

Audio . . .

CONSOLES OF INTEGRITY



AUTOMATED PROCESSES, INC.
789 PARK AVENUE, HUNTINGTON, NEW YORK 11743 • 516-427-6024,

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. . . The Innovators

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PHOTOGRAPHER: Jerry Tovo

COMPONENTS

FADERS

CONSOLES

AUTOMATION

SYNCHRONIZERS



AUTOMATED PROCESSES, INC.
790 PARK AVENUE, HUNTINGTON, NEW YORK 11743 • 516-427-6024

Audio Control Consoles

by Automated Processes utilize modular components designed and constructed in the finest tradition according to the highest standards, with state of the art techniques.

A broad spectrum of interchangeable modules permits a high degree of functional flexibility within the framework of standard "stock" designs; equalizers and input modules are prime examples. Rapid and inexpensive customization to satisfy specific requirements is also inherent in the design of Automated Processes equipment.

Automated Processes has pioneered many of the techniques now considered as standard, and is advancing the state of the art in such areas as voltage control of all console functions, digital remix memory systems, tape machine synchronization and automated disc mastering.

Human engineering, functional flexibility and ease of service are paramount considerations. Innovations are introduced to accomplish desired new functions in the most straightforward and understandable manner. Quality and reliability are never compromised.

All Automated Processes consoles meet or exceed the following specifications:

- a. Frequency response: Within 1 dB, 30Hz to 20kHz measured at any level up to +24 dBm output from all microphone inputs to all outputs.
- b. Signal to noise ratio: At least 75dB with controls set for nominal +4dBm line level and -50dBm mic level.
- c. Distortion for the complete system: Less than 0.4% T.H.D. at +24dBm sine wave output, measured at any frequency between 30Hz and 20kHz. (Typically 0.05% at normal operating levels)
- d. Crosstalk: Better than 70dB measured between two adjacent channels at normal control settings with -50dBm input level and +4dBm output level.
- e. Headroom: At least 20dB throughout the system.
- f. All line inputs balanced bridging, +4dBm nominal level.
- g. All microphone inputs bridging, transformer coupled with provision for phantom power.
- h. Maximum microphone input level: +16dBm before clipping.
- i. Microphone preamplifier gain: Continuously variable to 64dB maximum.
- j. All outputs including echo, cue and monitor, transformer coupled +4dBm nominal.

AUTOMATED PROCESSES' Audio Control Console Model 1604

Introduction

Designed for the audio professional, the Model 1604 Console affords flexibility in use, reliability in fixed or remote recording and broadcast service, and quality performance over a long, trouble-free life. Owing to the advanced engineering concepts employed in its design and construction, this superior quality has been achieved at surprisingly reasonable cost. It will accommodate up to sixteen inputs, four echo channels, two foldback circuits, four output channels, two foldback circuits, four output channels, four submasters, four speaker monitoring, slate, tone, and intercom circuits as well as audition and cue facilities. Each input can be used for either mic or line and all have integral peak indicators. Two or more 1604's can be connected together for additional inputs and outputs.

VCA grouping and/or various forms of Mixdown Memory Automation using the Automated Processes Random Access Programmer, are available. Consult the factory for details.

Applications

The Model 1604 finds application in the recording field for the smaller studio either as a fixed or remote unit, and is capable of sixteen microphone inputs to sixteen track outputs.

It is applicable for sixteen track mixdown into quad, stereo, or mono. It is also well suited to the needs of the Broadcast industry as a production, or "on the air" console with two simultaneous stereo outputs. The 1604 offers the foldback, audition, intercom and program interlock features required in Radio and T.V. audio applications. It may be equipped with optional modules offering remote control of tape machines and turntables, as well as remote input pre-selection. When used on location, the fold-

back circuits may be used as a studio cue line and the echo circuits are available as an independent P.A. feed.

The inherent flexibility of the 1604 makes it ideal for portable or fixed theatrical effects and general sound reinforcement installations. The careful engineering design and metal cabinet provide a high immunity to RF pickup which can often be encountered in remote operation.

The variety of interchangeable equalizers available for the 1604 enhances its usefulness, particularly in motion picture mixing applications.

It is a console that can grow and change to meet varying circumstances with no compromise in quality, performance or function.

Modular Plug-in Design

Modules for the 1604 console – all of them of our own design and manufacture – are the quality standard by which others are measured. Modularity provides ease of servicing and flexibility for future expansion since optional features may be added at any time.

The power supplies for all functions are identical, and also modular. All are regulated, current-limited, and protected against over-voltage. A spare power supply module is furnished with each console.

The Model 1604 is of plug-in design to permit complete installation in a few hours. All options are factory pre-wired, for easy field installation, and special modules for specific applications are also available.

Utility and Styling

Design features include wide use of printed circuit "mother board" construction, and external audio connections through Cannon XLR connectors. Phantom microphone power (universal type accommodating both 24V and 48V microphones) requires only the addition of the optional phantom power supply.

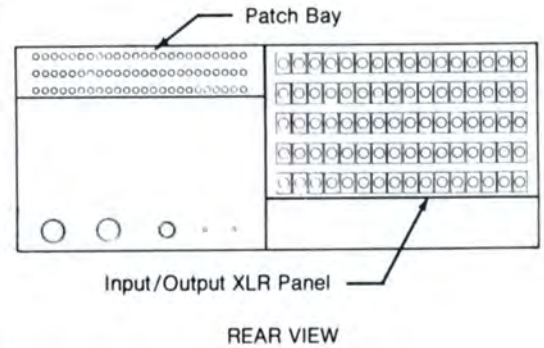
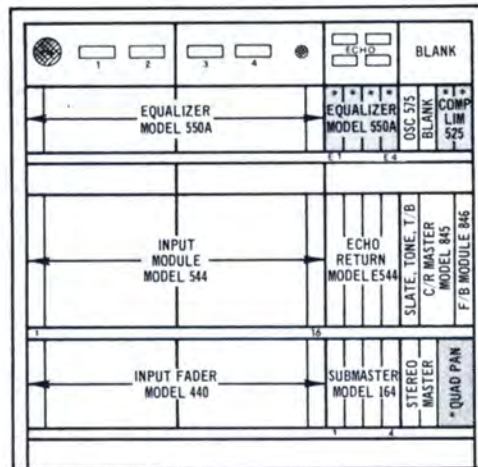
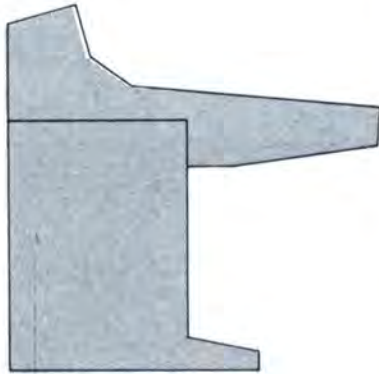
Construction features include: all metal cabinet, with spanish oak formica covered wood, padded vinyl armrest, color-coded knobs, illuminated fader scales, push-buttons that illuminate or change color when operated. The console may be table-top mounted or attached to an optional free standing base.

Fully guaranteed and warranted for one year, each console is certified and accompanied by factory performance test data.



Model 1604

Panel Layout



Length: 41-7/16 inches
 Height: 42 inches
 Depth: 38-3/4 inches

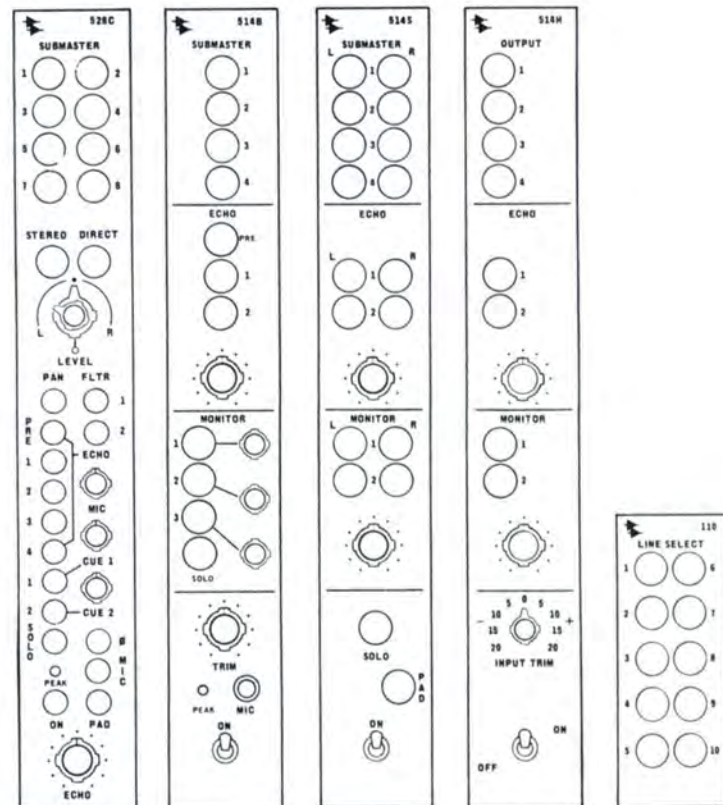
*Options shown in darker tone

Configuration

The Model 1604 Console is equipped with the following complement of modules and is prewired for the plug-in options listed below. These options may be easily installed in the field at any time.

MODEL NO.	DESCRIPTION	WIRED FOR	SUPPLIED
440	Channel Fader	16	16
544	Input Module	16	16
550A	Equalizer (input) (echo)	16 4	16 Option
559	Equalizer (Graphic)	16	Option
553	Equalizer (3 Frequency)	16	Option
554P	Equalizer (Parametric)	16	Option
164	Output Module	4	4
440-2	Stereo Master Fader	2	2
E544	Echo Return	4	4
845	Control Room Monitor Master	1	1
846	Foldback Module	1	1
525	Compressor/Limiter	2	Option
840	Master Talkback	1	1
575	Oscillator	1	1
—	VU Meters (4 Track, 4 Echo)	8	8
650A	Modular Power Supplies (3 required)	4	4 (1 Spare)
650RE	Rack Frame	1	1
Patchbay, Jacks		72	72
Connectors	I.T.T. Cannon, XLR Series	All Connections	Mating Connectors Not Supplied

Optional Input Modules



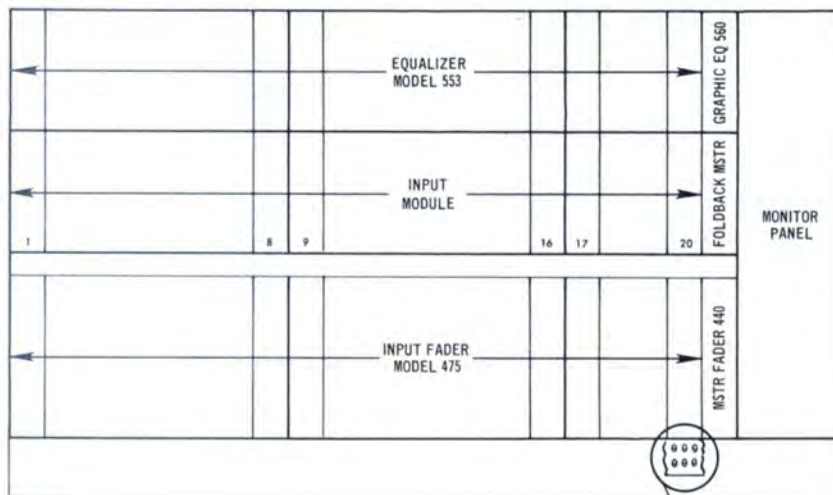
- 528C** Mic/Line Input, 8 Bus, Stereo Pan Output
- 514B** Mic/Line Input, 4 Bus Output
- 514S** Stereo Line Input, 4 Bus Output
- 514H** Line Input, 4 Bus Output
- 110** Line Select From 10 Inputs to 1 Output

AUTOMATED PROCESSES' Sound Reinforcement Console Model 2001

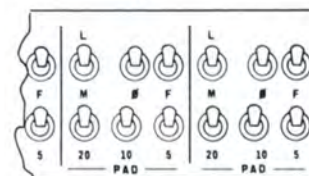


- Up to 20 inputs each with phase reversal, high pass filter, mic/line select, solo, input attenuator and equalization
- Three program busses with switchable equalization and metering
- Two isolated aux inputs
- Complete talkback and intercom facilities
- Pink noise generator test system
- Stereo headphone monitor and two external monitoring outputs
- Modular power supplies

Panel Layout



Length: 36 $\frac{3}{4}$ inches
 Height: 9 inches
 Depth: 22 inches
 Weight: 145 lbs.

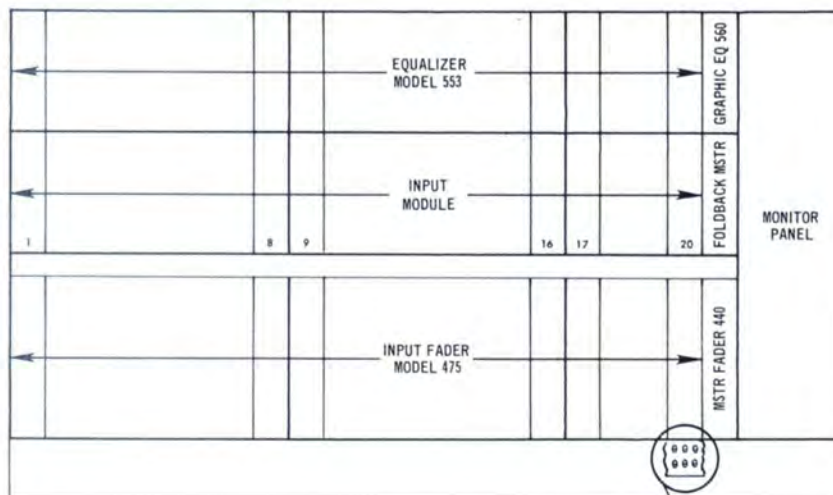


AUTOMATED PROCESSES' Sound Reinforcement Console Model 2001

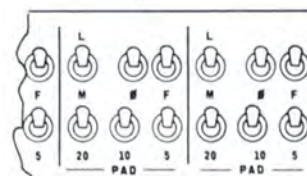


- Up to 20 inputs each with phase reversal, high pass filter, mic/line select, solo, input attenuator and equalization
- Three program busses with switchable equalization and metering
- Two isolated aux inputs
- Complete talkback and intercom facilities
- Pink noise generator test system
- Stereo headphone monitor and two external monitoring outputs
- Modular power supplies

Panel Layout



Length: 36 $\frac{3}{4}$ inches
 Height: 9 inches
 Depth: 22 inches
 Weight: 145 lbs.



AUTOMATED PROCESSES' Audio Control Console Model 2488

Introduction

Designed for the audio professional, the Model 2488 Console affords flexibility in use, reliability in studio service, and quality performance over a long, trouble-free life. Owing to the advanced engineering concepts employed in its design and construction, this superior quality has been achieved at surprisingly reasonable cost.

Modular Plug-in Design

Modules for the 2488 console—all of them of our own design and manufacture—are the quality standard by which others are measured. Modularity provides ease of servicing and flexibility for future expansion since optional features may be added at any time.

The power supplies for all functions are identical, and also modular. All are regulated, current-limited, and protected against over-voltage. A spare power supply module is furnished with each console.

The Model 2488 is of plug-in design to permit complete installation in a few hours. And all options are factory pre-wired for easy field installation.

VCA grouping and/or various forms of Mixdown Memory Automation using the Automated Processes Random Access Programmer, are available. Consult the factory for details.

Utility and Styling

Design features include: wide use of printed circuit "mother board" construction, and external connections through Cannon D.L. multi-pin connectors. Phantom microphone power (universal type accommodating both 24V and 48V microphones) requires only the addition of the optional phantom power supply.

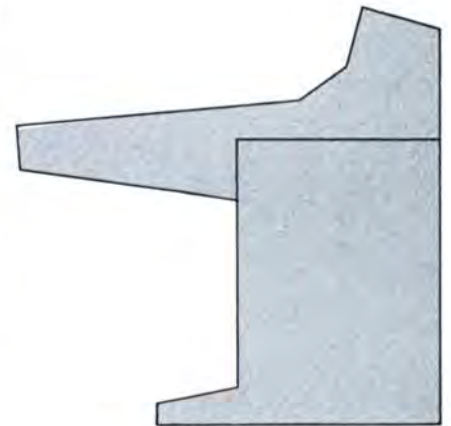
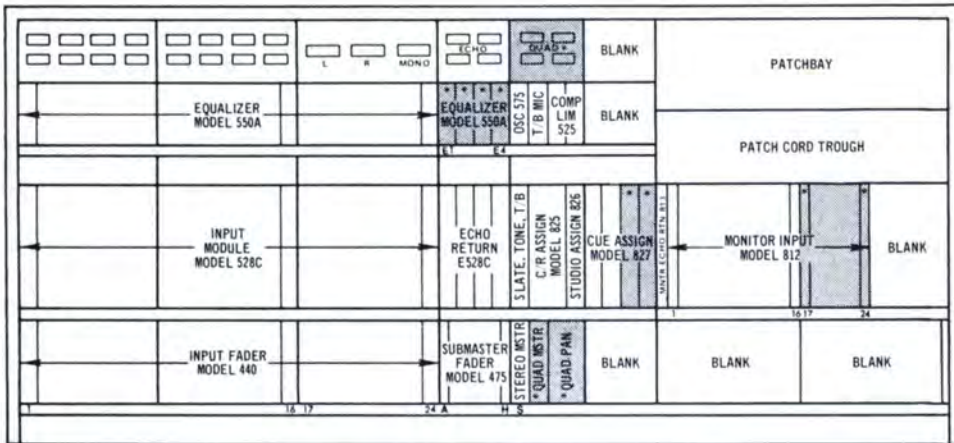
Construction features include: all metal cabinet, with Spanish oak formica covered wood, padded vinyl armrest, color-coded knobs, illuminated fader scales, pushbuttons that illuminate or change color when operated.

Fully guaranteed and warranted for one year, each console is certified and accompanied by factory performance test data.



Model 2488

Panel Layout



Length: 84-9/16 inches
 Height: 42 inches
 Depth: 38-3/4 inches

*Options shown in darker tone

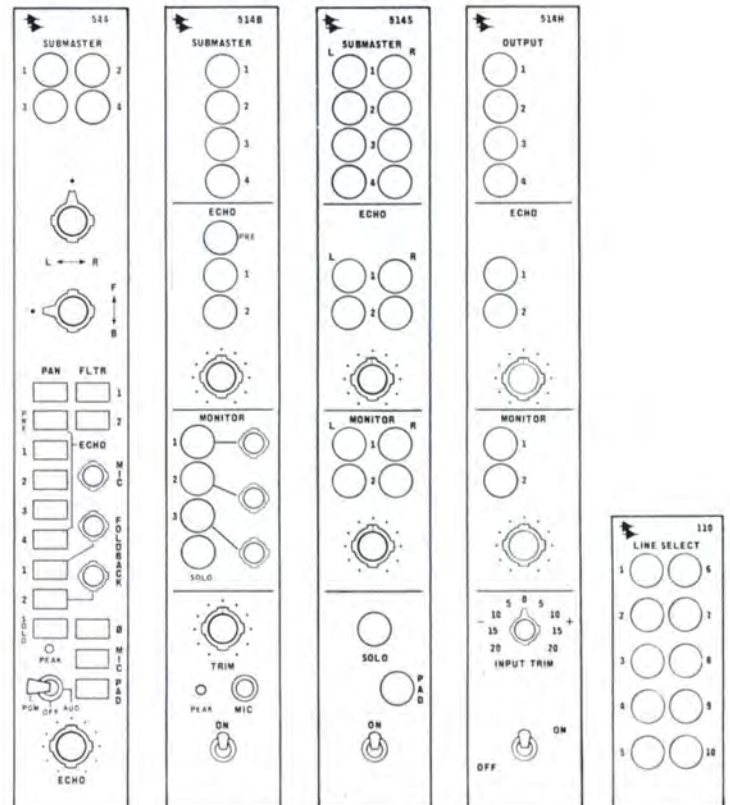
Configuration

The Model 2488 Console is equipped with the following complement of modules and is prewired for the plug-in options listed below. These options may be easily installed in the field at any time.

Optional Input Modules

MODEL NO.	DESCRIPTION	WIRED FOR	SUPPLIED
440	Channel Fader	24	Up to 24
528	Input Module	24	Up to 24
550A	Equalizer (input) (echo)	24 4	Up to 24 Option
475	Submaster Fader	8	8
440-2	Stereo Master Fader	1	1
440-4	Quad Master Fader	1	Option
480	Quad Panner	2	Option
E528	Echo Return	4	4
525	Compressor/Limiter	2	2
575	Oscillator	1	1
812	Multi-Monitor Input	24	Up to 24
813	Monitor Echo Return	1	1
825	Control Room Monitor Master	1	1
826	Studio Monitor Master	1	1
827	Cue Master	4	2
830	Master Talkback	1	1
—	VU Meters (16 Track, Left, Right, Mono, 4 Echo)	31*	Up to 31
—	VU Meters, Quad	4	Option
650A	Modular Power Supplies (3 Required)	4	4 (1 Spare)
650RE	Rack Frame	1	1
Patch Bay, Jacks		330	330
Connectors	I.T.T. Cannon, D.L. Series	All	Mating Connections

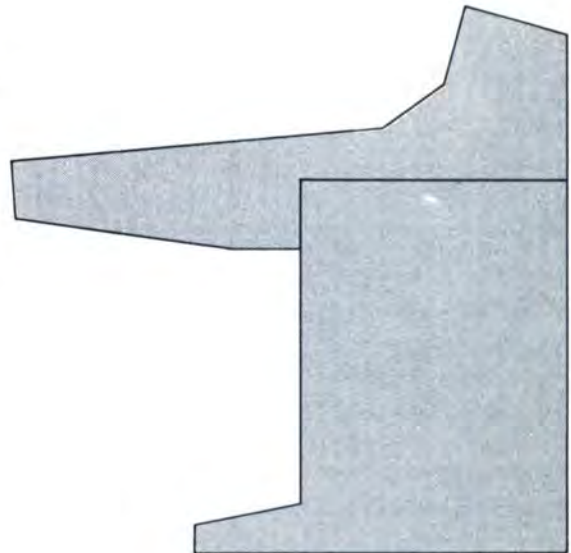
* Metering for channels 17 thru 24 when supplied with 24 Model 812 Multi-Monitor Modules.



- 544** Mic/Line Input, 4 Bus, Quad Pan Output
- 514B** Mic/Line Input, 4 Bus Output
- 514S** Stereo Line Input, 4 Bus Output
- 514H** Line Input, 4 Bus Output
- 110** Line Select from 10 Inputs to 1 Output

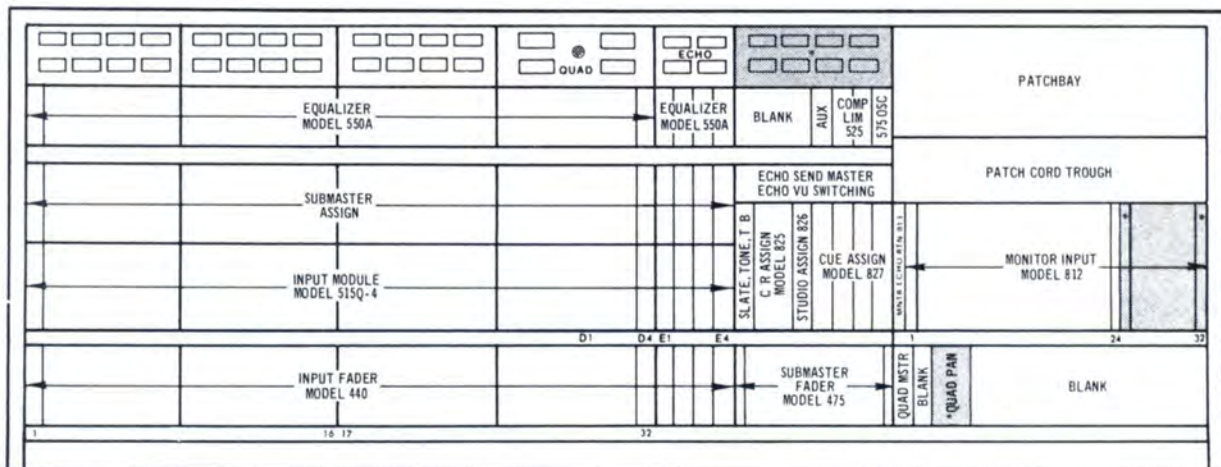
AUTOMATED PROCESSES' Audio Control Console Model 2824

- Up to 36 Mic inputs, 28 Line inputs, each with direct output and Quad or Stereo panning
- 16 mixing busses; output switches; up to 40 VU meters
- Simo Quad with VU meters
- Mono derived from Quad
- 4 echo busses with delay features; optional Equalizers in send or return; separate level controls and panning for delay and normal echo. Quad pan input has 4 delay and 4 regular echo feeds to follow program quad panning.
- Solo on inputs, echo, cue and monitor
- Slate, tone (with 575 oscillator); talkback to cue and studio individually
- Monitoring to 32 track with overdubbing facility; 4 Control Room and 4 Studio speakers with independently selectable source; speaker trims; ganged master controls; illuminated switches
- 2 input and 4 output cue busses
- 2 Model 525 compressor limiters
- Patch bay with 432 tip, ring, sleeve jacks
- Modular power supplies
- Optional producers desk
- Optional automation of input level and grouping



Panel Layout

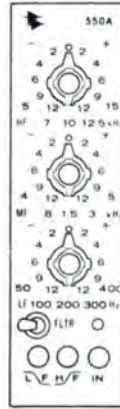
Length: 94½ inches
 Height: 42 inches
 Depth: 38-3/4 inches



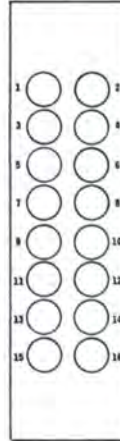
**Options shown in darker tone*

Model 2824 Standard Input and Echo Return Modules

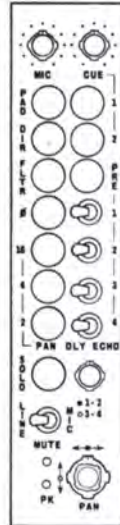
MODEL 550A EQUALIZER*



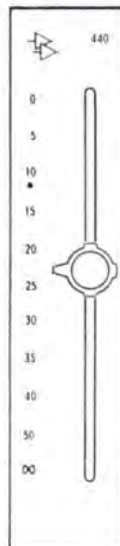
ILLUMINATED OUTPUT
ASSIGN SWITCHES



MODEL 515Q-4 (QUAD PAN)
INPUT MODULE



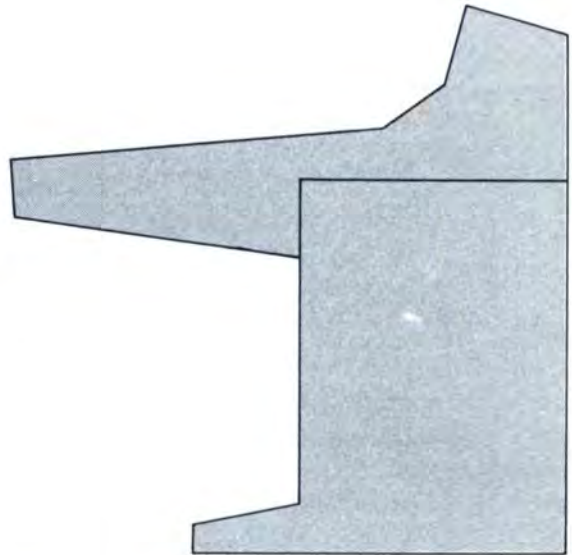
MODEL 440
ILLUMINATED FADER



* MODEL 554 PARAMETRIC EQUALIZER,
MODEL 560 GRAPHIC,
MODEL 553 THREE BAND EQUALIZER,
NOT SHOWN, MAY BE SUBSTITUTED
FOR THE MODEL 550A.

