

Yamaha STAGEPAS 500

Compact Portable PA System

By: Alan Hardiman

Yamaha's STAGEPAS 500 is a low-cost, compact portable PA system consisting of a ten-input mixer with integrated power amplifier and two high-impact molded loudspeaker cabinets for two-channel stereo operation. Each cabinet sports a storage cavity accessible from the rear. The mixer/amplifier is designed to fit securely in one cabinet, while the second offers storage for a microphone and the supplied AC power cable and two 5m speaker cables. All input and output connectors are mounted on the face of the mixer along with the controls, so the mixer does not have to be removed from storage in the loudspeaker cabinet for normal operation. As options, Yamaha offers rolling carrying cases for transporting the system, and a microphone stand adapter to mount the mixer conveniently for operation right from the stage.

The system is clearly designed for easy transport, setup, and stressless operation by one fairly non-technical person. I say stressless because, as some psychologists say, we are most stressed when forced to make decisions, and, since the Stagepas 500 removes virtually every operational decision customarily faced by someone running a sound system, few decisions equates with very little stress. This will become clear as we take a tour of the components.

Examining the System

The mixer features four mono and three stereo channels, for a total of ten input channels. The four mono channels are switchable mic/line. Line inputs are balanced ¼" phone jacks. Microphone inputs are balanced XLR-type, with phantom power for condenser microphones switchable to the four mono channels globally—there are no individual channel phantom power switches. Phantom power is +15V, within the range of +12 to +48V required by most condenser microphones, but perhaps too low for some B&K and Neumann models. In any event, buyers of this system are unlikely to be using expensive studio instruments.

The microphone preamps provide some 50dB of gain to accommodate just about any microphone on the market, but there are no input gain or trim controls. The mic/line switch introduces a gain reduction of 30dB to reduce both excessively high signals coming from the microphone and normal line level signals.

The first two channels feature dynamics control in the form of a single switch on each channel, which allows the operator to select either compression or peak limiting. With the switch in the "off" position (not illuminated), the infinite ratio limiter is selected by default to reduce excessively loud signals and prevent



overload. The compressor works a bit differently, by reducing louder parts of the signal while raising the level of lower signals, and this makes the signal more consistently loud, or, in some cases, punchier. Compressor attack, decay, and ratio values are a good compromise between the requirements for voice and those for music. All four channels feature two-band low- and high-frequency shelving equalization (bass and treble), providing 15dB of boost or cut at 100Hz and 10kHz.

Each of the four mono channels also features a reverb on/off switch that activates the send to a built-in 24-bit digital reverb from that channel at nominal level. The reverb send level is not adjustable by the operator—it's either on or off—but the overall reverb return level to the mix is adjustable via a rotary control in the master section. The reverb itself has a only a single setting with fairly long decay time, which may limit its utility, especially in rooms that are already fairly live. The volume of each input in the master mix is set by a rotary level control at the bottom of each input channel.

Unlike most PA mixers, the Stagepas 500 has no pan pots to position the mono signals anywhere from left to right in the stereo mix, except for the default center image. Each of the four mono input signals appears at both left and right output channels at the same level and polarity, and thus sounds as if it's coming from between the loudspeakers. To listeners who are midway between the left and right loudspeakers, the mono sound will appear to be coming from a "phantom" point at center stage, as in a home stereo system. This is not necessarily a drawback, as many PA systems operators prefer to position mono signals in the center of the stereo image, anyway, so all listeners hear the same mix no matter where they are in the hall.

Three stereo inputs accept unbalanced stereo line level signals from CD players, keyboard synthesizers, samplers, MP3 players, computers, and the like. Each of the three channels is equipped with a different complement of connectors: The first channel offers ¼" phone jacks, the second has both ¼" phone jacks and RCA-type cinch connectors, and the third RCA-type cinch connectors only. The only commonly used consumer-grade audio connector that's not here is the 1/8" mini-phone plug, usually found on computer sound cards and portable audio players, but adapter cables are easy to find. The volume of each stereo input in the mix is set by a rotary level control at the bottom of each input channel, but there are no controls for reverb, input trim, or left-right balance. As with the mono channels, two-band low- and high-frequency shelving equalization controls provide 15dB of boost or cut at 100Hz and 10kHz.

I plugged a balanced microphone into the line inputs via a line-matching transformer of the type commonly available in electronics stores. (For the test, I used an inexpensive EV627B dynamic cardioid mic and EV502CP line matching transformer.) More than enough gain is available at the line inputs to put them into service as additional mic inputs, if necessary, a handy feature for those occasions when four mic inputs isn't quite enough.

The master section on the left side of the mixer features a master output level control and five-segment LED meter, along with a limiter indicator that flashes when the master level is too high and the built-in limiter is working to hard to protect the loudspeakers. A speech/music switch inserts a high-pass filter to roll off rumble and other low-frequency content below 80Hz. The switch is illuminated when actuated in the "music" position when there is no roll-off. There are a couple of musically useful octaves below 80Hz, but the supplied loudspeakers do not reproduce much below 55Hz. For guitar-based acts, this switch should be activated to keep the mix clean, because the filter eliminates stage rumble without affecting vocals or guitar, the lowest string on a guitar vibrating above the cutoff frequency at about 82Hz.

