

WILKINSON
ELECTRONICS, INC.

TACS-2C STEREO AUDIO CONSOLE



FEATURES:

- Modern Formica Cabinet Design
- Completely Solid State Construction
- Maximum Accessibility
- Twenty-eight Inputs Available
- Nine Mixers: Three Mono: Six Stereo
- Vertical Step Attenuators for Easy Sight Control
- Incorporates Interchangeable High Level Amplifiers
- All Amplifiers Protected for Greater Reliability

WILKINSON

ELECTRONICS, INC.

GENERAL

The TACS-2C audio console is designed to provide audio amplification, switching and monitoring facilities necessary to radio stations broadcasting stereo programming. True broadcast audio is reproduced by distortion-free amplifiers controlled by long life vertical step attenuators. These attenuators are easy to operate and provide better control because the position of the fingertip knobs is instantly visible from any distance. The vertical step attenuator also provides greater reliability than rotary types since with linear movement linear tension is provided between the contacts and thus longer life and greater reliability is achieved. Each attenuator has a cue position.

DESCRIPTION

The TACS-2C is housed in an attractive walnut finish formica covered steel cabinet with a brushed aluminum front panel. The top cover is removable or can swing back, and the front panel is hinged to the base so that it may be swung forward for service. All components are on the front panel and base. Twenty-eight inputs are provided including nine microphones into three preamplifiers controlled by three vertical attenuators. A switch is located between the first two mixers which enables the operator to choose between independently controlling a dual microphone setup or riding level together on two microphones with one mixer. Six high level inputs and twelve remote or auxiliary lines.

PREAMPLIFIERS

Three preamplifiers are provided in the TACS-2C. Each of the microphone preamplifiers is constructed in an aluminum plug-in housing. The necessary input transformer is contained therein.

The preamplifier uses three silicon transistors as the active devices. These transistors are very low noise units designed specifically for this application. It is fully temperature compensated and can be operated within the specifications from approximately -10 to +50°C.

The input transformer of this preamplifier drives a two stage "gain-stage-pair". Following the "gain-stage-pair" is an output amplifier consisting of an emitter follower which is also a very low noise device. Two AC feedback loops stabilize the amplifier resulting in very low distortion, low noise and extremely flat response.

PREAMP SPECIFICATIONS

Input impedance ...	50 to 600 ohms source-terminated
Output impedance	600 ohms
Gain	60 db
Noise	-130 dbm (weighted)
Input N.F.	1.2-1.8 db (600 ohms)
Frequency Response	±1.0 db, 30 Hz to 20 KHz
Power Supply	25 VDC regulated
Current Drain	21 milliamperes
Distortion	Less than 0.25%
Power Output at 1% Harmonic Distortion	5.5 milliwatts

HIGH LEVEL AMPLIFIERS

Five high level amplifiers are incorporated in the TACS-2C for use as cue, program and monitor amplifiers. The amplifier boards are identical and interchangeable. If at any time a program amplifier fails, it is extremely simple to merely interchange either the cue or monitor amplifier for this service.

This amplifier uses eight silicon transistors and one silicon diode as the active devices. It is fully temperature stabilized and can be expected to operate within specifications from -20 to +55°C. Some crossover distortion will be evident below approximately +10°C at power levels above 5 watts.

This amplifier consists of two basic circuits—the first being a preamplifier section and the second being the power amplifier section.

The preamplifier consists of a two transistor “gain-stage-pair” driving an emitter follower output amplifier. Two AC feedback loops and two DC feedback loops stabilize the gain and frequency-response characteristics. Low noise transistors are used in this application.

The output from the amplifier section is fed via a gain control to the power amplifier section. The input stages of the power amplifier are also low noise transistors connected as a “gain-stage-pair”. This circuit current drives the base of the driver transistor.

The Collector load of the driver transistor is split between the bases of the two output transistors. These output transistors are operated complimentary-symmetry. Approximately 45 db of feedback in three loops is used to stabilize this amplifier for low distortion and excellent frequency response.

HIGH LEVEL AMPLIFIER SPECIFICATIONS

Input impedance 21 kilohms
Output impedance Less than 15 milohms
Gain (gain cont. max.) 70 db (voltage)
Noise -130 db
Frequency Response ± 0.25 db, 20 Hz to 35 KHz
(all power levels)
Power Supply 25 VDC regulated
Quiescent Current Drain 85 milliamperes
Distortion Less than 0.5% (program application)
Less than 0.5% (monitoring application)
Power output at 1% Harmonic Distortion
(RMS) 5 watts (8 ohms load)