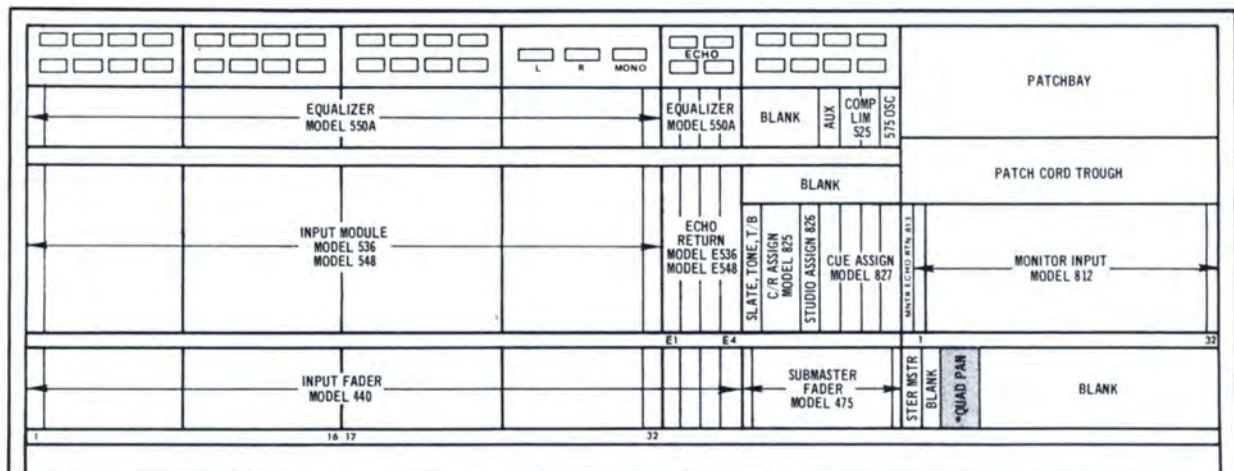
AUTOMATED PROCESSES' Audio Control Console Model 3232

- Up to 32 inputs each with direct output, stereo panning, peak indicators
- 16 Mixing busses with 39 VU meters
- Simo Stereo with VU meters
- Mono derived from Stereo with VU meter
- 4 echo busses with delay features, optional equalizers in send or return, stereo panning on echo returns.
- Slate, tone (with model 575 oscillator), talkback to cue and studio individually.
- Monitoring to 32 track with overdubbing facility, 4 Control Room and Studio Monitors with independently selectable source, monitor trims, ganged master controls and illuminated switches.
- 2 master cue outputs selectable from inputs and monitor.
- 2 Model 525C Compressor/Limiters
- Patch bay with 432 tip-ring-sleeve jacks
- Modular power supplies
- Optional producers desk
- Optional automation of input level and grouping



Length: 94½ inches
 Height: 42 inches
 Depth: 38¾ inches

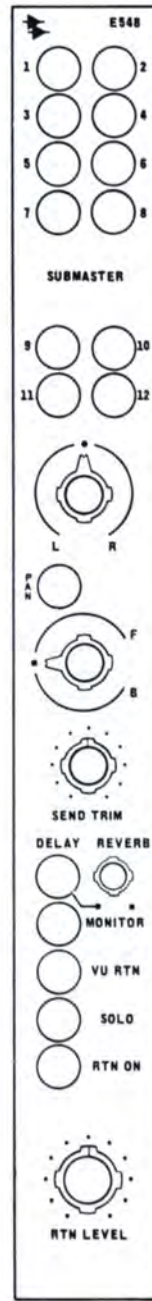
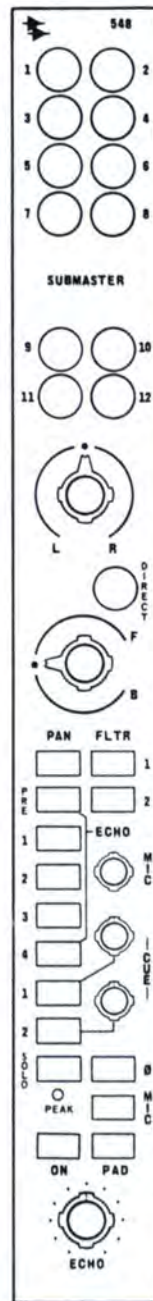
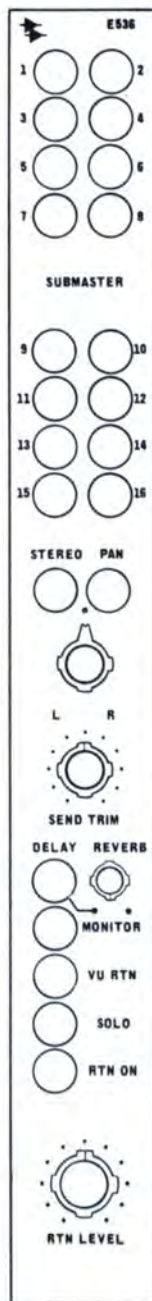
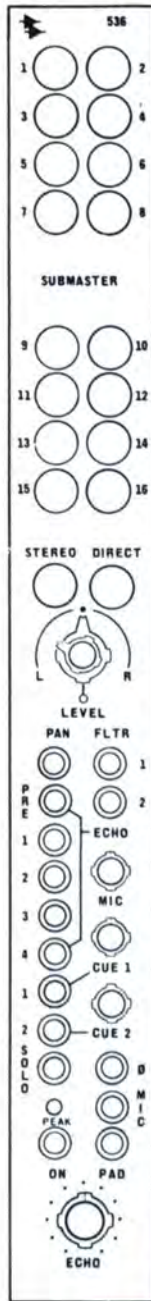
Panel Layout



*Options shown in darker tone

Model 3232

Standard Input and Echo Return Modules



MODEL 536
MIC/LINE INPUT, 16 BUS STEREO
PAN OUTPUT

MODEL E536
ECHO RETURN INPUT, 16 BUS,
STEREO OUTPUT

MODEL 548
MIC/LINE INPUT, 12 BUS,
QUAD PAN OUTPUT

MODEL E548
ECHO RETURN INPUT, 12 BUS,
QUAD PAN OUTPUT

AUTOMATED PROCESSES' Mixdown Console

AUTOMIX

is a console designed primarily for mixdown from multi-track sources. Up to 24 inputs (optional to 32) and 4 echo channels are accommodated, mixing down to Quad, Stereo, or Mono. Automix is capable of being completely programmed including equalization, or may be operated without programming memory as a traditional mixdown console, or with specific elements of the mix committed to memory, such as level control only.

The audio paths are entirely separated from the D.C. control circuits. Voltage control amplifiers and state variable devices in the audio paths provide for all functions; level, quad panning, and equalization. Control of multiple audio paths by a single manipulator (grouping) is possible for all functions; five level groups and two each for equalization and panning are provided.

Program and echo are separately pannable in quad or switchable to one or more of four respective busses.

The programmable equalizer is a three band parametric type with peaking or shelving of the low and high bands.

Overdubbing or studio recording through any or all channels is possible by the insertion of optional microphone input modules.

Stereo cue mixes are provided through separate modules. Space is provided for two such cue systems.

Tape motion controls and special sync/ready switches permit simple machine operation when using AUTOMIX as a programmable console. When used in the programmable mode, LED null indicators for each function on each channel permit rapid sensing of previously encoded settings. An accessory video screen displays the quad sound field, identifying each



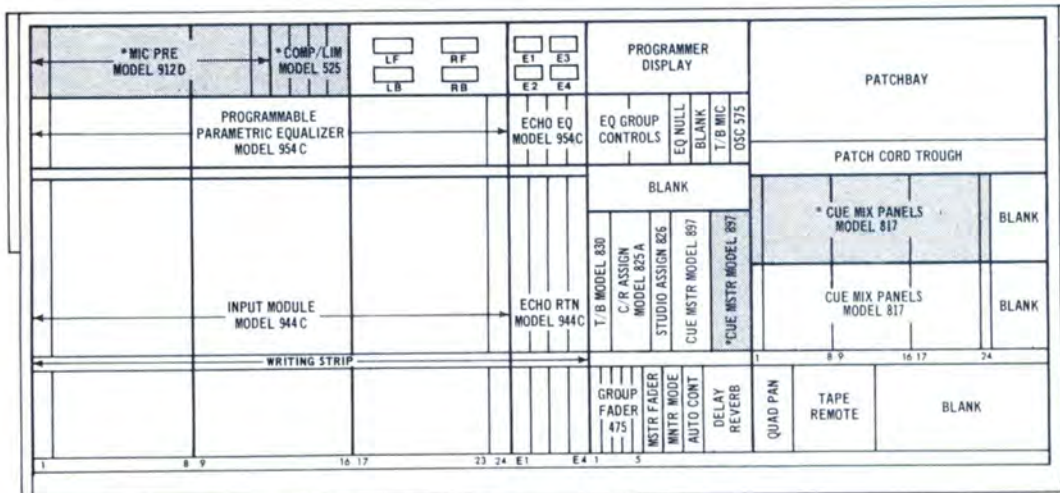
input, as a numeral, in its respective position. This is an invaluable aid in nulling or resetting pan positions.

Updating and writing of encoded data is accomplished in-total (Master), or function by function (Local). Any function in any portion of a program may be changed without altering any other characteristic of the material.

Subtle or drastic differences of level, panning, echo or equalization can be built into the mono, stereo and quad mixes of a program. The encoded mixes can then be stored for later recall, with the actual audio master being only one generation away from the original.

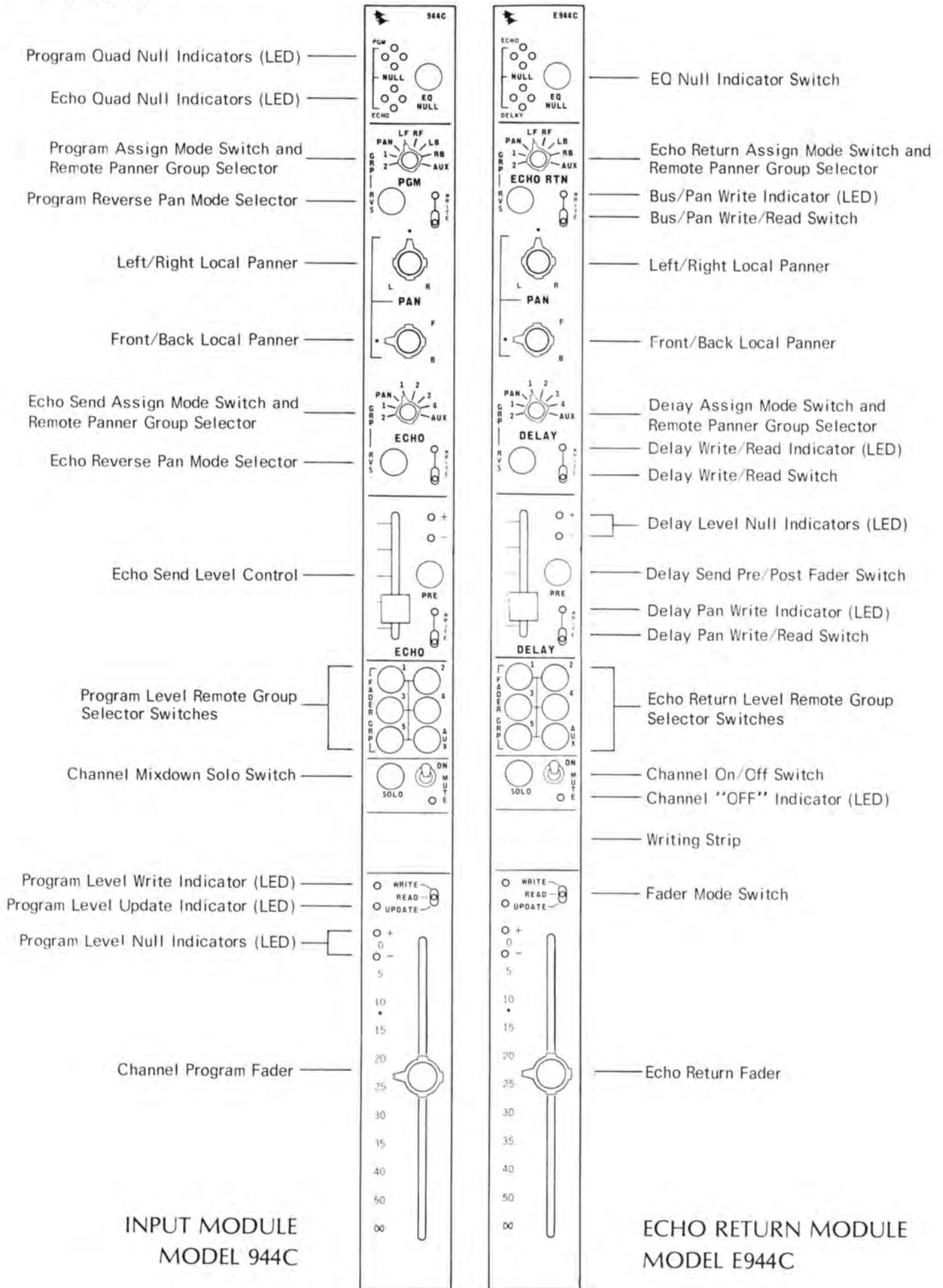
Panel Layout

Length: 96-1/2 inches
Height: 42 inches
Depth: 38-3/4 inches



*Options shown in darker tone

Automix



AUTOMATED's *Comprehensive!* CARD SYSTEM

MICROPHONE PRE-AMPLIFIER Model 312



Transformer coupled input and output. Exceptionally low noise (equivalent input -129 dBm) and high output capability with low distortion. Adjustable gain. Input to 0 dBm and output capability +30 dBm. Utilizes Model 2520 operational amplifier.

DISTRIBUTION AMPLIFIER Model 328



Bridging input. 8 identical transformerless balanced 600 ohm outputs. +24 dBm clip level with unity gain. Utilizes two Model 2520 operational amplifiers.

SPECIAL PURPOSE AMPLIFIERS Models 330P, 330T, 330F, 330G



Models available for RIAA Phono, NAB Tape, and Magnetic Film. Low noise, adjustable gain, high output capability. Equalization adjustable. 330F provides both 16 and 35 mm. curves, externally selectable.

Model 330G: Fixed frequency sine wave oscillator with up to +12 dBm transformer coupled output. Utilize Model 2520 operational amplifier.

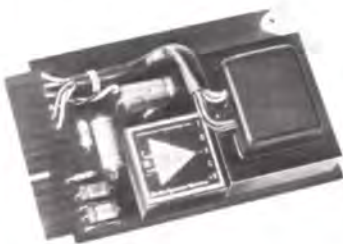
10 WATT POWER AMPLIFIER Model 701



A dynamic power limiting circuit monitors the power being delivered and automatically and instantaneously controls both current and voltage, thus providing complete protection and instant recovery from overload. The Model

701 operates from a bipolar power supply of ± 16 volts to deliver its full rated power. Up to eleven Model 701's can be mounted in the standard Automated Processes Model 411 Card Frame.

LINE AMPLIFIER • Model 325



Bridging input. Output capability +30 dBm. Adjustable gain, transformer coupled output. Can function as line amp, booster amp or "no loss" combining network. Utilizes Model 2520 operational amplifier.

All PC cards (2 3/4" x 4 1/2" x 1 1/2", except 314D) permit standard modular use. Power supply decoupling and reverse voltage protection are provided.

CARD FRAMES • Models 411, 405



Eleven amplifiers mount in Card Frame Model 411, 3 1/2" high, 6" deep, and 19" wide. Five amplifiers mount in Card Frame Model 405, which is 10" wide.

DISTRIBUTION AMPLIFIER Model 314 D



Transformer coupled input and four transformer coupled outputs, 600 ohm matching at +20 dBm clip level with unity gain. Utilizes one Model 2520 Operational Amplifier. Size: 4 1/2" x 6 3/4" x 1 1/2".

AUTOMATED PROCESSES

also manufactures

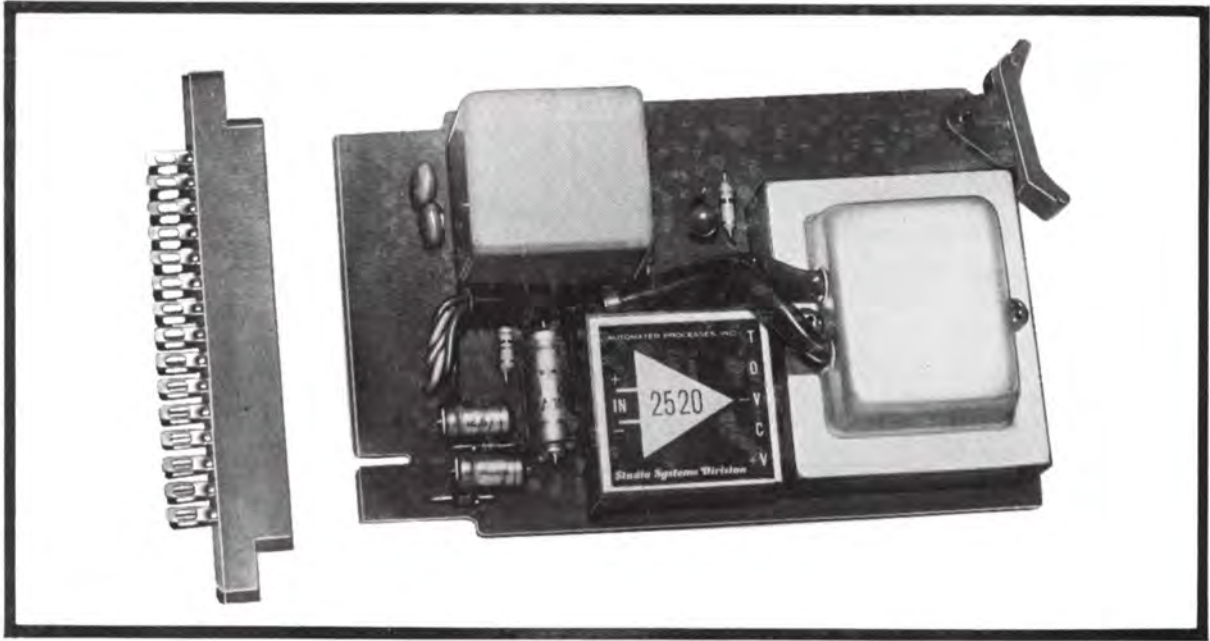
EQUALIZERS FADERS
COMPRESSORS LARGE POWER AMPLIFIERS
MODULAR CONSOLES and SYNCHRONIZERS



AUTOMATED PROCESSES, INC.
80 MARCUS DRIVE, MELVILLE, NEW YORK 11746 • 516-694-9212

Preamplifier

MODEL 312



Features:

- Transformer coupled input—150 ohm and 600 ohm Bridging
- Two transformer coupled outputs
- Gain externally adjustable (15 to 65 dB)
- Low noise and distortion
- High output (+30 dBm)
- Reverse polarity and overload protected
- Small interchangeable plug-in card
- Utilizes the Model 2520 Audio Operational Amplifier

Description:

The Model 312 is a plug-in PC card preamplifier having extremely low noise and distortion characteristics. Its power handling capability insures freedom from overload with today's high output microphones. Because of the high input acceptance level, the unit is also ideal as a line or booster amplifier. The Model 312 makes use of Automated Processes' 2520 Operational Amplifier as its active element and therefore exhibits the reliability, long life and uniformity which are characteristic of this device.

Gain of the Model 312 may be accurately adjusted through a 40 dB range to a maximum of 65 dB by the use of an appropriate fixed resistor on the external connector, or made variable within this range by the use of a potentiometer. By means of transformer connections, gain

may be reduced to 15 dB. Optimum signal to noise ratio and low distortion characteristics are maintained independent of gain settings within the ratings of the amplifier. Since all input and output impedance connections as well as gain selection are accomplished on an external connector, all Model 312 amplifiers in a system are completely interchangeable.

The output transformer of the Model 312 is of unique design and contains two independent secondary windings. The first winding, which is centertapped, provides greater than +26 dBm into 600 ohms. An output in excess of +22 dBm is simultaneously available from the second winding. Continuous undistorted power output capability of +30 dBm into 600 ohms is provided by strapping both secondary windings in series at the connector. The unit is short circuit protected and cannot be damaged by input or output overloads.

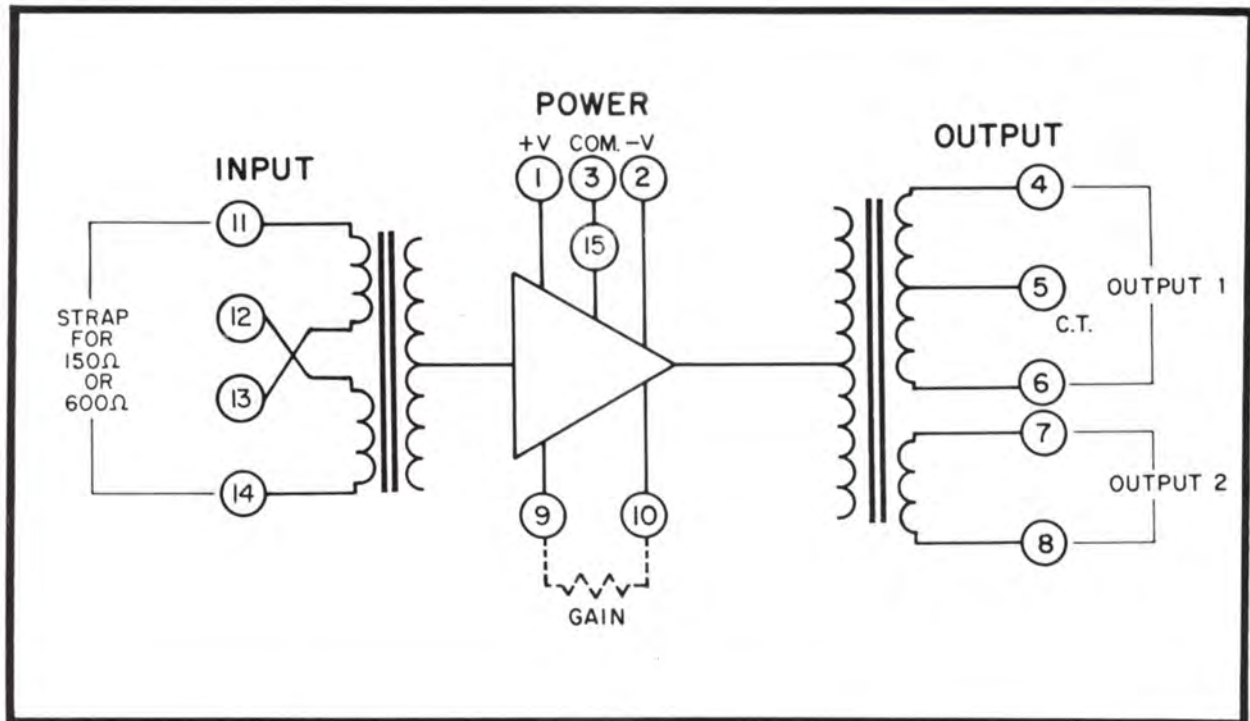
The Model 312 operates from a bipolar power supply of from ± 12 to ± 20 volts permitting great latitude in system design and assurance of stability under normal operating conditions. It is reverse polarity protected and will withstand transients as high as ± 30 volts preventing damage from power line surges and power supply malfunctions. Tightly regulated supplies are therefore not required. Power decoupling is also provided to prevent signal coupling in the power supply lines.

