

## ARCHITECT'S & ENGINEER'S SPECIFICATION

The automatic mixer shall use the Dugan Speech System of automatic mixing, incorporating 2 detectors for each input channel.

The automatic mixer shall be constructed in a card frame chassis, holding up to 8 input cards, one output card, and a power supply card. All cards shall be unpluggable from the front of the card frame, without requiring removable of wiring. The card frame chassis shall be capable of accepting other preamplifier, line amplifier, mixing and distribution cards. The chassis shall require no more than 3.5" of vertical rack space. The auto-mixer shall have a UL approved power supply. The unit shall be designed to mount in a standard 19" EIA rack.

Input cards shall accept balanced microphone or line level signals. The input cards shall

have remote control capability, mute-group mute and all mute capability, logic output, and selectable phantom power. Each input card in the auto-mixer shall have provision for a mix-minus output, and additional inputs for nulling into the mix-minus output.

All gain, tone control, weighting, and mix-minus level controls shall be mounted on the rear of the auto-mixer chassis. The unit shall allow removal and replacement of modules without requiring readjustment of controls.

The output card shall have provision for remote level control, dual balanced outputs, AUX input, and an optional automatic level control.

The auto-mixer chassis shall be linkable to allow up to 60 input channels to operate simultaneously. The automatic mixer shall be: PROTECH AUDIO CORP. MODEL 2000.

## SPECIFICATIONS, MODEL 2000

### INPUT SECTION

|                            |  |
|----------------------------|--|
| Input Gain Microphone..... | 30-50dB, Switch Selectable, Plus Trim Adjustable |
| Input Gain Line.....       | 0-20dB, Adjustable                               |
| Input Tone Control.....    | +12dB, Bass & Treble                             |
| Input Hi-Pass Filter.....  | 100Hz  |
| Mute Attenuation.....      | 70dB, Min.                                       |
| Maximum Input Level.....   | -10dBv Mic, +20dBv Line                          |
| Input Impedance.....       | 1K Ohms Nominal Mic, 15K Ohms Line               |
| Group Mute Control.....    | Slide Switch Connection To Buss                  |
| Phantom Power.....         | 15VDC Internal, 48VDC External                   |
| Remote Control Range.....  | +12dB, To -75dB                                  |

### OUTPUT SECTION

|                             |                          |
|-----------------------------|--------------------------|
| Master/Slave Operation..... | Slide Switch Controlled  |
| Distortion + N.....         | 0.07% Maximum            |
| Noise.....                  | -123dBV (150 Ohm Source) |
| Frequency Response.....     | 30Hz To 20KHz, ±0.1dB    |
| Operating Temperature.....  | 0 To +70 Degrees C       |
| Power Requirement.....      | 0.5 Amps/120VAC          |
| Dimensions.....             | 3.5"H x 19"W x 10.5"D    |
| Shipping Weight.....        | Approx. 10Lbs.           |

## ACCESSORIES

|  |  |
|--|--|
| Model 2000-662B Audio Distribution Amp Card, 1 In, 2 Out.  | Model 2000-674B Audio Mixer Card, 2 Line In, 1 Line Out. |
| Model 2000-663B Audio Distribution Amp Card, 1 In, 3 Out.  | Model 2000-675B Audio Mixer Card, 3 Line In, 1 Line Out. |
| Model 2000-664B Audio Distribution Amp Card, 1 In, 4 Out.  | Model 2000-676B Audio Mixer Card, 4 Line In, 1 Line Out. |
| Model 2000-665B Audio Distribution Amp Card, 1 In, 5 Out.  | Model 2000-677B Audio Mixer Card, 5 Line In, 1 Line Out. |
| Model 2000-683A Audio Power Amplifier Card, 10 Watts       | Model 2000-617B Audio Limiter Card, Adj. Gain & Thres.   |
| Model 2000-588C Gate/Ducker Card, 2 Mic/Line In, Line Out. | Model 2000-633B Audio Compressor Card                    |
| Model 2000-RVC-OP Remote Master Volume Control             | Model 2000-RVC-IN Remote Input Volume Control            |

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**PROTECH®**

## Model 2000

## Dugan Automixer

www.protechaudio.com



### FEATURES

- ✓ Automatic Mixing with Dugan Speech System. (More Useable Gain)
- ✓ Up to 8 Configurable/Variable Mix-Minus Outputs Per Frame.
- ✓ Modular Construction, Each Module Individually Fused.
- ✓ Optional ALC Leveling Available.
- ✓ Tone Controls & Hi-Pass Filter On Each Input Channel.
- ✓ Logic Output On Each Input Channel.
- ✓ Mute, Group Mute, and All Mute Functions.
- ✓ Remote Gain Control Capability On Each Input & Outputs.
- ✓ Phantom Power Capability On Each Input Channel.
- ✓ U.S. Patents 3,992,584, & 4,864,627

Simply put, the Model 2000 Dugan Automatic Mixing System is designed to be the best sounding, most reliable auto-mixer in the world. The unit is designed around the patented Dugan Speech System. Other manufacturers have used this system, but tried to skimp on the circuit implementation. We at Protech have worked with Dan Dugan, to design the best possible circuits to utilize this patented approach to automatic mixing. Simply put, more gain and less echo pickup. See "Dugan Automixing" application note.

