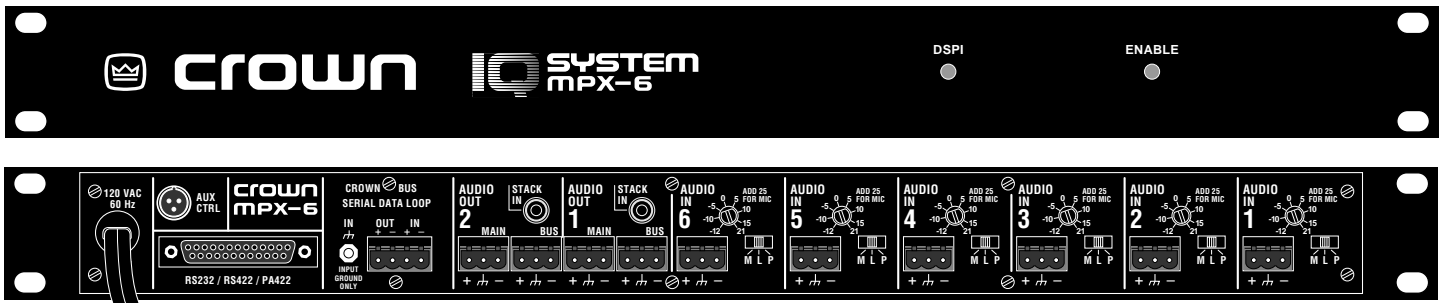# MPX-6™ Mixer-Router

MPX-6 COMPUTER CONTROLLED MIXER-ROUTER
(Front Panel shown above, Rear Panel shown below)

OVERVIEW
What is an MPX-6?

The MPX-6 is a single rack space five by one automatic mixer designed to be configured with a computer and appropriate software. Once initially setup the computer becomes optional. The key to the MPX-6 operating as a stand alone mixer is distributed intelligence™. In an IQ System the brains of the system live out in the system. This means the audio system is not going to be lost even if the computer or communication cables fail. The MPX-6 is an ideal choice for applications where computerized manual mixing or routing is desired and the automation of the SMX-6 or AMB-5 automatic mixers is not required.

HARDWARE BLOCK DIAGRAM

Refer to the pictures of the front and rear panels shown above and the block diagram of the MPX-6 mixer on Page 2.
Audio Main Inputs:

Six <u>balanced</u> inputs with removable 3 pin barrier block. The preamp stage includes:

 • <u>M/L/P switches</u> set each input to line level (L) with 0 dB gain, mic level (M) with 25 dB additional gain, or phantom (P) which is 25 dB additional gain and +44 VDC phantom power.
 • A <u>trim</u> pot at each input allows for prefade gain adjustment of –12 dB to +21 dB gain after the M/L/P switch.
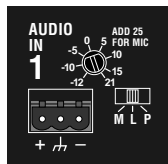
There are two <u>VCA</u>s under processor control at the output of each preamp. One VCA controls the gain from input to output mix 1 and the other VCA controls gain from the input to output mix 2. The net result is 12VCAs total.

Audio Stack Inputs:

<u>Two inputs</u>, one per output mix. Connections are via <u>unbalanced</u> RCA phono jacks. These inputs are op-amp <u>isolated</u>. There is <u>no processor control</u> of audio coming into these inputs. The purpose of the stack inputs is to allow construction of a wide mixer with more than six inputs by taking the outputs of one mixer and going into the stack inputs of a second mixer. This means that main inputs do not have to be used to expand the effective size of the overall mixer.

Audio Main Outputs:

There are <u>two</u> summing buses. Each summing bus provides the output mix for the corresponding output channel. Op-amps <u>buffer</u> the summing bus to the output connection and <u>balance</u> the audio output. The outputs are via 3 pin removable barrier blocks.
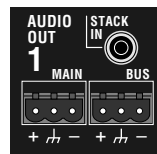
Audio Bus Outputs:

In addition to the two main outputs, there are also <u>two bus outputs</u>. Bus outputs 1 and 2 provide the <u>same audio</u> output as main outputs 1 and 2. Op-amps <u>buffer</u> the summing bus to the output connection and <u>balance</u> the audio output. What makes the Bus Outputs different are <u>relays</u> under processor control which may be used to turn on or off the Bus Output drive. 3 Pin removable barrier blocks are used.

