

FSR inc., innovators of audio and control products for systems contractors, introduces the Judicial Audio Control System (JACS). JACS was developed to simplify and economize today's judicial audio systems, permitting system contractors to provide fully functional and competitive audio system installations. JACS provides the audio and audio control subsystems most specified by courtroom audio system designers. JACS complements other manufacturer's microphones, automatic mixers, equalizers, audio power amplifiers and loudspeakers. JACS seamlessly integrates these components with circuitry to generate, mix, switch, distribute, and adjust audio signal levels. JACS replaces many separate components normally required to implement professional audio and audiovisual specifications.

#### **JACS provides System Integrators with the following benefits:**

- Economizes and organizes a judicial audio and control system by integrating many stand-alone components, thereby reducing the amount of audio and control equipment to order, ship, track, test, and configure.
- Performance specifications of all contained sub-systems meet or exceed manufacturer's specifications of separate components (Based on equipment contained in the **Federal Government AOUSC Guide Specifications for Audio Systems**).
- Improves the professionalism and organization of an installation by reducing front panel and internal rack space requirements, allowing for improved wire management and equipment access.
- Reduces inter-rack wiring issues due to multiple power supplies and differing manufacturer's wiring practices.
- Provides a family of products all engineered to work together.
- Easy to document installations, using manufacturer provided documentation and block diagram templates.
- Professionally fabricated control consoles in stained wood, anodized aluminum panels, and molded interconnection cables. Replaceable switch cap designations.

- Audio control is easily interfaced by paralleling momentary switch contacts. This permits multiple control panels and connection to more complex and expensive digital control systems, i.e. from audiovisual and evidence presentation systems.
  - Modular 2 rack unit console with field replaceable circuit boards, access to adjustment points, rear rail mounted power supply.
  - Furnished with removable captive screw barrier connectors for facilitating good wire management and pre-wiring of equipment racks.
  - Minimal outboard relays required for implementing additional system functional requirements. Interfaces with FSR relay products.
  - Two year warranty.
  - Various system configurations, spare boards, barrier connector kits, and pre-wire configurable options available on request.
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**JACS consists of the following sub-systems and components:**

### **JACS Frame**

- 20x4 audio matrix mixer for signal routing to industry standard electronic stenography recorders (ESR) with channels configurable from jumpers at the front of the rack.
- 2 microphone preamplifiers with jumper selectable phantom power.
- 2 channels of voltage controlled amplifiers with "last setting" on power-up. Each VCA controlled by 2 momentary switches (up/down).
- 3x1 audio summer with output gain control.
- 1x6 audio distribution amplifier with overall gain control.
- Digital noise masking signal for bench conferences, jumper selectable for white or pink noise curves.
- Remote audio system control from momentary switches. 8 switch inputs to 8 SPDT relays provided for audio signal control and switching. 1 dedicated momentary switch input for visual/audible signal. Momentary/maintained relay outputs selectable for 3 functions.
- 2 rack unit chassis (7 inches deep).

### **JACS Console**

- Control consoles in stained wood, anodized aluminum panels, and molded interconnection cables.
- LED back-lit switches. In-field replaceable switch cap designations. Panel layouts can be customized to work with the available 5 column by 3 row grid.

### **JACS Power Supply**

- Multivoltage power supply provided with rack mounting bracket for back rails, and a power cord, 6 feet long.

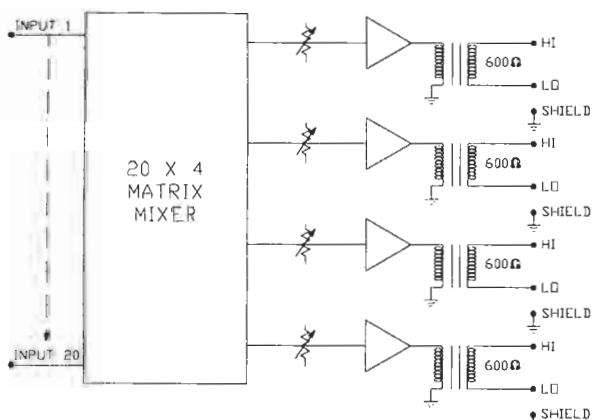
### **JACS Interpreter Console**

- Rugged die-cast metal enclosure with rounded corners, belt-clip, and pushbuttons for microphone on/off and private/broadcast functions that will switch the interpreter's microphone between private (IR emitter panel) and broadcast (loudspeakers). Supplied with a 25 foot strain relieved cable.

