

# Cetec Sparta Audio Equipment/1



**EQUALIZE**

PROG  
AUD  
UTIL

**FILTER**

HI  
LO

3KHz 5KHz

**PRESENCE**

+3 0db +12

**TREBLE**  
15KHz

-3 0db +3  
-6 +6  
-9 +9  
-12 +12  
-15 +15

**BASS**  
50Hz

-3 0db +3  
-6 +6  
-9 +9  
-12 +12  
-15 +15

**INPUT**

A  
B  
C

**SEND**

PROG  
AUD  
UTILITY

OFF ON

**CUE**

**INPUT**

A  
B  
C

**SEND**

PROG  
AUD  
UTILITY

OFF ON

100 100  
80 80  
60 60  
40 40  
20 20  
0 0

**CUE**

Front cover: **Centurion Series Consoles** mixer modules (center and right); user chooses either slide or rotary precision step attenuators. The two are electronically identical, cost the same. At left is the **Equalizer** optional module; see text for operation.

For general sales information and the location of the CBG district manager in your area of the US, call Cetec Broadcast Group. The Divisions can be contacted directly for technical assistance and other information:

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**CETEC SPARTA**, Sacramento, CA (916) 383-5353

**CETEC SCHAFER**, Goleta, CA (805) 968-0755

**The Centurion Console Concept.** Underlying this entire series design was Cetec Sparta's desire to create an up-to-the-minute, uncomplicated, perfectly quiet and very flexible console usable by 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 motherboard construction and space age ground plane PC techniques, and additionally assures against crosstalk. 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 a station planning to expand 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 has set new standards for the industry . . . the Cetec Sparta Centurion Series.

