broadcast

MC MARTIN

McMartin Industries Inc ■ 4500 South 76th Street ■ Omaha Nebraska 68127 ■ (402) 331-2000 ■ Telex 484485

World Radio History

World Radio History

McMartin

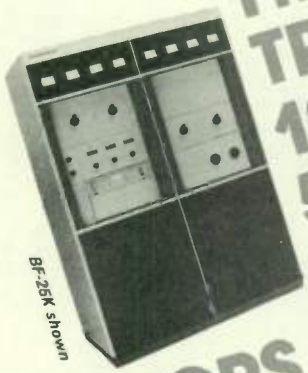
price schedule

Effective June 15, 1976

BROADCAST EQUIPMENT

AM TRANSMITTERS
1000w • 2500w NEW

FM TRANSMITTERS
10w • 1000w NEW • 3500w
5,000w NEW • 10,000w NEW
27,500w NEW • 55,000w NEW



MONITORS • AM Modulation
FM Frequency/Modulation
mono
stereo
sca

CONSOLES 5 and 8 Mixers

FM Relay and SCA Receivers
RF Amplifiers
Power Amplifiers

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

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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		
5MP1	Microphone preamplifier (B501/B503)	**27.50**
5MP2	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**

World Radio History

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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**

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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	135.00
	for each additional channel, add $10.00	
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

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World Radio History

World Radio History

250–1000 WATT AM TRANSMITTER

BA-1K

MC MARTIN

MC MARTIN BA-1K AM TRANSMITTER

SOLID-STATE UP TO FINAL AMPLIFIER AND MODULATORS

MOTOR DRIVEN VACUUM TUNING AND LOADING CONTROLS

VACUUM ENCASED CRYSTAL

SELF-CONTAINED DUMMY ANTENNA

DUAL POWER CAPABILITY

REMOTE CONTROL STANDARD

WASHABLE PERMANENT TYPE AIR FILTER

125% POSITIVE PEAK CAPABILITY

LOW POWER CONSUMPTION

OIL-FILLED MODULATION TRANSFORMER

The BA-1K delivers outstanding performance and reliability. It sounds clean and crisp . . . and it stays on the air. Initial investment is reasonable. Operating and maintenance costs, low.

We can't do anything about your programming to attract and hold an audience, but the BA-1K makes your programming sound great . . . and by selection of quality components and application of conservative design details, the BA-1K delivers reliability.

The BA-1K satisfies technical demands for ease of initial installation, tune-up and maintenance. Access to subassemblies and components is outstanding. By opening the hinge-down front panel, all solid-state low level AF and RF stages and the low voltage control power supply are easily inspected and adjusted.

The blower assembly is mounted on the inner surface of the hinged rear door for 'out-in-the-open' maintenance.

The RF power amplifier, and the modulator stages each use a pair of highly-reliable, moderately priced 4-500A tubes. During operation these tubes are visible through the cabinet front observation window.

The RF power amplifier output consists of a tuning/matching full pi-T network. Plate tuning is by means of a motor-driven vacuum capacitor. Output loading is adjusted by a motor-driven slug located concentrically in the output T-network inductor. The shunt capacitor in the output T-section, in conjunction with an adjustable tap on the input inductor of the T, permits precise adjustment for maximum second harmonic attenuation.

The BA-1K incorporates a built-in dummy load.

The modulator stage uses a high-quality, oil-filled modulation transformer, capacity-coupled to a modulation reactor to isolate RF power amplifier plate current from the modulation transformer secondary winding.

The RF exciter and AF driver stages are completely solid-state. The crystal oscillator operates in the 2160 to 4320 kiloHertz range. The operating frequency range of 540 to 1600 kHz is established by division of the crystal frequency by four for the range from 540 to 1080 kHz and by two, to cover the 1090 to 1600 kHz range.

The AF driver stages operating Class A are of solid-state design up to the grids of the 4-500A AB1 modulator tubes. Resistor-capacitor feedback networks give sufficient feedback compensation.

The BA-1K is fully metered. Individual, eye-level 4½" panel meters display PA plate current and voltage, RF line current, plus a nine-position multimeter for measurement of secondary operating parameters.

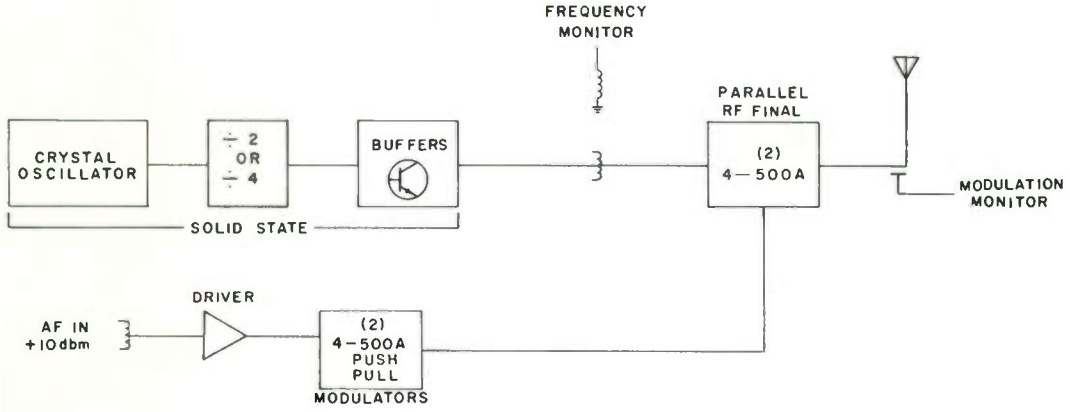
The BA-1K may be operated by remote control. All mechanical drives for plate tuning and output loading as well as on/off/power change switching are terminated for ready interconnection to standard remote control systems.

The BA-1K has 1200-watt output capability, leaving a more-than adequate power reserve. This permits smooth 125% positive peak modulation and reflects the truly conservative design factors which contribute to BA-1K reliability.

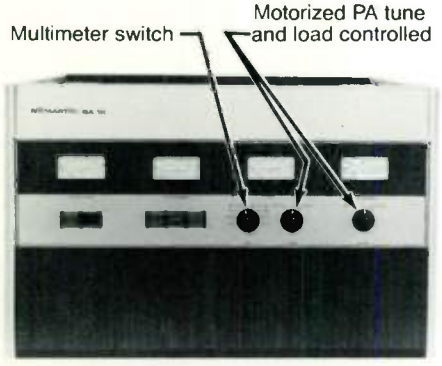
The BA-1K is handsomely-styled in an extremely rugged steel cabinet. Removable side panels give ready access to wiring harnesses. Those within the cabinet are housed in protective channelling.

The BA-1K—a pleasure to own—a pleasure to maintain—a pleasure to listen to!

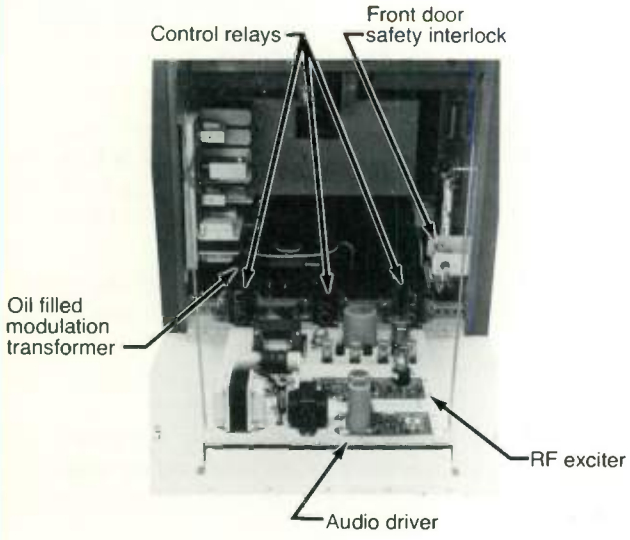
World Radio History



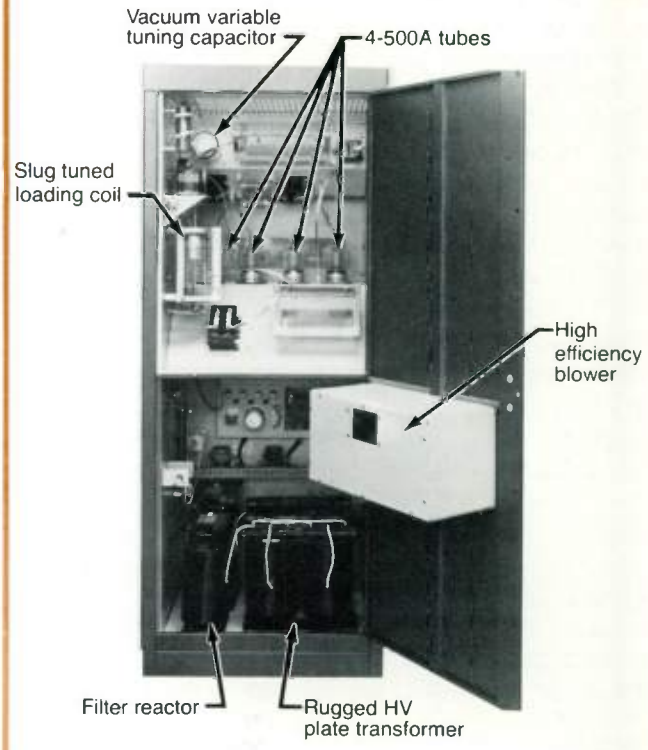
Block diagram



Front view BA-1K, top section

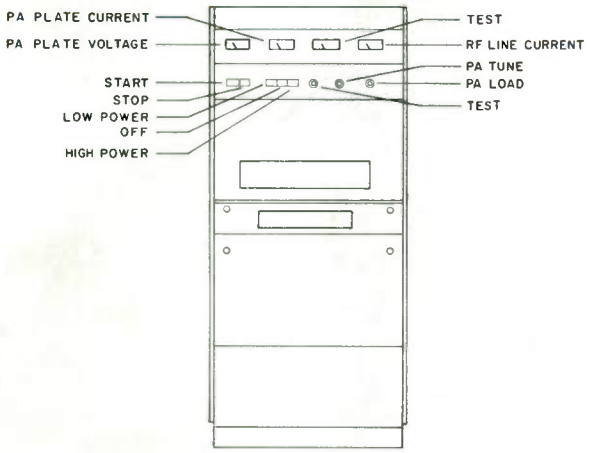


Front view BA-1K, bottom section door open

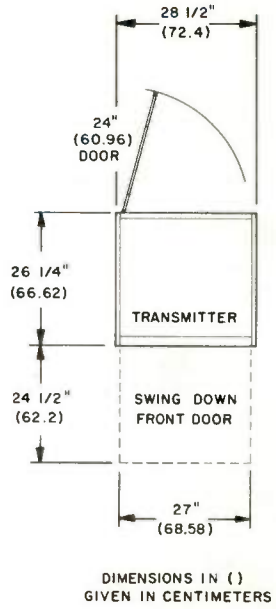


Back view, BA-1K

World Radio History



Front panel description



Floor plan

FEB/79

SPECIFICATIONS

FREQUENCY RANGE ..... 540 to 1600 kiloHertz (supplied on one specified frequency)

POWER OUTPUT ..... 1000/500/250 watts. May be operated at any two specified power levels. Pushbutton power change standard. Maximum output capability: 1200 watts

OUTPUT IMPEDANCE ..... 50 ohms unbalanced. Other impedances available on special order.

FREQUENCY STABILITY ..... ±5 Hertz over ambient temperature range

CARRIER AMPLITUDE REGULATION ..... 3% maximum

NOISE LEVEL ..... 60 dB or greater below 100% modulation @ 1000 Hertz

MODULATION CAPABILITY ..... 100% negative peaks 125% positive peaks

AF FREQUENCY RESPONSE ..... ±1.0 dB, 10-10,000 Hz, 1-kw output, 100% modulation

AF HARMONIC DISTORTION ..... 2.5% or less, 50-10,000 Hz, 1-kw output, 100% modulation. Sine wave input

AUDIO INPUT IMPEDANCE ..... 150/600 ohms, balanced

AUDIO INPUT LEVEL ..... +10, ±2, dBm

POWER SOURCE ..... 208/230 Vac, 50/60 Hz, single phase three-wire (grounded neutral)

POWER CONSUMPTION ..... 3,000 watts, no modulation 3,500 watts, 100% modulation

AMBIENT TEMPERATURE RANGE ..... −20 to +45 degrees Celsius

ALTITUDE ..... up to 7500 feet AMSL

DIMENSIONS ..... 70.5" (179 cm) height 25.75" (65.4 cm) depth 28.25" (71.8 cm) width

ORDERING INFORMATION

Model	Description	Product Code
BA-1K	1000/500/250 watt transmitter (Specify operating frequency and power levels desired)	**10-01-061**
SC-AM	Spare Vacuum Crystal	**10-01-064**
STA-1K	100% Spare Tube Kit (4 Type 4-500A)	**10-01-063**
SSC-1K	100% Spare Semiconductor Kit	**10-01-093**
SR-1K	Filament Voltage Regulator	**10-01-062**
PT-1K	Line transformer for 220/240 Vac, 10, 2-wire, primary power source (external mounting)	**10-01-065**

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World Radio History

World Radio History

3,000 watt AM TRANSMITTER BA-2.5K

MCMARTIN

the MCMARTIN BA-2.5K TRANSMITTER

Designed to meet export requirements for 3,000-watt AM broadcast service, the McMartin Model BA-2.5K provides a conservatively-rated transmitter for the new 2.5 KW power output level recently authorized in the U.S. by the Federal Communications Commission.

Completely solid-state, other than the high-powered RF output PA and modulator stages, only one type tube is required, the field-proved, 4-1000A. Two of these tubes are operated in parallel in the RF PA stage and another pair in the Class AB-1 modulator stage.

The BA-2.5K delivers outstanding performance and reliability. Access to sub-assemblies and components is outstanding. Patterned after the well-accepted mechanical configuration introduced in the McMartin BA-1K transmitter, the BA-2.5K features a hinge-down front panel by means of which all solid-state low level AF and RF stages are readily inspected and maintained.

The cabinet blower assembly, with maintainable air filters is conveniently mounted on the inside of the hinged rear door for "out-in-the-open" accessibility.

The four 4-1000A's are visible during operation through a cabinet front observation window.

Low harmonic radiation is insured by incorporation of a dual-pi PA output network with provision for independent series resonating of one leg of the network at the second harmonic of the operating frequency. Output tuning and loading is performed by easily-remotable motor-driven controls.

The RF exciter and audio driver stages are completely solid-state. The crystal oscillator operates in the 2,160 to 4,320 kiloHertz range, where the inherent stability of quartz crystals is superior. An output operating frequency between 540 and 1,080 kHz is derived by digital division by four; and between 1,090 and 1,600 kHz by division by two.

The BA-2.5K is fully metered. The operating parameters for RF line current, PA plate voltage and current and AC line voltage are separately shown on large 4½", eye-level meters. In addition, an 8-position multimeter permits selective metering of individual stage/element operation.

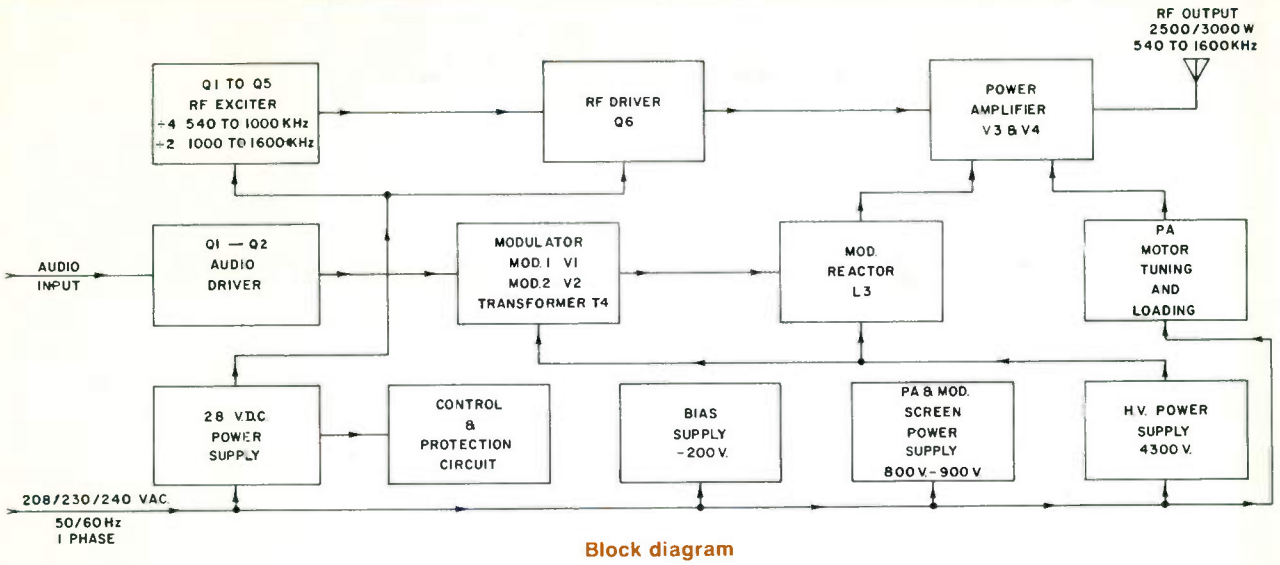
Solid-state overload protection circuitry with automatic recycling and status indication is standard. The recycling sequence will automatically replace the BA-2.5K to its normal operating mode for three overload situations occurring within a 30 second time period. The source of the overload condition is stored in memory and displayed on LED indicators which can be reset only manually after a fault occurs.

The BA-2.5K will interface with all standard remote control systems by simple interconnection to the relay-controlled motor-driven mechanisms in the transmitter. Sampling voltages for telemetry of PA plate voltage and current; and RF output line current are terminated in the BA-2.5K for convenient connection to remote control systems.

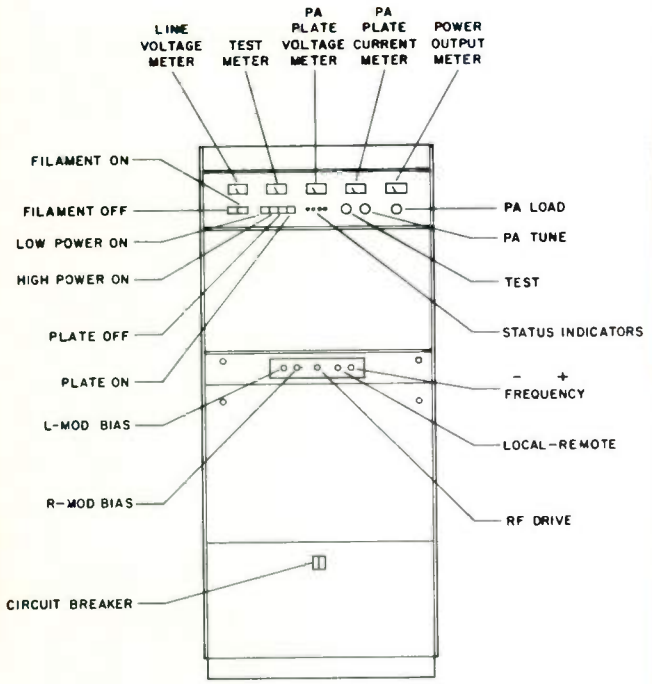
With its 3000-watt output capability, the McMartin BA-2.5K transmitter insures more-than-adequate power reserve, with extremely smooth 125% positive peak modulation and extended-life component reliability.

The McMartin BA-2.5K is a pleasure to own, a pleasure to maintain—and most importantly, a pleasure to listen to.

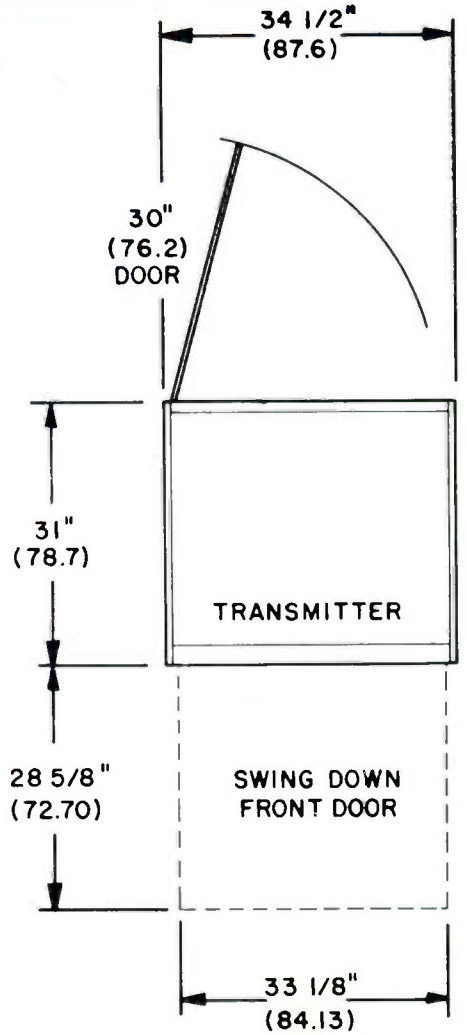
World Radio History



Block diagram



Front panel description



Floor plan dimensions

World Radio History

SPECIFICATIONS

FREQUENCY RANGE ..... 540 to 1600 kiloHertz (factory tuned & tested on one specified frequency)

POWER OUTPUT ..... 3,000 watts. May be operated at any two specified power levels. Pushbutton power change standard.

OUTPUT IMPEDANCE ..... 50 ohms unbalanced. Other impedances available on special order.

FREQUENCY STABILITY ..... ±5 Hertz over ambient temperature range

CARRIER AMPLITUDE REGULATION ..... 3% maximum

NOISE LEVEL ..... 55 dB or greater below 100% modulation @ 1,000 Hertz

MODULATION CAPABILITY ..... 100% negative peaks
125% positive peaks

AF FREQUENCY RESPONSE ..... ±1.5 dB, 50-10,000 Hz, 3.0 KW output, 100% modulation

AF HARMONIC DISTORTION ..... 2.5% or less, 50-10,000 Hz, 3.0 KW output, 100% modulation, Sine wave input

AUDIO INPUT IMPEDANCE ..... 150/600 ohms, balanced

AUDIO INPUT LEVEL ..... +10, ±2, dBm

POWER SOURCE ..... 208/230 Vac, 50/60 Hz, single phase

POWER CONSUMPTION .....
0% modulation
3,000W output: 8,100W
2,500W output: 6,700W
100% modulation
3,000W output: 10,300W
2,500W output: 8,800W
Power factor: 0.90

LINE VOLTAGE VARIATION ..... ±5%

AMBIENT TEMPERATURE RANGE ..... −20 to +50 degrees Celsius

ALTITUDE ..... up to 7,500 feet AMSL

DIMENSIONS ..... 78.5" H x 31.0" D x 34.5" W
(199 cm x 78.7 cm x 87.6 cm)
Rear door swing: 30" (76.2 cm)

FEB/77

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5,000 watt AM TRANSMITTER BA-5K

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World Radio History

the MCMARTIN BA-5K TRANSMITTER

The McMartin BA-5K AM Broadcast Transmitter consists of two BA-2.5K transmitters and a combiner cabinet. The BA-5K delivers up to 6,000 watts of RF output power.

A matching, 19-inch combiner cabinet, located between the two BA-2.5K cabinet assemblies, houses the combining network, reject load, common oscillator, and transfer switching as well as the switching control panel. The self-contained BA-5K equipment occupies floor space approximately 90″ wide by 31″ deep and is 78.5″ high. Power supplies are self-contained.

The redundant BA-2.5K transmitters and combining network assure uninterrupted broadcasting at no less than one-quarter of the normal combined output power in the event of failure, including loss of modulation, of one of the BA-2.5K units. The RF output of both transmitters is fed into the RF power combiner which offers the proper load to both transmitters and the proper source to the transmission line. It also provides complete protection in the event of failure of either transmitter by maintaining the proper load to the remaining unit. Essentially the combiner allows two transmitters to operate in parallel with the proper termination.

The control circuitry allows either transmitter to be operated separately at full or reduced power where dual power operation is a requirement.

For optimum operation and reliability, RF switching of the power combiner is accomplished by means of three vacuum relays of ceramic construction which permits front panel pushbutton full power combined operation or switching of either transmitter directly to the load. The switching arrangement is such that when one unit is connected to the load, the remaining transmitter is automatically routed to an external dummy load.

Each BA-2.5K unit is driven by split-power output from a common oscillator which is also located in the control panel assembly.

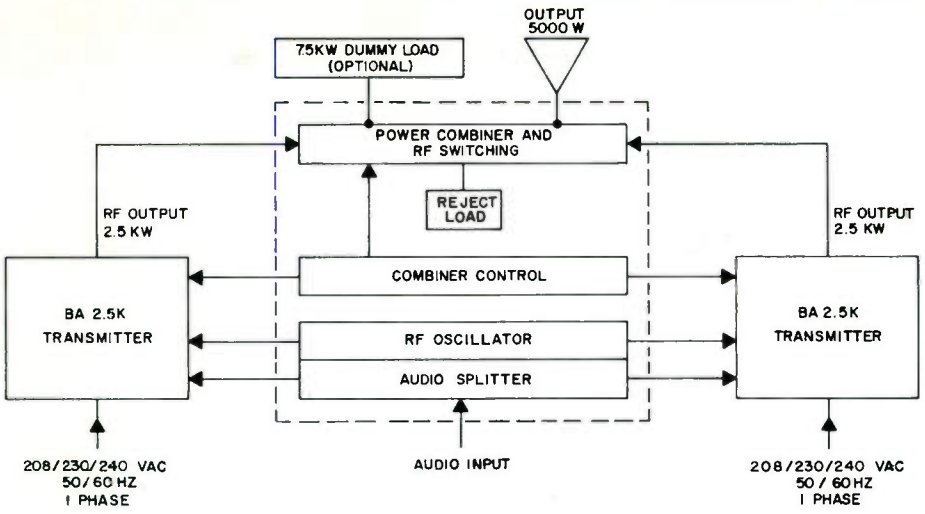
The specifications for the BA-5K are essentially identical to those shown for the BA-2.5K, except for power output, power consumption, and dimensions. Only one tube type is used in the BA-5K. Solid-state circuitry in the low power RF and audio stages and silicon rectifiers in all power supplies assure reliable performance and low operating costs.

The advantages of dual transmitter operation include:

- Uninterrupted transmission at one-quarter power, if a tube fails in either the modulator of final amplifier.
- Faulty transmitter can be repaired while other transmitter is on the air.
- More dollar value, more power, more reliability per watt.
- Single-phase power—no expensive three-phase transformers and components.

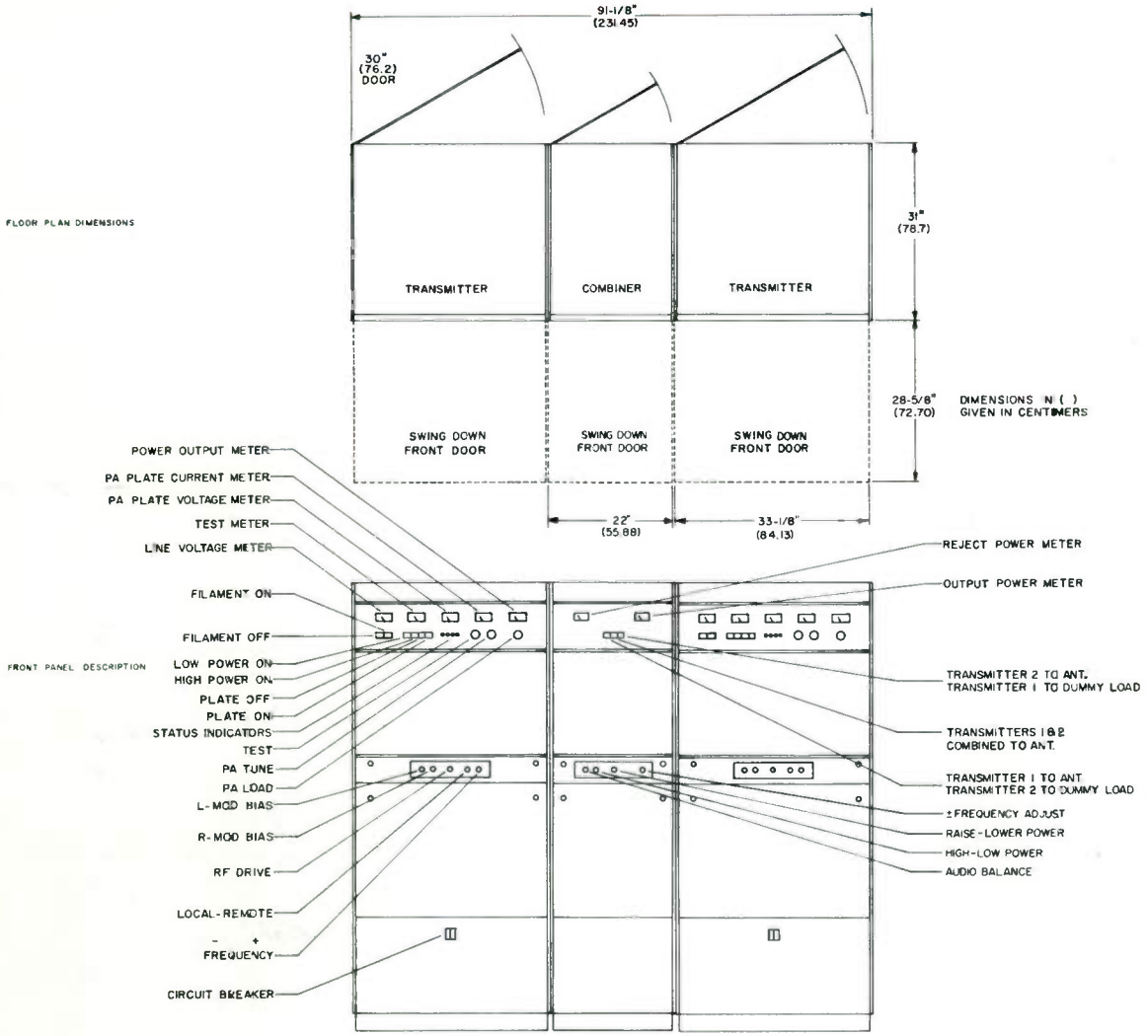
The McMartin Model BA-5K transmitter satisfies the most demanding requirements for uninterrupted AM broadcasting service, enhanced by excellent performance characteristics.

World Radio History



Block diagram

Floor plan dimensions



Front panel description

World Radio History

SPECIFICATIONS

TYPE OF EMISSION A3

FREQUENCY RANGE ..... 540-1600 kHz

POWER OUTPUT CAPABILITY ..... 6000 Watts. May be operated at any two specified power levels. Pushbutton power change standard.

CUTBACK CAPABILITY ..... 2500, 1000, 500 watts

OUTPUT IMPEDANCE ..... 50 ohms, unbalanced

FREQUENCY STABILITY ..... ±5 Hz

AUDIO INPUT IMPEDANCE ..... 150/600 ohms, balanced

AUDIO INPUT LEVEL ..... +10, ±2, dBm

AUDIO FREQUENCY RESPONSE ..... ±1.5 dB, 50-10,000 Hz @ 85% modulation

AUDIO HARMONIC DISTORTION ..... 2.5% or less, 50-10,000 Hz @ 100% modulation

MODULATION CAPABILITY ..... 100% negative peaks
125% positive peaks

NOISE LEVEL ..... 55 dB or greater below 100% modulation

CARRIER AMPLITUDE REGULATION ..... 3% maximum

POWER SOURCE ..... 208/230/240 VAC, 50/60 Hz, single phase

POWER CONSUMPTION AT (5000 WATT) .....
13.6 KW (0% modulation)
14.2 KW (40% modulation)
17.2 KW (100% modulation)

LINE VOLTAGE VARIATION ..... ±5%

AMBIENT TEMPERATURE RANGE ..... −20 to + 45 degrees Celsius

ALTITUDE ..... Up to 7500 feet above sea level

DIMENSIONS .....
56″ (142.2 cm) width
79″ (200.7 cm) height
30″ (76.2 cm) depth

World Radio History

5,000 WATT AM TRANSMITTER

BA-5K2

MCMARTIN

World Radio History

MC MARTIN BA-5K2 TRANSMITTER

SINGLE ENDED 5KW DESIGN

125% POSITIVE PEAK CAPABILITY

LOW OPERATING COSTS

SOLID STATE RF DRIVER

SOLID STATE AUDIO DRIVER

THREE TUBES — ALL OF SAME TYPE

DUAL CRYSTAL OSCILLATORS

OIL FILLED MODULATION TRANSFORMER

EASY ACCESS FRONT AND REAR

EXTENSIVE METERING

The McMartin BA-5K2 is a 5 kilowatt AM transmitter featuring a single ended design and housed completely in a single cabinet. Based on the highly successful McMartin BA-10K, ten kilowatt AM transmitter, the BA-5K2 uses conventional high level plate modulated circuitry providing high performance and high reliability at a very reasonable cost. The BA-5K2 is designed to accept and reproduce standard or highly processed audio and deliver full 125% positive peak modulation.

The transmitter is completely solid state other than the high powered RF output power amplifier and modulator stage. Only one tube type is used in these stages, 4CX5000A. One of these tubes is used in the RF power amplifier, and two are used in the class AB-1 push-pull modulator.

Access to sub assemblies and components is outstanding. The BA-5K2 features two hinged-down front panels by means of which all low level AF and RF stages are readily inspected and maintained.

A pair of high efficiency blowers are used to cool the three power tubes. The rear hinged doors have mounted on them the permanent type air filters with safety guards for "out-in-the-open" accessibility.

The RF exciter and audio drivers are completely solid state. The crystal oscillator achieves excellent stability by operating in the 2-4 MHz region where there is greatest inherent stability. The operating frequency is then divided to obtain the proper carrier frequency between 540 and 1,600 kHz. A two crystal accessory is available for export use on special request.

An important feature of the McMartin BA-5K2 is the incorporation of many meter functions often omitted in similar transmitters. These include individual filament voltage and individual PA and modulator cathodes. A total of nine meters are provided with a multimeter and 11 position rotary switch. All primary function meters are 4½" eye level meters with flush mounted lenses.

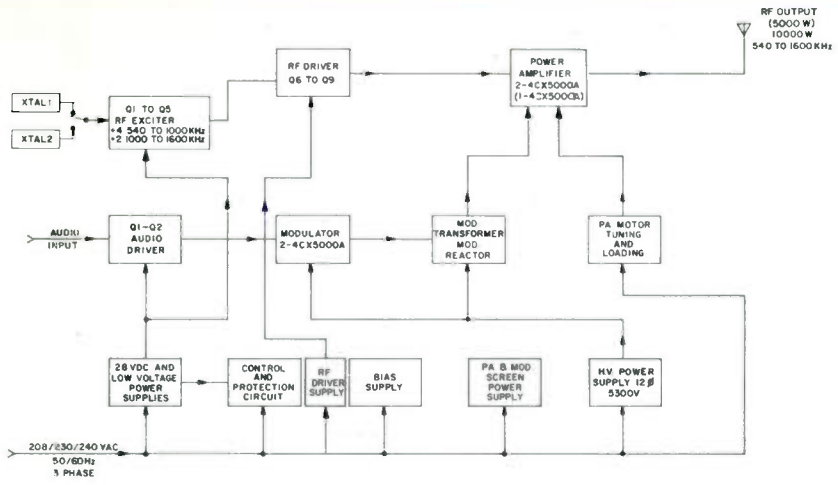
Solid state overload protection circuitry with automatic recycling and status indication is standard. The recycling sequences will automatically replace the BA-5K2 to its normal operating mode for three overloads occurring within a 30 second time period. The source of overload condition is stored in memory and displayed on LED indicators which can be reset only manually after a fault occurs.

The BA-5K2 will interface with all standard remote control systems by simple interconnections to the relay-controlled motor-driven mechanism in the transmitter. Tuning is accomplished by a motor-driven vacuum capacitor and loading is accomplished by a motor-driven permeability tuned coil. (No sliding contacts are used.)

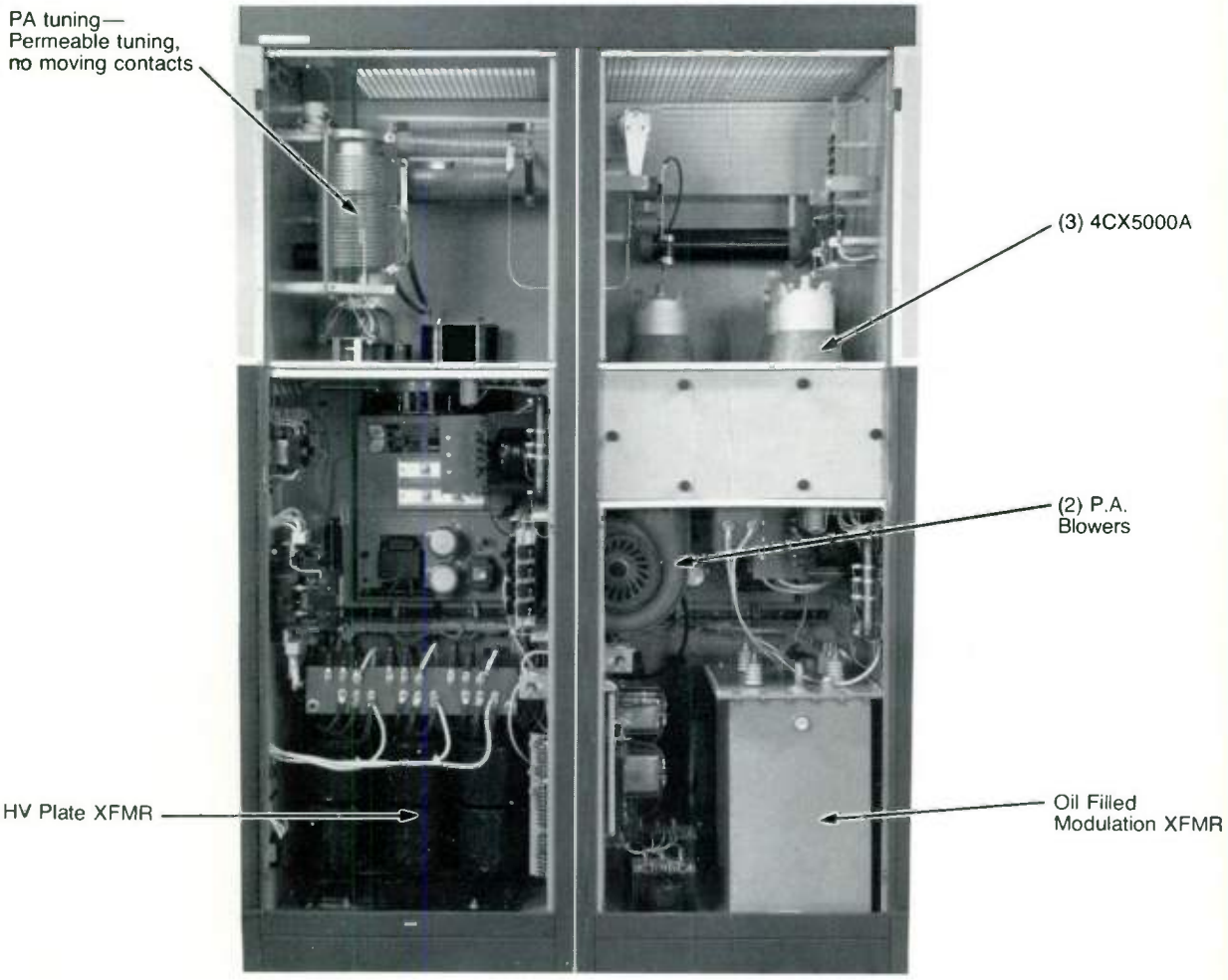
Sampling voltages for telemetry of PA plate voltage and current, and RF output line current, are terminated in the BA-5K2 for convenient connection to remote control systems.

With 5500 watt output capability, the McMartin BA-5K2 insures more than adequate power reserve with extremely smooth 125% positive peak modulation and extended-life component reliability. It's truly one of the McMartin NEWBREED of broadcast products designed to serve the needs of broadcasters throughout the world.

World Radio History

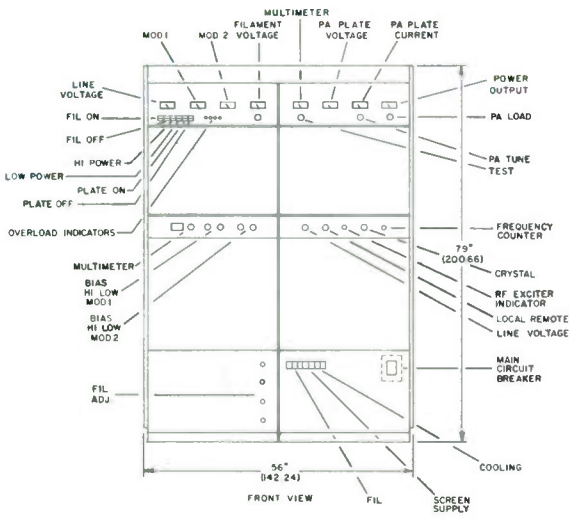


Block diagram

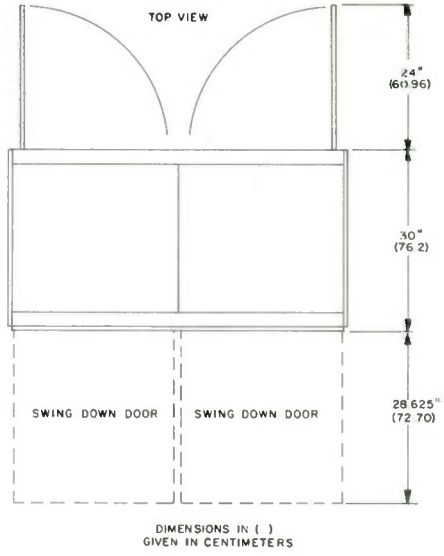


Rear view of BA-5K2

World Radio History



Front panel description



Floor plan

SPECIFICATIONS

TYPE OF EMISSION	A3
FREQUENCY RANGE	540-1600 kHz
POWER OUTPUT CAPABILITY	5,500 w
CUTBACK CAPABILITY	Built-in reduction to 2.5 kw or optional 1 kw
FREQUENCY STABILITY	±5 Hz
HARMONIC AND SPURIOUS RADIATION	Exceeds FCC regulations regarding harmonic and spurious radiation.
OUTPUT IMPEDANCE	50Ω unbalanced
MODULATION CHARACTERISTICS	High level plate modulation
AUDIO INPUT IMPEDANCE	150/600 Ω balanced
AUDIO INPUT LEVEL	+10, ±2 dBm
AUDIO FREQUENCY RESPONSE	Typically ±1.5 dB 50-10,000 Hz
AUDIO HARMONIC DISTORTION	2.5% or less 50-10,000 Hz 95% modulation
NOISE	60 dB or better, below 100% modulation
CARRIER AMPLITUDE REGULATION	3% maximum at 100% modulation
POWER SOURCE	208/240V, ±5%, 50/60 Hz three phase
POWER CONSUMPTION	0% mod, 9 kw; average mod, 11 kw; 100% mod, 14 kw
AMBIENT TEMPERATURE RANGE	−20 +45 degrees celsius
ALTITUDE	Up to 7500 feet above sea level
DIMENSIONS	height .79" (200.7 cm) width .56" (142.2 cm) depth .30" (76.2 cm)
TUBES USED	3" type 4C x 5000 A
WEIGHT	actual .2000 lbs. (908.0 kg) crated .2100 lbs. (953.4 kg)

ORDERING INFORMATION

Model	Description	Product Code
BA-5K2	5000 2500 watt AM transmitter complete with tubes, 208/230/240 Vac, 50/60 Hz, 3 phase	**10-01-056**
BA-5K2	5000/1000 watt AM transmitter complete as above with cutback to 1,000 watts	**Special Order**
STA-5K2	Spare tube kit for BA-5K2 4CX-5000A	**10-01-057**
	Individual spare tube for BA-5K2 4CX-5000A	**111123**
	Spare rectifier diode stack (RS 3.5-24-15S) 6 used	**210017**

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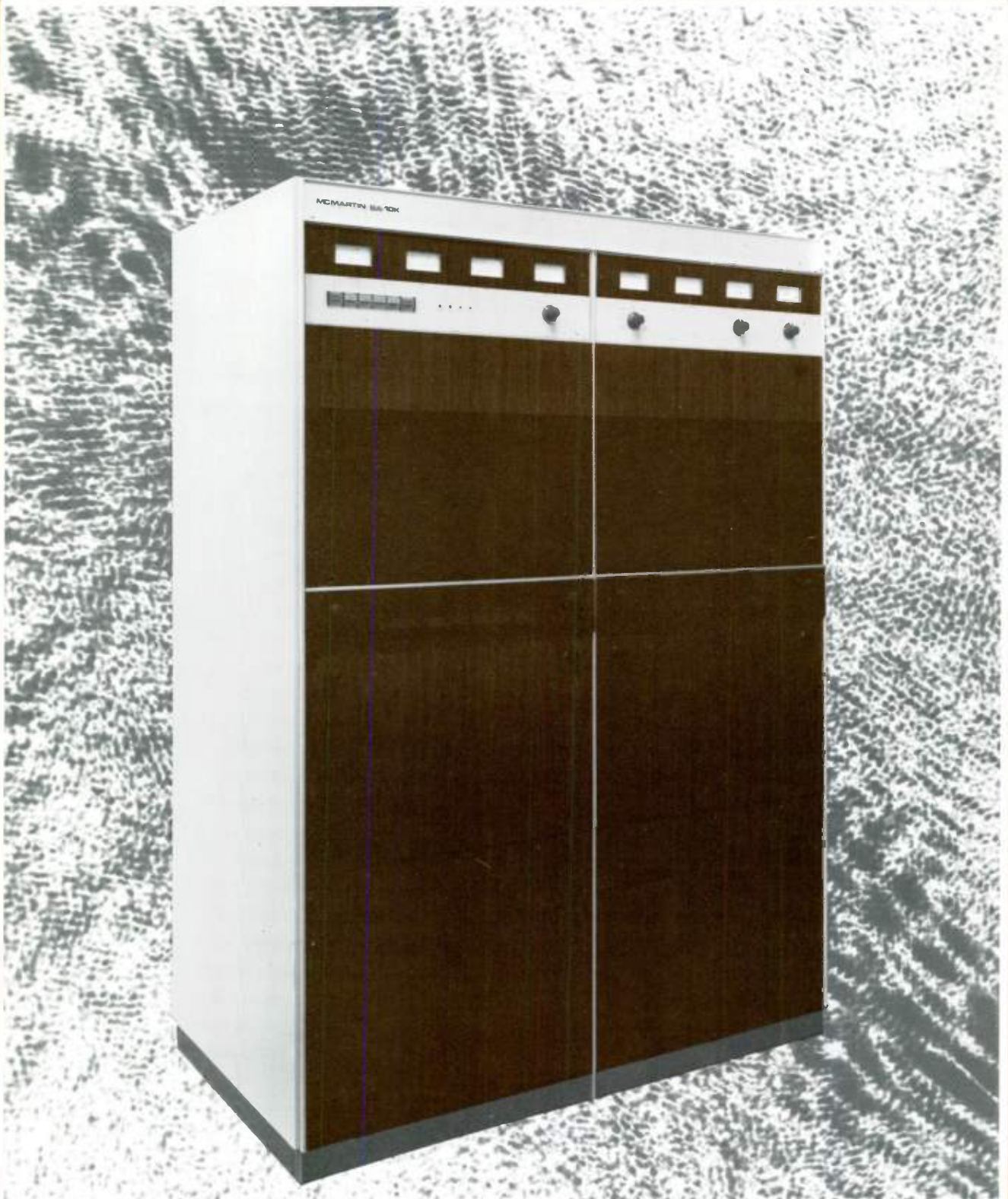
World Radio History

World Radio History

10,000 WATT AM TRANSMITTER

BA-10K



MCMARTIN

MC MARTIN BA-10K TRANSMITTER

LOW OPERATING COSTS

ONLY ONE TUBE TYPE, FOUR TOTAL

SOLID STATE RF DRIVER

SOLID STATE AUDIO DRIVER

DUAL CRYSTAL OSCILLATORS

HIGH PA EFFICIENCY

125% POSITIVE PEAK CAPABILITY

OIL FILLED MODULATION TRANSFORMER

EASY ACCESS FRONT AND REAR

Designed to meet the domestic and export requirements for 10,000 watt AM broadcast service, the McMartin Model BA-10K provides an extremely conservative-rated transmitter. The transmitter was designed to accept and reproduce standard or highly processed audio and deliver the 125% positive peaks demanded by broadcasters today.

The transmitter is completely solid state other than the high-powered RF output power amplifier and modulator stage. Only one tube type is used in these stages, 4CX5000A. Two of these tubes are operated in parallel in the RF power amplifier and another pair in the class AB-1 push-pull modulator.

The BA-10K delivers outstanding performance and reliability. Access to sub assemblies and components is outstanding. Patterned after the well-accepted, mechanical configuration introduced in the McMartin lower-powered AM transmitter, the BA-10K features two hinged-down front panels by means of which all solid-state low level AF and RF stages are readily inspected and maintained.

A pair of high efficiency blowers are used to cool the four high-powered tubes. The rear hinged doors have mounted on them the permanent type air filters with safety guards for "out-in-the-open" accessibility.

Low harmonic radiation is insured by incorporation of a dual-P1 power amplifier, output network with provision for independent series resonating of one leg of the network at the second harmonic of the operating frequency. Output tuning and loading is performed by built-in motor-driven controls with remote control standard.

The RF exciter and audio driver stages are completely solid state. The crystal oscillator operates in the 2 to 4 MHz range where the inherent stability is best then divided to the proper frequency between 540 and 1,600 kHz. A two crystal accessory is available for export use on special request.

The BA-10K is fully metered, enabling the operator to readily observe the operation of numerous circuits normally omitted in similar transmitters: Individual filament voltage, individual PA and modulator cathodes are typical examples. A total of nine meters are provided with a multimeter and 11 position rotary switch. All primary function meters are 4½" eye level meters with flush mounted lenses.

Solid state overload protection circuitry with automatic recycling and status indication is standard. The recycling sequences will automatically replace the BA-10K to its normal operating mode for three overload situations occurring within a 30 second time period. The source of overload condition stored in memory and displayed on LED indicators which can be reset only manually after a fault occurs.

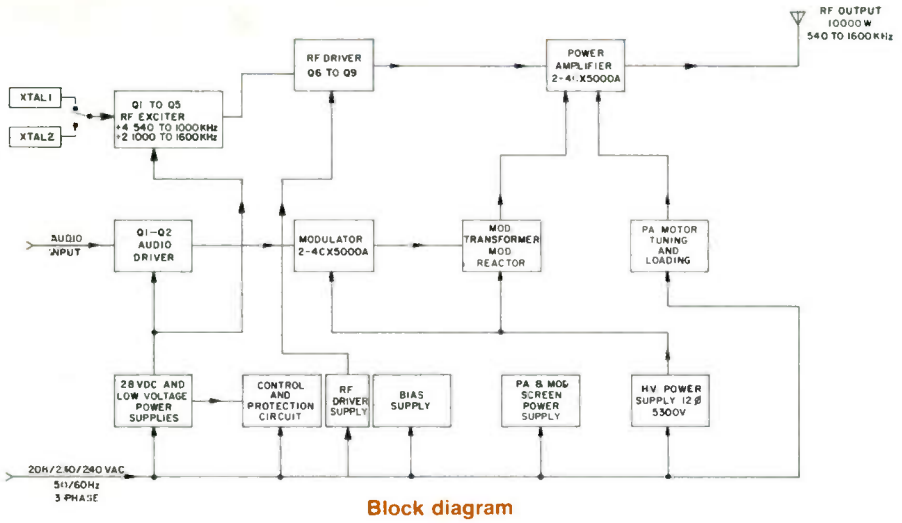
The BA-10K will interface with all standard remote control systems by simple interconnections to the relay-controlled motor-driven mechanism in the transmitter. Tuning is accomplished by a motor-driven vacuum capacitor and loading is accomplished by a motor-driven permeability tuned coil (no sliding contacts).

Sampling voltages for telemetry of PA plate voltage, and current and RF output line current are terminated in the BA-10K for convenient connection to remote control systems.

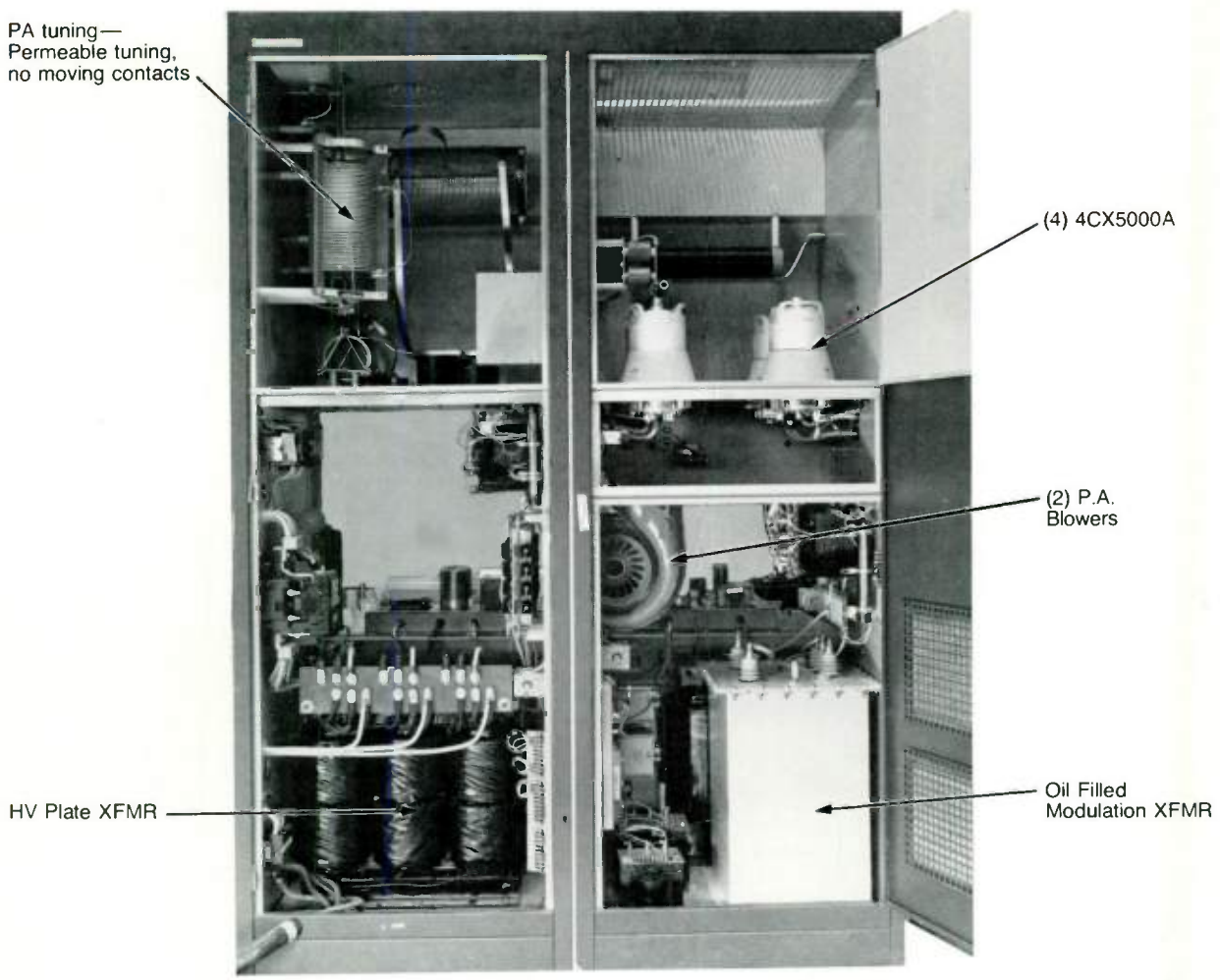
With 11 kw output capability, the McMartin BA-10K transmitter insures more-than-adequate power reserve, with extremely smooth 125% positive peak modulation and extended-life component reliability.

The McMartin BA-10K is a pleasure to own, a pleasure to maintain, and most importantly, a pleasure to listen to.

World Radio History

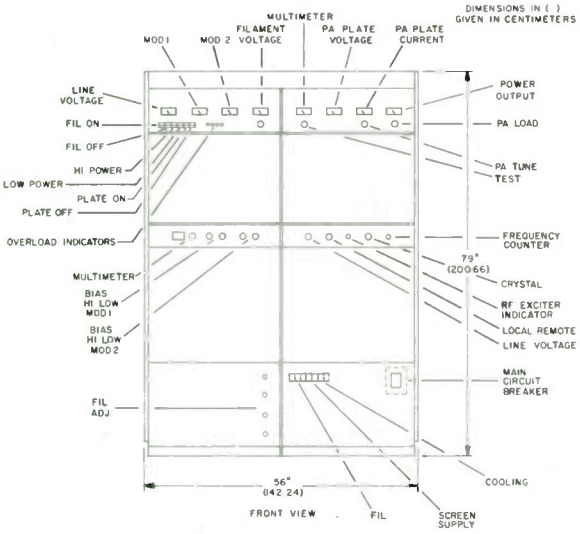


Block diagram

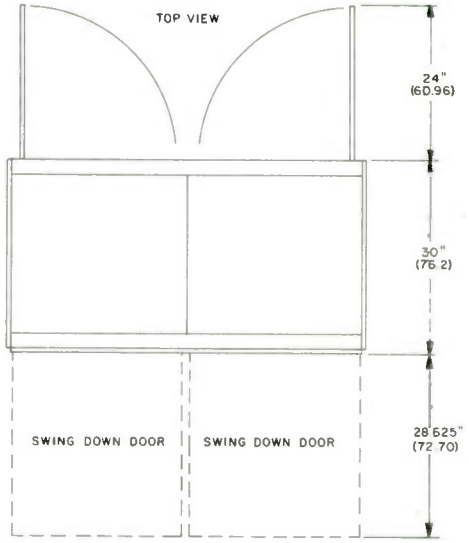


Rear view of BA-10K

World Radio History



Front panel description



Floor plan

SPECIFICATIONS

TYPE OF EMISSION	A3
FREQUENCY RANGE	540-1600 kHz
POWER OUTPUT CAPABILITY	11,000 w
CUTBACK CAPABILITY	Built-in reduction to 5 kw
FREQUENCY STABILITY	±5 Hz
HARMONIC AND SPURIOUS RADIATION	Exceeds FCC regulations regarding harmonic and spurious radiation.
OUTPUT IMPEDANCE	50 Ω unbalanced
MODULATION CHARACTERISTICS	High level plate modulation
AUDIO INPUT IMPEDANCE	150/600 Ω balanced
AUDIO INPUT LEVEL	10±2 dBm
AUDIO FREQUENCY RESPONSE	Typically ±1.5 dB 50-10,000 Hz
AUDIO HARMONIC DISTORTION	2.5% or less 50-10,000 Hz 95% modulation
NOISE	60 dB or better, below 100% modulation
CARRIER AMPLITUDE REGULATION	3% maximum at 100% modulation
POWER SOURCE	208/240V, ±5%, 50/60 Hz three phase
POWER CONSUMPTION	0% mod, 19 kw; average mod, 21 kw; 100% mod, 27 kw
AMBIENT TEMPERATURE RANGE	–20 +45 degrees celsius
ALTITUDE	Up to 7500 feet above sea level
DIMENSIONS	79" (200cm) high 56" (142cm) wide 30"(76cm) depth
TUBES USED	4 type 4C x 5000 A
WEIGHT	2100 pounds
CRATED WEIGHT	2200 pounds

ORDERING INFORMATION

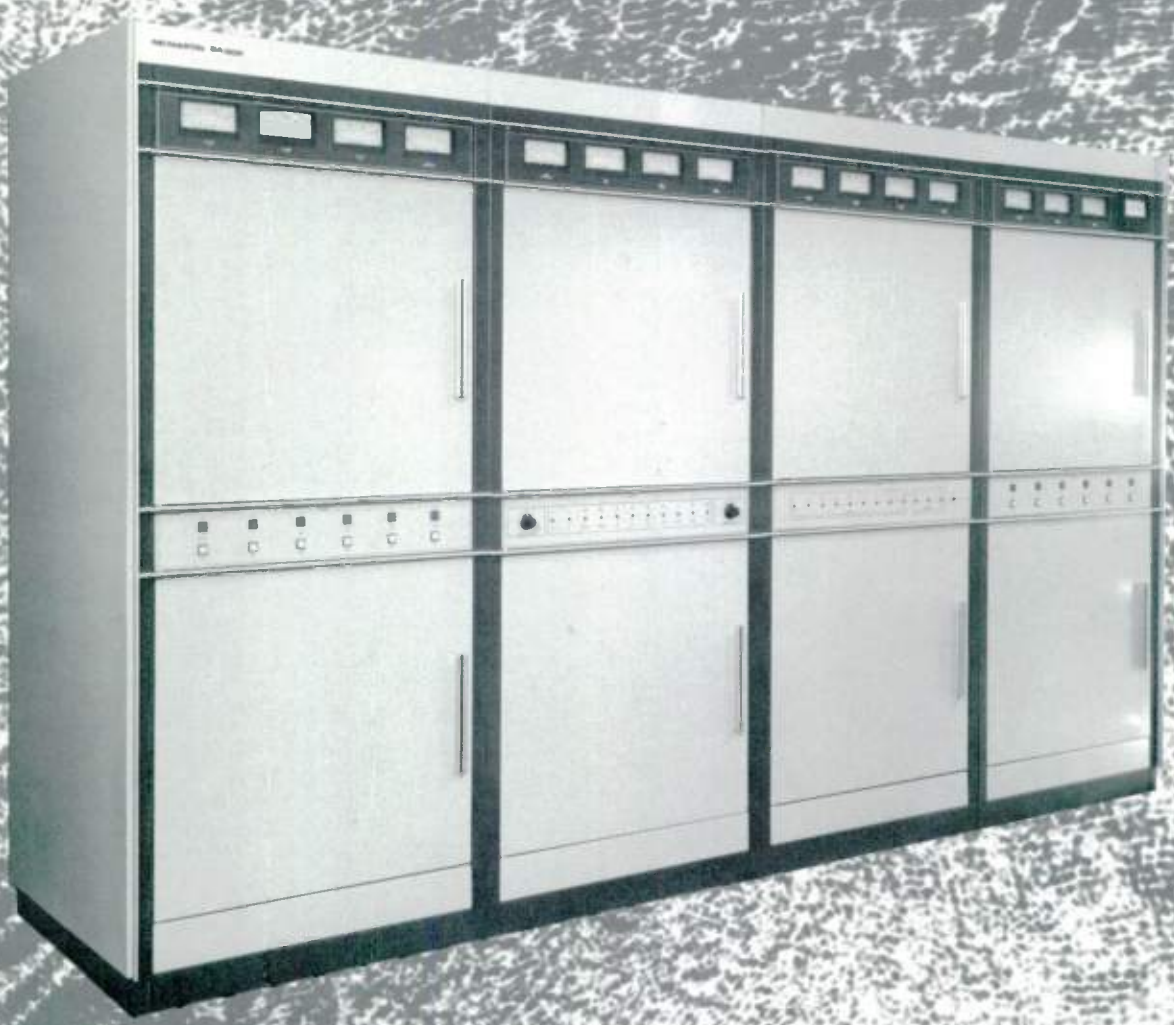
MODEL	DESCRIPTION	PRODUCT CODE
BA-10K	10,000/5000 or 2500 watt AM transmitter complete with tubes, 208/230/240 Vac, 50/60 Hz, 3 phase	**10-01-036**
BA-10K	10,000/1000 watt AM transmitter complete as above with cutback to 1,000 watts	**Special Order**
STA-10K	Spare tube kit for BA-10K 4CX-5000A	**10-01-0XX**
	Individual spare tube for BA-10K 4CX-5000A	**111123**
	Spare rectifier diode stack (RS 3.5-24-15S) 6 used	**210017**

World Radio History

World Radio History

50,000 WATT AM TRANSMITTER

BA-50K



MCMARTIN

BA-50K AM MEDIUM WAVE BROADCAST TRANSMITTER

EXCEPTIONAL FIDELITY — 125% PEAK MODULATION CAPABILITY
LOW POWER CONSUMPTION — LOW OPERATING COSTS
SOLID STATE RF DRIVER — SOLID STATE AUDIO DRIVER
DUAL AUTOMATIC CRYSTAL OSCILLATORS
OPTIMUM BANDWIDTH — INCIDENTAL PHASE CONTROL TO ACCOMMODATE STEREO OPERATION
ONLY ONE TUBE TYPE — FOUR TUBES TOTAL

The McMartin BA-50K, designed for performance, reliability, and simplicity, is a highly efficient, high-level plate-modulated 50 kW AM transmitter.

Solid State circuitry is used extensively in the audio and RF drivers including Dual Crystal Oscillators with Automatic Switching. Only four tubes are utilized in the BA-50K and all are of the same type, EIMAC 4CX20000B.

Constructed in a sleek cabinet, the BA-50K measures less than 123 inches in width. The external power supply and modulation transformer are both oil filled for extended performance and dependability. A complete power distribution and control panel is included to facilitate the transmitter's installation.

Designed specifically to meet the demanding needs of the domestic and export requirements for 50,000 Watt AM broadcast service, the McMartin BA-50K is an extremely conservative-rated transmitter. The transmitter is designed to accept and reproduce standard or highly processed audio and deliver the 125% positive peaks demanded by todays broadcaster.

PERFORMANCE

McMartin engineering of the BA-50K placed particular emphasis on obtaining high overall efficiency. Close to 90% efficiency is achieved in the RF power amplifier. The drive chain is operated at an even higher efficiency through the skillful use of solid-state technology.

The extremely high efficiency of the RF stages permits the use of a high-level modulator operating on the order of 70% efficiency while maintaining outstanding modulation fidelity. The BA-50K's efficiency is equivalent to other manufacturers' more complicated modulation techniques, but achieves it with simplicity and great reliability.

The BA-50K transmitter uses only four tubes, all of the same type. Two are in the final RF amplifier and two are in the modulation stages.

The EIMAC 4CX20000B is rated for power levels far in excess of the requirements of the BA-50K's design. They utilize an advanced radiator structure that permits very efficient anode cooling.

SIMPLICITY

The BA-50K has a component count that is less than half that of comparable models. This will double the mean time between failure (MTBF).

This low parts count is made possible by a straight forward electrical design that is easy to understand and troubleshoot. Each section of the transmitter is separate, both electrically and mechanically.

Swing out meter assemblies and control panels facilitate easy, convenient maintenance and part changes without disassembly.

CONVENIENCE

The BA-50K is fully metered, enabling the operator to readily observe the operation of numerous circuits normally omitted in similar transmitters: One meter for each AC line phase, Individual PA and Modulator cathodes are typical examples. A total of 20 meters are provided without resorting to multimeters for important operating parameters.

Two identical control panels, on the front at either end, permit adjustments and operations to be performed easily from any position. This allows the operator to see all the metering parameters clearly.

Each tube has it's own filament voltage adjustment (variable transformer) and filament voltmeter. The RF drive is adjustable with a variable transformer as is the screen voltage. The broadcaster can optimize the performance of the transmitter to suit his individual requirements.

SOLID STATE OVERLOAD PROTECTION

Solid State overload protection circuitry with automatic recycling and status indication is provided.The recycling sequences will automatically restore the BA-50K to normal operating mode after a predetermined number of overload situations which must occur within a 30 second time period. This way, isolated, occasional overloads will not be accumulated in the register. The source of overload condition is stored in memory and is displayed on LED indicators which can be reset only manually after a fault occurs.

The transmitter may be restarted by remote control and remain on the air in the low power mode (about 10 kW) until repairs can be made.

World Radio History

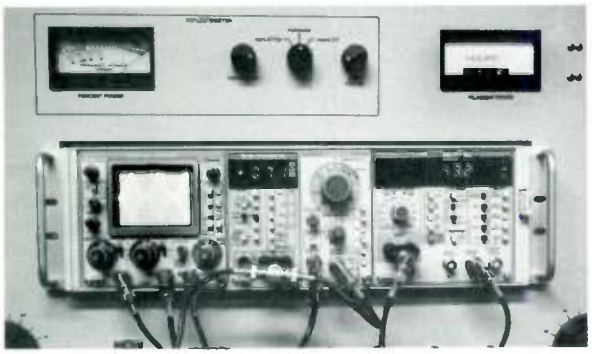
An arc-detector extinguishes an arc, should it occur, and restores the transmitter to operation. This adds a measure of assurance that components will be protected.

A significant advantage of the high fidelity modulation system, used in the BA-50K, is the ability to operate in a partially disabled condition. The transmitter can be operated with one PA tube disabled or removed. It can also be operated at reduced modulation percentage with only one tube in the modulator. The BA-50K may be easily operated at reduced power levels should external antenna problems occur.

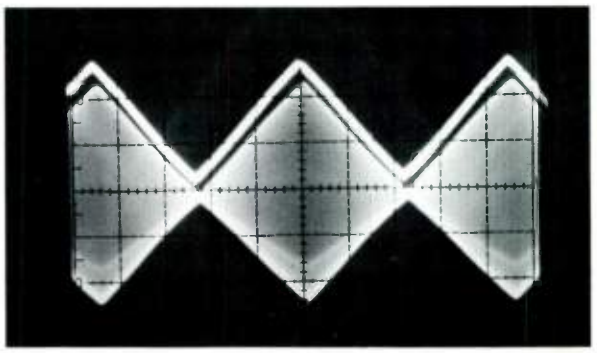
With 50 kW output capability, the BA-50K transmitter insures more-than-adequate power reserve, with extremely smooth 125% positive peak modulation and extended-life component reliability.

The McMartin BA-50K delivers outstanding performance and reliability. This 50,000 Watt transmitter employs the newest, most highly advanced, solid state technology available in the Broadcast Industry today.

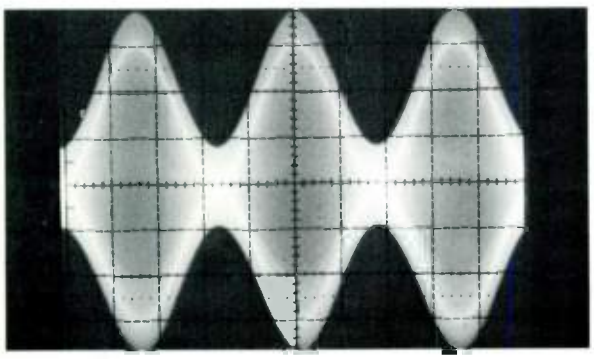
MCMARTIN . . . . . THE ONLY THING YOU'LL EVER NEED TO KNOW ABOUT BROADCAST EQUIPMENT!!!



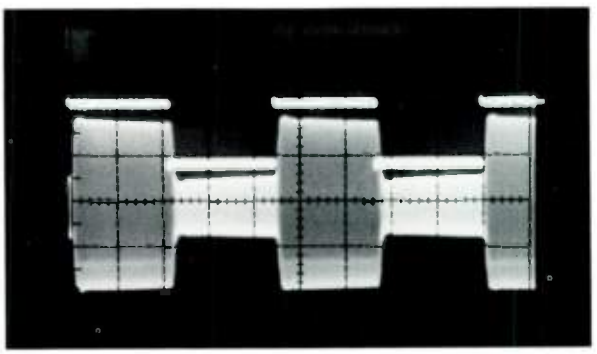
Harmonic Distortion 600 Hz, 0.432% at 90% mod.



Triangle waveform



SMPTE intermod. waveform, 60 Hz/7500 Hz, 4:1 ratio



400 Hz square wave

World Radio History

SPECIFICATIONS

ELECTRICAL

POWER OUTPUT	50 kW, capable of 60 kW. Convenient power reduction to other levels.
RF FREQUENCY RANGE	525 kHz to 1,620 kHz
RF OUTPUT IMPEDANCE	50 Ω nominal or as specified
RF FREQUENCY STABILITY	± 5 Hz or better
RF HARMONICS	Meets or exceeds FCC and CCIR specifications (– 80 dB or better)
CARRIER SHIFT	Less than 2% at 100% modulation
AUDIO FREQUENCY RESPONSE	± 1.5 dB 40 to 10,000 Hz at 95% mod.
AUDIO FREQUENCY DISTORTION	Less than 2% 50 Hz to 10 kHz at 95% modulation. Typically 1% at most frequencies
NOISE	– 63 dB or better below 100% modulation. Typical – 70 dB
AUDIO INPUT	600/150 Ω at + 10 dBm ± 2 dB for 100% modulation. Balanced and isolated from ground
PRIMARY POWER INPUT	380 V, or 480 V ± 5%, 3 Phase, 50/60 Hz (to be specified by customer)
POWER CONSUMPTION	74.3 kVA at 0% modulation 86.9 kVA at 30% modulation 106.99 kVA at 100% modulation
OVERALL EFFICIENCY	Better than 60% at average modulation
POWER FACTOR	95%
TUBES USED	Four (4) EIMAC 4CX20000B

MECHANICAL

TEMPERATURE RANGE	– 20° to + 55° C
HUMIDITY	95% maximum
ALTITUDE	7,500 feet above sea level or 10,000 feet density altitude (whichever is the greater)
OPERATING DUTY CYCLE	Continuous 100% sine wave modulation at any frequency between 40 and 10,000 Hz at 55 kW power output. Continuous 66.6% square-wave modulation at any frequency that will not cause the modulator overloads to trip (generally 100 Hz and above)

DIMENSIONS		
Transmitter	height	85″ (215.9 cm)
	width	30½″ (77.5 cm)
	length	122½″ (311.2 cm)
Modulator Component	height	49″ (124.5 cm)
	width	44″ (111.8 cm)
	length	67″ (170.2 cm)
High Voltage Power Supply	height	52″ (132.1 cm)
	width	55″ (139.7 cm)
	length	55″ (139.7 cm)
Power Panel	height	74″ (188 cm)
	width	12″ (30.5 cm)
	length	96″ (243.8 cm)
WEIGHT (estimated)	actual	15,000 lbs. (6,795 kg)
	shipping	15,200 lbs. (6,885.6 kg)
FINISH		McMartin beige

ORDERING INFORMATION

Model	Description	Product Code
BA-50K	50,000 W AM transmitter with 10 kW power cutback consisting of four section cabinet, power control panel, high voltage power supply, modulation transformer and reactor vault. 380/415/460 VAC, 50/60 Hz, 3 phase	10-01-058
STA-50K	100% Spare tube kit consisting of four 4CX20000B tubes	
BA-50K TEO	Test equipment option. Tektronix RTM-506 mainframe, DM502A counter, SG-505 function generator, SC502 oscilloscope, AA501 distortion analyzer	

MAR/81

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World Radio History

250 — 1,500 WATT FM TRANSMITTER

BF-1M

MCMARTIN

World Radio History

MC MARTIN BF-1M TRANSMITTER

EXCELLENT PA EFFICIENCY — 70-80%

OVERLOAD-STATUS LIGHTS BUILT-IN

AUTOMATIC RECYCLING

SOLID STATE DRIVER — ONE TUBE

**EASILY REMOTE CONTROLLED.
NO INTERFACE ADAPTERS NEEDED**

VERY STABLE OPERATION — GROUNDED GRID

NO NEUTRALIZATION REQUIRED

PA-OVERLOAD AND VSWR SENSING BUILT-IN

CONSERVATIVELY RATED

**PROTECTIVE CIRCUIT FOR LOSS OF AIR
PRESSURE AND EXCESSIVE TEMPERATURE**

Top notch performance at output levels in the 250 to 1,500 Watt range is assured by the McMartin Model BF-1M FM Broadcast transmitter. The BF-1M is FCC Type Accepted for any power output throughout this range.

The BF-1M is designed for operation on any specified frequency from 87.5 to 108 MHz. The grounded grid Class C PA stage assures excellent bandwidth characteristics, essential to the stringent demands of stereophonic and SCA multiplex transmission today.

The power amplifier stage uses a ceramic/metal, zero-bias, hi-mu triode — the 3CX1500/A7. As a grounded grid Class C amplifier, this tube requires no neutralization, no grid bias and no screen grid power supplies. The elimination of many components, required for power tetrode PA stages, contributes both to long-term reliability and stability and a remarkably simple and straightforward design of the output RF stage.