Up to eleven amplifiers can be mounted in Card Frame Model 411, which is 3½" high, 6" deep, and 19" wide. Five amplifiers can be mounted in Card Frame Model 405, which is 3½" high, 6" deep and 10" wide.

The Model 312 is supplied with mating connector and is equipped with a color coded card extractor handle.



AUTOMATED PROCESSES, INC.
789 PARK AVENUE, HUNTINGTON, NEW YORK 11743 - 516-427-6024



Specifications (600 ohm load unless otherwise specified)

Applications: Microphone Preamplifier, Line Amplifier, Booster Amplifier

Gain: Externally adjustable on mating connector from 15 dB to 65 dB.

Frequency Response: ± 0.5 dB, 30 Hz to 20 KHz at rated output

Noise: Equivalent to an input of -129 dBm, 20 Hz to 20 KHz unweighted

Distortion
 ± 16 V Operation: Less than 0.01% THD at $+4$ dBm output, 30 Hz to 20 kHz
 Less than 0.05% THD at $+18$ dBm output, 20 Hz to 30 kHz

Clipping Level (3% THD)
 ± 16 V Operation: $+26$ dBm (output 1 into 600 ohms)
 $+30$ dBm (both outputs in series)

Input: Bridging transformer

Source Impedance: 150 ohms or 600 ohms

Input Level: Signal amplitude as high as 0 dBm will produce no more than 0.5% THD, 30 Hz to 20 KHz, within the output ratings of the amplifier.

Input Impedance: Greater than 10 times source impedance

Output: 2 secondary windings which may be used in series or as 2 separate outputs.

Output Impedance: Less than 45 ohms (output 1)
 Less than 15 ohms (output 2)
 Less than 85 ohms (2 windings in series)

Overload Protection: Current limited; protected against overload or short circuit under any output or input condition.

Overload Recovery: Instantaneous

Power Requirements: ± 12 V to ± 20 VDC, Bipolar
 20 ma at $+4$ dBm output
 65 ma at $+30$ dBm output
 Protected against overvoltage (150%) and polarity reversal.

Temperature of Environment: Up to 150° F without derating

Connector: Dual 15 pin connector supplied

Dimensions: $2\frac{3}{4}$ " high, $4\frac{1}{4}$ " deep, $1\frac{1}{8}$ " wide

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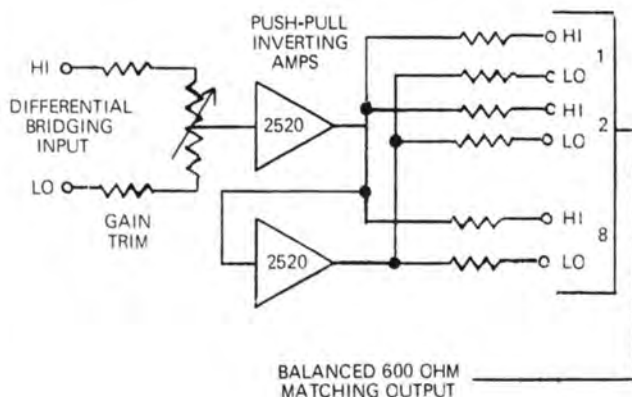
DISTRIBUTION AMPLIFIERS

Model 328



Bridging input. 8 identical transformerless balanced 600 ohm outputs. +24 dBm clip level with unity gain. Utilizes two Model 2520 operational amplifiers.

BLOCK DIAGRAM



SPECIFICATIONS

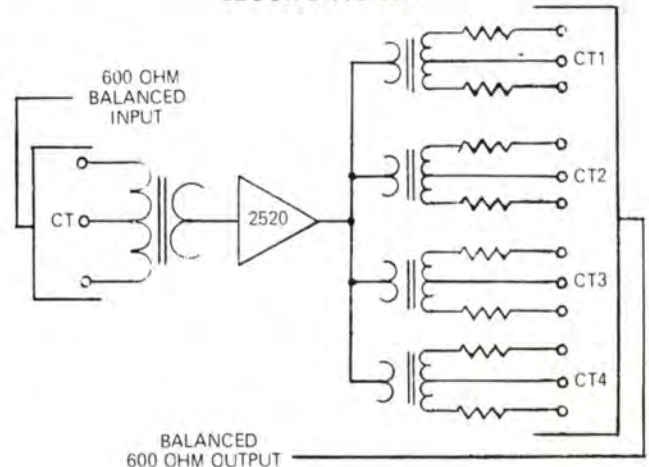
Outputs: 8 Balanced, 16 Unbalanced
Output Impedance: 600 Ohm (matching networks included)
Maximum Level: +30 dBm, open circuit
 +24 dBm, terminated
Isolation: 80 dB, output to output, output to input
Input Impedance: 5 k Ohm
Common Mode Voltage: 50 VDC
Common Mode Rejection: 80 dB typical
Frequency Response: ± 0.25 dB, 20 Hz to 20 kHz
Distortion: 0.5% THD max. at full output
 0.1% at +4 dBm typical
Output Noise: -90 dBm, 20 kHz BW unweighted
Gain*: Continually adjustable to +6 dB
Size: Plug-in PC module, 2 3/4" x 4 1/2" x 1"
Mounting: Model 411 Card Frame houses 11 modules;
 RETMA rack mount 19" wide x 3 1/2" high x 6" deep
Power:** Bipolar ± 20 VDC at 100 mA. Bipolar
 ± 15 V supply may be used with proportionally lower signal level
Configurations: 328-1: 600/600 Ω Unity Gain D.A.
 328-2: 600/600 Ω 20dB Gain D.A.
 328-3: 10K/600 Ω Unity Gain D.A.
 328-4: 10K/150 Ω Unity Gain D.A.

Model 314D



Transformer coupled input and four transformer coupled outputs, 600 ohm matching at +20 dBm clip level with unity gain. Utilizes one Model 2520 Operational Amplifier.

BLOCK DIAGRAM



SPECIFICATIONS

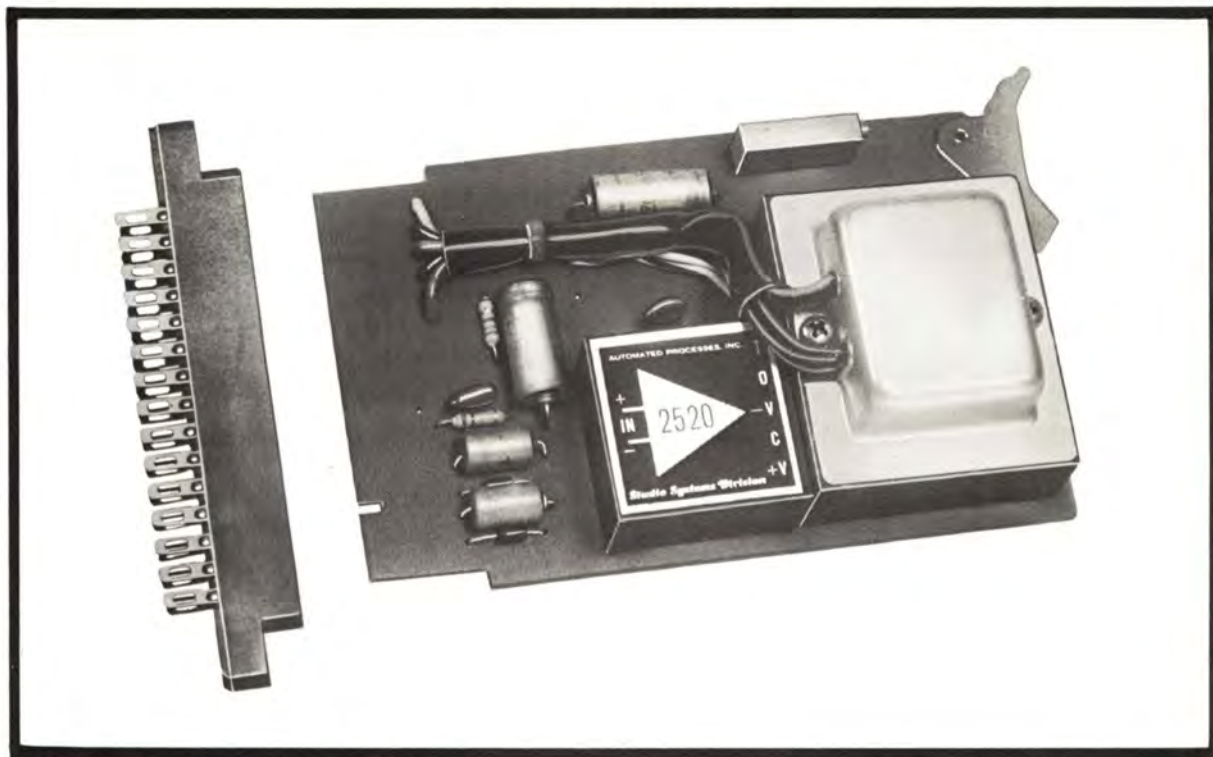
Outputs: 4 independent balanced center tapped transformers.
Output Impedance: 600 Ohm (matching networks included)
Maximum Level: +30 dBm, open circuit
 +24 dBm, terminated
Isolation: 80 dB, output to output, output to input
Input Impedance: 600 Ohm, balanced center tapped transformer
Frequency Response: ± 0.5 dB, 50 Hz to 20 kHz
Distortion: 0.5% THD max. at full output
Output Noise: -80 dBm max, 20 kHz BW unweighted
Gain: 0 dB ± 0.5 dB
Size: Plug-in PC module, 4 1/2" x 6 3/4" x 1 1/2"
Mounting: Model 414 Card Frame houses 10 modules;
 RETMA rack mount 19" wide x 5 1/4" high x 10" deep
Power:** Bipolar ± 20 VDC at 50 mA. Bipolar
 ± 15 V supply may be used with proportionally lower signal level
Configurations: 314C: 600 Ω Balanced Combining Amp.
 314D: 600 Ω Balanced Distribution Amp.

* Available adjustable to +26 dB gain on special order
 ** Companion power supplies available



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Phono, Tape, Film Equalized Preamplifier MODEL 330



Features

- Low Noise—Low Distortion
- Transformer Coupled High Level Output
- High Frequency Equalization and Output Level Adjustments
- Small Interchangeable Plug-in Card
- Reverse Polarity and Overload Protected
- Utilizes Automated Processes Model 2520 Audio Operational Amplifier

Description

The Model 330 series of equalized preamplifiers is designed to provide proper playback response curves according to RIAA disc standards (330P), NARTB 7½, 15 ips tape standards (330T), and SMPTE 16, 35mm film standards (330F). All Model 330 preamplifiers are on identical size PC cards, all have centertapped output transformers and all have sufficient gain to provide a +6 dBm output level when fed with the standard reference levels through appropriate and conventional magnetic tape heads or phonograph cartridges.

Each unit provides an easily accessible trimmer ad-

justment of the high frequency end of the curve to compensate for differences between individual tape heads, head wear, or variations in phono cartridges.

In the Model 330F, both 16mm and 35mm equalizations are provided and are selectable by means of an external switch which may be wired to the connector. If only one equalization is required, a permanent jumper wire can be installed in place of the switch. In this model there are two high frequency trimmers so that each equalization curve may be separately adjusted.

Gain of the Model 330 may be conveniently and accurately adjusted to a maximum of 54 dB by the use of an appropriate fixed resistor on the external connector, or made variable within this range by the use of a potentiometer. Optimum signal to noise ratio and low distortion characteristics are maintained independent of gain settings within the ratings of the amplifier.

The centertapped output transformer of the Model 330 provides continuous undistorted power output of +26 dBm into 600Ω. The unit is short circuit protected and cannot be damaged by input overloads.

The Model 330 operates from a bipolar power supply of from ±12 to ±20 volts permitting great latitude in system design and assurance of stability under normal operating conditions. The amplifiers are reverse polarity protected and will withstand transients as high as ±30



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volts, preventing damage from power line surges and power supply malfunctions. Tightly regulated supplies are therefore not required. Power decoupling is also provided to prevent signal coupling in the power supply lines.

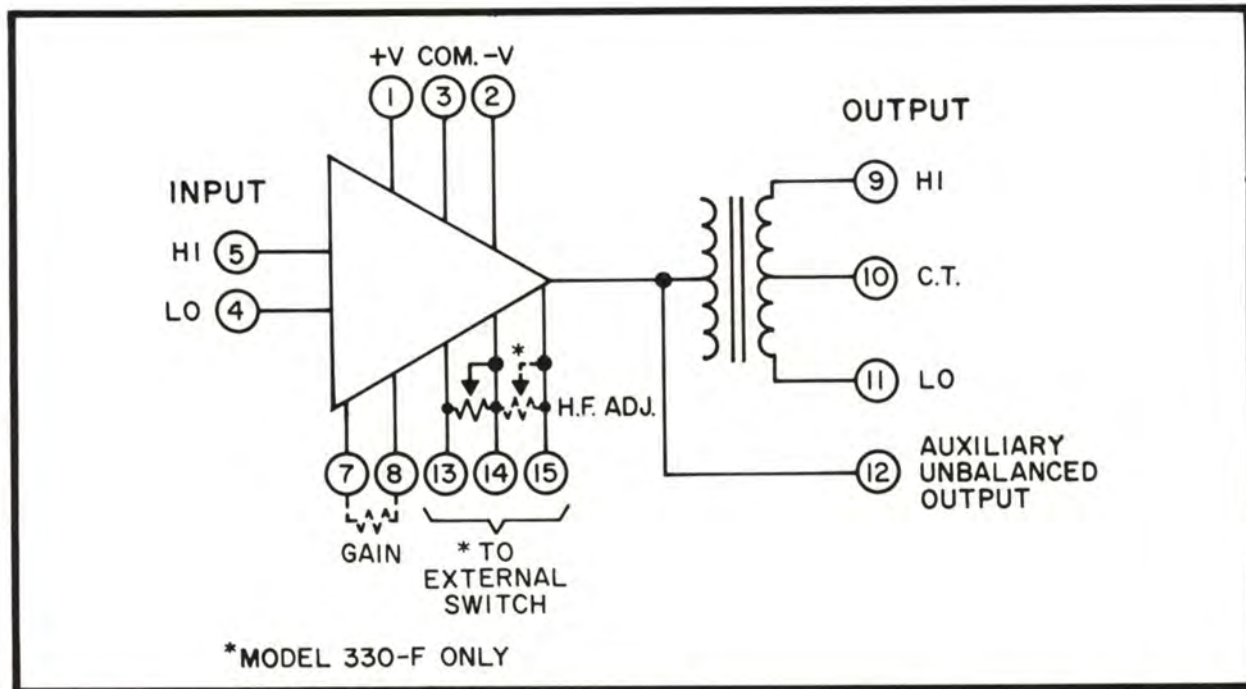
The Model 330 makes use of Automated Processes 2520 operational amplifier as its active element and therefore exhibits the reliability, long life and uniformity which are characteristic of this device.

Up to eleven amplifiers can be mounted in Model 411

Card Frame, which is 3½" high, 6" deep and 19" wide. Five amplifiers can be mounted in Model 405 Card Frame, which is 3½" high, 6" deep and 10" wide.

The Model 330 is supplied with mating connector and is equipped with a color coded card extractor handle.

The series of Model 330 Preamplifiers are ideal links between program sources and the main body of a professional audio system. The 330 series along with the Model 312 Microphone Preamplifier provides total, consistent, extremely high quality input capability.



Specifications

Applications: 330P: Phono Preamplifier — RIAA curve
 330T: Tape Playback Preamplifier NARTB 7½ and 15 ips curve
 330F: 35 and 16mm Magnetic film playback preamplifier SMPTE curves

Gain: 330P: Max. 54 dB (externally adjustable on connector)
 330T: Max. 52 dB (externally adjustable on connector)
 330F: Max. 50 dB (externally adjustable on connector)

Sensitivity: 330P: 1.4 mv at 1 kHz produces 0 dBm output
 330T: 2.3 mv at 700 Hz produces 0 dBm output
 330F: 2.8 mv at 1 kHz produces 0 dBm output

Frequency Response: ±1 dB of specified curve at rated output

Distortion: Less than 0.01% THD, 30 Hz to 20 kHz @ 4 dBm output
 Less than .05% THD, 30 Hz to 20Hz @ 18 dBm output

Noise: -75 dBm, Maximum Gain

Clipping Level (3% THD)
 ±16V Operation: +26 dBm

Signal Source: 330P: Less than 500 mhy
 330J: Less than 800 mhy
 330F: Less than 800 mhy

Input Impedance: 330P: 51 kΩ
 330T: 330 kΩ
 330F: 330 kΩ

Output: Center-tapped Transformer

Output Impedance: 55 Ω

Power Requirements: ±15V to ±20V D.C. Bipolar, 20 mA

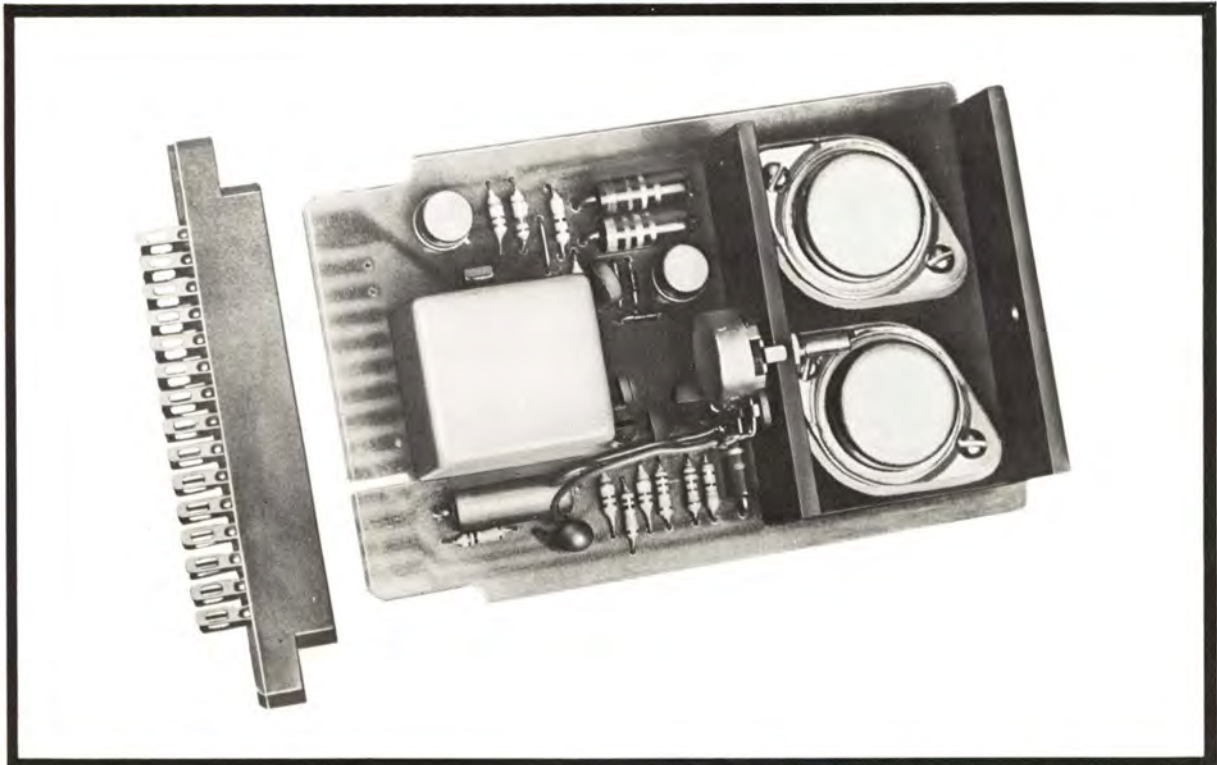
Dimensions: 2¾" high, 4¼" deep, 1¾" wide

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.



10 Watt Power Amplifier

MODEL 701



Features

- Small Size
- Fail Safe Design
- Low Noise
- Transformer Isolated Input
- Instant Overload Recovery
- Integral Level Control

Description

The Model 701 is a virtually burn out proof, miniature, power amplifier for driving headphones, small speaker systems or other devices.

Conservative design permits the amplifier to operate continuously at 10 watts rms sinewave at any audio frequency. A dynamic power limiting circuit monitors the power being delivered and automatically and instantaneously controls both current and voltage, thus providing complete protection and instant recovery from overload. This instant

recovery permits much higher average power output by reducing the objectionable peak overload distortion usually found in transistor amplifiers.

The Model 701 operates from a bipolar power supply of ± 16 volts to deliver its full rated power. Up to eleven Model 701's can be mounted in the standard Automated Processes Model 411 Card Frame. Five Model 701 amplifiers can be mounted in the Model 405 Card Frame.

Specifications

Power Output: 10 watts 4Ω , 8 watts 8Ω at ± 16 VDC
12.5 watts 4Ω , 15 watts 8Ω at ± 24 VDC

Distortion: Less than 0.3% T.H.D. 20 Hz to 20kHz

Frequency Response: 30 to 20kHz ± 0.3 dB

Hum and Noise: 110dB below full output

Input Voltage: 0.75 Volts for full output

Input Impedance: $16k\Omega$ (Transformer Isolated)

Power Requirement: ± 16 Volts to ± 24 VDC 800mA Max.