POWER SUPPLY

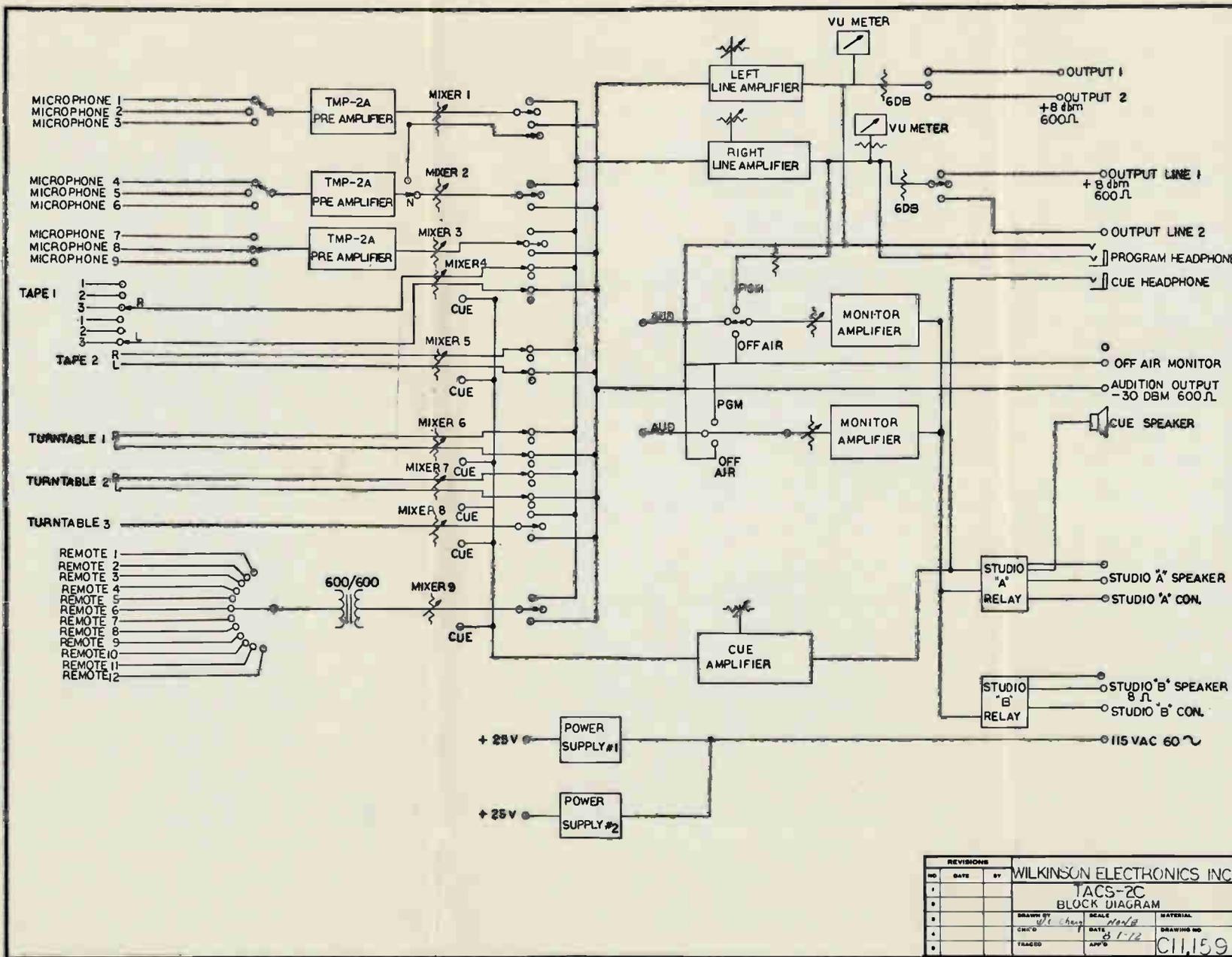
The power supply for the TACS-2C is an integral part of the unit. Two regulated supplies provide 25 volts for all amplifiers as well as the muting and speaker relays.

ELECTRICAL CHARACTERISTICS

Power 105-125 volts, 50/60Hz
Amplifiers (3) Preamplifiers
(2) Line Amplifier
(2) Monitor Amplifier
(1) Cue Amplifier
(2) Power Supplies
Inputs (9) microphones, 50/200/500 ohms
balanced or unbalanced
(5) high level stereo for tape, turntable
or utility, unbalanced
(12) remote lines, 50/125/200/500
ohms, balanced or unbalanced
Outputs (2) program lines-600 ohms +8 dbm
(2) speakers-8 ohms
VU Meter . Two standard VU meters with type B scale
Channels .. Two independent stereo program channels
Frequency Response
Program: ± 1 db, 30 to 20,000 Hz
Monitor: ± 1 db, 30 to 20,000 Hz
Distortion Program Lines: 0.5% or less, 30-20,000 Hz
at +8 dbm
Monitor: 0.5% or less, 30-15,000 Hz at 5 watts
Signal to Noise Ratio -120 db overall
Minimum Input Level -70 db
Maximum Output Level +16 dbm
Zero VU +8 dbm

MECHANICAL SPECIFICATIONS

Width 32 inches
Height 11 inches
Depth 19 inches
Weight 75 lbs.
Finish Walnut Formica



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REVISIONS			WILKINSON ELECTRONICS, INC.		
NO	DATE	BY	TACS-2C BLOCK DIAGRAM		
1			DRAWN BY	SCALE	MATERIAL
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WILKINSON
ELECTRONICS, INC.