The PA tube is driven by a solid-state intermediate power amplifier stage following the field-proven, high-performance McMartin Model BFM-8000 solid state exciter. Stereo or SCA multiplex capability is easily attained by use of the optional stereo and SCA generator assemblies.

The heart of the BF-1M is the advanced McMartin BFM-8000. All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal and, when so equipped, multiplex stereo and SCA subchannel signals.

The audio processor (optional) is McMartin's Exclusive *Maxi-1*, an exceptionally responsive design which assures maximum program loudness and limits overshoot to less than 2%.

The BFM-8000 replaces the McMartin B-910 exciter used in the "K" series FM transmitters and provides superior performance that includes improved stereo separation, lower SCA distortion, and extremely low SCA crosstalk into the main channel; lower, in fact, than the noise floor. The BFM-8000 is also unaffected by line voltage transients and is extremely stable under a wide range of environmental conditions.

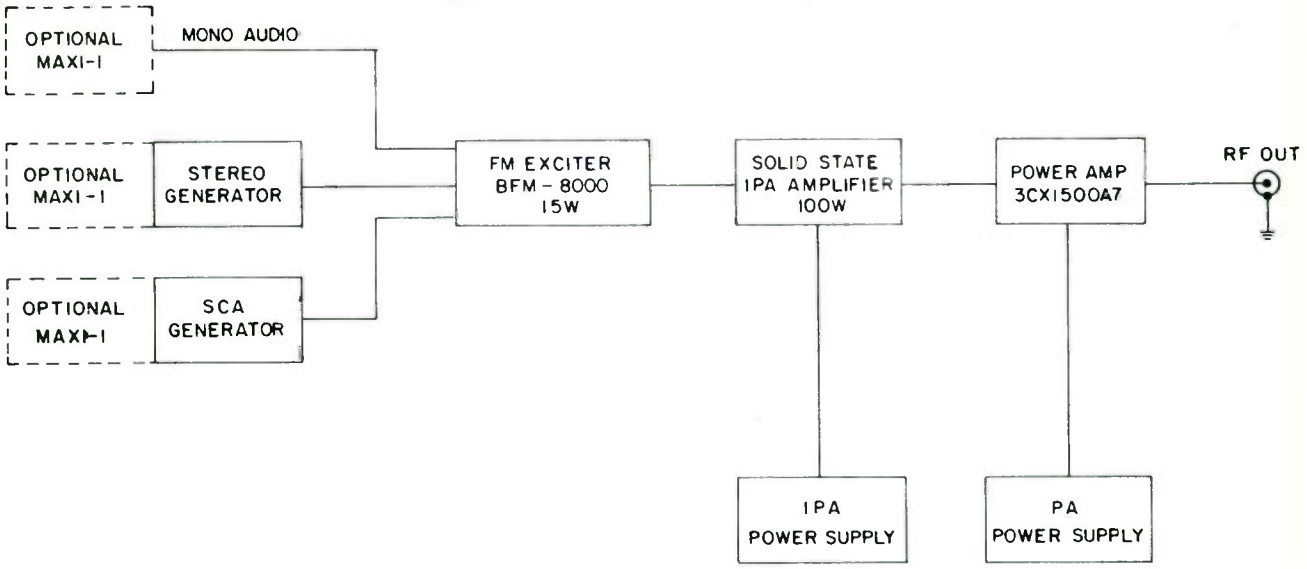
The BF-1M is easy to operate. Simple pushbutton start-stop switching, eye-level metering and convenient operating controls emphasize the "designed-for-humans" approach. Maintenance and servicing is simple — all components are readily accessible. Where remote control operation is employed, the BF-1M is ready. Terminations are provided for interface with all standard remote control systems. In addition to start-stop functions and motor driven power output control, telemetry sampling voltages of the major operating parameters, including VSWR indication, are standard.

The BF-1M has an automatic recycling system, backed up by a memory-type LED status indicator panel. Exciter output, IPA and PA overloads and VSWR values are monitored continuously. If a fault occurs, it is displayed on the LED status indicator associated with that portion of the transmitter circuit where it occurred. Three "start" pulses spaced about one second apart are automatically initiated. If the fault is corrected during the three-pulse sequence the BF-1M is returned to its normal operation; however, the status indicator remains energized until manually reset. If the fault persists, the BF-1M reverts to its "standby" condition. The status indicator localizes the fault and remains on until reset manually. The automatic recycling/status indicator combination immediately alerts engineering personnel to intermittent faults which are normally extremely difficult to isolate.

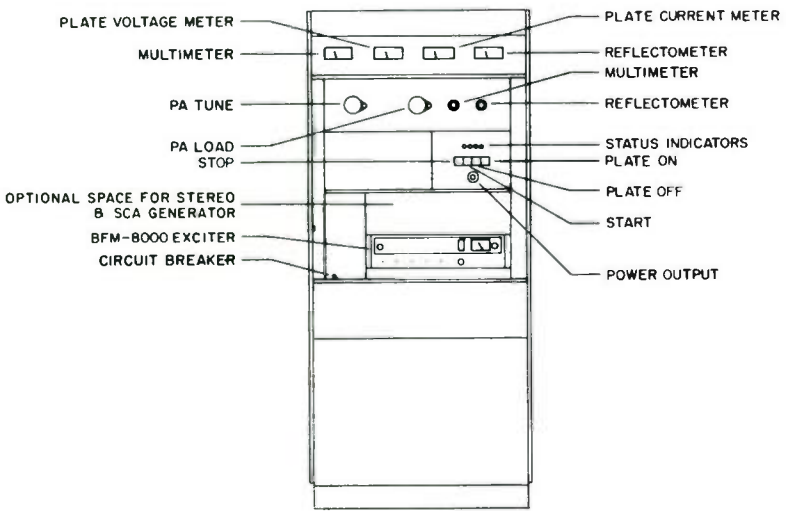
The BF-1M is completely self-contained in an attractively-styled cabinet. Positive pressure cabinet cooling, coupled with conservative operating levels for all components results in outstandingly cool operation, contributing to excellent, long-term reliability. Large, eye-level meters display PA plate voltage and current, VSWR, filament and line voltage, plus a ten-position multimeter readout of auxiliary operating voltages and currents.

The BF-1M is delivered to you, pretuned and tested, on your frequency, complete with engineering test data. Installation is strictly a matter of connecting primary power, audio input and monitor cables and the antenna transmission line.

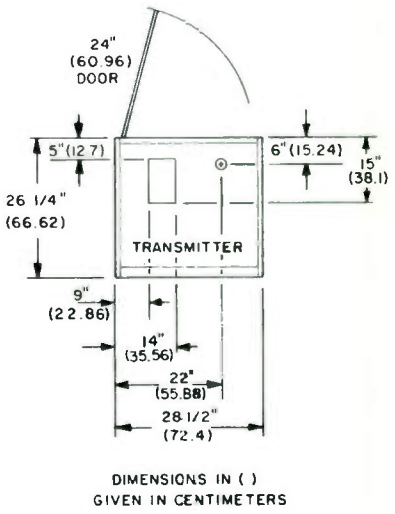
World Radio History



Block diagram



Front panel description



Floor plan

World Radio History

SPECIFICATIONS

OPERATING RANGE	87.5 to 108 MHz
RF POWER OUTPUT	250 to 1,500 W maximum
RF OUTUT IMPEDANCE	50 Ω (1⅝" EIA)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Std. FCC 75 μs pre-emphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% mod.
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
FM NOISE	>65 dB below 100% modulation (typical 70 dB)
AM NOISE	>55 dB below carrier level
POWER REQUIRED	208/230/240 VAC, 50/60 Hz, single phase, 3-wire.
POWER CONSUMPTION	1,5000 W output, 2,600 W 1,000 W output, 1,700 W 250 W output, 850 W
OPERATING TEMPERATURE	0° to 50° C
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	height . . . . . 70½" (179.1 cm) width . . . . . 28¼" (71.8 cm) depth . . . . . 25¾" (65.4 cm) rear door swing . . . . . 30" (76.2 cm)
WEIGHT	actual . . . . . 715 lbs. (323.9 kg) shipping . . . . . 955 lbs. (432.6 kg)
FINISH	McMartin beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Assembly)

AUDIO INPUT IMPEDANCE	600 Ω balanced, each channel
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Std. FCC 75 μs, pre-emphasis, each channel)
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz typically 50 dB or greater mid-range
FM NOISE	65 dB or greater below 100% mod.
PILOT STABILITY	± 1 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L + R to L − R, L − R to L + R)	40 dB or greater below 90% mod.

SCA OPERATION (with BFM-1531R SCA Generator Module)

AUDIO INPUT IMPEDANCE	600 Ω, 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
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N RATIO	60 dB or greater

ORDERING INFORMATION

Model	Description	Product Code
BF-1M	.25 - 1.5 kW FM broadcast transmitter, complete with exciter and and tubes, 208/230/240 VAC, 50/60 Hz, single phase 3-wire (grounded neutral)	**10-01-090**
STF-1K	Spare tube kit for BF-1M	**10-01-094**
	Spare rectifier diode stack RS 1.5-12-12M (Requires two)	**210015**

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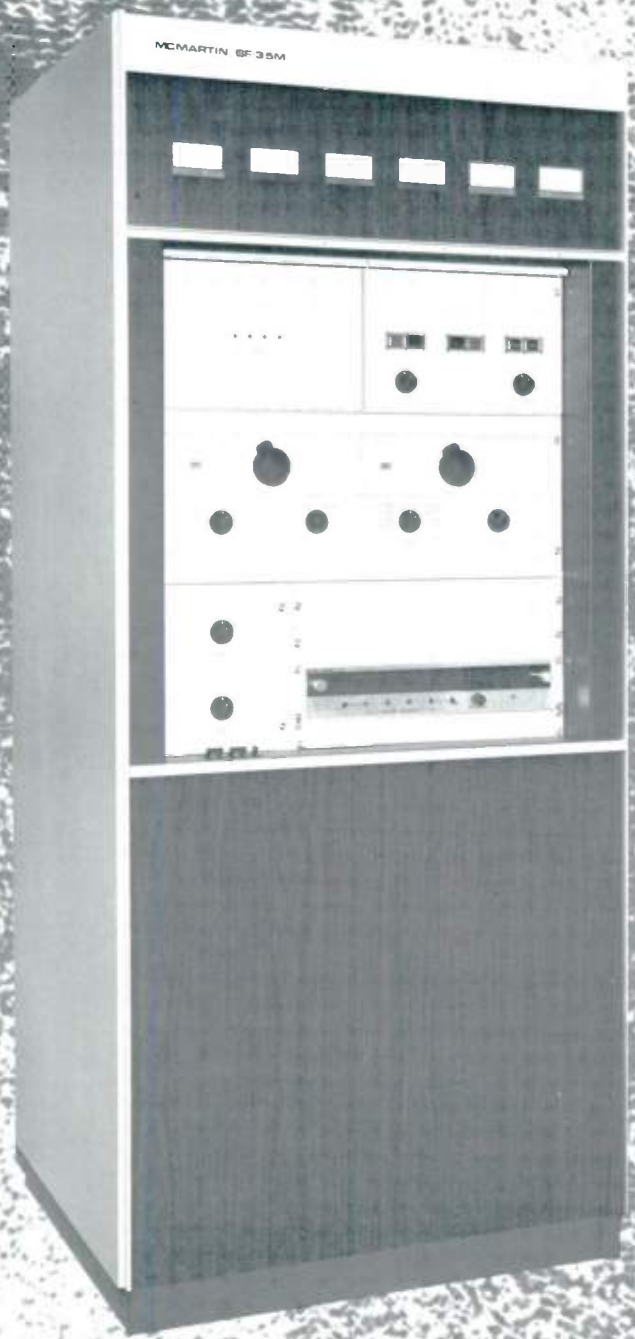
World Radio History

1,500 — 3,500 WATT FM TRANSMITTER

BF-3.5M



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World Radio History

MC MARTIN BF-3.5M TRANSMITTER

EXCELLENT PA EFFICIENCY — 70-80%

VERY STABLE OPERATION — GROUNDED GRID

OVERLOAD-STATUS LIGHTS BUILT-IN

NO NEUTRALIZATION REQUIRED

AUTOMATIC RECYCLING

PA-OVERLOAD AND VSWR SENSING BUILT-IN

EASILY REMOTE CONTROLLED. NO INTERFACE ADAPTERS NEEDED

CONSERVATIVELY RATED

PROTECTIVE CIRCUIT FOR LOSS OF AIR PRESSURE AND EXCESSIVE TEMPERATURE

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

The BF-3.5M 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-3.5M 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 88.5 to 108 MHz range, and at power output levels from 2,000 to 3,500 Watts, result in an extremely conservative transmitter. The BF-3.5M is FCC Type Accepted for any power output throughout this range.

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

The heart of the BF-3.5M is the advanced McMartin BFM-8000. All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal and, when so equipped, multiplex stereo and SCA subchannel signals.

The audio processor (optional) is McMartin's Exclusive *Maxi-1*, an exceptionally responsive design which assures maximum program loudness and limits overshoot to less than 2%.

The BFM-8000 replaces the McMartin BFM-910 exciter used in the "K" series FM transmitters and provides superior performance that includes improved stereo separation, lower SCA distortion, and extremely low SCA crosstalk into the main channel; lower, in fact, than the noise floor. The BFM-8000 is also unaffected by line voltage transients and is extremely stable under a wide range of environmental conditions.

The BF-3.5M 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-3.5M.

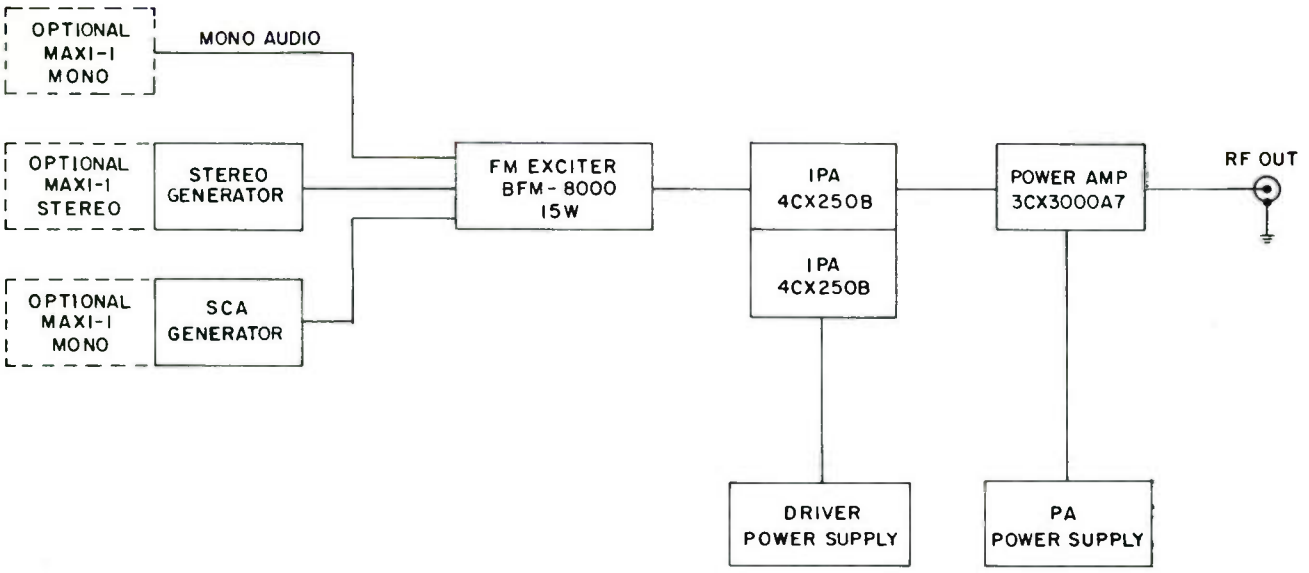
A quiet, centrifugal blower maintains positive air pressure through the compartmentized IPA and PA stages, and is supplemented by a cabinet exhaust fan. This air system greatly reduces thermal aging of components.

The BF-3.5M 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!

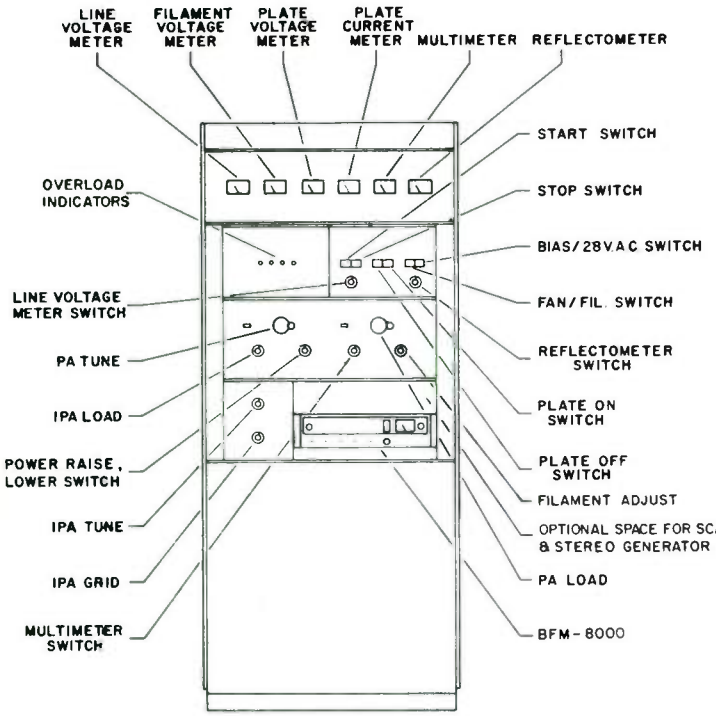
The electronic integrity is supplemented by rugged mechanical design in a style which is strikingly attractive.

The powerfully proud BF-3.5M is a pleasure to own . . . a pleasure to maintain . . . a pleasure to listen to . . . another new breed of McMartin broadcast products.

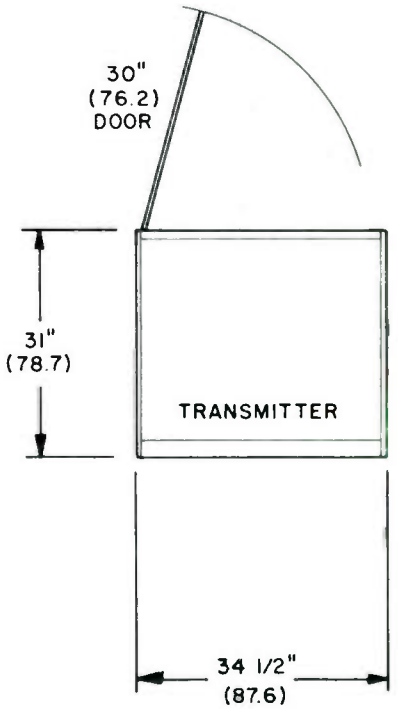
World Radio History



Block diagram



Front panel description



DIMENSIONS IN ( )
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Floor plan

World Radio History

SPECIFICATIONS

OPERATING RANGE	87.5 to 108 MHz
RF POWER OUTPUT	1,500 to 3,500 W maximum
RF OUTPUT IMPEDANCE	50 Ω (supplied with 1⅝" elbow and flange)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Std. FCC 75 μs pre-emphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% mod.
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
FM NOISE	65 dB below 100% modulation (typical 70 dB)
AM NOISE	55 dB below carrier level
POWER REQUIRED	208/230/240 Vac, 50/60 Hz single phase standard 208/230/240 Vac, 3-phase optional
POWER CONSUMPTION (Approx.)	2,000 W output, 4,400 W 2,500 W output, 5,200 W 3,000 W output, 5,900 W 3,500 W output, 6,500 W
OPERATING TEMPERATURE	0° to 50° C
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	height . . . 85" (215.9 cm) width . . . 34½" (87.6 cm) depth . . . 31" (78.7 cm) rear door swing . . . 30" (76.2 cm)
WEIGHT	actual . . . 975 lbs. (441.7 kg) shipping . . . 1275 lbs. (577.6 kg)
FINISH	McMartin beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Assembly)

AUDIO INPUT IMPEDANCE	600 Ω balanced, each channel
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Std. FCC 75 μs, pre-emphasis each channel)
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000Hz
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz
FM NOISE	60 dB or greater below 100% mod. typically 50 dB or greater at mid-range
PILOT STABILITY	± 1 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L + R to L − R, L − R to L + R)	40 dB or greater below 90% mod.

SCA OPERATION (with BFM-1531R SCA Generator Module)

AUDIO INPUT IMPEDANCE	600 Ω, 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
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	60 dB or greater

ORDERING INFORMATION

Model	Description	Product Code
BF-3.5M	1.5 - 3.5 kW FM transmitter, complete with exciter and tubes, 208/230/240 VAC, 50/60 Hz, single phase (optional 208/230/240 VAC, 3-phase)	**10-01-026**
STF-3.5K	Spare tube kit for BF-3.5M	**10-01-027**
	Spare Rectifier Diode Stack RS 3.5-24-12S (Requires four)	**210016**

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World Radio History

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3,500 — 5,500 WATT FM TRANSMITTER

BF-5M

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MC MARTIN BF-5M TRANSMITTER

EXCELLENT PA EFFICIENCY — 70-80%

VERY STABLE OPERATION — GROUNDED GRID

OVERLOAD-STATUS LIGHTS BUILT-IN

NO NEUTRALIZATION REQUIRED

AUTOMATIC RECYCLING

PA-OVERLOAD AND VSWR SENSING BUILT-IN

EASILY REMOTE CONTROLLED. NO INTERFACE ADAPTERS NEEDED

CONSERVATIVELY RATED

PROTECTIVE CIRCUIT FOR LOSS OF AIR PRESSURE AND EXCESSIVE TEMPERATURE

The McMartin BF-5M transmitter is designed for FM broadcast service, operating on a specific frequency in the range of 87.5 to 108 MHz, and power output levels from 3.5 to 5.5 kW. The BF-5M is FCC Type Accepted at these power ranges.

The BF-5M utilizes the high-performance McMartin BFM-8000 solid state exciter. The RF output of the exciter drives an intermediate power amplifier stage consisting of paralleled Type 4CX250B radial beam tetrodes. These supply RF excitation to a ceramic/metal, zero-bias, hi-mu triode tube, type 3CX3000/A7, operating as a grounded-grid Class C amplifier. This configuration is well-recognized as optimum for the wide-band characteristics essential to superior stereo and SCA multiplex operation today — and for quadraphonic sound, tomorrow.

Contributing to the long-term, stable operation of the transmitter are the following factors: (A) no grid-bias power supply, (B) no screen-voltage power supply, (C) no neutralization is required (which is essential to other transmitter designs, using power tetrode output tubes.

The heart of the BF-5M is the advanced McMartin BFM-8000. All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal, and, when so equipped, multiplex stereo and SCA subchannel signals.

The audio processor (optional) is McMartin's Exclusive *Maxi-1*, an exceptionally responsive design which assures maximum program loudness and limits overshoot to less than 2%.

The BFM-8000 replaces the McMartin B-910 exciter used in the "K" series FM transmitters and provides superior performance that includes improved stereo separation, lower SCA distortion, and extremely low SCA crosstalk into the main channel; lower, in fact, than the noise floor. The BFM-8000 is also unaffected by line voltage transients and is extremely stable under a wide range of environmental conditions.

The BF-5M is controlled by simple pushbutton start-stop switch operation, with terminations provided for interface with standard remote control systems, including telemetry sampling voltages.

Automatic recycling and memory-type LED status indication is standard. The status system senses and displays the source of any carrier interruption. The exciter output; IPA and PA stage overloads; and transmission line VSWR are monitored continuously. Any fault is detected and displayed on the LED indicator panel and can be "cleared" only by manual reset. The recycling circuitry upon a fault occurrence, automatically initiates three "start" pulses, spaced about one second apart. If the fault persists, the BF-5M will revert to its "standby" condition, and the LED status indicator associated with that portion of the transmitter within which the fault occurred, will be illuminated.

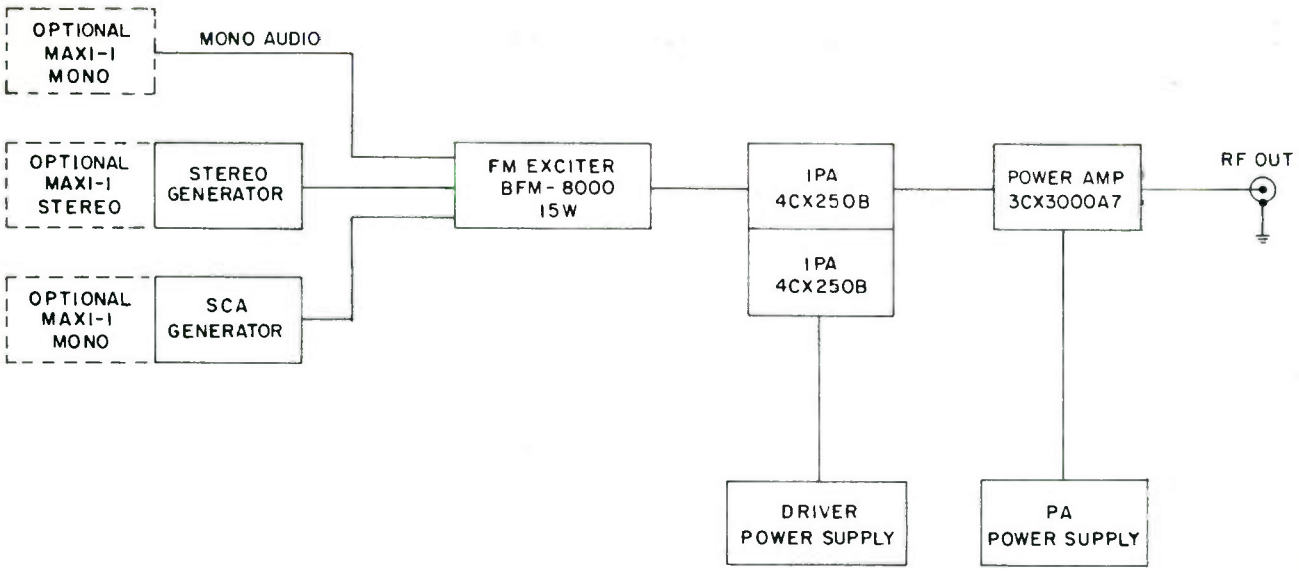
For output operating levels up to 4 kW, the BF-5M is completely self-contained. For 4 to 5.5 kW output, an external RF harmonic filter is supplied. This mounts horizontally above the BF-5M cabinet.

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.

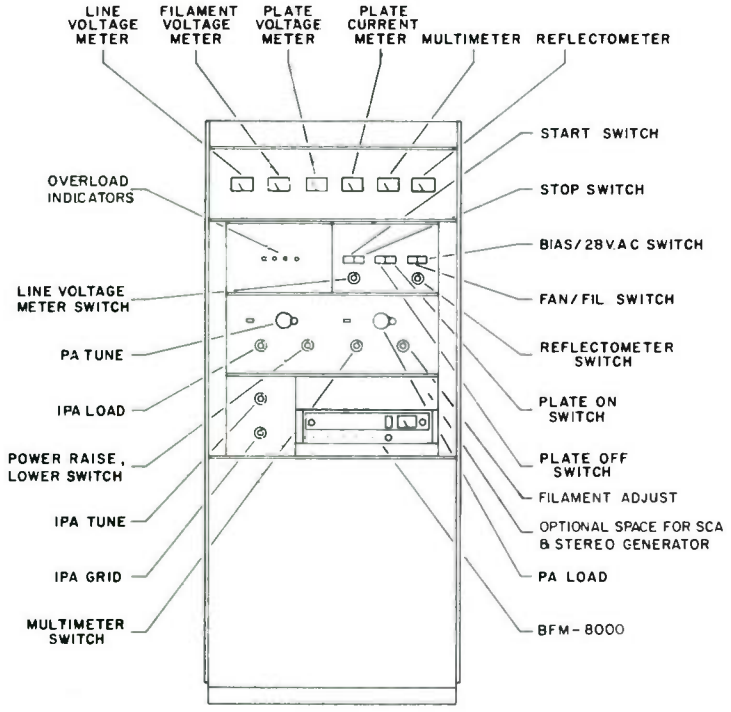
All major parameters are displayed on large front panel meters, including PA plate voltage and current; VSWR; filament and line voltages and a ten-position multimeter readout. Three-phase primary power is standard. Single phase operation is available as an option.

Where redundant or combined transmitter systems are desired, dual BF-5M units may be used. McMartin will gladly furnish quotations for specialized systems of this type, engineering-tailored to your specifications.

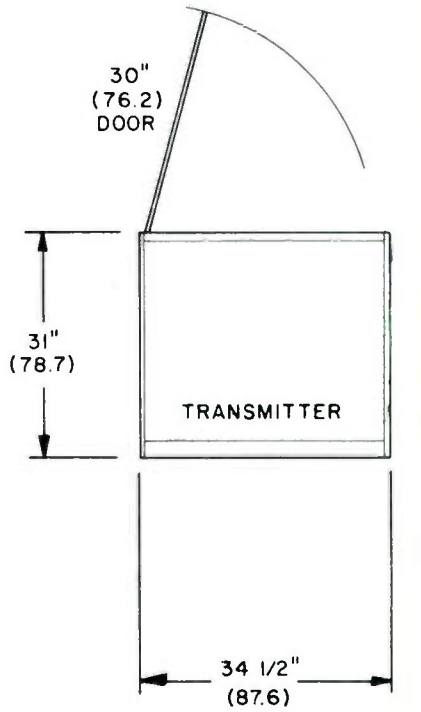
World Radio History



Block diagram



Front panel description



DIMENSIONS IN ( ) GIVEN IN CENTIMETERS

Floor plan

World Radio History

SPECIFICATIONS

OPERATING RANGE	87.5 to 108 MHz
RF POWER OUTPUT	3,500 to 5,500 W maximum
RF OUTPUT IMPEDANCE	50 Ω (1⅝" EIA)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (standard FCC 75 μs pre-emphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% modulation
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
FM NOISE	>65 dB below 100% modulation (typical 70 dB)
AM NOISE	>55 dB below carrier level
POWER REQUIRED	208/230/240 VAC, 50/60 Hz, 3 phase (other voltages available)
POWER CONSUMPTION (Approx.)	3,500 W output, 7,200 W 4,500 W output, 10,000 W 5,000 W output, 11,250 W 5,500 W output, 12,500 W
OPERATING TEMPERATURE	0° to 50° C
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	height . . . . . 78½" (199.4 cm) width . . . . . 34½" (87.6 cm) depth . . . . . 31" (78.7 cm) rear door swing . . . . . 30" (76.2 cm)
WEIGHT	actual . . . . . 975 lbs. (441.7 kg) shipping . . . . . 1,275 lbs. (577.6 kg)
FINISH	McMartin beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Generator)

AUDIO INPUT IMPEDANCE	600 Ω, balanced each channel
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Standard FCC 75 μs pre-emphasis, each channel)
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz typically 50 dB or greater at mid-range
FM NOISE	65 dB or greater below 100% modulation
PILOT STABILITY	± 1 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L + R to L − R, L − R to L + R)	40 dB or greater below 90% modulation

SCA OPERATION (with BFM-1531R SCA Generator)

AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
CARRIER FREQUENCY	41 or 67 kHz standard (others available on request)
CARRIER STABILITY	± 500 Hz
MODULATION CAPABILITY	± 75 kHz
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	60 dB or greater

ORDERING INFORMATION

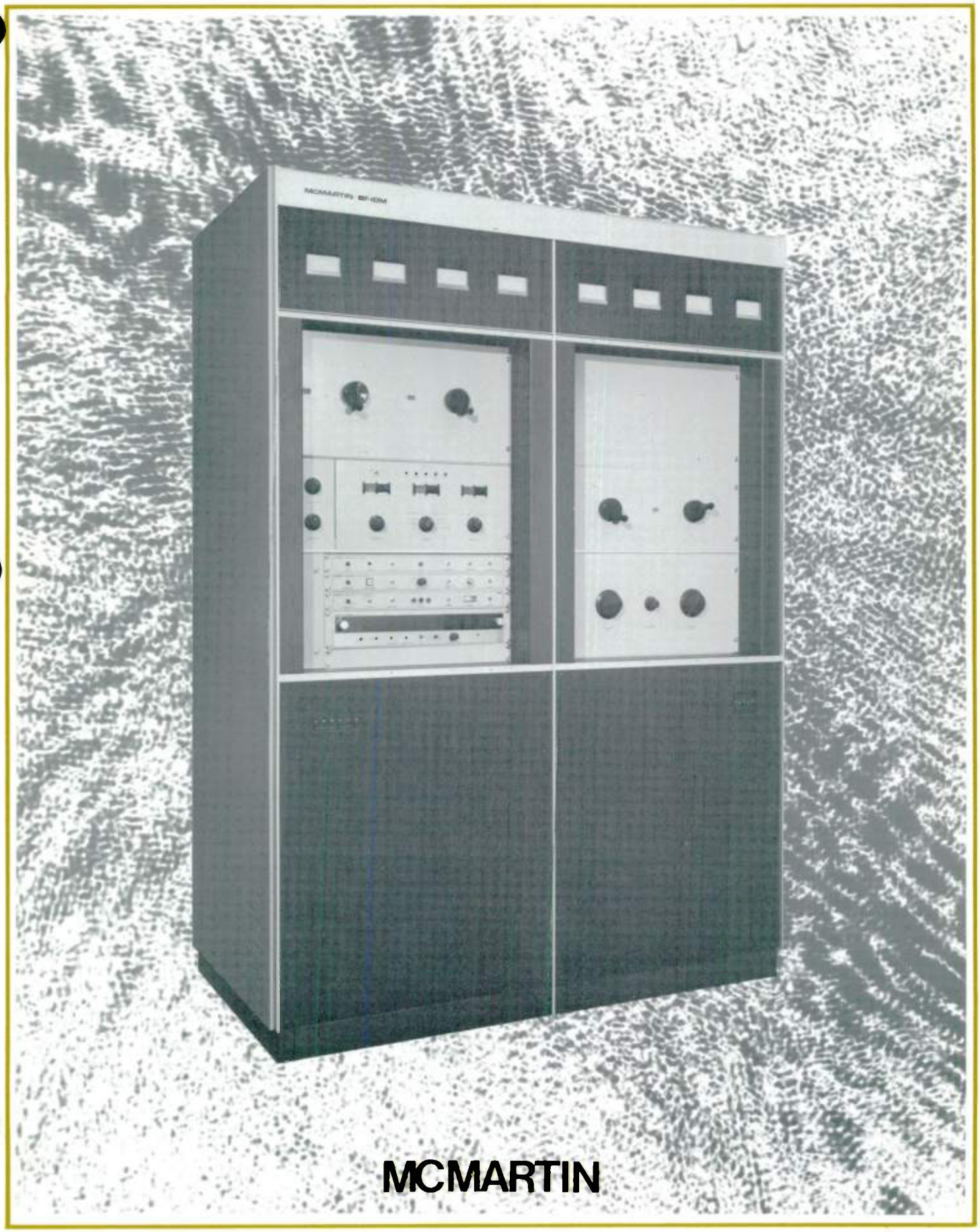
Model	Description	Product Code
BF-5M	3.5 - 5.5 kW FM broadcast transmitter complete with exciter and tubes, 208/230/240 VAC, 50/60 Hz, 3 phase (optional 208/230/240 VAC, single phase)	**10-01-040**
STF-5K	Spare tube kit for BF-5M	**10-01-027**
	Spare Rectifier Diode Stack RS 3.5-24-12S (Requires 4)	**210016**

MAR/81

World Radio History

5,500 — 15,000 WATT FM TRANSMITTER

BF-10M



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World Radio History

MC MARTIN BF-10M TRANSMITTER

EXCELLENT PA EFFICIENCY — 70-80%

VERY STABLE OPERATION — GROUNDED GRID

OVERLOAD-STATUS LIGHTS BUILT-IN

NO NEUTRALIZATION REQUIRED

AUTOMATIC RECYCLING

PA-OVERLOAD AND VSWR SENSING BUILT-IN

EASILY REMOTE CONTROLLED. NO INTERFACE ADAPTERS NEEDED

CONSERVATIVELY RATED

PROTECTIVE CIRCUIT FOR LOSS OF AIR PRESSURE AND EXCESSIVE TEMPERATURE

For optimum performance and long-term reliability in FM broadcast installations requiring transmitter power output in the range of 5.5 to 15 kW, the McMartin BF-10M FM Broadcast Transmitter is the finest choice. The BF-10M is FCC Type Accepted at these power ranges.

The BF-10M meets todays stringent requirements for monaural, stereophonic and SCA multiplex operation — and is ready for the mode of tomorrow — quadraphonic sound.

The excellent wideband characteristics of the BF-10M have been designed into the unit by the use of grounded-grid circuitry in its high-power RF driver and power amplifier stages. Both stages use ceramic/metal, zero-bias, high-mu triodes; a Type 3CX1500/A7 for the driver and a Type 3CX10,000/A7 in the PA stage. Widely recognized for their broadband characteristics in the grounded grid configuration, the use of these tube types also eliminates the need for neutralization and the many components required for grid bias and screen voltage power supplies. This results in an outstandingly simple and straightforward design approach in the critical high-power RF stages.

One additional tube, a Type 4CX250B serves as an intermediate power amplifier between the solid-state BFM-8000 exciter and the driver stage. Motor-driven screen voltage adjustment of the 4CX250B screen grid voltage insures extremely smooth control of the BF-10M power output level.

The heart of the BF-10M is the advanced McMartin BFM-8000. All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal and, when so equipped, multiplex stereo and SCA subchannel signals.

The audio processor (optional) is McMartin's Exclusive *Maxi-1*, an exceptionally responsive design which assures maximum program loudness and limits overshoot to less than 2%.

The BFM-8000 replaces the McMartin B-910 exciter used in the "K" series FM transmitters and provides superior performance that includes improved stereo separation, lower SCA distortion, and extremely low SCA crosstalk into the main channel; lower, in fact, than the noise floor. The BFM-8000 is also unaffected by line voltage transients and is extremely stable under a wide range of environmental conditions.

The BF-10M is completely self-contained in an attractively styled dual-section cabinet, with the exception of the RF harmonic filter which is externally mounted above the BF-10M cabinet.

The BF-10M is controlled by simple pushbutton start-stop switch operation, with terminations for remote control operation, which includes telemetry sampling voltages, for interface with all standard remote control systems.

Automatic recycling and memory-type LED status indications are standard. The status system senses and displays the source of any carrier interruption. The exciter output; IPA, driver and PA stage overloads; and transmission line VSWR are monitored continuously. Any fault is detected and displayed on the LED indicator panel and can be "cleared" only by manual reset. The recycling circuitry upon a fault occurrence, automatically reverts to a standby condition, and the LED status indicator associated with that portion of the transmitter in which the fault occurred will be illuminated.

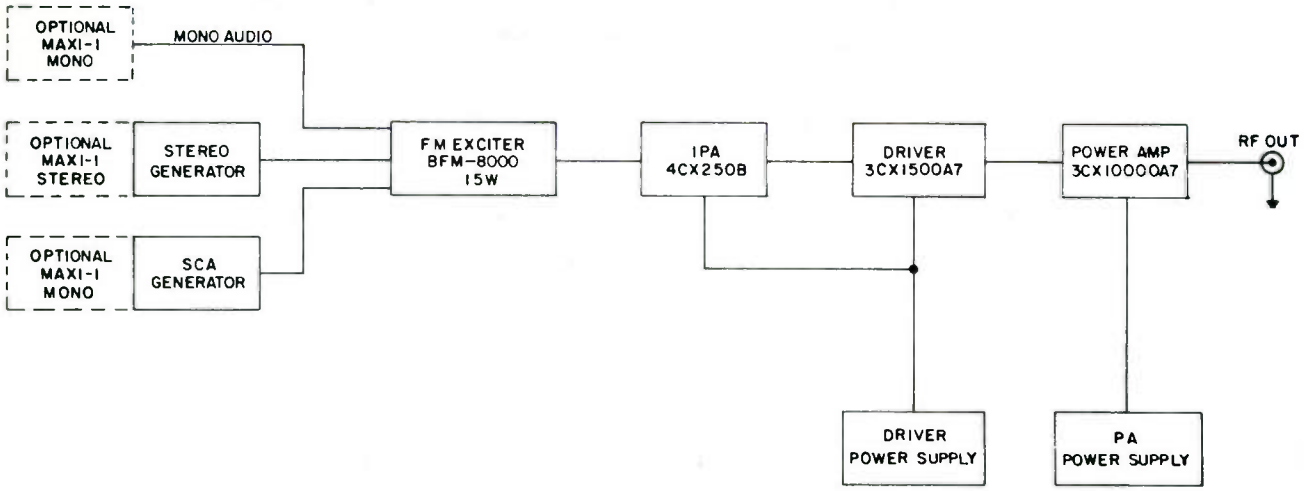
Positive pressure air cooling, in conjunction with conservative operation of the high-power RF stages, results in unusually cool operation of the BF-10M. This contributes to excellent long-term component reliability.

All major parameters are monitored on large-size front panel meters. Driver and PA plate voltages and currents are metered separately. In addition VSWR, input line voltages, driver/PA filament voltages and a ten-position multimeter readout occupy the upper front meter panel.

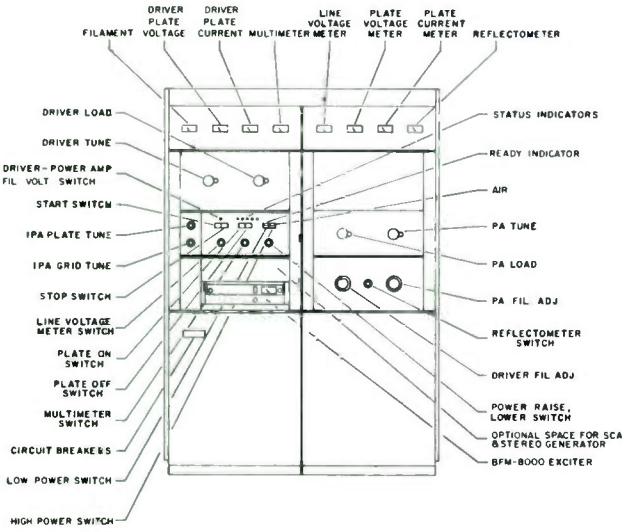
The electrical and mechanical design of the BF-10M provides for easy field installation of optional power output feed at an approximately 1000 Watt level directly from the 3CX1500/A7 driver stage.

Dual BF-10M units may be paired for redundant 5.5 to 15 kW or combined for 11 to 30 kW output operation. McMartin will gladly furnish quotations for special systems of this type, engineered and tailored to your specifications.

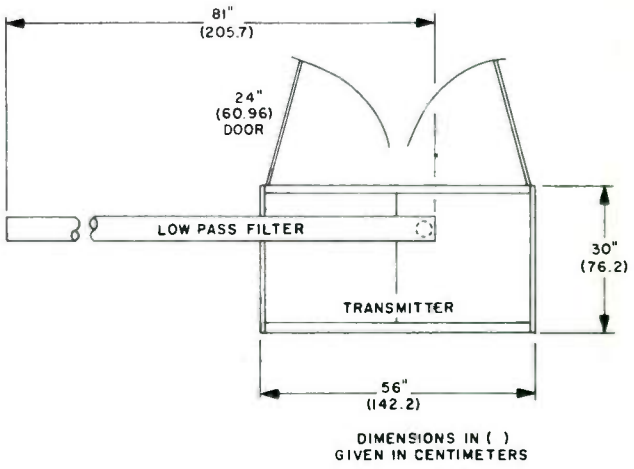
World Radio History



Block diagram



Front panel description



Floor plan

World Radio History

SPECIFICATIONS

OPERATING RANGE	87.5 to 108 MHz
RF POWER OUTPUT	5.5 to 15 kW maximum
RF OUTPUT IMPEDANCE	50 Ω (3⅛" EIA)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (standard FCC 75 μs pre-emphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% modulation
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
FM NOISE	>65 dB below 100% modulation (typical 70 dB)
AM NOISE	>55 dB below carrier level
POWER REQUIRED	208/230/240 VAC, 50/60 Hz, 3 phase (other voltages available)
POWER CONSUMPTION (Approx.)	5.5 kW output, 12 kVA 7.5 kW output, 15 kVA 10 kW output, 18 kVA 15 kW output, 27 kVA
OPERATING TEMPERATURE	0° to 50° C
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	height . . . 79" (200.7 cm) width . . . 56" (142.2 cm) depth . . . 30" (76.2 cm) rear door swing . . . 24" (61 cm)
WEIGHT	actual . . . 1600 lbs. (724.8 kg) shipping . . . 1,925 lbs. (872 kg)
FINISH	McMartin beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Generator)

AUDIO INPUT IMPEDANCE	600 Ω, balanced each channel
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Standard FCC 75 μs pre-emphasis, each channel)
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz typically 50 dB or greater at mid-range
FM NOISE	65 dB or greater below 100% modulation
PILOT STABILITY	± 1 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L + R to L − R, L − R to L + R)	40 dB or greater below 90% modulation

SCA OPERATION (with BFM-1531R SCA Generator)

AUDIO INPUT IMPEDANCE	600 Ω, 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
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	60 dB or greater

ORDERING INFORMATION

Model	Description	Product Code
BF-10M	5.5 - 15 kW FM broadcast transmitter complete with exciter and tubes, 208/230/240 VAC, 50/60 Hz, 3 phase (optional 208/230/240 VAC, single phase)	**10-01-045**
STF-10K	Spare tube kit for BF-10M	**10-01-048**
	Spare Rectifier Diode Stack, Low Voltage, RS 1.5-12-12M (Requires 2)	**210015**
	Spare Rectifier Diode Stack, High Voltage, RS 3.5-24-12S (Requires 6)	**210016**

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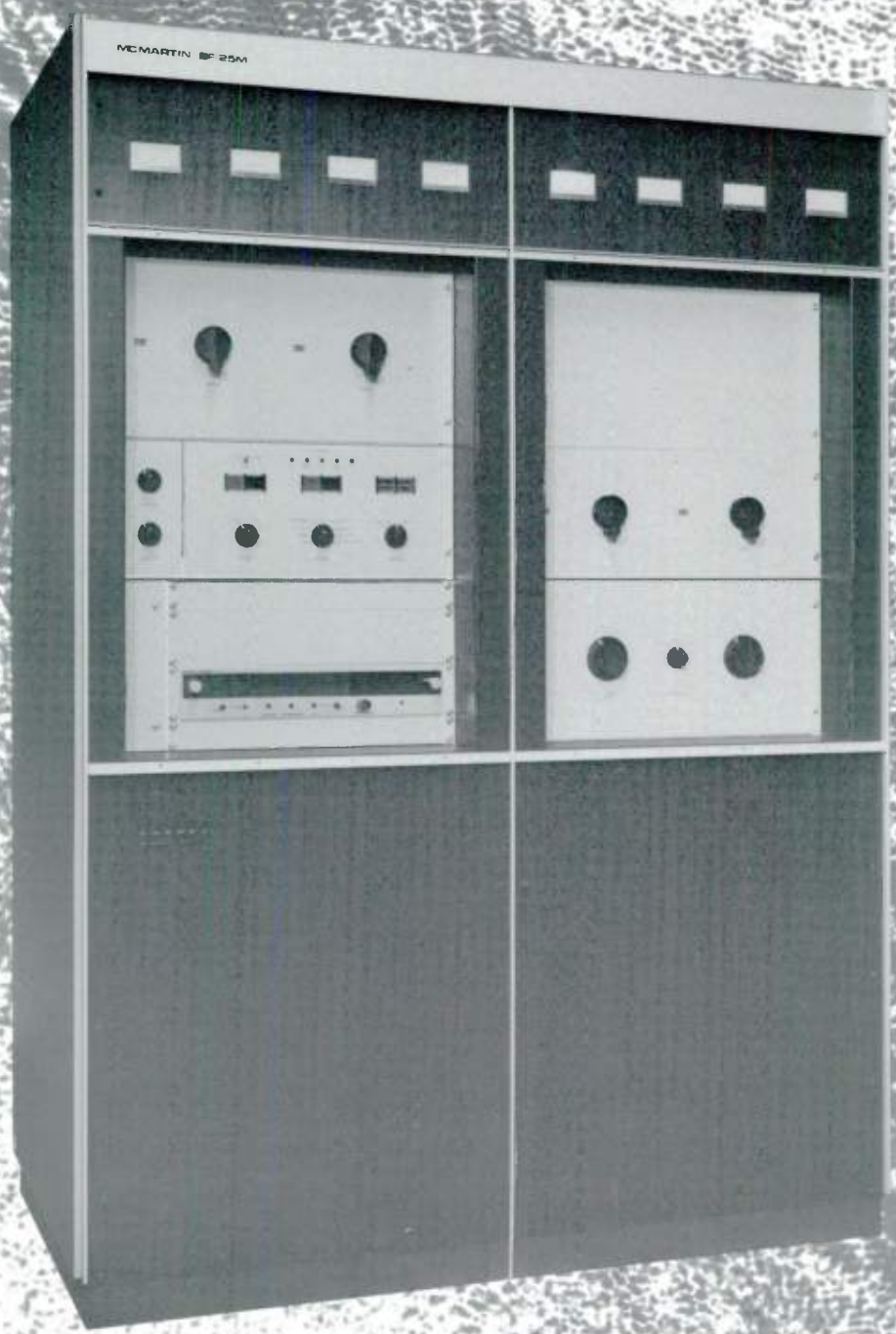
World Radio History

10,000 — 27,500 WATT FM TRANSMITTER

BF-25M



MCMARTIN

World Radio History

MC MARTIN BF-25M TRANSMITTER

EXCELLENT PA EFFICIENTY — 70-80%

OVERLOAD-STATUS LIGHTS BUILT-IN

AUTOMATIC RECYCLING

**EASILY REMOTE CONTROLLED.
NO INTERFACE ADAPTERS NEEDED**

VERY STABLE OPERATION — GROUNDED GRID

NO NEUTRALIZATION REQUIRED

PA-OVERLOAD AND VSWR SENSING BUILT-IN

**PROTECTIVE CIRCUIT FOR LOSS OF AIR
PRESSURE AND EXCESSIVE TEMPERATURE**

The McMartin BF-25M FM broadcast transmitter satisfies FM broadcast station installations requiring transmitter output levels from 10 to 27.5 kW. The BF-25M is FCC Type Accepted at these power ranges.

The BF-25M meets today's stringent requirements for stereo and SCA multiplex operation — and is ready for the mode of tomorrow: quadraphonic sound.

Selected for its widely recognized superior wideband characteristics, McMartin has incorporated grounded-grid Class C designs in the high-level driver and PA stages of the BF-25M. Both stages employ ceramic/metal, zero bias, high-mu triodes; a 3CX3000/A7 for the driver and a 3CX20,000/A7 in the power amplifier output stage. The latter tube, with rated 20,000 Watt plate dissipation, when operated at the 27.5 kW maximum BF-25M output level utilizes less than 40% of its plate dissipation capability. This conservative operation is typical of the overall design of the BF-25M. Emphasis has been placed on circuit simplicity, long-term reliability and ease of maintenance.

By the grounded-grid design approach, grid bias and screen-grid power supplies — essential to tetrode-tube type amplifiers, are completely eliminated. The sometimes touchy and troublesome neutralization problems are gone. The BF-25M RF amplifier stages do not require neutralization. The grounded-grid approach delivers another little bonus. A portion of the "drive" power appears in the PA output circuit. This results in outstanding PA efficiency.

One additional tube, a Type 4CX250B, is used as the intermediate power amplifier between the solid-state exciter and the driver stage. Extremely smooth adjustment of the RF power output of the BF-25M is controlled by motor driven adjustment of the screen voltage applied to the 4CX250B tube.

The heart of the BF-25M is the advanced McMartin BFM-8000. All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal, and, when so equipped, multiplex stereo and SCA subchannel signals.

The audio processor (optional) is McMartin's Exclusive *Maxi-1*, an exceptionally responsive design which assures maximum program loudness and limits overshoot to less than 2%.

The BFM-8000 replaces the McMartin B-910 exciter used in the "K" series FM transmitters and provides superior performance that includes improved stereo separation, lower SCA distortion, and extremely low SCA crosstalk into the main channel; lower, in fact, than the noise floor. The BFM-8000 is also unaffected by line voltage transients and is extremely stable under a wide range of environmental conditions.

The BF-25M is housed in an attractively styled dual-section cabinet with the power amplifier stage occupying one section and all other circuitry in the other. The two halves of the assembly are individually cooled. The electrical and mechanical design arrangement permit easy field installation of optional antenna transmission line switching to the output of the driver stage at a power level of approximately 2500 Watts.

Interlocked control logic permits simple pushbutton switching of all start-stop functions. Termination for remote control operation, including telemetering sampling voltages, permit interface of the BF-25M with all standard remote control systems.

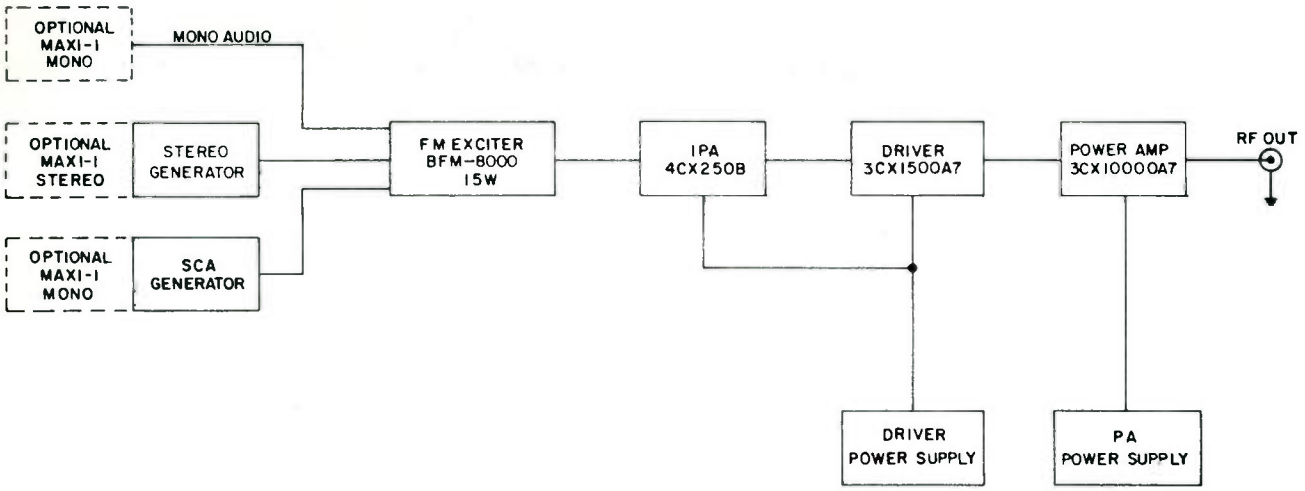
Automatic recycling and a memory-type LED status indicator display, sense and indicate the source of carrier interruptions. The exciter output, IPA, driver and PA stages, high-voltage overload and VSWR are monitored continuously. Any fault is sensed and displayed on the LED indicator panel and can be cleared only by manual reset. The recycling circuitry automatically initiates three "start" pulses, spaced approximately one second apart. If the fault persists, the recycling detection circuit illuminates the LED, indicating that portion of the transmitter system where the fault occurred.

The high-voltage power transformer and associated silicon rectifier stacks for PA plate supply are housed in a separate assembly. The RF harmonic filter mounts horizontally above the main transmitter cabinet.

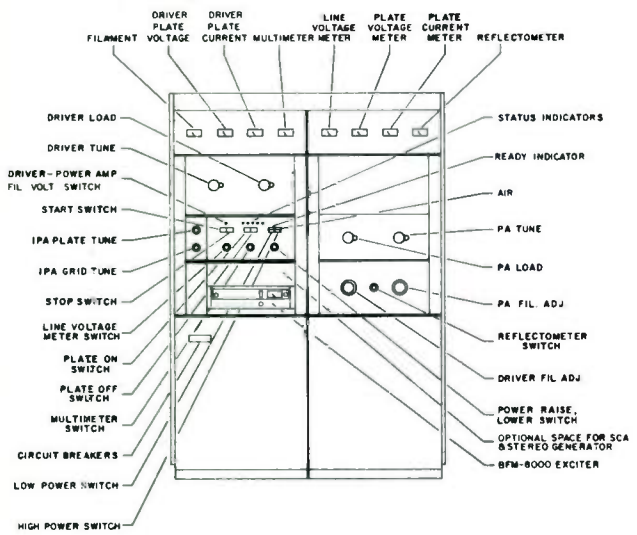
Driver and PA plate voltages and currents are separately metered. These parameters along with VSWR, line voltage, driver/PA filament voltages and a ten-position multimeter readout, are shown on the upper front-panel meter panel.

Dual BF-25M units are also available for redundant 27.5 or paralleled 55 kW output operation. McMartin would be pleased to furnish quotations on systems of this type, engineered and tailored to your specific situations.

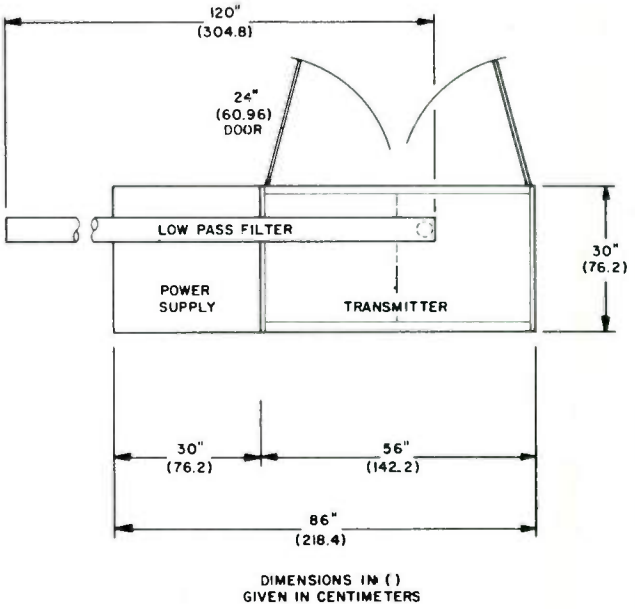
World Radio History



Block diagram



Front panel description



Floor plan

World Radio History

SPECIFICATIONS

OPERATING RANGE	87.5 to 108 MHz
RF POWER OUTPUT	10,000 to 27,500 W maximum
RF OUTPUT IMPEDANCE	50 Ω (3⅛" EIA)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (standard FCC 75 μs pre-emphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% modulation
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
FM NOISE	>65 dB below 100% modulation (typical 70 dB)
AM NOISE	>55 dB below carrier level
POWER REQUIRED	208/230/240 VAC, 50/60 Hz, 3 phase (other voltages available)
POWER CONSUMPTION (Approx.)	10,000 W output, 21 kVA 15,000 W output, 28.5 kVA 20,000 W output, 32 kVA 25,000 W output, 38 kVA
OPERATING TEMPERATURE	0° to 50° C
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	
Main Cabinet	height 79" (200.7 cm) width 56" (142.2 cm) depth 30" (76.2 cm) rear door swing 24" (61 cm)
Power Supply Assembly	height 29" (73.7 cm) width 30" (76.2 cm) depth 30" (76.2 cm)
WEIGHT	
Main Cabinet	actual 1,935 lbs. (876.6 kg) shipping 2,255 lbs. (1,021.5 kg)
Power Supply Assembly	actual 700 lbs. (317.1 kg) shipping 800 lbs. (362.4 kg)
FINISH	McMartin beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Generator)

AUDIO INPUT IMPEDANCE	600 Ω, balanced each channel
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Standard FCC 75 μs pre-emphasis, each channel)
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz typically 50 dB or greater at mid-range
FM NOISE	65 dB or greater below 100% modulation
PILOT STABILITY	± 1 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L + R to L − R, L − R to L + R)	40 dB or greater below 90% modulation

SCA OPERATION (with BFM-1531R SCA Generator)

AUDIO INPUT IMPEDANCE	600 Ω, 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
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	60 dB or greater

ORDERING INFORMATION

Model	Description	Product Code
BF-25M	10 — 27.5 kW FM broadcast transmitter complete with exciter and tubes, 208/230/240 VAC, 50/60 Hz, 3 phase	10-01-046
STF-25K	Spare tube kit for BF-25M	10-01-047
	Spare Rectifier Diode Stack, Low Voltage, RS 1.5-12-2S (Requires 4)	210016
	Spare Rectifier Diode Stack, High Voltage, RS 3.5-24-15S (Requires 6)	210017

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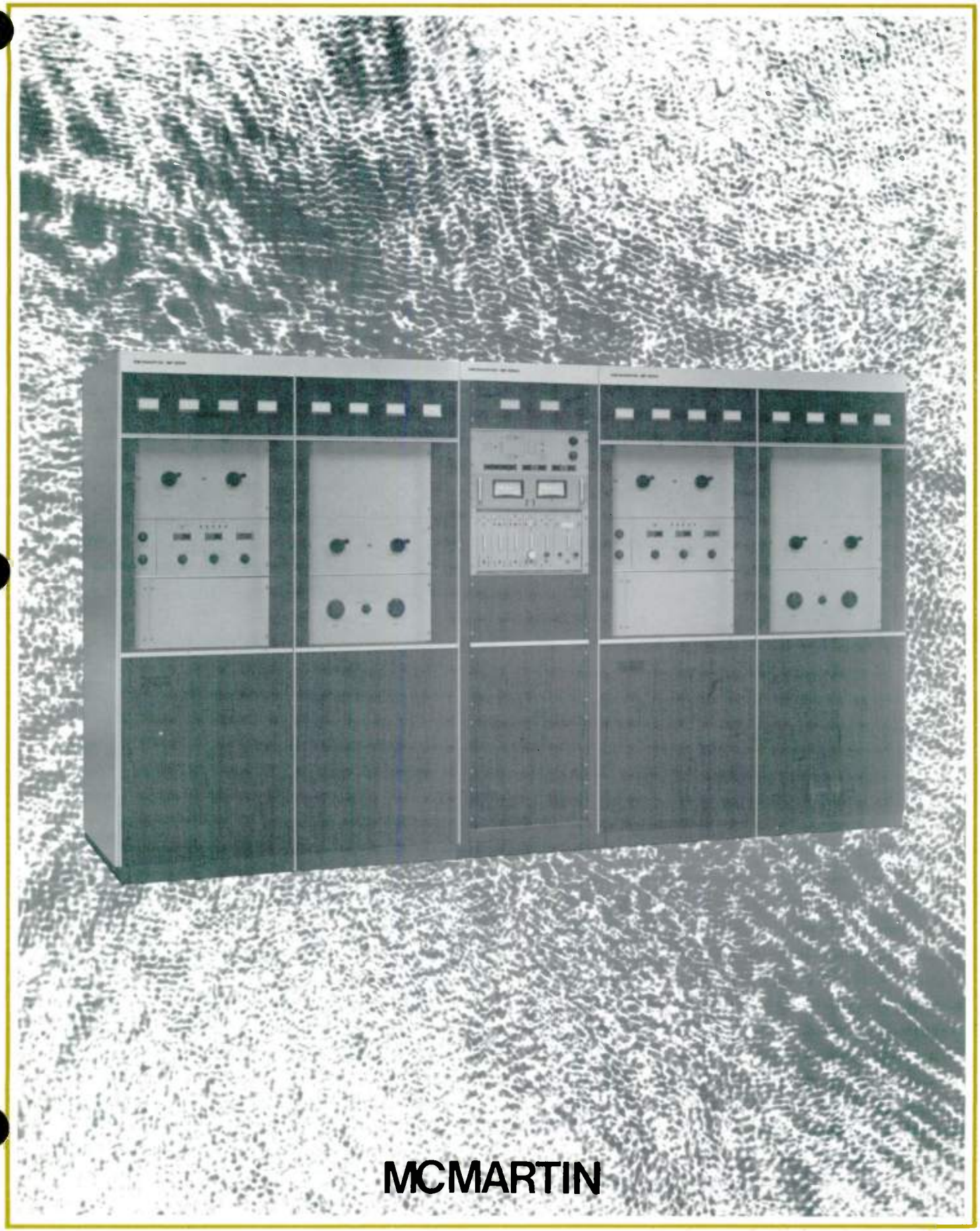
World Radio History

10,000 — 55,000 WATT TRANSMITTER

BF-55M



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World Radio History

MC MARTIN BF-55M TRANSMITTER

EXCELLENT PA EFFICIENCY — 70-80%

VERY STABLE OPERATION — GROUNDED GRID

OVERLOAD-STATUS LIGHTS BUILT-IN

NO NEUTRALIZATION REQUIRED

AUTOMATIC RECYCLING

PA-OVERLOAD AND VSWR SENSING BUILT-IN

EASILY REMOTE CONTROLLED. NO INTERFACE ADAPTERS NEEDED

CONSERVATELY RATED

PROTECTIVE CIRCUIT FOR LOSS OF AIR PRESSURE AND EXCESSIVE TEMPERATURE

The McMartin Model BF-55M kW FM Broadcast Transmitter consists of a single exciter which drives two identical 27.5 kW RF transmitter assemblies, the outputs of which are combined to provide a single RF output termination, delivering up to 55 kW of power.

The 55 kW output capability of the BF-55M has the advantage over competitive transmitters of 40 to 45 kW output capability, since the higher output power frequently permits the use of a less-complex, lower cost antenna array. This generally effects not only a lower investment in the antenna system itself, but also lowers total antenna windloading which is an important element in overall support tower costs.

In the event of a malfunction of one of the 27.5 kW RF power units, transmission continues uninterrupted at a power level equal to one-quarter of the 55 kW output level, or 13,750 Watts. An equivalent amount of power is dissipated in an air-cooled reject load.

The heart of the BF-55M is the advanced McMartin BFM-8000. All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal, and, when so equipped, multiplex stereo and SCA subchannel signals.

The audio processor (optional) is McMartin's Exclusive *Maxi-1*, an exceptionally responsive design which assures maximum program loudness and limits overshoot to less than 2%.

The BFM-8000 replaces the McMartin B-910 exciter used in the "K" series FM transmitters and provides superior performance that includes improved stereo separation, lower SCA distortion, and extremely low SCA crosstalk into the main channel; lower, in fact, than the noise floor. The BFM-8000 is also unaffected by line voltage transients and is extremely stable under a wide range of environmental conditions.

The output of the exciter is fed to a power divider network to provide equal RF drive to each of the 27.5 kW RF power amplifier assemblies. These each are the McMartin Model BF-25M broadcast transmitter, less exciter. The control circuitry for these BF-25M units is such that intermediate power amplifier stages and the RF power amplifier stages and associated power supplies may be controlled independently. This greatly simplifies servicing and maintenance. The RF power assemblies are independently powered so that full redundancy is insured beyond the exciter portion of the system.

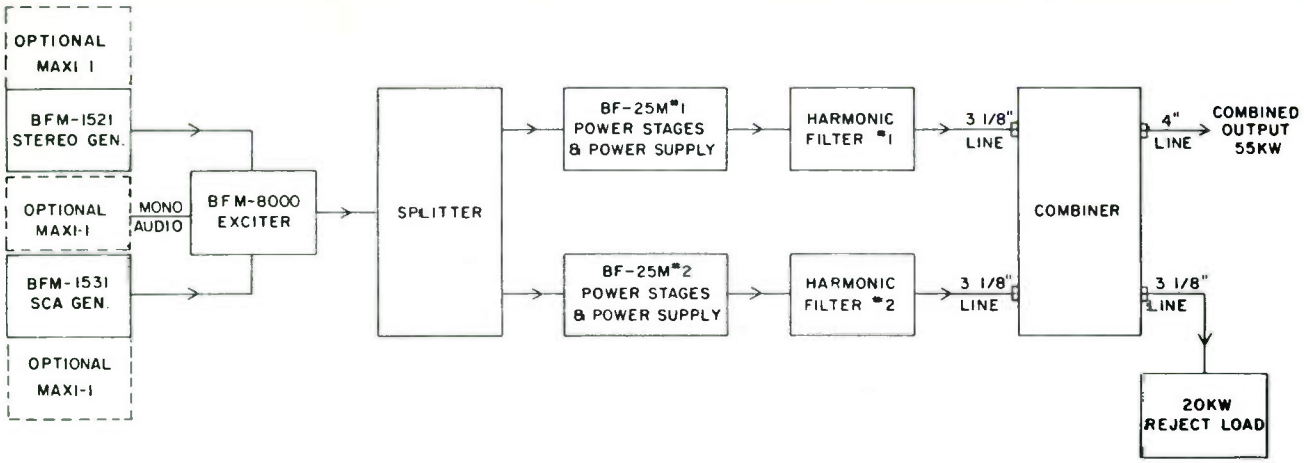
The individual RF power outputs feed low pass harmonic filters, the outputs of which are combined to produce a singe 6⅛" EIA coaxial output termination.

There is considerable latitude in the physical configuration of the transmitter system which can be adapted to the most convenient arrangement for an individual transmitter plant installation. The equipment will be housed in the cabinetry used for two Model BF-25M units, plus an auxiliary matching cabinet enclosure which will house the output combiner control circuitry, exciter and reject load monitoring panel. All coaxial lines, fittings and associated hardware required to mechanically interconnect the harmonic filter, combining networks, etc., are included.

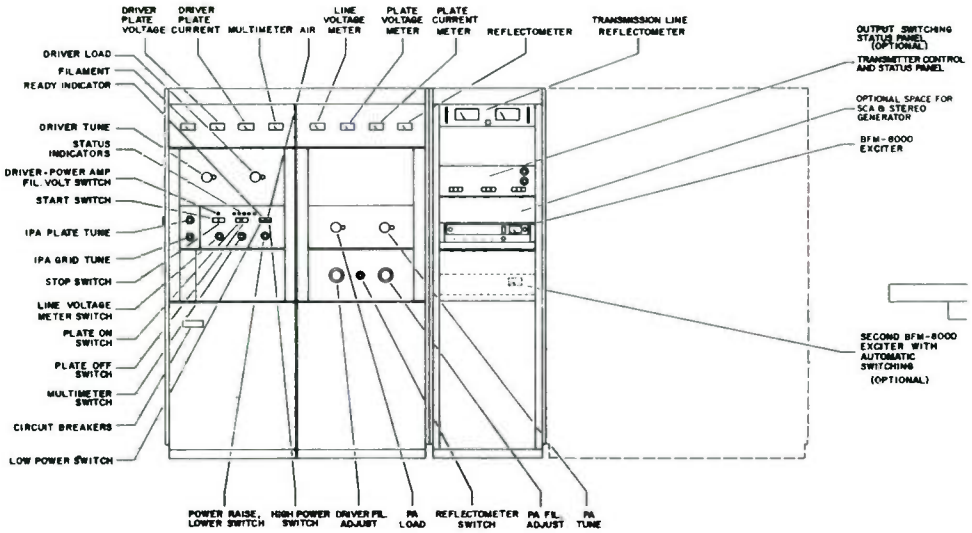
The guaranteed electrical operating specifications, except for those obviously relating to power output, etc., for the McMartin Model BF-55M are identical to those shown for the individual McMartin Model BF-25M transmitters.

The center combining cabinet incorporates the required control circuitry to operate either or both transmitters locally or by remote control.

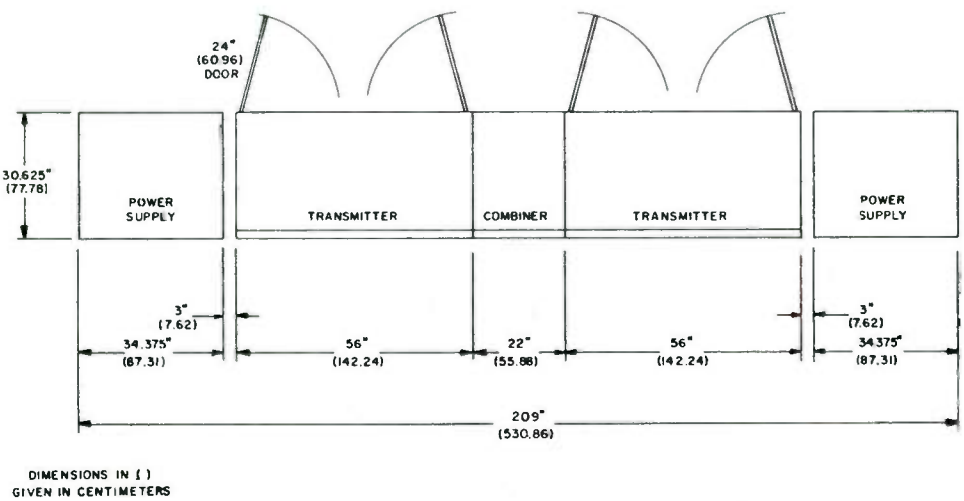
World Radio History



Block diagram



Front panel description



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Floor plan

World Radio History

SPECIFICATIONS

OPERATING RANGE	87.5 to 108 MHz
RF POWER OUTPUT	55,000 W maximum
RF OUTPUT IMPEDANCE	50 Ω (6⅛" EIA)
CENTER FREQUENCY STABILITY	± 500 Hz
MODULATION CAPABILITY	± 150 kHz
AUDIO INPUT IMPEDANCE	600 Ω, balanced
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (standard FCC 75 μs pre-emphasis)
TOTAL HARMONIC DISTORTION	0.3% or less, 30-15,000 Hz, 100% modulation
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
FM NOISE	>65 dB below 100% modulation (typical 70 dB)
AM NOISE	>55 dB below carrier level
POWER REQUIRED	208/230/240 VAC, 50/60 Hz, 3 phase (other voltages available)
POWER CONSUMPTION (Approx.)	30,000 W output, 54 kVA 40,000 W output, 72 kVA 50,000 W output, 90 kVA 55,000 W output, 98 kVA
OPERATING TEMPERATURE	0° to 50° C
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	
Main Cabinet	height 79" (200.7 cm) width 140" (355.6 cm) depth 30" (76.2 cm) rear door swing 24" (61 cm)
Power Supply Assembly (Two cabinets)	height 29" (73.7 cm) width 30" (76.2 cm) depth 30" (76.2 cm)
WEIGHT	
Main Cabinet	actual 2560 lbs. (1159.7 kg) shipping 2,760 lbs. (1250.3 kg)
Power Supply Assemblies	actual 1,460 lbs. (661.4 kg) shipping 1,540 lbs. (697.6 kg)
Combiner	actual 200 lbs. (90.6 kg) shipping 250 lbs. (113.3 kg)
FINISH	McMartin beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Generator)

AUDIO INPUT IMPEDANCE	600 Ω, balanced each channel
AUDIO INPUT LEVEL	+ 10, ± 2 dBm
AUDIO FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz (Standard FCC 75 μs pre-emphasis, each channel)
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
IM DISTORTION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz typically 50 dB or greater at mid-range
FM NOISE	65 dB or greater below 100% modulation
PILOT STABILITY	± 1 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L + R to L − R, L − R to L + R)	40 dB or greater below 90% modulation

SCA OPERATION (with BFM-1531R SCA Generator)

AUDIO INPUT IMPEDANCE	600 Ω, 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
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	± 1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	60 dB or greater

ORDERING INFORMATION

Model	Description	Product Code
BF-55M	30 — 55 kW FM broadcast transmitter complete with exciter (combined output of two BF-25M transmitters), 208/230/240 VAC, 50/60 Hz, 3 phase	**10-01-071**

OPTIONAL ACCESSORIES

AES	Automatic exciter switching for dual FM systems (provides complete exciter redundancy)	**10-01-072**
AOS	Automatic RF output switching for dual FM systems (first transmitter — to feed antenna and transmitter; second transmitter — to be fed to dummy load for maintenance)	**10-01-073**
APC	Automatic power control for FM transmitter	**10-01-074**
ARS-3	Three phase AC detector with auto restart	**10-01-075**
TCP-1	Transmitter control panel for remote control for AM/FM transmitter	**10-01-076**

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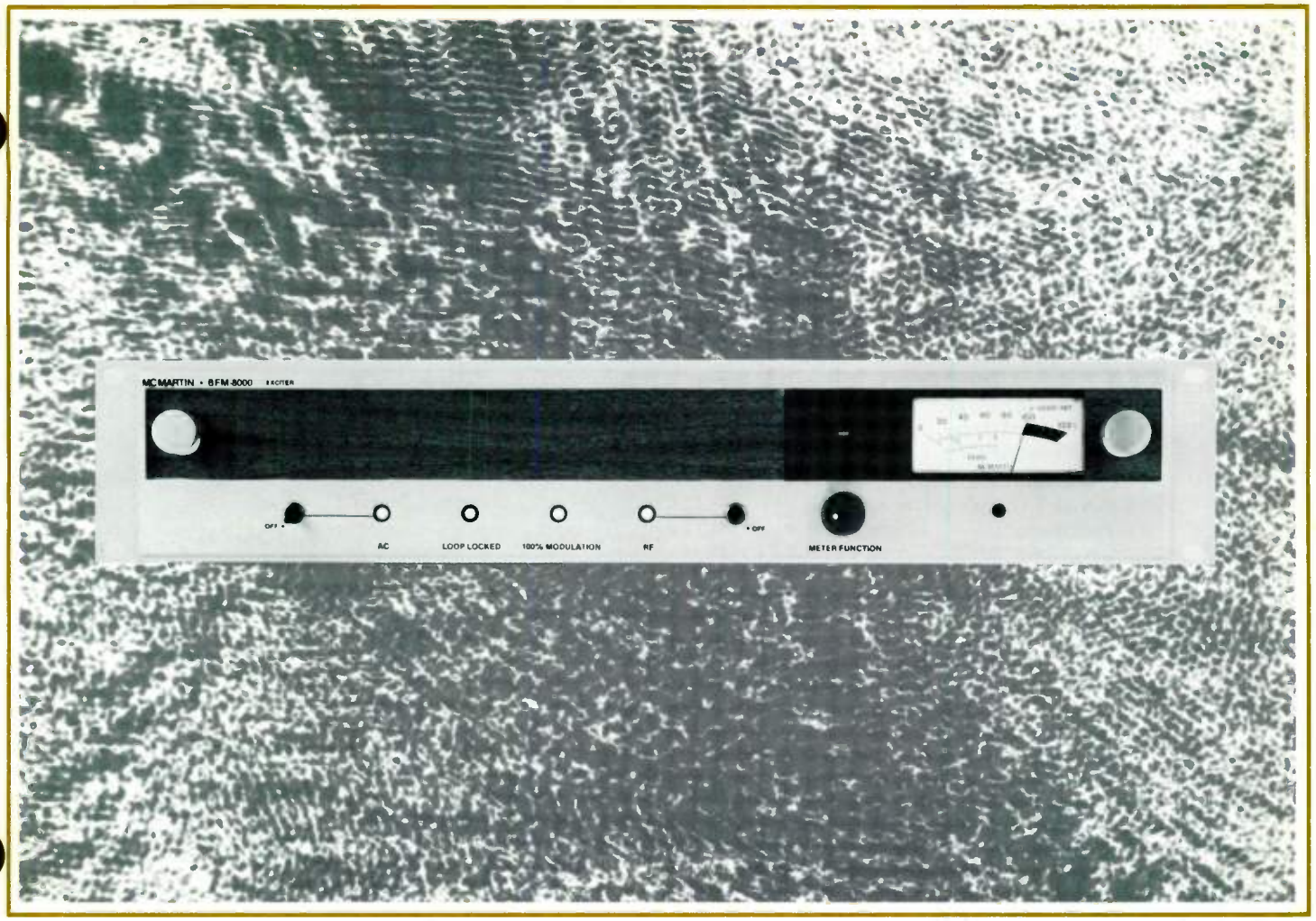
World Radio History



BFM-8000

fm exciter / transmitter

MCMARTIN

World Radio History

BFM-8000
FM EXCITER / TRANSMITTER

DIRECT FM
NO CRYSTAL OVEN
REMOTE CONTROL PROVISIONS
SUPERIOR STEREO SEPARATION
SELF CONTAINED WITH INTERNAL POWER SUPPLY
PHASE-LOCKED AFC PROVIDES ±500 Hz STABILITY
UNIT CAN BE USED AS EXCITER OR LOW POWER TRANSMITTER
FULL METERING INCLUDING FORWARD POWER, REFLECTED POWER, AND MODULATION PERCENTAGE
FIVE YEAR WARRANTY ON BFM-8000 EXCITER AND ACCESSORIES WHEN ORDERED AS A SYSTEM

The McMartin BFM-8000 is designed to function either as an exciter for a higher power FM broadcast transmitter, or as a 10 Watt FM broadcast transmitter.

