IED®
Innovative Electronic Designs

4000 Series Automatic Mixers

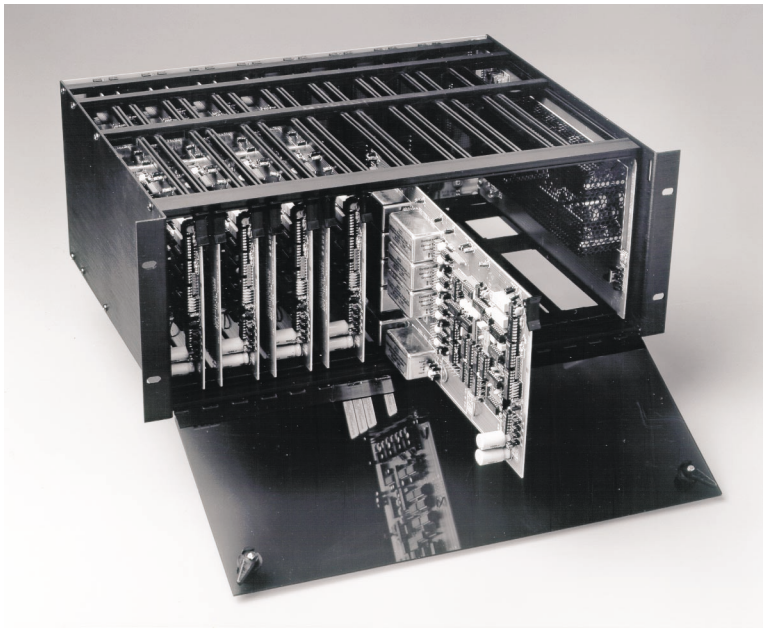
IED MODEL 4000 SERIES AUTOMATIC MIXER SYSTEM

The **IED 4000 Series Automatic Mixer System** is the most advanced, flexible Automatic Mixer System available today. The design is modular, allowing its components to be used to configure systems from the smallest to the very largest. Mainframes may be linked for even greater capacity. Linking of Mixer Cards or Mainframes may be fixed, or may be varied under computer control.

The **IED Model 4452 Automatic Mixer**, designed around **IED'S unique Active Functional Modules**, can be easily tailored to fit any application. Each of the four inputs on the card may be individually customized by combining a 160M Microphone Preamplifier or a 100L Line Preamplifier with a 110C Compressor, a 110V Voltage Controlled Amplifier, a 120P Programmable Gain Control, or with a fixed gain amplifier, whichever best suits the application. That is a total of 8 options on each input.

Each card is normally supplied with Model 200L Active Output Modules in both the MAIN and AUX outputs. If the system requires additional inputs without additional outputs, then the 200Ls may be omitted and the card is designated as Model 4452E Expansion Card.

In addition to a standard output with only the 200L Active Output Module, the MAIN and AUXILIARY output channels may also be supplied with a 110V for remote volume control of the outputs.



In addition to the MAIN and AUX mixed outputs there are four Direct outputs, one per input.

Input gating is controlled by the Discriminator, whose function it is to distinguish between a signal on a single microphone and unwanted background noise, turning on only the appropriate input. The discriminator circuit is effective even in the presence of extremely high noise levels. Another example is the fact that no special type of microphone is required. Virtually any type may be used.

A feature which pertains to the MAIN output only is the Digital Attenuator (not to be confused with the Model 132 Module). Its function is to sense the number of active inputs being used, then reduce the output level by 3dB each time the number of active inputs is doubled. The PRIORITY feature is activated by either a computer command or a jumper for each input. When a PRIORITY input turns on, all inputs not in priority are turned off.

The FILIBUSTER feature is used to limit the number of inputs which can turn on in a system at any one time. The limit is set separately for each card, but the setting is compared with the total number which is on the system. If the system total equals or exceeds the setting for a card, no more may turn on ON THAT CARD until the system total drops below the setting. Available settings are 1, 2, 3, 4, or

ALL. ALL defeats the Filibuster feature (any inputs on that card may turn on at any time). Filibuster may also be defeated by a computer command. Once an input is on it cannot be interrupted, except by a priority input or a force off command.

The many alternatives for LINKING MIXERS is another major area of flexibility of the 4452. There are two basic methods for linking (and an almost infinite number of combinations). The first is the Onboard Jumper Link, which is the hardwire linking of Mixers in a Mainframe by the use of jumpers. This method is described in detail in another publication. The second is a processor control for computer link-up.

The **IED MODELS 4422C, 4422CM, AND 4422CE LINK-UP CARDS** are the key to taking greatest advantage of the capabilities which have been designed into the Automatic Mixer.

