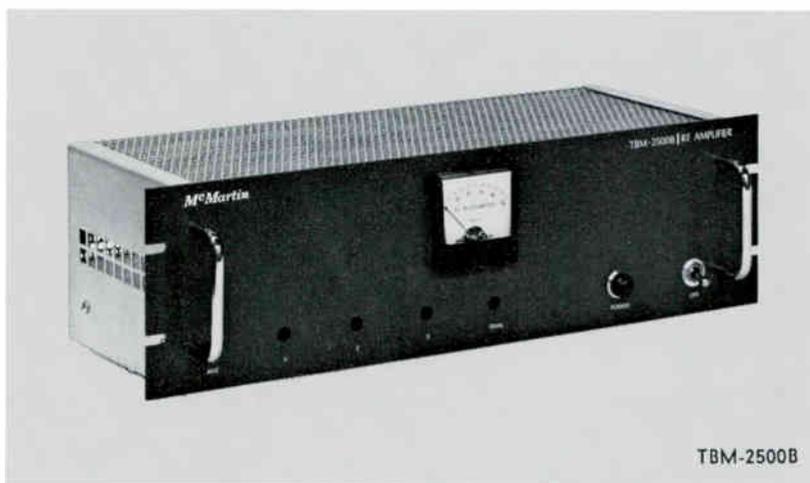


TBM-2500B FM RF AMPLIFIER



FEATURES

- Relative signal level meter
- Bandwidth suitable for Stereo/SCA
- Highly stable operation
- Includes 5-element Yagi & cable
- Complete RF shielding
- Eliminates Telephone line non-linearity & noise

DESCRIPTION

The McMartin TBM-2500B RF Amplifier is designed to operate with FM modulation and frequency monitors at locations remote from the FM transmitter whose parameters are being measured.

The TBM-2500B is furnished complete with a 5-element Yagi antenna and 50 feet of coaxial cable. The antenna elements are dimensioned for maximum forward gain on the operating frequency. The TBM-2500B is capable of highly-stable operation with a minimum input level of 1000 microvolts. At this, or higher input levels, the TBM-2500B is capable of producing 0.25 watts of output level. This is adequate to drive most available FM monitors.

The TBM-2500B eliminates non-linear frequency response and noise which are beyond the control of the broadcaster when commercial telephone lines are used for remote meter display. The selectivity of the TBM-2500B is such that the signals of other FM transmitters operating 800 kHz or more

from the desired frequency are attenuated at least 30 dB. Bandwidth at the 3dB points is adequate to provide excellent stereo and SCA monitor operation.

The TBM-2500B is of "straight-through" amplifier design. Recent developments in high-Q input tank circuit design have been incorporated in the TBM-2500B. These eliminate the necessity for heterodyne type techniques with their inherent problems relating to the generation of spurious frequencies resulting from injection oscillator circuits.

The TBM-2500B employs a carrier failure relay for activation of external alarm devices in the event of transmitter failure. A front-panel meter indicates relative input signal strength. Access to tuned circuits for trimming purposes is from the front.

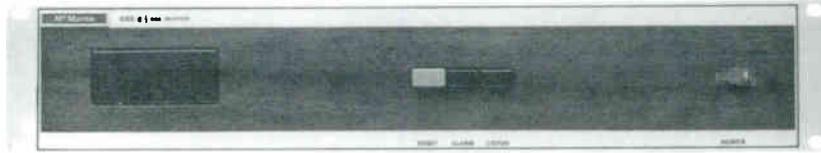
Two RF output terminations are provided for separate connection to frequency and modulation monitors.

SPECIFICATIONS

Operating Frequency	... 88-108 MHz (specify frequency)
RF Sensitivity	..... 1000 microvolts for 0.25 watt output
Front Panel Controls	.... RF tuning Power on/off
Rear Chassis Control	... Carrier relay threshold
Top Chassis Control	.... RF gain
Front Panel Indicators	... RF lever meter AC power pilot lamp
Tubes	..... 1- 6AK5 1- 6BH6 2- 6AG5 1- 5763
Finish	..... McMartin blue
Dimensions	..... Standard rack panel 19"W; 5 ¹ / ₄ "H; 7"D
Shipping Weight	..... 19 pounds
Antenna	..... 5-element Yagi, with 50' RG-59U coaxial cable and coaxial end fitting
Power	..... 120 vac 50/60 Hz, 55 watts

EBS TWO-TONE MONITOR

EBS-2



STABLE ± 3 Hz RESPONSE

DUAL RECEIVER INPUTS

STRAIGHT-FORWARD OPERATION

MONITORS NEW 2-TONE EBS SYSTEM

EXTERNAL ALARM CIRCUITRY

REMOTE RESET CAPABILITY

DESCRIPTION

The McMartin Model EBS-2, EBS Monitor is FCC certified and satisfies the need for a reliable, trouble-free method of monitoring the new two-tone Emergency Broadcast Service (EBS). In use, its operation is simple and readily understood by non-technical personnel.

The EBS-2 requires an audio input level of 300 millivolts to 6.0 volts, rms. It is designed primarily for use with the McMartin FMR-1 (FM) or AMR-1 (AM) fixed frequency receivers. Since the EBS-2 contains its own power supply, it may be used with other receiving equipment which can provide proper audio output level. Two EBS receivers may be connected simultaneously to the EBS-2 audio input.

By using precision tuning-fork techniques, the EBS-2 responds only to the two designated EBS tones of precise frequency tolerances. For example, the transmitted audio tone frequencies are 853 and 960 Hertz, plus or minus 0.5 Hertz.

When the proper tones are transmitted and received on the AMR-1 or FMR-1 the EBS-2 decodes the information and automatically switches the transmitted EBS message to its loudspeaker output. The EBS-2 has three front-panel pushbutton switches. Interlocked LISTEN/OPERATE switches and a momentary RESET switch. When the OPERATE switch is depressed, the EBS-2 is in its normal, muted, operating condition.

Depressing the LISTEN button by-passes the automatic speaker muting for checking purposes. After an EBS transmission has been received, depressing the RESET momentary switch restores the unit to its normal operating condition.

Audio output level from the loudspeaker is preset by an internal control to avoid loss of speaker output due to tampering or inadvertent misadjustment. Provision is made for the connection of external alarm devices and for remote reset of the EBS-2.

SPECIFICATIONS

AUDIO

TONE CONDITION:

Response	853 and 960 Hz, ± 3 Hz
Input level range	300 millivolts to 6.0 volts, rms
Response Time	8-16 seconds (factory adjusted for 12 secs.)

FRONT

PANEL CONTROLS:

- Interlocked LISTEN/OPERATE;
- Momentary RESET;
- Power on/off, illuminated.

REAR CONNECTIONS: Rear chassis screw terminals

- (1) receiver input #1
- (2) receiver input #2
- (3) ext. alarm relay closure

REAR CONNECTIONS (cont)

(4)	remote reset
(5)	ext. speaker

POWER REQUIRED:

120 Vac, 50/60 Hz,
6 watts

DIMENSIONS:

EIA standard rack 19" (48.3 cm) width
3½" (8.9 cm) height
6" (15.3 cm) depth

FRONT
PANEL FINISH:

McMartin beige with
woodgrain trim

SEPT/75

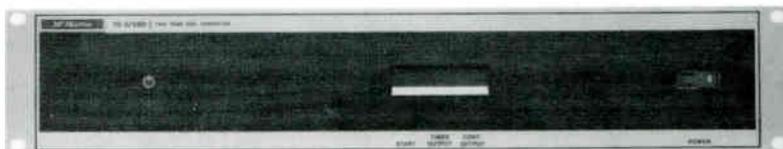
McMartin[®]

McMartin Industries Inc. ■ 4500 South 76th Street ■ Omaha, Nebraska 68127 ■ (402) 331-2000 ■ Telex 48-485

PRINTED IN U.S.A.

PRECISION TWO-TONE EBS GENERATOR

TG2/EBS



MANUAL OR AUTO TIMING

INDEPENDENT TONE LEVEL CONTROLS

CRYSTAL-DERIVED TONE BASE

REMOTE START

DESCRIPTION

The McMartin Model TG-2/EBS Precision Two Tone EBS Generator is FCC Type-Accepted to produce the Two-Tone Attention Signal for the new Emergency Broadcast System (EBS) effective for all AM, FM and TV stations on April 16, 1976.

The regulations specify the two tone frequencies as 853 and 960, ± 0.5 , Hertz. This stability is provided in the TG-2/EBS by digital logic division from a highly-stable crystal oscillator. The derived audio tones are filtered and combined, with individual level controls to produce a minimum +8 dBm, balanced 600-ohm output for feeding the two-tone information through normal program channels.

The individual tone level controls permit presetting of the output level to meet the 40%, $\pm 5\%$ modula-

tion requirement of the new rules.

The TG-2/EBS also incorporates an automatic duration timing device. The two tones may be initiated either by manual operation of a front panel CONTINUOUS OUTPUT pushbutton, or may be preset by a TIMED OUTPUT pushbutton switch with automatic transmission of 22 seconds duration by operation of a momentary-action front panel START pushbutton. The latter operation may also be initiated remotely. A front panel LED indicator shows the presence of tones.

The TG-2/EBS includes a self-contained power supply and regulator. It is finished in beige with woodgrain trim.

SPECIFICATIONS

OUTPUT FREQUENCIES: 853 and 960 Hertz

FREQUENCY STABILITY: ± 0.2 Hertz

OUTPUT LEVEL: +8 dBm min (each tone level independently adjustable)

OUTPUT IMPEDANCE: 600 ohms, balanced

HUM & NOISE: 65 dB below +8 dBm output

DISTORTION: less than 1.5%

TIMED OUTPUT DURATION: 22.5, ± 2.5 seconds

DIMENSIONS: EIA Standard rack mount
19" (48.3 cm) width
3½" (8.9 cm) height
6" (15.3 cm) depth

FINISH: McMartin beige with woodgrain trim

SEPT/75

McMartin

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PRINTED IN U.S.A.

AM/FM EBS RECEIVERS

AMR-1 single channel AM
AMR-3 three channel AM
FMR-1 single channel FM
FMR-5 five channel FM



FMR-1 shown

DESCRIPTION

The McMartin AMR-1 and FMR-1 are low cost, high performance, single channel AM or FM broadcast receivers. The AMR-3 is a three-channel AM receiver and the FMR-5, a five-channel FM receiver for use primarily as the companion AM or FM receiver for the EBS-2, two-tone Emergency Broadcast Systems monitors, or as reliable off-air sources for house monitoring systems.

The AMR-1 and AMR-3 contain a MOSFET RF amplifier and a monolithic silicon integrated circuit from which the mixer, low-drift tunable oscillator, 445 kHz IF amplifier, and AGC detector are constructed.

The AMR-3 by a single, front panel switch, selects any of three AM stations.

The RF amplifier stages of the FMR-1 and FMR-5 use a dual-gate, diode-protected MOSFET in conjunction with four high-Q tuned circuits, resulting in minimum cross-modulation and overload effects. AGC over a 30 dB range is applied to the input MOSFET device.

The FMR-1 and FMR-5 are crystal-controlled. Selectivity is established by a 4-pole 10.7 MHz IF filter. A monolithic silicon IC, featuring three stages of amplification/limiting; a doubly-balanced quadrature detector; delayed AGC voltage output; and audio preamplification is used.

Each model delivers rear chassis termination of both 0 dBm, 600 balanced, and 1.0 volt unbalanced audio output.

The latter is the audio drive signal for the EBS-2 monitor. The AMR-1, AMR-3, FMR-1 and FMR-5 circuitry includes a carrier-off relay closure to activate external alarm devices.

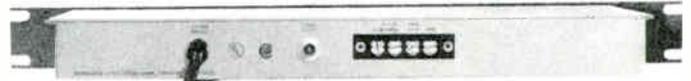
Each model occupies 1 3/4" of vertical space. An illuminated front panel power switch is provided.

SPECIFICATIONS

	FMR-1/FMR-5	AMR-1/AMR-3
FREQUENCY RANGE (specify operating frequency)	88-108 MHz	540-1620 kHz (AMR-3, 3 frequencies)
ANTENNA INPUT (BNC type conn.)	50/75 ohms	75 ohms
SENSITIVITY	2.0 μ V/30 dB quieting	30 μ V/20 dB S/N @ 30% mod.
SELECTIVITY	3 dB point: 280 kHz 50 dB point: 950 kHz	6 dB point: \pm 10 kHz
HARMONIC DISTORTION	0.75% or less	3.0% or less @ 90% mod.
S/N RATIO	60 dB below 100% mod. w/full limiting	45 dB below 100% mod. w/10 mV input
AF RESPONSE	\pm 1.0 dB, 30-15000 Hz	\pm 1.0 dB, 50-5000 Hz; \pm 3.0 dB 5-10 kHz
AUDIO OUTPUTS	0 dBm, 600 ohms bal., and 1.0 V, 600 ohms unbal.	
POWER REQUIRED	115 Vac, 50/60 Hz, 6 watts	
DIMENSIONS		.....1.9" (48.3 cm) width 1 3/4" (4.45 cm) height 6" (12.7 cm) depth
REAR CHASSIS TERMINATIONS		Antenna (BNC); Balanced audio out; unbal. audio out; Relay contacts (n.o.)
FINISH		McMartin beige with woodgrain trim

McMartin[®]

TBM-3019 TRANSISTORIZED 19 kHz FREQUENCY COUNTER



- Transistorized
- Accuracy ± 0.25 Hz
- Easy to Operate

- Remote Operation
- 1 3/4" Rack Panel
- 25 to 60 mv Input

DESCRIPTION

The McMartin TBM-3019 is a completely self-contained, all solid state, 19 kHz frequency counter. The unit is designed to work with the McMartin TBM-4500A or any other monitor that has provisions for providing a 19 kHz pilot signal between 25 and 60 mv. The TBM-3019 was designed to meet the FCC requirement that a broadcaster must measure the 19 kHz pilot at least once each day to insure an accuracy of ± 2 Hz. The TBM-3019 employs a 76 kHz crystal controlled oscillator divided down to provide a 19 kHz standard that is accurate to ± 0.25 Hz. The standard 19 kHz frequency in the TBM-3019 is then compared to the external 19 kHz frequency to be checked. The difference is displayed on a front panel lamp which will blink at the error frequency rate.

The front panel has a pilot lamp, a frequency error indicator lamp, a power switch, a BNC connector, and a push to operate button. On the rear of the TBM-3019 is a duplicate BNC connector and a terminal board with four terminals. By jumpering TB 3 and 4, the unit will operate continuously without pushing the button. A remote lamp may be connected to TB 1 and 2.

To measure the 19 kHz frequency error, push the operate

button and count the light flashes for 10 seconds, then divide the total by 10.

EXAMPLE: $\frac{14 \text{ flashes in } 10 \text{ seconds}}{10} = 1.4 \text{ Hz error}$

SPECIFICATIONS

19 kHz Input	BNC Connector (front & back)
Impedance	Greater than 10K ohms
Sensitivity	25 to 60 mv
Accuracy	± 0.25 Hz
Fuse	0.10 amp
Power	117 volts AC, 50/60 Hz, 15 watts
Ambient Temperature	
Range	10° - 50° C
Dimensions	
Width	Standard 19 inch Rack Panel Mount
Height	1 3/4 inches
Depth	6 inches overall
Weight	6 lbs.
Finish	McMartin Blue

TBM-2200 FM STEREO MONITOR



- **Silicon solid state**
- **Simultaneous reading—right and left modulation**
- **Plug-in modular circuitry**
- **All metering functions on one switch**
- **FCC Type Approved - #3-168/169**
- **Direct reading—separation and crosstalk**

DESCRIPTION

The solid state McMartin TBM-2200 FM Stereo Modulation Monitor is a complementary expansion unit for stereo modulation monitoring in conjunction with either a TBM-3500A Monaural FM Modulation Monitor or a TBM-4000A Monaural FM/SCA Modulation Monitor. The TBM-2200 is driven from the composite output signal derived from either of these monitors.

Thus, the FM broadcaster who wishes to add stereo operation may do so without obsoleting his existing McMartin monitors.

Critical components are located on readily accessible, plug-in, printed circuit boards. Silicon devices, operated well below manufacturer's ratings for maximum reliability, are used throughout.

Two front panel meters read left and right channel modulation percentage independently. These meters display peak values regardless of modulation waveform. The ability to continuously observe complex signal modulation on each channel eliminates the annoying problem of switching back and forth between channels, as required if only a single meter is available for displaying two varying conditions.

All primary metering functions are grouped on a single switch for measuring pilot injection level, $L+R$, $L-R$, 19 to 38 kHz phasing, 38 kHz suppression and FM signal-to-noise ratio.

The meters serve the secondary function, operating as audio voltmeters, of measuring channel separation. This is accomplished with a multi-position front panel switch which permits direct-reading separation measurements to be taken.

A 19 kiloHertz pilot frequency presence indicator lamp and front panel adjustment of exact phase coincidence of the internal 19 and 38 kHz circuits are provided.

Left and right channel audio information for feeding external monitoring systems or taking external distortion measurements is terminated on rear chassis terminal strips. For convenience, a headphone monitoring jack and a composite output signal connector are brought out to the front panel.

Quality components, operating ease and advanced engineering design combine to make the TBM-2200 the leader in FM stereo monitoring — another outstanding product bearing the McMARTIN name.

SPECIFICATIONS

Modulation Range

±75 kHz deviation—100% modulation
±100 kHz deviation—133% modulation

Composite Input

Impedance: 10K ohms
Level: 1.0 - 1.5 volts, peak-to-peak

Outputs—Left and Right Channel

Audio output for monitoring circuits:

Source Impedance: 600 ohms balanced
Level: +4 dBm @ 100% modulation - 400 Hz
Distortion: Less than 1.0% (50-15,000 Hz)

Audio output for external distortion measurements:

Impedance: 10K ohms, or greater
Level: 7 volts @ 100% modulation - 400 Hz
Frequency Response: ±0.5 dB (30-15,000 Hz)

Distortion:

Stereo 0.5% (30-15,000 Hz)

Noise Level: 66 dB or more below 100% modulation
@ 400 Hz

Composite Output:

Source Impedance: 800 ohms
Level: 0.3 volts, rms
Frequency Response: ±0.2 dB (50-100,000 Hz)

Stereo Headphone output:

Impedance: 20K ohms
Level: 2.0 volts, rms

Pilot Injection Circuit

Accuracy: ±0.5%
Meter Indication: 6-12% (Pilot Injection Scale)
Indicator: Front panel lamp (operates at 5% or higher injection levels)

Modulation Meters

Left or Right:
Accuracy: ±0.5 dB
Frequency Response: ±0.5 dB (30-15,000 Hz)

Separation

Left into Right/Right into Left: 35 dB, or better
(30-15,000 Hz)
67 kHz into either channel: —60 dB, or lower.
(Note: Separation can be measured directly down to —70 dB)

38 kHz Carrier Suppression

100% Modulation (5-15 kHz) —46 dB, or lower
0% Modulation —55 dB, or lower

Crosstalk

Main into stereo subchannel: 46 dB, or better
Stereo sub into main channel: 46 dB, or better
67 kHz into main or stereo: 66 dB, or better

Power Requirements: 105-125 vac, 50/60 Hz, 40 W.

Ambient Temperature Range: 10-50 degrees, C.

Dimensions: (W) EIA Standard 19" rack panel, (H) 7", (D) 1 1/2" overall

Weight: 15 pounds

Finish: McMartin Blue and Brushed Aluminum

15,000 – 27,500 watts

FM



TRANSMITTERS? it's only natural...MCMARTIN

SPECIFICATIONS

OPERATING RANGE	.....88 to 108 MegaHertz
RF POWER OUTPUT	.....27,500 watts maximum
RF OUTPUT IMPEDANCE	.....50 ohms
CENTER FREQUENCY STABILITY	.....±500 Hz
MODULATION CAPABILITY	.....±150 kHz
AUDIO INPUT IMPEDANCE	.....600 ohms, balanced
AUDIO INPUT LEVEL	.....+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	.....±0.75 dB, 30-15,000 Hz (Std. FCC 75 usec preemphasis)
TOTAL HARMONIC DISTORTION	.....0.3% or less, 30-15,000 Hz, 100% mod.
FM NOISE	.....65 dB below 100% modulation (400 Hz)
AM NOISE	.....55 dB below carrier level
POWER REQUIRED	.....208/230/240 Vac, 3-phase
POWER CONSUMPTION (Approx.)	.....15,000 watt output, 27 KVA 20,000 watt output, 36 KVA 25,000 watt output, 45 KVA 27,500 watt output, 49 KVA
OPERATING TEMPERATURE	.....0° to 50° Celsius
ALTITUDE	.....7,500 feet above mean sea level
DIMENSIONS:	
Main Cabinet	......56" (142.2 cm) width 79" (200.7 cm) height 30" (76.2 cm) depth 24" (60.7 cm) rear door swing
Power Supply Assy.	......30" W x 29" H x 30" D (76.2 x 73.7 x 76.2 cm)
WEIGHT	
Main Cabinet	.....1,500 pounds
Power Supply Assy.	.....700 pounds
FINISH	.....McMartin beige w/wood-grain trim

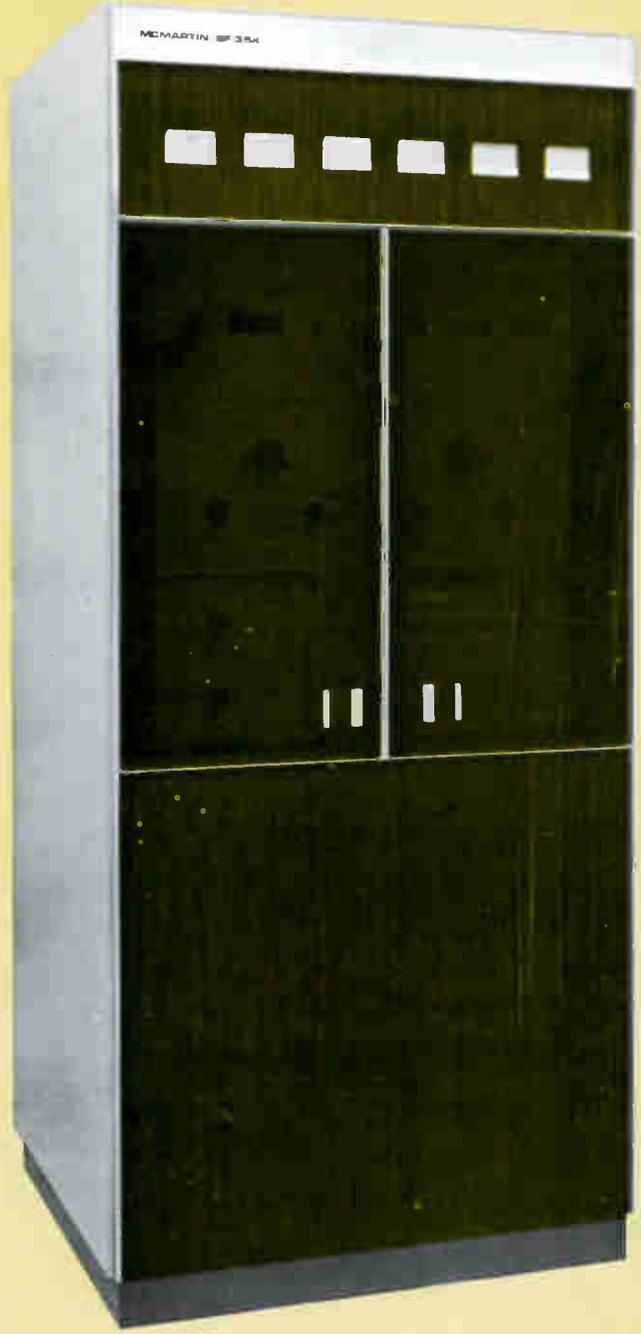
STEREO OPERATION (with B-110 Stereo Assembly)

AUDIO INPUT IMPEDANCE	.....600 ohms balanced, each channel
AUDIO INPUT LEVEL	.....+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	.....±0.75 dB, 30-15,000 Hz, Std FCC 75 usec, preemphasis, each channel
TOTAL HARMONIC DISTORTION	.....0.5% or less, 30-15,000 Hz
STEREO SEPARATION	.....35 dB or greater, 50-15,000 Hz
FM NOISE	.....60 dB or greater below 100% modulation
PILOT STABILITY	.....±1.0 Hertz over rated temperature range
SUBCARRIER SUPPRESSION	.....55 dB or greater
CROSSTALK (L+R to L-R, L-R to L+R)	.....42 dB or greater below 90% modulation

SCA OPERATION (with B-113 SCA Generator Module)

AUDIO INPUT IMPEDANCE	.....600 ohms, balanced
AUDIO INPUT LEVEL	.....+10, ±2, dBm
CARRIER FREQUENCY	.....41 or 67 KHz standard (others available on request)
CARRIER STABILITY	.....±500 Hz
MODULATION CAPABILITY	.....±7.5 kHz
PREEMPHASIS	.....150 usec standard, 50 or 75 usec available on request
FREQUENCY RESPONSE	.....±1.5 dB, 50-5000 Hz
CROSSTALK (main to sub, sub to main)	.....60 dB or lower
DISTORTION (50-5000 Hz)	.....0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	.....60 dB or greater

2,000 - 3,500 watt
FM
TRANSMITTER **BF-3.5K**



McMartin

DESCRIPTION

The McMartin BF-3.5K FM Broadcast Transmitter is an extremely stable, high performance unit meticulously designed for many years of reliable service.

The BF-3.5K design is simple and straightforward. It uses only two tube types. To provide the stability and bandwidth characteristics, essential to modern broadcast fidelity requirements, the BF-3.5K power amplifier stage employs a type 3CX3000A7 high mu, zero-bias power triode operating in grounded-grid Class C mode. The need for control grid bias, and screen voltage power supplies is eliminated. No neutralization is required.

Excellent plate efficiencies, in excess of 70% across the entire 88 to 108 MHz range and at power output levels from 2,000 to 3,500 watts, result in an extremely conservative transmitter.

The intermediate power amplifier stage uses a pair of rugged radial beam power tetrodes, 4CX250B's, operated in parallel. The BF-3.5K power output is adjusted by motor-driven control of screen voltage applied to the IPA stage.

The solid state McMartin B-910 FM exciter portion of the BF-3.5K, with its plug in modular design and stereo/SCA generator options, insures the finest, most stable and reliable

operation available to today's FM broadcaster.

The BF-3.5K includes as standard equipment, many features available in competitive models only as add-ons. Automatic recycling, with a memory-type LED fault indicator, forward-reverse reflectometer, plus full remote-control capability are built into the BF-3.5K.

A quiet, centrifugal blower maintains positive air pressure through the compartmentized IPA and PA stages, and is supplemented by a cabinet exhaust fan. This air system greatly reduces thermal aging of components.

The BF-3.5K satisfies the management, program and technical personnel of today's FM broadcast station. Reasonable initial and operating cost, a high quality sound, trouble-free operating and ease of maintenance are but a few of the design objectives met by the newest — and best — FM broadcast transmitter you can buy!

The electronic integrity is supplemented by rugged mechanical design in a style which is strikingly attractive.

The powerfully proud BF-3.5K is a pleasure to own . . . a pleasure to maintain . . . a pleasure to listen to . . . another step in the **growing** McMartin broadcast product line!