The BFM-8000 employs a unique C-MOS phase locked direct FM modulator. This provides ultra stable and precise frequency control.

All circuitry for the BFM-8000 FM Exciter/Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal and, when so equipped, multiplex stereo and SCA subchannel signals.

BFM-8000 FM TRANSMITTER

The BFM-8000 is also designed to serve as a 10 watt transmitter for low power educational FM stations, or as a 3-15 watt STL (studio to transmitter link) or relay transmitter in those countries where the 88 to 108 MHz band is available for such use.

The BFM-8000 is complemented by four units, each designed for rack mounting, for use with the BFM-8000 Exciter/Transmitter:

BFM-1531R SCA Generator
BFM-1521R Stereo Generator
BFM-1514R "Maxi-1" Stereo Audio Processor
BFM-1515R "Maxi-1" Monaural Audio Processor.

PHASE LOCK DIRECT FM MODULATOR

The heart of the BFM-8000 is the Direct FM modulator, with a phase lock AFC circuit providing ±500 Hz frequency stability. The frequency-modulated oscillator itself utilizes a free running oscillator at the operating frequency. This frequency is modulated by both the main and all sub-channel audio signals (stereo and/or SCA), and is buffered and amplified in the next stage. This on-carrier frequency signal is then digitally divided first by 11, then by 512, and compared in the phase/frequency comparator with a similarly divided signal from a highly stable temperature-compensated crystal oscillator. The phase comparator operates at about 20 kHz. Any phase difference detected between the two signals represents a frequency difference between the modulated oscillator and reference source and consequently an off-frequency condition of the FMO. A correction voltage is then derived, which serves as an AFC voltage to maintain the FMO at its precise frequency.

A front panel LED indicator is provided to confirm proper phase lock. At the same time, FM power is automatically available from the output connector.

Special emphasis is placed on obtaining the highest possible degree of reliability while maintaining the performance characteristics equal to or better than competing equipment. As a result of this emphasis, our tentative failure analysis indicates a Mean Time Between Failure (MTBF) of nearly 1,000 hours, almost three times that of a typical competitive exciter, for a reliability of .990 (monaural operation).

EASE OF OPERATION AND MAINTENANCE

The BFM-8000 is designed for simple and easy operation with operational controls held to a minimum.

Full front panel metering is provided to allow

World Radio History

monitoring of operating voltages, total modulation, and other parameters.

Tuning the BFM-8000 is a very easy procedure and is accomplished in minutes utilizing the front panel meter to give an indication of a phase lock condition between the frequency modulated oscillator and the reference oscillator. Once phase lock is achieved, the RF chain is optimized for maximum indication on the panel meter completing the tuning.

BFM-1521R STEREO GENERATOR

The optional BFM-1521R Stereo Generator provides the 19 kHz pilot and the composite stereo signals (L + R and L – R). The stereo generator utilizes a switching mode oscillator employing a temperature stabilized crystal at four times the 19 kHz pilot frequency (76 kHz). This 76 kHz signal is digitally divided to derive the 19 kHz pilot and the 38 kHz square wave signal used to alternately switch between the left and right channel audio signals. The circuitry is precisely designed to assure that 38 kHz subcarrier suppression is 55 dB below the modulated signal. Use of the square wave switching mode eliminates the need for troublesome carrier balance adjustments. This simplifies adjustment, and additionally provides for excellent stereo separation (40 dB through the entire exciter or tranmsitter). Adjustments for the BFM-1521R Stereo Generator are held to a minimum. Only Pilot Level and Pilot Phase adjustments (for setting proper timing of the pilot and L – R signal) are provided on the front panel.

Local and remote stereo/mono mode switching is provided for with front panel indication of stereo operation. A remote indicator may be connected.

The BFM-1521R Stereo Generator is equipped with 15 kHz input filters and a 53 kHz low-pass filter to assure that there is no interference with a 67 kHz SCA channel.

BFM-1514R AUDIO PROCESSOR

The BFM-1514R dual channel audio processor has been designed to precisely control the modulation of the FM stereo or mono transmission system preventing over-modulation with varying audio input levels.

Pre-emphasis may be switched in or out as desired. The processor is frequency conscious and follows the pre-emphasis curve, thereby assuring that the problems associated with pre-emphasis are controlled. This is accomplished by an extremely fast AGC circuit and not by diode clippers which produce undesired interference problems, especially in stereo transmissions. These circuits provide limiting of overshoot to 2%.

Approximately 20 dB of gain reduction at low frequencies, and 30 dB gain reduction at high frequencies (pre-emphasis in), produce optimum compression and gain reduction without the use of other signal processing devices.

A front panel release time control is adjustable in order to optimize the system for maximum loudness -using the fast setting (counterclockwise) - or for the best quality - using the slow setting (fully clockwise).

The recovery time will always be short for transients regardless of the setting of the control. Under sustained gain reduction, the recovery time will automatically lengthen depending on the program material content.

BFM-1515R MONAURAL PROCESSOR

The BFM-1515R Monaural Audio Processor is designed for use with a monaural main channel or for improving the loudness of an SCA channel. Its design and features are approximately the same as the BFM-1514R.

BFM-1531R SCA GENERATOR

The BFM-1531R SCA Generator is optionally available to provide for a 67 kHz subchannel in an exciter equipped with a stereo generator. For use with a monaural exciter, either a 67 kHz and/or a 41 kHz SCA Generator is available (other frequencies 20-75 kHz are available on special order).

The BFM-1531R is an ultra stable SCA generator utilizing a new internally compensated direct FM oscillator providing ultra stable operation even over widely varying temperature conditions. Manual or automatic SCA muting is provided and the mute circuitry is adjustable, both for modulation level and delay time (which is continuously adjustable from ½ to 8 seconds).

The BFM-1531R SCA Generators at 67 kHz are provided with optimum filtering depending on whether they are used with monaural or stereo exciters. When utilized with a monuaral exciter, a 7.5 kHz band pass input filter is used; and a 90 kHz low pass output filter is used (this assures lowest distortion SCA and main channel reception). This filter combination assures the cleanest monaural and SCA signals, with objectional interference and "birdies" totally eliminated. When a 67 kHz SCA Generator is used with an exciter equipped with a BFM-1521R Stereo Generator, the SCA generator's output filter is a 67 kHz band pass, thus assuring that no interference with the stereo (L-R) signal will occur.

The BFM-1531R SCA Generators at 41 kHz are equipped with 7.5 kHz input filters and a 60 kHz low pass output filter, which assures total non-interference with the main channel and the 67 kHz SCA channel.

Unique to the BFM-1531R is the ability to remotely disable the automatic mute. This circuit provides a ready means of obtaining the necessary signal when making measurements at the studio requiring an unmodulated SCA subcarrier.

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BFM-1531R SCA Generators are factory equipped for ±6 kHz deviation with a 7.5 input filter. For ±4 kHz SCA deviation requirement, a 5 kHz input filter is an option.

STANDARD SCA FILTER COMBINATIONS

SCA	INPUT FILTER 4 KHz • DEVIATION • 6 kHz		OUTPUT FILTER
41 kHz	5 kHz	7.5 kHz	80 kHz LP
67 kHz monaural	5 kHz	7.5 kHz	80 kHz LP
67 kHz stereo	5 kHz	7.5 kHz	80 kHz LP

The BFM-1531R also has provision to allow the SCA subcarrier to be switched on and off locally and remotely.

This care in providing optimum filtering is just another example of the quality and care that comes with a BFM-8000, assuring clean signals with no possible subchannel to main channel interference.

SPECIFICATIONS:

BFM-8000 EXCITER / TRANSMITTER

PERFORMANCE:

Type of Emission	F3/F9
Frequency Range	87.5-108 MHz
RF Power Output	3-15 W continuously adjustable
RF Output Impedance (Type BNC connector)	50 Ω, unbalanced
Carrier Frequency Stability	±500 Hz over rated temperature range
Frequency Deviation for 100% Modulation	±75 kHz
Modulation Capability	±150 kHz
Method of Modulation	Direct FM
Audio Input Impedance	600 Ω balanced
Audio Input Level	+10, ±2 dBm
Audio Frequency Response (Monophonic)	±0.5 dB, 30-15,000 Hz
Pre-Emphasis Network Time Constant	75 μs, 50 μs available
Composite Input Level	1 V_{rms}
Total Harmonic Distortion	less than 0.3%, 30-15,000 Hz
FM Noise	68 dB below 100% modulation
AM Noise	65 dB below carrier level
Power Required	120/240 VAC, 50/60 Hz
Power Consumption	50 W
Ambient Temperature	−20° to 50°C (−4° to 122°F)

DIMENSIONS	height 3½" (8.9 cm) width 19" (48.3 cm) depth 14¼" (36 cm)
WEIGHT	actual 20 lbs. (9.1 kg) shipping 25 lbs. (11.3 kg)
FINISH	McMartin Beige with woodgrain trim

STEREO OPERATION (with BFM-1521R Stereo Generator)

AUDIO INPUT IMPEDANCE	600 Ω balanced, each channel
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.5 dB, 30-15,000 Hz, Std FCC 75 μs pre-emphasis, each channel
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
IM DISTORION	0.2% or less, 60 Hz/7 kHz, 4:1 ratio
STEREO SEPARATION	40 dB or greater, 50-15,000 Hz typically 50 dB or greater at mid-range
FM NOISE	65 dB or greater below 100% modulation
PILOT STABILITY	±1.0 Hz over rated temperature range
SUBCARRIER SUPPRESSION	55 dB or greater
CROSSTALK (L+R to L−R, L−R to L+R)	40 dB or greater below 90% modulation

SCA OPERATION (with BFM-1531R SCA Generator)

AUDIO INPUT IMPEDANCE	600 Ω, 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
PRE-EMPHASIS	150 μs standard, 50 or 75 μs available on request
FREQUENCY RESPONSE	±1.5 dB, 50-5,000 Hz
CROSSTALK (main to sub, sub to main)	60 dB or lower
DISTORTION (50-5,000 Hz)	0.75% or less with LP output filter 2.5% or less with BP output filter
S/N NOISE	60 dB or greater

ORDERING INFORMATION

Model	Description	Product Code
BFM-8000	Exciter / Transmitter, monaural rack mount with slides	10-01-150
BFM-1521R	Stereo generator, rack mount	10-01-131
BFM-1531R	SCA generator, rack mount	10-01-132
BFM-1515R	Maxi-1 Audio processor, Mono (Specify AM, Mono FM, TV or SCA for correct pre-emphasis and bandwidth)	10-01-138
BFM-1514R	Maxi-1 Audio processor, Stereo	10-01-134
SCK-8000	Spare Semi-Conductor kit for BFM-8000	10-01-151

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STEREO AUDIO PROCESSOR **BFM-1514R**

MAXIMUM LOUDNESS FOR BROADCAST STATIONS
NATURAL SOUND — NO CLIPPING, THUMPING OR PUMPING EFFECTS
LOW LEVELS OF GAIN REDUCTION DO NOT DESTROY PRE-EMPHASIS
SELF-CONTAINED RACK MOUNTED UNIT

The BFM-1514R, "MAXI-1," dual channel audio processor has been designed to precisely control the modulation of the FM stereo transmission system preventing overmodulation with varying audio input levels. This allows broadcasters to realize an increase in overall volume of their transmitted signal. Although various limiting and compression devices have been available for some years, the MAXI-1 has been designed to eliminate the unpleasant and annoying distortions frequently associated with these units. The MAXI-1 utilizes very sophisticated circuits to provide natural sounding gain control adjustable from front panel controls.

Pre-emphasis may be switched in or out as desired. The processor is frequency conscious and follows the pre-emphasis curve, thereby assuring that the problems associated with pre-emphasis are controlled. This is accomplished by an extremely fast AGC circuit and not by diode clippers which produce undesired interference problems, especially in stereo transmissions.

Approximately 20 dB of gain reduction at low frequencies, and 30 dB gain reduction at high frequencies (pre-emphasis in), produce optimum compression and gain reduction without the use of other signal processing devices.

A front panel **release time** control is adjustable in order to optimize the system for maximum loudness — using the fast setting (counter clockwise) — or for the best quality—using the slow setting (fully clockwise).

The recovery time will always be short for transients regardless of the setting of the control. Under sustained gain reduction, the recovery time will automatically lengthen depending on the program material content.

The BFM-1514R, "MAXI-1," is a rack mounted stereo audio processor, suitable for use with virtually any FM exciter or stereo generator.

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Rear view of BFM-1514R

SPECIFICATIONS

INPUT IMPEDANCE . . . . . 600 Ω

INPUT LEVEL . . . . . – 10 dBm for low frequency limiting threshold; both channels adjustable for degree of limiting

OUTPUT IMPEDANCE . . . . . 1,000 Ω

OUTPUT LEVEL . . . . . Right and left adjusted separately

GAIN REDUCTION RANGE . . . . . Greater than 20 dB, typically 26 dB

LIMITER CONTROL SYSTEM . . . . . Variable gain cell driven from a DC control voltage; utilizes a distortion cancelling circuit with temperature compensation

AGC ATTACK TIME . . . . . Wide band limiter: 20 μs
Pre-emphasis limiter: 50 μs

RELEASE TIME . . . . . Low frequency: Variable with front panel control. Also memory controlled utilizing a multiple time constant. 20-250 m s

Pre-emphasis: Dual memory controlled time constant which varies with program content

OVERSHOOT . . . . . 2% or less

AGC CONTROL VOLTAGE . . . . . Ripple free at 30 Hz for low distortion audio

FREQUENCY RESPONSE . . . . . Tracks standard 75 μs pre-emphasis curve within ± 1 dB (below limiting threshold)

SEPARATION BETWEEN CHANNELS . . . . . Greater than 65 dB (50-15,000 Hz)

IM DISTORTION . . . . . Less than .25%

HARMONIC DISTORTION . . . . . 0.5% for the processor — 50-15,000 Hz at any degree of gain reduction up to 20 dB. 0.15% typical below threshold of limiting (measured through a 75 μs de-emphasis network)

SIGNAL TO NOISE RATIO . . . . . 70 dB or greater through a 75 μs de-emphasis network

19 kHz PILOT PROTECTION . . . . . A 15 kHz low overshoot, lowpass filter provides 65 dB attenuation at 19 kHz

METERING . . . . . Illuminated meter, calibrated 0-20 dB Maximum. High speed attack time and slow decay controlled by front panel *release time* control.

FRONT PANEL CONTROLS . . . . . Left Channel Modulation
Right Channel Modulation
Flat/Pre-emphasis switch
Release Time

POWER REQUIRED . . . . . 120/240 V, 50/60 Hz

OPERATING TEMPERATURE RANGE . . . . . – 20° to 50° C

DIMENSIONS . . . . . height . . . . . 1¾" (4.5 cm)
width . . . . . 19" (48.3 cm)
depth . . . . . 12" (30.5 cm)

WEIGHT . . . . . actual . . . . . 6.5 lbs. (2.9 kg)
shipping . . . . . 8.5 lbs. (3.9 kg)

ORDERING INFORMATION

Model	Description	Product Code
BFM-1514R	MAXI-1 stereo processor, self-contained, rack mount	**10-01-134**

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MONAURAL AUDIO PROCESSOR BFM-1515R

MAXIMUM LOUDNESS FOR BROADCAST STATIONS
NATURAL SOUND — NO CLIPPING, THUMPING OR PUMPING EFFECTS
LOW LEVELS OF GAIN REDUCTION DO NOT DESTROY PRE-EMPHASIS
SELF-CONTAINED RACK MOUNTED UNIT

The BFM-1515R, "MAXI-1," monaural audio processor has been designed to precisely control the modulation of AM or FM transmission systems preventing overmodulation with varying audio input levels. This allows broadcasters to realize an increase in overall volume of their transmitted signal. Although various limiting and compression devices have been available for some years, the MAXI-1 has been designed to eliminate the unpleasant and annoying distortions frequently associated with these units. The MAXI-1 utilizes very sophisticated circuits to provide natural sounding gain control adjustable from front panel controls.

Pre-emphasis may be switched in or out as desired. The processor is frequency conscious and follows the pre-emphasis curve, thereby assuring that the problems associated with pre-emphasis are controlled. This is accomplished by an extremely fast AGC circuit and not by diode clippers which produce undesired interference problems.

Approximately 20 dB of gain reduction at low frequencies, and 30 dB gain reduction at high frequencies (pre-emphasis in), produce optimum compression and gain reduction without the use of other signal processing devices.

A front panel **release time** control is adjustable in order to optimize the system for maximum loudness — using the fast setting (counter clockwise) — or for the best quality—using the slow setting (fully clockwise).

The recovery time will always be short for transients regardless of the setting of the control. Under sustained gain reduction, the recovery time will automatically lengthen depending on the program material content.

The BFM-1515R, "MAXI-1," is a rack mounted monaural audio processor, suitable for use in AM, FM, TV, SCA systems or wherever the dynamic range of any monaural signal needs to be compressed.

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SPECIFICATIONS

INPUT IMPEDANCE	600 Ω
INPUT LEVEL	– 10 dBm for low frequency limiting threshold; adjustable for degree of limiting
OUTPUT IMPEDANCE	1,000 Ω
OUTPUT LEVEL	adjustable
GAIN REDUCTION RANGE	Greater than 20 dB, typically 26 dB
LIMITER CONTROL SYSTEM	Variable gain cell driven from a DC control voltage; utilizes a distortion cancelling circuit with temperature compensation
AGC ATTACK TIME	Wide band limiter: 20 μs Pre-emphasis limiter: 50 μs
RELEASE TIME	Low frequency: Variable with front panel control. Also memory controlled utilizing a multiple time constant. 20-250 m s Pre-emphasis: Dual memory controlled time constant which varies with program content
OVERSHOOT	2% or less
AGC CONTROL VOLTAGE	Ripple free at 30 Hz for low distortion audio
FREQUENCY RESPONSE	Tracks standard 75 μs pre-emphasis curve within ± 1 dB (below limiting threshold) (when used in pre-emphasis mode)
IM DISTORTION	Less than .25%
HARMONIC DISTORTION	0.5% for the processor — 50-15,000 Hz at any degree of gain reduction up to 20 dB.
SIGNAL TO NOISE RATIO	70 dB or greater (75 μs de-emphasis)
19 kHz PILOT PROTECTION	A 15 kHz low overshoot, lowpass filter provides 65 dB attenuation at 19 kHz
METERING	Illuminated meter, calibrated 0-20 dB Maximum. High speed attack time and slow decay controlled by front panel *release time* control.
FRONT PANEL CONTROLS	Overall Gain Flat/Pre-emphasis switch Release Time
POWER REQUIRED	120/240 V, 50/60 Hz
OPERATING TEMPERATURE RANGE	– 20° to 50° C
DIMENSIONS	height . . . . . 1¾″ (4.5 cm) width . . . . . 19″ (48.3 cm) depth . . . . . 12″ (30.5 cm)
WEIGHT	actual . . . . . 6 lbs. (2.9 kg) shipping . . . . . 8.5 lbs. (3.9 kg)

ORDERING INFORMATION

Model	Description	Product Code
BFM-1515R	MAXI-1 monaural processor, self-contained, rack mount	**10-01-138**

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STEREO GENERATOR BFM-1521R

COMPLETE RFI SHIELDING

BUILT-IN 15 kHz LP FILTERS

REMOTE SELECTION OF MONO/STEREO

SWITCHING METHOD SIGNAL GENERATION

PROGRAM SEPARATION OF 50 dB OR GREATER

FRONT PANEL MODE SELECTION TO SPEED PROOF MEASUREMENTS

The BFM-1521R is a completely self-contained, rack-mount unit capable of generating a high-quality stereo composite signal. It is intended primarily for stereophonic mode broadcasting where the composite stereo signal originates at a studio location and composite STL equipment is used for relaying the program material to a remote transmitter site. Separate inputs are provided for either standard audio or highly processed, peak limited, audio. The processed audio input bypasses the input filters, pre-emphasis, transformers, etc.

The BFM-1521R includes local mono/stereo operating mode switching with provision for remote control.

Each channel includes built-in 15 kHz low pass filtering. Separate switches are provided for pilot disable and easy selection of L, R, L + R, L – R.

Separate audio and stereo generator modules are mounted within the 3½ " rack-mounted package.

SPECIFICATIONS

FREQUENCY RESPONSE	± 0.5 dB, 30-15,000 Hz
HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
SEPARATION	40 dB or greater, 30-15,000 Hz (typically 50 dB)
CROSSTALK	40 dB, 30-15,000 Hz
FM S/N RATIO	65 dB or greater
PRE-EMPHASIS	75 μ seconds standard
PILOT STABILITY	± .5 Hz over rated temperature range
38 kHz SUPPRESSION	60 dB minimum
AF INPUT IMPEDANCE	600 ohms, balanced (L and R channel)
AF INPUT LEVEL	+ 10 dBm, ± 2 dB
COMPOSITE OUTPUT LEVEL	0-3 volts, P/P
OUTPUT IMPEDANCE	Low (suitable for driving 10' of coax)
POWER REQUIRED	115/230 VAC, 50/60 Hz, 10 watts
OPERATING TEMPERATURE	– 20° to 50° C
DIMENSIONS	height . . . 1¾ " (4.5 cm) width . . . 19" (48.3 cm) depth . . . 11" (27.9 cm)
WEIGHT	actual . . . 8 lbs. (3.6 kg) shipping . . . 10 lbs. (4.5 kg)
FINISH	McMartin beige

ORDERING INFORMATION

Model	Description	Product Code
BFM-1521R	Stereo generator, self-contained	**10-01-131**

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SCA GENERATOR — BFM-1531R

AUTOMATIC MUTING
VARIABLE MUTE DELAY
ULTRA STABLE VCO DESIGN
FRONT PANEL SCA FREQUENCY TEST JACK

DC TELEMETRY INPUT
RACK MOUNT, SELF-CONTAINED
INTEGRAL INPUT/OUTPUT FILTERS

The BFM-1531R SCA Generator is a completely self-contained unit designed for the generation of high quality subchannel information for use in FM or TV broadcast SCA applications.

The BFM-1531R is available with input/output filter combinations to insure optimum compatibility with either monaural or stereophonic main channel operation.

Electronic muting, adjustable to respond to levels from 3% to 100% modulation and muting delay from ½ to 5 seconds, is standard.

Local/remote switching is provided with front panel level control.

The BFM-1531R is designed for rack mounting.

SPECIFICATIONS

CARRIER FREQUENCY	(26 - 114 kHz) 67 kHz standard, other frequencies on special order
CARRIER STABILITY	0.25%
AF RESPONSE	± .5 dB, 30-5,000 Hz
DISTORTION	less than .5% at 400 Hz, ± 6kHz, 67 kHz
AF INPUT LEVEL	+ 10, ± 2 dBm
AF INPUT IMPEDANCE	600 Ω, balanced
OUTPUT LEVEL	0-6 V P/P, adjustable
PRE-EMPHASIS	150 μ seconds (50 or 75 μ seconds special order)
MODULATION CAPABILITY	± 12% of subchannel carrier frequency
S/N RATIO	65 dB or greater
MUTE DELAY	0.2 to 2 seconds
OPERATING TEMPERATURE	– 20° to + 50° C
POWER REQUIRED	115/230 Vac, 50/60 Hz
DIMENSIONS	height 1¾" (4.5 cm) width 19" (48.3) depth 11" (27.9 cm)
WEIGHT	actual 6 lbs. (2.7 kg) shipping 8 lbs. (3.6 kg)
FINISH	McMartin beige

ORDERING INFORMATION

Model	Description	Product Code
BFM-1531R	SCA Generator, self-contained	10-01-132

Consult factory for other than 67 kHz operation.

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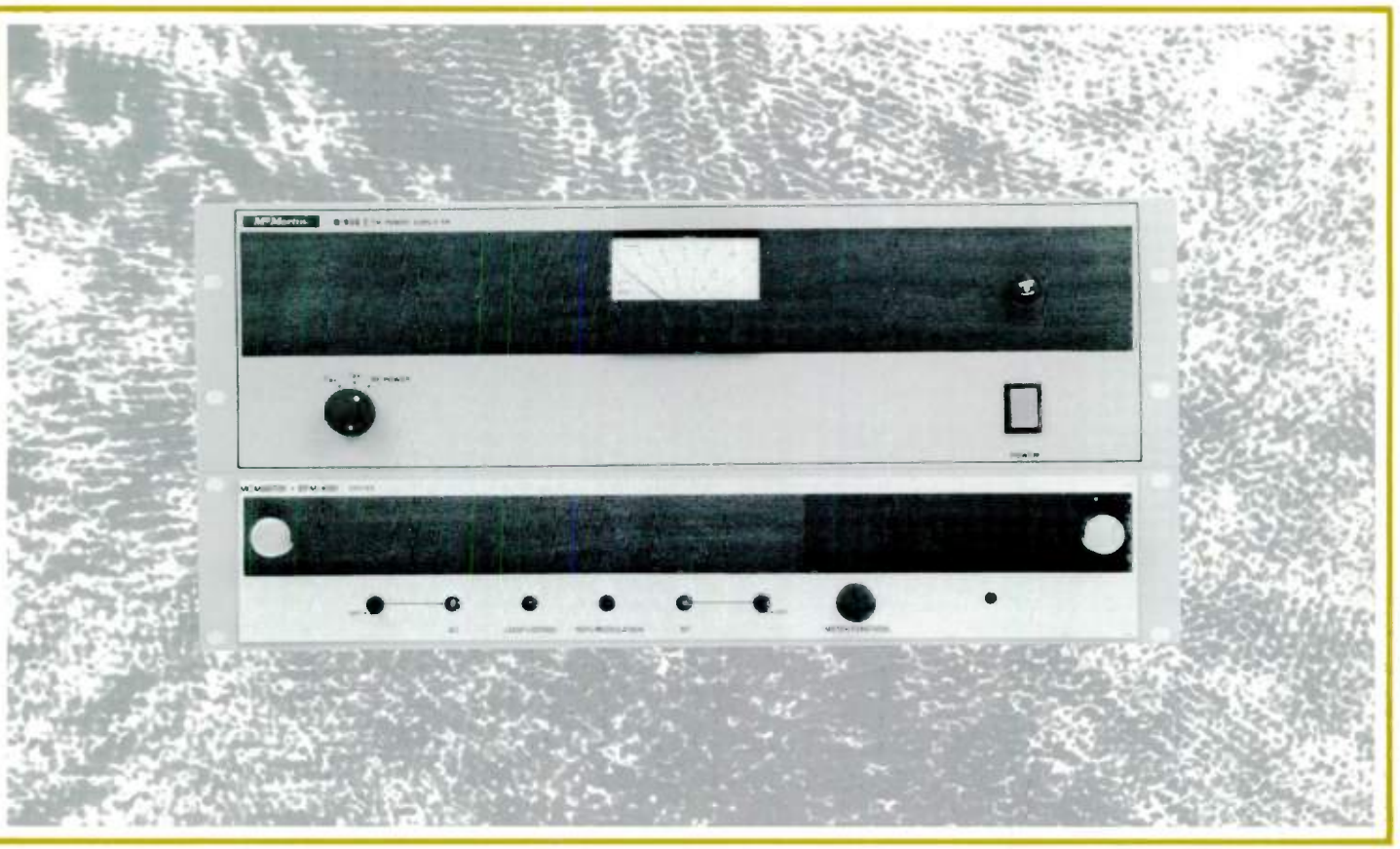
50 WATT FM AMPLIFIER

50 WATT FM TRANSMITTER / BFM-8000

B-950



100 WATT FM AMPLIFIER

100 WATT FM TRANSMITTER / BFM-8000

B-9100

MCMARTIN

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MC MARTIN AMPLIFIERS / TRANSMITTERS

B-950

SINGLE STAGE FOR POWER EFFICIENCY

COMPLETELY SOLID STATE

NO VSWR PROTECTION REQUIRED

FULL METERING

TRANSMITTER VERSION AVAILABLE MONO OR STEREO WITH AUDIO PROCESSING AND SCA OPTIONS

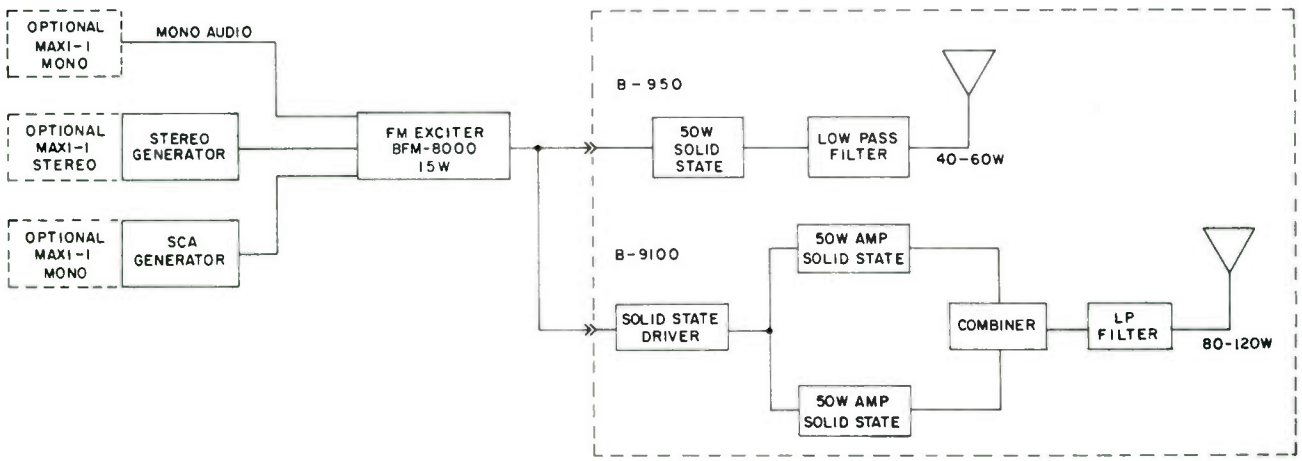
The McMartin B-950 is a 50 Watt FM amplifier designed to be coupled with any FM exciter to produce a 50 Watt FM transmitter. The B-950 is also available with a McMartin BFM-8000 exciter as a complete 50 Watt FM transmitter package.

The B-950, 50 Watt power amplifier, utilizes a single high reliability RF power transistor and easily achieves 50 Watts of output power when driven by an exciter producing 10 watts of power. Designed for 70 Watt output capability, the B-950 operates very conservatively at its rated 50 Watt output level.

By using a single stage solid state design, the B-950 reduces power supply requirements. A single +28 Volt DC supply is utilized. The power transistor requires no VSWR protection. It is capable of sustaining either open or direct short circuit conditions.

Front panel metering on the B-950 displays power supply voltage, PA collector current, and RF power output. No tuning controls are required or necessary as the power amplifier is drive limited and broadbanded. All tuning and power control is accomplished in the FM exciter used with the amplifier.

When coupled with a McMartin BFM-8000 FM exciter to make a complete 50 Watt FM transmitter, the output specifications for the complete transmitter are the same as those for the exciter alone, except for power consumption and output power.



Block diagram

World Radio History

B-9100

DUAL POWER AMPLIFIERS ASSURE 25% POWER IF ONE POWER AMP FAILS

COMPLETELY SOLID STATE

FULL METERING

TRANSMITTER VERSION AVAILABLE MONO OR STEREO WITH AUDIO PROCESSING AND SCA OPTIONS

The McMartin B-9100 is a 100 Watt FM power amplifier designed to be coupled with any FM exciter to produce a 100 Watt FM transmitter. The B-9100 is also available with a McMartin BFM-8000 exciter as a complete 100 Watt FM transmitter package.

The BFM-100 provides a 100 Watt FM broadcast signal in the 87.5 to 108 MHz frequency range, and is well suited to low power broadcast applications and as an emergency standby transmitter for higher powered FM stations. The B-9100 amplifier is ideally suited to upgrading ten watt educational stations to 100 Watts.

The B-9100 consists of a basic 100 Watt FM power amplifier and internal harmonic filter, and may be used in conjuntion with any FM exciter capable of at least 5 Watts output. The unit is designed for standard 19" rack mounting. The antenna is connected directly to the output jack.

The B-9100 features a combined solid-state two stage amplifier in which the driver output is coaxially split and used to drive two 50 Watt amplifiers, which in turn are coaxially combined by a hybrid combiner. A resistive reject load is used to absorb excess RF power if one of the final amplifiers should fail. In this situation, one-quarter power, i.e. 25 Watts, will appear at the antenna terminal.

The use of redundant RF amplifiers provides unusual reliability in a low powered unit, making it an excellent choice for remotely located low power installations and for use as an emergency back-up unit.

A state-of-the-art exciter — the BFM-8000

The McMartin BFM-8000 is designed to function either as an exciter for a higher power FM broadcast transmitter, or as a 10 Watt FM broadcast transmitter.

The BFM-8000 employes a unique C-MOS phase locked direct FM modulator. This provides ultra stable and precise frequency control.

All circuitry for the BFM-8000 FM Exciter / Transmitter is housed in a single drawer-type cabinet which provides excellent accessibility for servicing and maintenance. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included.

The BFM-8000 also has been designed to provide the cleanest, most crisp sounding FM main channel signal and, when so equipped, multiplex stereo and SCA subchannel signals.

There are four units, each designed for rack mounting, for use with the BFM-8000 Exciter / Transmitter:

BFM-1531R SCA Generator
BFM-1521R Stereo Generator
BFM-1514R "Maxi-1" Stereo Audio Processor
BFM-1515R "Maxi-1" Monaural Audio Processor

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SPECIFICATIONS — B-950, B-9100

PERFORMANCE

Type of Emission	F3 / F9
Frequency Range	87.5 - 108 MHz
RF Power Output	B-950 . . . 50 Watts B-9100 . . . 80 -120 Watts
RF Output Impedance	50 Ω, unbalanced
Carrier Frequency Stability	± 500 Hz over rated temperature range
Frequency Deviation for 100% Modulation	± 75 kHz
Modulation Capability	± 150 kHz
Method of Modulation	Direct FM
Audio Input Impedance	600 Ω, balanced
Audio Input Level	+ 10, ± 2 dBm
Audio Frequency Response	± 0.5 dB 30-15,000 Hz
Pre-Emphasis	75 μs pre-emphasis, 50 μs available
IM Distortion	0.2% or less 60 Hz/7 kHz, 4:1 ratio
Total Harmonic Distortion	less than 0.3% 30-15,000 Hz
FM Noise	>65 dB below 100% modulation, typically 70 dB
AM Noise	65 dB below carrier level

ELECTRICAL:

Power Required	100-135 (200-270), VAC 50/60 Hz
Power Consumption	B-950 . . . 175 W B-9100 . . . 275 W
(With Stereo and SCA Generator) Ambient Temperature	– 20° to 50° C (– 4° to 122° F)

DIMENSIONS

BFM-8000 Exciter	height	3½" (8.9 cm)
	width	19" (48.3 cm)
	depth	14¼" (36.2 cm)
B-950 Amplifier	height	5¼" (13.3 cm)
	width	19" (48.3 cm)
	depth	14¾" (37.5 cm)
B-9100 Amplifier	height	9" (22.9 cm)
	width	19" (48.3 cm)
	depth	14¼" (36.2 cm)

WEIGHT

BFM-8000 Exciter	actual	20 lbs. (9.1 kg)
	shipping	25 lbs. (11.3 kg)
B-950	actual	25 lbs. (11.3 kg)
	shipping	35 lbs. (15.9 kg)
B-9100	actual	37 lbs. (16.8 kg)
	shipping	47 lbs. (21.3 kg)

FINISH . . . McMartin beige with woodgrain trim

OUTPUT CONNECTOR REQUIRED . . . PL 259

SCA OPERATION (with BFM-1531R SCA Generator)

AUDIO INPUT IMPEDANCE . . . 600 Ω, balanced

AUDIO INPUT LEVEL . . . + 10, ± 2 dBm

CARRIER FREQUENCY . . . 41 or 67 kHz standard (others available on request)

MODULATION CAPABILITY . . . ± 7.5 kHz

PRE-EMPHASIS . . . 150 μs standard, 50 or 75 μs available on request

FREQUENCY RESPONSE . . . ± 1.5 dB, 50-5,000 Hz

CROSSTALK (main to sub, sub to main) . . . 60 dB or lower

DISTORTION (50-5,000 Hz) . . . 0.75% or less with LP output filter 2.5% or less with BP output filter

S/N NOISE . . . 60 dB or greater

All specifications for monaural, stereo and SCA operation are for the entire BFM-8000 / B-950 or B-9100 combinations.

STEREO OPERATION (with BFM-1521R Stereo Generator)

AUDIO INPUT IMPEDANCE . . . 600 Ω, balanced each channel

AUDIO INPUT LEVEL . . . + 10, ± 2 dBm

AUDIO FREQUENCY RESPONSE . . . ± 0.5 dB, 30-15,000 Hz, Standard FCC 75 μs, pre-emphasis, each channel

TOTAL HARMONIC DISTORTION . . . **0.3% or less, 30-15,000 Hz**

IM DISTORTION . . . 0.2% or less 60 Hz/7 kHz, 4:1 ratio

STEREO SEPARATION . . . 40 dB or greater, 50-15,000 Hz typically 50 dB or greater at mid-range

FM NOISE . . . >60 dB or greater below 100% modulation

PILOT STABILITY . . . ± 1 Hz over rated temperature range

SUBCARRIER SUPPRESSION . . . 55 dB or greater

CROSSTALK (L + R to L – R, L – R to L + R) . . . 40 dB or greater below 90% modulation

ORDERING INFORMATION

Model	Description	Product Code
B-950	50 W RM Amplifier, rack mount	10-01-025
B-9100	100 W FM Ampliier, rack mount	10-01-002
BFM-8000	Exciter/Transmitter, monaural rack mount with slide	10-01-150
BFM-1521R	Stereo generator, rack mount	10-01-131
BFM-1531R	SCA generator, rack mount	10-01-132
BFM-1515R	Maxi-1 Audio processor, mono specify pre-emphasis and bandwidth	10-01-138
BFM-1514R	Maxi-1 Audio processor, stereo	10-01-134

MAR/81

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World Radio History

McMartin

PORTABLE REMOTE PICKUP TRANSMITTER **RPU-1103**

RECHARGEABLE BATTERY

DUAL FREQUENCY OPERATION (ONE SUPPLIED)

DESIGN EXCEEDS ALL NEW F.C.C. REQUIREMENTS

150 MHz 3 W PORTABLE REMOTE PICKUP TRANSMITTER

RUGGED LIGHTWEIGHT CONSTRUCTION

ALL SOLID STATE

The McMartin RPU-1103 Portable Remote Pickup Transmitter is a completely self-contained 150 MHz, three watt battery operated transmitter. The transmitter is designed to be used by today's on-the-go newsman. When carrying the unit on the shoulder strap, the RPU-1103 allows instant viewing of the controls and indicators. Along with the unique styling, the transmitter provides a degree of audio and RF performance never before available in a portable RPU. The transmitter incorporates the latest in solid state circuit technology. Only the highest quality circuit components, silver mica and tantalum capacitors, are used wherever possible.

Optional two frequency operation is available from the factory or can be added later in the field simply by plugging in the second channel element. Two channel operation with up to 1 MHz separation will not deteriorate performance.

Two high quality audio inputs are provided. The microphone input, located on the front panel, offers 25 dB of compression along with an L.E.D. indicator to display proper operation. A front panel switch is provided to key the transmitter when using the rear mounted line input. This eliminates a live microphone condition if the "push-to-talk" button is used to key the transmitter while using the line input. The audio compressor functions on both the line and microphone allowing simple talk over line operation.

A rear compartment provides quick easy access to the battery. A charger jack is located on the rear of the RPU to allow charging of the battery without removal from the transmitter. A fully charged battery is capable of operating the unit on a continuous basis for about one and one half hours, and correspondingly longer on an intermittent basis. If desired, a field battery change can be quickly accomplished. Spare batteries are available as an option.

The microphone input jack mates with either a GC-18-092 or Amphenol 88-870 or equivalent, one of which is included with each unit. The standard whip antenna provides increased gain and transmitting range over the optional rubber duck type antenna.

The durable aluminum construction complimented by the small size offers an extremely attractive portable transmitter weighing only six pounds, including battery.

AUG/80

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World Radio History

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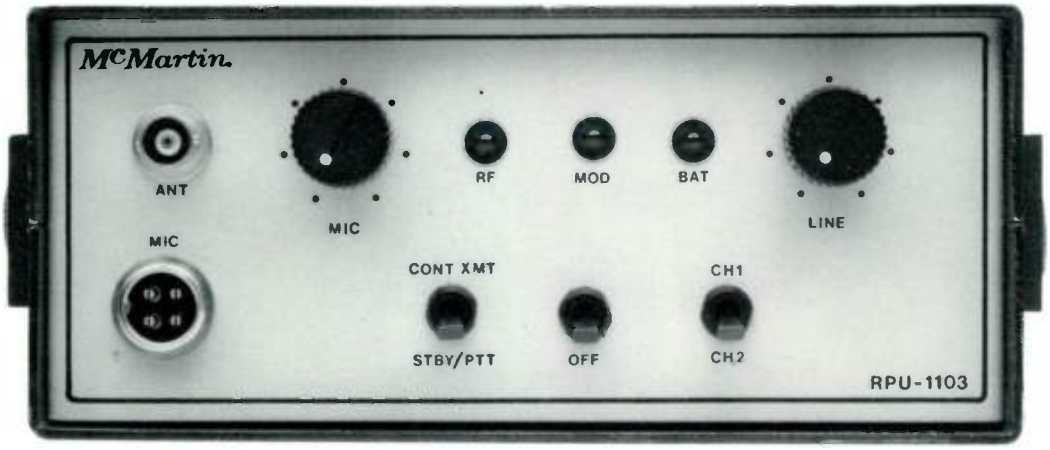

Control panel (top view) of RPU-1103

SPECIFICATIONS

FREQUENCY ..... 150-172 MHz

CRYSTAL MULTIPLICATION .... Times 12

DUAL FREQUENCY OPERATION ..... Front panel switch selectable (crystal optional)

SPURIOUS EMISSIONS ..... >60 dB below rated output

RF OUTPUT ..... 3 W nominal

VSWR PROTECTION ..... No damage incurred by excessive VSWR

RF OUTPUT CONNECTION ..... Type BNC

TEMPERATURE RANGE ..... −20° to 50°C (0° to 120°F)

MODULATION ..... 30F3 adjusted for ±5 kHz deviation

NOISE ..... >50 dB below 100% modulation

AUDIO INPUTS ..... 2 provided, 1 mic input push-to-talk, 1 unbalanced high level input

AUDIO RESPONSE ..... ±0.75 dB, 50-7,5000 Hz (75 μs pre-emphasis)

DISTORTION ..... 1.5% 100-7,500 Hz, 1% typical

AUDIO INPUT LEVEL ... Microphone −65 dBm to −30 dBm
Line −20 dBm to +18 dBm

AUDIO INPUT IMPEDANCE ..... Mic 50/150/600, Line 8Ω/600Ω

MIC INPUT CONNECTOR ..... Amphenol 4 pin type 80-871

LINE INPUT CONNECTOR ..... RCA type Phono Jack

POWER REQUIREMENTS ..... 2.5 AH battery, 10-13 V battery internally mounted for quick change. Battery drain 80 MA standby, 600 MA transmit

DIMENSIONS ..... height ..... 9¾" (24.8 cm)
width ..... 7" (17.8 cm)
depth ..... 3" (7.6 cm)

ORDERING INFORMATION

Model	Description	Product Code
RPU/BAT	Replacement 12 V battery	**10-01-115**
RPU/BC	Battery Charger	**10-01-111**
RPU/ANT	Antenna, Duck-1-BNC	**10-01-112**
RPU/ZCH	Second Channel Module	**10-01-114**
RPU/MIC	Microphone 350D, push to talk	**10-01-113**

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McMartin

PORTABLE REMOTE PICKUP TRANSMITTER

RPU-1403-40F3
RPU-1403-20F3

RECHARGEABLE BATTERY

DUAL FREQUENCY OPERATION (ONE SUPPLIED)

DESIGN EXCEEDS ALL NEW F.C.C. REQUIREMENTS

450 MHz 3 W PORTABLE REMOTE PICKUP TRANSMITTER

AVAILABLE FOR BOTH WIDE AND NARROW F.C.C. RPU CHANNELS

The McMartin RPU-1403 Portable Remote Pickup Transmitter is a completely self-contained 450 MHz, three watt battery operated transmitter. The transmitter is designed to be used by today's on-the-go newsman. When carrying the unit on the shoulder strap, the RPU-1403 allows instant viewing of the controls and indicators. Along with the unique styling, the transmitter provides a degree of audio and RF performance never before available in a portable RPU. The transmitter incorporates the latest in solid state circuit technology. Only the highest quality circuit components, silver mica and tantalum capacitors, are used wherever possible.

Optional two frequency operation is available from the factory or can be added later in the field simply by plugging in the second channel element. Two channel operation with up to 2 MHz separation will not deteriorate performance.

Two high quality audio inputs are provided. The microphone input, located on the front panel, offers 25 dB of compression along with an L.E.D. indicator to display proper operation. A front panel switch is provided to key the transmitter when using the rear mounted line input. This eliminates a live microphone condition if the "push-to-talk" button is used to key the transmitter while using the line input. The audio compressor functions on both the line and microphone allowing simple talk over line operation.

A rear compartment provides quick easy access to the battery. A charger jack is located on the rear of the RPU to allow charging of the battery without removal from the transmitter. A fully charged battery is capable of operating the unit on a continuous basis for about one and one half hours, and correspondingly longer on an intermittent basis. If desired, a field battery change can be quickly accomplished. Spare batteries are available as an option.

The microphone input jack mates with an Amphenol 88-870 plug, or equivalent, which is included with each unit. A 6" "Rubber Duck" antenna is furnished, however a whip or fixed mounted external antenna can be used.

The durable aluminum construction complimented by the small size offers an extremely attractive portable transmitter weighing only six pounds, including battery.

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Control panel (top view) of RPU-1403

SPECIFICATIONS

FREQUENCY RANGE ..... 450-456 MHz

OSCILLATOR MULTIPLICATION ..... Times 36

FREQUENCY STABILITY ..... .0005%

DUAL FREQUENCY OPERATION ..... Front Panel Switch Selectable, max. separation 2 MHz. (Second crystal optional)

SPURIOUS EMISSIONS ..... >60 dB below rated output

RF OUTPUT ..... 3W nominal

VSWR PROTECTION ..... No damage incurred by excessive VSWR

RF OUTPUT CONNECTION ..... Type BNC

TEMPERATURE RANGE ..... −30 to +50° C
−20 to +120° F

AUDIO INPUT IMPEDANCE ..... Mic 50/150/600 Balanced
Line 8 ohm/600 Unbal.

MIC INPUT CONNECTOR ..... Amphenol 4 pin type 80-871 (Push-to-Talk)

LINE INPUT CONNECTOR ..... RCA type Phono Jack

AUDIO INPUT LEVEL ..... Microphone −65 dBm to −30 dBm
Line −20 dBm to +18 dBm

FM NOISE ..... >50 dB below 100% modulation
−55 dB typical

DISTORTION ..... Less than 1.5% within audio bandpass; 0.75% typical

	RPU-1403-40F3	RPU-1403-20F3
Channel Desig.	N1, R (50 KHz)	N2 (25 KHz)
Audio Response	30-10 KHz ±1 dB	30-5 KHz ±1dB
Carrier Dev.	±10 KHz	±5 KHz

PRE-EMPHASIS ..... 75 microsecond, standard

LED INDICATORS ..... Rectified RF output
3 dB audio 'Peak Flasher'
Battery Condition

POWER REQUIRED ..... 2.5 AH battery, 10-13 volt battery internally mounted for quick change.
Battery drain 80 MA standby,
800 MA transmit

DIMENSIONS ..... 9¾" (24.77 cm) height
7" (17.78 cm) width
3" (7.62 cm) depth

FINISH ..... McMartin beige and bronze with simulated leather exterior.
Rugged shoulder strap.

WEIGHT ..... 7.7 lbs. (3.5 kg)

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
RPU-1403	Portable Remote Pick-up Transmitter	**10-01-087**
RPU/BAT	Battery 12 volts, replacement	**10-01-115**
RPU/BC	Battery Charger	**10-01-111**
RPU/ANT 450 MHz	Antenna (rubber duck), replacement	**10-01-118**
RPU/2CH	Second Channel Module	**10-01-114**
RPU/MIC	Microphone 350D, push to talk	**10-01-113**

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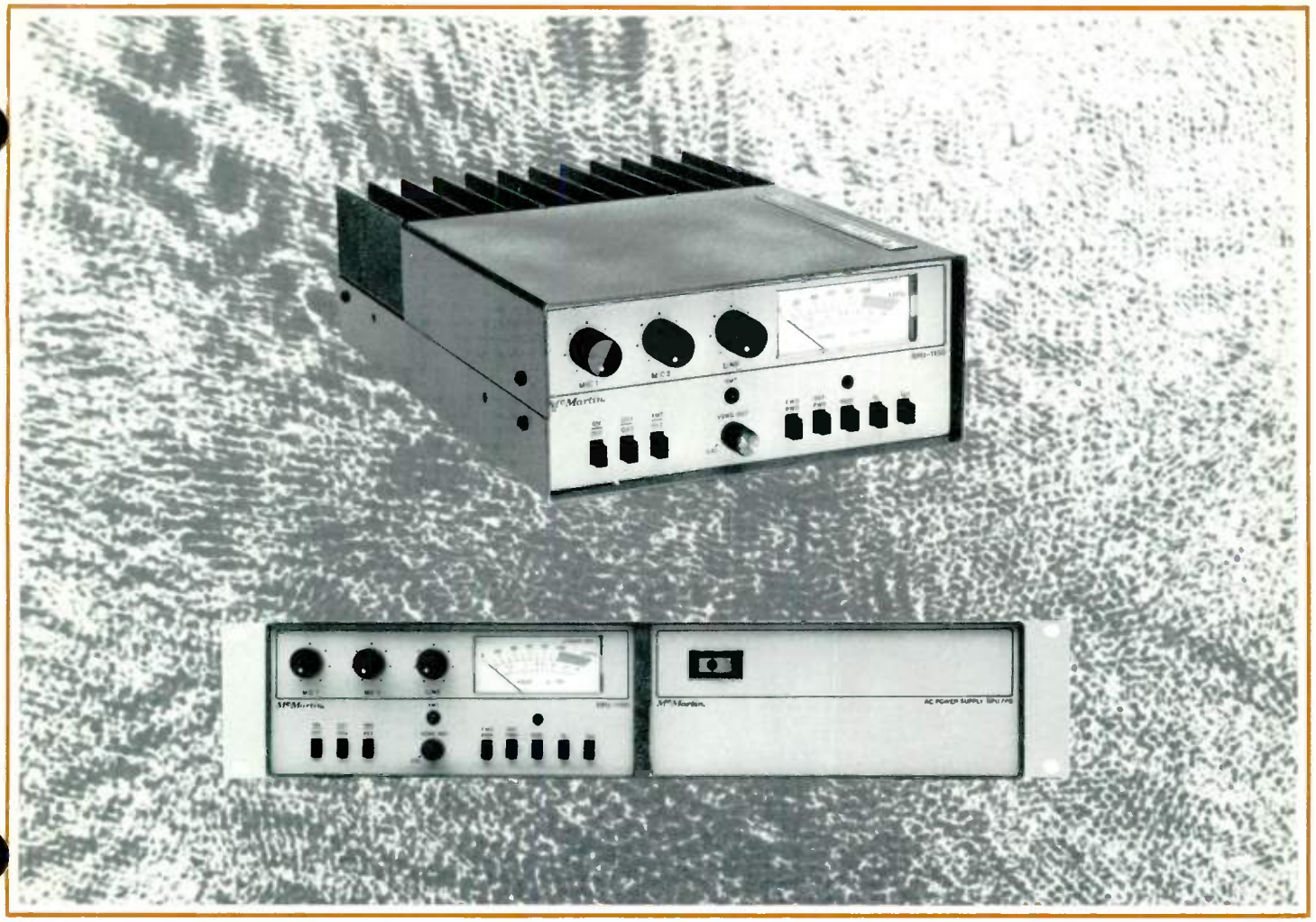


150 MHz / 450 MHz remote broadcast transmitters

MCMARTIN

World Radio History

150-170 MHz and 450-455 MHz broadcast quality remote pick-up transmitters.

Mobile of Fixed Base Operation.

Front panel multimeter indicates modulation, forward, and reflected power, Vc, IPA

Dual frequency operation

Microphone and line transformer inputs.

Compressor limiter operates on both line and mic inputs.

Talk over line input capability.

Latest design exceeds all new F.C.C. requirements.

Rugged lightweight construction (weighs only 8 lbs.).

All solid state; High VSWR and Thermal Overload protected.

Use of highest quality components.

Full-line of accessories available including 120/240 VAC power supply, rack mount frame, antennas, etc.

Superior serviceability.

The McMartin RPU-1150 and RPU-1430 Remote Broadcast transmitters incorporate the latest in FM solid state technology and are designed for high audio quality remote broadcast program origination. The RPU-1150 operates on a specified frequency in the range of 150-170 MHz with a continuous power output rating of 50 watts.

The RPU-1430 operates on a specified frequency in the 450-455 MHz range with a continuous power output of 30 watts. The units are identical in size and appearance and utilize the same accessories except for antennas.

The basic unit is designed for 13.5 VDC mobile power sources but can also be operated from 115 or 230 VAC, 50-60 Hz with an optional companion power supply. The supply can be mounted separately or side-by-side with the transmitter in an optional rack-mount cabinet. By removing the de-mountable rack ears and attaching a carrying handle (supplied), the cabinet doubles as a smart portable carrying case.

The unit is equipped with a full complement of front panel-mounted controls and has provisions for a remote control head. A combination under-dash/floor mount cradle is furnished as standard for mobile operation.

A switch-selected multimeter allows the user to read forward and reflected RF power, modulation level, supply voltage and power amplifier current.

The RPU-1150 and RPU-1430 employ a direct FM modulation process employing a crystal oscillator operating at 1/12 or 1/36 the output frequency. The transmitter has built-in two channel capability. All that is required to expand the operation to two channels is install the second plug-in channel element. The frequency is then determined by the front panel or remote channel select switch. Both frequencies must be in the same FCC channel grouping.

The audio processing circuitry provides excellent limiting characteristics with minimum distortion. Excellent overload and dynamics range characteristics are ensured by the use of two section microphone gain controls. This permits the use of either high performance or close talking microphones with nominal output levels over the range of −60 to −30 dBm.

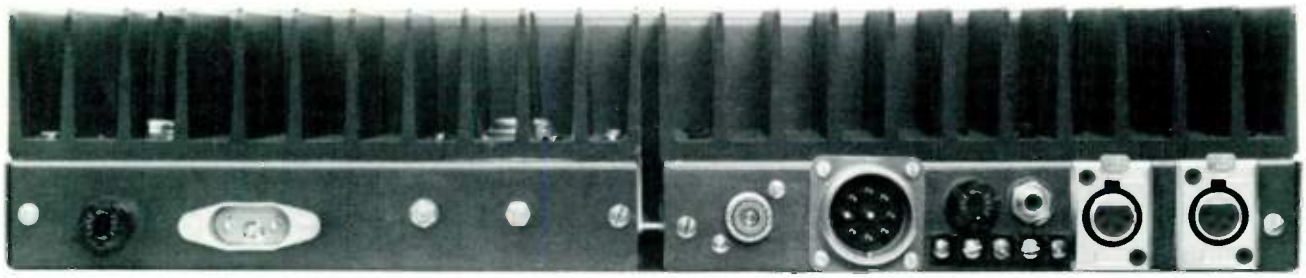
The RF power amplifier is a completely solid state design, conservatively rated for continuous RF output. It is capable of withstanding infinite VSWR conditions at rated supply voltage and drive levels and is thermostatically protected against long-term mismatch or overload conditions.

All interstage and output impedance matching is accomplished with broadband microstrip techniques and there are no amplifier tuning adjustments to be made.

A convenient built-in VSWR bridge enables the user to check or adjust the antenna system for a favorable match to effect maximum radiated power.

The transmitters utilize harmonic and spurious suppression techniques that attenuate all undesired signals well below present FCC and international standards.

World Radio History



Rear View of RPU 1150 with Power Supply (RPU/PS)

EMISSION/FREQUENCY AVAILABILITY

RPU-1150

GROUP	FREQUENCY MHz	EMISSION DESIG.	AUDIO B.W.	FREQUENCY DEVIATION
K_1	152.87-153.35 (9 ch.)	25F3	7.5 kHz	±5 kHz
K_2	161.64-161.76 (5 ch.)	25F3	7.5 kHz	±5 kHz
L	166.25 (1 ch.)	20F3	5.0 kHz	±5 kHz
M	170.15 (1 ch.)	20F3	5.0 kHz	±5 kHz

RPU-1430

N_1	450 (6 ch.) 455 (6 ch.)	40F3/40F3A *	10.0 kHz	±10 kHz
N_2	450 (12 ch.) 455 (12 ch.)	20F3/20F3A *	5.0 kHz	±5 kHz
R	450 (5 ch.) 455 (6 ch.)	40F3/40F3A *	10.0 kHz	±10 kHz

NOTE:
1. Standard carrier frequency stability required is ±.0005%.
2. Group N_1 and R channels may only be used for program material and cues. All other groupings listed can be used for program, cues and communications.
* 3. The (A) versions of the RPU-1430 designate frequency tolerance of ±.0002% required when these units are used as base stations or mobile repeators.
4. For dual frequency operation, both operating frequencies must be in the same channel group. Additionally, the maximum channel spacing at 455 MHz should be less than 2 MHz.

RPU/MC Mobile Control Head

World Radio History

SPECIFICATIONS

	RPU-1150	RPU-1430
OPERATING FREQUENCY RANGE	148-172 MHz	450-456 MHz
RF OUTPUT POWER	50 watts (Minimum continuous @ 13.5 VDC into 50 ohms.)	30 watts
POWER REQUIRED	10 A transmit 100 MA Standby @ 13.5 VDC. (12.5 to 14.5 VDC operating range)	7 A transmit 100 MA Standby
OSCILLATOR MULTIPLICATION	X12	X36

TEMPERATURE RANGE ..... −20 to 120° F. (−30 to 50° C)

SPURIOUS EMISSIONS ..... Greater than 65 dB below rated output

MODULATION ..... Direct FM VCXO; See table for licensed frequencies and bandwidths.

FREQUENCY STABILITY ..... ±.0005% STD
±.0002% for 450 MHz fixed stations.

FM and AM NOISE ..... Better than −50 dB below 100% modulation −55 dB typical

FREQUENCY RESPONSE* ..... .30 Hz to 5 kHz, 7.5 kHz, or 10 kHz ±1 dB depending on licensed channel BW. 75 microsecond pre-emphasis is standard on all units.

* see NOTE

AUDIO DISTORTION ..... 0.8% typical
1.5% maximum, 50-7500 Hz

MODULATION CONTROL ..... By means of audio filter and compressor-limiter

AUDIO LIMITING ..... .25 dB at 2 millisecond attack time. 300 millisecond delay

AUDIO INPUTS ..... .3 independent, 2 mic input push-to-talk, 1 high level line input

AUDIO INPUT LEVEL ..... Microphone −65 dBm to −30 dBm.
Line −20 dBm to +18 dBm

AUDIO INPUT IMPEDANCE ..... Mic 50/150/600 balanced,
Line 8 to 600 ohm balanced or unbalanced.

MIC INPUT CONNECTORS ..... Amphenol 4 pin type XLR-31

LINE INPUT CONNECTION ..... Phone Jack, unbalanced; term strip, balanced

RF OUTPUT CONNECTION ..... Type SO-239

DIMENSIONS ..... height ..... 3½" (9 cm)
width ..... 8½" (20 cm)
depth ..... 13" (33 cm)

WEIGHT ..... actual ..... 7.7 lbs. (3.5 kg)
shipping ..... 11 lbs. (5 kg)

FINISH ..... McMartin Beige & Bronze, on heavy-duty aluminum cabinet

NOTE: Unless otherwise specified, unit will be supplied with audio filter and carrier deviation adjusted as follows:

CHANNEL GROUP	AUDIO BANDWIDTH	CARRIER DEVIATION	EMISSION DESIG.
K1, K2	7.5 kHz	±5 kHz	25F3
L, M	5.0 kHz	±5 kHz	20F3
N2	5.0 kHz	±5 kHz	20F3
N1, R	10.0 kHz	±10 kHz	40F3

75 microseconds Pre-emphasis is standard in all units.

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
RPU-1150	50 watt 150 MHz remote pickup transmitter. Includes mobile mount, requires 13.5 volt DC @ 10 amps transmit. (Specify frequency)	**10-01-088**
RPU-1430	30 watt 450 MHz remote pickup transmitter. Includes mobile mount, requires 13.5 volt DC @ 7 amps transmit. (Specify frequency)	**10-01-089**
RPU/PS	AC power supply	**10-01-095**
RPU/RmCc	Rack mount and carrying case provides convenient carrying case and rack mounting for both the power supply and 50 or 30 watt transmitter. (Not required for mobile installations)	**10-01-096**
RPU/MC	Mobile control head for use when unit is trunk mounted. Includes cable from control head to transmitter.	**10-01-098**

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World Radio History

McMartin

REMOTE PICK-UP RECEIVERS

RPU-1150R
RPU-1450R

150-175 MHz & 450-470 MHz RPU RECEIVER

BALANCED 600 OHM OUTPUT

6 HIGH "Q" TUNED RF CIRCUITS

ALL SOLID STATE

PROVISION FOR DUAL FREQUENCY OPERATION WITHIN 1 MHz

FULLY METERED

HIGH SENSITIVITY

4 BANDWIDTHS AVAILABLE

IMPROVED NOISE SQUELCH

CARRIER OPERATED RELAY

The McMartin RPU-1150R (150-175 MHz) and RPU-1450R (450-470 MHz) are rack mounted, dual channel, (optional) crystal-controlled receivers with high sensitivity and selectivity. Remote channel switching allows the receiver to be placed close to the receiving antenna for optimum performance.

The receiver utilizes dual conversion. The RF signal is amplified and converted to a 10.7 MHz, first IF frequency to provide good image frequency rejection. The 10.7 MHz signal is converted to the second IF frequency of 455 kHz where the signal is amplified hard limited and demodulated with the new PTD, precise tracking decoder circuit.

The front end of the RPU-1150R and RPU-1450R utilized diode protected dual gate D MOS-FET RF amplifier. This device has a very linear AGC control providing greater than 50 dB gain reduction without any detuning effect of the high "Q" RF tuned circuits.

A noise squelch is used to mute the receiver at the desired S/N output and is controlled by a recessed front panel control.

A carrier-operated relay provides either normally open or normally closed contacts in the absence or presence of an RF carrier. This is independently controlled and not related to the noise squelch circuit but to the RF input level.

The selectivity can be tailored to the desired bandwidth by inserting the proper bandpass filter.

A front panel meter is used to indicate the relative RF input and modulation levels. A front panel function switch selects the desired channel. RF input and modulation levels. The sensitivity of the RF metering circuitry allows indication of RF as low as 1 microvolt or less.

MAY/79

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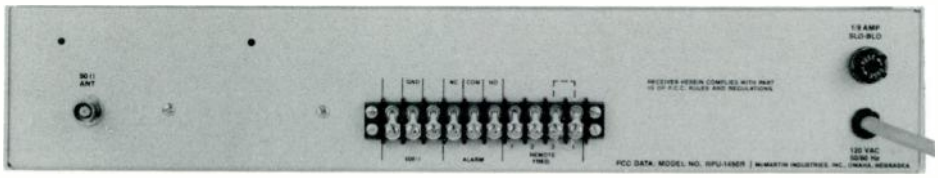

Rear view of RPU-1450R

SPECIFICATIONS	RPU-1150R	RPU-1450R
CARRIER FREQUENCY RANGE	150-175 MHz	450-470 MHz
DUAL FREQUENCY OPERATION	Two frequency operation with 1 MHz spacing. Second channel operation optional.	Two frequency operation with 2 MHz spacing. Second channel operation optional.
INPUT IMPEDANCE	50 ohm BNC connector	50 ohm BNC connector
SENSITIVITY	0.5 microvolts for 20 dB quieting referenced from ±5 kHz deviation @ 400 Hz	0.5 microvolts for 20 dB quieting referenced from ±5 kHz deviation @ 400 Hz
SELECTIVITY	±15 kHz @ 6 dB ±40 kHz @ 60 dB. Determined by deviation specified	±15 kHz @ 6 dB ±60 kHz @ 60 dB. Optional filters available. Determined by deviation specified
S/N RATIO	.55 dB below 100%, 60 dB typical	
SPURIOUS RESPONSE	At least −65 dB	
AUDIO OUTPUT	Balanced 600 ohm +10 dBm	
SQUELCH	Adjustable up to 20 μ volts	
RF FILTERING	Double shielding of RF and oscillator circuits	
METERING	2 Channels — RF input level and modulation	
POWER REQUIREMENTS	120 VAC 50/60 Hz, 25 watts	
DIMENSIONS	Standard rack mount: Width — 19" (48.3 cm) Height — 3½" (8.9 cm) Depth — 11" (27.9 cm)	
WEIGHT	actual 10 lbs. (4.5 kg) shipping 13 lbs. (5.9 kg)	
FINISH	McMartin beige with woodgrain trim	

ORDERING INFORMATION

Model	Description	Product Code
RPU-1150R	Receiver, 150 MHz, rack mount, 2 channel (specify frequency)	10-03-032
RPU-1450R	Receiver, 450 MHz rack mount, 2 channel (specify frequencies)	10-03-033

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McMartin

150 & 450 MHz CUE RECEIVERS

RPU-1150Q
RPU-1450Q

shown adapted to the RPU-1103

**FOUR CHANNEL,
TWO BAND CAPABILITY**

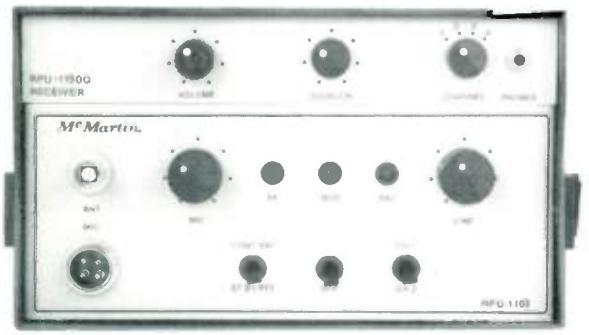
SWITCHING DIODE TR SWITCH STANDARD

McMartin's New Breed, the RPU cue receiver, is a piggy-back receiver which can be added to McMartin's RPU transmitters, the RPU-1103 and RPU-1403. These receivers come in two basic versions, one a 150 MHz unit with two channels and the other, a 450 MHz unit with two channels. The second channel is an additional cost item.

Provision has been made to incorporate into either version an additional front end circuit board which will extend coverage by two channels to four channels. You may order either version with four channels, and it is possible to have cross band operation with two channels on 150 and two channels on 450. This allows the ENG crew to monitor any one of four different frequencies in either low band or high band channels. You can monitor local police, fire department channels, and competitor's RPU channels as well. This greatly adds to the versatility of the RPU transmitters with the addition of the RPU cue receiver.

**ADDITIONAL CHANNELS FOR POLICE,
FIRE, & COMPETITION**

PIGGY-BACK TO RPU TRANSMITTER



Receiver section

Transmitter section

top view, adapted to the RPU-1103

DEC/78

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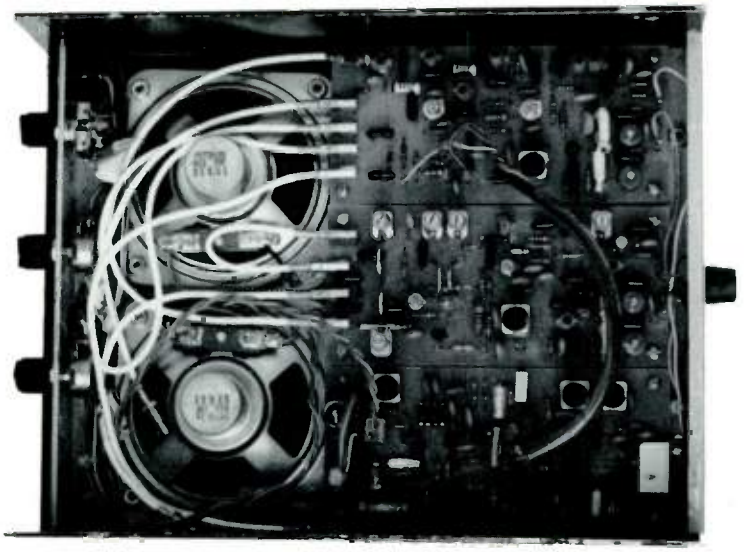
World Radio History

McMartin



Interior view of RPU-1150Q Receiver

SPECIFICATIONS

APPLICATION ..... Sensitive, crystal controlled dual-conversion receiver with excellent voice quality and high audio output power intended for on-the-scene cueing (not for program material). An add-on piggyback receiver for McMartin 3 watt transmitters.

FREQUENCY RANGE ..... RPU-1150Q: 150-172 MHz with 2 channel capability. RPU-1450Q: 450-456 MHz with 2 channel capability.

SENSITIVITY ..... 1 μv for 20 dB quieting 150 MHz 2 μv for 20 dB quieting 450 MHz

SELECTIVITY ..... 6 dB @ ±10 kHz, 45 dB @ ±20 kHz; 1 volt on adjacent channel will not produce interference.

IF STAGES ..... 10.7 MHz and 455 kHz with 455 kHz limiter and bandpass ceramic ladder filter.

AUDIO RESPONSE ..... 50-5000 Hz ±2 dB (75 microsecond de-emphasis standard)

SQUELCH ..... Smooth but positive acting RF level squelch with hysteresis to prevent jitter; no noise bursts

AGC ..... D-MOS FET RF amplifier provides the ultimate in low noise reception and provides 50 dB AGC range. Accommodates signal levels from .3 μv to greater than one (1) volt without overloading.

AUDIO OUTPUT ..... 2 watts into internal speaker; external 8 ohm output jack provided for phones or external speaker.

DISTORTION ..... Less than 5%@ 5 kHz deviation and 1 watt audio output.

POWER REQUIREMENT ..... 35 MADC at 12 volts idle, 100 MADC average at normal listening levels derived from RPU transmitter battery pack.

ANTENNA ..... Uses transmitter antenna by means of a solid-state pin-diode antenna switching network.

CIRCUITRY ..... 3 IC's, 5 transistors (including 2 MOS FET's)

CONTROLS ..... Volume, squelch, channel select, external output jack.

WEIGHT ..... Adds approximately 10 ounces to the RPU transmitter.