Dimensions: $2\frac{3}{4}$ " high, $4\frac{1}{4}$ " deep, $1\frac{1}{4}$ " wide

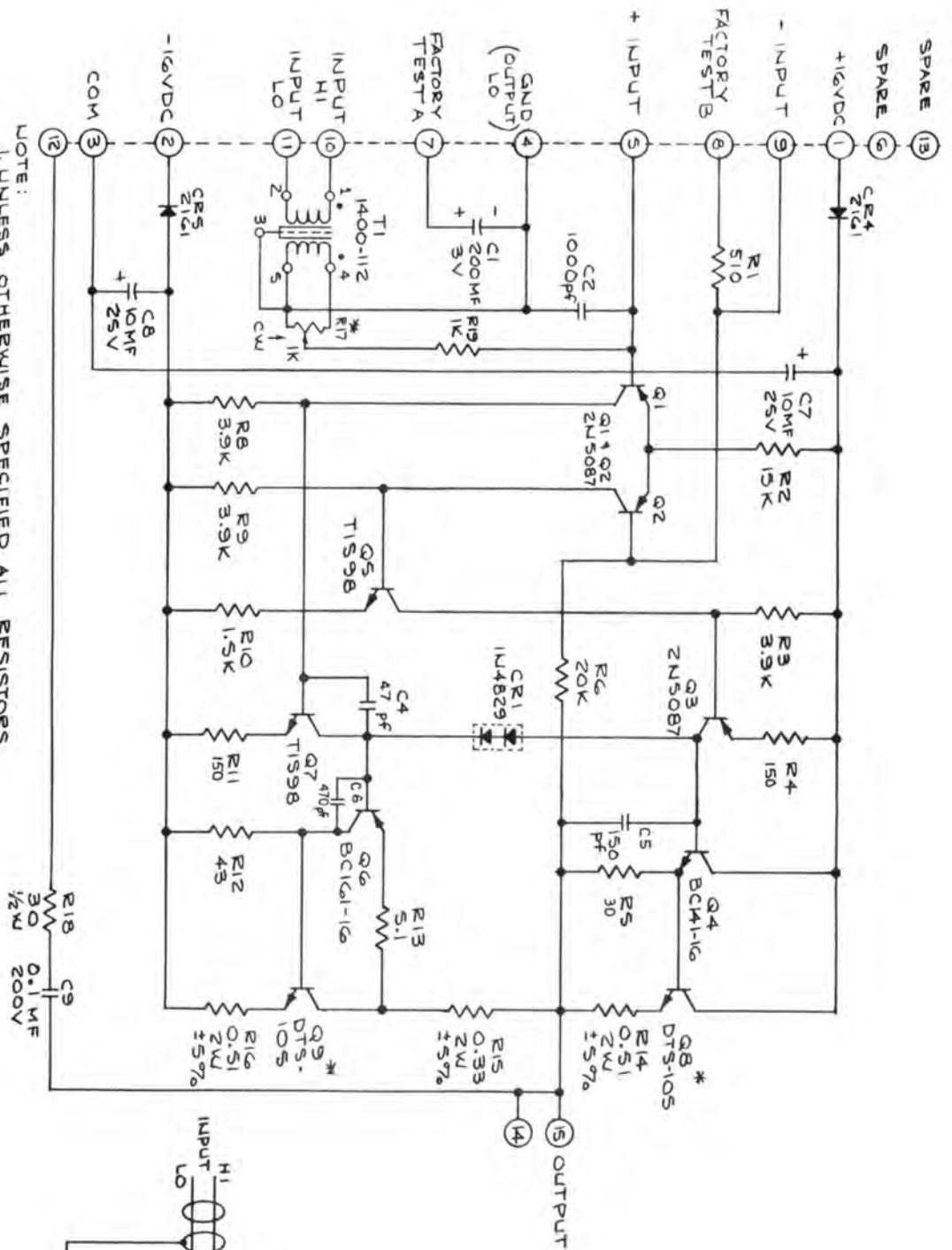
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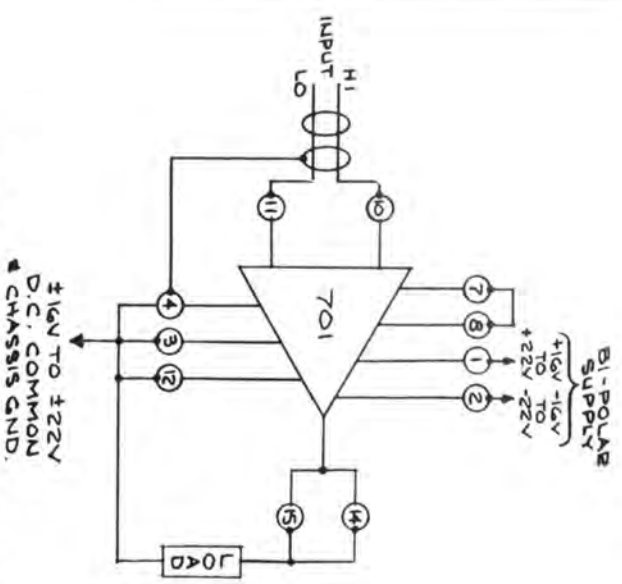
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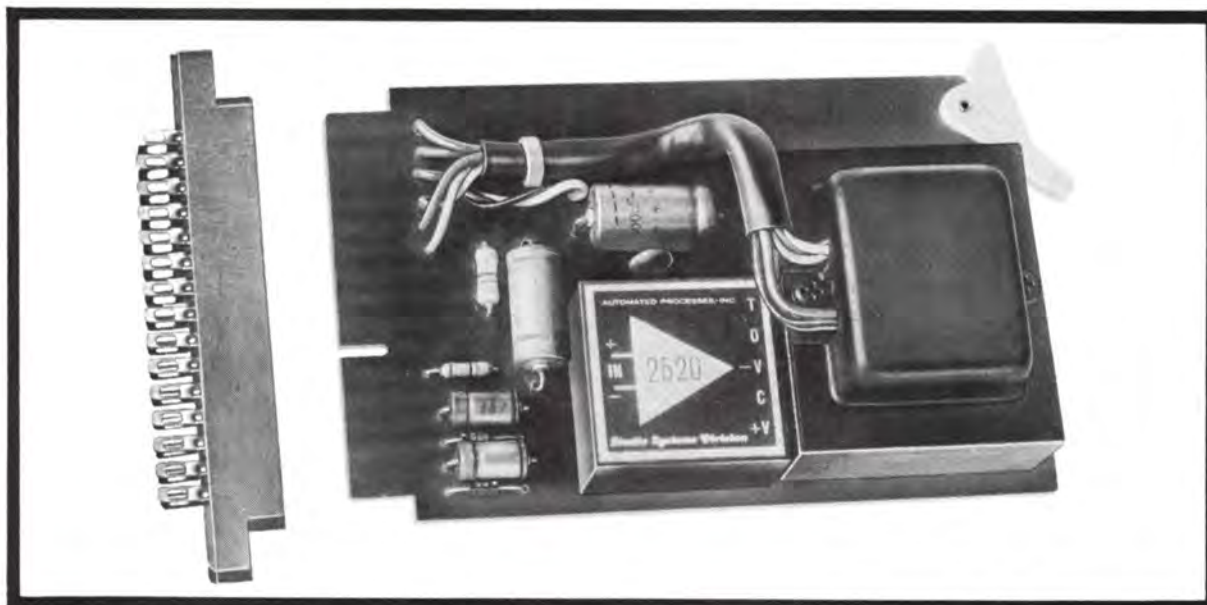


NOTE:
 1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE IN OHMS, 1/4 W, ±5%
 2. TRANSISTORS Q8 & Q9 & POT R17 ARE LOCATED ON HEATSINK.

CONNECTION DIAGRAM



Line, Booster, or Combining Amplifier MODEL 325



Features

- Bridging or combining function input.
- Three transformer coupled outputs.
- Gain externally adjustable.
- Low noise and distortion.
- High output (+30 dBm).
- Reverse polarity and overload protected.
- Small interchangeable plug-in card
- Utilizes the Model 2520 Audio Operational Amplifier.

Description

The Model 325 is unique in its design as a bridging amplifier and a differential active combining network with transformer coupled output.

All of the connections for the two modes of operation are accomplished at the external connecting socket. A companion terminal board containing a precision summing network is also available.

The Model 325 makes use of Automated Processes' 2520 operational amplifier as its active element and therefore exhibits the reliability, long life and uniformity which are characteristic of this device.

Gain of the Model 325 may be conveniently and accurately adjusted through a 40 dB range to a maximum of 49 dB by the use of an appropriate fixed resistor on the external connector, or made variable within this range by the use of a potentiometer. By means of transformer connections, gain may be reduced to unity. Optimum signal to noise ratio and low distortion characteristics

are maintained independent of gain settings within the ratings of the amplifier. Since mode of operation, choice of impedance, and gain selection are accomplished on an external connector, all Model 325 amplifiers in a system are completely interchangeable.

The output transformer of the Model 325 is of unique design and contains three independent secondary windings. Each winding is capable of simultaneous outputs in excess of +20 dBm into 600 ohms. Continuous undistorted power output of +30 dBm into 600 ohms is available by strapping all three secondary windings in series at the connector. The unit is short circuit protected and cannot be damaged by input overloads. The Model 425 companion Summing Network gives complete freedom of choice as to number of inputs to be summed up to 22, with gain set between unity and 20 dB.

The Model 325 operates from a bipolar power supply of from ± 12 to ± 20 volts permitting great latitude in system design and assurance of stability under normal operating conditions.

It is reverse polarity protected and will withstand transients as high as ± 30 volts preventing damage from power line surges and power supply malfunctions. Tightly regulated supplies are therefore not required. Power decoupling is also provided to prevent signal coupling in the power supply lines.

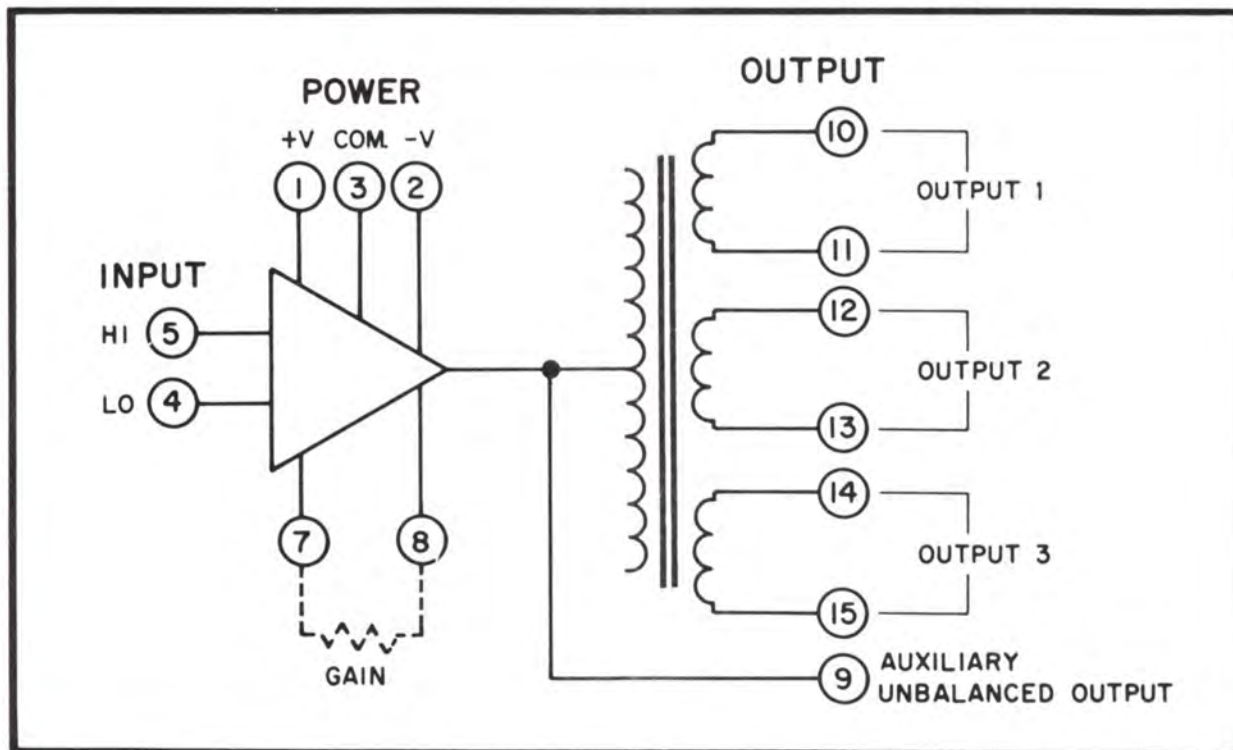
Up to eleven amplifiers can be mounted in Model 411 Card Frame, which is $3\frac{1}{2}$ " high, 6" deep, and 19" wide. Five amplifiers can be mounted in Model 405 Card Frame, which is $3\frac{1}{2}$ " high, 6" deep and 10" wide.

The Model 425 Summing Network mounts between adjacent amplifiers in either card frame and therefore does not require additional space.

The Model 325 is supplied with mating connector and is equipped with a color coded card extractor handle.



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Specifications (600 ohm load unless otherwise specified)

Applications: Line Amplifier, Booster Amplifier, Lossless Combining Network, Differential Amplifier, Headphone or Cue Amplifier.

Gain: Externally adjustable on mating connector from unity to 49 dB.

Frequency Response: ± 0.25 dB, 30 Hz to 20 KHz at rated output

Distortion Less than 0.01% THD at +4 dBm output, 30 Hz to 20 kHz
 ± 16 V Operation: Less than 0.05% THD at +18 dBm output, 20 Hz to 30 kHz

Clipping Level (3% THD) +22 dBm (3 simultaneous outputs into 600 ohms)
 ± 16 V Operation: +30 dBm (3 outputs in series)

Noise: Equivalent to an input of -125 dBm, 20 Hz to 20 KHz unweighted

Input Impedance: 12,000 ohms

Output: 3 identical secondary windings which may be used as 3 separate outputs, or in any series or any parallel combination.

Output Impedance: Less than 15 ohms (each output)
 Less than 85 ohms (3 windings in series)

Overload Protection: Current limited; protected against overload or short circuit under any output or input condition.

Overload Recovery: Instantaneous.

Power Requirements: ± 12 V to ± 20 V DC Bipolar
 20 ma at +4 dBm output
 65 ma at +30 dBm output
 Protected against overvoltage (150%) and polarity reversal.

Temperature of Environment: Up to 150°F without derating

Connector: Dual 15 pin connector supplied (15 spare terminals)

Dimensions: 2 $\frac{3}{4}$ " high, 4 $\frac{1}{4}$ " deep, 1 $\frac{1}{8}$ " wide.

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.



Compressor-Limiter

MODEL 525



Features

- Switchable Compression and Limiting functions
- Ceiling control for 20 dB of compression or limiting
- De-Ess (Anti Sibilant)
- Four selectable Release times

- Fast attack time
- Integral Illuminated meter
- Threshold and Output level controls
- In-Out switch
- Two range, frequency dependent release time
- Transformer coupled output to +24 dBm
- Flat Frequency Response
- Low distortion, less than 0.5% 30 to 20,000 Hz
- Low noise
- Stereo Interconnect
- Utilizes Automated Processes 2520 Op Amps

Description

The Automated Processes Model 525 Compressor-Limiter is ideal for the reduction of distortion due to overload or overmodulation of program peaks in recording or broadcast applications.

The Model 525 is designed for individual channel use, however its extreme flexibility, repeatable settings and stereo interconnect features make it ideal for all studio applications. Virtually any type of program material can be dynamically controlled by the 525 without annoying side effects through the use of its various features.

The unique Ceiling Control permits extreme ease of operation by providing up to 20 dB of compression or limiting in 2 dB steps while maintaining a constant peak output level.

Two small rotary controls set the initial operating parameters of threshold and output level. Full range of operation is achieved with signal input levels from -15 dBm to +20 dBm and output capability is +24 dBm through an integral output transformer.

The six remaining controls are push buttons that select the various methods of operation. One interlocked group of three buttons sets the basic mode of operation of the 525: Compression (C), Limiting (L), or as a unity gain amplifier disabling the gain reduction features (OFF).

Rapid and accurate evaluation of the effect of dynamic range reduction is accomplished by switching between Off and Limiting or Compression. The switches may also be used to insert a preset amount of dynamic range reduction on cue.

The other three push buttons are non-interlocking, and control the release time constant providing a choice of four release times, and the Anti Sibilant (De Ess) feature.

The basic release time is frequency dependent with all low frequency program material (below 300 Hz) having a substantially longer time constant than material above this frequency. The selectable increase of release time primarily affects high frequency material. This unique combined action of variable and selectable release time reduces distortion and, along with the fast



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attack time, insures proper dynamic range reduction for a wide variety of program material, and a freedom from undesirable program colorations such as "pumping" or "breathing". The De Ess or Anti Sibilant feature through frequency dependent gain reduction, reduces high frequency overloads due to sibilant voices and certain brass and percussion instruments. Higher levels can therefore be safely utilized in pre-emphasized media such as tape and disc recorders and FM transmission with a resultant improved signal to noise ratio. The stereo interconnect feature prevents changes in the stereo balance due to unequal compression or limiting in one channel of a stereo pair.

The 525 is extremely stable and does not require frequent adjustment. Initial set up is remarkably simple and can be done in approximately fifteen seconds using

only an oscillator and VU meter.

The Model 525 Compressor-Limiter makes use of Automated Processes 2520 operational amplifiers and therefore exhibits the reliability, long life and uniformity which are characteristic of this device.

The transformer coupled output will feed loads as low as 300Ω at levels up to +24 dBm.

The Model 525 operates from a bipolar power supply of from ± 15 to ± 18 volts permitting latitude in system design and assurance of stability under normal operating conditions. It is reverse polarity protected and will withstand 150% transients reducing the likelihood of damage from power line surges and power supply malfunctions. Power decoupling is also provided to minimize signal coupling in the power supply lines.

The Model 525 is supplied with mating connector.

Specifications

Input Impedance:	10 $k\Omega$
Output Impedance:	100 Ω
Input Level:	-15 dBm to +20 dBm
Maximum Gain:	25 dB
Noise:	95 dB below +10 dBm output at 10 dB Compression
Frequency Response:	± 0.5 dB 30 Hz to 20 kHz
Harmonic Distortion:	0.5% Max. 30 Hz to 20 kHz
Attack Time:	15 micro seconds
Release Time Constant:	.1, .5, 2.0, 2.5 seconds
De Essing:	Reciprocal Voice Energy Curve
Slopes:	Compression, Approx. 2:1, Limit, Approx. 20:1
Metering:	Compression or limiting—illuminated

Controls:	Rotary: Threshold, Output (presets); Ceiling (operating) Push Button: Compression (C); Limiting (L); Off; Release Time (four release times through the use of combinations of two buttons); De-ess (DS)
Power Requirement:	± 15 V Bipolar D.C. 60 mA max. for +24 dBm output (24 Volt, 30 mA meter lamp on separate terminals. May be strapped to same power through dropping resistor, furnished)
Dimensions:	1½" Wide, 5¼" High, 6" Deep. Also available with 1½" x 5¼" Panel on special order
Connector:	30 pin PC connector supplied
Stereo Limiting:	Units are easily coupled at the connector for stereophonic operation.

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.



Program Equalizer

MODEL 553

FEATURES

- No insertion loss
- Continuously variable low, mid and high frequency equalization controls
- Up to 15 dB boost or attenuation
- LED indicator
- Low noise and distortion
- Uses the Model 2520 Op Amp
- Output is transformer isolated and may be operated balanced or unbalanced
- Interchangeable with other Automated Processes equalizers

The Automated Processes Model 553 is a low cost, modular Equalizer suitable for a wide variety of applications in broadcasting, recording, film mixing, and sound reinforcement installations.

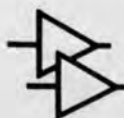
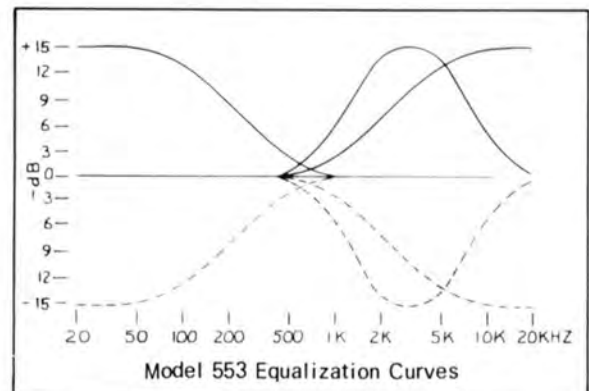
The shelving type low and high frequency families of curves produce familiar overall balance changes in the musical spectrum. The 3kHz mid-frequency peaking curves specifically affect the "presence" range of music and dialogue. The chosen frequencies and shapes of equalization for the three ranges permit great latitude in altering musical balance and character in a most simple manner.



SPECIFICATIONS

(600 ohm load unless otherwise specified)

INPUT IMPEDANCE:	Greater than 10,000 Ω
OUTPUT IMPEDANCE:	Less than 85 Ω , transformer coupled
FREQUENCY RESPONSE:	± 0.25 dB, 30 Hz to 20 kHz, unequalized
DISTORTION:	.01 % T.H.D. max. 30 Hz to 20 kHz at +4 dBm .05 % T.H.D. max. 30 Hz to 20 kHz at +18 dBm +30 dBm minimum at 3% T.H.D.
CLIPPING LEVEL:	+30 dBm minimum at 3% T.H.D.
NOISE:	Below -90 dBm, 20 Hz to 20 kHz, unweighted, unequalized
CONTROLS:	High Frequency; continuously variable shelving to ± 15 dB Mid Frequency; continuously variable band-pass (bell shaped) to ± 15 dB at 3 kHz Low Frequency; continuously variable shelving to ± 15 dB In/Out Switch; silent action with LED indicator
POWER REQUIREMENTS:	± 15 VDC to ± 18 VDC at 30 mA
DIMENSIONS:	Escutcheon 1 1/2" x 5 1/4" depth 5 3/4" behind panel
CONNECTOR:	15 pin PC connector supplied
WEIGHT:	1 pound



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PROGRAMMABLE PARAMETRIC EQUALIZER

MODEL 954C

FEATURES

- Voltage controlled – compatible with the Automated Processes Programmer
- Continuously variable boost and cut to ± 15 dB
- Bell shaped and notch filter modes
- High and low frequency shelving
- Grouping mode for stereo and quad channels
- Unique input circuitry eliminates ground loops
- Compact – Same size as other Automated Processes equalizers
- Self-contained Read/Write controls for automated remix memory systems
- Manual version (Model 554) also available, has identical performance specifications

The Model 954 Programmable Parametric Equalizer features wide dynamic range continuously variable overlapping non-interactive controls. It provides flexibility and versatility consistent with the most advanced automated and manual audio mixing systems.

Precision voltage controlled "state variable" filters are employed to achieve both bell shaped and high "Q" notch filter characteristics. Self-contained Read/Write electronics, permit direct interface with Mixdown Memory Programmers. The grouping function permits any number of equalizers to be ganged by voltage control. In this way, simultaneous equalization or dynamic filter effects can be achieved in stereo, quad, or even multi-track channels.

The 954 provides three overlapping voltage controlled ranges. The upper and lower ranges are provided with selectable shelving modes. Retrofitting into existing consoles is simplified since the control panel is the same size as the Automated Processes Model 550A, and the associated electronics card may be mounted anywhere in the console. Silent electronic switching is provided on all functions.

In addition to conventional response curve shaping for tonal effects, the Model 954 is ideal for bandpass, bandstop and notch filtering for the elimination of noise, sibilance, resonance, etc. Non-interactive circuitry prevents response curve anomalies when center frequencies are brought close or coincident. Consequently, peaks or notches of as much as 30dB can be achieved. Special effects can also be produced by varying or sweeping the filter frequencies during use.

The voltage control and automation functions are particularly useful in achieving dynamic equalization for film and broadcast applications in addition to providing special musical effects.

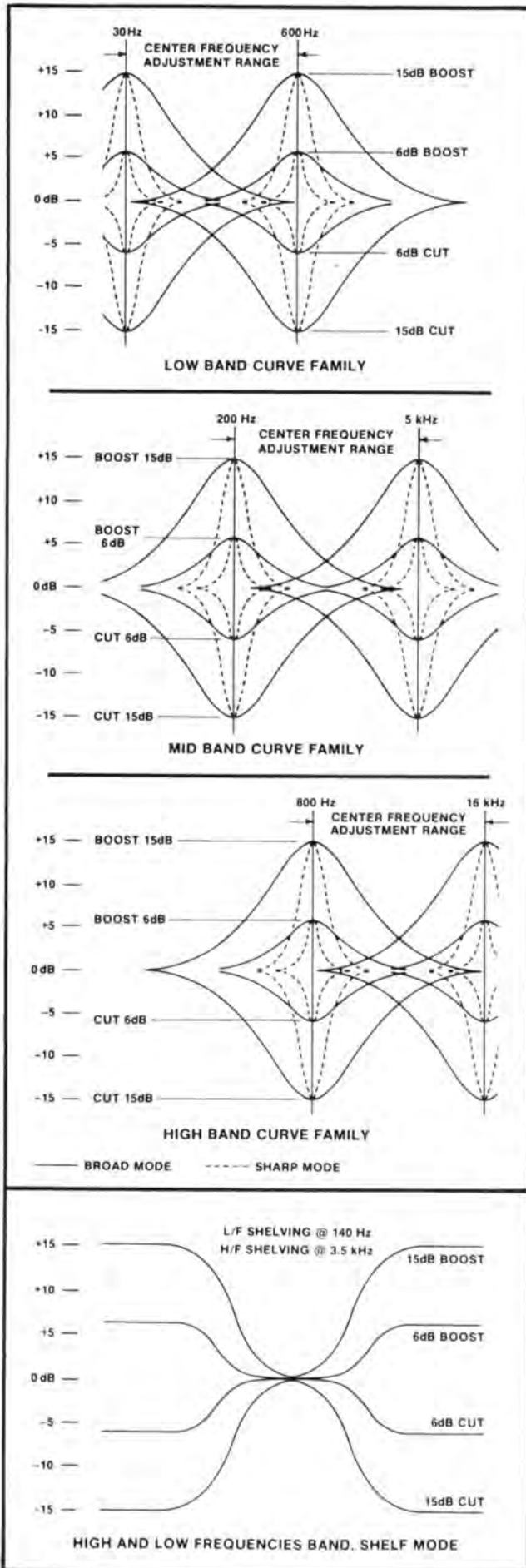


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A.P. Ltd., 17 Erncroft Way, Twickenham, Middlesex TW1 1DA, England-01-891-2770,
and Respected Dealers Throughout the World.

