

MODEL-7117C

操作手册 (*OPERATION MANUAL*)

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OPERATION GUIDE (ENGLISH VERSION)

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IV. Caution :

No matter "PASS / FAIL Test" or "Fo Readout" mode is being used, all the adjustment and pre-setting must be done before performing any measurement, If a loudspeaker is connected first, then, the result will not be accurate. Under this condition, users should detach first the connecting wires for half a second, to let Model-7117C goes back to normal.

B. The "Upper Limit" and "Lower limit" should be preset only after an adequate "Fo frequency range" push-button [either from (8) to (11)] had been chosen, otherwise, if setting first the upper, lower limits before selecting the Fo Freq. range push-buttons, then, the upper and lower limits will be changed subsequently.

Since Model-7117C uses the phase lock loop to measure the Fo value, if the Q value of a loudspeaker is too low (Ex.: the frame of a certain mid-range or tweeter is completely sealed, thus, the Q value will be very low), consequently, the measured Fo value will not be accurate.

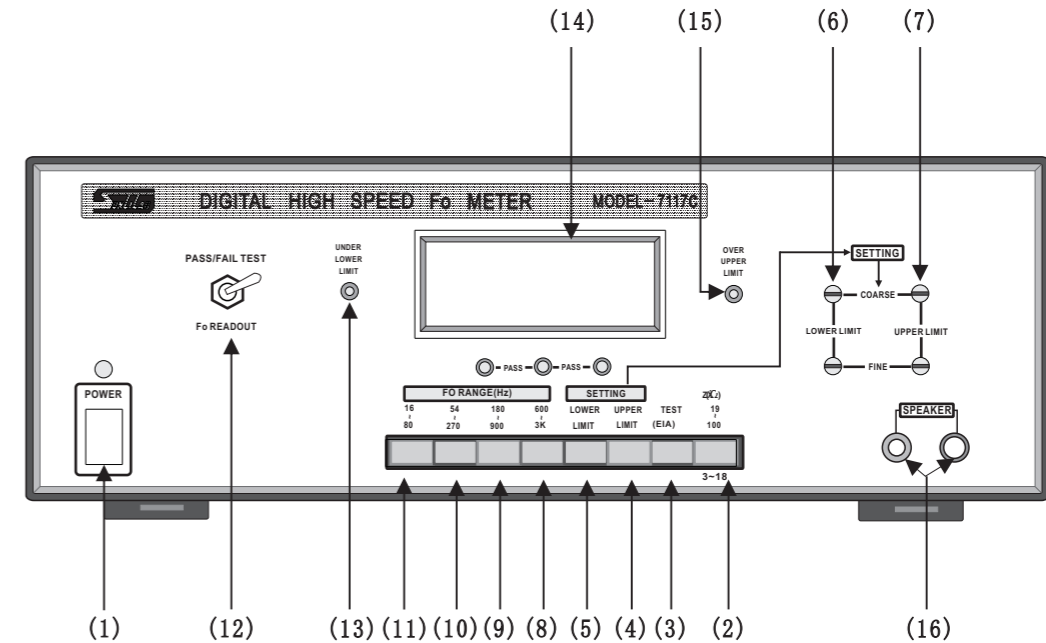
Such loudspeaker with a low Q value, when tested by Model-7117C, it might have a " PHASE LOCK FAIL" symptom that generate a sound similar to sweeping or oscillation, consequently, it will not display an accurate Fo value,

For the loudspeaker whose Q value is not too low, but not highly enough either, when making the measurement with Model-7117C, although it will not generate a sound similar to oscillation, instead, it can display the Fo value, but the error of displayed Fo value might be slightly bigger than the specification set in Model-7117C, since the Q value of the loudspeaker is not highly enough.

Summary:

Every measuring instrument has its "LIMITED CAPABILITY" in measurement, so with Model-7117C, thus, it is not suitable to measure a loudspeaker with a low Q value.

Fo 高速测定器 MODEL-7117C



一、功能

本仪器主要有两大功能：

1. 全自动测试Fo，不需用手调动仪器，其测出之Fo值，是以“数字显示器”自动显示出数值，只要1秒到1.5秒即可显出正确的Fo数值。以数字显示Fo，比用电表以指针指示Fo值有更多好处 a.易读，b.没有目视误差，c.精确度更高。
2. 第2大功能是：它可用在生产线上，高速判定每支喇叭之Fo值有否在规格范围之内，其速度之快，可在0.3秒~0.7秒之内立刻以灯光显示。