DIMENSIONS ..... Replaces top cover of the RPU-1103 or 1403, adding 1" (2.54 cm) depth to the transmitter. Easy to field install on existing units

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
RPU 1150Q	150 MHz Cue Receiver	**10-03-054**
RPU 1450Q	450 MHz Cue Receiver	**10-03-055**

McMartin Industries Inc. ■ 4500 South 76th Street ■ Omaha, Nebraska 68127 ■ (402) 331-2000 ■ Telex 484485

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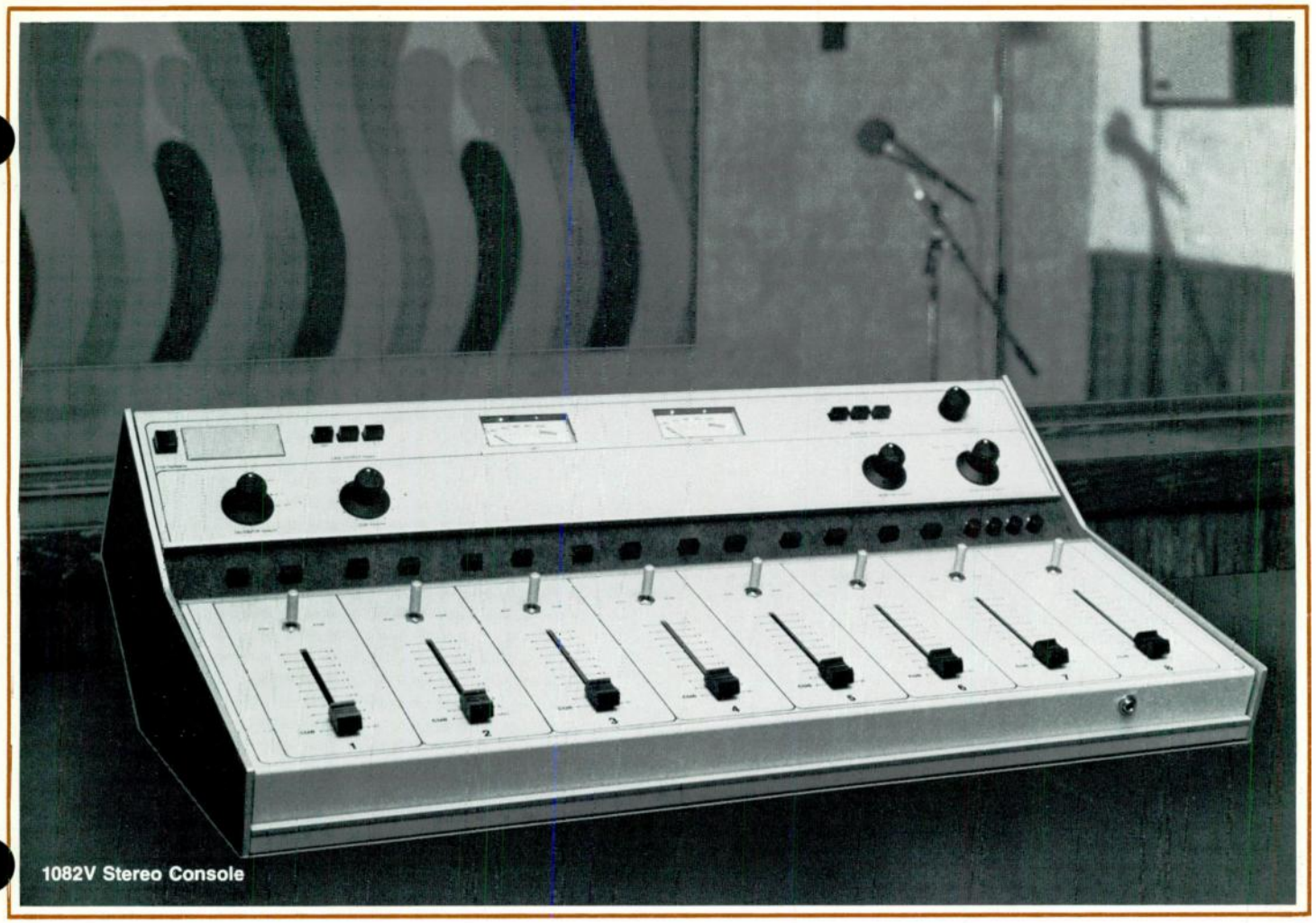


1082V Stereo Console

1000 series audio consoles

MCMARTIN

World Radio History

5 Channel Stereo / vertical attenuators

8 Channel Stereo or Mono / vertical attenuators

8 Channel Stereo or Mono / rotary attenuators

Gold plated PCB contacts

All channels convertible to MIC or HI level inputs

15 watts • Monitor amplifier output

Headphone amplifier with volume control

Cue amplifier

External power supply

10 inputs into 5 mixer (5 channel consoles)

18 inputs into 8 mixer (8 channel consoles)

Audition output usable as 2nd program output

Cassette Input Jack 8-Channel Models

The McMartin B-1000 Series of audio consoles is a new breed of human-engineered, easy-to-live-with consoles that last and last. Clean design keeps board operations tight and accurate. Clean construction and internal lay-out makes service, when required, fast and easy. Clean engineering assures you of a clean signal.

FIVE OR EIGHT CHANNELS

Plenty of inputs are provided for a variety of broadcast production needs. The eight channel models have 18 inputs while the five channel models provide for 10. This affords sufficient input selection for most of today's broadcast requirements.

VERTICAL OR ROTARY ATTENUATORS

Both mono and stereo versions come with either vertical, recording studio type slide attenuators or the more commonly used rotary attenuators. Either style provides the operator with the precision control necessary to meet the demands of today's broadcasting.

ALL CHANNELS CONVERTIBLE

All channel positions can be converted to mic. or line inputs, the line inputs either balanced or unbalanced. Check the ordering information for the standard configuration of mic. and line inputs.

STEREO OR MONO

The design of the B-1000 Series was conceived with stereo performance in mind. Mechanically both stereo and mono units are the same. Many of the functional parts in the monaural units are the same as those used in the stereo versions. This similarity of parts provides greater value per dollar than is found in some units costing considerably more.

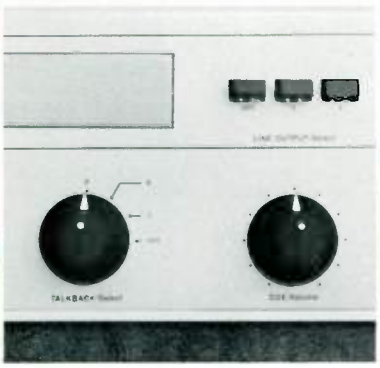
Monaural stations contemplating conversion to stereo at a later date will find the 1000 series stereo console an excellent investment in future growth.

HEADPHONE AMPLIFIER WITH VOLUME CONTROL

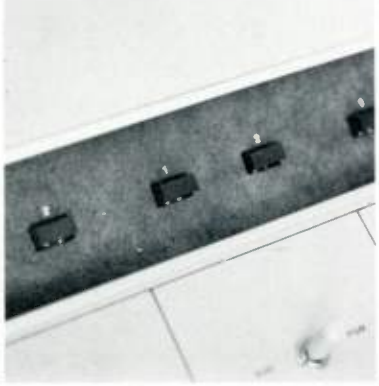
Headphone amplifier can be switched to monitor several console functions. Check the picture for the versatility provided.

FIFTEEN WATT MONITOR OUTPUT AMPLIFIER

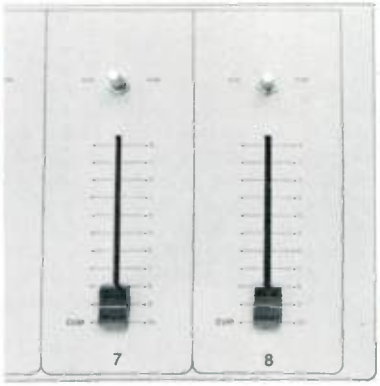
Enough power for almost any monitor speaker is provided without requiring the use of an external monitor amplifier. The hybrid amplifier modules easily provide up to 15 watts per channel output.



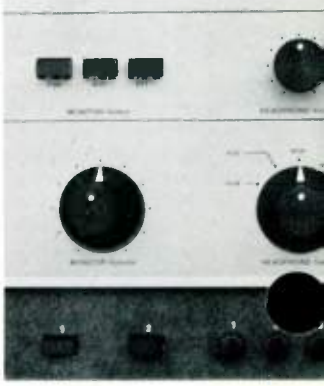
Cue and talkback controls



Pushbutton input select switches

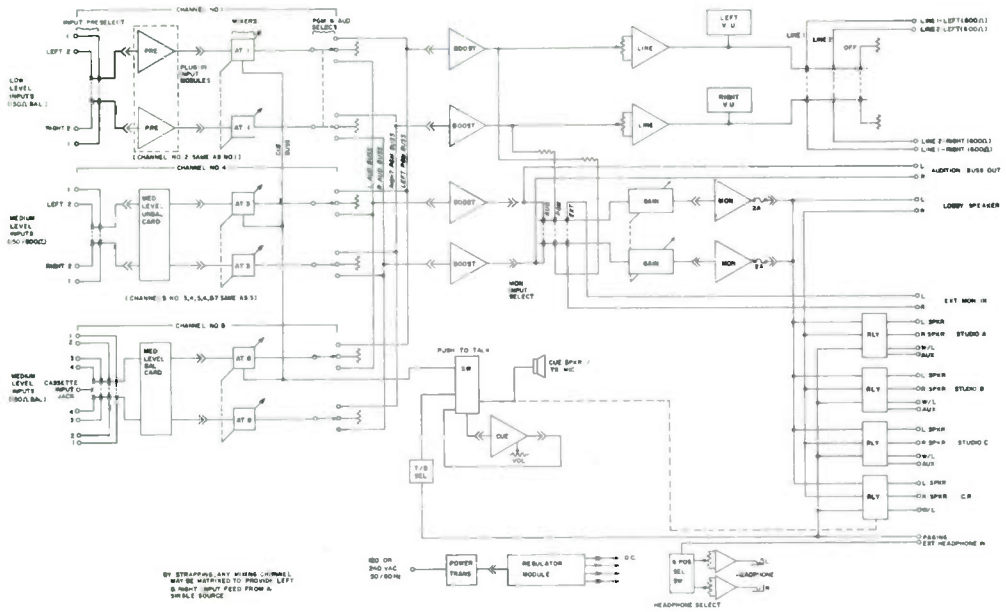


Slide attenuators, rotaries also available



Monitor and headphone select controls

World Radio History



Block diagram

McMartin's B-1000 Series consoles offer plain and simple performance and reliability, but without gadgets, complexity or exotic appearance. The McMartin plain and simple philosophy makes McMartin consoles more versatile, easier to learn, and faster to service. They become a total tool for effective broadcasting, not a machine to be reckoned with. You don't have to worry about performance or reliability. McMartin engineering is state-of-the-art, plain and simple.

CUE AMPLIFIERS

Built in cue amplifier provides adequate volume for cueing purposes and cue is available on all channels.

AUDITION OUTPUT USEABLE AS SECOND PROGRAM OUTPUT

The audition output could be used as a program amplifier in an emergency situation. This makes your McMartin console more versatile.

PUSH-BUTTON INPUT SWITCHING

Pre-select from two input sources on each channel (channel eight has four inputs). On channels one, two and three, push-buttons can also assign control of speaker muting/warning light relays to the correct studio.

LOW PROFILE DESIGN

The industrial design of the B-1000 was conceived with the operator in mind. It is both attractive and yet easy to see and work with.

SIMPLE MODULAR DESIGN

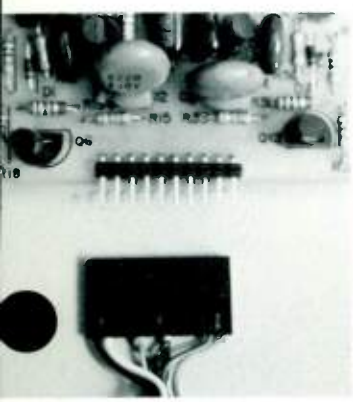
Plain and simple design makes servicing simple and fast. Easy inter-changeability can keep you on the air.

GOLD PLATED CONTACTS AND TANTALUM CAPACITORS USED WHERE IT COUNTS

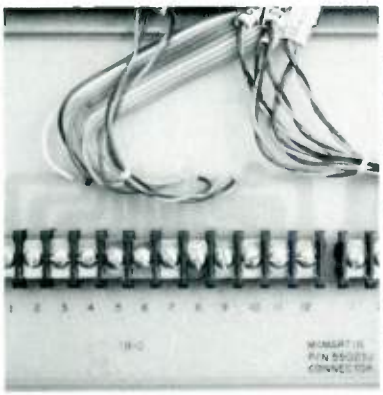
McMartin has chosen to use high quality components throughout the B-1000 Series. Gold plated contacts on printed circuit board plugs and sockets and tantalum capacitors show that this unit has been designed with quality in mind.

EXTERNAL POWER SUPPLY

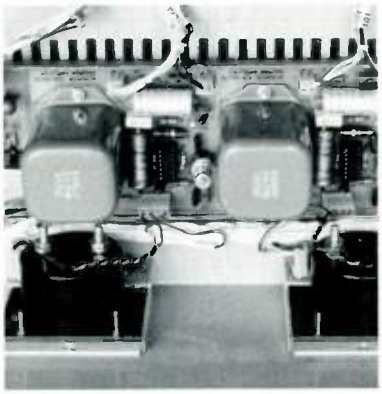
The heavy duty external power supply has five separate fused lines. One AC primary line fuse, the four other separately fusing individual circuit groups. Should a failure occur in the monitor or cue amplifiers, program circuits will continue to function.



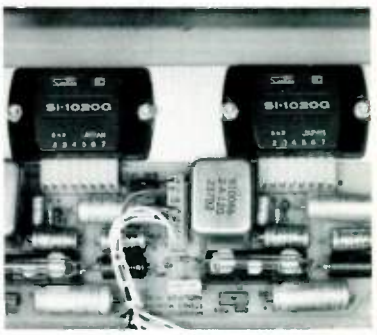
uality components—
old plated plug & sockets



Terminal strip wiring of all inputs



Program amplifier—
IC amplifiers quality transformers



15 watt per channel
monitor amplifier

World Radio History

SPECIFICATIONS

PROGRAM CHANNELS (Mono, Left or Right)

FREQUENCY RESPONSE: ± .5 dB, 30 to 15,000 Hz
± 1 dB, 20 to 20,000 Hz

DISTORTION: 0.5% or less, 30 to 15,000 Hz
1.0% or less 20 to 20,000 Hz @ +18 dBm Output, produced by a −50 dBm signal fed to any microphone input.

S/N RATIO: .74 dB or greater below +18 dBm output, produced by a −50dBm signal fed to any microphone input with channel mixer and master gain control each set for approx. 12 dB attenuation.

OVERALL GAIN: .95 dB±3 dB microphone input to line output

OUTPUT LEVEL: +8 dBm nominal, +28 dBm maximum

OUTPUT IMPEDANCE: 600 ohms balanced

INPUT LEVELS: MICROPHONE CHANNELS; −60 dBm nominal, −22 dBm maximum
MEDIUM LEVEL CHANNELS; −15 dBm nominal, +20 dBm maximum

INPUT IMPEDANCES: MICROPHONE CHANNELS: 150 ohms balanced (50 or 600 ohms available by strapping) Unbalanced medium level channels: 600 ohms Balanced Medium Level Channels: 150 ohms balanced (600 ohms by strapping)

CROSSTALK: Below noise level

AUDITION BUS OUTPUT: +10 dBm unbalanced 600 ohms

MONITOR CHANNEL (Mono, Left or Right)

FREQUENCY RESPONSE ±.5 dB, 50 to 15,000 Hz

HARMONIC DISTORTION 0.5% or less 50 to 20,000 Hertz at full 15 watt output

S/N RATIO 80 dB below full output

OUTPUT IMPEDANCE 4/8/16 ohms unbalanced

OUTPUT LEVEL 15 watts rms

HEADPHONE AMP 1 watt, 0.25% Distortion, Mono/Stereo

CUE AMPLIFIER 1 watt - Mono only

FINISH Upper and lower control panels are textured McMartin beige; center control panel and aluminum end panels have dark brown leather trim.

DIMENSIONS

8 Channel	width	30" (76.2 cm)
	depth	19½" (49.5 cm)
	height	10" (25.4 cm)
5 Channel	width	19½" (49.5 cm)
	depth	19½" (49.5 cm)
	height	10" (25.4 cm)
Power Supply:		8" (20.32 cm) width 13" (33.02 cm) depth 5¼" (13.3 cm) height

WEIGHT

8 Channel	actual	34.5 lbs (15.6 kg)
	shipping	50.0 lbs (22.5 kg)
5 Channel	actual	24.5 lbs (11.1 kg)
	shipping	35.0 lbs (15.75 kg)
Power Supply	actual	9.5 lbs (4.3 kg)
	shipping	10.0 lbs (4.5 kg)

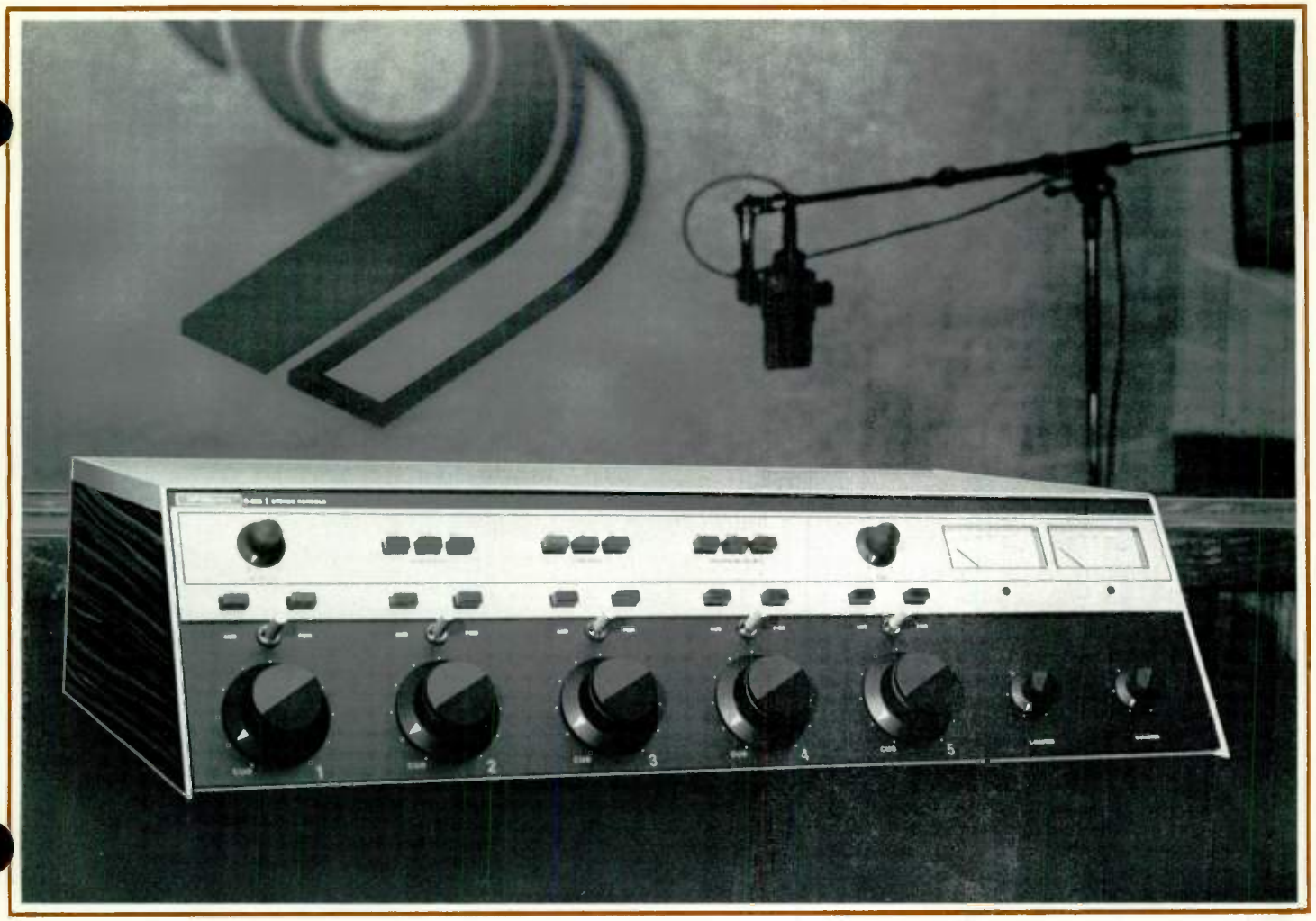
ORDERING INFORMATION

Model	Description	Product Code
1052V	5 Channel Stereo Vertical Attenuators CH 1, Microphone Input CH 2, 3, 4, HI Level Unbalanced Input CH 5, HI Level Balanced Input	**10-02-146**
1081	8 Channel Mono Rotary Attenuators CH 1, 2, Microphone Input CH 3, 4, 5, 6, 7 HI Level Unbalanced Input CH 8, HI Level Balanced Input	**10-02-120**
1081V	8 Channel Mono Vertical Attenuators CH 1, 2, Microphone Input CH 3, 4, 5, 6, 7, HI Level Unbalanced Input CH 8, HI Level Balanced Input	**10-02-119**
1082	8 Channel Stereo Rotary Attenuators CH 1, 2, Microphone Input CH 3, 4, 5, 6, 7, HI Level Unbalanced Input CH 8, HI Level Balanced Input	**10-02-118**
1082V	8 Channel Stereo Vertical Attenuators CH 1, 2, Microphone Input CH 3, 4, 5, 6, 7, HI Level Unbalanced Input CH 8, HI Level Balanced Input	**10-02-117**

REPLACEMENT PRINTED CIRCUIT CARDS for 1000 SERIES CONSOLES

Cue/Talkback Amplifier	**10-02-124**
Program Amplifier	**10-02-125**
Monitor Amp Stereo	**10-02-126**
Monitor Amp Mono	**10-02-134**
SANKEN Hybrid Module for use with MONITOR AMPS. Requires 1 Mono, 2 Stereo	
Stereo Mic PreAmp	**10-02-130**
Mono Mic PreAmp	**10-02-135**
Headphone Amplifier	**10-02-129**
Stereo HI Level Balanced Input	**10-02-131**
Mono HI Level Balanced Input	**10-02-136**
Mono or Stereo HI Level Unbalanced Input	**10-02-132**

World Radio History



500 series audio consoles

MCMARTIN

World Radio History

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 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

Functional, Large, Well Located Controls

Monaural, and Stereo Models

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

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.

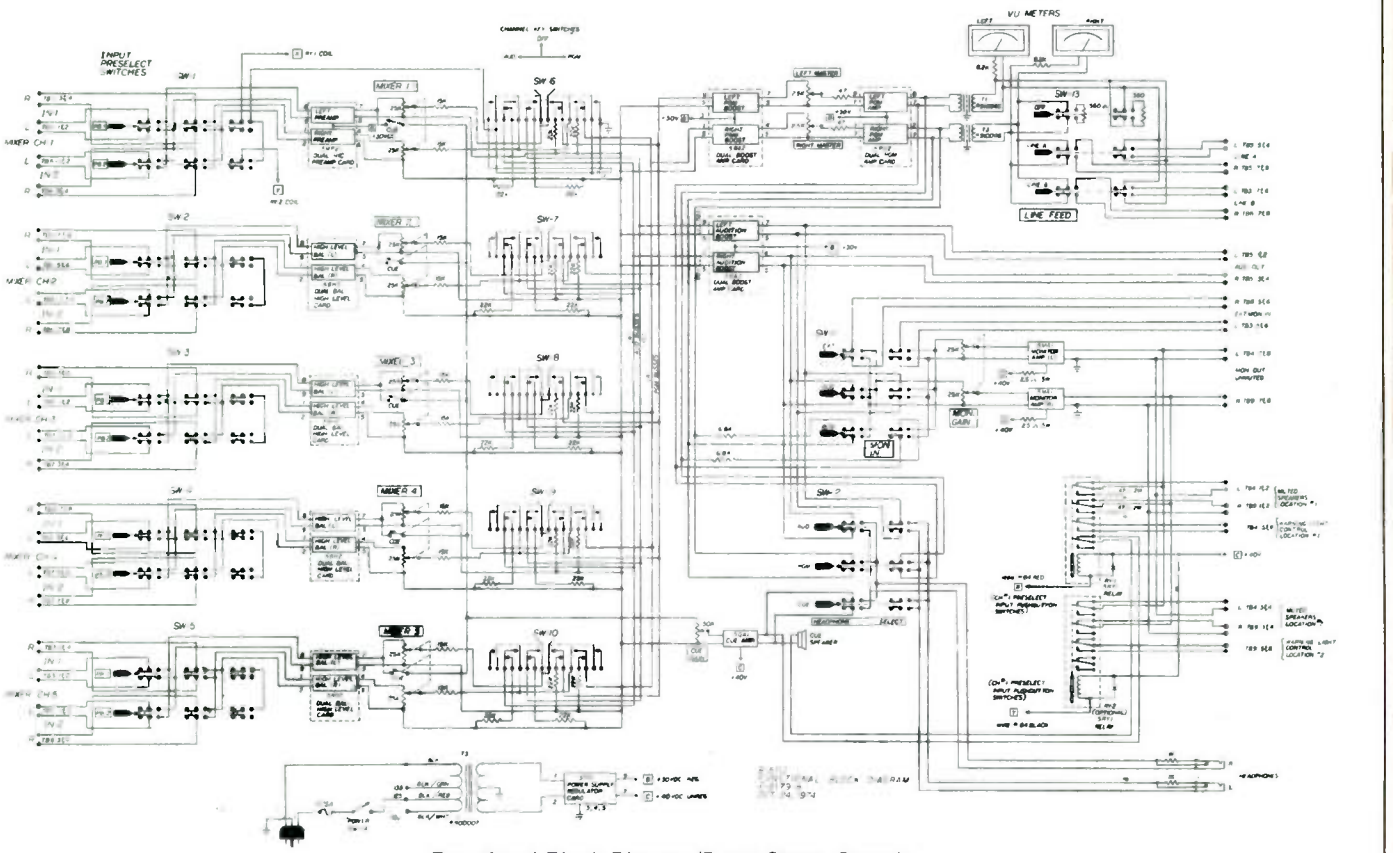
Convenient headphone jacks for monitoring are provided on both models, with front panel switch selection of the program, audition or cue busses.

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

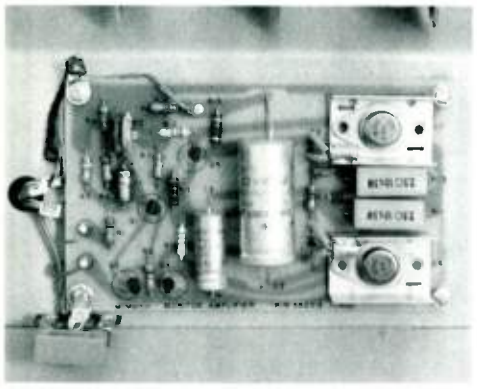
Program outputs are for 600 ohm balanced lines, and are at a + 8 dBm output level. Audition output levels, available to feed recording equipment, are 1.5V rms and can feed unbalanced 2.5K ohm loads.

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.

World Radio History

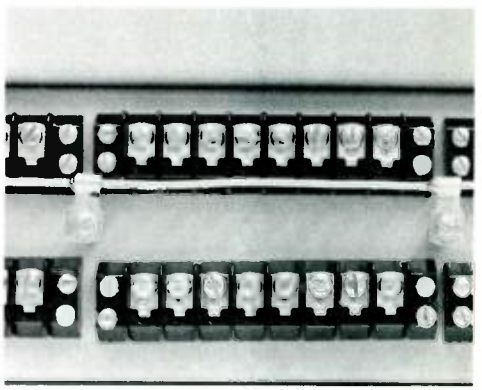


Functional Block Diagram/B-502 Stereo Console



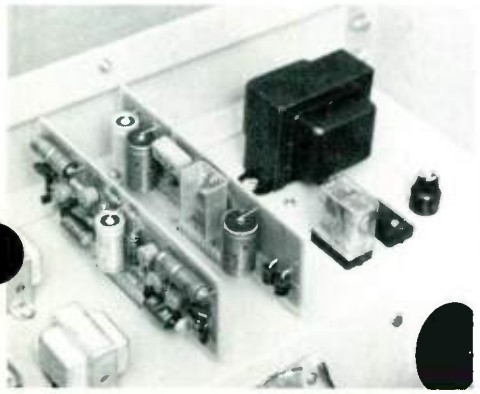
Monitor amplifier

Attenuator, input and program audition select switches

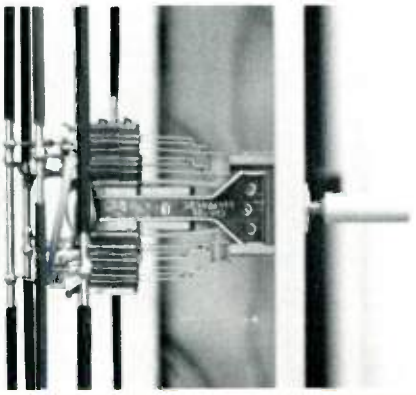


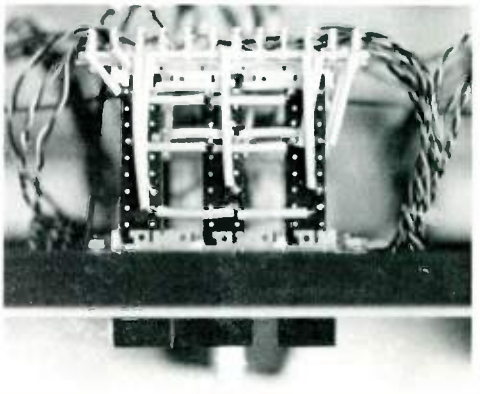
Screw terminal wiring of all inputs—no solder connections

Plug in printed circuit cards



High quality switches used throughout





World Radio History

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 (audition to program)	below noise level
B-502	
Stereo (left channel to right channel 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
High level channels	−15 dBm nominal, +10 dBm maximum
Input Impedances Microphone channels	150/250 ohms balanced
High level	50/150/600 ohms balanced
Output Impedances	600 ohms balanced

AUDITION 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
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
DIMENSIONS	16″ (40.6 cm) deep 7″ (17.8 cm) high 27″ (68.6 cm) wide
WEIGHT	64 lbs. Shipping Weight 67 lbs.
FINISH	McMartin beige with matte black in mixer control area, wood grain end panels

ORDERING INFORMATION

B-501	5 Mixer Monaural Audio Console (one mic, four hi-bal input cards standard)	**10-02-041**
B-501SA	B-501 equipped with step attenuators	**10-02-044**
B-502	5 Mixer Stereophonic Audio Console (One dual mic, four dual hi-bal input cards standard)	**10-02-042**
B-502SA	B-502 equipped with step attenuators	**10-02-045**

Plug-in Input Cards for B-501;

5MP1	Plug-in Microphone Preamplifier	**10-02-056**
5BH1	Plug-in Balanced High Livel Input Card	**10-02-054**

Plug-in Input Cards for B-502:

5MP2	Plug-in Balanced High Preamplifier	**10-02-060**
5BH2	Plug-in Dual Balanced High Level Input Card	**10-02-058**
5RY1	Speaker Muting Relay	**10-02-064**

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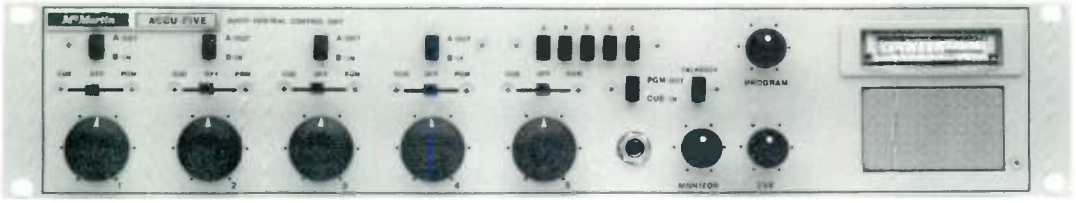
McMartin

FIVE MIXER AUDIO CENTRAL CONTROL UNIT — ACCU-FIVE



FULL PROGRAM, MONITOR & CUE FACILITIES
ACCOMMODATES UP TO 13 MICROPHONE INPUTS
HIGH/LOW LEVEL INPUT SWITCHING ON 3 CHANNELS
ALL INPUTS TRANSFORMER ISOLATED
COMPLETELY SILICON SOLID STATE
CUE/TALKBACK CAPABILITY

The McMartin "Accu-Five" five channel mini-console is completely self-contained in a 3½-inch rack-mount unit.

Mixers 1 and 2 are designed to control low level microphone inputs with panel selection of two sources per channel. Loudspeaker muting associated with channel switching for these two mixers is provided.

Mixers 3 and 4 may accommodate either microphone or high level (as from tape devices, turntables, etc.) inputs by means of rear chassis switching. Mixer 5 accommodates five similar type inputs through preselect pushbutton selection.

All input sources may be previewed by cue bus switching for each channel without disturbing the mixer control positions. A panel mounted cue speaker is driven by the internal cue amplifier. The latter also performs a second function. It serves as a talkback amplifier, permitting communication between the control room and studio. Provision is made for headphone monitoring of program or cue material. When the latter function is used, the cue speaker is muted.

The "Accu-Five," in spite of its compactness, retains truly professional operating parameters. Program output capability is +18dBm with ±1.0dB response and 0.5% or lower harmonic distortion, 30-15,000Hz.

The monitor amplifier delivers 4.0 watts rms into an 8-ohm load with ±1.5dB response and 1.0% or less THD at full output, 50-15,000Hz.

XL type microphone connectors are used for one each of the two microphone-level inputs to Mixers 1 & 2. All remaining input and output connections are made to screw-type terminals on the rear of the unit.

An illuminated VU meter calibrated for zero-VU deflection when +8dBm appears at the program channel output terminals, permits visual monitoring of the program material.

The "Accu-Five" is ideally suited for broadcast remote or production applications, educational broadcast or training purposes or as the audio complement to closed circuit TV operations.

APR/79

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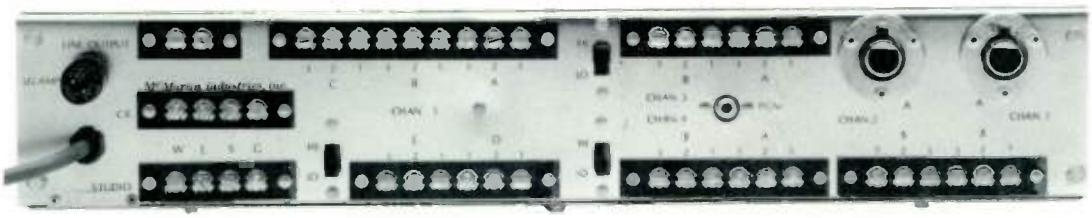

Rear View of ACCU-FIVE

SPECIFICATIONS

PROGRAM CHANNEL

Frequency response: ±1.0dB, 30-15,000 Hz

Harmonic distortion: 0.5% or less, 30-15,000Hz @ +18 dBm output and −50dBm signal to any low-level input

S/N ratio: 60dB below +8dBm output produced by −50dBm signal to any low-level input

Overall gain: 100, ±2dB

Input impedances: Low level mode: 150-ohms, balanced
High level mode; 600-ohms, balanced

Input levels: Low level mode: −60dBm nom; −35dBm max.
High level mode: −20dBm nom; +5dBm max.

Output: 600-ohms balanced (transformer isolated) +8dBm nom; +18dBm max.

CROSSTALK (Cue to Program Channels): Below system noise

MONITOR CHANNEL:

Frequency response: ±1.5dB, 50-15,000 Hz

Harmonic distortion: 1.0% or less, 50-15,000 Hz @ full output

Output level: 4 watts, rms

Output impedance: 8 ohms, unbalanced

POWER REQUIRED: 120/240 VAC, 60 Hz, 30 Watts

DIMENSIONS: width EIA Standard 19″ rack mount, (48 cm)
height 3½″, (8.9 cm)
depth 10″ overall (25.4 cm)

WEIGHT: actual 12 pounds (5.4 kg)
shipping 16 lbs. (7.2 kg)

FINISH: McMartin Beige

ORDERING INFORMATION

Model	Description	Product Code
ACCU-FIVE	5 Channel rack mount mini-console	**10-02-080**
DTC-1	Cabinet for desk mounting	**30-02-026**

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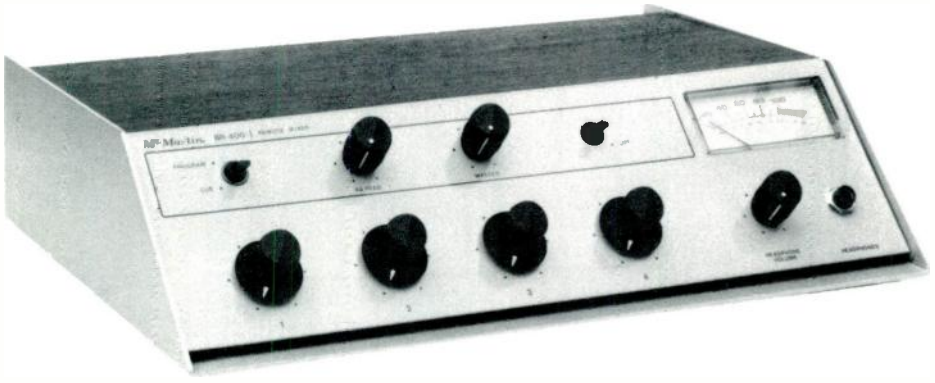
McMartin

4-CHANNEL REMOTE AMPLIFIER BR-400



AC LINE/BATTERY OPERATION
RIAA PHONO OPTION—MIXERS #3 & #4
INBUILT TONE GENERATOR

PA FEED
COMPACT, LIGHTWEIGHT
HEADPHONE AMPLIFIER

DESCRIPTION

The McMartin Model BR-400 four-channel broadcast remote amplifier incorporates extreme flexibility in a lightweight portable package and meets today's stringent requirements for high quality remote broadcasting.

Basically, a four-channel, balanced low-impedance microphone mixer, two of the mixing channels are field convertible to RIAA equalized phono operation, or alternatively, to accommodate balanced line-level inputs. In addition to +8 dBm 600-ohm balanced output, visually-monitored by a front panel VU meter, a PA feed output with independent level control is provided. The BR-400 includes an internal 1000 Hz tone generator for presetting levels.

An isolated headphone amplifier with independent level gain control will accommodate low- as well as high-impedance headphones. This amplifier is switchable to the incoming telephone line where used for remote "cueing" purposes.

The BR-400 is normally powered from 115 Vac power; however, it is designed to house an internal battery power supply with automatic changeover to battery operation in the event of a power line failure. The BR-400 dc supply consists of nine readily-available D-type cells. When rechargeable types are used, the BR-400 provides the means of recharging these by switch operation. Battery life permits approximately 100 hours of continuous operation, with half this time if the VU meter lamp, which may be switched off, is used continuously.

The complete assembly is housed in a durable aluminum enclosure. Ready access to batteries and circuitry is afforded by the hinged top cover/front panel construction.

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McMartin

SPECIFICATIONS

FREQUENCY RESPONSE ..... ±2.0 dB, 20-20,000 Hz (mic or line level input) (±2.0 dB RIAA curve phono service)

TOTAL HARMONIC DISTORTION ..... 0.5% or less, 20-20,000 Hz @ +8 dBm output

INPUT IMPEDANCES ..... 150/250 ohms, balanced. Mixers #3 and #4 switchable to 47K-ohm RIAA mag. phono or 600 ohm balanced input.

INPUT LEVELS ..... −60 dBm (microphone input)
−20 dBm (line input)
2.0 mV, equalized phono input

OUTPUTS

Line out ..... +8 dBm nominal (+18 dBm max) 600 ohms balanced

PA Feed ..... 0.5 volts rms max (adjustable) 5K-ohms unbalanced. (1.0 V into 25K-ohm or higher-Z load)

Headphone ..... +8 dBm max (adjustable) 600 to 20K-ohms unbalanced

HUM & NOISE ..... 62 dB or greater below +8 dBm output (equivalent input noise −122 dBm)

OVERALL GAIN ..... 90, ±2, dB

POWER REQUIREMENTS ..... 115 Vac, 50/60 Hz -or- 13 Vdc, 30 milliamperes, (80 ma with meter illuminated), from internal battery pack (nine D-type cells) or external supply

FRONT PANEL CONTROLS .....

A. ..... Mixer #1 through Mixer #4
B. ..... Master gain control
C. ..... PA feed gain control
D. ..... Headphone level control
E. ..... Cue/program switch
F. ..... Power switch

REAR PANEL CONTROLS .....

A. ..... Tone generator on/off
B. ..... RIAA Eq./flat response (Mixers #3 & #4)
C. ..... Mic/Line impedance (Mixers #3 & #4)
D. ..... Battery on/off charge
E. ..... Meter lamp on off
F. ..... Battery test button

DIMENSIONS ..... 14" W x 3.5" H x 10.5" D (35.6 x 8.9 x 26.7 cm)

WEIGHT ..... 6.5 pounds, 8.0 pounds with batteries

FINISH ..... McMartin beige with woodgrain trim

ORDERING INFORMATION

Model BR-400 ..... 4-channel remote amplifier (Supplied less D-cell batteries, which are readily available in the field)

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McMartin

RIAA EQUALIZED PHONO PREAMP

B-200B

- **MONO OR STEREO**
- **HI/LO FILTERS**
- **BALANCED OUTPUT**

DESCRIPTION

The McMartin B-200 turntable preamplifier for use with either mono or stereo magnetic phono cartridge inputs is suitable for professional, high-performance applications.

The B-200 is completely self-contained. Its frequency response characteristics conform, within 1 dB, with the standard RIAA curve.

Its excellent stereo crosstalk performance is such that a single B-200 unit may be used for preamplification of two separate mono sources. Both "high" and "low" filters may be switch selected. The "high" filter produces 15 dB attenuation at 20 kHz. The "low" filter attenuates 20 Hz signals by 10 dB.

Individual RCA phono input jacks are provided, with individual channel preset level controls. The outputs are terminated on barrier-type screw terminals.

SPECIFICATIONS

FREQUENCY RESPONSE	± 1.0 dB of RIAA curve
DISTORTION	less than 0.25% at +8 dBm output; (20-20,000 Hz)
NOISE LEVEL	108 dBm equivalent input noise at 1,000 Hz
CROSSTALK	55 dB @ 15,000 Hz 65 dB or greater @ 1,000 Hz
INPUT IMPEDANCE	47 K-ohms, resistive
INPUT SENSITIVITY	2.5 mV @ 1,000 Hz for +8 dBm output (overload: −20 dBV @ 1,000 Hz)
OUTPUT IMPEDANCE	600 ohms, balanced
OUTPUT LEVEL	+18 dBm, max.
HIGH FILTER ATTENUATION	−15 dB @ 20,000 Hz
LOW FILTER ATTENUATION	−10 dB @ 20 Hz
POWER REQUIREMENTS	115 Vac, 50/60 Hz, 5 watts
DIMENSIONS	2 3/8" H x 4 1/8" W x 11 1/2" D (6 x 10.5 x 29.2 cm)
SHIPPING WEIGHT	4 pounds

SEP 76

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McMartin

MIXER / PREAMPLIFIER **MX-5**

BUILT-IN TONE GENERATOR

FOUR MICROPHONE & ONE PROGRAM INPUT CHANNEL

OPERABLE FROM EXTERNAL DC SUPPLY

TWO MIC CHANNELS CONVERTIBLE TO RIAA MAG PHONE SERVICE

The McMartin MX-5 five-channel mixer/preamplifier is a high quality, high performance unit offering excellent flexibility in the choice of input mixing functions required either for subsequent amplification in sound distribution systems, or for premixing for recording equipment with "line-level" input requirements.

Four balanced, low-level, low impedance inputs, terminated in female, XL-type connectors accommodate 150 ohm microphones. Any of these inputs, by change in internal jumper-plug orientation, may be modified to accept high-impedance, unbalanced microphones. In additon, two of the inputs may be modified for magnetic phone, RIAA equalized, service. By operation of a rear-panel slide switch, the first microphone input channel is converted to a 1,000 Hz tone generator. This permits prechecking of overall system operating levels.

The program-level input mixer accepts either low impedance balanced sources through rear-chassis screw teminals, or unbalanced 25 k ohm input through an RCA phono jack.

The level of the premixed inputs is controlled by a front-panel Master gain control. Output level from the MX-5 is monitored by an illuminated VU meter, with front-panel switching for "zero VU" meter indication of either +4 dBm or +8 dBm line level output levels.

A 600 ohm, transformer-isolated, balanced line output appears on rear-panel screw terminals. In addition, microphone level, at nominally −40 dBm, is terminated in a male XL-type connector; unbalanced 5 k ohm output appears on an RCA phono jack; and an isolated +18 dBm signal is brought out to a rear, standard 1/4 inch phone jack for headphone monitoring. Where desired, the MX-5 may be powered from a 36 volt 70 milliampere, external DC power supply — in lieu of the normal built-in MX-5 power supply which operates from a 120 VAC, 60 Hz power source.

The versatility of the MX-5 operation is enhanced by its compact packaging. The MX-5 is completely self-contained in an attractively-finished blue and silver gray, aluminum housing which is only 12¾″ wide, 7½″ deep, with a low 2¾″ profile.

The MX-5 is a quality instrument, using high-grade, long-life components, most of which are mounted on a single grade G-10, glass epoxy base, printed circuit board for ease of maintenance and servicing.

The MX-5 satisfies the requirement for professional, high quality and reliable sound installations.

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Rear view of MX-5

SPECIFICATIONS

INPUTS

Microphone . . . . . Four (4) Total: Channel 1 switchable to operate as 1 kHz tone generator. Channels 3 and 4 switchable to RIAA equalized magnetic phono service, by simple internal plug reversal

Program . . . . . One (1)

INPUT IMPEDANCES

Mic Channels . . . . . 50-150 Ω balanced; switchable to 25 kΩ unbalanced by internal jumper plug. Channels 3 and 4 switchable to 47 kΩ for magnetic phono service by internal plug reversal

Program Channel . . . . 600 Ω matching; or 10 kΩ bridging; or 100 mV, 25 kΩ, unbalanced

INPUT LEVELS

Mic Channels . . . . . – 60 dBV balanced; – 28 dBV overload point; – 55 dBV, unbalanced. Channels 3 and 4 in magnetic phono mode: 2 mV at 1 kHz

Program Channel . . . 600 Ω matching; or 10 kΩ bridging; or 100 mV, 25 kΩ, unbalanced

FREQUENCY RESPONSE

Mic Channels . . . . . ± 1 dB, 50-20,000 Hz, ± 2 dB, 20-20,000 Hz; Channels 3 and 4 in magnetic phono mode: within 2.0 dB of RIAA curve

Program Channel . . . ± 0.5 dB, 50-20,000 Hz; ± 1 dB, 20-20,000 Hz

NOISE

Mic Channels . . . . . 65 dB (wide band) and 72 dB (with 15 kHz low pass filter) below + 8 dBm output, with 3 mV input signal. Equivalent Input Noise: — 122 dBm. Channels 3 and 4 in magnetic phone mode: – 55 dB.

Program Channel . . . 80 dB (wide band) and 85 dB (with 15 kHz LP filter) below + 18 dBm output.

OUTPUT IMPEDANCES & LEVELS . . . . . A) . 600 Ω balanced: + 4 dBm or + 8 dBm nominal by front panel switching: + 18 dBm maximum into 600 Ω load.
B) . . . . . 5 kΩ, unbalanced (isolated) at 3 V rms
C) . . . . . 50/150 balanced: – 45 dBm
D) . . . . . Headphone jack: 600 Ω, unbalanced (isolated) at + 18 dBm

TOTAL HARMONIC & INTERMODULATION DISTORTION . . . . . 0.5% or less, 20-20,000 Hz at + 8 dBm output level; 1% or less, 20-20,000 Hz at + 18 dBm output level

FRONT PANEL CONTROLS . . . . . Mic 1—tone generator, Mic 2—level, Mic 3 and 4—equalized phono levels Program level and Master gain

FRONT PANEL SWITCHES . . . . . Output level, + 4 or + 8 dBm; power on/off.

REAR PANEL SWITCHES . . . . . Mic 1—Tone generator

REAR PANEL TERMINATIONS . . . . . Channel 1 to 4 inputs, C1F connectors; Mic Level Output, C1M connector; Balanced program input and balanced 600 Ω output, screw terminals; unbalanced program input and 5 kΩ unbalanced output, RCA phono jack; 36 V DC external power, two pin Cinch Jones socket.

POWER REQUIREMENTS . . . . . 105/125 VAC, 50/60 Hz, 3 W (Fuse: 1/8 A, slo-blo)

DIMENSIONS . . . . . height . . . . . 2¾" (7 cm)
width . . . . . 12¾" (32.4 cm)
depth . . . . . 7¾" (19.7 cm)

WEIGHT . . . . . actual . . . . . 5½ lbs. (2.5 kg)
shipping . . . . . 6 lbs. (2.7 kg)

FINISH . . . . . McMartin blue and silver gray

ORDERING INFORMATION

Model	Description	Product Code
MX-5	5 Channel mixer/preamp	**20-04-045**
MRP-7	Rack mount adaptor	**30-02-028**

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McMartin

AM / FM TUNER **AF-200B**

DUAL GATE MOS FET FM AND AM FRONT END
CERAMIC 10.7 MHz AND 455 kHz FM & AM IF BLOCK FILTER
SWITCH CONTROLLED FM MUTE AND AFC
ILLUMINATED SIGNAL LEVEL TUNING METER
DUAL INTEGRATED CIRCUIT FM AND AM IF AMPLIFIER
REGULATED 12 VDC POWER SUPPLY
EXTERNAL MOUNTED AM FERRITE ANTENNA

The AF-200B is a high performance AM/FM tuner. The all silicon transistor, MOS FET and integrated circuit design insures long life and trouble free performance over a wide range of ambient operating conditions. The FM AFC, double regulated AM oscillator and wide-range AGC circuits provide long term stability without re-tuning, regardless of signal level, temperature, or line voltage variations.

The dual gate MOS FET RF stage on both the AM and FM sections of the tuner provide excellent selectivity, sensitivity, and rejection of spurious signals.

The high quality 10.7 MHz and 455 kHz ceramic IF filters, together with the high gain dual 10.7 MHz and 455 kHz IF amplifier, provide excellent selectivity and a linear IF passband for true high fidelity audio. A composite output pin ahead of the FM audio de-emphasis is also provided on the circuit board for driving a stereo decoder.

The FM and AM audio output from the tuner board is fed through an additional amplifier and emitter follower stage, to provide a high level 600 ohm output.

The AF-200B is attractively packaged in an all aluminum chassis with 3½" E.I.A. standard rack mount front panel. The front panel is finished in McMartin beige textured enamel, with vinyl leather grain trim.

The AF-200B may also be housed in the McMartin DTC-1 cabinet for desk top mounting.

Front panel controls consist of an illuminated "on-off" rocker switch, function selector, tuning control, and a calibrated slide rule dial with logging and AM/FM frequency scales. An illuminated signal level tuning meter is also visible through the tuning dial window.

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Rear view of AF-200B

SPECIFICATIONS

	FM	AM
TUNING RANGE	88 - 108 MHz	540 - 1600 kHz
ANTENNA INPUT	300 Ω balanced or 75 Ω unbalanced (screw terminals)	High impedance unbalanced (screw terminals) Rear mounted ferrite loopstick standard
SENSITIVITY	3 μV 30 dB quieting (2 μV typical)	30 μV 20 dB S/N @ 30% mod.
SELECTIVITY	– 45 dB minimum alternate channel (400 Hz)	– 20 dB @ ± 10 kHz, – 40 dB @ ± 20 kHz
IMAGE REJECTION	– 60 dB	– 40 dB
IF RESPONSE	– 65 dB	– 30 dB
SPURIOUS RESPONSE	– 65 dB	– 35 dB
CAPTURE RATIO	2 dB	-----
HARMONIC DISTORTION	1% or less at 100% modulation 400 Hz (0.5% typ.)	3% or less at 90% modulation 400 Hz (1.5% typ.)
S/N RATIO	– 70 dB	– 40 dB below 30% modulation (– 45 dB typical) 1000 μV input
AF RESPONSE	± 1 dB 30-15,000 Hz	± 3 dB 20-15,000 Hz

AF OUTPUT	+ 2 dBm (1 V rms into 600 Ω)	0 dBm (.78 V rms into 600 Ω)
MUTE DEPTH (Squelch)	– 70 dB	-----
POWER REQUIRED	120 V 50/60 Hz 5 W	

REAR CHASSIS TERMINATIONS

Audio	pin jack
Antennas	screw terminals

DIMENSIONS	height . . . 3½" (8.9 cm)
	width . . . 19" (48.3 cm)
	depth . . . 10½" (25.4 cm)
WEIGHT	actual . . . 4½ lbs. (2 kg)
	shipping . . . 5 lbs. (2.3 kg)
FINISH	McMartin beige with vinyl leather grain trim

ORDERING INFORMATION

Model	Description	Product Code
AF-200B	AM/FM tuner (rackmount)	**30-01-001**
DTC-1	Desk top cabinet	**30-02-026**

ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The AM/FM tuner shall be a McMartin AF-200B or approved equal. The tuner shall employ dual gate MOS FET RF input stages in both the AM and FM front end, ceramic block filters for both AM and FM IF sections, and a high gain multi-function integrated circuit AM/FM IF amplifier. A switch selectable FM AFC and FM mute, illuminated signal tuning meter, external AM ferrite antenna and regulated 12 VDC supply will be standard. The tuner will have provisions for either 75 Ω unbalanced or 300 Ω balanced FM antenna inputs and an external unbalanced high impedance (long wire) AM antenna input. Output level shall be at least 0 dBm, 0.778 V rms into 600 Ω. Power requirement will be 120 V 60 Hz nominal at 5 W.

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TRANSISTOR AMPLIFIERS, 10-15 watts

LT-80C
108C

LT-80C shown

10-15 WATTS RMS POWER OUTPUT

LOW PROFILE 3½" HIGH

BALANCED LOW Z MICROPHONE INPUT

MICROPHONE/PROGRAM INPUTS

BUILT-IN ELECTRONIC MUTING (LT-80C)

ELECTRONIC SHORT CIRCUIT PROTECTION

ALL SILICON DESIGN

SINGLE/DUAL RACK MOUNT OPTIONS

The LT-80C and 108C are conservatively rated wide power-bandwidth 10-15 watt rms audio amplifiers. They are designed for system sound applications requiring one microphone and one program source. As many as twenty speakers (tapped ½ watt) may be driven from the 25 or 70.7 volt balanced output, or a single four-ohm speaker system may be driven to a full 15 watts rms from the unbalanced output.

The microphone input is standard balanced low impedance 50/150 ohms with −60 dBm input sensitivity and 30 dB dynamic range. The microphone input is also convertible to high impedance unbalanced input. A three pin XL female connector is provided for microphone termination on the LT-80C. Screw terminal input connection is provided on the 108C.

The LT-80C features a fully electronic page mute system. Actuation of a simple single pole, single-throw switch closure at the microphone location automatically mutes the program channel and energizes the microphone channel for paging purposes. This switching operation is completely free of clicks and pops.

The program channel input is unbalanced 25K ohms with 300 millivolt sensitivity. An optional plug-in transformer card, Model MT-3, provides for balanced bridging input with sensitivity of −10 dBm. Input termination is either screw terminals or pin connector for the unbalanced inputs, and screw terminals for balanced input.

A 20 dB treble-cut tone control is provided for high-end roll off of the program channel. The microphone input is wired for 10 dB bass roll-off for crisp voice quality and may be field modified for flat response. On the LT-80C, the tone control is on the front panel and in the 108C, it is a front access, recessed screwdriver adjusted control. An optional gain limit control may be field installed to limit the range of the front panel controls.

Screw terminal output termination allows for connection of unbalanced loads from 4 to 16 ohms. Balanced 25 volt (62.5 ohm) and 70.7 volt (500 ohm) outputs are also provided. Continuous short circuit operation of any output will not damage transistors or the power supply.

Attractive, low profile packaging, with the capability of single or dual-unit optional rack mounts, make the LT-80C and 108C even more flexible in application.

FEB/79

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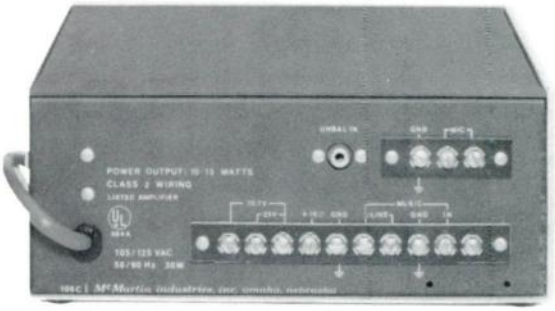
McMartin

Rear View, LT-80C



Rear View, 108C

SPECIFICATIONS

POWER OUTPUT: .....10 watts rms—16 ohms unbalanced; 25/70.7 volt balanced line
.....12.5 watts rms—8 ohms unbalanced
.....15 watts rms—4 ohms unbalanced

FREQUENCY RESPONSE: .....±1 dB, 50-15,000 Hz

DISTORTION: .....1% or less, 50-20,000 Hz at 12.5W output

HUM & NOISE:
MIC: .....60 dB below 10 watts output
PGM: .....70 dB below 10 watts output

OUTPUTS: .....4/8/16 ohms unbalanced; 25/70.7 volt balanced line

PROGRAM/LINE INPUT: .....25K-ohm unbalanced, 600 ohms balanced with optional MT-3 plug-in card

PROGRAM/LINE SENSITIVITY: .....300 millivolts, 25K ohm unbalanced input.
−10 dBm (balanced 10K ohm bridging with MT-3 plug-in card.)
0 dBm (balanced 600-ohm matching with MT-3 plug-in card.)

OPERATING TEMPERATURE: .....to 150°F (66°C)

OVERLOAD PROTECTION: .....Solid state protection circuit samples output stage current and disables input signal during excessive loading condition

POWER REQUIRED: .....120 Vac, 50/60 Hz, 30 watts (Primary taps for 105 and 125 Vac)

MIC INPUT: .....150 ohms balanced

MIC TERMINATION:
LT-80C .....XL Connector
108C .....Screw terminals

MUTING:
LT-80C .....Electronic muting of microphone and program circuits
108C .....None

RESPONSE EQUALIZATION:
LT-80C .....Front panel treble cut tone control (−20 dB at 20 kHz)
Microphone bass cut (−10 dB at 50 Hz). Flat response possible by change of one capacitor.

108C .....Front panel screwdriver adjustment treble cut tone control (−20 dB at 20 kHz); Microphone bass cut (−10 dB at 50 Hz). Flat response possible by change of one capacitor.

DIMENSIONS .....height .....3½" (8.9 cm)
width .....8½" (21.6 cm)
depth .....7¼" (18.4 cm)

FINISH: .....McMartin Blue and gray

WEIGHT: .....actual .....4 lbs. (1.8 kg)
shipping .....7 lbs. (3.2 kg)

OPTIONAL ACCESSORIES:

MT-3 .....Plug-in program channel matching/bridging line input card

MRP-3 .....Single unit rack mounting kit
height .....3½" (8.9 cm)
width .....19" (48.3 cm)

MRP-4 .....Dual unit rack mounting kit
(two units racked side by side)
height .....3½" (8.9 cm)
width .....19" (48.3 cm)

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
LT-80C	10-15 watt amplifier	20-04-008
108C	10-15 watt amplifier	20-04-001
MT-3	line input card	20-04-043
MRP-3	single rack mounting kit	30-02-023
MRP-4	dual rack mount kit	30-02-024

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McMartin

25 WATT UNIVERSAL AMPLIFIER LT-252B

ONE LOW-Z MIC INPUT

ONE LOW-Z MIC/MAG PHONO INPUT

DESK MOUNT

TONE COMPENSATION

EXCELLENT PERFORMANCE

ONE HI-Z UNBALANCED PROGRAM INPUT CONVERTIBLE TO LOW-Z BALANCED

The McMartin LT-252B is a 25 watt rms silicon solid state amplifier designed for multiple input applications. It is completely self-contained and housed in an attractive cabinet suitable for desk top use.

The LT-252B accommodates two 150 ohm balanced microphone inputs through XLR type connectors and a medium level 25 k ohm unbalanced program input. The program input can accommodate medium level, 600 ohm matching or 10 k ohm bridging signal sources by addition of the optional plug-in MT-3 module.

Front panel tone compensation controls permit ± 15 dB treble and bass boost or cut.

The LT-252B is designed to feed 25 or 70.7 volt balanced; or 4 or 8 ohm unbalanced loads. Where applicable, direct coupled 4 ohm loads by-passing the output transformer provide ± 10 dB frequency response from 50 to 20,000 Hz.

The LT-252B is conservatively designed to provide highly-reliable continuous service.

DEC/80

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SPECIFICATIONS

POWER OUTPUT ..... 25 W rms, 35 W music, 50 W peak

FREQUENCY RESPONSE

Microphone Inputs ... ± 2.0 dB, 200-20,000 Hx, with 10 dB controlled low frequency roll-off. Convertible to ± 2l dB response, 40-20,000 Hz.

Program Input ..... ± 1.0 dB, 50-10,000 Hz; ± 1.0 dB, 50-20,000 Hz with 4 Ω direct-coupled output.

Tone Controls ..... Treble: ± 15 dB at 15,000 Hz. Bass: ± 15 dB at 50 Hz.

HUM & NOISE

Microphone Inputs ... 60 dB or greater below RPO with 30 mV reference input signal

Program Input ..... 70 dB or greater below RPO

INPUT SENSITIVITY

Microphone Inputs .... – 60 dBm

Program Input ..... 0.4 V unbalanced. With optional MT-3 plug-in card: 0 dBm, 600 Ω matching; or – 10 dBm, 10 kΩ bridging.

INPUTS

Microphone ..... Two (2) 150 Ω balanced.

Program ..... One (1), 25 kΩ unbalanced. Convertible to 600 Ω balanced matching, or 10 kΩ balanced briding (with optional MT-3 card).

OUTPUTS ..... 25 and 70.7 V balanced; 4 or 8 Ω unbalanced. Unbalanced 4 Ω direct coupled output available on terminal strip.

CONTROLS ..... Two microphone gain; one program gain; one bass boost/cut; one treble boost/cut; illuminated power switch.

OPERATING TEMPERATURE ..... Full performance specifications to 150° F (65° C).

POWER REQUIRED ... 105-115/115-125 VAC, 50/60 Hz, 75 W

DIMENSIONS ..... height ..... 3½" (8.9 cm)
width ..... 12" (30.5 cm)
depth ..... 8¾" (22.3 cm)

WEIGHT ..... actual ..... 7½ lbs. (3.4 kg)
shipping ..... 10 lbs. (4.5 kg)

FINISH ..... McMartin beige with leather grain trim

ORDERING INFORMATION

Model	Description	Product Code
LT-252B	25 watt amplifier	**10-05-003**
ACCESSORIES		
MT-3	line input card	**20-04-043**

All tests conducted in accordance with EIA Standard SE-101-A where applicable.

ARCHITECTS'S & ENGINEERS' SPECIFICATIONS

The amplifier shall be a McMartin LT-252B, or approved equal. It shall be of all silicon, solid state design and be capable of 25 W rms, 35 W rms music or 50 W peak power output. Only amplifiers meeting all three wattage ratings will be accepted. The amplifier shall have 1.0% or less total harmonic distortion when operated at rated power output level, or below. Frequency response through the microphone inputs shall be ± 2.0 dB or less over the range of 200 to 20,000 Hz with provision by simple field alteration of extending the frequency range to cover 40 to 20,000 Hz. The frequency response of the program input channel shall be within ± 1.0 dB over the spectrum from 50 to 10,000 Hz. The hum and noise level shall be 60 dB or greater below rated power output produced by a 3.0 mV reference input signal through either of the microphone channels. The hum and noise through the program input channel shall be 70 dB or greater below the rated power output level. The amplifier shall permit ± 5 dB boost/cut at 15,000 Hz and 50 Hz by means of treble/bass front panel controls respectively. The amplifier shall have outputs of 4 and 8 Ω unbalanced and 25 and 70 V balanced configuration. Rear panel termination of a 4 Ω direct coupled output shall be provided.

The amplifier shall be listed by Underwriters Laboratories

The amplifier front panel shall be finished in McMartin beige with leather grain trim, self-contained in an aluminum enclosure of bronze metallic finish, suitable for desk top use.

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McMartin

25 WATT POWER AMPLIFIER

LT-250C

LESS THAN 1% DISTORTION

CURRENT SENSING OVERLOAD PROTECTION

BASS CUT SWITCH FOR HORN SPEAKER USE

40 - 20,000 Hz FULL POWER FREQUENCY RESPONSE

BALANCED 70.7 & 25 VOLT OUTPUTS

UNBALANCED 4, 8 & 16 OHM OUTPUTS

The LT-250C is a 25 watt rms silicon solid-state transistorized amplifier designed for low distortion output over a full power bandwidth of 40-20,000 Hz. The low frequency response of the amplifier can be extended to 20 Hz when operated with the field convertible direct coupled output.

This basic amplifier utilizes plug-connected circuit board construction, with power transistors and power supply components mounted and placed for maximum accessibility. Computer grade capacitors, and conservatively-rated transformers contribute to maximum performance and reliability.

The LT-250C accommodates either an unbalanced high impedance or a 600 ohm balanced program input. The balanced input utilizes a transformer, factory wired for 600 ohms matching. It is easily field modified for 10 k ohms bridging without additional components.

The front panel program gain control may be transferred to the rear panel where that location is preferred.

The LT-250C amplifier features an overload protection, fast-acting current-limiting electronic circuit that automatically disables amplifier drive should a potentially harmful overload occur.

The LT-250C amplifier has 70.7 V and 25 V balanced outputs, plus 4, 8 and 16 ohm unbalanced outputs. Input and output connections are on convenient screw terminals.

The amplifier output may be directly coupled to an 8 ohm load. When so operated, the low-end frequency response is extended to 20 Hz.

A rear-panel mounted bass cut switch tailors the amplifier response (14 dB down at 100 Hz) in installations where horn speakers are utilized.

The LT-250C, styled in McMartin beige with complementary leather grain accent, is designed for direct mounting in a 19″ rack. An attractive desk top cabinet is available.

LT-250C — continuing the excellence in solid-state amplifiers pioneered by McMartin Industries.

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SPECIFICATIONS

POWER OUTPUT ..... 25 W rms, 35 W music, 50 W peak

FREQUENCY RESPONSE ..... ± 1 dB 40-20,000 Hz, ± 1 dB 20-20,000 Hz direct coupled output

DISTORTION ..... Less than 1% (40-20,000 Hz) at RPO and below

HUM AND NOISE (Program) ..... 85 dB below RPO

PROGRAM INPUT ..... Unbalanced 25 kΩ, and balanced 10 kΩ bridging or balanced 600 Ω matching.

INPUT SENSITIVITY ..... 0.4 V balanced 0 dBm 600 Ω matching – 10 dBm 10 kΩ bridging

OUTPUTS ..... Balanced 70.7 V and 25 V; Unbalanced 4, 8 and 16 Ω Unbalanced 8 Ω direct output.

CONTROLS ..... Program gain; power on/off

POWER REQUIRED ..... 105-115 VAC or 115-125 VAC 50/60 Hz, 75 W

OPERATING TEMPERATURE ..... Full performance to 150° F (65° C)

DIMENSIONS ..... height ..... 3½" (8.9 cm) width ..... 19" (48.3 cm) depth ..... 5¾" (14.6 cm)

WEIGHT ..... actual ..... 11 lbs. (5 kg) shipping ..... 13 lbs. (5.9 kg)

FINISH ..... McMartin beige with leather grain trim

ORDERING INFORMATION

Model	Description	Product Code
LT-250C	25 watt power amplifier	30-01-002
ACCESSORIES		
DTC-1	Desk top cabinet	30-02-026

All tests conducted in accordance with EIA Standard SE-101-A where applicable.

ARCHITECTS' & ENGINEERS' SPECIFICATIONS

The amplifier shall be a McMartin LT-250C, or approved equal. It shall be of all silicon solid-state construction and capable of 25 W rms, 35 W music, and 50 W peak power output. Only amplifiers meeting all three wattage ratings will be accepted. The amplifier shall have less than 1% distortion at rated output and below. The frequency response shall be ±1 dB 40-20,000 Hz with a transformer output, and ±1 dB 20-20,000 Hz with a field strappable direct 8 Ω output. The amplifier noise shall be at least 85 dB below signal at the rated power output. The amplifier shall be designed to operate continuously on line voltages of 105 to 125 V, 50/60 Hz over a temperature range of 0° to 150° F (– 18° to 65° C). The amplifier shall be equipped with a current sensing overload protection circuit that will remove audio drive from the amplifier should an overload or short circuit develop. This protection circuit shall restore the amplifier in one ms when the short or overload is removed.

Only amplifiers offering this type of protective circuits shall be acceptable.

The amplifier shall be capable of accepting either a balanced or unbalanced program input without the installation of additional equipment. A transformer shall be permanently installed in the amplifier to accommodate 10 kΩ and 600 Ω balanced line inputs, both matching and bridging shall be available. Screw terminals shall be provided for balanced inputs. The amplifier shall have outputs of 4, 8 and 16 Ω unbalanced, and 70.7 V and 25 V balanced. the balanced circuits shall be capable of being balanced to ground, or floating balanced. A bass cut switch shall be provided that shall attenuate the bass in the output. A 14 dB cut at 100 Hz will be required. Screw type terminals shall be provided for all outputs. A direct coupled 8 Ω output shall be available by strapping the rear panel connector, and the direct coupled output shall provide extended low frequency response down to 20 Hz.

The amplifier shall be equipped with a program gain control, and an illuminated power on/off switch.

The amplifier shall have an unswitched 115 V 3 wire grounded accessory outlet.

The amplifier shall be McMartin beige with a leather grain trim.

The amplifier shall be capable of being directly mounted in a 19" relay rack, and shall be ☐ supplied with, ☐ capable of being housed in a complementary appearing desk top housing.

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50 WATT POWER AMPLIFIER LT-500D

65 WATT RMS EIA RATING
50 WATT RMS CONTINUOUS RATING
DUAL SLOPE LOAD LINE PROTECTION
CONSTANT CURRENT AND THERMAL BIAS STABILIZATION
LESS THAN 0.25% THD AT RATED OUTPUT 20-20,000 Hz ON DIRECT OUTPUT
LESS THAN 1% THD AT RATED OUTPUT 30-20,000 Hz ON 70.7 V LINE.
FULL PERFORMANCE OVER −40°C TO +65°C TEMPERATURE RANGE
SIMPLE, RUGGED CONSTRUCTION FOR LONG TERM RELIABILITY
LOW PROFILE 3½" PANEL HEIGHT

The McMartin LT-500D is a professional quality power amplifier rated for continuous 50 watt rms output. This new D version amplifier is equipped with dual slope load line protection to protect the driver-output components and power supply during output shorts and overload, or input overdrive.

A low-cut filter provides a low frequency roll-off of 10 dB at 100 Hz to protect horn drivers from low frequency transients. Input provisions include a built-in balanced line input transformer for 600 ohm matching input or 10 K ohm bridging input.

Sufficient gain is provided to drive the amplifier to full output from a −20 dBm line level input. A 25 K ohm (nominal) unbalanced input is also provided for direct drive from unbalanced sources. A unique input pad configuration also permits balanced bridging input from balanced line sources up to 100 volts rms. This provides cascading of amplifiers for system expansion as a "booster" amplifier from the 70.7 volt system feed of another amplifier. Sound systems may therefore be expanded as buildings are enlarged without adding a "home run" line back to the central feed point, and without increased loading of the existing system. Removal of the front panel without exposure to live circuitry also permits easy mounting of the LT-500D amplifier to a structure or enclosure other than a standard E.I.A. rack cabinet. Computer grade electrolytic capacitors and oversized transformers provide safe, full performance operation over a temperature range of −40°C to +65°C.

Circuit design of the power amplifier section is also all new. The use of an integrated circuit predriver and dual slope load line protection network together with a conjugate full complimentary output section provides the ultimate in simplicity, ruggedness, and performance. The constant current biasing used in the predriver also maintains absolute AB_2 bias stabilization over extreme variations in power line voltage and temperature.

Installation and servicing of all "D" version amplifiers provides the ultimate in simplicity. The removable front panel provides ease of handling of the chassis assembly during rack mounting even if other units or panels are installed directly above and below the rack opening. This also provides access to the power supply components and output devices. Removal of the rear panel provides access to the circuit board, input transformer and other circuit components. This panel may be opened and locked in place for tests and servicing.

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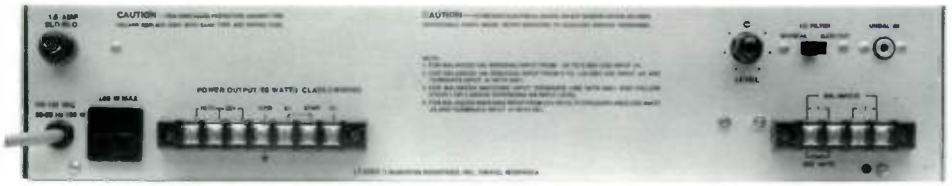

Rear View of LT-500D

SPECIFICATIONS

POWER OUTPUT
- **Direct Output** ..... 50 watts rms 20-20,000 Hz at less than 0.25% THD (0.15% or less typical)
- **70.7 V Output** ..... 50 watts rms 30-20,000 Hz at less than 1% THD (0.5% or less typical)

FREQUENCY RESPONSE:
- **Direct Output** ..... ±1 dB 20-20,000 Hz
- **70.7 V Output** ..... ±1 dB 30-20,000 Hz

INPUT SENSITIVITY
- **Unbalanced** ..... 80 MV for RPO
- **Balanced 600 ohms or 10 K bridging** ..... −20 dBm

HUM AND NOISE ..... −80 dB below RPO (−90 dB typical)

I.M. DISTORTION ..... Less than 0.5% 100 MW to RPO

LOW CUT FILTER ..... −3 dB @ 300 Hz, −10 dB @ 100 Hz, −20 dB @ 40 Hz

REGULATION:
- **70.7 V Output** ..... 2 dB or less NL to FL (1 dB typical)

OPERATING TEMPERATURE ..... −40°C to +65°C

POWER REQUIRED ..... 120 VAC nominal 50/60 Hz, 90 W @ RPO, 20 W idle

INPUTS:
- **Unbalanced** ..... 25 K ohms nominal
- **Balanced** ..... 600 ohms matching or 10 K ohms bridging

OUTPUTS:
- **Unbalanced** ..... 4 and 8 ohms
- **Balanced** ..... 25 & 70.7 V

CONTROLS:
- **External** ..... Input level, Lo Filter In-Out
- **Internal** ..... Bias Adjust

INDICATORS ..... Power "on"

PROTECTION ..... Electronic and 1.5 amp fuse

DIMENSIONS ..... 3.5" (8.9 cm) high, 19" (48.3 cm) wide, 8" (20.4 cm) deep

SHIPPING WEIGHT ..... 15 lbs. (6.8 Kgms)

FINISH ..... Beige front panel with leather grain trim; caustic etched aluminum chassis

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
LT-500D	50 Watt Power Amplifier	**30-01-014**

All tests conducted in accordance with EIA Standard SE-101-A and SE-104 where applicable.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

The power amplifier shall be a McMartin model LT-500D or approved equal, all silicon type, solid state amplifier. The amplifier shall have a continuous power output rating of 50 watts rms at less than 1% THD over the frequency range of 30 to 20,000 Hz with all components operating within safe limits. Reserve power shall be available to produce 65 watts rms from 50 to 15,000 Hz at less than 5% THD for use in commercial and industrial paging applications. The amplifier shall have a frequency response of ±1 dB 30-20,000 Hz and an input sensitivity of 80 MV unbalanced and −20 dBm balanced. Hum and noise shall be at least 80 dB below rated output. Intermodulation distortion from 100 MW to RPO shall be less than 0.5%. A low-cut filter shall provide at least 10 dB attenuation at 100 Hz and 20 dB at 40 Hz. Input impedance shall be unbalanced 25 K ohm and balanced 600 or 10,000 ohm bridging with built-in line transformer. Output regulation shall be less than 2 dB no load to full load at RPO on the 70.7 V output. Controls for gain, low filter "IN-OUT" and a power "on" indicator shall be provided. Power requirements shall be 105 to 130 VAC, 50/60 Hz single phase and the amplifier shall draw no more than 20 watts with no input signal and 90 watts at 50 watts rms output. Outputs shall be 4 and 8 ohms unbalanced, and 25 and 70.7 volts balanced. Protection shall be load line limiting electronic protection and an AC line fuse for power supply protection. The shipping weight shall be 15 lbs. (6.8 Kgms). The amplifier shall be a standard 19 inch (48.3 cm) rack panel mounted, having a height of 3.5 inches (8.9 cm) and a depth of 8 inches (20.9 cm). Finish shall be McMartin beige with leather grain trim. Access to all components shall be available through removal of the front panel and rear chassis terminal cover.

