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**SPARTA**  
ELECTRONIC CORPORATION

**NEW PRODUCT  
TECHNICAL BULLETIN**

## **MODEL 635 35 kw FM TRANSMITTER**



The Model 635 uses as its driver a complete Model 605B 5 kw Transmitter, offering automatic high-power backup whenever the super-power stage might require maintenance. Either mechanical or automatic switchover devices can be supplied for switching, as options.

The Model 635 uses the 680-Series FM Exciter, Stereo Generator (Model 682) and SCA Generator (Model 683) where applicable.

Standard features of the Model 635 include VSWR protection, Automatic Power Control, and the popular 'Tally Light' fault locator system. An outstanding economy feature of using the Model 635 to attain a 100,000 Watt circularly-polarized ERP is that it requires only a 6-bay antenna. An economy PLUS feature is that the antenna can be fed with 3 1/8" line, rather than the much more expensive 6" required for higher transmitter output power.

Accessibility and installation ease are integral parts of the Model 635, as they are in the complete Sparta AM and FM Transmitter line. The driver and final amplifier are in same-size cabinets,

with separate power supply, so that the complete unit can be installed in a variety of configurations to suit the transmitter building. Full size front and rear doors are coupled with swing-out front panels to allow maintenance access to every part of the transmitter, including control circuitry. Amplifier assemblies are reached through easily removed aluminum panels.

A full complement of on/off switches, and filament voltage controls are provided in both the driver and final amplifier sections. Overload relays are included in all important tube parameters. An automatic sequencing system prevents plate power turn on before all filaments are at correct temperature. The 'Tally Light' spotlights overload conditions through memory; it must be reset manually after it informs the engineer where the overload occurred. Brief overloads are ignored by using a positive recycle system which automatically cycles power off three times before lockout.

The high power performance of the 635 is achieved with very high reliability without continual fine adjustments, through a broadband grounded grid final amplifier.

**SPECIFICATIONS:**

MAXIMUM POWER OUTPUT: 35 KW.  
 AC INPUT POWER: 200/250 VAC 50/60 Hz 3-phase; 53 kW  
 at 0.9 power factor.  
 TUBE COMPLEMENT: One each 4CX250B, 3CX3000A7,  
 3CX2000A7.  
 WEIGHT, CUBAGE: 3,500 pounds, 92.7 cubic feet.  
 SIZE: Two cabinets each 34"W x 75"H x 25 1/2"D, and one  
 cabinet 34"W x 36"H x 25 1/2"D.  
 FREQUENCY RANGE: 88-108 MHz, tuned to specified  
 operating frequency.  
 RF OUTPUT IMPEDANCE: 50 ohms.  
 OUTPUT TERMINATION: 3 1/8" EIA flange.  
 FREQUENCY STABILITY:  $\pm$  1,000 Hz after initial warmup.  
 TYPE OF MODULATION: Direct FM.  
 MODULATION CAPACITY:  $\pm$  150 kHz.  
 RF HARMONICS: Suppression exceeds all FCC requirements.  
 ALTITUDE: To 7,500 feet.  
 AMBIENT TEMPERATURE RANGE: 0-50° Centigrade.  
 MAXIMUM VSWR: 1.7:1.

**MONAURAL MODE**

AUDIO INPUT IMPEDANCE: 600 ohms balanced.  
 AUDIO INPUT LEVEL:  $\pm$ 10 dBm  $\pm$  2 dB for 100% modulation  
 at 400 Hz.  
 AUDIO FREQUENCY RESPONSE: Standard FCC 75 uS pre-  
 emphasis curve +0.25 to -0.5 dB 50-15,000 Hz.  
 DISTORTION: 0.5% or less 50-15,000 Hz.  
 FM NOISE: 65 dB below 100% modulation at 400 Hz.  
 AM NOISE: 55 dB below reference, carrier AM modulated  
 100%.  
 SYNCHRONOUS AM: -50 dB maximum at 400 Hz, due to  
 100% FM.

**STEREOPHONIC MODE**

PILOT STABILITY: 19 kHz  $\pm$  1 Hz.  
 AUDIO INPUT IMPEDANCE: 600 ohms balanced, both  
 channels.  
 AUDIO INPUT LEVEL: + 10 dBm, both channels.  $\pm$  1 dB  
 for 100% modulation at 400 Hz.  
 AUDIO FREQUENCY RESPONSE: Standard FCC 75 uS pre-  
 emphasis curve +0.25 to -0.5 dB 50-15,000 Hz, both  
 channels.  
 DISTORTION: 0.75% or less 50-15,000 Hz, both channels.  
 STEREO SEPARATION: -40 dB minimum or better  
 50-15,000 Hz.  
 SUBCARRIER SUPPRESSION: (main-to-subchannel or  
 subchannel-to-main) -65 dB below 100% modulation. 50 dB  
 below 100% modulation 50-15,000 Hz.  
 CROSSTALK: (main-to-subchannel or subchannel-to-main)  
 50 dB below 100% modulation 50-15,000 Hz.

**SCA SPECIFICATIONS**

FREQUENCY STABILITY:  $\pm$  500 Hz.  
 FREQUENCY: 25-75 kHz. 41 or 67 kHz standard.  
 MODULATION: Direct FM.  
 MODULATION CAPABILITY:  $\pm$  15%.  
 AUDIO INPUT IMPEDANCE: 600 ohms balanced.  
 AUDIO INPUT LEVEL: + 10 dBm for 100% modulation at  
 400 Hz.  
 DISTORTION: Less than 1.5% 50-7,500 Hz.  
 FM NOISE: 65 dB below reference, 15% deviation.  
 CROSSTALK: (subchannel-to-main) -60 dB or better.  
 CROSSTALK: (main-to-subchannel) 50 dB below 100%  
 modulation at 400 Hz.  
 AUTOMATIC MUTE LEVEL: -10 dBm at 400 Hz.  
 MUTING DELAY: Variable from 0.6-4 seconds.

**SPECIFICATIONS: MODEL 625**  
**25 kw FM TRANSMITTER**

**MAXIMUM POWER OUTPUT: 25 KW.**

**AC INPUT POWER: 200/250 VAC 50/60 Hz 3-phase; 35 KW at**  
**0.9 power factor.**

**TUBE COMPLEMENT: One each 4x150, 5CX1500A, 3CX15000A7.**

**WEIGHT, CUBAGE: 3,000 pounds, 92.7 cubic feet.**

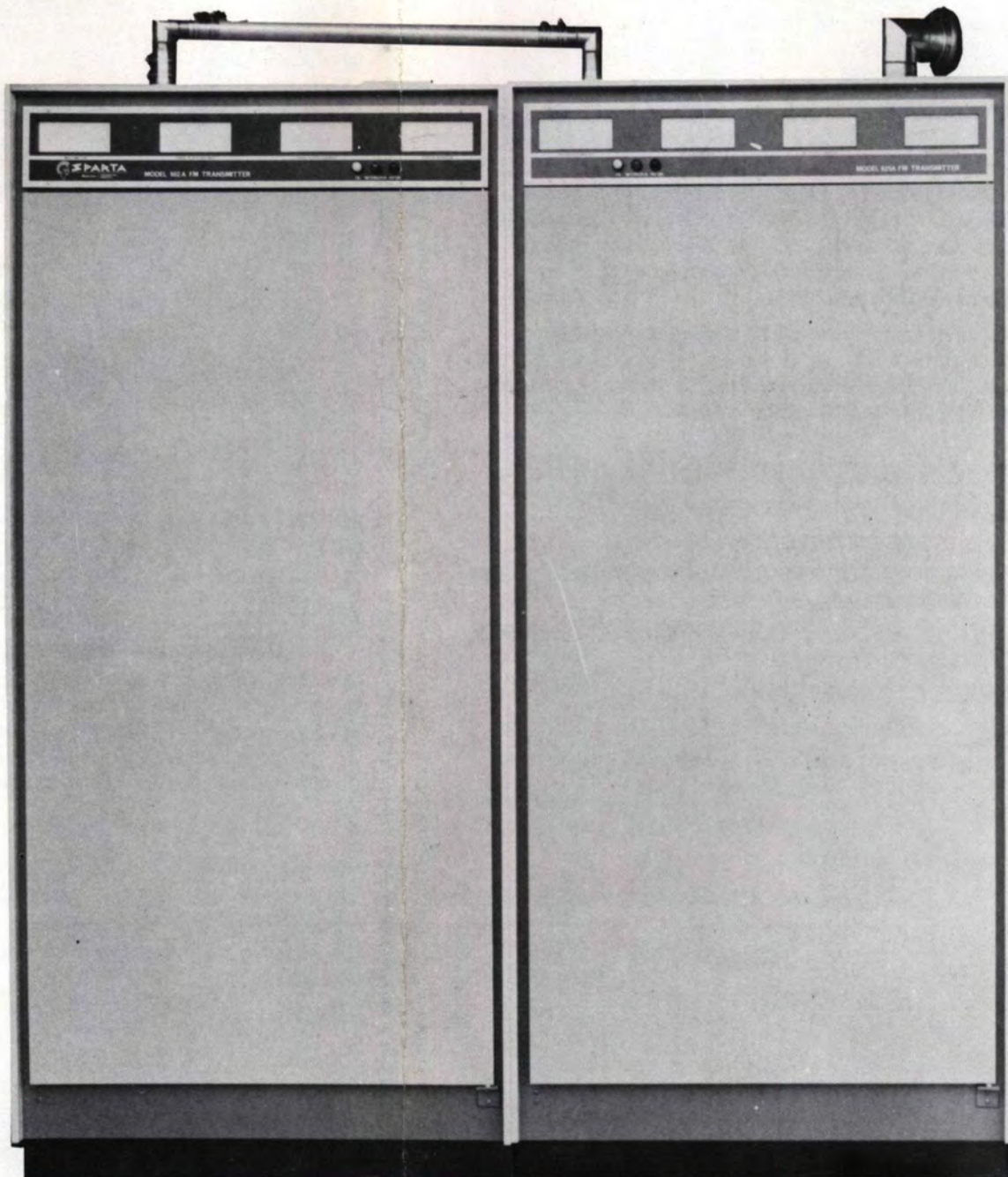
**All other specifications are identical**  
**with the Model 635, above.**



**SPARTA**  
**ELECTRONIC CORPORATION**

5851 FLORIN-PERKINS ROAD  
 SACRAMENTO, CALIFORNIA 95828

April 1975



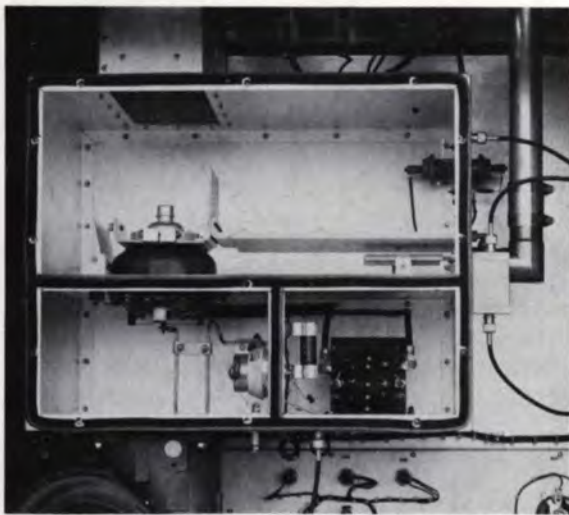
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## Models 610A and 625A FM Transmitters

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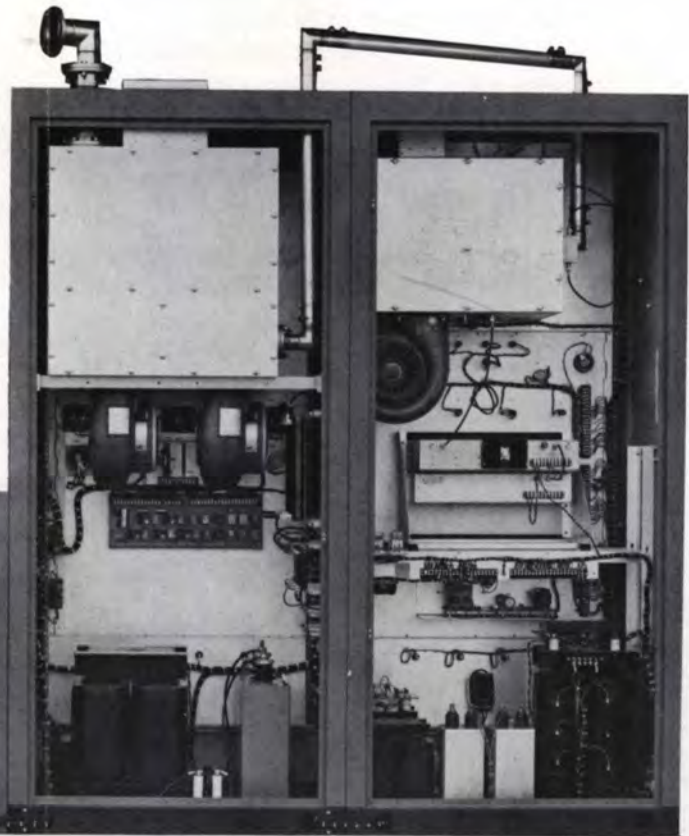
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Upper section of 2,500 Watt driver in 625A. Output via rigid line proceeds to final amplifier or direct to antenna as needed. Note the simplified tuning system which operates without coils or moving contacts.



Model 625A



### MODELS 610A 10kW and 625A 25kW TRANSMITTERS

Both the 610A and 625A offer high-power backup, since the first driver stage of each transmitter is formed by a complete lower-power transmitter. The Model 601A, operating at approximately 710 Watts, is the driver of the Model 610A. A complete Model 602A, operating at approximately 1,700 Watts, drives the Model 625A.

In either case the basic driver transmitter can be connected directly to the antenna feed for backup, while the high-power stage undergoes maintenance. As options either a mechanical or automatic switch-over device can be supplied. The alternative is physically connecting the driver output to the antenna feed line.

Both transmitters use the trouble free Sparta Model 680 Direct FM Exciter, with the optional Model 682 Stereo Generator and 683 SCA Generator (41 and 67 KHz) to suit station requirements.

The 610A is type accepted to operate at from 7.5-13 kW output. It has been designed for optimum useful size through a modern modular approach, into two

identical cabinets which can be installed variously to suit the buyer.

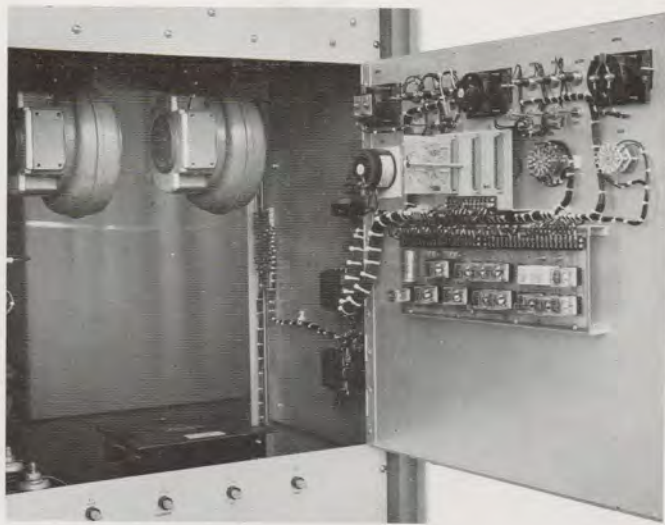
### DUAL SYSTEMS

In addition to the basic 10kW and 25kW units both transmitters are available as 610A-plus-610A (or 625A-plus-625A) and 610A/610A (625A/625A). The former are actually two complete transmitters combined in a 3dB coupler giving power output of 26kW (or 50kW). Automatic switching systems are available that sense failure and provide direct feed to the antenna by a single transmitter. The 610A/610A system (or 625A/625A) consists of two separate transmitters operating as main/alternate-main transmitters.

### MAXIMUM ACCESSIBILITY

Each driver and final amplifier is constructed in an identical cabinet and can be installed side-by-side or in different parts of the transmitter room; thus building sites can be utilized that might be prohibitive to larger single cabinet units.

Full size front and rear doors are used and since the front door is non-interlatched it can be removed if



desired to gain additional room.

Access to control circuitry is available through a swingout front panel and to the amplifier assemblies through an easily removed aluminum panel.

#### CONTROL FEATURES

Both driver and final amplifier have a full complement of on-off switching and filament voltage control. When operated in the normal driver/final configuration, controls are interlatched so as to provide simple on-off functions, either local or remote. Overload relays are included in all important tube parameters. An automatic sequencing system prevents turn-on of plate power before all filaments are heated. A positive recycle system automatically cycles power off three times before lock-out in the event of brief overloads or power interruptions. Any overload condition is spotlighted through a memory type 'Tally Light' system.

#### GROUNDING GRID FINAL AMPLIFIER

The output tube, a ceramic triode, offers high power gain and full power apparent efficiency near 80%. The 610A utilizes a 3CX10000A7, the 625A a 3CX15000A7. These two tubes differ in filament structure only, the physical sizes being identical. Fixed inductive dividers are used to limit currents within sliding short circuits thus providing low loss, long life tuning circuits. Maintenance of maximum power output without daily "tweaking" of multiple controls is easily obtainable with either the 610A or 625A. Control of power output is accomplished by a motor driven screen rheostat in the IPA stage.

#### AUTOMATIC POWER CONTROL-VSWR PROTECTION

Two automatic supervisory functions are included as a standard part of the 610A and 625A. Output (forward) power is monitored continuously by a comparator circuit. Should power increase or decrease beyond pre-set levels automatic correction within the limits of the motorized screen control will take place.

Reverse (reflected power) is also monitored on a continuous basis and should VSWR exceed a pre-set level the transmitter will be shut down as a normal overload function.

#### POWER SUPPLY

The model 610A utilizes a 5,500 volt power supply, the 625A a 7,500 volt supply. The 610A power supply is self contained in the final amplifier cabinet. The 625A power supply is contained in an external vault measuring 34" wide x 25 1/2" deep x 36" high. It can be installed adjacent to the final amplifier or at any convenient location.

Both power supplies utilize step-start contacts which allow a "Y" or "Delta" configuration. A front panel switch makes use of this function to provide a low/high power operating condition.

## Specifications: Model 610A

**MAXIMUM POWER OUTPUT:** 13kW.

**601A DRIVER OUTPUT:** 700-1,500 Watts.

**AC INPUT POWER:** 200/250 VAC, 50/60 Hz, 3-phase; 21 kW at 0.9 power factor.

**TUBE COMPLEMENT:** One each 4X150A, 5CX1500A, 3CX10000A7.

**WEIGHT, CUBAGE:** 2,600 lbs., 75.2 cu. ft.

**SIZE:** Two cabinets, each 34"W x 75"H x 25 1/2"D.

All other specifications—monaural, stereo, and SCA—identical with Model 625A.

## Specifications: Model 625A

**MAXIMUM POWER OUTPUT:** 25kW.

**602A DRIVER OUTPUT:** 1,000-2,500 Watts.

**AC INPUT POWER:** 200/250 VAC, 50/60 Hz, 3-phase; 38kW at 0.9 power factor.

**TUBE COMPLEMENT:** One each 4X150A, 5CX1500A, 3CX15000A7.

**WEIGHT, CUBAGE:** 3,000 pounds, 92.7 cu. ft.

**SIZE:** Two cabinets each 34"W x 75"H x 25 1/2"D, and one cabinet 34"W x 36"H x 25 1/2"D.

**FREQUENCY RANGE:** 88—108MHz, tuned to specified operating frequency.

**RF OUTPUT IMPEDANCE:** 50 ohms.

**OUTPUT TERMINATION:** 3 1/8" EIA flange.

**FREQUENCY STABILITY:** ± 1,000 Hz after initial warmup.

**TYPE OF MODULATION:** Direct FM.

**MODULATION CAPACITY:** ± 95 Hz.

**RF HARMONICS:** Suppression exceeds all FCC requirements.

**ALTITUDE:** To 7,500 feet.

**AMBIENT TEMPERATURE RANGE:** 0—50° Centigrade.

**MAXIMUM VSWR:** 1.7:1.

## Monaural Mode

**AUDIO INPUT IMPEDANCE:** 600 ohms balanced.

**AUDIO INPUT LEVEL:** + 10 dBm ± 2 dB for 100% modulation at 400 Hz.

**AUDIO FREQUENCY RESPONSE:** Standard 75 microsecond, FCC pre-emphasis curve +0.25 to -0.5 dB, 50-15,000Hz.

**DISTORTION:** 0.5% or less, 50-15,000Hz.

**FM NOISE:** 65dB below 100% modulation, referenced to 400 Hz.

**AM NOISE:** 55 dB below reference, carrier AM modulated 100%.

**SYNCHRONOUS AM:** -50 dB maximum at 400 Hz due to 100% FM.

## Stereophonic Mode

**PILOT STABILITY:** 19kHz ± 1Hz.

**AUDIO INPUT IMPEDANCE:** (left and right) 600 ohms balanced.

**AUDIO INPUT LEVEL:** (left and right) ± 10 dBm + 1 dB for 100% modulation at 400 Hz.

**AUDIO FREQUENCY RESPONSE:** (left and right) Standard 75 microsecond, FCC pre-emphasis curve + 0.25 to -0.5 dB, 50-15,000Hz.

**DISTORTION:** (left and right) 0.75% or less, 50-15,000 Hz.

**STEREO SEPARATION:** -40 dB minimum 50-15,000 Hz or better.

**SUB-CARRIER SUPPRESSION:** -65 dB below 100% modulation (main to sub-channel or sub-to main channel); 50 dB below 100% modulation, 50-15,000 Hz.

**CROSSTALK:** (main to sub-channel or sub to main channel) 50 dB below 100% modulation, 50-15,000 Hz.

## SCA Specifications

**FREQUENCY STABILITY:** ± 500Hz.

**FREQUENCY:** Between 25 and 75 KHz, 41 or 67 KHz, standard.

**MODULATION:** Direct FM.

**AUDIO INPUT IMPEDANCE:** 600 ohms balanced.

**AUDIO INPUT LEVEL:** + 10 dBm for 100% modulation at 400 Hz.

**DISTORTION:** Less than 1.5%, 50-7,500 Hz.

**FM NOISE:** -65 dB maximum, referenced to 15% deviation.

**CROSSTALK:** (sub-channel to main channel) -60 dB or better.

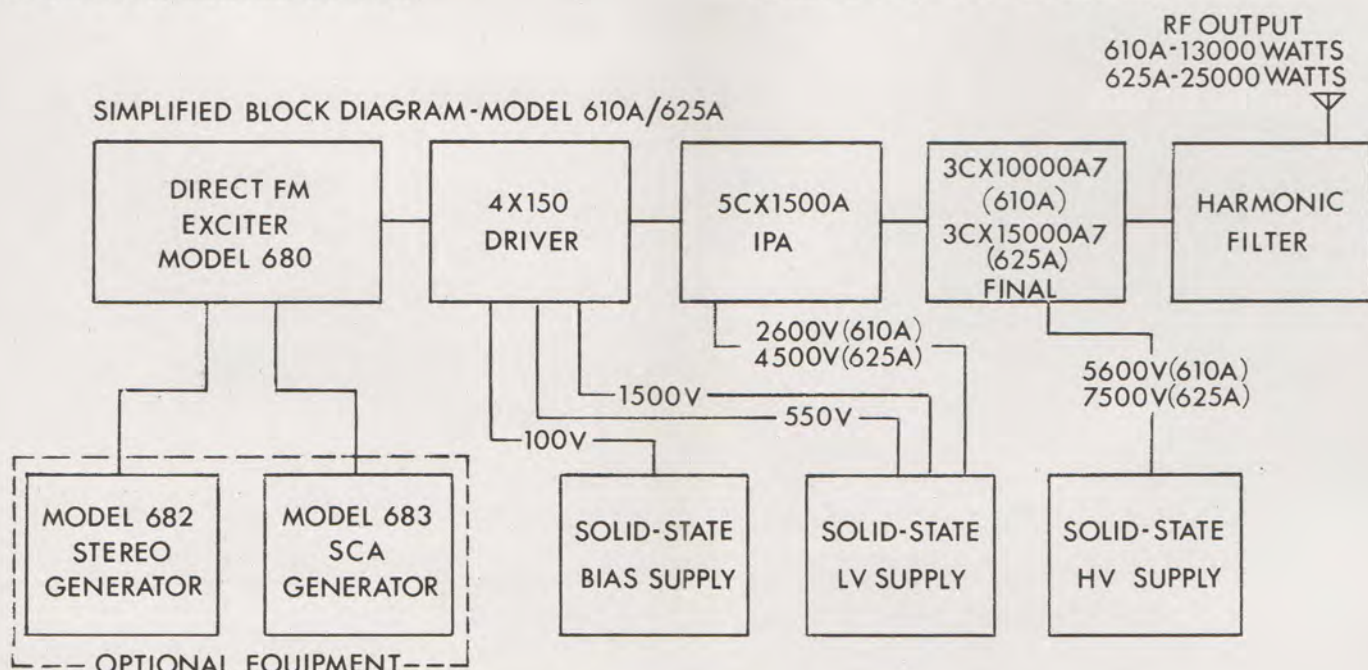
**CROSSTALK:** (Main channel to sub-channel) 50 dB below 100% modulation, referenced to 400 Hz.

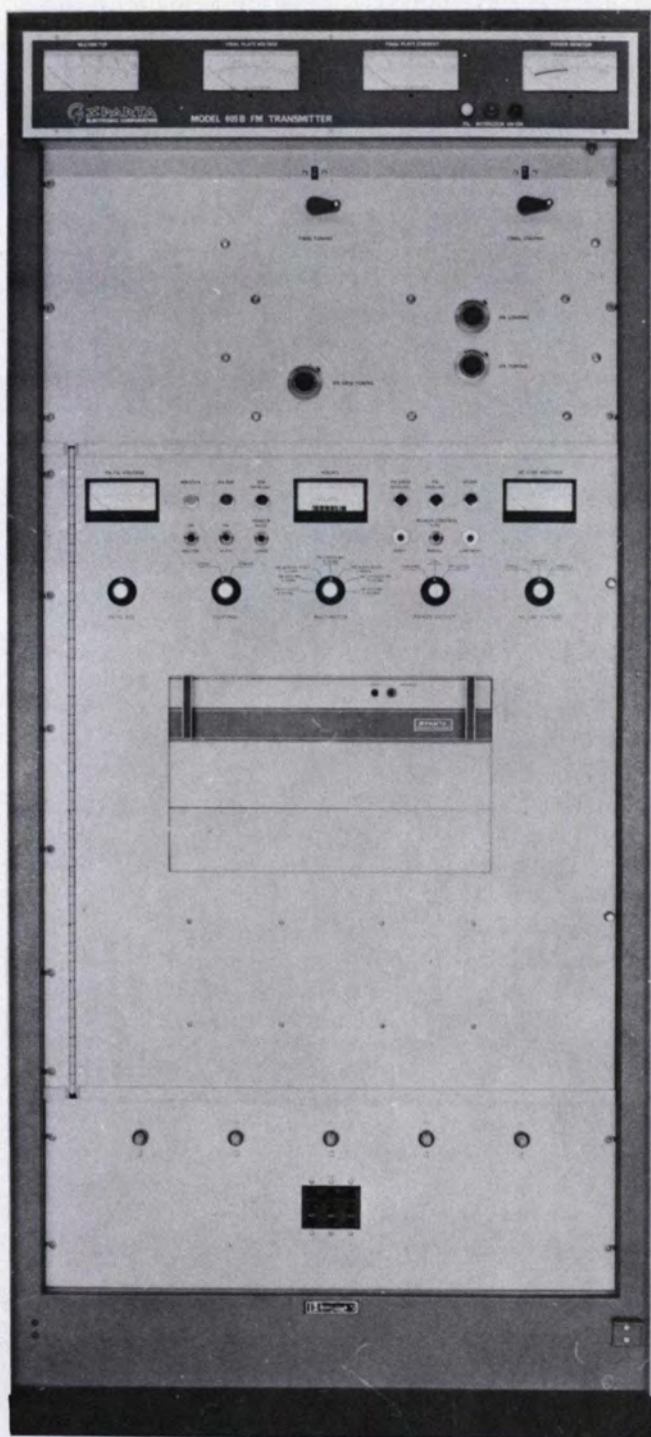
**AUTOMATIC MUTE LEVEL:** -10 dBm at 400 Hz.

**MUTING DELAY:** Variable from 0.6 to 4 seconds.

#### ORDERING INFORMATION:

The Models 610A and 625A are supplied complete with the Model 680 Exciter, crystal and oven, tubes and harmonic filter, factory tuned and tested on frequency. For stereo option specify Model 682 Stereo Generator. For SCA specify Model 683.





# Models 603 and 605B FM Transmitters



## Models 603 3 kw and 605B 5 kW FM Transmitters

These modern transmitters belong together in one design series, and are largely identical with the exception of the high voltage power supplies. The Model 603 is type accepted from 2,500 to 3,500 Watts output. The Model 605B is type accepted from 3,500 to 5,500 Watts.

Both transmitters use the Sparta Model 680 Direct FM Exciter, with optional 682 Stereo Generator and 683 SCA Generator (41 or 67 kHz).

One 3CX3000A7 ceramic zero bias triode, operated conservatively even at the highest output of the 605B, is common to both models. It is driven by a ceramic tetrode, 4CX250BC, which is housed in a separate aluminum enclosure for excellent RF shielding. tuning is straight forward, and does not require continual adjustment to maintain optimal performance.

Driver plate current, final screen and a final plate current are overload protected and monitored by a 'Tally Light' system with a built-in memory. The low voltage power supply and the control system are readily accessible through a swing-out front panel. Full length hinged doors are provided front and rear. Since the front door is not interlocked it can be removed easily if a space problem exists.

In high power applications the 605B becomes the driver for the 35,000 Watt Model 635. Where licensing rules permit the higher power amplifier can be added at any time without major modifications of the lower power unit.

From the transmitter engineer's point of view the Sparta Models 603 and 605B leave nothing to be desired in ease of maintenance and reliability; the design is straightforward and uncluttered.



*Model 603 lower cabinet, from rear.*

## Specifications: Model 603

**POWER OUTPUT CAPABILITY:** 2,500 to 3,500 Watts

**LINE POWER CONSUMPTION:** 5.7 kW at 0.9 PF  
(3,500 Watts out)

**WEIGHT:** 1,500 pounds (676 Kg)

The Model 603 specifications are otherwise identical to the Model 605B with the exception of the high voltage power supply, which operates at 3kV. See Model 605B specifications below.

## Specifications: Model 605B

**TYPE OF MODULATION:** F3, F9 direct frequency modulation of mono, stereo, and SCA inputs

**POWER OUTPUT CAPABILITY:** 3,500 to 5,500 Watts

**FREQUENCY RANGE:** 88 to 108 MHz

**FREQUENCY STABILITY:**  $\pm$  1000 Hz

**RF OUTPUT IMPEDANCE:** 50 ohms nominal

**MODULATION CAPABILITY:**  $\pm$  150 KHz

**FM NOISE:** Better than 65 dB below 100% modulation (mono, stereo, and SCA) referred to 400 Hz

**AM NOISE:** Better than 50 dB below equivalent 100% AM

**HARMONICS:** Exceeds all FCC requirements

**LINE POWER SUPPLY:** 200-245 VAC, 50/60 Hz, 3-phase

**LINE POWER CONSUMPTION:** 8.9 kW at 0.9 power factor (5,500 Watts out)

**ALL AUDIO INPUTS:** 600 ohms  $\pm$  10% balanced, +10 dBm  $\pm$  2 dB for 100% modulation (referred to 400 Hz)

**POWER TUBE COMPLEMENT:** 1 each 4CX250BC, 3CX3000A7

**CABINET SIZE:** 75" high x 34" wide x 25½" deep (101 x 86 x 65 cm), low pass filter included

**WEIGHT:** 1,700 pounds (771 Kg)

**ALTITUDE:** to 7,500 feet (2,285 meters)

**AMBIENT TEMPERATURE:** to 113°F (45°C)

## Monaural Operation:

**FREQUENCY RESPONSE:** Within 1 dB 50-15,000 Hz (referred to 75 usec pre-emphasis)

**DISTORTION:** Less than 0.5% 50-15,000 Hz

## Stereophonic Operation:

**PILOT CARRIER STABILITY:** 19 kHz  $\pm$  1 Hz

**SUBCARRIER SUPPRESSION:** -45 dB or better

**FREQUENCY RESPONSE:**  $\pm$  0.5 dB from 50-15,000 Hz (referred to 75 usec pre-emphasis)

**PRE-EMPHASIS:** 75 usec or 50 usec

**SEPARATION:** 40 dB or better, 50-15,000 Hz

**CROSSTALK:** (Main channel to subchannel and subchannel to main channel) 50 dB or better below 100% modulation, 50-15,000 Hz

**DISTORTION:** 0.1% or less distortion of composite wave form (100% modulation by composite stereo)

# SCA Operation

**AMBIENT TEMPERATURE LIMITS:** + 5° C to = 50° C

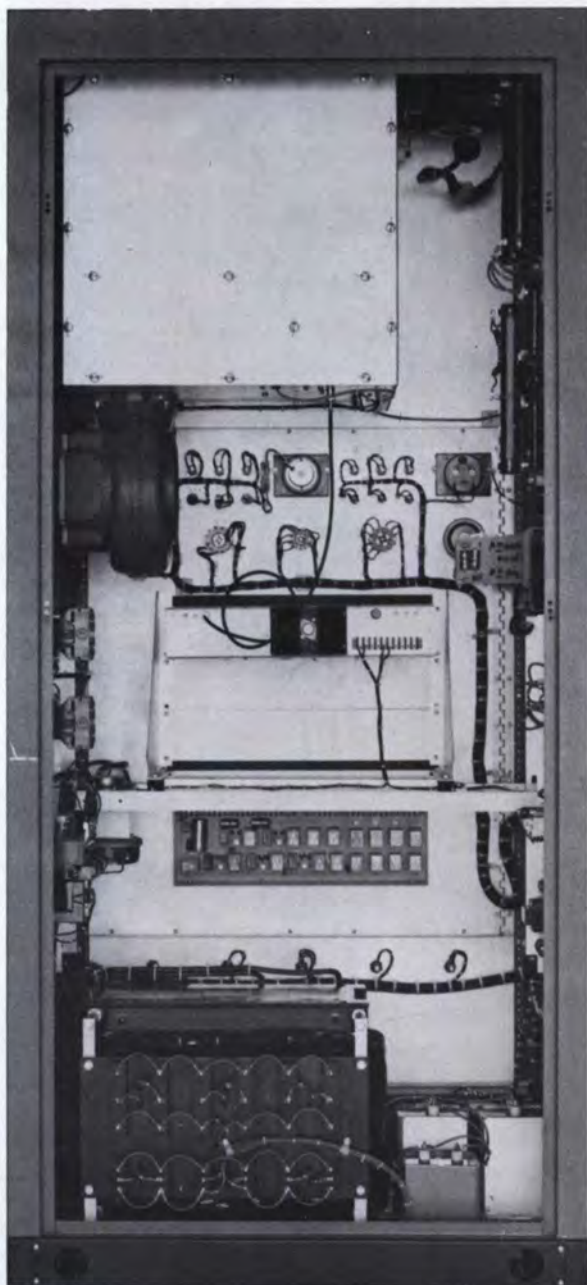
**TYPE OF MODULATION:** FM

**CENTER FREQUENCY RANGE OF SUBCARRIER:**  
Standard 41 or 67 kHz

**OUTPUT VOLTAGE:** At least 2 Volts peak to peak into 10,000 ohms

**MODULATION CAPABILITY:**  $\pm 15\%$  of subcarrier frequency (10% deviation = 100% modulation)

**INJECTION RANGE:** Subcarrier injection adjustable from 0 to 30%



Model 605B interior.