二、规格

显示：3 $\frac{3}{4}$ 位数字显示。

精确度：Fo的测定误差小于 $\pm (1\% + 1\text{Hz})$ 。

测定范围：16Hz~3KHz，共分4段

- ① 16Hz~80Hz ② 54Hz~270Hz
- ③ 180Hz~900Hz ④ 600Hz~3KHz

测定Fo时，加於待测喇叭的电压：1Vr.m.s. $\pm 10\%$ (根据美国EIA标准)

可测喇叭之阻抗，分成两档，分别是：

- ① 3 Ω ~18 Ω 及
- ② 19 Ω ~100 Ω 。

测定时间：数字显示时1秒~1.5秒。
通行显示时0.3秒~0.7秒。

上下限之设定：通行范围的上限与下限，可各自独立地事先设定，互不影响，其设定范围皆为 16Hz ~ 3KHz 可随意调整。

使用之限制：本机不可用来测定气垫喇叭的 F_0 （喇叭之金属框架完全密闭不透气的也属之），因其 Q_0 值太低。

三、使用方法

1. 依据喇叭之阻抗值，选择按入或按出“阻抗选择键 (2)”，分别是 $3\Omega\sim 18\Omega$ 或 $19\Omega\sim 100\Omega$ 档。
2. 判断待测喇叭之 F_0 大约是几Hz，然后在“ F_0 频率范围按键 (8)~ (11)” 选择适宜的范围档。
3. 使用时如是要测出 F_0 的“数值”，则应把仪器左边上方之开关(12)向下扳在“数字显示”的位置，（此开关反下时，即使待测喇叭未接上时，在本机中间之显示窗仍会显示出数字，但它是没有任何意义的，可不必理会它，只要待测喇叭一接上本机，它就会立刻显示出正确的 F_0 值）。再按入执行测试的“测试键 (3)”，下限(5)及上限(4)可以暂时不必管它，然后就可把待测喇叭与本机右下方之测试端子(16)相接续，那么显示窗立刻就会显出该喇叭的 F_0 值，测出时间约1秒~1.5秒。

■注意：在未选定好 F_0 频率范围档及按入“测试键”时，请勿在测试端子(16)上接上任何喇叭或负载；必须在按入所要的 F_0 频率范围档及测试键(3)后再接上受测喇叭，以测得正确的 F_0 值。

4. 如用在生产线时，不但需要更快的测定速度，而且可以不必知道 F_0 的确实数值是多少，只要知道待测的 F_0 有否在某规格内即可的时候，那么我们把本机先设定出这个规格的上下限，然后测出待测喇叭之 F_0 有否在这上下限之内。其法如下：先做好上述三项步骤之后，按入“上限”的按键 (4) 以一小起子调整右上方注有“上限”二字的小孔内之调整钮(7)，使显示窗显示出的数字等於所要设定的上限(例如 $F_0 = 100\text{Hz} \pm 15\%$ 时，上限应为115Hz,下限应为 85 Hz)。调好后，再按入“下限”按键 (5)，同样以小起子调整右上角之下限孔的调整钮(6)，以调出下限之值，在上下限都调好后，就可按下“测试”按键 (3) 并把显示开关(12)方向由原来的“数字显示”向上扳至“通行显示”，这时候，显示窗 (14)内的数值会立即消失，没有任何数值显示，但是当你把待测喇叭接上本机时，就会出现下列三种状况中的某一种状况：

■注意：上限调整钮(7)及下限调整钮(6)分别各有一组粗调(COARSE)及微调(FINE)调整钮，使调整的细密度更高，能让使用者易於精确调出所需的上、下限频率值，这也是新机型7117C不同於旧机型7117K的地方之一。

displayed value be equal to the presetting upper limit (Ex.: $F_0 = 100\text{Hz} \pm 15\%$, the upper limit should be equal to 115Hz, the lower limit should be equal to 85Hz). After presetting, press in “Lower limit” push-button (5), and adjust vernier (6) with a small minus screwdriver, to set the lower limit, after setting both the upper & lower limits, press “Test” push-button (3), & flick upward (12) to “PASS / FAIL Test” position, at this stage, the digits displayed on the “Display Panel” (14) will disappear, but once the user have connected the under testing loudspeaker to Model-7117C, either one of the following states will occur:

■ Note: Upper limit adjusting potentiometer (7) and lower limit adjusting potentiometer (6) each has the Coarse and Fine potentiometers, this will enable the adjustment to be more precise, therefore, user can be able to make more easily and precisely adjustment in order to attain to his demand upper, lower limits frequency values, this is the one of the differences between the old Model-7117K and the new Model-7117C.