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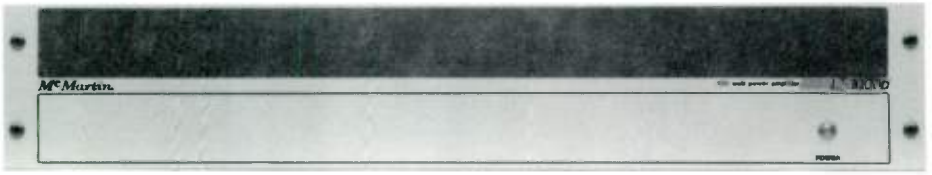
100 WATT POWER AMPLIFIER — LT-1000D



125 WATT RMS EIA RATING
100 WATT RMS CONTINUOUS RATING
DUAL SLOPE LOAD LINE PROTECTION
CONSTANT CURRENT AND THERMAL BIAS STABILIZATION
LESS THAN 0.25% THD AT RATED OUTPUT 20-20,000 Hz ON DIRECT OUTPUT
LESS THAN 1% THD AT RATED OUTPUT 30-20,000 Hz ON 70.7 V LINE.
FULL PERFORMANCE OVER −40°C TO +65°C TEMPERATURE RANGE
SIMPLE, RUGGED CONSTRUCTION FOR LONG TERM RELIABILITY
LOW PROFILE 3½" PANEL HEIGHT

The McMartin LT-1000D is a professional quality power amplifier rated for continuous 100 watt rms output. This new D version amplifier is equipped with dual slope load line protection to protect the driver-output components and power supply during output shorts and overload, or input overdrive.

A low-cut filter provides a low frequency roll-off of 10 dB at 100 Hz to protect horn drivers from low frequency transients. Input provisions include a built-in balanced line input transformer for 600 ohm matching input or 10 K ohm bridging input.

Sufficient gain is provided to drive the amplifier to full output from a −20 dBm line level input. A 25 K ohm (nominal) unbalanced input is also provided for direct drive from unbalanced sources. A unique input pad configuration also permits balanced bridging input from balanced line sources up to 100 volts rms. This provides cascading of amplifiers for system expansion as a "booster" amplifier from the 70.7 volt system feed of another amplifier. Sound systems may therefore be expanded as buildings are enlarged without adding a "home run" line back to the central feed point, and without increased loading of the existing system. Removal of the front panel without exposure to live circuitry also permits easy mounting of the LT-1000D amplifier to a structure or enclosure other than a standard E.I.A. rack cabinet. Computer grade electrolytic capacitors and oversized transformers provide safe, full performance operation over a temperature range of −40°C to +65°C.

Circuit design of the power amplifier section is also all new. The use of an integrated circuit predriver and dual slope load line protection network together with a conjugate full complimentary output section provides the ultimate in simplicity, ruggedness, and performance. The constant current biasing used in the predriver also maintains absolute AB_2 bias stabilization over extreme variations in power line voltage and temperature.

Installation and servicing of all "D" version amplifiers provides the ultimate in simplicity. The removable front panel provides ease of handling of the chassis assembly during rack mounting even if other units or panels are installed directly above and below the rack opening. This also provides access to the power supply components and output devices. Removal of the rear panel provides access to the circuit board, input transformer and other circuit components. This panel may be opened and locked in place for tests and servicing.

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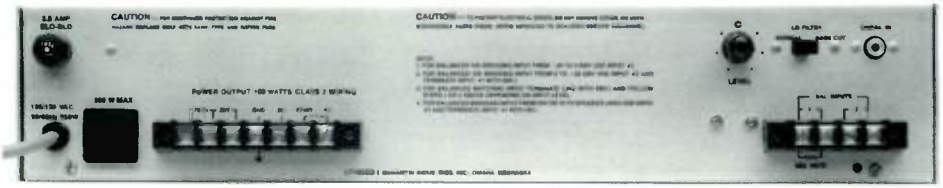

Rear View of LT-1000D

SPECIFICATIONS

POWER OUTPUT
Direct Output ..... 100 watts rms 20-20,000 Hz at less than 0.25% THD (0.15% or less typical)
70.7 V Output ..... 100 watts rms 30-20,000 Hz at less than 1% THD (0.5% or less typical)

FREQUENCY RESPONSE:
Direct Output ..... ±1 dB 20-20,000 Hz
70.7 V Output ..... ±1 dB 30-20,000 Hz

INPUT SENSITIVITY
Unbalanced ..... 80 MV for RPO
Balanced 600 ohms or 10 K bridging .... −20 dBm

HUM AND NOISE .... −80 dB below RPO (−90 dB typical)

I.M. DISTORTION .... Less than 0.5% 100 MW to RPO

LOW CUT FILTER .... −3 dB @ 300 Hz
−10 dB @ 100 Hz
−20 dB @ 40 Hz

REGULATION:
70.7 V Output ..... 2 dB or less NL to FL (1 dB typical)

OPERATING TEMPERATURE ..... −40°C to +65°C

POWER REQUIRED .. 120 VAC nominal 50/60 Hz
190 W @ RPO, 25 W idle

INPUTS:
Unbalanced ..... 25 K ohms nominal
Balanced ..... 600 ohms matching or 10 K ohms bridging

OUTPUTS:
Unbalanced ..... 4 and 8 ohms
Balanced ..... 25 & 70.7 V

CONTROLS:
External ..... Input level
Lo Filter In-Out
Internal ..... Bias Adjust

INDICATORS ..... Power "on"

PROTECTION ..... Electronic and 2.5 amp fuse

DIMENSIONS ..... 3.5" (8.9 cm) high
19" (48.3 cm) wide
8" (20.4 cm) deep

SHIPPING WEIGHT ... 20 lbs. (9.2 Kgms)

FINISH ..... Beige front panel with leather grain trim; caustic etched grain aluminum chassis

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
LT-1000D	100 Watt Power Amplifier	**30-01-015**

All tests conducted in accordance with EIA Standard SE-101-A and SE-104 where applicable.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

The power amplifier shall be a McMartin model LT-1000D, or approved equal, all silicon type, solid state amplifier. The amplifier shall have a continuous power output rating of 100 watts rms at less than 1% THD over the frequency range of 30 to 20,000 Hz with all components operating within safe limits. Reserve power shall be available to produce 125 watts rms from 50 to 15,000 Hz at less than 5% THD for use in commercial and industrial paging applications. The amplifier shall have a frequency response of ±1 dB 30-20,000 Hz and an input sensitivity of 80 MV unbalanced and −20 dBm balanced. Hum and noise shall be at least 80 dB below rated output. Intermodulation distortion from 100 MW to RPO shall be less than 0.5%. A low-cut filter shall provide at least 10 dB attenuation at 100 Hz and 20 dB at 40 Hz. Input impedance shall be unbalanced 25K ohm and balanced 600 or 10,000 ohm bridging with built-in line transformer. Output regulation shall be less than 2 dB no load to full load at RPO on the 70.7 V output. Controls for gain, low filter "IN-OUT" and a power "on" indicator shall be provided. Power requirements shall be 105 to 130 VAC, 50/60 Hz single phase and the amplifier shall draw no more than 25 watts with no input signal and 190 watts at 100 watts rms output. Outputs shall be 4 and 8 ohms unbalanced, and 25 and 70.7 volts balanced. Protection shall be load line limiting electronic protection and an AC line fuse for power supply protection. The shipping weight shall be 20 lbs (9.2 Kgms). The amplifier shall be a standard 19 inch (48.3 cm) rack panel mounted, having a height of 3.5 inches (8.9 cm) and a depth of 8 inches (20.9 cm). Finish shall be McMartin beige with leather grain trim. Access to all components shall be available through removal of the front panel and rear chassis terminal cover.

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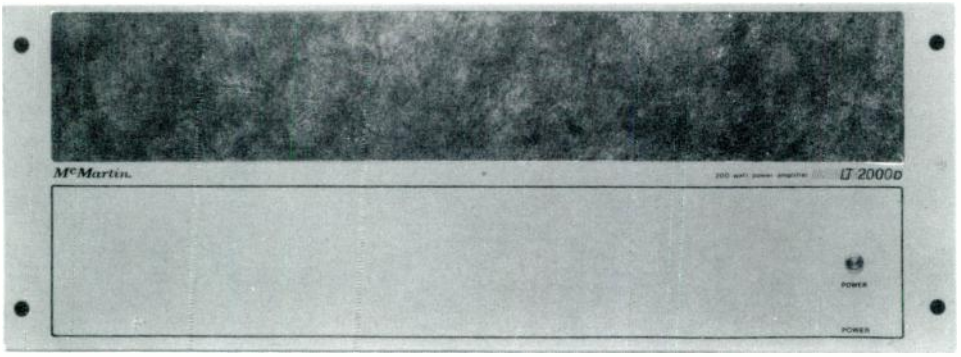
200 WATT POWER AMPLIFIER — LT-2000D



250 WATT rms E.I.A. RATING

200 WATT rms CONTINUOUS RATING

FAILSAFE ELECTRONIC PROTECTION

CONSTANT CURRENT AND THERMAL BIAS STABILIZATION

LESS THAN 1% THD AT RATED OUTPUT 50–10,000 Hz ON 70.7 V LINE

FULL PERFORMANCE OVER −40°C TO +65°C TEMPERATURE RANGE

MODULAR CONSTRUCTION WITH REMOVABLE REAR CIRCUIT ASSEMBLY

The McMartin LT-2000D is a professional quality power amplifier rated for continuous 200 watt rms output. The "D" version amplifiers are all equipped with a new improved instantaneous shutdown, automatic reset, all electronic M-Gard protection network. This circuit prevents damage to the driver-output components and power supply during output shorts and overload or input overdrive.

A low-cut filter provides a low frequency roll-off of 10 dB at 100 Hz to protect horn drivers from low frequency transients. Input provisions include a built-in balanced line input transformer for 600 ohm matching input or 10K ohm bridging. Sufficient gain is provided to drive the amplifier to full output from a —20 dBm line level input. A 25K ohm (nominal) unbalanced input is also provided for direct drive from unbalanced sources. A unique input pad configuration also permits balanced bridging input from balanced line sources up to 100 volts rms. This provides cascading of amplifiers for system expansion as a "booster" amplifier from the 70.7 volt system feed of another amplifier. Sound systems may therefore be expanded as buildings are enlarged without adding a "home run" line back to the central feed point, and without increased loading of the existing system. Computer grade electrolytic capacitors and oversized transformers provide safe, full performance operation over a temperature range of −40°C to +65°C.

Installation and servicing of all "D" version amplifiers provides the ultimate in simplicity. The removable front panel provides ease of handling of the heavy chassis assembly during rack mounting, even if other units or panels are installed directly above and below the rack opening. This also provides access to the power supply components for servicing. The entire amplifier circuit assembly is mounted on the removable rear panel. The rear panel contains the driver and protection circuit board input-output terminations, and the output stage heatsinks and devices. This panel may either be opened and locked in place for tests and field servicing, or it may be completely unplugged and removed for bench servicing without removing the heavy power supply assembly from the rack installation.

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SPECIFICATIONS

POWER OUTPUT:
Continuous rms @ less than 1% THD:
Direct Output ..... 200 watts 50–15,000 Hz
70.7 Volt Output ..... 200 watts 50–10,000 Hz
E.I.A. Rating less than 5% THD ..... 250 watts 50–10,000 Hz

FREQUENCY RESPONSE:
Direct Output ..... ±1 dB, 30–20,000 Hz
70.7 Volt Output ..... ±1 dB, 30–15,000 Hz

INPUT SENSITIVITY:
Unbalanced ..... 80 MV for Rated Power Output
Balanced 600 ohms or 10K bridging ..... −20 dBm

HUM & NOISE ..... −80 dB below RPO

I.M. DISTORTION ..... Less than 0.5% 100 MV to RPO

LOW CUT FILTER ..... −3 dB @ 300 Hz
−10 dB @ 100 Hz
−20 dB @ 40 Hz

REGULATION 70 V OUTPUT ..... 2 dB or less

OPERATING TEMPERATURE ..... −40°C to +65°C

POWER REQUIRED ..... 120 VAC nominal, 50/60 Hz
500 watts @ RPO
45 W idle

INPUTS:
Unbalanced ..... 25K ohms
Balanced ..... 600 ohm matching
10K ohm bridging

OUTPUTS:
Unbalanced ..... 1.5 and 8 ohms
Balanced ..... 25 and 70.7 V

CONTROLS:
External ..... Input level
Lo filter "IN-OUT"
Internal ..... Input gain limit
Current trip level

INDICATORS ..... Power on

PROTECTION ..... Electronic and 6.2 amp fuse

DIMENSIONS ..... 7"(17.8 cm) High
19"(48.3 cm) wide
11"(27.9 cm) depth

WEIGHT ..... actual ..... 57.0 lbs (25.8 kg)
shipping ..... 60.0 lbs (27.2 kg)

FINISH: ..... Beige front panel with leather grain trim; Caustic-etched aluminum chassis

ORDERING INFORMATION:

Model	Description	Product Code
LT-2000D	...200 Watt Power Amplifier	**30-01-016**

All tests conducted in accordance with E.I.A. Standard SE-101-A and SE-104 where applicable.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

The power amplifier shall be a McMartin model LT-2000D, or approved equal, all silicon type, solid state amplifier. The amplifier shall have a continuous power output rating of 200 watts rms at less than 1% THD over the frequency range of 50 to 10,000 Hz with all components operating within safe limits. Reserve power shall be available to produce 250 watts rms from 50 to 10,000 Hz at less than 5% THD for use in commercial and industrial paging applications requiring only intermittent duty operation. The amplifier shall have a frequency response of 30 to 15,000 Hertz ±1 dB and an input sensitivity of 80 MV unbalanced and —20 dBm balanced. Hum and noise shall be at least 80 dB below rated output. Intermodulation distortion from 100 MW to RPO shall be less than 0.5%. A low-cut input filter shall provide at least 10 dB attenuation at 100 Hz and 20 dB at 40 Hz. Input impedance shall be unbalanced 25K ohm and balanced 600 or 10,000 ohm bridging with built-in line transformer. Regulation shall be better than 2 dB. Controls for gain, filter "IN-OUT" and a power "ON" indicator shall be provided. Power requirements shall be 105 to 130 VAC, 50/60 Hz single phase and the amplifier shall draw no more than 45 watts with no input signal and 500 watts at 200 watts rms output. Outputs shall be 1.5 and 8 ohms unbalanced and 25 and 70.7 V volts balanced. Protection shall be self-resetting electronic shutdown and an AC line fuse for power supply protection. The shipping weight shall be 60 pounds (27 Kgms). The amplifier shall be a standard 19 inch (48.3 cm) rack panel mounted, having a height of 7 inches (17.8 cm) and a depth of 11 inches (48.3 cm). Finish shall be McMartin beige with leather grain trim. Access to all components shall be available through removal of the front panel and rear chassis assembly.

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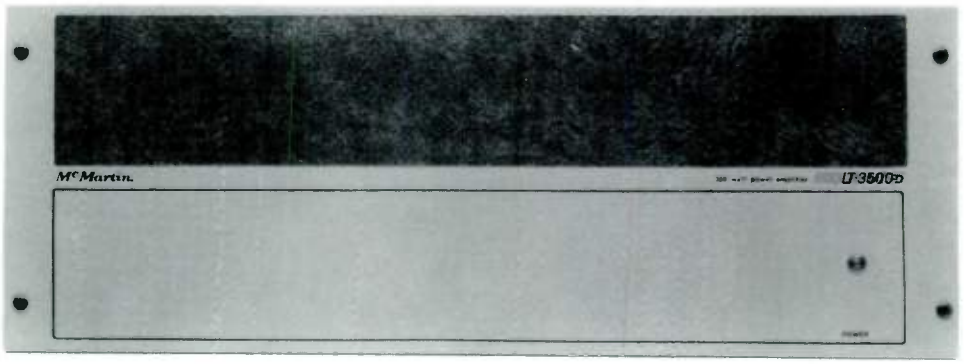
350 WATT POWER AMPLIFIER

LT-3500D



425 WATT RMS EIA RATING

350 WATT RMS CONTINUOUS RATING

FAIL SAFE ELECTRONIC PROTECTION

CONSTANT CURRENT AND THERMAL BIAS STABILIZATION

LESS THAN 1% THD AT RATED OUTPUT 50-10,000 Hz ON 70.7 V LINE

FULL PERFORMANCE OVER −40°C TO +65°C TEMPERATURE RANGE

MODULAR CONSTRUCTION WITH REMOVABLE REAR CIRCUIT ASSEMBLY

The McMartin LT-3500D is a professional quality power rated amplifier rated for continuous 350 watt rms output. The "D" version amplifiers are all equipped with a new improved instantaneous shutdown, automatic reset, all electronic M-Gard protection network. This circuit prevents damage to the driver-output components and power supply during output shorts and overloads, or input overdrive.

A low-cut filter provides a low frequency roll-off of 10 dB at 100 Hz to protect horn drivers from low frequency transients. Input provisions include a built-in balanced line input transformer for 600 ohm matching input or 10 k ohm bridging inputs. Sufficient gain is provided to drive the amplifier to full output from a −20 dBm line level input. A 25 k ohm (nominal) unbalanced input is also provided for direct drive from unbalanced sources. A unique input pad configuration also permits balanced bridging input from balanced line sources up to 100 volts rms. This provides cascading of amplifiers for system expansion as a "booster" amplifier from the 70.7 volt system feed of another amplifier. Sound systems may therefore be expanded as buildings are enlarged without adding a "home run" line back to the central feed point, and without increased loading of the existing system. Computer grade electrolytic capacitors and oversized transformers provide safe, full performance operation over a temperature range of −40°C to +65°C.

Installation and servicing of all "D" version amplifiers provides the ultimate in simplicity. The removable front panel provides ease of handling of the heavy chassis assembly during rack mounting even if other units or panels are installed directly above and below the rack opening. This also provides access to the power supply components for servicing. The entire amplifier circuit assembly is mounted on the removable rear panel. The rear panel contains the driver and protection circuit board, input-output terminations, and the output stage heatsinks and devices. This panel may either be opened and locked in place for tests and field servicing, or it may be completely unplugged and removed for bench servicing without removing the heavy power supply assembly from the rack installation.

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SPECIFICATIONS

POWER OUTPUT
Continuous rms @ less than 1% THD:
Direct Output ..... 350 W rms 50-15,000 Hz
70.7 V Output ..... 350 W rms 50-10,000 Hz
E.I.A. Rating less than 5% THD ..... 425 W rms 50-10,000 Hz

FREQUENCY RESPONSE
Direct Output ..... ± 1 dB 30-20,000 Hz
70.7 Output ..... ± 1 dB 30-15,000 Hz

INPUT SENSITIVITY
Unbalanced ..... 80 mV for RPO
Balanced 600 Ω or 10 k bridging ..... – 20 dBm

HUM AND NOISE ..... – 80 dB below RPO

I.M. DISTORTION ..... Less than 0.5% 100 mV to RPO

LOW CUT FILTER ..... – 3 dB at 300 Hz, – 10 dB at 100 Hz, – 20 dB at 40 Hz

REGULATION
70.7 V Output ..... 2 dB or less

OPERATING TEMPERATURE ..... – 40 °C to + 65 °C

POWER REQUIRED ..... 120 VAC nominal 50/60 Hz
800 W at RPO, 45 W idle

INPUTS
Unbalanced ..... 25 kΩ
Balanced ..... 600 Ω matching or 10 kΩ bridging

OUTPUTS
Unbalanced ..... 1.5 Ω
Balanced ..... 70.7 V

CONTROLS
External ..... Input level, Lo Filter In-Out
Internal ..... Input gain limit Current trip level

INDICATORS ..... Power "on"

PROTECTION ..... Electronic and 10 A fuse

DIMENSIONS ..... height ..... 7" (17.8 cm)
width ..... 19" (48.3 cm)
depth ..... 11" (27.9 cm)

WEIGHT ..... actual ..... 65 lbs. (29.5 kg)
shipping ..... 70 lbs. (31.7 kg)

FINISH ..... Beige front panel with leather grain trim; caustic-etched aluminum chassis

ORDERING INFORMATION

Model	Description	Product Code
LT-3500D	350 watt Power Amplifier	30-01-017

All tests conducted in accordance with EIA Standard SE-101-A and SE-104 where applicable.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The power amplifier shall be a McMartin model LT-3500D or approved equal, all silicon type, solid state amplifier. The amplifier shall have a continuous power output rating of 350 W rms at less than 1% THD over the frequency range of 50 to 10,000 Hz with all components operating within safe limits. Reserve power shall be available to produce 425 W rms from 50 to 10,000 Hz at less than 5% THD for use in commercial and industrial paging applications requiring only intermittent duty operation. The amplifier shall have a frequency response of ± 1 dB 30-15,000 Hz and an input sensitivity of 80 mV unbalanced and – 20 dBm balanced. Hum and noise shall be at least 80 dB below rated output. Intermodulation distortion from 100 mW to RPO shall be less than 0.5%. A low-cut filter shall provide at least 10 dB attenuation at 100 Hz and 20 dB at 40 Hz. Input impedance shall be unbalanced 25 kΩ and balanced 600 or 10,000 Ω bridging with built-in line transformer. Output regulation shall be better than 2 dB. Controls for gain, low filter "IN-OUT" and a power "on" indicator shall be provided. Power requirements shall be 105 to 130 VAC, 50/60 Hz single phase and the amplifier shall draw no more than 45 W with no input signal and 800 W at 350 W rms output. Outputs shall be 1.5 Ω unbalanced, and 70.7 V balanced. Protection shall be self resetting electronic shutdown and an AC line fuse for power supply protection. The shipping weight shall be 70 lbs. (32 kg). The amplifier shall be standard 19" (48.3 cm) rack panel mounted, having a height of 7" (17.8 cm) and a depth of 11" (27.9 cm). Finish shall be McMartin beige with leathergrain trim. Access to all components shall be available through removal of the front panel and rear chassis assembly.

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McMartin

AM RF AMPLIFIER

RF-85B

MINIMUM ENVELOPE DISTORTION

AUTOMATIC GAIN CONTROL

REMOTE/LOCAL POWER CHANGE SWITCHING

1.0 MILLIVOLT SENSITIVITY

CARRIER FAILURE ALARM

MOD/FREQ MONITOR OUTPUT

The McMartin Model RF-85B AM RF amplifier is intended for off-air operation of FCC Type Approved AM modulation/frequency monitors.

Special attention has been placed on amplifying the incoming signal with minimum disturbance of the modulation envelope. This includes consideration of providing adequate reserve amplification to accommodate signals with positive modulation peaks in excess of 100%.

The RF-85B uses Class A amplification through the modulation monitor drive circuitry. The frequency monitor output is heavily limited to strip the modulation and produces an approximately square wave output.

The AGC is effective over a 30 dB input signal range and maintains the output level within 0.5 dB for this wide variation in input level.

A high-low panel switch, remotable through an external contact closure, accommodates dual power situations. The RF-85B is equipped with a carrier-failure relay which operates on carrier interruptions of one second or longer duration. The relay contacts are terminated for connection of external visual or aural alerting devices.

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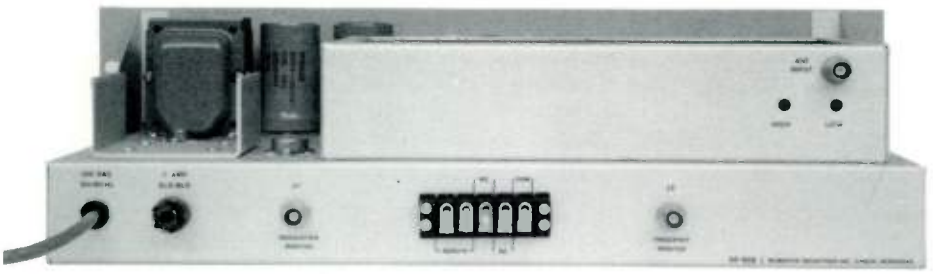

Rear view of RF-85B

SPECIFICATIONS

FREQUENCY RANGE: .....540-1600 kHz

INPUT SENSITIVITY: .....1.0 millivolts, minimum

INPUT IMPEDANCE: .....50 ohms unbalanced, nominal

SELECTIVITY: .....down 1.0 dB or less, ±10 kHz
down 40.0 dB or greater, ±40 kHz

S/N RATIO: .....50 dB or greater below 100% modulation (with 1.0 millivolt input signal)

AGC RANGE: ..... 30 dB variation in input level produces less than 0.5 dB output level change

OUTPUTS
Modulation Monitor: ...0 to 0.5 watts, unmodulated carrier, 50 ohms
Frequency Monitor: ...5 volts, peak-to-peak, square wave, 1K-ohm

TEMPERATURE RANGE: .....0° to 50° Celsius

REAR CHASSIS TERMINATIONS: .....1. Input (BNC)
2. Mod. Mon. out (BNC)
3. Freq. Mon. out (BNC)
4. Carrier failure alarm
5. Remote power level switching

POWER REQUIRED: .....117 Vac, 50/60 Hz

DIMENSIONS: .....EIA standard rack,
19" (48.3 cm) width
5¼" (13.3 cm) height
10" (25.5 cm) depth

WEIGHT .....10 lbs. (4.4 kgms)

FINISH: ..... McMartin Beige with woodgrain trim

ORDERING INFORMATION

Model	Description	Product Code
RF-85B	Am RF Amplifier	**10-03-104**

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AM FIXED - FREQUENCY TUNER — AMR - 1

RACK MOUNT
SELF - CONTAINED
DESIGNED FOR E.B.S. OR OFF-AIR MONITORING

The McMartin Model AMR - 1 is a low cost, high performance, single channel AM broadcast receiver for use as a reliable off-air source for house monitoring systems.

It is also intended as a companion AM receiver unit for use with the McMartin Model EBS - 2 EBS Decoder.

The AMR - 1 contains a monolithic silicon integrated circuit from which the RF amplifier, IF amplifier, mixer, oscillator, and AGC detector are constructed.

It operates on the superheterodyne principle with a 455 kHz IF frequency. A cascode IF amplifier with controlled output impedance and negligible Miller-effect eliminates regeneration and selectivity skewing. A discrete diode detector and audio amplifier are also provided from which both 600 ohm balanced output at a 0 dBm level, as well as unbalanced audio at a nominal 1.0 volt level are brought out to rear chassis screw terminals. The latter serves as audio drive for the EBS - 2 monitor. The AMR - 1 circuitry also includes a carrier off relay closure to activate external alarm devices in the event the control system becomes inoperative.

The AMR - 1 is a completely self-contained, rack mount unit occupying 1¾" of vertical space. An illuminated front panel power switch is also provided.

SPECIFICATIONS

FREQUENCY RANGE (specify operating frequency)	540-1620 kHz
ANTENNA INPUT (BNC type connector)	75 Ω
SENSITIVITY	30 μV/20 dB S/N at 30% modulation
SELECTIVITY	6 dB point: ± 10 kHz
HARMONIC DISTORTION	3.0% or less at 90% modulation
S/N RATIO	45 dB below 100% modulation with 10 μV input
AF RESPONSE	± 1.0 dB, 50-5,000 Hz; ± 3.0 dB, 5-10 kHz
AUDIO OUTPUTS	0 dBm, 600 Ω bal., and 1.0 V, 600 Ω unbal.
POWER REQUIRED	120 VAC, 50/60 Hz, 6 watts
DIMENSIONS	height 1¾" (4.45 cm) width 19" (48.3 cm) depth 6" (12.7 cm)
WEIGHT	actual 4.5 lbs. (2 kg) shipping 6 lbs. (2.7 kg)
FINISH	McMartin beighe with woodgrain trim
REAR CHASSIS TERMINATIONS	Antenna (BNC); Balanced audio out; unbal. audio out; Relay contacts (n.o.)

ORDERING INFORMATION

Model	Description	Product Code
AMR - 1	AM Monitor Receiver	**10-04-003**

OCT/80

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McMartin

FIXED FREQUENCY FM TUNER — FMR-1D

NEW PTD (PRECISE TRACKING DECODER)

IMPROVED SENSITIVITY

50db LINEAR AGC

BALANCED 600 OHM OUTPUT (+8dbm)

ADJUSTABLE NOISE SQUELCH CONTROL

REAR PANEL RELAY CONTACTS (NO) OR (NC)

The McMartin FMR-1D is a low cost, high performance, crystal controlled broadcast tuner. This tuner insures high reliability, high quality audio signal for station or studio monitoring or for use in sound distribution systems.

The RF front end of the FMR-1D is crystal controlled and utilizes a diode protected dual gate D-MOS (FET) field effect RF amplifier and a dual gate MOS-FET mixer. The D-MOS (FET) provides greater than 50db linear AGC control resulting in an overall tuner dynamic range of over 100db with minimum cross modulation. The AGC does not produce any skewing or detuning of the high "Q" RF tuned circuits.

The FMR-1D utilizes a new concept in tuner design providing space age technology in which the tuner actually tracks the modulated signal from the transmitter. The PTD will "lock on" and accurately recover the main channel signal identical to those originally transmitted. No multisection LC filters are used to disturb the original phase relationship of the transmitted signal reducing distortion. This system also tracks the original signal and reduces the effects of multipath.

An entirely new IF system has been designed eliminating the multisection 10.7 mHz IF band-pass filter. The system has been encapsulated within a specially designed hybrid chip. The FMR-1D provides better selectivity to reject unwanted signals and still provide high quality audio signals. Provisions are provided for the addition of an optional filter for exceptional high selectivity.

A specially designed mute circuit is incorporated in the chip to provide noise free muting and is a function of RF noise rather than RF input level. A relay circuit will provide either contact closure or open contacts in the absence of an RF carrier. The relay threshold is also adjustable from 3-15 microvolts.

An audio (1C) integrated circuit is used to drive a transformer providing a balanced 600 ohm output at a level of +8dbm at 100% modulation @ 400 Hz. A 15 kHz low-pass filter is used to eliminate the troublesome 19 kHz stereo pilot signal from the audio output when used for rebroadcast or recording.

The number of components have been greatly reduced due to the use of the hybrid chip IF system. 1C's are also used in the audio system; fewer components means greater reliability.

The FMR-1D utilizes only 1¾" of vertical rack space. An illuminated front panel power switch is provided.

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Rear view of FMR-1D

SPECIFICATIONS

RF INPUT IMPEDANCE	50/72 ohms unbalanced
FREQUENCY RANGE	88-108 mHz
SENSITIVITY	1 microvolt—30db quieting 3 microvolts—50db quieting
SELECTIVITY	50db alternate channel (Standard) 65db with optional filter
DYNAMIC RANGE	Typically 100db
CAPTURE RATIO	Typically 1db without filter 1.5db with optional filter
AM REJECTION	60db or greater
AGC RANGE	—50db or greater
DISTORTION	0.5% or less
FREQUENCY RESPONSE	±1db 30-15000 Hz
SIGNAL TO NOISE RATIO	Typically 65db or greater Below 100% modulation (400 Hz)
19 kHz PILOT CARRIER REJECTION	65db or greater
AUDIO OUTPUT IMPEDANCE	600 ohm balanced
AUDIO OUTPUT LEVEL	+8dbm 100% modulation @ 400 Hz
RELAY CONTACTS RATING	0.5 A @ 24 volts
POWER REQUIRED	120 VAC 50/60 Hz 6 watts
DIMENSIONS	19″ (48.3 cm) width 1¾″ (4.45 cm) height 6″ (12.7 cm) depth
REAR CHASSIS TERMINATIONS	Antenna (BNC); balance 600 ohm audio output. Unbalance audio output, relay contacts. Can be either NO or NC by reversing an internal plug.
FINISH	McMartin beige with woodgrain trim

ORDERING INFORMATION

MODEL	DESCRIPTION	PRODUCT CODE
FMR-1D	FM Monitor Receiver Monaural, Single Channel	**10-04-012**

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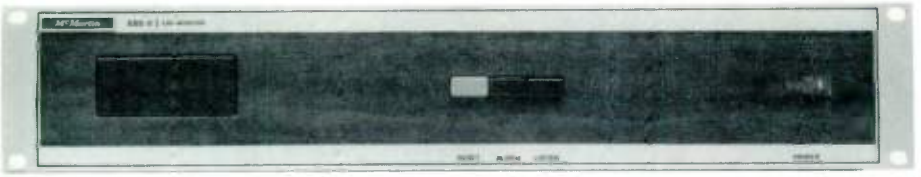
McMartin

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

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 volts, rms. It is designed primarily for use with the McMartin FMR-1D (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 Hz, plus or minus 0.5 Hz.

When the proper tones are transmitted and received on the AMR-1 or FMR-1D, 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 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 mV to 6 V rms
- **Response time** . . . . . 8-16 s (factory adjusted for 12 s)

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
(4) . . . . . remote reset
(5) . . . . . ext. speaker

POWER REQUIRED . . . . . 120 VAC, 50/60 Hz, 6W

DIMENSIONS . . . . . height . . . . . 3½" (8.9 cm)
width . . . . . 19" (48.3 cm)
depth . . . . . 6" (15.3 cm)

WEIGHT . . . . . actual . . . . . 4½ lbs. (2 kg)
shipping . . . . . 9 lbs. (4 kg)

FINISH . . . . . McMartin beige with woodgrain trim

ORDERING INFORMATION

Model	Description	Product Code
EBS-2	EBS Decoder	**10-04-002**

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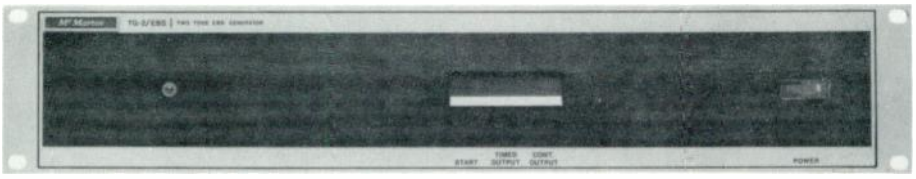
PRECISION TWO-TONE EBS GENERATOR TG-2/EBS



MANUAL OR AUTO TIMING

INDEPENDENT TONE LEVEL CONTROLS

CRYSTAL-DERIVED TONE BASE

REMOTE START

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 Hz. 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%, ± 5% modulation 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 OUTUT 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 Hz
FREQUENCY STABILITY	± 0.2 Hz
OUTPUT LEVEL	+8 dBm min (each tone level independently adjustable)
OUTPUT IMPEDANCE	600 Ω, balanced
HUM & NOISE	65 dB below +8 dBm outut
DISTORTION	less than 1.5%
TIMED OUTPUT DURATION	22.5, ± 2.5 s

DIMENSIONS	height . . . 3½" (8.9 cm) width . . . 19" (48.3 cm) depth . . . 6" (15.3 cm)
WEIGHT	actual . . . 4½ lbs. (2 kg) shipping . . . 9 lbs. (4 kg)
FINISH	. . . McMartin beige with woodgrain trim

ORDERING INFORMATION

Model	Description	Product Code
TG-2/EBS	Precision two tone EBS Generator	**10-04-011**

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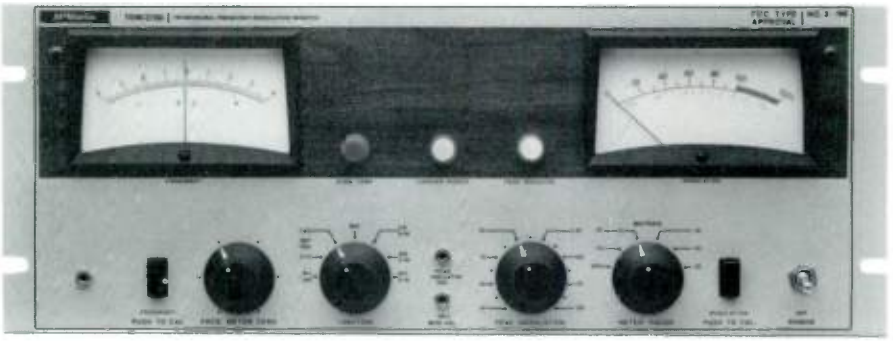
FM FREQUENCY / MODULATION MONITOR

TBM-3700



REAR ACCESS PLUG-IN CARDS
REMOTE METERING AVAILABLE
DIRECT READING AM & FM S/N
STEREO/SCA ADD-ON CAPABILITY
BUILT-IN FREQUENCY/MODULATION CALIBRATION
INDEPENDENT FREQUENCY/MODULATION SECTIONS

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

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

The frequency deviation and modulation monitoring functions are independent of each other. Frequency measurements and calibration switching may be performed without interrupting 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 which permits precise modulation percentage meter calibration and the monitor's measurement of inherent internal FM noise (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-2200A Stereo Modulation Monitor and/or TBM-2000B SCA Frequency/Modulation Monitor.

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

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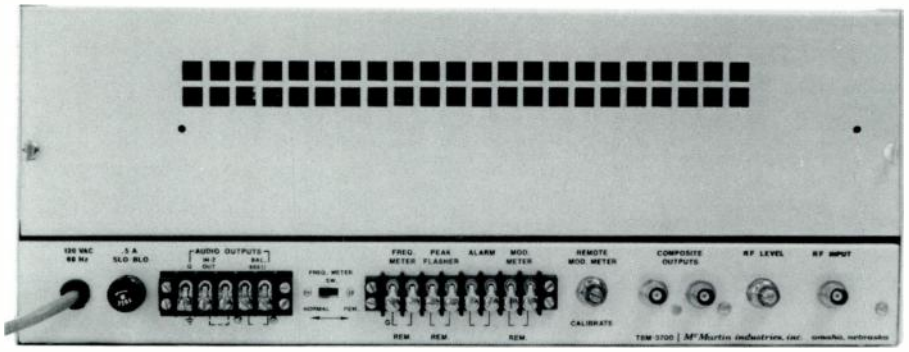

Rear view of TBM-3700

SPECIFICATIONS

OPERATING RANGE . . . . . 88-108 MHz

INPUT . . . . . 50 Ω, unbalanced, 0.1 to 1 W level

OUTPUTS:

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

Distortion Measurement . . . . . 10 kΩ impedance, unbalanced; 5 V (100% modulation at 400 Hz) Distortion: 0.25% (30-15,000 Hz) SNR: 66 dB below 100% modulation at 400 Hz

Composite Output . . Two rear chassis BNC connectors — 300 Ω unbalanced; 1 V peak-to-peak ± 0.2 dB (50-100,000 Hz)

MODULATION METER

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

Total modulation position . . . . . Accuracy, ± 0.5 dB; Frequency 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, 100 Hz increments

Accuracy . . . . . Better than ± 500 Hz

REMOTE METERING:

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

Frequency . . . . . Can accommodate up to 3,000 Ω 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, 45 W

AMBIENT TEMPERATURE RANGE . . . . . 10° to 50° C

DIMENSIONS . . . . . height . . . . . 7″ (17.8 cm) width . . . . . 19″ (48.3 cm) depth . . . . . 13″ (33 cm)

WEIGHT . . . . . actual . . . . . 26.5 lbs. (12 kg) shipping . . . . . 28 lbs. (12.7 kg)

FINISH . . . . . McMartin beige with wood grain trim

ORDERING INFORMATION

Model	Description	Product Code
TBM-3700	Frequency and monaural modulation monitor	**10-03-049**
ACCESSORIES		
RM-37T	Remote metering plug-in card	**10-03-052**
RM-37R	Remote metering rack panel	**10-03-051**

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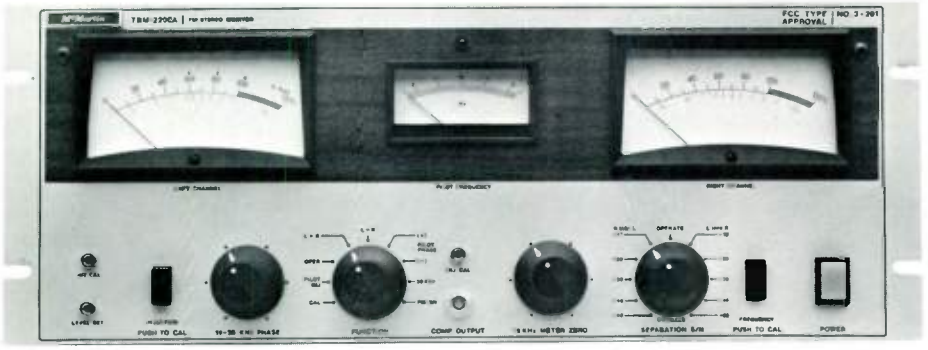
STEREO MODULATION/FREQUENCY MONITOR TBM-2200A



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

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.

JUNE/79

The FCC type approval number is 3-201.

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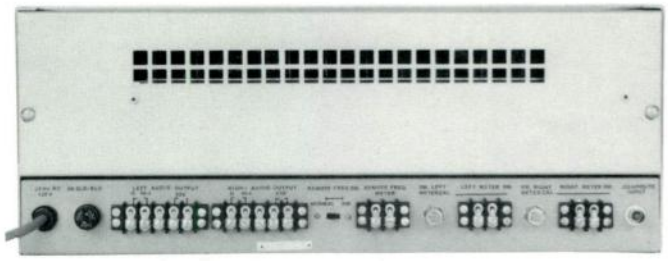

Rear view of TBM-2200A

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 of 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 60 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 external loop resistance.

POWER REQUIRED: 105-125 volts AC

AMBIENT TEMPERATURE RANGE: 10-50 degrees C

DIMENSIONS width 19″ (48.3 cm), height 7″ (17.8 cm), depth 13″ (33.0 cm)

WEIGHT actual 15 lbs (6.8 kg), shipping 19 lbs (8.6 kg)

FINISH: McMartin beige with wood grain trim

ORDERING INFORMATION

Model	Description	Product Code
TBM-2200A	Stereo modulation and pilot frequency monitor	**10-03-034**
RM-22T	Remote metering plug-in card	**10-03-037**
RM-22R	Remote metering rack mount panel	**10-03-036**

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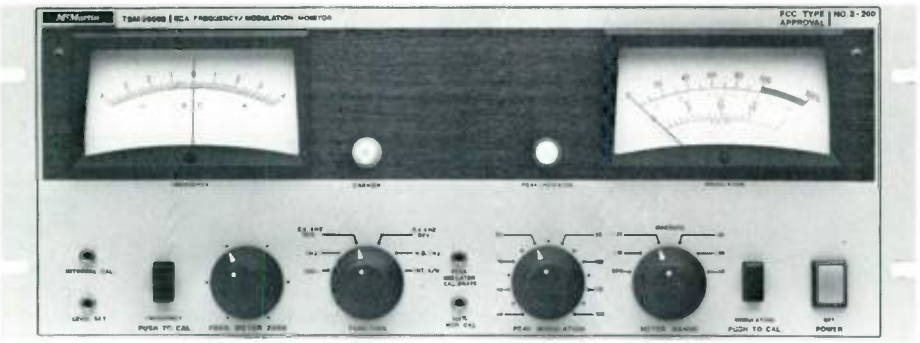
SCA FREQUENCY/MODULATION MONITOR TBM-2000B



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 additional 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 de-activated 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.

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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: ±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

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FM MODULATION MONITOR

TBM-3500B

DIRECT READING AM & FM S/N
MODULAR PLUG-IN CONSTRUCTION
OPTIONAL PLUG-IN LOW LEVEL INPUT

INTERNAL CALIBRATION
CARRIER FAILURE ALARM
REMOTE METERING AVAILABLE

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 woodgrain trim.

The FCC type approval number is 3-219.

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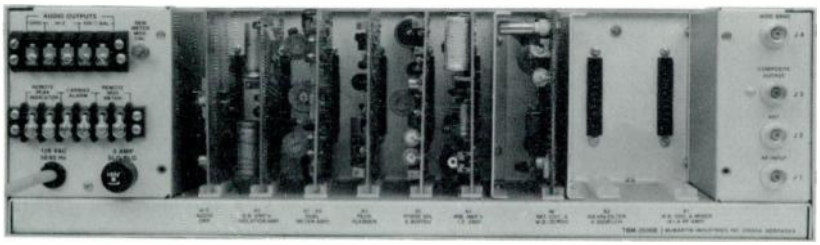

Rear view of TBM-3500B

SPECIFICATIONS

OPERATING RANGE . . . . . 88-108 MHz

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

RF INPUT (standard)
Impedance . . . . . 50 Ω unbalanced
Sensitivity . . . . . 0.1 to 1 W

RF INPUT (with optional LL-35B low level input card)
Impedance . . . . . 50 Ω unbalanced
Sensitivity . . . . . 350 μV minimum

OUTPUTS
Audio Output for Monitoring Circuits
Source impedance . . . . . 600 Ω balanced
Level . . . . . +2 dBm at 100% modulation at 400 Hz
Distortion . . . . . less than 0.5%, 50-15,000 Hz
Audio Output for Distortion Measurement
Impedance . . . . . 10 kΩ or greater
Level . . . . . 5 V at 100% modulation at 400 Hz
Frequency response . . . . . ±0.5 dB, 30-15,000 Hz
Distortion
Monaural . . . . . 0.2%, 30-15,000 Hz
Noise Level . . . . . −75 dB below 100% modulation at 400 Hz
Composite Output (2)
Source impedance . . . . . 300 Ω
Level . . . . . Aproximately 1 V peak-to-peak
Frequency response . . . . . ±0.2 dB, 30-100,000 Hz
3 dB down at 180 kHz

NOTE: 75 μs de-emphasis or flat response selectable for measurement purposes.

MODULATION METER (Ballistics meet FCC Requirements)
Main Channel Position
Accuracy . . . . . ±0.5 dB
Frequency response . . . . . ±0.25 dB, 30-15,000 Hz at 100% modulation

PEAK FLASHER . . . . **(Peak Flasher Meets FCC Requirements)** . . . . . Peak light adjustable to read positive and negative peaks from 50% to 120% modulation
Total Modulation (+) or (−) Positions
Accuracy . . . . . ±0.5 dB
Frequency response . . . . . ±0.25 dB, 30-75,000 Hz

INTERNAL CALIBRATION
Accuracy . . . . . 2% of 100% modulation

POWER REQUIRED . . . . . 105 to 125 VAC, 50/60 Hz, 35 W

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

DIMENSIONS . . . . . height . . . . . 5¼″ (13.3 cm)
width . . . . . 19″ (48.3 cm)
depth . . . . . 13″ (33 cm)

WEIGHT . . . . . actual . . . . . 20 lbs. (9 kg)
shipping . . . . . 23 lbs. (10.4 kg)

FINISH . . . . . McMartin beige with woodgrain trim

REMOTE FACILITIES
MODULATION . . . . . RM-35 meter panel optionally available. Modulation may be remotely monitored with 2,500 Ω 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.

ORDERING INFORMATION

Model	Description	Product Code
TBM-3500B	FM Modulation Monitor	10-03-029
RM-35B	Remote metering rack mount panel	10-03-045
LL-35B	Low level input module	10-03-044

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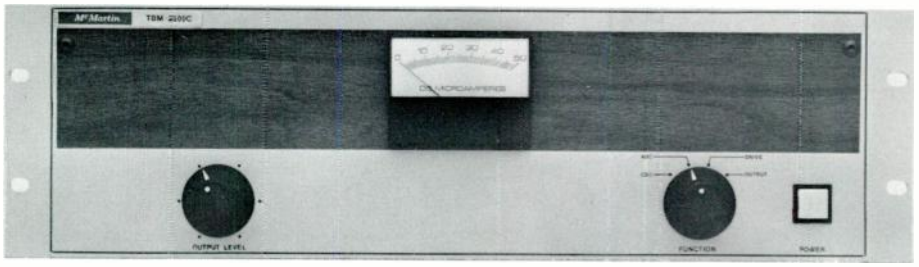
SOLID STATE RF AMPLIFIER **TBM 2500-C series**



TBM-2500-C: FM BAND
TBM-2500-CL: TV-CH 2-6
TBM-2500-CH: TV-CH 7-13

FULLY METERED
ULTRASTABLE OPERATION
AGC LEVEL CONTROL

DESCRIPTION

The TBM-2500-C, -CL and -CH are designed to amplify off-air signals in the FM and VHF-TV frequency ranges to a level suitable for driving FCC Type-Approved frequency and modulation monitoring equipment located at sites remote from the transmitter.
Utilizing essentially identical circuitry, the three models perform this function with minimum degradation of the transmitted signal and its sidebands.
Excellent passband and skirt selectivity characteristics of a special IF filter insure optimum response to the desired signal and rejection of interfering signals.
A sum and difference oscillator injection technique is used so that a zero operating-frequency error results.
The models incorporate AGC circuitry to maintain constant output signal with input signal variations over a 45 dB range. This, in conjunction with excellent limiter action, minimizes signal amplitude variations resulting from propagation effects or "flutter" generated by signal reflections caused by passing aircraft.
Metering of injection voltage, AGC bus voltage, RF drive and RF output is provided.
0.5 watts output (0.2 for the TBM-2500-CH) is developed with a 500-microvolt input signal, with complete limiting.
Although designed for specific use with the complete McMartin line of FM and VHF-TV FCC Type Approved monitoring equipment, the TBM-2500-C series RF amplifier will drive any of the current monitors regardless of manufacture.

SPECIFICATIONS

OPERATING RANGES:	
TBM-2500-C	88-108 MHz
TBM-2500-CL	TV Channels 2-6
TBM-2500-CH	TV Channels 7-13
SELECTIVITY:	290 kHz @ 3 dB points 60 dB down at 800 kHz
SENSITIVITY:	
TBM-2500-C	500 microvolts at antenna input produces 0.5 watts output and full limiting
TBM-2500-CL	Same as TBM-2500-C
TBM-2500-CH	500 microvolts at antenna input produces 0.2 watts output and full limiting
LEVEL, Input Overload	100,000 microvolts
LEVEL, Maximum Output	
TBM-2500-C	0.5 watts
TBM-2500-CL	0.5 watts
TBM-2500-CH	0.2 watts
IMPEDANCES:	
Input	50 ohms, unbalanced (BNC connector)
Output	50 ohms, unbalanced (BNC connector)
AGC RANGE:	45 dB
POWER REQUIRED	115/230 VAC, 50/60 Hz, 15 watts
DIMENSIONS:	19 (W) x 5¼" (H) x 10 (D)
WEIGHT:	10 pounds
CONTROLS, FRONT PANEL:	Power on/off; output level; Metering, (1)OSC; (2)AGC; (3)Drive; (4)Output

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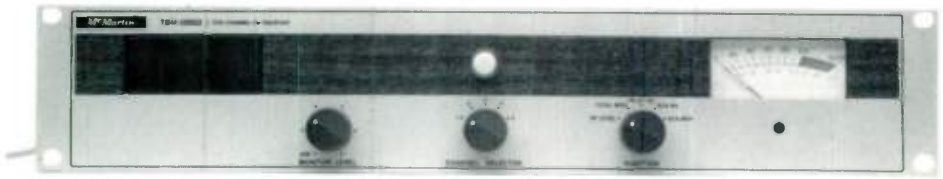
FM RELAY RECEIVER

FM range **TBM-1005D**
TV (VHF only) **TBM-1003D**



NEW PTD (Precise Tracking Decoder)
IMPROVED SENSITIVITY
GREATER RF DYNAMIC RANGE
STEREO/SCA PLUG-IN OPTIONS

1-5 CHANNEL CAPABILITIES
IMPROVED LINEARITY
FULLY METERED
PANEL MOUNTED MONITORING SPEAKER

The McMartin TBM-1005D is a 1-5 channel crystal controlled FM relay receiver for operation on 88 to 108 MHz. The McMartin TBM-1003D is available for operation in the VHF-TV aural channels. Channel 2 through 6 and channel 7 through 13 only.

The McMartin TBM-1005D is a high performance FM relay receiver with an accurate wide band composite signal output. The receiver also provides stereo and/or SCA outputs by simple insertion of optional plug-in cards. Two cards may be accommodated. The optional STE-1D stereo plug-in card provides a left and right channel output at a level of +8 dBm (600 ohms), and provides accurate measurement of the stereo pilot injection level.

The optional SCA-2-67D or SCA-2-41D SCA plug-in cards will provide an SCA audio output of +8 dBm (600 ohms) and provide measurement of the SCA injection level plus monitoring of the modulation level, selectable by the front panel function switch. Two SCA plug-in cards may be used simultaneously with the second SCA card inserted in the mono or stereo socket.

The standard mono card incorporates a 15 kHz low-pass filter to remove the troublesome 19 kHz stereo signal from the audio which can otherwise create problems if the signal is used for rebroadcast or recording.

The TBM-1005D utilizes a new concept in receiver design providing space age technology in which the receiver actually tracks the modulated signal from the FM transmitter providing accurate composite signals identical to what was originally transmitted.

The front end of the TBM-1005D is crystal controlled and utilizes a diode protected dual gate D-MOS field effect RF amplifier. This device has very linear AGC control providing greater than 50 dB gain reduction resulting in an overall tuner dynamic range of over 100 dB with minimum of cross modulation. The AGC does not produce any skewing or detuning of the RF circuits. All RF circuitry switching and tracking is performed by using Varactor tuning techniques. No switch contacts are used in RF circuits and each channel is tuned by a trimpot potentiometer controlled by the front panel function switch.

An entirely new IF system has been designed eliminating the multisection 10.7 MHz IF band-pass filter. The TBM-1005D provides better selectivity to reject unwanted signals and still provide accurate composite signals. Provisions are provided for the addition of an optinal filter for exceptional high selectivity.

Adjustable squelch control of main channel and two SCA channels are provided. The two SCA squelch controls are mounted on the rear chassis and are adjustable from 3% to 10% injection levels.

The TBM-1005D and 1003D are rack mounted and styled in beige with woodgrain trim.

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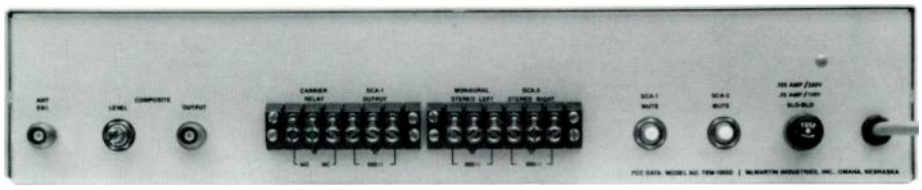

Rear view of TBM-1005D

SPECIFICATIONS

MAIN CHANNEL

Antenna Input Impedance ..... 50/72 Ω unbalanced

Range
TBM-1005D ..... 88-108 Mhz
TBM-1003D ..... VHF-TV channels 2-13 aural carriers

Sensitivity
TBM-1005D ..... 1 μV for 30 dB quieting
(Monaural) ..... 3 μV for 50 dB quieting
TBM-1003D (CH.2-6) ..... 1.5 μV for 30 dB quieting
(CH. 7-13) ..... 3 μV for 30 dB quieting

Selectivity (TBM-1005D) ..... 50 dB alternate channel (Standard) 70 dB with optional filter

Capture Ratio ..... 1.5 dB or less

Composite Output ..... 1.5 V (P-P) adjustable

Composite Frequency Response ..... ±0.3 dB 10-75,000 Hz

PROGRAM AUDIO OUTPUTS

MONAURAL PLUG-IN CARD (standard)

Audio Output Impedance ..... 600 Ω balanced

Output Level ..... +8 dBM at 100% mod. 400 Hz

Frequency Response ..... ±0.5 dB 30-15,000 Hz

De-emphasis ..... 75 μs standard 25 or 50 μs available

S/N Ratio ..... Typically 65 dB or greater below 100% modulation 400 Hz

Distortion ..... THD 0.5% or less (30-15,000 Hz)

19 kHz pilot carrier rejection ..... 65 dB or greater

STEREO PLUG-IN CARD STE-1D (optional)

Audio Ouput Impedance ..... 600 Ω balanced right and left channel

Output Level ..... +8 dBm right and left channel

Frequency Response ..... +0.5 dB 30-15,000 Hz

De-emphasis ..... 75 μs standard 25 or 50 μs available

S/N Ratio ..... 55 dB or greater below 100% Modulation 400 Hz left or right CH.

Distortion ..... THD 1% or less 30-15,000 Hz

Channel Separation ..... 40 dB 30-10,000 Hz 30 dB 10,000-15,000 Hz

Pilot injection metering ..... ±1% accuracy when receiver is completely limited

SCA rejection ..... 65 dB or greater

SCA PLUG-IN CARD SCA-2-67D (optional)

Audio Output Impedance ..... 600 Ω balanced

Output Level ..... +8 dBm 100% modulation (±6 kHz deviation) at 200 Hz

Frequency Response ..... ±3 dB 30-6,000 Hz with modified 150 μs de-emphasis

S/N Ratio ..... Typical 60 dB below 100% modulation referenced at 200 Hz

Distortion ..... 1% or less 30-6,000 Hz Typcially 0.5% at 400 Hz

SCA injection metering ..... Meter is semi-peak reading and referenced at ±6 kHz deviation for 100% modulation

SCA—PLUG-IN CARD SCA-2-41D (optional)

Specifications are generally the same as for the SCA-2-67D kHz plug-in card excepting the 100% modulation is referenced at ±4 kHz deviation. *NOTE: Other SCA frequencies are available.*

METERING FUNCTIONS ..... Relative RF level, total modulation, pilot injection, SCA injection and SCA modulation

POWER REQUIRED ..... 120/240 VAC 50/60 Hz 25 W

REAR CHASSIS TERMINATION ..... Antenna (BNC), composite output (BNC) monaural or stereo left, SCA-2 or stereo right, SCA-1 and carrier relay contacts (NO) or (NC)

RELAY CONTACTS RATING ..... 0.5 A at 24 V

DIMENSIONS .....
height ..... 3½" (8.9 cm)
width ..... 19" (48.3 cm)
depth ..... 12" (30.9 cm)

WEIGHT .....
actual ..... 12.5 lbs. (5.7 kg)
shipping ..... 14 lbs. (6.4 kg)

FINISH ..... McMartin beige with woodgrain trim

ORDERING INFORMATION

Model	Description	Product Code
TBM-1005D	5 Channel relay receiver with one crystal	10-03-015
TBM-1003D	Aural TV channel 2-13	10-03-014
ACCESSORIES		
STE-1D	Stereo Plug-in Demodulator card	10-03-012
SCA-2-41D	SCA Plug-in Demodulator Card 41 kHz	10-03-010
SCA-2-67D	SCA Plug-in Demoduator Card 67 kHz	10-03-011

World Radio History

McMartin

TV SCA RECEIVER

TVR-1

HIGH SENSITIVITY

MAIN OR SCA OUTPUT

EARPHONE CORD ANTENNA

EXTREMELY RUGGED PLASTIC CASE

NEW LINEAR DIFFERENTIAL DECODER

OPERATION ON CHANNEL 2-6 AND CHANNEL 7-13

CRYSTAL CONTROLLED ON DESIRED CHANNEL

The new McMartin TVR-1, TV SCA pocket receiver is a high performance unit designed for cueing, paging, monitoring, etc., utilizing an SCA carrier on the aural TV carrier. The earphone cord has been RF isolated and designed as an integral part of the antenna system providing high RF pick up and good SCA reception under difficult conditions.

The TVR-1 receiver utilizes a new linear differential decoder to provide greater recovery of weak RF signals.

The RF section of the TVR-1 utilizes a low noise, grounded base RF amplifier which achieves a very low noise figure.

A main or SCA slide switch is provided; also an adjustable volume control is used to set the level of the earphone audio to suit individual requirements.

The TVR-1, TV SCA receiver is designed to be readily attached around the waist by means of a cloth strap supplied.

APR/79

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SPECIFICATIONS

TV AURAL CHANNEL

Operating frequency ..... Channel 2-6 TV Aural Carrier. Channel 7-13 TV Aural Carrier.

Sensitivity:
Channel 2-6 ..... 0.5 microvolts for 20 dB quieting
Channel 7-13 ..... 1.0 microvolts for 20 dB quieting

Antenna ..... Headphone cable RF isolated above ground and audio and tuned to desired channel.

SCA CHANNEL

Frequency Deviation ..... 39.5 kHz or 67 kHz
39.5 kHz, ±4 kHz deviation
67 kHz, ±6 kHz deviation

Output Level ..... Adjustable up to 1 volt across 2000 ohm earphones

Frequency Response ..... 100 to 3500 Hz

Distortion ..... Less than 2%

De-emphasis ..... Modified 150 microsecond

SENSITIVITY CHANNEL 2-6

39.5 kHz SCA Carrier:
10% injection ..... (±2.5 kHz dev. of aural carrier) 10 microvolts for 20 dB quieting.
20% injection ..... (±5 kHz dev. of aural carrier) 5 microvolts for 20 dB quieting.

67 kHz SCA Carrier:
10% injection ..... (±2.5 kHz dev. of aural carrier) 10 microvolts for 20 dB quieting.
20% injection ..... (±5 kHz dev. of aural carrier) 5 microvolts for 20 dB quieting.

SENSITIVITY CHANNEL 7-13

39.5 kHz SCA Carrier:
10% injection ..... (±2.5 kHz dev. of aural carrier) 10 microvolts for 20 dB quieting.
20% injection ..... (±5 kHz dev. of aural carrier) 5 microvolts for 20 dB quieting.

67 kHz SCA CARRIER:
10% injection ..... (±2.5 kHz dev. of aural carrier) 15 microvolts for 20 dB quieting.
20% injection ..... (±5 kHz dev. of aural carrier) 7.5 microvolts for 20 dB quieting.

POWER SUPPLY REQUIRED

Battery Operated ..... 9.6 volts (standard transistor radio battery)

Battery Drain ..... 9 volts ..... 34 ma

DIMENSIONS ..... Height ..... .5" (12.7 cm)
Width ..... $2\ 3/16$" (5.5 cm)
Depth ..... 1" (2.54 cm)

WEIGHT ..... actual ..... .6 oz. (169.8 kg)
shipping ..... 12 oz. (339.6 kg)

ORDERING INFORMATION

Model	Description	Product Code
TVR-1	TV/SCA Receiver, 39.5/67 kHz	**40-02-011**

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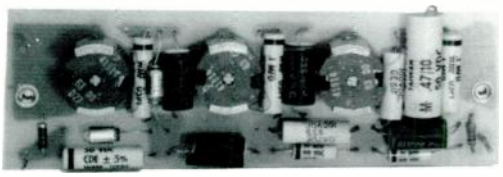
SCA-PLUS SYSTEM

BSP-2800 Dual Channel SCA Encoder



SPL-2800A Audio Channel Decoding Filter
SPH-2800A Data Channel Decoding Filter

SPL-2800B Audio Channel Decoding Filter
SPH-2800B Data Channel Decoding Filter

TRANSMIT AURAL AND DATA SIGNALS SIMULTANEOUSLY OVER THE SAME FM/SCA CHANNEL
USE ALL EXISTING RECEIVERS AND TRANSMITTING EQUIPMENT
NO CROSSTALK
LOW COST

The McMartin SCA-Plus system allows an audio signal and a digital data signal to be transmitted *simultaneously* over the *same* SCA subchannel of an FM carrier. For example, a background music service and a business information service (feeding Teletype or computer style terminals) can now make use of the same SCA channel.

SCA-Plus makes use of a band-sharing scheme in which those frequencies containing most of the energy of voice and music broadcasts are allocated for aural information, while the less used frequencies are reserved for transmission of specially encoded digital information.

The SCA-Plus system consists of one headend unit, the BSP-2800 encoder, and four decoding filters, each designed for a specific application. All SCA-Plus components are fully compatible with existing FM exciters, monitors, and tuners. The SCA-Plus units are used in conjunction with existing FM/SCA equipment.

The McMartin *BSP-2800* is used to feed the audio and data signals into the SCA input of an FM transmitter. It contains its own power supply and mounts into a standard 19" equipment rack.

Inputs: Audio signal
Data signal
Outputs: Composite output

Decoding filters are used in conjunction with standard SCA receivers to separate the desired signal from the composite dual channel SCA signal.

The "SPL" models retrieve the *audio channel* signal, the "SPH" models retrieve the *data channel* signal.

The "A" models are circuit boards designed for internal mounting in an SCA tuner or tuner/amplifier.

The "B" models are each housed in a metal box and contain input/output transformers. They are designed for external connection between the SCA tuner and power amplifier. The "B" model decoding filters allow rapid field conversion to the SCA-Plus system without any modification of existing FM/SCA equipment.

A word about data communications hardware . . .
Most aural FM/SCA operators wishing to expand into SCA data communications will probably carry a franchised data service. The franchiser will usually provide the data signal in a format ready to be inserted into a McMartin BSP-2800 Dual Channel SCA Encoder, and will also make available the necessary display hardware.

If you wish to generate your own digital data, McMartin Industries can provide you with information about equipment requirements.

OCT/78

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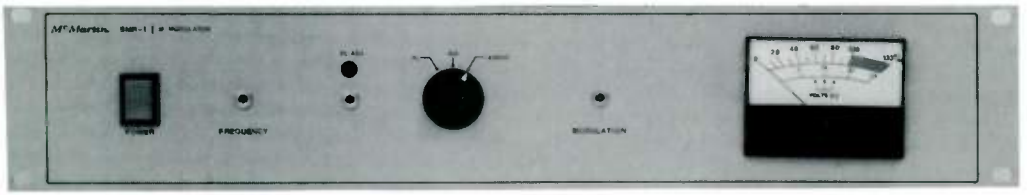
McMartin

SATELLITE/MICROWAVE
IF MODULATOR AND DEMODULATOR

SMR-1 IF Modulator
SDR-1 IF Demodulator



FOR SATELLITE/MICROWAVE IF SYSTEMS REQUIRING 52-88 MHz MODULATORS AND DEMODULATORS

50-5,000 Hz AUDIO BANDWIDTH

SUITABLE FOR AUDIO AND DATA TRANSMISSION

DEMODULATOR TRACKS AND RELOCKS TRANSPONDER FREQUENCY ERROR GREATER THAN ±50 KHz

The McMartin SMR-1 IF Modulator and SDR-1 IF Demodulator are intended for narrow band FM services using a maximum 5 KHz audio bandwidth in a 52 MHz — 88 MHz carrier frequency range. Although designed for satellite communications, the products are also excellent in terrestrial microwave applications. Possible applications include data and/or aural coordination communications for broadcasters and CATV operators, medium grade aural program communications, and nationwide distribution of digital information services.

The SMR-1 modulator uses a crystal referenced phase lock technique to generate a direct FM modulated signal.

The balanced 600 ohm audio input is pre-emphasized at 75 μs and band limited to 6 kHz by means of a LC type low pass filter in the modulator. The RF output is adjustable to approximately +10 dBm level and filtered by a multi-section band pass filter.

The modulator produces an audio response of 50-5,000 Hz, ±1 dB, with a nominal ±10 kHz frequency deviation. It is capable of an RF output up to +10 dBm into a 50 ohm load, and its signal to noise ratio is 60dB or greater. The unit is available for operation with any FM deviation from ±10 kHz to ±75 kHz.

The SDR-1 IF Demodulator is designed for continuous duty reception of signals in a 52 to 88 MHz range and utilizes a dual conversion technique for elimination of image responses in this frequency range.

The demodulator consists of a low noise dual gate "D" MOS FET RF amplifier. A discreet first mixer and amplifier feed the single chip second mixer/amplifier/limiter/demodulator and an audio amplifier. The unit is capable of acquiring and tracking, and relocking, a signal even when the transponder frequency error is ±50 kHz or more. The SDR-1 locks onto the carrier frequency insuring that the signal is precisely centered in the IF pass band.

An automatic sweep circuit is used to reacquire lock in case of carrier failure or AC power loss to the demodulator. The output signal is also muted in the absence of a carrier.

A recessed front panel control allows the program level to be set to the desired level between 0 dBm and +18 dBm across a 600 ohm load. A carrier "on" light is used to indicate the presence of a carrier of suitable level to produce frequency lock. A power "on" indicator light is used to insure that AC power is applied to the demodulator.

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The SDR-1 delivers at least 33 dB Signal-to-Noise ratio for a C/KT of 58 dB (or a Carrier-to-Noise ratio of 14 dB in a 25 kHz predetection bandwidth). Its distortion limited performance with high Carrier-to-Noise is greater than −60 dB.

The SMR-1 and SDR-1 are both designed for standard 19″ rack mounting. The front panels are finished in McMartin beige.

SPECIFICATIONS

	SMR-1	SDR-1
AUDIO		
Impedance	600Ω	
Pre-Emphasis	75 μs	
Deviation	±10 kHz	
Sensitivity	+12 dBm to +24 dBm (+18 dBm nominal)	
OUTPUT		
Frequency	52-88 MHz	
Level	+10 dBm ±1 dB (Adjustable to −10 dBm)	
Impedance	50-75 ohm unbalanced	
Occupied Bandwidth	25 kHz	
Spurious	−70 dB	
Harmonics	−30 dB	
FREQUENCY RESPONSE	±1.5 dB (100-5kHz)	
DISTORTION		
ThD	<1% (100-5 kHz)	
IM	<3%	
SIGNAL TO NOISE	Better than 60 dB	
POWER REQUIRED	120 VAC ±10% 50/60 Hz	
DIMENSIONS	height 3½″ (8.9 cm) width 19″ (48.3 cm) depth 13″ (33.0 cm)	
WEIGHT	actual 8.5 lbs. (3.9 kg) shipping 12 lbs. (5.4 kg)	
FINISH	McMartin beige	
FREQUENCY RANGE		Single frequency in range of 52-88mHz crystal controlled
TRACKING RANGE		At least ±50kHz
RF INPUT Z		Nominally 75 ohms unbalanced
RF QUIETING SENSITIVITY		1 Microvolt for greater than 30dB quieting
SELECTIVITY		±12.5kHz at 3dB bandwidth
HUM AND NOISE		Greater than 60 dB below +18 dBm output into a 600 ohm load. (1000 Hz. reference)
FREQUENCY RESPONSE		±1dB 100-5000Hz
DE-EMPHASIS		75 microseconds
DISTORTION		
THD		2% or less (100-5000Hz)
IM		5% or less
SIGNAL TO NOISE RATIO		High carrier to noise: greater than 60 dB signal to noise ratio. 14 dB carrier to noise in a 25 kHz pre-detection bandwidth (equal to a C/KT of 58 dB) and a ±10 kHz deviation: 33 dB signal to noise ratio.
OUTPUT LEVEL — FRONT PANEL CONTROL		0 to +18dBm across 600 ohm load
TEMPERATURE RANGE		0-50°C
POWER REQUIRED		120V AC ±10% 50/60Hz
DIMENSIONS		height 1¾″ (4.4 cm) width 19″ (48.3 cm) depth 8″ (20.3 cm)
WEIGHT		actual 4 lbs. (1.8 kg) shipping 7 lbs. (3.2 kg)
FINISH		McMartin beige

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IF DEMODULATOR

SPR-3

PRELIMINARY

PROGRAM CHANNEL IF DEMODULATOR

SUITABLE FOR SATELLITE AND MICROWAVE APPLICATIONS

DEMODULATOR TRACKS TRANSPONDER FREQUENCY ERROR OF UP TO ±40 kHz

The McMartin SPR-3 IF Demodulator is designed for use in the satellite reception of high quality (30-15,000 Hz) audio program material.

The SPR-3 IF Demodulator is designed for continuous duty reception of signals in a 52 to 88 MHz range. Remote three channel operation is achieved by short-circuiting any one of three terminals on the rear chassis to ground. The three channels must be within a 2 MHz band segment. The demodulator consists of a low noise dual gate "D" MOS FET RF amplifier, "D" MOS FET mixer, a special 10.7 MHz filter with flat group delay and a frequency tracking demodulator. The unit is capable of acquiring and tracking a signal with a transponder frequency error of up to ±40 kHz. The SPR-3 tracks the carrier frequency insuring that the recovered audio distortion and noise is low over this frequency error. The output signal is also muted in the absence of a carrier.

A recessed front panel control allows the program level to be set to the desired level between 0 dBm and +18 dBm across a 600 ohm load. A carrier "on" light is used to indicate the presence of a carrier of suitable level to produce frequency lock. A power "on" light indicates that AC power is applied to the demodulator.

SPECIFICATIONS

FREQUENCY RANGE	52-88 MHz, crystal controlled, 3 selectable channels within 2 MHz
TRACKING RANGE	at least ±40 kHz
RF INPUT IMPEDANCE	75 Ω (unbalanced)
RF LEVEL	−65 to −20 dBm (normal operating range)
RF QUIETING SENSITIVITY	1 μV for greater than 30 dB quieting
SELECTIVITY	220 kHz at 3 dB bandwidth
HUM AND NOISE	greater than 67 dB below +18 dBm output into a 600 Ω load 1,000 Hz reference (wide band)
FREQUENCY RESPONSE	±1 dB, 30 Hz - 15 kHz
DE-EMPHASIS	none (controlled by expandor)
DISTORTION	
THD	less than 1% (50 Hz - 15 kHz)
IM	less than 1%
SIGNAL TO NOISE RATIO (C/N measured over 200 kHz bandwidth)	C/N +27 dB ±0.5 dB
NOISE FIGURE	less than 15 dB
AM REJECTION	greater than 40 dB
ADJACENT CHANNEL REJECTION	greater than 65 dB
AFC RANGE	±40 kHz
SIGNAL TO PERIODIC NOISE	greater than 67 dB
OUTPUT LEVEL	adjustable from 0 to +18 dBm across 600 Ω load
RETURN LOSS	greater than 23 dB
TEMPERATURE RANGE	0° to 57° C
POWER REQUIRED	120 VAC ±10% 50/60 Hz
DIMENSIONS	height 1¾" (4.4 cm) width 19" (48.3 cm) depth 8" (20.3 cm)
WEIGHT	actual 4 lbs. (1.8 kg) shipping 7 lbs. (3.2 kg)
FINISH	McMartin beige

MAR/81

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McMartin

BROADCAST PROFESSIONAL TURNTABLE — TT-12C

INSTANT START

RUGGED — ONLY 3 MOVING PARTS

STEREO RUMBLE LESS THAN – 48 dB

RIM DRIVE

THREE STANDARD SPEEDS (33⅓, 45, 78)

SYNCHRONOUS MOTOR

BUILT-IN 45 RPM ADAPTER

SPEED CAN BE CHANGED WITH PLATTER TURNING

ONE YEAR PARTS WARRANTY — LIFETIME WARRANTY ON WORKMANSHIP

The McMartin TT-12C custom turntable is designed to provide the broadcaster, or other discerning user, with a rugged reliable turntable which can come up to speed in a fraction of a second — less than 1/16th revolution — but can still operate free from rumble, wow and flutter.

This high performance is made possible by the use of precision manufacturing and assembly techniques and by thorough testing.

Freedom from rumble, wow and flutter are further attained by the selection of an acoustic absorbing phenolic for the motor shaft to achieve perfect concentricity, and by specially designing an idler wheel to transmit the motor torque to the inside rim of a perfectly round concentric platter.

The utilization of outer rim drive has been demonstrated, over the years, as the best method of achieving "instant" start with a minimum of vibration effects. (Center hub drive does not have the mechanical advantage of outer rim drive, it requires a substantial motor with attendant isolation problems.)

The McMartin TT-12C is supplied with a synchronous motor for exact speed and minimum rumble. Most major tone arms can be mounted on the TT-12C baseplate.

SPECIFICATIONS

SPEEDS (RPM)	33⅓, 45, 78
LINE VOLTAGE	115 V, 60 Hz, standard (230 V — 50 Hz, optional)
START-UP TIME AT 33⅓ RPM	1/16th of revolution for Full Speed
RUMBLE (stereo with respect to NAB standard of –36 dB	– 48 dB
WOW AND FLUTTER	Less than 0.1%
Speed Regulation	99.5%
Concentricity of Platter	± .001″ D
Drive	outer rim with idler
Capstan	phenolic, ground on motor shaft
Platter	± .001″ (± .0025 cm) Concentricity, 5.5 lb. (2.5 kg) Aluminum
DIMENSIONS	height 5″ (12.7 cm) width 15″ (38.1 cm) depth 15½″ (39.4 cm) cubage 1.7 cu. ft. (.05 m³)
WEIGHT	actual 21½ lbs. (9.7 kg) shipping 25 lbs. (11.3 kg)
FINISH	McMartin beige with left pad for "slip" cueing.

ORDERING INFORMATION

Model	Description	Product Code
TT-12C	Turntable	**10-02-110**

MAY/81

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McMartin.

HIGH SPEED TAPE ERASER

TE-70
TE-105

ERASES CLEAN
SIMPLE "HANDS OFF" OPERATION
SAVES TIME AND IMPROVES QUALITY
FAST — 4 SECONDS FOR MOST TAPES
HANDLES AUDIO / VIDEO REELS AND CARTRIDGES

The McMartin TE-70 and TE-105 bulk tape erasers are designed to automate your tape erasing operations and to eliminate residual noise problems.

