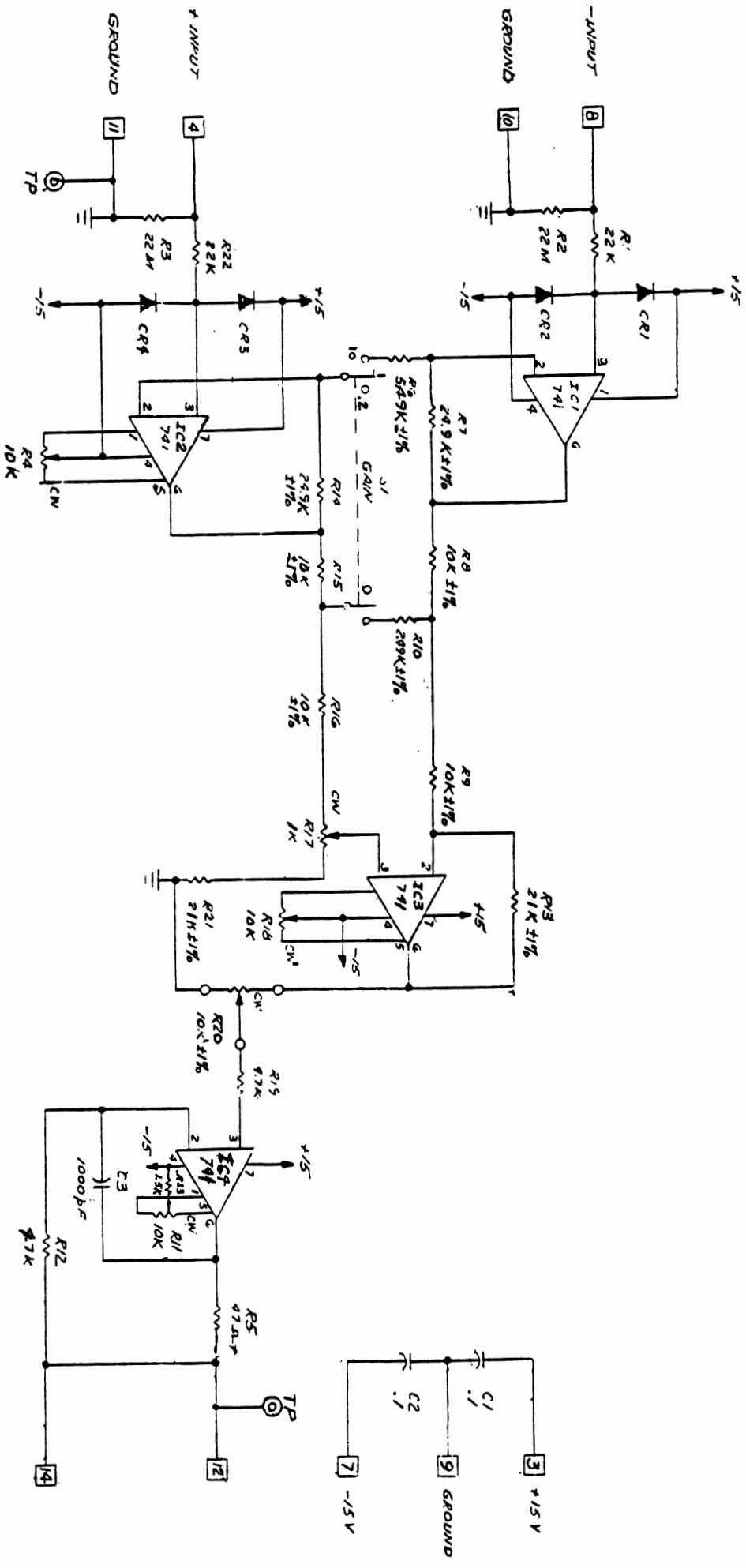
- A. Short both inputs to system ground -- WK-4 receptacle Pins 2 and 3 shorted to Pin 1 or 4.
- B. Connect a digital voltmeter between IC1 Pin 6 and IC2 Pin 6. Adjust potentiometer R4 to obtain a zero reading.

3.3 DC OFF-SET ADJUSTMENT (Continued)

- C. Connect DVM across Gain Pot R20 with (-) lead on "ccw" terminal and (+) lead on "cw" terminal. Adjust R18 to obtain zero reading.

3.4 COMMON MODE ADJUSTMENTS

- 3.4.1 For maximum DC common mode rejection, connect a DC signal source between system ground - WK-4 pin 1 or 4, and both (+) and (-) inputs - WK-4 pins 2 and 3. While monitoring the output of the BA112, vary the input from a plus 10 VDC to a minus 10 VDC, and adjust R17 to obtain a minimum change in output voltage for the input change.
- 3.4.2 To obtain a maximum AC common mode rejection at a specific frequency, connect an AC signal of the desired frequency between system ground and both inputs. Monitor the output of the BA112 with an oscilloscope and adjust R17 for minimum AC output. For frequencies above 1 kHz, reduce the input voltage to 1 volt peak-to-peak to prevent slew rate differences from affecting the adjustment.



4. INDICATES CIRCUIT BD CONN PIN NUMBERS
 3. DIODES ARE IN 914
 2. CAPACITOR VALUES ARE IN MICROFARADS
 1. RESISTOR VALUES ARE IN OHMS $\pm 10\%$ 1/4 WATT
- NOTES: UNLESS OTHERWISE SPECIFIED

