OLYMPIA
Olympic Theatre, 506 S. Washington.
2/9 Wurlitzer. Occasionally.

PULLMAN
Physical Sciences Bldg., Wash. St. U.
2/7 Robert Morton. Periodically.

SEATTLE
Haller Lake Improvement Club,
12579 Densmore.
3/8 Wurlitzer-Marr & Colton. Often.

Paramount Theatre, Ninth & Pine.
4/20 Wurlitzer. Occasionally.

Pizza & Pipes #1, 100 N. 85th.
3/17 Wurlitzer. Nightly.

Queen Anne High School, 215 Galer.
3/10 Kimball. Rarely.

TACOMA
Pizza & Pipes #2, 19th & Mildred.
3/17 Wurlitzer. Nightly.

Temple Theatre, 49th St. Helens.
2/9 Kimball. Occasionally.

VANCOUVER
Uncle Milt's Pizza Co.
3/18 Wurlitzer. Nightly.

WISCONSIN

BARABOO
Al Ringling Theatre.
3/9 Barton. Occasionally.

MADISON
Madison Civic Center.
3/14 Barton. Periodically.

MILWAUKEE
Organ Piper Pizza, 4353 S. 108th.
3/28 Moller. Nightly except Monday.

Pabst Theatre, 144 E. Wells.
4/20 Moller. Often.

Pipe Organ Pizza #1, 620 W. Oklahoma
4/16 Hybrid. Daily.

Pipe Organ Pizza #2, Capital Drive.
Daily.

Riverside Theatre,
116 W. Wisconsin Avenue.
3/13 Wurlitzer. Occasionally.

CANADA

BRITISH COLUMBIA

VANCOUVER
Organ Grinder Restaurant #2.
3/12 Wurlitzer-Hinners. Daily.

Orpheum Theatre, 884 Granville.
3/13 Wurlitzer. Rarely.

ONTARIO

TORONTO
Casa Loma, 1 Austin Ter.
4/18 Wurlitzer. Monthly, Sept. - May.

Organ Grinder Restaurant #1,
58 The Esplanade.
3/13 Hybrid. Nightly.

THE THEATRE ORGAN IN STEREO

PART II: AMPLIFIERS

by Ron Musselman

Next to loudspeakers, the most misunderstood link in the stereo component chain is the amplifier. This is particularly true with respect to reproducing the sound of a pipe organ at reasonably life-like levels.

Misconception: Modern day loudspeakers with extended bass response are inefficient and very power-hungry. So, if I buy a pair of those low-efficiency acoustic suspension speaker systems (which describes all but one of the speakers covered in the first part of this series), I'll have to invest in a big, expensive amplifier to drive them.

While this opinion amounts to an exaggeration today, it was true to some extent back in the mid-1950s when the first bookshelf-size acoustic suspension systems made their appearance. No larger than a microwave oven, they could reproduce fundamentals below 30 cps at least as well as conventional systems the size of a refrigerator. The only drawback to these diminutive marvels was that they required more power than their predecessors. How much? Well, to do justice to the king of instruments, about 40 watts in a moderate-sized living room. Less demanding material such as Sinatra with soft strings could get by on 25 watts. These are modest requirements by current standards, but in those days, an amplifier that could put out 25 to 40 honest watts was quite a hunk of equipment. Many home hi-fi speakers were fed on 15 or 20 watts. These days, 100-watt amplifiers are both commonplace and affordable. While the power requirements stated above are valid, they are misleading if not put into perspective. They refer to peak or maximum power requirements for reasonably loud listening levels . . . which means for most of us with normal hearing. Even with the least efficient speaker system (about ½% efficiency compared with as much as 15% for large horn systems used in auditoriums), the average power draw runs somewhere between .5 watt to 4 or 5 watts. However, you'll need all of that 40 or 50 watts for big crescendos, cymbal crashes, bass drum beats, and especially those big pedal pipe rumblings that make the wide, wavy grooves in better records where the bass end hasn't been chopped off. So, yes, you will need an amplifier that puts out a good 40 to 50 watts per channel . . . or more, depending on how loud you like your music. And if you have a few records in your collection with the rarely-recorded 16-30 cps (32' octave) sub-bass fundamentals and like to listen at high levels, you'll need to consider a high-power amp and speakers in the category of the AR-9s. Of course, the good news is

that most people will be concerned with frequencies down to 32 cps (16' low C). Since fundamentals lower than that are almost never found in recordings, much consideration should be given this before paying a considerable premium for a system capability you may never need. With a medium-priced amplifier of about 50 watts per channel and a $400 pair of loudspeakers, you can get fairly impressive results down to around 25 cps at moderate levels. But obtaining undiminished, clean output clear down to 16 cps is a rather expensive proposition, as we'll see a little later.

Misconception: A 100-watt amplifier will drive the same pair of speakers *twice* as loud as a 50-watt amplifier.