MODEL 954 CONTROLS



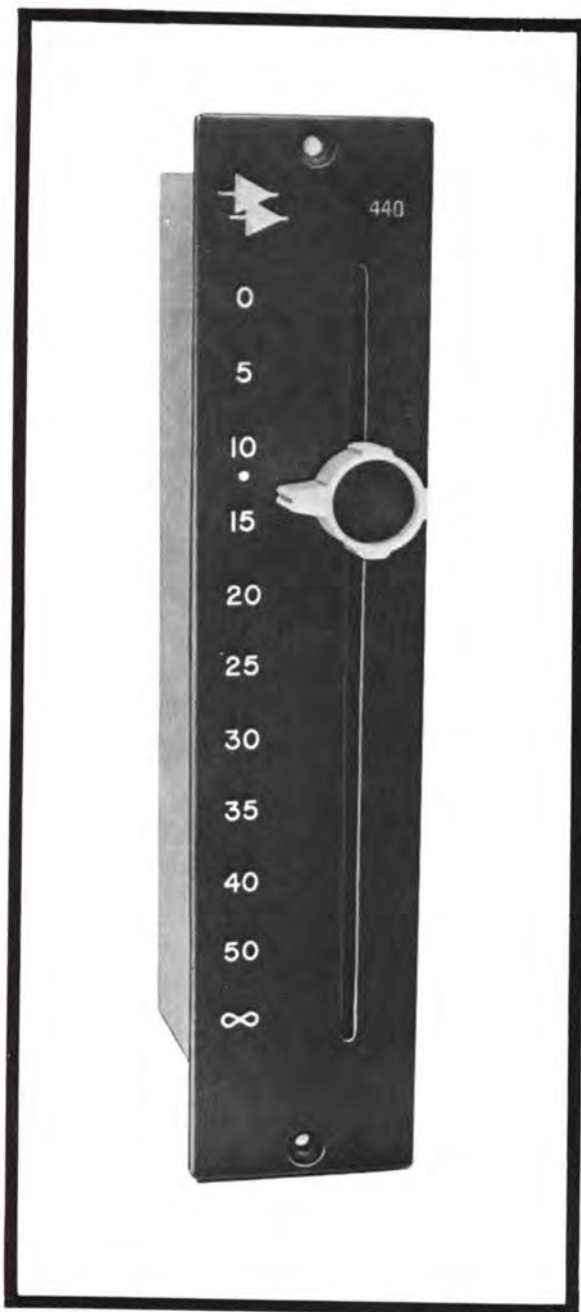
HF Level:	Variable to ± 15 dB
HF Frequency:	Variable 800 Hz to 16 kHz
HF Sharp:	Changes Bandwidth from 1 octave to 1/10 octave
HF Shelf:	Converts from peak to shelf mode
MF Level:	Variable to ± 15 dB
MF Frequency:	Variable 200 Hz to 5 kHz
MF Sharp:	Changes Bandwidth from 1 octave to 1/10 octave
LF Level:	Variable to ± 15 dB
LF Frequency:	Variable 30 Hz to 600 Hz
LF Sharp:	Changes Bandwidth from 1 octave to 1/10 octave
LF Shelf:	Converts from peak mode to shelf mode
EQ In/Out:	Silent. No level shift when actuated
Read/Write:	Transfers 6 analog control functions to automatic programmer control
Indicators:	LED indicators for EQ In/Out, Write and Group modes
EQ Group Selector Switch:	Transfers EQ operation to either of the EQ group controls

MODEL 954 SPECIFICATIONS

Input Impedance:	$>10K\Omega$ resistive, balanced (accepts floating or unbalanced sources)
Output Impedance:	85Ω transformer coupled (600 ohm load nominal)
Nominal Level:	0 dBm to +10 dBm
Clipping Level:	+30 dBm (3% T.H.D.)
Insertion Loss:	0 ± 0.5 dB (600 ohm load)
Frequency Response:	± 0.35 dB, 30 Hz to 20 kHz (unequalized)
Noise:	-90 dBm, unequalized, 20 Hz to 20 kHz unweighted
Distortion: (T.H.D.)	.05% max at +18 dBm, 30 Hz to 20 kHz
Control Voltage:	0 to +5 VDC six control functions per equalizer
Power Requirement:	+5 VDC at 25 mA +24 VDC at 50 mA ± 15 VDC at 125 mA
Dimensions:	Control Unit: $1\frac{1}{2}'' \times 5\frac{1}{4}'' \times 6''$ deep (mounts in same space as Automated Processes Model 550A) Electronics Card: $6\frac{1}{4}'' \times 10'' \times 1\frac{1}{2}''$ wide (mounts in standard 7'' rack mounting card cage)
Weight:	Approximately 2 lbs.

All specifications subject to change without notice.

Conductive Plastic Linear Motion Fader MODEL 440



Features

- 1, 2, 4, 6, 8 gang units available in same panel size: 1½" x 7"
- Infinite resolution—truly stepless
- Resistance element material developed for MIL Spec and Aerospace applications—rated in "millions of cycles" of operation
- Multiple finger, precious metal wiper
- Very low noise
- Long Life
- Adjustable damping
- Illuminated scale markings
- 100,000 hour scale illumination lamps
- Internal SPDT switch operates in Off or Infinity position
- Dust protected element and slide mechanism
- Special Rulon* and Nylon* bearings for smooth action
- Polarized connector, gold plated contacts
- Multi gang units track within ± 0.5 dB
- Color coded knobs—five colors

Description

Making use of a newly developed, mirror finish, resistance material which has proven extraordinarily successful in the precision military and aerospace potentiometer field, Automated Processes has developed a Linear Motion Fader of ideal characteristics for the audio industry.

Designated Model 440, the fader's conductive plastic element and precious metal wiper provide very long life and noise free operation. The unit is stepless and provides smooth fading over its entire range.

Scale markings are illuminated and provide an attractive appearance as well as increased legibility in low light level environments.

The slide mechanism is smooth in operation and is provided with a pressure adjustment to vary the damping to suit operator preferences.

The internal "low force" switch may be used to extinguish the fader scale illumination in the Off position if desired. Tally lights, relays, etc. may also be controlled by the switch so that they are energized in either the Off or On position of the fader.

A stiff switch detent may be specified for broadcast cueing or similar applications, where a positive stop prior to switch actuation is desired.

*Trade Mark



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Specifications

Maximum Attenuation: 90 dB (Audio Passband)

Panel Finish: Black Matte Epoxy. Conforms to MIL Spec P7788

Case Finish: Cadmium Gold Iridite

Knob: Clear anodized aluminum. Nextel™ color inserts: black, red, green, yellow, blue

Impedance: 600Ω or 10,000Ω constant impedance ladder network. Tap on connector provides zero insertion loss potentiometer output

Configurations: Mono, stereo, four, six, and eight channel faders available in the same panel size. (See dimensional drawing)

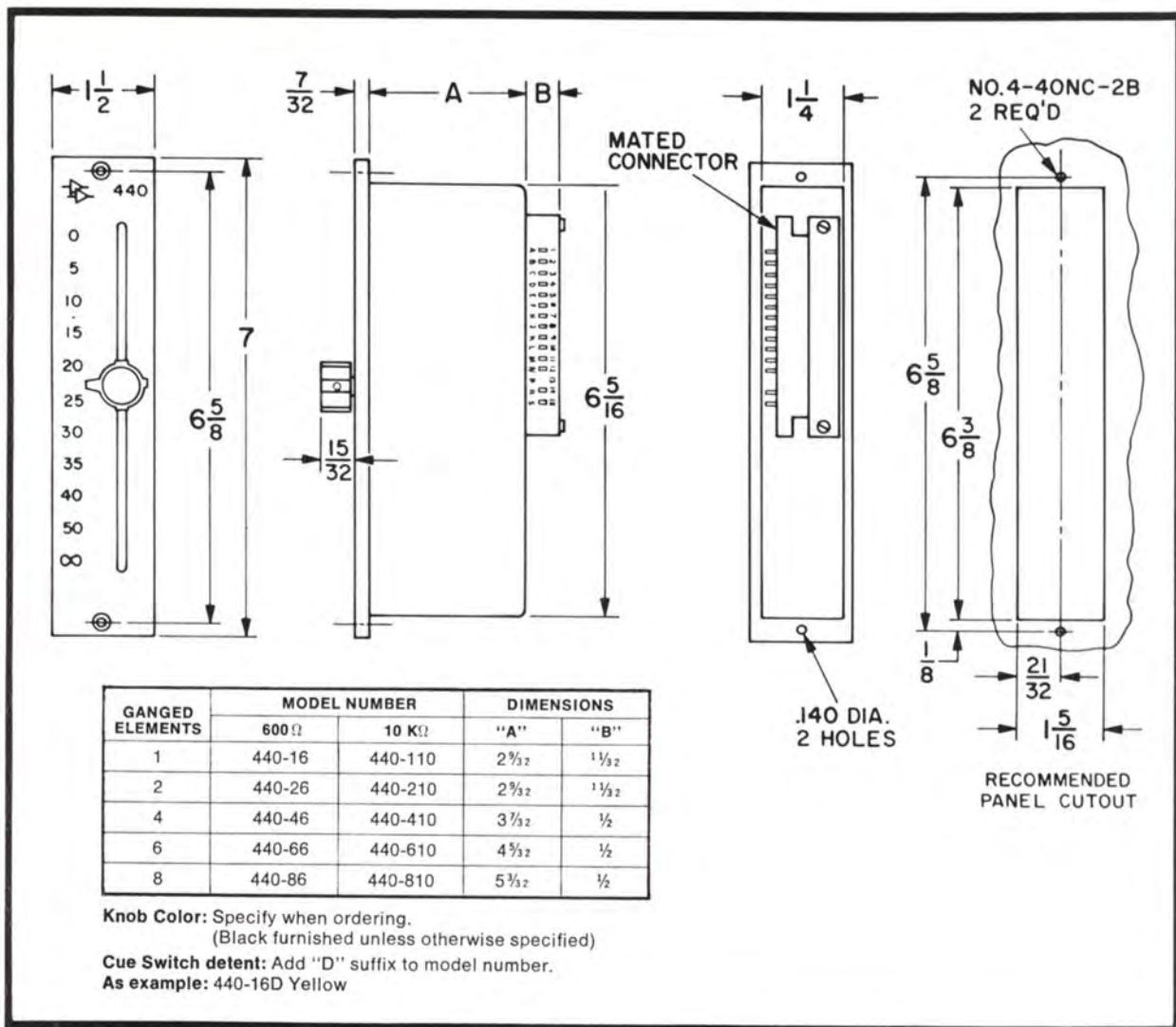
Tracking Accuracy: ±0.5 dB

Internal Switch: Operates at Infinity position, SPDT silver contacts. 1 Amp DC rating. Cue detent optional at no additional cost

Lamp Voltage: 18-24V, 50-60 mA.

Connector: A low profile high reliability connector is furnished:
Mono and Stereo; Amphenol 143-015-01 or equal
Multi-Channel; Elco 6007-030 or equal

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.



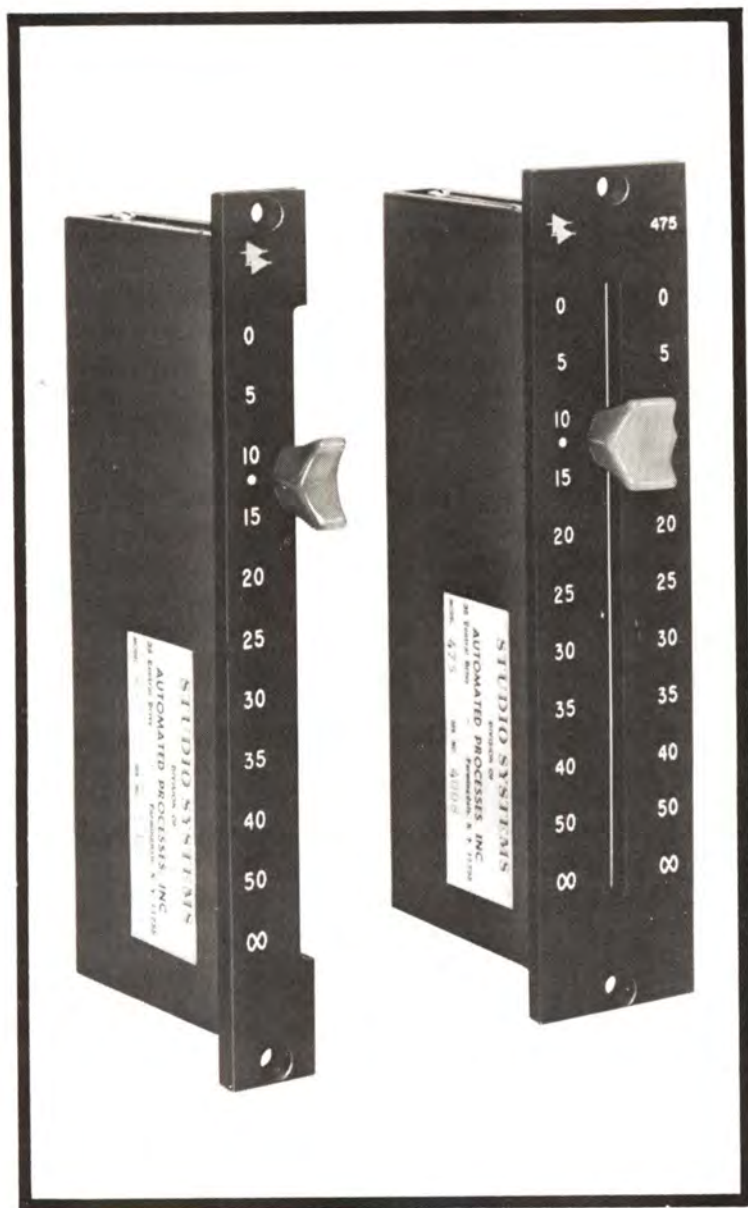
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Conductive Plastic Linear Motion Fader

MODEL 475



PATENT PENDING

Features

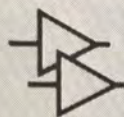
- Available with $\frac{3}{4}$ " escutcheon, $1\frac{1}{2}$ " escutcheon, or without escutcheon.
- Resistance element material developed for MIL Spec and Aerospace applications—rated in "millions of cycles" of operation.
- Multiple finger, precious metal wiper.
- Very low noise.
- Infinite resolution—truly stepless.
- Long life.
- Adjustable damping.
- Protected element and slide mechanism.
- Special Rulon* and Nylon* bearings for smooth action.
- Polarized connector, gold plated contacts.

Description

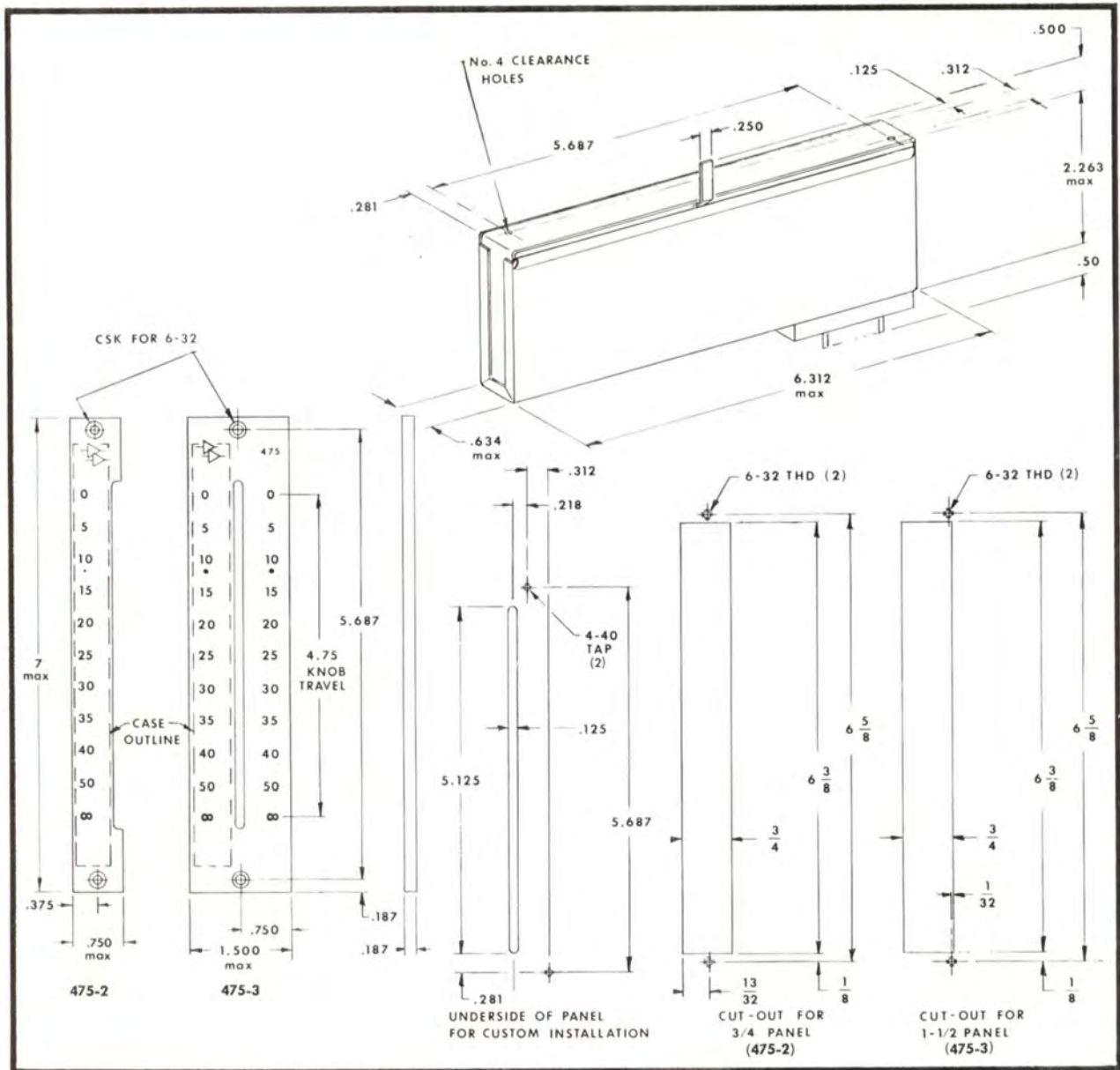
Using the same conductive plastic technology which has made the Model 440 series of faders so widely acclaimed, Automated Processes has developed the Model 475. This unit incorporates the same mirror finish element and multiple finger precious metal wiper as the 440 and therefore exhibits the low noise, long life and stepless fading qualities which are characteristic of these materials.

One of the most important features of this fader is the width of its case. When ordered with the $\frac{3}{4}$ " escutcheon panel, the total width of the Model 475 fader is only $\frac{3}{4}$ ", allowing two units to be mounted into the space occupied by a conventional $1\frac{1}{2}$ " wide fader.

The Model 475 is also available with a $1\frac{1}{2}$ " escutcheon, and without the escutcheon for use in strips or larger panels. When ordered without escutcheon, the Model 475 may be obtained with or without knob and will readily accept any appropriate knob drilled for a $\frac{1}{4}$ " shaft.



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Specifications

Maximum Attenuation:	90 dB (Audio Passband)
Panel Finish (475-2, 475-3):	Black matte aluminum with engraved scale.
Impedance:	600Ω or 10,000Ω constant impedance ladder network. May be operated as zero insertion loss potentiometer when connected to bridging load.
Configuration:	Single channel.
Connector:	A low profile high reliability connector is furnished.
Dimension :	See drawings above.
Models Available:	Model 475-1: No escutcheon. Model 475-2: 3/4 inch escutcheon. Model 475-3: 1½ inch escutcheon.

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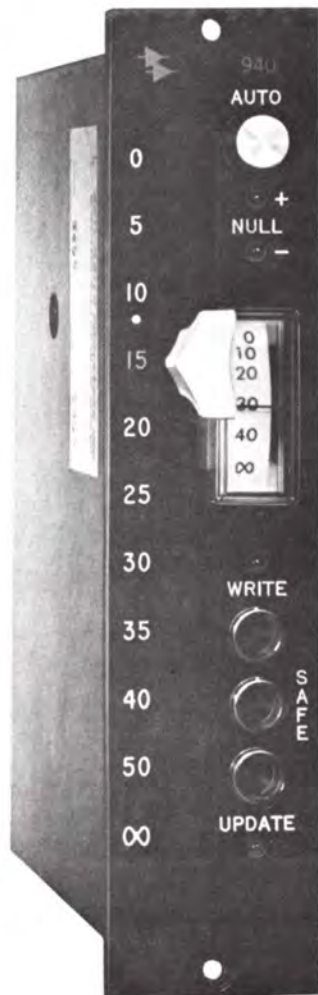


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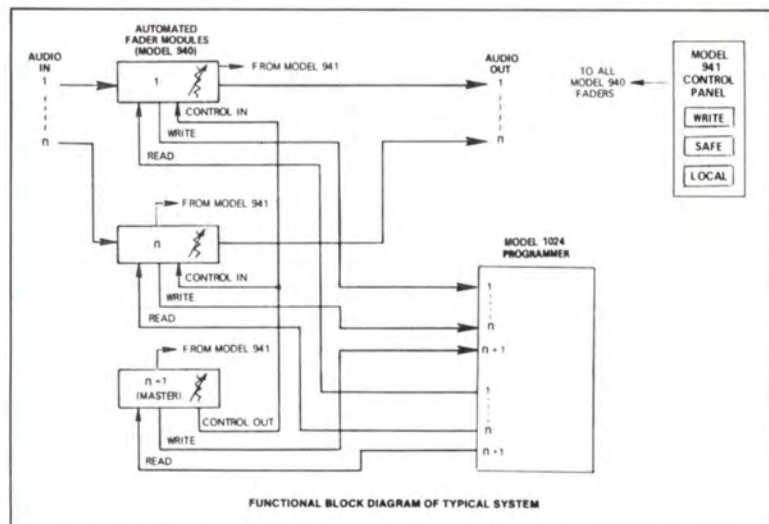
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AUTOMATED FADER

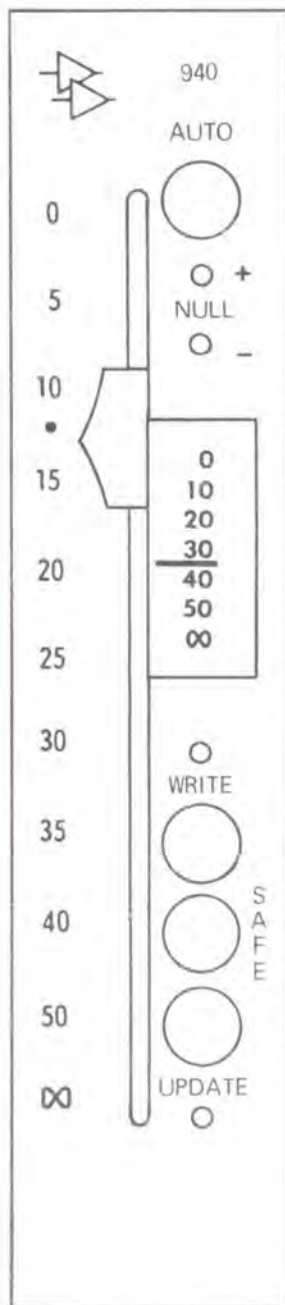
MODEL 940



The Fader Module contains a conductive plastic slide attenuator, and all controls necessary to READ, WRITE, meter and UPDATE. This module fits in the space normally occupied by a conventional fader so that no additional console panel area is required when converting to automated control. Any 940 fader may serve as a Group or Grand master capable of controlling the outputs of any number of other 940 modules. Control logic points are also made available to permit the operating mode of all modules to be changed simultaneously by means of master control switches. Presetting of control functions is easily accomplished, and status indicators clearly show the actual operating mode at all times.



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- Mode Pushbutton:** Sets fader to Automation Mode (IN-Automation OUT-Manual)
- Null Indicator:** Compares present and previously recorded fader settings (both LED'S light at null) Used for stepless transfer from SAFE to WRITE, or WRITE to SAFE
- Fader Knob:** Slide fader with conductive plastic element. Used in both MANUAL and AUTOMATION modes.
- Illuminated Meter:** Indicates attenuation level being recorded in WRITE or UPDATE Modes or attenuation level being read back in SAFE mode. Displays VCA status to show what the automation controls are actually doing at all times.
- Write Indicator:** Indicates when fader is in WRITE mode (LED). WRITE Mode is used for initial rough mix and to completely revise any portion of previous mix. Actual Fader settings are recorded in this mode.
- Write Pushbutton:** Press to record Fader setting. May be remotely controlled by MASTER WRITE switch.
- Safe Pushbutton:** Press to play back or "READ" previously recorded attenuation settings. May be remotely controlled by MASTER SAFE switch which overrides all individual or "LOCAL" mode switches.
- Update Pushbutton:** Press to increase or decrease previous mix level relative to 15dB. Stepless transfer is automatically achieved when going from SAFE to UPDATE or vice versa. Usual way to make minor changes in an otherwise satisfactory mix. Meter shows actual attenuation while fader knob indicates amount of change from previous mix.
- Update Indicator:** Indicates fader is in UPDATE mode (LED). Several faders may be preset and switched in and out of UPDATE simultaneously by means of MASTER LOCAL switch.

Specifications

Input Impedance: 47 K Ω (unbalanced, bridging)
Maximum Input: +30 dBm
Output Impedance: Less than 1 Ω , direct coupled
Load Impedance: 75 Ω minimum
Frequency Response: ± 0.1 dB, 20 Hz to 20 kHz
Distortion: 0.05% max. T.H.D. at +4 dBm, 30 Hz to 20 kHz
 0.1 % max T.H.D. at +18 dBm, 30 Hz to 20 kHz
Clipping Level: +22 dBm minimum at 3% T.H.D.
VCA Attenuation Characteristic: 20 dB/volt to 100 dB
 (0 VDC = 0 dB, +5 VDC = 100 dB)

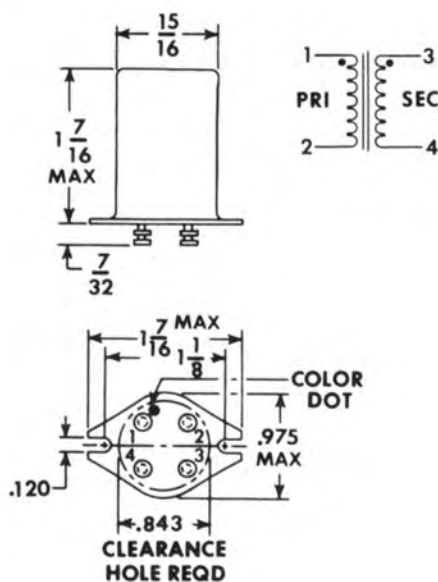
VCA Tracking Accuracy: ± 0.5 dB, 0 to -50 dB
 ± 2 dB to -100 dB.
Null Accuracy: ± 0.5 dB, 0 to 50 dB
Power Requirement: +5 VDC, 40 mA
 ± 15 VDC, 50 mA
Dimensions: 1 1/2" x 7" x 3 3/4" deep
 (mounts in same space as a conventional fader)
Weight: 1.5 lbs.