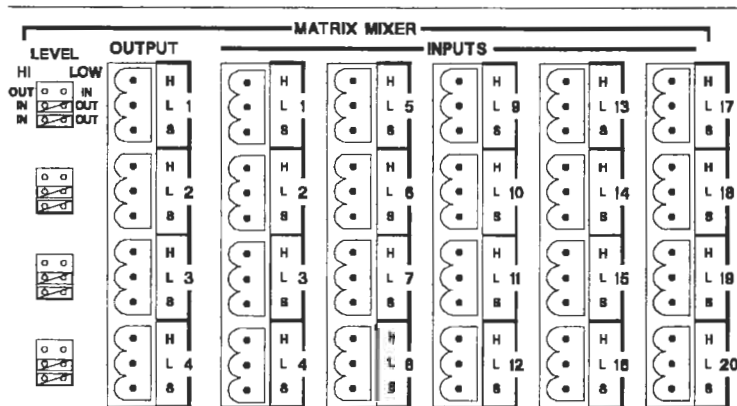
### 20x4 MATRIX MIXER

This Matrix Mixer was designed specifically for integration of Lanier and SONY 4 channel logging recorders commonly specified in courtroom systems, however it will work equally well with other court room recorders. Transformer coupling on each of the four Matrix Mixer outputs eliminates ground loop hum which can be encountered when a non-transformer output is connected to the single-ended inputs such as the SONY BM-246 recorders. A gain adjustment is provided on each output. The 20 electronically balanced input connections on the rear-panel are designed to interface with direct outputs provided by automatic microphone mixer(s). Each of the twenty input channels can be assigned to any one of the four transformer-balanced outputs via a jumper, accessible from the front panel.

Input impedance: 20 Kohm , +/- 1% balanced 10 Kohm Single Ended  
 Max. input level: +18 dBm  
 Output impedance: 600 ohms transformer coupled  
 Output level HI: 0 dB (output gain adjust set at 0 dB)  
 Output level LOW: -55 dB (output gain adjust set at 0 dB)  
 Output gain adjust: -20 dB - +6 dB +/- .5 dB  
 Frequency Response: 20 Hz — 20 kHz +/- .5 dB  
 Distortion: < 0.1% , 20 Hz — 20 kHz

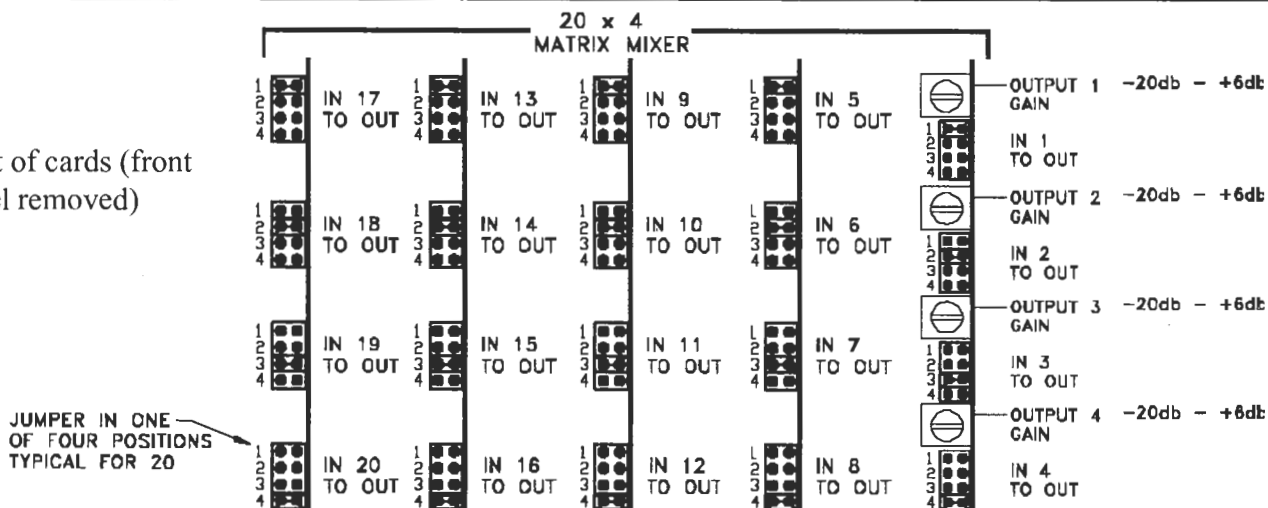


MATRIX MIXER



rear panel sectional view

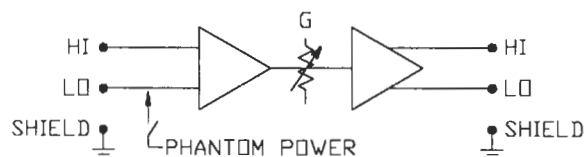
front of cards (front panel removed)