If a compact car with an 80 hp engine can reach 85 mph, it's obvious that just doubling the horsepower to 160 won't increase the top speed to a blinding 170 mph. And that holds true with amplifier power and loudness. If everything else is held constant, a 100-watt amplifier will give a loudness increase of only 3 db over a 50-watt amp. It's an appreciable gain, noticeable to even the most casual listener, but far from being "twice as loud." *However,* that extra 3 db can be very important in one area — headroom. Let's say you listen at fairly loud levels with your 50-watt amp and everything sounds full and natural until that big, fat 16-foot Tibia enters the scene. Then, the overall sound takes on a rough, muddy quality, and if pushed too hard, develops a buzzing raspiness or throbbing sound. The amplifier is telling you it's running out of steam. So before the protection circuits shut the whole thing down, you back off the volume control, and the distortion goes away . . . but so does the "fullness." The sense of space seems to recede into the speakers. RX? A 150-watt amplifier that would handle those bass peaks and allow the volume control to be kept at the setting where things really "bloom." Even though this may sound like a lot of power, large acoustic suspension speakers used in a good-sized room can soak up a lot of amplifier power and sound "big" and "life-size" . . . but not loud or blatant, especially with a good recording of a smooth, refined organ in a large theatre. Of course, recordings of electric guitars that sound like amplified chain saws will give a different result.

Misconception: It's worse to have "too much" amplifier for a given speaker than too little.

Most high quality loudspeakers being made today are quite rugged. More than one small system with an 8" woofer has been found to take the full output of a 100-watt amp without a sign of distress. In fact, when distortion is encountered at high listening levels, it's usually the amplifier starting to clip off signal peaks as it's being forced to operate beyond its capability . . . and not the speakers. So it's not easy to have too much amp for the speakers. Even so, sensible usage is a good practice so as not to tempt fate.

On the other hand, a low-powered amp used with larger speakers needing a middleweight amp might do more than distort the sound with the volume control turned up. If run hard enough, an overworked unit may produce a nasty type of distortion that will burn out a tweeter quicker than you can say "poof!" Pairing a budget amp with low-to-medium efficiency speakers to save money is false economizing. Even at best, the speakers will not sound as clean as they would with an amplifier that would be loafing under the same conditions, and the highs tend to be dulled when a marginal amp is used.

Component-grade amplifiers are available in different configurations. You can purchase a separate "preamplifier" and "power amplifier" and combine them to form the complete amplifier. The preamp section contains the lower level amplification circuitry to raise the level of the "weak" program sources (phono, tuner, tape deck) to drive the final stages of the power section. It also contains a special phono preamp to increase the level of signal (only a few thousandths of a volt) coming from the magnetic pickup of the turntable arm. And the preamplifier includes volume and tone controls as well as the usual input selector switch for tuner, tape deck, etc.

The power amplifier section takes the slightly amplified signal of the preamp and boosts it up to a much higher wattage. This larger facsimile of the original signal has the necessary power to drive the loudspeaker. The power amp usually sports little more than a power switch or pair of meters on its front panel.

The separate preamp/power amp combinations are usually incorporated into higher priced systems ($2,000-$5,000) and allow the buyer more flexibility in selecting the features he wants in the preamp and matching it with the power amp of his choice. In some cases, the separates are more carefully built, using more select parts than the 2-in-1 "integrated" amplifiers.

The integrated amp usually gives more watts-per-dollar than separates because everything is on one chassis and housed in one case instead of two, and there is only one power supply section rather than two.

The third configuration is the one that will suit most people the best: a receiver, consisting of the preamplifier, power amplifier, and an FM-AM tuner, all on one chassis. This popular format is the equivalent of a high quality stereo radio, minus the speakers. The savings in buying a receiver are substantial. Compared with separate units of comparable value, the tuner section of some receivers is practically a gift.

Now that we've covered the basics of amplifiers and what to expect, let's examine some models currently available. In looking at several medium price receivers and amplifiers, three happy facts were uncovered. First of all, the better models in that range ($350-$500) produce ample power for listening to pipe organ recordings at reasonably realistic levels in a typical listening room. If your living or family room encloses from 2,400 cubic feet (15' x 20' with an 8' ceiling) to about 3,500 cubic feet of space, 40 to 50 watts per channel should be adequate, as long as you don't demand plaster-cracking loudness. Secondly, the least expensive receiver's distortion figures (within its output capabilities) compared favorably with the more expensive units. The differences tend to be more measurable than audible. And third, many of the models could be purchased at discount stores for as much as 30% off the list price. As an example, the Technics SA-404 (a receiver I would strongly recommend for systems under $1,000) has a list price of $350, which is what many stereo shops sell it for. And it's an excellent value even at the list price, delivering a total of 100 watts with a total harmonic distortion

(THD) of just .04% (any THD figure below .1% is quite good). I walked into a discount store and saw that same receiver tagged at just $250.

Another Technics receiver, the 80-watt SA-303, carried the list price of $290 at one store, but was offered at a discount store for only $200. It features a solid amp section claiming a THD figure of .04%, but I would opt for spending another $50 on the greater reserve of the SA-404.

