



JOOK LEUNG

## LUXMAN TP-117 TUNER/PREAMPLIFIER AND MULTIROOM SYSTEM CONTROLLER

*Julian Hirsch, Hirsch-Houck Laboratories*

**T**HERE is a growing trend toward home audio/video entertainment systems that can provide different programs in several rooms from a single group of source components. This approach can offer both aesthetic and performance advantages: by minimizing the visible presence of the major system components and by channeling the total equipment investment into higher-quality components instead of several systems of lesser quality.

In its simplest form, a "multiroom system" might consist of a stereo receiver driving separate pairs of speakers in different rooms. But such an arrangement does not permit different programs to be sent to the two rooms, nor does it provide for independent volume adjustment or program selection from each listening location.

At the other extreme of complexity (and cost) is a system that permits program selection and control of all key operating functions from each listening location. This degree

of versatility is likely to be expensive, frequently involving a number of custom-designed components and typically requiring that all of the components come from the same manufacturer.

Somewhere between these limits is a new multiroom system based on standard Luxman components but able to use (and control) source components and speakers made by other companies. The heart of this system is the Luxman TP-117, which combines a tuner, a preamplifier, and a system remote-control center.

From the user's perspective, the TP-117 resembles a rather simple conventional stereo receiver. Its front panel contains a display window that shows the selected tuner frequency, band, preset channel number, and operating mode, or comparable information for another selected input source. There are several tuner-control buttons, but the twenty FM or AM preset channels are accessible only through the supplied wireless remote control. The

FM tuner is unusual in having tuning increments of 25 kHz instead of the customary 200 kHz (an internal switch can be set to disable the 25-kHz feature).

The TP-117's audio control section consists of small, center-detented tone and balance knobs, a large volume knob, and buttons to bypass the tone controls and activate the subsonic filter and loudness-compensation circuits. A CD STRAIGHT button connects the CD input signal directly to the volume control, bypassing all input switching and other controls.

A narrow panel extending across the full width of the unit hinges down to reveal a number of buttons, three small knobs, and a headphone jack. One group of buttons selects the source(s) supplied to the recording outputs, and another selects the dubbing interconnections between two audio recorders and a VCR. The remaining controls duplicate the front-panel audio controls and are identified as SYSTEM-2.

The subpanel SYSTEM-2 controls are the only clue to the unique nature of the TP-117. Within this conventional appearing case is not only an AM/FM tuner but *two* separate preamplifiers, all of excellent quality. The rear apron is studded with some forty-five phono jacks, a number of 1/4-inch-*phone* and DIN jacks, antenna binding posts, and no fewer than *eight* AC outlets, all of them switched. Since there are two pairs of power-amplifier outlets,

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one pair for System-1 and one for System-2, with each pair rated to handle a total load of 500 watts, as well as two pairs of source-component outlets, each pair rated for 300 watts total, it's clear that the TP-117 is able to control *two* rather complete A/V systems.

In a multiroom setup, the RTP-117 remote control—two of which are supplied with the TP-117—

selects the input source for whichever room it is used in. Options include tuner, CD, phono, tape 1 or 2, videodisc, VCR, and AV (which can be an additional VCR or videodisc audio channel). Many of the remote unit's buttons operate specific functions of Luxman components, including CD players and tape decks. The numerical buttons of the CD section can also be used to select

tuner presets, and other buttons adjust the volume, switch between AM and FM, and turn either the system in the room or the entire system on or off.

Through the RTP-117 units, a single TP-117 can control two "zones," each covering one or more rooms. Each zone uses one of the systems in the TP-117, and up to three TP-117 units can be "daisy-chained" to control a total of six zones, each with independent program selection and volume control. Each system within a TP-117 has its own motor-driven volume control, which can be operated remotely.

A multiroom system requires accessory modules that connect to the TP-117. The RC-501 infrared remote sensor picks up control signals from a nearby RTP-117 controller and relays them down a coaxial cable to a TP-117 in another location. The RC-501 can also pass a VHF TV signal (Channel 3 or 4) coming from a VCR connected to the TP-117 via the coaxial cable to a TV set in the remote room. The RC-502 remote signal converter can be used to connect additional RC-501 sensors to the same TP-117 or to increase video-signal switching capacity. An RC-503 infrared remote-control repeater can be connected to the TP-117 to allow control of non-Luxman units such as VCR's or videodisc players through a TP-117 without hard-wired connections. Finally, the RC-504 is an external infrared emitter that can be aimed more precisely than the RC-503.

Obviously, a system based on the Luxman TP-117 can be highly complex when the control center's capabilities are fully utilized. Space does not permit going into detail on the myriad system configurations and control possibilities; the instruction manual and an installer's guide cover these matters quite thoroughly, although the installation probably should be done by an experienced person.