**CARRIER FREQUENCY STABILITY:**  $\pm 500$  Hz over temperature range

**AUDIO INPUT IMPEDANCE:** 600 ohms balanced

**AUDIO INPUT LEVEL:** + 10 dBm at 400 Hz (100% modulation)

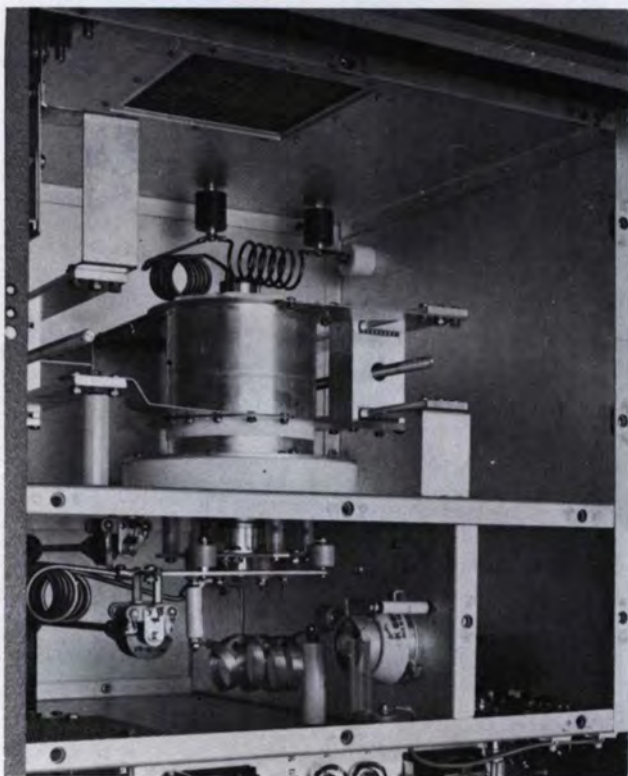
**AUDIO FREQUENCY RESPONSE:** (50-7,500 Hz)  $\pm 2$  dB referred to 75 usec pre-emphasis (convertible to 50 or 150 usec pre-emphasis)

**HARMONIC DISTORTION:** Less than 1.5%, 50-7,500 Hz

**FM NOISE LEVEL:** -65 dB maximum, referred to 15% deviation

**AUTOMATIC MUTE SENSITIVITY:** -20 dB below 10% deviation or better, 100% modulation (muting is front panel controlled for on/off/automatic muting of subcarrier)

**MUTING DELAY:** Adjustable from 0.6 to 4 seconds, nominal

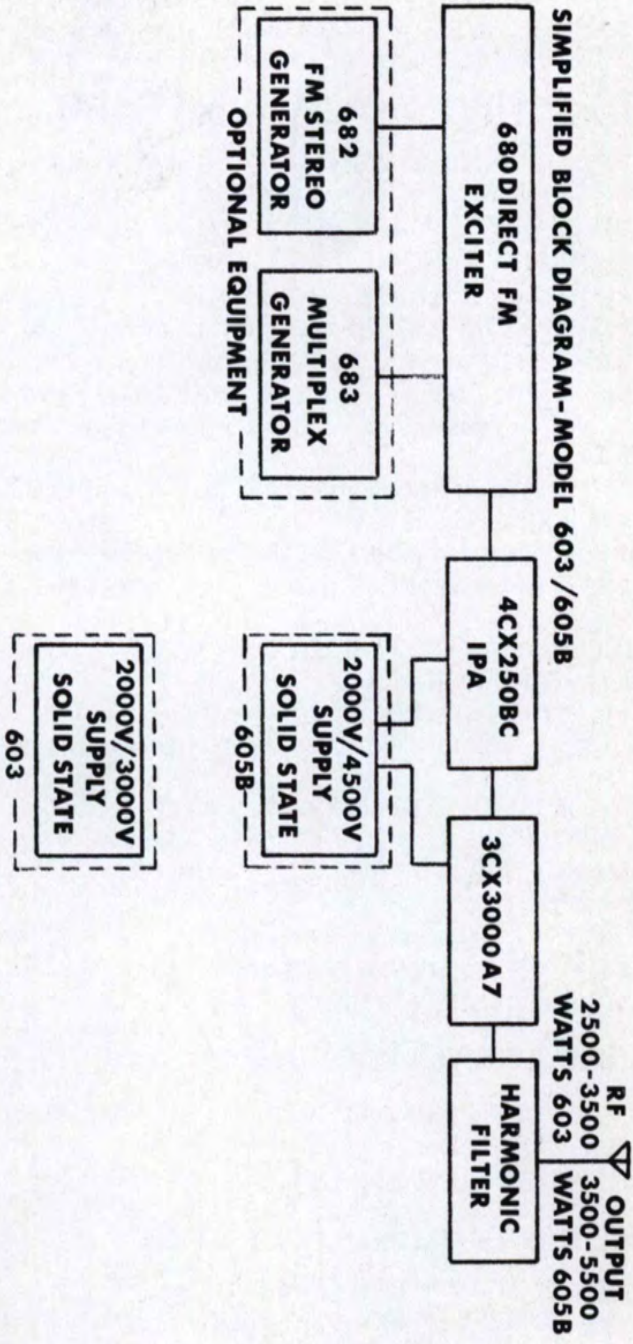


*Model 605B final cavity. The clean design of the transmitters—allowing easy access to all components—extends through all sections.*

#### **ORDERING INFORMATION:**

Model 603 and 605B are supplied complete with the Model 680 Exciter, crystal and oven, tubes and harmonic filter, factory tuned and tested on frequency. For stereo option specify Model 682 Stereo Generator. For SCA specify Model SCA Generator, and further specify subcarrier frequency.

**SIMPLIFIED BLOCK DIAGRAM - MODEL 603 / 605B**

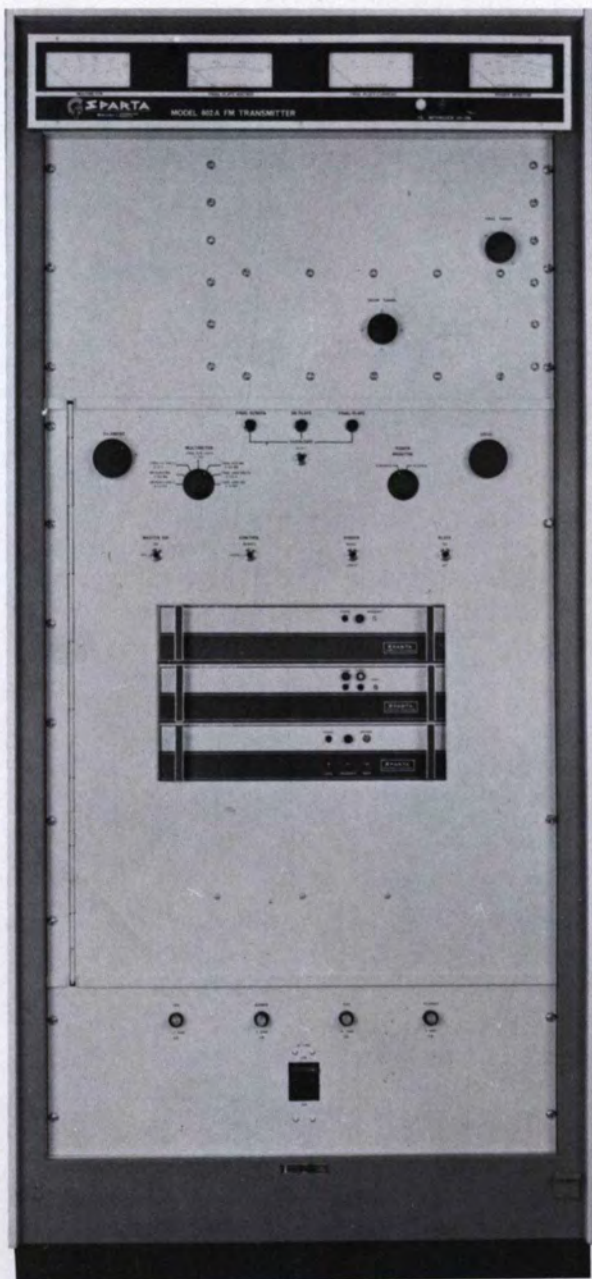


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## Models 601A and 602A FM Transmitters

## **MODELS 601A 1kW and 602A 2.5kW FM TRANSMITTERS**

These modern transmitters belong together in one design series, and are largely identical with the exception of the high voltage power supplies. The Model 601A is type accepted from 700 to 1,500 Watts output. The model 602A is type accepted from 1,000 to 2,500 Watts; with 3-bay antenna it makes the most economical Class A full power package available.

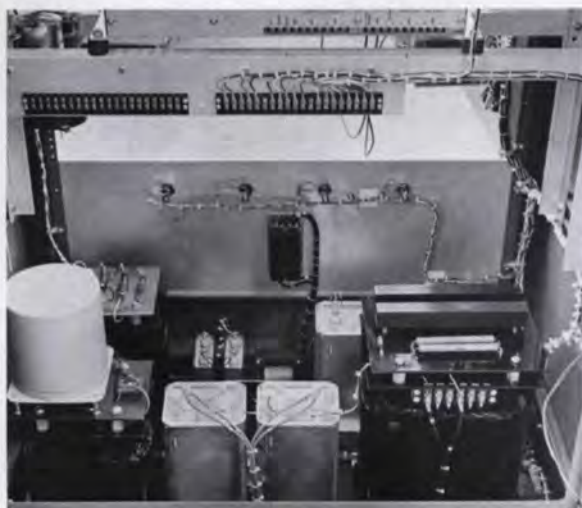
Both transmitters use the Sparta Model 680 Direct FM Exciter, with optional 682 Stereo Generator and 683 SCA Generator (41 or 67 kHz).

A ceramic pentode, the 5 CX1500A, is common to both models. It is operated conservatively even at the higher 2500 Watt output power of the 602A. Neutralization is unnecessary. Tuning is straightforward and does not require continual adjustment to maintain optimum performance.

Driver plate current, final screen and final plate current are overload protected and monitored by a "Tally Light" system with a built-in memory. The low voltage power supply and the control system are readily accessible through a swing-out front panel. Full length hinged doors are provided front and rear. Since the front door is not interlocked it can be removed easily if a space problem exists.

In high power applications the 601A becomes the driver for the 10,000 Watt Model 610A, while the 602A is the driver for the 25,000 Watt Model 625A. Where licensing rules permit the higher power amplifier can be added at any time without major modifications of the lower power unit.

From the transmitter engineer's point of view the Sparta Models 601A and 602A leave nothing to be desired in ease of maintenance and reliability; the design is straightforward and uncluttered.



**Model 601A lower cabinet, from rear.**  
[www.SteamPoweredRadio.Com](http://www.SteamPoweredRadio.Com)

Single phase power supply for both the 601A and 602A gives the user an economy bonus in installation and operation.

## Specifications, Model 601A

**POWER OUTPUT CAPABILITY:** 700 to 1,500 Watts

**LINE POWER CONSUMPTION:** 3,300 Watts at 0.9 PF (1,500 Watts out)

The Model 601A specifications are otherwise identical to the Model 602A with the exception of the high voltage power supply, which operates at 3kv. See Model 602A specifications below.

## Specifications, Model 602A

**TYPE OF MODULATION:** F3, F9 direct frequency modulation of mono, stereo, and SCA audio inputs.

**POWER OUTPUT CAPABILITY:** 1,000 to 2,500 Watts

**FREQUENCY RANGE:** 88 to 108 MHz

**FREQUENCY STABILITY:**  $\pm$  1 kHz after initial warmup

**RF OUTPUT IMPEDANCE:** 50 ohms nominal

**MODULATION CAPABILITY:**  $\pm$  150 kHz

**FM NOISE:** Better than 65dB below 100% modulation (mono, stereo and SCA) referred to 400 Hz

**AM NOISE:** Better than 50 dB below equivalent 100% AM

**HARMONICS:** At least 80 dB below fundamental

**LINE POWER SUPPLY:** 200-245 VAC, 50/60 Hz, single phase

**LINE POWER CONSUMPTION:** 5,400 Watts at 0.9 power factor (2,500 Watts out)

**ALL AUDIO INPUTS:** 600 ohms balanced + 10 dBm  $\pm$  2 dB for 100% modulation (referred to 400 Hz).

**POWER TUBE COMPLEMENT:** 1 each 4 x 150 driver, 1 ea 5CX-1500A Power Amplifier (Exciter and power supplies are completely solid state).

**CABINET SIZE:** 75" high x 34" wide x 25-1/2" deep (101 x 86 x 65 cm), low pass filter included

**WEIGHT:** 1,000 pounds (453.6 Kg)

**ALTITUDE:** to 7,500 feet

**AMBIENT TEMPERATURE:** to 113°F (45°C)

**MONAURAL OPERATION:**

**FREQUENCY RESPONSE:** Within 1dB 50-15,000 Hz (referred to 75 usec pre-emphasis)

**DISTORTION:** Less than 0.5% 50-15,000 Hz.

**STEREOPHONIC OPERATION:**

**PILOT CARRIER STABILITY:** 19 kHz  $\pm$  1 Hz

**SUBCARRIER SUPPRESSION:** -45dB or better

**FREQUENCY RESPONSE:** +0.25 to -0.5dB from



50-15,000 Hz (referred to 75 usec pre-emphasis)

**PRE-EMPHASIS:** 75 usec-convertible to 50 usec

**LEFT-RIGHT CHANNEL SEPARATION:** 40dB or better, 50 Hz to 15 kHz.

**CROSSTALK-STEREOPHONIC:** 50dB or better below 100% modulation, (main channel to subchannel) 50 to 15,000 Hz

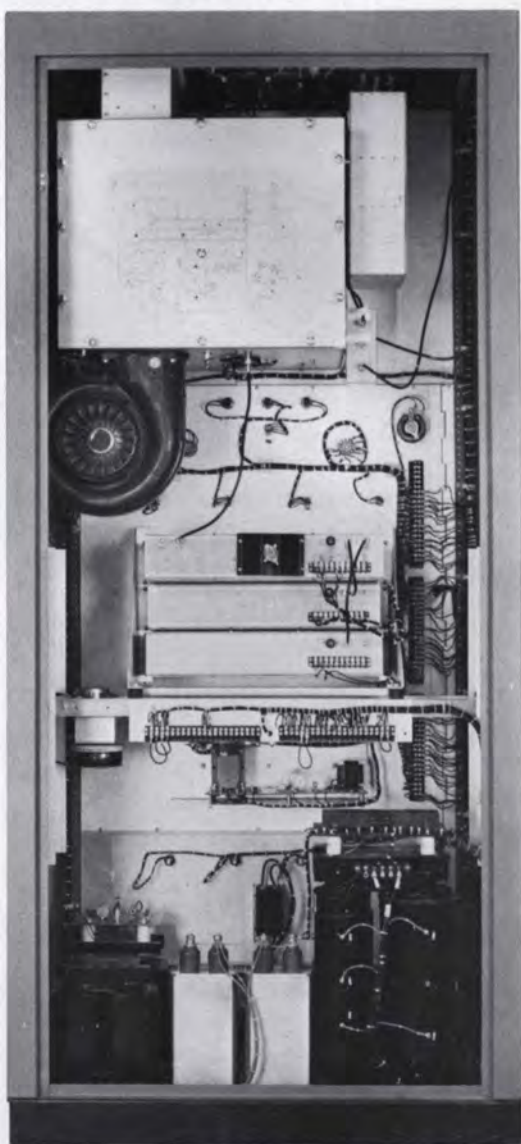
**CROSSTALK:** 42dB or better below 100% modulation, (subchannel to main channel) 50 to 15,000 Hz

**DISTORTION:** 0.1% or less distortion of composite wave form (100% modulation by composite stereo)

**SCA OPERATION:**

**AMBIENT TEMPERATURE LIMITS:** + 5° C to + 50° C

**TYPE OF MODULATION:** FM



Model 602A interior.

**CENTER FREQUENCY RANGE OF SUBCARRIER:**

Standard 41 or 67 kHz

**OUTPUT VOLTAGE:** At least 2 volts peak to peak into 10,000 ohms

**FREQUENCY DEVIATION:** + 10% of center frequency (100% subcarrier modulation)

**MODULATION CAPABILITY:** + 15%

**CARRIER FREQUENCY STABILITY:** 2,500 Hz over temperature range

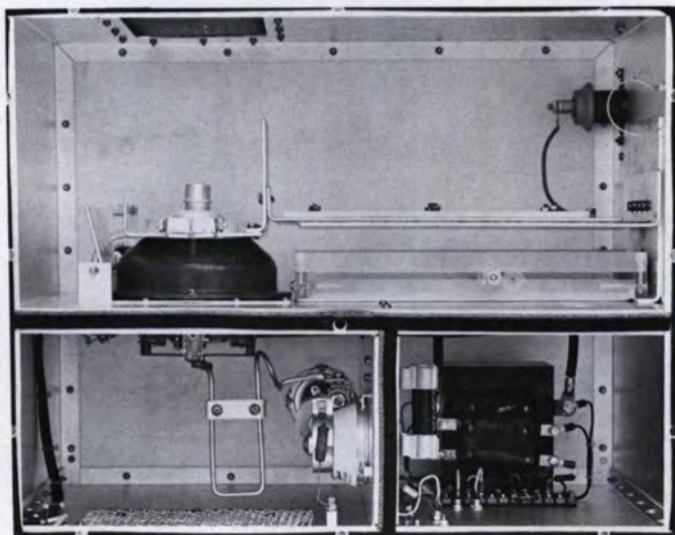
**AUDIO INPUT IMPEDANCE:** 600 ohms balanced

**AUDIO INPUT LEVEL:** + 10dBm at 400 Hz (100% modulation)

**AUDIO FREQUENCY RESPONSE:** (30 to 7,500 Hz)  $\pm$  2dB referred to 75 usec pre-emphasis (convertible to 50 or 150 usec pre-emphasis)

**HARMONIC DISTORTION:** Less than 1.5% (50 to 7,500 Hz)

**FM NOISE LEVEL:** -65dB maximum (referred to 15% deviation)

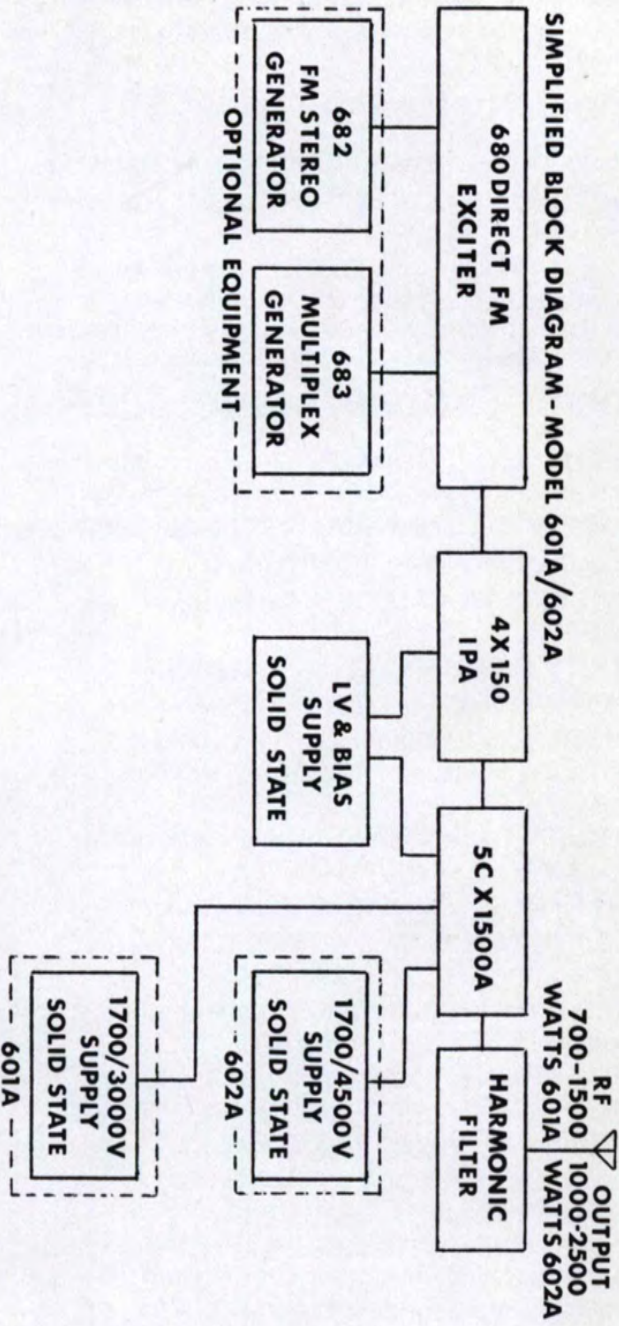


Model 601A-602A final cavity. The clean design of the transmitters—allowing easy access to all components—extends through all sections.

**ORDERING INFORMATION:**

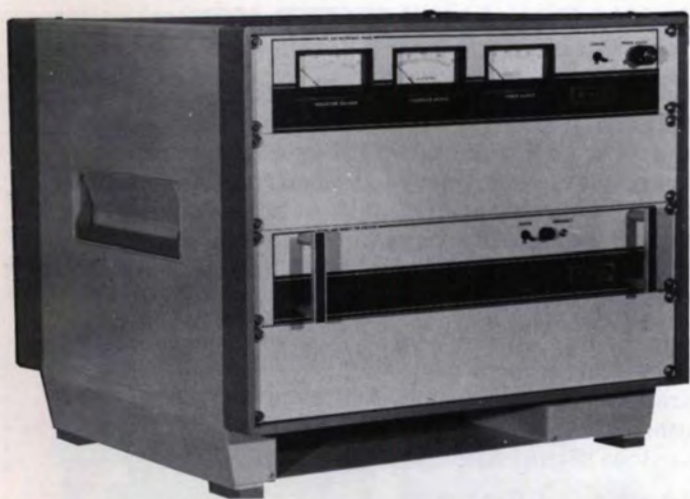
The Models 601A and 602A are supplied complete with the Model 680 Exciter, crystal and oven, tubes and harmonic filter, factory tuned and tested on frequency. For stereo option specify Model 682 Stereo Generator. For SCA specify Model 683 SCA Generator, and further specify subcarrier frequency.

**SIMPLIFIED BLOCK DIAGRAM - MODEL 601A/602A**



**Cetec Broadcast Group**

75 Castilian Drive Goleta, CA 93017  
 (805) 968-1561



## 680 Series FM Exciter and Options

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### MODELS 680 and 680/1 EXCITER AND TRANSMITTER

The Model 680-680/1 FM Exciter/Transmitter is designed to function either as an exciter (Model 680) for an FM power amplifier, or as a 10 Watt FM broadcast transmitter (Model 680/1). The two units differ only in that the 680/1 incorporates a three-meter panel and low pass filter. The meter panel (Model 681) indicates collector voltage, current, and power output.

Long term reliability and simplified operation have been obtained by a design concept that utilizes minimum parts plus modern circuit techniques. automatic carrier balance, strip-line circuitry, and ovenless digital AFC control are a few of these.

The entire exciter is contained in a package measuring only 3.5" high by 19" wide and 10" in depth. There are only two front panel controls; an on/off switch and a fine frequency adjustment. No other field adjustments are needed.

The Model 680 interfaces with and replaces any type accepted FM exciter. It is capable of full stereo and SCA operation, using the Models 682 and 683 or other approved units.

### PRE-EMPHASIS AMPLIFIER

Monaural signals are applied to the modulator via operational amplifier 1IC1, the peripheral components of which provide the required 75 micro-second pre-emphasis characteristic. Wide band signals applied to inputs J1 and J2 bypass the pre-emphasis amplifier and connect to the modulator via compensated attenuators.

### OSCILLATOR-MODULATOR

Transistors 1Q1 and varicap diodes 1D1 and 1D2 comprise a low noise, low distortion modulated oscillator operating on the carrier frequency. The center frequency is maintained within the required tolerance by a digital discriminator and crystal-controlled reference oscillator.

The RF signal from the oscillator is supplied to buffer amplifier 1Q2 which raises the level to approximately one Watt.

### RADIO FREQUENCY AMPLIFIER

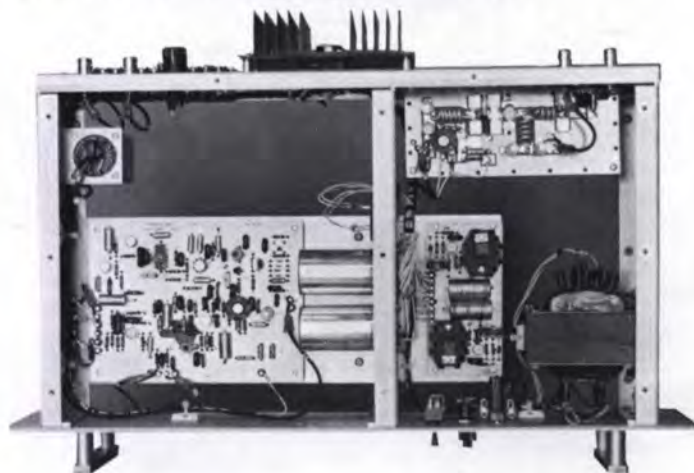
A two-stage stripline RF amplifier comprised of transistors 3Q1 and 3Q2 provides power amplification to 10 Watts with a minimum of components and adjustments. A rheostat connected between terminals 5 and 6 provides a means of

power output control when used as a 10 Watt transmitter (680/1).

### REFERENCE OSCILLATOR AND SYNC DETECTOR

Transistor 1Q3 and its associated components comprise an overtone crystal oscillator. The crystal operating frequency is selected to equal the operating frequency plus 200 KHz, divided by two. The crystal is a special temperature-stable device optimized for operation in this circuit. It can easily meet frequency stability requirements without an oven.

The output of the oscillator and a small sample from the buffer amplifier are mixed in the synchronous detector, producing a 200 KHz sine wave.



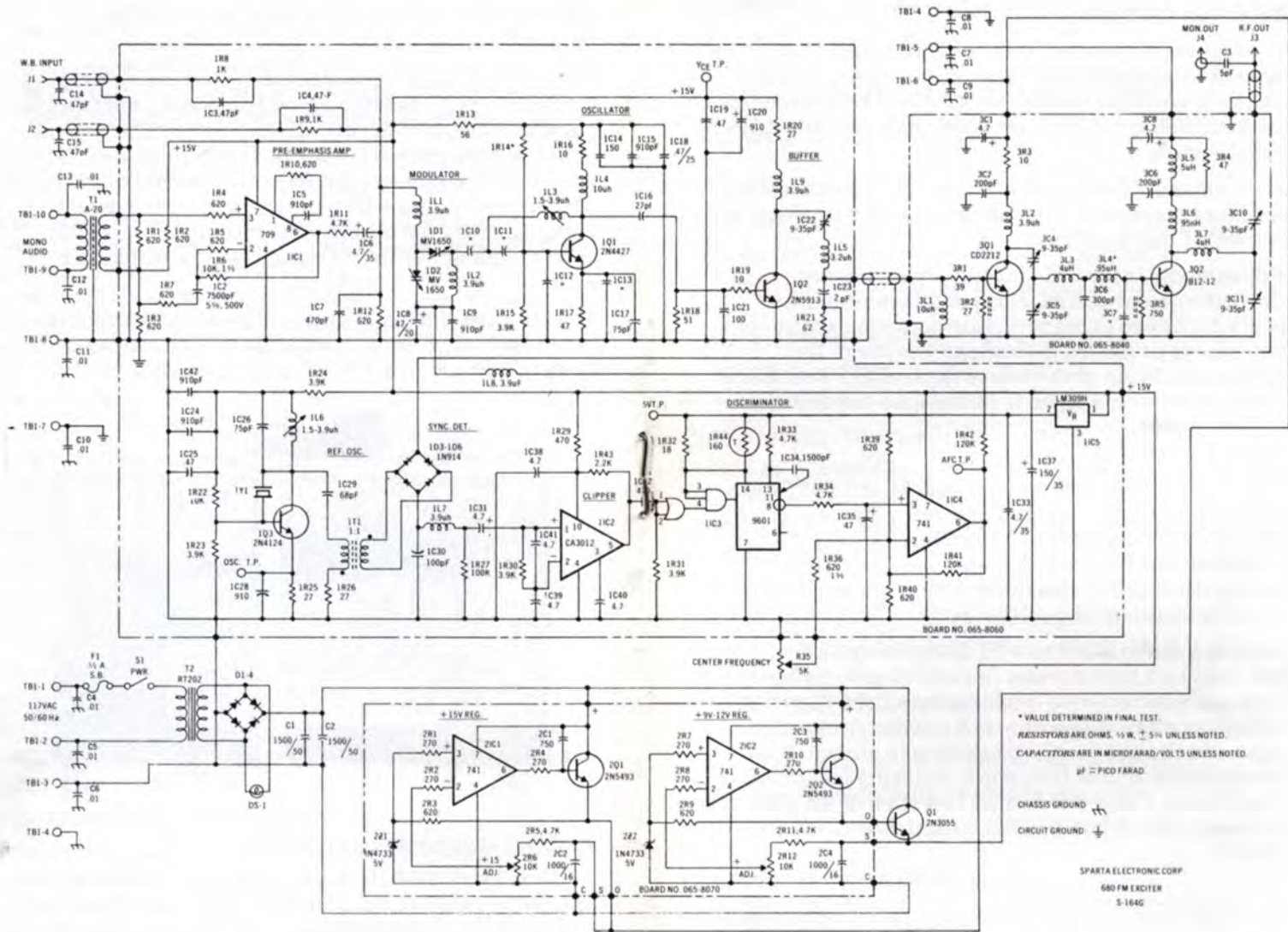
### 200 KHZ DISCRIMINATOR

The low level 200 KHz signal from the detector is applied to operational amplifier 1IC2, connected as a clipper. The symmetrical square wave output of the clipper is differentiated into a sharply-peaked waveform by 1C32 and 1R31. The negative going edge of this waveform is used to trigger a monostable multivibrator, 1IC3. This multivibrator provides an output pulse of uniform width regardless of the repetition rate of that pulse.

Because of this the duty cycle of the output waveform is dependent upon frequency. Simple integration of this signal by 1R34 and 1C35 produces a DC potential with an amplitude that is a function of frequency. Circuit constants chosen produce a DC voltage at 200 KHz of 2 volts. Since the function is linear the level will be 4 volts at 400 KHz and zero volts at zero frequency. 1IC4 operates as a DC amplifier and comparator.

The voltage at the inverting input (pin 2) is set by 1R36 and determines the 'crossover point' of the discriminator and hence the center of the exciter.

The output of this amplifier is applied back to the



vari-cap modulator via 1R42 to set its bias and thus maintain the center frequency. Operating parameters of this critical stage are temperature compensated by thermistor 1R44 and regulator 1IC5.

### POWER SUPPLIES

Two independent regulated power supplies are used in the 680; one to supply the high current requirements of the RF amplifier board, the second to supply all other requirements. Both power supplies are self-protecting from short circuits.

### 682 STEREO GENERATOR

The Model 682 Stereo Generator is a self-powered rack mount unit designed for use with the Model 680 or other direct FM exciter. It can also be used to generate a composite stereo signal at the studio for transmission of an STL system.

Excellent stereo separation and crosstalk specifications are obtainable with the 682. Only one front panel control is needed for successful day-in/day-out operation. This control (pilot) sets pilot amplitude and adjusts the overall gain of the system.



An ultra-stable 67 KHz oscillator provides a low distortion signal that is digitally divided to derive the 19 KHz pilot and the 38 KHz square wave signal used to alternately switch the left and right audio channels. Circuit design assures that the 38 KHz subcarrier suppression will be at least 65 dB below the modulated signal without the need for carrier

\* VALUE DETERMINED IN FINAL TEST.  
RESISTORS ARE OHMS, 1/2 W, 5% UNLESS NOTED.  
CAPACITORS ARE IN MICROFARAD/VOLTS UNLESS NOTED.  
pF = PICO FARAD.

CHASSIS GROUND  
CIRCUIT GROUND

SPARTA ELECTRONIC CORP  
680 FM EXCITER  
S-164G

balance adjustments.

In addition it provides for excellent stereo separation (40 dB or better from 50-15,000 Hz). A phase linear filter removes objectionable harmonics without distorting the phase between the main and subchannels.

A stereo on/off switch and indicator are located on the front panel, and provisions are made for remote control of this function.

Adjustments for the Model 680 are minimized through careful design. No special maintenance procedures are necessary. Components used should not exhibit problems throughout the life of the equipment. None of the active devices are operating with parameters known to cause time-dependent failure modes.

#### **MODEL 683 S.C.A. GENERATOR**

Like the 682 Stereo Generator, the Model 683 SCA Generator is rack mounted and self-powered. It can be used with any direct FM exciter. Two inputs are provided: one for program, and one for telemetry. Automatic muting when modulation is absent is front panel-selectable.

Incoming audio is fed to a 10 dB resistive pad followed by a transformer fed active pre-emphasis network which can be field connected for 75 or 150 microsecond time constants. A telemetry network bypasses the pre-emphasis section to allow the transmission of low frequency metering information. Provision is also made for the insertion of a 5 KHz low pass filter when the 683 is used within a stereo facility.



The modulated oscillator is followed by a diode gate, a buffer amplifier and a low pass filter which removes the harmonics of the oscillator waveform. The diode gate, providing a delay between the end of modulation and the muting of the subcarrier, is adjustable from the front panel.

Provision to switch the subcarrier on/off locally or remotely is a standard feature of the Model 683.

## **Specifications: Model 680/1 FM Transmitter**

SIZE: (Standard EIA rack mount) 19"W x 7"H x 18"D. (In optional custom cabinet, with room for Models 682 and 683) 19½"W x 17"H x 18"D.

All electronic specifications of the Model 680/1  
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are identical with the Model 680 Direct FM Exciter, below.

## **Specifications: Model 680 Direct FM Exciter**

**FREQUENCY RANGE:** 85-125 MHz.

**MODULATION:** F3 and F9.

**POWER OUTPUT:** 5-12½ Watts adjustable.

**OUTPUT IMPEDANCE:** 35.5-91 ohms, 50 ohms nominal.

**MODULATION CAPABILITY:** ± 150 KHz.

**CARRIER FREQUENCY STABILITY:** ± 1 KHz.

**RF BANDWIDTH:** 2.5 MHz at -3 dB power points.

**INPUT LEVEL:** 10 dB ± 2 dB at 400 Hz.

**INPUT IMPEDANCE:** (Monaural) 600 ohms + 10% balanced. (Wide-band) 1 K unbalanced.

**FREQUENCY RESPONSE:** (Monaural) + 0.25 to -0.5 dB from 75 uS curve.

(Wideband) ± 1.0 dB 20-25,000 Hz.

**DISTORTION:** 0.5% or less, all frequencies.

**WIDEBAND PHASE RESPONSE:** +0.25 from phase linearity.

**HARMONIC ATTENUATION:** 43 dB below carrier.

**FM NOISE:** 70 dB below 100% modulation at 400 Hz.

**AM NOISE:** At least 55 dB below carrier level.

**LOAD VSWR:** O-infinity at all phase angles.

**POWER SUPPLY:** 95-135 VAC 50/60 Hz, Single phase.

**POWER CONSUMPTION:** 35 Watts nominal.

**SIZE:** (Standard EIA rack mount) 19"W x 3½"H x 10"D.

**SHIPPING:** 680; 18 pounds (8.1 kilos). 682; add 7 pounds

(3.2 kilos). 683; add 12 pounds (5.2 kilos).