The mechanical architecture of the Model 2000 is card frame based. Each module is individually fused. If a fault should occur, the module will remove itself from the power supply bus, allowing the remainder of the system to continue operating. It also allows microphone or line input circuits to be provided on a channel-by-channel basis. Each Model 2000 chassis can accommodate up to 8 input cards. Frames are linkable, to allow for larger systems.

The input cards provide a wide variety of popular options, all user definable. Each input card also provides a balanced mix-minus output. The initial mix-minus outputs provide a total mix bus signal, minus that channel's input signal. Since each input module provides a mix-minus output, the system can have any number of custom mixes. It is not limited to 8 or 12 outputs. A system having 48 inputs would have 48 mix-minus outputs available. Each mix-minus output is configureable to allow separate mixes and mix levels at each output. This system allows maximum gain before feedback in each area of a room. A typical installation would be a boardroom, legislative chamber, or house of worship, where the speakers nearest the participants microphones would receive only the microphone signals from the other area microphones, while other area speakers in the facility might receive different mixes. The combinations can be tailored to any room. For a complete list of features, see page 2.

Model 2000 Dugan Automixer

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Engineering Data 9/01

## Input Selection - Microphone or Line

Each input card has a selector switch that allows the card to be set for operation with a microphone, or a line level device. With the microphone position selected, internal 15 volt phantom power is available, or an external 48 volt phantom power may be used. In the line level position, the phantom power connection is automatically disabled.

Each input card also contains a gain selector switch. In the "HI" gain position, the microphone input provides 50dB of gain, and the line level provides 20dB of gain. In the "LO" position, the microphone input provides 30dB of gain, while the line level input provides 0dB gain.

Each input card is individually fused, to prevent system wide failure. If a fault should occur, the module will remove itself from the power supply bus, allowing the remainder of the system to continue operating. Modules may be replaced in minutes, without the need for readjusting controls (see "Adjustments").

## Tone Controls & Low Cut Filter -

Each input channel has a low cut filter, and a bass and treble control. The low cut filter is used to eliminate unwanted low frequency noise. The bass and treble control provide both cut and boost. This feature is used to optimize intelligibility, tone quality, and match the sound of different microphones.

## Mute Functions -

Each input card has provision for 4 separate mute controls. The first mute control is an on-board slide switch to mute unused channels. The second mute control, individual channel mute, is activated by a closure to ground. This can be used to mute channels from remote locations. The third mute control is an on-board slide switch that assigns individual channels to the group mute bus. When the group mute is activated, by a remote closure to ground, or the logic closure on a chairman's microphone channel, all inputs assigned to the group mute bus will be turned off. The fourth mute control is the all mute, activated by a remote closure to ground, which turns off all inputs.

## Remote Gain Control -

Each input channel, and the master outputs have provision for remote gain control. They may be controlled by accessory products manufactured by Protech Audio, or remote control products manufactured by Panja or Crestron. For applications assistance in using the Panja/Crestron products, see the touchpanel application note. Each input may be individually controlled by a Protech Audio Model 2000-RVC-IN Remote Wall Plate unit. The wall plate unit contains a potentiometer, build-out resistors, and a three pin connector, all mounted on a printed circuit assembly. The printed circuit assembly may be removed from the single gang wall plate, to allow it to be mounted in custom wall plates.

The gain range of each Model 2000-RVC-IN may be restricted by the rear panel controls on the chassis of the Model 2000.

The gain of the outputs may be controlled, in similar fashion to the inputs, by a Model 2000-RVC-OP. In addition to the individual channel controls, Protech Audio also manufactures the Model 2000-CON Remote Control Console. Each console can control 8 input channels, one set of master outputs, and two ground closure circuits for controlling group mute, or other switchable functions. The Model 2000-CON can be custom labeled, for exact room setups.

## Logic Closures -

Each input card provides a logic closure to ground, that is activated by someone speaking into a microphone, or audio being applied to a line level input. These closures can be used for camera queuing, or for chairman's override of all other audio channels. Simply wiring the chairman's logic closure to the group mute, will allow automatic override of the other inputs.

## AUX Input

Each Model 2000 Frame contains an unbalanced auxiliary input. This input is designed to accept line level signals.

## Master Outputs -

Each Model 2000 frame provides 2 master outputs, to allow a gallery reinforcement signal and an ancillary room or monitor output.