Aux Port:

The unit is equipped with a TB-3M type <u>mini-XLR</u> port. This port may be used to provide a control signal or sense a control signal. Pin 1 is <u>ground</u> reference. Pin 2 is <u>output</u> under processor control. When on it provides <u>10 VDC</u> at 16 ma. When off it is <u>open collector</u> (high impedance). Pin 3 is <u>sensing input</u>. +5 to

+30 VDC is sensed as a logic high. The circuit floats, therefor tie to ground or TTL source for definite high or low.
Indicators:

A <u>Power</u> light on the front panel indicates the unit is powered. A <u>DSPI</u> data signal presence indicator indicates communication.
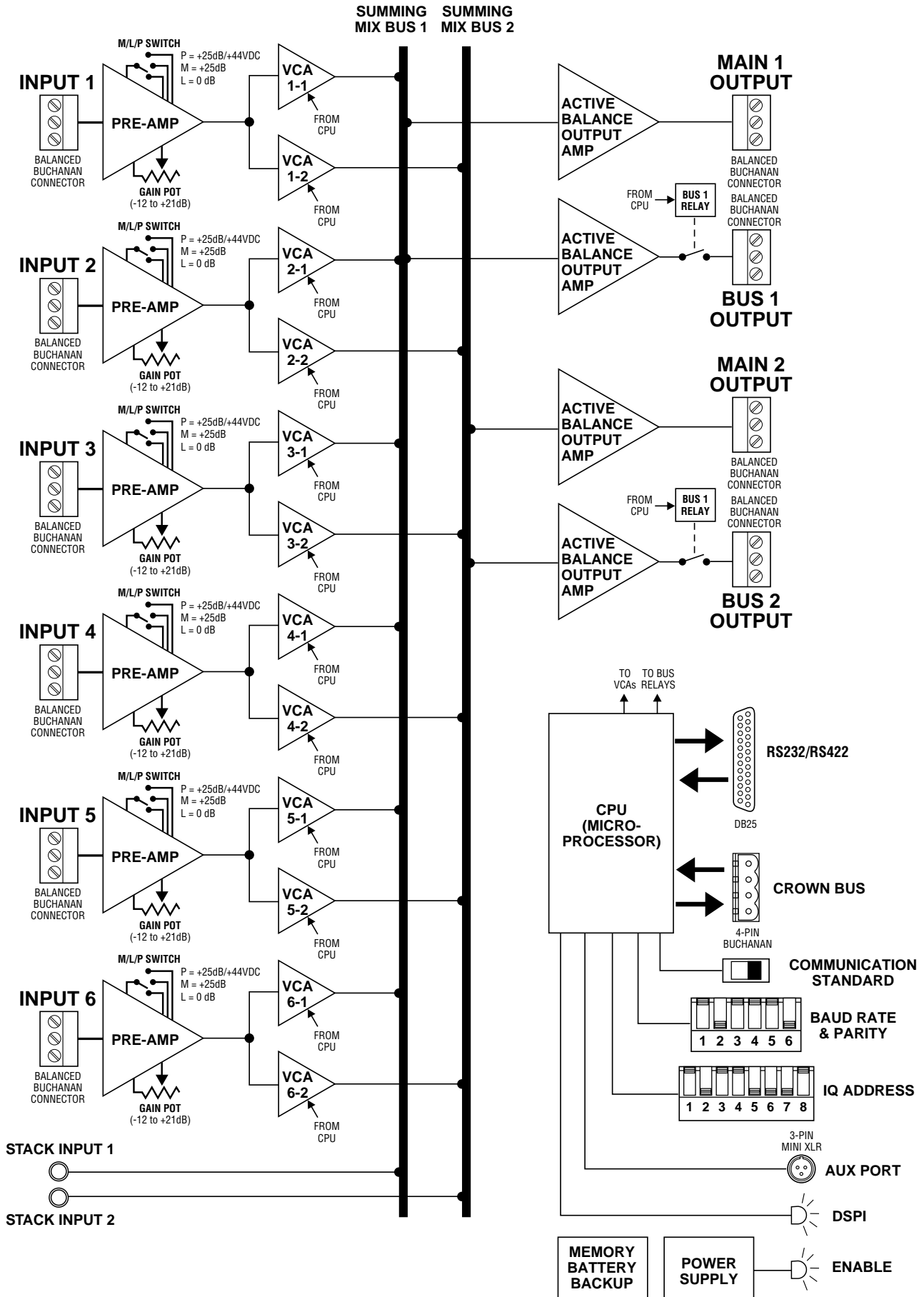### Crown Bus Port:

The Crown Bus is a <u>serial data loop</u> where components are connected into the loop and one component serves as system interface for all. This unit may serve as a system interface or may simply operate as a component on a Crown Bus data loop. Although the Crown Bus may function on a variety of media, Crown uses a <u>two-wire 20 ma current loop</u> for input and output Crown Bus connections. On this unit connections are made via 4 pin removable barrier block. Even if the unit is communicating directly with a PC via its serial port, it always functions in software as an addressable component on a Crown Bus loop. The unit must have a valid loop address. A valid address is:

 • 1 to 250 set via 8 segment DIP switch
 • No other MPX on the same Crown Bus data loop may have the same address.

The Crown Bus is asynchronous with 8 data bits, 1 start bit, 1 stop bit, no parity, and operates at 38400 baud. The MPX is <u>not a U-Code</u> protocol component.
Serial Port:

The serial port on this unit is a <u>female 25 pin</u> D-Shell. <u>RS232 and RS422</u> are supported with 8 Data bits, 1 start bit, 1 stop bit, no parity. Up to <u>19200 baud</u> supported. The serial port for the AMB may be used for direct communication with a PC such that the AMB serves as <u>interface</u>:

MPX-6 Basic Block Diagram (Page 2 of 3)

• May serve as interface for components connected to the Crown Bus.