TAC-1C AUDIO CONSOLE



FEATURES:

- Modern Formica Cabinet Design
- Completely Solid State Construction
- Twenty-two Inputs Available
- Eight High Level Vertical Step Attenuators
- All Amplifiers Protected
- Incorporates Identical Interchangeable High Level Amplifiers

WILKINSON

ELECTRONICS, INC.

GENERAL:

The TAC-1C audio console has been especially engineered to offer the ultimate in switching, monitoring and amplification required by radio and television stations. It presents many features found only in custom built equipment and greatly enhances smoothness of operation in the broadcast or sound studio. The use of high quality vertical step attenuators provides eight mixers in the space normally required for six rotary type mixers. The vertical attenuator provides greater reliability than rotary types since with linear movement, linear tension is provided between the contacts and thus longer life and greater reliability is achieved. The vertical step attenuator also provides better visual control since there is no question as to what position the fader is in, and such can be viewed from at least twenty feet.

DESCRIPTION:

The TAC-1C is housed in an attractive walnut finish formica covered steel cabinet with a brushed aluminum front panel. The top cover is removable or can swing back, and the front panel is hinged to the base so that it may be swung forward for service. All components are on the front panel and base.

Twenty-two inputs are provided, including six microphones into two preamplifiers controlled by two vertical attenuators. Six high level mixers control two turntable inputs, three tape or other high level inputs, and twelve remote or auxiliary lines. Space is available for one optional additional preamplifier for low level operation.

PREAMPLIFIERS:

Two preamplifiers are normally provided in the TAC-1C with space for an additional preamplifier. Each of the microphone preamplifiers is constructed in an aluminum plug-in housing. The necessary input transformer is contained therein.

The preamplifier uses three silicon transistors as the active devices. These transistors are very low noise units designed specifically for this application. It is fully temperature compensated and can be operated within the specifications from approximately -10 to +50°C.

The input transformer of this preamplifier drives a two stage "gain-stage-pair". Following the "gain-stage-pair" is an output amplifier consisting of an emitter follower which is also a very low noise device. Two AC feedback loops and two DC feedback loops stabilize the amplifier resulting in very low distortion, low noise and extremely flat frequency response.

SPECIFICATIONS:

Input impedance	50 to 600 ohms source-terminated
Output impedance	620 ohms
Gain	60 db
Noise	-130 dbm (weighted)
Input N.F.	1.2-1.8 db (600 ohms)
Frequency Response	±1.0 db, 50 Hz to 20 KHz
Power Supply	25 VDC regulated
Current Drain	21 milliamperes
Distortion	Less than 0.25%
Power output at 1% Harmonic Distortion	5.5 milliwatts

HIGH LEVEL AMPLIFIERS:

Three high level amplifiers are incorporated in the TAC-1C for use as cue, program and monitor amplifiers. The amplifier boards are identical and interchangeable. If at any time a program amplifier fails, it is extremely simple to merely interchange either the cue or monitor amplifier for this service.

This amplifier uses eight silicon transistors and one silicon diode as the active devices. It is fully temperature stabilized and can be expected to operate within specifications from -20 to +55°C. Some crossover distortion will be evident below approximately +10 C at power levels above 5 watts.

This amplifier consists of two basic circuits—the first being a preamplifier section and the second being the power amplifier section.

The preamplifier consists of a two transistor “gain-stage-pair” driving an emitter follower output amplifier. Two AC feedback loops and two DC feedback loops stabilize the gain and frequency-response characteristics. Low noise transistors are used in this application.

The output from the preamplifier section is fed via a gain control to the power amplifier section. The input stages of the power amplifier are also low noise transistors connected as a “gain-stage-pair”. This circuit current drives the base of the driver transistor.

The Collector load of the driver transistor is split between the bases of the two output transistors. These output transistors are operated complimentary-symmetry. Approximately 45 db of feedback in three loops is used to stabilize this amplifier assuring low distortion and excellent frequency response.

SPECIFICATIONS:

Input impedance	21 kilohms
Output impedance	Less than 15 milohms
Gain (gain cont. max.)	70 db (voltage)
Noise	-130 dbm
Input N.F.	1.2–1.8 db (600 ohms)
Frequency Response	± 0.25 db, 20 Hz to 35 KHz (all power levels)
Power Supply	25 VDC regulated
Quiescent Current Drain	85 milliamperes
Distortion	Less than 0.1% (program application) Less than 0.5% (monitoring application)
Power output at 1% Harmonic Distortion	8.4 watts (8 ohms load) 10.5 watts (4 ohms load)

POWER SUPPLY:

The power supply for the TAC-1C is an integral part of the unit. Two regulated supplies provide 25 volts for all amplifiers as well as the muting and speaker relays.