The Luxman TP-117 measures 17¼ inches wide, 13 inches deep, and 4¾ inches high, and it weighs about 11½ pounds. Prices: TR-117 with one RTP-117, \$1,250; RC-501 sensor, \$100; RC-502 converter, \$180; RC-503 repeater, \$150; RC-504 emitter, \$20. Luxman, Dept.

## FEATURES

- Digital-synthesis AM/FM tuner with twenty presets
- Tuning for FM band in 25-kHz steps
- Independent preamplifier sections for two systems
- Two independent, motor-driven volume controls with automatic low-level turn-on settings
- Inputs for CD, phono, videodisc, two audio tape decks, VCR, and auxiliary A/V
- Independent connection of any input with either preamplifier section
- Facilities for tape dubbing between audio decks and VCR
- CD STRAIGHT button to bypass input selectors for CD signal
- Bass and treble tone controls with bypass button
- Switchable subsonic filter
- Switchable loudness compensation
- Front-panel display of selected source for each system, station frequency, signal strength, tuner mode
- Dual-zone control system; up to three units can be "daisy chained" to control up to six separate zones of one or more rooms each
- Jacks for connecting external signal processor and remote-control jacks for Luxman tape recorders
- Accessory infrared repeaters to allow remote control of system from other rooms or to carry video signals (through coaxial cable) from TP-117 to remote TV set or monitor
- Eight switched AC outlets
- Two pairs of preamplifier outputs for each system (zone)
- Buffered video switching to allow use of video sources
- Can control dubbing from one VCR to another
- Supplied with multifunction infrared remote controls (two per unit) for full system control from any zone

## LABORATORY MEASUREMENTS

- Tuner Section** (all figures for FM only except frequency response; measurements in microvolts, or  $\mu\text{V}$ , referred to 75-ohm input)
  - Usable sensitivity** (mono): 10.4 dBf (0.9  $\mu\text{V}$ )
  - 50-dB quieting sensitivity**: mono, 16 dBf (1.75  $\mu\text{V}$ ); stereo, 38 dBf (21.8  $\mu\text{V}$ )
  - Signal-to-noise ratio** at 65 dBf: mono, 77 dB; stereo, 71 dB
  - Harmonic distortion** (THD + noise) at 65 dBf: mono, 0.145%; stereo, 0.073%
  - Capture ratio** at 65 dBf: 1.1 dB
  - AM rejection**: 62 dB
  - Selectivity**: alternate-channel, unmeasurable (see text); adjacent-channel, 11 dB
  - Stereo threshold**: 22 to 19 dBf (3.5 to 2.5  $\mu\text{V}$ )
  - Pilot-carrier leakage**: 19 kHz, -68 dB; 38 kHz, -68 dB
- Hum**: -78 dB (180 Hz)
- Stereo channel separation** at 100, 1,000, and 10,000 Hz: 42, 42.5, and 41 dB
- Frequency response**: FM, 30 to 15,000 Hz +0.5, -0.2 dB; AM, -6 dB at 45 and 3,600 Hz
- Preamplifier Section**
  - Clipping output level**: 9 volts
  - Sensitivity** (for 0.5-volt output): CD, 75 mV; phono, 1.25 mV
  - A-weighted noise** (referred to a 0.5-volt output): CD, -90 dB; phono, -94 dB
  - Phono-input overload**: 115 to 169 mV from 20 to 20,000 Hz
  - Phono-input impedance**: 35,000 ohms in parallel with 95 pF
  - RIAA equalization error**: +0.5, -1.25 dB from 20 to 20,000 Hz

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SR, 19145 Gramercy Pl., Torrance, CA 90501.

### Lab Tests

We tested (and used) only the tuner and basic preamplifier functions of the Luxman TP-117, driving the speakers through a Luxman M-113 power amplifier.

The FM tuner's frequency response was very flat, measuring +0.5, -0.2 dB from 30 to 15,000 Hz, and its channel separation (rated as 48 dB at 1,000 Hz) was almost as uniform, between 40 and 42.5 dB from 30 to 11,000 Hz and 34 dB at 15,000 Hz. The mono FM usable sensitivity was slightly better than the rated 10.8 dbf, measuring 10.4 dbf (0.9 microvolts, or  $\mu\text{V}$ ) into the 75-ohm antenna input. The mono 50-dB quieting sensitivity, rated as 14.8 dbf, was 16 dbf (1.75  $\mu\text{V}$ ), and the stereo figure matched the rated 38 dbf (21.8  $\mu\text{V}$ ). The signal-to-noise ratio (S/N) was 77 dB in mono (rated 78 dB), and in stereo it measured 71 dB (rated 72 dB). The total harmonic distortion (THD) plus noise was 0.145 percent in mono and 0.073 percent in stereo (rated 0.1 and 0.15 percent, respectively).