**ALTITUDE RANGE:** to 12,500 feet.

**AMBIENT OPERATING TEMPERATURE:** 0-45° Centigrade.

## **Specifications: Model 682 Stereo Generator**

**PILOT FREQUENCY STABILITY:** +1 Hz maximum.

**INPUT IMPEDANCE:** 600 Ohms, balanced.

**INPUT LEVEL:** + 10 dBm ± 2 dB at 400 Hz for 90% modulation.

**FREQUENCY RESPONSE:** + 0.25 to -0.5 dB from 50 Hz to 15,000 Hz (referred to 75-usec pre-emphasis).

**DISTORTION:** 0.1% of composite waveform or less.

**NOISE:** -65 dB below 100% modulation.

**CROSSTALK:** -50 dB or better (-60 dB typical)

**SEPARATION:** 40 dB, 50 to 15,000 Hz or better.

**POWER SUPPLY:** 105-125 VAC, 50/60 Hz, 15W.

**SIZE:** 19" W x 31½" H x 6"D.

**AMBIENT OPERATING TEMPERATURE:** +5° Centigrade to +50 Centigrade.

**MAXIMUM ALTITUDE:** To 12,500 feet.

## Specifications: Model 683 SCA Generator

**CENTER FREQUENCY RANGE OF SUBCARRIER:**

Standard 41 or 67KHz

**INPUT IMPEDANCE:** 600 ohms balanced.

**INPUT LEVEL:** +10 dBm at 400 Hz (100% modulation).

**OUTPUT VOLTAGE:** At least 2 volts peak to peak into 10,000 ohms.

**FREQUENCY DEVIATION:** +10% of center frequency (100% subcarrier modulation).

**MODULATION CAPABILITY:** +15%.

**CARRIER FREQUENCY STABILITY:** 2,500 Hz over temperature range.

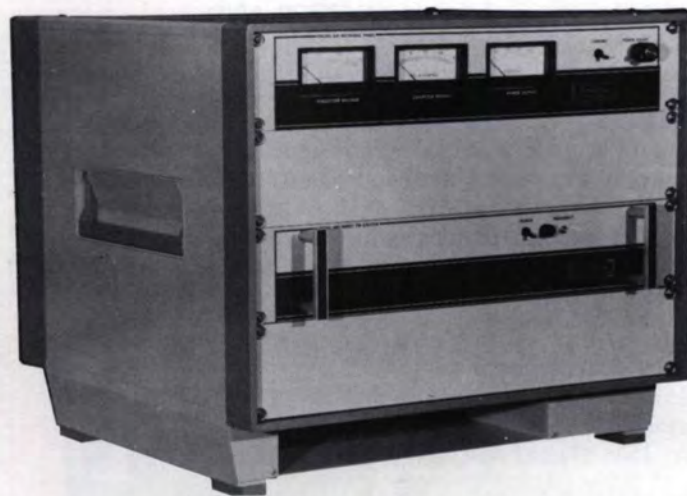
**FREQUENCY RESPONSE:** ±2 dB ref. 75 usec. pre-emphasis (convertible to 50 or 150 usec. pre-emphasis).

**HARMONIC DISTORTION:** Less than 1.5% (50Hz to 7.5 KHz).

**FM NOISE LEVEL:** -65 dB maximum (ref. to 15% deviation).

**SIZE:** 19" W x 3½" H x 10"D.

**AMBIENT OPERATING TEMPERATURE:** +5° Centigrade to +50° Centigrade.



## 680 Series FM Exciter and Options



**Cetec Broadcast Group**

75 Castilian Drive Goleta, CA 93017  
(805) 968-1561



## **Solid State FM Transmitters Models SS250F and SS500F\***



Sparta was the first manufacturer in the broadcast industry to apply micro-strip techniques to high power solid state FM amplifiers. First introduced in the Model 680 Direct FM Exciter in 1973, it was followed by the all-solid state 250 Watt FM Model 600B in 1974. Now in 1976 model numbers are being changed to reflect the solid state technology, and a 500 Watt model based on the 600B is being introduced.

The SS-Series of FM transmitters each use two RF amplifiers; both the inputs and outputs of the amplifiers are combined, using untuned, passive quarter-wave devices which require no maintenance. The combiners, although simple in design, provide over 30 dB of isolation between them so that they do not interact in their operation.

Three 12 volt transistors are used in each RF amplifier of the SS250A. They are 28 volt transistors in the SS500A.

Operation of the Sparta solid state FM transmitter line is simple and straightforward. As there is no warmup time required, On/Off operation is provided by a single switch. The RF amplifiers are overload protected by fast acting reed relays. Overtemperature switches mounted on the RF amplifier heatsinks protect transistor circuitry should the cooling source fail. Isolating switches permit single amplifier operation when required.

The SS-Series transmitters are supplied complete with the Model 680 Exciter, reflectometer and harmonic filter, factory tuned and tested on frequency. For stereo operation specify Model 682 Stereo Generator. For SCA order the Model 683 SCA Generator, and specify sub-carrier frequency.

\* Available summer 1976.

- **World's FIRST solid state broadcast transmitter to go into quantity production was SS250A (600B).**
- **Backup operation on 12 volt car battery (SS250A).**
- **Instant high power backup through use of combined RF amplifiers.**

**SPECIFICATIONS: MODEL SS250F**

RF POWER OUTPUT: 100-250 Watts, adjustable.

POWER CONSUMPTION: 0.8 kW at full output.

WEIGHT: 410 pounds (186 kg).

All other specifications identical to Model SS500F, below.

**SPECIFICATIONS: MODEL SS500F**

RF POWER OUTPUT: 300-500 Watts, adjustable.

POWER CONSUMPTION: 1.3 kW at full output.

WEIGHT: 500 pounds (227 kg).

SIZE: 58"H x 25"W x 28"D (147 x 63.5 x 71 cm).

CABINET STYLE: enclosed steel cabinet; access provided through rear door and removable front panels.

INPUT/OUTPUT CONNECTIONS:

RF OUTPUT: Type N Female.

MONITOR: Type BNC Female.

AUDIO INPUT: Barrier strip.

AMBIENT TEMPERATURE: 0-45 C.

ALTITUDE: to 12,500' at rated output.

HUMIDITY: 0-95%.

FREQUENCY RANGE: 88-108 MHz.

OUTPUT IMPEDANCE: 50 ohms.

VSWR: 0-infinity.

FREQUENCY STABILITY:  $\pm 1,000$  Hz.MODULATION CAPABILITY:  $\pm 150$  kHz.

RF BANDWIDTH: 2.5 MHz.

HARMONIC ATTENUATION: 80 dB minimum.

**MONAURAL MODE:**

AUDIO INPUT IMPEDANCE: 600 ohms balanced.

AUDIO INPUT LEVEL: +10 dBm  $\pm 2$ dB for 100% modulation at 400 Hz.

AUDIO FREQUENCY RESPONSE: Standard 75 microsecond, FCC pre-emphasis curve +0.25 to -0.5 dB, 50-15,000 Hz.

DISTORTION: 0.5% or less, 50-15,000 Hz.

FM NOISE: 65dB below 100% modulation, referenced to 400 Hz.

AM NOISE: 55 dB below reference, carrier AM modulated 100%.

SYNCHRONOUS AM: -50 dB maximum at 400 Hz due to 100% FM.

**STEREOPHONIC MODE**PILOT STABILITY: 19kHz  $\pm 1$  Hz.

AUDIO INPUT IMPEDANCE: (left and right) 600 ohms balanced.

AUDIO INPUT LEVEL: (left and right) +10 dBm  $\pm 1$  dB for 100% modulation at 400 Hz.

AUDIO FREQUENCY RESPONSE: (left and right) Standard 75 microsecond, FCC pre-emphasis curve + 0.25 to -0.5 dB, 50-15,000 Hz.

DISTORTION: (left and right) 0.75% or less, 50-15,000 Hz.

STEREO SEPARATION: -40 dB minimum 50-15,000 Hz or better.

SUB-CARRIER SUPPRESSION: -65 dB below 100% modulation (main to sub-channel or sub-to main channel); 50 dB below 100% modulation, 50-15,000 Hz.

CROSSTALK: (main to sub-channel or sub to main channel) 50 dB below 100% modulation, 50-15,000 Hz.

**SCA SPECIFICATIONS**FREQUENCY STABILITY:  $\pm 500$  Hz.

FREQUENCY: Between 25 and 75 kHz, 41 or 67 kHz, standard.

MODULATION: Direct FM.

AUDIO INPUT IMPEDANCE: 600 ohms balanced.

AUDIO INPUT LEVEL: + 10 dBm for 100% modulation at 400 Hz.

DISTORTION: Less than 1.5%, 50-7,500 Hz.

FM NOISE: -65 dB maximum, referenced to 15% deviation.

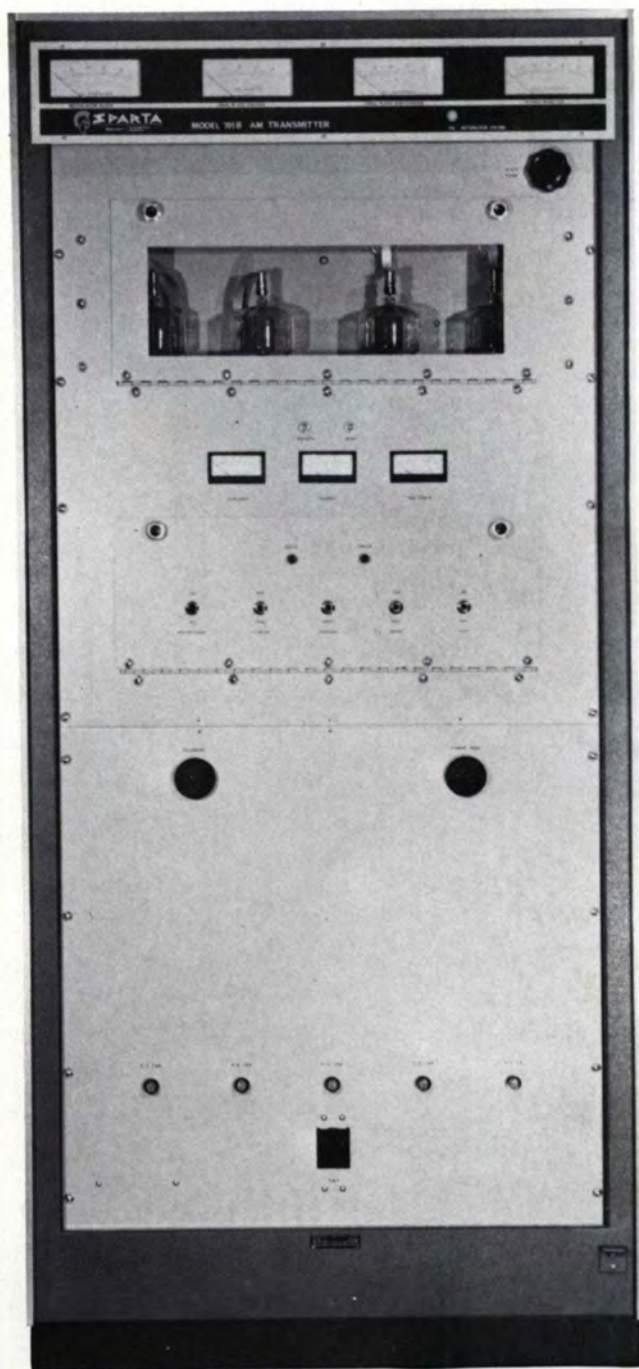
CROSSTALK: (sub-channel to main channel) -60 dB or better.

CROSSTALK: (Main channel to sub-channel) 50 dB below 100% modulation, referenced to 400 Hz.

AUTOMATIC MUTE LEVEL: -10 dBm at 400 Hz.

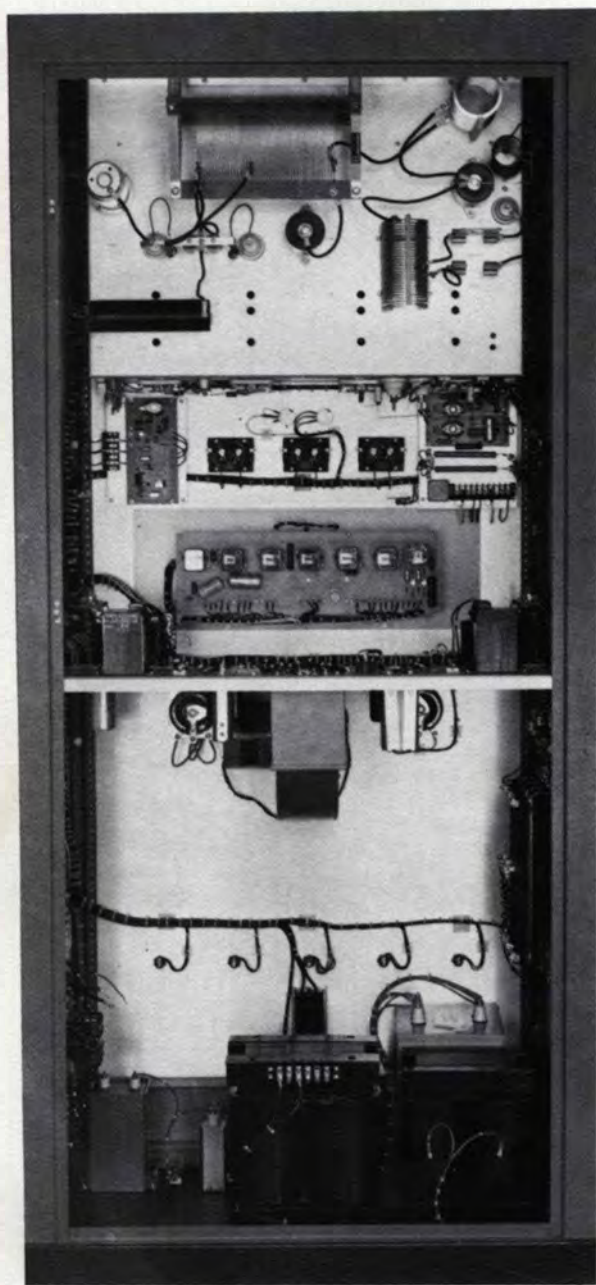
MUTING DELAY: Variable from 0.6 to 4 seconds.

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# MODEL 701B

1000/500/250 Watt AM TRANSMITTER



### **MODEL 701B**

#### **1000/500/250 Watt AM Transmitter**

The Sparta 701B is a self-contained plate modulated AM transmitter capable of up to 1,100 Watts output in the 535 to 1620 KHz band.

Solid state devices are combined with only one tube type to provide a simple, highly dependable design. A high quality oil filled modulation transformer eliminates moisture deterioration and assures long lasting reliability. Another quality feature is the vacuum capacitor used for

plate tuning which eliminates arcing and roller coil freezing, associated with conventional tuning methods. The 'Tally Light' system will reduce downtime and help preventive maintenance by identifying the point of overload. The 701B has a dummy load as standard equipment.

Frequency response of the 701B is excellent, distortion is low, and 125% positive peak modulation capability is there for those who wish to use it.

Simultaneous full meter display of all important functions can be monitored with doors of the 701B closed. Access to the front panel switches and subsidiary metering is through a non-interlocked hinged front door, which can be changed to open from either side. Rear access is provided through a full-size, hinged and interlocked door. All control circuitry is mounted on a swing-down front panel for easy accessibility. There is only one front panel tuning control. Remote control interface kits are optional for the user's choice of systems.

The entire transmitter is housed in a single steel cabinet which is mounted on a sturdy 12-gauge steel base.

### **SIMPLIFIED POWER CUTBACK**

The 701B is supplied in the user's choice of two powers. A single switch controls final plate voltage, audio, and RF drive simultaneously. (See 'Ordering Information')

### **SOLID STATE POWER SUPPLIES**

All power supplies use encapsulated silicon bridge rectifiers which provide low power drain, cooler operation, and reliable performance. A single low voltage transformer provides bias voltage for the modulator tubes, 25 volts for the RF drive section, 800 volts for the modulator screens, and 400 volts for the solid state audio driver.

An epoxy-sealed plate transformer provides high voltage for the modulator and final amplifier tubes.

### **SOLID STATE OSCILLATOR AND RF DRIVER**

Adding an extra measure of transmitter stability, the 701B utilizes a solid state oscillator and RF driver. An ovenless crystal operating in the highly stable area four times carrier frequency is used. Two binary divider IC's operating in tandem count down the oscillator to the desired carrier frequency. A buffer transistor follows the divider, then an output transistor that is matched to the final grids through an "L" network.

Type 4-500A tetrodes have been used in the RF section of the transmitter, reducing the required stages and the power consumption. Tetrodes also eliminate the need for neutralization.

The parallel operated final tubes operate in conventional Class C at an average efficiency of 75%. The built-in dummy load is capable of full power operation continuously.

### **HIGH QUALITY MODULATOR**

A simple two stage transistor amplifier provides ample audio drive for two 4-500A tetrode modulator tubes operating Class AB-1. A high quality modulation transformer, sealed in oil, provides exceptional sound and modulation capability.



**AUDIO DRIVER ASSEMBLY:** the simplicity and space-saving design of the 2-stage transistor amplifier is evident in this closeup. Two 4-500A tetrodes operating AB-1 are powered by this stage (right). **RF DRIVER ASSEMBLY:** this solid state system enables a highly stable ovenless crystal to operate at its best frequency, the output being counted down to operating frequency (left).

## Specifications:

**AF INPUT IMPEDANCE:** 600 ohms

**AF INPUT LEVEL:** +10 dBm  $\pm$  2 dBm (100% Modulation)

**AF RESPONSE:** 50-10,000 Hz (95% Modulation)  $\pm$  1.5 db (typical -  $\pm$  1 db)

**AF DISTORTION:** 50-10,000 Hz (95% Modulation) less than 3% (typical - 1.5%)

**NOISE:** (below 100% Modulation) 1000 Watts — 55 db; 250 Watts — 52 db

**FREQUENCY RANGE:** 540-1600 KHz

**FREQUENCY STABILITY:**  $\pm$  10Hz 0-50°C

**OUTPUT IMPEDANCE:** 50 Ohms unbalanced — others available on special order

**CARRIER SHIFT:** 3% or less (0-100% Modulation)

**DUMMY ANTENNA:** 50 Ohms — Capable full time operation 100% Program Modulation

**POWER OUTPUT:** 1000/500/250 Watts — Any combination of two power levels (capable 1100 Watts)

**POWER SUPPLY:** 208-240 volts  $\pm$  5%, 50/60 Hz, Single Phase

**POWER CONSUMPTION:** (1000 Watts output — 90% PF) Approximate: 0% Modulation 2950 Watts; 30% Modulation 3400 Watts; 100% Modulation 4150 Watts

**AMBIENT OPERATING TEMPERATURE:** To 113°F

**ALTITUDE RANGE:** To 7500 — Higher Altitudes on special order

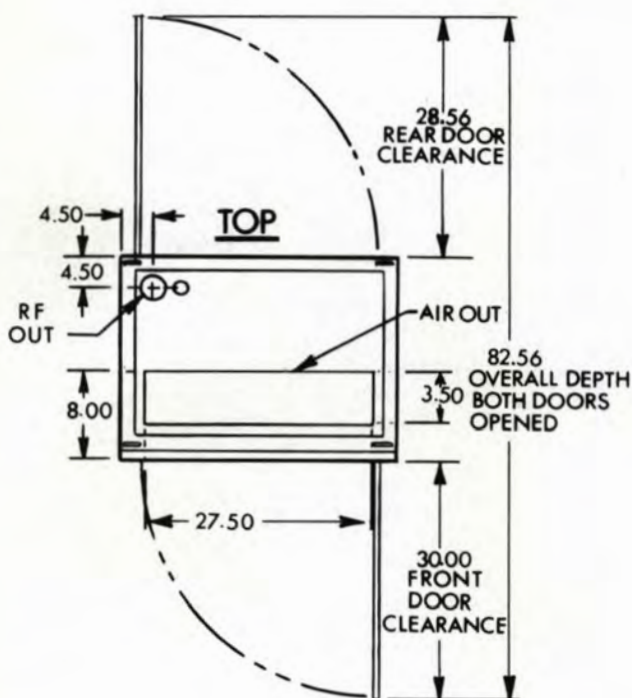
**SIZE:** 75" High, 34" Wide, 25½" Deep

**WEIGHT:** 1000 lbs. NET

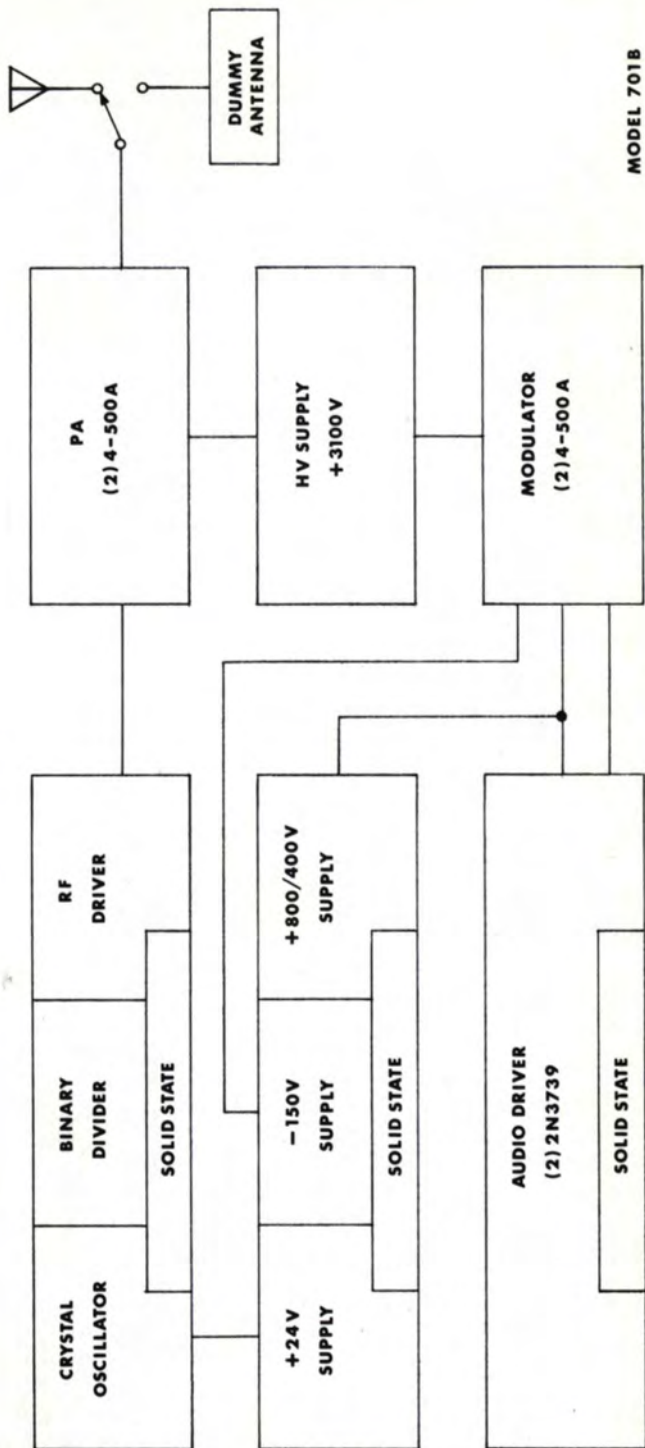
**OPTIONAL EQUIPMENT:** (factory installed) RMK-1 — Remote Control Kit, including control relay interface assembly and motor rheostat. CVT — Constant Voltage Transformer to maintain filament and low voltage supplies within  $\pm 1\%$ . 60 Hz only.

**ORDERING INFORMATION:** the 701B is supplied complete with tubes, transistors and crystal, tuned and tested on frequency. Specify one maximum and one switchable lesser power level between 250 and 1,000 Watts. If no specification is made the transmitter will be furnished in 1,000/250 Watt switchable configuration.

**POWER REQUIREMENT:** the 701B operates from 208-240 volt, 50/60 Hz, single phase power supply.



**FLOORPLAN, MODEL 701B.** Two alternatives should be kept in mind: (1) the FRONT door can be switched in the field to open in the opposite manner to the drawing, and (2) the RF output is standard at top of cabinet, but can also emerge exactly below the position in the drawing for trench feed to tower.




MODEL 701B



# SPARTA

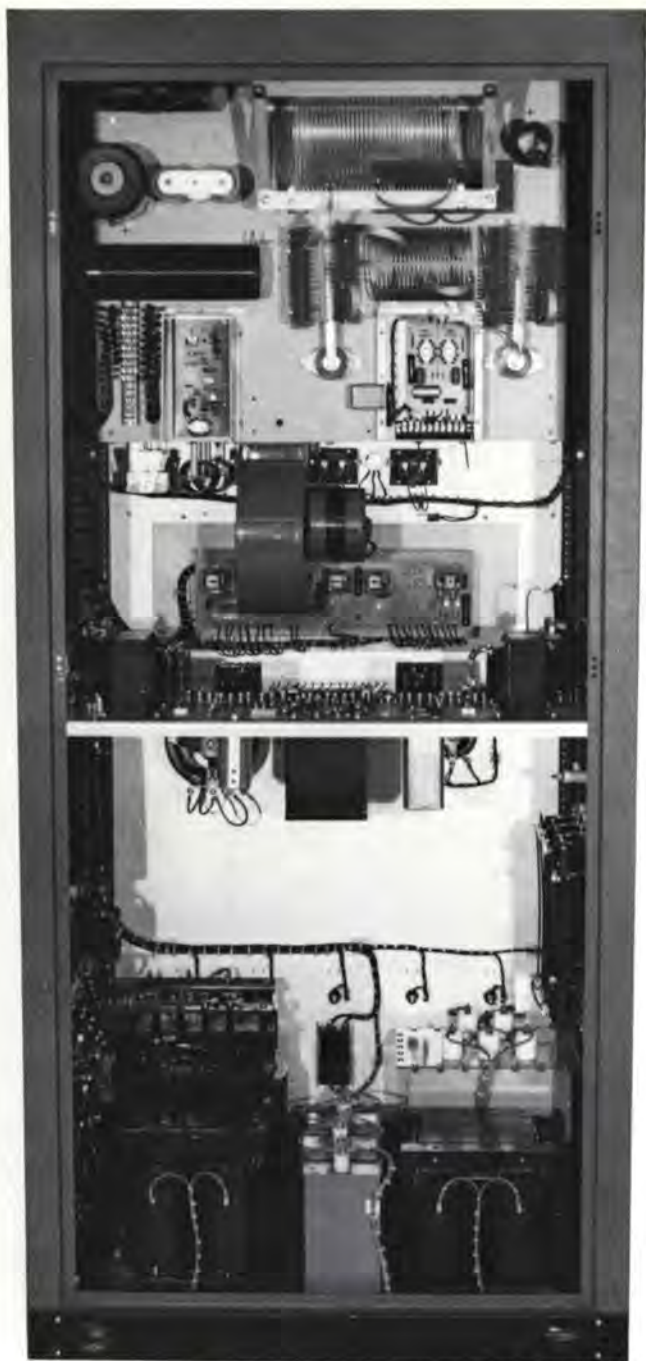
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 a Subsidiary of  Cetec Corporation





# **Model 703B 2.5 kW AM Transmitter**



### **MODEL 703B**

#### **2500 Watt AM Transmitter**

The Sparta 703B is a self-contained plate modulated AM transmitter capable of up to 3,000 Watts output in the 535 to 1620 KHz band.

Solid state devices are combined with only one tube type to provide a simple, highly dependable design. A high quality oil filled modulation transformer eliminates moisture deterioration and assures long lasting reliability. Another quality feature is the

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vacuum capacitor used for plate tuning which eliminates arcing and roller coil freezing, associated with conventional tuning methods. The 'Tally Light' system will reduce downtime and help preventive maintenance by identifying the point of overload.

Frequency response of the 703B is excellent, distortion is low, and 125% positive peak modulation capability is there for those who wish to use it.

Simultaneous full meter display of all important functions can be monitored with doors of the 703B closed. Access to the front panel switches and subsidiary metering is through a non-interlocked hinged front door, which can be changed to open from either side. Rear access is provided through a full-size, hinged and interlocked door. All control circuitry is mounted on a swing-down front panel for easy accessibility. There is only one front panel tuning control. Remote control interface kits are optional for the user's choice of systems.

The entire transmitter is housed in a single steel cabinet which is mounted on a sturdy 12-gauge steel base.

### **POWER CUTBACK**

For a minimal extra charge the 703B can be supplied with a power cutback to 1000 or 500 watts. A single switch controls final plate voltage, audio and RF drive simultaneously.

### **SOLID STATE POWER SUPPLIES**

All power supplies use encapsulated silicon bridge rectifiers which provide low power drain, cooler operation, and reliable performance. A single low voltage transformer provides bias voltage for the modulator tubes, 25 volts for the RF drive section, 800 volts for the modulator screens, and 400 volts for the solid state audio driver.

An epoxy-sealed plate transformer provides high voltage for the modulator and final amplifier tubes.

### **SOLID STATE OSCILLATOR AND RF DRIVER**

Adding an extra measure of transmitter stability, the 703B utilizes a solid state oscillator and RF driver. An ovenless crystal operating in the highly stable area four times carrier frequency is used. Two binary divider IC's operating in tandem count down the oscillator to the desired carrier frequency. A buffer transistor follows the divider, then an output transistor that is matched to the final grids through an "L" network.

Type 4-1000A tetrodes have been used in the RF section of the transmitter, reducing the required stages and the power consumption. Tetrodes also eliminate the need for neutralization.

The parallel operated final tubes operate in conventional Class C at an average efficiency of 75%.

## HIGH QUALITY MODULATOR

A simple two stage transistor amplifier provides ample audio drive for two 4-1000A tetrode modulator tubes operating Class AB-1. A high quality modulation transformer, sealed in oil, provides exceptional sound and modulation capability.



**AUDIO DRIVER ASSEMBLY:** the simplicity and space-saving design of the 2-stage transistor amplifier is evident in this closeup. Two 4-1000A tetrodes operating AB-1 are powered by this stage (right). **RF DRIVER ASSEMBLY:** this solid state system enables a highly stable ovenless crystal to operate at its best frequency, the output being counted down to operating frequency (left).

## Specifications:

**AF INPUT IMPEDANCE:** 600 ohms

**AF INPUT LEVEL:** + 10 dBm  $\pm$  2 dBm (100% Modulation)

**AF RESPONSE:** 50-10,000 Hz (95% Modulation)  $\pm$  1.5 db (typical -  $\pm$  1 db)

**AF DISTORTION:** 50-10,000 Hz (95% Modulation) less than 3% (typical - 1.5%)

**NOISE:** (below 100% Modulation) 2500 Watts — 60 db

**FREQUENCY RANGE:** 540-1600 KHz

**FREQUENCY STABILITY:**  $\pm$  10Hz 0-50° C

**OUTPUT IMPEDANCE:** 50 Ohms unbalanced — others available on special order

**CARRIER SHIFT:** 3% or less (0-100% Modulation) Nominal - 2500 watts, capable - 3000 watts

**POWER OUTPUT:** Nominal - 2500 watts, capable - 3000 watts

**POWER SUPPLY:** 208/240 or 380/415 volts,  $\pm$  5%, 50/60 Hz, three phase

Single phase available at extra cost and with

slightly reduced noise, distortion and response specification

**POWER CONSUMPTION:** 2500 watts output - 90% PF approximate: 0% modulation - 5.95KW; average modulation - 6.7kW; 100% modulation - 8.4kW.

**AMBIENT OPERATING TEMPERATURE:** To 113° F

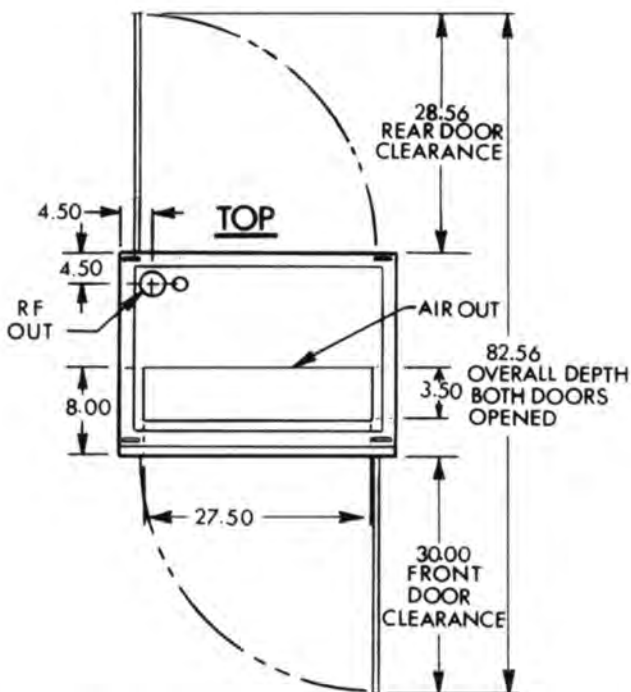
**ALTITUDE RANGE:** To 7500' — Higher Altitudes on special order.

**SIZE:** 75" high, 34" Wide, 25½" Deep

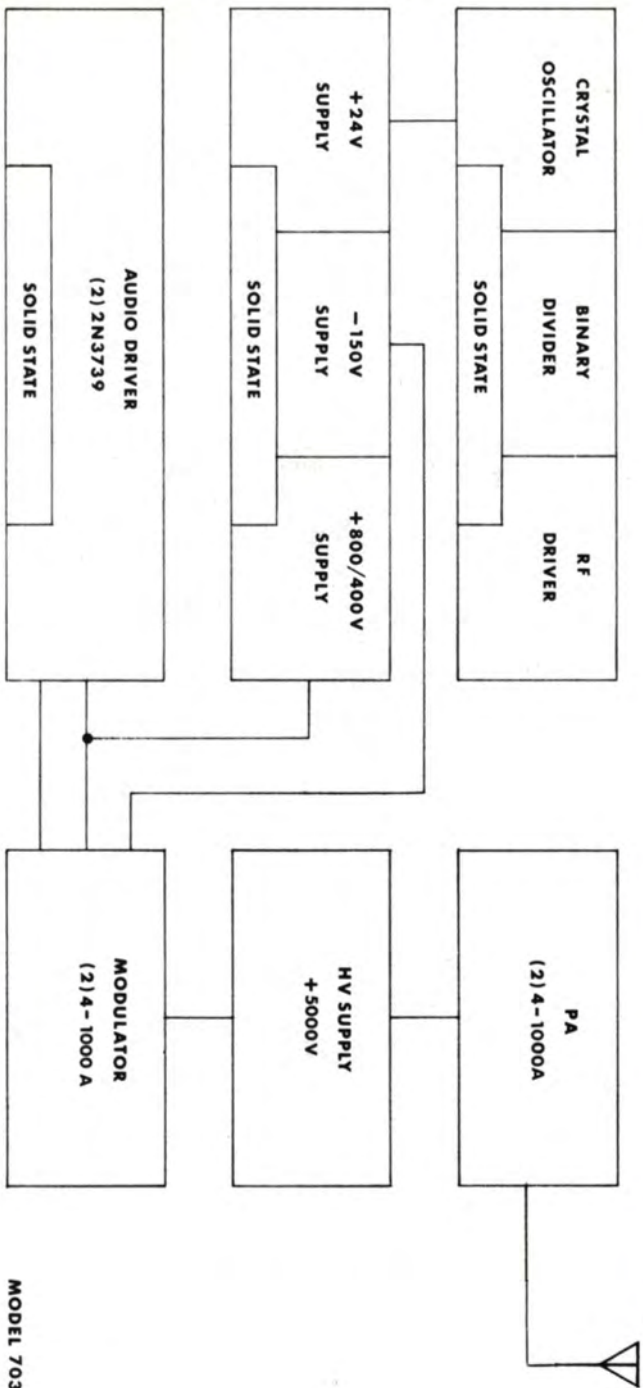
**WEIGHT:** 1500 lbs. NET

**OPTIONAL EQUIPMENT:** (factory installed) RMK-1 — Remote Control Kit, including control relay interface assembly and motor rheostat. CVT — Constant Voltage Transformer to maintain filament and low voltage supplies within  $\pm 1\%$ . 60 Hz only.

**ORDERING INFORMATION:** the 703B is supplied complete with tubes, transistors and two crystals, tuned and tested on frequency.



**FLOORPLAN, MODEL 703B.** Two alternatives should be kept in mind: (1) the FRONT door can be switched in the field to open in the opposite manner to the drawing, and (2) the RF output is standard at top of cabinet, but can also emerge exactly below the position in the drawing for trench feed to tower.