ELECTRICAL CHARACTERISTICS:

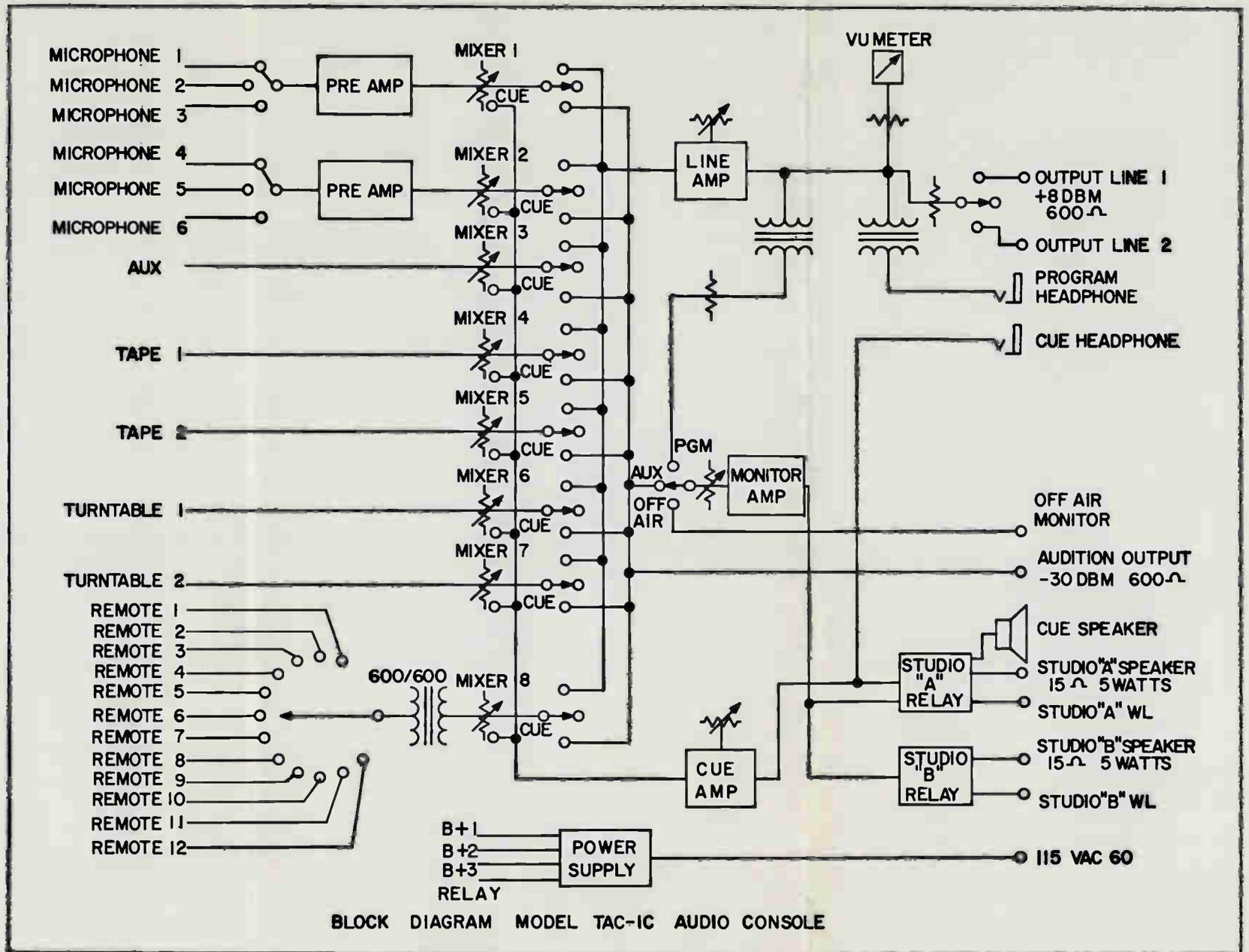
Power	105–125 volts, 50/60 Hz
Amplifiers	(2) Preamplifiers (1) Line Amplifier (1) Monitor Amplifier (1) Cue Amplifier (2) Power Supplies
Inputs	(6) microphones, 50/200/500 ohms balanced or unbalanced (5) high level for tape, turntable or utility, unbalanced (12) remote lines, 50/150/250/600 ohms, balanced or unbalanced
Outputs	(2) program lines - 600 ohms balanced 0 VU equals +8 dbm out (2) speakers - 4 ohms
VU Meter	One standard VU meter with type B scale
Channels ..	Two independent program & audition channels
Frequency Response ...	Program: ± 1 db, 30 to 15,000 Hz Monitor: ± 1 dbm, 30 to 15,000 Hz
Distortion	Program Lines: .5% or less, 50–15,000 Hz at +8 dbm Monitor: 1% or less, 50–15,000 Hz at 4 watts
Signal to Noise Ratio	-120 db overall
Minimum Input Level	-70 db
Maximum Output Level	+16 dbm
Zero VU	+8 dbm

MECHANICAL SPECIFICATIONS:

Width	29 inches
Height	11 inches
Depth	19 inches
Weight	75 lbs.
Finish	Walnut Formica

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WILKINSON ELECTRONICS, INC.