• Components supported include other MPX units, SMX-6 mixers, AMB-5 mixers, PIP-AP, PIP-APM, PIP-APS, all MRX matrixers, and the White 4700 Series EQ.

• No support for U-Code protocol.

Setup Switches:

• The IQ Address is set by an 8 segment DIP switch. Valid address values are 1 to 250 (0 and 251-255 are reserved for system usage).

• RS232/422 Standard switch must be configured appropriately for use of the serial port.

• Baud is adjustable via DIP switch up to 19200. This setting must be configured properly for use of the serial port.

• Parity is set ON or OFF and ODD or EVEN via DIP switch. Normally set to OFF, this setting only applies to use of the serial port.

Memory Backup:

The unit is equipped with a rechargeable battery. The unit has 60 day memory backup on full charge.

COMPUTERIZED FEATURES

DSPI:

The Data Signal Presence Indicator (DSPI) light on the front panel flashes to indicate data traffic addressed to or from the unit. This light may be forced on from software.

Aux Port:

The aux port on the mixer is used to send or receive a control voltage. From software you may turn the aux output on or off. IQ software is also able to sense the status of the aux input and is capable of taking independent action based on a sensed input.

Bus Output Relays:

Audio bus outputs are identical to their respective main outputs in every way except for the addition of software controlled isolation relays.

VCA Gain Control:

The heart of the MPX is its functionality as a mixer. Each of the six main inputs may be routed to either or both outputs by VCAs under processor control. The VCAs offer a control range of −100 to +25 dB.

MANUAL MIXING IN REAL TIME

All setup is accomplished with IQ software from a PC. You may make changes from software that affect VCA gain in real time. Gain may also be manipulated in real time from alternate control devices such as a Drone or a third party control device (Ex. AMX, Crestron, Interface Controls, etc.). Once VCA gains are set from the PC (or control device) the processor maintains that gain structure until it receives an instruction to change.

SYSTEM LEVEL INFORMATION

Communication:

In an IQ System the basic communication structure is based on the premise that it must be able to support a PC being used with several IQ components. The computer is connected to the IQ System interface via RS232. The interface converts the protocol from RS232 to Crown Bus media and back again. In a small system or a single MPX system the MPX itself may serve as the system interface. The IQ-INT II, IQ-PSI, Drone, SMX-6, AMB-5 and MPX-6 are all components which may serve as a system interface for an MPX-6. The Crown Bus is a serial data loop carrier of IQ command protocol. Crown has implemented it as a two wire twisted pair current loop to allow for low cost long distance connections. For very long loops (over 1000 feet) data repeaters (IQ-RPT) or fiber optic cable may be used to connect equipment rooms that are some distance apart. The Crown Bus itself does not carry audio.

U-Code Protocol:

U-Code is new form of IQ command protocol developed for enhanced new product and third party product development. At this time the MPX-6 firmware is not written in U-Code. Although it may be used in systems with U-Code products, the MPX-6 may not be used as system interface for U-Code products.

Software:

Several IQ Software packages are available to communicate with an MPX-6. Each unit is shipped with basic DOS software which allows you to communicate with the SMX-6, AMB-5, MPX-6, and MRX Matrixer units. More advanced software includes the Turbo or Sys-Config software packages. Turbo is a DOS program that includes powerful graphics support and support of the full IQ product line. Sys-Config is an advanced package which has security, scheduling, alert reporting, and other powerful features plus the power of Turbo built in.

PC Requirements:

The computer you select for use with your IQ System is very important. Exact minimum requirement vary depending on the software package being used, but for the more advanced software your machine should at least be a 486SX/33 with the following: 4 MB RAM, 16550 UART for the com port used by IQ, DOS 6.2, Mouse (with DOS driver, third button features supported). In most cases Turbo software will operate as a DOS application from Windows,® including Windows 95.®

SPECIFICATIONS

Maximum Input Level (Mic): +7 dBu.

Maximum Input Level (Line): +32 dBu.

Phantom Power: +44 VDC.

AC Power: 120/240 VAC 50/60 Hz.

Common Mode Rejection: 55 dB: 60 to 1 kHz typical; 45 dB: 20 to 20 kHz.

Frequency Response: +0/-1 dB, 20 to 20 kHz.

THD: <0.05% at +4 dBm output; <0.15% at +20 dBm output 20 to 20 kHz measured at mic input with 40 dB gain.

Noise: Output noise all inputs off is –80dBu (106 dB below rated output); output noise with one line input at 0 dB is 80 dB; equivalent input noise at mic input with 46 dB of gain and 150 ohm source is –125 dBu. Note that noise specs are typical, unweighted, and 20 to 20 kHz.

Crosstalk: Adjacent inputs/outputs at 1 kHz better than –80 dB; adjacent inputs/outputs 20 to 20 kHz better than –65 dB.

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