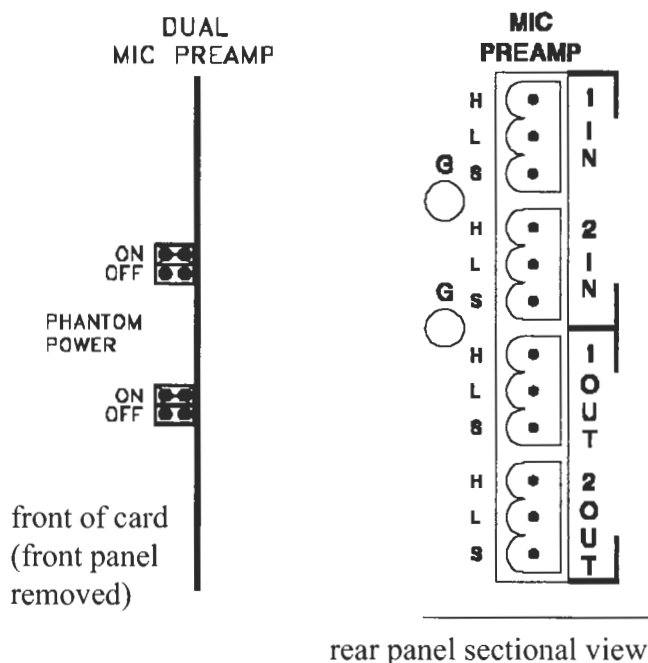
### TWO MICROPHONE PREAMPLIFIERS

In addition to the 20 balanced inputs, two balanced microphone preamplifiers are provided, typically one for the interpreter's microphone and the other for the sidebar microphone. Phantom power is provided to meet the requirements if condenser microphones are specified for these functions. The heart of the preamplifier is a specially designed, overvoltage-protected, electronically balanced integrated circuit. The preamplifiers have a gain adjustment accessible from the rear panel. The phantom power may be also disabled from the rear panel.

Input impedance: 4Kohm balanced (approx.)  
 Max. input level: +1dBV  
 Input gain adjust: +30 dB to +66 dB  
 Frequency Response: 20 Hz — 20 kHz +/-0.5 dB  
 Distortion: <0.001%, 20 Hz — 20 kHz



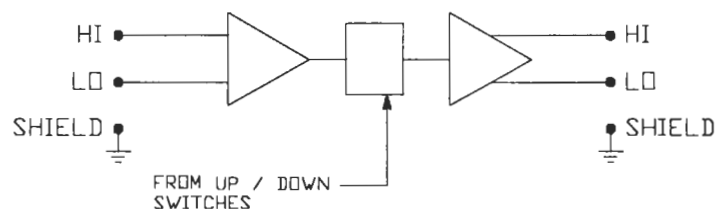
MICROPHONE PREAMP (TYPICAL OF 2)



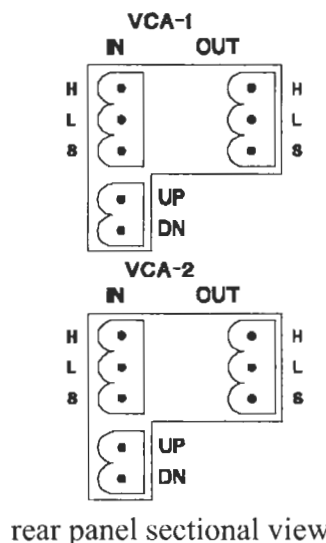
### DUAL VOLTAGE-CONTROLLED AMPLIFIER (VCA)

These VCAs interface to two momentary (closure-to-ground) switches provided by the JACS console. These switches allow audio level adjustment across the overall range in .5dB increments. Stepping is either one increment per push or auto-incrementing if the switch is held. Non-volatile storage insures that power interruptions result in the powering up to the last adjusted level. Both VCAs have a balanced input and output.