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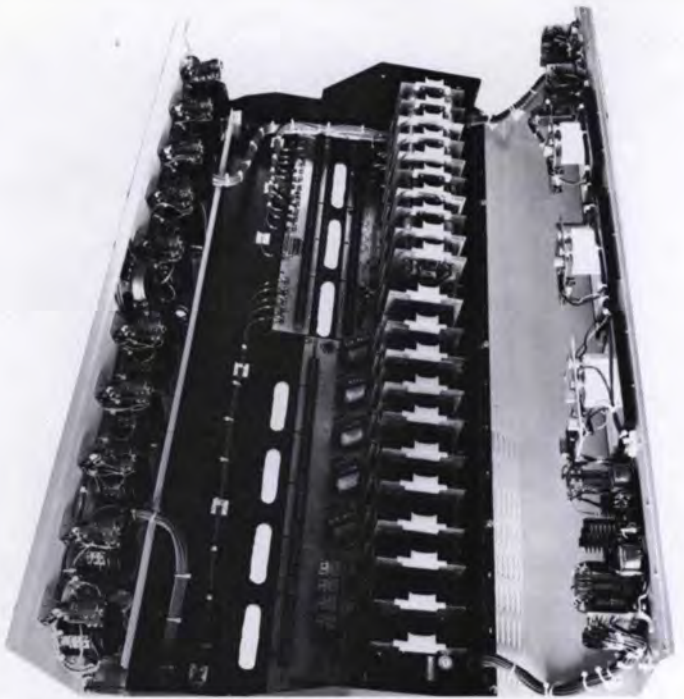
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## **Model 3410 Stereo Console**



### **MODELS 3410 STEREO CONSOLE**

The 3000-Series dual-channel, medium priced line of both mono and stereo consoles neatly bridges the gap between the Sparta 1000-Series and Centurion Series in terms of capacity, features, performance and price. The 1000-Series offers both mono and stereo consoles of five- and eight-mixer capacity; the 3000-Series is ten-mixer only; the Centurion Series modularity permits eight-, nine-, ten-, eleven-, twelve-, eighteen-, and twenty-four mixer master control room flexibility.

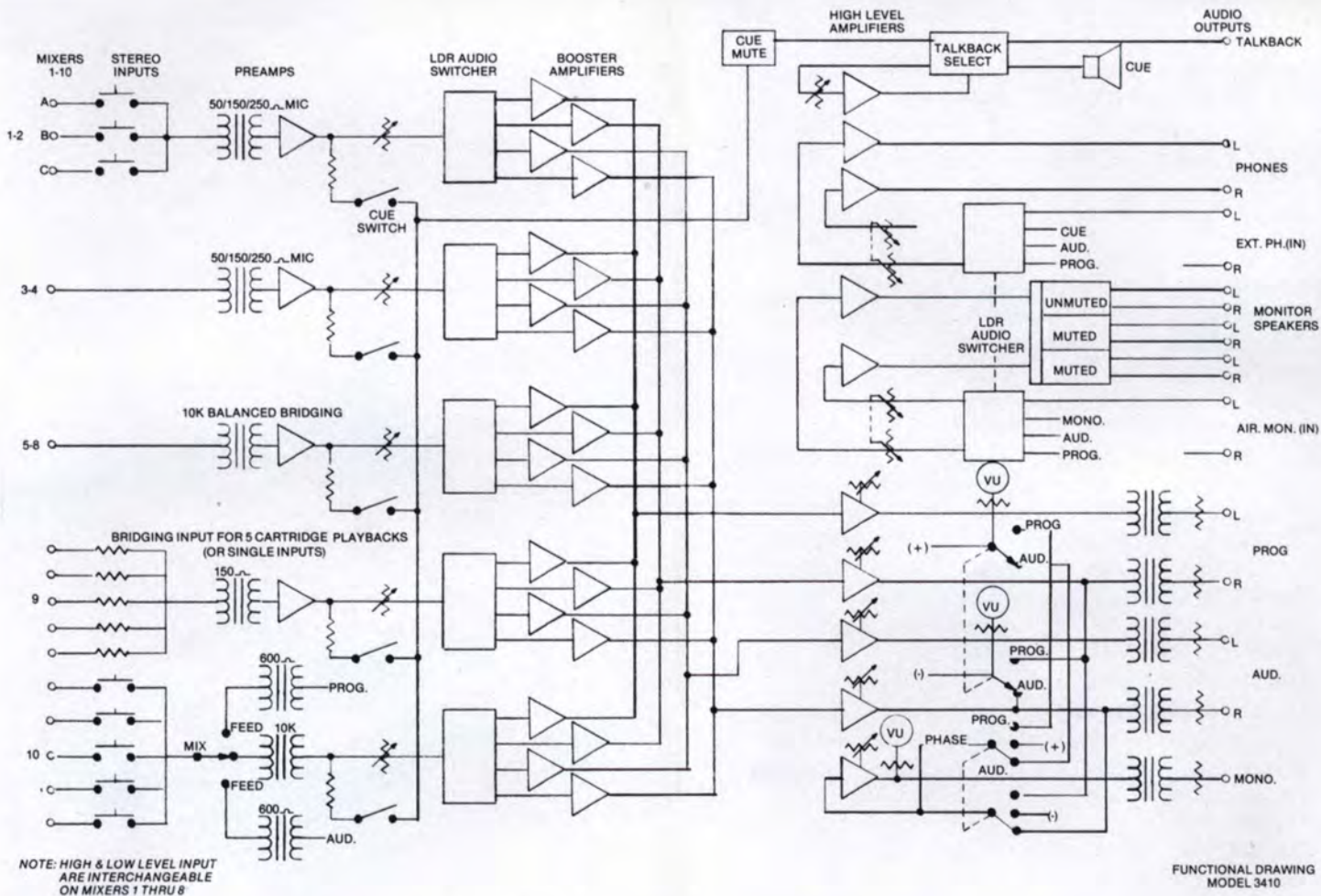
### **MODEL 3410 FEATURES**

The 10-mixer 3410 is supplied standard as a full dual-channel console, with precision step type cue-detent attenuators. Both Program and Audition circuits employ completely noiseless optically-coupled switching, with identical line level balanced outputs on each; both busses are switch-metered. There is a metered mono output selectable from either Program or Audition, which is further switch-selectable to be monitored audibly.

The mono output meter is also useful when switched to read the combined left and right stereo channels out of phase, in order to evaluate the way a stereo cartridge will sound to a mono listener. A five-source bridging input at Mixer 9 permits connecting up to five cartridge playbacks without interaction; it works as well, of course, for a single input.

A Pan Pot on Mixer 4 can be used to position a mono audio source anywhere across the stereo field. Microphone preamps and line level input cards are interchangeable; the latter have three-position switches for -10, 0, and +10 dBm sensitivity as required.



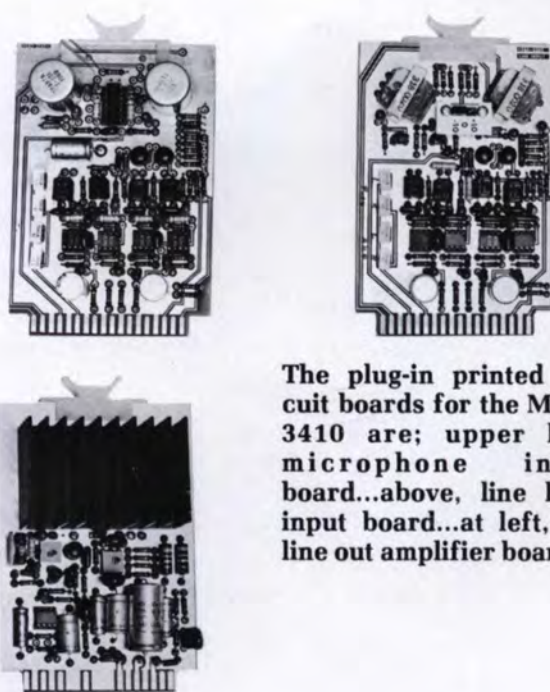


The cue speaker is centrally mounted on the front panel, and also serves as the intercom microphone/speaker. 'Send/Mix' switches on Mixers 9 and 10 feed Program or Audition audio to any of five remote lines, or route the audio from a selected remote line to the console mixer. A built-in monitor amplifier delivers 12 Watts RMS per channel of high fidelity sound.

Besides the interchangeable microphone and line level amplifiers, only one other amplifier type is used; it functions as headset, cue, line, and monitor amplifier. All active circuits are plug-in, using the latest in IC technology.

Access to the console interior is via dual hinged front and top panels; all components and circuits are completely revealed in one motion. Inputs and outputs are made to barrier strips which are accessible from the front; cable entries are through slots in the bottom panel.

The 3410 is finished in tough polyurethane enamels, with woodgrain finish end caps. The VU meters are rear-lighted, and meters and control knobs are over-size for operator convenience.



The plug-in printed circuit boards for the Model 3410 are; upper left, microphone input board...above, line level input board...at left, the line out amplifier board.

## MODEL 3410 OPTIONS

The only option offered is for export; 230 VAC instead of the standard 117 VAC 50/60 Hz.

# Specifications: Model 3410

**MIXERS:** Ten.

**INPUTS:** Twenty-two; 8 microphone and 14 line level.

**INPUT IMPEDANCE:** Microphone; 50/150/250 ohms balanced. Line; 10 K balanced bridging (can be terminated in 600 ohms).

**INPUT LEVELS:** Microphone mixers 1, 2, 3, 4: nominal -55 dBm. Line level mixers 5-10; switch selected sensitivity of -10 0. and + 10 dBm.

**OUTPUT LEVELS:** (Program and Audition identical) 8 dBm into 600 ohms for 0 VU indication. Twenty-two dBm maximum output. Monitor; 12 Watts RMS. Cue/Talkback; 5 Watts. Phones; 0.5 Watt to 4 ohm headset (high Z also useable).

**RESPONSE:** All program amplifiers within 1 dB 20-20,000 Hz at rated output. All monitor amplifiers  $\pm$  1 dB 20-20,000 Hz at rated output.

**CROSSTALK:** Below noise in all channels.

**HARMONIC DISTORTION:** All program amplifiers less than 0.3% 20-20,000 Hz at rated output; typically less than 0.1% at 1,000 Hz. All monitor amplifiers less than 0.5% 20-20,000 Hz at rated output; typically less than 0.3% at 1,000 Hz.

**INTERMODULATION DISTORTION:** All program amplifiers less than 0.05% at rated output; less than 0.2% at any operating level. All monitor amplifiers less than 0.5% at rated output or less. SMPTE measurement standards.

**NOISE:** 68 dB below + 8 dBm output, referenced to -55 dBm input 20-20,000 Hz unweighted. Equivalent input noise -123 dBm.

**MUTING/CONTROL:** Two separately muted monitor speaker outputs, with contacts for 'on air' lights. Two more relays provided for control functions or additional muting.

**POWER:** 117V 50/60 Hz (230V optional).

**SIZE:** 37" W x 7½" H x 15½" D. (860 x 190 x 390 mm).

**SHIPPING:** Console and Power Supply; 89 pounds (40.5 kilos).



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## **Model 3410 Stereo Console**



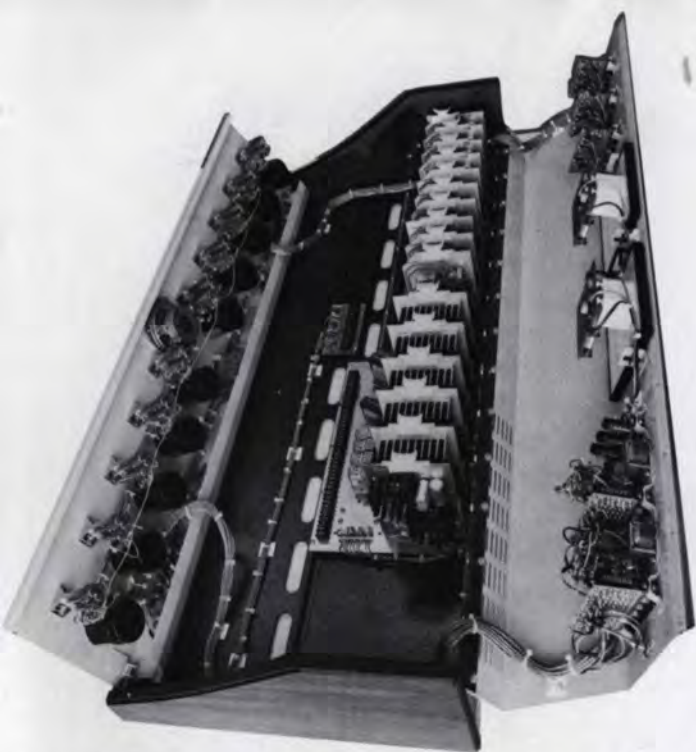
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## Model 3310 Monaural Console

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The 3000-Series dual-channel, medium priced line of both mono and stereo consoles neatly bridges the gap between the Sparta 1000-Series and Centurion Series in terms of capacity, features, performance and price. The 1000-Series offers both mono and stereo consoles of five- and eight-mixer capacity; the 3000-Series is ten-mixer only; the Centurion Series modularity permits eight-, nine-, ten-, eleven-, twelve-, eighteen-, and twenty-four mixer master control room flexibility.

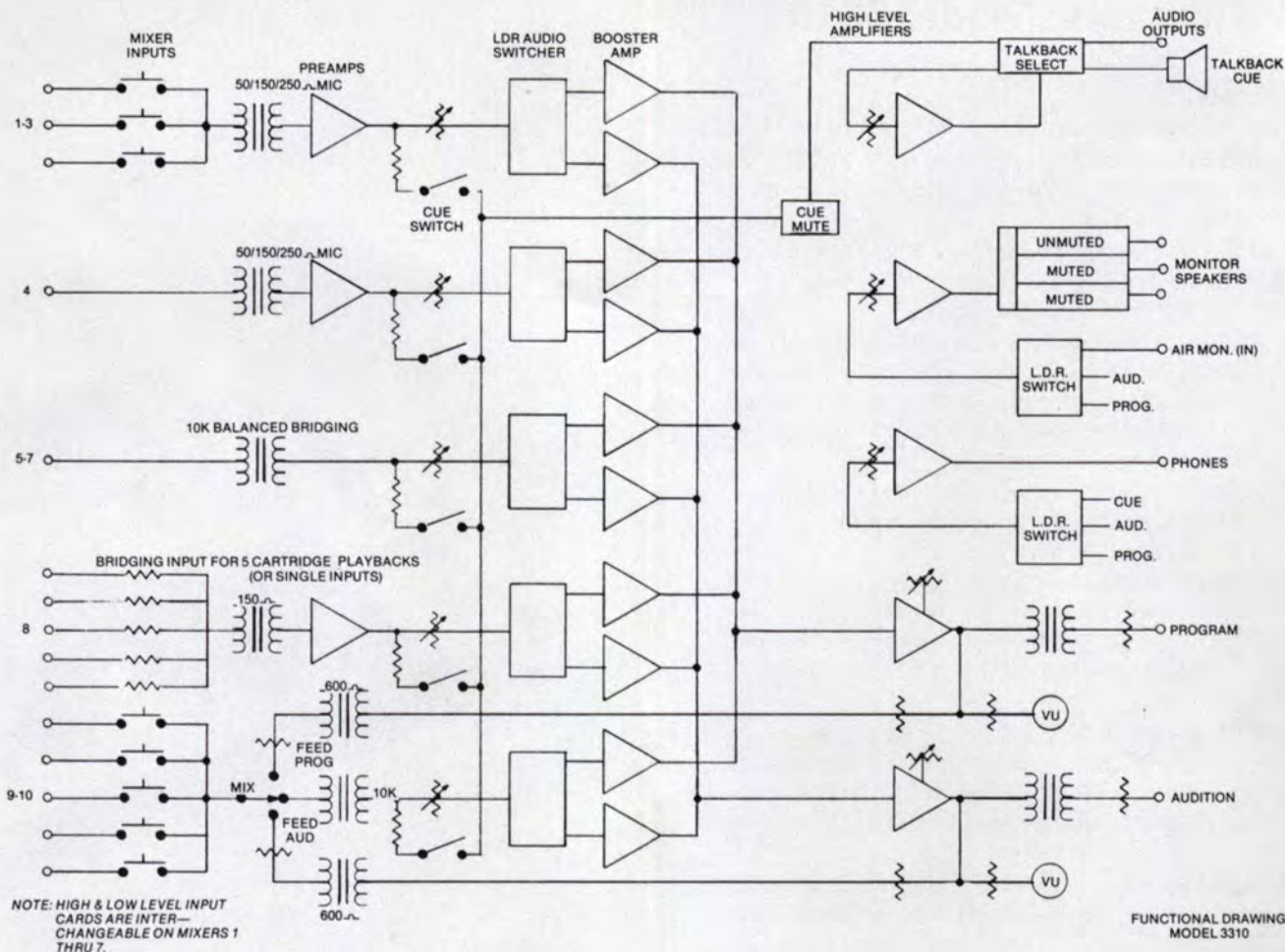
#### **MODEL 3310 FEATURES**

The 10-mixer 3310 is supplied standard as a full dual-channel console, with precision step type cue-detent attenuators. Both Program and Audition circuits employ completely noiseless optically-coupled switching, with identical line level balanced outputs on each; both busses are metered.

Noiseless on/off remote control of all mixers is provided, so that newsmen or studio announcers can turn on their own microphones, or a video switcher can control the console for TV 'audio-follow-video' application.

A five-source bridging input at Mixer 8 permits connecting up to five cartridge playbacks without interaction; it works as well, of course, for a single input. Microphone preamps and line level input cards are interchangeable; the latter have three-position switches for -10, 0, and +10 dBm sensitivity as required.

The cue speaker is centrally mounted on the front panel, and also serves as the intercom microphone/speaker. 'Send/Mix' switches on Mixers 9 & 10 feed



Program or Audition audio to any of five remote lines, or route the audio from a selected remote line to the console mixer. A built-in monitor amplifier delivers 12 Watts RMS per channel of high fidelity sound.

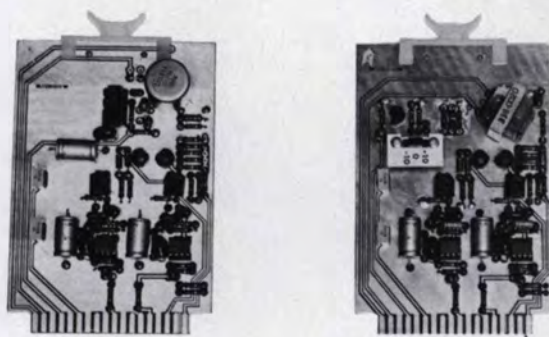
Besides the interchangeable microphone and line level amplifiers, only one other amplifier type is used; it functions as headset, cue, line, and monitor amplifier. All active circuits are plug-in, using the latest in IC technology.

Access to the console interior is via dual hinged front and top panels; all components and circuits are completely revealed in one motion. Inputs and outputs are made to barrier strips which are accessible from the front; cable entries are through slots in the bottom panel.

The 3310 is finished in tough polyurethane enamels, with woodgrain finish end caps. The VU meters are rear-lighted, and meters and control knobs are over-size for operator convenience.

#### MODEL 3310 OPTONS

The only option offered is for export; 230 VAC instead of the standard 117 VAC 50/60 Hz.



The plug-in printed circuit boards for the Model 3310 are; upper left, microphone input board... above, line level input board...at left, the line out amplifier board.



# Specifications: Model 3310

**MIXERS:** Ten.

**INPUTS:** Twentyeight; 10 microphone and 18 line level.

**INPUT IMPEDANCE:** Microphone 50/150/250 ohms balanced. Line; 10 K balanced bridging (can be terminated in 600 ohms).

**INPUT LEVELS:** Microphone mixers 1, 2, 3, 4: nominal -55 dBm. Line level mixers 5-10; switch selected sensitivity of -10, 0, and + 10 dBm.

**OUTPUT LEVELS:** (Program and Audition identical) 8 dBm into 600 ohms for 0 VU indication. Twenty-two dBm maximum output. Monitor; 12 Watts RMS. Cue/Talkback; 5 Watts. Phones; 0.5 Watt to 4 ohm headset (high Z also useable).

**RESPONSE:** All program amplifiers within 1 dB 20-20,000 Hz at rated output. All monitor amplifiers  $\pm$  1 20-20,000 Hz at rated output.

**HARMONIC DISTORTION:** All program amplifiers less than 0.3% 20-20,000 Hz at rated output; typically less than 0.1% at 1,000 Hz. All monitor amplifiers less than 0.5% 20-20,000 Hz at rated output; typically less than 0.3% at 1,000 Hz.

**INTERMODULATION DISTORTION:** All program amplifiers less than 0.05% at rated output; less than 0.2% at any operating level. All monitor amplifiers less than 0.5% at rated output of less. SMPTE measurement standards.

**NOISE:** 68 dB below + 8 dBm output, referenced to -55 dBm input 20-20,000 Hz unweighted. Equivalent input noise -123 dBm.

**MUTING/CONTROL:** Two separately muted monitor speaker outputs with contacts for 'on air' lights. Two more relays provided for control functions or additional muting.

**POWER:** 117V 50/60 Hz (230V optional).

**SIZE:** 37"W x 7½"H x 15½"D. (860 x 190 x 390 mm).

**SHIPPING:** Console and Power Supply; 79 pounds (36 kilos).



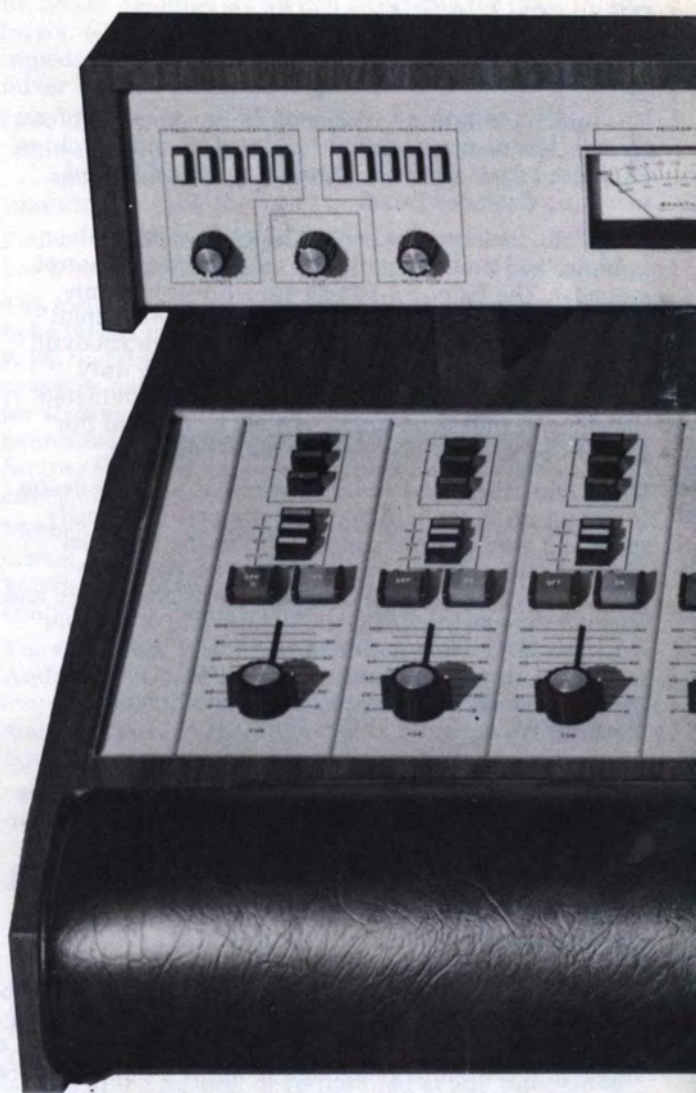
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**Model 3310 Monaural  
Console**

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# CENTURION I Monaural Console

# The Centurion Console Concept

The Sparta Centurion series console line consists of six models; the monaural Centurion I and III and matching Extender Panel, and stereo Centurion II and IV, and matching Extender Panel.

Physically the consoles consist of a lower bay (mixer modules and motherboard) and an upper bay (control systems). The Extender Panels are a lower bay only, with controlling functions carried out by the 'parent' console. Metal surfaces are finished in tough catalytic paints, control knobs are plastic/metal heavy duty combinations, casing for bays is of full 1/8" laminated plastic over industrial grade particle board, and the foam-filled armrest is covered with Naugahyde.

Underlying the entire series design was Sparta's desire to put an up-to-the-minute, uncomplicated, perfectly quiet and very flexible console within the financial reach of radio stations of every size and type. The Centurions, it was decided, should be of ample size and heavy duty construction as befitted a deluxe console expected to function faultlessly for many years. The roominess should assure easy accessibility to all industrial grade components in the totally modular construction style.

Scientific predictability of performance from console to console was thought to be essential for the design; this led to elimination of hard-wiring through using motherboard construction and space-age ground plane PC techniques.

Mixing arrangements were to be flexible through fully interchangeable mixing modules, each of which would be switch selectable for high, medium, or low level inputs so that equipment assignments to mixers could be changed at will. Another flexibility factor to be built in would be a variable number of mixing modules within a single unit design large enough to allow a dozen mixers. From this latter consideration the size of the console was determined; the standard large console has eight mixers, but single mixers may be added up to twelve total. Thus the station planning expanded control room functions may add mixing channels to an existing Centurion I or II console (Centurion III and IV are 6-mixer only), and if the total of twelve mixers proves insufficient, add one or two 6-mixer Extender Panels for an 18-mixer, 54-input or a 24-mixer, 72-input master control system.

These design aims have been fully realized in the broadcast console line which will become the industry's standard for years to come . . . the Sparta Centurion Series.

## Features of Centurion I Monaural Console

Mono mixer modules are identical and interchangeable. The same plug-in electronics are used in both Centurion I and its matching Extender Panel, and the mono Centurion

III. Mixer modules are switch selectable for three input levels, which automatically select the correct input impedance. Muting is operable from all modules, and each mixer has cue position.

Only three types of amplifiers are used in the entire mono series; one high level for headset, cue and line out . . . one type for mixer modules . . . and one type of summing amplifiers.

Perfectly noiseless optically isolated audio switching has been provided, with illuminated on/off pushbuttons.

The switching techniques used allow any mixer modules to be turned on from an external source of Form C contact. A PC board with six Form A contacts is standard; it provides momentary (or strap for maintained) contact for starting (or holding 'on') other equipment. It can be connected to the logic level outputs of any six mixers. Muting for three speakers . . . plus 'on air' light contacts . . . is provided.

Motherboard construction and ground plane printed circuit techniques have virtually eliminated hard-wired harness, assuring against crosstalk no matter in what configuration the Centurion is used.

The Centurion I has three mixing busses; Program, Audition and Utility. Cue speaker is internal. Headset amplifier is provided for low impedance 'phones. Monitor amplifier is 25 Watts. Intercom is standard with 5 Watts power.

## Centurion I Functional Description

The standard version of the Centurion I has eight mixer modules; spaces for the other four optional modules are normally filled with same size blank panels, or custom copy board and one blank panel. Mixer modules may be added at the factory, or in the field at any time, up to a total of twelve. Slide or rotary precision step attenuators are optional for the mixer modules, and are identical in price and electronic function.

The upper-bay electronic housing contains all high level amplifiers and level indicators. All functions are fully metered, with three meters standard for the Program, Audition and Utility busses. Meter illumination is 'on' only when a buss is in use.

Monitor, Cue, and Phone assignment switches and gain controls are at the left of the hood; Phones and Monitor are each pushbutton selected from any of five sources. Cue has gain control only.

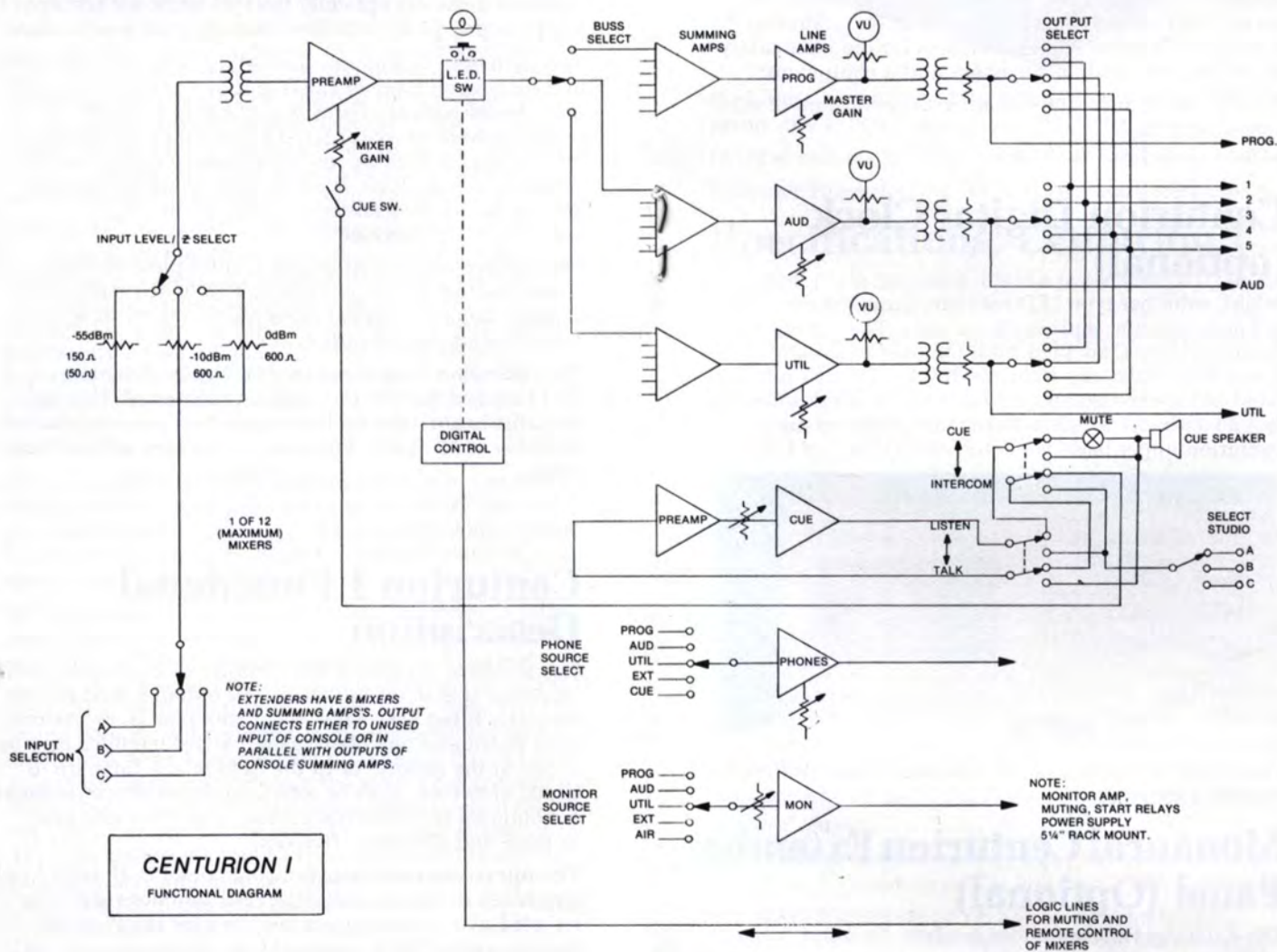
Beside each VU meter are five Feed pushbuttons; audio from that particular buss is thus assignable to any of five locations, determined by studio needs.

Intercom (talkback) controls are the six pushbuttons next to the speaker grille (or digital clock) near the right of the hood. The functions selectable all control the cue speaker;

it is fed with Cue, Talk, or Listen, acting alternately as speaker or microphone. The Intercom connection is assignable to any of three locations, depending on its particular use at the station.

Centurion I options are; Digital Clock, slide or rotary attenuators, six-mixer Extender Panels (one or two may be added), and Peak Program Meters in place of the VU meters.

## Functional Diagram



**CENTURION I**  
FUNCTIONAL DIAGRAM

## Centurion Series Power Supply

The power supply uses 3-terminal regulators, and is common to the entire Centurion console line, both mono and stereo. It is short circuit-proof, and has thermal overload protection, providing several fail-safe features.

Monitor amplifiers, power supply, muting relays and external control circuits are all contained within the 5.25" rack mount chassis.





Plug-in boards are used for all three functions; one monitor amplifier board has three muting relays and 'on air' light contacts for up to 60 Watt bulbs . . . another PC board has six Form A relay contacts for the momentary or maintained 'start' of accessory audio equipment.

Six LED status indicators monitor the condition of all power circuits.

## Centurion Digital Clock (optional)

Bright, solid bar type LED readouts show the exact time in hours, minutes and whole seconds. The extremely functional clock, adapted from the Spartamation DC24, is readable under any light conditions. The red numbers stand out starkly against the black clock face, mounted in a meter bezel which matches the others on the Centurion upper bay.



Front panel controls provide convenient and full setting of exact time.

## Monaural Centurion Extender Panel (Optional)

The Extender Panel provides 6-mixer, 18-input additional capacity to the Centurion I, and connects to it directly without changes to either unit. Its mixers are electronically identical to those of the Centurion I.

Either one or two Extender Panels may be added to Centurion I.

The connection of the EP to the Centurion I may be made in either of two ways: 1) the EP output may connect directly to the three summing busses or 2) the EP output may become the input of a selected Centurion I mixer. In the latter case a group of six microphones, for instance, could be 'ganged' into a single mixer module of the main console, which would act as a 'submaster' control. In



the former case, all eighteen mixers would be individually assignable to equipment input functions.

In either case the EP is fully metered on the 'parent' console.

Extender Panel options are; slide or rotary attenuators.

## Specifications: Centurion I

**MIXERS:** Eight Standard. Can be ordered with 9, 10, 11 or 12 (maximum).

**INPUTS:** Twenty-four standard. Three per mixer in any configuration.

**INPUT IMPEDANCE:** 150 ohms balanced microphone; 600 ohms balanced medium and high level, automatically selected by INPUT LEVEL SWITCH.

**INPUT LEVELS:** Switch selectable on each module for -55 dBm, -10 dBm, or 0 dBm.

**OUTPUT LEVELS:** (three lines, identical) 8 dBm into 600 ohms for 0 VU indication. Twenty-two dBm maximum output. Monitor; 25 Watts RMS. Cue; 5 Watts to internal speaker. Intercom (talkback); 5 Watts. Phones; 1 Watt per channel to 4 ohm headset. High impedance phones also useable.

**OUTPUT LINES:** Program, Audition, Utility. Each switch selected into any of 5 output lines or locations. Talkback can call or listen to three switch selected locations, using cue speaker.

**RESPONSE:** All amplifiers within 1 db, 20-20,000 Hz, at rated output.

**DISTORTION:** All amplifiers less than 0.5%, 20-20,000 Hz, at rated output. Typically less than 0.15% at 1,000 Hz.

**SIGNAL-TO-NOISE:** 70 db below +8 dBm output, referenced to -55 dBm input, 20-20,000 Hz unweighted. Equivalent input noise -125 dBm.

**MUTING:** Three muting relays, operated by any mixer or combination of mixers, for three speakers.

**CONTROLS:** Six Form A contacts, momentary or maintained (if strapped). Can be strapped to operate from selected mixers.

**POWER:** 117V 50/60 Hz (230V optional).

**SIZE:** Console; 41"W x 24"D x 15"H (1036 x 613 x 380 mm). Power supply, Muting, Monitor Amplifier; 5 1/4" (133.35 mm) rack mount. Rack Mount is 19" (482.6 mm) American standard.

**CENTURION I OPTIONS:** Digital Clock, Slide or Rotary attenuators, one or two 6-mixer Extender Panels, Peak Program Meters in place of VU meters.

## **Specifications: Centurion Monaural Extender Panel**

**EXTENDER PANEL OPTIONS:** Slide or Rotary attenuators.

All other specifications of the Centurion Mono Extender Panel are identical with the model I.