FM2500E 2.5KW FM TRANSMITTER

WILKINSON EXCLUSIVE FEATURES

INCORPORATES THE ULTIMATE FME-10 EXCITER

- Stable - So Drift Free It Requires No Oven.
- Fidelity - 25 Hz - 15 KHz 100% Modulation Capability.
- Distortionless and Noiseless with Response 30-15000 Hz with Pre-emphasis.
- Solid State 10 Watts Output with Built-In Power Supply.

INCORPORATES AN ASSURED POWER AMPLIFIER

- Single Pentode 5CX1500A Final Amplifier. Assures Absolute Stability and Power Capability.
- Vacuum Capacitor Tuning And Loading Eliminates Sliding Contacts and Mechanical Problems to Assure Reliability and Long Life.
- Input and Output Reflectometers Assure Ease of Tuning, Maintenance and Accuracy of Adjustment.
- The Output Circuit and Exclusive Harmonic Filter Assure Freedom of Spurious Emissions and Harmonics.

INCORPORATES PROTECTED POWER SUPPLIES

- Uses Self Testing Wilkinson Silicon Rectifiers Voltage Protection 400% Current Protection 800%
- Modern Fiberglass Printed Circuit Control Ladder Conserves Space, Reduces Complexity and Eliminates Unnecessary Wiring.
- Solid State Time Delay and Recycling Increases Reliability and Eliminates Expensive Relay Replacement.
- Double Duty Plate Transformer and Filter Reactor Always Loaf.

GENERAL MECHANICAL DESCRIPTION

The FM2500E broadcast transmitter is housed in a steel cabinet finished in a hard durable Black Vinyl Finish with Brushed Aluminum Trim. Only four square feet of floor space is required. All operating controls are on the front panel and access to the interior of the power amplifier is thru the door of the PA cubicle. A sliding drawer directly beneath the PA houses the low voltage power supplies and control ladder circuits. Interlock and overload indicators as well as overload reset controls are on the front panel of this slide-out drawer. All components of these circuits are completely accessible when the drawer is opened.

The exciter and where required, the stereo generator is the next vertical component beneath the control circuit drawer. There are two slide-out compartments in the exciter itself which facilitate exciter adjustments, but for service or maintenance on the exciter power supply, opening of the rear provides complete accessibility:



All components can be reached from this access or from the full rear door.

The Main power supply including plate transformer, and filter circuitry are located on the base of the transmitter with the main circuit breaker on the lower front panel.

Full and complete metering is provided. To the right of the power amplifier two multimeters measure screen and control grid voltage and current. A third meter measures the incident and reflected power of the exciter output.

The upper meter panel indicates plate current, plate voltage, AC Mains voltage and output power in terms of percentage. Full metering for the IPA stage is incorporated in the 65 watt section. The output power meter can be switched to read reflected power from the antenna.

EXCITER FME-10 and IPA

The FME-10 is a direct FM exciter capable of both monophonic and stereophonic operation. During monophonic operation two sub-carriers can be used; during stereophonic operation only one sub-carrier can be used.

The exciter is comprised of three basic sections, the power supply, a direct FM oscillator and automatic frequency control section, and the multiplier-power amplifier section. The latter two sections are

contained in separate housings to eliminate interaction between the two systems. The power supplies and control circuits are contained in the main frame of the exciter. The exciter drives the IPA, which is a Motorola 2N6166, which supplies 65 watts of drive for the final tube. This is more than adequate for this service.