Model TE-70 can handle cartridges and reels up to seven inches in diameter. Model TE-105 can also handle tapes up to 10½ inches in diameter.

Operation is simple and efficient. Just press the power button and put any reel or cassette on the endless belt. In four seconds it delives a clean, "no-whump" erasure that will meet stringent recording standards.

With the TE-70 or TE-105, tape erasing is no longer drudgery. Tapes need not pile up because no one wants to tackle hand erasing.

SPECIFICATIONS

POWER ..... 117 VAC, 60 Hz 220 VAC, 50 Hz

ERASER LEVEL ..... – 80 dB nominal

METHOD OF OPERATION ..... Tapes are passed on a continuous belt over high flux coils and deposited at end of machine.

THERMAL PROTECTION ..... Overheating is prevented by automatic cut-off switch, which reactivates eraser after cool-down period.

DIMENSIONS

TE-70 .....
height ..... 5″ (12.7 cm)
width ..... 27″ (68.6 cm)
depth ..... 10″ (25.4 cm)
belt width ..... 7½″ (19 cm)

TE-105 .....
height ..... 5″ (12.7 cm)
width ..... 27½″ (69.9 cm)
depth ..... 13¼″ (33.7 cm)
belt width ..... 11″ (27.9 cm)

WEIGHT

TE-70 .....
actual ..... 60 lbs. (27.2 kg)
shipping ..... 65 lbs. (29.5 kg)

TE-105 .....
actual ..... 80 lbs. (36.2 kg)
shipping ..... 88 lbs. (39.9 kg)

FINISH ..... light tan

ORDERING INFORMATION

Model	Description	Product Code
TE-70	High Speed Tape Eraser	10-02-114
TE-105	High Speed Tape Eraser	10-02-115

FEB/80

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McMartin

FM BROADCAST ANTENNAS

MLCP
MHCP

CIRCULARLY POLARIZED
MADE OF HIGHEST QUALITY WELDED TUBULAR BRASS
PURGE VALVE FOR QUICK REMOVAL OF FEEDLINE MOISTURE
AVAILABLE WITH DE-ICERS OR RADOMES
TWO YEAR WARRANTY

The radiating surfaces of the McMartin MLCP and MHCP antennas are constructed of the highest quality welded tubular brass with hemispherical corona suppressing adjustable element tips.

The unique curved, interlaced element design provides excellent bandwidth characteristics over the entire 88-108 MHz band. The antennas are factory adjusted to maintain an input standing wave ratio of 1.1:1 or less over a 400 KHz bandwidth, providing excellent stereo, SCA and quadraphonic performance.

Each element has a feed point centrally located on the main boom. A high quality teflon insulator is used to route the RF to the driven element.

Every antenna is factory tuned on a tower section similar to the customer specified tower to be used.

Antennas include a special purge valve to allow for quick removal of feedline moisture.

Options: Optimization of the pattern is available at additional cost as well as directionalizing. When ordering directionalizing, consult the FCC rules and regulations.

SEP/79

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SPECIFICATIONS

	Model MLCP	Model MHCP
POWER RATING	10 KW per bay 10 KW max.	10KW per bay 40 KW max.
NO. OF BAYS	2-14	1-14
FEED LINE DIAMETER	1 5/8"(41.3mm)	3 1/8"(79.4mm)
VSWR RATING	1.1:1 ± 200 KHz.	1.1:1 ± 200 KHz.
HORIZONTAL/ VERTICAL RATIO	50/50	50/50
BEAM TILT	Optional	Optional
NULL FILL	Optional	Optional
DE-ICING	Optional	Optional
RADOMES	Optional	Optional

MLCP ANTENNA

TOWER SPACE REQUIREMENT (in feet) =

$$\left(\frac{984}{\text{frequency in MHz.}}\right) \text{ X (Number of bays -1)}$$

INPUT CONNECTOR SIZE: 1 5/8 inch EIA female

INPUT CONNECTOR LOCATION:

Two through seven bays: 8 feet below bottom bay

Eight through 14 bays: 12 feet below array center

Note: Model MLCP is not available in a one bay configuration as it is identical to the MHCP-1.

MHCP ANTENNA

TOWER SPACE: Same as for MLCP

INPUT CONNECTOR SIZE: 3 1/8 inch EIA female

INPUT CONNECTOR LOCATION:

One bay: at bay itself

Two through five bays: 3 feet below bottom bay

Six and seven bays: 8 feet below bottom bay

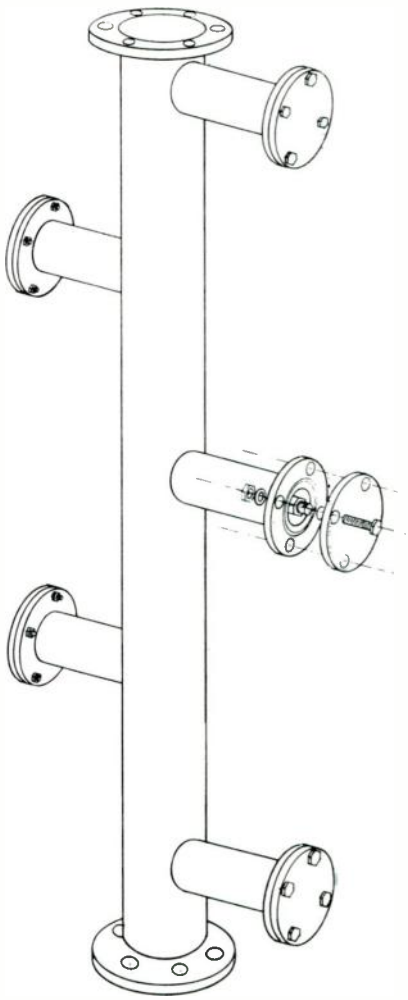
Eight through 14 bays: 13 feet below array center

ORDERING INFORMATION

Antennas up to and including seven bays are end fed antennas, eight bays and over are center fed.

Antennas of more than six bays have a three stub fine matcher section. Antennas of more than six bays are fed approximately 12 feet below the top element. This allows for the transformer and fine matcher section.

When specifying Radomes or de-icers use the appropriate suffix: R = Radomes, D = De-icers. Typical model number for a six bay antenna with de-icers would be MLCP-6-D. This antenna would be fed from the end approximately 4 feet below the end, after the matching transformer.



Fine Tuner

World Radio History

MLCP FM Antenna

TYPE NO. AND BAYS	POWER GAIN RATIO	GAIN IN DB	FIELD GAIN	FS @ 1 MILE 1 KW, MV/M	SAFE POWER RATING	NET WEIGHT WITH MOUNTING BRACKETS	WINDLOAD AT 50/33 PSF (112 MPH) WITH MOUNTING BRACKETS
MLCP-2 w/de-icers w/radomes	1.0	0.0	1.0	137.6	10 KW	102 lbs. 120 lbs. 162 lbs.	163 lbs. 187 lbs. 323 lbs.
MLCP-3 w/de-icers w/radomes	1.5	1.76	1.23	168.4	10 KW	157 lbs. 183 lbs. 247 lbs.	256 lbs. 304 lbs. 496 lbs.
MLCP-4 w/de-icers w/radomes	2.1	3.22	1.45	199.2	10 KW	213 lbs. 247 lbs. 333 lbs.	347 lbs. 420 lbs. 667 lbs.
MLCP-5 w/de-icers w/radomes	2.7	4.31	1.64	225.2	10 KW	270 lbs. 313 lbs. 420 lbs.	440 lbs. 536 lbs. 840 lbs.
MLCP-6 w/de-icers w/radomes	3.2	5.05	1.79	246.0	10 KW	399 lbs. 407 lbs. 579 lbs.	570 lbs. 691 lbs. 1050 lbs.
MLCP-7 w/de-icers w/radomes	3.8	5.80	1.95	268.0	10 KW	414 lbs. 473 lbs. 624 lbs.	662 lbs. 807 lbs. 1222 lbs.
MLCP-8 w/de-icers w/radomes	4.3	6.34	2.07	285.2	10 KW	472 lbs. 540 lbs. 712 lbs.	755 lbs. 924 lbs. 1395 lbs.
MLCP-9 w/de-icers w/radomes	4.9	6.90	2.21	303.8	10 KW	557 lbs. 640 lbs. 869 lbs.	866 lbs. 1060 lbs. 1586 lbs.
MLCP-10 w/de-icers w/radomes	5.5	7.40	2.35	322.4	10 KW	599 lbs. 684 lbs. 899 lbs.	977 lbs. 1195 lbs. 1777 lbs.
MLCP-12 w/de-icers w/radomes	6.6	8.20	2.57	353.2	10 KW	716 lbs. 819 lbs. 1076 lbs.	1162 lbs 1428 lbs. 2123 lbs.
MLCP-14 w/de-icers w/radomes	7.8	8.92	2.79	383.5	10 KW	800 lbs. 907 lbs. 1222 lbs.	1344 lbs. 1661 lbs. 2469 lbs.

World Radio History

McMartin

MHCP FM Antenna

TYPE NO. AND BAYS	POWER GAIN RATIO	GAIN IN DB	FIELD GAIN	FS @ 1 MILE 1 KW, MV/M	SAFE POWER RATING	NET WEIGHT WITH MOUNTING BRACKETS	WINDLOAD AT 50/33 PSF (112 MPH) WITH MOUNTING BRACKETS
MHCP-1 w/de-icers w/radomes	0.46	-3.37	0.678	93.2	10 KW	21 lbs. 30 lbs. 51 lbs.	48 lbs. 57 lbs. 128 lbs.
MHCP-2 w/de-icers w/radomes	1.0	0.0	1.0	137.6	20 KW	117 lbs. 135 lbs. 177 lbs.	195 lbs. 219 lbs. 355 lbs.
MHCP-3 w/de-icers w/radomes	1.5	1.76	1.23	168.4	30 KW	187 lbs. 213 lbs. 277 lbs.	320 lbs. 368 lbs. 560 lbs.
MHCP-4 w/de-icers w/radomes	2.1	3.22	1.45	199.2	40 KW	258 lbs. 292 lbs. 378 lbs.	443 lbs. 516 lbs. 763 lbs.
MHCP-5 w/de-icers w/radomes	2.7	4.31	1.64	225.2	40 KW	330 lbs. 373 lbs. 480 lbs.	568 lbs. 664 lbs. 968 lbs.
MHCP-6 w/de-icers w/radomes	3.2	5.05	1.79	246.0	40 KW	474 lbs. 482 lbs. 654 lbs.	730 lbs. 851 lbs. 1210 lbs.
MHCP-7 w/de-icers w/radomes	3.8	5.80	1.95	268.0	40 KW	504 lbs. 563 lbs. 714 lbs.	854 lbs. 999 lbs. 1414 lbs.
MHCP-8 w/de-icers w/radomes	4.3	6.34	2.07	285.2	40 KW	577 lbs. 645 lbs. 817 lbs.	979 lbs. 1148 lbs. 1619 lbs.
MHCP-9 w/de-icers w/radomes	4.9	6.90	2.21	303.8	40 KW	677 lbs. 760 lbs. 989 lbs.	1122 lbs. 1316 lbs. 1842 lbs.
MHCP-10 w/de-icers w/radomes	5.5	7.40	2.35	322.4	40 KW	734 lbs. 819 lbs. 1034 lbs.	1265 lbs. 1483 lbs. 2065 lbs.
MHCP-12 w/de-icers w/radomes	6.6	8.20	2.57	353.2	40 KW	881 lbs. 984 lbs. 1241 lbs.	1514 lbs 1780 lbs. 2475 lbs.
MHCP-14 w/de-icers w/radomes	7.8	8.92	2.79	383.5	40 KW	995 lbs. 1102 lbs. 1417 lbs.	1760 lbs. 2077 lbs. 2885 lbs.

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McMartin

SUPER HIGH POWER ANTENNA

MSHCP

Circularly Polarized

EXTREMELY BROAD BANDWIDTH

CIRCULARITY OF PATTERN ±1 dB

HEAVY RUGGED BRASS CONSTRUCTION

TWO YEAR WARRANTY

With a power rating of 30 kW per bay and a total antenna rating of 80 kW, the McMartin super high power antenna will accept the output of any currently produced high power transmitter. An extremely large surface area designed into this antenna virtually eliminates the common problems related to corona and arcing. With the greatly reduced surface potentials, power levels as high as 30 kW per bay are easily handled during the most severe weather conditions. The massive antenna construction provides for an excellent low "Q" condition resulting in a superior broad-band performance characteristic.

The unique antenna design, although simple in construction, provides the best possible radiating system available. The feed system between the bays is 6⅛ inch diameter line. The attachment of the elements to the line sections is by means of a heavy brass casting. The four elements are constructed of 3 inch diameter heavy duty brass tubing. The center support boom is pressurized to the feed point from the same system which pressurizes the feed line. Each antenna is equipped with an overpressure relief valve allowing easy purging to remove moisture as well as preventing over pressurization due to pressurizing equipment failure.

JUN/80

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Bandwidth/VSWR - Over a 400 kHz bandwidth, or ±200 kHz, the antenna is factory tested to have an input terminal VSWR of 1.1:1 or better. This test is performed while the antenna is mounted on a tower section similar to that used by the customer. This rigid testing procedure minimizes the need for field tuning of the antenna. Under normal conditions the antenna will not require further field tuning. However, for optimum performance, always consult the transmitter manufacturer when matching the antenna to the transmitter.

Signal Pattern - When mounting the antenna on any metallic surface, the circularity of the pattern will be distorted somewhat from an ideal ±1dB pattern of the antenna element in free space. When mounted on a typical pole, the pattern will be ±1.2dB or less. If the antenna is mounted on the face of a tower with a 30 inch face, the expected non-circularity will be approximately ±3dB. When mounting the antenna on a tower, consult the factory to insure that no azimuth pattern null falls within the area of maximum desired signal.

Hardware - Heavy duty galvanized mounting brackets are provided to mount the antenna. The particular type of tower must be specified. Upon special request, at additional cost, the antenna can be adapted to mount on tapered poles, tapered towers, or on the face sides of a tower. When specifying the type of mounting situation, the mounting hardware is included with the mounting brackets.

Directionalizing • Beamtilt • Null Fill - If a directional pattern is required, consult the FCC rules to avoid a non-compliance. McMartin offers a complete service for directional patterns, including pattern certification.
Details on particular beam tilt and null fill can be supplied on request. Power gain figures in the horizontal plane will be affected by beam tilt and this information is available on request.

De-Icing - In geographical areas when icing and sleet conditions exist, it is recommended that de-icers be employed to maintain the low VSWR inherent in the antenna design. One kW of heating is available for each antenna bay; however, this may be operated at 110 VAC instead of the nominal 240 VAC for an effective heating capacity of 250 watts per bay. When de-icers are employed, the inner-bay wiring and junction boxes are included. De-icers are manually operated unless a precision, thermostatically controlled, automatic system is ordered.

Tower Space Requirements - The total number of feet required is:

$$\frac{984}{f_0}(N-1)$$

f_0 = frequency in MHz
N = number of bays

For a 1 bay antenna, the antenna connector is a 3⅛ inch E.I.A. female connector. For 2 thru 6 bays, the feed point is nine feet below the bottom bay and is a 6⅛ inch E.I.A. female connector. For 8 thru 12 bays, the feed point is 13 feet below the antenna center, and is a 6⅛ inch E.I.A. female connector.

Warranty - The two year warranty covers defects in material and workmanship to the original purchaser of the antenna and begins the date of delivery of the antenna.

Technical Data -

Type No. and Bays	Power Gain	Gain in dB	Field Gain	FS @ 1 Mile kW, mV/m	Net Weight	Safe Power Rating	Windload 50/33 PSF
MSHCP-1	.46	-3.37	0.678	93.2	212 Lbs.	30 kW	269 Lbs.
MSHCP-2	1.0	0	1.0	137.6	425 Lbs.	60 kW	540 Lbs.
MSHCP-3	1.6	1.98	1.25	172.	634 Lbs.	60 kW	806 Lbs.
MSHCP-4	2.1	3.30	1.46	201.	1007 Lbs.	80 kW	1254 Lbs.
MSHCP-5	2.7	4.35	1.65	227.	1167 Lbs.	80 kW	1460 Lbs.
MSHCP-6	3.3	5.20	1.82	250.	1320 Lbs.	80 kW	1662 Lbs.
MSHCP-7	3.9	5.90	1.97	271.	1540 Lbs.	80 kW	1970 Lbs.
MSHCP-8	4.5	6.50	2.11	291.	1758 Lbs.	80 kW	2245 Lbs.
MSHCP-10	5.7	7.53	2.38	328.	2202 Lbs.	80 kW	2827 Lbs.
MSHCP-12	6.7	8.26	2.59	356.	2640 Lbs.	80 kW	3410 Lbs.

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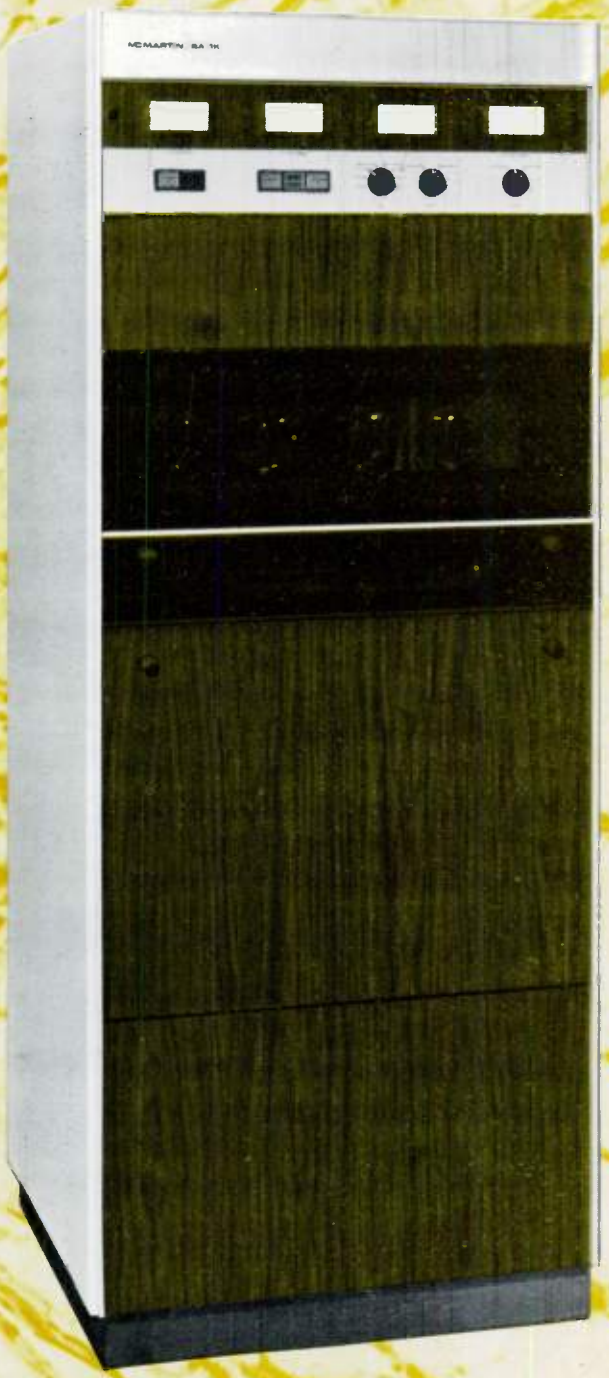
World Radio History

McMartin®

1000/500/250 watt AM TRANSMITTER BA-1K



excellent performance specifications for that crisp, clean sound
unique accessibility both front and rear
125% positive peak capability
power driven vacuum variable tuning/loading controls
1200 watts output with pushbutton Hi-Lo power operation
full remote control/metering capability
built-in dummy load
totally solid state except for four 4-500A tubes
that provide rugged, reliable, economic operation

World Radio History

McMartin®

DESCRIPTION

The BA-1K delivers outstanding performance and reliability. It sounds clean and crisp...and it stays on the air. Initial investment is reasonable. Operating and maintenance costs, low.

We can't do anything about your programming to attract and hold an audience, but the BA-1K makes your programming sound great ... and by selection of quality components and application of conservative design details, the BA-1K delivers reliability.

The BA-1K satisfies technical demands for ease of initial installation, tune-up and maintenance. Access to subassemblies and components is outstanding. By opening the hinge-down front panel, all solid-state low level AF and RF stages and the low-voltage control power supply are easily inspected and adjusted.

The blower assembly is mounted on the inner surface of the hinged rear door for 'out-in-the-open' maintenance.

The RF power amplifier, and the modulator stages each use a pair of highly-reliable, moderately priced 4-500A tubes. During operation these tubes are visible through the cabinet front observation window.

The RF power amplifier output consists of a tuning/matching full pi-T network. Plate tuning is by means of a motor-driven vacuum capacitor. Output loading is adjusted by a motor-driven slug located concentrically in the output T-network inductor. The shunt capacitor in the output T-section, in conjunction with an adjustable tap on the input inductor of the T, permits precise adjustment for maximum second harmonic attenuation.

The BA-1K incorporates a built-in dummy load.

The modulator stage uses a high-quality, oil-filled modulation transformer, capacity-coupled to a modulation reactor to isolate RF power amplifier plate current from the modulation transformer secondary winding.

The RF exciter and AF driver stages are completely solid-state. The crystal oscillator operates in the 2160 to 4320 kiloHertz range. The operating frequency range of 540 to 1600 kHz is established by division of the crystal frequency by four for the range from 540 to 1080 kHz and by two, to cover the 1090 to 1600 kHz range.

The AF driver stages operating Class A are of solid-state design up to the grids of the 4-500A AB1 modulator tubes. Resistor-capacitor feedback networks give approximately 10 dB of feedback compensation.

The BA-1K is fully metered. Individual, eye-level 4½" panel meters display PA plate current and voltage, RF line current, plus a nine-position multimeter for measurement of secondary operating parameters.

The BA-1K may be operated by remote control. All mechanical drives for plate tuning and output loading as well as on/off/power change switching are terminated for ready interconnection to standard remote control systems.

The BA-1K has 1200-watt output capability, leaving a more-than adequate power reserve. This permits smooth 125% positive peak modulation and reflects the truly conservative design factors which contribute to BA-1K reliability.

The BA-1K is handsomely-styled in an extremely rugged steel cabinet. Removable side panels give ready access to wiring harnesses. Those within the cabinet are housed in protective channelling.

The BA-1K - a pleasure to own - a pleasure to maintain - a pleasure to listen to!

SPECIFICATIONS

FREQUENCY RANGE	540 to 1600 kiloHertz (supplied on one specified frequency)
POWER OUTPUT	1000/500/250 watts. May be operated at any two specified power levels. Pushbutton power change standard. Maximum output capability: 1200 watts
OUTPUT IMPEDANCE	50 ohms unbalanced. Other impedances available on special order
FREQUENCY STABILITY	±5 Hertz over ambient temperature range
CARRIER SHIFT	3% maximum
NOISE LEVEL	60 dB or greater below 100% modulation @ 1000 Hertz
MODULATION CAPABILITY	100% negative peaks 125% positive peaks
AF FREQUENCY RESPONSE	±1.0 dB, 50-10000 Hz 1-kw output 100% modulation
AF HARMONIC DISTORTION	2.5% or less, 50-10000 Hz 1-kw output, 100% modulation Sine wave input
AUDIO INPUT IMPEDANCE	150/600 ohms, balanced
AUDIO INPUT LEVEL	+10, ± 2, dBm
POWER SOURCE	208/230 Vac, 50/60 Hz, single phase
POWER CONSUMPTION	4500 watts (1200 watts output, 100% modulation)
AMBIENT TEMPERATURE RANGE	-20 to +45 degrees Celsuis
ALTITUDE	up to 7500 feet AMSL
DIMENSIONS	70.5" h x 25.75" d x 28.25" w (179 cm x 65.4 cm x 71.8 cm)

ORDERING INFORMATION

MODEL BA-1K	1000/500/250 watt transmitter (Specify operating frequency and power levels desired)
SC-AM	Spare Vacuum Crystal
STA-1K	100% Spare Tube Kit (4 Type 4-500A)
SSC-1K	100% Spare Semiconductor Kit
SR-1K	Filament Voltage Regulator
RCS-1	Remote Control Solenoid Kit

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World Radio History

3,000 watts AM

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

World Radio History

the MCMARTIN BA-2.5K TRANSMITTER

Designed to meet export requirements for 3,000-watt AM broadcast service, the McMartin Model BA-2.5K provides a conservatively-rated transmitter for the new 2.5 KW power output level recently authorized in the U.S. by the Federal Communications Commission.

Completely solid-state, other than the high-powered RF output PA and modulator stages, only one type tube is required, the field-proved, 4-1000A. Two of these tubes are operated in parallel in the RF PA stage and another pair in the Class AB-1 modulator stage.

The BA-2.5K delivers outstanding performance and reliability. Access to sub-assemblies and components is outstanding. Patterned after the well-accepted mechanical configuration introduced in the McMartin BA-1K transmitter, the BA-2.5K features a hinge-down front panel by means of which all solid-state low level AF and RF stages are readily inspected and maintained.

The cabinet blower assembly, with maintainable air filters is conveniently mounted on the inside of the hinged rear door for "out-in-the-open" accessibility.

The four 4-1000A's are visible during operation through a cabinet front observation window.

Low harmonic radiation is insured by incorporation of a dual-pi PA output network with provision for independent series resonating of one leg of the network at the second harmonic of the operating frequency. Output tuning and loading is performed by easily-remotable motor-driven controls.

The RF exciter and audio driver stages are completely solid-state. The crystal oscillator operates in the 2,160 to 4,320 kiloHertz range, where the inherent stability of quartz crystals is superior. An output operating frequency between 540 and 1,080 kHz is derived by digital division by four; and between 1,090 and 1,600 kHz by division by two.

The BA-2.5K is fully metered. The operating parameters for RF line current, PA plate voltage and current and AC line voltage are separately shown on large 4½", eye-level meters. In addition, an 8-position multimeter permits selective metering of individual stage/element operation.

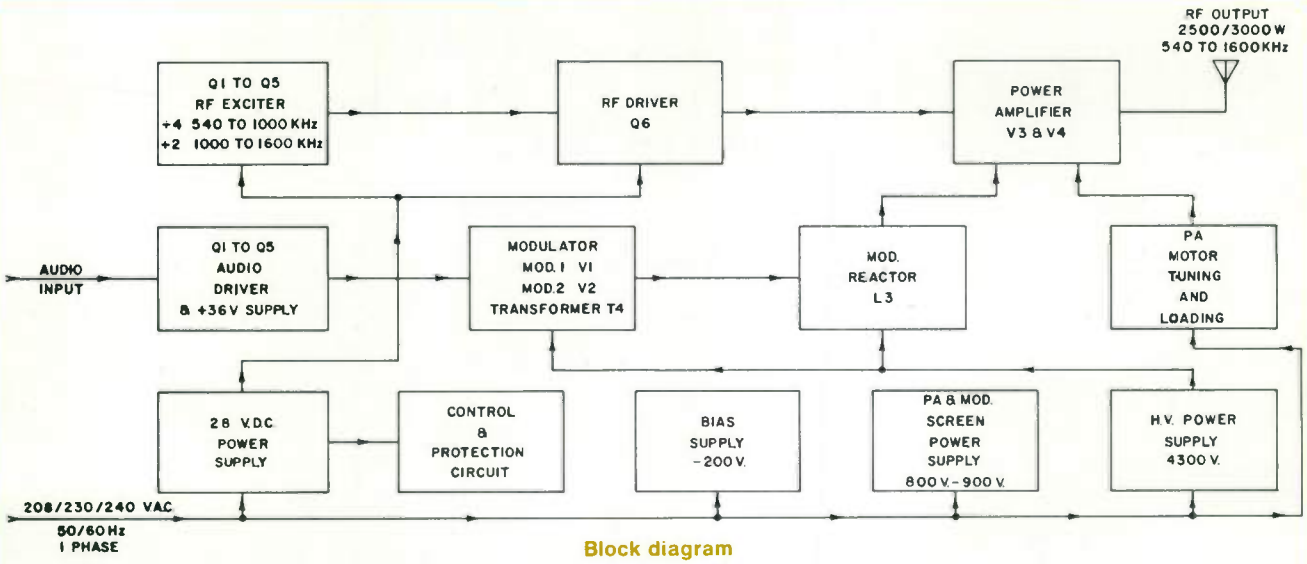
Solid-state overload protection circuitry with automatic recycling and status indication is standard. The recycling sequence will automatically replace the BA-2.5K to its normal operating mode for three overload situations occurring within a 30 second time period. The source of the overload condition is stored in memory and displayed on LED indicators which can be reset only manually after a fault occurs.

The BA-2.5K will interface with all standard remote control systems by simple interconnection to the relay-controlled motor-driven mechanisms in the transmitter. Sampling voltages for telemetry of PA plate voltage and current; and RF output line current are terminated in the BA-2.5K for convenient connection to remote control systems.

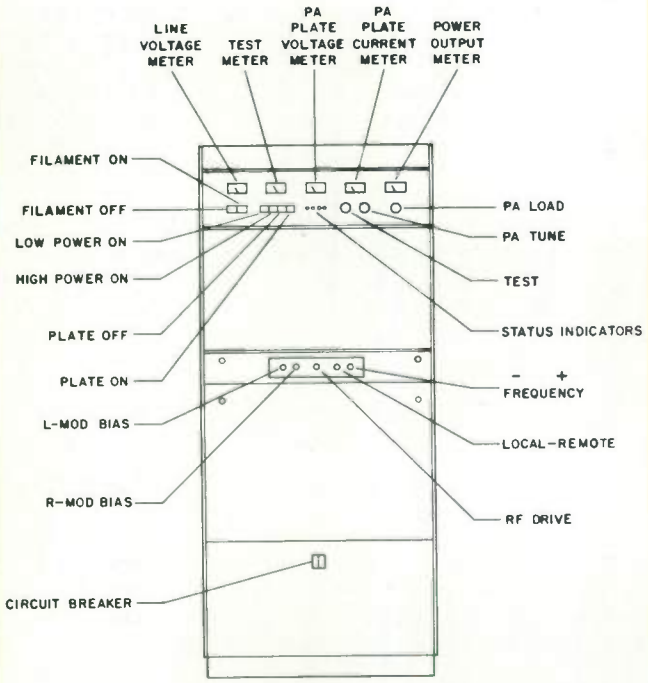
With its 3000-watt output capability, the McMartin BA-2.5K transmitter insures more-than-adequate power reserve, with extremely smooth 125% positive peak modulation and extended-life component reliability.

The McMartin BA-2.5K is a pleasure to own, a pleasure to maintain—and most importantly, a pleasure to listen to.

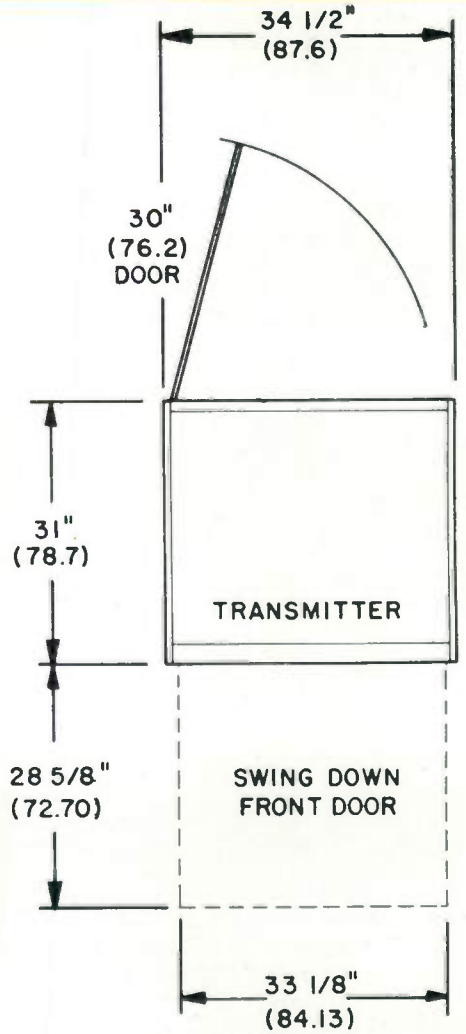
World Radio History



Block diagram



Front panel description



Floor plan dimensions

World Radio History

SPECIFICATIONS

FREQUENCY RANGE .... 540 to 1600 kiloHertz (factory tuned & tested on one specified frequency)

POWER OUTPUT .... 3,000 watts. May be operated at any two specified power levels. Pushbutton power change standard.

OUTPUT IMPEDANCE .... 50 ohms unbalanced. Other impedances available on special order.

FREQUENCY STABILITY ....±5 Hertz over ambient temperature range

CARRIER SHIFT .... 3% maximum

NOISE LEVEL .... 60 dB or greater below 100% modulation @ 1000 Hertz

MODULATION CAPABILITY .... 100% negative peaks 125% positive peaks

AF FREQUENCY RESPONSE ....±1.5 dB, 50-10,000 Hz, 3.0 KW output, 100% modulation

AF HARMONIC DISTORTION .... 2.5% or less, 50-10,000 Hz, 3.0 KW output, 100% modulation, Sine wave input

AUDIO INPUT IMPEDANCE .... 150/600 ohms, balanced

AUDIO INPUT LEVEL ..... +10, ±2, dBm

POWER SOURCE .... 208/230 Vac, 50/60 Hz, single phase

POWER CONSUMPTION .... 11,500 watts (3,000 watts output); 9,850 watts (2,500 watts output) 100% modulation. Power factor: 0.90

LINE VOLTAGE VARIATION ....±5%

AMBIENT TEMPERATURE RANGE .... −20 to +50 degrees Celsius

ALTITUDE .... up to 7,500 feet AMSL

DIMENSIONS .... 78.5" H x 31.0" D x 34.5" W (199 cm x 78.7 cm x 87.6 cm)

Rear door swing: 30" (76.2 cm)

MAR/76

World Radio History

500–1,500 watts FM

TRANSMITTERS? it's only natural . . . MCMARTIN

World Radio History

the MC MARTIN BF-1K TRANSMITTER

Topnotch performance at output power levels in the 500 to 1.5 KW range is assured by the McMartin Model BF-1K FM Broadcast transmitter.

Designed for operation on any specified frequency from 88 to 108 MegaHertz, the BF-1K, with its grounded grid Class C PA stage, assures excellent bandwidth characteristics essential to the stringent demands of stereophonic and SCA multiplex transmission today — and to the "sound of tomorrow" — quadraphonic broadcasting.

The power amplifier stage uses a ceramic/metal, zero-bias, hi-mu triode — the 3CX1500/A7. As a grounded grid Class C amplifier, this tube requires no neutralization, nor grid bias and screen grid power supplies. The elimination of these many components, required for power tetrode PA stages, contributes both to long-term reliability and stability and a remarkably simple and straightforward power output RF stage design.

The PA tube is driven by a solid-state intermediate power amplifier stage following the field-proven, high-performance McMartin Model B-910 solid state exciter, of modular plug-in design. Stereo or SCA multiplex capability is easily attained by use of the optional modular B-110 stereo and B-113 SCA generator assemblies.

Using modern-day phase-lock-loop techniques, the B-910 solid state exciter employs a direct FM modulation system with ultra-stable, precise center frequency control. Outstanding performance for monaural, stereophonic or SCA broadcasting is assured. For example, frequency response characteristics within 0.5 dB, and total harmonic distortion of 0.3% or less, over the 30 to 15,000 Hz audio spectrum are typical of the full-fidelity operation you can anticipate from the BF-1K transmitter. When the stereo or SCA multiplex generator options are used, stereo separation and crosstalk characteristics are outstanding for the industry. All filters, frequently optional "add-ons" in competitive models, are integral portions of the generator assemblies.

The BF-1K is easy to operate. Simple pushbutton start-stop switching, eye-level metering and convenient operating controls emphasize the "designed-for-humans" approach. Maintenance and servicing is simple — all components are readily accessible. Where remote control operation is employed, the BF-1K is ready. Terminations are provided for interface with all standard remote control systems. In addition to start-stop functions and motor driven power output control, telemetry sampling voltages of the major operating parameters, including VSWR indication, are standard.

The BF-1K has an automatic recycling system, backed up by a memory-type LED status indicator panel. Exciter output, IPA and PA overloads and VSWR values are monitored continuously. If a fault occurs, it is displayed on the LED status indicator associated with that portion of the transmitter circuit where it occurred. Three "start" pulses spaced about one second apart are automatically initiated. If the fault is corrected during the three-pulse sequence the BF-1K is returned to its normal operation; however, the status indicator remains energized until manually reset. If the fault persists, the BF-1K reverts to its "standby" condition. The status indicator localizes the fault and remains on until reset manually. The automatic recycling/status indicator combination immediately alerts engineering personnel to intermittent faults which are normally extremely difficult to isolate.

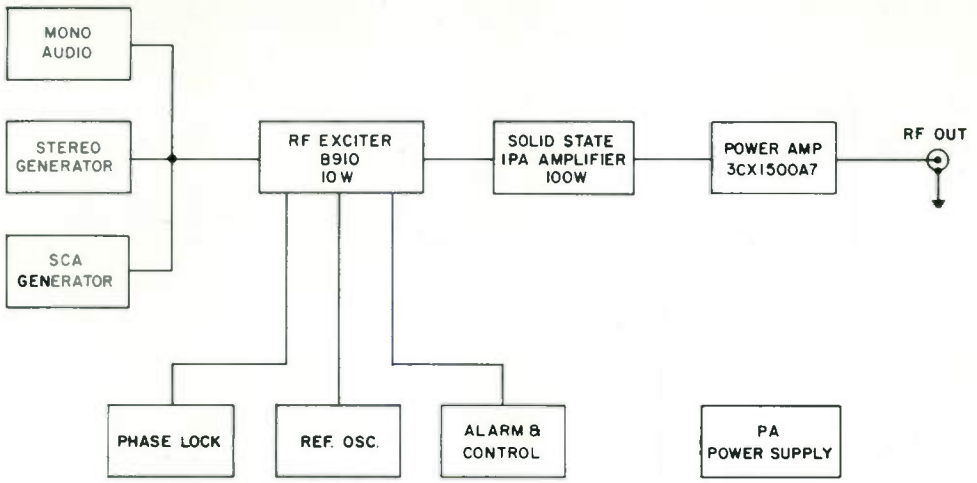
The BF-1K is completely self-contained in an attractively-styled cabinet.

Positive pressure cabinet cooling, coupled with conservative operating levels for all components results in outstandingly cool operation, contributing to excellent, long-term reliability.

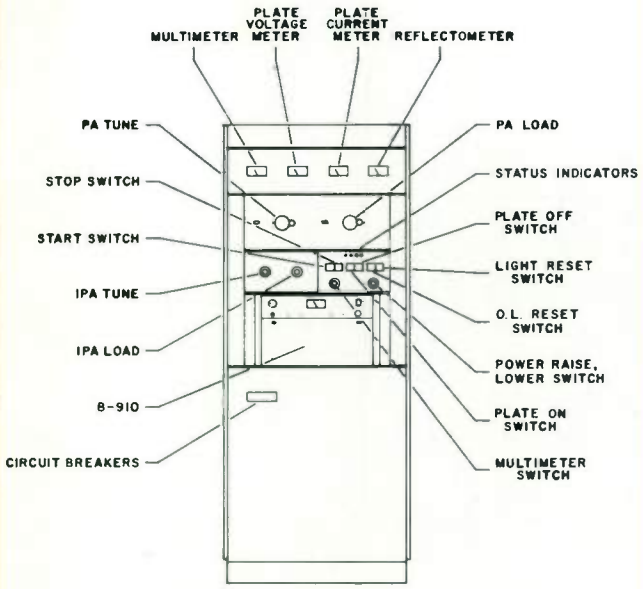
Large, eye-level meters display PA plate voltage and current, VSWR, filament and line voltage, plus a ten-position multimeter readout of auxiliary operating voltages and currents.

The BF-1K is delivered to you, pretuned and tested, on your frequency, complete with engineering test data. Installation is strictly a matter of connecting primary power, audio input and monitor cables and the antenna transmission line.

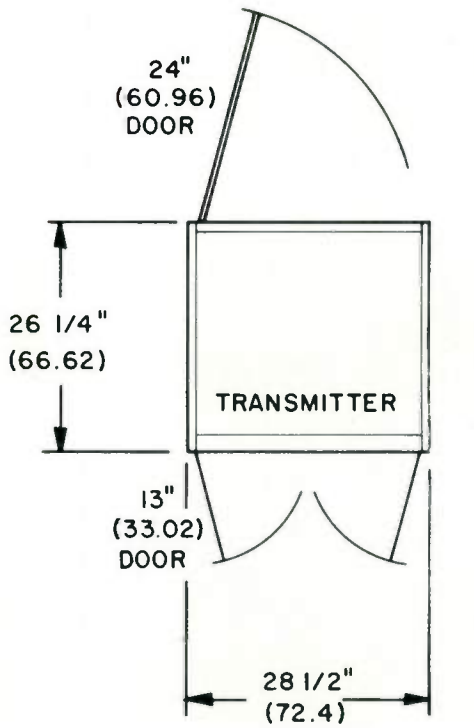
World Radio History



Block diagram



Front panel description



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Floor plan dimensions

World Radio History

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	28¼" (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

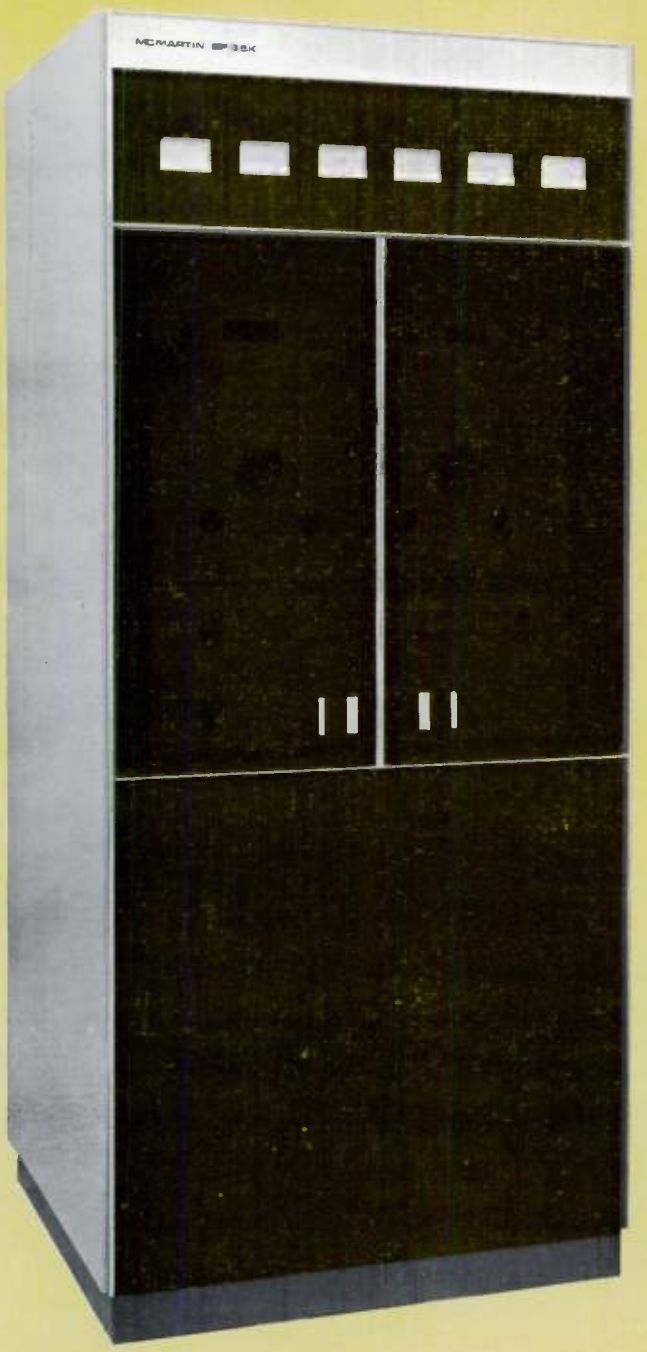
SCA OPERATION (with B-113 SCA Generator Module)

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

MAR/76

World Radio History

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



McMartin®

World Radio History

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 ungassed 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)	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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World Radio History

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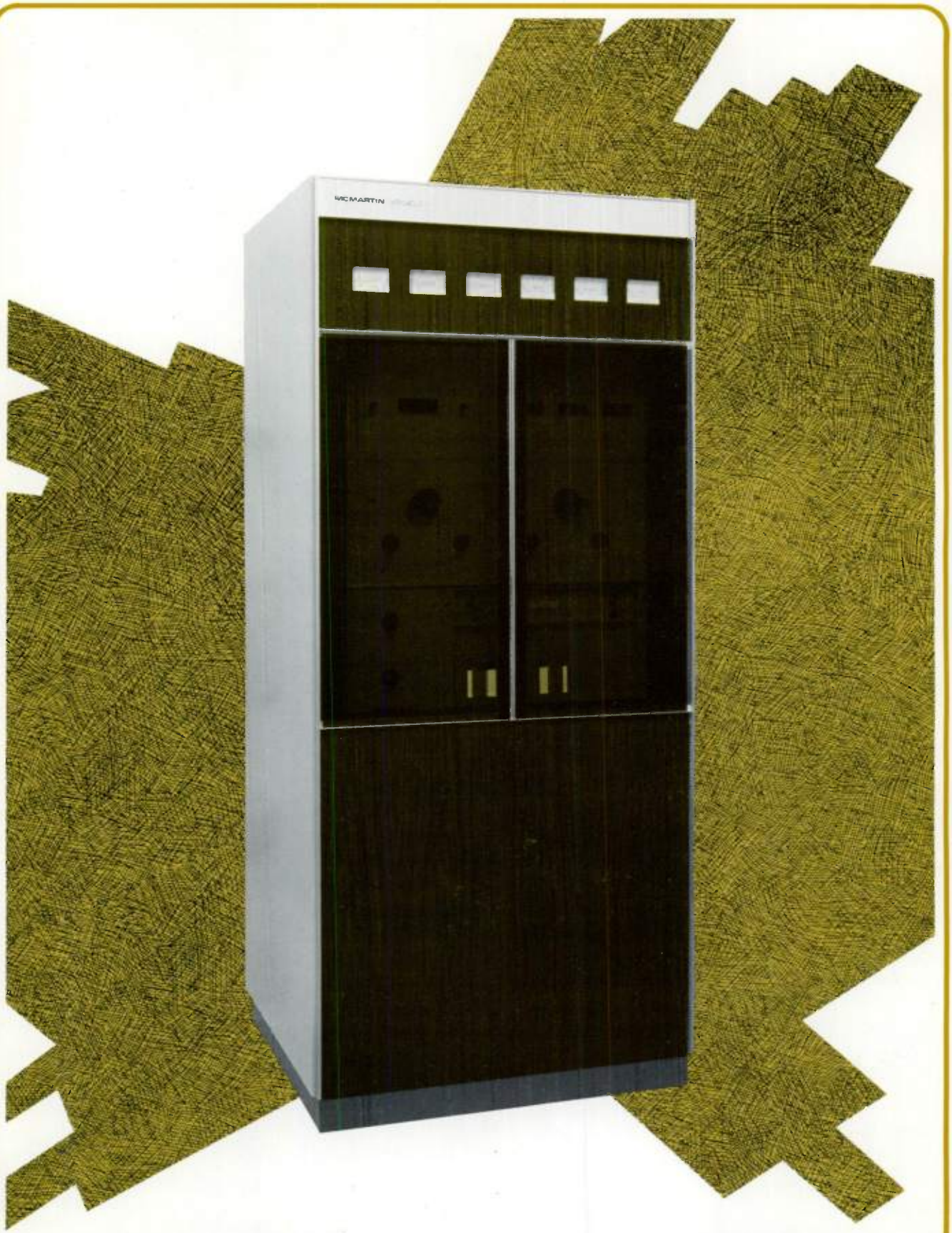
3,500 – 5,500 watts FM



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

the MCMARTIN BF-5K TRANSMITTER

The McMartin BF-5K transmitter is designed for FM broadcast service, operating on a specific frequency in the range of 88 to 108 MHz, and power output levels from 3.5 to 5.5 KW.

The BF-5K utilizes the well-accepted, field-proven, high-performance McMartin B-910 solid state exciter. The RF output of the exciter drives an intermediate power amplifier stage consisting of paralleled Type 4CX250B radial beam tetrodes. These supply RF excitation to a ceramic/metal, zero-bias, hi-mu triode tube, Type 3CX3000/A7 operating as a grounded-grid Class C amplifier. This configuration is well-recognized as optimum for the wide-band characteristics essential to superior stereo and SCA multiplex operation today — and for quadraphonic sound, tomorrow.

In addition, the elimination of grid-bias and screen-voltage power supplies and the need for neutralization, essential to transmitter designs using power tetrode output tubes, contributes to long-term, stable operation.

The B-910 solid state exciter, of modular, plug-in design, facilitates optional stereo or SCA multiplex transmission. The B-910 incorporates a unique phase-locked direct FM modulator for ultrastable, precise center-frequency control. Outstanding performance specifications for all transmission modes are assured. For example, frequency response within 0.5 dB and total harmonic distortion of 0.3% or less over the 30 to 15,000 Hertz audio spectrum are typical of the full-fidelity capability of the BF-5K transmitter.

With the B-110 stereo or B-113 SCA plug-in options, stereo separation and crosstalk characteristics are outstanding. All filters necessary for optimum stereo and SCA transmission are integral portions of the generator assemblies, with no hidden "extra costs" when these modes are used.

The BF-5K is controlled by simple pushbutton start-stop switch operation, with terminations provided for interface with standard remote control systems, including telemetry sampling voltages.

Automatic recycling and memory-type LED status indication is standard. The status system senses and displays the source of any carrier interruption. The exciter output; IPA and PA stage overloads; and transmission line VSWR are monitored continuously. Any fault is detected and displayed on the LED indicator panel and can be "cleared" only by manual reset. The recycling circuitry upon a fault occurrence, automatically initiates three "start" pulses, spaced about one second apart. If the fault persists, the BF-5K will revert to its "standby" condition, and the LED status indicator associated with that portion of the transmitter within which the fault occurred will be illuminated.

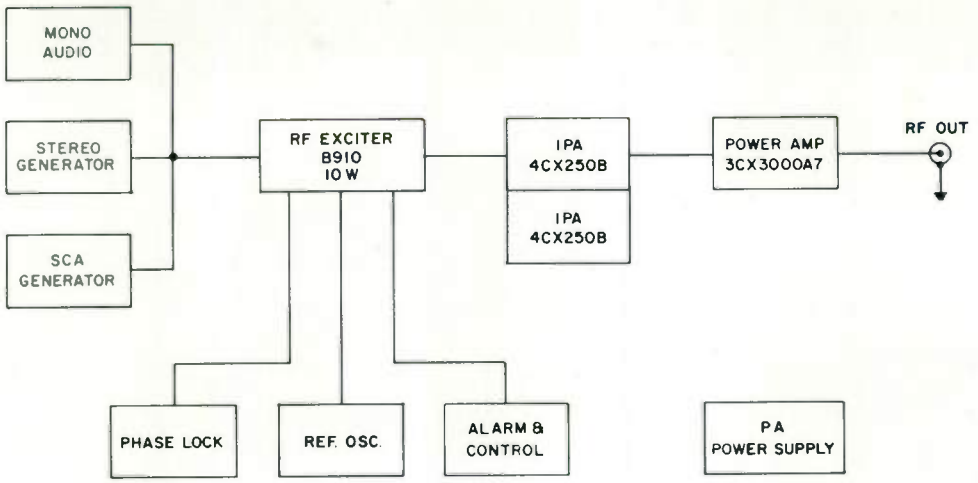
For output operating levels up to 4KW, the BF-5K is completely self-contained. For 4.0 to 5.5 KW output, an external RF harmonic filter is supplied. This mounts horizontally above the BF-5K cabinet.

Positive-pressure air cooling, in conjunction with conservative operating levels for all components results in unusually cool operation of the BF-5K. This contributes to excellent long-term component reliability.

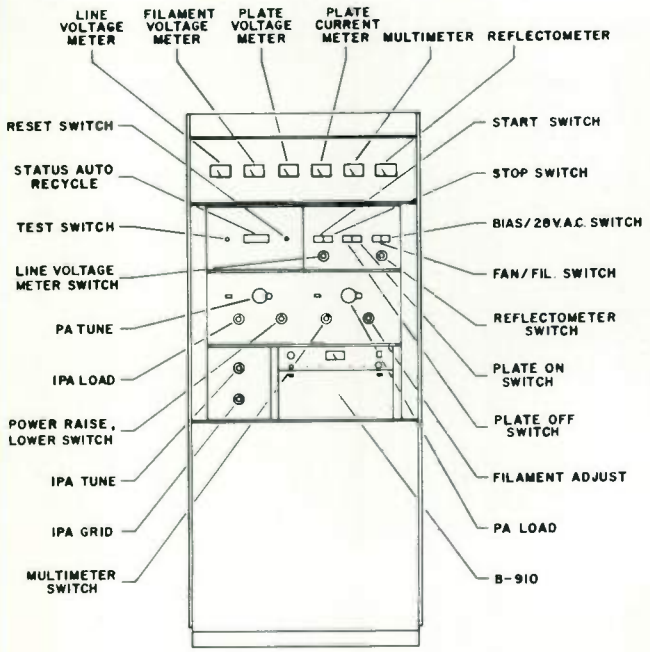
All major parameters are displayed on large front panel meters, including PA plate voltage and current; VSWR; filament and line voltages and a ten-position multimeter readout. Three-phase primary power is standard. Single phase operation when requested will be supplied at no additional cost.

Where redundant or combined transmitter systems are desired, dual BF-5K units may be used. McMartin will gladly furnish quotations for specialized systems of this type, engineering-tailored to your specifications.

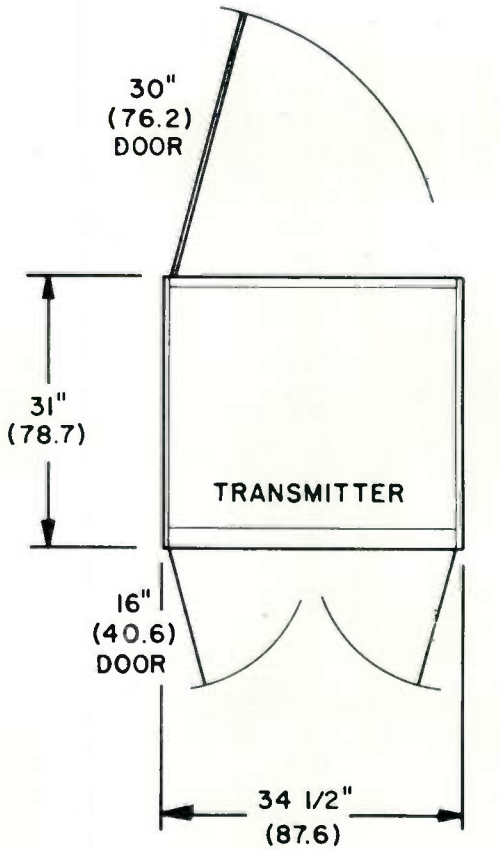
World Radio History



Block diagram



Front panel description



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Floor plan dimensions

World Radio History

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

MAR/76

World Radio History

10,000 – 13,500 watts FM

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

World Radio History

the MCMARTIN BF-10K TRANSMITTER

For optimum performance and long-term reliability in FM broadcast installations requiring transmitter power output in the range of 10 to 13.5 KW, the McMartin Model BF-10K FM Broadcast Transmitter is the finest choice.

The BF-10K meets todays stringent requirements for monaural, stereophonic and SCA multiplex operation — and is ready for the mode of tomorrow — quadraphonic sound.

The excellent wideband characteristics of the BF-10K have been designed into the unit by the use of grounded-grid circuitry in its high-power RF driver and power amplifier stages. Both stages use ceramic/metal, zero-bias, high-mu triodes; a Type 3CX1500/A7 for the driver and a Type 3CX10,000/A7 in the PA stage. Widely-recognized for their broadband characteristics in the grounded grid configuration, the use of these tube types also eliminates the need for neutralization and the many components required for grid bias and screen voltage power supplies. This results in an outstandingly simple and straightforward design approach in the critical high-power RF stages.

One additional tube, a Type 4CX250B serves as an intermediate power amplifier between the solid-state B-910 exciter and the driver stage. Motor-driven screen voltage adjustment of the 4CX250B screen grid voltage insures extremely smooth control of the BF-10K power output level.

The field-proven, high-performance, solid-state B-910 exciter, of modular, plug-in design, facilitates optional stereo or SCA multiplex operation. The B-910 incorporates a unique phase-locked direct FM modulator for ultra-stable, precise frequency control. Outstanding performance specifications for all transmission modes are assured. For example, frequency response within 0.5 dB over the 30-15,000 Hertz audio spectrum and total harmonic distortion of 0.3% or less are typical of the full-fidelity capabilities of the BF-10K. With the B-110 stereo or the B-113 SCA generator plug-in options, stereo separation and crosstalk characteristics are outstanding. All filters necessary for optimum stereo and SCA optional modes are supplied as standard, with no hidden "extra costs."

The BF-10K is controlled by simple push-button start-stop switching, with terminations for remote control operation, including telemetry sampling voltages, for interface with all standard remote control systems.

Automatic recycling and memory-type LED status indication is standard. The latter system senses and displays the source of any carrier interruption. The exciter RF output; IPA, driver and PA stage overloads; and transmission line VSWR are continuously monitored. Any fault is detected and displayed on the LED indicator panel and can be "cleared" only by manual reset. The recycling circuitry automatically revert to a standby condition, and the LED status indicator for that portion of the transmitter in which the fault occurred will be illuminated.

The BF-10K is completely self-contained in an attractively-styled dual-section cabinet, with the exception of the RF harmonic filter which is externally mounted above the BF-10K cabinet.

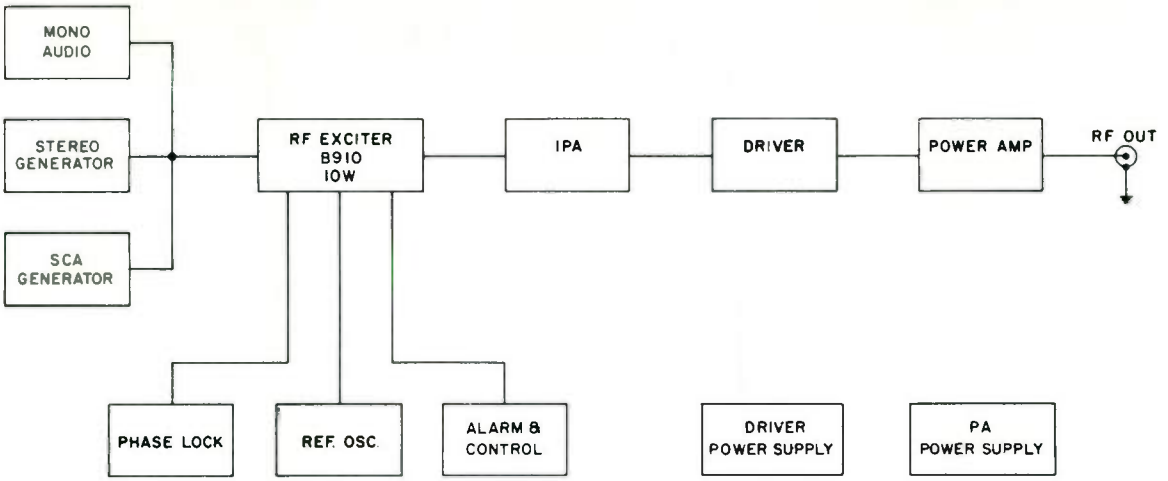
Positive pressure air cooling, in conjunction with conservative operation of the high-power RF stages results in unusually cool operation of the BF-10K. This contributes to excellent long-term component reliability.

All major parameters are monitored on large-size front panel meters. Driver and PA plate voltages and currents are metered separately. In addition VSWR, input line voltages, driver/PA filament voltages and a ten-position multimeter readout occupy the upper front meter panel.

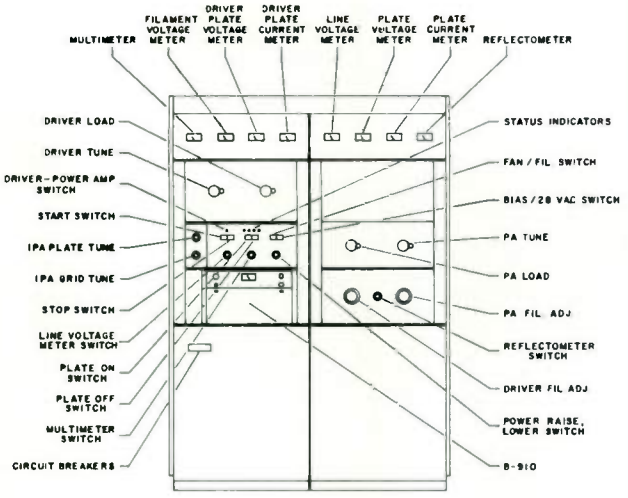
The electrical and mechanical design of the BF-10K provides for easy field installation of optional power output feed at an approximately 1000 watt level directly from the 3CX1500/A7 driver stage.

Dual BF-10K units may be combined for redundant 10 to 13.5 KW, or combined 20 to 27 KW output operation. McMartin will gladly furnish quotations for special systems of this type, engineered and tailored to your specifications.

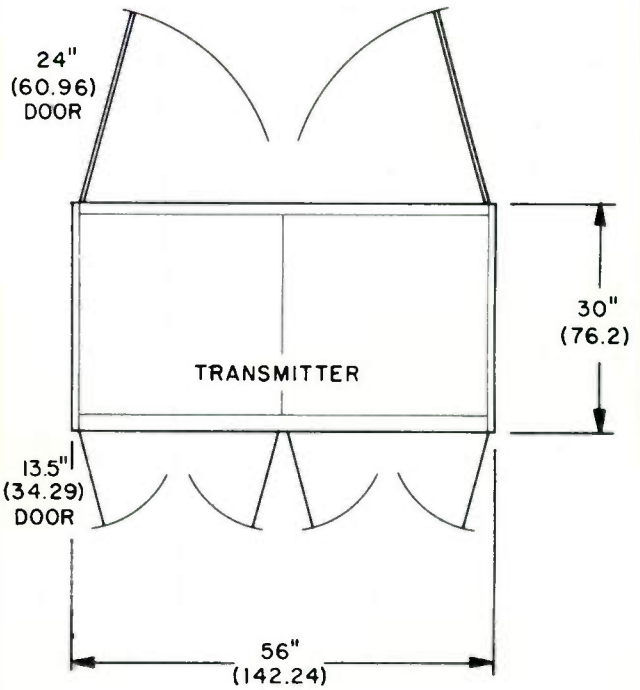
World Radio History



Block diagram



Front panel description



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Floor plan dimensions

World Radio History

SPECIFICATIONS

OPERATING RANGE	88 to 108 MegaHertz
RF POWER OUTPUT	13.5 kW 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.)	10,000 watt output, 20,000 watts 13,000 watt output, 25,000 watts
OPERATING TEMPERATURE	0° to 50° Celsius
ALTITUDE	7,500 feet above mean sea level
DIMENSIONS	56" (142.2 cm) width 79" (200.7 cm) height 30" (76.2 cm) depth 24" (60.7 cm) rear door swing
WEIGHT	1,750 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

MAR/76

World Radio History

15,000 – 27,500 watts FM

TRANSMITTERS? it's only natural . . . MCMARTIN

World Radio History

the MCMARTIN BF-25K TRANSMITTER

The McMartin BF-25K FM broadcast transmitter satisfies FM broadcast station installations requiring transmitter output levels from 15 to 27.5 kW.

The BF-25K meets today's stringent requirements for stereo and SCA multiplex operation—and is ready for the mode of tomorrow, quadraphonic sound.

Selected for its widely recognized superior wide band characteristics, McMartin has incorporated grounded-grid Class C designs in the high-level driver and PA stages of the BF-25K. Both stages employ ceramic/metal, zero/bias, high-mu triodes; a 3CX3000/A7 for the driver and a 3CX20,000/A7 in the power amplifier output stage. The latter tube, with rated 20,000 watt plate dissipation, when operated at the 27.5 KW maximum BF-25K output level utilizes less than 40% of its plate dissipation capability. This conservative operation is typical of the overall design of the BF-25K. Emphasis has been placed on circuit simplicity, long-term reliability and ease of maintenance.

By the grounded-grid design approach, grid bias and screen-grid power supplies—essential to tetrode-tube type amplifiers, are completely eliminated. The sometimes touchy and troublesome neutralization problems are gone. The BF-25K RF amplifier stages do not require neutralization. The grounded-grid approach delivers another little bonus. A portion of the "drive" power appears in the PA output circuit. This results in outstanding PA efficiency.

One additional tube, a Type 4CX250B, is used as the intermediate power amplifier between the solid-state exciter and the driver stage. Extremely smooth adjustment of the RF power output of the BF-25K is controlled by motor driven adjustment of the screen voltage applied to the 4CX250B tube.

The exciter for the BF-25K is the field-proved, high-performance solid-state Model B-910. With its modular plug-in design, stereo and/or SCA mode options are readily available. The B-910 incorporates a unique phase-lock direct FM modulator for ultra stable and precise frequency control. An alarm/control module is incorporated which automatically shuts down the BF-25K in the unlikely event that the frequency should vary more than 100 kHz from the assigned operating frequency.

Interlocked control logic permits simple pushbutton switching of all start-stop functions. Termination for remote control operation, including telemetering sampling voltages, permit interface of the BF-25K with all standard remote control systems.

Automatic recycling and a memory-type LED status indicator display, sense and indicate the source of carrier interruptions. The exciter output, IPA, driver and PA stages, high-voltage overload and VSWR are monitored continuously. Any fault is sensed and displayed on the LED indicator panel and can be cleared only by manual reset. The recycling circuitry automatically initiates three "start" pulses, spaced approximately one second apart. If the fault persists, the recycling detection circuit illuminates the LED, indicating that portion of the transmitter system where the fault occurred.

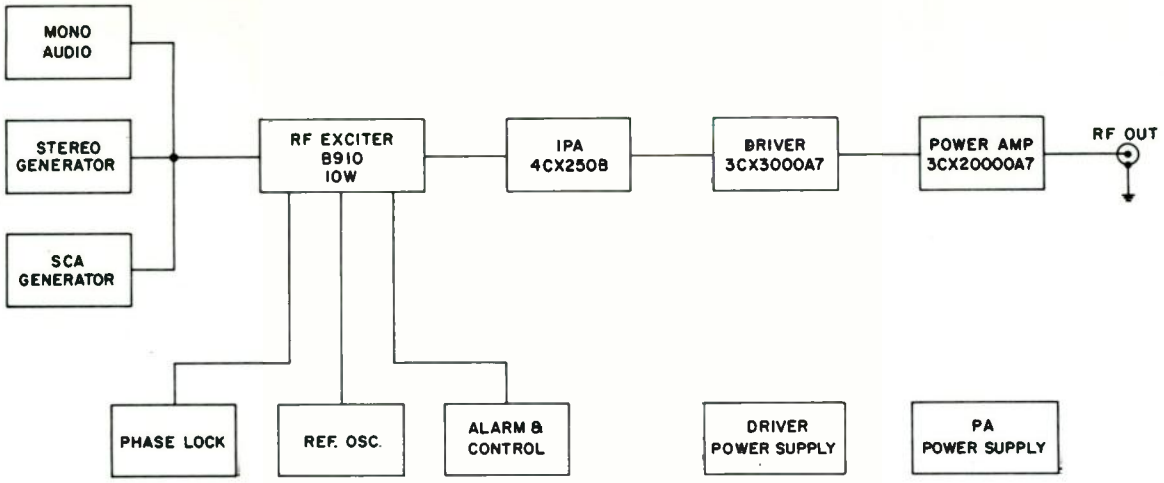
The BF-25K is housed in an attractively styled dual-section cabinet with the power amplifier stage occupying one section and all other circuitry in the other. The two halves of the assembly are individually cooled. The electrical and mechanical design arrangement permits easy field installation of optional antenna transmission line switching to the output of the driver stage at a power level of approximately 2500 watts.

The high-voltage power transformer and associated silicon rectifier stacks for PA plate supply are housed in a separate assembly. The RF harmonic filter mounts horizontally above the main transmitter cabinet.

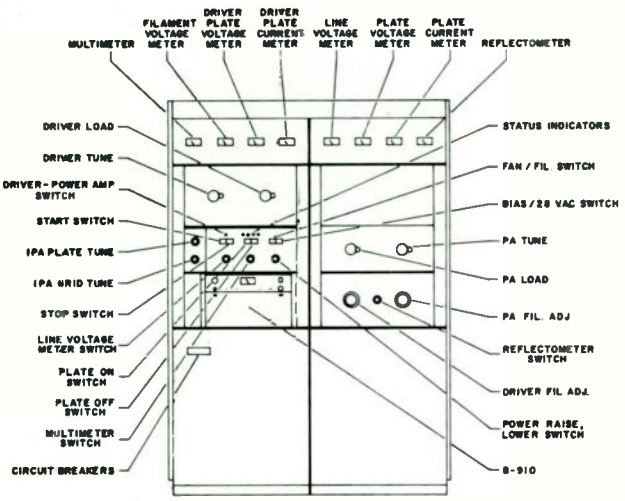
Driver and PA plate voltages and currents are separately metered. These parameters along with VSWR, line voltage, driver/PA filament voltages and a ten-position multimeter readout, are shown on the upper front-panel meter panel.

Dual BF-25K units are also available for redundant 27.5 or paralleled 55 KW output operation. McMartin would be pleased to furnish quotations on systems of this type, engineered and tailored to your specific situations.

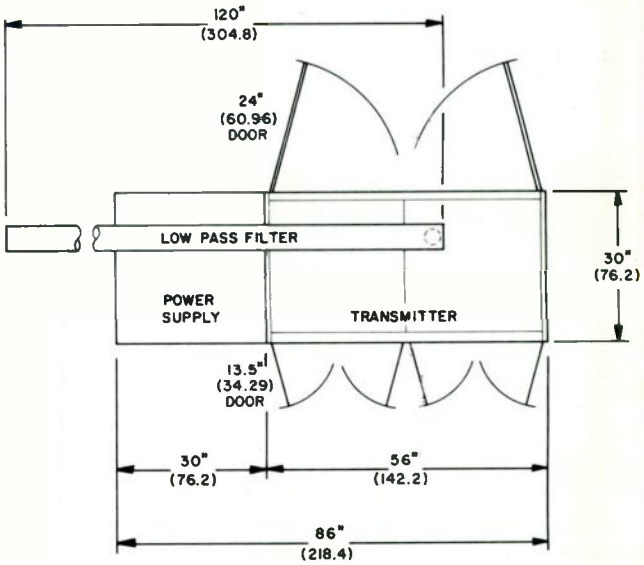
World Radio History



Block diagram



Front panel description



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Floor plan dimensions

World Radio History

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

World Radio History

McMartin

10 watt FM exciter transmitter B-910 series

Direct FM Modulation
Unique Phase-Lock AFC Provides ±500 Hz Stability
Plug-In Modular Design
Outstanding Performance
Full Metering
Off-Frequency Operation Impossible with unique Fail-Safe, Positive Action Alarm Circuit
Remote Control Provisions
Available As Exciter/Or 10-Watt Transmitter
Available Monaural Or Stereo – With or Without SCA
Optimum Filtering For Stereo/SCA Combinations

World Radio History

GENERAL DESCRIPTION

The B-910/B-910T 10-watt Exciter/Transmitter is designed to function either as an exciter for a higher power FM broadcast transmitter or, as a Model B-910T, as a 10-watt FM broadcast transmitter. The B-910 and the B-910T differ only in that the B-910T incorporates a low-pass output filter and is housed in an attractive matching cabinet.

The B-910 is fully type accepted by the FCC for use as a monaural exciter, or when it includes a plug-in B-110 Stereo Generator, and/or a plug-in B-113 SCA Generator, for stereophonic and/or SCA broadcasting. The B-910 FM Exciter is available in models for monaural, with one or two SCA channels; or for stereo, with or without an SCA channel. The B-910 additionally will directly accept a composite stereo signal for applications where the stereo generator is located at the studio.

The B-910 incorporates, as standard in its design, a unique phase-locked direct FM modulator. This provides for ultra-stable and precise frequency control, offering frequency stability not previously available in an FM Exciter/10-watt FM Transmitter.

All circuitry for the B-910/B-910T FM Exciter/Transmitter, with the exception of heavy power supply components, is housed on front accessible plug-in modules, with a module extender provided. Front panel metering of necessary operating parameters is provided. Monitoring and full remote control provisions are included in the B-910/B-910T.

The B-910/B-910T has been designed to provide the cleanest, crispest, most usable FM main channel signal, and when so equipped, multiplex stereo and SCA subchannel signals. Particular care is taken in providing optimum filtering in B-910 units equipped with Stereo and/or SCA Generators.

The B-110 Stereo Generator is equipped with 15 kHz input filters and a 53 kHz low-pass output filter to assure that there is no interference with a 67 kHz SCA channel.

67 kHz B-113 SCA Generators are provided with optimum filtering depending on whether they are used with monaural or stereo exciters. When utilized with a monaural exciter, a 7.5 kHz band pass input filter is used; and a 90 kHz low pass output filter is used (this assures lowest distortion SCA and main channel reception). This filter combination assures the cleanest monaural and SCA signals, with objectionable interference and "birdies" totally eliminated. When a 67 kHz SCA Generator is used with an exciter equipped with a B-110 Stereo Generator, the SCA generator's output filter is a 67 kHz bandpass filter, thus assuring that no interference with the stereo (L-R) signal will occur.

41 kHz B-113 SCA Generators are equipped with 7.5 kHz input filters and a 60 kHz low pass output filter, which assures total non-interference with the main channel and the 67 kHz SCA.

B-113 SCA Generators are factory equipped for ±6 kHz deviation with the 7.5 kHz input filter. For ±4 kHz SCA deviation requirement a 5 kHz input filter is optionally available.

This care in providing optimum filtering is just another example of the quality and care that comes with a B-910/B-910T, assuring clean signals with no possible sub-channel to main channel interference.

PHASE-LOCK DIRECT FM MODULATOR

The heart of the B-910/B-910T is the Direct FM modulator, with a unique phase-lock AFC circuit providing ±500 Hz frequency stability. The frequency-modulated oscillator itself, as shown on the block functional of the B-910/B-910T, utilizes a free running oscillator at ½ of the operating frequency. This frequency is modulated by both the main and all sub-channel audio signals (stereo and/or SCA), and is then doubled to the operating frequency. This on-carrier frequency signal is then digitally divided, and compared in the reference oscillator with a similarly divided signal from a highly stable temperature controlled crystal oscillator at 1/10 of the operating frequency. The AFC voltage to the Frequency Modulated Oscillator (FMO) is derived from a phase comparator that compares the two signals at 1/10,000 of operating frequency (a frequency, dependent on carrier frequency, between 8.8 kHz and 10.8 kHz). Any phase difference detected between the two signals represents a frequency difference between the two signals, and consequently an off-frequency condition of the FMO. A correction voltage is then derived, which serves as an AFC voltage to maintain the FMO at its precise frequency.

Front panel indication is provided to show if loss of the phaselock condition occurs, with provision for connection of external aural alarms and/or a remote indication. In the unlikely chance of failure of the digital dividing circuitry, which would cause a loss of signal to the phase comparator, provision is made for manually controlling operating frequency.

To assure that the B-910/B-910T cannot operate beyond FCC permitted frequency tolerances, an additional phase-lock comparator is utilized in a "carrier-loss" circuit. This circuit, in the further unlikely event that the operating frequency goes 100 kHz beyond the operating frequency will cause a loss of B+ to the RF amplifier and turn off the RF output.

B-910T 10-WATT FM TRANSMITTER

The B-910T 10-watt FM Transmitter is available for low-power non-commercial Educational FM stations and also for use as an STL (Studio to Transmitter Link) or Relay Transmitter in those areas where the 88 MHz to 108 MHz band is available for such use. The B-910T 10-watt FM Transmitter consists of a B-910 FM Exciter equipped with a harmonic filter and is available housed in an attractive dustproof matching cabinet (rack mount B-910T units are also available). It is fully type accepted by the FCC for use as a 10-watt FM transmitter.