SPECIFICATIONS

OPERATING RANGE	88 to 108 MegaHertz
RF POWER OUTPUT	3,500 watts maximum
RF OUTPUT IMPEDANCE	50 ohms (Termination Andrew #4861A ungasged field coupling)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 ohms, balanced
AUDIO INPUT LEVEL	+ 10, ± 2, dBm
AUDIO FREQUENCY RESPONSE	± 0.75 dB, 30-15000 Hz (Std. FCC 75 usec preemphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% mod.
FM NOISE .....	.65 dB below 100% modulation (400 Hz)
AM NOISE .....	.55 dB below carrier level
POWER REQUIRED ...	208/230/240 Vac, 50/60 Hz, single phase — or — 208/230/240 Vac, 3-phase
POWER CONSUMPTION (Approx.)	2000 watt output, 4500 watts 2500 watt output, 5400 watts 3000 watt output, 6200 watts 3500 watt output, 7100 watts
OPERATING TEMPERATURE	0° to 50° Celsius
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	34½" (87.6 cm) width 85" (219.9 cm) height 31" (78.7 cm) depth 30" (76.2 cm) rear door swing
WEIGHT	1,030 pounds
FINISH	McMartin beige w/wood-grain trim

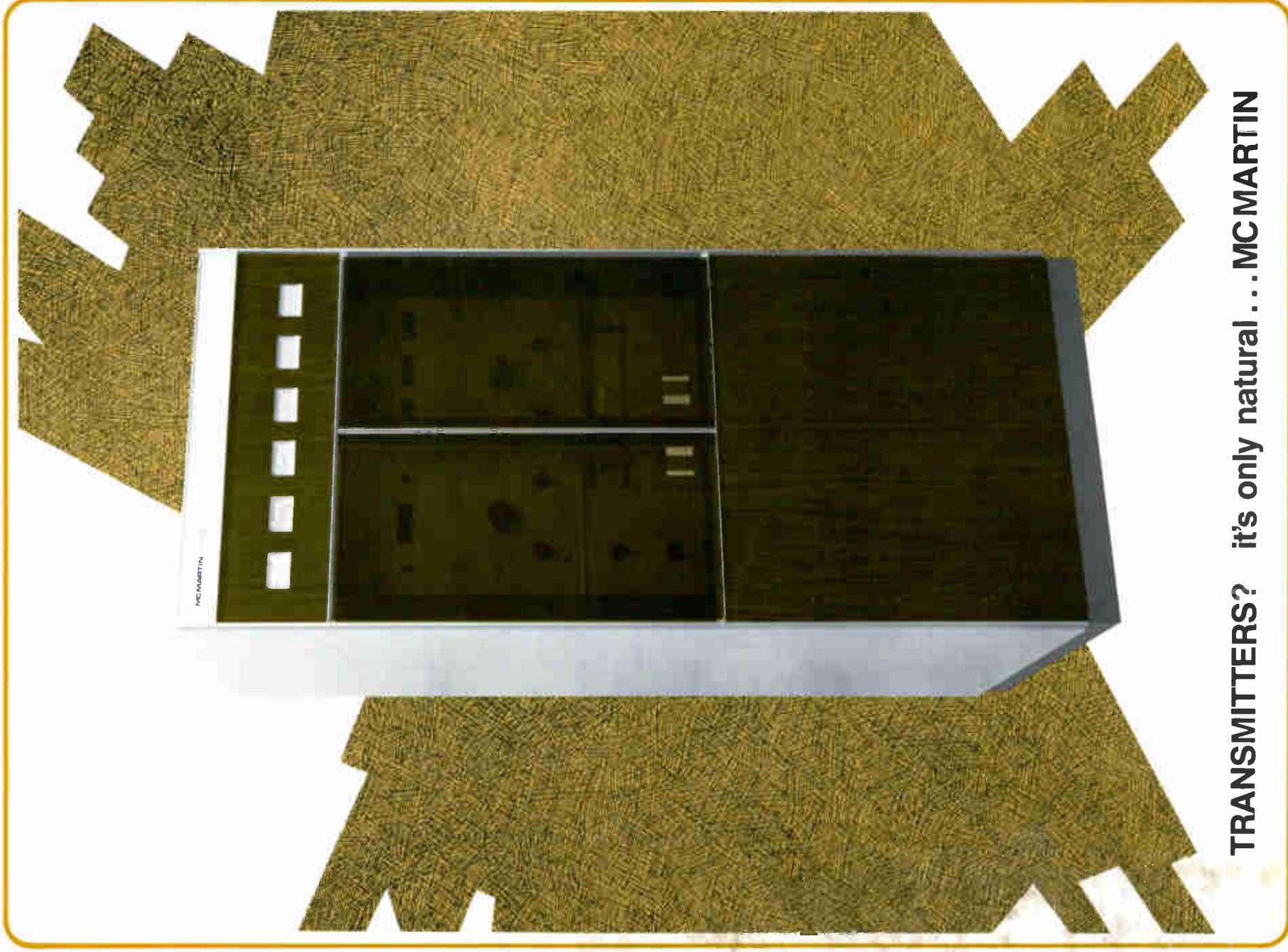
STEREO OPERATION (with B-110 Stereo Assembly)

AUDIO INPUT IMPEDANCE	600 ohms balanced, each channel
AUDIO INPUT LEVEL	+ 10, ± 2, dBm
AUDIO FREQUENCY RESPONSE	± 0.75 dB, 30-15000 Hz, Std FCC 75 usec, deemphasis, each channel
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15000 Hz
STEREO SEPARATION .....	.35 dB or greater, 50-15000 Hz
FM NOISE .....	.60 dB or greater below 100% modulation
PILOT STABILITY	± 1.0 Hertz over rated temperature range
SUBCARRIER SUPPRESSION .....	.55 dB or greater
CROSSTALK (L+R to L-R, L-R to L+R) .....	.42 dB or greater below 90% modulation

SCA OPERATION (with B-113 SCA Generator Module)

AUDIO INPUT IMPEDANCE	600 ohms, balanced
AUDIO INPUT LEVEL	+ 10, ± 2, dBm
CARRIER FREQUENCY .....	.41 or 67 kHz standard (others available on request)
CARRIER STABILITY	± 500 Hz
MODULATION CAPABILITY	± 7.5 kHz
PREEMPHASIS	150 usec standard, 50 or 75 usec available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5000 Hz
CROSSTALK (main to sub, sub to main) .....	.60 dB or lower
DISTORTION (50-5000 Hz) .....	.075% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE .....	.60 dB or greater

3,500 – 5,500 watts FM



TRANSMITTERS? it's only natural... MCMARTIN

SPECIFICATIONS

OPERATING RANGE	88 to 108 MegaHertz
RF POWER OUTPUT	5,500 watts maximum
RF OUTPUT IMPEDANCE	50 ohms
CENTER FREQUENCY STABILITY	±500 Hz
MODULATION CAPABILITY	±150 kHz
AUDIO INPUT IMPEDANCE	600 ohms, balanced
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.75 dB, 30-15,000 Hz (Std. FCC 75 usec preemphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% mod.
FM NOISE .....	.65 dB below 100% modulation (400 Hz)
AM NOISE .....	.55 dB below carrier level
POWER REQUIRED	208/230/240 Vac, 3-phase or single phase
POWER CONSUMPTION (Approx.)	3500 watt output, 7200 watts 4500 watt output, 10,000 watts 5000 watt output, 11,250 watts 5500 watt output, 12,500 watts
OPERATING TEMPERATURE	0° to 50° Celsius
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	34½" (87.6 cm) width 78.5" (199 cm) height 31" (78.7 cm) depth 30" (76.2 cm) rear door swing
WEIGHT	1,200 pounds
FINISH	McMartin beige w/wood-grain trim

STEREO OPERATION (with B-110 Stereo Assembly)

AUDIO INPUT IMPEDANCE	600 ohms balanced, each channel
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.75 dB, 30-15,000 Hz, Std FCC 75 usec, preemphasis, each channel
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
STEREO SEPARATION .....	.35 dB or greater, 50-15,000 Hz
FM NOISE .....	.60 dB or greater below 100% modulation
PILOT STABILITY	±1.0 Hertz over rated temperature range
SUBCARRIER SUPPRESSION .....	.55 dB or greater
CROSSTALK (L+R to L-R, L-R to L+R) .....	.42 dB or greater below 90% modulation

SCA OPERATION (with B-113 SCA Generator Module)

AUDIO INPUT IMPEDANCE	600 ohms, balanced
AUDIO INPUT LEVEL	+10, ±2, dBm
CARRIER FREQUENCY .....	.41 or 67 KHz standard (others available on request)
CARRIER STABILITY	±500 Hz
MODULATION CAPABILITY	±7.5 kHz
PREEMPHASIS	150 usec standard, 50 or 75 usec available on request
FREQUENCY RESPONSE	±1.5 dB, 50-5000 Hz
CROSSTALK (main to sub, sub to main) .....	.60 dB or lower
DISTORTION (50-5000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE .....	.60 dB or greater

BROADCAST AUDIO CONTROL CONSOLES

MODELS
B-801 Monaural
B-802 Stereo
B-803 Dual Channel



DESCRIPTION

Featuring plug-in modular design of all amplifiers and input channel devices for complete operational flexibility, the new McMartin audio consoles provide pushbutton selection of twenty-seven input sources controllable through eight mixing channels.

Three models are available. The B-801 monaural, the B-802 stereo and the B-803 dual channel models are housed in identical cabinetry.

In their standard configurations, the first three mixing channels are equipped with low-level microphone preamplifiers. Mixers #4 through #7 accommodate high-level unbalanced input sources and Mixer #8 is a high level balanced input for network, auxiliary and four remote line input application. The B-802 is equipped with module complement to deliver full stereo capability in both the program and monitor channels, throughout the entire console system.

Because of the plug-in module feature, any combination of low or high-level balanced or unbalanced inputs may be accommodated by insertion of the appropriate module. Spare switch contacts have been incorporated to permit extension of speaker muting and warning light control logic to all eight inputs. These contact closures are available for remote control of tape or turntable devices when the channel is assigned to high-level service.

High-quality step-type attenuators with cue switches are used in all mixing channels. Complete cueing of all eight mixer inputs, with built-in panel speaker, is provided.

Monitor amplifier modules provide 8-watt rms output level for studio and house monitor speakers.

All models are equipped with selective intercom between the operating position and each of three studios or four remote lines plus a general paging location.

All solid-state devices are operated at conservative ratings and only highest grade components are used. Close attention has been paid to human engineering design with switches and controls positioned for logical, error-free operation.

The B-800 Series is handsomely styled and completely self-contained. With the interconnection of power source and external device cabling, these consoles are ready to deliver many years of highly-professional, reliable service.

The B-801, B-802 and B-803 join the expanding line of broadcast products by McMartin . . . a name that insures reliability, quality and superlative performance.

SPECIFICATIONS

PROGRAM CHANNEL(S)

ALL MODELS

FREQUENCY RESPONSE ±0.5 dB, 20 to 20,000 Hertz

TOTAL HARMONIC DISTORTION 0.5% or less, 20 to 20,000 Hz @ +18 dBm output with -50 dBm signal fed to any low level input

SIGNAL-TO-NOISE RATIO 74 dB or greater below +18 dBm output. -50 dBm input to any low level input. Master and channel mixers adjusted for equal attenuation, totaling 34 dB.

OVERALL GAIN 102, ±2, dBm

OUTPUT LEVEL +8 dBm nominal. +24dBm maximum capability

INPUT LEVELS Channels #1 - 3: -60 dBm nom., -30 dBm max.
Channels #4 - 8: -15 dBm nom., +10 dBm max.

INPUT IMPEDANCES Channels #1-3: 150 ohms balanced. (50/600 ohms by strapping).
Channels #4-7: 600 ohms unbalanced. (150 ohms by strapping).
Channel #8: 600 ohms balanced (150 ohms by strapping).

	B-801 MONAURAL	B-802 STEREO	B-803 DUAL CHANNEL
LINE OUTPUT SWITCHING	Line 1, Line 2 and terminated OFF positions	Stereo (separate L and R outputs), Mono (L+R feeding Line 1) & terminated OFF positions	CH-A to Line 1/CH-B to Line 2, Reversal, and terminated OFF positions
AUDITION BUS OUTPUT(S)	-10 dBm, 10K ohms, unbalanced	-10 dBm, 10K ohms, unbalanced	None
CROSSTALK	Below noise level (audition to program)	Below noise level (L to R to audition)	Below noise level (Channel A to Channel B)

MONITOR CHANNEL(S)

ALL MODELS

FREQUENCY RESPONSE ±0.5 dB, 20 to 20,000 Hertz

TOTAL HARMONIC DISTORTION 0.75% or less, 20 to 20,000 Hz @ 8 watts rms output

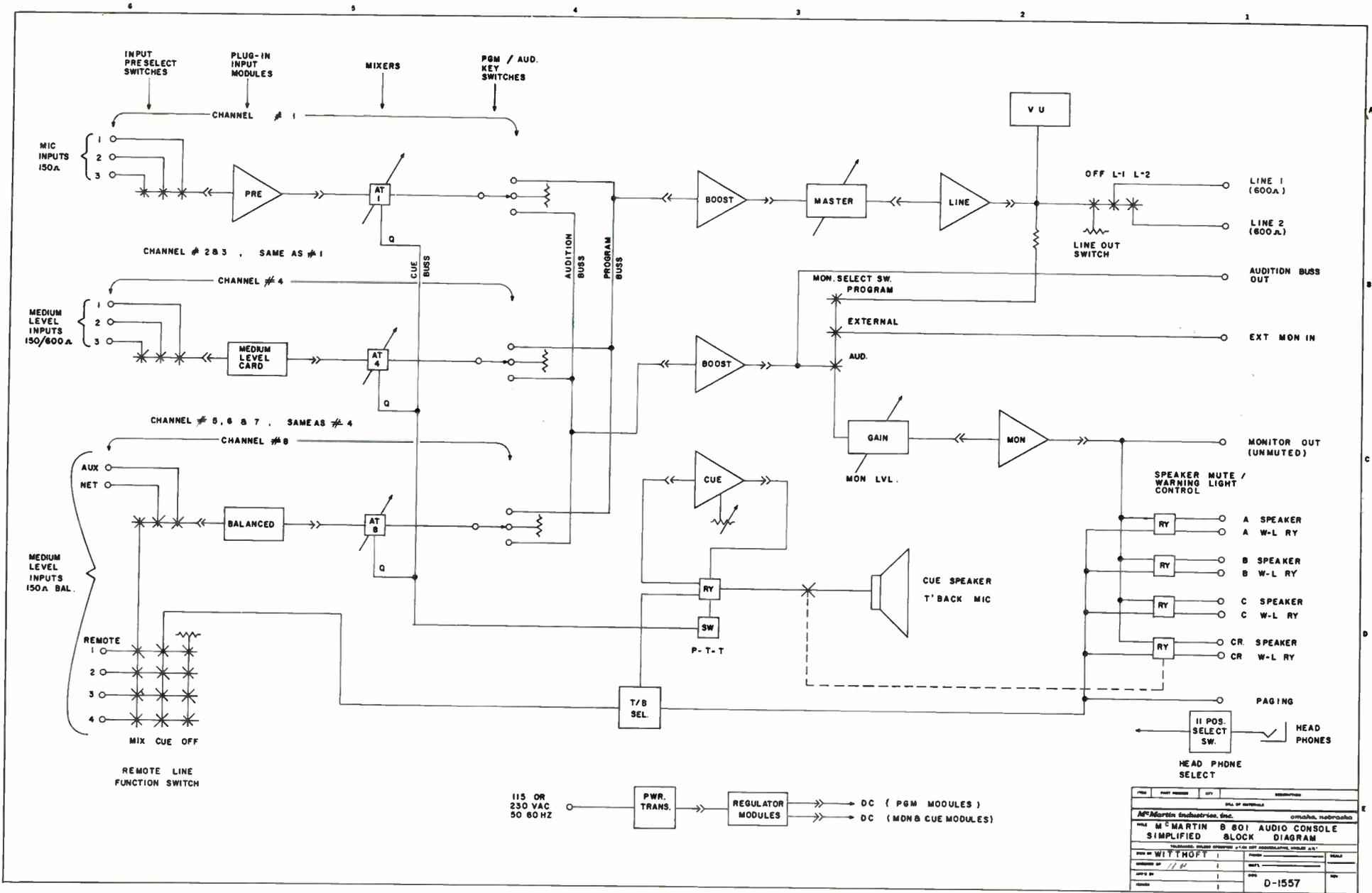
SIGNAL-TO-NOISE RATIO 70 dB below 8 watts (with +18 dBm at program line output(s).)

OUTPUT LEVEL 8 watts rms

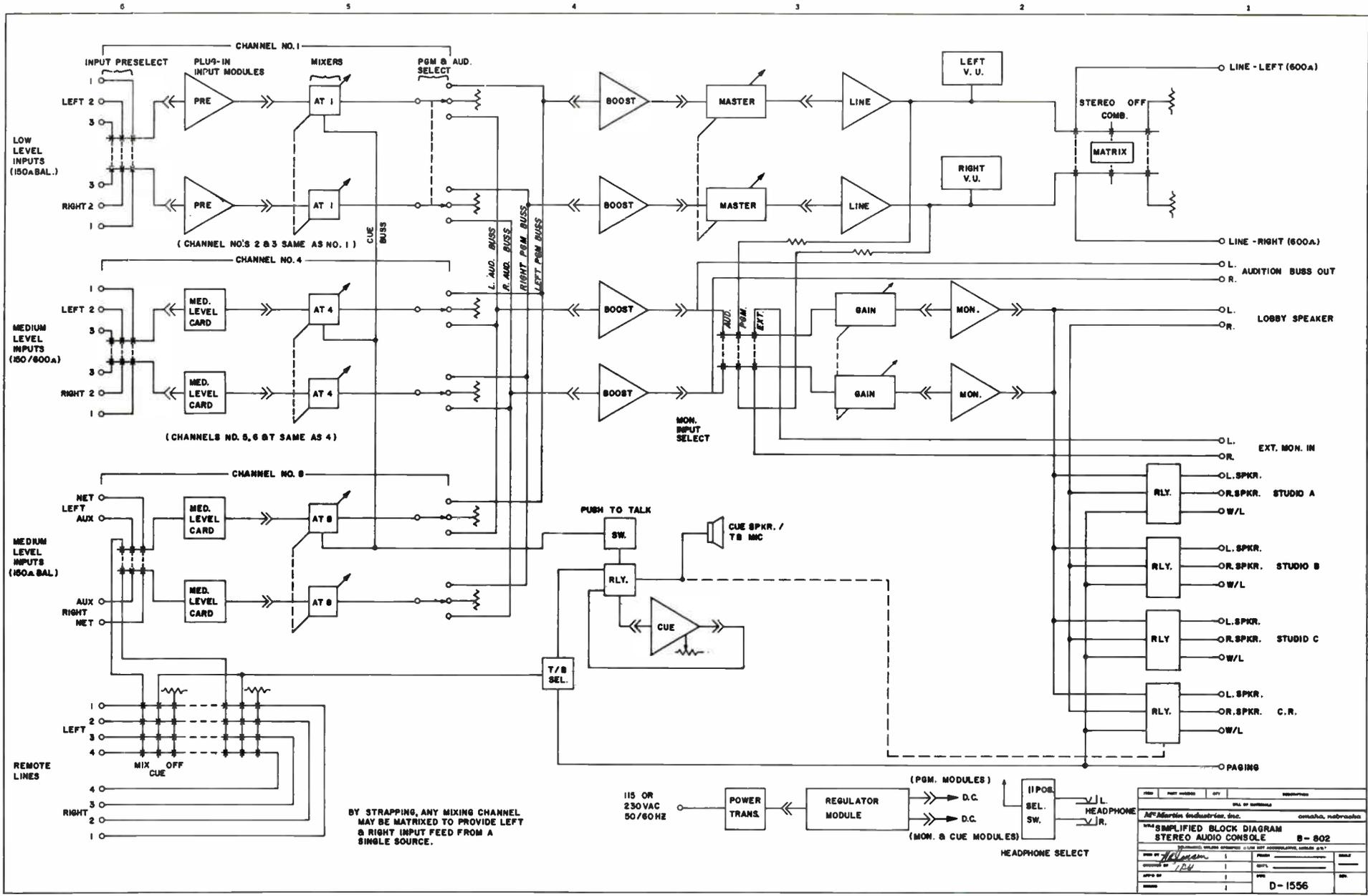
OUTPUT IMPEDANCE 8 to 16 ohms, unbalanced

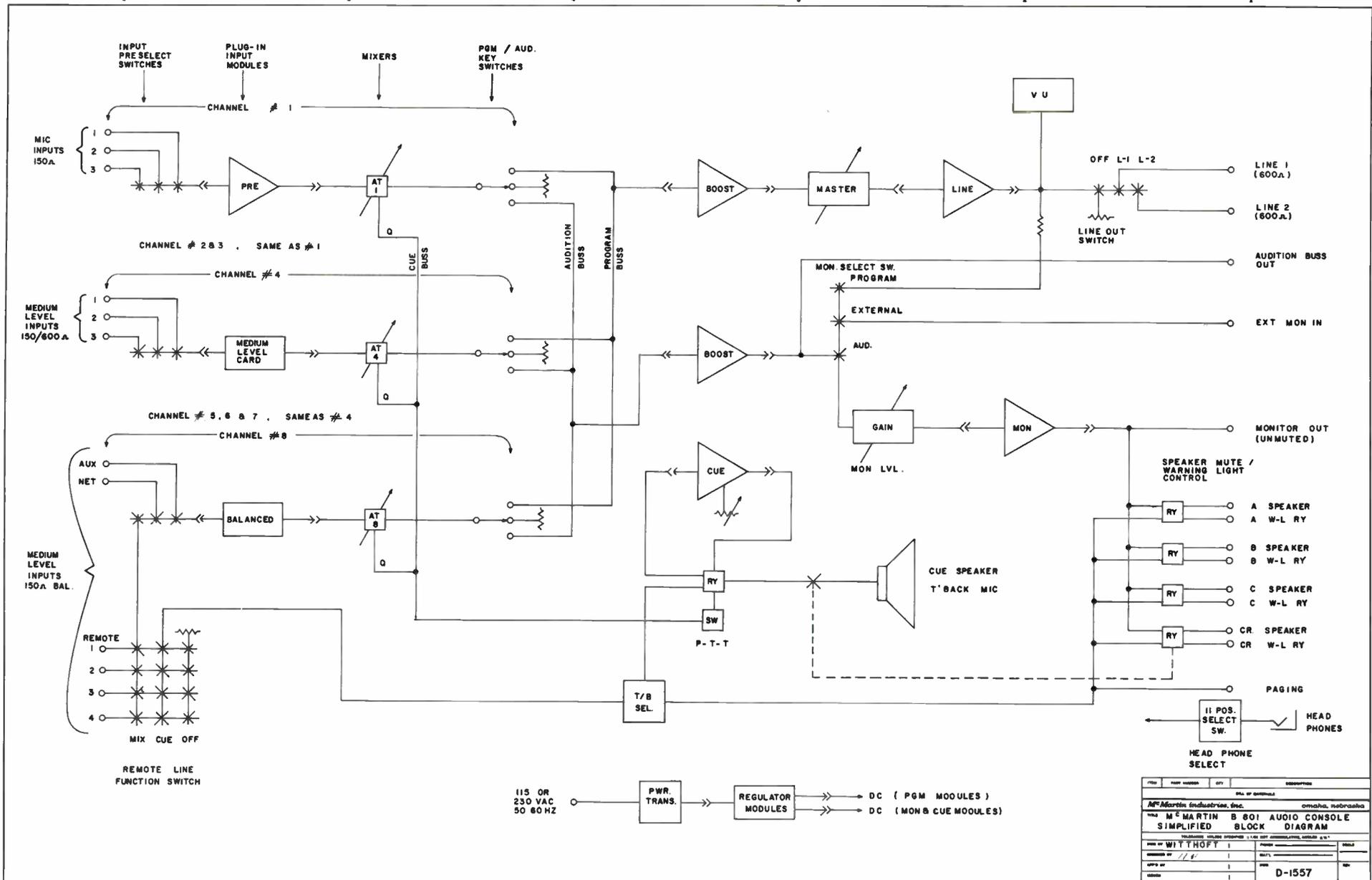
GENERAL

	B-801 MONAURAL	B-802 STEREO	B-803 DUAL CHANNEL
POWER REQUIREMENTS		115 or 230 Volts AC, 50/60 Hertz	
	65 watts	100 watts	80 watts
DIMENSIONS	44 ⁷ / ₈ " wide, 18 ¹ / ₄ " deep, 9 ³ / ₄ " high		
FINISH	Cabinet: Beige with wood trim end panels Front Panel: Upper control area - beige Lower control area - black		

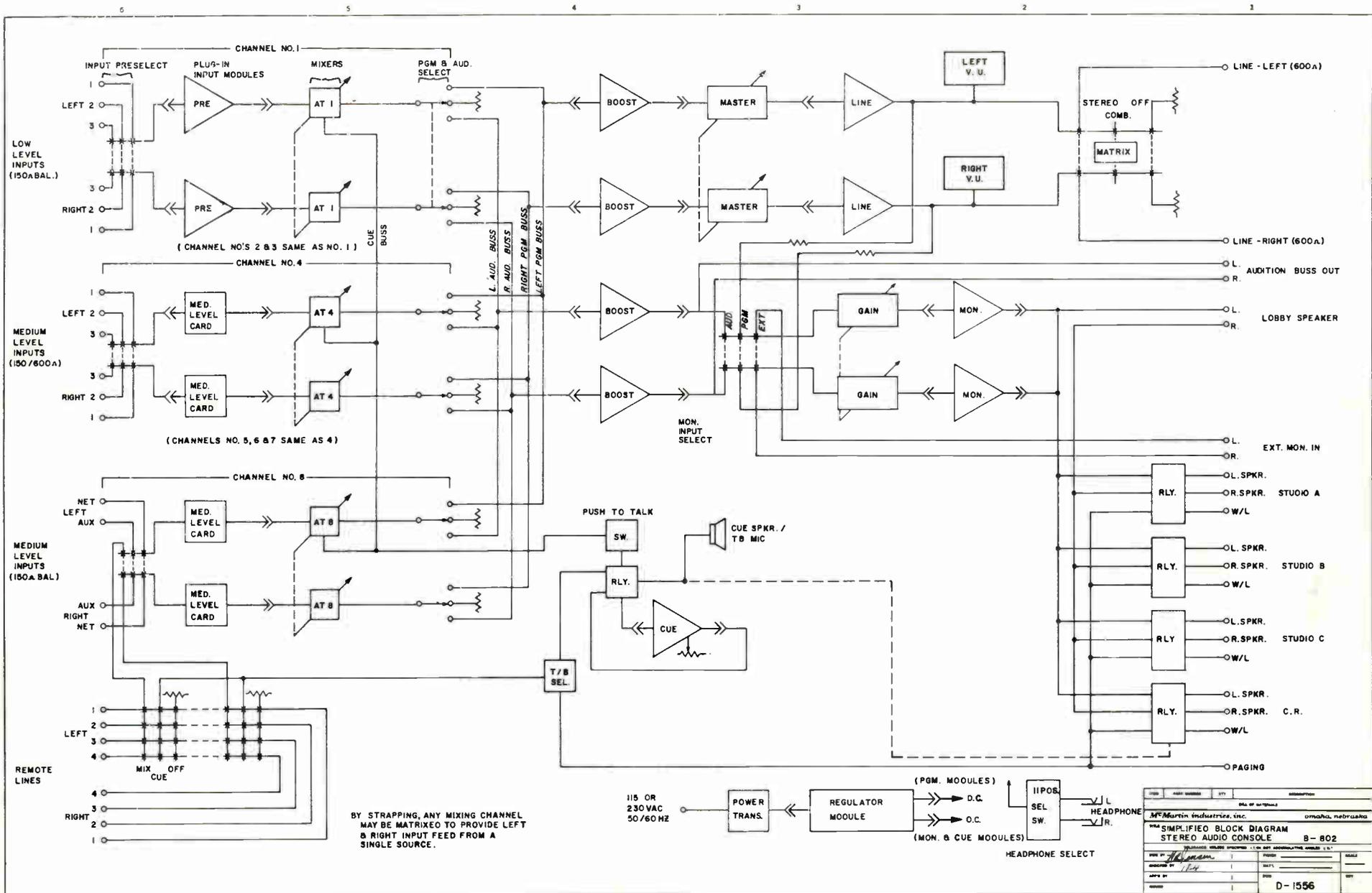


FILE NO.	DATE	REV.	BY
M.C. Martin Industries, Inc. omaha, nebraska			
M.C. MARTIN 8801 AUDIO CONSOLE			
SIMPLIFIED BLOCK DIAGRAM			
*TOLERANCES UNLESS OTHERWISE SPECIFIED ARE AS FOLLOWS:			
DESIGNED BY	WITTHOFT	DATE	1964
DRAWN BY	WITTHOFT	DATE	1964
CHECKED BY		DATE	
APPROVED BY		DATE	
D-1557			





REV.	DATE	BY	DESCRIPTION
1			REV. OF ORIGINAL
M.C. Martin Industries, Inc. omaha, nebraska			
THIS M.C. MARTIN B 801 AUDIO CONSOLE SIMPLIFIED BLOCK DIAGRAM			
DRAWING NUMBER SPECIFIED IN THE SET IDENTIFICATION LABELS IS "1"			
DESIGNED BY	WITTHOFT	DATE	
DRAWN BY		DATE	
CHECKED BY		DATE	
APPROVED BY		DATE	
			D-1557



REV.	DATE	BY	DESCRIPTION
1			REV. OF SKETCHES
MCMartin Industries, Inc. COMMERCIAL, MEDICAL & AEROSPACE			
SIMPLIFIED BLOCK DIAGRAM			
STEREO AUDIO CONSOLE B-802			
DESIGNED BY	DATE	FILE NO.	SCALE
DRAWN BY	DATE	REV.	
CHECKED BY	DATE	APP.	
APPROVED BY	DATE	APP.	
D-1556			

TBM-2200 FM STEREO MONITOR



FEATURES

- Silicon solid state
- Simultaneous reading—right and left modulation
- Plug-in modular circuitry
- All metering functions on one switch
- FCC Type Approved - #3-168/169
- Direct reading—separation and crosstalk

DESCRIPTION

The solid state McMartin TBM-2200 FM Stereo Modulation Monitor is a complementary expansion unit for stereo modulation monitoring in conjunction with either a TBM-3500A Monaural FM Modulation Monitor or a TBM-4000A Monaural FM/SCA Modulation Monitor. The TBM-2200 is driven from the composite output signal derived from either of these monitors.