Number of control steps: 64  
 dB level change for any step: 0.5 dB/step  
 VCA Volume Range: -20dB — +10dB +/-1dB  
 Input impedance: 20 Kohm +/-1% balanced  
 Max. input level: +18 dBm  
 Output impedance: 50 ohms  
 Gain range,  
 (input-to-output @ max setting): -20dB - +10dB  
 +/-0.5dB  
 Frequency Response: 20Hz — 20KHz +/- 0.5 dB  
 Distortion: <0.02 %, 20 Hz — 20 kHz



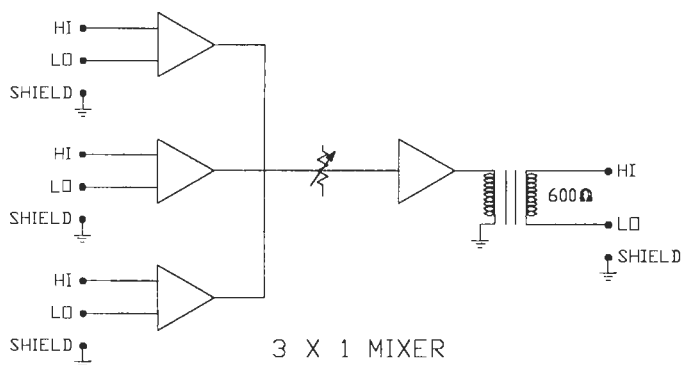
VCA (TYPICAL OF 2)



### 3x1 SUMMER ( MIXER)

The 3 by 1 Summing Mixer produces a single transformer balanced output derived from the sum of three electronically balanced inputs. Level control is provided for the output stage.

Input impedance: 20 Kohm , +/- 1% balanced  
 Max.input level: +18 dBm  
 Output gain adjust: -20dB to +6 dB +/- 0.5 dB  
 Output impedance: 600 ohms transformer coupled  
 Frequency Response: 20 Hz — 20 KHz +/- 0.5 dB  
 Distortion: < 0.1% , 20 Hz — 20 KHz



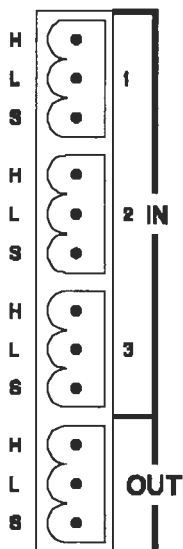
3 X 1 MIXER

3 x 1  
MIXER

GAIN  
-20db  
+6db

front of card  
(front panel  
removed)

MIXER

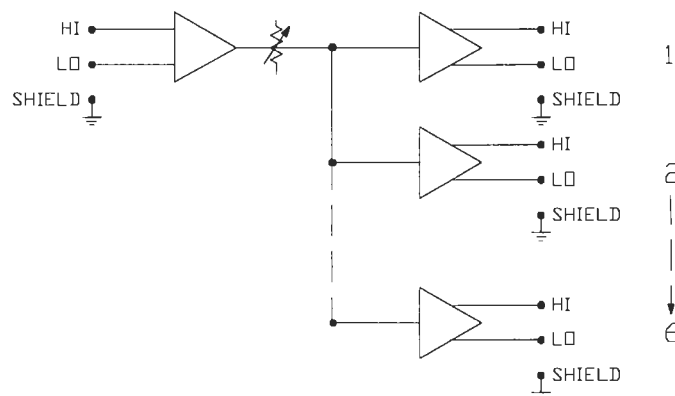


rear panel sectional view

### 1x6 DISTRIBUTION AMPLIFIER

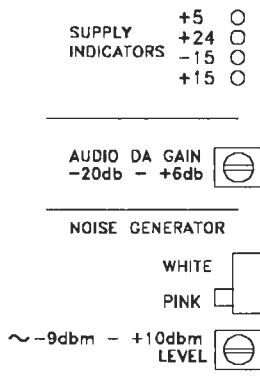
The Distribution Amplifier is a one-input, six-output functional audio block, which facilitates a variety of courtroom sound system connectivity needs. The input is electronically balanced.