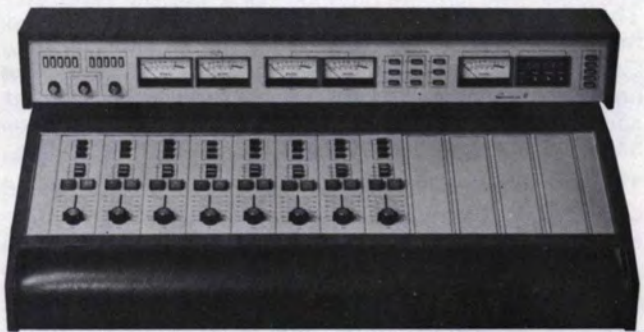
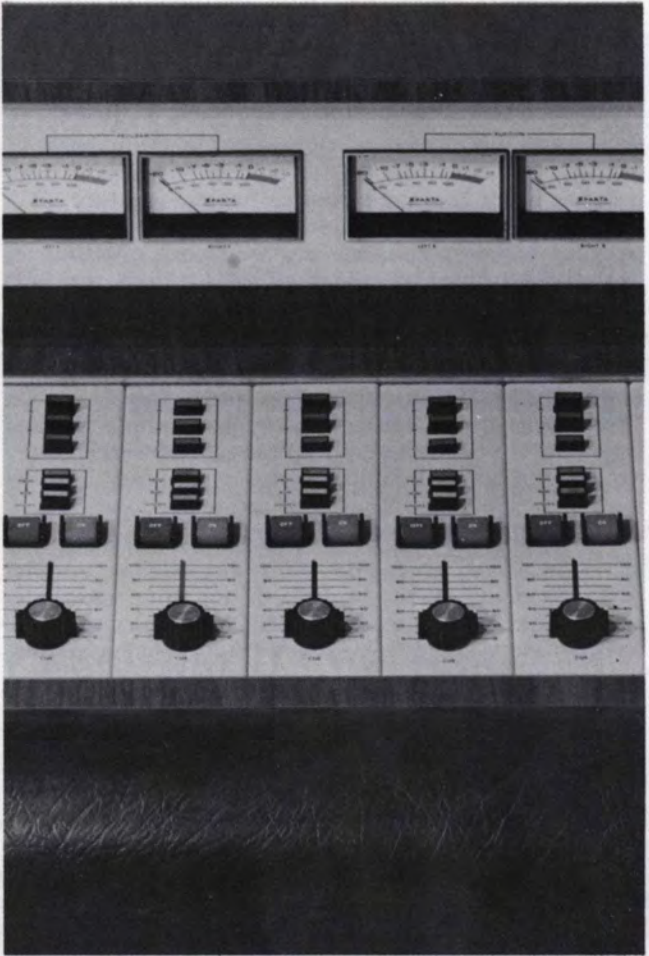


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# CENTURION II

## Stereo Console

# The Centurion Console Concept

The Sparta Centurion series console line consists of six models; the monaural Centurion I and III and matching Extender Panel, and stereo Centurion II and IV and matching Extender Panel.

Physically the consoles consist of a lower bay (mixer modules and motherboard) and an upper bay (control systems). The Extender Panels are a lower bay only, with controlling functions carried out by the 'parent' console. Metal surfaces are finished in tough catalytic paints, control knobs are plastic/metal heavy duty combinations, casing for bays is of full 1/8" laminated plastic over industrial grade particle board, and the foam-filled armrest is covered with Naugahyde.

Underlying the entire series design was Sparta's desire to put an up-to-the-minute, uncomplicated, perfectly quiet and very flexible console within the financial reach of radio stations of every size and type. The Centurions, it was decided, should be of ample size and heavy duty construction as befitted a deluxe console expected to function faultlessly for many years. The roominess should assure easy accessibility to all industrial grade components in the totally modular construction style.

Scientific predictability of performance from console to console was thought to be essential for the design; this led to elimination of hard-wiring through using motherboard construction and space-age ground plane PC techniques.

Mixing arrangements were to be flexible through fully interchangeable mixing modules, each of which would be switch selectable for high, medium, or low level inputs so that equipment assignments to mixers could be changed at will. Another flexibility factor to be built in would be a variable number of mixing modules within a single unit design large enough to allow a dozen mixers. From this latter consideration the size of the console was determined; the standard large console has eight mixers, but single mixers may be added up to twelve total. Thus the station planning expanded control room functions may add mixing channels to an existing Centurion I or II console (Centurion III and IV are 6-mixer only), and if the total of twelve mixers proves insufficient, add one or two 6-mixer Extender Panels for an 18-mixer, 54-input or a 24-mixer, 72-input master control system.

These design aims have been fully realized in the broadcast console line which will become the industry's standard for years to come . . . the Sparta Centurion Series.

## Features of Centurion II Stereo Console

Stereo mixer modules are identical and interchangeable. The same plug-in electronics are used in both Centurion II and its matching Extender Panel, and the stereo Centurion

IV. Mixer modules are switch selectable for three input levels, which automatically select the correct input impedance. Muting is operable from all modules, and each mixer has cue position.

Only three types of amplifiers are used in the entire stereo series; one high level for headset, cue and line out . . . one type for mixer modules . . . and one type of summing amplifier.

Perfectly noiseless optically isolated audio switching has been provided, with illuminated on/off pushbuttons.

The switching techniques used allow any mixer modules to be turned on from an external source of Form C contact. A PC board with six Form A contacts is standard; it provides momentary (or strap for maintained) contact for starting (or holding 'on') other equipment. It can be connected to the logic level outputs of any six mixers. Muting for three speaker pairs . . . plus 'on air' light contacts . . . is provided.

Motherboard construction and ground plane printed circuit techniques have virtually eliminated hard-wired harness, assuring against crosstalk no matter in what configuration the Centurion is used.

The Centurion II has four mixing busses; Program, Audition, Utility and Monaural. Cue speaker is internal. Headset amplifier is provided for low impedance 'phones. Monitor amplifier is 25 Watts per channel RMS.

## Centurion II Functional Description

The standard version of the Centurion II has eight mixer modules; spaces for the other four optional modules are normally filled with same size blank panels, or custom copy board and one blank panel. Mixer modules may be added at the factory, or in the field at any time, up to a total of twelve. Slide or rotary precision step attenuators are optional for the mixer modules, and are identical in price and electronic function.

The upper electronic bay contains all high level amplifiers and level indicators. All functions are fully metered, with five meters standard for the Right/Left Program, Right/Left Audition, and Mono busses. The Utility stereo buss can be visually monitored separately from programming by assigning it to the Mono meter. Meter illumination is 'on' only when a buss is in use.

Output selection pushbutton switches are labeled 'Air', 'Record' and 'Mono'; each buss (Program, Audition or Utility) can be separately fed to these assignments. The Mono assignment provides an excellent cross check on how a stereo station's signal is being received on monaural equipment. In addition, completely unassigned 'Accessory' pushbuttons at the far right of the Centurion II upper bay can be used for any in/out function; there are five of them.

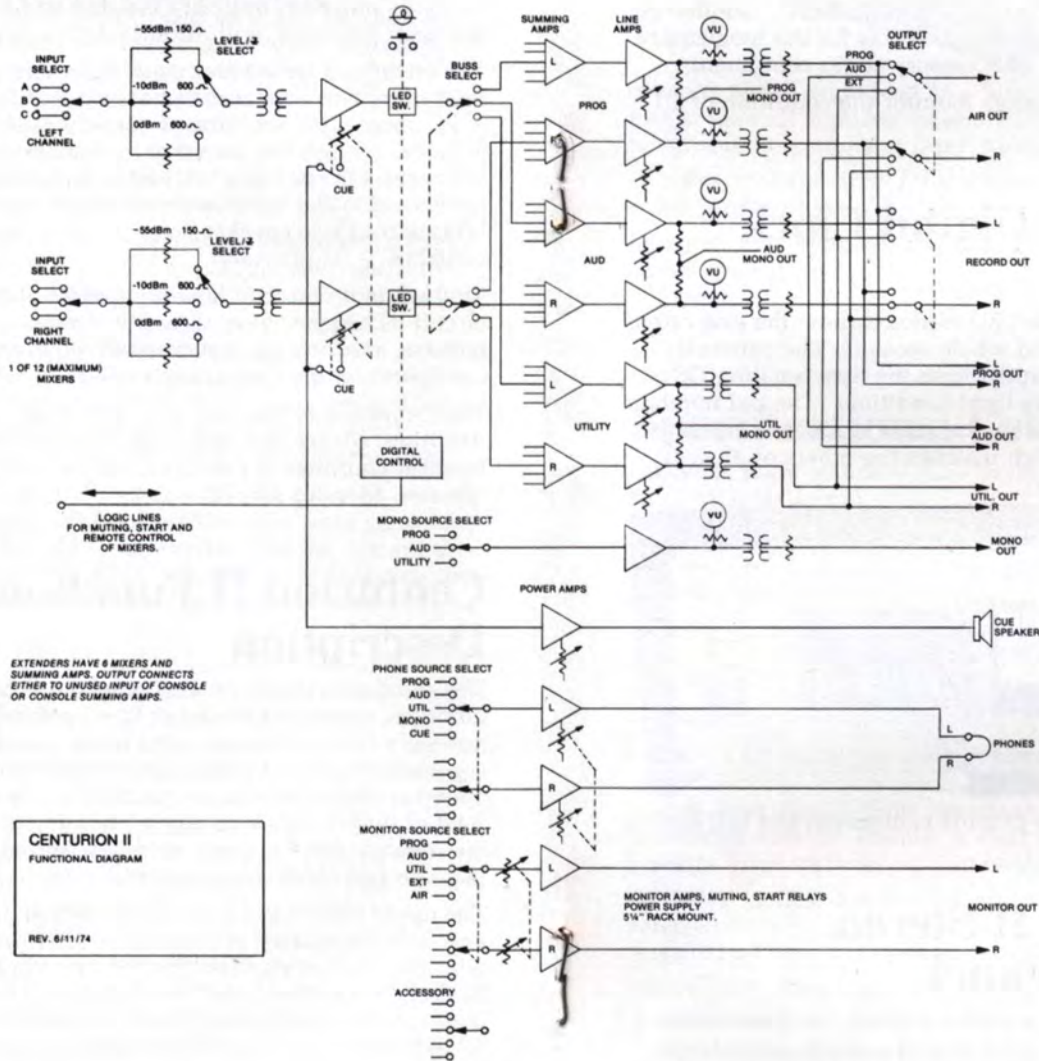
Monitor, Cue and Phone assignment switches and gain controls are at the left of the upper bay; Phones and

Monitor are each pushbutton selected from any of five sources. Cue has gain control only.

Centurion II options are: Digital Clock, slide or rotary

precision step attenuators, six-mixer Extender Panels (one or two may be added), and Peak Program Meters in place of the VU meters.

## Functional Diagram



## Centurion Series Power Supply

The power supply uses 3-terminal regulators, and is common to the entire Centurion console line, both mono and stereo. It is short circuit-proof, and has thermal overload protection, providing several fail-safe features.

Monitor amplifiers, power supply, muting relays and external control circuits are all contained within the 5.25" rack mount chassis.







Plug-in boards are used for all three functions; one monitor amplifier board has three muting relays and 'on air' light contacts for up to 60 Watt bulbs... another PC board has six Form A relay contacts for the momentary or maintained 'start' of accessory audio equipment.

Six LED status indicators monitor the condition of all power circuits.

## Centurion Digital Clock (optional)

Bright, solid bar type LED readouts show the exact time in hours, minutes and whole seconds. The extremely functional clock, adapted from the Spartamation DC24, is readable under any light conditions. The red numbers stand out starkly against the black clock face, mounted in a meter bezel which matches the others on the Centurion upper bay.



Front panel controls provide convenient and full setting of exact time.

## Centurion II Stereo Extender Panel

The Extender Panel provides 6-mixer, 18-input additional capacity to the Centurion II, and connects to it directly without changes to either unit. Its mixers are electronically identical to those of Centurion II.

Either one or two Extender Panels may be added to Centurion II for an 18-mixer, 54-input or a 24-mixer, 72-input master control system.

The connection of the EP to the Centurion II may be made in either of two ways: (1) the EP output may connect directly to the three summing busses, or (2) the EP output may become the input of a selected Centurion II mixer. In the latter case a group of six microphone pairs, for instance, could be 'ganged' into a single mixer module of the main



console, which would act as a 'submaster' control. In the former case all eighteen mixers would be individually assignable to equipment input functions.

In either case the EP is fully metered on the 'parent' console upper bay.

Extender Panel options are; slide or precision step rotary attenuators.

## Specifications: Centurion II

**MIXERS:** Eight standard. Can be ordered with 9, 10, 11 or 12 (maximum).

**INPUTS:** Twenty-four standard. Three per mixer in any configuration.

**INPUT IMPEDANCE:** 150 ohms balanced microphone; 600 ohms balanced medium and high level, automatically selected by INPUT LEVEL SWITCH.

**INPUT LEVELS:** Switch selectable on each module for -55 dBm, -10 dBm, or 0 dBm.

**OUTPUT LEVELS:** (three lines, identical) 8 dBm into 600 ohms for 0 VU indication. Twenty-two dBm maximum output. Monitor; 25 Watts per channel RMS. Cue; 5 Watts to internal speaker. Phones; 1 Watt per channel to 4 ohm headset. High impedance phones also useable.

**OUTPUT LINES:** Air, Record, and Mono; each switch selected from Program, Audition, or Utility busses. Direct unswitched lines also available from each buss.

**RESPONSE:** All amplifiers within 1 db, 20-20,000 Hz, at rated output.

**DISTORTION:** All amplifiers less than 0.5%, 20-20,000 Hz, at rated output. Typically less than 0.15% at 1000 Hz.

**SIGNAL-TO-NOISE:** 68 db below +8 dBm output, referenced to -55 dBm input, 20-20,000 Hz unweighted. Equivalent input noise -123 dBm.

**MUTING:** Three muting relays, operated by any mixer or combination of mixers, for three speaker systems.

**CONTROLS:** Six Form A contacts, momentary or maintained (if strapped). Can be strapped to operate from selected mixers.

**POWER:** 117V 50/60 Hz (230V optional).

**SIZE:** Console; 41"W x 24"D x 15"H (1036 x 613 x 380 mm). Power supply, Muting, Monitor Amplifier; 5¼" (133.35 mm) rack mount. Rack Mount is 19" (482.6 mm) American standard.

**SHIPPING:** Console; 92 pounds (41.7 kilos) packed in 19.5 cubic foot (0.55 cubic meter) container. Power Supply/etc., 32 pounds (14.5 kilos) packed in 1.75 cubic foot (.064 cubic meter) container.

**CENTURION II OPTIONS:** Digital Clock, Slide or Rotary Precision Step Attenuators, one or two 6-mixer Extender Panels, Peak Program Meters in place of VU meters.

## **Specifications: Centurion II Stereo Extender Panel**

**MIXERS:** Six.

**INPUTS:** Eighteen.

**OUTPUT LINES:** Program, Audition, Utility.

**SIZE:** Console; 23"W x 23½"D x 6⅞"H (580 x 600 x 184 mm). No separate Power Supply/Muting/Monitor Amplifier.

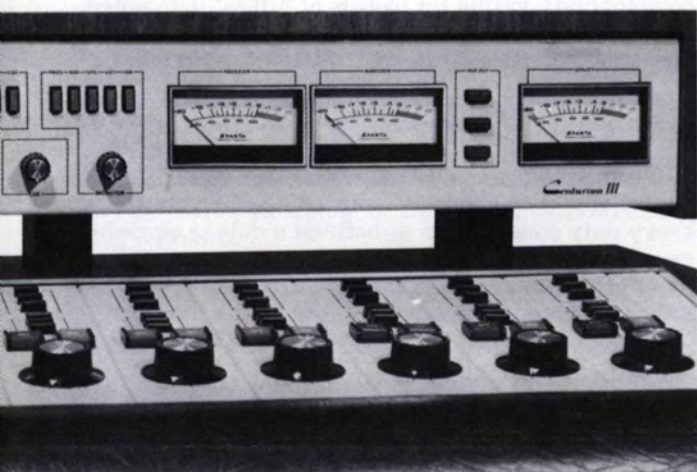
**SHIPPING:** Console; 70.5 pounds (32 kilos) packed in 12.8 cubic foot (0.362 cubic meter) container.

**EXTENDER PANEL OPTIONS:** Slide or Rotary Precision Step Attenuators.

All other specifications of the Centurion II Stereo Extender Panel are identical with the Centurion II, above.



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# CENTURION III

## Monaural Console

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# The Centurion Console Concept

The Sparta Centurion series console line consists of six models; the monaural Centurion I and III and matching Extender Panel, and stereo Centurion II and IV and matching Extender Panel.

Physically the consoles consist of a lower bay (mixer modules and motherboard) and an upper bay (control systems). The Extender Panels are a lower bay only, with controlling functions carried out by the 'parent' console. Metal surfaces are finished in tough catalytic paints, control knobs are plastic/metal heavy duty combinations, casing for bays is of full 1/8" laminated plastic over industrial grade particle board, and the foam-filled armrest is covered with Naugahyde.

Underlying the entire series design was Sparta's desire to put an up-to-the-minute, uncomplicated, perfectly quiet and very flexible console within the financial reach of radio stations of every size and type. The Centurions, it was decided, should be of ample size and heavy duty construction as befitted a deluxe console expected to function faultlessly for many years. The roominess should assure easy accessibility to all industrial grade components in the totally modular construction style.

Scientific predictability of performance from console to console was thought to be essential for the design; this led to elimination of hard-wiring through using mother-board construction and space-age ground plane PC techniques.

Mixing arrangements were to be flexible through fully interchangeable mixing modules, each of which would be switch selectable for high, medium, or low level inputs so that equipment assignments to mixers could be changed at will. Another flexibility factor to be built in would be a variable number of mixing modules within a single unit design large enough to allow a dozen mixers. From this latter consideration the size of the console was determined; the standard large console has eight mixers, but single mixers may be added up to twelve total. Thus the station planning expanded control room functions may add mixing channels to an existing Centurion I or II console (Centurion III and IV are 6-mixer only), and if the total of twelve mixers proves insufficient, add one or two 6-mixer Extender Panels for an 18-mixer, 54-input or a 24-mixer, 72-input master control system.

These design aims have been fully realized in the broadcast console line which will become the industry's standard for years to come . . . the Sparta Centurion Series.

## Centurion Series Power Supply

The power supply uses 3-terminal regulators, and is common to the entire Centurion console line, both mono and stereo. It is short circuit-proof, and has thermal overload protection, providing several fail-safe features.

Monitor amplifiers, power supply, muting relays and external control circuits are all contained within the 5.25" rack mount chassis.



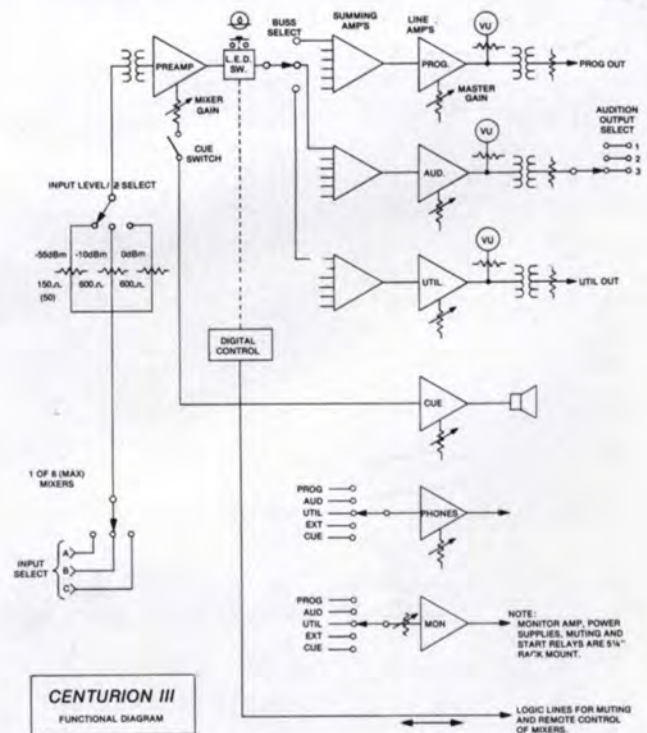
Plug-in boards are used for all three functions; one monitor amplifier board has three muting relays and 'on air' light bulbs . . . another PC board has six Form A relay contacts for the momentary or maintained 'start' of accessory audio equipment.



Six LED status indicators monitor the condition of all power circuits.

## Centurion III Functional Description

The six-mixer Centurion III is electronically identical to the Centurion I and Monaural Extender Panel. It also shares many basic functional characteristics with the Centurion I. It differs mainly in that its design is for less demanding requirements of the production room or smaller station.



The Audition Out pushbutton selection of the Centurion III allows feeding audio to three locations. It is a full three-channel board: Program, Audition and Utility are identical busses, the same as the Centurion I.

Centurion III options include slide or rotary attenuators and Peak Program Meters in place of the VU meters.

## Specifications: Centurion III

**MIXERS:** Six.

**INPUTS:** Eighteen.

**INPUT IMPEDANCE:** 150 ohms balanced microphone; 600 ohms balanced medium and high level, automatically selected by INPUT LEVEL SWITCH.

**INPUT LEVELS:** Switch selectable on each module for -55 dBm, -10 dBm, or 0 dBm.

**OUTPUT LEVELS:** (three lines, identical) 8 dBm into 600 ohms for 0 VU indication. Twenty-two dBm maximum output. Monitor; 25 Watts RMS. Cue; 5 Watts to internal speaker. Phones; 1 Watt per channel to 4 ohm headset. High impedance phones also useable.

**OUTPUT LINES:** Program, Audition, Utility; Audition can be switch selected into any of 3 output lines.

**RESPONSE:** All amplifiers within 1 db, 20-20,000 Hz, at rated output.

**DISTORTION:** All amplifiers less than 0.5%, 20-20,000 Hz, at rated output. Typically less than 0.15% at 1,000 Hz.

**SIGNAL-TO-NOISE:** 70 db below +8 dBm output, referenced to -55 dBm input, 20-20,000 Hz unweighted. Equivalent input noise -125 dBm.

**MUTING:** Three muting relays, operated by any mixer or combination of mixers, for three speakers.

**CONTROLS:** Six Form A contacts, momentary or maintained (if strapped). Can be strapped to operate from selected mixers.

**POWER:** 117 V 50/60 Hz (230 V optional).

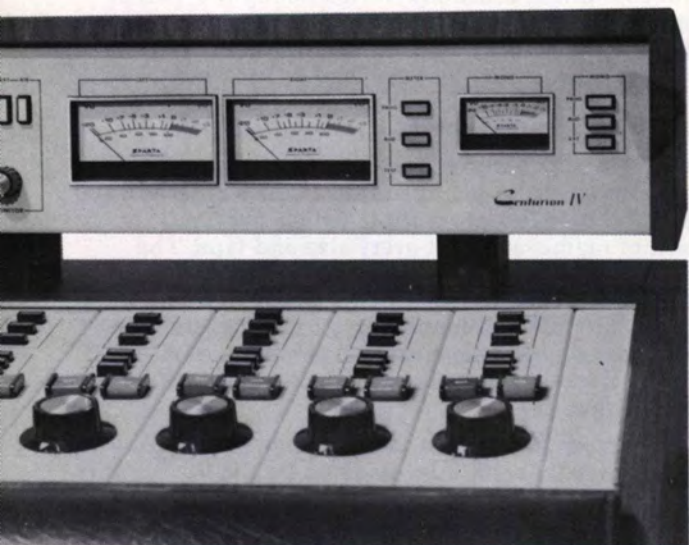
**SIZE:** Console, 23"W x 23½"D x 14"H (580 x 600 x 358 mm). Power Supply/Muting/Monitor Amplifier; 5¼" (133.35 mm) rack mount. Rack mount is 19" (482.6 mm) American standard.

**SHIPPING:** Console; 77 pounds (35 kilos) packed in 12.8 cubic foot (0.362 cubic meter) container. Power Supply/Monitor Amplifier/Muting; 23 pounds (10.5 kilos) packed in 1.75 cubic foot (.064 cubic meter) container.

**CENTURION III OPTIONS:** Slide or Rotary Precision Step Attenuators, Peak Program Meters in place of VU meters.



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# CENTURION IV

## Stereo Console

# The Centurion Console Concept

The Sparta Centurion series console line consists of six models; the monaural Centurion I and III and matching Extender Panel, and stereo Centurion II and IV and matching Extender Panel.

Physically the consoles consist of a lower bay (mixer modules and motherboard) and an upper bay (control systems). The Extender Panels are a lower bay only, with controlling functions carried out by the 'parent' console. Metal surfaces are finished in tough catalytic paints, control knobs are plastic/metal heavy duty combinations, casing for bays is of full 1/8" laminated plastic over industrial grade particle board, and the foam-filled armrest is covered with Naugahyde.

Underlying the entire series design was Sparta's desire to put an up-to-the-minute, uncomplicated, perfectly quiet and very flexible console within the financial reach of radio stations of every size and type. The Centurions, it was decided, should be of ample size and heavy duty construction as befitted a deluxe console expected to function faultlessly for many years. The roominess should assure easy accessibility to all industrial grade components in the totally modular construction style.

Scientific predictability of performance from console to console was thought to be essential for the design; this led to elimination of hard-wiring through using motherboard construction and space-age ground plane PC techniques.

Mixing arrangements were to be flexible through fully interchangeable mixing modules, each of which would be switch selectable for high, medium, or low level inputs so that equipment assignments to mixers could be changed at will. Another flexibility factor to be built in would be a variable number of mixing modules within a single unit design large enough to allow a dozen mixers. From this latter consideration the size of the console was determined; the standard large console has eight mixers, but single mixers may be added up to twelve total. Thus the station planning expanded control room functions may add mixing channels to an existing Centurion I or II console (Centurion III and IV are 6-mixer only), and if the total of twelve mixers proves insufficient, add one or two 6-mixer Extender Panels for an 18-mixer, 54-input or a 24-mixer, 72-input master control system.

These design aims have been fully realized in the broadcast console line which will become the industry's standard for years to come . . . the Sparta Centurion Series.

## Centurion Series Power Supply

The power supply uses 3-terminal regulators, and is common to the entire Centurion console line, both mono and stereo. It is short circuit-proof, and has thermal overload protection, providing several fail-safe features.

Monitor amplifiers, power supply, muting relays and external control circuits are all contained within the 5.25" rack mount chassis.



Plug-in boards are used for all three functions; one monitor amplifier board has three muting relays and 'on air' light contacts for up to 60 Watt bulbs . . . another PC board has six Form A relay contacts for the momentary or maintained 'start' of accessory audio equipment.



Six LED status indicators monitor the condition of all power circuits.

## Centurion IV Functional Description

The six-mixer Centurion IV stereo console is electronically similar to the Centurion II, and shares many basic functional characteristics. Its flexibility makes it a superb choice where studio demands do not call for the extreme range of the Centurion II.

Right and Left meters are switch selectable to monitor levels of the Program and Audition busses, and 'Test'. The latter position reads Left and Right channels out-of-phase as they sample the monitored Program buss; out-of-phase condition of tape cartridges or program material is instantly apparent if there is a significant meter reading.

The Mono meter is separately switch selectable to monitor Program, Audition or an External signal source. The mono output is of particular use in producing a monaural feed from stereo Program, Audition or an External source proceeding from or through the console, as in recording monaural tape cartridges directly from stereo Program materials.

A low level Utility buss is also provided, which can be used to feed external reverberation or equalization circuits, brought back to the console, and remixed with program material for special effects.

Monitor, Cue and Phone assignment switches and gain controls are at the left of the upper bay; Phones and Monitor are each pushbutton selected from any of five sources. Cue has gain control only.

Centurion IV options are; Slide or Rotary Precision Step Attenuators and Peak Program Meters in place of VU meters.

## Specifications: Centurion IV

**MIXERS:** Six.

**INPUTS:** Eighteen.

**INPUT IMPEDANCE:** 150 ohms balanced microphone; 600 ohms balanced medium and high level, automatically selected by INPUT LEVEL SWITCH.

**INPUT LEVELS:** Switch selectable on each module for -55 dBm, -10 dBm, or 0 dBm.

**OUTPUT LEVELS:** (Program, Audition, Mono) 8 dBm into 600 ohms for 0 VU indication. Twenty-two dBm maximum output. Monitor; 25 Watts per channel RMS. Phones; 1 Watt per channel to 4 ohm headset. High impedance phones also useable.

**OUTPUT LEVEL:** (Utility) -10 dBm unbalanced.

**OUTPUT LINES:** Program, Audition, Utility, Mono. Mono switch selectable for Program, Audition, or External in/out use.

**RESPONSE:** All amplifiers within 1 db, 20-20,000 Hz, at rated output.

**DISTORTION:** All amplifiers less than 0.5%, 20-20,000 Hz, at rated output. Typically less than 0.15% at 1,000 Hz.

**SIGNAL-TO-NOISE:** 68 db below +8 dBm output, referenced to -55 dBm input, 20-20,000 Hz unweighted. Equivalent input noise -123 dBm.

**MUTING:** Three muting relays, operated by any mixer or combination of mixers, for three speaker systems.

**CONTROLS:** Six Form A contacts, momentary or maintained (if strapped). Can be strapped to operate from selected mixers.

**POWER:** 117V 50/60 Hz (230V optional).

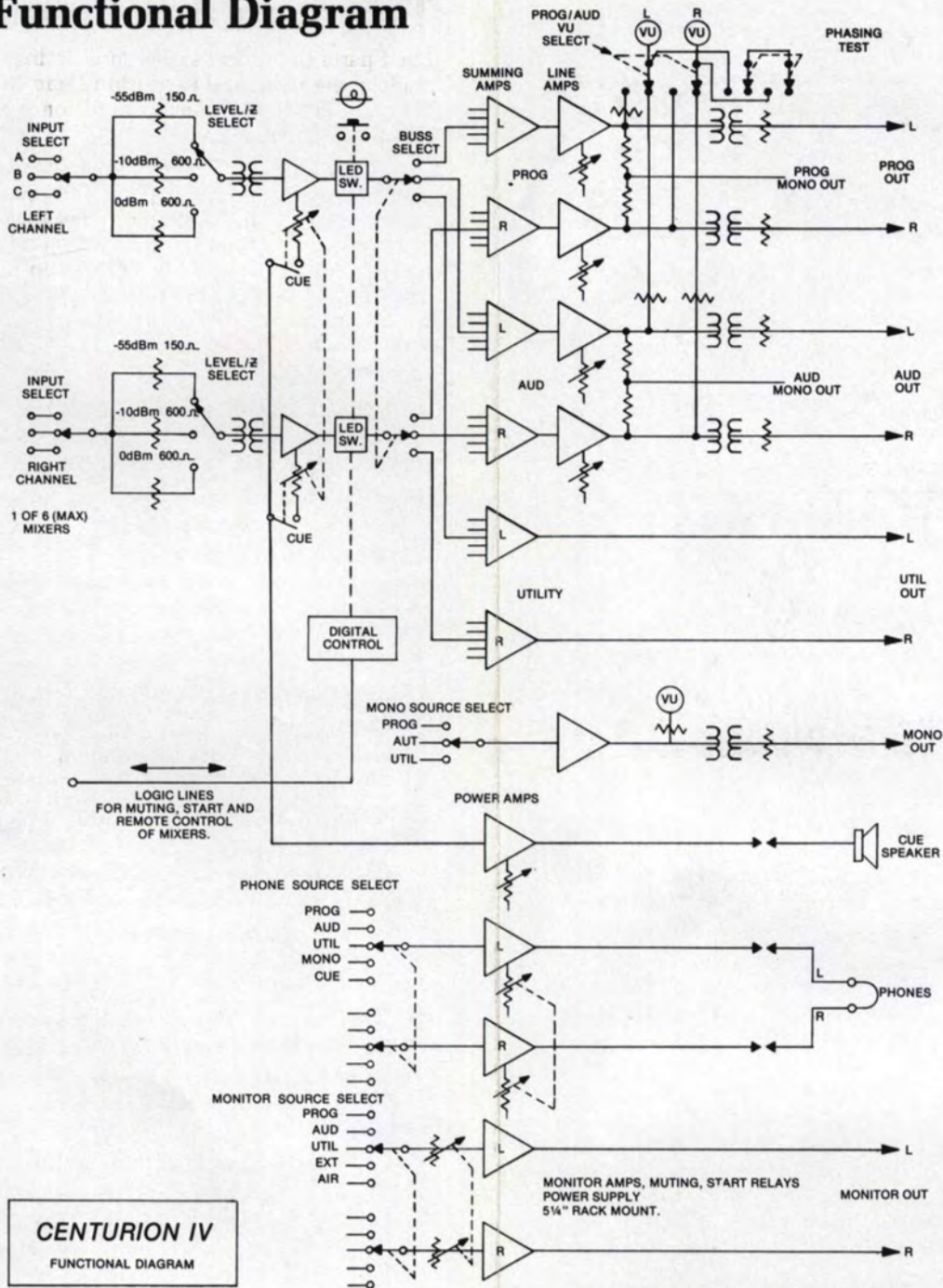
**SIZE:** Console; 23"W x 24"D x 14¼"H (580 x 613 x 366 mm). Power Supply/Muting/Monitor Amplifier; 5¼" (133.35 mm) rack mount. Rack Mount is 19" (482.6 mm) American standard.

**SHIPPING:** Console; 76.7 pounds (35 kilos) packed in 12.8 cubic foot (0.362 cubic meter) container. Power Supply/Muting/Monitor Amplifier; 23 pounds (10.5 kilos) packed in 1.75 cubic foot (.064 cubic meter) container.

**CENTURION IV OPTIONS:** Slide or Rotary Precision Step Attenuators, and Peak Program Meters in place of VU meters.



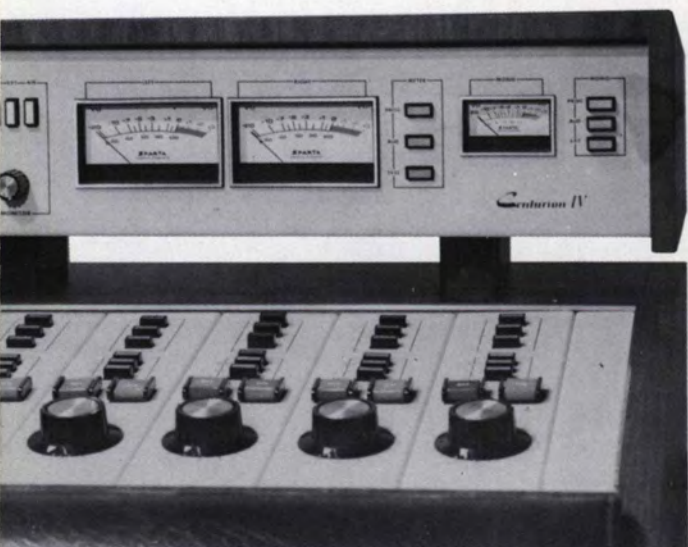
# Functional Diagram



**CENTURION IV**  
FUNCTIONAL DIAGRAM



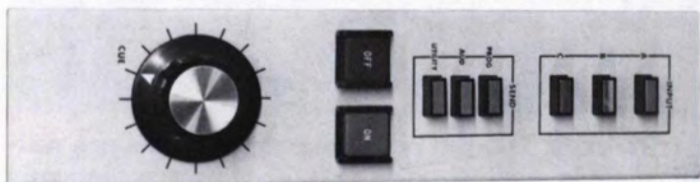
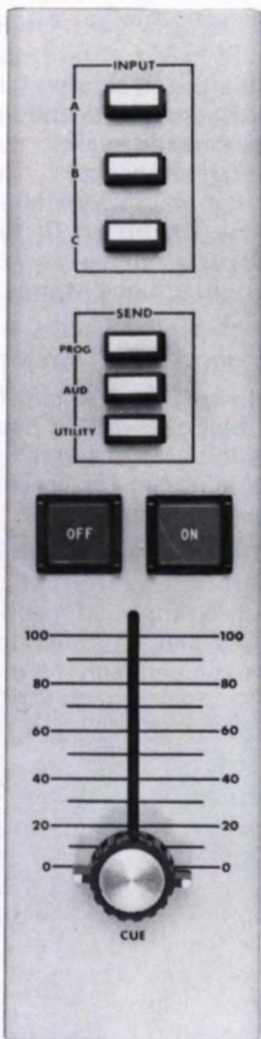
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# CENTURION IV

## Stereo Console

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# Centurion Options and Accessories

The Centurion I and II consoles (mono and stereo respectively) are furnished in a standard 8-mixer configuration, with identical mixer modules available as options. Up to twelve will fit the Centurion I or II basic console cabinet, either added one-at-a-time or all four at once.

Centurion mixer module individual controls are identical, whether mono or stereo. Mixers are completely interchangeable within the same console series: mono mixer-modules interchange among Centurion I, Centurion III and Mono Extender Panels....while stereo mixer modules interchange among Centurion II, Centurion IV and Stereo Extender Panels. Please refer to the list of models and their individual options at the end of this product guide.