## Mix-Minus Outputs -

Each Model 2000 Frame assembly provides for up to 8 mix-minus outputs. One for each input card used. These outputs are configurable to allow custom mixes to be sent to different areas of the room. The mix-minus approach to sound reinforcement allows more gain before feedback, and makes system setup much easier.

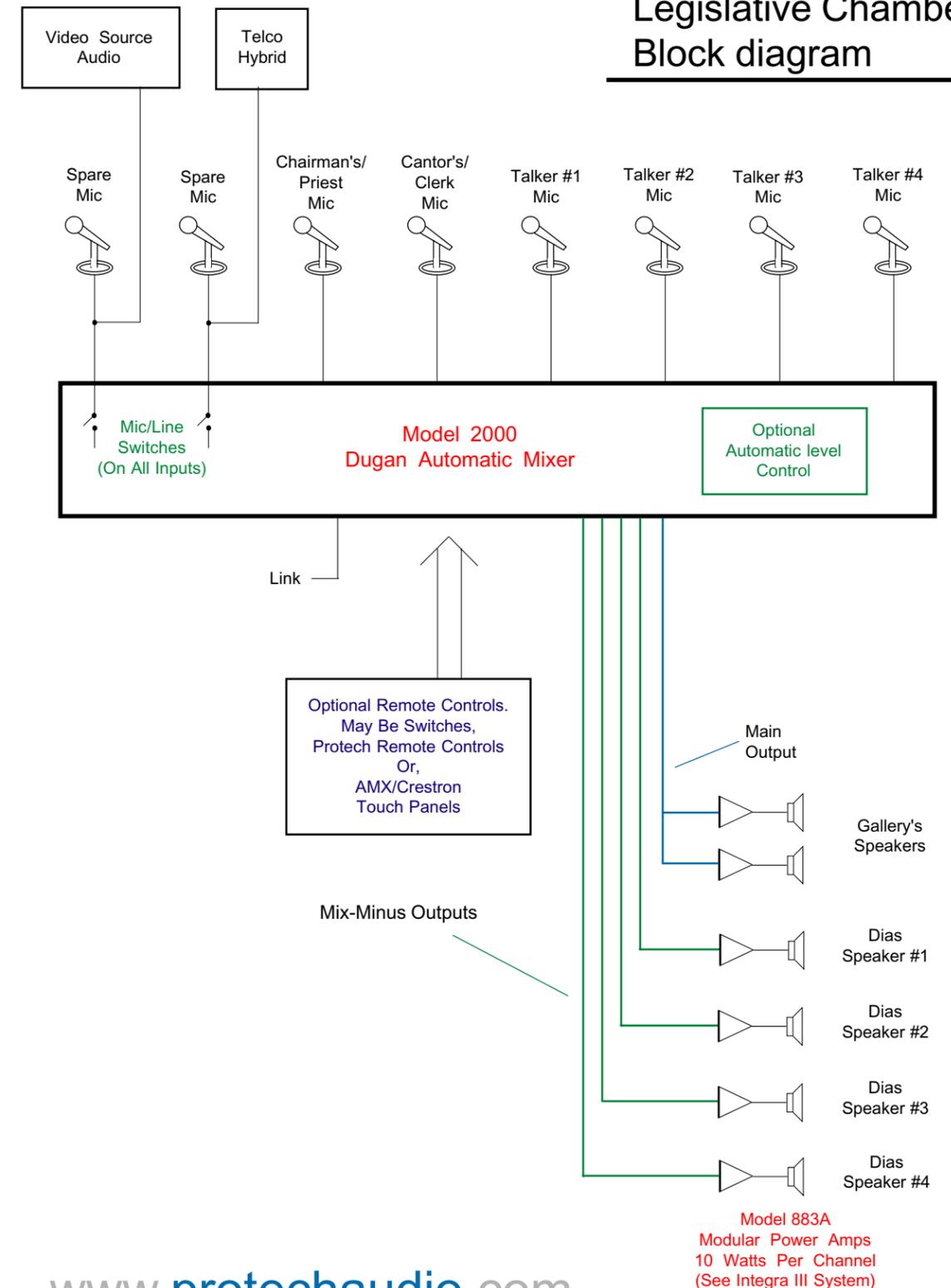
## Linking Feature -

The Model 2000 Frame is linkable, to create larger systems. When linked, the master frame "Master" outputs will contain all input signals. The slave frame "Master" outputs will contain only the input signals attached to that frame, or any earlier frame. The linking creates a "Link Forward" effect. Frame #2, in a 3 frame system, would have on it's master outputs, all input signals contained on frames 1 & 2. Frame #3 master outputs would contain all input signals.

## Adjustments -

All level adjustments, tone control adjustments, and mix-minus level adjustments, are made via trimpots mounted on the rear of the frame. This eliminates the need for readjustment when a spare module is put into use.

## Typical Boardroom/HOW/ Legislative Chamber Block diagram



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