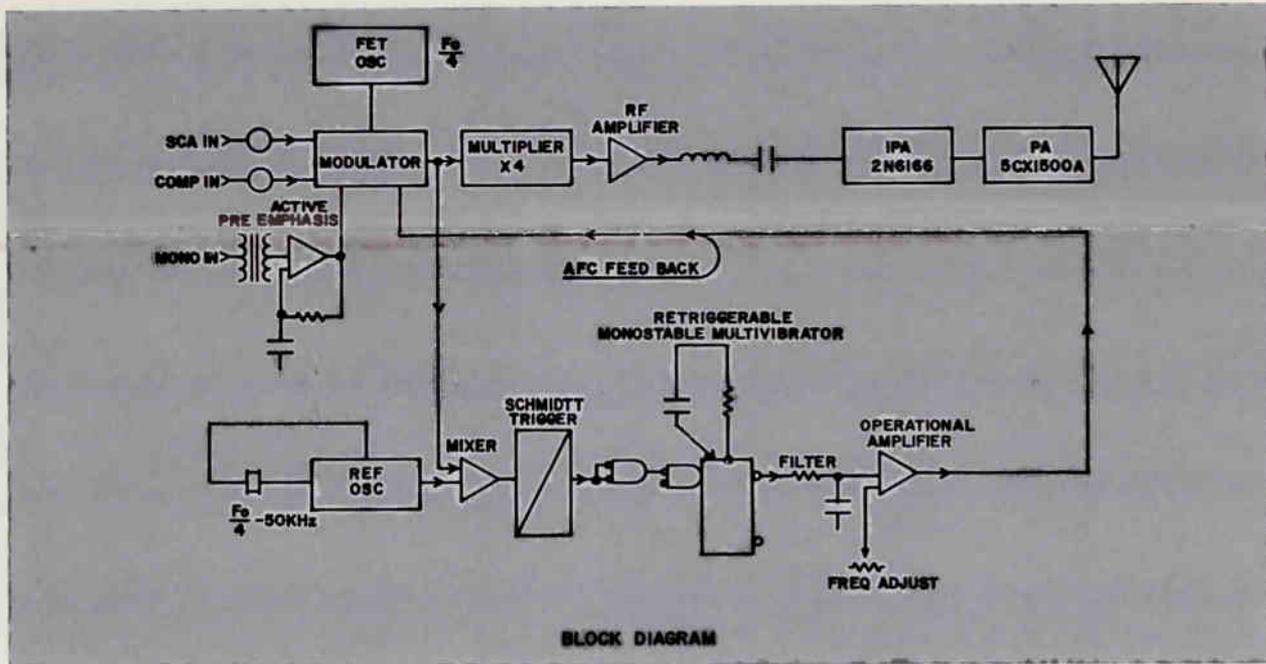
POWER AMPLIFIER

A single 5CX1500A tube capable of 3000 watts is used as the final RF amplifier. Operating in a grounded cathode configuration. It does not require neutralization because of the internal structure of the

screen grid. Capacity tuned networks are used in both input and output circuits and both circuits incorporate reflectometers for assurance of correct tuning and safe operations. The inductance in the output is fixed during factory test and variable vacuum capacitors vary tuning and loading of the final.

POWER SUPPLY

A full wave single phase bridge silicon rectifier provides 4500 volts for the 5CX1500A plate. Separate bridge circuits provide the 500 volt screen supply and 120 volt bias supply.



SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

Type of Emission F3 F9
 Frequency Range 88 to 108 MHz
 Rated Power Output 2500 watts
 RF Output Impedance (7/8" EIA Flange) ... 50 ohms
 Audio Input Impedance 600 ohms
 Audio Input Level 10 ± 2 dbm
 Amplitude vs. Frequency $+1/4$ to $1/2$ db of 75
 microsec. curve 30 Hz to 15 KHz
 Carrier Frequency Stability ± 1000 Hz
 Modulation Capability ± 150 KHz
 Audio Frequency Distortion... $1/2\%$ Max. 50 - 15 KHz
 FM Noise Below ± 75 kc 65 db
 AM Noise RMS 55 db below carrier
 Harmonic Attenuation at least 73 db

ELECTRICAL SPECIFICATIONS

Power Line Requirements
 Voltage 208 or 230 volts, 50 or 60 cycles, 1 phase

Slow Line Variations $\pm 5\%$
 Rapid Line Variations $\pm 3\%$
 Regulation 3%
 Power Consumption 5800 watts (approx.)
 Power Factor (approx.) 90%

MECHANICAL SPECIFICATIONS

Transmitter Overall Dimensions

Width $28\frac{1}{4}$ "
 Height 76"
 Depth 27"
 Net Weight 1200 lbs. (approx.)
 Maximum Altitude 7500 feet
 Ambient Temperature -30°F min. $+120^{\circ}\text{F}$ max.

TUBE COMPLEMENT

1-5CX1500A

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TSC-4A STEREO CONSOLE

FEATURES

- Highest Quality, Lowest Cost
- Solid State Engineered for Stereo
- Maximum Accessibility in a Compact Package
- Fifteen Inputs; 6 Microphone, 9 Stereo
- Seven Mixers; 2 Mono, 5 Stereo
- Top Quality Attenuators each with Cue Position
- Sliding Faders for Easy Sight Control



The economic TSC-4A is a versatile, compact stereo console featuring first quality audio, first quality components and first quality engineering. True broadcast audio is reproduced by distortion-free amplifiers controlled by long life sliding step attenuators. These attenuators are easier to operate and provide better control because the position of the finger-tip knobs is instantly visible from any distance.