Thus, the FM broadcaster who wishes to add stereo operation may do so without obsoleting his existing McMartin monitors.

Critical components are located on readily accessible, plug-in, printed circuit boards. Silicon devices, operated well below manufacturer's ratings for maximum reliability, are used throughout.

Two front panel meters read left and right channel modulation percentage independently. These meters display peak values regardless of modulation waveform. The ability to continuously observe complex signal modulation on each channel eliminates the annoying problem of switching back and forth between channels, as required if only a single meter is available for displaying two varying conditions.

All primary metering functions are grouped on a single switch for measuring pilot injection level, $L+R$, $L-R$, 19 to 38 kHz phasing, 38 kHz suppression and FM signal-to-noise ratio.

The meters serve the secondary function, operating as audio voltmeters, of measuring channel separation. This is accomplished with a multi-position front panel switch which permits direct-reading separation measurements to be taken.

A 19 kiloHertz pilot frequency presence indicator lamp and front panel adjustment of exact phase coincidence of the internal 19 and 38 kHz circuits are provided.

Left and right channel audio information for feeding external monitoring systems or taking external distortion measurements is terminated on rear chassis terminal strips. For convenience, a headphone monitoring jack and a composite output signal connector are brought out to the front panel.

Quality components, operating ease and advanced engineering design combine to make the TBM-2200 the leader in FM stereo monitoring — another outstanding product bearing the McMARTIN name.

SPECIFICATIONS

Modulation Range

±75 kHz deviation—100% modulation
±100 kHz deviation—133% modulation

Composite Input

Impedance: 10K ohms
Level: 1.0 - 1.5 volts, peak-to-peak

Outputs—Left and Right Channel

Audio output for monitoring circuits:

Source Impedance: 600 ohms balanced
Level: +4 dBm @ 100% modulation - 400 Hz
Distortion: Less than 1.0% (50-15,000 Hz)

Audio output for external distortion measurements:

Impedance: 10K ohms, or greater
Level: 7 volts @ 100% modulation - 400 Hz
Frequency Response: ±0.5 dB (30-15,000 Hz)

Distortion:

Stereo 0.5% (30-15,000 Hz)

Noise Level: 66 dB or more below 100% modulation
@ 400 Hz

Composite Output:

Source Impedance: 800 ohms
Level: 0.3 volts, rms
Frequency Response: ±0.2 dB (50-100,000 Hz)

Stereo Headphone output:

Impedance: 20K ohms
Level: 2.0 volts, rms

Pilot Injection Circuit

Accuracy: ±0.5%
Meter Indication: 6-12% (Pilot Injection Scale)
Indicator: Front panel lamp (operates at 5% or higher injection levels)

Modulation Meters

Left or Right:
Accuracy: ±0.5 dB
Frequency Response: ±0.5 dB (30-15,000 Hz)

Separation

Left into Right/Right into Left: 35 dB, or better
(30-15,000 Hz)
67 kHz into either channel: —60 dB, or lower.
(Note: Separation can be measured directly down to —70 dB)

38 kHz Carrier Suppression

100% Modulation (5-15 kHz) —46 dB, or lower
0% Modulation —55 dB, or lower

Crosstalk

Main into stereo subchannel: 46 dB, or better
Stereo sub into main channel: 46 dB, or better
67 kHz into main or stereo: 66 dB, or better

Power Requirements: 105-125 vac, 50/60 Hz, 40 W.

Ambient Temperature Range: 10-50 degrees, C.

Dimensions: (W) EIA Standard 19" rack panel, (H) 7", (D) 11½" overall

Weight: 15 pounds

Finish: McMartin Blue and Brushed Aluminum

FIVE MIXER AUDIO CONTROL CONSOLE

B-501 mono
B-502 stereo



DESCRIPTION

The McMartin B-500, 5-mixer consoles are designed for production and subcontrol room applications, or as the main control unit for smaller operations. Two models are available, the B-501 for monaural operation and the B-502 for stereo applications.

A total of ten inputs, two per mixing channel are available. The standard configuration assigns low level microphone inputs to Mixer 1. The remaining four mixers accommodate balanced high-level inputs. Since all program circuits are on plug-in cards, full flexibility in mixer function assignments is possible by simple interchange of input module cards. Relay

control of speaker muting/warning light operation at a second location is possible. Spare contacts on the channel lever key switches and preselect input push-buttons permit extension of muting logic to all channels, if desired.

Each model represents a complete self-contained system with full program, audition, cue and monitoring capability. All external connections are made to barrier-type screw terminals on the rear of the cabinet.

The B-500 Series Consoles are finished in beige and black with wood-grain finish end panels.

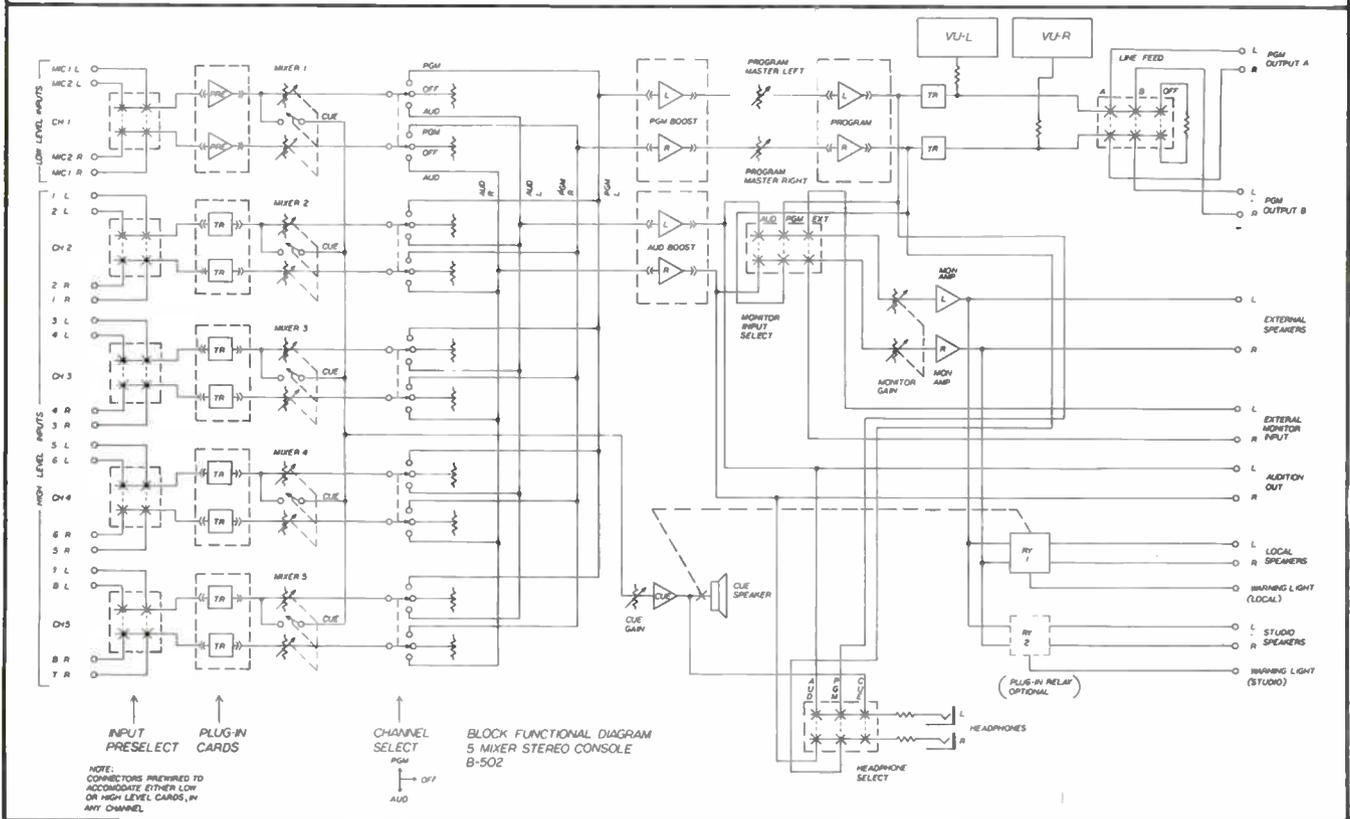
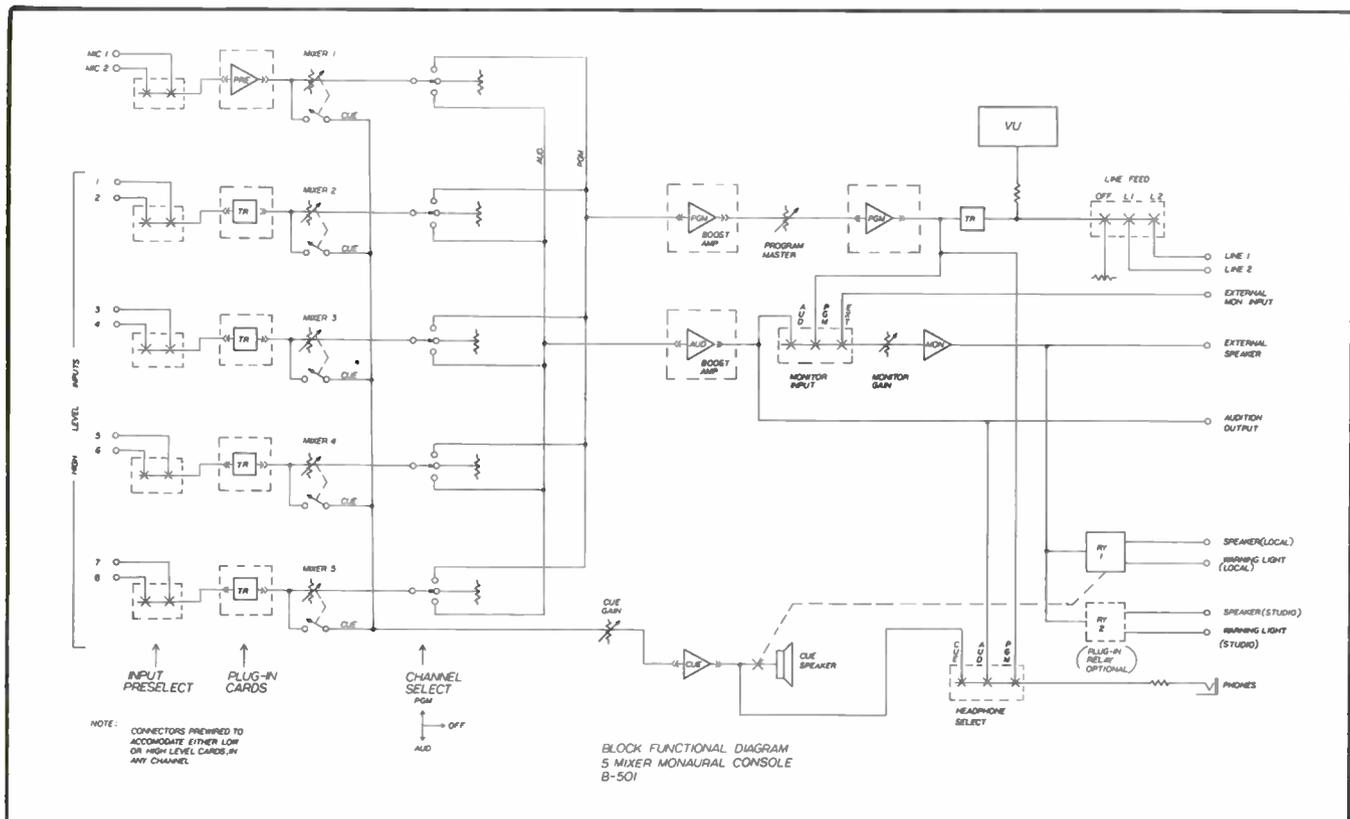
SPECIFICATIONS

PROGRAM CHANNEL(S):

Frequency Response	.....	±0.5 dB, 30-15,000 Hz
Harmonic distortion	.....	0.5% or less, 30-15,000 Hz @ +18 dBm output
S/N ratio	.....	72 dB or greater below +18 dBm output
Overall gain	.....	100, ±2, dB
Output level	.....	+8 dBm for 0 VU meter reading. +18 dBm capability
Input level	.....	Microphone channels: -60 dBm nom., -34 dBm max. High level channels: -15 dBm nom., +10 dBm max.
Impedances	.....	Mic channels, 150 ohms balanced; High level channels, 600 ohms, balanced; Audition bus, 2500 ohms unbalanced; Program line output(s); 600 ohms balanced

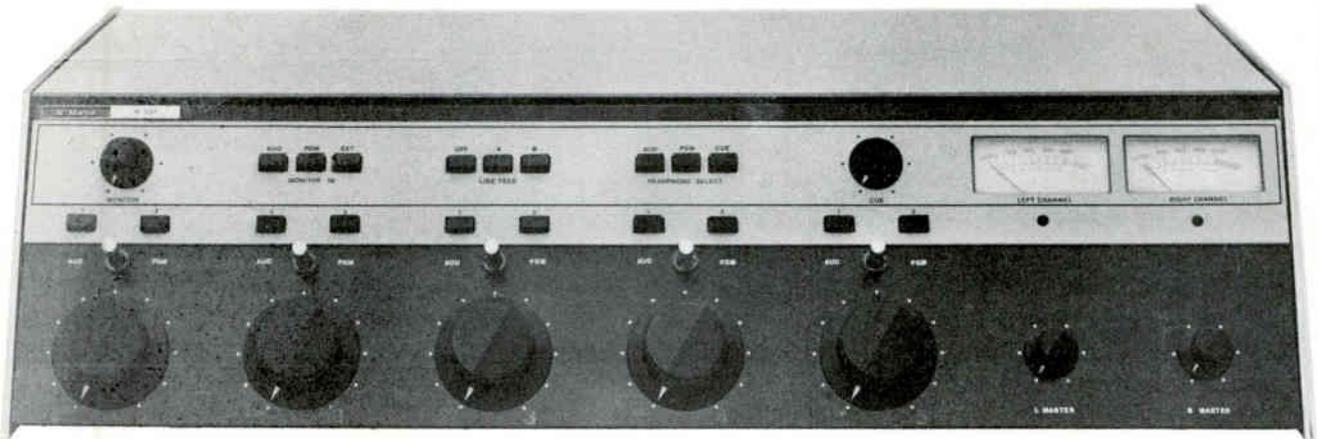
MONITOR CHANNEL(S):

Frequency response	.....	±1.0 dB, 30-15,000 Hz
Harmonic distortion	.....	1.0% or less, 30-15,000 Hz @ 4 watts rms output
S/N ratio	.....	60 dB below 4 watts rms output (fed through program input).
Output level	.....	4 watts rms continuous; 8 watts, normal program content
Output impedance	.....	8 ohms, unbalanced
TERMINATIONS	....	Barrier-type screw terminals at rear
POWER SUPPLY	....	115 VAC, 50/60 Hz (230 VAC on special order).
DIMENSIONS	.....	27" width x 7" height x 16" depth
FINISH	.....	Beige, matte black in control knob area, wood grain end panel trim

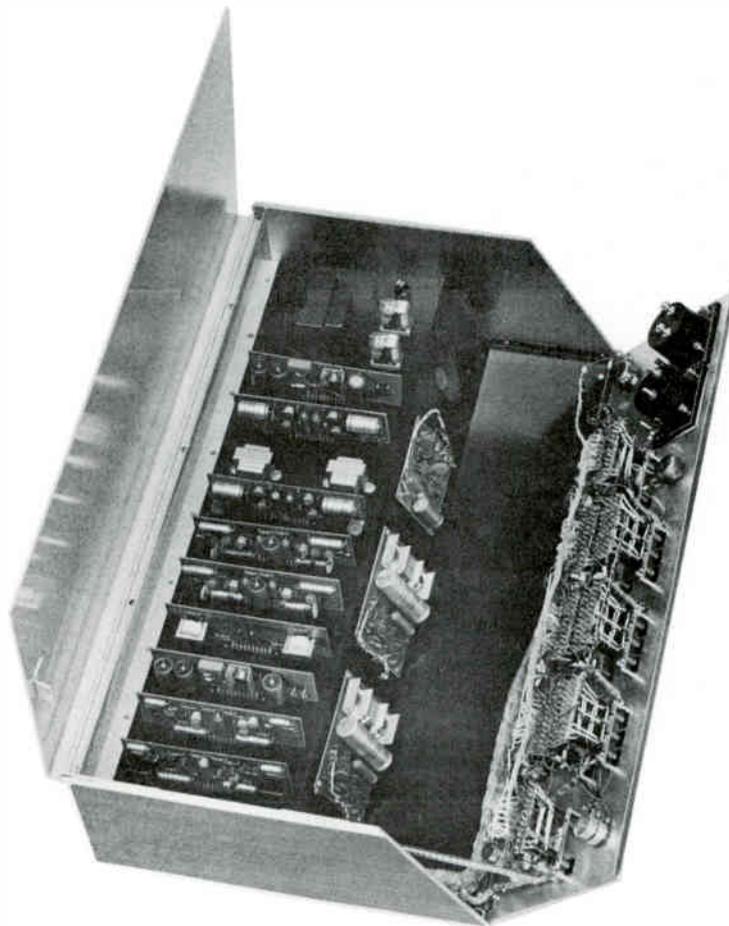


FIVE CHANNEL MIXER

B-502



FRONT VIEW



OPEN VIEW

C-2

BROADCAST AUDIO CONTROL CONSOLES

MODELS
B-801 Monaural
B-802 Stereo
B-803 Dual Channel



DESCRIPTION

Featuring plug-in modular design of all amplifiers and input channel devices for complete operational flexibility, the new McMartin audio consoles provide pushbutton selection of twenty-seven input sources controllable through eight mixing channels.

Three models are available. The B-801 monaural, the B-802 stereo and the B-803 dual channel models are housed in identical cabinetry.

In their standard configurations, the first three mixing channels are equipped with low-level microphone preamplifiers. Mixers #4 through #7 accommodate high-level unbalanced input sources and Mixer #8 is a high level balanced input for network, auxiliary and four remote line input application. The B-802 is equipped with module complement to deliver full stereo capability in both the program and monitor channels, throughout the entire console system.

Because of the plug-in module feature, any combination of low or high-level balanced or unbalanced inputs may be accommodated by insertion of the appropriate module. Spare switch contacts have been incorporated to permit extension of speaker muting and warning light control logic to all eight inputs. These contact closures are available for remote control of tape or turntable devices when the channel is assigned to high-level service.

High-quality step-type attenuators with cue switches are used in all mixing channels. Complete cueing of all eight mixer inputs, with built-in panel speaker, is provided.

Monitor amplifier modules provide 8-watt rms output level for studio and house monitor speakers.

All models are equipped with selective intercom between the operating position and each of three studios or four remote lines plus a general paging location.

All solid-state devices are operated at conservative ratings and only highest grade components are used. Close attention has been paid to human engineering design with switches and controls positioned for logical, error-free operation.

The B-800 Series is handsomely styled and completely self-contained. With the interconnection of power source and external device cabling, these consoles are ready to deliver many years of highly-professional, reliable service.

The B-801, B-802 and B-803 join the expanding line of broadcast products by McMartin . . . a name that insures reliability, quality and superlative performance.

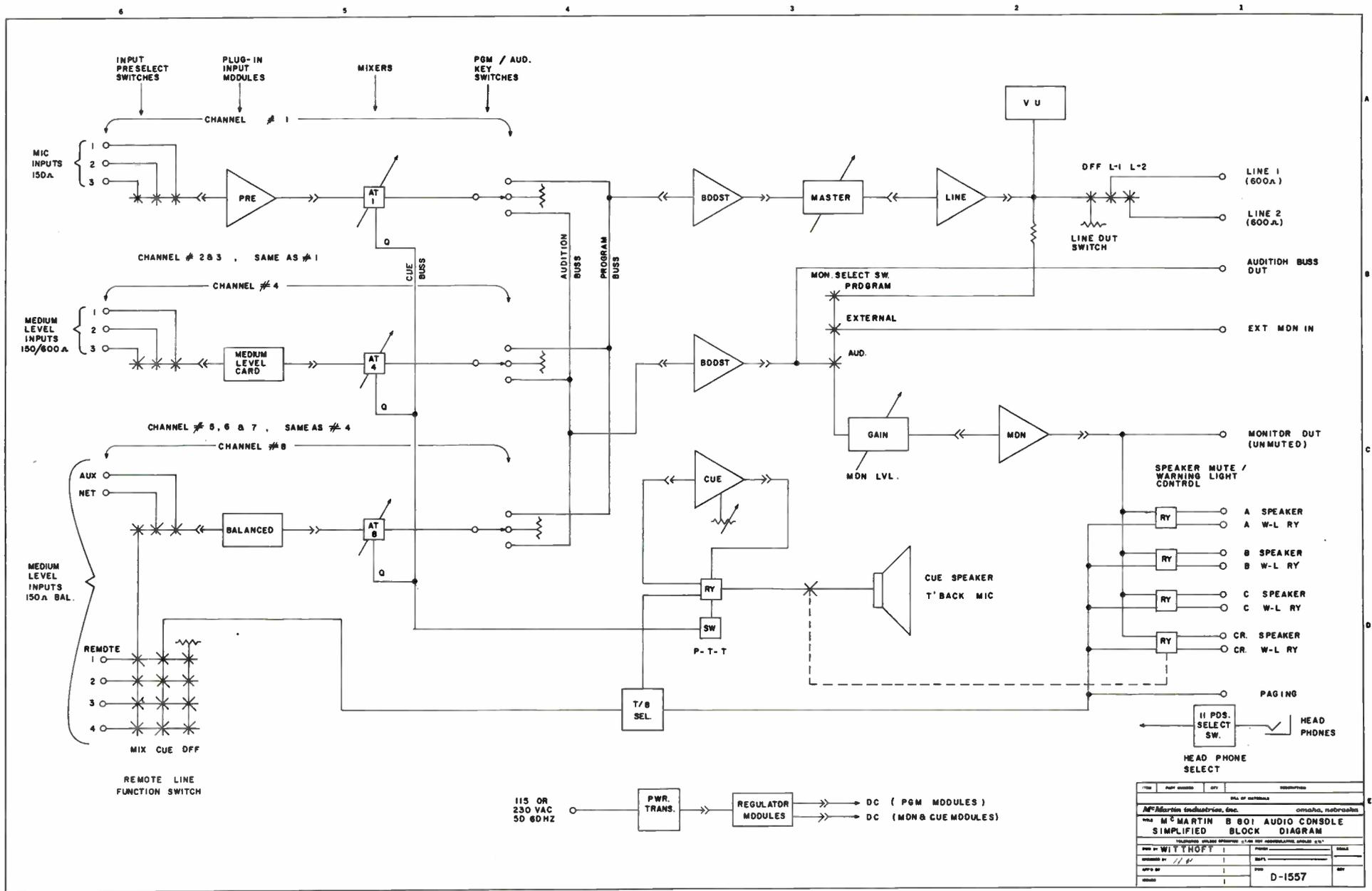
L-O

17-01

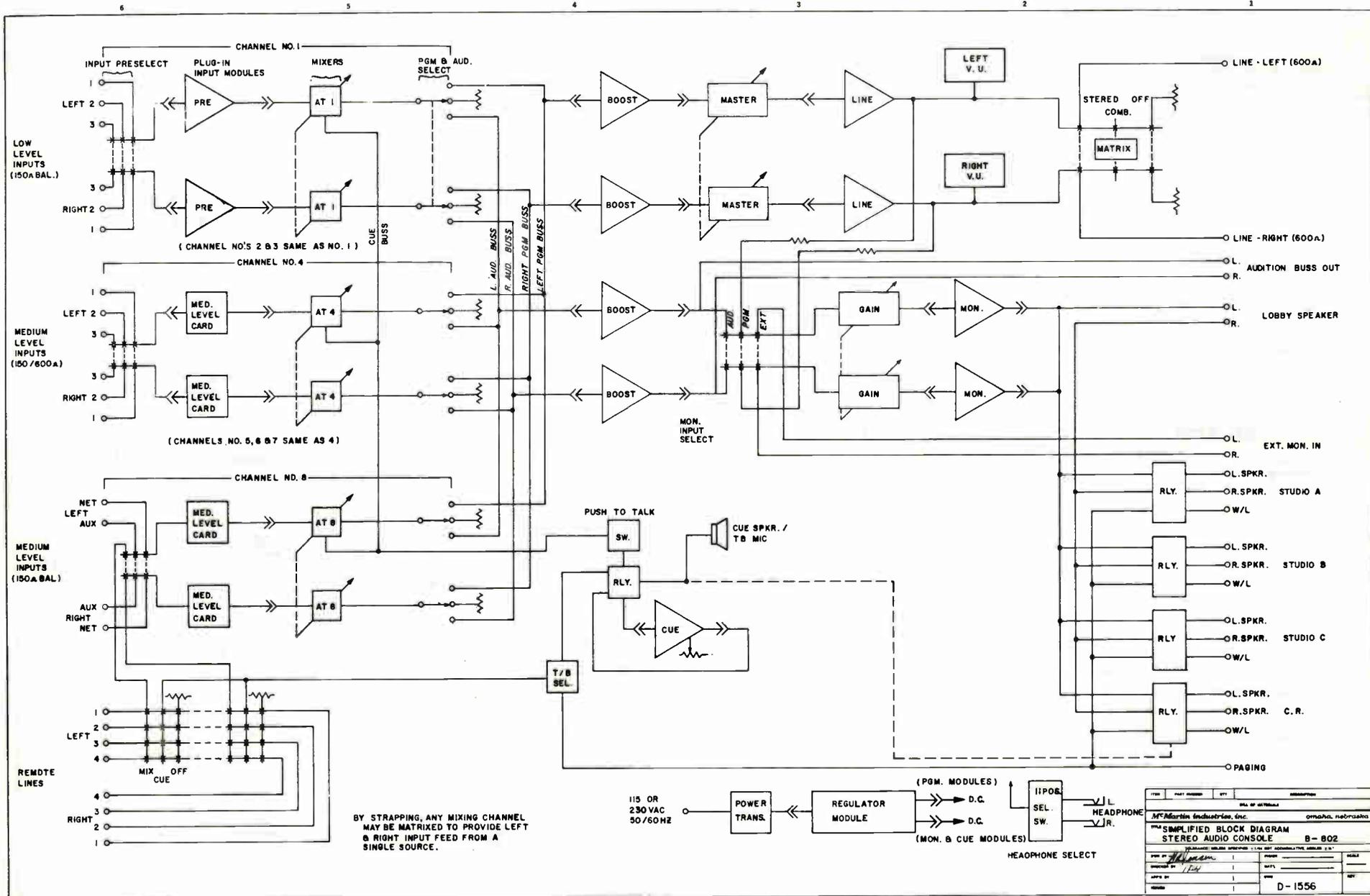
SPECIFICATIONS

PROGRAM CHANNEL(S)	ALL MODELS		
FREQUENCY RESPONSE.....	±0.5 dB, 20 to 20,000 Hertz		
TOTAL HARMONIC DISTORTION.....	0.5% or less, 20 to 20,000 Hz @ +18 dBm output with -50 dBm signal fed to any low level input		
SIGNAL-TO-NOISE RATIO.....	74 dB or greater below +18 dBm output. -50 dBm input to any low level input. Master and channel mixers adjusted for equal attenuation, totaling 34 dB.		
OVERALL GAIN.....	102, ±2, dBm		
OUTPUT LEVEL.....	+8 dBm nominal. +24dBm maximum capability		
INPUT LEVELS.....	Channels #1 - 3: -60 dBm nom., -30 dBm max. Channels #4 - 8: -15 dBm nom., +10 dBm max.		
INPUT IMPEDANCES.....	Channels #1-3: 150 ohms balanced. (50/600 ohms by strapping). Channels #4-7: 600 ohms unbalanced. (150 ohms by strapping). Channel #8: 600 ohms balanced (150 ohms by strapping).		
LINE OUTPUT SWITCHING.....	B-801 MONAURAL	B-802 STEREO	B-803 DUAL CHANNEL
	Line 1, Line 2 and terminated OFF positions	Stereo (separate L and R outputs), Mono (L+R feeding Line 1) & terminated OFF positions	CH-A to Line 1/CH-B to Line 2, Reversal, and terminated OFF positions
AUDITION BUS OUTPUT(S).....	-10 dBm, 10K ohms, unbalanced	-10 dBm, 10K ohms, unbalanced	None
CROSSTALK.....	Below noise level (audition to program)	Below noise level (L to R to audition)	Below noise level (Channel A to Channel B)