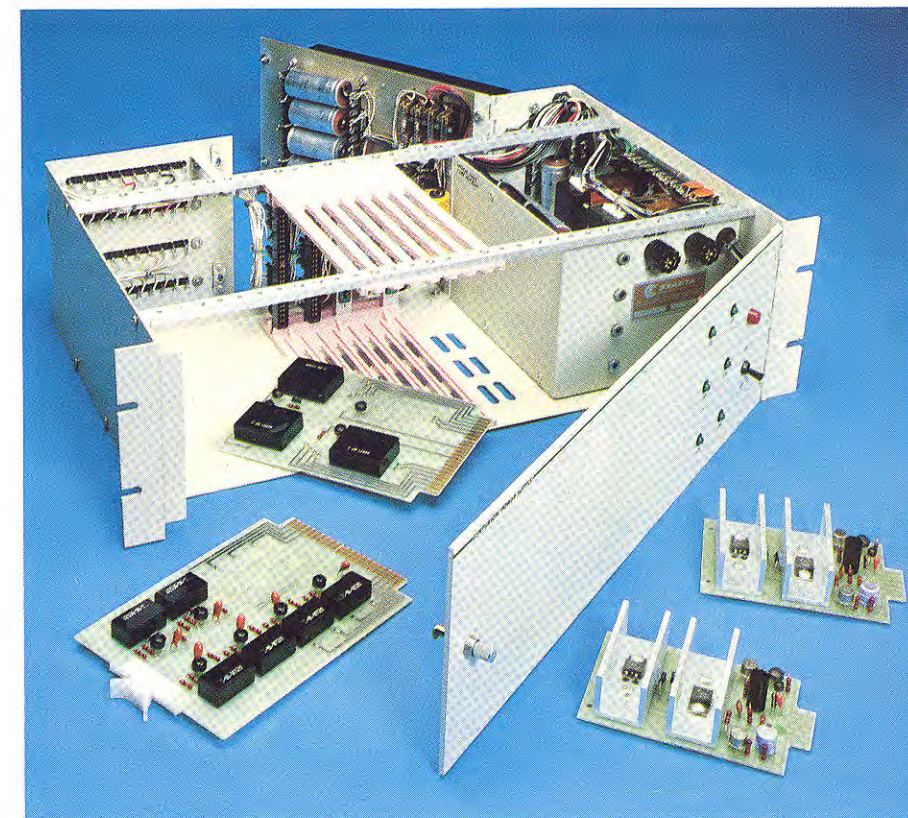


Top: **Centurion II** stereo console  
Left: **Centurion III** monaural console





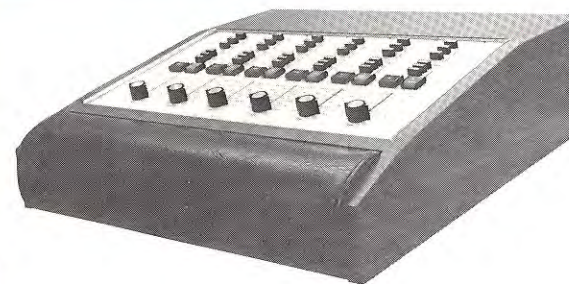
Above: **Centurion I** monaural console  
 Far Right: **Centurion Series power supply**, common to all models  
 Lower Right: **Extender Panel**, mono or stereo versions are optional with either Centurion I or II only



**The Centurion Power Supply.** The power supply, common to the entire Centurion Series line, uses 3-terminal regulators, is short circuit-proof, and has thermal overload protection among other 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 equipment. Six LED status indicators monitor the condition of all power circuits.

**Functions; Extender Panels.** Connection of the EP to the Centurion I or 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 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.

**Centurion Digital Clock.** Bright, solid bar type LED readouts show the exact time in hours, minutes and whole seconds. The extremely accurate and functional clock is readable under any light conditions. The red numbers stand out starkly against the black clock face, mounted in a bezel matching the Centurion meters. Front panel controls provide convenient, full setting of exact time.



**The Centurion Series Console Line.** Physically the consoles consist of a lower bay of mixer modules and motherboard, and an upper control systems bay. 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.

**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 mono program busses. Options: one or two 6-mixer Extender Panels, Digital Clock, Slide or Rotary Precision Step Attenuators, Utility Stereo VU Meters, 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 mono program busses. Options: Slide or Rotary Precision Step Attenuators, Peak Program Meters.

**Extender Panels.** Six mixers each. One or two mono can be added to Centurion I. One or two stereo can be added to Centurion II. Total inputs with 12-mixer 'parent' console and two Extender Panels becomes 72 inputs with 24 mixers electronically identical. Options: Slide or Rotary Precision Step Attenuators.

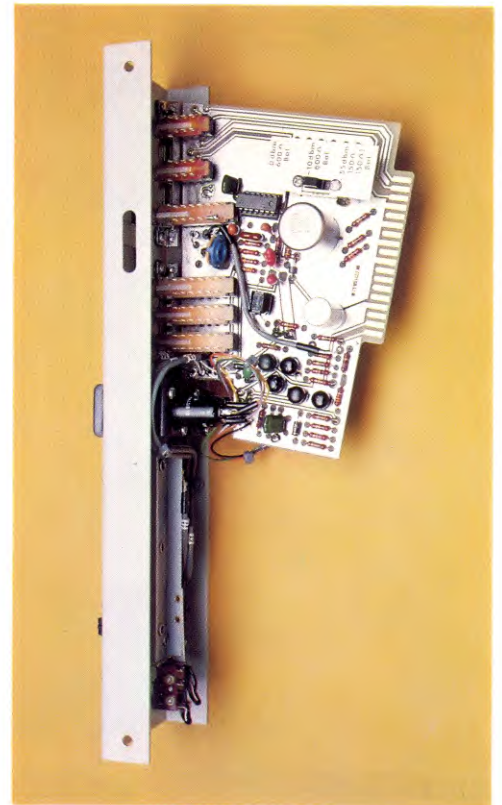
**Features; Centurion I and II.** Mono mixer modules are identical and interchangeable. The same plug-in electronics are used in Centurion I, mono Extender Panels, and Centurion III. Stereo mixer modules and plug-in electronics are also common to Centurion II, stereo Extender Panels, and Centurion IV. All 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 four types of amplifiers are used. Perfectly noiseless optically isolated audio switching has been provided, with illuminated on/off pushbuttons. The switching techniques used allow any mixer module 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, and 'on air' light contacts, are 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 console is used.