Input impedance: 20 Kohm , +/- 1% balanced  
 Max.input level: +18 dBm (at minimum gain)  
 Output impedance: 50 ohms  
 Output gain adjust: -20 dB - +6 dB +/- 0.5 dB  
 Frequency Response: 20 Hz — 20 KHz +/- 0.5 dB  
 Distortion: < 0.1% , 20 Hz — 20 kHz



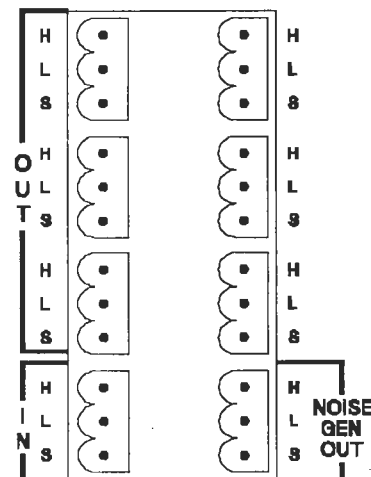
1 X 6 DISTRIBUTION AMPLIFIER

1 x 6  
AUDIO DA



front of card  
(front panel  
removed)

AUDIO DA  
1 X 6



rear panel sectional view

### DIGITAL NOISE SOURCE

The noise section provides a noise masking signal which is user-selectable with a switch located in front for pink noise (equal power per octave) or white noise (equal power per Hertz).

A level control is accessible from the rear panel for control of the output level on the fully balanced output.

(see preceeding page for rear panel sectional view)

White noise

Output level: -8 dBm to +4 dBm

Output impedance: 600 ohm

Bandwidth: Lower rolloff: -3dB at 100Hz

Upper rolloff: -3dB at 30KHz

Pink noise

Output level: -8 dBm to +4 dBm

Output impedance: 600 ohm

Bandwidth: Lower rolloff: -3dB at 100Hz

Upper rolloff: -3dB at 30KHz

### CONTROL AND SWITCHING

The control and switching section of the JACS is the interface between the various consoles in the system and the audio functions that must be either controlled or switched as commanded by the judge or clerk.

This section of the JACS has;

5 momentary switch inputs and 5 lamp drive outputs operating SPDT relays in a momentary fashion.

3 momentary switch inputs along with 3 lamp outputs driving SPDT relays that can be DIP switch selected for either maintained or momentary operation.

1 "signal" momentary switch input with an associated lamp output driving a sound device in the respective console is activated by the operation of this switch. The signal will remain on while the switch is activated.

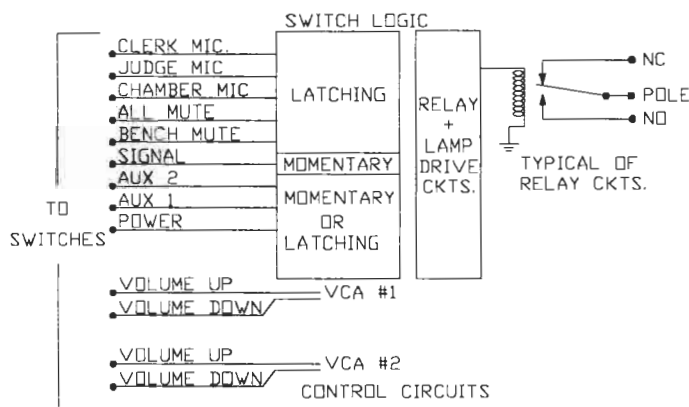
Control inputs: Momentary push-button switch closure to ground, may be wire-OR'd by paralleling two or more control consoles. Each relay provides a common, NO and NC set of contacts.

Relay life: 5,000,000,000 Min.

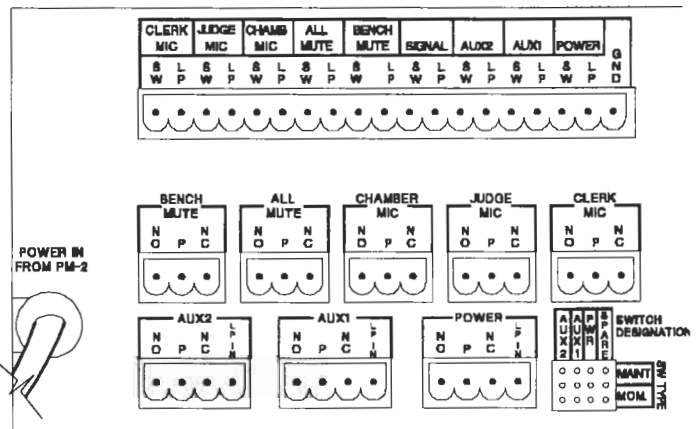
Max. relay voltage: 125 V AC or 60 V DC

Max relay current: 1A

Lamp drive: Switched +12V, @ 60mA



EACH SWITCH INPUT HAS A CORRESPONDING LAMP OUTPUT AND A RELAY ASSOCIATED WITH IT.