EASE OF OPERATION AND MAINTENANCE

The B-910/B-910T is designed for simple and easy operation with operational controls held to a minimum.

Full front panel metering is provided to allow monitoring of operating voltages, total modulation and other parameters.

Tuning the B-910/B-910T is a very easy procedure and is accomplished in seconds utilizing the front panel meter to give an indication of a phase-lock condition between the frequency modulated oscillator and the reference oscillator. Once phase-lock is achieved, no further frequency tuning is required or necessary.

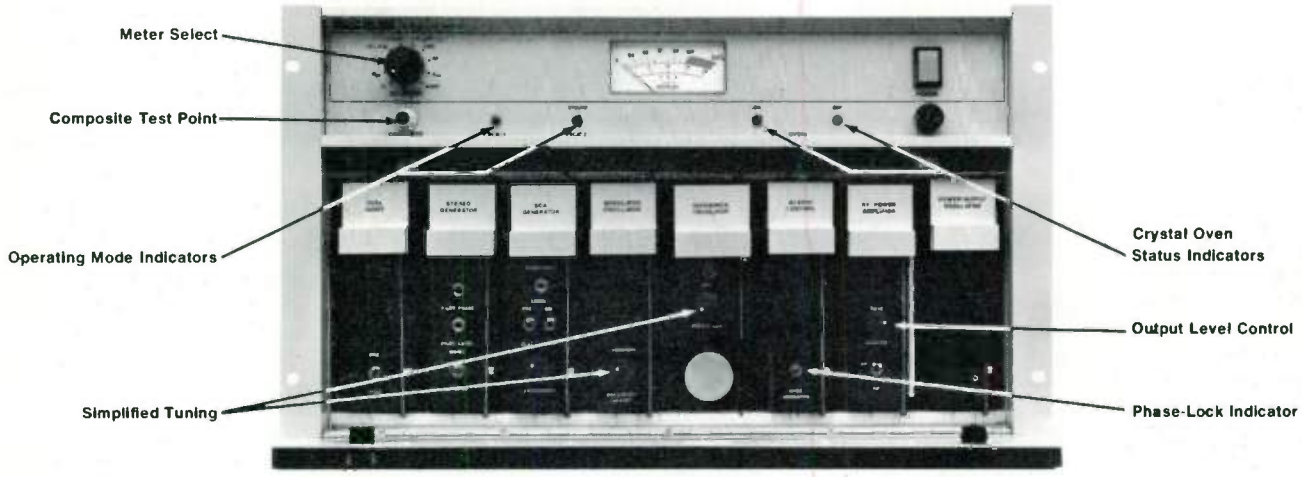
Front accessible plug-in modules are used for all operating circuitry with a hinged protective front cover and a module extender provided.

World Radio History

McMartin "Full Choice" line

B-910/B-910T COMPLETE WITH STEREO AND SCA GENERATORS

(Front cover opened showing Plug-In Modules and Simplified Controls)



B-110 STEREO GENERATOR

The optional B-110 Stereo Generator operates in the B-910/B-910T in conjunction with a B-111 Stereo Audio Amplifier, and provides for the generation of the 19 kHz pilot and the composite stereo signals (L+R and L−R). The stereo generator utilizes a switching mode oscillator employing a temperature stabilized crystal at four times the 19 kHz pilot frequency (76 kHz). This 76 kHz signal is digitally divided to derive the 19 kHz pilot and the 38 kHz square wave signal used to alternately switch between the left and right channel audio signals. Circuitry is precisely designed to assure that 38 kHz subcarrier suppression is 55 dB below the modulated signal. The use of the square wave switching mode eliminates the need for troublesome carrier balance adjustments. This simplifies adjustment, and additionally provides for excellent stereo separation (35 dB through the entire exciter or transmitter). A 53 kHz low-pass filter is employed to assure that no objectionable harmonic content of the 19 kHz pilot exists. This assures that no interference will occur with a 67 kHz SCA channel.

Adjustments for the B-110 Stereo Generator are held to minimum with only Pilot Level and Pilot Phase (for setting proper timing of the pilot and L-R signal) provided on the front panel.

Local and remote stereo/mono mode switching is provided for, with front panel indication provided when in stereo operation, with provision for connection of a remote indicator.

B-113 SCA GENERATOR

The B-113 SCA Generator is optionally available to provide for a 67 kHz subchannel in an exciter equipped with a stereo generator. In a monaural exciter either a 67 kHz and/or a 41 kHz SCA Generator are optionally available (other frequencies 20-75 kHz are available on special order).

The B-113 is an ultrastable SCA generator utilizing direct FM modulation providing for a subcarrier frequency accuracy of ±500 Hz. Manual or automatic SCA muting is provided and the mute circuitry is adjustable, both as to modulation level, and delay time which is continuously adjustable ½ to 8 secs.

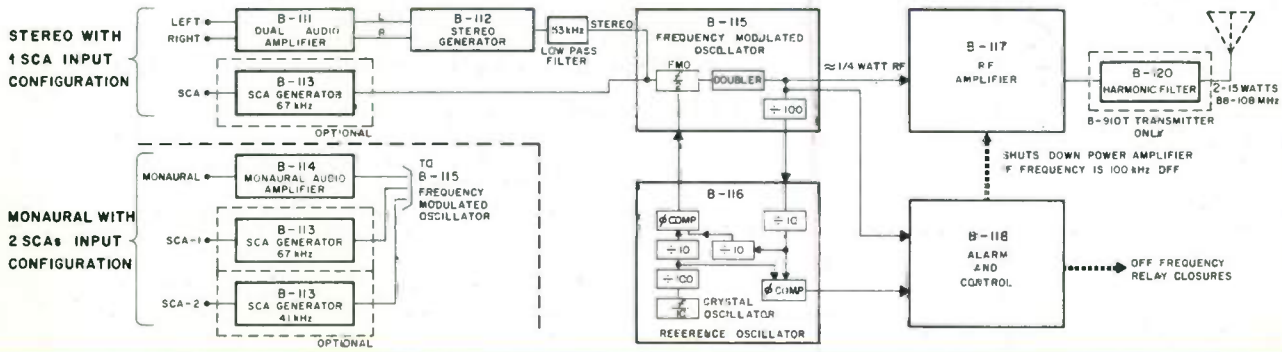
Unique to the B-113 is the ability to remotely disable the automatic mute. This circuit provides a ready means of obtaining the necessary signal when making measurements at the studio requiring an unmodulated SCA subcarrier.

B-113 SCA Generators are factory equipped for ±6 kHz deviation with a 7.5 kHz input filter. For ±4 kHz SCA deviation requirement a 5 kHz input filter is optionally available.

The B-113 also has provision to allow the SCA subcarrier to be switched on and off locally and remotely.

STANDARD SCA FILTER COMBINATIONS			
SCA	INPUT FILTER 4 kHz - DEVIATION - 6kHz		OUTPUT FILTER
41 kHz	5 kHz	7.5 kHz	60 kHz LP
67 kHz monaural	5 kHz	7.5 kHz	90 kHz LP
67 kHz stereo	5 kHz	7.5 kHz	67 kHz BP

System Block Diagram of B-910/B-910T FM Exciter/10 Watt FM Transmitter



World Radio History

SPECIFICATIONS

B-910T 10-WATT FM TRANSMITTER

PERFORMANCE:

TYPE OF EMISSION	F3/F9
FREQUENCY RANGE	88-108 MHz
RF POWER OUTPUT	B-910 Exciter 2-15 watts continuously adjustable. B-910T 10-watt transmitter; 10 watts nominal
RF OUTPUT IMPEDANCE (Type BNC connector)	50 ohms, unbalanced
CARRIER FREQUENCY STABILITY	±500 Hz over rated temperature range
FREQUENCY DEVIATION FOR 100% MODULATION	±75 kHz
MODULATION CAPABILITY	±150 kHz
METHOD OF MODULATION	Direct FM
AUDIO INPUT IMPEDANCE	600 ohms balanced
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.5 dB 30-15,000 Hz
PRE-EMPHASIS NETWORK TIME CONSTANT	75 μ sec pre-emphasis, 50 μ sec avail
TOTAL HARMONIC DISTORTION	less than 0.3%, 30-15,000 Hz
FM NOISE	68 dB or greater below 100% modulation at 400 Hz
AM NOISE	65 dB below carrier level

ELECTRICAL:

POWER REQUIRED	100-135 (200-270) VAC 50/60 Hz
POWER CONSUMPTION (With Stereo and SCA Generator)	50 watts
AMBIENT TEMPERATURE	−20° to 50° C (−4° to 122° F)

MECHANICAL:

DIMENSIONS	Rack Mount	10½" (26.7cm) High 19" (48.3cm) Wide 17¾" (45.1cm) Deep
	in B-122 cabinet	11¾" (29.8cm) High 20" (50.8cm) Wide 18" (45.7cm) Deep
WEIGHT	Rack Mount	25 lbs. (11.3kg) *shipping weight* 30 lbs. (13.6kg)
	in B-122 Cabinet	30 lbs. (13.6kg) *shipping weight* 35 lbs. (15.9kg)
FINISH		McMartin beige with wood grain trim front access panel

B-110 STEREO GENERATOR

PERFORMANCE:

PILOT CARRIER STABILITY	19 kHz ±1 Hz over rated temperature range
SUBCARRIER SUPRESSION	−55 dB or greater
AUDIO INPUT IMPEDANCE (Left and right channels into B-111 Stereo Audio Amplifier)	600 ohms balanced
AUDIO INPUT LEVEL (Left and right channels into B-111 Stereo Audio Amplifier)	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±0.5 dB 30-15,000 Hz
PRE-EMPHASIS NETWORK TIME CONSTANT	75 μ sec pre-emphasis, 50 μ sec avail
TOTAL HARMONIC DISTORTION	0.5% or less, 30-15,000 Hz
STEREO SEPARATION (50-15,000 Hz)	39 dB or greater through B-112 module 35 dB or greater through B-910/B-910T typically 45 dB or greater at mid range
CROSSTALK (main channel to sub channel and sub channel to main channel 30-15,000 Hz)	47 dB or greater, less 15 kHz LP filters; 50 dB (30-5,000 Hz); 45 dB (5-10 kHz); 40 dB (10-15 kHz); with filters.
FM NOISE	65 dB or greater below 100% modulation
REMOTE CAPABILITY	pilot on/off, pilot on indication
FILTERING PROVIDED	15 kHz input, 53 kHz low pass output

B-113 SCA GENERATOR

PERFORMANCE:

TYPE OF MODULATION	Direct FM
CARRIER FREQUENCY	67 kHz and 41 kHz standard (20 kHz to 75 kHz available)
FREQUENCY STABILITY	±500 Hz over rated temperature range
AUDIO INPUT IMPEDANCE	600 ohms balanced
AUDIO INPUT LEVEL	+10, ±2, dBm
AUDIO FREQUENCY RESPONSE	±1.5 dB, 50-5,000 Hz
TOTAL HARMONIC DISTORTION	less than 0.6% at 400 Hz (B-113 only) less than 0.75% 50-5,000 Hz (through B-910/B-910T Monaural 67 kHz SCA) less than 2.5% 50-5,000 Hz (through B-910/B-910T Stereo 67 kHz SCA)
CROSSTALK (main channel to SCA and SCA to main channel)	60 dB or greater below normal program levels
MODULATION CAPABILITY	±7.5 kHz
PRE-EMPHASIS NETWORK TIME CONSTANT	150 μ sec standard, 75 μ sec or 50 μ sec available
AUTOMATIC MUTE	Adjustable to any level between 100% and 3% modulation
MUTE DELAY	0.5 sec to 8 sec (continuously adjustable)
FM NOISE	60 dB below 100% modulation (±6 kHz deviation) 150 μ sec de-emphasis
REMOTE CAPABILITY	SCA-on/off, Auto-Mute on/off

FILTERING PROVIDED:

Monaural Exciter	7.5 kHz input, 90 kHz low pass output
Stereo Exciter	5 kHz input, 67 kHz band pass output
41 kHz units with Monaural Exciter	7.5 kHz input, 60 kHz low pass output

(Other filter combinations are available.)

All specifications for monaural, stereo and SCA operation are for the entire B-910/B-910T system and not just through a single part of the system.

ORDERING INFORMATION

B-910/910T FM Exciter units are available in the following configuration as original purchase options:

Monaural Operation:	B-910 Monaural FM Exciter (specify main channel frequency)
SCA Operation:	B-910 Monaural FM Exciter with single B-113 SCA Generator (specify main channel and SCA Frequencies) B-910 Monaural FM Exciter with two B-113 SCA Generators (specify main channel and SCA Frequencies)
Stereo Operation:	B-910 FM Exciter with B-110 Stereo Generator Assembly (specify main channel frequency)
Stereo/SCA Operation:	B-910 FM Exciter with B-110 Stereo and B-113 SCA Generator (specify main channel and SCA frequencies)
10-Watt FM Transmitter:	B-910T 10-Watt FM Transmitter (in B-122 cabinet) B-910T 10-Watt FM Transmitter (rack mount)

All B-910/B-910T monaural units may be field converted to stereo operation by adding B-110 Stereo Generator Assembly.

Add-On Options:

B-110 Stereo Generator Assembly Includes:
B-111 Stereo Audio Amplifier (replaces B-114 Monaural Audio Amplifier)
B-112 Stereo Generator

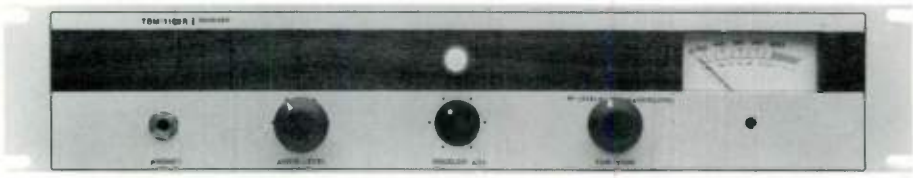
B-113 SCA Generator
(specify frequency 41 kHz and 67 kHz standard)
(other frequencies 20-75 kHz available)

World Radio History

McMartin.

remote pickup broadcast systems RPU

B-1100T



TBM-1100R

McMartin Industries, Inc. • 4500 South 76th Street • Omaha, Nebraska 68127 • Phone (402) 331-2000

World Radio History

• The McMartin Remote Pickup Broadcast System

B-1100T Front view Smooth control of microphone and program level inputs; panel metering of all operating parameters, including modulation and VSWR; RF output level and phase lock LED indicator as well as standby/transmit condition switching contribute to high-performance, reliable operation.

B-1100T Rear Chassis View. Microphone/program input and remote switching termination to right. 115/230 Vac, 13-volt DC power receptacle and fuses to left. Large external heat sink insures long-term thermal stability. RF output connector at left edge of heat sink.

The McMartin RPU-1100 Remote Pickup Broadcast System combines the highly-sophisticated B-1100T 40 watt FM transmitter and TBM-1100R FM Receiver to produce the highest-performance equipment presently available to the broadcaster for program relay from remote points to the control studio.

This system is not restricted to "speech-only" originations. The RPU-1100 System permits relaying of all types of program material with performance specifications substantially better than those available from leased-wire circuits. The system permits unusual flexibility in remote broadcast originations.

Up to 40 watts continuous output power from the B-1100T insures maximum coverage area. Combined with the highly-sophisticated TBM-1100R FM Receiver—from McMartin, the leaders in professional FM receiver design and manufacture—the ultimate in a high-quality remote origination system is assured.

The B-1100T uses techniques generally found only in FM broadcast transmitter exciters. The frequency stability is determined by the latest phase-lock loop designs with automatic protection against off-frequency operation.

The TBM-1100R receiver unit is designed for rack installation at the station console operating location. The B-1100T transmitter may be operated either from a normal power line source, or with the optional CU-1100 control unit from a mobile, 13-volt battery supply.

40 WATTS OUTPUT, CONTINUOUS
SILICON SOLID STATE
MOBILE/FIXED POWER SUPPLY
TWO MICROPHONE, ONE HIGH LEVEL INPUT

B-1100T

The McMartin B-1100T solid state FM transmitter delivers continuous 40 watts output power on any specified frequency in the 148-172 megaHertz range. For intermittent operation, 45 watts RF output power is available.

Designed for Remote Pickup Broadcast service under Part 74 of the FCC Rules, the B-1100T when used with the McMartin TBM-1100R provides a reliable, high-performance program transmission system.

Audio input connectors; two microphone and one high level input are XLR-3 type. Transmit on/off switching is by an illuminated front-panel standby pushbutton switch, or remotely by a switch closure at the microphone location.

Audio response is ± 0.5 dB from 50 to 7,500 Hertz at 1.5% harmonic distortion with 25 dB of audio compression, which may be disengaged with an internal switch. When operated without compression, the distortion is 0.5% or less. The B-1100T is fully-metered with switch selection of tripler/doubler collector currents, collector voltage, PA collector current, peak modulation and both forward and reflected power.

RF output is adjustable by a front panel control from zero up to the full 40-watt output level.

The B-1100T may be powered either from a 115/230 Vac or + 13 Vdc source. An accessory control unit, the CU-1100, is required for dc operation.

An attractive, rugged metal cabinet with carrying handle is available or the B-1100T may be mounted in a standard rack when used in fixed, base-station installations.

EXCELLENT SELECTIVITY
0.8 MICROVOLT SENSITIVITY
0.5% DISTORTION, 30 to 7500 Hz
S/N RATIO: 60 dB BELOW ± 7.5 kHz DEVIATION

TBM-1100R

The McMartin TBM-1100R is a high performance, solid state, dual conversion FM receiver designed for relay broadcast service in the 148 to 174 megaHertz range.

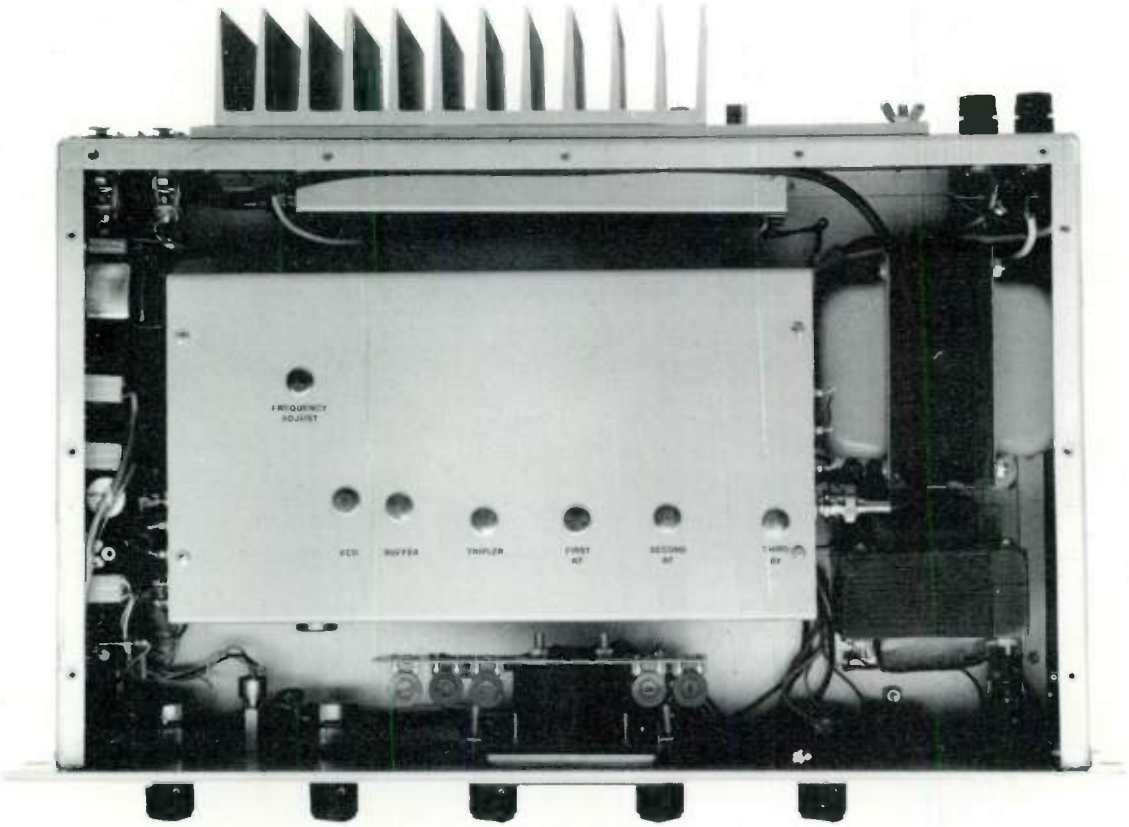
Featuring excellent sensitivity, 0.8 microvolts for 30 dB of quieting; a low noise MOS FET RF amplifier with superb cross-modulation and overload characteristics; coupled with an AGC range of 40 dB, the TBM-1100R represents the ultimate in relay broadcast receiver design.

The TBM-1100R audio output is at a maximum level of + 10 dBm, to match standard 600 ohm balanced feeds.

The unique squelch circuit is triggered by the residual high frequency noise level, rather than the conventional signal level reference. The trigger point is adjustable so that the tolerable signal-to-noise ratio for a given path or quality of program transmission may be preset.

The TBM-1100R is intended for use with the companion McMartin B-1100T 40 watt, fixed/mobile solid state relay broadcast transmitter; however, it may be used with similar transmitting equipment of any manufacture operating in the 148 to 172 MHz range.

World Radio History



B-1100T (top view, cover removed) Note dual-shielding for exciter-driver stages. Shielded PA output stage at top mounted on external rear-chassis heat sink.

CU-1100 Mobile Control Unit Assembly. Control head for remote mounting shown at right. Permits on/off switching of battery source power, standby/transmit control, either by panel switch or by push-to-talk microphone control. LED status indicators. Unit at left is power plug interface adaptor. Assembly includes 10' interconnecting cable (not shown).

World Radio History

SPECIFICATIONS:

TBM-1100R

FREQUENCY RANGE	Specified frequency in the 148 to 172 MHz range
INPUT IMPEDANCE	50 ohms, unbalanced (BNC connector)
SENSITIVITY	0.8 microvolts for 30 dB of quieting
IMAGE AND SPURIOUS RESPONSE	greater than −85 dB
FREQUENCY STABILITY	0.0005% (−25° to +55° C)
AGC RANGE	40 dB
DEVIATION (100% Mod)	±7.5 kHz

	TBM-1100R only	System, used w/B-1100T
FREQUENCY RESPONSE (Hertz)	±0.5 dB, 30 to 7500 Hz	±1.5 dB, 50 to 7500 Hz
DISTORTION (Max)	0.5%	1.5%

AUDIO OUTPUT Max (Adjustable)	+10 dBm
SELECTIVITY	±15 kHz @ 75 dB ±60 kHz @ 75 dB
S/N RATIO	60 dB
SQUELCH CONTROL	Adjustable to desired S/N ratio by front panel control. Controls relay contact closure.
METERING	Relative RF input level and audio output level
POWER REQUIREMENTS	120/230 Vac, 50/60 Hz, 20 watts
DIMENSIONS	EIA standard 3½" high panel; 19" wide; 11" deep (8.9 HX48.3 WX27.9 D cm)
WEIGHT	10 LBS.
FINISH	McMartin beige with woodgrain trim

B-1100T

FREQUENCY RANGE	Any specified frequency, 148-172 MHz
OUTPUT POWER (adjustable)	0-40 watts, continuous 45 watts, intermittent
OUTPUT IMPEDANCE	50 ohms, unbalanced
EMISSION	30F3 (±7.5 kHz equals 100% modulation)
FREQUENCY STABILITY	0.0005% (−25 to +55° Celsius)
AF RESPONSE	±0.5 dB, 50 to 7500 Hz
AF DISTORTION	less than 0.5%; 1.5% with 25dB compression
S/N RATIO	55 dB or greater (typically 60 dB) below 100% modulation
AUDIO INPUTS	Two microphones, one program (XLR-3 connector)
AUDIO INPUT IMPEDANCE	
Microphone	150 ohms balanced
Program	600 ohms balanced
AUDIO INPUT LEVELS	
Microphone	−30 to −60 dBm
Program	-10 to +10 dBm
AUDIO LIMITING	25 dB range. 1.0 millisecond attack time, 300 ms decay. May be disabled by internal switch.
FRONT PANEL CONTROLS	mic gain (2), program gain, RF output level, standby switch, multimeter
METERING	RF tripler/doubler stage collector currents, PA collector current, collector voltage, peak modulation, forward power, reflected power.
POWER SOURCE	115/230 Vac, 50/60 Hz, 120 watts; or 13 Vdc, negative ground, 6 A maximum
SIZE	5¼" HX19" WX14½"D 13.3X48.3X36.8 cm
WEIGHT	30 pounds
FINISH	McMartin beige with woodgrain trim front panel
B-1100T ACCESSORIES	
CC-1100	Metal case, with handle
CU-1100	Control Unit (req'd for battery operation)

McMartin Industries, Inc. • 4500 South 76th Street • Omaha, Nebraska 68127 • Phone (402) 331-2000

World Radio History

FCC Form 313
January 1971

Form Approved
Budget Bureau No. 52-R0100

Federal Communications Commission
WASHINGTON, D. C. 20554

APPLICATION FOR AUTHORIZATION IN THE AUXILIARY RADIO BROADCAST SERVICES

APPLICANT SHOULD NOT USE THIS BOX

(FOR COMMISSION USE ONLY)

File No.

Name of applicant (see Instruction E)

Post Office address (Number, Street, City, State and ZIP Code)

INSTRUCTIONS

A. This form is to be used by licensees or permittees of existing Standard (AM), FM, and Television Broadcast stations when applying for Remote Pick-up, STL, and other stations coming under the Auxiliary Radio Broadcast Services (See Part 74 of the Rules).

B. A separate FCC Form 313 must be filed for each station authorization being requested. Complete all paragraphs if for a new station or for modification of construction permit or license; complete paragraphs 1, 3, 4, and 7 if for a license. (This form is to be used for **RENEWAL** of license **ONLY** when there have been changes in the information shown on the station license being renewed; when there have been no changes use FCC Form 313-R.) When this form is filed for renewal, complete all paragraphs necessary to indicate changes.

C. Prepare and file two copies (three for Television), with the Federal Communications Commission, Washington, D. C. 20554.

D. Number exhibits serially in the spaces provided in the body of the form and date each exhibit.

E. The name of the applicant must be stated exactly as it appears in the authorization for the broadcast station with which the auxiliary station is to be used.

F. This application shall be personally signed by the applicant, if the applicant is an individual; by one of the partners, if the applicant is a partnership; by an officer, if the applicant is a corporation; by a member who is an officer, if the applicant is an unincorporated association; by such duly elected or appointed officials as may be competent to do so under the laws of the applicable jurisdiction, if the applicant is an eligible government entity; or by the applicant's attorney in case of the applicant's physical disability or of his absence from the United States. The attorney shall, in the event he signs for the applicant, separately set forth the reason why the application is not signed by the applicant. In addition, if any matter is stated on the basis of the attorney's belief only (rather than his knowledge), he shall separately set forth his reasons for believing that such statements are true.

G. Items 4(a) and 4(b) apply to stations at fixed locations only and Item 4(c) applies to mobile stations only. All parts of Items 4(a) and (b) must be answered on all applications for new fixed stations and modifications thereof. Item 4(b) means the point of communication of the transmitter being applied for. (For Remote Pickup stations, the point of communication is normally the base station location for mobile units and the mobile units for base stations.)

1. Purpose of this application (indicate below)

(a) Type of station requested (see Instruction A):

(b) Call Sign of existing Permit or of License being renewed:

(c) Kind of authorization requested:

- ☐ New Station (for mobile and fixed stations)
- ☐ Modification of Existing Authorization
- ☐ License (for fixed stations only)
- ☐ Renewal and Modification (see Instruction B)

(d) Modification of existing authorization:

Call .....

- Change frequency ..... ☐
- Replace equipment ..... ☐
- Change power ..... ☐
- Change transmitter location ..... ☐
- Install different antenna system ..... ☐
- Other modification (explain below) ..... ☐

(e) Broadcast station(s) with which auxiliary station is to be used:

Call Sign(s)

2. If cost involved exceeds $1,000, submit as Exhibit No. a statement itemizing cost and a balance sheet of the applicant as at the close of a month within 90 days of the date of the application.

3. Facilities requested

FREQUENCIES	POWER [1]	TYPE OF EMISSION [2]	COMMUNICATION BAND - WIDTH (kH_z)[3]
	40 watts	35F3	30 kHz

[1] For amplitude modulation television (A5), give maximum antenna input power during synchronizing pulses. If particulars are not fully described above, such as aural and visual carrier frequencies for television and type of emission, etc., supply this information here:

[2] Use emission symbols listed in Part 2 of Commission's Rules.

[3] Communication bandwidth is the actual bandwidth of the emission plus twice the frequency tolerance. (See appropriate service rules for permissible bandwidth.)

4. Location of proposed transmitter

(a) For stations with fixed location

City	County	State

Street and number (or other description of location)

NORTH LATITUDE	WEST LONGITUDE
o ' "	o ' "

(b) Receiving point (See Instruction G)

City	County	State

Street and number (or other description of location)

(c) For portable or mobile operation

Area in which station is to be used:

World Radio History

5. Antenna system

(a) Description (including manufacturer and type number, if any)

Is a directional antenna system to be used? . . . . YES ☐ NO ☐
If "Yes," specify antenna gain in the main lobe of radiation, preferably in terms of free-space field in millivolts per meter for 1 kilowatt at 1 mile.

Direction of radiation of the main lobe of the transmitting antenna in degrees, measured in a clockwise direction with true north as zero azimuth. (If more than one antenna is used, give direction for each.)

(b) Supply the following for fixed installations only:

Over-all height above ground level in feet	Over-all height above mean sea level in feet

Description and height of supporting structure (differentiate between structure now existent and that to be erected.) Attach as Exhibit No. a sketch of vertical plan, showing heights of significant portions.

(c) Is supporting structure to be used in common for the antenna system of another class of station? YES ☐ NO ☐
If the answer is "Yes," give:

Class of station(s) Call letters

6. If this application is for a television remote pick-up or television STL station incorporating an aural transmitter, the information requested in paragraphs 7 and 8 should also be supplied for the aural transmitter in Exhibit No.

7. Transmitting apparatus proposed to be installed

Manufacturer	Type No.	Maximum rated power output
McMartin Industries	B-1100T	40 watts

Oscillator:

Type of circuit	Frequency
Modified Pierce VCO	fo / 3

~~Tubes~~ Transistor

Make	Type	Number
Various	2N5246	1

Last radio stage:

~~Tubes~~ Transistor

Make	Type	Number
Various	2N6084	1

Normal total plate current in last radio stage	Plate voltage	Method of modulation
5.0 amps	13.0 V	FM

8. Frequency and modulation

For what percentage of modulation or swing is the transmitter designed? ±30 kHz

What is the guaranteed frequency tolerance in percent? ±0.0005

Describe means incorporated in the transmitter for maintaining the frequency tolerance stated above. Oscillator is phase-locked to reference oscillator operating at 1/12th of the operating frequency

What external means will be employed by the applicant to insure that the assigned frequency is maintained with the tolerance specified by the Commission's Rules?

THE APPLICANT hereby waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. (See Section 304 of the Communications Act of 1934.) THE APPLICANT represents that this application is not filed for the purpose of impeding, obstructing, or delaying determination on any other application with which it may be in conflict. THE APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations, and that all the exhibits are a material part hereof and are incorporated herein as if set out in full in the application.

CERTIFICATION

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Signed and dated this _____ day of _____, 19 _____

_____
(NAME OF APPLICANT)

By _____
(SIGNATURE)

Title _____

INCLUDE FILING FEE WITH THIS APPLICATION. SEE PART 1 OF FCC RULES FOR AMOUNT OF FEE.

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND IMPRISONMENT. U.S. CODE, TITLE 18 SECTION 1001.

Exhibits furnished as required by this form

Exhibit No.	Para. No. of Form	Name of officer or employee (1) by whom or (2) under whose direction exhibit was prepared (show which)	Official title

World Radio History

McMartin®

STEREO GENERATOR B-110R

BUILT-IN 15 KHZ LP FILTERS
SEPARATION—39 dB OR GREATER

3½" RACK MOUNT
SWITCHING METHOD SIGNAL GENERATION

DESCRIPTION

The B-110R is a completely self-contained, rack-mount unit capable of generating a high-quality stereo composite signal. It is intended primarily for stereophonic mode broadcasting where the composite stereo signal originates at a studio location and aural STL equipment is used for relaying the program material to a remote transmitter site.

The B-110R includes local mono/stereo operating mode switching with provision for remote control.

Each channel includes built-in 15 kiloHertz low pass filtering.

Separate dual-audio and stereo generator plug-in modules are accessible from the front of the unit through a hinge-down panel.

SPECIFICATIONS

FREQUENCY RESPONSE	±0.5 dB, 30-15000 Hz
HARMONIC DISTORTION	0.5% or less, 30-15000 Hz
SEPARATION	39 dB or greater, 30-15000 Hz
CROSSTALK	50 dB, 30-15000 Hz 45 dB, 5-10 kHz 40 dB, 10-15 kHz
FM S/N RATIO	65 dB or greater
PREEMPHASIS	75 microseconds
PILOT STABILITY	±1.0 Hz over rated temperature range
19 KHZ SUPPRESSION	55 dB min.
AF INPUT IMPEDANCE	600 ohms, balanced (each channel)
AF INPUT LEVEL	+10, ±2 dBm
OUTPUT IMPEDANCE	600 ohms, unbalanced
OUTPUT LEVEL	0-2.5 volts, P/P
POWER REQUIRED	115/230 VAC, 50/60 Hz
OPERATING TEMPERATURE	−20° to 50° C
DIMENSIONS	EIA standard rack mount 19" (48.3 cm) wide 3½" (8.9 cm) high 15½" (39.4 cm) deep

MAR/75

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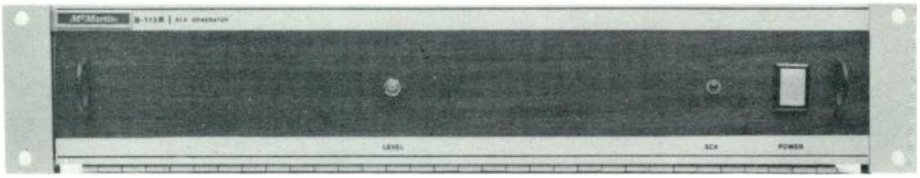
McMartin®

SCA GENERATOR **B-113R**



AUTOMATIC MUTING
VARIABLE MUTE DELAY

RACK MOUNT, SELF-CONTAINED
INTEGRAL INPUT/OUTPUT FILTERS

DESCRIPTION

The B-113R SCA Generator is a completely self-contained unit designed for the generation of high quality subchannel information for use in FM broadcast SCA applications.

The B-113 is available with input/output filter combinations to insure optimum compatibility with either monaural or stereophonic main channel operation.

Electronic muting, adjustable to respond to levels from 3 to 100% modulation and muting delay from ½ to 5 seconds are featured.

Local/remote switching is provided with front panel level control.

The B-113R is designed for rack mounting with access to the generator plug-in module by means of a hinge-down front panel.

SPECIFICATIONS

CARRIER FREQUENCY.....41 or 67 kHz standard
other frequencies on special order

CARRIER STABILITY.....±500 Hz

AF RESPONSE.....±1.5 dB, 50-5000 Hz

DISTORTION.....0.75% maximum, 50-5000 Hz (LP output filter)
2.5% maximum, 50-5000 Hz (BP output filter)

AF INPUT LEVEL.....+10, ±2 dBm

AF INPUT IMPEDANCE.....600 ohms, balanced

OUTPUT LEVEL..... 0-10V P/P, adjustable

PREEMPHASIS.....150 microseconds (50 or 75 microseconds special order)

MODULATION CAPABILITY.....±12% of subchannel carrier frequency

S/N RATIO.....60 dB or greater

MUTE DELAY.....0.5 to 5.0 seconds

OPERATING TEMPERATURE.....−20° to +50°C

POWER REQUIRED.....115/230 Vac, 50/60 Hz

DIMENSIONS.....EIA standard rack mount
19" (48.3 cm) wide
3½" (8.9 cm) high
15½" (39.4 cm) deep

ORDERING INFORMATION

MODEL	INPUT FILTER	OUTPUT FILTER	MAIN CHANNEL MODE
B-113R/5/41	5 kHz LP	41 kHz LP	Mono
B-113R/7/41	7.5 kHz LP	41 kHz LP	Mono
B-113R/5/67	5 kHz LP	67 kHz LP	Mono
B-113R/7/67	7.5 kHz LP	67 kHz LP	Mono
B-113R/5/67B	5 kHz LP	67 kHz BP	Stereo

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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

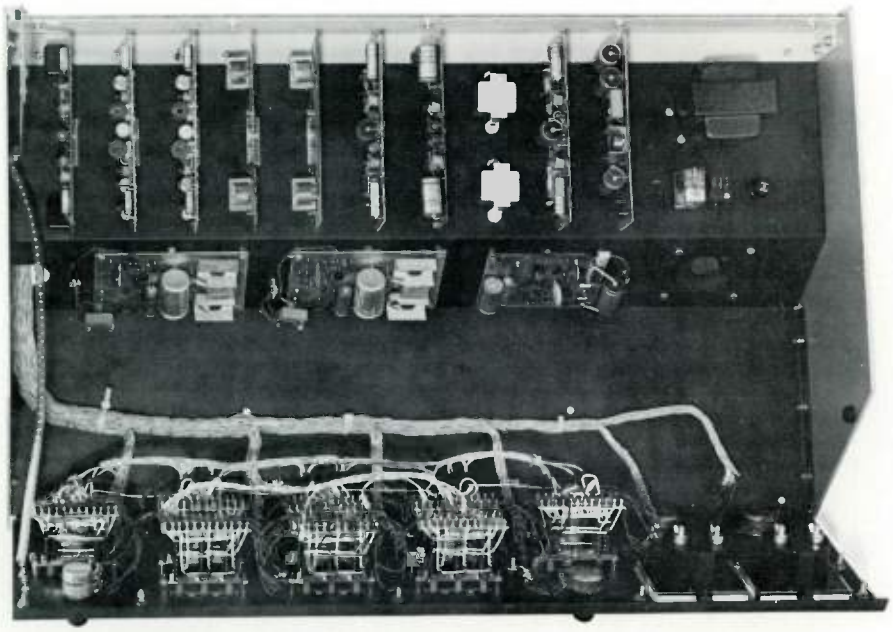
speaker muting for one studio, muting for second studio optional

attractively styled

functional, large, well located controls

monaural, stereo and dual-channel models

World Radio History



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 potentimeters 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 separate 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.

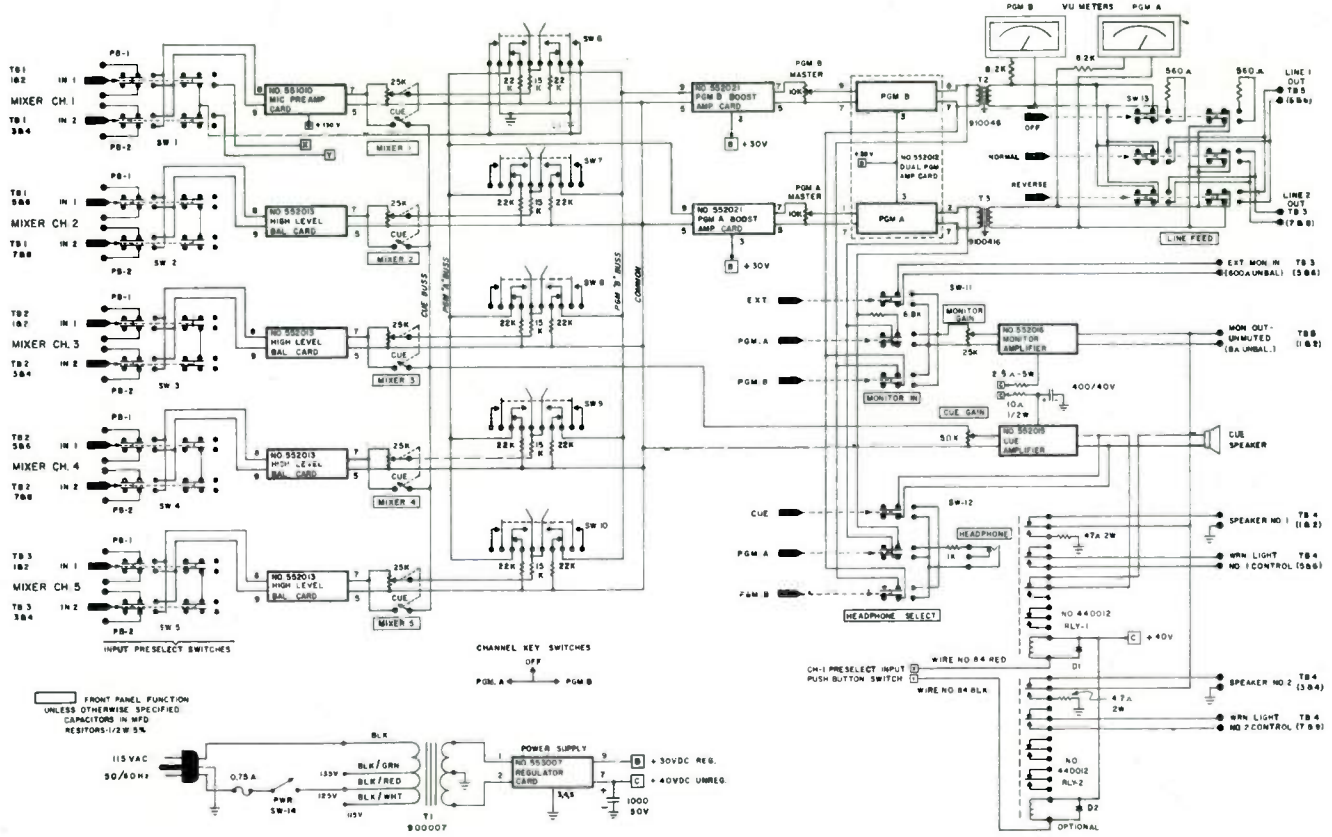
The console outputs may be switched to two output lines or to an internal terminating load.

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.

World Radio History

FUNCTIONAL BLOCK DIAGRAM / B-503 dual channel console



World Radio History

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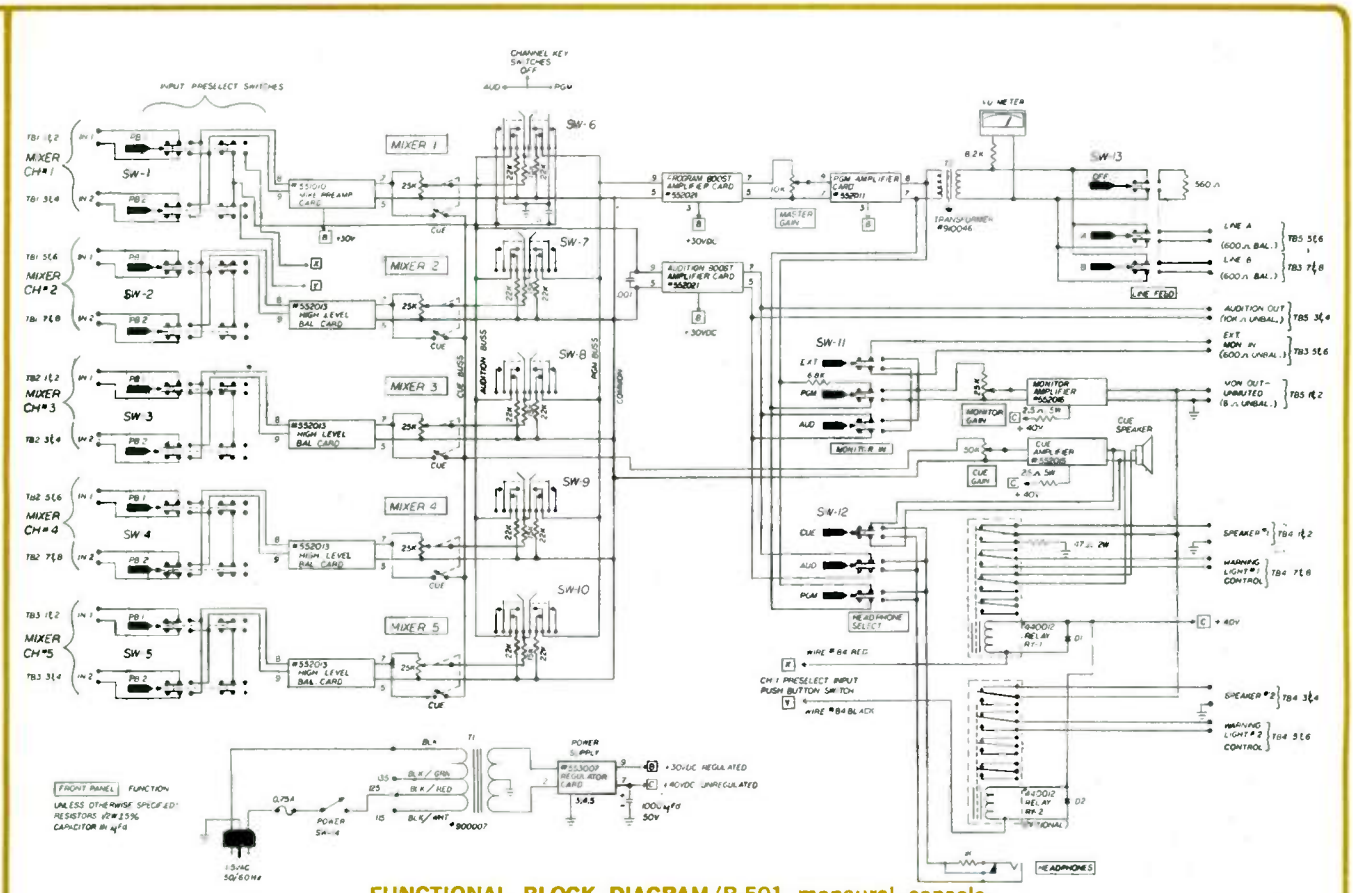
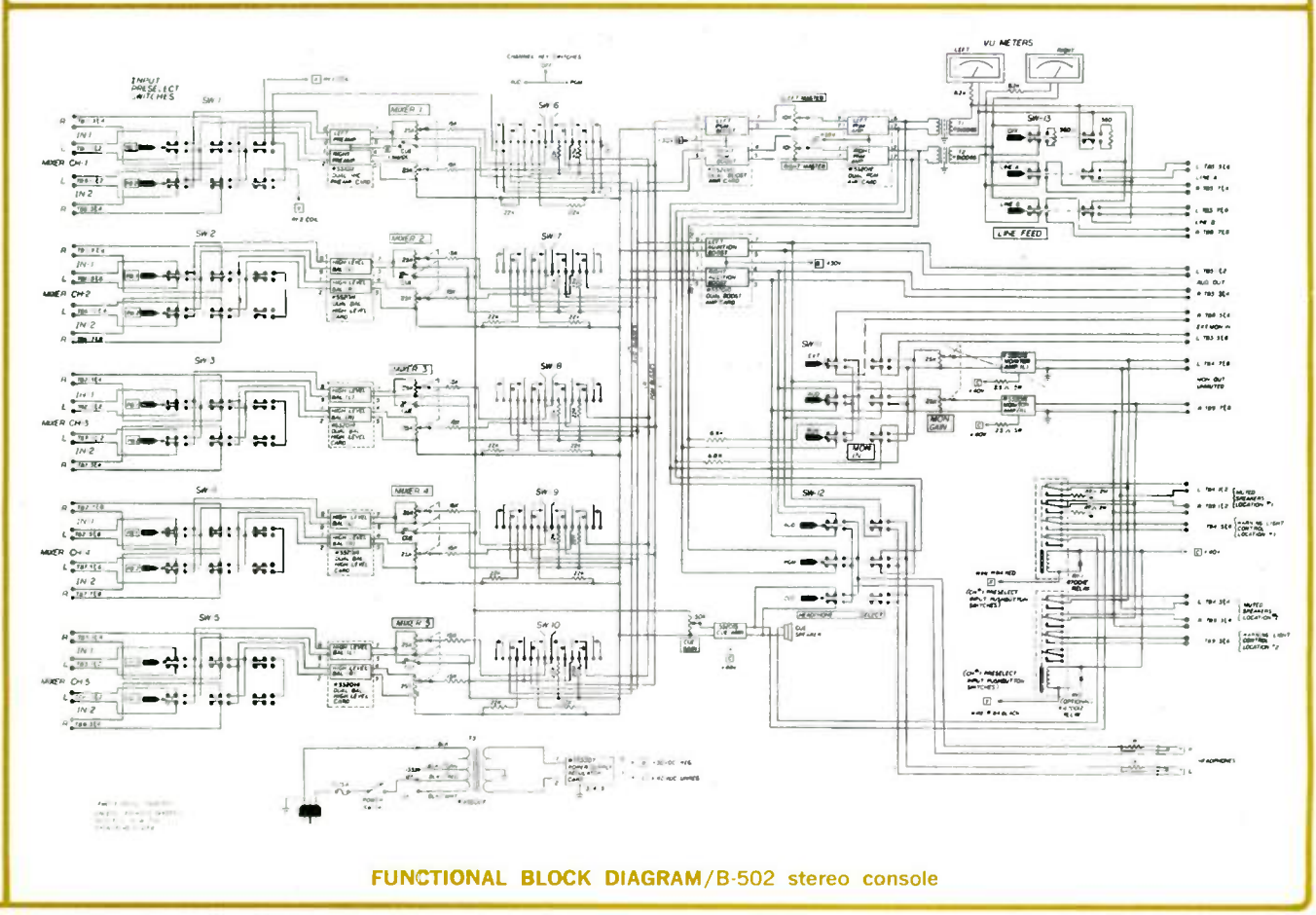
"Full Choice" line



FUNCTIONAL BLOCK DIAGRAM/B-501 monaural console



FUNCTIONAL BLOCK DIAGRAM/B-502 stereo console

World Radio History

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 (audition 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

AUDITION 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
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
WEIGHT	64 lbs. Shipping Weight 67 lbs.
FINISH	McMartin beige with matte black in mixer control area, wood grain end panels

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 Preamplifier
5EP1	Plug-in RIAA Phono Preamplifier
5BH1	Plug-in Balanced High Level Input Card

Plug-in Input Cards for B-502:

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

SEPT/75

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McMartin®

CONTROL DESK UNIT

B-500D

DESCRIPTION

The B-500D Control Desk Unit is an attractive and durable control center designed specifically for a centralized production center accommodating any of the McMartin B-500 Series 5-mixer audio consoles and dual turntables.

The assembly consists of a 66¼" by 24¾" desk top unit with integral side and rear panels, mounted on dual 21" x 24⅝" pedestals to provide a working surface 30" above floor level.

The desk top is precut to accommodate the Russco "Studio Pro" or "Cuemaster" professional turntables.

The unit is extremely rugged with the basic structure of ¾" plywood. Covering is adhesive-bonded formica with the pedestals in wood-grain and the top of beige, suede finish.

The B-500D is perfectly suited to production control or subcontrol room applications, or as the main control room operating center for smaller stations.

Its fine professional appearance makes the B-500D the perfect answer for remote broadcast originations in full public view where a "show-case" atmosphere is essential.

SPECIFICATIONS:

DIMENSIONS: ..... 66¼" wide, 24¾" deep, 30" high

FINISH: ..... Top: suede, beige formica
Pedestals: woodgrain formica

SHIPPING WEIGHT: ..... 85 pounds. Top and pedestals boxed separately.
Mounting brackets supplied.

SEPT/75

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McMartin

"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 prewired 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.

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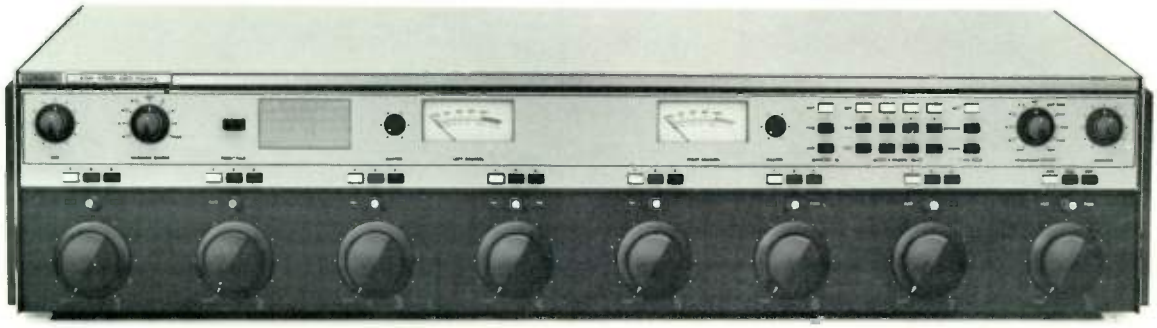

FRONT VIEW/B-802 stereo console

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: 44⅞" wide, 18¼" deep, 9¾" high

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

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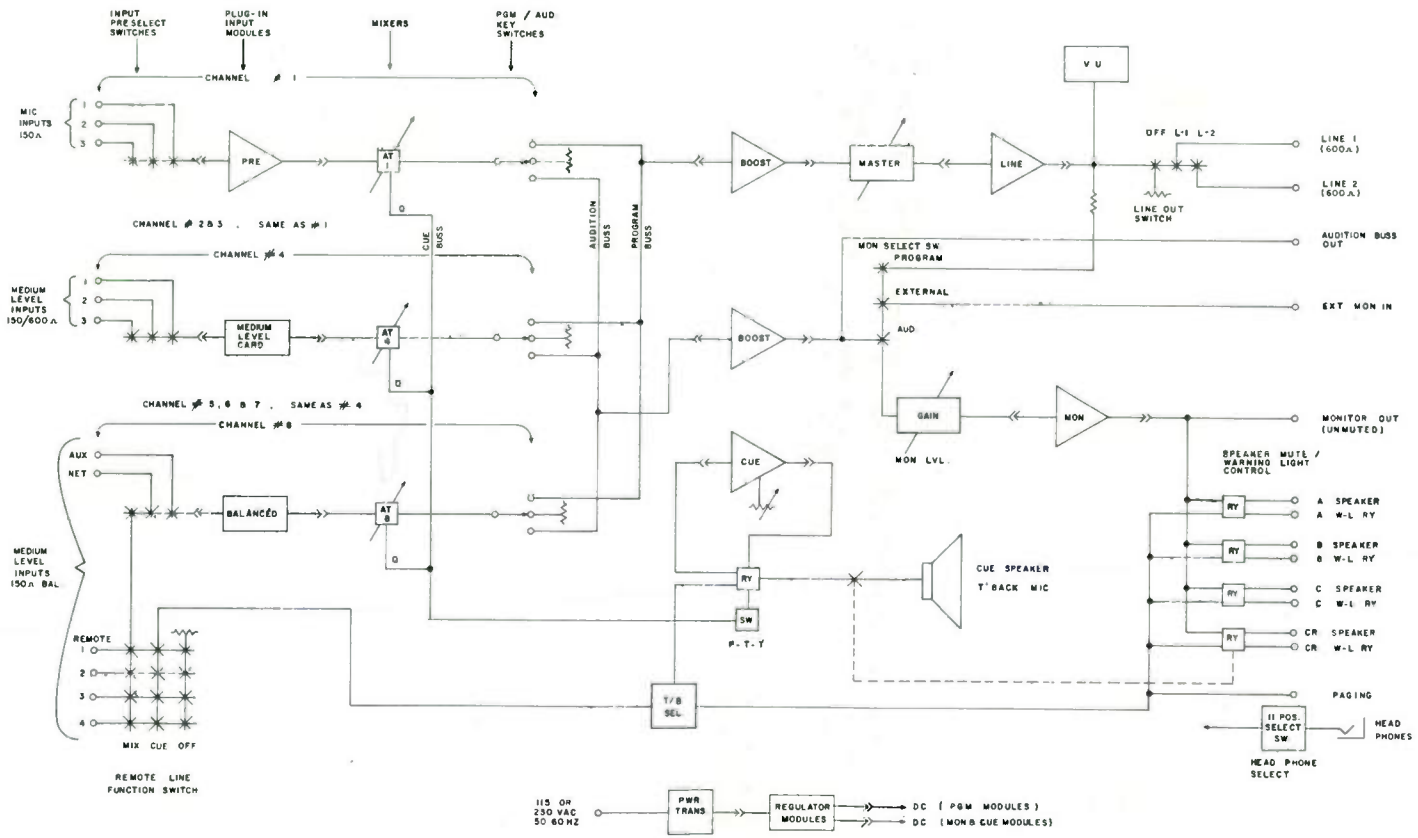
FUNCTIONAL BLOCK DIAGRAM/B-801 monaural console



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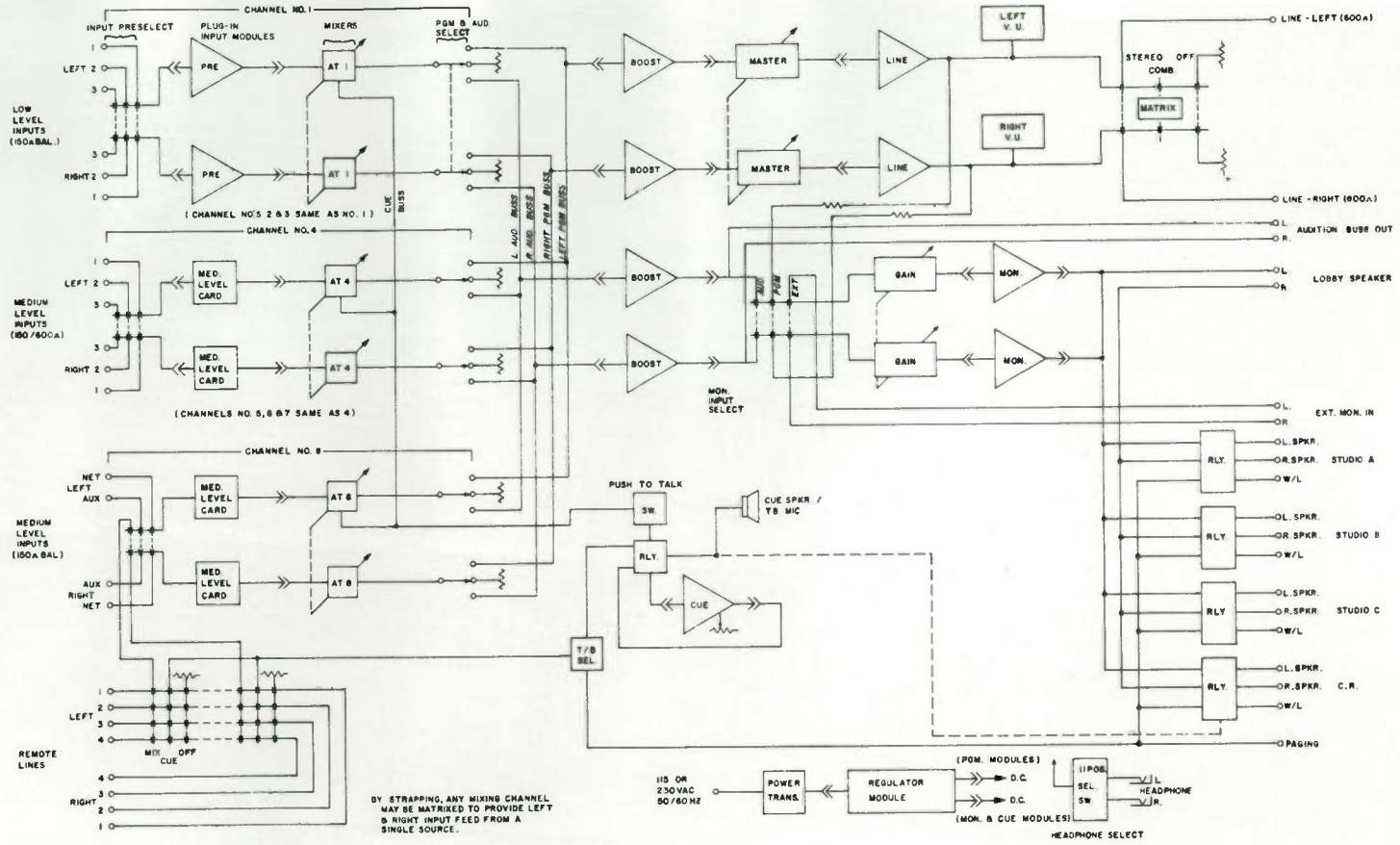
FUNCTIONAL BLOCK DIAGRAM/B-802 stereo console



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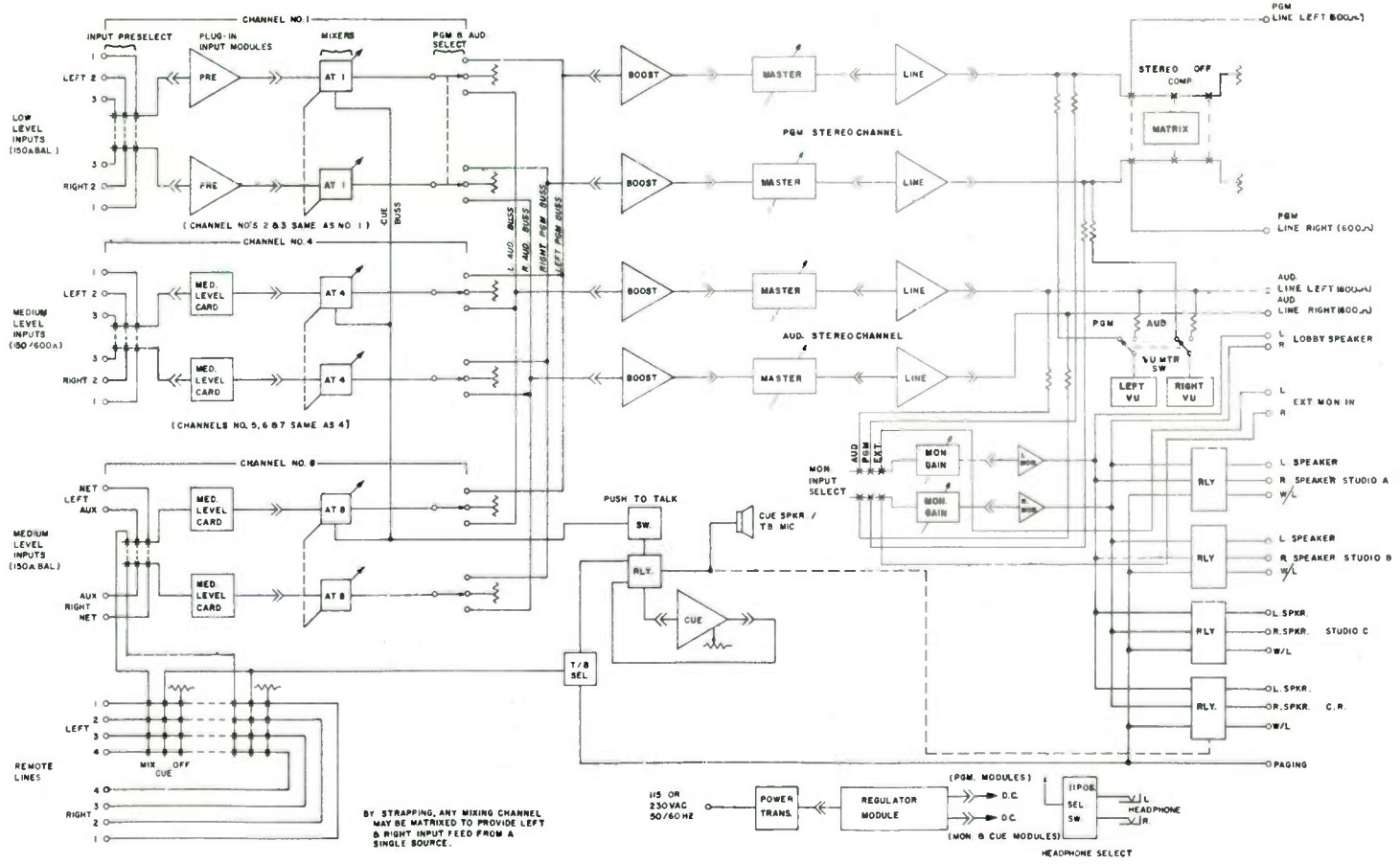
FUNCTIONAL BLOCK DIAGRAM/B-802-S1 dual stereo console



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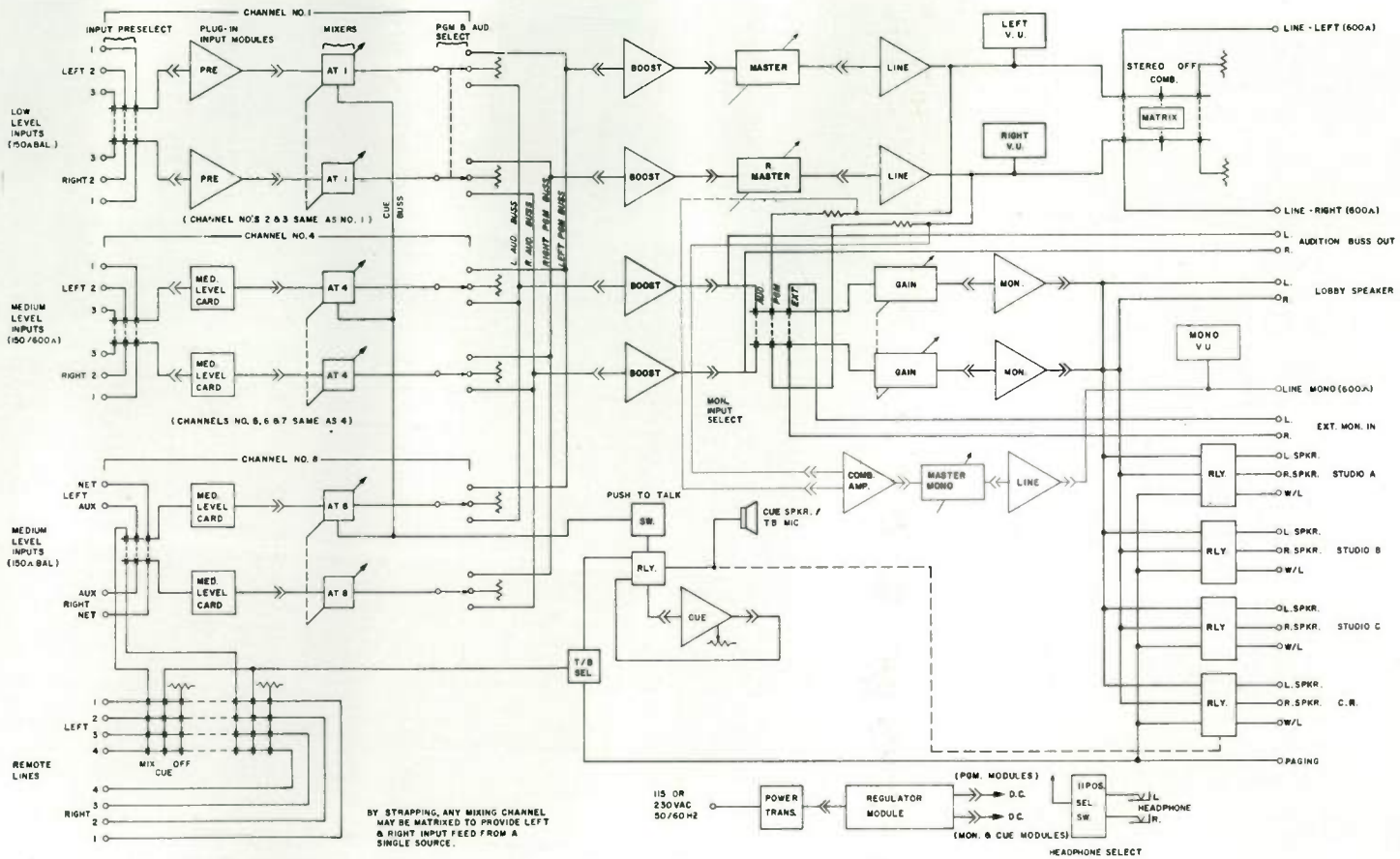
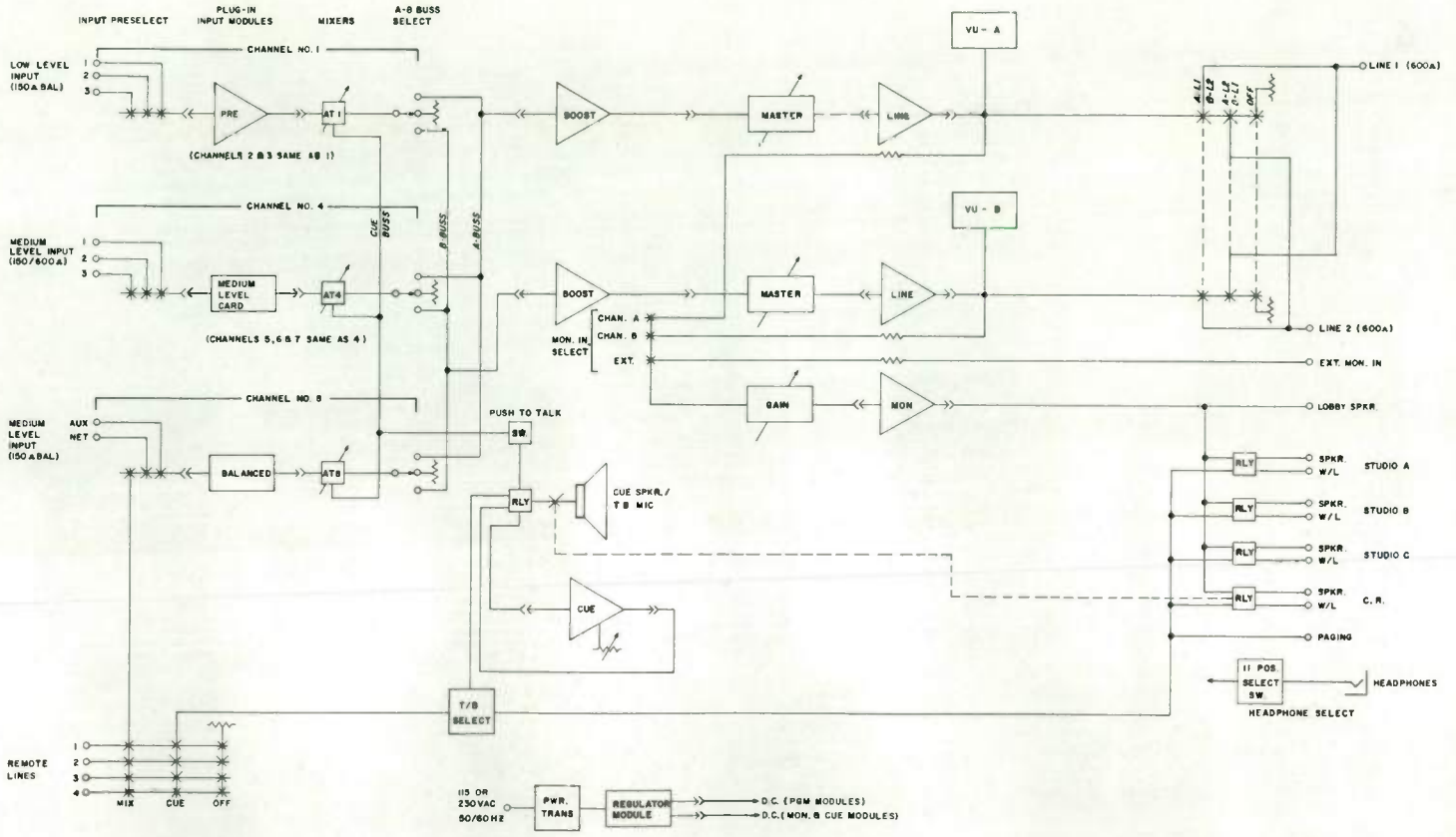
FUNCTIONAL BLOCK DIAGRAM/B-802-S2 stereo/monaural



FUNCTIONAL BLOCK DIAGRAM/B-803 dual channel console



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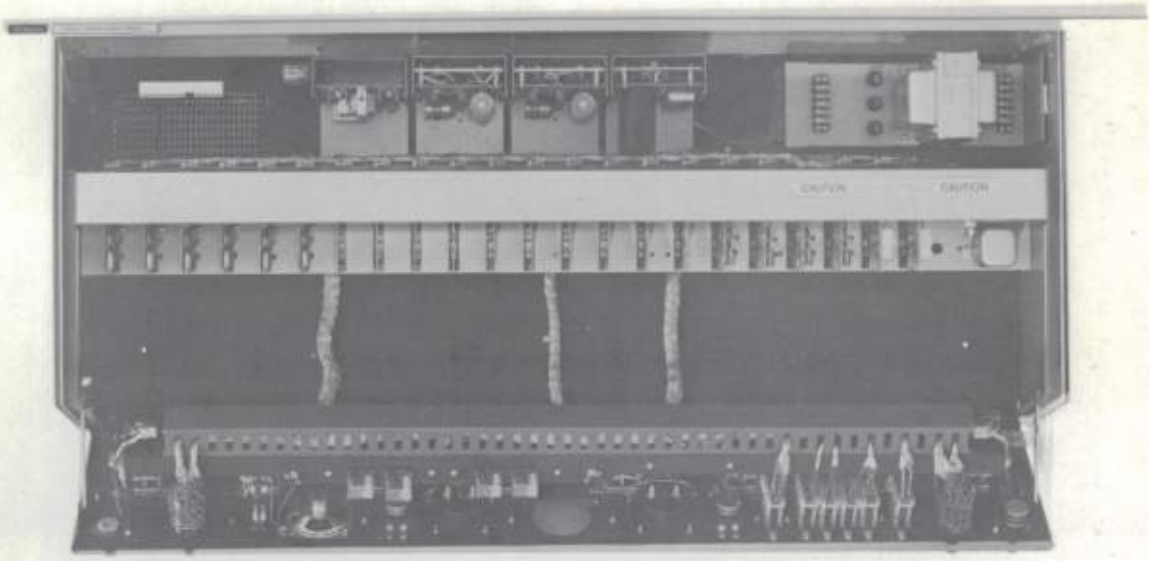

OPEN VIEW/B-802 stereo console

TYPICAL PLUG-IN CAPABILITY/B-800 series

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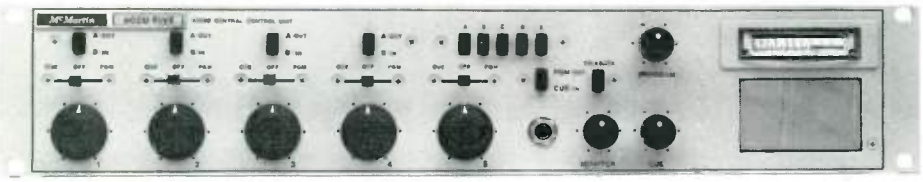
FIVE MIXER AUDIO CENTRAL CONTROL UNIT **ACCU-FIVE**



FULL PROGRAM, MONITOR & CUE FACILITIES
ACCOMMODATES UP TO 13 MICROPHONE INPUTS
HIGH/LOW LEVEL INPUT SWITCHING ON 3 CHANNELS

ALL INPUTS TRANSFORMER ISOLATED
COMPLETELY SILICON SOLID STATE
CUE/TALKBACK CAPABILITY

DESCRIPTION

The McMartin "Accu-Five" five channel mini-console is completely self-contained in a 3½-inch rack-mount unit.

Mixers 1 and 2 are designed to control low level microphone inputs with panel selection of two sources per channel. Loudspeaker muting associated with channel switching for these two mixers is provided.

Mixers 3 and 4 may accommodate either microphone or high level (as from tape devices, turntables, etc.) inputs by means of rear chassis switching. Mixer 5 accommodates five similar type inputs through pre-select pushbutton selection.

All input sources may be previewed by cue bus switching for each channel without disturbing the mixer control positions. A panel mounted cue speaker is driven by the internal cue amplifier. The latter also performs a second function. It serves as a talkback amplifier, permitting communication between the control room and studio. Provision is made for headphone monitoring of program or cue material. When the latter function is used, the cue speaker is muted.

The "Accu-Five", in spite of its compactness, retains truly professional operating parameters. Program output capability is +18dBm with ±1.0dB response and 0.5% or lower harmonic distortion, 30-15000Hz.