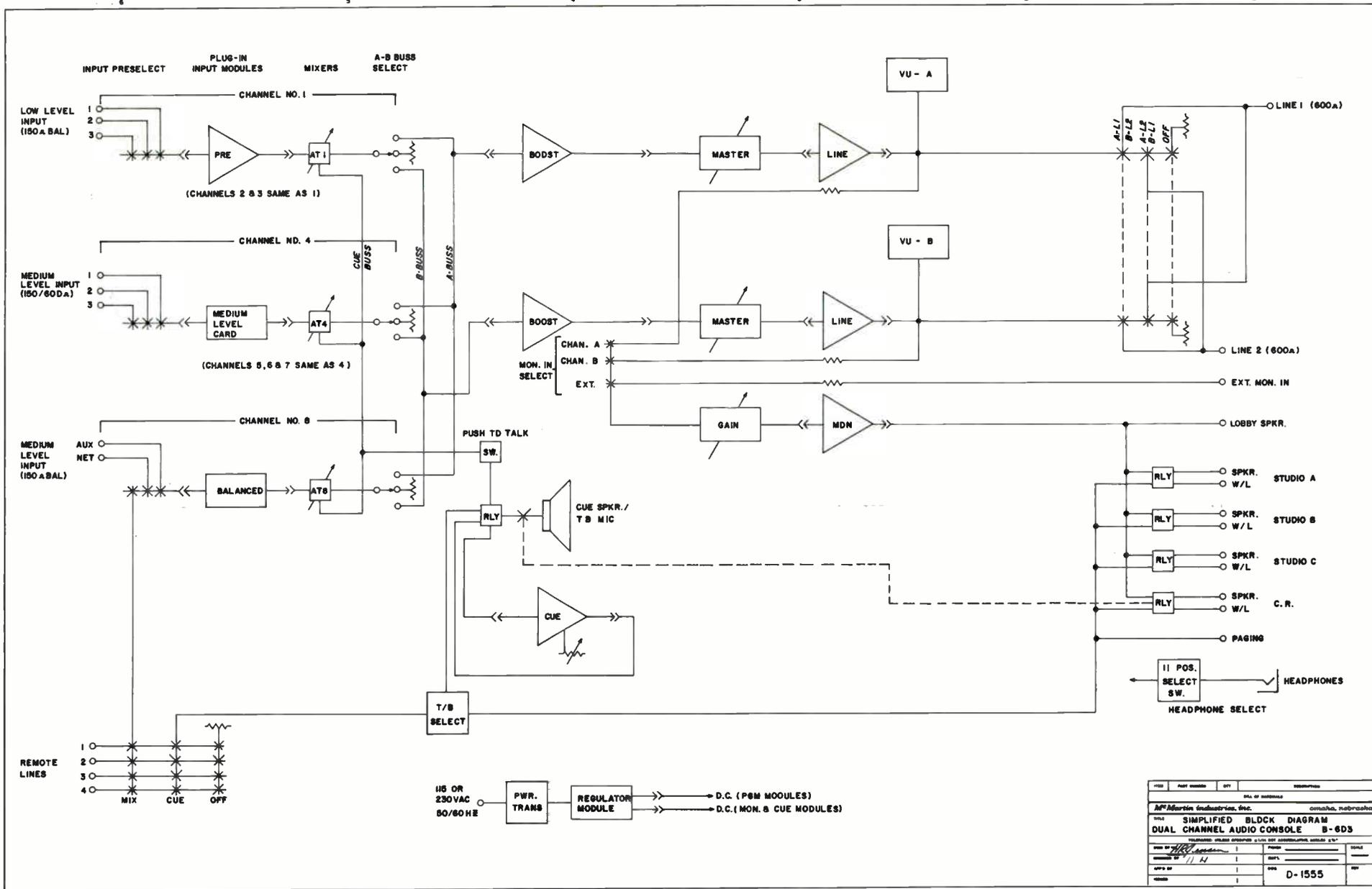
MONITOR CHANNEL(S)	ALL MODELS		
FREQUENCY RESPONSE.....	±0.5 dB, 20 to 20,000 Hertz		
TOTAL HARMONIC DISTORTION.....	0.75% or less, 20 to 20,000 Hz @ 8 watts rms output		
SIGNAL-TO-NOISE RATIO.....	70 dB below 8 watts (with +18 dBm at program line output(s).)		
OUTPUT LEVEL.....	8 watts rms		
OUTPUT IMPEDANCE.....	8 to 16 ohms, unbalanced		
GENERAL			
POWER REQUIREMENTS.....	115 or 230 Volts AC, 50/60 Hertz		
	B-801 MONAURAL	B-802 STEREO	B-803 DUAL CHANNEL
	65 watts	100 watts	80 watts
DIMENSIONS.....	44 ⁷ / ₈ " wide, 18 ¹ / ₄ " deep, 9 ³ / ₄ " high		
FINISH.....	Cabinet: Beige with wood trim end panels Front Panel: Upper control area - beige Lower control area - black		



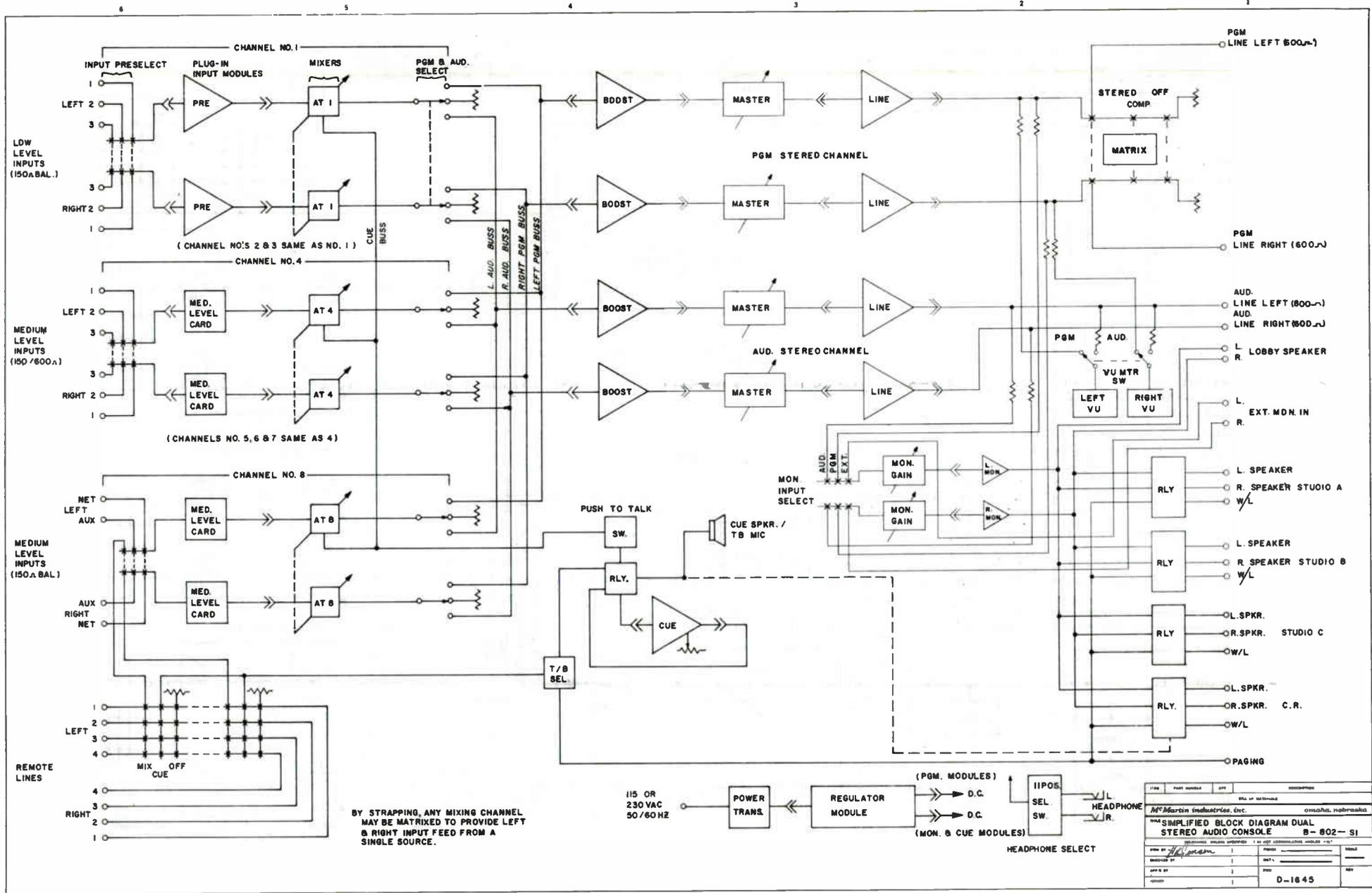
REV.	DATE	BY	DESCRIPTION
1			
M ^C Martin Industries, Inc. omaha, nebraska			
M ^C MARTIN B 801 AUDIO CONSOLE			
SIMPLIFIED BLOCK DIAGRAM			
DESIGNED BY	W. W. WYTHOFF	DATE	
APPROVED BY		DATE	
REVISED		DATE	
			D-1557



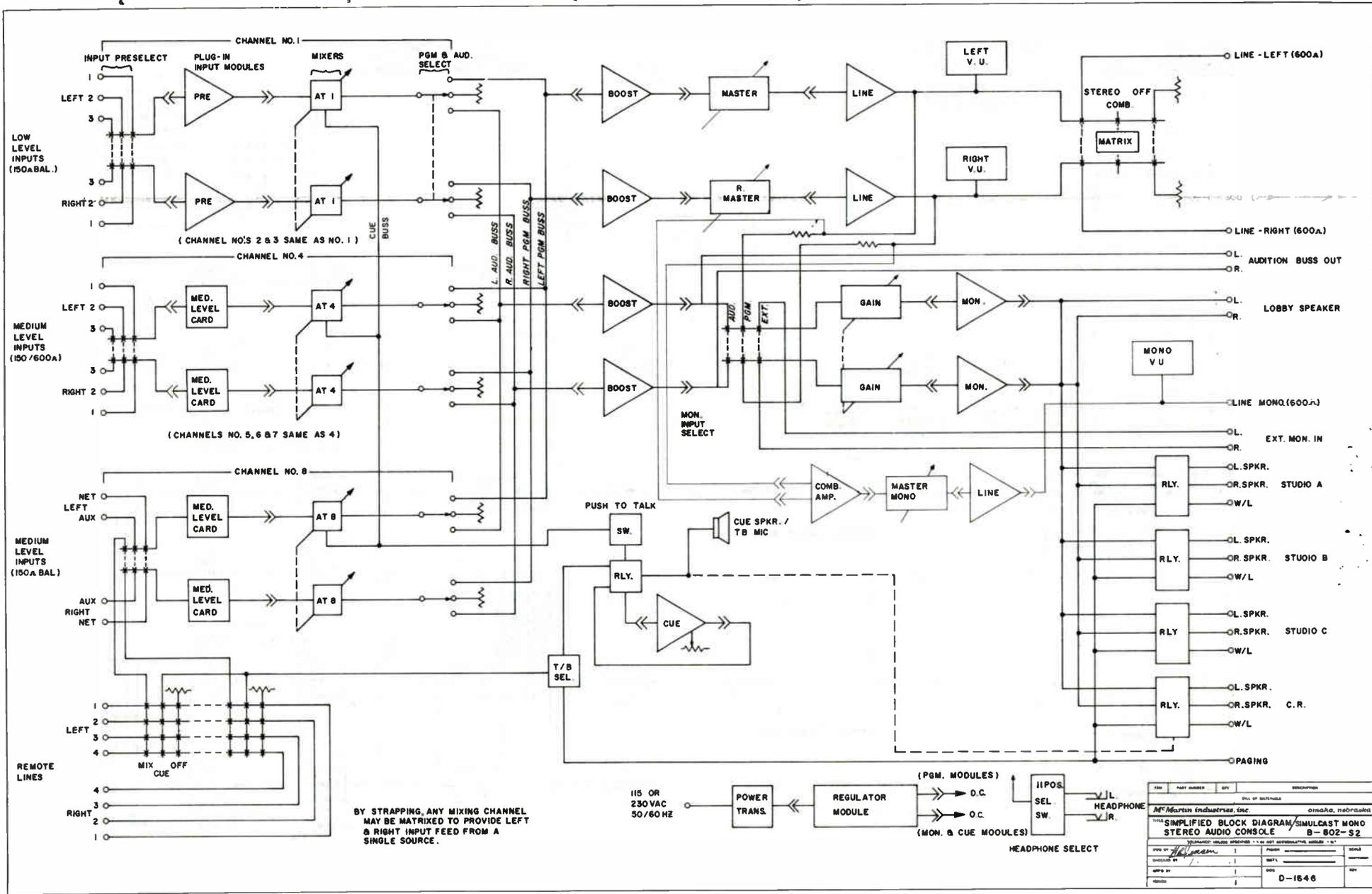
TYPE	PART NUMBER	QTY	REVISION
MCM Martin Industries, Inc. omaha, nebraska			
SIMPLIFIED BLOCK DIAGRAM			
STEREO AUDIO CONSOLE B-802			
DESIGNED BY	DATE	SCALE	
DRAWN BY	DATE		
CHECKED BY	DATE		
APPROVED BY	DATE		
D-1556			



ITEM	PART NUMBER	QTY	REMARKS
SIMPLIFIED BLOCK DIAGRAM DUAL CHANNEL AUDIO CONSOLE B-6D5			
DATE	DESIGNED BY	APP'D BY	SCALE
11/11			
REV	DATE	BY	DESCRIPTION
D-1555			11



ITEM	PART NUMBER	QTY	DESC. OF MATERIAL	REVISION
Martin Industries, Inc. omaha, nebraska				
SIMPLIFIED BLOCK DIAGRAM DUAL STEREO AUDIO CONSOLE B-802-SI				
DESIGNED BY	W. J. MASON	1	DATE	11/15/64
APP'D BY		1	DATE	
DATE		1	DATE	
REV.		1	DATE	
				D-1645



REV.	PART NUMBER	REV.	DESCRIPTION
THE SIMPLIFIED BLOCK DIAGRAM/SIMULCAST MONO STEREO AUDIO CONSOLE B-802-S2			
DESIGNED BY	DATE	SCALE	
DRAWN BY			
CHECKED BY			
DATE			
D-1546			

MC MARTIN INDUSTRIES, INCORPORATED

BROADCAST EQUIPMENT PRICE LIST

B-800 8-MIXER AUDIO CONSOLES

<u>MODEL</u>	<u>DESCRIPTION</u>	<u>PRICE</u>
B-801	MONAURAL, 8-MIXER CONSOLE. COMPLETE WITH FOLLOWING PLUG-IN MODULES: (3) MICROPHONE PREAMPS, (2) BOOSTER AMPS, (1) PROGRAM AMP, (1) CUE/TALKBACK AMP, (1) 8-WATT MONITOR AMP, (4) HIGH-LEVEL UNBALANCED INPUT, (1) HIGH-LEVEL BALANCED INPUT, (1) POWER SUPPLY REGULATOR, AND (1) MODULE EXTENDER CARD.	\$2,350.00
B-802	STEREO, 8-MIXER CONSOLE. COMPLETE WITH FOLLOWING PLUG-IN MODULES: (6) MICROPHONE PREAMPS, (4) BOOSTER AMPS, (2) PROGRAM AMPS, (1) CUE/TALKBACK AMP, (2) 8-WATT MONITOR AMPS, (8) HIGH-LEVEL UNBALANCED INPUT, (2) HIGH-LEVEL BALANCED INPUT, (1) POWER SUPPLY REGULATOR, AND (1) MODULE EXTENDER CARD.	3,200.00
B-802-S1	INCLUDES STANDARD MODULE CONTENT SHOWN FOR B-802 IN "B-800 SERIES CONSOLE PRICE LIST", PLUS TWO (2) PLUG-IN PROGRAM AMPLIFIER MODULES TO PROVIDE BALANCED, 600 OHM STEREO, LINE LEVEL OUTPUTS FROM THE AUDITION CHANNELS. INCLUDES SEPARATE INTERNAL AUDITION CHANNEL MASTER GAIN CONTROLS AND FRONT-PANEL VU METER SELECTOR SWITCH TO PERMIT PGM/AUD OUTPUT LEVEL METERING.	3,450.00
B-802-S2	INCLUDES STANDARD MODULE CONTENT SHOWN FOR B-802 IN "B-800 SERIES CONSOLE PRICE LIST", PLUS PLUG-IN PROGRAM AMPLIFIER MODULE AND PLUG-IN COMBINING AMPLIFIER STAGE TO PROVIDE CONTINUOUS BALANCED, 600 OHM LINE LEVEL MONAURAL OUTPUT FOR "SIMULCAST" OPERATION. A THIRD, PANEL-MOUNTED, VU METER IS ADDED TO MONITOR MONAURAL OUTPUT. AN INTERNAL TRIM CONTROL PERMITS INDEPENDENT ADJUSTMENT OF MONAURAL OUTPUT LEVEL.	3,400.00
B-803	DUAL CHANNEL, 8-MIXER CONSOLE. COMPLETE WITH FOLLOWING PLUG-IN MODULES: (3) MICROPHONE PREAMPS, (2) BOOSTER AMPS, (2) PROGRAM AMPS, (1) CUE/TALKBACK AMP, (1) 8-WATT MONITOR AMP, (4) HIGH-LEVEL UNBALANCED INPUT, (1) HIGH-LEVEL BALANCED INPUT, (1) POWER SUPPLY REGULATOR, AND (1) MODULE EXTENDER CARD.	2,650.00

B-800 CONSOLE ACCESSORY PLUG-IN MODULES

<u>MODEL</u>	<u>DESCRIPTION</u>	<u>PRICE</u>
551001	MICROPHONE PREAMPLIFIER	\$ 25.75
551008	RIAA EQUALIZED PHONO PREAMPLIFIER	25.75
552004	BOOSTER AMPLIFIER	25.75
552003	PROGRAM AMPLIFIER	25.00
552002	MONITOR AMPLIFIER	80.00
552001	CUE/TALKBACK AMPLIFIER	60.00
553001	POWER SUPPLY REGULATOR	40.00
550001	HIGH-LEVEL BALANCED INPUT	20.00
550002	HIGH-LEVEL UNBALANCED INPUT	1.50
555001	MODULE EXTENDER CARD (10-PIN)	3.00
555005	MODULE EXTENDER CARD (15-PIN)	5.00

B-500 5-MIXER AUDIO CONSOLES

<u>MODEL</u>	<u>DESCRIPTION</u>	<u>PRICE</u>
B-501	MONAURAL, 5-MIXER CONSOLE. COMPLETE WITH (1) CUE AMPLIFIER, (1) MONITOR AMPLIFIER AND FOLLOWING PLUG-IN CARDS: (1) MIC PREAMP, (4) HI-BAL CARDS, (2) BOOSTER AMPS, (1) PROGRAM AMP AND (1) POWER SUPPLY REGULATOR. INCLUDES (1) SPEAKER MUTING RELAY.	\$ 750.00
B-502	STEREO, 5-MIXER CONSOLE. COMPLETE WITH (1) CUE AMPLIFIER, (2) MONITOR AMPLIFIERS AND FOLLOWING PLUG-IN CARDS: (1) DUAL MIC PREAMP, (4) DUAL HI-BAL CARDS, (1) DUAL BOOSTER AMP, (1) DUAL PROGRAM AMP AND (1) POWER SUPPLY REGULATOR. INCLUDES (1) SPEAKER MUTING RELAY.	1,050.00

B-500 CONSOLE ACCESSORY PLUG-IN MODULES

<u>MODEL</u>	<u>DESCRIPTION</u>	<u>PRICE</u>
<u>PLUG-IN CARDS</u>		
551010	MICROPHONE PREAMPLIFIER (B-501)	\$ 22.00
551011	DUAL MIC PREAMP (B-502)	43.50
552021	BOOSTER AMP (B-501)	12.00
552010	DUAL BOOSTER AMP (B-502)	16.00
552011	PROGRAM AMP (B-501)	15.00
552012	DUAL PROGRAM AMP (B-502)	23.00
552013	HIGH LEVEL BALANCED (B-501)	19.50
552014	DUAL HIGH LEVEL BALANCED (B-502)	37.50
553007	POWER SUPPLY REGULATOR (BOTH MODELS)	16.00
551020	RIAA EQUALIZED PHONO PREAMPLIFIER	22.00
551021	DUAL RIAA EQUALIZED PHONO PREAMPLIFIER	43.50

B-500 CONSOLE ACCESSORY PLUG-IN MODULES (CONT.)

<u>MODEL</u>	<u>DESCRIPTION</u>	<u>PRICE</u>
<u>FIXED CARDS</u>		
552015	CUE AMPLIFIER (BOTH MODELS)	\$ 18.00
552016	MONITOR AMPLIFIER (BOTH MODELS)	23.00
<u>OPTIONAL</u>		
550022	SPEAKER MUTING RELAY (BOTH MODELS)	10.00

TBM-3000A DIGITAL FM FREQUENCY MONITOR



FEATURES

- **Illuminated Digital Readout**
- **Measures Main Carrier & Stereo Pilot Frequencies**
- **1 kHz and 2 kHz Deviation Indicators**
- **FCC Type Approved # 3-164**
- **Front Access to Plug-in Cards**
- **No Calibration Adjustments Required**

DESCRIPTION

The new McMartin TBM-3000A FM Frequency Monitor provides digital display of either main channel carrier or 19 kiloHertz pilot frequencies of transmitters operating in the standard FM broadcast band.

Incorporating advanced techniques, a special purpose, seven-segment numeric display features excellent readability under high ambient light conditions, reducing substantially the possibility of human error. The new TBM-3000A is specifically designed to meet the requirements of Section 73.331 of the FCC Rules and Regulations.

The display exhibits frequency deviations of ± 3.9 kiloHertz of the main carrier or ± 3.9 Hertz of the 19 kHz pilot signal. Added protection against large deviations is afforded by indicator lamps which operate when the main carrier frequency shifts 1 kHz and 2 kHz. The latter excursion is accompanied by a relay closure which may be used to actuate an external alarm, or through external interlock circuitry, remove the transmitter from the air.

The TBM-3000A has a unique, self-adjusting RF attenuator to automatically accommodate RF input levels up to 5 watts, with a front panel warning indication if insufficient drive is present.

Operating controls consist of four front panel pushbuttons.

Three of these are interlocked for frequency measurement of 1) unmodulated main carrier; 2) modulated main carrier; and 3) the 19 kHz pilot carrier. The fourth pushbutton is of the momentary type, used for reset of the 2 kHz shift indicator lamp. The normal operating mode is in the modulated main channel position where carrier shift with modulation may be observed.

In the "Modulated Carrier" mode the data is sampled once each ten seconds. The sampling rate in the "Unmodulated Carrier" mode is five times per second. This permits relatively continuous observation of the monitor display during frequency adjustments of the FM transmitter. A front panel indicator light monitors proper operation of the crystal oven. Care has been taken to minimize the effects of power line fluctuations, ambient temperature variations and crystal aging. Pre-calibration adjustment is not required.

All critical circuitry is located on plug-in printed circuit boards, accessible from the front of the monitor by easy removal of a front panel insert. Optional plug-in cards are available to expand the capabilities of the TBM-3000A to provide parallel digital output for driving automatic binary coded digital (BCD) logging equipment; analog output (2000 Hz/volt) for remote metering; and an RF card for input levels down to 1000 microvolts.

SPECIFICATIONS

Operating Frequency: Main Carrier: 88 to 108 MHz
Stereo Pilot: 19 kHz

Main Carrier:

Input level .05 to 5 watts, maximum

Input impedance 50 ohms

Frequency stability ± 2 PPM (parts per million), (equivalent to ± 200 Hz @ 100 MHz) from 0 to 55° C.

Aging rate Less than 2 PPM per month

Stereo Pilot:

Input level .035 to 1.0V, rms

Input impedance 10,000 ohms

Frequency stability ± 0.19 Hz from 0 to 55° C.

Aging rate Less than .04 Hz per month.

Display:

Main Carrier: Digital readout: Zero to ± 3.9 kHz in 100 Hz increments

Lamp alarm indicators: ± 1 and ± 2 kHz deviations.
Low RF input level.

Stereo Pilot: Digital Readout: Zero to ± 3.9 Hertz in 0.1 Hz increments

Lamp alarm Indicators: ± 1 and ± 2 Hertz deviations.
Pilot indicator.

Dimensions: Standard 19" Rack Panel x 3.50" high x 9.50" deep.

Weight: 12 pounds

Power Requirements: 120, ± 10 V; or 240, ± 20 V, ac, 50/60 Hz, 20 watts.

Finish: McMartin blue and brushed aluminum.

OPTIONAL ACCESSORIES

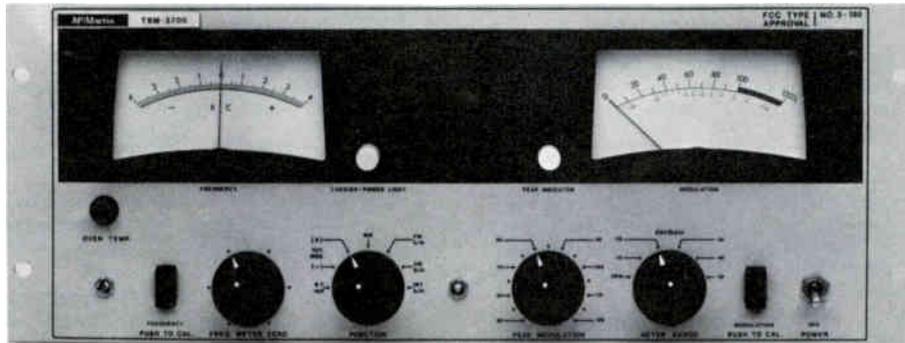
Analog output card

Parallel Digital output card

RF Card

FM FREQUENCY/MODULATION MONITOR

TBM-3700



DIRECT READING AM & FM S/N
REAR ACCESS PLUG-IN CARDS
REMOTE METERING AVAILABLE

INDEPENDENT FREQUENCY/MODULATION SECTIONS
BUILT-IN FREQUENCY/MODULATION CALIBRATION
STEREO/SCA ADD-ON CAPABILITY

DESCRIPTION

The McMartin TBM-3700 combines the frequency deviation and modulation percentage functions in a single rack mount unit.

The TBM-3700 uses silicon solid-state semiconductors. Most circuits are mounted on plug-in, glass epoxy base printed circuit boards accessible from the rear.

The frequency deviation and modulation monitoring functions are independent of each other. Frequency measurements and calibration switching may be performed without interruption of the modulation monitoring or audio feed to house monitor systems. Audio output is automatically muted when RF feed to the TBM-3700 is not present.

The TBM-3700 incorporates circuitry permitting precise calibration of the modulation percentage meter and measurement of inherent internal FM noise of the monitor (typically -75 dB below 100% modulation). Direct reading of AM and FM signal-to-noise ratios is also featured.

Provision is made for remote metering of both frequency deviation and modulation percentage. Accessory kits for this purpose are available.

Two isolated composite signal outputs are provided for driving the McMartin TBM-2200 Stereo Modulation Monitor and/or TBM-2000A SCA Frequency/Modulation Monitor.