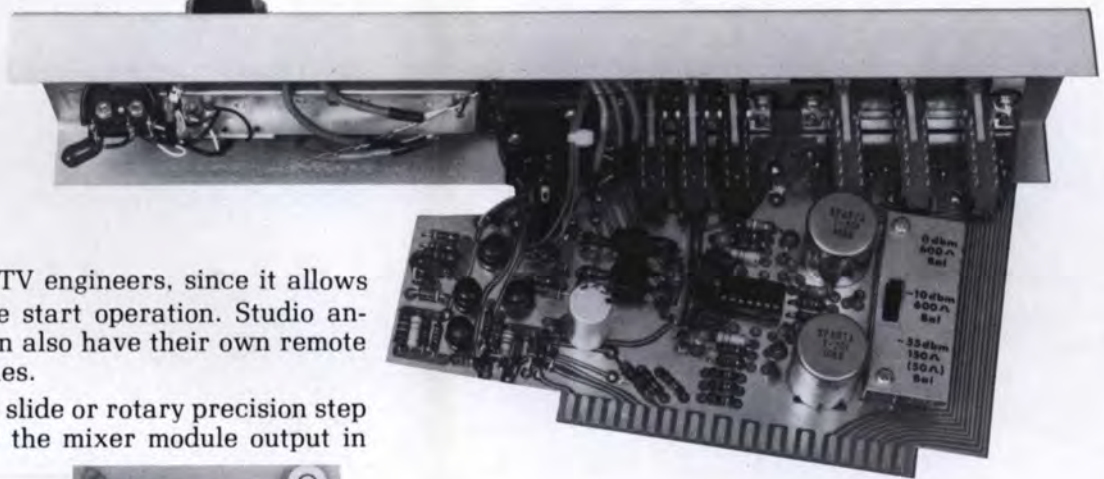
### **CENTURION MIXER MODULES**

Each module plugs vertically down into the motherboard receptacle, fitted exactly by rigid, slotted frame members which guide the front and back (left and right in accompanying photo) of the module. The console must be opened for changing of mixer modules.

Slide or rotary precision step attenuators are optional with any Centurion console; there is no difference in price, and the two types may even be supplied together in one console for special applications the user may determine. There are four control common to each module:

- 1) **INPUT:** Three pushbutton selectors, designated A, B, C. This control group selects from three sources, determined by station requirements; the sources can be microphone or equipment level inputs, but the input level selector switch on the module's PC board (see photo; switch has large selector plate on which input variations are printed) must be changed to accommodate the different types. Input level selection automatically switches to the correct impedance. The levels so selected are -55 dBm, -10 dBm, and 0 dBm.
- 2) **SEND:** Three pushbutton selectors, designated Prog(ram), Aud(ition), and Util(ity) assign that mixer output to the mixing buss so designated. Centurion II and IV have an additional mixing buss, Mono, which is selected on the upper bay set of output selection push-buttons; the Mono feed is not controllable directly by the mixer module.
- 3) **OFF/ON:** The red and green pushbuttons are self-illuminated, and provide absolutely noiseless, optically isolated switching. Any six mixers chosen may operate Form A contacts through the 'On' switch; this allows simultaneous start of accessory audio equipment, such as reel/reel playbacks. If the 'On-start' Form A impulse is to be maintained, rather than momentary, the output must be strapped. 'Off', of course, stops any and all activity in the console relating to that mixer.

Any mixer module may be turned 'On' or 'Off' from an external source which provides Form C contact, or separate on/off pushbuttons. This feature has proven



of particular interest to TV engineers, since it allows audio-follow-video remote start operation. Studio announcers or newsmen can also have their own remote on/off microphone switches.

**4) ATTENUATOR:** either slide or rotary precision step attenuators chosen alter the mixer module output in conventional fashion.

A Module Extender Card is available for the testing and maintenance of individual mixer modules. With the console in otherwise normal use, the Extender places the selected mixer more than four inches above its usual position, so that its electronics are fully exposed while it is functionally connected to the console.



### EQUALIZATION MODULE

This module, exactly half the width of a mixing module, replaces the trim strip at the right hand of any Centurion mixer array. It does not connect to the motherboard in the fashion of a mixer module, but instead equalizes the output of selected mixers feeding that particular mixing buss, selected by bushbuttons on the equalizer module itself. It is a 'positive action' device; one buss **must** be selected for equalization, or the equalizer is entirely out of all console circuitry.

There are five controls in easily-identified groups on the module:

**1) EQUALIZE:** pushbutton switches select which buss is to be subject to equalization. . .Prog(ram), Aud(ition), or Util(ity). Again, if **no EQUALIZE** pushbutton is depressed, the Equalizer is inoperative.

**2) FILTER:** pushbutton selectable for 'Hi' or 'Lo' cutoff.

**3) PRESENCE:** a boost control attenuator calibrated from 0 dB to +12 dB for the two mid-range frequencies most useful for voice enhancement. The frequencies are 3 KHz (pushbutton normal) and 5 KHz (pushbutton depressed).

**4) TREBLE CONTROL:** (15 KHz) either **boosts or cuts** treble, controllable from -15 through 0 to + dB.

**5) BASS CONTROL:** (50 Hz) either **boosts or cuts** bass, in the same range as the Treble Control.

Selective equalization would generally be accomplished by:

- A) Assigning certain mixer output(s) to Utility.
- B) Equalizing Utility as selected in (A).
- C) Bringing the equalized Utility output into a mixer (which thus acts as a sub-master if more than one mixer output has been equalized in the first step) and assigning its output to Program.

Since the busses are identical, Audition or Utility could be used.

### REVERBERATION UNITS

A variety of controllable spring delay line reverb systems is available with the Centurion console series. The one illustrated is the Multi-Track Dual Equalized model.



Typical spring delay line systems consist of one or more metallic springs packaged with pickup amplifier, a power supply, and oftentimes a separate control unit.

In use with the Centurion series consoles, the output either of one mixer module or one entire mixing buss (Utility would usually be used) would feed the reverb unit, and be remixed against Program line content. In this way the attenuator of the mixer feeding Utility to the reverb would control the degree of reverberation introduced into the Program line. .

## PEAK PROGRAM METERS in place of VU METERS

The Peak Program Meter (PPM) began as a British Broadcasting Corporation specification, and has become Europe's standard level indicator. In most areas of the world where European engineers acted as consultants, the PPM has also become standard. Its use in comparison with the VU standard meter gives the PPM an advantage in ease of reading, and a number of American stations are specifying the PPM in place of the VU meter for that reason alone.

The PPM as specified by the B.B.C.-developed standard differs from typical VU meter design chiefly in these areas: faster attack and slower decay time to ease reading and lessen eye strain...a minimum (eight) of gradation, evenly spaced, to again promote ease of reading...white printed scale on a black background to lessen eye strain.

The ultimate specifications arrived at are: 2.4 milliseconds attack time...one second decay time. The moving-coil meter movement is tightly controlled and quite a bit faster than normal movements. Careful damping is thus a requirement to avoid too great over-indications, which requirement conflicts with the quickness of the meter and results in a rather more expensive and precise instrument.



The PPM calibration compared to VU meter calibration is: (PPM reading first, VU reading in dBm second) 0=no indication, 1 = -14, 2 = -8, 3 = -4, 5 = +4, 6 = +8, 7 = +14, PPM full scale deflection is undefined.

The Sparta PPM exactly fits the normal VU meter space in the Centurion upper bay.

**THE CENTURION SERIES CUSTOM CONSOLE LINE  
CONSISTS OF:**

**CENTURION I:** Monaural, 8-12 mixers, 3 identical program busses. Options: one or two 6-mixer Extender Panels, Digital Clock, Slide or Rotary Precision Step attenuators, Peak Program Meters in place of VU meters.

**CENTURION II:** Stereo, 8-12 mixers, three stereo and one monaural program busses. Options: one or two 6-mixer Extender Panels, Digital Clock, Slide or Rotary Precision Step Attenuators, Peak Program Meters in place of VU meters.

**CENTURION III:** Monaural, 6 mixers, 3 identical program busses. Options: Slide or Rotary Precision Step Attenuators, Peak Program Meters.

**CENTURION IV:** Stereo, 6 mixers, three stereo and one monaural program busses. Options: Slide or Rotary Precision Step Attenuators, Peak Program Meters.

**CENTURION STEREO EXTENDER PANEL:** Six mixers each. One or two can be added to Centurion II. Total inputs with 12-mixer Centurion II and two Extender Panels becomes 72 inputs with 24 mixers electronically identical. Options: Slide or rotary Precision Step Attenuators.

**CENTURION MONAURAL EXTENDER PANEL:** Six mixers each. One or two can be added to Centurion I. Total inputs with 12-mixer Centurion I and two Extender Panels becomes 72 inputs with 24 mixers electronically identical. Options: Slide or Rotary Precision Step Attenuators.



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## 1000-Series Stereo Consoles

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## MODEL 1040 8-MIXER CONSOLE

This fourth-generation of the famous AS40 design supplies stereo FM stations with a superb, flexible console for most control room uses. At the same time the 1040 costs less than comparable competing units because of its ten-year history of continuous improvement; great reliability at modest cost is the 1040 hallmark of excellence.

The fourteen stereo inputs of the 1040 are well balanced for average studio needs between low and high level mixer positions, with exchange of low-for-high level mixing in one mixer channel optional at the factory.

### MIXERS

All eight rotary Precision Step Attenuators have Cue position, which feeds a self-contained Cue amplifier; Cue gain is provided, with terminals for external speaker.

The standard mixer assignment of the 1040 is:

**MIXER 1 LOW LEVEL**, with pushbutton selection of three microphone sources. A microphone 'pan pot' included in Mixer 1 allows the right or left microphone to be panned between the stereo channels. It also compensates for variations in microphone level. The Microphone Mode switch on Mixer 1, together with the 'pan pot' 3-station pushbutton selector, allows extreme flexibility of microphone selectivity and balance, and creates a total of five microphone inputs in the first mixer.

**MIXER 2 LOW LEVEL**, single microphone source.

**MIXER 3 HIGH LEVEL**, single equipment source. Microphone preamplifier optional in this mixing position.

**7-8 HIGH LEVEL**, each with a 3-station pushbutton selector for assignment as the user sees fit.

Muting is provided for microphone mixers with the Sparta MAS-50 Monitor Amplifier with its plug-in Muting Relay System.

### BUSSES AND BRIDGING

The 1040 assures the best use of virtually any input source through a system of 10,000 ohm bridging transformers. Sources intended for single-ended, high impedance loads can therefore be used directly as inputs, and 620 ohm resistors placed across the line at either the source or console end can provide terminations if required.

Audition and Program outputs employ identical, interchangeable values and all components, so standby operation from the Audition side of the console is possible. The VU meters are switchable to monitor either buss.

Program and Audition busses have balance controls, either to compensate for minor component imbalances or quickly correct program source imbalance. No

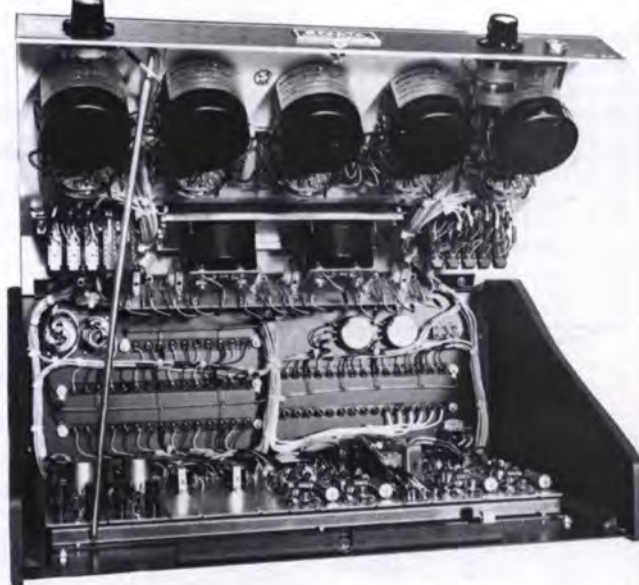
significant change of total Program output level results from these minor balancing changes.

The power supply (PS-8) is externally mounted. The Headphone station has separate gain control, and is switchable to monitor Program, Audition, and one other source of the user's choice (Cue, Air monitor, etc.).

An auxiliary 3-station pushbutton bank appears as an unassigned feature on the face of the console. Its use is left up to customizing requirements of the station.

## 1030/1035 5-MIXER CONSOLE

The 1030/1035, with its nine stereo inputs, makes an excellent standby, production room, or remote broadcast unit. Its wide assortment of functions have been found ideally suited to many smaller FM stations as a control room main console as well. The 1030/1035 was originally produced (as the AS30 series) concurrent with the rise of FM stereo, and was among the very first mixing consoles ever available for that broadcast medium.



### MIXERS

Microphone or high level inputs have been given flexibility aimed at accommodating the greatest number of types of sources. The five rotary mixers (Model 1030 designates standard mixers, the Model 1035 uses Precision Step Attenuators) all have Cue position.

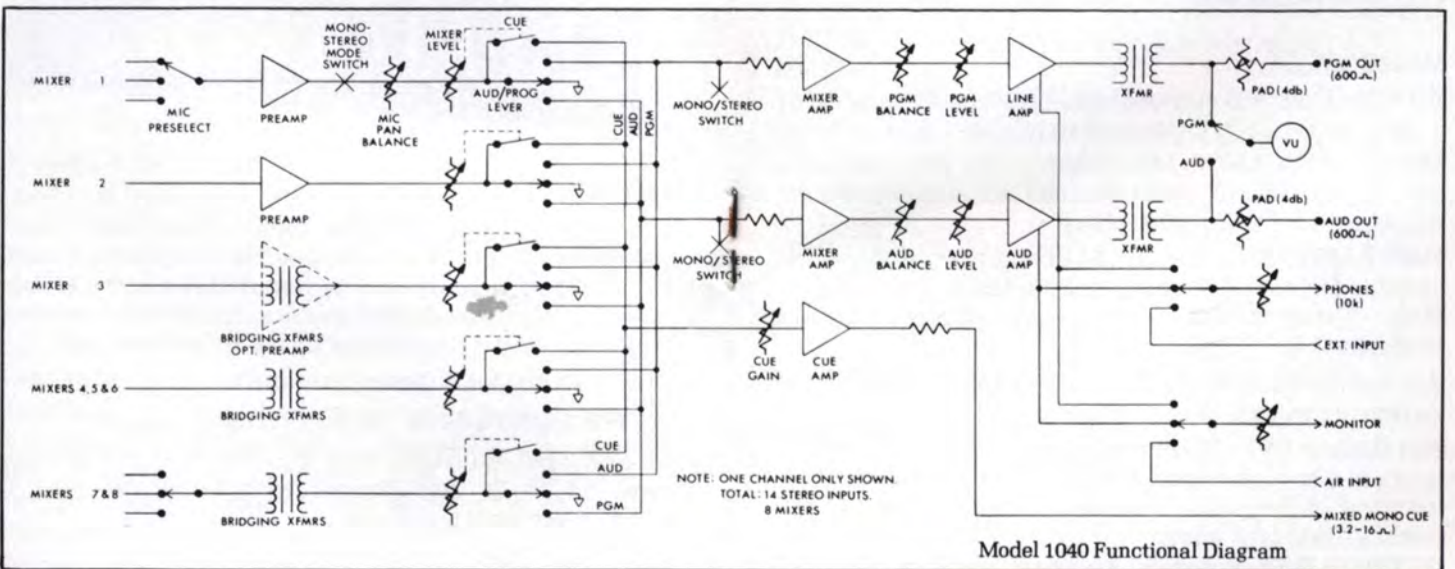
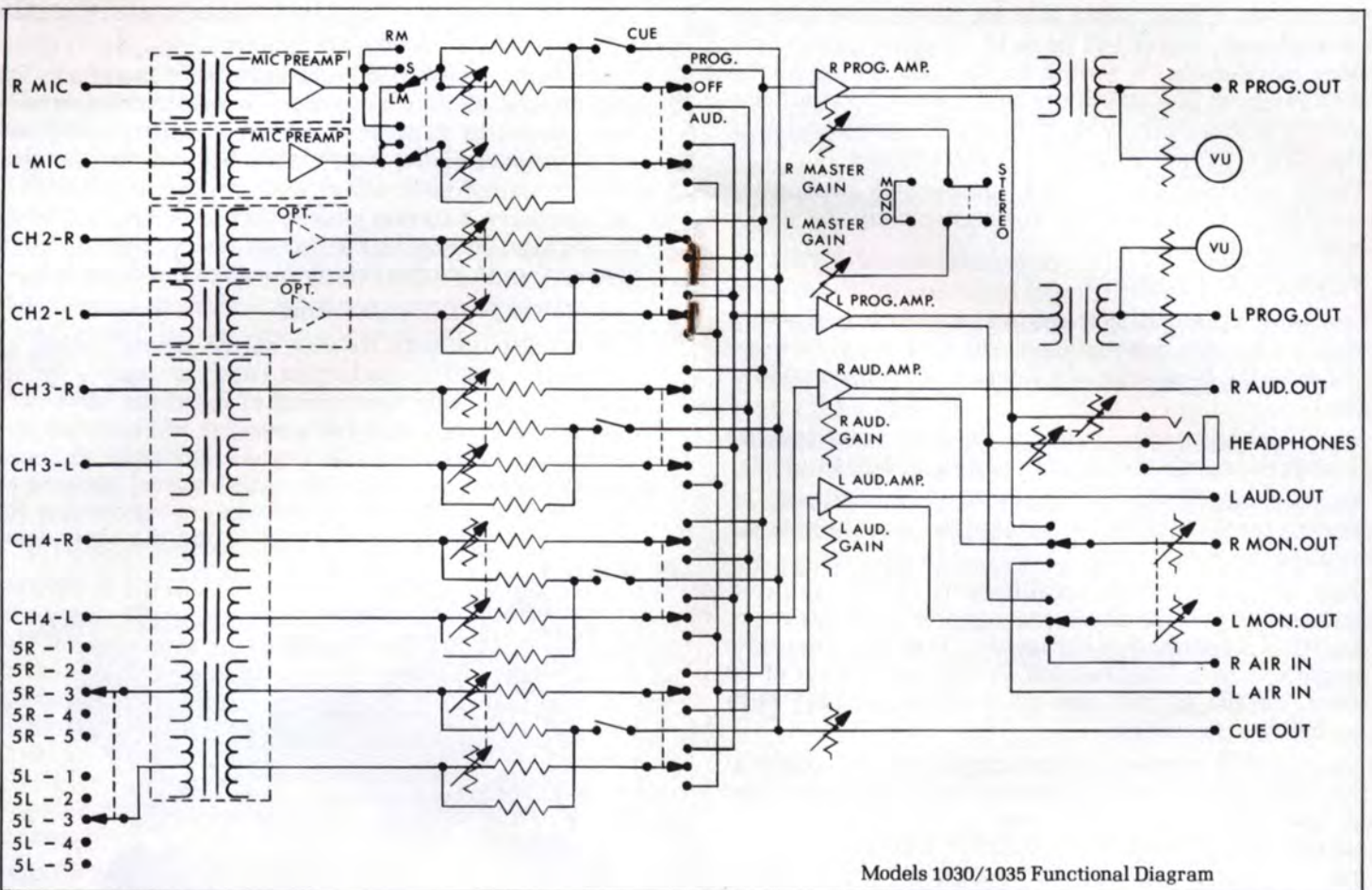
The 1030/1035 is supplied in standard form as follows:

**MIXER 1 LOW LEVEL**, single microphone input.

**MIXER 2 HIGH LEVEL**, with the input transformer on a card which is replaceable with a second pair of microphone preamplifiers.

**3-4 HIGH LEVEL**, single mixers

**MIXER 5 HIGH LEVEL**, with pushbutton pre-selection of multiple line inputs.



In addition, a front panel selector permits the Mixer 1 microphones, either left or right, to drive both output lines monaurally. A switch on the rear panel allows both Program line amplifiers to drive the Program amplifiers monaurally, also. This system provides quick checking of proper phasing of stereo sources.

There are two unused and unassigned pushbutton stations on the front panel for customizing the user's operation of the console.

### **BUSSES AND BRIDGING**

Low level preamplifiers are designed to operate with 150 to 250 ohm microphones; 50 ohm types are accommodated by change of a jumper on the preamplifier card.

High level inputs are balanced bridging, and operate flexibly in exactly the same manner as the 1040, above.

Audition and Program busses employ identical, interchangeable amplifiers. Master Program gain is set by a Master gain control.

Gain of the Audition amplifiers is set by internal resistors to provide about the same level as Program. Audition output terminals are fed from Audition line amplifiers by a single-ended source impedance of 60 ohms, so the output can drive multiple loads with negligible attenuation.

For external monitor and cue amplifiers, the optional Sparta MAS50Q can be used with the 1030/1035. The Monitor output signal is varied by a front panel gain control. Either Program or Audition material, plus the user's choice of an external input, may be pushbutton elected for Monitor.

## **Specifications: Model 1040**

**MIXERS:** Eight.

**INPUTS:** Fourteen stereo pairs. Three in mixer 1; one each in mixers 2-6; three each in mixers 7-8.

**INPUT IMPEDANCE:** Microphone; 150/250 ohm balanced. High level; 10K ohm balanced bridging for source impedances of 600-10,000 ohms.

**INPUT LEVELS:** Low level; -55 dBm, preamplifiers standard in mixers 1 and 2, optional in mixer 3. High level; -10 dBm nominal from 600 ohm sources, standard in mixers 3-8.

Air and external monitor; 1 volt nominal into 10K ohms.

**OUTPUT LEVELS:** Program and Audition; 8 dBm into 600 ohms at 0 VU, 22 dBm maximum. Monitor; 1 volt nominal into high Z load. Cue; 1 Watt mixed mono into external 3.2-8 ohm speaker. Headphones; 1 mW nominal into 10 K ohms.

**OUTPUT LINES:** Program, Audition, Monitor, Cue, and Headphones.

**RESPONSE:** All outputs;  $\pm$  2 dB, 20-20,000 Hz.

**DISTORTION:** All outputs; less than 0.5% THD at normal operating levels. Less than 1.0% THD at maximum output.

**SIGNAL-TO-NOISE:** 65 dB or more below 0 VU out (8 dBm), with -55 dB low level input. 75 dB or more below 0 VU out (8 dBm), with -10 dBm high level input.

**CROSSTALK:** Within 6 dB of noise at normal operating levels.

**MUTING:** Switch closure on Audition and Program for mixers 1-3, for control of external relays.

**POWER:** 115/230 VAC, 50/60 Hz.

**SIZE:** 28½" W x 10¾" D x 6½" H (710 x 271 x 165 mm). Power Supply, Model PS8; 4¾" W x 6½" D x 3¼" H (120 x 165 x 83 mm).

**SHIPPING:** Console and Power Supply boxed together; 37 pounds (16.75 kilos).

**SHIPPING:** Console and Power Supply boxed together; 37 pounds (16.75 kilos).

**1040 OPTIONS:** Low level preamplifier in mixer 3.

## **Specifications: Model 1030/1035**

(Where not specified, same as Model 1040 above)

**MIXERS:** Five.

**INPUTS:** Nine stereo pairs. One each in mixers 1-4; five in mixer 5; external Air input.

**INPUT LEVELS:** Low level; -55 dBm, preamplifier standard in mixer 1, optional in mixer 2. High Level; -10 dBm nominal from 600 ohm sources, standard in mixers 2-5.

**SIZE:** 15½" W x 10¾" D x 6½" H (395 x 271 x 165 mm).

**SHIPPING:** 24 pounds, including power supply (12 kilos).

**1030/1035 OPTIONS:** Precision Step Attenuators, Specify Model 1035; low level preamplifier in mixer 2.



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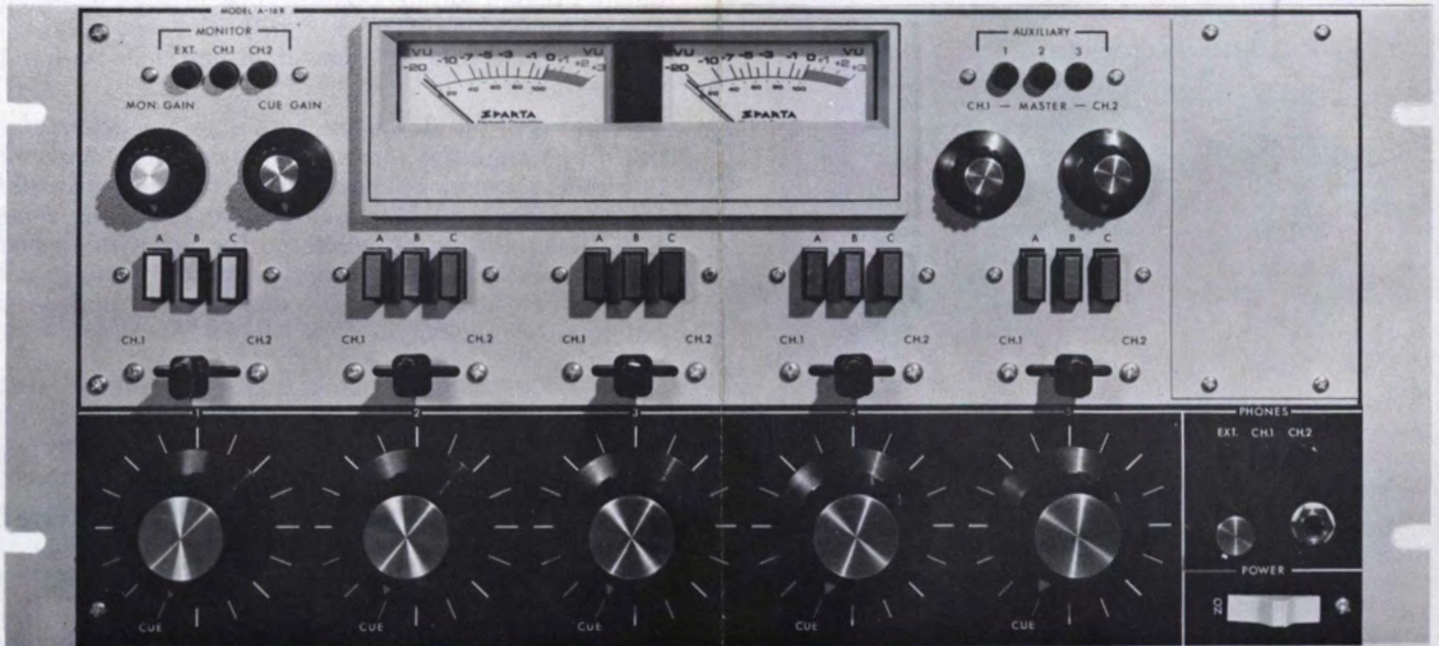
**1000-Series  
Stereo Consoles**

**POWER:** 117 VAC 50/60 Hz.

**POWER OUTPUT:** 3 Watts maximum.

**SIZE:** 4 1/2"W x 7"D x 2 1/2"H (114 x 178 x 63.2 mm).

**SHIPPING:** 2 1/2 pounds (1.14 kilos).



## Accessory Audio Consoles

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## MODEL A16R MONO CONSOLE

The all solid state design and quality components used, with rugged construction within a steel enclosure make the A16R a well-shielded, rigid unit for mobile or fixed station use.

The A16R takes 8.75" of standard rack space, and provides flexible audio switching far out of proportion to its size. Five mono mixing channels each have three separate pushbutton selectors for a total of fifteen program channels. Mixer 1 is standard 150/250 ohm microphone level (can be strapped for 50 ohm), and Mixers 2-5 are standard 10K ohm balanced high level. Input cards are identical in size, so may be interchanged as needed for various high/low input combinations.

The muting system provides three separate relays; monitor outputs on the back panel include three muted from the relays, and one un-muted. Each of the relays also provides isolated contact for control of external equipment or 'on air' lights. Each relay connects to 'close' from any combination of selected inputs on mixers 1-3.

A number of spare barrier strip terminals are provided on the rear of the steel case to accommodate added custom features.

The A16R features the same time-proven active circuits and power supply as the popular 1020 and 1040 (A20B and AS40B) consoles.

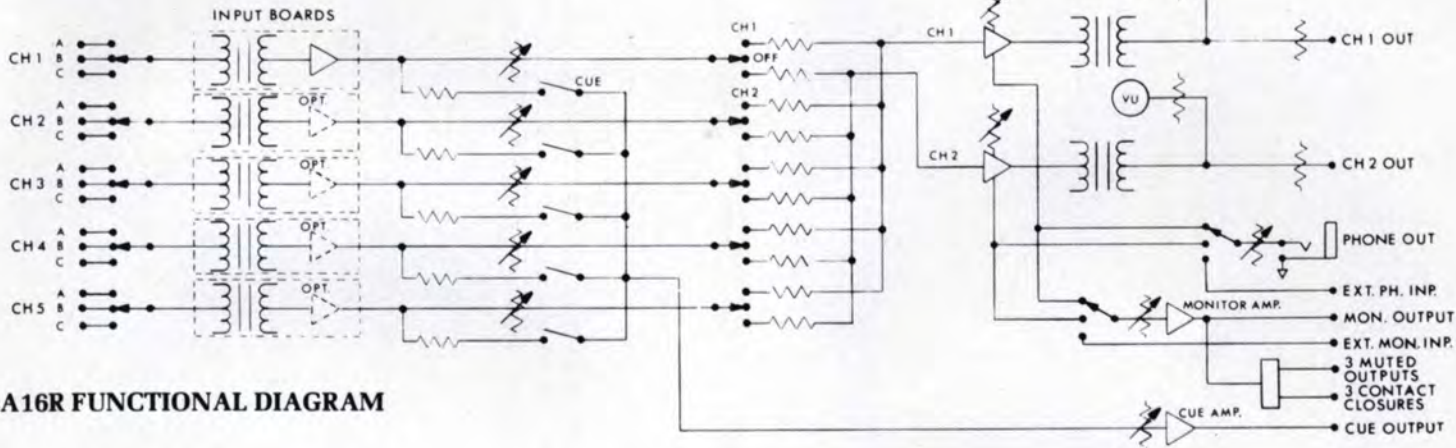


## MODEL RA4 REMOTE MIXER

The 4-mixer RA4 gives a choice of either microphone or high-level inputs to each channel. The low-level inputs can be either 600 ohm terminated or high impedance bridging.

AC line and DC battery supplies are internal, with automatic battery operation in the event of line power failure. During AC operation there is no load on the batteries. No-signal drain is very low; only actual program output draws significant current. Ten dBm nominal program level is delivered into 600 ohms, with 22 dBm maximum.

A test-tone oscillator at 700 Hz allows the operator to set Master gain without changing present Mixer positions. The headphone circuit, which operates with its own amplifier, allows monitoring of program out, or any of the cue positions. High impedance phones must be used.



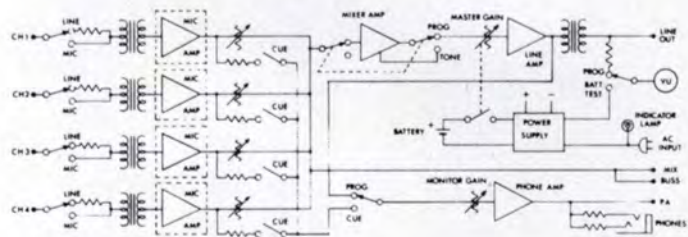
**A16R FUNCTIONAL DIAGRAM**

Two or more RA4s may be stacked for multiple mixing applications and multiple line feed due to accessibility of the mixer buss.

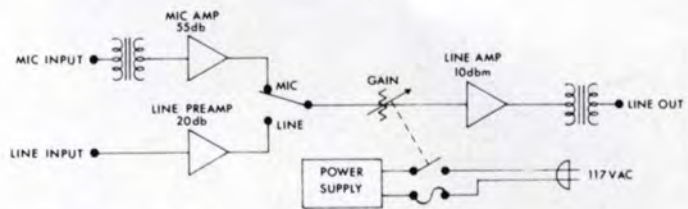
**MODEL RA1 UTILITY AMPLIFIER**

This general purpose amplifier acts as either a microphone preamp (up to +65 dB), line booster or remote station amplifier (up to +30 dB). The output level is 10 dB nominal into 600 ohms in either case, with a 22 dB maximum.

The RA1 is of full IC design, with a unique low current drain line amplifier for quiet dependability. Separate line and microphone input connectors are provided; transient-free switching enables both operating modes to be used alternately while on the air without electronic noise. Portable tape playbacks and similar audio sources can be operated through the high impedance balanced bridging input.



**RA4 FUNCTIONAL DIAGRAM**



**RA1 FUNCTIONAL DIAGRAM**

ohms. Monitor; 8 Watts, 8 ohms. Headphones; 1 mW RMS into 10K ohms.

**OUTPUT LINES:** Twin Program, Cue, Monitor, Headphones.

**RESPONSE:** Program, Monitor, and Cue; within 2 dB 20-20,000 Hz.

**DISTORTION:** Program (both channels); less than 0.5% THD at normal operating levels. Monitor and Cue; less than 1.0% THD at rated output.

**SIGNAL-TO-NOISE:** 65 dB or more below rated output with -55 dB low level input. 75 dB or more below rated output with -10 dB high level input.

**CROSSTALK:** Within 6 dB of noise at normal operating levels.

**MUTING:** Switch closure on both Program channels for Mixers 1-3, for control of external relays.

**POWER:** 117/230 VAC, 50/60 Hz.

**Specifications: A16R Console**

**MIXERS:** Five.

**INPUTS:** Fifteen.

**INPUT IMPEDANCE:** Microphone; 150/250 ohms, with 50 ohms optional. High level; 10K ohm balanced bridging for source impedances of 600-10,000 ohms.

**INPUT LEVELS:** Low level; -55 dBm, preamplifier standard in Mixer 1, optional for Mixers 2-5. High level; -10 dBm nominal from 600 ohm sources, standard on Mixers 2-5.

**OUTPUT LEVELS:** Program; (two channels) 8 dBm into 600 ohms for 0 VU. 22 dBm maximum. Cue; 1 Watt, 3.2

**SIZE:** 19"W x 12"D x 8 3/4"H (Standard rack mount)  
(480 x 305 x 221 mm).

**SHIPPING:** 37 pounds (16.75 kilos).

## Specifications: RA4 Remote Mixer

**MIXERS:** Four.

**INPUTS:** Four.

**INPUT IMPEDANCE:** Switch selectable for either low level (150/250 or 50 ohm microphones), or high level balanced bridging.

**INPUT LEVELS:** Low level; -55 dBm. High level; 0 dB nominal.

**OUTPUT LEVELS:** Program; 10 dBm into 600 ohms at 0 VU. 24 dBm maximum on AC operation, 18 dBm maximum on battery operation. Test tone oscillator; 700 Hz, 10 dBm at 0 VU, output via Master Gain. Headphones; monitor Program or Talkback, high impedance. Monitor Output; to external monitor amplifier.