The monitor amplifier delivers 4.0 watts rms into an 8-ohm load with ±1.5dB response and 1.0% or less THD at full output, 50-15000Hz.

XL type microphone connectors are used for one each of the two microphone-level inputs to Mixers 1 & 2. All remaining input and output connections are made to screw-type terminals on the rear of the unit.

An illuminated VU meter calibrated for zero-VU deflection when +8dBm appears at the program channel output terminals, permits visual monitoring of the program material.

The "Accu-Five" is ideally suited for broadcast remote or production applications, educational broadcast or training purposes or as the audio complement to closed circuit TV operations.

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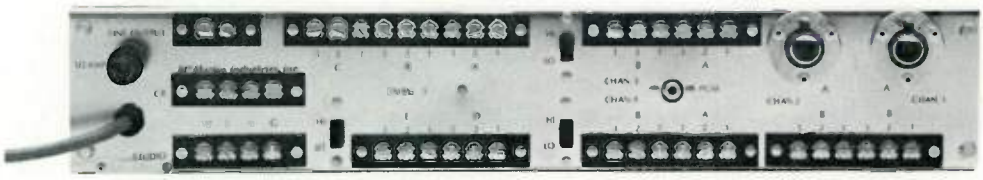

ECIFICATIONS

.OGRAM CHANNEL

Frequency response: ±1.0dB, 30-15,000 Hz

Harmonic distortion: 0.5% or less, 30-15,000Hz @ +18 dBm output and −50dBm signal to any low-level input

S/N ratio: 60dB below +8dBm output produced by −50dBm signal to any low-level input

Overall gain: 100, ±2dB

Input impedances: Low level mode: 150-ohms, balanced
High level mode; 600-ohms, balanced

Input levels: Low level mode: −60dBm nom; −35dBm max.
High level mode: −20dBm nom; +5dBm max.

Output: 600-ohms balanced (transformer isolated) +8dBm nom; +18dBm max.

CROSSTALK
(Cue to Program Channels): Below system noise

MONITOR CHANNEL:

Frequency response: ±1.5dB, 50-15,000 Hz

Harmonic distortion: 1.0% or less, 50-15,000 Hz @ full output

Output level: 4 watts, rms

Output impedance: 8 ohms, unbalanced

GENERAL:

Power requirements: 115/230V AC, 50/60 Hz, 30 watts

Dimensions: (W) EIA Standard 19" rack mount, (H) 3½", (D) 10" overall

Weight: 12 pounds

Finish: McMartin Beige

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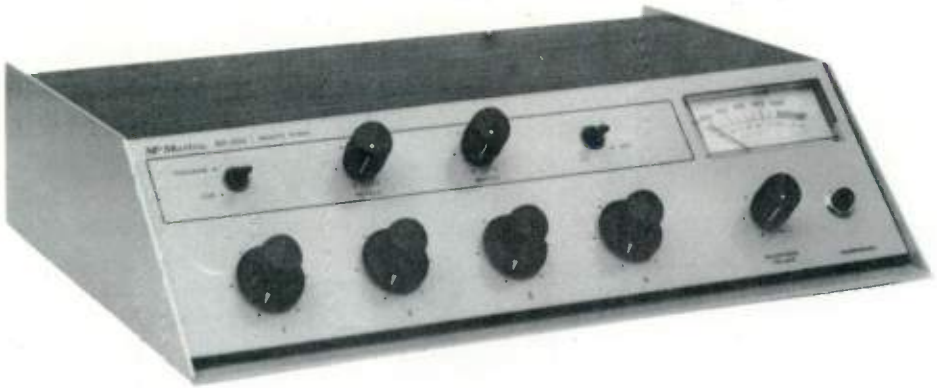
4-CHANNEL REMOTE AMPLIFIER **BR-400**



AC LINE/BATTERY OPERATION
RIAA PHONO OPTION — MIXERS #3 & #4
INBUILT TONE GENERATOR

PA FEED
COMPACT, LIGHTWEIGHT
HEADPHONE AMPLIFIER

DESCRIPTION

The McMartin Model BR-400 four-channel broadcast remote amplifier incorporates extreme flexibility in a lightweight portable package and meets today's stringent requirements for high quality remote broadcasting.

Basically, a four-channel, balanced low-impedance microphone mixer, two of the mixing channels are field convertible to RIAA equalized phono operation, or alternatively, to accommodate balanced line-level inputs. In addition to +8 dBm 600-ohm balanced output, visually-monitored by a front panel VU meter, a PA feed output with independent level control is provided. The BR-400 includes an internal 1000 Hz tone generator for presetting levels.

An isolated headphone amplifier with independent level gain control will accommodate low- as well as high-impedance headphones. This amplifier is switchable to the incoming telephone line where used for remote "cueing" purposes.

The BR-400 is normally powered from 115 Va power; however, it is designed to house an interna battery power supply with automatic changeover tc battery operation in the event of a power line failure. The BR-400 dc supply consists of nine readily-available D-type cells. When rechargeable types are used, the BR-400 provides the means of recharging these by switch operation. Battery life permits approximately 100 hours of continuous operation with half this time if the VU meter lamp, which may be switched off, is used continuously.

The complete assembly is housed in a durable aluminum enclosure. Ready access to batteries and circuitry is afforded by the hinged top cover/front panel construction.

MAR/76

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SPECIFICATIONS

FREQUENCY RESPONSE ..... ±2.0 dB. 20-20,000 Hz (mic or line level input) (±2.0 dB RIAA curve phono service)

TOTAL HARMONIC DISTORTION ..... 0.5% or less, 20-20,000 Hz @ +8 dBm output

INPUT IMPEDANCES ..... 150/250 ohms, balanced. Mixers #3 and #4 switchable to 47K-ohm RIAA mag. phono or 600 ohm balanced input.

INPUT LEVELS ..... −60 dBm (microphone input)
−20 dBm (line input)
2.0 mV, equalized phono input

OUTPUTS

Line out ..... +8 dBm nominal (+18 dBm max) 600 ohms balanced

PA Feed ..... 0.5 volts rms max (adjustable) 5K-ohms unbalanced. (1.0 V into 25K-ohm or higher-Z load)

Headphone ..... +8 dBm max (adjustable) 600 to 20K-ohms unbalanced

HUM & NOISE ..... 62 dB or greater below +8 dBm output (equivalent input noise −122 dBm)

OVERALL GAIN ..... 90, ±2, dB

POWER REQUIREMENTS ..... 115 Vac, 50/60 Hz -or- 13 Vdc, 30 milliamperes, (80 ma with meter illuminated), from internal battery pack (nine D-type cells) or external supply

FRONT PANEL CONTROLS .....
A. ..... Mixer #1 through Mixer #4
B. ..... Master gain control
C. ..... PA feed gain control
D. ..... Headphone level control
E. ..... Cue/program switch
F. ..... Power switch

REAR PANEL CONTROLS .....
A. ..... Tone generator on/off
B. ..... RIAA Eq./flat response (Mixers #3 & #4)
C. ..... Mic/Line impedance (Mixers #3 & #4)
D. ..... Battery on/off charge
E. ..... Meter lamp on off
F. ..... Battery test button

DIMENSIONS ..... 14" W x 3.5" H x 10.5" D (35.6 x 8.9 x 26.7 cm)

WEIGHT ..... 6.5 pounds, 8.0 pounds with batteries

FINISH ..... McMartin beige with woodgrain trim

ORDERING INFORMATION

Model BR-400 ..... 4-channel remote amplifier (Supplied less D-cell batteries, which are readily available in the field)

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McMartin

RIAA EQUALIZED PHONO PREAMP

B-200B/
B-200U

- **MONO OR STEREO**
- **HI/LO FILTERS**
- **BALANCED OR UNBALANCED OUTPUT OPTIONS**

DESCRIPTION

The McMartin B-200 turntable preamplifier for use with either mono or stereo magnetic phono cartridge inputs is suitable for professional, high-performance applications.

The B-200 is completely self-contained. Its frequency response characteristics conform, within 1 dB, with the standard RIAA curve.

Its excellent stereo crosstalk performance is such that a single B-200 unit may be used for preamplification of two separate mono sources. Both "high" and "low" filters may be switch selected. The "high" filter produces 15 dB attenuation at 20 kHz. The "low" filter attenuates 20 Hz signals by 10 dB.

Individual RCA phono input jacks are provided, with individual channel preset level controls. The outputs are terminated on barrier-type screw terminals.

Individual models for balanced (B-200B) or unbalanced (B-200U) 600-ohm output applications are available.

SPECIFICATIONS

FREQUENCY RESPONSE	±1.0 dB of RIAA curve
DISTORTION	less than 0.25% at +8 dBm output; (20-20,000 Hz)
NOISE LEVEL	−108 dBm equivalent input noise at 1,000 Hz
CROSSTALK	−55 dB @ 15,000 Hz −65 dB or greater @ 1,000 Hz
INPUT IMPEDANCE	47 K-ohms, resistive
INPUT SENSITIVITY	2.5 mV @ 1,000 Hz for +8 dBm output (overload: −20 dBV @ 1,000 Hz)
OUTPUT IMPEDANCE	
(B-200B)	600 ohms, balanced
(B-200U)	600 ohms, unbalanced
OUTPUT LEVEL	+18 dBm, max.
HIGH FILTER ATTENUATION	−15 dB @ 20,000 Hz
LOW FILTER ATTENUATION	−10 dB @ 20 Hz
POWER REQUIREMENTS	115 Vac, 50/60 Hz, 5 watts
DIMENSIONS	2⅜" H x 4⅛" W x 11½" D (6 x 10.5 x 29.2 cm)
SHIPPING WEIGHT	4 pounds
ORDERING INFORMATION	B-200B, 600-ohm balanced output B-200U, 600-ohm unbalanced output

FEB/76

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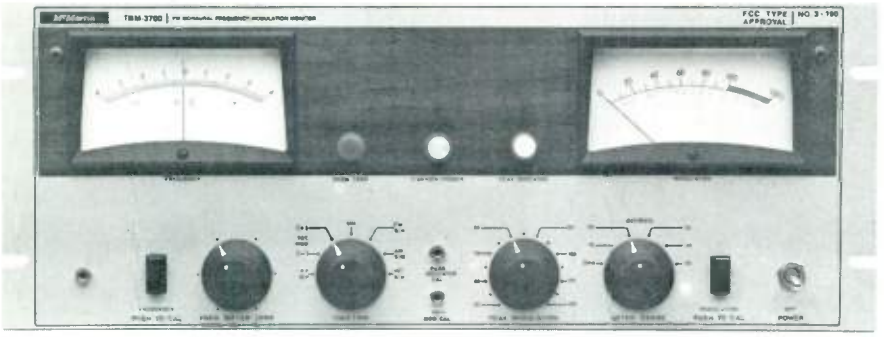
FM FREQUENCY/MODULATION MONITOR — TBM-3700



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).

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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 ±0.2dB (50-100,000 Hz)

MODULATION METER:

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

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

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

FREQUENCY METER:

Scale ..... ±4kHz, 100Hz increments

Accuracy ..... Better than ±500 Hz

REMOTE METERING:

Modulation — up to 2,500 ohms external loop resistance may be accommodated. Requires RM-37-T 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

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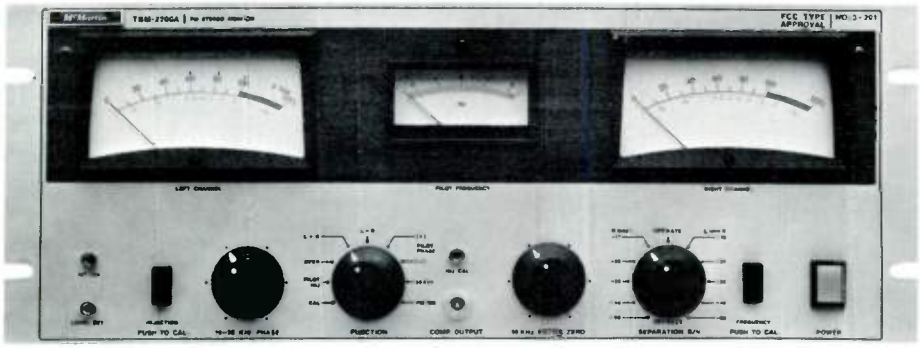
STEREO MODULATION/FREQUENCY MONITOR TBM-2200A



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.

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The FCC type approval number is 3-201.

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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 external 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

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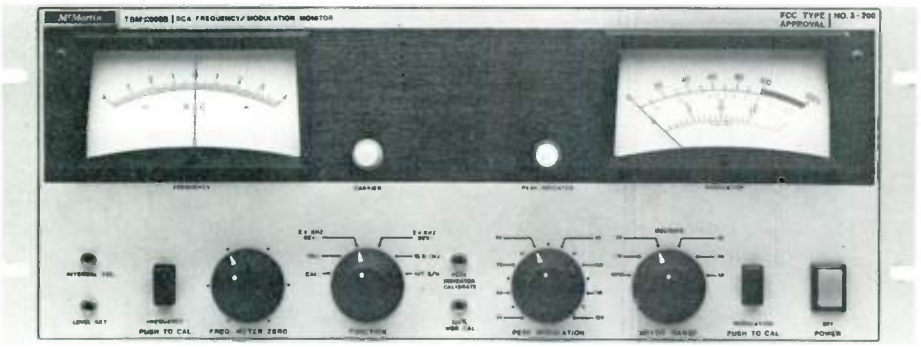
SCA FREQUENCY/MODULATION MONITOR TBM-2000B



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 additional 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 de-activated 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.

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The FCC type approval number is 3-200.

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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: ±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

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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.

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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-3500B ..... FM Modulation Monitor
LL-35B ..... Low Level input Card
RM-35B ..... Remote Modulation Meter Panel

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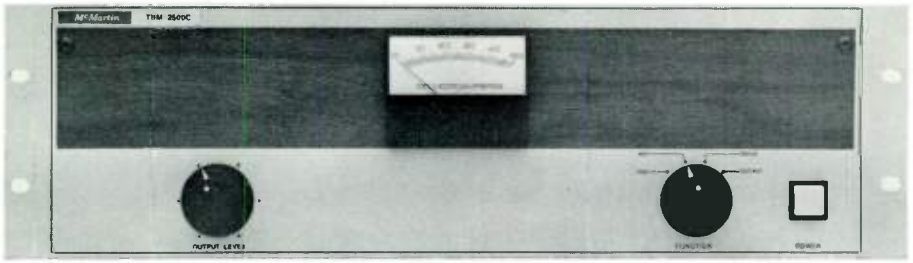
SOLID STATE RF AMPLIFIER **TBM 2500-C series**



TBM-2500-C: FM BAND
TBM-2500-CL: TV-CH 2-6
TBM-2500-CH: TV-CH 7-13

FULLY METERED
ULTRASTABLE OPERATION
AGC LEVEL CONTROL

DESCRIPTION

The TBM-2500-C, -CL and -CH are designed to amplify off-air signals in the FM and VHF-TV frequency ranges to a level suitable for driving FCC Type-Approved frequency and modulation monitoring equipment located at sites remote from the transmitter.
Utilizing essentially identical circuitry, the three models perform this function with minimum degradation of the transmitted signal and its sidebands.
Excellent passband and skirt selectivity characteristics of a special IF filter insure optimum response to the desired signal and rejection of interfering signals.
A sum and difference oscillator injection technique is used so that a zero operating-frequency error results.
The models incorporate AGC circuitry to maintain constant output signal with input signal variations over a 45 dB range. This, in conjunction with excellent limiter action, minimizes signal amplitude variations resulting from propagation effects or "flutter" generated by signal reflections caused by passing aircraft.
Metering of injection voltage, AGC bus voltage, RF drive and RF output is provided.
0.5 watts output (0.2 for the TBM-2500-CH) is developed with a 500-microvolt input signal, with complete limiting.
Although designed for specific use with the complete McMartin line of FM and VHF-TV FCC Type Approved monitoring equipment, the TBM-2500-C series RF amplifier will drive any of the current monitors regardless of manufacture.

SPECIFICATIONS

OPERATING RANGES:	
TBM-2500-C	88-108 MHz
TBM-2500-CL	TV Channels 2-6
TBM-2500-CH	TV Channels 7-13
SELECTIVITY:	290 kHz @ 3 dB points 60 dB down at 800 kHz
SENSITIVITY:	
TBM-2500-C	500 microvolts at antenna input produces 0.5 watts output and full limiting
TBM-2500-CL	Same as TBM-2500-C
TBM-2500-CH	500 microvolts at antenna input produces 0.2 watts output and full limiting
LEVEL, Input Overload	100,000 microvolts
LEVEL, Maximum Output	
TBM-2500-C	0.5 watts
TBM-2500-CL	0.5 watts
TBM-2500-CH	0.2 watts
IMPEDANCES:	
Input	50 ohms, unbalanced (BNC connector)
Output	50 ohms, unbalanced (BNC connector)
AGC RANGE:	45 dB
POWER REQUIRED	115/230 VAC, 50/60 Hz, 15 watts
DIMENSIONS:	19 (W) x 5¼" (H) x 10 (D)
WEIGHT:	10 pounds
CONTROLS, FRONT PANEL:	Power on/off; output level; Metering, (1)OSC; (2)AGC; (3)Drive; (4)Output

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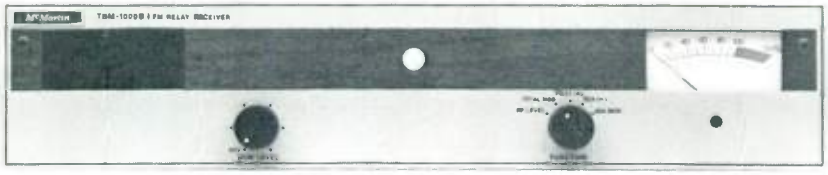
FM RELAY RECEIVERS **TBM-1000B series**



MODELS FOR FM, VHF-TV & STL SERVICE
IMPROVED FRONT-END SELECTIVITY
STEREO/SCA PLUG-IN OPTIONS

SILICON SOLID STATE
FULLY METERED
PANEL-MOUNTED SPEAKER

DESCRIPTION:

Incorporating the latest state-of-the-art devices and design techniques, this new generation of FM Relay Receivers supersedes the performance-proved TBM-1000A Series.

A full family of models include the TBM-1000B for single-channel FM broadcast band operation, 88 to 108 MHz; the TBM-1003A for Channel 2 through 13, VHF-TV aural service; the TBM-1001B for 150 MHz operation; and the TBM-1005A for switch-selectable, 5-channel reception in the 88-108 MHz range.

The new TBM-1000B Series incorporates improved front-end selectivity. The RF amplifier uses a dual-gate, diode-protected MOSFET with delayed AGC operation over a 45 dB range.

A carrier-actuated relay, with SPST contact closures terminated on the rear chassis, is standard equipment.

The new TBM-1000B Series receiver can provide stereo and/or SCA outputs by simple insertion of optional plug-in cards. Two cards may be accommodated. The STE-1 stereo card provides +8 dBm, 600-ohm balanced audio output of left-and-right-channel information. The SCA-2 card delivers +8 dBm, 600-ohm balanced audio ouput. Design is such that, with no internal wiring changes, combinations of card options may be used to provide stereo only, stereo plus 67 kHz SCA, a single 67 or 41 kHz SCA, or simultaneous 67 kHz and 41 kHz SCA outputs.

Front panel switch selection permits metering of RF levels down to 2 or 3 microvolts input; peak modulation metering—and when the STE-1 and/or SCA-2 cards are used, full-scale metering of 19 kHz pilot carrier and SCA injection levels.

Loudspeaker monitoring of main channel audio (mono or L+R stereo) and SCA audio is provided.

IF selectivity for the standard model is nominally 280 kHz at the 3dB points and at the 50 dB rejection point is typically ±475 kHz. For applications requiring additional selectivity, an optional narrow-band plug-in filter, the NB-1, is available. By adding the NB-1, the IF bandwidth at the 3dB points is nominally 230 kHz, with typical bandwidth characteristics of ±225 kHz at the 50dB rejection point.

Adjustable squelch control of both main and SCA channel signals is provided.

The TBM-1005A, five-channel model, features front panel selection of up to five frequencies in the 88-108 MHz range. All RF circuitry switching and tracking is performed using varactor tuning techniques. No switch contacts are used in RF circuits and lead lengths involved in conventional RF switching methods are eliminated. Each channel frequency may be peaked by adjustment of a single trimmer-type potentiometer.

The TBM-1000B Series Receivers are rack-mounted and styled in beige with wood-grain trim.

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SPECIFICATIONS

MAIN CHANNEL

FREQUENCY RANGES:
- TBM-1000B ..... 88-108MHz single crystal controlled frequency
- TBM-1001B ..... 150 MHz band
- TBM-1003A ... VHF-TV channels 3-13 (aural carriers)
- TBM-1005A ..... 88-108 MHz (any five frequencies)

SENSITIVITY: (for 30dB quieting)
- TBM-1000B ..... 1.5 microvolts
- TBM-1001B ..... 3.0 microvolts
- TBM-1003A . 1.5 microvolts (CH 2-6), 5.0 microvolts (CH-7-13)
- TBM-1005A ..... 1.5 microvolts

SELECTIVITY: .... Standard, ±140 kHz @ 3dB point; ±475 kHz @ 50 dB point. With optional NB-1 plug-in filter: ±115 kHz @ 3dB point, ±225 kHz @ 50 dB point.

DE-EMPHASIS: ..... 75 microseconds (±1.0dB)

ANTENNA INPUT IMPEDANCE: .... 50 ohms unbalanced (BNC connector)

PROGRAM AUDIO OUTPUT: ..... Monaural (or left and right channels with the optional STE-1 card).

- **Level:** ..... +8 dBm (min) @ 100% modulation, 400 Hz
- **Load impedance:** ..... 600 ohms, balanced
- **Harmonic distortion:** ..... 0.75% or less (50-15000 Hz) standard model; 1.0% or less (50-15000 Hz) with NB-1 optional filter.
- **Frequency response:** ..... ±1.0 dB (20-15000 Hz)
- **S/N ratio:** ..... 65 dB or greater below 100% modulation, 400 Hz.

COMPOSITE OUTPUT: (with 10% injection level)

- **Level:** ..... 2.5 volts, peak-to-peak, max, (adjustable)
- **Impedance:** ..... 5,000 ohms
- **Frequency response:** ..... ±1.0 dB (20-75,000 Hz)

SUBCHANNEL: (with optional SCA-2 card)

OPERATING FREQUENCIES: 41 or 67 kHz (other frequencies available on special order with possible change in specifications).

DEVIATION: ... ±6 kHz equals 100% modulation

SENSITIVITY: ..... 7.5 microvolts for 30 dB quieting

S/N RATIO: ..... 60 dB below 100% modulation, 400 Hz (at injection levels of 15% and 10% for 41 or 67 kHz subcarriers, respectively).

DE-EMPHASIS: ..... 150 microseconds

SELECTIVITY: ..... ±8 kHz @ 3 dB points

AUDIO OUTPUT(S): (two SCA-2 cards may be accommodated)

- **Level:** ..... +8 dBm (min) @ 100% modulation, 400 Hz
- **Load impedance:** ..... 600 ohms, balanced
- **Harmonic distortion:** ..... 67 kHz SCA, 1.0% or less (30-7500 Hz) +6 kHz deviation. 41 kHz SCA, 2.0% or less (30-5000 Hz) ±4 kHz deviation.
- **Frequency response:** ..... 67 kHz SCA ± 1.5 dB (30-7,500 Hz). 41 kHz SCA ±1.5 dB (30-5,000 Hz)

GENERAL

POWER REQUIREMENTS: 120/240 VAC, 50/60 Hz, 25 watts

AMBIENT TEMPERATURE: ..... 10-50°C

DIMENSIONS: .... (w) 19" EIA standard rack mount, (h) 3½", (d) 12" overall behind panel

PLUG IN ACCESSORIES:

- **STE-1:** ..... Stereo demodulator card
- **SCA-2:** ..... SCA demodulator card (specify frequency)
- **NB-1:** ..... Narrow band filter

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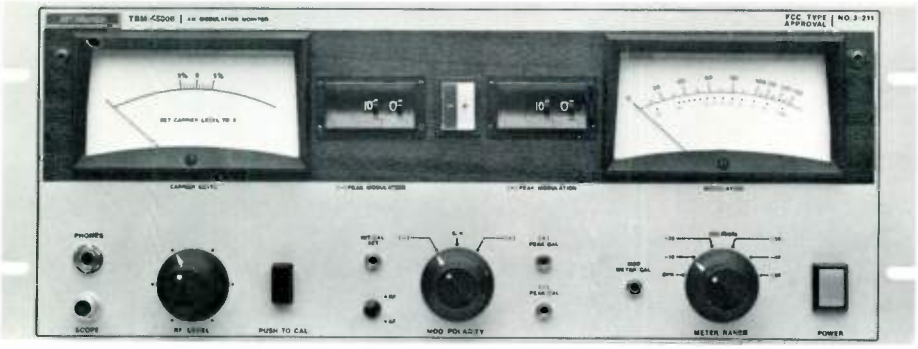
AM MODULATION MONITOR — TBM-8500B



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 accessiblity 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 remoting 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.

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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)

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AM RF AMPLIFIER

RF-85B

MINIMUM ENVELOPE DISTORTION

AUTOMATIC GAIN CONTROL

REMOTE/LOCAL POWER CHANGE SWITCHING

1.0 MILLIVOLT SENSITIVITY

CARRIER FAILURE ALARM

MOD/FREQ MONITOR OUTPUT

DESCRIPTION

The McMartin Model RF-85B AM RF amplifier is intended for off-air operation of FCC Type Approved AM modulation/frequency monitors.

Special attention has been placed on amplifying the incoming signal with minimum disturbance of the modulation envelope. This includes consideration of providing adequate reserve amplification to accommodate signals with positive modulation peaks in excess of 100%.

The RF-85B uses Class A amplification through the modulation monitor drive circuitry. The frequency monitor output is heavily limited to strip the modulation and produces an approximately square wave output.

The AGC is effective over a 30 dB input signal range and maintains the output level within 0.5 dB for this wide variation in input level.

A high-low panel switch, remotable through an external contact closure, accommodates dual power situations. The RF-85B is equipped with a carrier-failure relay which operates on carrier interruptions of one second or longer duration. The relay contacts are terminated for connection of external visual or aural alerting devices.

SPECIFICATIONS

FREQUENCY RANGE: .....540-1600 kHz

INPUT SENSITIVITY: .....1.0 millivolts, minimum

INPUT IMPEDANCE: .....50 ohms unbalanced, nominal

SELECTIVITY: .....down 1.0 dB or less, ±10 kHz
down 40.0 dB or greater, ±40 kHz

S/N RATIO: .....50 dB or greater below 100% modulation (with 1.0 millivolt input signal)

AGC RANGE: ..... 30 dB variation in input level produces less than 0.5 dB output level change

OUTPUTS

Modulation Monitor: ...0 to 0.5 watts, unmodulated carrier, 50 ohms

Frequency Monitor: ...5 volts, peak-to-peak, square wave, 1K-ohm

TEMPERATURE RANGE: .....0° to 50° Celsius

REAR CHASSIS TERMINATIONS: .....1. Input (BNC)
2. Mod. Mon. out (BNC)
3. Freq. Mon. out (BNC)
4. Carrier failure alarm
5. Remote power level switching

POWER REQUIRED: .....117 Vac, 50/60 Hz

DIMENSIONS: .....EIA standard rack,
19" (48.3 cm) width
5¼" (13.3 cm) height
10" (25.5 cm) depth

WEIGHT: .....10 pounds

FINISH: ..... McMartin Beige with woodgrain trim

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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 1¾" 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 μV/30 dB quieting	30 μV/20 dB S/N @ 30% mod.
SELECTIVITY	3 dB point: 280 kHz 50 dB point: 950 kHz	6 dB point: ±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 inp
AF RESPONSE	±1.0 dB, 30-15000 Hz	±1.0 dB, 50-5000 Hz; ±3.0 dB 5-10 k
AUDIO OUTPUTS	0 dBm, 600 ohms bal., and 1.0 V 600 ohms unbal.	
POWER REQUIRED	115 Vac, 50/60 Hz, 6 watts	
DIMENSIONS	19" (48.3 cm) width 1¾" (4.45 cm) heig 5" (12.7 cm) dep	
REAR CHASSIS TERMINATIONS	Antenna (BNC); Balanced audio out; unbal. audio out; Relay contacts (n.o.)	
FINISH	McMartin beige with woodgrain trim	

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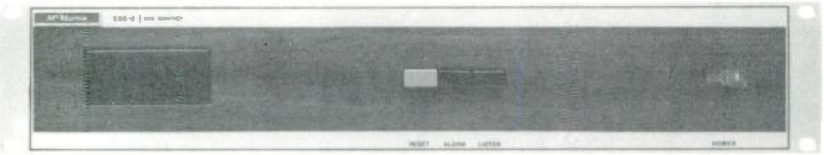
EBS TWO-TONE MONITOR — EBS-2



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 trans ed EBS message to its loudspeaker output. The E has three front-panel pushbutton switches. - locked 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 outpu due to tampering or inadvertent misadjustme Provision is made for the connection of ext. 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

DIMENSIONS: ..... EIA standard rack 19" (48.3 cm) widt 3½" (8.9 cm) height 6" (15.3 cm) depth

FRONT PANEL FINISH: ..... McMartin beige with woodgrain trim

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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%, ±5% modulation 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) wide
3½" (8.9 cm) high
6" (15.3 cm) deep

FINISH: ..... McMartin beige with woodgrain trim

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TRANSISTOR AMPLIFIERS, 10-15 watts **LT-80C/108C**

10-15 WATTS RMS POWER OUTPUT
LOW PROFILE 3½" HIGH
BALANCED LOW Z MICROPHONE INPUT
MICROPHONE/PROGRAM INPUTS

BUILT-IN ELECTRONIC MUTING (LT-80C)
ELECTRONIC SHORT CIRCUIT PROTECTION
ALL SILICON DESIGN
SINGLE/DUAL RACK MOUNT OPTIONS

DESCRIPTION

The LT-80C and 108C are conservatively rated wide power-bandwidth 10-15 watt rms audio amplifiers. They are designed for system sound applications requiring one microphone and one program source. As many as twenty speakers (tapped ½ watt) may be driven from the 25 or 70.7 volt balanced output, or a single four-ohm speaker system may be driven to a full 15 watts rms from the unbalanced output.

The microphone input is standard balanced low impedance 50/150 ohms with −60 dBm input sensitivity and 30 dB dynamic range. A three pin XL female connector is provided for microphone termination on the LT-80C. Screw terminal input connection is provided on the 108C.

The LT-80C features a fully electronic page mute system. Actuation of a simple single pole, single-throw switch closure at the microphone location automatically mutes the program channel and energizes the microphone channel for paging purposes. This switching operation is completely free of clicks and pops.

The program channel input is unbalanced 25K ohms with 300 millivolt sensitivity. An optional plug-in transformer card, Model MT-3, provides for balanced bridging or 600-ohm matching inpu a sensitivity of −10 dBm. Input termination is screw terminals or pin connector for the u anced inputs, and screw terminals for bala input.

A 20 dB treble-cut tone control is provide high-end roll off of the program channel. The m phone input is wired for 10 dB bass roll-off voice quality and may be field modif response. On the LT-80C, the tone the front panel and in the 108C is a recessed screwdriver adjusted contro gain limit control may be field inst the range of the front panel controls.

Screw terminal output termination allo nection of unbalanced loads from 4 to 1 Balanced 25 volt (62.5 ohm) and 70.7 volt ohm) outputs are also provided. Continuous circuit operation of any output will not dar transistors or the power supply.

Attractive, low profile packaging, with the capability of single or dual-unit optional rack mounts, make the LT-80C and 108C even more flexible in application.

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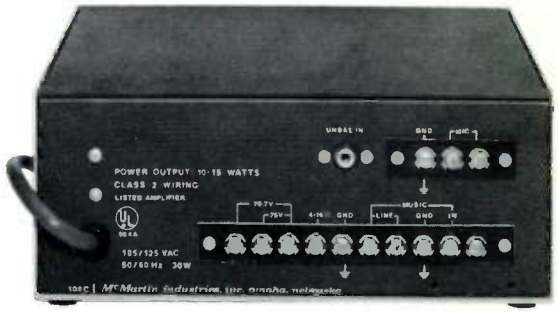

SPECIFICATIONS

	LT-80C	108C
POWER OUTPUT:	10 watts rms—16 ohms unbalanced; 25/70.7 volt balanced line 12.5 watts rms—8 ohms unbalanced 15 watts rms—4 ohms unbalanced	
FREQUENCY RESPONSE:	±1 dB, 50-15,000 Hz	
DISTORTION:	1% or less, 50-20,000 Hz at 12.5W output	
HUM & NOISE:		
MIC:	60 dB below 10 watts output	
PGM:	70 dB below 10 watts output	
OUTPUTS:	4/8/16 ohms unbalanced; 25/70.7 volt balanced line	
PROGRAM/LINE INPUT:	25K-ohm unbalanced, 600 ohms balanced with optional MT-3 plug-in card	
PROGRAM/LINE SENSITIVITY:	300 millivolts, 25K ohm unbalanced input. −10 dBm (balanced 10K ohm bridging with MT-3 plug-in card.) 0 dBm (balanced 600-ohm matching with MT-3 plug-in card.)	
RATING TEMPERATURE:	to 150°F (66°C)	
OVERLOAD PROTECTION:	Solid state protection circuit samples output stage current and disables input signal during excessive loading condition	
POWER REQUIRED:	115 Vac, 50/60 Hz, 30 watts (Primary taps for 105 and 125 Vac)	
MIC INPUT:	150 ohms balanced	
MIC TERMINATION:	XL Connector	Screw terminals
MUTING:	Electronic muting of microphone and program circuits	None
RESPONSE EQUALIZATION:	Front panel treble cut tone control (−20dB at 20kHz)	Front panel screwdriver adjustment treble cut tone control (−20dB at 20kHz) Microphone bass cut(−10dB at 50Hz). Flat response possible by change of one capacitor.
DIMENSIONS:	8½"W x 7¼"D x 3½"H (21.6 cm W x 18.4 cm D x 8.9 cm H)	
FINISH:	McMartin Blue and gray	
SHIPPING WEIGHT:	4 pounds (1.81 kg)	

OPTIONAL ACCESSORIES:

MT-3	Plug-in program channel matching/bridging line input card
MRP-3	Single unit rack mounting kit 3½" x 19" EIA standard rack (8.8 cm H x 48.3 cm W)
MRP-4	Dual unit rack mounting kit (two units may be rack mounted, side by side) 3½" x 19" EIA standard rack (8.8 cm H x 48.3 cm W)

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25 WATT POWER AMPLIFIER LT-250C

LESS THAN 1% DISTORTION • 40 - 20,000 Hz FULL POWER FREQUENCY RESPONSE
CURRENT SENSING OVERLOAD PROTECTION • BALANCED 70.7 & 25 VOLT OUTPUTS
BASS CUT SWITCH FOR HORN SPEAKER USE • UNBALANCED 4, 8, & 16 OHM OUTPUTS

DESCRIPTION

The LT-250C is a 25 watt rms silicon solid-state transistorized amplifier designed for low distortion output over a full power bandwidth of 40-20,000 Hz. The low frequency response of the amplifier can be extended to 20 Hz when operated with the field convertible direct coupled output.

This basic amplifier utilizes plug-connected circuit board construction, with power transistors and power supply components mounted and placed for maximum accessibility. Computer grade capacitors, conservatively-rated transformers and heat sinks contribute to maximum performance and reliability.

The LT-250C accommodates either an unbalanced high impedance or a 600 ohm balanced program input. The balanced input utilizes a transformer, factory wired for 600 ohms matching. It is easily field modified for 10K ohms bridging without additional components.

The front panel program gain control may be transferred to the rear panel where that location is preferred.

The LT-250C amplifier features an overload protection, fast-acting current-limiting electronic circuit that automatically disables amplifier drive should a potentially harmful overload occur.

The LT-250C amplifier has 70.7 V and 25 V balanced outputs, plus 4, 8, and 16 ohm unbalanced output. Input and output connections are on convenie screw terminals.

The amplifier output may be directly couple an 8 ohm load. When so operated, the low-frequency response is extended to 20 Hz.

A rear-panel mounted bass cut switch tailors amplifier response (14 dB down at 100Hz) in ins lations where horn speakers are utilized.

The LT-250C, styled in McMartin beige with com plementary leather grain accent, is designed fo direct mounting in a 19" rack. An attractive des top cabinet is available.

LT-250C — continuing the excellence in solid-state amplifiers pioneered by McMartin Industries.

JUNE/74

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World Radio History

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SPECIFICATIONS

POWER OUTPUT	25 watts rms 35 watts music 50 watts peak
FREQUENCY RESPONSE	±1 dB 40-20,000 Hz ±1 dB 20-20,000 Hz direct coupled output
DISTORTION	Less than 1% (40-20,000 Hz) at RPO and below
HUM AND NOISE (Program)	85 dB below RPO
PROGRAM INPUT	Unbalanced 25K ohms, and balanced 10K ohms bridging or balanced 600 ohms matching
INPUT SENSITIVITY	0.4 volts unbalanced 0 dBm 600 ohms matching −10 dBm 10K ohms bridging
OUTPUTS	Balanced 70.7 volts and 25 volts; Unbalanced 4, 8, and 16 ohms; Unbalanced 8 ohm direct output
CONTROLS	Program gain power on/off
POWER REQUIRED	105-115 Vac or 115-125 Vac 50/60 Hz 75 watts
DIMENSIONS	3½" (8.9 cm) high 19" (48.3 cm) wide 5¾" (14.5 cm) deep
WEIGHT	11 lbs. Shipping weight 13 lbs.
OPERATING TEMPERATURE	Full performance to 150° F (65° C)
FINISH	McMartin beige with leather grain trim

ORDERING INFORMATION

LT-250C	25 watt rms basic amplifier
ACCESSORIES	
DTC-1	Desk top cabinet; 3½" (8.9 cm) high 19¼" (48.9 cm) wide 9¼" (23.5 cm) deep

All tests conducted in accordance with EIA Standard SE-101-A where applicable.

ARCHITECTS' & ENGINEERS' SPECIFICATIONS

The amplifier shall be a McMARTIN LT-250C, or approved equal. It shall be of all silicon solid-state construction and capable of 25 watts rms, 35 watts music, 50 watts peak power output. Only amplifiers meeting all three wattage ratings will be accepted. The amplifier shall have less than 1% distortion at rated output and below. The frequency response shall be ±1 dB 40-20,000 Hz with a transformer output, and ±1 dB 20-20,000 Hz with a field strappable direct 8-ohm output. The amplifier noise shall be at least 85 dB below signal at the rated power output. The amplifier shall be designed to operate continuously on line voltages of 105 to 125 Volts, 50/60 Hz over a temperature range of 0° to 150° F. (−18° C to 65° C). The amplifier shall be equipped with a current sensing overload protection circuit that will remove audio drive from the amplifier should an overload or short circuit develop. This protection circuit shall restore the amplifier in one millisecond when the short or overload is removed.

Only amplifiers offering this type of protective circuits shall be acceptable.

The amplifier shall be capable of accepting either a balanced or unbalanced program input without the installation of additional equipment. A transformer shall be permanently installed in the amplifier to accommodate 10K ohm and 600 ohm balanced line inputs, both matching and bridging shall be available. Screw terminals shall be provided for balanced inputs.

The amplifier shall have outputs of 4, 8, and 16 ohms unbalanced, and 70.7 V and 25 V balanced. The balanced circuits shall be capable of being balanced to ground, or floating balanced. A bass cut switch shall be provided that shall attenuate the bass in the output. A 14 dB cut at 100 Hz will be required. Screw type terminals shall be provided for all outputs. A direct coupled 8 ohm output shall be available by strapping the rear panel connector, and the direct coupled output shall provide extended low frequency response down to 20 Hz.

The amplifier shall be equipped with a program gain control, and an illuminated power on/off switch.

The amplifier shall have an unswitched 115 volt 3 wire grounded accessory outlet.

The amplifier shall be McMartin beige with a leather grain trim.

The amplifier shall be capable of being directly mounted in a 19" relay rack, and shall be ☐ supplied with, ☐ capable of being housed in a complementary appearing desk top housing.

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50 WATT POWER AMPLIFIER LT-500C

LESS THAN 1% DISTORTION

40 - 20,000 Hz FULL POWER FREQUENCY RESPONSE

UNBALANCED 4, 8, & 16 OHM OUTPUTS

CURRENT SENSING OVERLOAD PROTECTION

BASS CUT SWITCH FOR HORN SPEAKER USE

BALANCED 70.7 & 25 VOLT OUTPUTS

DESCRIPTION

The LT-500C is a 100 watt rms solid-state transistorized amplifier designed for low distortion output over a full power bandwidth of 40-20,000 Hz. The low frequency response of the amplifier can be extended to 20 Hz when operated with the field convertible direct coupled output.

The amplifier utilizes plug-connected printed circuit board construction, with power transistors and power supply components mounted and placed for maximum accessibility. Computer grade capacitors, conservatively-rated transformers and heat sinks contribute to maximum performance and reliability.

The LT-500C accommodates either an unbalanced high impedance or a balanced 600 ohm program input. The balanced input utilizes a transformer, factory wired for 600 ohms matching. It is easily field modified for 10K ohms bridging without additional components.

The front panel program gain control may be transferred to the rear panel where that location is preferred.

The LT-500C amplifier features an overload protection, fast-acting current-limiting electronic circuit that automatically disables amplifier drive should a potentially harmful overload occur. An optional M-GUARD EF-3 electronic fuse is available to supplement the standard current sensing protective circuit. The M-GUARD upon sensing a fault, shuts down the amplifier power supply protecting the output devices in the amplifier. M-GUARD action is instantaneous and rapidly restores the amplifier to operation when the short or overload is removed.

The LT-500C amplifier has 70.7 V and 25 V balanced outputs, plus 4, 8, and 16 ohm unbalanced outputs. Input and output connections are on convenient screw terminals.

The amplifier output may be directly coupled to an 8 ohm load. When so operated, the low-end frequency response is extended to 20 Hz.

A bass cut switch tailors the amplifier response (14 dB down at 100 Hz) in installations where horn speakers are utilized.

The LT-500C amplifier, styled in McMartin beige with complementary leather grain accent, is designed for direct mounting in a 19" rack. An attractive desk top cabinet is available.

LT-500C — continuing the excellence in solid-state amplifiers pioneered by McMartin Industries.

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SPECIFICATIONS

POWER OUTPUT	50 watts rms 75 watts music 100 watts peak
FREQUENCY RESPONSE	±1 dB 40-20,000 Hz ±1 dB 20-20,000 Hz direct coupled output
DISTORTION	Less than 1% (40-20,000 Hz) at RPO and below
HUM AND NOISE (Program)	85 dB below RPO
PROGRAM INPUT	Unbalanced 25K ohms and balanced 10K ohms bridging or balanced 600 ohms matching
INPUT SENSITIVITY	0.4 volts unbalanced 0 dBm 600 ohms matching −10 dBm 10K ohms bridging
OUTPUTS	Balanced 70.7 volts and 25 volts unbalanced 4, 8, and 16 ohms. Unbalanced 8 ohm direct output
CONTROLS	Program gain power on/off
POWER REQUIRED	105-115 Vac or 115-125 Vac or 125-135 Vac 50/60 Hz 150 watts
DIMENSIONS	5¼" (13.3 cm) high 19" (48.3 cm) wide 9¼" (23.5 cm) deep
WEIGHT	26 lbs. Shipping weight 28 lbs.
OPERATING TEMPERATURE	Full performance to 150° F (65° C)
FINISH	McMartin beige with leather grain trim

ORDERING INFORMATION

LT-500C	50 watt rms basic amplifier

ACCESSORIES

EF-3	M-GUARD electronic fuse
DTC-2	Desk top cabinet; 5¼" (13.3 cm) high 19¼" (48.9 cm) wide 13½" (34.3 cm) deep

All tests conducted in accordance with EIA Standard SE-101-A where applicable.

ARCHITECTS' & ENGINEERS' SPECIFICATIONS

The amplifier shall be a McMARTIN LT-500C or approved equal. It shall be of all silicon solid-state construction and capable of 50 watts rms, 75 watts music, 100 watts peak. Only amplifiers meeting all these wattage ratings will be accepted. The amplifier shall have distortion less than 1% at rated output and below. The frequency response shall be ±1 dB 40-20,000 Hz with transformer output, and ±1 dB 20-20,000 Hz with field strappable direct output. The amplifier noise shall be at least 85 dB below signal at the rated power output. The amplifier shall be designed to operate continuously on line voltages of 105 to 125 Volts, 50/60 Hz over a temperature range of 0° to 150 F. (−18 C to 65° C). The amplifier shall be equipped with a current sensing overload protection circuit that will remove audio drive from the amplifier should an overload or short circuit develop. This protection circuit shall restore the amplifier in one millisecond when the short or overload is removed. The amplifier shall optionally accommodate an all solid-state electronic protection circuit that will shut down the amplifier power supply should an overload or short circuit occur. This optional protective circuit will rapidly restore the amplifier to operation after the short or overload is removed. Only amplifiers offering the capability of both types of protective circuits shall be acceptable.

The amplifier shall be capable of accepting either a balanced or unbalanced program input without the installation of additional equipment. A transformer shall be permanently installed in the amplifier to accommodate 10K ohm and 600 ohm balanced line inputs, both matching and bridging shall be available. Screw terminals shall be provided for balanced inputs.

The amplifier shall have outputs of 4, 8, and 16 ohms unbalanced, and 70.7 V and 25 V balanced. The balanced circuits shall be capable of being balanced to ground, or floating balanced. A bass cut switch shall be provided that shall attenuate the bass in the output. A 14 dB cut at 100 Hz will be required. Screw terminals shall be provided for all outputs. A direct coupled 8 ohm output shall be available by strapping the rear panel connector and the direct coupled output shall provide extended low end frequency response down to 20 Hz.

The amplifier shall be equipped with a program gain control, and an illuminated on/off switch.

The amplifier shall have an unswitched 115 Volt 3 wire grounded accessory outlet.

The amplifier shall be McMartin beige with a leather grain trim.

The amplifier shall be capable of being directly mounted in a 19" relay rack, and shall be ☐ supplied with, ☐ capable of being housed, in a complementary appearing desk top housing.

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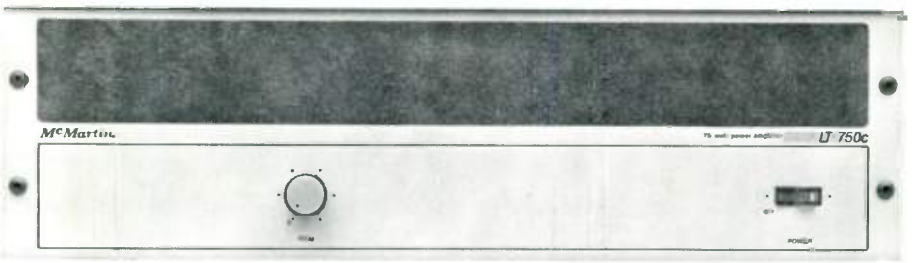
75 WATT POWER AMPLIFIER LT-750C



LESS THAN 1% DISTORTION

40 - 20,000 Hz FULL POWER FREQUENCY RESPONSE

UNBALANCED 4, 8, & 16 OHM OUTPUTS

CURRENT SENSING OVERLOAD PROTECTION

BASS CUT SWITCH FOR HORN SPEAKER USE

BALANCED 70.7 & 25 VOLT OUTPUTS

DESCRIPTION

The LT-750C is a 75 watt rms solid-state transistorized amplifier designed for low distortion output over a full power bandwidth of 40-20,000 Hz. The low frequency response of the amplifier can be extended to 20 Hz when operated with the field convertible direct coupled output.

The amplifier utilizes plug-connected printed circuit board construction, with power transistors and power supply components mounted and placed for maximum accessibility. Computer grade capacitors, conservatively-rated transformers and heat sinks contribute to maximum performance and reliability.

The LT-750C accommodates either an unbalanced high impedance or a balanced 600 ohm program input. The balanced input utilizes a transformer, factory wired for 600 ohms matching. It is easily field modified for 10K ohms bridging without additional components.

The front panel program gain control may be transferred to the rear panel where that location is preferred.

The LT-750C amplifier features an overload protection, fast-acting current-limiting electronic circuit that automatically disables amplifier drive should a potentially harmful overload occur. An optional M-GUARD EF-3 electronic fuse is av able to supplement the standard current sensir protective circuit. The M-GUARD upon sensir fault, shuts down the amplifier power supply tecting the output devices in the amplif GUARD action is instantaneous and rapidly the amplifier to operation when the short load is removed.

The LT-750C amplifier has 70.7 V and 25 V b outputs, plus 4, 8, and 16 ohm unbalanced outputs Input and output connections are on convenien screw terminals.

The amplifier output may be directly coupled to an 8 ohm load. When so operated, the low-end frequency response is extended to 20 Hz.

A bass cut switch tailors the amplifier response (14 dB down at 100 Hz) in installations where horn speakers are utilized.

The LT-750C amplifier, styled in McMartin beige with complementary leather grain accent, is designed for direct mounting in a 19" rack. An attractive desk top cabinet is available.

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SPECIFICATIONS

POWER OUTPUT	75 watts rms 112 watts music 150 watts peak
FREQUENCY RESPONSE	±1 dB 40-20,000 Hz ±1 dB 20-20,000 Hz direct coupled output
DISTORTION	Less than 1% (40-20,000 Hz) at RPO and below
HUM AND NOISE (Program)	85 dB below RPO
PROGRAM INPUT	Unbalanced 25K ohms and balanced 10K ohms bridging or balanced 600 ohms matching
INPUT SENSITIVITY	0.4 volts unbalanced 0 dBm 600 ohms matching −10 dBm 10K ohms bridging
OUTPUTS	Balanced 70.7 volts and 25 volts unbalanced 4, 8, and 16 ohms. Unbalanced 8 ohm direct output
CONTROLS	Program gain power on/off
POWER REQUIRED	105-115 Vac or 115-125 Vac or 125-135 Vac 50/60 Hz 200 watts
DIMENSIONS	5¼" (13.3 cm) high 19" (48.3 cm) wide 9¼" (23.5 cm) deep
WEIGHT	26 lbs. Shipping weight 28 lbs.
OPERATING TEMPERATURE	Full performance to 150° F (65° C)
FINISH	McMartin beige with leather grain trim

ORDERING INFORMATION

LT-750C	75 watt rms basic amplifier
ACCESSORIES	
EF-3	M-GUARD electronic fuse
DTC-2	Desk top cabinet; 5¼" (13.3 cm) high 19¼" (48.9 cm) wide 13½" (34.3 cm) deep

All tests conducted in accordance with EIA Standard SE-101-A where applicable.

ARCHITECTS' & ENGINEERS' SPECIFICATIONS

amplifier shall be a McMARTIN LT-750C or approved equal. ll be of all silicon solid-state construction and capable atts rms, 112 watts music, 150 watts peak. Only ampli- meeting all these wattage ratings will be accepted. The ier shall have distortion less than 1% at rated output and The frequency response shall be ±1 dB 40-20,000 Hz ransformer output, and ±1 dB 20-20,000 Hz with field ppable direct output. The amplifier noise shall be at least B below signal at the rated power output. The amplifier e designed to operate continuously on line voltages of 25 Volts, 50/60 Hz over a temperature range of 0° to 150 C to 65 C). The amplifier shall be equipped with a sing overload protection circuit that will remove drive from the amplifier should an overload or short cir- evelop. This protection circuit shall restore the amplifier millisecond when the short or overload is removed. The ifier shall optionally accommodate an all solid-state elec- protection circuit that will shut down the amplifier power y should an overload or short circuit occur. This optional tive circuit will rapidly restore the amplifier to operation the short or overload is removed. Only amplifiers offering capability of both types of protective circuits shall be acceptable.

The amplifier shall be capable of accepting either a balanced or unbalanced program input without the installation of additional equipment. A transformer shall be permanently installed in the amplifier to accommodate 10K ohm and 600 ohm balanced line inputs, both matching and bridging shall be available. Screw terminals shall be provided for balanced inputs.

The amplifier shall have outputs of 4, 8, and 16 ohms unbalanced, and 70.7 V and 25 V balanced. The balanced circuits shall be capable of being balanced to ground, or floating balanced. A bass cut switch shall be provided that shall attenuate the bass in the output. A 14 dB cut at 100 Hz will be required. Screw terminals shall be provided for all outputs. A direct coupled 8 ohm output shall be available by strapping the rear panel connector and the direct coupled output shall provide extended low end frequency response down to 20 Hz.

The amplifier shall be equipped with a program gain control, and an illuminated on/off switch.

The amplifier shall have an unswitched 115 Volt 3 wire grounded accessory outlet.

The amplifier shall be McMartin beige with a leather grain trim.

The amplifier shall be capable of being directly mounted in a 19" relay rack, and shall be ☐ supplied with, ☐ capable of being housed, in a complementary appearing desk top housing.

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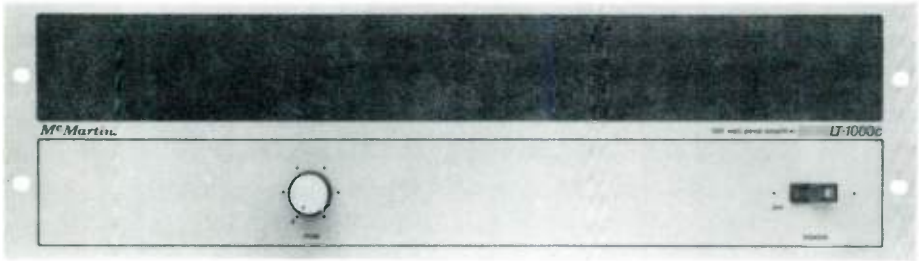
100 WATT POWER AMPLIFIER — LT-1000C



LESS THAN 1% DISTORTION

40 - 20,000 Hz FULL POWER FREQUENCY RESPONSE

UNBALANCED 4, 8, & 16 OHM OUTPUTS

CURRENT SENSING OVERLOAD PROTECTION

BASS CUT SWITCH FOR HORN SPEAKER USE

BALANCED 70.7 & 25 VOLT OUTPUTS

DESCRIPTION

The LT-1000C is a 100 watt rms solid-state transistorized amplifier designed for low distortion output over a full power bandwidth of 40-20,000 Hz. The low frequency response of the amplifier can be extended to 20 Hz when operated with the field convertible direct coupled output.

The amplifier utilizes plug-connected printed circuit board construction, with power transistors and power supply components mounted and placed for maximum accessibility. Computer grade capacitors, conservatively-rated transformers and heat sinks contribute to maximum performance and reliability.

The LT-1000C accommodates either an unbalanced high impedance or a balanced 600 ohm program input. The balanced input utilizes a transformer, factory wired for 600 ohms matching. It is easily field modified for 10K ohms bridging without additional components.

The front panel program gain control may be transferred to the rear panel where that location is preferred.

The LT-1000C amplifier features an overload protection, fast-acting current-limiting electronic circuit that automatically disables amplifier drive should a potentially harmful overload occur. An optional M-GUARD EF-3 electronic fuse is available to supplement the standard current sensing protective circuit. The M-GUARD upon sensing a fault, shuts down the amplifier power supply protecting the output devices in the amplifier. M-GUARD action is instantaneous and rapidly restores the amplifier to operation when the short or overload is removed.

The LT-1000C amplifier has 70.7 V and 25 V b anced outputs, plus 4, 8, and 16 ohm unbala outputs. Input and output connections are o venient screw terminals.

The amplifier output may be directly coupl an 8 ohm load. When so operated, the low frequency response is extended to 20 Hz.

A bass cut switch tailors the amplifier res (14 dB down at 100 Hz) in installations wh speakers are utilized.

The LT-1000C amplifier, styled in McMartin b with complementary leather grain accent, is signed for direct mounting in a 19" rack. An att tive desk top cabinet is available.

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SPECIFICATIONS

POWER OUTPUT ..... 100 watts rms
150 watts music
200 watts peak

FREQUENCY RESPONSE ..... ±1 dB 40-20,000 Hz
±1 dB 20-20,000 Hz direct coupled output

DISTORTION ..... Less than 1% (40-20,000 Hz) at RPO and below

HUM AND NOISE (Program) ..... 85 dB below RPO

PROGRAM INPUT ..... Unbalanced 25K ohms and balanced 10K ohms bridging or balanced 600 ohms matching

INPUT SENSITIVITY ..... 0.4 volts unbalanced
0 dBm 600 ohms matching
−10 dBm 10K ohms bridging

OUTPUTS ..... Balanced 70.7 volts and 25 volts unbalanced 4, 8, and 16 ohms. Unbalanced 8 ohm direct output

CONTROLS ..... Program gain, power on/off

POWER REQUIRED ..... 105-115 Vac or 115-125 Vac or 125-135 Vac 50/60 Hz 250 watts

DIMENSIONS ..... 5¼" (13.3 cm) high
19" (48.3 cm) wide
9¼" (23.5 cm) deep

WEIGHT ..... 26 lbs. Shipping weight 28 lbs.

OPERATING TEMPERATURE ..... Full performance to 150° F (65° C)

FINISH ..... McMartin beige with leather grain trim

ORDERING INFORMATION

LT-1000C ..... 100 watt rms basic amplifier

ACCESSORIES

EF-3 ..... M-GUARD electronic fuse

DTC-2 ..... Desk top cabinet; 5¼" (13.3 cm) high
19¼" (48.9 cm) wide
13½" (34.3 cm) deep

All tests conducted in accordance with EIA Standard SE-101-A where applicable.

ARCHITECTS' & ENGINEERS' SPECIFICATIONS

The amplifier shall be a McMARTIN LT-1000C or approved equal. It shall be of all silicon solid-state construction and capable of 100 watts rms, 150 watts music, 200 watts peak. Only amplifiers meeting all these wattage ratings will be accepted. The amplifier shall have distortion less than 1% at rated output and below. The frequency response shall be ±1 dB 40-20,000 Hz with transformer output, and ±1 dB 20-20,000 Hz with field strappable direct output. The amplifier noise shall be at least 85 dB below signal at the rated power output. The amplifier shall be designed to operate continuously on line voltages of 105 to 125 Volts, 50/60 Hz over a temperature range of 0° to 150 F. (−18° C to 65° C). The amplifier shall be equipped with a current sensing overload protection circuit that will remove audio drive from the amplifier should an overload or short circuit develop. This protection circuit shall restore the amplifier in one millisecond when the short or overload is removed. The amplifier shall optionally accommodate an all solid-state electronic protection circuit that will shut down the amplifier power supply should an overload or short circuit occur. This optional protective circuit will rapidly restore the amplifier to operation after the short or overload is removed. Only amplifiers offering the capability of both types of protective circuits shall be acceptable.

The amplifier shall be capable of accepting either a balanced or unbalanced program input without the installation of additional equipment. A transformer shall be permanently installed in the amplifier to accommodate 10K ohm and 600 ohm balanced line inputs, both matching and bridging shall be available. Screw terminals shall be provided for balanced inputs.

The amplifier shall have outputs of 4, 8, and 16 ohms unbalanced, and 70.7 V and 25 V balanced. The balanced circuits shall be capable of being balanced to ground, or floating balanced. A bass cut switch shall be provided that shall attenuate the bass in the output. A 14 dB cut at 100 Hz will be required. Screw terminals shall be provided for all outputs. A direct coupled 8 ohm output shall be available by strapping the rear panel connector and the direct coupled output shall provide extended low end frequency response down to 20 Hz.

The amplifier shall be equipped with a program gain control, and an illuminated on/off switch.

The amplifier shall have an unswitched 115 Volt 3 wire grounded accessory outlet.

The amplifier shall be listed by Underwriters Laboratories and the Canadian Standards Association.

The amplifier shall be McMartin beige with a leather grain trim.

The amplifier shall be capable of being directly mounted in a 19" relay rack, and shall be ☐ supplied with, ☐ capable of being housed, in a complementary appearing desk top housing.

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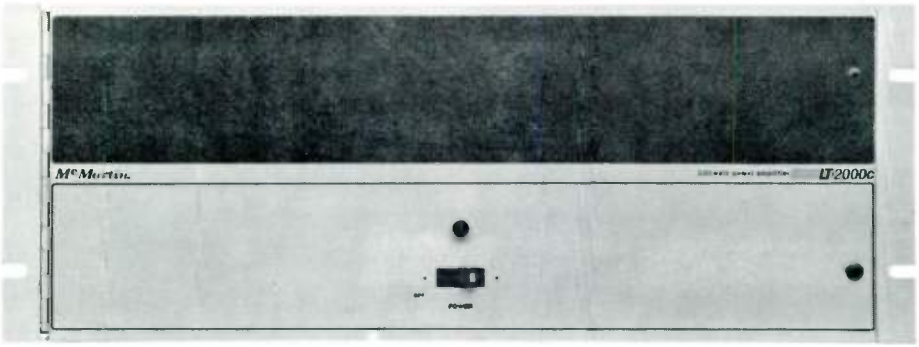
200 WATT POWER AMPLIFIER — LT-2000C



200 WATT rms CONTINUOUS RATING
HIGH AND LOW PASS INPUT FILTERS
275 WATT rms ON 33% DUTY CYCLE
HINGED SERVICE PANELS

FAILSAFE PROTECTION
LESS THAN 1.5% DISTORTION
ULTRA COMPACT — 7″ HIGH
ALL SILICON TRANSISTORS

DESCRIPTION

The McMartin LT-2000C is a professional quality power amplifier, rated for continuous 200 watt rms output. The LT-2000C incorporates a number of truly unique features for ultra-reliable, high-power amplification.

Fail-safe system reliability is assured through incorporation of the M•Gard electronic fuse with 5-microsecond response time and automatic electronic reset. Solid state techniques eliminate use of relay closures. M•Gard completely compensates for transient voltages from lightning strikes, switching at full output power and power surges which often disable high-power amplifiers. Separate ac and dc fuses guard against power supply malfunction.

Protection of horn assemblies and elimination of high frequency oscillation is accomplished by the combination low-pass/high-pass filter. Either segment of the filter may be switched in or out as required. With both networks switched in, amplifier response is tailored for the voice range.

Routine servicing is facilitated by swing-out service panels on both the front and rear of the amplifier.

The LT-2000C is supplied with a line input transformer so that balanced bridging or terminating lines may be used on all installations. Computer grade electrolytic capacitors and oversized transformers provide a continuous 200 watts at less than 1.5% distortion from 50 to 10,000 Hertz, with all components operating well within temperature and electrical tolerances. For commercial paging applications where response is limited by the input filter and the duty cycle is less than 33%, the LT-2000C will deliver 275 watts rms from 400 to 4000 Hertz at less than 5% total harmonic distortion.

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SPECIFICATIONS

POWER OUTPUT

Continuous rms	200 watts @ less than 1.5% THD from 50 Hz to 10 kHz
Intermittent rms (33% duty cycle)	275 watts at less than 5% THD
Music*	300 watts
Peak*	400 watts
FREQUENCY RESPONSE (3 dB below RPO)	±1.5 dB from 30-15,000 Hz
GAIN	82 dB
HUM AND NOISE	At least 80 dB below RPO
INPUT SENSITIVITY	250 MV
IM DISTORTION	Less than 1.0% at 150 MW output with 4:1 intermixed 60 Hz and 7 kHz input
ER RESPONSE	
h pass	
ent	−2 dB at 4 kHz −6 dB at 10 kHz −15 dB at 20 kHz
ass	
nt	−7 dB at 200 Hz −14 dB at 100 Hz −22 dB at 50 Hz
TS	
balanced	10K ohms
nced	600 or 10K ohms
REGULATION	Better than 2 dB
OUTPUTS	70.7 and 25 volt CT balanced and 8 ohms unbalanced
CONTROLS	Program gain, power on/off, low filter in/out, high filter in/out
PROTECTION	AC line fuse, slo-blow dc fuse and electronic fuse
SIZE	19" (48.3 cm) wide 7" (17.8 cm) high 11" (27.9 cm) deep
SHIPPING WEIGHT	67 pounds
FINISH	McMartin beige with leather grain trim
POWER REQUIRED	105-135 Vac, 50/60 Hz

POWER INPUT

No signal	45 watts
200 watt output	600 watts

*based on 200 watt rms output

ORDERING INFORMATION

LT-2000C	200 watts rms basic amplifier

ND ENGINEERS SPECIFICATIONS

mplifier shall be a McMartin model LT-2000C or on type solid state amplifier. The power amplifier a continuous power output rating of 200 watts rms an 1.5% distortion over the frequency range of 50 Hz Hertz with all components operating within their elec- and temperature standards. Reserve power shall be to produce 275 watts rms from 400 Hz to 4000 Hertz s than 5% distortion for use in commercial and industrial g applications, where the duty cycle is less than 33%. The ier shall have a frequency response of 30 to 15,000 Hertz an a power gain of 82 dB at 200 watts rms and input of 250 millivolts. Hum and noise shall be at least ow rated output. Intermodulation distortion at 150 with a 60 Hertz and 7 kiloHertz 4 to 1 mixed input ess than 1.0%. An input filter shall provide at least 6 ttenuation at 10,000 Hertz, 15 dB of attenuation at Hertz, 14 dB of attenuation at 100 Hertz and 22 dB of ation at 50 Hertz. Input shall be balanced 600 or 10,000 ohms with the line input transformer supplied. Regulation shall be better than 2 dB. Controls for gain, power on-off, low filter in-out, high filter in-out and a power indicator light shall be provided. Power requirements shall be 105 to 135 volts ag 50/60 Hertz single phase and the amplifier shall draw no more than 45 watts with no signal input and 600 watts at 200 watts rms output. Outputs shall be 70.7 and 25 volts balanced center tapped, and 8 ohm unbalanced. Protection shall be ac line fuse, slow blow dc fuse and ultra-rapid electronic fuse. The electronic fuse circuit shall be automatic, shall operate with five microseconds and shall be self-restoring. Shipping weight shall be 67 pounds and the amplifier shall be no larger than 19.0" wide, 7.0" high and 11.0" deep. Finish shall be McMartin beige with leather grain trim. Access to all components shall be available through front and rear swingout service panels.

The amplifier shall be listed by Underwriters Laboratories.

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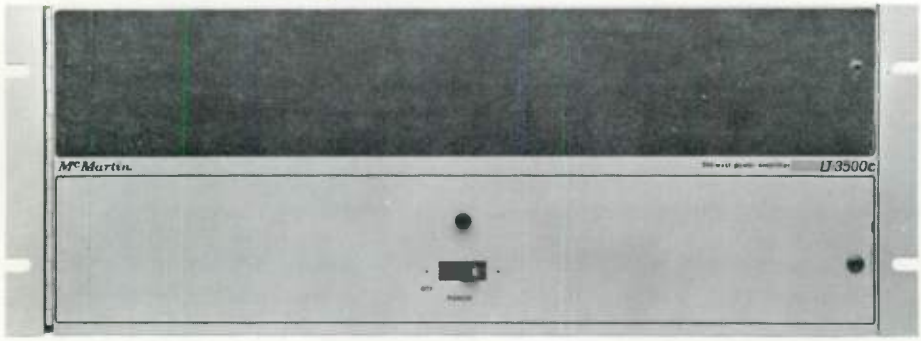
350 WATT POWER AMPLIFIER

LT 3500C



350 WATT rms CONTINUOUS RATING
HIGH AND LOW PASS INPUT FILTERS
425 WATT rms ON 33% DUTY CYCLE
HINGED SERVICE PANELS

FAILSAFE PROTECTI
LESS THAN 2% DISTORT
ULTRA-COMPACT — 7" HIG
ALL SILICON TRANSISTOR

DESCRIPTION

The McMartin LT-3500C is a professional quality power amplifier rated for continuous 350 watt output. The LT-3500C incorporates a number of truly unique features for ultra-reliable, high-power amplification.

Fail-safe system reliability is assured through incorporation of the M•Gard electronic fuse with five microsecond response time. M•Gard completely compensates for transient voltages from lightning strikes, switching at full output power and power surges which often disable high-power amplifiers. Separate ac and dc fuses guard against power supply malfunction.

Protection of horn assemblies and elimination of high frequency oscillation is accomplished by the combination low-pass/high-pass active filter. Either segment of the filter may be switched in or out as required. With both networks switched in, amplifier response is accurately tailored for the voice range.

Routine servicing is facilitated by swing-out ice panels on both the front and rear of the a fier. The rear panel makes available the elect fuse, the active low/high pass filter and the ou circuitry. The front panel provides access t driver and the line input transformer.

The LT-3500C is supplied with a in former so that balanced bridging or m may be used in all installations. Con electrolytic capacitors and oversized tr provide a continuous 350 watts at less tha tortion from 50 to 7500 kiloHertz, with al nents operating well within temperature an trical tolerances. For commercial paging a tions where response is limited by the active filter and the duty cycle is less than 33%, 3500C will deliver 425 watts rms from 50 Hertz at less than 5% total harmonic dist

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SPECIFICATIONS

POWER OUTPUT	
Continuous rms	350 watts @ less than 2% THD from 50 to 7500Hz
Intermittent rms (33% duty cycle)	425 watts at less than 5% THD from 50 to 7500Hz
Music (based on 350 watt rms load)	525 watts
Peak based on 350 watt rms load)	700 watts
FREQUENCY RESPONSE (3 dB below RPO)	±1.5 dB from 30-15,000 Hz
GAIN	85 dB
HUM AND NOISE	At least 80 dB below RPO
INPUT SENSITIVITY	250 MV
IM DISTORTION	Less than 0.5% at 150 MW output with 4:1 intermixed 60 Hz and 7 kHz input
ACTIVE FILTER RESPONSE	
High pass segment	−1 dB at 4 kHz −15 dB at 10 kHz −36 dB at 20 kHz
Low pass segment	−1 dB at 200 Hz −9 dB at 100 Hz −27 dB at 50 Hz
INPUTS	
Unbalanced	25K ohms
Balanced	600 and 10K ohms
REGULATION	Better than 2 dB
OUTPUTS	70.7 volt balanced and 25 volt unbalanced
CONTROLS	Program gain, power on/off, low filter in/out, hi-filter in/out
INDICATORS	Power on, clipping and overload
PROTECTION	AC line fuse, slo-blow dc fuse and electronic fuse
SIZE	7″ (17.8 cm) high 19″ (48.3) wide 11″ (27.9 cm) deep
SHIPPING WEIGHT	70 pounds
FINISH	McMartin beige with leather grain trim
POWER REQUIRED	105-135 Vac 50/60 Hz
POWER INPUT	
no signal	45 watts
350 watt output	800 watts

ORDERING INFORMATION

LT-3500C	350 watt rms basic amplifier

ARCHITECTS AND ENGINEERS SPECIFICATIONS

The power amplifier shall be a McMartin model LT-3500C, or equal, all silicon type solid state amplifier. The power amplifier shall have a continuous power output rating of 350 watts rms at less than 2% distortion over the frequency range of 50 to 7500 Hertz with all components operating within their electrical and temperature standards. Reserve power shall be available to produce 425 watts rms from 50 to 7500 Hertz at less than 5% distortion for use in commercial and industrial paging applications, where the duty cycle is less than 33%. The amplifier shall have a frequency response of 30 to 15,000 Hertz ±1.5 dB and a power gain of 85 dB at 350 watts rms and input sensitivity of 250 milivolts. Hum and noise shall be at least 80 dB below rated output. Intermodulation distortion at 150 miliwatts with a 60 Hertz and 7 kiloHertz 4 to 1 mixed input shall be less than 0.5%. An active input filter shall provide at least 15 dB of attenuation at 10,000 Hertz, 36 dB of attenuation at 20,000 Hertz, 10 dB of attenuation at 100 Hertz and 27 dB of attenuation at 50 Hertz. Input shall be unbalanced 25,000 ohm nominal or balanced 600 and 10,000 ohms with the line input transformer which is to be supplied. Regulation shall be better than 2 dB. Controls for gain, power on-off, low filter in-out, high filter in-out and indicators for power, clipping and overload shall be provided. The overload light shall light at any time the speaker line is shorted or the load is increased to the point where the amplifier is overloaded. The clipping light shall light whenever the input signal amplitude is increased higher than that necessary to provide rated input. Power requirements shall be 105 to 135 volts ac 50/60 Hertz single phase and the amplifier shall draw no more than 45 watts with no signal input and 800 watts at 350 watts rms output. Outputs shall be 70.7 volt balanced and 25 volts unbalanced. Protection shall be ac line fuse, slow blow dc fuse and ultra-rapid electronic fuse. The electronic fuse circuit shall be automatic, shall operate within five microseconds and shall be self-restoring. Shipping weight shall be 70 pounds and the amplifier shall be no larger than 19.0″ wide, 7.0″ high and 11.0″ deep. Finish shall be McMartin beige with leather grain trim. Access to all components shall be available through front and rear swingout service panels.

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TERMS AND CONDITIONS OF SALE

1. **Prices:** McMartin endeavors to keep published price lists current and to advise customers of price changes; however, all prices are subject to change without notice. Published prices apply to United States sales and are based on a cash transaction, FOB, Omaha, Nebraska. No applicable federal, state or local taxes are included.

2. **Terms of Payment:** Terms of payment are cash with order. Orders are accepted from customers with an established credit rating with full payment due within 30 days of shipping date. The prompt payment discount is one percent 10th and 25th, net 30. Payments made beyond the 30-day period are subject to a finance charge of 1½ percent per month (equivalent to an annual percentage rate of 18 percent). Customers wishing to establish 30-day terms should furnish trade and bank references and current financial information for review by McMartin's Credit Department. Equipment is available through a lease/purchase option plan. Contact McMartin's Sales Department for details.

3. **Warranty:** McMartin products are warranted to be free from defects in materials and workmanship for a period of one year after shipping date when subjected to normal usage or service. All warranties are void if (a) equipment has been altered or repaired by others without McMartin's specific prior written authorization, or (b) equipment is operated under environmental conditions or circumstances other than those specifically described in McMartin literature or instruction manuals.

   The above warranty does not apply to equipment manufactured by others, and included in McMartin shipments. Said items are subject only to such adjustment as McMartin may obtain from the supplier thereof.

4. **Repair or Replacement:** If a product fails during the applicable warranty period, repair parts will be furnished free of charge FOB Omaha. On request, and at the discretion of McMartin, the customer may be required to return the defective part or equipment to McMartin, FOB, Omaha, Nebraska. Parts or equipment may be returned only with McMartin's prior authorization and must be accompanied by return authorization number issued by McMartin's Customer Service Department. All returned merchandise must be sent freight prepaid and with appropriate insurance coverage. Full details of the circumstances of the failure or malfunction should be included to expedite repair or replacement. Repaired equipment will be shipped to the customer, FOB, factory.

5. **Out-of-Warranty Service:** McMartin's laboratory and technical services are available for the repair and/or recalibration of McMartin products operated beyond the warranty period. Time required for recalibration/repair varies with equipment type and plant load. Contact McMartin's Customer Service Manager for current repair times and recalibration, labor and parts rates. McMartin warrants recalibration and parts utilized in the repair of equipment for a period of 90 days beyond the shipping date of said recalibration or repair. Prior return authorization is required for equipment being returned for recalibration or repair and a return authorization number must accompany said return. All transportation and insurance charges to and from the factory are to be paid by the customer.

6. **Returns:** Merchandise produced and shipped in good faith is not returnable for credit. Merchandise may be exchanged if McMartin Industries determines, in its sole discretion, that circumstances warrant such concession. Merchandise for exchange must be of current design and in unopened factory cartons, and is subject to a 20 percent restocking charge, plus a 10 percent retuning charge for products with tuned RF stages.

7. **Product Changes:** McMartin reserves the right without advance notice to make engineering and production changes including substitution of vendor sources for components which may modify the design or specifications of its products, provided said modification will not materially affect the performance of the product.

8. **General:**

   A. The preferred shipping method should be specified in your order. When not specified, shipment will be made by a common carrier selected by McMartin. Generally, shipments will be made with transportation charges collect.

   B. Claims for damage incurred in transit must be made by the customer directly with the carrier, except for shipments handled by United Parcel Service (UPS). UPS claims must be filed at the point of origin. In either case, McMartin must be immediately notified of damage details, dates and McMartin invoice numbers involved.

   C. In no event is McMartin liable for consequential damages resulting from late or non-delivery, or malfunction or failure of its products.

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