The TBM-3700 conforms in all respects with FCC Rules (Approval #3-190).

SPECIFICATIONS

OPERATING RANGE 88-108 MHz

INPUT 50 ohms, unbal. 0.1 to 1.0 W. level

OUTPUTS:

Audio monitoring 600 ohms balanced; +2dBm (100% modulation-400Hz) Distortion: less than 0.5% (50-15,000 Hz)

Distortion measurement ... 10K ohms impedance, unbalanced; 5 volts (100% modulation @ 400 Hz) Distortion: 0.25% (30-15,000 Hz) SNR: 66dB below 100% modulation @ 400 Hz

Composite output Two rear chassis BNC connectors—300 ohms unbalanced; 1.0 volt peak-to-peak ± 0.2 dB (50-100,000 Hz)

MODULATION METER:

Main channel position Accuracy, ± 0.5 dB; Freq. Response: ± 0.5 dB (30-15,000 Hz)

Total modulation position Accuracy, ± 0.5 dB; Freq. Response: ± 0.5 dB (30-75,000 Hz)

Range ± 75 kHz deviation, 100% modulation; ± 100 kHz deviation, 133% modulation (full scale)

FREQUENCY METER:

Scale ± 4 kHz, 100Hz increments

Accuracy Better than ± 500 Hz

REMOTE METERING:

Modulation up to 2,500 ohms external loop resistance may be accommodated. Requires RM-37T accessory plug-in card and RM-37-R remote meter panel kit

Frequency can accommodate up to 3,000 ohms external loop resistance. Remote meter panel kit available

CARRIER ALARM ... Monitor automatically mutes at preset muting control level. Rear panel terminals available for external alarm interconnection

POWER REQUIRED 105-125 VAC, 50/60 Hz, 45W

AMBIENT TEMPERATURE RANGE

..... 10° to 50° C

DIMENSIONS

..... 19" width (EIA standard rack mount)

7" height, 13" depth

FINISH

..... Beige with wood grain trim

TBM-2000A SCA FREQUENCY/MODULATION MONITOR



- **FCC Type Approval #3-154**
- **Permits Direct Crosstalk and S/N Measurements**
- **Two-Channel SCA Capability**
- **Adaptable to Planned SCA Expansion**
- **Accommodates Both ± 4 and ± 6 kHz Deviation Systems**
- **Modular Plug-In Construction**

DESCRIPTION

The McMartin TBM-2000A is a fully-transistorized SCA monitor for simultaneous measurement of frequency and modulation percentage of either of two subchannels. Designed as an expansion unit for SCA broadcasters, the TBM-2000A is FCC type-approved for use with the McMartin TBM-3500A Monaural FM Modulation Monitor; the TBM-4000A FM/SCA Modulation Monitor (when more than two SCA channels are used); and the TBM-4500A FM Stereo Modulation Monitor.

Featuring plug-in construction, individual modules may be removed for greatly simplified field service. Each module is isolated from a common power supply employing double regulation for all critical circuits. This results in highly stable operation.

For each of two subchannels, the TBM-2000A is capable of measuring frequency and modulation simultaneously; modulation peaks by flasher indication, adjustable over a range of 50 to 120% modulation; subchannel injection level; frequency response;

crosstalk; and signal-to-noise ratios. In addition to monitoring injection levels of SCA carriers separated by 5 kHz as required by the FCC, the unique dual bandpass filters employed in the TBM-2000A permit monitoring of injection levels of modulated SCA carriers without interruption of SCA programming.

The standard TBM-2000A accommodates 67 kHz subcarriers. 41 kHz or another subchannel frequency is optionally available. It is recommended that the second channel be ordered at the time of purchase of the initial TBM-2000A, or that the unit be returned to the factory for addition of a second channel to insure proper calibration.

The TBM-2000A, designed for standard 19-inch rack mounting, is finished in McMartin blue with the lower control panel area in brushed aluminum.

For the ultimate in quality FM monitor equipment, the name McMARTIN is your assurance of quality, reliability and optimum performance.

SPECIFICATIONS

Operating Range 67 kHz standard, 41 kHz and other frequencies optional as second subchannel.

Modulation Range ± 4 or ± 6 kHz deviation for 100% modulation (selectable by front panel control).

Modulation Meter (Conforms to FCC requirements)
Accuracy ± 0.5 dB
Frequency Response ... 30-7500 Hz, ± 1.0 dB (67 kHz)
30-5,000 Hz, ± 1.0 dB (41 kHz)

Peak Flasher Indicator... Responds to modulation peaks of 1 millisecond duration. Remains on for 2 to 4 seconds per FCC requirements. (Range adjustable, 50 to 120%, from front panel).

SCA Frequency Meter:

Operating Range Any two SCA sub-carriers. (Front panel select switch)

Deviation Range $\pm 4,000$ Hz, center zero

Accuracy Better than ± 50 Hz @ 67 kHz

Stability Maintained by crystal with .005% tolerance

SCA Injection Circuit:

Meter Scale 0-15% in 1% increments, 0-30% in 2% increments. (Range switch, chassis-mounted.)

Accuracy $\pm 1.0\%$

Outputs—SCA Sub-channel:

Audio—for monitoring circuits:

Source Impedance ... 600 ohms, balanced

Level + 4 dBm @ ± 6 kHz deviation (100% modulation) - 400 Hz

Distortion Less than 1.0% @ 400 Hz.

Audio—for distortion measurements:

Impedance 10,000 ohms or greater

Level 7 volts @ ± 6 kHz deviation (100% modulation) - 400 Hz

Frequency Response ... 30-7,500 Hz, ± 1.0 dB (67 kHz)

Distortion 1.0%, or less - 400 Hz

Noise Level 66 dB or greater below ± 6 kHz deviation (100% modulation) - 400 Hz

Audio—headphone monitoring (front panel jack)

Impedance 30,000 ohms

Level 2.0 volts

Cross Talk: (Front panel range control measures down to -70 dB)

Main Channel (30 - 15000 Hz) into SCA

Sub-channel 66 dB or better

Stereo (23-53 kHz) into SCA Sub-channel (67 kHz) 55 dB or better

SCA Channel #1 with

SCA Channel #2 66 dB or better

Power Requirements 105-125 volts AC, 50/60 Hz, 35 watts

Front Panel Controls Function Switch, Frequency Meter Zero, Subchannel Select, Peak Flasher Range, Crosstalk-S/N, Power

Front Panel Terminations Composite Input (BNC), Headphone Monitor Jack

Rear Panel Controls 75/150 μ sec De-emphasis, Subcarrier Mute, Composite Input Level

Rear Panel Terminations High Impedance Distortion Output and Low Impedance Audio Output (screw terminals); Peak Lamp Remote (Cinch Jones), Composite Input (BNC).

Ambient Temperature

Range 10-50° C

Dimensions (W) Standard 19" Rack Panel, (H) 7", (D) 12 1/2" (overall)

Weight 25 pounds

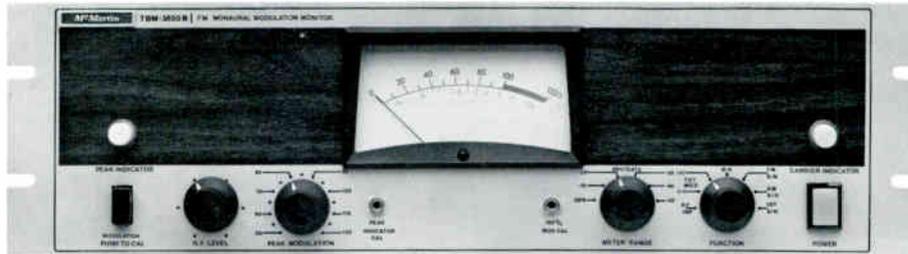
Finish McMartin blue and brushed aluminum

OPTIONAL EQUIPMENT

SCA-2002 ... Second subchannel for TBM-2000A. Includes reference crystal and bandpass filter. (Specify frequency)

FM MODULATION MONITOR

TBM-3500B



DIRECT READING AM & FM S/N
MODULAR PLUG-IN CONSTRUCTION
OPTIONAL PLUG-IN LOW LEVEL INPUT
FCC TYPE APPROVAL #3-219

INTERNAL CALIBRATION
CARRIER FAILURE ALARM
REMOTE METERING AVAILABLE

DESCRIPTION

The McMartin TBM-3500B monitors the modulation of main-channel FM broadcast stations, and when used with a) the TBM-2200A, all parameters of stereophonic transmission; and/or b) the TBM-2000B, all parameters of SCA multiplex operation.

The TBM-3500B permits metering of total positive and negative modulation and measurement of FM and AM signal-to-noise ratios as low as -70 dB. A peak flasher independent of meter switching indicates the highest positive or negative peak encountered. Threshold is adjustable from 50% to 120%.

The meter functions as a semi-peak reading voltmeter for modulation. When used to read AM or FM noise the meter is damped to improve readability in the presence of noise. Meter positions are provided to read the inherent internal noise (typically -75 dB below 100% modulation) of the monitor and internal calibration. When reading AM, FM or internal noise 75 microsecond de-emphasis is automatically inserted into the measuring circuit.

With the optional plug-in LL-35B low level input

card installed the TBM-3500B will operate with RF signals as low as 350 microvolts. This permits operation from an antenna-derived input signal in most situations and eliminates the need for an external RF amplifier.

Should RF input be interrupted or fall below a preset level, a front panel carrier presence lamp is extinguished, audio output is automatically muted, and a carrier-off relay operates. External alarm devices may be activated by the latter.

The optional Model RM-35B provides for rack-mount remote modulation metering and peak flasher indication. Up to 2,500 ohms of loop and meter resistance can be accommodated in the remote meter circuit.

High impedance audio output for connection of external distortion measurement equipment, and a 600-ohm balanced output for audio monitoring are rear-chassis terminated.

Designed for rack mounting, the TBM-3500B is attractively styled in McMartin beige with wood grain trim.

MAR/76

SPECIFICATIONS

OPERATING

RANGE.....88-108 MHz

MODULATION

RANGE..... 75 kHz deviation-
100% modulation
100 kHz deviation-
133% modulation

RF INPUT (standard)

Impedance.....50 ohms unbalanced
Sensitivity.....0.1 to 1 watt

RF INPUT

(with optional
LL-35B low level
input card)

Impedance..... 50 ohms unbalanced
Sensitivity.....350 microvolts minimum

OUTPUTS

Audio output for monitoring circuits

Source
Impedance.....600 ohms balanced
Level..... ± 2 dBm at 100% modulation at 400 Hz
Distortion.....less than 0.5%,
50 to 15,000 Hz

Audio output for distortion measurement

Impedance.....10K ohms or greater
Level.....5 volts at 100% modulation at 400 Hz
Frequency response..... ± 0.5 dB, 30-15,000 Hz

Distortion

Monaural.....0.2%, 30 to 15,000 Hz
Noise level.....-75 dB below 100% modulation at 400 Hz

Composite Output (2)

Source
Impedance.....300 ohms
Level.....Approximately 1.0 volt peak-to-peak
Frequency response..... ± 0.2 dB, 30 to 100,000 Hz
3 dB down at 180 kHz

75 microsecond deemphasis or flat response selectable for measurement purposes.

PEAK FLASHER

(Peak Flasher Meets
FCC Requirements)..Peak light adjustable
to read positive and
negative peaks from 50%
to 120% modulation

MODULATION

METER

(Ballistics meet
FCC Requirements)

Main Channel

Position.....
Accuracy..... ± 0.5 dB
Frequency response..... ± 0.25 dB, 30 to 15,000 Hz
at 100% modulation

Total

Modulation

(+) or (-) Positions

Accuracy..... ± 0.5 dB
Frequency response..... ± 0.25 dB, 30 to 75,000 Hz

INTERNAL

CALIBRATION

Accuracy..... 2% of 100% modulation

REMOTE FACILITIES

MODULATION.....RM-35 meter panel
optionally available.
Modulation may be remotely
monitored with 2,500 ohm
external loop resistance
plus remote meter resistance.
Remote meter is completely
independent of
internal meter.

PEAK

INDICATOR.....The peak light may
be remotely monitored.

ALARM

INDICATOR

AND MUTE.....Relay contact closures
are available on the
rear terminals when the
RF carrier fails or falls
below a preset value.
Audio output from the
monitor is muted.

POWER

REQUIREMENTS.....105 to 125 volts AC,
50/60 Hz, 35 watts

AMBIENT

TEMPERATURE

RANGE.....10° to 50° C (50° F to
122° F)

DIMENSIONS

.....19''(48.2 cm) wide x
5¼''(13.3 cm) high x
13''(33 cm) deep

WEIGHT

.....20 pounds Shipping
weight 23 pounds

FINISH

.....McMartin beige with
wood grain trim

ORDERING INFORMATION:

TBM-35C0B.....FM Modulation Monitor
LL-35B.....Low Level Input Card
RM-35B.....Remote Modulation
Meter Panel

500 – 1,500 watts

FM



TRANSMITTERS? it's only natural... MC MARTIN

SPECIFICATIONS

OPERATING RANGE	.88 to 108 MegaHertz
RF POWER OUTPUT	1,500 watts maximum
RF OUTPUT IMPEDANCE	50 ohms
CENTER FREQUENCY STABILITY	±500 Hz
MODULATION CAPABILITY	±150 kHz
AUDIO INPUT IMPEDANCE	600 ohms, balanced
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.75 dB, 30-15,000 Hz (Std. FCC 75 usec preemphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% mod.
FM NOISE	.65 dB below 100% modulation (400 Hz)
AM NOISE	.55 dB below carrier level
POWER REQUIRED	208/230/240 Vac, 50/60 Hz, single phase, 3-wire.
POWER CONSUMPTION (Approx.)	1500 watt output, 3000 watts 1000 watt output, 2200 watts 750 watt output, 1400 watts 500 watt output, 1100 watts
OPERATING TEMPERATURE	.0° to 50° Celsius
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	.28¾" (71.8 cm) width 70½" (179 cm) height 25¾" (65.4 cm) depth 30" (76.2 cm) rear door swing
WEIGHT	700 pounds
FINISH	McMartin beige w/wood-grain trim

STEREO OPERATION (with B-110 Stereo Assembly)

AUDIO INPUT IMPEDANCE	600 ohms balanced, each channel
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.75 dB, 30-15,000 Hz, Std FCC 75 usec, preemphasis, each channel
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
STEREO SEPARATION	.35 dB or greater, 50-15,000 Hz
FM NOISE	.60 dB or greater below 100% modulation
PILOT STABILITY	±1.0 Hertz over rated temperature range
SUBCARRIER SUPPRESSION	.55 dB or greater
CROSSTALK (L+R to L-R, L-R to L+R)	.42 dB or greater below 90% modulation

SCA OPERATION (with B-113 SCA Generator Module)

AUDIO INPUT IMPEDANCE	600 ohms, balanced
AUDIO INPUT LEVEL	+10, ±2, dBm
CARRIER FREQUENCY	41 or 67 KHz standard (others available on request)
CARRIER STABILITY	±500 Hz
MODULATION CAPABILITY	±7.5 kHz
PREEMPHASIS	.150 usec standard, 50 or 75 usec available on request
FREQUENCY RESPONSE	±1.5 dB, 50-5000 Hz
CROSSTALK (main to sub, sub to main)	.60 dB or lower
DISTORTION (50-5000 Hz)	.0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	.60 dB or greater

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price schedule

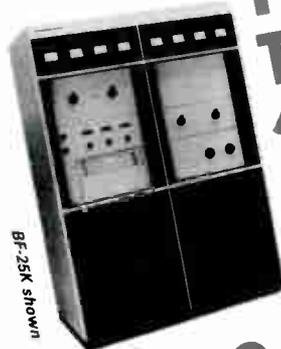
Effective July 15, 1976

BROADCAST EQUIPMENT



BA-25K shown

**AM
TRANSMITTERS
1000W • 2500W**



BF-25K shown

**FM
TRANSMITTERS
10W • 1000W • 3500W
5,000W • 10,000W
27,500W • 55,000W**

**MONITORS • AM Modulation
FM Frequency/Modulation
mono
stereo
sca**



TBM-35003 shown

CONSOLES 5 and 8 Mixers



B-800 console shown

**FM Relay and SCA Receivers
RF Amplifiers
Power Amplifiers**

McMartin.

AM TRANSMITTING EQUIPMENT

BA-1K	1000/500/250 watt AM transmitter, 220/240 Vac, single-phase, 3-wire	\$7,480.00
SR-1K	Sola filament regulator for BA-1K	200.00
STA-1K	100% spare tubes for BA-1K	344.00
SC-AM	Spare vacuum crystal	85.00
PT-1K	Line transformer for 220/240 Vac, single-phase, 2-wire BA-1K power	200.00
BA-2.5K	2.5KW AM broadcast transmitter	11,500.00
SR-2.5K	Sola filament regulator for BA-2.5K	300.00
STA-2.5K	100% spare tubes for BA-2.5K	760.00
SC-AM	Spare vacuum crystal	85.00

FM TRANSMITTING EQUIPMENT

BF-1K	1.0 - 1.5KW FM broadcast transmitter	8,500.00
STF-1K	Spare tube kit for BF-1K	230.00
BF-3.5K	2 - 3.5KW FM transmitter	11,500.00
STF-3.5K	Spare tube kit for BF-3.5K	388.00
BF-5K	5.0 - 5.5KW FM broadcast transmitter	15,000.00
STF-5K	Spare tube kit for BF-5K	388.00
BF-10K	10 - 13KW FM broadcast transmitter	21,000.00
STF-10K	Spare tube kit for BF-10K	1,069.00
BF-25K	15 - 27.5KW FM broadcast transmitter	30,000.00
STF-25K	Spare tube kit for BF-25K	1,349.00
BF-50K	30 - 55KW FM broadcast transmitter (combined output of two BF-25K transmitters)	on request
B-910	Exciter, monaural, 10 watt	2,194.50
Plug-In Modules		
B-111	Dual Audio Amplifier (Used with B-112 stereo generator)	412.50
B-112	Stereo generator (includes 53 kHz filter)	962.50
B-113	SCA generator	495.00
B-114	Mono audio amplifier	192.50
B-115	Modulated oscillator	258.50
B-116	Reference oscillator	297.00
B-117	RF power amplifier	330.00
B-118	Alarm and control module	330.00
B-119	Power supply regulator	143.00
Accessories		
B-120	Harmonic filter	198.00
B-121	Module extender	71.50
B-122	Cabinet assembly	198.00
SCK-910	100% spare semiconductor kit	310.00
CRYSTAL	For reference oscillator	38.50
CRYSTAL SET	2 crystals, 1 for reference oscillator, 1 for alarm and control module	55.00
B-910T	Transmitter, 10 watt, rack mount	2,392.50
B-910T	Transmitter, 10 watt, with cabinet	2,590.50
B-110	Stereo generator assembly, plug in (B-111/B-112 & filter)	1,375.00
B-110R	Stereo generator, self-contained, rack mount	1,475.00
B-113R	SCA generator, self-contained, rack mount	595.00

REMOTE PICKUP BROADCAST EQUIPMENT (142-175 MHz)

B-1100T	40 watt transmitter, rack mount (single frequency) for second frequency, add \$35.00	750.00
TBM-1100R	Receiver, rack mount (single frequency) for second frequency, add \$30.00	450.00
CU-1100	Control unit (for battery operation, B-1100T)	35.00
CC-1100	Carrying case, B-1100T	35.00

McMartin.

AUDIO CONSOLES

B-501	5 mixer, monaural, 1 mic, 4 hi-bal	825.00
B-501SA	B-501 with step attenuators	1,075.00
B-502	5 mixer, stereo, 1 mic, 4 hi-bal	1,155.00
B-502SA	B-502 with step attenuators	1,555.00
B-503	5 mixer, dual channel, 1 mic, 4 hi-bal	1,050.00
B-503SA	B-503 with step attenuators	1,300.00
Plug-In Cards		
SMP1	Microphone preamplifier (B501/B503)	27.50
SMP2	Microphone preamplifier (B-502)	55.00
5EP1	RIAA equalized phono preamplifier (B501/B503)	27.50
5EP2	Dual RIAA equalized phono preamplifier (B-502)	55.00
5BH1	High level balanced input (B501/B503)	25.00
5BH2	Dual high level balanced input (B-502)	50.00
5BA1	Booster amplifier (B501/B503)	18.00
5BA2	Dual booster amplifier (B-502)	21.00
5PG1	Program amplifier (B-501)	20.00
5PG2	Dual program amplifier (B502/B503)	28.00
5PS1	Power regulator (All models)	21.00
Wired-In Cards		
5QA1	Cue amplifier	25.00
5MA1	Monitor amplifier	28.00
Accessories		
B-500D	Control Desk unit	370.00
5RY1	(All models) speaker muting relay	12.50
B-801	8 mixer, monaural, 3 mic, 4 hi-unbal, 1 hi-bal	2,585.00
B-802	8 mixer, stereo, 3 mic, 4 hi-unbal, 1 hi-bal	3,520.00
B-802S1	8 mixer, dual stereo, 4 channel out	3,795.00
B-802S2	8 mixer, stereo, simultaneous monaural out	3,740.00
B-802S3	8 mixer, dual stereo/simulcast, combines S1 and S2	4,235.00
B-803	8 mixer, dual channel, 3 mic, 4 hi-unbal, 1 hi-bal	2,915.00
Plug-In Cards		
8MP1	Microphone preamplifier	30.00
8EP1	RIAA equalized phono preamplifier	30.00
8BH1	High-level balanced input	25.00
8UH1	High-level unbalanced input	5.00
8BA1	Booster amplifier	30.00
8PG1	Program amplifier	27.50
8MA1	Monitor amplifier	88.00
8QA1	Cue-talkback amplifier	66.00
8PS1	Power supply regulator	44.00
8CA1	Combining amplifier	22.00
Module Extenders		
8XC10	Module extender (10 pin)	4.00
8XC15	Module extender (15 pin)	6.00
ACCU-FIVE	5 channel rack mount mini console	595.00

AUDIO ACCESSORIES

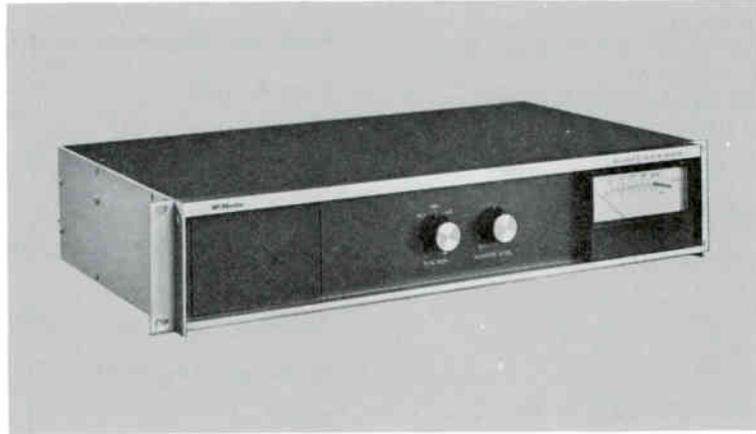
BR-400	4 channel remote mixer amplifier	310.00
B-200U	Mono/stereo equalized phono preamplifier, unbalanced 600-ohm output	120.00
B-200B	Mono/stereo equalized phono preamplifier, balanced 600-ohm output	135.00
MX-5	5-channel mixer/preamplifier	149.00

McMartin

AM MONITORS		
TBM-8500B	Modulation monitor	975.00
RM-85B	Remote metering rack mount panel	120.00
RF-85B	AM RF amplifier	533.50
AM/FM MONITOR AND EBS EQUIPMENT		
AMR-1	AM monitor receiver, single channel	99.50
AMR-3	AM monitor receiver, three-channel	125.00
FMR-1	FM monitor receiver, single channel	99.50
FMR-5	FM monitor receiver, five channel, first channel operation for each additional channel, add \$10.00	135.00
EBS-2	EBS decoder for AMR-1/AMR-3 and FMR-1/FMR-5 (Two-tone system)	99.50
TG-2/EBS	Precision two-tone EBS generator	225.00
FM MONITORS		
TBM-3700	Frequency and monaural modulation monitor	1,485.00
RM-37T	Remote metering plug-in card	65.00
RM-37R	Remote metering rack mount panel	120.00
TBM-2200A	Stereo modulation and pilot frequency adaptor	1,325.00
RM-22T	Remote metering plug-in card	92.50
RM-22R	Remote metering rack mount panel	180.00
TBM-2000B	SCA modulation and frequency adaptor	1,325.00
RM-20T	Remote metering plug-in card	65.00
RM-20R	Remote metering rack mount panel	120.00
TBM-3500B	Modulation monitor	1,300.00
RM-35BR	Remote metering rack mount panel	100.00
LL-35B	Low level input module	180.00
TBM-2500C	RF amplifier	533.50
FM REBROADCAST RECEIVERS		
TBM-1000B	Relay receiver (88-108 MHz)	385.00
TBM-1001B	Relay receiver (150 MHz range)	440.00
TBM-1005A	Five channel relay receiver (88-108 MHz) with one crystal	440.00
	Each additional channel crystal	10.00
TBM-1003A	Aural TV channel 2-13 receiver	440.00
STE-1	Plug-in stereo demod card for relay receiver	150.00
SCA-2	Plug-in SCA demodulator card	100.00
NB-1	Plug-in filter for narrow band operation	30.00
RELATED FM ANTENNAS		
A-72-SF-3	3 element Yagi antenna cut to band (2 per carton)	12.35
A-72-SF-5	5 element Yagi antenna cut to band	20.05
AS-1	Stacking harness (for A-72-SF-3/SF-5)	19.05
BROADCAST MONITOR AMPLIFIERS		
LT-80C/B	12-watt universal amplifier with one mic, 1 program input	81.00
LT-252B/B	25-watt universal amplifier with two mic, 2 program input	150.00
LT-250C/B	25-watt power amplifier	145.00
LT-500C/B	50-watt power amplifier	208.00
LT-750C/B	75-watt power amplifier	246.00
LT-1000C/B	100-watt power amplifier	283.00
LT-2000C/B	200-watt power amplifier	402.00
LT-3500C/B	350-watt power amplifier	723.00
MT-3B	Plug-in balanced/bridging transformer	11.25
ALL PRICES ARE FOB FACTORY AND ARE SUBJECT TO CHANGE WITHOUT NOTICE • MINIMUM ORDER \$15.00		

Printed in U.S.A.

TBM-1000A FM RELAY RECEIVER



- Silicon Transistors and IC's
- Fixed-Tune 10.7 MHz IF
- Excellent Bandwidth Linearity
- True Peak Meter Display
- Panel-Mounted Speaker
- Plug-In SCA Capability

DESCRIPTION

The McMartin TBM-1000A is a solid-state, crystal-controlled FM Relay Receiver designed for high quality, dependable monitoring and/or network relay of main channel program material in the FM broadcast range of 88 to 108 MHz. Models TBM-1001A and 1002A are available for use in the 150 MHz and 235 MHz bands respectively. By the addition of the SCA-1 Subchannel Kit, comprising four plug-in cards, full SCA capability is possible. Composite signal output is available for feed (a) directly to an FM transmitter; b) to a McMartin TBM-2000A or TBM-4000A modulation monitor; or c) to the McMartin TBM-0380 Stereo Demodulator for high-quality reception of stereo transmission.

Front end crossmodulation effects are minimized and linear AGC action is insured by use of cascode-connected FET's in the RF amplifier stages. High-frequency oscillator circuitry is well-shielded to prevent interference with adjacent communications services.

No tuned circuits are used beyond the first mixer. Use of a solid state fixed 10.7 MHz bandpass filter

and double symmetrical limiting in the IF stages insures excellent bandpass linearity and negligible distortion byproducts. Linear recovery of the composite signal output is provided by an extremely wide bandwidth pulse-counting detector.

600-ohm, balanced, main channel and subchannel (with the SCA-1 kit) audio outputs (at +8 dBm for 100% modulation) are terminated on the rear chassis. These audio outputs are not affected by front panel switching or gain adjustments. Main channel and subchannel signals may be monitored independently by a panel speaker.

A 4-inch illuminated modulation meter, meeting FCC requirements for rise time, decay and overshoot, displays true peak readings. Meter switch selection of main channel and subchannel audio output plus relative RF signal strength is provided. In the RF signal strength mode meter characteristics are ideal for monitoring weak signals.

The name McMARTIN is your guarantee of quality, outstanding performance and reliability.