Also provided are a master reverb return level control and monitor send level control, which allows a line-level feed of the master mix to be output from a pair of ¼" phone jacks at the top of the master section and routed to a pair of self-powered monitor speakers, headphone amplifier, or other device. The master level control does not affect the level of the monitor mix. Plugging into only the left monitor output jack sums the left and right signals into a mono output.

A pair of RCA-type cinch connectors is also provided in parallel with the master output, but before the master output level control, for a line-level feed to a recording device such as a cassette recorder. A pair of ¼" speaker connectors rounds out the master section, to the left of which are the IEC AC-power connector and master on/off switch for the unit. There is no dedicated headphone output on the mixer.

Yamaha rates the Class D stereo power amplifier at 250W per channel into 4 ohms, hence the designation 500 in the system's moniker. At 250W per channel, however, the amplifier produces a whopping 10% harmonic distortion (THD) according to the company's specifications, so I doubt that the system is really intended to be run at this level. Yamaha rates the amplifier at a more conservative 200W per channel with 1% THD at 1kHz into

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the supplied loudspeakers. The difference between 250W and 200W is less than 1dB, so it seems to me that the 250W per channel rating (250 x 2 = 500) is in the spec only to justify the marketing label Stagepas 500.

The loudspeaker systems are two-way, with a 10"- low-frequency driver and 1" compression driver. Crossover frequency is 4kHz. Response is specified as 10dB down at 55Hz and 20kHz. Maximum output level is 116dB SPL measured at 1m, enough to justify Yamaha's log line for the system, "huge sound in a small package." The cabinet is molded with a convenient carrying handle at the rear top. On the bottom is a standard 35mm integral pole-socket, but mounting poles are not included as standard equipment. Yamaha strongly recommends that no other loudspeakers be used with the mixer/amplifier, due to the somewhat extreme digital signal processing (DSP) in the master output circuitry that compensates for the idiosyncrasies of the loudspeakers. Among other things, the DSP provides a healthy amount of low-frequency boost to compensate for the volume of the cabinet that has been lost to the storage cavity. This DSP may produce unpredictable and undesired results if used with a different loudspeaker.

In use, it takes less than five minutes to deploy, connect, and start the Stagepas 500. Laying out cable and setting up microphones and stands usually takes a bit longer. Users unaccustomed to this level of efficiency may think they have left something out or done something wrong. The manual comes on a single piece of paper folded in eight, much like the "getting-started" sheets packaged with computer systems. The instructions are in plain English, with only one or two typographical errors that don't bear on the system's operation.

I believe that the absence of many features and controls that usually appear on PA systems is in no way a drawback. Fewer controls translate directly into fewer chances to use the system improperly. For example, it is difficult, if not impossible, to mismatch gain stages in this system, which can typically occur when an input trim level control is turned way down and an attempt is made to restore the lost gain by turning up the channel output level control excessively. Such practices merely result in degrading the signal-to-noise ratio, and the design of the Stagepas 500 prevents that from happening. Furthermore, switchable limiters on two of the input channels and a

permanently integrated limiter in the master output section make it virtually impossible to overmodulate the system. The Stagepas 500 has been optimized by its designers to provide an audio operating level high enough above the noise floor, and sufficiently below overload level, to provide more than satisfactory operation by non-technical lay people. But anyone needing the range of control offered by a conventional mixer will buy something else.

Conclusions

Yamaha says that the Stagepas 500 is aimed at "schools, churches, corporate multimedia presentations, solo performers, keyboardists, and small musical ensembles." For these applications, the system seems well-designed. I would also add that, in this age of corporate downsizing and layoffs, it is also a good choice for solo entrepreneurs who are surviving the new economic reality by selling products or services in multi-level marketing organizations, and for those involved in lifestyle coaching, motivational seminars, and the like. In fact, anyone who needs a hassle-proof system to handle public meetings with a couple of stage mics, an audience mic or two, some background music before the meeting gets underway, and audio from a laptop for the main presentation, will find the Stagepas 500 to be an ideal tool, and one powerful enough to fill most mid-sized meeting rooms. The cost of the complete system is about the same as a few rentals of a hotel house sound system that may be more complex and difficult to operate. Buying the Stagepas 500 for this kind of application is a no-brainer.

It's about time that someone recognized that not all users of sound systems are audio enthusiasts or sound professionals. Hats off to Yamaha for this and having the guts to put a piece of gear out on the market that's designed primarily for ease of use, without marginalizing the average person by resembling the flight deck of a Boeing 747. The Stagepas 500 should be on the shelves of business and presentation supply stores, if only Yamaha could see a way into that distribution channel.

Incidentally, Yamaha also markets the Stagepas 300, a slightly smaller version, at a lower price point. I have owned a number of Yamaha products over the years and have found them to be almost invariably great value for the money. It looks like the Stagepas 500 is no exception. 📶

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