Image rejection, rated as 80 dB, was virtually unmeasurable, reading 138 dB (an improbably high figure). The alternate-channel selectivity was 66 dB, close to the rated 68 dB, and the adjacent-channel selectivity was 11 dB. The 1.1-dB capture-ratio measurement was not only exceptionally good, but it surpassed the rated 1.5 dB.

The preamplifier's frequency response (CD input) was +0, -0.05 dB from 60 to 20,000 Hz and -0.27 dB at 20 Hz. The response in the CD STRAIGHT mode was virtually identical, with a gain change of +0.03 dB. The subsonic-filter response was flat above 200 Hz, -0.5 dB at 60 Hz, and -3 dB at 22 Hz. The bass tone control had a maximum boost of 14 dB at 40 Hz and a maximum cut of 16.5 dB at 20 Hz. The treble control's maximum range was +10, -11 dB at 20,000 Hz. The loudness compensation introduced a fixed characteristic at volume settings lower than -10 or -15 dB, with a low-frequency boost of 7.5 dB below 30 Hz and a 6-dB boost at 20,000 Hz.

The RIAA phono-equalization error was +0.5 dB at 20,000 Hz and -1.25 dB at 20 Hz. The phono-input impedance was a lower-than-usual 35,000 ohms, in parallel with 95 picofarads, and the phono stage overloaded at inputs between 115 and 169 millivolts from 20 to 20,000 Hz.

The minimum preamplifier distortion (THD plus noise) occurred at 1.5 to 2 volts output, where it was 0.004 to 0.005 percent. It was still only 0.03 percent just before the output clipped, at 6 to 7 volts, and it was constant with frequency. The A-weighted noise level through the CD input was -90 dB referred to a 0.5-volt output; through the phono input it was -94 dB. A spectrum analysis of the output noise showed a decline from -102 dB at 20,000 Hz to -120 dB at 50 Hz. Power-line hum components (also referred to a 0.5-volt output) were present at very low levels, the largest being the 180-Hz component at -101 dB (60 Hz was -110 to -115 dB).

### Comments

Our lab measurements clearly showed the Luxman TP-117 is a first-rate tuner and preamplifier. In general, it was well above average in respect to meeting its published ratings. The preamplifier performance was particularly excellent in respect to output voltage capability (9 volts at clipping) and noise level.

At another location, we observed a nine-room system being installed using four TP-117's, a Luxman CD player and cassette deck, ten Luxman power amplifiers, and a videodisc player, a VCR, and two TV sets from other manufacturers. While the installation process was indeed quite complex, Luxman's various auxiliary components appeared to provide all the flexibility that could be desired.

When completed, this installation will allow any of the program sources—CD, tape, tuner, phono, stereo TV, videodisc, or VCR—to be heard or seen in any room while any other source is heard or seen in any other location. Whichever room you're in, control is handled by the same simple RTP-117 remote unit.

Ergonomic considerations are especially important in a multiroom

system. First, it should be possible to operate all significant functions from any remote zone, and second, the user should have reasonable assurance that any given command has been executed. The first requisite appears to be met very neatly by the Luxman TP-117 system, thanks in good measure to the highly versatile, yet uncluttered, RTP-117 remote control. The second, which is far more difficult and costly to achieve, has been met only indirectly. From either zone, you can turn the system on or off, select any connected program source, select CD tracks or station presets, operate either or both tape decks in their various modes, and have some control over TV and VCR operation. The accomplishment of any given switching configuration is confirmed, however, only by the appearance of the expected *result*: the desired audio or video program.

There is evidence of thoughtful design throughout the Luxman TP-117/RTP-117. One of the best examples of this is the automatic initial setting of the motorized volume controls. Since listeners in any room may have set their system volume high (or fully off) during previous operation of the system, it would be possible to have it come on at an uncomfortably loud level, or with *no* audible output, the next time. Therefore, each time the TP-117 is turned on, both of its volume controls move to a low-level setting—about 20 percent of the maximum level—before the internal muting relay releases. Thus, the sound always comes on at a low, but audible, level. A red LED on the main knob serves as a pointer and shows its setting whenever the unit is powered.

The Luxman TP-117 and its related system components have far too many features for us to do full justice to them here. If you are interested in a fine multiroom system that can be set up to suit your personal needs at a much lower cost than a fully custom-designed installation, be sure to see a dealer equipped to demonstrate the Luxman system properly. Our experience with the TP-117 was a wholly positive one.

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