SPECIFICATIONS

MAIN CHANNEL

Frequency Ranges: TBM-1000A—88-108 MHz (specify frequency)
TBM-1001A—150 MHz band (specify frequency)
TBM-1002A—235 MHz band (specify frequency)

Sensitivity: 1 μ volt for 30 dB of quieting

IF Selectivity: 310 kHz @ 3 dB points

De-emphasis: 75 μ secs, ± 1 dB (50 μ secs optional)

Antenna Input: 50 ohm BNC connector

Program Audio Output

Level: +8 dBm @ 100% modulation (400 Hertz)

Impedance: 600 ohms, balanced

Harmonic Distortion: Less than 0.5% (50 - 15,000 Hz)

Frequency Response: ± 1 dB (30 - 15,000 Hz)

Hum & Noise: 60 dB below 100% modulation (400 Hertz)

Monitor Audio Output

Level: 1 watt to panel mounted speaker

Harmonic Distortion: Less than 1% @ 400 Hz

Frequency Response: ± 1.5 dB (50 - 15,000 Hz)

Composite Output

Level: 1 volt peak-to-peak max. (adjustable)

Impedance: 5000 ohms

Harmonic Distortion: 0.5% @ 50% modulation

Frequency Response: ± 0.5 dB (20-100,000 Hz)

SUBCHANNEL (with SCA-1 Kit)

Operation Range: 41, 42 or 67 kHz (other frequencies optional)

Modulation Range: ± 6 kHz deviation equal to 100% modulation

Sensitivity: 3 μ volts for 30 dB of quieting

Signal/Noise Ratio: 60 dB below 100% modulation—400 Hertz

De-emphasis: 150 μ secs (75 μ secs optional)

Selectivity: 8 kHz @ 3 dB points

SCA Audio Output

Level: +8 dBm @ 100% modulation—400 Hertz

Impedance: 600 ohms balanced

Harmonic Distortion: Less than 1.0% (30-7,500 Hz)

Frequency Response: ± 1.5 dB (30 - 7,500 Hz)

Hum & Noise: 60 dB below 100% modulation—400 Hz

Monitor Audio Output: Same amplifier as used on Main Channel

PEAK-READING MODULATION METER (Conforms to FCC requirements)

Accuracy: ± 0.5 dB

Frequency Response: 30 - 75,000 Hz

Functions: a) Main channel modulation; b) Subchannel modulation; c) RF signal strength

GENERAL

Power Requirements: 120/240 volts AC, 50/60 Hz, 25 watts

Ambient Temperature

Range: 10 - 50° C

Front Panel Controls: Function switch
Power switch
Monitor speaker level

Rear Panel Controls: Main channel squelch
Subchannel squelch
Composite output level

Rear Panel

Terminations: Antenna (BNC Connector)
Composite output (BNC Connector)
Main channel audio output (Screw Terminals)
Subchannel audio output (Screw Terminals)

Dimensions: (W) 19" standard rack mount (H) 3 1/2" (D) 9 1/2" overall

Weight: 12 pounds

OPTIONAL EQUIPMENT

SCA-1 Subchannel Kit. Consists of four plug-in subchannel cards: 1) Demodulator, 2) mute circuit and preamplifier, 3) bandpass filter, and 4) audio amplifier. Provides for full SCA/main channel operation of TBM-1000A.

TBM-0380 Transistorized stereo demodulator. Provides left and right channel low impedance unbalanced audio outputs for retransmission, recording or monitoring. Lamp indication of pilot carrier presence.

TBM-1005 5-CHANNEL FM RELAY RECEIVER



- Silicon Transistors and IC's
- Switchable 5-Channel Operation
- Fixed Tune 10.7 MHz IF's
- True Peak Meter Display
- Panel Monitoring Speaker
- Plug-in SCA Capability

DESCRIPTION

The McMartin TBM-1005 is a fully solid-state, crystal-controlled FM Relay Receiver designed for dependable high-quality monitoring and/or network relay of up to five separate FM broadcast stations in the 88-108 MHz band. In addition to balanced 600 ohm audio output, the TBM-1005 includes a composite signal output termination. Connection to a McMartin TBM-0380 Stereo Demodulator permits high-quality reception of stereo transmissions. The composite output is also suitable for feed directly to an FM transmitter or SCA modulation monitors (McMartin TBM-2000A or 4000A).

Each of the five channels is selectable from the front panel. All tuned circuits preceding the mixer 10.7 MHz IF output are switched, permitting each channel to be peaked for optimum performance. Cascade-connected FET's in the RF stages protect against crossmodulation effects and insure linear AGC action. Interference to adjacent radio services is eliminated by excellent shielding of HF oscillator-doubler circuits.

No tuning is required beyond the HF mixer. A solid-state, fixed 10.7 MHz bandpass filter followed by double symmetrical limiting insures excellent bandpass linearity and negligible distortion byproducts. An extremely wide-band pulse-counting detector produces linear recovery of the composite signal output.

Full SCA capability is possible with the TBM-1005 by employing the SCA-1 Subchannel Kit, comprising four plug-in module cards.

Balanced 600 ohm main channel and subchannel (with SCA-1 Kit) audio is brought out to rear terminals at a +8 dBm level. These outputs are not affected by operation of front panel controls. A panel speaker provides monitoring of each channel. A 4-inch illuminated modulation meter, meeting FCC ballistics requirements, is switchable to display true peak readings of main and SCA audio, plus RF signal strength.

SPECIFICATIONS

MAIN CHANNEL

Frequency Range: Any five fixed frequencies (88-108 MHz)
Sensitivity: 1 μ volt for 30 dB of quieting
IF Selectivity: 310 kHz @ 3 dB points
De-emphasis: 75 μ secs, \pm 1 dB (50 μ secs optional)
Antenna Input: 50-75 ohms. BNC connector

Program Audio Output

Level: +8 dBm @ 100% modulation (400 Hz)
Impedance: 600 ohms, balanced
Harmonic Distortion: Less than 0.5% (50-15,000 Hz)
Frequency Response: \pm 1.0 dB (30-15,000 Hz)
Hum & Noise: 60 dB below 100% modulation (400 Hz)

Monitor Audio Output

Level: 1 watt to panel mounted speaker
Harmonic Distortion: Less than 1.0% @ 400 Hz
Frequency Response: \pm 1.5 dB (50-15,000 Hz)

Composite Output

Level: 1.0 volt peak-to-peak max. (adjustable)
Impedance: 5,000 ohms
Harmonic Distortion: 0.5% @ 50% modulation
Frequency Response: \pm 1.5 dB (50-15,000 Hz)

SUBCHANNEL (with SCA-1 Kit)

Operating Range: 41, 42 or 67 kHz (other frequencies optional)
Modulation Range: \pm 6 kHz deviation equal to 100% modulation
Sensitivity: 3.0 μ volts for 30 dB of quieting
Signal/Noise Ratio: 60 dB below 100% modulation—400 Hz
Selectivity: 8 kHz @ 3 dB points
De-emphasis: 150 μ secs (75 μ secs optional)

SCA Audio Output

Level: +8 dBm @ 100% modulation @ 400 Hz

Impedance: 600 ohms, balanced
Harmonic Distortion: Less than 1.0% (30-7500 Hz)
Frequency Response: \pm 1.5 dB (30-7500 Hz)
Hum & Noise: 60 dB below 100% modulation @ 400 Hz

Monitor Audio Output — Same amplifier as used on main channel.

PEAK-READING MODULATION METER (Conforms to FCC requirements)

Accuracy: \pm 0.5 dB
Frequency Response: 30 - 75,000 Hz
Functions: (Selectable by front panel switch)
a) Main channel modulation;
b) Subchannel modulation; and
c) RF signal strength

GENERAL

Power Requirements: 120/240 volts AC, 50/60 Hz, 25 watts
Ambient Temperature Range: 10 - 50° C
Front Panel Controls: Function switch, Monitor speaker level (with AC on/off)
Rear Panel Controls: Main channel squelch; Subchannel squelch, Composite output level
Rear Panel Terminations: (BNC Connectors) Antenna, composite output. (Screw terminals) Main channel audio output, Sub-channel audio output
Dimensions: (W) 19" standard rack mount; (H) 3 1/2"; (D) 9 1/2"
Weight: 12 pounds
Finish: McMartin blue and brushed aluminum

OPTIONAL ACCESSORIES

SCA-1 Subchannel Kit, consists of four plug-in sub-channel cards: 1) Demodulator; 2) Mute circuit and preamplifier; 3) Bandpass filter; and 4) Audio amplifier. Provides for full SCA/main channel operation of TBM-1005.

TBM-0380 Transistorized stereo demodulator. Provides left and right channel low impedance, unbalanced audio outputs for retransmission, recording or monitoring. Lamp indication of pilot carrier presence.

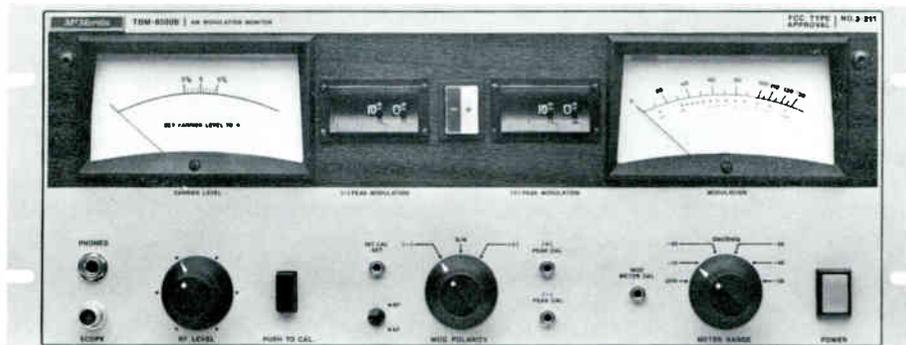
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AM MODULATION MONITOR

TBM-8500B



FCC TYPE APPROVAL #3-211

INTERNAL CALIBRATION

THUMBWHEEL SETTABLE PEAK FLASHERS FOR BOTH POSITIVE & NEGATIVE PEAKS

MONITORS 125% POSITIVE PEAK MODULATION

DIRECT READING AM S/N RATIO

REAR ACCESS PLUG-IN CARDS

REMOTE METERING CAPABILITY

SWITCHABLE AF/RF SCOPE OUTPUT

DESCRIPTION

The McMartin TBM-8500B is designed to accurately monitor the percentage of modulation, both positive and negative, of an AM broadcast transmitter as well as indicate carrier shift. The TBM-8500B also provides means to directly measure the AM signal-to-noise ratio.

A built in modulation calibrator allows front panel calibration of the monitor.

The TBM-8500B uses the latest techniques in solid-state circuitry and utilizes rear accessible plug-in grade G-10 glass epoxy etched circuit boards for ease in accessibility and maintenance.

The TBM-8500B features large, easy to read, 4½" meters for percentage of modulation and for carrier level indication. Separate peak flashers for simultaneous positive and negative modulation indication are adjustable by means of digital thumbwheel switches. The positive peak flasher can be set for any value of modulation between 50% and 129%, and the negative peak flasher for any value of modulation between 50% and 100%, both in 1% increments.

The modulation percentage meter functions as a semi-peak reading voltmeter. A switch provides monitoring of either positive or negative modulation. The modulation meter is switch-selectable to

allow direct measurement of AM signal-to-noise ratios as low as -70 dB. In this function the meter is appropriately damped to improve readability in the presence of noise. RF input level and carrier shift are continuously monitored by the front panel carrier level meter.

Front panel terminations include a headphone jack for monitoring the recovered audio, and an oscilloscope output that is switchable between the input RF and the recovered audio.

The rear panel provides termination for balanced 600 ohm recovered audio signal for monitoring, and a high impedance audio output for connection of external distortion measuring equipment.

A carrier failure alarm circuit is provided in the TBM-8500B with relay contacts provided for connection of external alarm devices.

Terminations are provided for remoteing both the negative and the positive peak flashers. Modulation percentage may be monitored at a remote location by addition of the optional Model RM-85B 5¼" rack mount remote meter panel.

The TBM-8500B is a 7" rack mount unit and is attractively finished in McMartin beige with a complementary wood grain.

FEB./74

SPECIFICATIONS

RF FREQUENCY RANGE 540 to 1,600 kiloHertz

RF INPUT
Sensitivity 3 to 10 volts rms
Impedance 50 ohms unbalanced

OUTPUTS:

AUDIO OUTPUT FOR MONITORING
Source impedance .. 600 ohms balanced
Minimum level ±4 dBm (100% modulation at 1kHz)
Frequency response ±0.5 dB (30 to 10,000 Hz)
Distortion 0.3% (30 to 10,000 Hz)

AUDIO OUTPUT FOR DISTORTION MEASUREMENTS
Impedance 10K ohms minimum
Minimum level 6 to 7 volts rms
(100% modulation at 1 kHz)
Frequency response ±0.5 dB (30 to 10,000 Hz)
Distortion 0.3% (30 to 10,000 Hz)

HEADPHONE OUTPUT
Impedance 22K ohms
Minimum level 3.0 volts rms
Frequency response ±0.5 dB (30 to 10,000 Hz)

OSCILLOSCOPE OUTPUT
(Switchable between input RF and audio output)
Impedance greater than 100K ohms
Level 5 volts p-p nominal
Termination BNC

PEAK FLASHERS
Accuracy ±2% of full scale (30 to 10,000 Hz)
Range Adjustable in 1% increments
Positive Peaks 50% to 129%
Negative Peaks 50% to 100%

MODULATION METER
(ballistics meet FCC requirements)
Size 4½"
Accuracy ±2% for 100% modulation
±4% full scale at any other percentage of modulation
Frequency response ±0.5 dB (30 to 10,000 Hz)
Scale 0-100% Negative
0-125% Positive Peaks
0-130% Full Scale

CARRIER LEVEL METER
Size 4½"
Scale Zero center. ±5% carrier shift indication in 1% increments

REMOTE PROVISIONS
Peak flashers & modulation meter directly remotable
(up to 3700 ohms external loop resistance may be accommodated)

CARRIER FAIL ALARM Normally open and normally closed contacts available on rear panel

POWER REQUIRED 105 to 125 Vac 50/60 Hz 45 watts

AMBIENT TEMPERATURE 0° C to 50° C (32° to 122° F)

MECHANICAL DIMENSIONS 19" (48.3cm) wide x 7" (17.8cm) high x 11" (27.9cm) deep

WEIGHT 22½ lbs.

FINISH McMartin beige with wood grain trim

ORDERING INFORMATION

TBM-8500B AM Modulation Monitor

RM-85B Remote Metering Panel (5¼" Rack Mount)

DIGITAL AM FREQUENCY MONITOR

TBM-8000



**ILLUMINATED DIGITAL READOUT
10 AND 20 Hz DEVIATION INDICATORS**

**FCC TYPE APPROVAL #3-182
FRONT ACCESS TO PLUG-IN CARDS**

DESCRIPTION

The McMartin TBM-8000 AM Frequency Monitor is designed to provide a visual, digital readout of frequency deviation of the operating carrier of standard AM broadcast transmitters in the range of 540 to 1600 kiloHertz.

The readout is by means of seven-segment numeric display modules which afford excellent readability even in high ambient light environments. Since both polarity and the frequency deviation are displayed directly, human error is virtually eliminated.

Three modes of operation are selectable by push-button switching. The normal operating mode is with the "Modulated Carrier" button depressed. This mode of operation uses a 10-second gate time. Readings over the deviation range from 0 to ± 39 Hertz are displayed.

With the "Unmodulated Carrier" button depressed, a 1-second gate time is employed. This position is

intended primarily for transmitter frequency adjustment.

A "Wide Range" mode is provided. The sampling rate is 1/10 second and increases the display range to ± 390 Hz. This position is useful for correcting wide deviations of the carrier frequency. Deviations beyond 390 Hz will blank the display; however, the polarity lamp will continue to operate with deviations up to ± 1 kiloHertz from the assigned frequency.

Protection against large deviations is afforded by indicator lamps which operate when frequency excursions in excess of 10 Hz and 20 Hz occur. Relay contact closures are available for the connection of external alarms when ± 20 Hertz has been exceeded.

A self-adjusting RF attenuator accommodates RF input levels up to 5 watts. A front panel warning indicator is provided to detect insufficient RF input.

Optional plug-in cards are available for :(1) driving automatic logging equipment with BCD logic; or (2) analog operation of remote meters.

SPECIFICATIONS

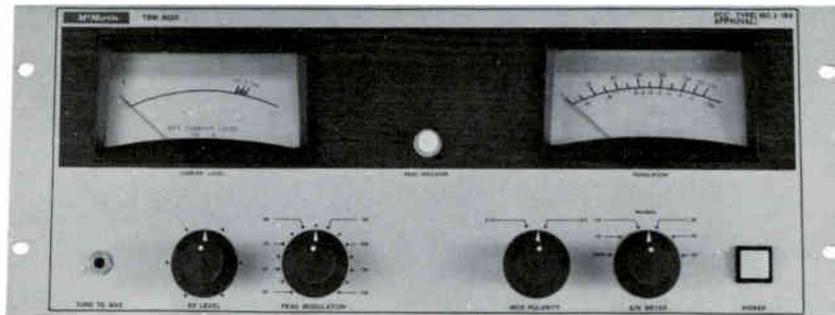
OPERATING RANGE	Any 10 kiloHertz increment, 540 to 1600 kHz
INPUT LEVEL	0.05 to 5.0 watts (max)
INPUT IMPEDANCE	50 ohms (UHF connector)
FREQUENCY STABILITY	Better than ± 2 parts per million (PPM). 0-55° C.
AGING RATE	Less than 2 PPM/mo.
AM REJECTION	Will reject a minimum of 95% modulation and typically will reject 98%
DISPLAY	0 to ± 39 Hertz in 1.0 Hz increments (Modulated and Unmodulated Carrier positions). 0 to ± 390 Hertz in 10.0 Hz increments (Wide Range position).
ALARM INDICATORS	1. Low RF input 2. Greater than 10 Hz deviation. 3. Greater than 20Hz deviation (contact closures available when ± 20 Hz has been exceeded).
POWER REQUIREMENTS	120, ± 10 Vac or 240, ± 20 Vac; 50/60 Hz. 20 watts
DIMENSIONS	(W) EIA Standard 19" Rack; (H) 3½"; (D) 9½"
WEIGHT	14 pounds
FINISH	Beige with Wood Grain Trim

OPTIONAL ACCESSORIES

RM-80-T/R	Remote Metering Kit, consisting of: RM-80-T, Plug-in BCD/analog conversion card; RM-80-R, Remote Rack Panel with meter and calibration control.
RM-81-T	Plug-in parallel BCD output (for driving automatic logging equipment).

AM MODULATION MONITOR

TBM-8500



FCC Type Approval #3-188

Silicon Solid State

Direct-Reading AM S/N Ratio

Carrier-Failure Alarm

Modular Plug-In Cards

Remote Metering Capability

DESCRIPTION

The McMartin Model TBM-8500 is designed to monitor the percentage of modulation of AM broadcast transmitters operating in the 540 to 1600 kiloHertz range.

The TBM-8500 employs the latest techniques in silicon, solid state circuit design. All devices are conservatively rated. Critical circuitry is placed on plug-in, Grade G-10 glass epoxy base, etched circuit boards.

The modulation percentage meter functions as a semi-peak reading voltmeter. When used for direct measurement of AM signal-to-noise ratio, the meter is appropriately damped to improve readability in the presence of noise.

A polarity switch permits measurement of either positive or negative modulation peaks by the meter and the peak flasher. The peak flasher lamp thresh-

old is adjustable for modulation levels from 20 to 120 per cent for positive peaks and 0 to 100 per cent for negative peaks.

RF input level and carrier shift are continuously monitored.

Rear chassis termination provides a balanced 600-ohm audio output signal, a high impedance audio output for external distortion measurements, relay contact closures for actuation of carrier-failure alarm devices and connections for remote peak flasher and modulation metering.

An optional remote metering kit, Model RM-85T/R, consists of the RM-85T plug-in remote meter amplifier card and the RM-85R, 5 1/4 inch rack-mount remote meter panel.

The TBM-8500 is attractively finished in the new McMartin beige and wood grain motif.

SPECIFICATIONS

RF Frequency Range 540 to 1,600 kiloHertz

RF INPUT

Sensitivity 5 to 10 volts rms

Impedance 50 ohms unbalanced

OUTPUTS

A. Audio Output for Monitoring Circuits

Source Impedance 600 ohms balanced

Level +4 dBm at 100 per cent modulation at 1 kHz

Frequency response ± 0.5 dB, 30 to 15,000 Hertz

Distortion 0.25 per cent maximum, 30 to 15,000 Hertz

B. Audio Output for distortion measurements

Impedance 10 K-ohms minimum

Level 6 to 7 volts rms at 100 per cent modulation at 1 kHz

Frequency response 30 to 15,000 Hertz, ± 0.5 dB

Distortion 0.25 per cent maximum, 30 to 15,000 Hertz

C. Headphone Output

Impedance 22 K-ohms

Level 2 volts rms

Frequency response 30 to 15,000 Hertz, ± 0.5 dB

PEAK FLASHER

Accuracy ± 2 per cent of full scale, 30 to 15,000 Hertz

Range Continuously adjustable 0 to 120 per cent positive peaks; 0 to 100 negative peaks

MODULATION METER (Ballistics meet FCC requirements)

Accuracy ± 2 per cent of full scale at 1,000 Hertz modulating frequency

Frequency response ± 0.5 dB, 30 to 15,000 Hertz

Scale 0 to 100 per cent negative peaks, 0 to 110 per cent positive peaks, 0 to 120 per cent full scale.

Remote Metering Terminations provided for remote peak flasher; and (with RM85-T/R kit) remote modulation meter

Power Requirements 105 to 125 volts AC, 50/60 Hertz

Fuse 0.5 amps

Ambient Temperature -10° C to 55° C

Mechanical dimensions Standard rack panel 19" w x 7" h x 11" d

Weight 22 $\frac{1}{2}$ pounds

Finish McMartin beige and wood grain trim

Optional accessory RM85-T/R remote meter kit

TBM-4000A FM/SCA MODULATION MONITOR



FEATURES

- **Modular Plug-In Construction**
- **Monitors Main, Total & Two SCA's**
- **Output for Stereo & SCA Expansion**
- **Entirely Solid-State**
- **Simultaneous Metering of Operating Parameters**
- **FCC Type Approval #3-153**

DESCRIPTION

Providing simultaneous metering of monaural FM total or main channel modulation plus frequency and modulation of one of two SCA channels, the McMartin TBM-4000A features plug-in, modular construction. Modules containing critical circuitry may be removed for field service.

Employing silicon transistors throughout, the TBM-4000A is a completely self-contained unit for measurement of all modulation characteristics of the FM broadcast station operating with SCA programming. Complete monitoring of 67 kHz subchannel parameters is standard equipment. Modules for monitoring a second subchannel (41 kHz or another frequency) are optionally available. In addition to monitoring SCA injection levels for carriers separated by 5 kHz (as required by the FCC), a unique McMartin filter design permits SCA injection level input monitoring without interruption of SCA programming.

For ease of measurements, a single function switch selects RF input level, total modulation, main channel modulation, SCA injection level, subchannel modulation, and FM or AM signal-to-noise ratios. In addition, SCA carrier frequency

and crosstalk main-to-SCA, SCA-to-main and SCA to SCA may be measured. ± 4 kHz or ± 6 kHz subcarrier deviation system monitoring is selectable from the front panel.

A composite signal output connector permits connection to a TBM-2000A SCA monitor (when up to two additional subchannels are to be monitored); to a TBM-2200 for stereo monitoring; or to external test equipment for measurement verification.

Individual high-speed indicating flashers, with terminations for remote indicators, adjustable over a 50-120% range, display peaks of total and subchannel modulation.

The TBM-4000A serves as a "basic" unit for the FM/SCA broadcaster whose planned expansion calls for additional SCA channels, or for stereo. The McMartin TBM-2000A or TBM-2200, respectively permit such expansion without obsoleting existing equipment.

For unsurpassed FM/SCA quality, the name McMARTIN is your assurance of quality product, reliable operation and optimum performance.

SPECIFICATIONS

MAIN CHANNEL MODULATION

Operating Range 88-108 MHz
 Modulation Range ± 75 kHz deviation for 100% modulation; ± 100 kHz deviation for 133% modulation

RF INPUT (UHF CONNECTOR)

Level 0.1 to 1.0 watt
 Impedance 50 ohms, unbalanced

MODULATION MAIN CHANNEL SCA CHANNEL METERS

Accuracy	± 0.5 dB	± 0.5 dB
Frequency Response	± 0.5 dB (30-15000 Hz) (Main Posn)	± 1.0 dB (30-7500 Hz @ 67 kHz; 30-5000 Hz @ 41 kHz)
	± 0.5 dB (30-75000 Hz) (Total Posn)	
	(Meter characteristics conform to FCC requirements)	

AUDIO OUTPUTS

(for aural monitoring)

Source impedance	600 ohms balanced	600 ohms balanced
Level (@ 100% mod - 400 Hz)	+4 dBm ± 75 kHz deviation	+4 dBm @ ± 6 kHz deviation
Distortion	Less than 1.0% (50-15000 Hz)	Less than 1.0% (400 Hz)

(for distortion measurements)

Impedance	10K ohms, or higher	10K ohms, or higher
Level (@ 100% mod)	7.0 volts	7.0 volts
Frequency Response	± 0.5 dB (30-15000 Hz)	± 1.0 dB (30-7500 Hz) - 67 kHz
Distortion	0.25% (30-15000 Hz)	1.0% (400 Hz)
Noise Level	66 dB below 100% mod. - 400 Hz	66 dB below 100% mod. (± 6 kHz) - 400 Hz

(Panel Headphone Jacks)

Impedance	20K ohms	20K ohms
Level	2.0 volts	2.0 volts

PEAK FLASHERS

Peak light adjustable to read positive and negative peaks from 50% to 120% mod. Meets FCC requirements.	Peak light adjustable to read modulation peaks from 50 to 120%. Responds to mod. peaks of 1 millisecond duration and remains on for 2-4 seconds as required by the FCC.
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MAIN CHANNEL COMPOSITE OUTPUT

Source Impedance 300 ohms
 Level 0.30 volts, peak-to-peak
 Frequency Response ± 0.2 dB, (50-100,000 Hz)

SCA MULTIPLEX MODULATION

Operating Range 67 kHz standard (2nd channel @ 41 kHz. Other frequencies available at additional cost)
 Modulation Range ± 4 kHz and ± 6 kHz deviation (ranges selectable by front panel function switch)

SCA FREQUENCY MONITOR

Operating Range Any two SCA sub-carriers selected by front panel switch
 Deviation Range ± 4000 Hz, center zero
 Accuracy Better than ± 50 Hz at 67 kHz
 Stability Maintained by crystal with .005% tolerance

SCA INJECTION LEVEL

Accuracy ± 1.0 %
 Meter Indication 0-15% in 1% increments, or 0-30% in 2% increments (Ranges selectable by chassis-mounted switch)

CROSSTALK (Crosstalk can be measured internally, down to -70 dB)

Main channel (30-15000 Hz) into SCA subchannel (67 kHz) -66 dB maximum
 Stereo (23-53 kHz) into SCA Subchannel (67 kHz) -55 dB maximum
 SCA #1 channel (67 kHz) into SCA #2 channel (41 kHz) -66 dB maximum
 SCA #2 channel (41 kHz) into SCA #1 channel (67 kHz) -66 dB maximum
 SCA channel (67 kHz) into main channel (30-15000 kHz) -66 dB maximum

AMBIENT TEMPERATURE

RANGE 10-50° C

POWER REQUIREMENTS

105-125 volts AC, 50/60 Hz, 45 watts

FRONT PANEL CONTROLS

Function switch, total and sub peak indicator modulation % ranges, subchannel selector switch, crosstalk-S/N, mod. polarity, freq. meter zero, SCA freq. deviation range, power

FRONT PANEL TERMINATIONS

Main channel phones, sub channel phones

REAR PANEL CONTROLS

RF level input, de-emphasis in/out, de-emphasis 75/150 μ sec

REAR PANEL TERMINATIONS

Main channel audio: 600 & Hi-z, sub-channel audio: 600 & Hi-z (screw terminals); RF input (UHF Connector); composite output (BNC); remote flasher-main and remote flasher-sub (Cinch-Jones)

DIMENSIONS

(W) Standard 19" rack panel, (H) 8 $\frac{3}{4}$ ", (D) 12 $\frac{1}{2}$ " overall

WEIGHT

25 pounds

FINISH

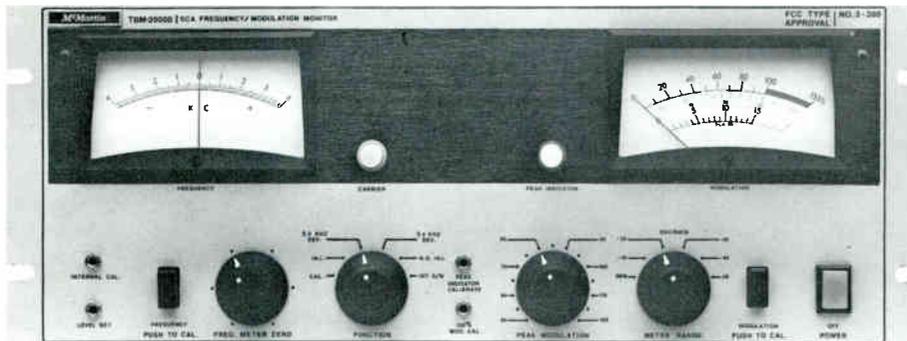
McMartin blue and brushed aluminum

OPTIONAL EQUIPMENT

SCA-4002 Second subchannel for TBM-4000A. Includes reference crystal and bandpass filter (Specify frequency)

SCA FREQUENCY/MODULATION MONITOR

TBM-2000B



INTERNAL CALIBRATION
MODULAR PLUG-IN CARD DESIGN

REMOTE METERING OPTION
CARRIER-OFF MUTING

DESCRIPTION

The McMartin TBM-2000B silicon solid-state SCA monitor, in conjunction with the McMartin TBM-3700, TBM-3500B, TBM-3500A, TBM-4000A or TBM-4500A monitors, will monitor all the characteristics of the SCA transmission. The TBM-2000B features the measurement of injection level, modulation, frequency of the SCA carrier, SCA FM signal-to-noise, and crosstalk.