Each attenuator has a cue position.

Fifteen inputs are provided. Six low level mono inputs are switchable to two preamplifiers. Four stereo high level inputs are connected to 4 faders and 5 additional inputs are switchable to an auxiliary fader. Thus the TSC-4A can easily control 9 stereo sources and 6 microphones.

Amplifiers and power supplies are produced on professional fiberglass printed circuit boards which are easily removable. The utmost in accessibility is accomplished because the face of the console incorporates 90 percent of all components and swings forward to expose all parts.

CIRCUIT DESCRIPTION (Refer to Block Diagram)

MICROPHONE PREAMPLIFIERS

Two microphone preamplifiers are normally provided in the TSC-4A. Each of the microphone preamplifiers is constructed in an aluminum plug-in housing. The necessary input transformer is contained therein.

The microphone preamplifier uses three silicon transistors as the active devices. These transistors are very low noise units designed specifically for this application. It is fully temperature compensated and can be operated within the specifications from approximately -10 to +50°C.

The input transformer of this microphone preamplifier drives a two stage "gain-stage-pair". Following the "gain-stage-pair" is an output amplifier consisting of an emitter follower which is also a very low noise device. Two AC feedback loops and two DC feedback loops stabilize the amplifier resulting in very low distortion, low noise and extremely flat frequency response.

LINE AMPLIFIERS

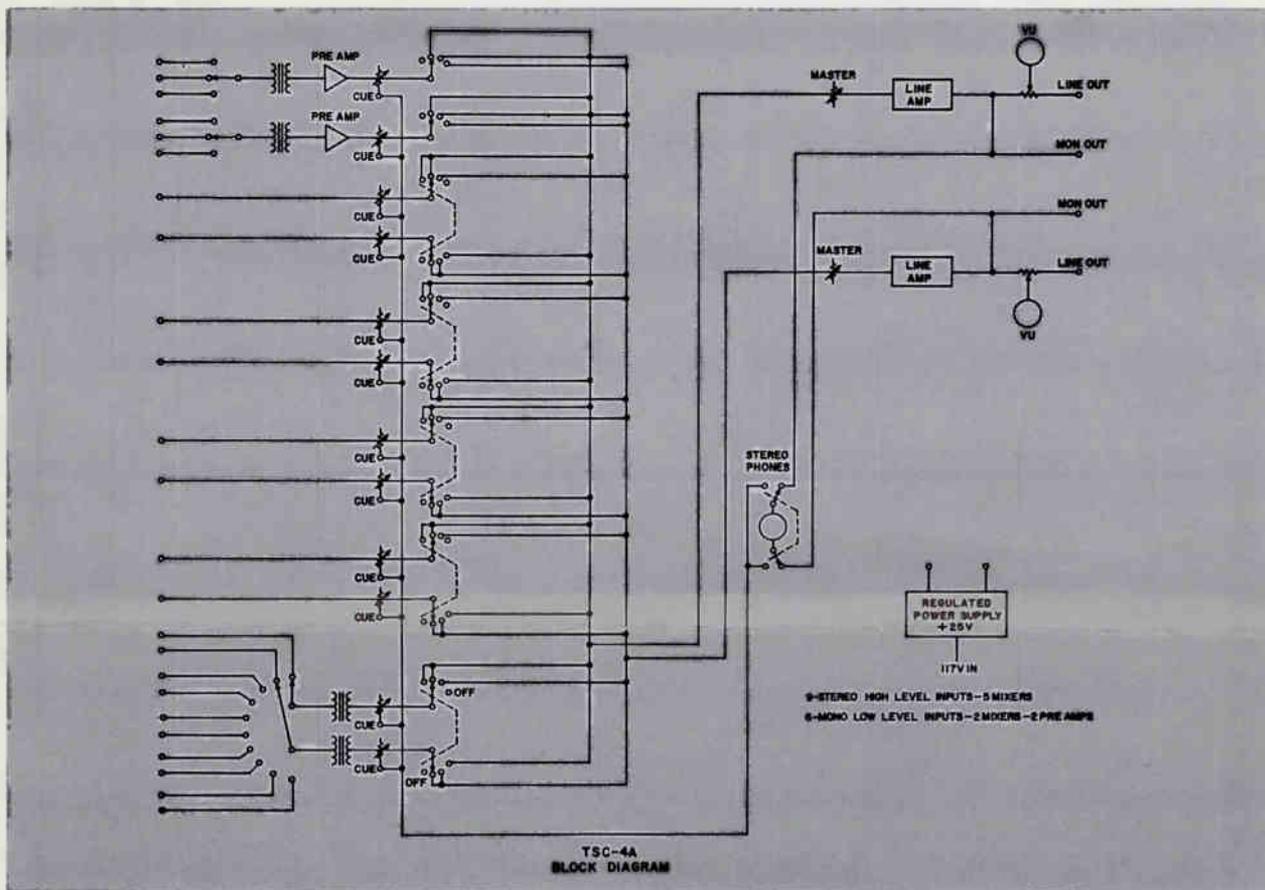
The line amplifiers consist of a two transistor "gain-stage-pair" driving a class A driver which supplies the necessary signal current to feed the output stage. The output stage, consisting of two transistors, is connected in a conventional "totem pole" output configuration operating as emitter followers.