AUDIO TRANSFORMERS

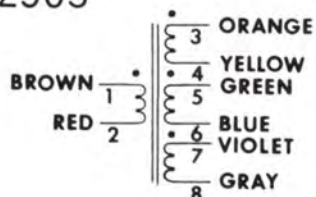
MODEL NO.	APPLICATION	PRIMARY IMPEDANCE	SECONDARY IMPEDANCE	FREQUENCY RESPONSE	MAXIMUM LEVEL	NOTES
AP2164	Input (Bridging)	10,000 Ω	600 Ω	20 to 30kHz ± 0.3 dB	+20dBm	
AP2503-1 AP2503-2	Output (Amplifier to Line)	75 Ω	75 Ω (1:1)* 300 Ω (1:2)* 600 Ω (1:3)*	30 to 20kHz ± 0.5 dB	+30dBm	Electrically identical, transformers differ only in mechanical details
AP2622	Input (Mic Preamp)	150/600 Ω	10,000 Ω	30 to 20kHz ± 0.5 dB	0dBm	
AP2623-1 AP2623-2 AP2623-3 AP2623-4	Output (Amplifier to Line)	75 Ω	75 Ω (1:1)* 300 Ω (1:2)*	30 to 20kHz ± 0.5 dB	+30dBm	Electrically identical, transformers differ only in mechanical details

*Minimum Load Impedances

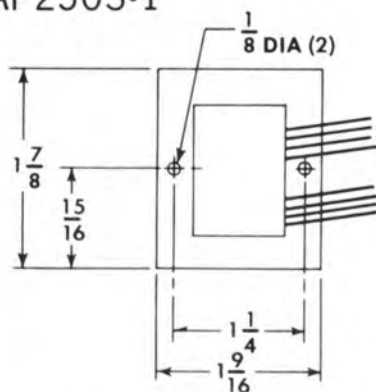
AP2164



AP2503



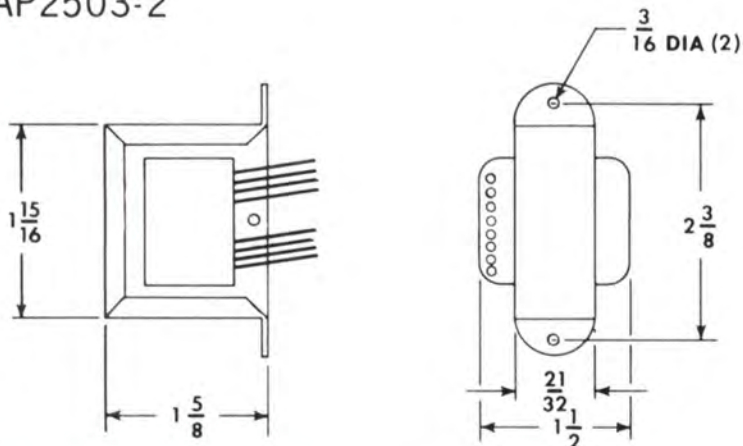
AP2503-1



(SHIELD NOT SHOWN)

SUPPLIED WITH SHIELD AND MTG HARDWARE

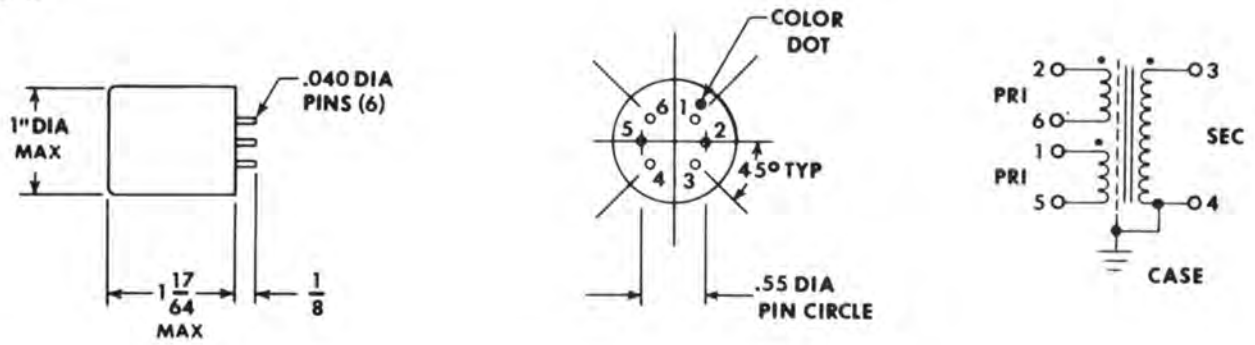
AP2503-2



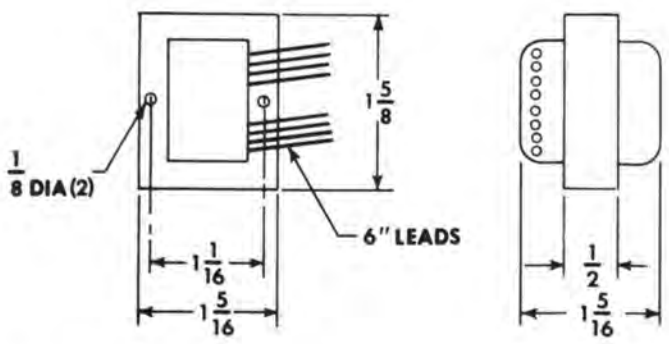
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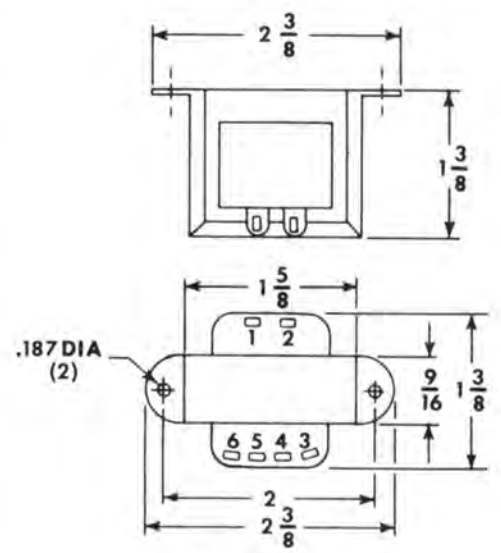
AP2622



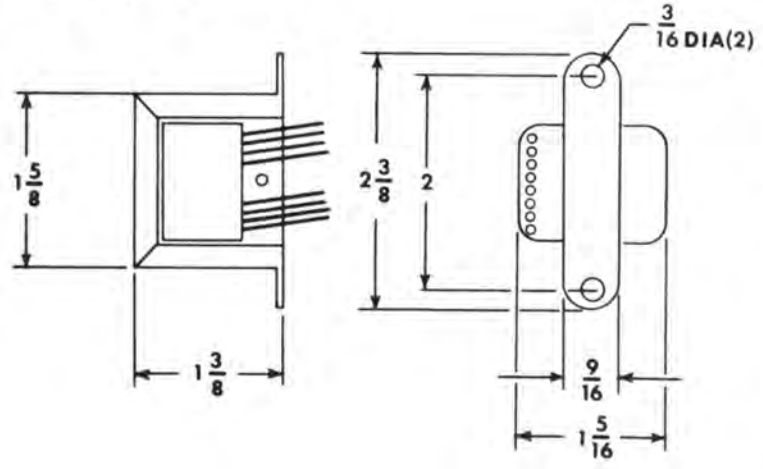
AP2623-1



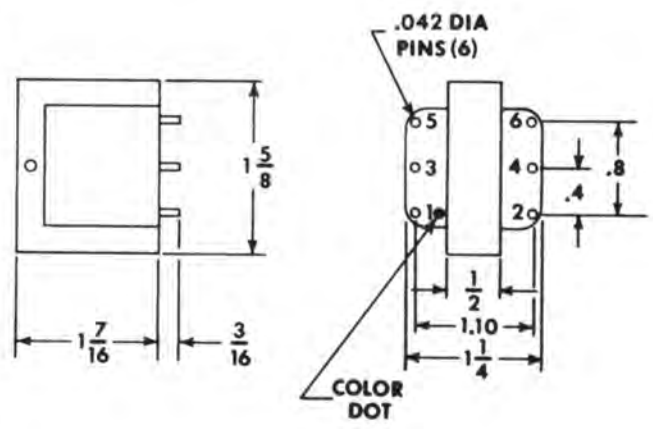
AP2623-3



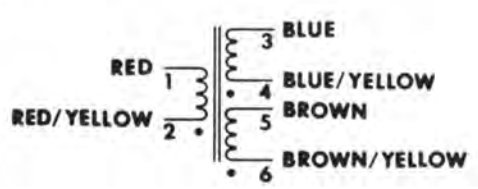
AP2623-2



AP2623-4



AP2623



Quadrasonic Stereo Panner

MODEL 480



Features

- Connections for panning 1 channel into 4 or simultaneous 2 into 2.
- Conductive plastic elements for long life and low noise.
- Infinite resolution (stepless).
- A passive device. No power supply required.
- Compact. Easily mounted into existing equipment.

Description

The Automated Processes Model 480 Quadrasonic Stereo Panner is designed to meet the most critical requirements of four channel sound positioning. All types of motional effects as well as static positioning are easily accomplished through the use of this device.

The Model 480 utilizes conductive plastic elements to achieve precise, infinite resolution signal splitting to four separate outputs. The multiple finger precious metal wiping contacts are moved silently and accurately by a "joystick" that gives excellent visual indication of the "phantom" location of the sound source.

There are many additional applications of the Model 480 in the stereo field, such as unusual segueways between

stereo programs and unique and interesting direct and reverberant sound combinations.

Specifications

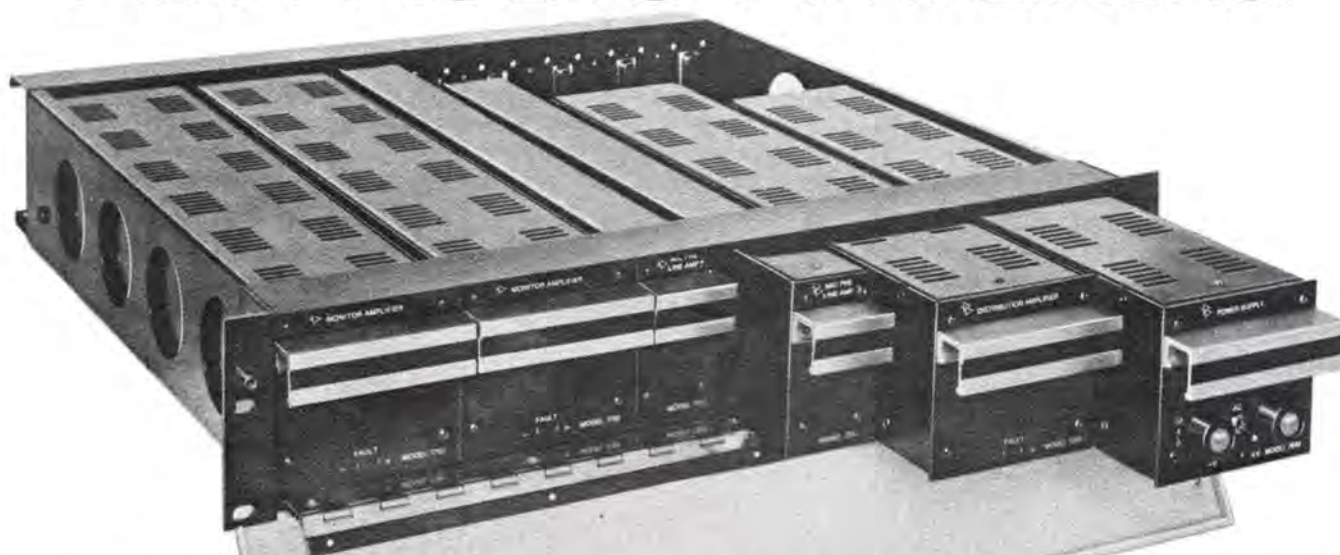
Input Resistance:	600 Ω
Output Resistance:	3000 Ω maximum
Minimum Load Resistance:	47K Ω
Maximum Input Level:	+20 dBm continuous +30 dBm peak
Tracking Accuracy:	± 0.5 dB or 5 degrees of indicated position
Insertion Loss:	1 dB maximum
Size:	Panel size: 3" wide x 3 1/2" high Depth below panel: 3 5/8"

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.



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Automated Processes created these NEW AUDIO AMPLIFIERS.



WILL YOUR PRESENT AMPLIFIERS MEET THESE SPECS?

From the leading U.S. manufacturer of audio consoles comes a new series of audio amplifiers with the most advanced specifications and unexpected features available anywhere.

Designed at the request of a major broadcasting network, these modular amplifiers will replace their present audio facilities and are specified into all their new installations. This series of Automated Processes' Audio Amplifiers will outperform any competitive audio equipment!

CHECK THESE SPECS:

All amplifier modules provide transformer isolated inputs and outputs. Each amplifier may be pre-set for the desired gain by means of strapping on mating connectors. In addition, some are equipped with voltage controlled amplifiers which permit remote level control and muting, as well as remotely controlled limiting.

Reliability and safety features include: short circuit and overload protection; automatic current limiting.

MIC-PRE/LINE AMPLIFIER, Model 7312

- Internal voltage-controlled amplifier.
 - Remote DC control of output level and muting.
 - Remotely controllable internal limiter.
- Gain Range:** 20 dB to 54 dB, microphone strapping
10 dB loss to 24 dB gain, line strapping
- Maximum Input Level:** 0 dBm, microphone
+30 dBm, line
- Maximum Output:** +30 dBm, continuous sine wave
- Frequency Response:** ± 0.5 dB, 30 Hz to 20 kHz
- Distortion:** Less than .5% T.H.D. at full output, typically .05% at normal operating levels.
- Maximum Output Noise:** 100 dB below full output, 20 kHz bandwidth

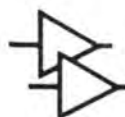
DISTRIBUTION AMPLIFIER, Model 7326

- Six transformer-isolated outputs capable of driving six 150 ohm loads to +30 dBm simultaneously.
- Gain Range:** 10 dB loss to 30 dB gain
Maximum Input Level: +30 dBm
Maximum Output: +30 dBm (all 6 outputs simultaneously)
- Maximum Output Noise:** 100 dB below full output, 20 kHz bandwidth
- Output Isolation:** Greater than 50 dB, 50 Hz to 15 kHz
- Frequency Response:** ± 0.5 dB, 30 Hz to 20 kHz
- Distortion:** Less than .5% T.H.D. at full output, typically .05% at normal operating levels.

MONITOR AMPLIFIER, Model 7702

- 20 watts of sine wave power into 150 ohm, 8 ohm, or 25 volt loads.
 - Internal voltage-controlled amplifier permits remote DC control of audio level and muting.
- Gain Range:** 32 dB to 60 dB
Maximum Input Level:
High Gain Strapping: 0 dBm
Low Gain Strapping: +30 dBm
- Maximum Output:** +43 dBm (20 watts) continuous sine wave
- Maximum Output Noise:** 85 dB below full output
- Frequency Response:** ± 0.5 dB, 30 Hz to 20 kHz
- Distortion:** Less than .5% T.H.D. at full output, typically .05% at normal operating levels.

Change to the very best... contact us for further details and prices.



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SERIES 7000 MODULAR AMPLIFIERS



MIC-PRE/LINE AMPLIFIER
Model 7312

Housed in a single width module, the Model 7312 Mic-Pre/Line Amplifier provides up to +30 dBm output with inputs ranging from microphone level to line level. An internal voltage controlled amplifier (VCA) permits remote DC control of output level and muting. A remotely controllable internal limiter operates in conjunction with the VCA. Nominal amplifier gain is pre-set by means of strapping on the mating connector. The amplifier is self-protected against overload and short circuit. Internal current limiting resistors prevent excessive load on the power busses in the event of a protection circuit malfunction.

The following specifications are based upon 150 Ohm signal source resistance and 150 Ohm output load resistance.

Input Impedance: 1500 Ohms nominal, Microphone; 4500 Ohms, Line.

Gain Range: 20 dB to 54 dB, Microphone; 10 dB loss to 24 dB gain, Line.

Maximum Input Level: 0 dBm, Microphone; +30 dBm, Line.

Maximum Output: +30 dBm, continuous sine wave

Output Impedance: 15 Ohms maximum
Frequency Response: ± 0.5 dB, 30 Hz to 20 kHz

Spurious Response: No significant peaks outside the audio band.

Distortion: Less than 0.5% T.H.D. at full output, typically .05% at normal operating levels.

Maximum Output Noise: 100 dB below full output, 20 kHz bandwidth

Limiter Control Outputs: TTL compatible logic levels or contact closures.

Limiter Characteristics:

Threshold: +10 dBm Output, nominal
Control Range: 20 dB, minimum

Compression Ratio: 20:1, nominal

Power Requirement: Bipolar ± 30 V to ± 34 V DC @ 100 mA for full output.

Size: 1.7" Wide X 3.25" High X 14" Deep



MONITOR AMPLIFIER
Model 7702

Housed in a double width module, the Model 7702 Monitor Amplifier provides 20 watts of sine wave power into 150 Ohm, 8 Ohm, or 25 Volt loads. An internal voltage controlled amplifier permits remote DC control of audio level and muting. Nominal amplifier gain is pre-set by means of strapping on the mating connector.

The amplifier is self-protected against overload and short circuit, and will reduce power output capability to prevent damage in the event of a potentially unsafe thermal condition. Internal fuses prevent excessive load on the power busses in the event of a protection circuit malfunction. L.E.D. blown fuse "Fault" indicators are visible on the front.

The following specifications are based upon 150 Ohm signal source resistance and 150 Ohm output load resistance unless otherwise indicated.

Input Impedance: Greater than 10k Ohms, 50 Hz to 15 kHz.

Gain Range: 32 dB to 60 dB

Maximum Input Level:

High Gain Strapping: 0 dBm

Low Gain Strapping: +30 dBm

Maximum Output: +43 dBm (20 watts) continuous sine wave.

Output Impedance: 20 Ohms maximum, 150 Ohm output

1 Ohm maximum, 8 Ohm output

Frequency Response: ± 0.5 dB, 30 Hz to 20 kHz

Spurious Response: No significant peaks outside the audio band.

Distortion: Less than .5% T.H.D. at full output, typically .05% at normal operating level.

Maximum Output Noise: 85 dB below full output, at maximum gain (20 kHz bandwidth)

Power Requirement: Bipolar ± 34 V DC @ 1A for full output

Size: 3.4" Wide X 3.25" High X 14" Deep



DISTRIBUTION AMPLIFIER
Model 7326

Housed in a double width module, the Model 7326 Distribution Amplifier provides six transformer isolated outputs capable of driving six 150 Ohm loads to +30 dBm simultaneously. Amplifier gain is pre-set by means of strapping on the mating connector.

The amplifier is self-protected against overload and short circuit, and will reduce power output capability to prevent damage in the event of a potentially unsafe thermal condition. Internal fuses prevent excessive load on the power busses in the event of a protection circuit malfunction. L.E.D. blown fuse "Fault" indicators are visible on the front panel.

The following specifications are based upon 150 Ohm signal source resistance and 150 Ohm output load resistances.

Input Impedance: Greater than 5k Ohms, 50 Hz to 15 kHz.

Gain Range: 10 dB loss to 30 dB gain.

Maximum Input Level: +30 dBm.

Maximum Output: +30 dBm (all 6 outputs simultaneously)

Output Tracking: Within 2 dB, maximum to minimum

Output Impedance: 150 Ohms, nominal
Frequency Response: ± 0.5 dB, 30 Hz to 20 kHz.

Spurious Response: No significant peaks outside the audio band.

Distortion: Less than 0.5% T.H.D. at full output, typically .05% at normal operating levels.

Maximum Output Noise: 100 dB below full output, (20 kHz bandwidth)

Output Isolation: Greater than 50 dB, 50 Hz to 15 kHz

Power Requirement: Bipolar ± 30 V to ± 34 V DC @ .75A for full output

Size: 3.4" Wide X 3.25" High X 14" Deep



POWER SUPPLY
Model 7640

Housed in a double width module, the Model 7640 Power Supply provides the bipolar DC power necessary to operate all types of Series 7000 amplifiers. The Model 7640 may be plugged directly into the Mounting Tray along with any of the amplifier modules in the series, and is capable of powering all of the modules in that tray. The power switch, pilot lamp, and line fuses are all front panel accessible.

Input Power: 115 VAC $\pm 10\%$, 60 Hz @ 3 A maximum. (220 Volt 50 Hz available on special order.)

Output Voltage: Bipolar ± 34 Volts DC nominal

Output Current: 3 Amps DC continuous

Load Regulation: 25% NL to FL

Ripple: 3% maximum

Size: 3.4" Wide X 3.25" High X 14" Deep

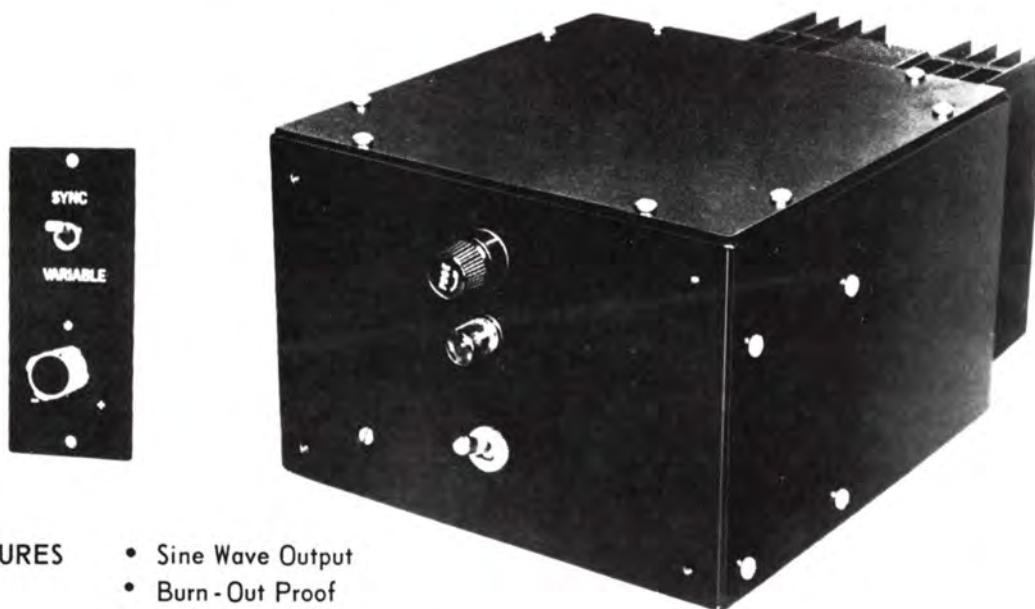
EQUIPMENT TRAY
Model 7410



Compatible with all standard 19" equipment racks, the Model 7410 Equipment Tray conveniently mounts in 3 1/2" of rack height and captivates as many as ten single width Series 7000 modules, five double width modules, or any combination of modules totaling 17" in width. Bullpin guides assure proper alignment with the rear bulkhead mounted connectors and also provide keying to prevent incorrect module insertion. The tray is of rugged steel construction. A rear closure strip assures personnel safety, and rear brackets are provided for additional support where required. Total depth is 16 1/2" behind mounting surface.

Variable Speed Capstan Drive

MODEL 250A



FEATURES

- Sine Wave Output
- Burn-Out Proof
- Line Sync Mode
- Remote Voltage Control
- Transformer Isolated
- $\pm 50\%$ Speed Control

Capable of powering synchronous motor audio tape drives, the Model 250A provides a simple and convenient means of switching between synchronous and variable speed operation. The power unit contains a stable voltage controlled oscillator which drives a rugged transformer isolated power amplifier. A solid state switch transfers the amplifier input to the power line for synchronous operation in order to permit instantaneous mode change. Sine wave output of the Model 250A reduces bearing rattle and RF pickup usually associated with the more conventional square wave capstan drivers. The remote control unit containing the variable speed control and the Sync/Variable switch may be mounted at any convenient location. The Power Unit is small enough to be mounted inside most tape machine cabinets, or may be rack mounted by means of an accessory adaptor panel.