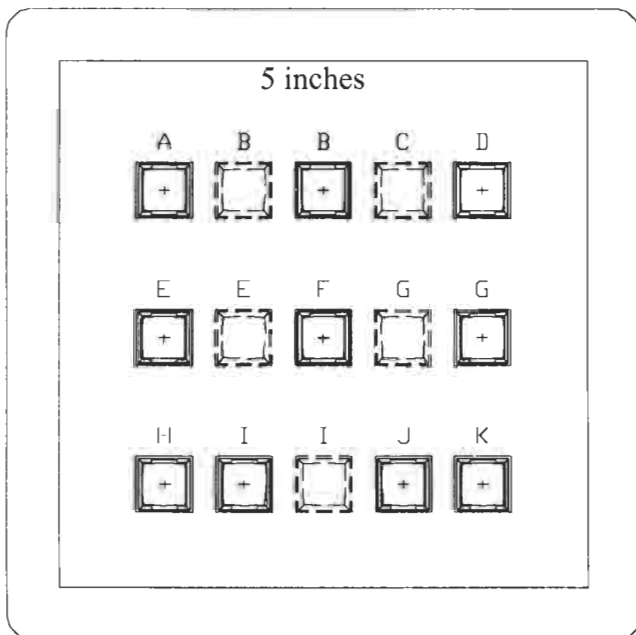
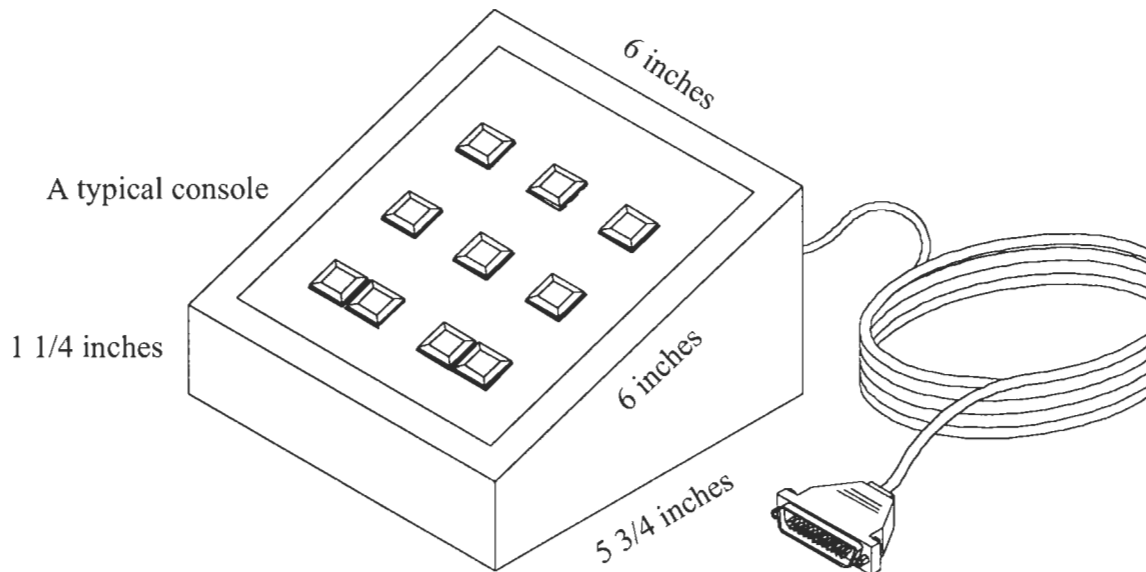
rear panel sectional view

## JACS CONSOLE

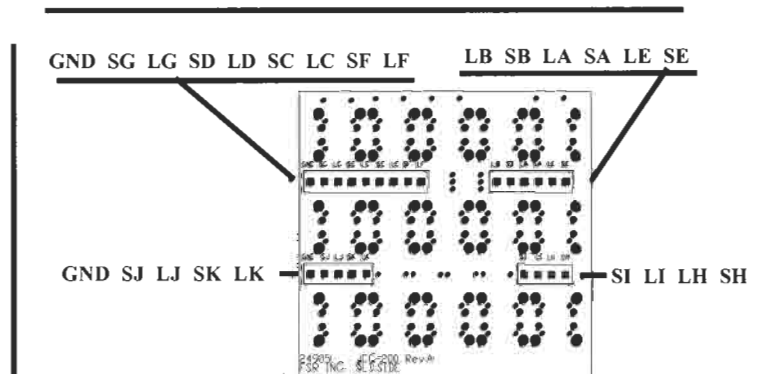
The JACS console is a stained wood enclosure with an anodized aluminium panel having LED backlit switches. The designations for each of the switches are field replaceable.