For simplicity of operation, the various metering functions are incorporated in one switch. The functions read on the right meter as follows: Set level-cal., injection level, ± 6 kHz deviation, ± 4 kHz deviation, narrow band injection, and internal signal-to-noise of the monitor. In addition, the TBM-2000B features push-button calibration of the frequency meter, injection level, and modulation meter.

The modulation meter is a peak indicating device capable of measuring true peak value. The meter is also used as an audio voltmeter to measure the FM signal-to-noise of the sub-channel, main to sub-channel crosstalk, crosstalk between two sub-channels and the inherent FM S/N of the monitor. When the meter range switch is in the 'operate' position, the meter ballistics conform to the FCC requirement.

A crystal reference oscillator is used to calibrate the frequency meter. This oscillator and addi-

tional circuitry are used to accurately calibrate the modulation meter and the internal calibrate system. The internal FM noise of the TBM-2000B is typically 70 dB below 100% modulation.

The frequency meter is automatically protected against severe overload. A carrier light indicates presence of the sub-channel. The audio is automatically muted and the frequency meter deactivated in the absence of the subcarrier. The mute threshold is adjustable.

The TBM-2000B has complete facilities for remote monitoring of the modulation, carrier frequency deviation, peak modulation indicator and sub-carrier presence indicator.

Two rear-chassis composite output terminations are available for viewing the wide band output.

A relay is activated when the SCA carrier is muted or falls below a predetermined level. One pair of relay closures are available on the rear chassis for operation of an external signal system for indication of carrier 'On' or 'Off' condition.

All critical circuits have double regulation for added stability. All solid state devices are operated far below their rated voltage for greater reliability.

MAR/74

The FCC type approval number is 3-200.

SPECIFICATIONS

OPERATING RANGE: 67 kHz standard (26, 41, 42 and 65 kHz frequencies optional)

MODULATION

RANGE: ± 6 kHz deviation—100 percent modulation
 ± 4 kHz deviation—100 percent modulation
 .. Selection is made by front panel function switch

COMPOSITE INPUT

Impedance: 2000 ohms
 Level adjustable by front panel level set: 0.3 volts rms or greater

MODULATION METER

Accuracy: ± 0.5 dB
 Frequency response: 30 - 7500 Hz ± 1 dB (67 kHz)
 30 - 5000 Hz ± 1 dB (41 kHz)

PEAK FLASHER INDICATOR:

Peak light adjustable to read modulation peaks from 50 to 120 percent. Responds to modulation peaks of 0.1 millisecond duration and remains on for 2 to 4 seconds as required by the FCC.

INTERNAL MODULATION CALIBRATION ACCURACY:

..... $\pm 2\%$

SCA FREQUENCY METER

Deviation range: ± 4000 Hz, center zero
 Accuracy: Better than ± 50 Hz at 67 kHz
 Stability: Maintained by crystal with 0.005 percent tolerance

SCA INJECTION CIRCUIT

Accuracy: ± 0.5 percent
 Meter indication: 0-15 percent in 1 percent increments
 0-30 percent in 1 percent increments

Internal injection calibrator accuracy: ± 0.5 percent

OUTPUTS—SCA SUB-CHANNEL

AUDIO OUTPUT FOR MONITORING CIRCUITS

Source impedance: 600 ohms balanced
 Level: +2 dBm at ± 6 kHz deviation (100 percent modulation -400 Hz)
 Distortion: Less than 1 percent (400 Hz)

AUDIO OUTPUT FOR DISTORTION MEASUREMENTS

Impedance: 10K ohms or greater
 Level: 4 volts at ± 6 kHz deviation (100 percent modulation -400 Hz)
 Frequency response: 30-7500 Hz ± 1 dB (67 kHz)
 Distortion: 1.0 percent, or less -400 Hz
 Noise level: 66 dB or greater below ± 6 kHz deviation (100 percent modulation -400 Hz)

CROSSTALK (front panel range control measures down to -70 dB)

Main channel (30-15000 Hz) into SCA sub-channel: 66 dB or better
 Stereo (23-53 kHz) into SCA sub-channel (67 kHz): 55 dB or better
 SCA-1 channel into SCA-2 channel: 66 dB or better

POWER REQUIRED: 105-125 volts AC, 50/60 Hz 35 watts
FUSE: 0.5 amp slo-blo

AMBIENT TEMPERATURE RANGE:

..... 10-50° C

DIMENSIONS:

(w) 19" (EIA standard rack mount)
 (h) 7"
 (d) 13" overall

WEIGHT:

..... 20 pounds

FINISH:

McMartin beige with wood grain trim

REMOTE MONITORING FACILITIES

Modulation: (optional) RM-37 T/R kit available. Modulation may be remotely monitored with 2,500 ohm external loop resistance plus remote meter resistance. Remote meter is completely independent of internal meter

Frequency: Subcarrier frequency may be remotely monitored with remote line resistance up to 3,000 ohms

Peak flasher: Termination provided for remote peak flasher installation

Subcarrier presence indicator: Termination provided of relay closure for remote "Subcarrier On" indicator or external carrier failure alarm devices

STEREO MODULATION/FREQUENCY MONITOR

TBM-2200A



PLUG-IN MODULAR DESIGN

19 kHz FREQUENCY METERING

19-38 kHz PHASING ADJUSTMENT

LEFT AND RIGHT MODULATION METERS

FULL REMOTE METERING OPTIONS

INTERNAL 19 kHz CALIBRATION

DESCRIPTION

The McMartin TBM-2200A solid state stereo modulation and frequency monitor is designed to operate in conjunction with McMartin base band monitors, TBM-3700, TBM-4000A, TBM-3500A, or TBM-3500B, to provide all stereo monitoring requirements. Three meters are used for simultaneously monitoring the left and right stereo channels and the center frequency deviation of the 19 kHz pilot carrier. The right and left meters are also used as audio voltmeters, which serve a secondary function of measuring separation between right and left channels, crosstalk between main and subchannels, 38 kHz carrier suppression and stereo S/N of each channel.

The various meter functions are incorporated in one switch. Functions read on the left meter are as follows: Calibrate level, pilot injection level, operate, L+R, 19-38 kHz phasing, 38 kHz suppression and stereo signal-to-noise ratio. L-R information is read on the right meter. When the function switch is in the stereo S/N position, the audio is automatically de-emphasized.

A precise 19 kHz signal and additional circuitry are used to accurately calibrate the 19 kHz pilot injection measuring circuits. This allows

daily verification of the accuracy of the monitor and frequency of the 19 kHz pilot.

The metering circuits used in the TBM-2200A are peak-indicating devices capable of accurately measuring composite signals. The meter driving circuits are designed to go into saturation slightly above full scale deflection to protect the meters against severe overload.

An indicator light displays the presence of the 19 kHz pilot carrier. A phasing control, located on the front panel allows adjustments of the 19 and 38 kHz circuits for exact phase coincidence.

A switched front panel termination permits viewing of the pilot carrier, L+R and L-R signals. All critical circuits are on plug-in cards, removable from the rear of the chassis for ease of servicing. The power supply design includes short circuit protection. A squelch circuit disables the 19 kHz frequency metering in the absence of the pilot carrier.

The TBM-2200A has complete facilities for optional remote monitoring of the 19 kHz pilot carrier level, left and right stereo modulation and frequency deviation of the pilot carrier.

SPECIFICATIONS

COMPOSITE INPUT

Impedance: 5K ohms
Sensitivity: 0.9 to 1.5 volts peak to peak

OUTPUTS (left and right)

AUDIO OUTPUT FOR MONITORING CIRCUITS

Source impedance: 600 ohms balanced
Level: +2 dBm at 100 percent modulation
at 400 Hz
Distortion: Less than 0.5 percent
(50-15,000 Hz)

AUDIO OUTPUT FOR DISTORTION MEASUREMENT

Impedance: 10K ohms or greater
Level: 5 volts at 100 percent at 400 Hz
Frequency response: ± 0.5 dB, 30-15,000 Hz

DISTORTION

STEREO: 0.35 percent, 30-15,000 Hz
STEREO NOISE
LEVEL: -66 dB below 100 percent modulation
at 400 Hz

COMPOSITE OUTPUT SOURCE

IMPEDANCE: 1000 ohms
LEVEL: 0.3 volts rms
FREQUENCY
RESPONSE: ± 0.2 dB, 50-75,000 Hz

PILOT INJECTION CIRCUIT

ACCURACY: ± 0.5 percent
METER INDICATION: 6-12 percent (pilot injection scale)
INDICATOR: Pilot lamp (operates at 5 percent or
greater injection level)

INTERNAL PILOT CALIBRATE

ACCURACY: ± 0.5 percent

MODULATION METERS (left or right)

ACCURACY: ± 0.5 dB
FREQUENCY
RESPONSE: ± 0.5 dB, 30-15,000 Hz

SEPARATION

LEFT and
RIGHT CHANNELS: -45 dB or better (50 to 10,000 Hz)
-40 dB or better (10,000-15,000 Hz)

NOTE: Separation can be measured internally down to 30 dB

MEASUREMENT OF SUPPRESSED 38 kHz CARRIER

MODULATED 100%
WITH FREQUENCIES
ABOVE 5 kHz: Better than 50 dB
NO MODULATION: Better than 60 dB

CROSSTALK

MAIN INTO STEREO
SUB CHANNEL: 50 dB or better
STEREO
SUBCHANNEL INTO
MAIN CHANNEL: 50 dB or better
67 kHz INTO
MAIN OR
STEREO CHANNEL: 66 dB or better

PILOT CARRIER FREQUENCY METER

DEVIATION RANGE: ± 2.5 Hz
ACCURACY: ± 0.25 Hz

REMOTE MONITORING FACILITIES

MODULATION: Optional RM-22 T/R kit available.
Left and right meter may be remotely
monitored with 2500 ohm external
loop resistance. Remote meters are
completely independent of internal
meters.

PILOT CARRIER FREQUENCY:

Frequency deviation may be remotely
monitored with 2500 ohms ex-
ternal loop resistance.

POWER REQUIRED: 105-125 volts AC

AMBIENT TEMPERATURE RANGE:

..... 10-50 degrees C

DIMENSIONS: (w) . . . 19" (EIA Standard rack mount)
(h) 7"
(d) 13" overall

WEIGHT: 15 lbs.

FINISH: McMartin beige with wood grain trim

TBM-3500A FM MODULATION MONITOR



- **Modular Plug-In Construction**
- **FCC Type Approval #3-161**
- **Completely Silicon Solid State**
- **Reads AM/FM S/N Ratios**
- **Permits Future Expansion for SCA/Stereo**
- **Meter Ballistics Conform to New FCC Rules**

DESCRIPTION

The McMartin TBM-3500A FM Modulation Monitor is of completely new silicon solid-state design and features modular, plug-in construction. It monitors the modulation characteristics of a monaural FM broadcast station. In addition, the TBM-3500A serves as the basic unit for future expansion to include SCA programming or stereophonic broadcasting, by addition of the TBM-2000A SCA monitor and/or the TBM-2200 Stereo Modulation Monitor, respectively. Dual composite output connectors are provided for this purpose.

The indicating meter and associated circuitry function as a semi-peak reading voltmeter, independent of waveform. Meter calibration is readily checked with an internal reference oscillator. When the front panel "Function" switch is in the "Main" or "Total" modulation position, the meter ballistics and circuitry conform to Section 73.332 of the FCC Rules and Regulations. Meter damping is employed in the AM and FM signal-to-noise positions to facilitate meter readings under noisy conditions. In these latter positions 75 microsecond de-emphasis is automatically inserted into the measuring circuitry. An RF input level position is also provided.

A high-speed peak indicating light, adjustable over a 50 to 120% modulation range, is mounted on the front panel with provisions for connection of a remote indicator. The lights remain on for a duration of 2 to 4 seconds in accordance with FCC requirements.

A modulation polarity switch permits meter monitoring of negative or positive peaks.

All transistors are conservatively rated for reliable, trouble-free service. Power supply decoupling and isolation eliminate failure in the event of a short-circuit in any plug-in module.

Rear chassis terminations provide access to high-or-low impedance audio outputs for aural monitoring or external measurements. De-emphasis may be switched in or out for test purposes.

The advanced design and performance of the new TBM-3500A is typical of the reliability, convenience and quality assured by any product bearing the McMARTIN name.

SPECIFICATIONS

Operating Range 88-108 MHz
Modulation Range ± 75 kHz deviation—100% modulation
..... ± 100 kHz deviation — 133% modulation

RF Input:

Impedance 50 ohms, unbalanced
Sensitivity 0.1 to 1.0 watt

Composite Input:

Impedance 33,000 ohms
Sensitivity 1 volt peak-to-peak

Modulation Meter (scale and ballistics conform to FCC requirements)

Accuracy ± 0.5 dB
Frequency Response .. ± 0.5 dB (30-75,000 Hz)
Adjustable over range of 50 to 120% modulation. Remains on for 2 to 4 seconds after peak, per FCC requirements.

Outputs

Audio—for monitoring circuits

Source impedance 600 ohms, balanced
Level +4 dBm @ 100% modulation @ 400 Hz
Frequency Response .. ± 0.5 dB, (30-15,000 Hz)
Distortion Less than 1.0% (50-15,000 Hz)

Audio—for distortion measurements

Impedance 10,000 ohms, minimum
Level 7.0 volts RMS @ 100% modulation — 400 Hz
Frequency Response .. ± 0.5 dB (30-15,000 Hz)
Distortion 0.25% (30-15,000 Hz)

Headphone jack

Impedance 22,000 ohms
Level 2.0 volts RMS
Frequency Response .. ± 0.5 dB (30-15,000 Hz)

Composite:

Source Impedance 300 ohms
Level 1.0 volt, peak-to-peak
Frequency Response .. ± 0.25 dB (50-100,000 Hz)

Crosstalk (with SCA operation)

Main channel(30-15,000 Hz) into Subchannel (67 kHz) 46 dB or better
Subchannel (67 kHz) into Main channel (30-15,000 Hz) 66 dB or better

Front Panel Controls Function Switch
..... Modulation Polarity
..... Meter Range
..... Power On/Off
..... Peak Mod. Adjust

Front Panel Terminations: Composite output (BNC)
Headphones (jack)

Rear Panel Controls RF input level
..... De-emphasis in/out

Rear Panel Terminations .. Hi-Z audio (screw term.)
..... Lo-Z audio (screw term.)
..... Remote flasher (Cinch-Jones)
..... Composite input (BNC)
..... Composite output—2 (BNC)
..... RF input (UHF)

Power Requirements 105-125 volts, AC; 50/60 Hz; 25 watts

Ambient Temperature ... 10°-50° C

Dimensions (W) Standard 19" Rack Panel,
..... (H) 7"; (D) 8"

Weight 20 pounds

Finish McMartin blue and brushed aluminum

"8" MIXER AUDIO CONTROL CONSOLES

monaural **B-801**
stereo **B-802**
dual mono **B-803**
dual stereo **B-802-S1**
stereo mono **B-802-S2**



DESCRIPTION

Featuring plug-in modular design of all amplifiers and input channel devices for complete operational flexibility, the new McMartin audio consoles provide pushbutton selection of twenty-seven input sources controllable through eight mixing channels.

Standard models are the B-801 monaural, the B-803 dual-channel mono, the B-802 stereo, the B-802-S1 dual-channel stereo and the B-802-S2 stereo/mono "simulcast" version. All models are housed in identical cabinetry.

In their standard configurations, the first three mixing channels are equipped with low-level microphone preamplifiers. Mixers #4 through #7 accommodate high-level unbalanced input sources and Mixer #8 is a high level balanced input for network, auxiliary and four remote line input application. The B-802 models are equipped with module complement to deliver full stereo capability in both the program and monitor channels, throughout the entire console system.

All eight mixing channel module connectors are pre-wired to permit use of microphone or high level modules in any of the input channels. Spare switch contacts have been incorporated to permit extension

of speaker muting and warning light control logic to all eight inputs.

High-quality step-type attenuators with cue switches are used in all mixing channels. Complete cueing of all eight mixer inputs, with built-in panel speaker, is provided.

Monitor amplifier modules provide 8-watt rms output level for studio and house monitor speakers.

All models are equipped with selective intercom between the operating position and each of three studios or four remote lines plus a general paging location.

All solid-state devices are operated at conservative ratings and only highest grade components are used. Close attention has been paid to human engineering design with switches and controls positioned for logical, error-free operation.

The B-800 Series is handsomely styled and completely self-contained. With the interconnection of power source and external device cabling, these consoles are ready to deliver many years of highly-professional, reliable service.



FRONT VIEW/B-802 stereo console

SPECIFICATIONS

PROGRAM CHANNEL(S)

FREQUENCY RESPONSE: ± 0.5 dB, 20 to 20,000 Hertz

TOTAL HARMONIC DISTORTION 0.5% or less, 20 to 20,000 Hz @ +18 dBm output with -50 dBm signal fed to any low level input

S/N RATIO: 74 dB or greater below +18 dBm output. -50 dBm input to any low level input. Master and channel mixers adjusted for equal attenuation, totaling 34 dB

OVERALL GAIN ... 102, ± 2 , dBm

OUTPUT LEVEL ... +8 dBm nominal. +24 dBm maximum capability

INPUT LEVELS ... Channels 1-3: -60 dBm nom., -30 dBm max. Channels 4-7: -15 dBm nom., +10 dBm max.

INPUT IMPEDANCES ... Channels 1-3: 150 ohms balanced. (50/600 ohms by strapping). Channels 4-7: 600 ohms unbalanced. (150 ohms by strapping). Channel 8: 600 ohms balanced (150 ohms by strapping).

LINE OUTPUT SWITCHING B-801: Line 1, Line 2 and terminated OFF positions.
B-802: Stereo (separate L and R outputs), Mono (L+R feeding Line 1) and terminated OFF positions.
B-803: Channel A to Line 1/Channel B to Line 2, Reversal, and terminated OFF positions.

AUDITION BUSS

OUTPUT(S) B-801, B-802, B-802/S2: -10 dBm, 10K ohms, unbalanced. B-803: None.
B-802/S1: +8 dBm nominal, +24 dBm maximum.

CROSSTALK B 801, below noise level (audition to program)
B-802, below noise level (L to R to audition)
B-803, below noise level (Channel A to Channel B)

MONITOR CHANNEL(S)

FREQUENCY RESPONSE: ± 0.5 dB, 20 to 20,000 Hertz

TOTAL HARMONIC DISTORTION 0.75% or less, 20 to 20,000 Hz @ 8 watts rms output

S/N RATIO: 70 dB below 8 watts (with ± 18 dBm at program line output(s)).

OUTPUT LEVEL 8 watts rms

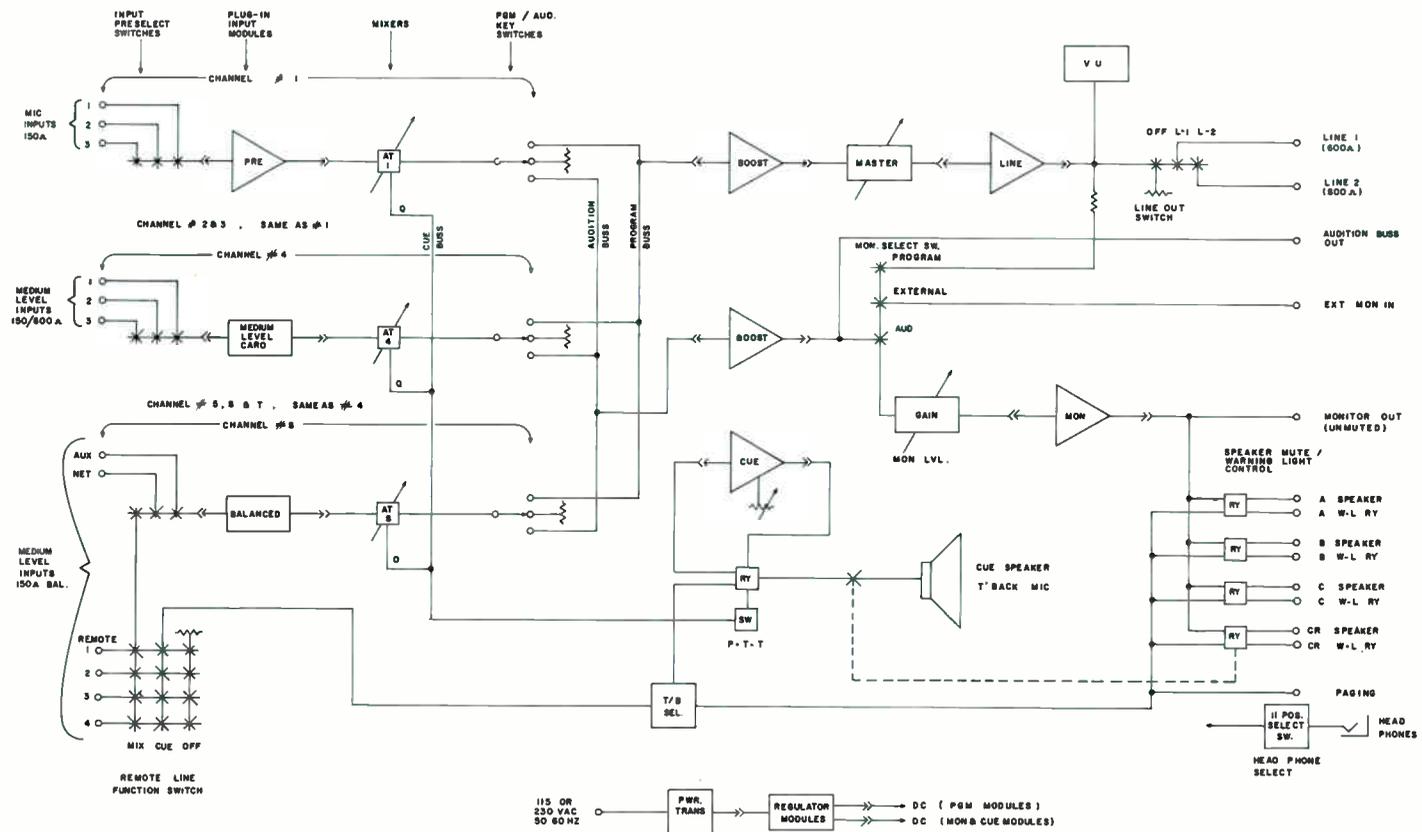
OUTPUT IMPEDANCE 8 to 16 ohms, unbalanced

POWER REQUIRED B-801 65 watts
..... B-802 100 watts
..... B-803 80 watts

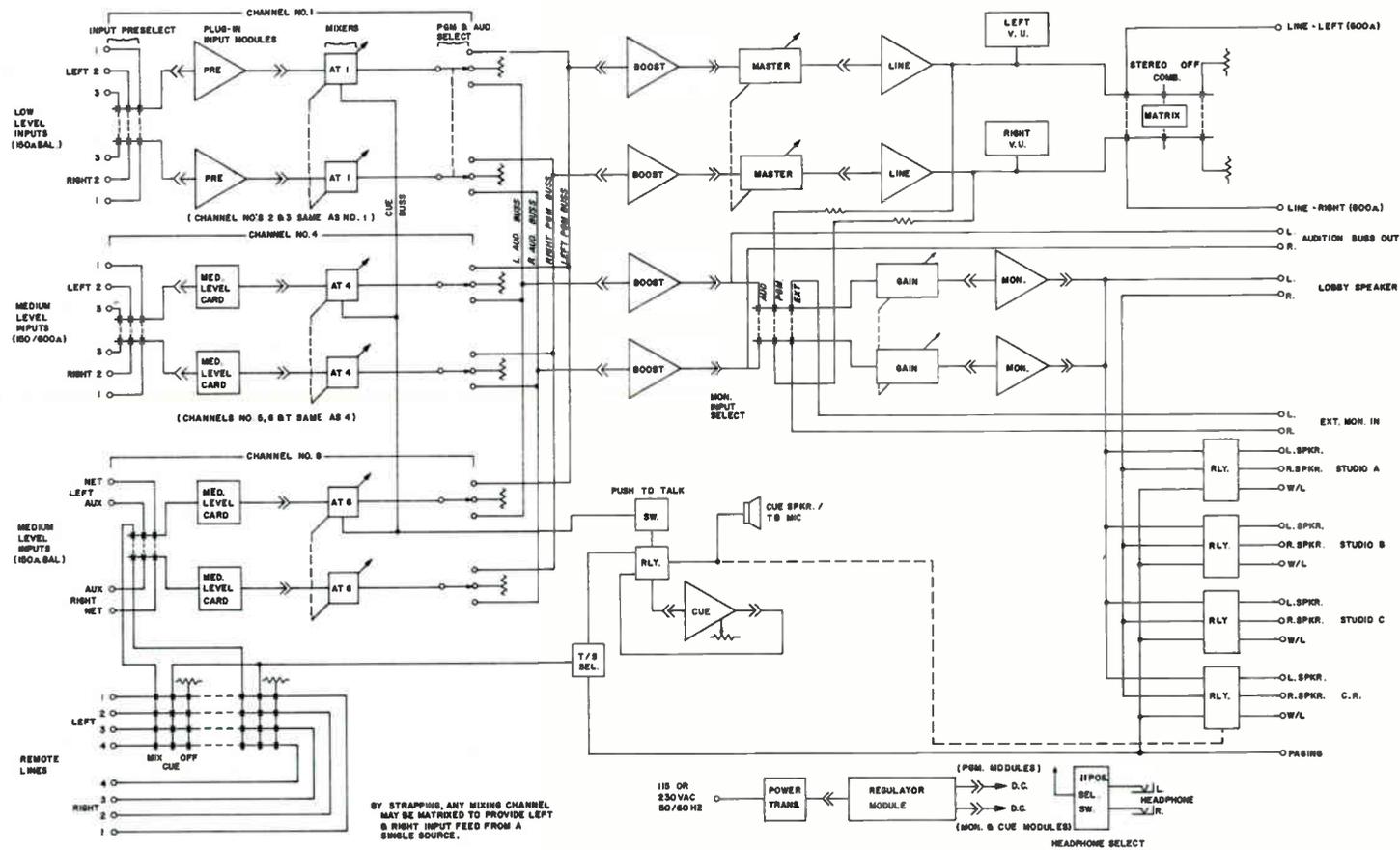
DIMENSIONS: ... 44 $\frac{7}{8}$ " wide, 18 $\frac{1}{4}$ " deep, 9 $\frac{3}{4}$ " high

FINISH Cabinet: Beige with wood trim end panels. Front Panel: Upper control area — beige, lower control area — black.