**OUTPUT LINES:** Program, Test Tone, Headphones, Monitor.

**RESPONSE:** + 2 dB 50-15,000 Hz at all operating levels.

**DISTORTION:** Less than 0.5% THD at all operating levels. Typically 0.15% THD.

**SIGNAL-TO-NOISE:** 57 dB below + 10 dBm output, referenced to -55 dBm input. Equivalent input noise -112 dBm.

**POWER:** 117 VAC or (2) 9V transistor batteries.

**SIZE:** 12"W x 9"D x 2 1/2"H (305 x 230 x 64 mm).

**SHIPPING:** 7 pounds (3.15 kilos).

## Specifications: RA1 Utility Amplifier

**MICROPHONE:** 150/250 ohms; can be jumpered for 50 ohms.

**LINE:** 20K ohms balanced bridging (10K ohms, single-ended inputs). Removable 600 ohm terminating resistor installed.

**GAIN:** Microphone; 65 dB maximum. Line; 30 dB maximum.

**OUTPUT LEVEL:** 10 dBm into 600 ohms balanced, nominal. 22 dBm maximum.

**RESPONSE:** + 1 dB 20-20,000 Hz.

**DISTORTION:** Less than 1.0% THD at all operating levels. Typically 0.5%.

**SIGNAL-TO-NOISE:** 65 dB or more below 10 dBm output level.

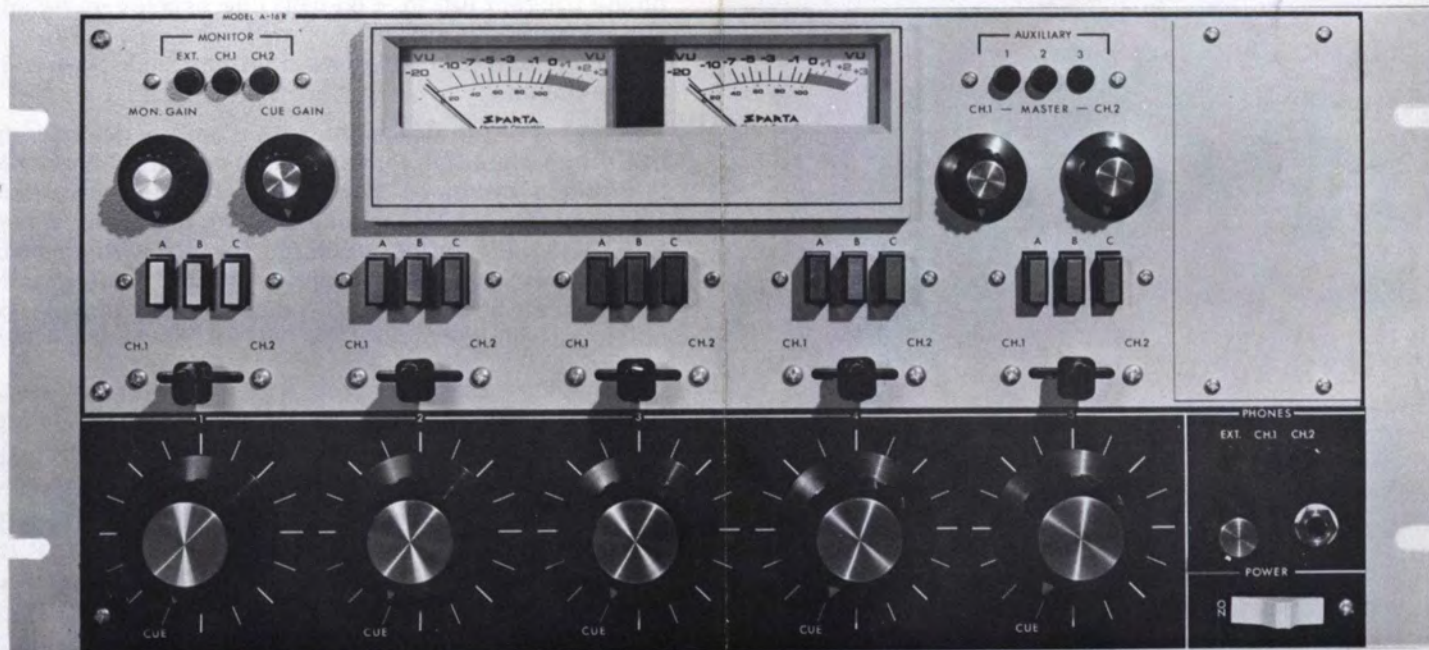


**POWER:** 117 VAC 50/60 Hz.

**POWER OUTPUT:** 3 Watts maximum.

**SIZE:** 4 1/2" W x 7" D x 2 1/2" H (114 x 178 x 63.2 mm).

**SHIPPING:** 2 1/2 pounds (1.14 kilos).



## Accessory Audio Consoles



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**Turntables and  
Accessories**

## MODEL GT12 TURNTABLE

The Sparta GT12 was designed with two major considerations for broadcast use; (1) dependability and ruggedness for years of trouble-free service, and (2) quick and easy one-hand cueing and start.

Construction of the GT12 is founded upon a massive one-piece cast frame of aluminum alloy, ribbed for utmost rigidity (see centerfold). The bearing well for the platter shaft, the platter-and-shaft assembly (pressed together), and bearing itself are completely interchangeable. This is accomplished by creating the shaft and bearing well of 'free machining' superior steel, holding tolerances of the two main components within .0002". The bearing is a single ball of super hard steel which can be replaced in a moment.

The exclusive Sparta 'power Paddle' is a thumb's length away from the platter for slip cueing and starting. The switch has a spring-loaded cue position, so it returns to 'off' when released. When pushed in the opposite direction it is a secure start/run switch.



## MODEL GT3-12

The GT3-12 is identical in specifications with the GT12, sharing the chassis casting, 'power Paddle' and machining of critical operating parts to very close tolerances. It differs mainly in offering a 78 RPM speed in addition to the 33 and 45 speeds of the GT12, and in having just one 'on' light rather than the individual 'on-speed' indicator lights of the GT12. The GT3-12 uses the synchronous motor exclusively.

The GT3-12, as prepared for European and other export markets typically is furnished with a heavier, flush-top platter, rather than the slightly dished style familiar to American broadcasters for use with 45 RPM records. The European small singles do not use the

same large center hole as American-made ones, so the center spindle of the flush-top platter is virtually the same as we associate with LP record use (see illustration). The European style platter is slightly heavier than the American (dished) style; there is no appreciable difference in acceleration speed or other specifications.

## SPARTA TURNTABLE OPTIONS

The Models GT12 and GT3-12, are available with the ST220 or AT1005 Tone Arms, with other makers' tone arms, or blank for field mounting of the users' choice of tone arm. The Sparta 220S or other phono pickup cartridge can be supplied with any turntable or arm combination.



## TEP-SERIES PREAMPLIFIERS

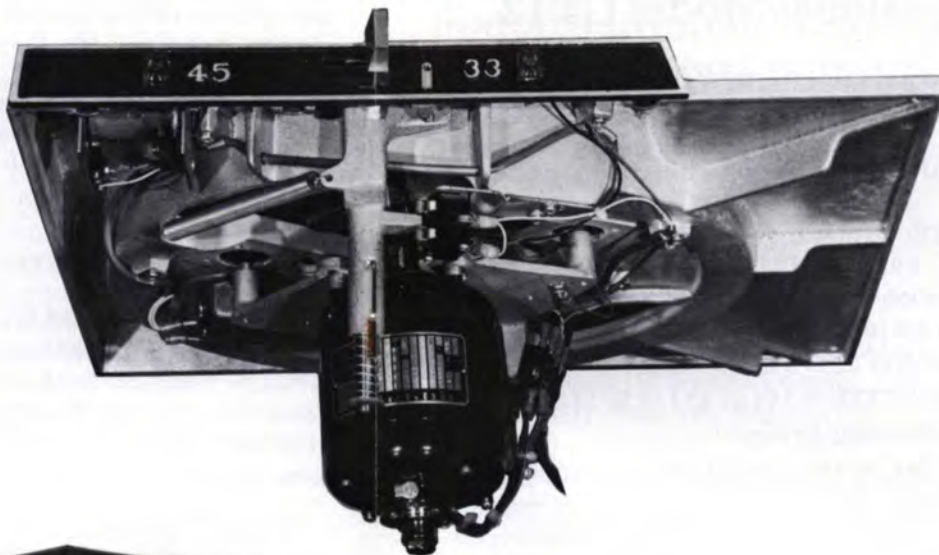
Sparta TEP preamplifiers are high quality professional models, equalized for the standard RIAA curve. The RFI protection is superior, and they perform equally well with all modern high-Z cartridges including the low output types.

Operating gain and equalization depend entirely on the characteristics of simple passive components, to assure long-term stability and reliability. IC preamps with extremely high open-loop gain are used in the design to accomplish this. TEP3S is the stereo model, TEP3M is monaural.

## AT1005 TONE ARM

This Tone Arm offers even more precision in adjustment of tracking force (within 0.5 gram), stylus overhang, and other factors of importance to the quality-conscious broadcaster, than the ST220. Minimal tracking error and an anti-skating device are other deluxe features. Pivot bearings are subject to constant inspection, since they are viewed through a unique smoked plastic cover at all times.

The GT12 Turntable with synchronous motor is shown at right; the massive cast base seen here is not changed in any respect for the GT3-12 and ST12 Turntables.



Twin GT12 Turntables are pictured in the Sparta 'Showcase Series I' control room furniture pedestal module. Single pedestals are available in this series, as well as 'Showcase Series II' furnishings featuring a different style which accommodates the Centurion Series Consoles.



#### ST220 TONE ARM

The ST220 is available either as a mono or stereo unit, allowing use of any modern pickup cartridge and stylus chosen. The ST220, when used with the GT12, GT3-12, or ST12 Turntables, is fully adjustable for all important recorded sound reproduction factors. The arm itself is of very light but tough alloy, with a low-mass cartridge shell. Its rotation is on a small precision ball bearing, with full adjustment of arm height, lateral balance, and tracking force.



#### 220S CARTRIDGE

The Sparta 220S was designed to exactly fit the major requirements of broadcasters today. Its weight and tracking force perfectly fit the recommendations of both MOR and classical music stations, and it produces superior separation and response at a surprisingly modest price. Its output places it well within the range required by nearly all modern preamplifiers, and its specifications match the best performance characteristics of the Sparta TEP-Series preamplifiers and Tone Arms.

## Specifications: Model GT12

**BASE:** 16"W x 15½"D (401 x 392 mm).  
**BOTTOM CLEARANCE:** Six and one-half inches (165 mm).  
**TOP CLEARANCE:** Two inches without tone arm (51 mm).  
**PLATTER SIZE:** Twelve inches (305 mm).  
**SPEEDS:** 33 1/3 and 45 RPM.  
**ACCELERATION:** Less than 1/16th turn at 33 1/3 RPM. Less than 1/10th turn at 45 RPM.  
**RUMBLE:** -45 dB at 33 1/3 RPM.  
**WOW AND FLUTTER:** 0.1% at 33 1/3 RPM.  
**MOTOR:** Synchronous or 4-pole.  
**POWER:** 117 VAC 60 Hz. 230VAC 50 Hz optional.  
**CONSTRUCTION:** Chassis; 1-piece cast aluminum alloy. Platter; machined aluminum alloy. Well; roller burnished aluminum alloy. Shaft; 'free-machining' steel.  
**FINISH:** Polyurethane enamel, brushed aluminum, acrylic vinyl 'felt'.  
**SHIPPING:** 18.25 pounds without tone arm (8.25 kilos).

## Specifications: Model GT3-12

**SPEEDS:** 33½, 45, and 78 RPM.  
**ACCELERATION:** Less than ½ turn at 78 RPM.  
**SHIPPING:** 19.375 pounds without tone arm (8.8 kilos).  
All other specifications of the GT3-12 are identical with the GT12, above.

## Specifications: TEP-Series

**FREQUENCY RESPONSE:** RIAA (NAB) within ± 0.5 dB typical; ± 1.0 dB maximum.  
**PROGRAM OUTPUT LEVEL:** 0 dBm into 600 ohms balanced, adjustable to below -20 dBm.  
**MAXIMUM OUTPUT LEVEL:** 12 dBm.  
**DISTORTION:** Less than 0.5% THD; .15% typical.  
**INPUT IMPEDANCE:** 47K ohms.  
**SENSITIVITY:** 5 mV for 0 dBm output at 1 kHz.  
**NOISE:** 70 dB below program level; more than 80 dB below maximum output.  
**HUM:** Inaudible; below noise.  
**SEPARATION (STEREO):** 70 dB typical; 65 dB minimum.  
**DIMENSIONS:** 4.5"H x 2.625"W x 6.5"D (130 x 67 x 165 mm).  
**SHIPPING:** 1.375 pounds (.62 kilo).  
**POWER:** 117 VAC, 50/60 Hz, 0.25 A.  
**MOUNTING:** Rubber feet, plus two single-hole "Z" clamps.

## Specifications: Model AT1005

**TOTAL LENGTH:** 12 13/16 inches (323 mm).  
**EFFECTIVE LENGTH:** 9½ inches (240 mm).  
**OVERHANG:** 19/32" (15 mm); stylus tip 19/32" (8 mm) from end of shell.  
**OFFSET ANGLE:** 17°.  
**STYLUS PRESSURE:** Adjustable 0-3 grams; calibrated in 0.5 grams.  
**TRACKING ERROR:** ± 1° 30" or less.  
**MOUNTING:** 11/16" diameter single hole, 1" long threaded shank (17.5 and 25.4 mm).  
**ARM HEIGHT:** Both arm and rest adjustable 1¼ to 2¾ (44-70 mm).  
**CARTRIDGE SHELL:** International standard 4-pin.  
**CONNECTING CABLE:** Four feet long; plugs into base arm.  
**MOUNTING BOARD:** Up to .835" (22 mm).

## Specifications: Model ST220

**TOTAL LENGTH:** 12 13/32 inches (310 mm).  
**EFFECTIVE LENGTH:** 8 21/32 inches (220 mm).  
**OVERHANG:** 19/32 inches (15 mm); stylus tip 19/32" (8 mm) from end of shell.  
**OFFSET ANGLE:** 22°.  
**LATERAL BALANCE:** Adjustable for center of gravity, all cartridges.  
**STYLUS PRESSURE:** Adjustable 1-6 grams.  
**TRACKING ERROR:** + 4° , -1° .  
**MOUNTING:** 7/8" diameter single hole, 1" long threaded shank (22 and 25.4 mm).  
**ARM HEIGHT:** Both arm and rest adjustable 1 9/16 to 2 3/8" (40-60 mm).  
**CARTRIDGE SHELL:** International standard 4-pin.  
**CONNECTING CABLE:** Five feet long; plugs into base of arm.  
**MOUNTING BOARD:** Up to .75" (19 mm) maximum.

## Specifications: Model 220S

**STYLUS TIP:** LP only; 0.5 mil diamond tip.  
**OUTPUT LEVEL:** 4 mV.  
**FREQUENCY RESPONSE:** 20-25,000 Hz.  
**CHANNEL BALANCE:** Within 2 dB.  
**CHANNEL SEPARATION:** Over 20 dB.  
**COMPLIANCE:** 10 x 10<sup>-6</sup> cm/dyne.  
**TRACKING FORCE:** 1-3 grams.  
**WEIGHT:** 5.5 grams.  
**DIMENSIONS:** 1.3"L x .625"W x .665"H (33 x 16 x 17 mm).  
**REPLACEMENT STYLUS:** Sparta MODEL 22SN.



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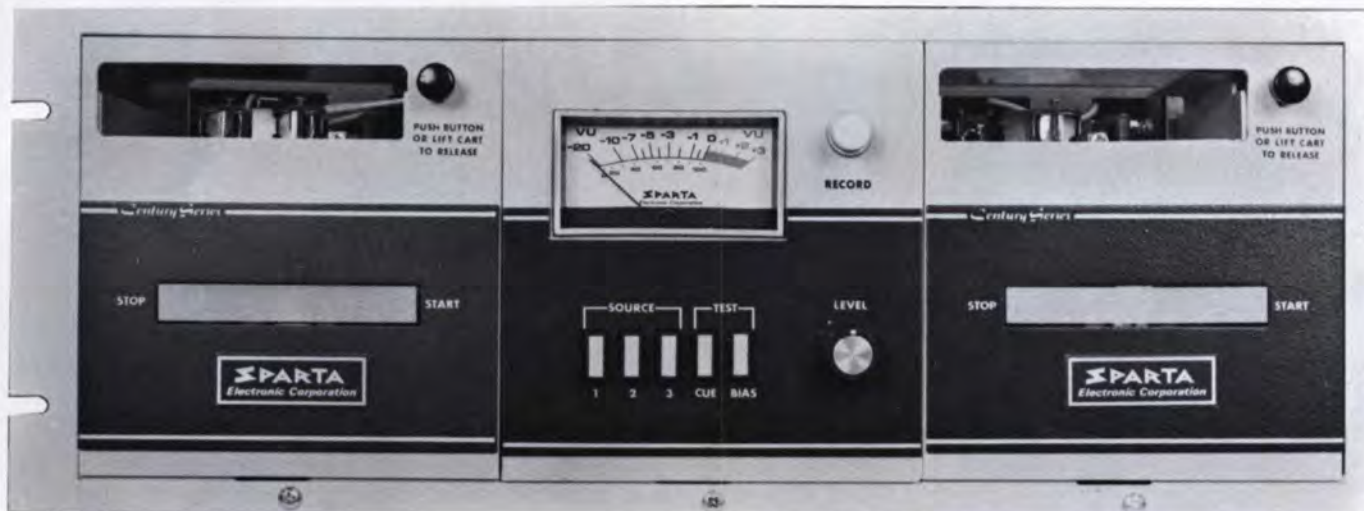
**Turntables and  
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## Century Series

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Century Series mono R/P and Playback in Triple Rack Mount

## SPARTA CENTURY SERIES TAPE CARTRIDGE EQUIPMENT

The Century Series comprises a same-size-modular system of either monaural or stereo Record and Playback equipment. This flexibility is furthered by design of the Playback module to be replaceable, with addition of a record head, in any Record/Playback system: each is pre-wired to accept the record control array. Wiring from module to module in a multiple array is facilitated by AC-out plugs being provided at the rear of each Playback.

The Century Series playback is supplied with accurate high-speed motor, coupled to the capstan flywheel by twin 'flutter filter' belts. The resulting indirect drive costs less, runs cooler, and is far less subject to motor manufacturing differences than even very expensive direct drive machines.

The pinch roller is raised to within 1/8" of the capstan upon inserting a cartridge preparatory to play. With this short distance to travel the pinch roller makes virtually no noise in contacting the capstan when play begins, eliminating expensive damping mechanisms.

The Century Series is equipped with the Sparta "True Tangent" non-magnetic HM-2 head mount, which is fully adjustable. The cartridge release mechanism has dual operation; it is activated by either tilting up the cartridge, or pushing a release button. A built-in audio switcher enables the outputs of several Century playbacks to be fed into one audio console mixer without other isolation equipment.

The cue channel output is amplified for either an automation control signal, or ease in checking cue tone quality. End-of-Message (EOM) cue tone is optional.

Recording with Century Series is made easier in the production room through pushbutton selection of three audio inputs, and VU meter testing of cue tone and bias record levels, as well as audio recording level. Tone detectors are Integrated Circuits, making for fewer components and giving reliable cue detection. ICs are plug-in, as are PC boards in both Playback and Record modules.

Single PC boards in Playback and Record modules are warranted by Sparta for a full year.

## OTHER CENTURY SERIES FEATURES IN BRIEF

- 'Touch Bar' start/stop is illuminated red-green for visual indication of standby-end-play
- EOM auxiliary optional tone causes red side of 'Touch Bar' to flash while green remains 'on' during runout
- Record electronics has separate power supply
- Access to heads and adjustments is full and easy
- Deck plate is laminated for anti-warp without weight

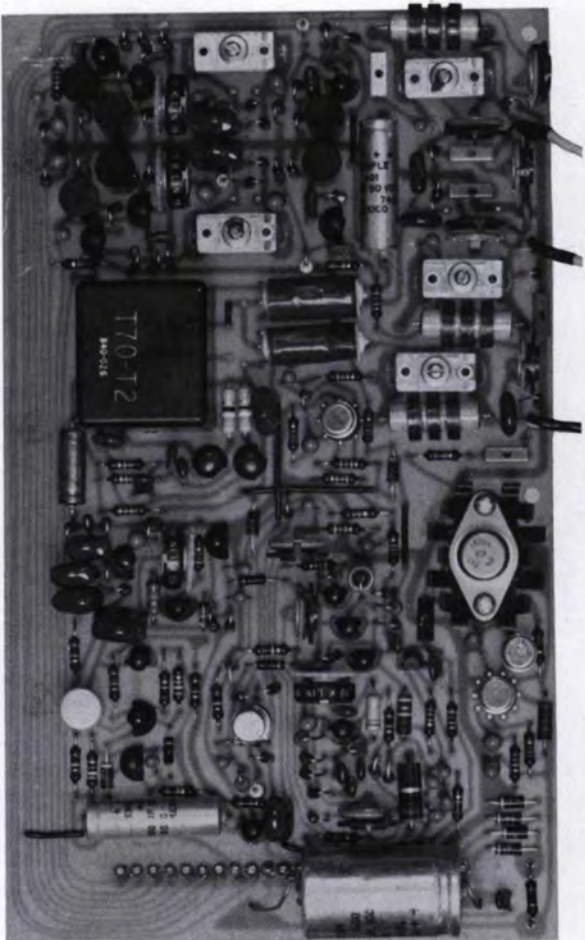
## CENTURY SERIES OPTIONS:

Remote control for all functions; EOM secondary cue signal; Triple Rack Mount; Single or Dual 'Fliptop' covers; special power requirements.





Rear of mono Century Series R/P, showing Record Control inter-connection, AC out of playback to record module, clearly indicated connections.



Century Series stereo record circuit board.

# Specifications

**RECORD INPUTS:** Three, pushbutton selected.

**INPUT IMPEDANCE:** Balanced bridging -10 to +8 dBm.

**AUDIO OUTPUT:** 600 ohms balanced; +6 dBm nominal, +16 dBm maximum.

**DRIVE AND TAPE SPEED:** Shielded hysteresis synchronous motor drives non-magnetic dynamically balanced flywheel via dual 'Flutter Filter' belts; tape speed 7½ ips.

**PLAYING TIME:** :02-10:30 (NAB "A" cartridge).

**WOW & FLUTTER:** 0.2% or less.

**EQUALIZATION:** NAB standard, CCIR/IEC optional.

**RESPONSE:** ± 2 dB 50-15,000 Hz.

**DISTORTION:** 2% or less.

**SIGNAL-TO-NOISE:** 55 dB or better below saturation, mono record; 52 dB or better below saturation, stereo record.

**CUE SIGNALS:** 1 KHz standard NAB primary (stop) cue; 150 Hz secondary (EOM) cue; Form A contact closure, EOM signal.

**POWER:** 117 VAC, 60 Hz (others on special order).

**DIMENSIONS:** Single playback or record module, 6"H x 5 3/4"W x 14"D (153 x 145 x 355 mm); Dual PB or R/P, double above width; Triple Rack Mount, 7"H x 19"W x 14"D (177 x 482 x 355 mm);

**SHIPPING:** Single playback module without bottom plate (for rack mount) 17 pounds (7.75 kilos). Single record module, without bottom plate (for rack mount) 9 pounds (4.1 kilos). Bottom plate one pound (.475 kilo). Single Flip-Top Cover three pounds (1.45 kilos). Dual Flip-Top Cover six pounds (2.9 kilos). Triple Rack Mount 11 pounds (5 kilos).



**SPARTA**  
Division of Cetec Corporation

5851 Florin-Perkins Road, Sacramento, Ca. 95828  
(916) 383-5353 • Telex 377-488 • Cable SPARTA

**Century Series**

[www.SteamPoweredRadio.Com](http://www.SteamPoweredRadio.Com)



**Cetec Broadcast Group**

75 Castilian Drive Goleta, CA 93017  
(805) 968-1561

## **CENTURY II Tape Cartridge Equipment**

**With Two Year Warranty!**

## Century II . . .

CENTURY II mechanically is rock-solid, silent and tough. It features direct capstan drive with synchronous 450 RPM motor, and air-damped solenoid.

Functionally and electronically CENTURY II offers more features than competing units in its price range also: keyboard style illuminated pushbutton controls (with both single and 'ganged' functions), peak reading record level meters with LED overload indicators in the meter face and digital tone detection system.

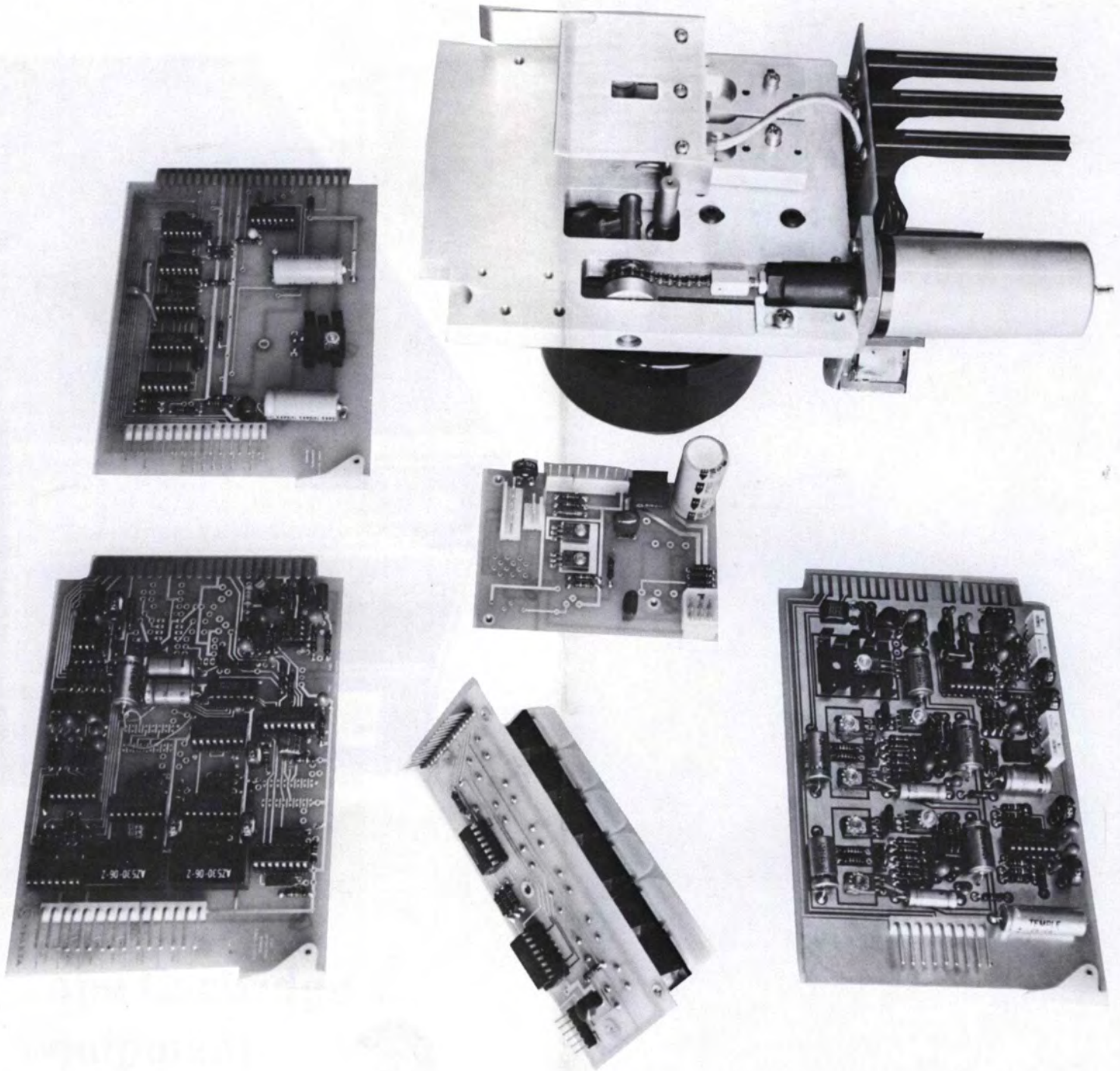
The ruggedness of CENTURY II construction is keynoted by the massive cast front panel and machined deck, insuring maximum rigidity of the unit in any mounting configuration and resultant long life with exceptionally consistent performance.

Standard features of the CENTURY II include secondary (End of Message) and tertiary cue tones; primary (Stop) cue tone defeat; audio mute on playbacks; logging signal input and output; and built-in SPLICE FINDER. In conjunction with the splice finder, virtually the only option is addition of a HIGH SPEED feature.

The compact modules (the Record/Playback is a single unit) are standard single desk-top units, with optional triple rack mount. A single unit measures only 5 1/4" H x 5 3/4" W x 14 1/2" D.



**With Two Year Warranty!**

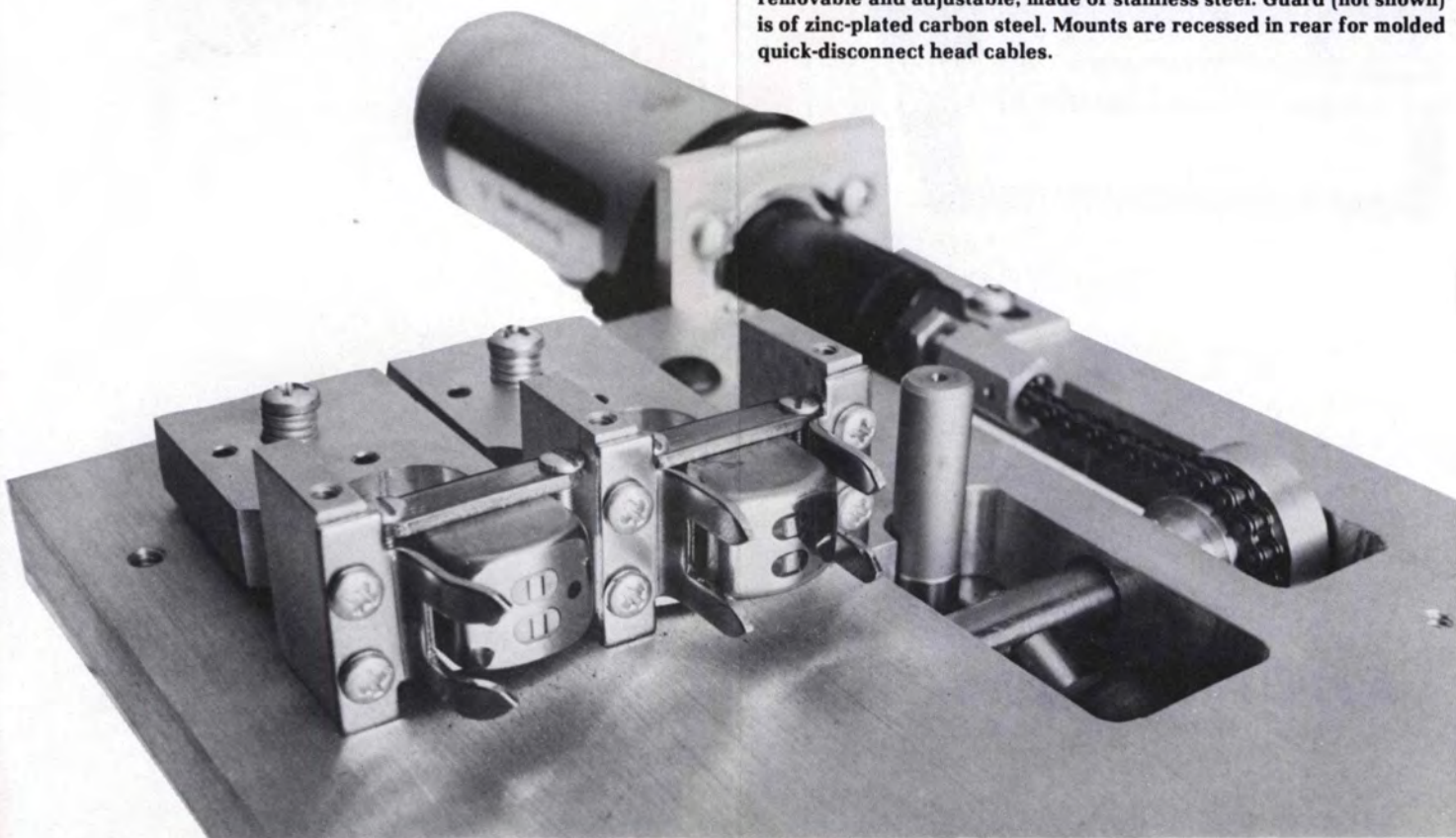


**Simplicity of the totally modular Century II design is illustrated above by the small number of components.**

**Printed circuit boards interconnect with molded Molex connectors for very rapid assembly.**



**ABOVE.** View of the basic deck, showing rigidity of construction with  $\frac{1}{2}$ " machined aluminum deck, 450 RPM direct drive motor with "Hydro-honed" capstan, and silent air-damped solenoid. **BELOW.** Century II's new machined headstacks, featuring extremely precise adjustability for all tape performance parameters. Guides are removable and adjustable, made of stainless steel. Guard (not shown) is of zinc-plated carbon steel. Mounts are recessed in rear for molded quick-disconnect head cables.



## **SPECIFICATIONS:**

**MECHANICAL:** Direct drive 450 RPM hysteresis synchronous motor; Air-damped solenoid; Die-cast front panel and half-inch thick deck.

**TAPE SPEED:** 7½ ips (190.5 mm/sec) ± 0.2%. Optional FAST WIND is 30 ips. Start/Stop time less than 0.1 second.

**FLUTTER:** Less than ± 0.15% weighted peak per ANSI S4.3.

**AUDIO OUTPUT:** +10 dBm from recording at reference fluxivity (160 nWb/m at 1 kHz). Maximum output + 28 dBm. Output impedance 70 ohms for 600 ohm rated load.

**RECORDER INPUT:** 10K balanced bridging (differential input; no transformer). -8 dBm minimum, +14 dBm maximum input level from 600 ohm source to record a 1 kHz signal at reference fluxivity. Record meter is peak reading, with LED overload indicators.

**HARMONIC DISTORTION:** Record and Reproducer amplifiers; less than 0.25% THD 50-20,000 Hz at rated levels. Record/Reproduce system; less than 2.0% THD at reference fluxivity.

**SIGNAL-TO-NOISE:** Reproducer; better than 53 dB mono, 50 dB stereo, 20-20,000 Hz from reference fluxivity with +10 dBm output level. Record/Reproduce System; better than 50 dB mono, 47 dB stereo.

**EQUALIZATION:** NAB Standard, CCIR/IEC optional.

**BIAS OSCILLATOR FREQUENCY:** 100 kHz.

**CUE SIGNALS:** Primary; 1 kHz (stop tone). Secondary; 150 Hz (EOM tone). Tertiary; 8 kHz. Logging tone; 3.5 kHz. Secondary and Tertiary signal outputs are ground switching, 25 volts at 50 ma. Optional Form C contact closures are available.

**CUE-TO-PROGRAM CROSSTALK:** Less than -50 dB all tone frequencies.

**REMOTE SWITCHING:** Start, Stop and Record can be activated by a momentary contact closure to ground, or a ground switching circuit capable of sinking 1 ma at 15 volts. For automation a 'playing' signal is provided which is +15 volts, active high. For logging applications, the cue track bias can be turned on by a maintained contact closure or ground switching signal.

**POWER:** 117 volts +10% 60 Hz. 230 volts/50 Hz optional.

**DIMENSIONS:** (of a single module; R/Ps and Reproducers are identical) 5 ¼"H x 5 ¾"W x 14 ½"D.

**SHIPPING:** (each single module shipped separately; triple rack mount shipped separately from modules) 23 pounds (10.5 kg), 1.5 cubic feet (158.17 cubic cm).





## **CENTURY II Tape Cartridge Equipment**

**With Two Year Warranty!**



**Cetec Broadcast Group**

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## Specifications: TR96 Cart Rack

**CAPACITY:** 96 NAB "A" size.

**FINISH:** Same as MR200.

**DIMENSIONS:** 20" H x 18" diameter

**WEIGHT:** 23 pounds.

## Specifications: TR 48 CART Rack

**CAPACITY:** 48 NAB "A" size.

**FINISH:** Same as MR200

**DIMENSIONS:** 20" H x 13" diameter.

**WEIGHT:** 11 pounds.

## Specifications: Test-Tape Carts & Equipment

**CL-1:** 1 KHz standard reference level.

**CL-2:** 1 KHz standard reference level at -10 dB.

**AL-1:** 12 KHz full-track; head alignment test.

**NAB-3:** NAB-approved monaural frequency response.

**NAB-4:** NAB-approved stereo frequency response.

**AG-2:** Prismatic optical device checks head adjustment on any tape cartridge equipment; pocket size.

**DM-44:** Wand-type head demagnetizer; reach is sufficient for heads on any currently made equipment.



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## Tape Cartridge Equipment, Services and Accessories

## **SPARTA BROADCAST TAPE CARTRIDGES**

The broadcaster has a choice of two distinctly different tape cartridges from Sparta, one of which will exactly suit his station's needs.

The SPARTA BROADCAST PREMIUM cartridge is designed specifically to meet requirements of the many broadcasters who need quality tape cartridge performance for airing music. It is offered empty for custom loading, or in eleven lengths; see Price Schedule for details.

The SPARTA BROADCAST STANDARD is a more economical cartridge of time-tested design, the performance of which leaves nothing to be desired for use in spot announcement and news airing. It has been an outstanding favorite among U.S. radio stations since its introduction. The Price Schedule has lengths and further details.