In a standard installation, two consoles are used. Typical locations are at the Judge and Court Clerk, but more panels can be accommodated.

The consoles are manufactured of beautiful hardwood and finished in a selection of stains to match the decor and personal tastes of the customer. The panel is bronze anodized aluminium accommodating two to eleven switches, including a signal button and variable volume audible tone. The buttons have replaceable designations and feature lamp (LED) feedback to indicate status. A 12 foot cable exits the rear of the unit and is terminated in a DB25 male connector.



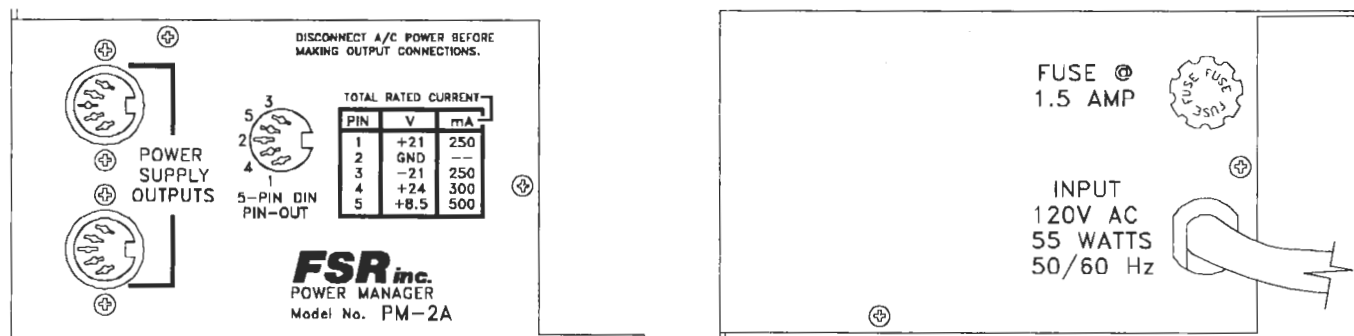
Detail of the front of the console, showing the possible locations of all switches along with their designators (a--k).



Rear of console pc board showing wiring hookup for the various switches and lamps (LEDs). The prefix S means switch and the prefix L means lamp

## JACS POWER SUPPLY

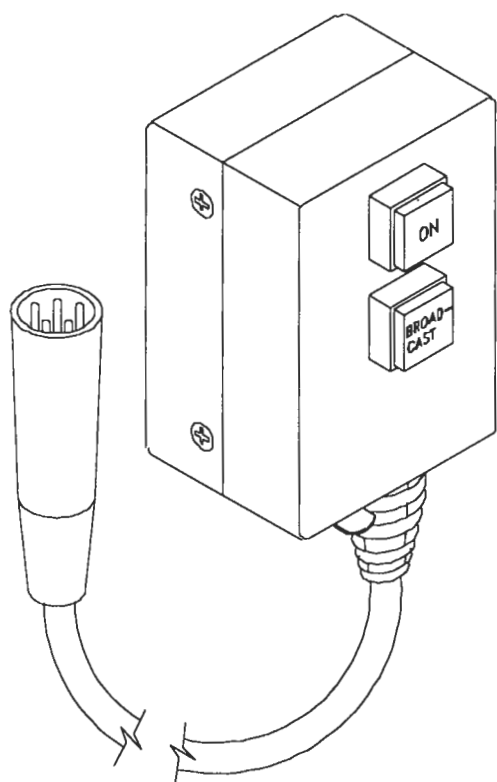
This power supply, the PM-2A, is a well regulated linear supply providing all the voltages required for proper operation of the JACS. It is housed in a small metal case and is typically mounted in the rear of the rack.



Two views of the power supply.

## JACS INTERPRETER UNIT

The interpreters box is a belt mountable rugged unit that will switch the interpreters microphone between private (IR emitter panel) and broadcast (loudspeakers).



INTERPRETER UNIT