Pioneer is another company with several excellent receivers. Its model SX-3700 puts out 45 watts a channel (90 total) and claims a THD of .02%. It lists for $375, but some discounters sell it for around $280. It boasts features like "Fluroscan" power output meters and digital tuner readouts, niceties that are beginning to show up on many receivers. Extras like that are fun to play with, but you may not want to pay extra for a host of gadgets that spur significant extra cost. In this case they don't appear to, but be aware of nonperformance features when weighing value against price. Another excellent offering from Pioneer is their SX-3800 with a total of 120 watts and an exceptionally low THD of .005%. This large receiver offers refinements such as a dimmer-brightener for the radio dial. A good value at its list of $500, it is widely discounted for $380. And for those of you considering something like a pair of AR-9's (See Part 1: The Loudspeaker), the Pioneer SX-3900 will crank out 240 watts with equally low distortion. While it lists for $800, I found a store selling it for less than $600. If you have earmarked something in the neighborhood of $650 for a receiver, the Nikko NR-1219 supplies a full 200 watts and claims a THD of .03%. A very flexible and complete unit, it's loaded with features.

Sony has always built excellent receivers, and their model STR-V45 is one worth including in your auditions. Its output is 80 watts minimum with a THD of .04%. The list price is $420.

If an integrated amplifier or preamp/power amp combination is being considered, the field is smaller, but still offers many choices. Typical of medium power integrated amps is the Marantz PM-500, rated at 100 watts with a low THD of .025%. It has several useful features, including a 5-band graphic equalizer, which amounts to a much more flexible version of the tone controls usually found on amplifiers. Marantz has always been very conservative when it comes to power claims, so this unit may produce a much greater output than its rating indicates. List is $330.

Kenwoods KA-80 is a cleanly-styled integrated delivering 48 watts per channel with a THD figure of .02%. With excellent overall specifications and advanced circuit design, this $300 unit is a top contender in the medium power class.

For a cost-is-no-object system to be played at fairly high levels in a large room over 3,500 cubic feet, separate preamp/power amps should be considered. The headroom requirements of such a setup can leave even a 200-watt receiver gasping for breath if pedal fundamentals to 30 cps and below are included.

Preamps generally range in price from $300 to around $2,000. The big bargain of the bunch is the Hafler DH-101. It's a well made no-frills piece of gear with top-drawer performance; THD is .001% and its circuitry is exceptionally quiet. Although it outperforms a "prestige" preamp that sells for well over $1,500, the DH-101 will set you back less than $300. And if you're a kit builder, the DH-101 is an even better deal in kit form at less than $200.

Another preamp that must be mentioned in passing is the Carver C-4000. This incredible device is loaded with features far too numerous to go into here, but we must point out its most outstanding feature: sonic holography. This new development does seemingly impossible things with a normal 2-speaker stereo setup. Instruments don't just issue from the speakers themselves, but from in back of, to the sides of, and in front of them. With a carefully-miked theatre organ recording, this preamp works wonders in heightening the sense of immediacy. The illusion of space it creates makes many systems without it sound somewhat constricted. The C-4000 sells for $867.

While the higher output amps don't come cheap, two models now on the market are quite reasonably-priced in view of their performance. The Carver M-400 would make an ideal companion to the C-4000 or the Hafler preamp. Occupying only about 1/5th of a cubic foot, this small amp is rated at a potent 402 watts with a THD of .05%. It features sophisticated protection circuitry that makes it just about impossible to damage either the amplifier or the speakers it drives, even deliberately. The M-400, which has broken new ground in the power amp cost/performance ratio, is an extraordinary value at less than $350.

Similar in size and performance characteristics to the M-400 is the Adcom GFA-1. Rated at 400 watts, it, too, is worthy of the finest associated components. Priced at $400.

For even more reserve power, the Phase Linear 700 Series II can supply 720 watts total with a THD of .09%. It sells for $1,000. Overshadowing just about any other amplifier in terms of maximum power output is the Phase Linear D-500, Series II. This powerhouse puts out a staggering 1,000 watts + at .09% THD. The price is $1,600. It will easily drive any loudspeaker in the largest home installation with power to spare. If used with ultra-wide range speakers with considerable power handling capacity, the D-500 will provide sound pressure levels that'll practically clean the drapes and rearrange the furniture. Of course, no one in a sane state of mind would listen to such high levels continuously, but the reserve power of this component and others in the high power league is there when needed. And when the instrument being listened to covers everything from a barely-audible Aeoline to a thunderous large-scale 32' Diaphone, this kind of capability can make a noticeable improvement over lower-powered amplifiers.

In this article, we've covered the full range of amplifiers the theatre organ enthusiast would need for any system; from a modest (but very high quality) $750 rig to a $5,000 + sky-is-the-limit audio fantasy. The best products in every price level can be justified, but one thing will become clear as you begin to shop around and listen: beyond a certain dollar level, every additional dollar buys less improvement.

NEXT: Evaluating Loudspeakers.

NOTE: All models, descriptions and prices are the latest available as of fall/winter 1980. □