OUTPUT TRANSFORMER

The use of an output transformer allows the driving of both high impedance and balanced or unbalanced 600 ohm lines. By restrapping the secondary of the transformer 150 ohm lines can be driven.

POWER SUPPLY

The power supply for the TSC-4A is an integral part of the unit. This supply provides 25 volts for all amplifiers, as well as the muting and speaker relays.



ELECTRICAL CHARACTERISTICS

15 Inputs:

Six low level mono inputs switchable to two preamplifiers.
 Nine high level stereo inputs to five mixers.
 All inputs switchable to either/or both output channels.

Outputs:

Two high level monitored by VU meters.

Noise with 50 db Gain:

-68 db referred to +8 VU output.

Output Capability:

+16 dbm into 600 ohm load, 30 Hz to 15 KHz.

Distortion:

Less than 1% at +8 dbm into 600 ohm load,
 50 Hz to 15 KHz:

Frequency Response:

± 1 db, 50 Hz to 15 KHz.

Cross Talk and Leakage:

At least 60 db below +8 VU output signal at 1 KHz.

Input Impedance:

Low Level - 200 ohm balanced.
 High Level - 600 ohms unbalanced.

Output Impedance:

600 ohms balanced or unbalanced.
 May be restrapped for 150 ohms.

Gain:

60 db

Power Supply:

+25V DC

Input Power:

105-125V, 50/60 Hz

MECHANICAL SPECIFICATIONS

Dimensions:

Width 22"
 Height 10"
 Depth 17½"
 Color Black with white front panel

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August 31, 1973

Mr. G. Peterson
President
Astronaut Electronics
161 East Goebel Drive
Lombard, IL 60148

Dear Sir:

Thank you very much for your inquiry about Wilkinson Electronics audio consoles. We are pleased to enclose catalog sheets on each of these units for your information. Not only are these consoles beautiful in appearance, but their performance is superior to anything on the market.

We incorporate the highest quality step-attenuators which are easily cleaned and adjusted. These slide attenuators provide maximum flexibility and operation of these audio boards since as many as four attenuators can be operated simultaneously.

The walnut formica finish of the TAC-1C and TACS-2C will add to the appearance of your control room, and the human-engineered design of the brushed aluminum control panel will make it easy for the operator and reduce fatigue.

Prices of these consoles are as follows:

TAC-1C	-	\$2,195.00
TACS-2C	-	\$2,995.00
TSC-4A	-	\$1,895.00

Delivery of these units is from stock. Again, thank you for your inquiry.

Very truly yours,

WILKINSON ELECTRONICS, INC.


Guffy P. Wilkinson
President

GPW:loc
Enc.

SURE AS TODAY - NEW AS TOMORROW

WILKINSON ELECTRONICS, INC.

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May 4, 1973

Mr. G. Petersen, President
Astronaut Electronics
161 East Goebel Drive
Lombard, IL 60148

Dear Sir:

Wilkinson Electronics is pleased to announce the type acceptance and availability of a new single tube 2 1/2 KW FM transmitter, the Wilkinson Electronics FM-2500E.

This new transmitter incorporates some very remarkable features. Using an all solid state exciter, followed by a 65 W solid state IPA, the transmitter uses only one 5CX1500 pentode tube in the final. This tube is rated for 3,150 watts output--and at 2,500 watts it virtually loafs.

The final amplifier incorporates variable vacuum capacitor tuning and loading, and no sliding shorts or variable inductances are used.

Output power, as well as reflected power, is measured from the output of the power amplifier as well as the exciter so that the transmitter is extremely easy to tune.

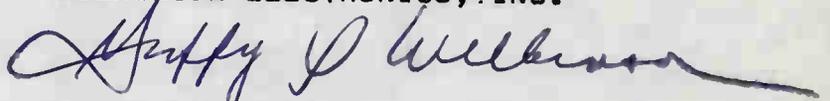
The transmitter is small, requiring only 4 square feet of floor space, yet all components are completely accessible.

The FM-2500E is priced at only \$8,950.00 for monaural service, and stereo operation can be provided with the addition of a stereo generator.

Delivery of this transmitter is approximately 60 days from receipt of your order.

Very truly yours,

WILKINSON ELECTRONICS, INC.



Guffy P. Wilkinson
President

GPW:loc

SURE AS TODAY - NEW AS TOMORROW



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