The Centurion I has three mixing busses; Program, Audition and Utility. Monitoring functions consist of an internal Cue speaker, headset amplifier for low impedance 'phones, and 25 Watt monitor amplifier. A 5 Watt intercom amplifier is unique to the Centurion I.

The Centurion II has four mixing busses; Program, Audition, Utility and Monaural. Monitor Amplifier is 25 Watts per channel RMS. Other features are the same as Centurion I.

The standard versions of Centurion I and II have eight mixer modules; spaces for the other four optional modules are normally filled with module-size blank panels. 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 all mixer modules, and are identical in price and electronic functions. The upper bay electronic housing contains all high level amplifiers and level indicators.

**Centurion mono mixer module:** identical in Centurion I, III, and mono Extender Panel



**Functions; Centurion I.** 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 upper bay; Phones and Monitor are each pushbutton selected from any of five sources. Cue has gain control only. Beside each VU (or PPM) 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 bay. 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.

**Functions; Centurion II.** 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. 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 upper bay can be used for any in/out function; there are five of them. Other functions not listed are identical to Centurion I above.

**Functions; Centurion III.** The 6-mixer mono Centurion III is electronically identical with Centurion I and the mono Extender Panel. It differs mainly in that its design is for less demanding requirements of the production room or smaller station. The Audition Out pushbutton selection allows feeding audio to three locations. It is a full three-channel board; Program, Audition and Utility are identical busses as in Centurion I.

**Functions; Centurion IV.** 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 carts 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 carts 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 controls are the same as the Centurion II.

Centurion IV



**Peak Program Meters.** The PPM began as a British Broadcasting Corporation specification, and its advantages in ease of reading has led to adoption by increasing numbers of US stations. The PPM offers these advantages as compared to the VU meter; faster attack and slower decay time to ease reading and lessen eye strain . . . white printed scale on a black background for the same reasons . . . a minimum of gradation, evenly spaced, for ease and accuracy in reading. The moving-coil meter is faster than normal movements, requires damping to avoid overindications, and is thus a more expensive and precise instrument.

**Functions; Mixer Modules.** Mixers are completely interchangeable within the same console series and its Extender Panel option. Each module plugs vertically down into the motherboard receptacle, fitted exactly by rigid slotted frame member guides front and back. The console must be opened to change a mixer module, or accommodate the Module Extender Card. Slide or Rotary Precision Step Attenuators are optional with any Centurion Series unit, are identical in price and in electronic function.

There are four controls common to each module: **(1) Input:** Three pushbutton selectors designated A, B, and C. This control group selects from three sources, determined by station requirements; the sources can be microphone or equipment level inputs, with the input selector switch on each module's PC board changed to accommodate the input. The levels selectable are  $-55$ ,  $-10$  and  $0$  dBm. **(2) Send:** Three pushbutton selectors, Prog(ram), Aud(ition), and Util(ity), assign that mixer output to the mixing buss so designated. Stereo Centurions also have a Mono mixing buss which is selected on the upper bay set of output selection buttons; the Mono feed is not controllable directly by the mixer module. **(3) Off/On:** The red and green pushbuttons are self-illuminated, providing 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. If the Form A contact is to be maintained, the output must be strapped. 'Off' stops any and all activity in the console relating to the mixer. Any mixer module may be turned on or off from an external source which provides Form C contact, or separate on/off buttons. This feature has proven of particular interest in TV applications, allowing audio-follow-video remote start operation. Studio announcers or newsmen may also have their own remote on/off microphone switches. **(4) Attenuator:** Either slide or rotary attenuators chosen alter the mixer module output in conventional fashion.