## **SPARTA TAPE CARTRIDGE SERVICE**

Factory trained technicians will inspect, clean, re-lube (if required), repair and reload your tape cartridges to exacting specifications. Minor parts are replaced as a matter of course; the charges for these are absorbed in the normal Sparta service charge. Major parts are replaced at the discretion of the reload specialists, and charged for.

Every cartridge refurbished and reloaded by Sparta is returned in LIKE-NEW condition.

## **SPARTA KUM-KLEEN CARTRIDGE LABELS**

These well-known labels strip off a tape cartridge easily, leaving no adhesive residue, and can be re-applied to other cartridges repeatedly.

## **BULK AUDIO TAPE**

The finest lube magnetic tape for cartridge reloading is available from Sparta in 1800' or 3600' reels. This is the same top quality tape used in the Sparta Tape Cartridge Reloading Service Department, for station custom reloading.

## **SPARTA REEL/CARTRIDGE TAPE ERASER**

The Model CE-3 is a heavy-duty professional model for cassettes, cartridges, and reels up to 10-1/2". A feature is the duty light which warns user if current remains ON after use, guarding against damage to the entire unit because of a defective switch. Handsome, in glossy black plastic case, contrasting laminated top color, and clear acrylic plastic guard panel.

## **WALL AND DESK STORAGE RACKS CR100 AND CR120**

These handsome racks both match the Sparta

'Showcase' studio furniture in appearance and quality.

The CR100 is a wall-mount container for 100 NAB-"A" carts. The CR120 is a 'lazy susan' desk-top container for 120 NAB-"A" carts.

Both units are made with industrial grade particle board, sturdy laminated plastic wood grain finish.

## **MR200**

Mobility is the chief feature of this roll-around 'lazy-susan' rack. Construction is of heavy gauge welded steel rod, chrome-plated for lasting beauty and durability. Individual vertical racks holding 25 cartridges are removable from the wheeled base, allowing a convenient means of making program changes involving many cartridges.

## **TR48 and TR96**

These two similar revolving table top cart rack models are patterned after the MR200 above. Individual vertical racks (each holds 12 cartridges) are removable from the base for programming convenience. Racks are chrome plated, base is japanned black, construction is all welded steel.

## **SPARTA TAPE CARTRIDGE TEST ACCESSORIES**

Uniform tones and levels are maintained by Sparta on tapes required for testing and calibrating your tape cartridge equipment of any type or age. Rigid specifications of quality are tested for by Sparta check out technicians in random samples of the basic test-tape material.

## **Specifications: "Kum-Kleen" Cartridge Labels**

**COLOR:** Black-on-white litho stock.

**DIMENSIONS:** Each label 5/8" x 3". Roll measures 3-1/4" W x 2-3/4" diameter; labels are horizontal across width of roll.

**QUANTITIES:** 500 labels/roll.

**WEIGHT:** 6 oz./roll.

## **Specifications: CE-3 Tape Eraser**

**POWER INPUT:** 1,000 Watts, 90-135 VAC, 60 Hz.

**DUTY CYCLE:** 1:3 on-off.

**CONSTRUCTION:** Heavy insulating plastic case, completely epoxy sealed. Rubbed padded bottom protects furniture. Removable reel center pin.

**SWITCH:** Momentary 'on'; service light for power 'on'.

**WIRING:** Heavy-duty wire for high current draw.

**OPTIONS:** 3-wire grounding plug available.



Premium Cartridge



Standard Cartridge



AG2



CR100



CR120



TR48



MR200



TR96



CE3

## Specifications: CR100 Cart Rack

**CAPACITY:** 100 NAB "A" size.

**FINISH:** Walnut grain laminated plastic over furniture grade particle board.

**DIMENSIONS:** 25" W x 27-1/2" H x 5" D.

## Specifications: CR120 Cart Rack

**CAPACITY:** 120 NAB "A" size.

**FINISH:** Walnut grain laminated plastic over furniture grade particle board.

**DIMENSIONS:** 15-1/4" W x 15-1/4" D x 29" H (requires 18" area to revolve).

## Specifications: MR200 Cart Rack

**CAPACITY:** 200 NAB "A" Size.

**FINISH:** Heavily chrome plated racks, with black japanned base.

**ADJUSTMENTS:** Individual racks (WR25) removable.

Main rack adjusts through ten inches of height to suit control room needs.

**DIMENSIONS:** Adjusts from 4' 3" to 5' 1" high.

## Specifications: TR96 Cart Rack

**CAPACITY:** 96 NAB "A" size.

**FINISH:** Same as MR200.

**DIMENSIONS:** 20" H x 18" diameter

**WEIGHT:** 23 pounds.

## Specifications: TR 48 CART Rack

**CAPACITY:** 48 NAB "A" size.

**FINISH:** Same as MR200

**DIMENSIONS:** 20" H x 13" diameter.

**WEIGHT:** 11 pounds.

## Specifications: Test-Tape Carts & Equipment

**CL-1:** 1 KHz standard reference level.

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**AG-2:** Prismatic optical device checks head adjustment on any tape cartridge equipment; pocket size.

**DM-44:** Wand-type head demagnetizer; reach is sufficient for heads on any currently made equipment.



**Cetec Broadcast Group**

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**Tape Cartridge  
Equipment, Services  
and Accessories**

## Specifications: SP40 Speaker System

**CROSSOVER FREQUENCIES:** 500, 2,000 and 10,000 Hz.

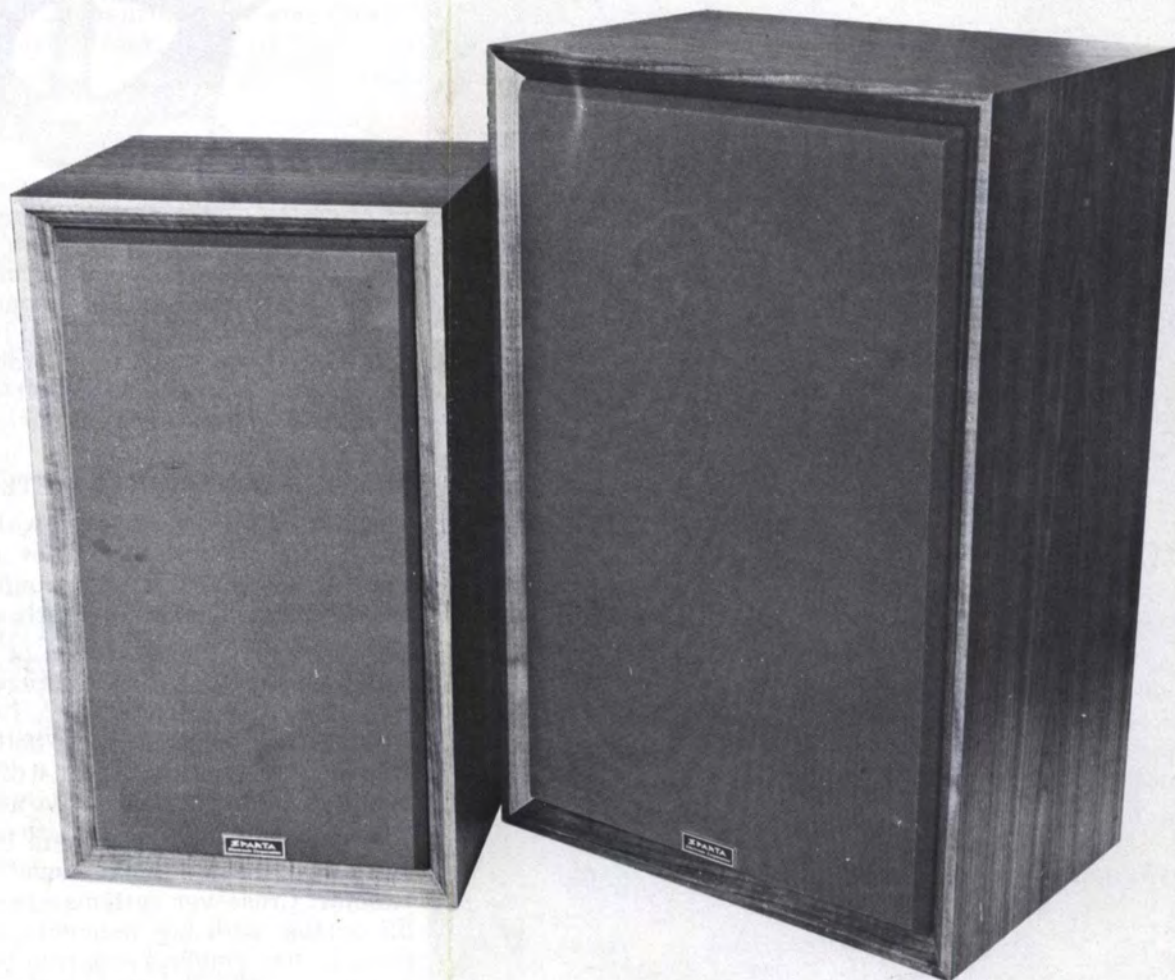
**IMPEDANCE:** 8 ohms.

**FREQUENCY RESPONSE:** 22-22,000 Hz.

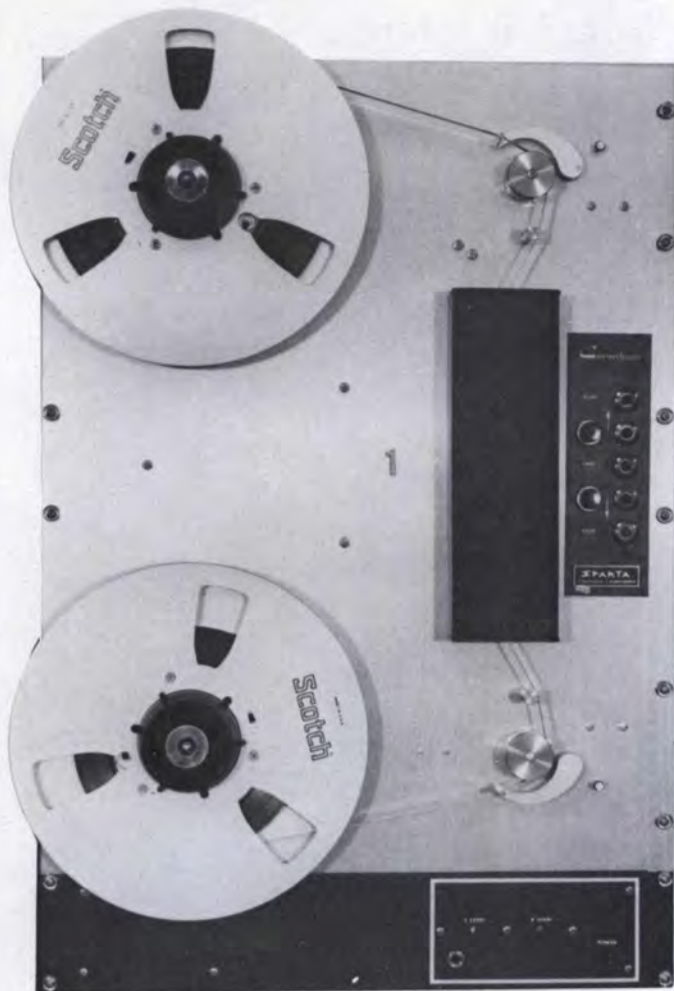
**POWER HANDLING:** 120 Watts peak.

**SIZE:** 17 1/2"W x 11 1/2"D x 26 1/2"H (440 x 290 x 670 mm).

**SHIPPING:** 43 pounds (19.5 kilos).



## Corinthian and Audio Accessories



### CORINTHIAN REEL/REEL PLAYBACK

This handsome deck provides up to 16" reel capacity for long periods of unattended automation operation. Foil reversing ensures maximum use of tapes. The capstan is direct drive, with dual speed hysteresis synchronous motor. A front panel level control is screwdriver adjustable. Amplifiers are plug in; there is easy access to all the transport construction.

### MA-SERIES MONITOR AMPLIFIERS



Either the Sparta MA25 (mono) or MAS50 (stereo) amplifiers have the power to drive monitor speakers at studio listening levels. The design is solid state, with easy removal of the single PC board for inspection. The power supply design is such that instantaneous program peaks will be faithfully reproduced.

Both the MA25 and MAS50 can be fitted with accessory cue amplifiers (specify MA25Q or MAS50Q), and muting/relay accessory SM3.



### MIC6 MICROPHONE

The Sparta MIC6 is one of the industry's most popular professional quality microphones of all-around performance. Has built-in pop and breath blast filter. The MIC6 complete includes microphone, all connecting cable, and 'gooseneck' mount for most secure and trouble free studio installation.

### SP30 AND SP40 SPEAKER SYSTEMS

These solid hardwood, oiled-walnut finish enclosures are of matching design. They not only complement Sparta 'Showcase' studio groups, but are handsome as they are functional for nearly any studio decor.

The SP30 is a 3-way system of 10" cone woofer, 5" cone mid-range, and 4" "Super Dome" tweeter with frequency dispersion of 160°. Two controls inside the removable cloth grille adjust both mid- and high-range frequencies separately from -6 dB to +2 dB. The crossover network is a 12 dB/octave arrangement.

The SP40 is a 4-way system of 15" woofer, 6.5" dome mid-range, the 4" "Super Dome" tweeter, and 3" cone tweeter. Crossover systems are of both 6 dB/ and 12 dB/octave, with low magnetic resistance and ferrite core. It, too, employs separate tone controls to adjust to the acoustics of a given room. The SP40 reproduces profound bass fundamentals with great fidelity.

### IN ADDITION....

Besides the products described in this brochure, Sparta offers:

**MICROPHONES:** selected models from Shure, EV, Sony, and other established makers including VEGA  
**WIRELESS MICROPHONES.**



Either the Sparta MA25 (mono) or MAS50 (stereo) amplifiers have the power to drive monitor speakers at studio listening levels. The design is solid state, with easy removal of the single PC board for inspection. The power supply design is such that instantaneous program peaks will be faithfully reproduced.

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The SP40 is a 4-way system of 15" woofer, 6.5" dome mid-range, the 4" "Super Dome" tweeter, and 3" cone tweeter. Crossover systems are of both 6 dB/ and 12 dB/octave, with low magnetic resistance and ferrite core. It, too, employs separate tone controls to adjust to the acoustics of a given room. The SP40 reproduces profound bass fundamentals with great fidelity.

### IN ADDITION....

Besides the products described in this brochure, Sparta offers:

**MICROPHONES:** selected models from Shure, EV, Sony, and other established makers including VEGA  
**WIRELESS MICROPHONES.**

**SPEAKERS:** The Argos 'Slim Line' and other monitor models.

**MICROPHONE ACCESSORIES:** Desk and floor stands by Flexo, Shure, EV and others.

**REEL/REEL:** Selection includes recorders and reproducers by Ampex, Crown, Revox, Scully, Metrotech, Otari, and others. Virtually any choice of the broadcaster in reel/reel makers and configurations can be supplied by Sparta.

## Specifications: Corinthian Tape Deck

**HEAD CONFIGURATIONS:** Monaural; half- and full-track. Stereo; half- and quarter-track.

**TAPE SPEED:** 3.75 and 7.5 IPS.

**REEL SIZE:** up to 16".

**REEL HUBS:** NAB and EIA standards.

**STARTING TIME:** 1/10 second.

**REWIND TIME:** 120 seconds for 4800' reel.

**PLAYING TIME:** 14" reel of 1.0 mil tape at 7.5 IPS; 6 hours.

**WOW/FLUTTER:** .13% RMS at 7.5 IPS.

**TIMING ACCURACY:** 99.8%

**SIZE:** Transport; 19"W x 5.75"D x 24.5"H (485 x 145 x 620 mm). Electronics; 19"W x 7.75"D x 3.5"H (485 x 197 x 89 mm).

**SHIPPING:** (Deck and Electronics packed separately) 100 pounds (45 kilos).

## Specifications: MA25 Monitor Amplifier

**POWER OUTPUT:** 25 Watts RMS continuous into 8 ohm load.

**FREQUENCY RESPONSE:** +1 dB 20-30,000 Hz.

**DISTORTION:** Less than 0.5% THD at 25 Watts.

**HUM AND NOISE:** 80 dB below rated output.

**INPUT IMPEDANCE:** 25K ohms.

**LOAD IMPEDANCE:** 8 ohms.

**INPUT:** Less than 1 Volt RMS for rated output.

**CONTOUR:** Switchable; +12 dB at 50 Hz.

**CONTROLS:** Rear panel; contour gain. Front panel; power, pilot light.

**POWER:** 117 VAC 50/60 Hz (230 VAC optional).

**SIZE:** 19"W x 9"D x 3.5"H (485 x 230 x 89 mm).

**SHIPPING:** MA25; 8 1/2 pounds (3.83 kilos). Cue Amplifier; add 1/2 pound (.23 kilo). SM3 Muting & Relay; add 7/8 pound (.39 kilo).

## Specifications: MAS50 Monitor Amplifier

**CHANNEL SEPARATION:** 40 dB.

**CONTROLS:** Rear panel; contour gain, ganged for stereo, plus balance control.

**SHIPPING:** MAS50; 9 1/5 pounds (4.15 kilos).

All other specifications, dimensions and requirements of the MAS50 are identical to the MA25, above.

## Specifications: SM3 Muting and Relay

**MOUNTING:** Outside of monitor amplifier chassis, behind rack-mount face panel (refer to photo).

## Specifications: Cue Amplifier

**MOUNTING:** Within monitor amplifier chassis.

**POWER OUTPUT:** 0.5 Watt.

## Specifications: MIC6

**RESPONSE:** 80-13,000 Hz.

**IMPEDANCE:** 150 ohms.

**OUTPUT LEVEL:** -55 dB

## Specifications: SP30 Speaker System

**CROSSOVER FREQUENCIES:** 600 and 1,500 Hz.

**IMPEDANCE:** 8 ohms.

**FREQUENCY RESPONSE:** 27-22,000 Hz.

**POWER HANDLING:** 70 Watts peak.

**SIZE:** 13"W x 11 1/2"D x 22 1/2"H (330 x 290 x 570 mm).

**SHIPPING:** 33 pounds (15.0 kilos).

## Specifications: SP40 Speaker System

**CROSSOVER FREQUENCIES:** 500, 2,000 and 10,000 Hz.

**IMPEDANCE:** 8 ohms.

**FREQUENCY RESPONSE:** 22-22,000 Hz.

**POWER HANDLING:** 120 Watts peak.

**SIZE:** 17 1/2"W x 11 1/2"D x 26 1/2"H (440 x 290 x 670 mm).

**SHIPPING:** 43 pounds (19.5 kilos).



## Specifications: SP40 Speaker System

**CROSSOVER FREQUENCIES:** 500, 2,000 and 10,000 Hz.

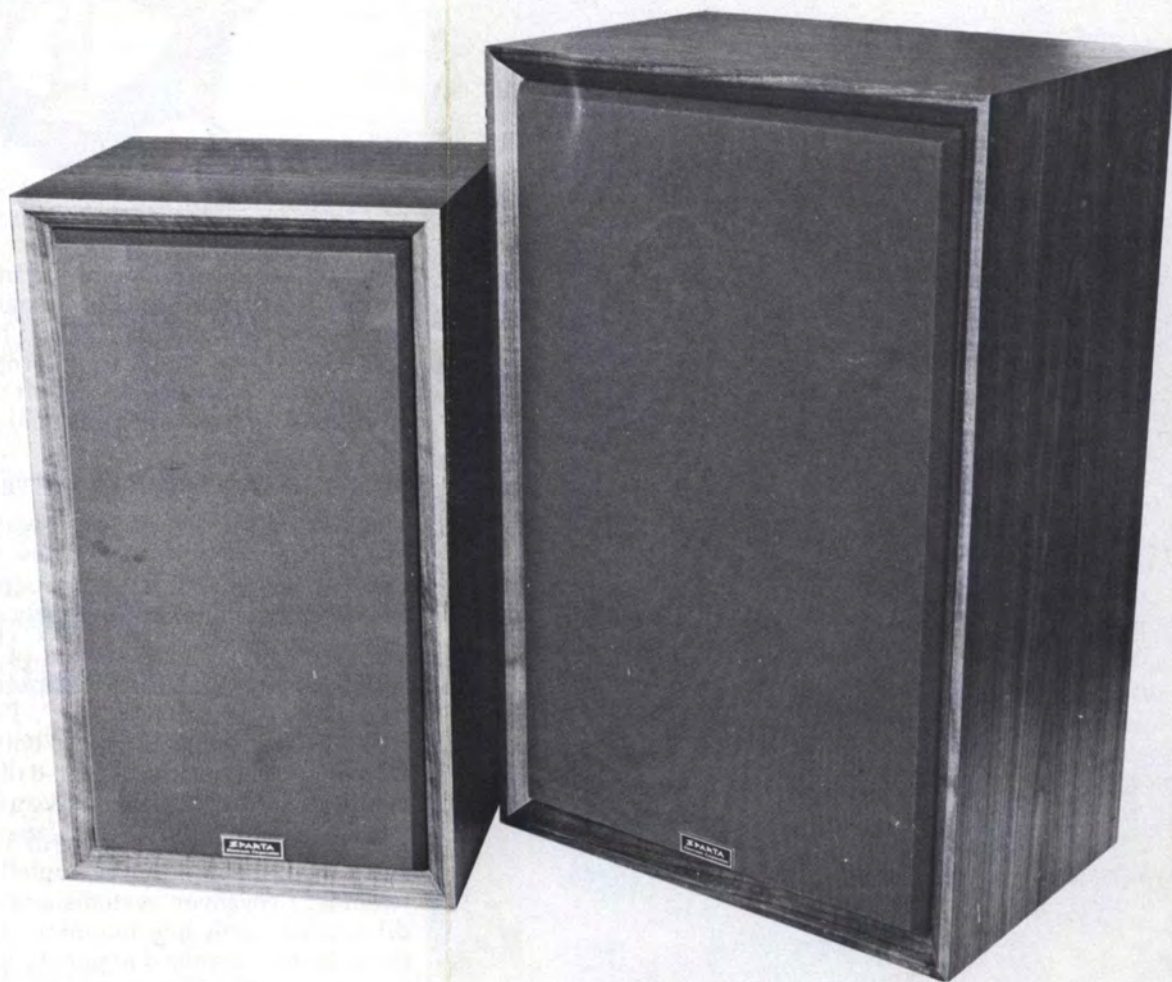
**IMPEDANCE:** 8 ohms.

**FREQUENCY RESPONSE:** 22-22,000 Hz.

**POWER HANDLING:** 120 Watts peak.

**SIZE:** 17 1/2"W x 11 1/2"D x 26 1/2"H (440 x 290 x 670 mm).

**SHIPPING:** 43 pounds (19.5 kilos).



## Corinthian and Audio Accessories

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**Cetec Broadcast Group**

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**Audio  
Studio/ Remote  
Systems**

Sparta 'Showcase' control room cabinetry gives any station a custom look without custom cost. The designs — whether for 1000-Series, 3000-Series or Centurion Series consoles — have been carefully arrived at to provide the best in beauty, durability, and utility.

The Studio/Remote Audio Control Centers enjoy every design advantage of the 'Showcase' groups, with the added feature of portability to virtually any remote location. The same fine materials are selected, the same rock-steady stance for turntable level is provided as in the 'Showcase' series, assuring the user of studio quality even on remote locations.

Basic material is carefully protected with heavy laminated plastic, in woodgrain and a light decorator offsetting color chosen to enhance the appearance of both your studio and the Sparta audio equipment provided with the cabinetry. Finish of the laminated plastic work surfaces is 'velvet', which resists everyday usage marks to a surprising extent. Attention to detail by the Sparta cabinet shop is the equal of furniture-grade workmanship anywhere in the nation.

#### SHOWCASE SERIES I

Designed around the famous 1000-Series 8-mixer Sparta 'work-horse' consoles, this furniture style graces perhaps more U.S. studios than any other ready-made equipment.

The Series I furnishings are also available with the Models 3310 (mono) or 3410 (stereo) 10-mixer state-of-the-art audio consoles. The Models 3310 and 3410 also suit Series II Showcase furnishings.

Showcase Series I components are available individually, as well as in groups with equipment installed. Such items as the single or dual turntable cabinets, tape cartridge racks, and utility cabinets have proven useful and handsome in many studio settings without other Sparta-made furniture.

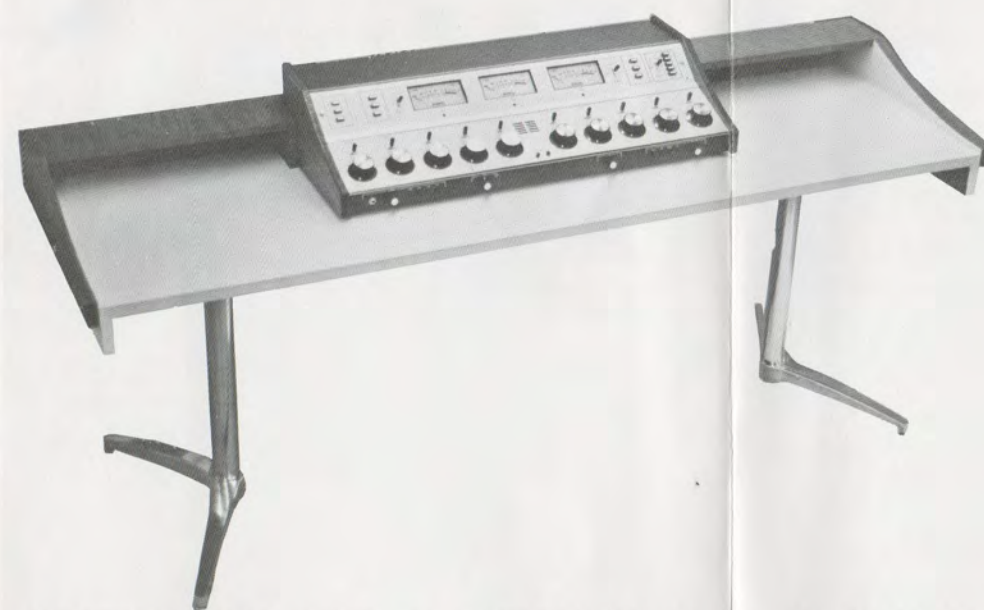
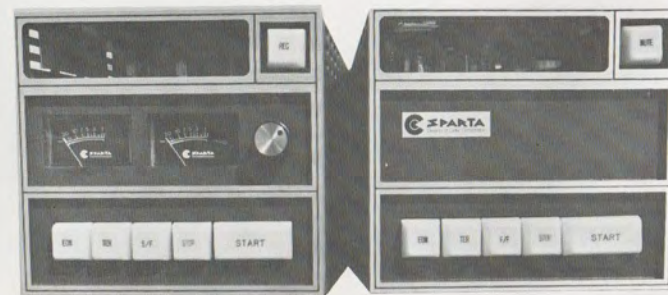
#### SHOWCASE SERIES II

This beautifully finished design sets off either the Centurion I (mono) or Centurion II (stereo) master control room console types, or the 3000-Series 10-mixer consoles as mentioned above.

A variation of the pictured Series II substitutes a small support pedestal where the turntable cabinet is not used. The tape cartridge storage hutch contains 128 NAB 'A' carts; the Series I hutch stores 96.



**ABOVE:** Showcase Series I with 1000-Series console, Century Series tape cartridge equipment. **RIGHT:** Showcase Series II with Centurion Console. Either Showcase Series is available with 3000-Series console. **BELOW:** Century II tape cartridge equipment is the newest, state-of-the-art Sparta design. Direct capstan drive, air-damped solenoid, rigid casting/machining deck construction, built-in splice finder and fast wind option are a few of its many features.



**ABOVE:** 3000-Series console on customized desk to suit Series I Showcase. **UPPER RIGHT:** AC155 (mono) Studio/Remote Audio Control Center for handsome portability, top dollar value.



**RIGHT CENTER:** Optional Bench-Lid protects AC155 and ASC305 during transit, provides seat on location. **LOWER RIGHT:** ASC305B stereo unit. **COVER:** the Utility Shelf with Century Series tape cart equipment. Accommodates reel/reel or other equipment.



## STUDIO/REMOTE AUDIO CONTROL CENTERS

The AC155 (mono) and ASC305 (stereo) units are at this writing unique in the broadcast industry; no other such sturdy, handsome, and flexible units are available to the broadcaster or disco-DJ for portability where showmanship is vital! Fully protected by the bench-lid combination, and with the utility shelf to provide working space for any assignment, the systems have proven so popular that even other equipment manufacturers frequently buy them from Sparta!

### SPECIFICATIONS and ORDERING INFORMATION SHOWCASE SERIES I

**FLOORPLAN DIMENSIONS:** 83"W x 65"D x 51"H (height; cart hutch on utility cabinet) (211 x 165 x 130 cm).

### SHIPPING INFORMATION

**MODEL 1020 CONSOLE:** 37 lbs (16.8 kg), 4.1 cu ft (.12 cu meter).

**MODEL 1040 CONSOLE:** 35 lbs (16 kg), 4.1 cu ft.

**CONSOLE DESK:** 75 lbs (34 kg), 16.1 cu ft (.46 cu meter).

**CONSOLE HOOD WITH SPEAKER (FITS 1020 or 1040):** 15 lbs (6.8 kg), 4.2 cu ft (.12 cu meter).

**DUAL TURNTABLE CABINET:** 120 lbs (54.4 kg), 11.5 cu ft (.33 cu meter).

**SINGLE TURNTABLE CABINET:** 70 lbs (31.75 kg), 7.1 cu ft (.2 cu meter).

**TAPE CARTRIDGE STORAGE HUTCH:** 60 lbs (27.2 kg), 11.5 cu ft (.33 cu meter).

**UTILITY CABINET:** 168 lbs (76.2 kg), 11.5 cu ft.

### EITHER SHOWCASE SERIES: COMPONENTS AND ACCESSORIES

### SHIPPING INFORMATION

**MODEL 3310 CONSOLE:** 74 lbs (33.6 kg), 6.5 cu ft (.18 cu meter).

**MODEL 3410 CONSOLE:** 76 lbs (34.5 kg), 6.5 cu ft.

**CENTURY SERIES TAPE CARTRIDGE RECORD/PLAYBACK SYSTEM:** 38 lbs (17.24 kg), 2.25 cu ft (.06 cu meter).

**CENTURY SERIES PLAYBACK MODULE:** 21 lbs (9.5 kg), 1.5 cu ft (.04 cu meter).

**CENTURY II TAPE CARTRIDGE RECORD/PLAYBACK OR PLAYBACK UNIT:** 24 lbs (10.8 kg), 1.5 cu ft.

**GT12 TURNTABLE (WHEN SHIPPED BOXED, SEPARATE FROM CABINET):** 24 lbs (10.8 kg), 2.4 cu ft (.07 cu meter).

**CR100 ACCESSORY WALL-MOUNT CART RACK:** 30 lbs (13.6 kg), 2.4 cu ft.

**CR120 ACCESSORY LAZY SUSAN CART RACK:** 37 lbs (16.8 kg), 3 cu ft (.085 cu meter).

### SHOWCASE SERIES II

**FLOORPLAN DIMENSIONS:** 93"W x 67"D x 56"H (height; cart hutch on utility cabinet) (236 x 170 x 142 cm).

### SHIPPING INFORMATION

**CONSOLE DESK:** 48 lbs (21.8 kg), 2.9 cu ft (.08 cu meter).

**LARGE MODESTY PANEL: (WITH COMPLETE SHOWCASE)** 9 lbs (4.1 kg), 1 cu ft (105.4 cu cm).

**SMALL MODESTY PANEL: (SHOWCASE WITHOUT TURNTABLE CABINET)** 8 lbs (3.6 kg), 1 cu ft.

**DESK SUPPORT PEDESTAL:** 63 lbs (28.6 kg), 9 cu ft (.25 cu meter).

**CONSOLE DESK OPTIONAL SUPPORT PEDESTAL: (SHOWCASE WITHOUT TURNTABLE CABINET)** 40 lbs (18.1 kg), 2 cu ft (.06 cu meter).

**COMPLETE CONSOLE DESK WITH BOTH SUPPORT PEDESTALS AND SMALL MODESTY PANEL:** 159 lbs (72.1 kg), 26 cu ft (.74 cu meter).

**UTILITY CABINET:** 151 lbs (68.5 kg), 15.4 cu ft (.44 cu meter).

**TAPE CARTRIDGE HUTCH (HOLDS 128 NAB "a" CARTS):** 60 lbs (27.2 kg), 4.3 cu ft (.12 cu meter).

**DUAL TURNTABLE CABINET WITH TURNTABLES AND PREAMPS:** 306 lbs (138.8 kg), 20 cu ft (.82 cu meter).

**CENTURION I CONSOLE (WITH STANDARD 8 MIXERS):** 90 lbs (40.8 kg), 15.9 cu ft (.76 cu meter).

**CENTURION II CONSOLE (WITH STANDARD 8 MIXERS):** 92 lbs (41.7 kg), 15.9 cu ft.

**CENTURION POWER SUPPLY:** 32 lbs (14.5 kg), 1.1 cu ft (18 cu cm).

**CENTURION EXTENDER PANEL:** 70.5 lbs (32 kg), 15.9 cu ft.

Showcase Series II cabinetry with equipment is, unlike Series I, shipped by padded van except for the securely boxed console the user has chosen. Shipment weight and cubic space can vary according to the choices of the user. Console shipping data should be added to above.

### STUDIO/REMOTE AUDIO CONTROL CENTERS

**FLOORPLAN DIMENSIONS (AC155 and ASC305 identical):** 54"W x 26"D x 34"H (41"H with Utility Shelf) (depth is 19" without folding work surface extended) (137 x 66[or 48] x 86 [or 104] cm).

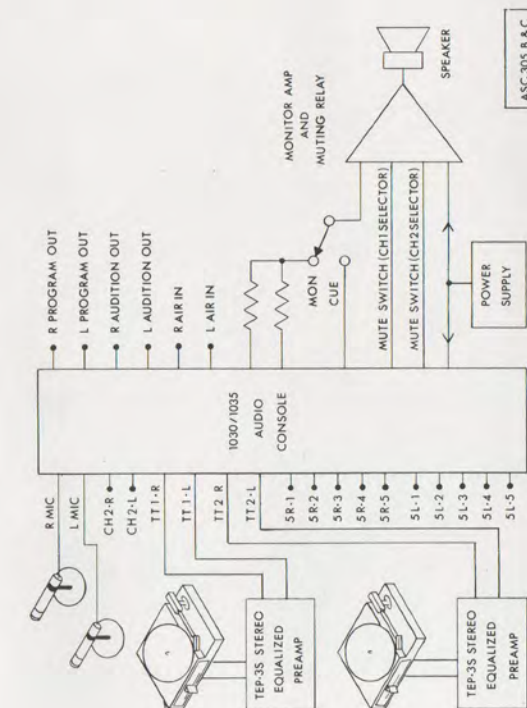
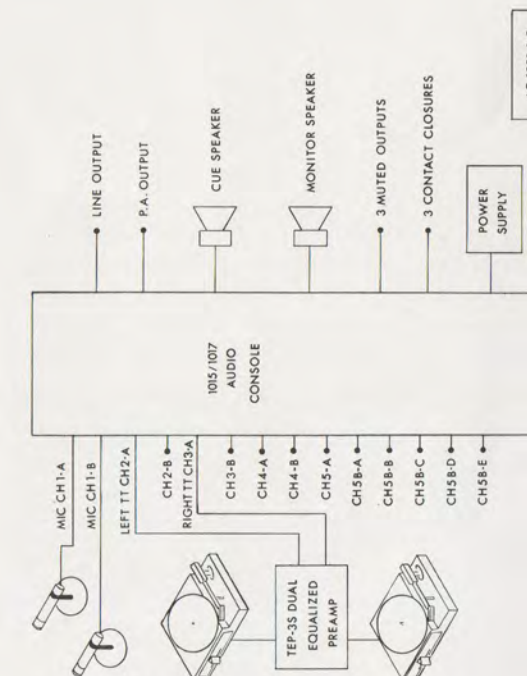
### SHIPPING INFORMATION

**AC155B or C:** 170 lbs (77 kg), 17.7 cu ft (.5 cu meter).

**ASC305B or C:** 175 lbs (79.4 kg), 17.7 cu ft.

**BENCH-LID:** 70 lbs (31.7 kg), 17.7 cu ft.

**UTILITY SHELF:** 70 lbs, 17.7 cu ft.





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