SPECIFICATIONS

Output: 110V AC, 50 VA, Sine Wave
Frequency: 30 to 90 Hz
Sync/Variable
Control: Contact Closure (5 V, 1 mA)
Power Input: 115/230 VAC, 50-60 Hz, 120 Watts



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DUAL 200 WATT POWER AMPLIFIER

MODEL 730



FEATURES

- Burn-out proof
- Transformer isolated
- Stereo Mode: 200 Watts RMS per channel
- Mono Mode: 350 Watts RMS
- Rated Power into all normal loads
- Thermal protection circuit
- Instantaneous overload recovery
- LED overload indicators
- Compact; shelf or rack mount

DESCRIPTION:

Combining "state of the art" dynamic protection circuitry with time proven power derating techniques, the Model 730 Dual 200 Watt Audio Power Amplifier provides the degree of reliability previously associated with the finest vacuum tube units. Although virtually burn-out proof regardless of loading conditions, from open to short circuit, all the desirable features of transistor circuitry such as stability, small size, and cool operation are maintained.

Conservative design permits the amplifier to operate continuously at full sine wave RMS power at any audio frequency.

A thermal protection circuit prevents damage due to overheating, but permits operation at reduced power if the amplifier is subjected to unusually high temperature ambients.

Overload or overtemperature status is indicated by Light Emitting Diodes (LED's) located on the front panel. True isolation transformer outputs deliver rated power into all normal speaker load impedances as well as 25 Volt and 70.7 Volt lines.

In STEREO MODE, each of the two channels provide output capability of 200 Watts RMS. The MONO MODE permits output capability of 350 Watts RMS. The unique dynamic power limiting circuit monitors the power being delivered and automatically and instantaneously controls both current and voltage, providing complete protection and instant recovery from overload. This permits higher average power levels without the audible distortion encountered in conventional amplifiers of equivalent power rating. This circuit also permits safe operation under incorrect or unusual load conditions at reduced power levels.

The Model 730 is housed in a rugged steel cabinet with attractive blue textured vinyl and brushed aluminum front panel. Removable 19" rack mounting brackets are supplied.

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HUNTINGTON, N. Y. 11743



AUTOMATED PROCESSES, INC.
80 MARCUS DRIVE, MELVILLE, NEW YORK 11746-516-691-9212

SPECIFICATIONS

Power Output

Stereo: 200 RMS Watts continuous per channel into 4, 8, 16 ohms, 25 or 70.7 Volt lines both channels operating.

Mono: 350 RMS Watts Continuous into 2, 4, 8, 16 ohms, 25 or 70.7 Volt lines.

Harmonic Distortion:

Less than .5% THD at rated power. Distortion decreases as output power is reduced.

Intermodulation Distortion:

Less than .5% (60Hz and 6kHz, 4:1) at instantaneous peak power output of 300 Watts per channel in STEREO mode; 600 Watts in MONO mode. Intermodulation decreases as output power is reduced.

Frequency Response:

150W	30 – 20,000Hz ± .5dB
180W	30 – 20,000Hz ± 1dB
200W	35 – 17,000Hz ± 1dB

Hum and Noise: At least 100dB below rated output.

Output Taps: Transformer isolated outputs deliver rated power to the following loads:
STEREO: 4 Ω (25V), 8 Ω , 16 Ω , 70.7V
MONO: 2 Ω (25V), 4 Ω , 8 Ω , 16 Ω , 70.7V

Output Impedance:

Less than 10% of rated load.

Input Impedance:

Greater than 10k Ω . Balanced transformerless input bridges 600 Ω

Input Sensitivity:

.775 Volts for rated output. Level control provided to adjust for higher input voltage levels.

Protection Devices:

Load line type electronic overload and short circuit protection with instantaneous recovery. Permits safe operation into any load from open to short circuit, resistive or reactive. Electronic thermal protection: permits operation at reduced power in high temperature ambients. Power line circuit breaker for overall protection.

Indicators

Power: Long life neon lamp indicates AC power ON.

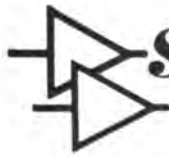
Overload: Light emitting diode (LED) indicates overload or overtemperature condition.

Power Requirements:

115 Volts, 50/60 Hz, 0.5 Amps idling, 6 Amps at rated output.

Size and Weight:

7" High x 13" Deep x 17" Wide. Supplied with 19" Rack Adaptor, Approximately 65 pounds.



Studio Systems Division

AUTOMATED PROCESSES, INC.
35 CENTRAL DRIVE, FARMINGDALE, NEW YORK 11735 • 516-894-9212

MODEL 575 SINE WAVE OSCILLATOR

Features

- 20Hz to 20kHz in 31 Calibrated steps
- Calibrated output from -70 to +13dBm
- Low distortion
- Stable operation
- Metered Output Level
- Small Size
- Transformer Coupled Output
- Utilizes Automated Processes' 2520 Op Amps

The Automated Processes Model 575 panel mounted channel module Sine Wave Oscillator is designed to meet the most exacting requirements of system testing or calibration from microphone input to line level applications.

The 31 available frequencies are selected by a rotary switch and a three range multiplier. Each higher range of frequencies duplicates one frequency from the lower range for assurance of level accuracy.

The output level is set to calibration by a vernier control on the front panel. Three non-interlocked pushbuttons determine output levels through a 70dB range in 10dB increments. A small integral calibrated meter monitors the output permitting continuous control of output levels over the entire range.

The 575 has an On-Off switch and presents the same load impedance to a line whether On or Off permitting intermittent use in systems while assuring that bus levels remain unchanged by differences in loading. The switch is wired through the connector and strapped for either of two modes of operation. In one mode, the oscillator is left running and the output amplifier is switched, permitting instantaneous tone keying. In the other mode, the oscillator is disabled preventing any possibility of leakage if located in particularly sensitive areas.

The Model 575 Oscillator makes use of Automated Processes 2520 operational amplifiers and therefore exhibits the reliability, long life and uniformity which are characteristic of this device.

The Model 575 operates from a bipolar power supply of from ± 15 to ± 20 volts permitting latitude in system design and assurance of stability under normal operating conditions. It is reverse polarity protected and will withstand transients as high as ± 30 volts preventing damage from power line surges and power supply malfunctions. Power decoupling is also provided to prevent signal coupling in the power lines.

MODEL 575 SPECIFICATIONS

Frequencies:

Multiplier on X 10

20, 30, 40, 50, 60, 70, 80, 100, 120, 150, 200 Hz

Multiplier X 100

200, 300, 400, 500, 600, 700, 800, 1k, 1.2k, 1.5k, 2kHz

Multiplier on X 1k

2k, 3k, 4k, 5k, 6k, 7k, 8k, 10k, 12k, 15k, 20kHz

Distortion: Less than 0.02% THD

Frequency Calibration Accuracy: $\pm 5\%$

Controls:

Rotary Switch: Frequency 11 positions
2, 3, 4, 5, 6, 7, 8, 10, 12, 15, 20

3 Push Buttons: Frequency Multiplier
X 10, X 100, X 1k

3 Push Buttons: Output Multiplier
-40, -20, +10

Rotary: Level Set
Vernier Potentiometer to adjust output level to desired amount on meter and into Output Multiplier

Toggle Switch - OSC-OFF

Output Level:
Calibrated Maximum +13dBm
Calibrated Minimum -70dBm
(Output is algebraic sum of meter reading and Output Multiplier)

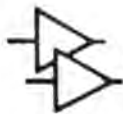
Output Level Accuracy: ± 0.5 dB from indication

Load and Output Impedance: 600Ω

Power Requirement: ± 15 volts @ 30mA, (24 volt, 30mA meter lamp on separate terminals. May be strapped to same power through dropping resistor, furnished)

Dimensions: Escutcheon $1\frac{1}{2}$ " x $5\frac{1}{4}$ ", case $5\frac{3}{4}$ " behind panel

Connector: 30 pin PC connector supplied.



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789 PARK AVENUE, HUNTINGTON, NEW YORK 11743 • 516-427-6024

VU METER AMPLIFIER

MODEL 8100

Designed to mount directly to the terminals of most standard VU meters, the Model 8100 VU Meter Amplifier provides a precise and stable means to meter a wide range of audio levels. The low power drain and wide power supply voltage range makes it possible to operate from almost any available DC source, such as a lamp or relay supply. The high impedance differential input will not load or unbalance 150 Ω or 600 Ω lines. A multiturn precision trimmer permits accurate zero adjustment over a range in excess of 36dB without degrading ballistics or frequency response.

The Model 8100 printed circuit amplifier card is furnished complete with mounting brackets and matting connectors.

SPECIFICATIONS

Input Resistance:	100k Ω (differential)
Output Resistance:	3.6k Ω (for Standard VU Meter Ballistics)
Frequency Response:	Within 0.25dB 20Hz to 20kHz
Gain Range:	+30dB to -6dB (for 0 VU from -20dBm to +16dBm at 150 Ω , or -26dBm to +10dBm at 600 Ω)
Power Requirement:	12 to 32 VDC at 10mA
Size:	2" X 3"

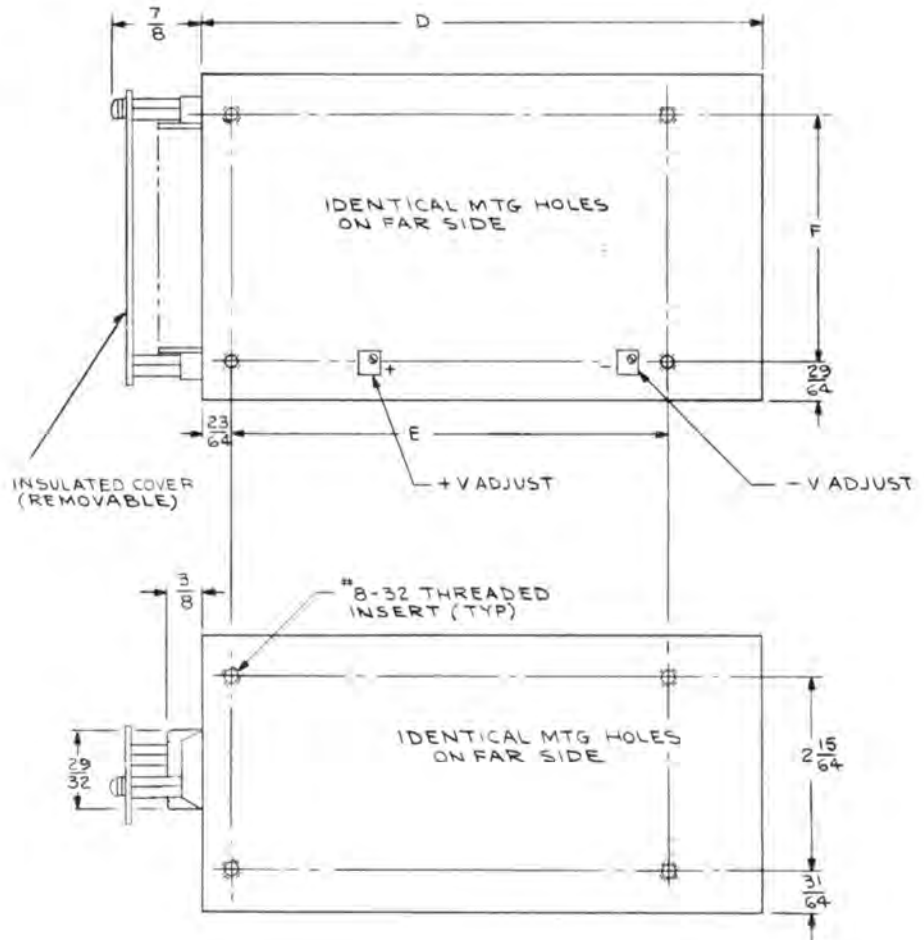
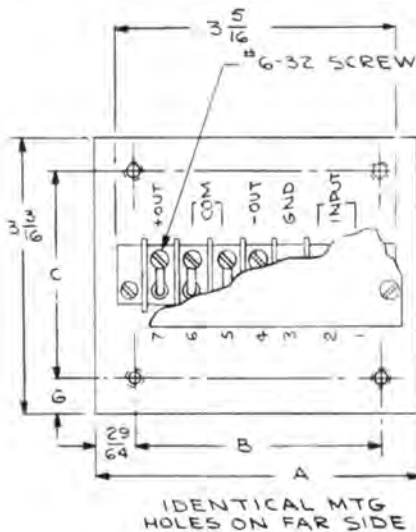
Specifications subject to change without notice.

POWER SUPPLIES

Models 605, 610, 620

Specifically designed and constructed to meet the exacting requirements of the professional audio industry, these power supplies furnish the well regulated low noise bipolar voltages required to operate most modern operational amplifier equipment, including the Automated Processes standard line of products. The supplies feature over voltage protection to prevent damage to system components due to line transients or other malfunctions as well as protection against all overload and short circuit conditions. The electrostatically shielded power transformer and the low ripple circuitry assure minimum system noise, while conservative design and rugged construction assure maximum reliability.

DIMENSIONS			
MODEL	605	610	620
A	3 3/4	4 15/16	4 15/16
B	2 27/32	4 1/32	4 1/32
C	2 3/8	2 15/64	2 15/64
D	6 1/2	6 1/2	9 3/8
E	5 1/16	5 1/16	6 57/64
F	2 27/32	3 3/4	3 3/4
G	13/32	15/32	15/32



SPECIFICATIONS

Input Voltage: 115/230 VAC $\pm 10\%$ 47-63 Hz
115 or 230 volt selected by means of internal jumpers

Output Voltage: Bipolar output, ± 16 VDC (Adjustable to ± 15 VDC)

Regulation: .1% Max., Line and Load Combined

Ripple: 1 mV RMS Max.

Transient Response: 25 μ sec typical recovery to $\pm 1\%$

Overload Protection: Electronic current limiting capable of withstanding continuous short circuit. Instantaneous recovery

Overvoltage Protection: SCR Crowbar preset between 19 and 21.5V

Temp Range: 0-50°C without derating

Temp. Coefficient: Better than .015%/°C (typical)

Model	605	610	620
Output Current:	.5Amp DC	1.0Amp DC	2.0Amp DC
Input Current:(115V)	.4Amp AC	.7Amp AC	1.4 Amp AC
Weight:	4 lbs	5 lbs.	8 lbs.

RANDOM ACCESS PROGRAMMER

MODEL 1024



The new Automated Processes Model 1024 Random Access Programmer differs from previous console automation memory systems in that it uses a separate recording medium to store the programming information.

Data is written on a digital data tape cartridge in blocks, each representing approximately 1.7 seconds of programming information. Analog data from the console is digitized, then processed along with the data previously read from the cartridge, and finally written onto the cartridge.

The system is referenced to a timing signal, which normally is a "MagLink" timing code recorded on one track of the multitrack tape, but also may be an appropriately formatted data stream from a tape timer (thereby requiring no tracks of the multitrack tape) or the output of any time code generator.

In addition to synchronous operation in which all control functions relate in time to the program tape, data may also be introduced asynchronously. For example, initial equalizer settings may be recorded on the data cartridge before the program tape is started.

During playback, data is recalled from memory in synchronism with the program tape or other timing source without accumulation of delay at each pass since timing data is included in each block of data on the cartridge. New

data is recorded at each updating pass, while previous data is retained in the data cartridge, formatted as part of the new data. It is thus always possible to return to the previous mix, and many mixes may be stored for later recall.

Since only timing data is derived from the program tape, only one track is required, and since no data is recorded on the program tape during remix, crosstalk is no worse than with normal program audio. The MagLink code, which provides the timing data, is derived from a self-contained code generator in the programmer. Thus the timing code track can also serve to synchronize an additional tape machine by means of a MiniMag or MagLink Synchronizer, but the synchronizer is not required for any part of the programmer operation.

Specifications

MEDIUM: Data Tape Cartridge (3M DC 300A). Data Tape Recorder/Reproducer included in system.

RECORDING FORMAT: P. E. , 1600 bpi, 16,384 bit blocks with cyclic redundancy check per 1024 bits.

MAX. ANALOG CHANNELS: 1024 Channels @ 32 Channels/card.

TIMING REFERENCE: MagLink timing code.

TIMING CODE SPECIFICATIONS:

- A. **Recording Level:** OVU to -20VU
- B. **Signal to Noise Ratio:** 20dB min.
- C. **Bandwidth:** 4200 Hz

ACCURACY: ± 0.2 dB input to output via programmer.

SCANNING RATE: 37.5 Hz repetition rate*. No time delay accumulation.

NOISE IMMUNITY: Data is processed to eliminate the effects of input noise bursts or dropouts.

DROPOUT PROTECTION: Dropouts will cause timing code decoder to free-wheel, causing no error in timing or status information.

ERROR PROTECTION: The system contains an error correction mechanism which virtually eliminates status delay errors. Typical: Less than one (1) error per 150 hours.

*The 37.5 Hz repetition rate provides a maximum delay of 53 milliseconds between time of manual control actuation and control response in the automation mode. This delay does not increase with successive passes.

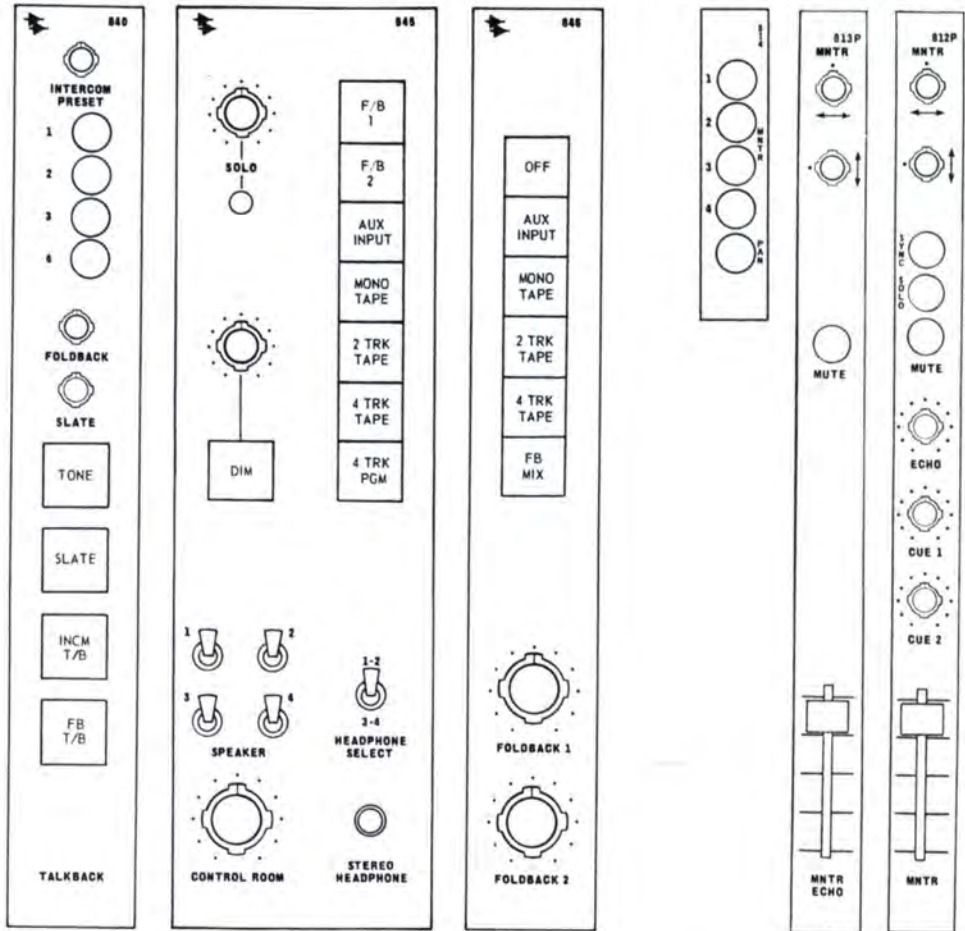
Monitor and Cue Master Modules

MODEL 840
SLATE, TONE, TALKBACK

MODEL 845
CONTROL ROOM MASTER

MODEL 846
FOLDBACK

USED IN CONSOLE
MODEL 1604



MODEL 814
CONTROL ROOM MNTR
ASSIGN MATRIX

MODEL 813P
PAN MONITOR AND
CUE ECHO

MODEL 812P
PAN MONITOR MATRIX

MODEL 830
SLATE, TONE, TALKBACK

MODEL 825
CONTROL ROOM MASTER

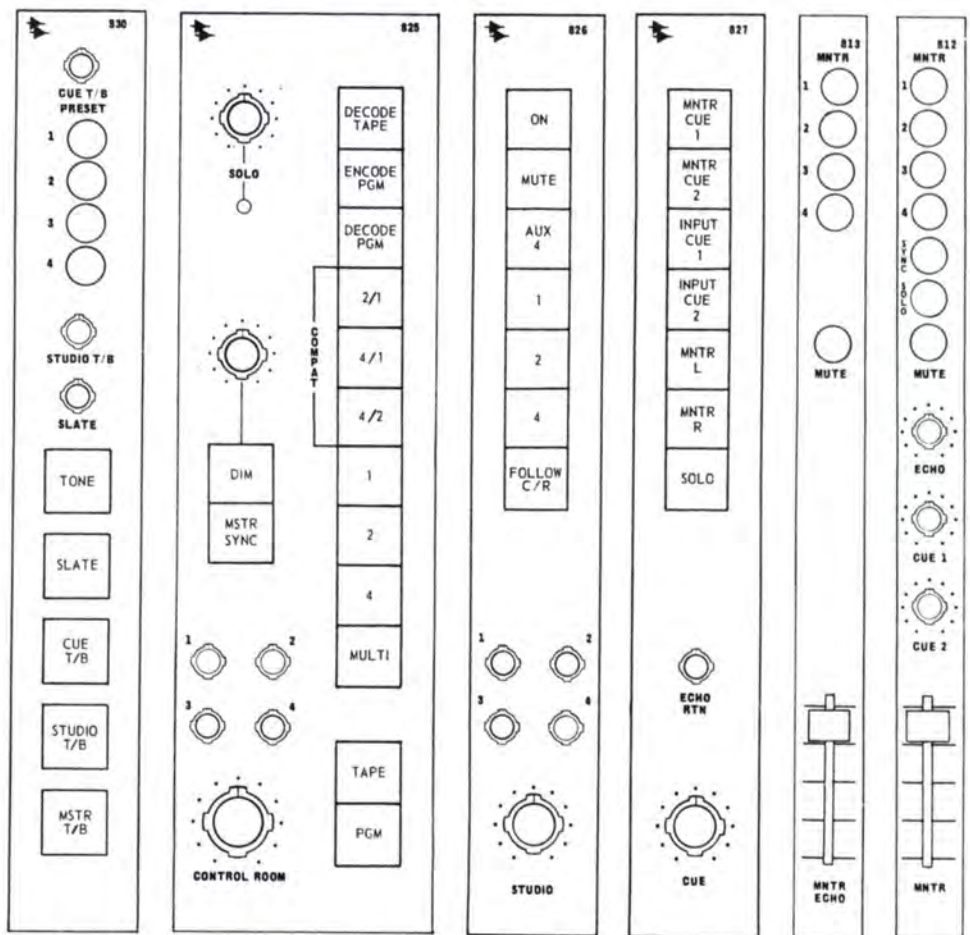
MODEL 826
STUDIO MASTER

MODEL 827
CUE MASTER

MODEL 813
MONITOR AND CUE ECHO

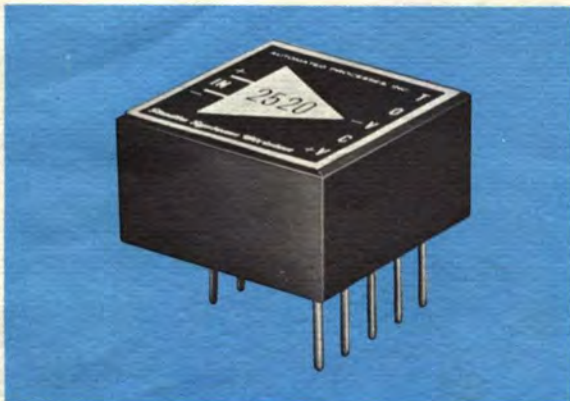
MODEL 812
MONITOR MATRIX

USED IN ALL
MULTI-TRACK CONSOLES



Audio Operational Amplifier

MODEL 2520



Features

- Extremely low noise
- High output power
- Operation under a wide range of supply voltages
- Low quiescent current
- Low distortion
- Wide power bandwidth
- Standard OP-AMP connections (Plug-in or P.C. mount)
- Stable operating characteristics
- Electrostatically shielded
- Short-Circuit and overload protected

Applications

- Microphone Preamplifiers
- Line or Booster Amplifiers
- Lossless Combining Amplifiers
- Balanced Transformerless Amplifiers
- Equalizers and Equalized Preamplifiers
- Earphone or Small Speaker Drivers

The Model 2520 is a high gain, wide band, direct coupled amplifier with differential input, designed specifically for audio amplifier applications. Several Operational Amplifier circuits typical of those most often used in the audio field are shown on the following page, along with their characteristics. These circuits have been tested and the data shown has been validated in Automated Processes laboratories.

The virtually perfect performance of the Model 2520 in audio operational amplifier applications makes possible the design of complete systems utilizing this low cost device as the only active element.

Since Operational Amplifier circuits derive their characteristics almost entirely from the performance of the passive elements connected into the feedback loop, accurate, predictable, and stable performance is assured. The use of this single active plug-in element reduces maintenance and service costs to a minimum.