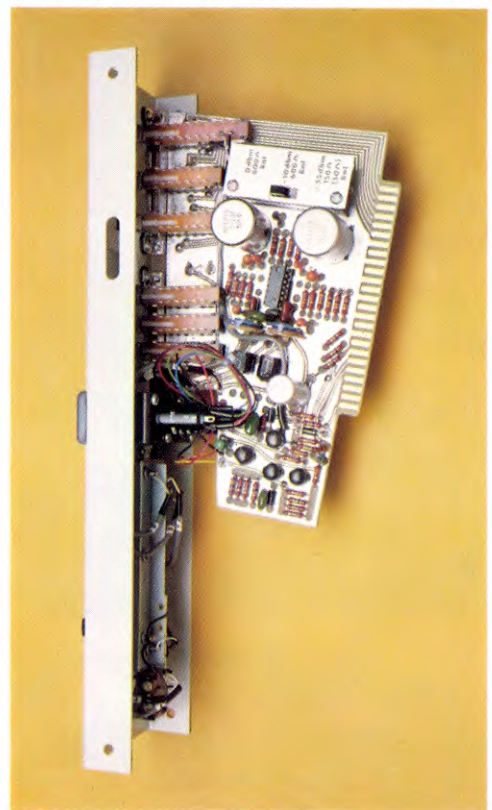
**Functions; Equalization Module.** This module replaces the trim strip at the right hand of any Centurion mixer array. It equalizes the output of selected mixers feeding that particular mixing buss, selected by pushbuttons on the module itself. It is a 'positive action' device; one buss must be selected 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;** Prog(ram), Aud(ition), or Util(ity) pushbuttons select which buss is to be equalized. **(2) Filter:** 'Hi' or 'Lo' cutoff pushbutton selection. **(3) Presence:** a boost control attenuator calibrated from  $0$  to  $+12$  dB for the two mid-range frequencies ( $3$  kHz and  $5$  kHz) most useful for voice enhancement. **(4) Treble Control;** ( $15$  kHz) either boosts or cuts treble, controllable from  $-15$  through  $0$  to  $+15$  dB. **(5) Bass Control;** ( $50$  Hz) either boosts or cuts bass in the same range as Treble Control. **Selective Equalization.** Accomplished by (A) assigning certain mixer output(s) to Utility, (B) equalizing Utility buss as desired, and (C) bringing the equalized Utility output into a mixer (which acts as a submaster if more than one mixer output has been equalized in step A) and assigning its output to Program. Audition, since all busses are identical, could be used instead of Utility.

**Reverberation Units.** A variety of controllable spring delay line reverb systems will work well with the Centurion consoles. In use, 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.

**Module Extender Card.** With the console in otherwise normal use, the Extender places a selected mixer more than four inches above its usual position. The mixer module electronics are fully exposed while it is functionally connected to the console.

**Centurion stereo mixer module:** identical in Centurion II, IV, and stereo Extender Panel



**The Model 3310 mono and 3410 stereo** 10-mixer consoles bridge the gap between the 1000-Series and Centurion Series lines in terms of price, capacity, performance and features.

These are full dual channel consoles 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, with switch-metering used on the stereo 3410.

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. There is a built-in monitor amplifier.

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.

Maintenance access 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.

Finish is tough polyurethane enamel, with woodgrain finish end caps. The VU meters are rear-illuminated, and meters and control knobs are oversize for operator convenience.