The 4422C and 4422CM PROCESSOR CONTROL CARDS allows for the utmost degree of flexibility under computer control. Setups and link-ups are controlled easily and quickly from the computer keyboard. The primary functions of the 4422 (both versions) are: linking all mixer busses (Main, Auxiliary, Digital Attenuator, Priority, and Discriminator); routing the audio; setting individual inputs to AUTOMATIC, ON, OFF, or PRIORITY; and activating the FILIBUSTER. The MODEL 4422C and 4422CM have some additional functions such as acting as interface between the mixer and the computer, and reporting the status of the mixer card to the computer for display (which channels are ON or OFF). The 4422CE Computer Link Card is utilized in fixed link systems in which processor control of input features such as Force On, Force Off, Priority, and Filibuster are desired.

The **IED MODEL 4530L/H POWER SUPPLY** is an efficient, high reliability, 150 watt switching power supply specifically designed for the 4000 series Automatic Mixer System. It mounts in its own dedicated slot. All its outputs have LED indicators.

The **IED MODEL 4174 MAINFRAME** provides an attractive, quality housing for the 4000 Series Automatic Mixer System, as well as the primary means for interconnection between cards. The Model 4174-8C mainframe can accommodate up to 8 mixer cards, 8 computer cards, and 1 power supply. If the linkage is to remain fixed, then the 4422C Link-up Cards are not needed, and the Models 4174-8 Mainframe may be utilized.

The **IED ACTIVE MODULE SERIES** is a family of physically similar units designed to perform a variety of audio processing functions in high quality audio systems.

The **IED MODEL 100L ACTIVE INPUT MODULE** is a line level preamplifier with a totally balanced input which replaced the input transformer and its associated circuitry.

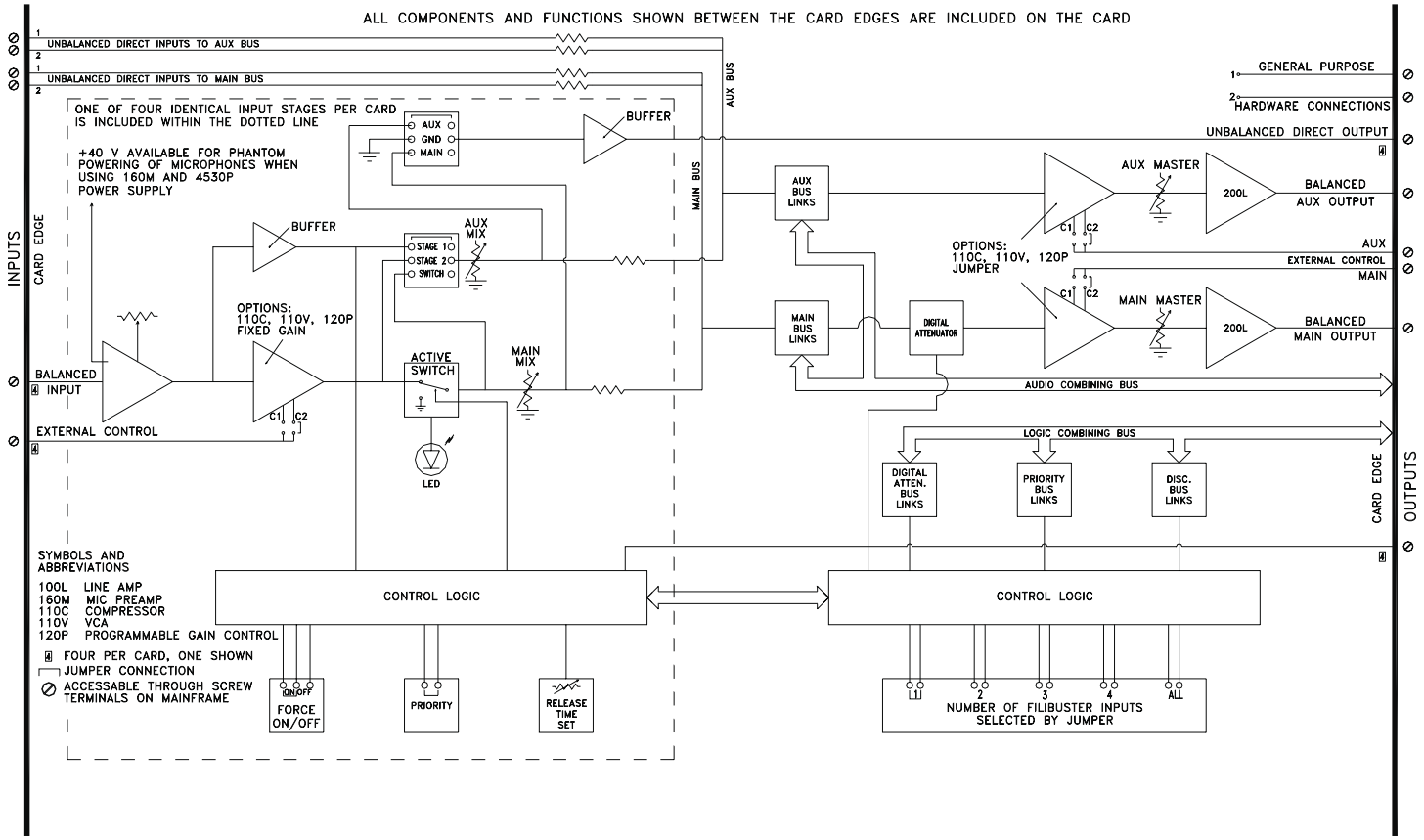
The **IED MODEL 110C COMPRESSOR** has smooth, natural sounding performance.