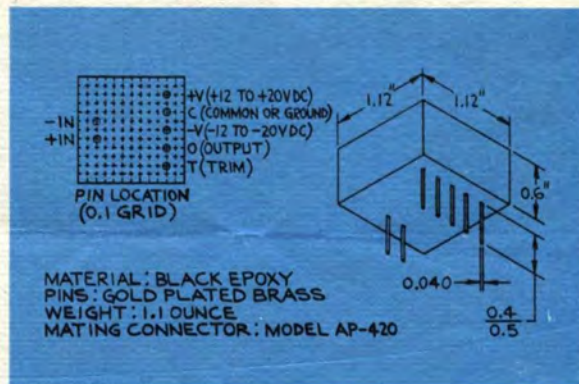
The specially formulated, thermally conductive epoxy in which this nine transistor amplifier is encapsulated, protects the internal circuitry against thermal shocks, vibration and humidity. Conservative design based upon "worst case analysis" plus thorough in-process inspection and performance test after "burn-in" assure long life and reliable performance.

Specifications

Gain:	Greater than 110 dB, DC
Frequency Response:	Small signal Gain Bandwidth Product—50 mHz Full Output Frequency—40 kHz
Equivalent Input Noise:	Less than 0.5 microvolts
Input Impedance:	Greater than 10 megohms, DC
Input Current Offset:	25 nA Typ.; 75 nA Max.
Input Voltage Offset:*	4 mV Typ.; 10 mV Max.
Common Mode Input:	±12 Volts with ±15 VDC supply ±15 Volts with ±20 VDC supply
Distortion:	0.2% THD, 20 to 20,000 Hz at rated output
Output Voltage:	Greater than 7.75 Volts RMS, ±15 VDC supply Greater than 11 Volts RMS, ±20 VDC supply
Minimum Load Impedance:	75Ω for full output voltage
Continuous Power Output: (Minimum Load Impedance)	0.8 Watts RMS @ ±15 VDC supply 1.5 Watts RMS @ ±20 VDC supply
Quiescent Current:	15 Milliamperes @ ±15 VDC supply 26 Milliamperes @ ±20 VDC supply
Current at Rated Output 600Ω Load:	18 Milliamperes @ ±15 VDC supply 32 Milliamperes @ ±20 VDC supply
75Ω Load:	60 Milliamperes @ ±15 VDC supply 85 Milliamperes @ ±20 VDC supply
Power Supply Voltage:	Bi-polar, ±12 VDC to ±20 VDC

*Output offset may be nulled to zero by means of a 100 kΩ trim pot between the +V and T terminals. This is normally not necessary in Audio applications.

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.

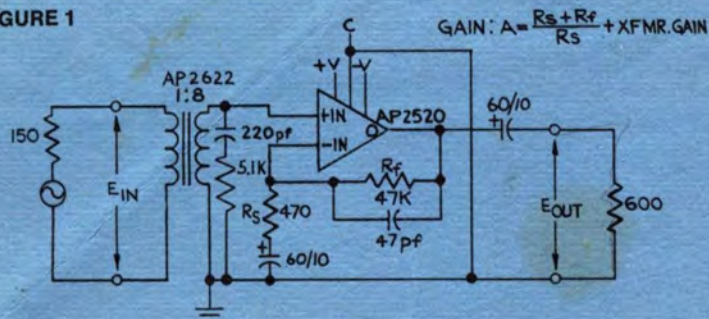


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2520 5M 973

Circuit Specifications

FIGURE 1



MICROPHONE PREAMPLIFIER (GAIN: 58dB)

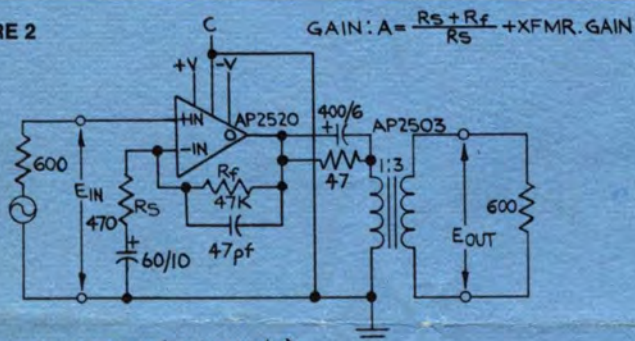
GENERAL (Figures 1-5)

- Load Impedance:** 600 Ω
- Frequency Response:** ± 0.25 dB, 20 to 20 kHz at rated output power
- Distortion:** Less than 0.2% THD, 20 to 20 kHz at rated output power

MICROPHONE PREAMPLIFIER (Figure 1)

- Gain:** 58 dB
- Equivalent Input Noise:** -129 dBm, 20 to 20 kHz, unweighted
- Input Impedance:** Greater than 1500 Ω
- Output Impedance:** Less than 5 Ω
- Power Output:** +21 dBm, ± 15 VDC supply
+24 dBm, ± 20 VDC supply

FIGURE 2

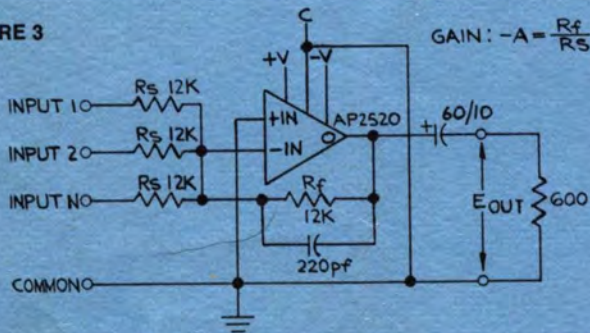


LINE AMPLIFIER (GAIN: 49dB)

LINE AMPLIFIER (Figure 2)

- Gain:** 49 dB
- Equivalent Input Noise:** -125 dBm, 20 to 20 kHz, unweighted
- Input Impedance:** Greater than 2 megohms
- Output Impedance:** Less than 100 Ω
- Power Output:** +28 dBm, ± 15 VDC supply
+30 dBm, ± 20 VDC supply

FIGURE 3



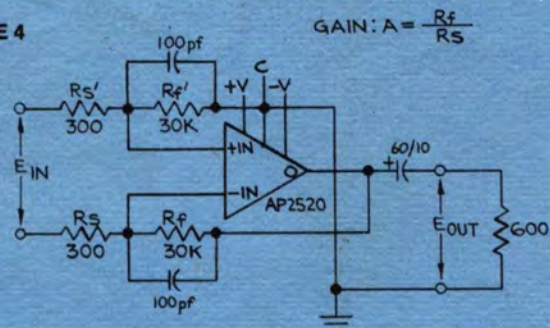
LOSSLESS COMBINING AMPLIFIER (GAIN: 0dB)

LOSSLESS COMBINING AMPLIFIER (Figure 3)

- Gain:** 0 dB
- Maximum Crosstalk:** -100 dB
- Maximum Gain:** 20 dB for 10 inputs
10 dB for 32 inputs
- Equivalent Input Noise:** -105 dBm for 10 inputs
-95 dBm for 32 inputs
- Input Impedance:** 12k Ω
- Output Impedance:** Less than 5 Ω
- Power Output:** +21 dBm, ± 15 VDC supply
+24 dBm, ± 20 VDC supply

Note: This circuit produces a 180° phase reversal. An output transformer of such as that shown in Figure 2 may be used to correct the phase, and can also provide additional gain.

FIGURE 4

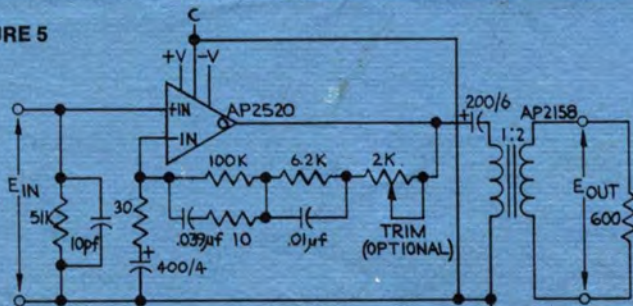


BALANCED TRANSFORMERLESS AMPLIFIER (GAIN: 40dB)

BALANCED TRANSFORMERLESS AMPLIFIER (Figure 4)

- Gain:** 40 dB
- Equivalent Input Noise:** -124 dBm, 20 to 20 kHz, unweighted
- Input Impedance:** 600 Ω
- Common Mode Rejection:** Greater than 90 dB (with matched resistors)
- Maximum Common Mode Voltage:** ± 8 Volts peak
- Output Impedance:** Less than 2 Ω
- Power Output:** +21 dBm ± 15 VDC supply
+24 dBm ± 20 VDC supply

FIGURE 5



PHONO PREAMPLIFIER (GAIN: 54dB)

PHONO PREAMPLIFIER (Figure 5)

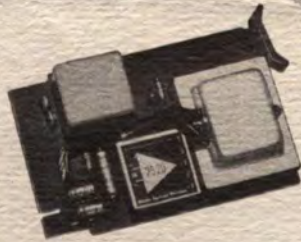
- Equalization:** RIAA
- Gain:** 54 dB (2.5 mV at 1 kHz produces +4 dBm output)
- Input Impedance:** 50k Ω
- Output Impedance:** Less than 100 Ω
- Power Output:** +25 dBm ± 15 VDC supply
+28 dBm ± 20 VDC supply

System Engineered Audio Components



COMPRESSOR-LIMITER Model 525

Push-button selection of Compression, Limiting, De-essing and release time. Single knob 20dB Ceiling Control. Lighted meter. Transformer isolated. Size: 1½" x 5¼" x 6¼" deep.



MICROPHONE PRE-AMPLIFIER—Model 312

Transformer coupled input and output with exceptionally low noise (-129 dBm) and high output power capability with low distortion. Adjustable gain. Utilizes Model 2520 operational amplifier.



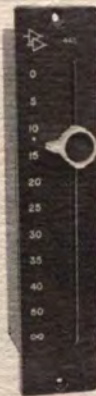
LINE AMPLIFIER—Model 325

Bridging input, low noise. Output power capability greater than +30 dBm. Adjustable gain, transformer coupled output. Can function as line amp, booster amp or "no-loss" combining network. Utilizes Model 2520 operational amplifier.

In both components, the output transformers are unique, permitting simultaneous multiple outputs. Both are PC cards (2¾" x 4½" x 1½") permitting standard modular use. Power supply decoupling and reverse voltage protection are provided.

LINEAR FADER—Model 440

Illuminated scale; infinite resolution; low-noise and long life; multi-gang and cue switch units available. Size: 7" x 1½" x 2¼" deep.



EQUALIZER — Model 550

Concentric High, Mid and Low frequency range switches allow a choice of 11 center frequencies with up to 12 dB boost or cut in each range. Additional switches provide independently selectable low and high frequency bell or shelf curves, band pass filter, and in-out function with indicator light. Output +28 dBm, transformer isolated.

Model 2520 Operational Amplifier sockets, card mounting frames, power supplies and other accessories available.

Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design and fabrication.



EQUALIZED PREAMPLIFIER Model 330

Models available for RIAA Phono, NAB Tape, and Magnetic Film. Low noise, adjustable gain, high output capability. Equalization adjustable. Film model provides both 16 and 35 mm. curves, externally selectable. Utilizes Model 2520 operational amplifier.

Represented by:

AUTOMATED PROCESSES, INC.
35 CENTRAL DRIVE
FARMINGDALE, N.Y. 11735
516-694-9212

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Audio Operational Amplifier

MODEL 2520



Features

- Extremely low noise
- High output power
- Operation under a wide range of supply voltages
- Low quiescent current
- Low distortion
- Wide power bandwidth
- Standard OP-AMP connections (Plug-in or P.C. mount)
- Stable operating characteristics
- Electrostatically shielded
- Short-Circuit and overload protected

Applications

- Microphone Preamplifiers
- Line or Booster Amplifiers
- Lossless Combining Amplifiers
- Balanced Transformerless Amplifiers
- Equalizers and Equalized Preamplifiers
- Earphone or Small Speaker Drivers

The Model 2520 is a high gain, wide band, direct coupled amplifier with differential input, designed specifically for audio amplifier applications. Several Operational Amplifier circuits typical of those most often used in the audio field are shown on the following page, along with their characteristics. These circuits have been tested and the data shown has been validated in Automated Processes laboratories.

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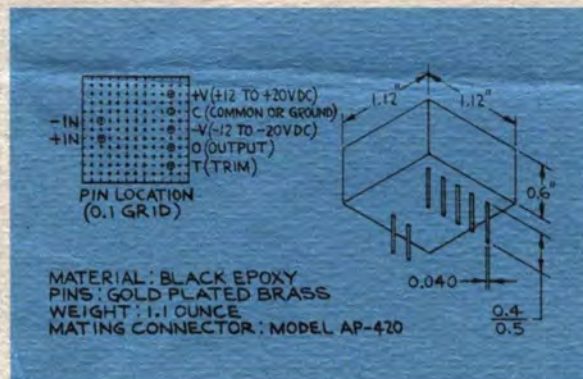
The specially formulated, thermally conductive epoxy in which this nine transistor amplifier is encapsulated, protects the internal circuitry against thermal shocks, vibration and humidity. Conservative design based upon "worst case analysis" plus thorough in-process inspection and performance test after "burn-in" assure long life and reliable performance.

Specifications

Gain:	Greater than 110 dB, DC
Frequency Response:	Small signal Gain Bandwidth Product—50 mHz Full Output Frequency—40 kHz
Equivalent Input Noise:	Less than 0.5 microvolts
Input Impedance:	Greater than 10 megohms, DC
Input Current Offset:	25 nA Typ.; 75 nA Max.
Input Voltage Offset:*	4 mV Typ.; 10 mV Max.
Common Mode Input:	±6 Volts with ±15 VDC supply ±8 Volts with ±20 VDC supply
Distortion:	0.2% THD, 20 to 20,000 Hz at rated output
Output Voltage:	Greater than 7.75 Volts RMS, ±15 VDC supply Greater than 11 Volts RMS, ±20 VDC supply
Minimum Load Impedance:	75Ω for full output voltage
Continuous Power Output: (Minimum Load Impedance)	0.8 Watts RMS @ ±15 VDC supply 1.5 Watts RMS @ ±20 VDC supply
Quiescent Current:	15 Milliamperes @ ±15 VDC supply 26 Milliamperes @ ±20 VDC supply
Current at Rated Output 600Ω Load:	18 Milliamperes @ ±15 VDC supply 32 Milliamperes @ ±20 VDC supply
75Ω Load:	60 Milliamperes @ ±15 VDC supply 85 Milliamperes @ ±20 VDC supply
Power Supply Voltage:	Bi-polar, ±12 VDC to ±20 VDC

*Output offset may be nulled to zero by means of a 100 kΩ trim pot between the +V and T terminals. This is normally not necessary in Audio applications.

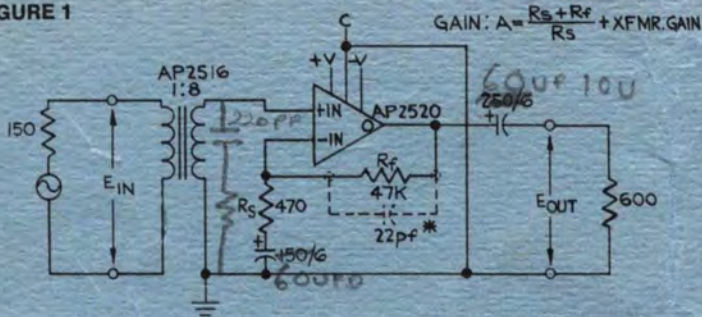
Our staff is fully equipped and stands ready to provide engineering services, from applications assistance to complete system design, and fabrication.



TYPICAL AMPLIFIER CIRCUITS

Circuit Specifications

FIGURE 1



MICROPHONE PREAMPLIFIER (GAIN: 58dB)

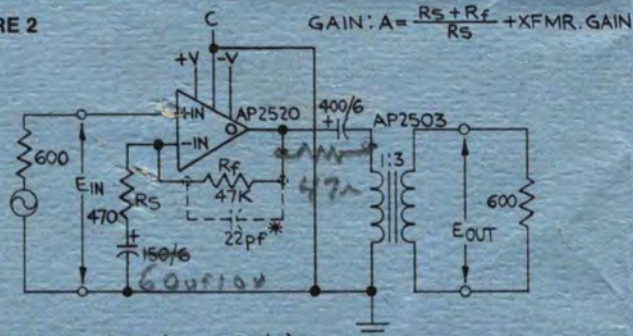
GENERAL (Figures 1-5)

- Load Impedance:** 600Ω
- Frequency Response:** ±0.25 dB, 20 to 20 kHz at rated output power
- Distortion:** Less than 0.2% THD, 20 to 20 kHz at rated output power

MICROPHONE PREAMPLIFIER (Figure 1)

- Gain:** 58 dB
- Equivalent Input Noise:** -129 dB, 20 to 20 kHz, unweighted
- Input Impedance:** Greater than 1500Ω
- Output Impedance:** Less than 2Ω
- Power Output:** +21 dBm, ±15 VDC supply
+24 dBm, ±20 VDC supply

FIGURE 2

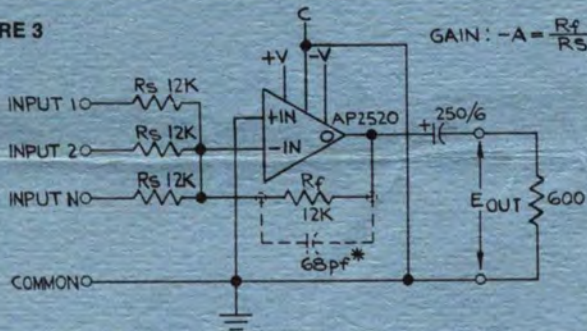


LINE AMPLIFIER (GAIN: 49dB)

LINE AMPLIFIER (Figure 2)

- Gain:** 49 dB
- Equivalent Input Noise:** -125 dB, 20 to 20 kHz, unweighted
- Input Impedance:** Greater than 2 megohms
- Output Impedance:** Less than 2Ω plus transformer reflected impedance
- Power Output:** +28 dBm, ±15 VDC supply
+30 dBm, ±20 VDC supply

FIGURE 3



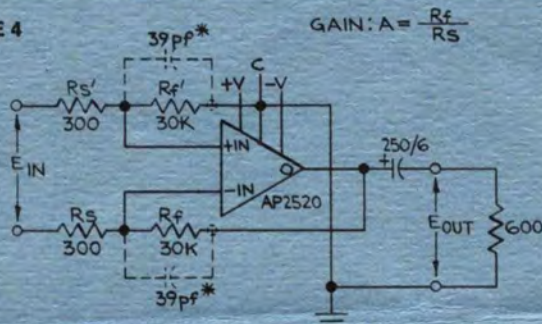
LOSSLESS COMBINING AMPLIFIER (GAIN: 0dB)

LOSSLESS COMBINING AMPLIFIER (Figure 3)

- Gain:** 0 dB
- Maximum Crosstalk:** -100 dB
- Maximum Gain:** 20 dB for 10 inputs
10 dB for 32 inputs
- Equivalent Input Noise:** -115 dBm for 10 inputs
-110 dBm for 32 inputs
- Input Impedance:** 12kΩ
- Output Impedance:** Less than 2Ω
- Power Output:** +21 dBm, ±15 VDC supply
+24 dBm, ±20 VDC supply

Note: This circuit produces a 180° phase reversal. An output transformer such as that shown in Figure 2 may be used to correct the phase, and can also provide additional gain.

FIGURE 4

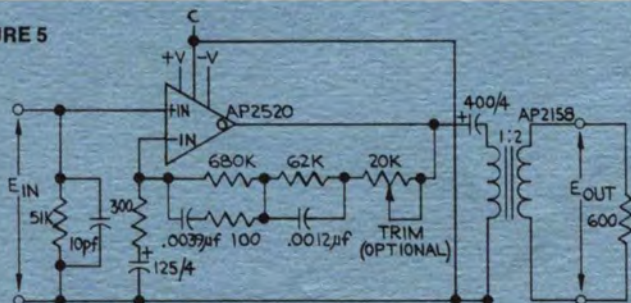


BALANCED TRANSFORMERLESS AMPLIFIER (GAIN: 40dB)

BALANCED TRANSFORMERLESS AMPLIFIER (Figure 4)

- Gain:** 40 dB
- Equivalent Input Noise:** -120 dB, 20 to 20 kHz, unweighted
- Input Impedance:** 600Ω
- Common Mode Rejection:** Greater than 90 dB (with matched resistors)
- Maximum Common Mode Voltage:** ±8 Volts peak
- Output Impedance:** Less than 2Ω
- Power Output:** +21 dBm ±15 VDC supply
+24 dBm ±20 VDC supply

FIGURE 5



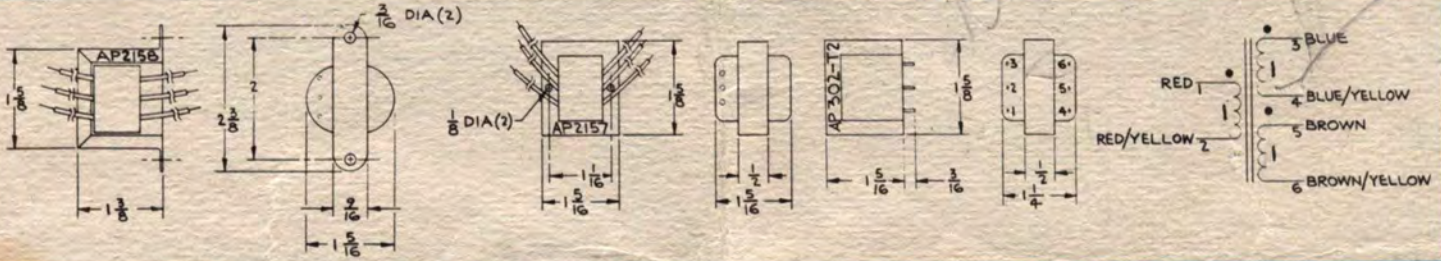
PHONO PREAMPLIFIER (GAIN: 54dB)

PHONO PREAMPLIFIER (Figure 5)

- Equalization:** RIAA
- Gain:** 54 dB (2.5 mV at 1 kHz produces +4 dBm output)
- Equivalent Input Noise:** -125 dBm
- Input Impedance:** 50kΩ
- Output Impedance:** Less than 2Ω plus transformer reflected impedance
- Power Output:** +25 dBm ±15 VDC supply
+28 dBm ±20 VDC supply

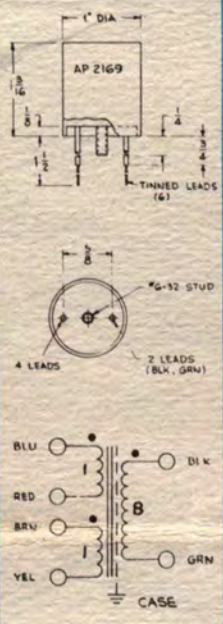
*OPTIONAL ROLL-OFF CAPACITOR

SYSTEM ENGINEERED AUDIO COMPONENTS

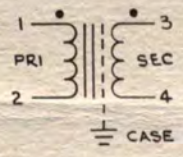
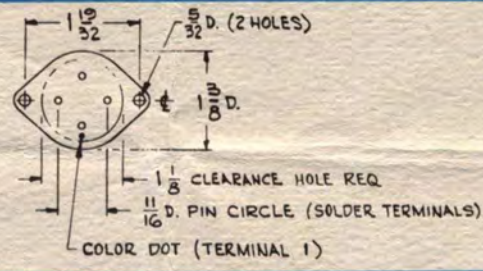
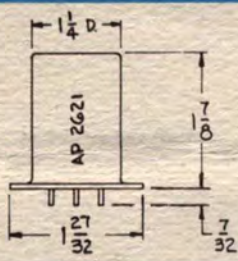
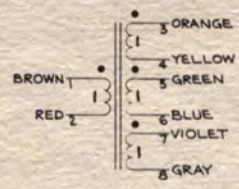
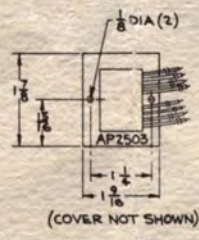
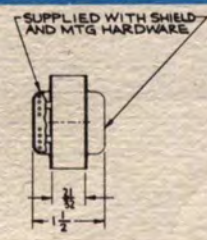


AUDIO TRANSFORMERS

	AP 2169	AP 2164	AP 2157* AP 2158* AP 302T2*	AP 2503	2621 AP 2164
Application	Input (Mic Preamp)	Input (Bridging)	Output (Amplifier to line)	Output (Amplifier to line)	Isolation (Line to Line)
Primary Impedance	150/600 Ω	10,000 Ω	75 Ω	75 Ω	600 Ω**
Secondary Impedance	10,000 Ω	600 Ω	75 Ω(1:1)† 300 Ω(1:2)†	75 Ω(1:1)† 300 Ω(1:2)† 600 Ω(1:3)†	600 Ω**
Frequency Response	30 to 20 kHz ±0.5 dB	20 to 30 kHz ±0.3 dB	30 to 20 kHz ±0.5 dB	30 to 20 kHz ±0.5 dB	30 to 30 kHz ± 0.25 dB
Maximum Level	0 dBm	+20 dBm	+30 dBm	+30 dBm	+20 dBm



*These transformers are electrically identical and differ only in mechanical details.
 †Minimum load impedances.
 **May be used unterminated to isolate a bridging load.



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