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

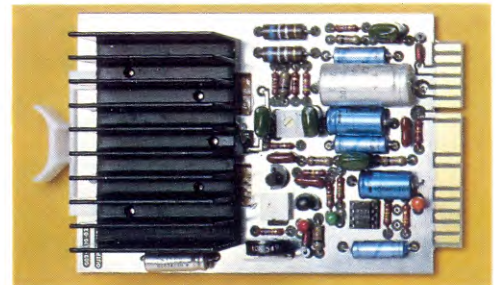
**Model 3310** monaural console



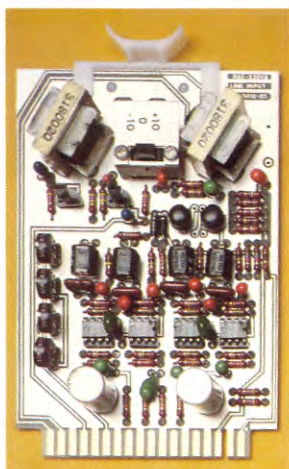
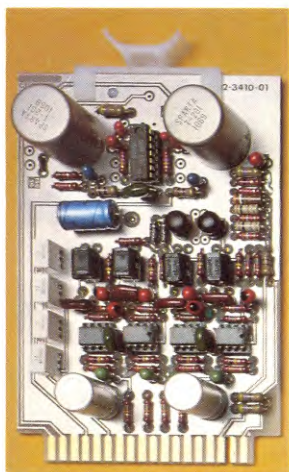
**Model 3410** stereo line out amplifier board

**Model 3310 Features.** 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 tape cart playbacks without interaction. Microphone preamps and line level input cards are interchangeable; the latter have three-position switches for -10, 0, and +10dBm sensitivity as required.

**Model 3410 Features.** 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. The 3410 five-source bridging input is at mixer 9. 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, and switch-selectable for sensitivity as in the 3310.







Above: **Model 3410** stereo console  
 Upper Left: **Model 3410** microphone input board  
 Lower Left: **Model 3410** line level input 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  $\pm 1$  dB 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 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; 79 pounds (36 kilos).

### Model 3410

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

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

**Shipping:** Console and Power Supply; 89 pounds (40.5 kilos). All other specifications identical with Model 3310.

## 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 -123 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; see below.

**Shipping:** Console; 90 pounds (40.8 kilos) packed in 19.5 cubic foot (0.55 cubic meter) container. Power Supply/etc.; see below.

### 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; same as Centurion I. Power Supply/etc; see below.

**Shipping:** Console; 92 lbs (41.7 kilos) packed in 19.5 cubic foot (0.55 cubic meter) container. Power Supply/etc; see below.

### Centurion III

**Mixers:** Six.

**Inputs:** Eighteen.

**Output Levels:** Same as Centurion I except no talkback.

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

**Size:** Console; 23"W x 24"D x 14.25"H (580 x 612 x 366 mm).

Power Supply/Muting/Monitor Amplifier; see below.

**Shipping:** Console; 77 lbs (35 kilos) packed in 12.8 cubic foot (0.362 cubic meter) container. Power Supply/etc.; see below.

All other specifications identical with Centurion I.

### Centurion IV

**Mixers:** Six.

**Inputs:** Eighteen.

**Output Levels:** Same as Centurion II except no internal speaker.

**Output Level:** (Utility) -10 dBm unbalanced.

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

**Size:** Same as Centurion III. Power Supply; see below.

**Shipping:** Console; 76.7 lbs (35 kilos) packed in 12.8 cubic foot (0.362 cubic meter) container. Power Supply/etc; see below.

All other specifications identical with Centurion II.

### Extender Panels

**Mixers:** Six.

**Inputs:** Eighteen.

**Output Lines:** Program, Audition, Utility.

**Size:** Console; 23"W x 23.5"D x 6.875"H (580 x 600 x 184 mm). No separate Power Supply/etc.

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

Electronic specifications of the Stereo Extender Panel are identical with the Centurion II.

Electronic specifications of the Mono Extender Panel are identical with the Centurion I.

### Power Supply/Muting/Monitor Amplifier

**Size:** 5.25"H (133.35 mm) rack mount. Rack Mount is 19" (433 mm) American standard.

**Shipping:** 32 lbs (14.5 kilos) packed in 1.75 cubic foot (0.064 cubic meter) container.

The same Power Supply is shipped with Centurion models I, II, III or IV.



## Cetec Broadcast Group

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