The **IED MODEL 110V VOLTAGE CONTROLLED AMPLIFIER (VCA)** is a remote gain control.

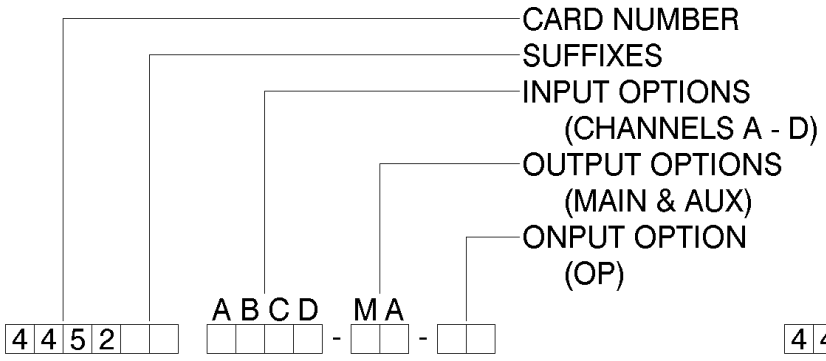
The **IED MODEL 120P PROGRAMMABLE GAIN CONTROL (PGC)** (Patent Pending) operates quite differently from commonly used circuits in that it has a release time which is effectively infinite. When the input level drops below the threshold, the last gain setting is held until the input again exceeds the threshold. The attack time was chosen to have no effect on the sound quality of normal speech, yet it will attenuate loud speech, quickly at first by several dB, then more gradually as necessary up to approximately 40 dB. Nominal initial gain is 20 dB.

The **IED MODEL 160M ACTIVE INPUT MODULE** is a microphone preamplifier with totally balanced input. It eliminates the need for an input transformer and the problems and circuitry associated with it, while affording the high quality possible only with an active circuit.

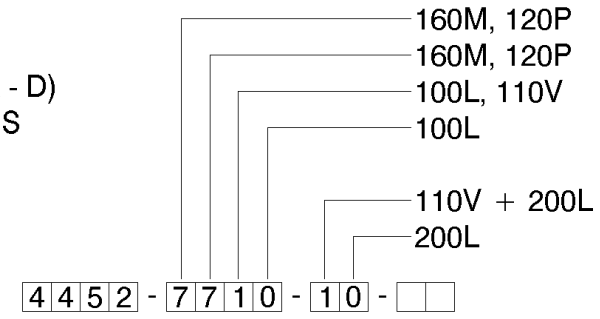
The **IED MODEL 200L ACTIVE OUTPUT MODULE** (Patented) performs the function of the output transformer and associated circuitry, without its disadvantages. It incorporates ground isolation to provide a balanced FLOATING output.



SPECIFYING MODULE OPTIONS



EXAMPLE



SUFFIXES FOR ABOVE

E = Expansion Card, no output capability

For Processor Control Applications

CE = Both of the above

INPUT OPTIONS

OPTION NO	MODULES POS 1	POS 2
0	100L	BUFFER
1	100L	110V
2	100L	120P
4	100L	110
5	160M	BUFFER
6	160M	110V
7	160M	1120P
9	160M	110C

OUTPUT OPTIONS

OPTION NO	MODULES
0	200L ONLY
1	110V + 200L

TYPICAL APPLICATIONS

The IED Model 4000 Series is useful in many applications such as:

CONVENTION CENTERS - HOTELS - RESORT CENTERS - TRAINING CENTERS

Meeting Rooms • Ballrooms • Multimedia Theaters • Exhibition Halls • Arenas

CHURCHES - BOARDROOMS - SCHOOLS - HOSPITALS - COURTROOMS - THEATERS - TELECONFERENCING

In addition to conventional mixer functions, the Model 4452 may be used for . . .
Automatic speaker muting, Video camera switching, Tape recorder/player control, remote control.