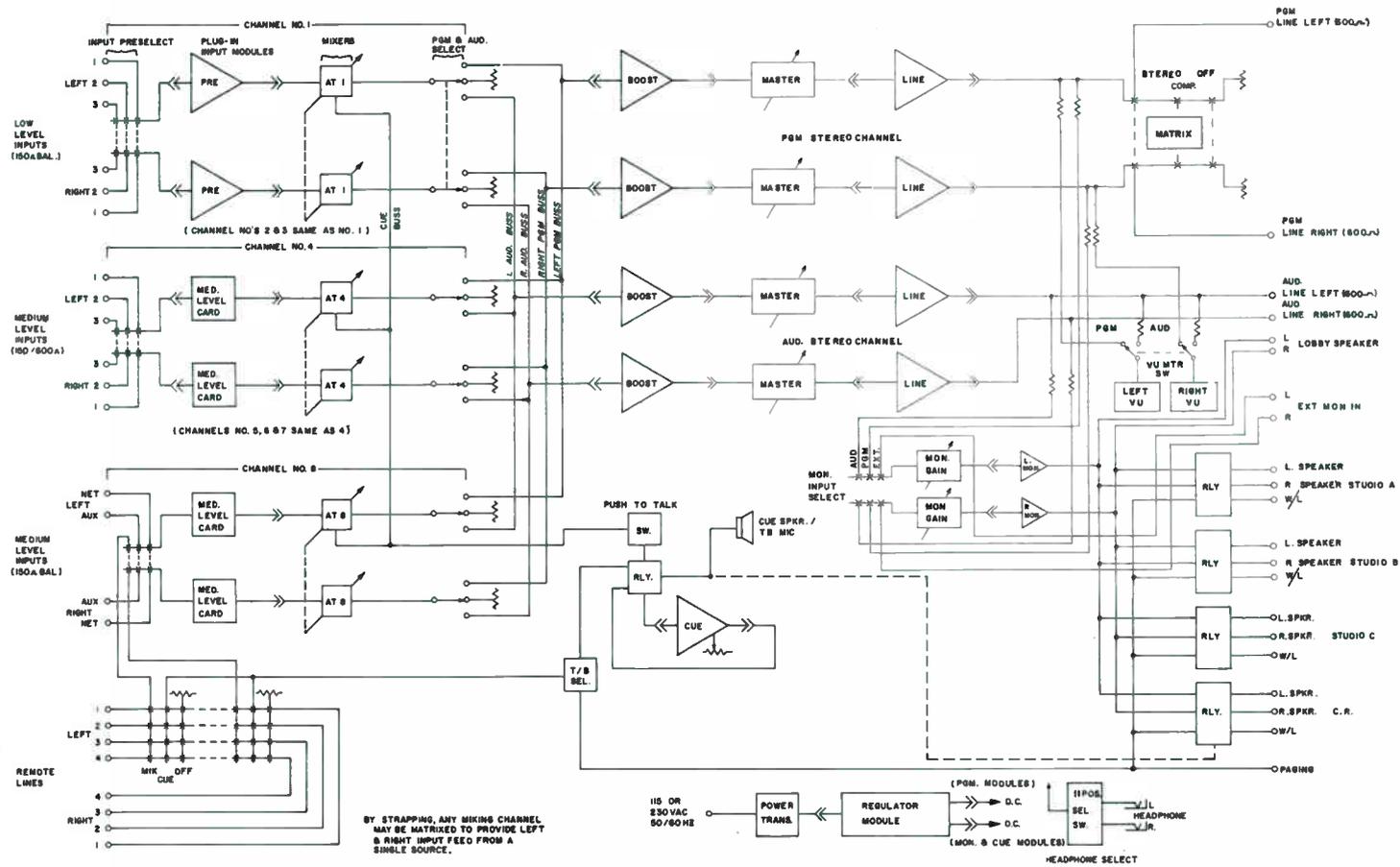
FUNCTIONAL BLOCK DIAGRAM/B-801 monaural console



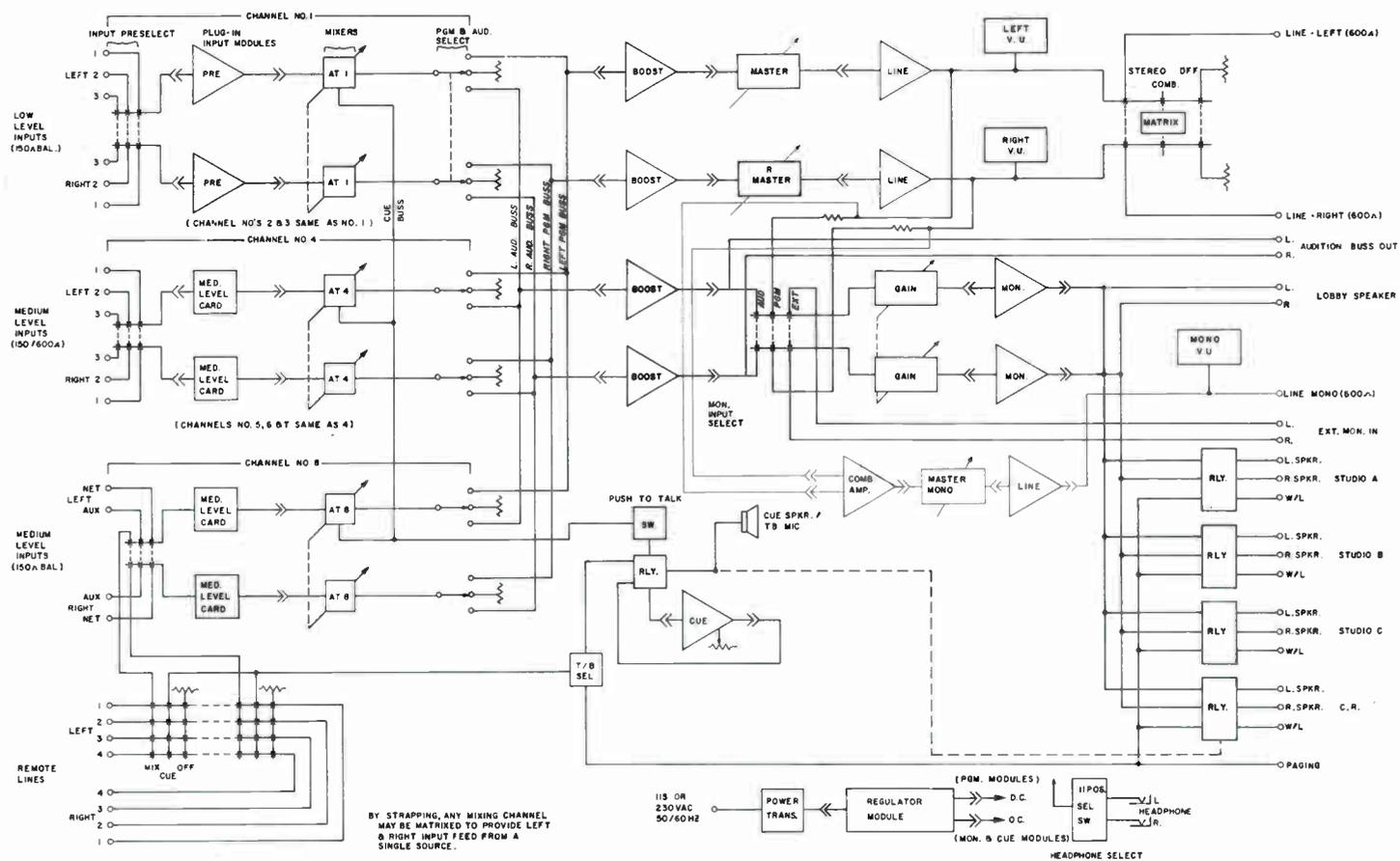
FUNCTIONAL BLOCK DIAGRAM/B-802 Stereo Console



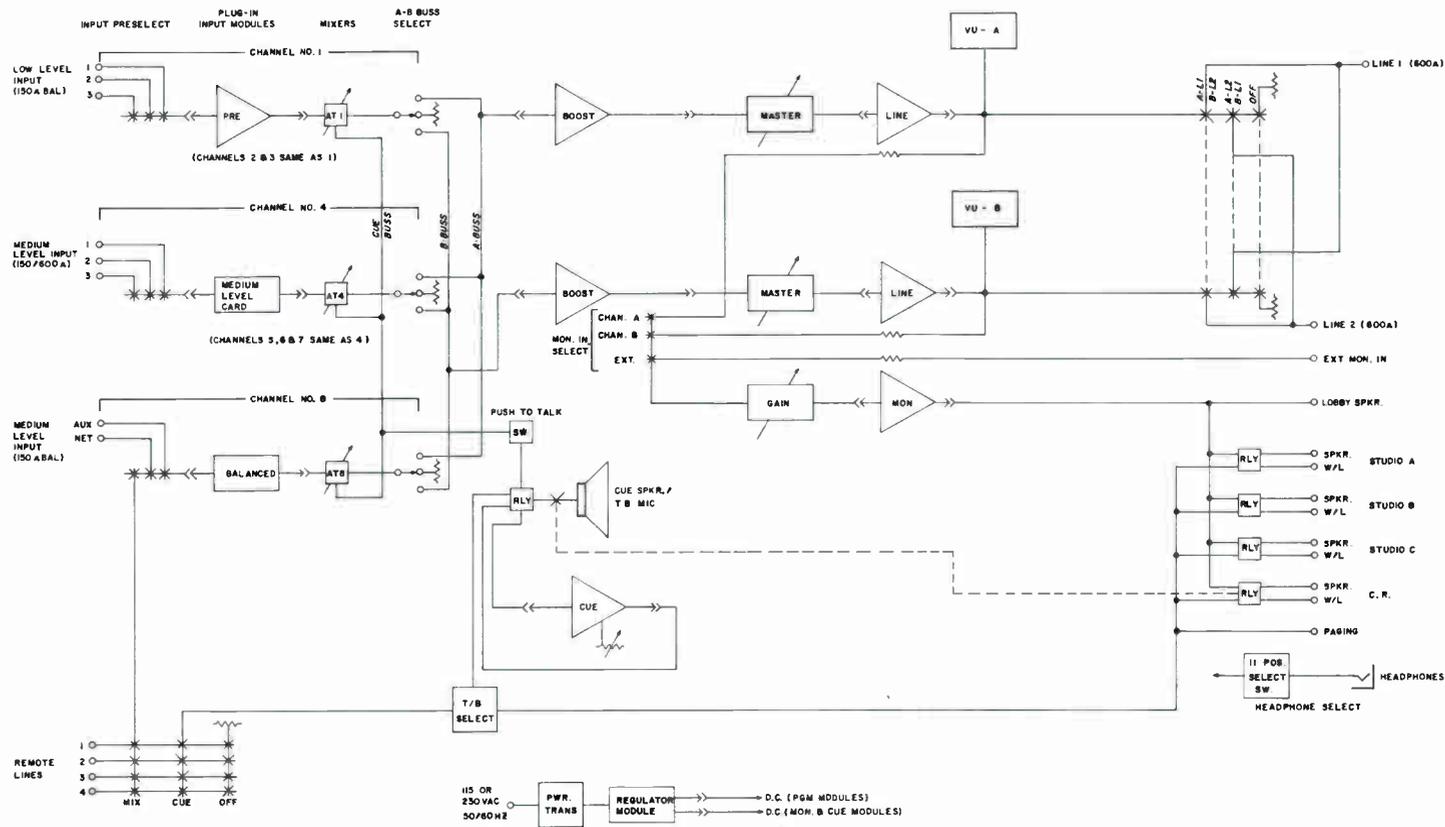
FUNCTIONAL BLOCK DIAGRAM/B-802-S1 dual stereo console

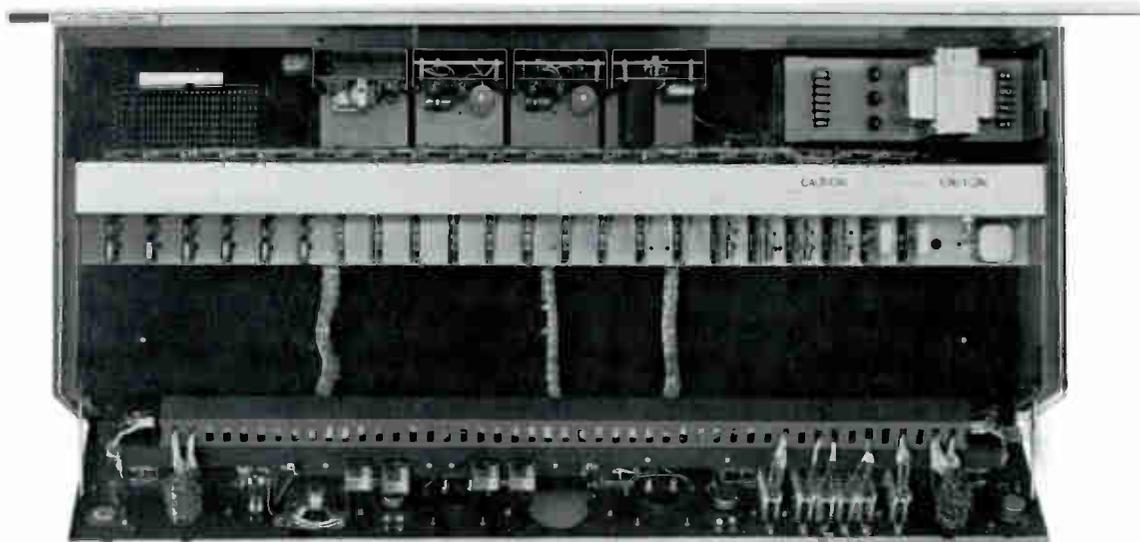


FUNCTIONAL BLOCK DIAGRAM/B-802-S2 stereo/monaural

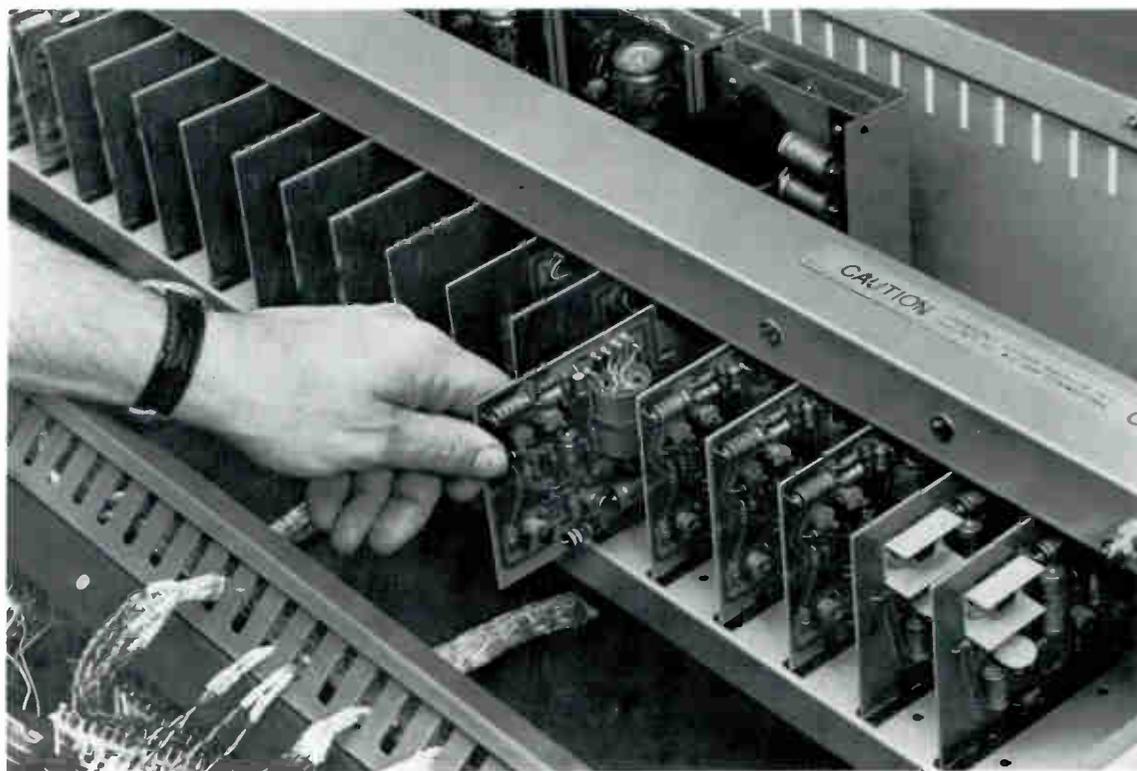


FUNCTIONAL BLOCK DIAGRAM/B-803 dual channel console





OPEN VIEW/B-802 stereo console



TYPICAL PLUG-IN CAPABILITY/B-800 series

McMartin

five mixer
audio control
console

B-500 series



compact design ideal for production and
small on-air studios as well as mobile units

excellent performance specifications

plug-in modular design

input modules available for:

microphone, RIAA phono, and balanced high-level

standard configuration one microphone, four balanced high level inputs
other input combinations by simple plug-in module substitution

two preselect inputs per mixer

four watt rms monitor amplifier

cue on all mixers

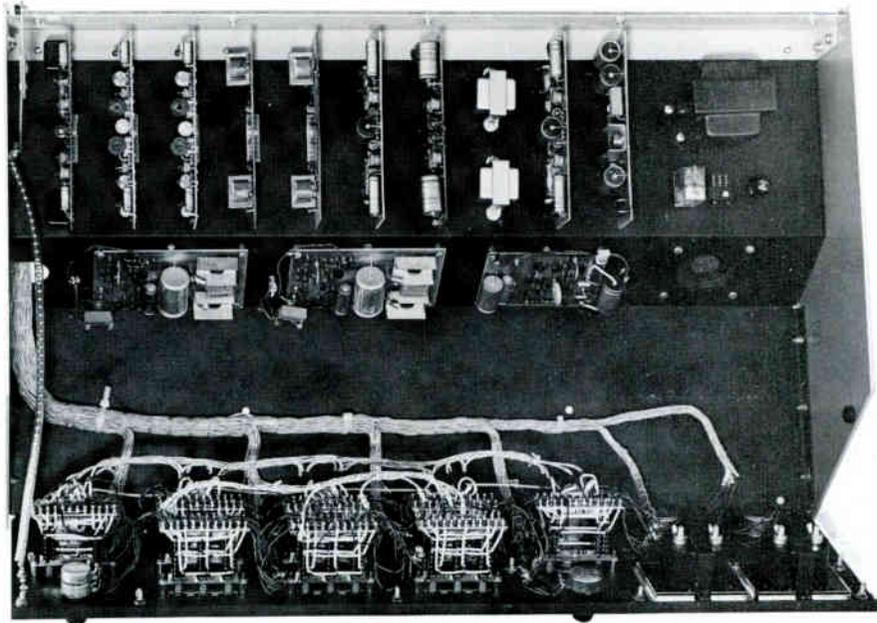
built-in cue-amplifier and speaker

speaker muting for one studio, muting for second studio optional

attractively styled

functional, large, well located controls

monaural, stereo and dual-channel models



OPEN VIEW/B-502 stereo console

DESCRIPTION

The McMartin B-500 series five-mixer audio consoles have been designed to provide for audio mixing and control for production and broadcasting application. Three models in the B-500 series are available, the B-501 monaural console, the B-502 stereo console and the B-503 dual channel console.

B-500 series consoles provide five mixing channels, with switch selection of two inputs per mixer (a total of 10 inputs are provided). Each mixer output may be switched to the program or the audition busses of the console. Each mixer is provided with a detented counter-clockwise cue switch, to allow aural monitoring of any input channel by means of an integral 2-watt cue amplifier and built-in cue speaker. A front panel cue gain control is provided.

The five mixers are precision molded composition triple wiper attenuators which will typically operate for over 5 million operations without mechanical or electrical degradation. These potentiometers are guaranteed by McMartin for five years. B-500 series five mixer consoles are available with step attenuators. These are identified by the basic model number plus the suffix "SA" for the step attenuator models.

Plug-in modules are used in the program and audition channels of the B-500 consoles. Input cards are available for microphone and RIAA equalized phono preamplification and for balanced high level inputs.

The use of these plug-in cards permits the user to tailor the console to his specific operating requirement. The standard models are supplied with one microphone preamplifier and four balanced high level input modules. Numerous other combinations are available as original purchase options or may be changed in the field at any time simply by unplugging one card, and plugging in the desired type input card.

Plug-in phono preamps, utilizing the consoles well-regulated and ripple-free power supply and requiring no external packaging, are considerably more economical than the sep-

arate outboard type. The phono preamplifier printed circuit board will accommodate a user-installed scratch filter.

The microphone preamplifiers accept low impedance balanced microphones of 150 ohm or 250 ohm impedance.

Balanced high level input cards are factory wired to accept 600 ohm balanced line inputs. Additional transformer taps accommodate 150 ohm or 50 ohm balanced inputs.

Each console is provided with a speaker muting/warning light relay for one location that operates in conjunction with the A input of mixer #1. Switching of that input to either the audition or the program bus will activate the relay. A prewired socket accepts an optional second relay for an additional location. It is connected to operate in conjunction with the B input of mixer #1. Spare contacts are available on all channel lever key switches, and on input select pushbuttons to allow extension of the muting/warning light relay control wiring to any or all other mixing channels.

All wiring connections to B-500 consoles are by means of rear panel mounted barrier type screw terminal strips. Space and cutouts are provided to allow field installation of two XLR-3 microphone connectors.

Convenient headphone jacks for monitoring are provided on both models, with front panel switch selection of the program, audition or cue busses.

The console outputs may be switched to two output lines or to an internal terminating load.

Program outputs are for 600 ohm balanced lines, and are at a + 8 dBm output level. Audition output levels, available to feed recording equipment, are 1.5V rms and can feed unbalanced 2.5K ohm loads.

B-500 series consoles represent the ultimate in flexibility, in a compact and attractive cabinet. They reflect the extensive, professional-quality, audio experience of McMartin in the design and manufacture of broadcast audio consoles.

SPECIFICATIONS

SPECIFICATIONS

PROGRAM CHANNEL(S)

Frequency response	±0.5 dB, 30-15,000 Hz
Harmonic Distortion	0.5% or less, 30-15,000 Hz @ +18 dBm output
S/N Ratio	72 dB or greater below +18 dBm output with -50 dBm signal fed to microphone input

Crosstalk

B501 Monaural (addition to program)	below noise level
B-502 Stereo (left channel to right channel to audition channel)	below noise level

B-503

(Program bus #1 to program bus #2 to audition channel)	below noise level
Overall Gain	100 ±2 dB
Output Level	+8 dBm for 0 VU meter reading +18 dBm capability

Input Levels

Microphone channels	-60 dBm nominal, -34 dBm maximum
RIAA Phono channels (optional)	input sensitivity 1 millivolt rms at 1 kHz 100 millivolts maximum
High level channels	-15 dBm nominal, +10 dBm maximum

Input Impedances

Microphone channels	150/250 ohms balanced
RIAA phono channels	47,000 ohms unbalanced
High level	50/150/600 ohms balanced
Output Impedances	600 ohms balanced

Frequency Response

RIAA Phono (optional)	±1 dB of RIAA Curve 20-20,000 Hz
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AUCTION CHANNEL(S)

Output Impedance	2,500 ohms unbalanced
Level	1.5 volts rms

MONITOR CHANNEL(S)

Frequency Response	1.0 dB, 30-15,000 Hz
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Harmonic Distortion	1.0% or less, 30-15,000 Hz @ 4 watts rms output
S/N	60 dB below 4 watts rms output (through program input)
Output Level	4 watts rms continuous; 8 watts normal program content
Output Impedance	4-16 ohms unbalanced

TERMINATIONS

	Barrier screw terminals on rear; space and cutouts to mount two XLR-3 microphone connectors, McMartin Part Number 173003
Power Required	115/125/135 VAC 50/60 Hz (230 VAC on special order) B-501 40 watts, B-502 50 watts, B-503 50 watts

DIMENSIONS

	16" (40.6 cm) deep 7" (17.8 cm) high 27" (68.6 cm) wide
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WEIGHT

	64 lbs. Shipping Weight 67 lbs.
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FINISH

	McMartin beige with matte black in mixer control area, wood grain end panels
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ORDERING INFORMATION

B-501	5 Mixer Monaural Audio Console (one mic, four hi-bal input cards standard)
B-501SA	B-501 equipped with step attenuators
B-502	5 Mixer Stereophonic Audio Console (One dual mic, four dual hi-bal input cards standard)
B-502SA	B-502 equipped with step attenuators
B-503	5 Mixer Dual Channel Audio Console (one mic, four hi-bal input cards standard)
B-503SA	B-503 equipped with step attenuator

Plug-in Input Cards for B-501; B-503

5MP1	Plug-in Microphone Preamp
5EP1	Plug-in RIAA Phono Preamp
5BH1	Plug-in Balanced High Level Input Card

Plug-in Input Cards for B-502:

5MP2	Plug-in Dual Microphone Preamp
5EP2	Plug-in Dual RIAA Phono Preamp
5BH2	Plug-in Dual Balanced High Level Input Card
5RY1	Speaker Muting Relay

TX-300A FM MODULATION MONITOR CALIBRATOR



FEATURES

- **Completely Solid State**
- **0.25 dB Accuracy**
- **Straightforward Operation**
- **Eliminates Complex Test Set-Ups**
- **Visual Null Indication**
- **Simplified Bessel Function Test**

DESCRIPTION

The McMartin TX-300A FM Modulation Calibrator permits simple field calibration of FM broadcast modulation monitors to an accuracy of 0.25 dB.

The TX-300A consists essentially of a 13.587 kHz crystal-controlled, precision audio signal generator and a highly selective main channel receiver.

The TX-300A eliminates the need for complex test set-ups involving an audio signal generator, frequency counter and communications receiver required for making FM modulation monitor calibration measurements.

The TX-300A provides a crystal-controlled 13.587 kHz, 600-ohm, balanced audio source for input to the FM transmitter, at a signal level of up to +10 dBm.

The RF output of the FM transmitter is fed to a BNC-type connector located on the rear apron of the TX-300A. In some instances where high field intensities exist, a short wire, acting as an antenna, inserted into the RF input connector will suffice. The FM transmitter frequency is heterodyned against a crystal-controlled oscillator to produce a 10.7 MHz intermediate frequency.

A second mixer heterodynes this signal with that of a stabilized variable oscillator operating in the 10.25 MHz range to produce a 450 kiloHertz signal. Front panel adjustment

of the variable frequency oscillator permits peaking of the input signal on the panel meter. The 450 kHz signal is processed through a solid-state filter, amplified and detected. The detector output signal is displayed on the null detector meter.

Based on Bessel functions, the second FM carrier disappearance is produced at ± 75 kHz deviation as the 13.587 kHz signal fed to the audio input terminals of the FM transmitter is increased in level.

With the TX-300A, observation of this condition is simple. The front panel "Audio Gain" control is rotated clockwise from its "off" position. As the 13.587 kHz audio signal level is increased, two distinct nulls (dips) in carrier level can be observed on the panel meter. The second null indicates that the FM carrier frequency is deviating ± 75 kHz (100% modulation).

The front-panel "Sensitivity" control provides for full scale deflection of the panel meter and compensates for varying RF input levels.

The circuitry utilizes transistors and integrated circuit devices and is powered by an integral Zener-regulated power supply. The TX-300A is completely self-contained and housed in a standard 3 1/2-inch rack panel.

SPECIFICATIONS

Operating Range: 88 to 108 MHz (specify operating frequency)

Accuracy: 0.25 dB ($\pm 2.5\%$ @ 100% modulation)

RF Input Level: 50,000 microvolts to 0.5 volt

Audio Output Frequency: 13.587 kHz

Audio Output Impedance: 600 ohms, balanced

Audio Output Level: Adjustable ($+10$ dBm, maximum)

Front Panel Indicator: ... Carrier Null Detector

Front Panel Controls: ... RF Sensitivity, Audio Gain, Fine Tuning, Power.

Rear Panel Terminations: RF Input — BNC
Audio Output—screw terminals.

Power Requirements: ... 105-125 volts ac, 50/60 Hz, 12 watts

Ambient Temperature

Range: 10-50° C

Dimensions: Width: 19" standard rack panel

Height: 3 $\frac{1}{2}$ "

Depth: 7 $\frac{1}{2}$ " overall

Weight: 7 $\frac{1}{2}$ pounds

Finish: McMartin Blue