Empire
Model 698 Turntable

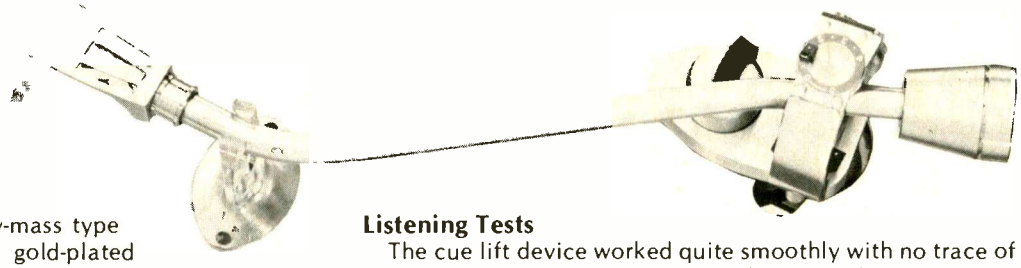
MANUFACTURER'S SPECIFICATIONS
Speeds: 33-1/3 & 45 rpm.
Type of Motor: Hysteresis Synchronous.
Drive System: Belt.
Wow and Flutter: 0.04 per cent, weighted.
Rumble: 68 dB below 3.54 cm/sec @ 1 kHz, ARLL method.
Speed Accuracy: 0.25 per cent.
Tracking Error: 1.5°.
Track Force Range: 0 to 4 grams.
Dimensions: 8 3/16 in. (20.8 cm) H x 17 1/2 in. (44.5 cm) W x 15 1/8 in. 38.4 cm) D.
Weight: 15 1/8 lbs. (13.6 kg).
Price: $400.00.

The Empire 698 is an updated version of the well-known Model 598 Troubador, reviewed in *Audio* in December 1970. The new model still has the same basic features such as the massive platter and belt-drive system, but it now boasts a newly designed tonearm with anti-skating control. There are a number of other refinements such as a photo-cell activated automatic arm lift and nifty touch contacts to initiate cueing. There are two of these contacts, one to raise the arm and the other one to lower it, using a d.c. solenoid in conjunction with an amplifier. Next to the contacts, on the right, is an *On/Off* switch; when the power is on, one of the contacts is illuminated as well as the plastic arm rest. The tonearm is made of lightweight tubular aluminum, nine inches long with a specially decoupled counterweight. There are 32 jeweled bearings, and friction in both modes is claimed to be less than 0.001 grams. The stylus force device uses the well-proven clock-spring method, and the calibrated dial is on the left hand side of the pivot. The anti-skating control also employs a spring, and the dial is mounted on top of the pivot assembly.

The dynamically balanced platter, which weighs over seven pounds, is two inches deep and so acts like a heavy flywheel. Most of it is below the surface of the top plate and a 12 inch "dress ring" is fixed to its perimeter so at first glance it looks like a conventional turntable. The platter shaft is made of stainless steel, which has been through an aging process, and it turns in twin oilite, self-lubricating bearings. A belt-drive, which is ground to a precision tolerance of only 0.0001 inches in thickness, couples the platter to the motor. The motor is a hysteresis synchronous type with a dual diameter drive spindle (we'll come back to that later). It is mounted on rubber suspension grommets in the front left corner, while a tripod structure holds the platter bearings at the center and the tonearm base at the end of one of the legs. Each leg is suspended by a spring and dashpot combination to isolate it from the base. Connections from the photo-sensor and solenoid (which is an integral part of the arm) terminate in plugs which go into the appropriate sockets underneath. (The arm is packaged separately.) Phono connections terminate in a socket under the base and two sets of cables are supplied—one being low capacitance types suitable for CD-4 cartridges, and the other having the more or less standard 250 pF capacity.

Although the top platter is embellished with strobe markings, no illumination is provided. This brings us to the method of speed change which is similar to that used by the original 598. The cover on the left has to be removed, and the belt moved up or down to the other position on the drive spindle. It is very easy to do but even so, it is not nearly as convenient as a push-button switch. Also, under the cover is a small knob which gives a small speed variation by changing the axis of the motor shaft. The construction and mechanical design of the unit, which includes the tonearm, is really superb. Styling is clean and uncluttered, and the gold finish makes a most pleasing contrast with the light walnut base. The dustcover uses friction-type hinges and is installed by simply placing it

so that the U-shaped hinges fit over the bearings located at the top of the rear panel.



Measurements

The cartridge shell is a low-mass type with the leads terminating in gold-plated printed circuit, toil-type connections. For these tests, a Goldring 900 SE cartridge was selected and the arm was balanced in the usual manner. Both the tracking force and the anti-skating dials were set to 1.5 grams, which turned out to be slightly greater than optimum.

Instead of measuring wow and flutter first, as I usually do, I decided to see what speed variation could be obtained with the axis tilting system . . . it clocked in at +4.5 per cent and -0.3 per cent. In other words, it was almost "on the nose," and there was very little margin on the minus side. Subsequent tests over a long period showed that the speed remained absolutely constant once it was set. Wow and flutter came out at 0.04 per cent DIN, exactly as claimed, and rumble measured -68 dB using the ARLL weighting. Tracking error was within the 0.5 degrees per inch, standard for this type of arm, and both vertical and horizontal tracking friction were too low to measure with any accuracy, but I have no reason to doubt the specified figure of 10 mg.

Tonearm resonance with the Goldring cartridge was at 7 Hz, showing a rise of only two dB. Both the tracking force and anti-skating dial calibrations were as accurate as my standard, which means they were within one or two per cent at most.

Listening Tests

The cue lift device worked quite smoothly with no trace of annoying sideplay—you could really cue with it! However, the platform could be longer as it does not support the arm as far as it could, so there is the possibility that it could swing free with disastrous results. The arm permitted tracking to less than a gram with the 900 SE cartridge, and because of the arrangement of pistons and springs used for isolation there was no problem with acoustic feedback.

How about the speed change method? This is somewhat of an anachronism on such a beautifully engineered unit, although it is quite easy to cope with. The only 45 rpm discs I play these days are the direct-to-disc recordings made by Crystal Clear, and I imagine few readers of *Audio* bother much with commercial 45 rpm records these days.

Summing up, then, the Empire 698 is well-engineered, a solidly constructed unit capable of years of trouble-free operation. The accurate cueing facility plus the fast speed torque (full speed is reached in less than one-third of a revolution) would commend it to recording studios and broadcast stations in particular. Another strong plus feature is the tonearm with its jeweled bearings, not forgetting the freedom from acoustic feedback. All this adds up to a fine turntable.

George W. Tillett

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