IED MODEL 4452 AUTOMATIC MIXER SPECIFICATIONS

INPUT CHARACTERISTICS

WITH 100L (LINE INPUT)	
Input Impedance	>1 M
Source Impedance	Any
Nominal Input Level	+4 dB
Overload Level	+23 dB @ Min Gain
	+9 dB @ Max Gain
WITH 160M (MIC INPUT)	
Input Impedance	10K k
Source Impedance	Any (50-150 Ω preferred)
Nominal Input Level	-50 dB
Overload Level	-5 dB @ Min Gain
	-26 dB @ Max Gain
DIRECT INPUT	
Input Impedance	57 k
Source Impedance	<10 k
Nominal Input Level	0 to +4 dB
Overload Level	+23 dB

OUTPUT CHARACTERISTICS

MAIN AND AUX OUTPUTS (200L)	
Output Impedance	<0.5 ohm
Load Impedance	>150 ohm
Maximum Output Level	+23 dB (600 ohm load)
DIRECT OUTPUT	
Output Impedance	<0.5 ohm
Load Impedance	>600 ohm
Maximum Output Level	+21 dB (600 ohm load)

SYSTEM GAIN

INPUT OPTIONS 0 and 1	
To Direct Output	+18.5 dB Max*
To Main Output	+38 dB Max*
To Aux Output	+24 dB Max*
INPUT OPTIONS 2 and 4	
To Direct Output	+38.5 dB Max*
To Main Output	+58 dB Max*
To Aux Output	+44 dB Max*
INPUT OPTIONS 5 and 6	
To Direct Output	+46.5 dB Max*
To Main Output	+66.5 dB Max*
To Aux Output	+52.5 dB Max*
INPUT OPTIONS 7 and 9	
To Direct Output	+66.5 dB Max*
To Main Output	+86.5 dB Max*
To Aux Output	+72.5 dB Max*
MAIN DIRECT INPUT	
To Main Output	+5 dB
AUX DIRECT INPUT	
To Aux Output	–9 dB

*Gain adjustable over a range from Max. figures shown to 20 dB less.

FREQUENCY RESPONSE

ALL INPUT OPTIONS	
20 Hz - 20 kHz	+0, –1 dB

HARMONIC DISTORTION

ALL INPUT OPTIONS Except 4 & 9	
20 HZ - 20 kHz	.03% Max
(2 kHz to 20 kHz for compressor options 4 & 9)	

IM DISTORTION

ALL INPUT OPTIONS	
20 Hz - 20 kHz	.05% Max

NOISE

ALL INPUT OPTIONS	
Main Output, +4 dB Ref.	<–73 dB
20 Hz - 20 kHz Filters	

AUTOMATIC FUNCTIONS

INPUT ATTACK TIME	
10 μsec to 10 msec	
(½ wave, 20 Hz - 20 kHz after signal exceeds threshold)	
INPUT THRESHOLD ADJUSTMENT RANGE	
INPUT OPTIONS	
0 and 1	-28 to -48 dB
2 and 4	-28 to -48 dB
5 and 6	-56 to -76 dB
7 and 9	-76 to -96 dB
INPUT RISE TIME	
Turn-on after attack	30 to 60 nsec
INPUT ATTENUATION RANGE	
Adjustable	0 to 90 dB
INPUT RELEASE TIME	
Adjustable	1 to 8 secretary
FEEDBACK PREVENTION	
For each doubling of inputs	3 dB

CONTROLS

LINEAR TAPER POT	JUMPER, AMP 531220-1
Preamplifier Gain	Filibuster
Auxiliary Mix	Priority
Main Mix	Force On/Off
Main Master	Control Input
Auxiliary Master	Auxiliary Mix Selection
Release Time	Direct Output Selection

INDICATORS, LED

POWER ON-GREEN
INPUT ACTIVE-RED

FRONT DOOR

Smoke-colored plexiglass with aluminum bottom hinge and dual latches.

SIZE - 4174 MAINFRAME

Height	7in
Depth	151/4 in. (overall)
Width	19 in. (including flange)

MOUNTING DEPTH

Rack Depth Required for proper installation and operation.	17.5 in.

WEIGHT

4174-8C Mainframe	8.4 lb
4452 Mixer Card	1.8 lb
4422 Computer Link Card	.6 lb
4530 Power Supply	1.7 lb

CONNECTORS

ALL INPUTS AND OUTPUTS (EXCEPT COMPUTER)	Lugless compression type screw terminals
LINE CORD	Belden 17250

POWER REQUIREMENT

4530L	120V, 50/60 Hz, 150 W
4530H	240V, 50/60 Hz, 150 W

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