(a) The first state:

If the F_0 value of the loudspeaker is within the specification of the specified upper and lower limits (which means that the loudspeaker is a qualified one), then, in just 0.3 to 0.7 second, the “DISPLAY PANEL” will display the digits instantly, and the three green LED indicators accompanied with the words “PASS” will light up, this means that the under testing loudspeaker is qualified, the judging time is quite short!, As long as there is a digit displayed on the “Display PANEL” and the three green indicators light up, it means that the under testing loudspeaker is qualified. User please take not that if he wishes to know the actual displayed F_0 value, he has to wait for a longer time (around 1.5 seconds), since normally it will take a longer time before the digital voltmeter can display the actual F_0 value, the instantly displayed value is not the real F_0 value.

(b) The second state:

If the F_0 value of the pre-measure loudspeaker is higher than the upper limit, the “DISPLAY PANEL” will not display any digits, instead a red indicator at the right corner of (15) will light up, which indicates that F_0 value is higher than the upper limit

(c) The third state:

If the F_0 value of the pre-measure loudspeaker is lower than the lower limit, the “ DISPLAY PANEL” will not display any digits, instead a yellow indicator at the left corner or (13) will light up, which indicates that F_0 value is lower than the lower limit.

The F_0 value of the under-testing loudspeaker can be sorted at a very fast speed based on the aforementioned 3 states, since Model-7117C is indicated by LED, visual error can be avoided, besides, it response faster than a needle indicator.

- E. Can test the impedance of an under-testing loudspeaker: Divided into two ranges, which are (1) 3Ω to 18Ω ; (2) 19Ω to 100Ω .
- F. Measuring Speed: "Fo Readout" in 1 to 1.5 seconds.
"PASS / FAIL Test" in 0.3 to 0.7 second.
- G. Limit Setting: Both the upper & lower limits of a loudspeaker can be preset independently from 16Hz to 6KHz, and have no interference with each other.
- H. Limitation in usage: Model-7117C can not be used to measure the Fo value of an air suspension loudspeaker, including those loudspeakers which are air tight frame, since their Q.o. values are too low to measure.

III. Usage:

- A. Based on the impedance of an under-testing loudspeaker, choose either press in or press out the "Impedance range push-button" (2). Which is $3\Omega \sim 18\Omega$ or $19\Omega \sim 100\Omega$ range.
- B. Determine roughly the Fo value of a pre-measure loudspeaker, and choose the most appropriate range from "Fo frequency range push-buttons" (8) to (11).
- C. To measure the "value" of Fo, user is required to flick down switch (12) to "Fo Readout" position, [when switch (12) is being flicked down, and if a pre-measure loudspeaker is not yet been connected, although "DISPLAY PANEL" will still display digits, user can ignore it. Once the loudspeaker is being connected, the correct Fo value will display instantly]. And press-in the "Test (3) push-button", to execute the testing, user may temporarily ignore the lower limit (5) and upper limit (4) push-buttons, then, connect the pre-measure loudspeaker to the output testing terminals at the lower right corner of the instrument (16), then, the actual Fo value will be displayed at once on the "DISPLAY PANEL", measuring time is approx. 1 to 1.5 seconds.

■ Note: Before selecting the "Fo frequency range" push-buttons (8-11) and press in the "Test" push-button (3), please don't connect any loudspeaker or load on the "Output testing terminals" (16); user should select first the desired "Fo frequency range" and press in the "Testing" push-button, then, user may connect the under-testing loudspeaker to the instrument, to test the correct Fo value.

- D. When used in a production line, more speedy measuring time is needed, besides, it is unnecessary to know the exact Fo value, user needs to know only on whether the Fo value of a pre-measure loudspeaker is within a qualified range, then, user may set on Model-7117C, the upper and lower limits of this qualified range, and to test if the Fo of the pre-measure loudspeaker is within the range of the upper and lower limits. The procedures are: After doing steps (A) to (C), press in "Upper limit" push-button (4), adjust vernier (7) with a small minus screwdriver, to let the

第一种状况：如果其Fo值在规格的上下限范围之内（亦即为合格品）：那么在0.3秒~0.7秒之内，显示窗内会立刻有数字显示出来，同时辅以三个绿色LED指示灯亮光显示PASS这代表受测喇叭为“合格品”，时间只要这么短！只要显示窗内有任何数值显示出来，以绿色LED指示灯亮起来，即代表受测品合格，但由于数字表要反映出正确的数值通常需要长一点的时间，因此这个瞬间显示的数字并非精确的Fo值，如使用人要确知Fo之值，他只要再等约1秒钟后显示窗就会立即显示出正确的Fo数值，也就是说，要正确的Fo值，则测定的时间较长约1.5秒左右，若只要测知“合格”（或通行）与否，则只要看绿色LED指示灯是否亮起来即可，时间约0.3秒~0.7秒即足

第二种状况：该待测喇叭的Fo值高于上限值，则显示窗内会无任何数字显示，但是显示窗右方的红色小灯会亮，表示Fo高于上限。

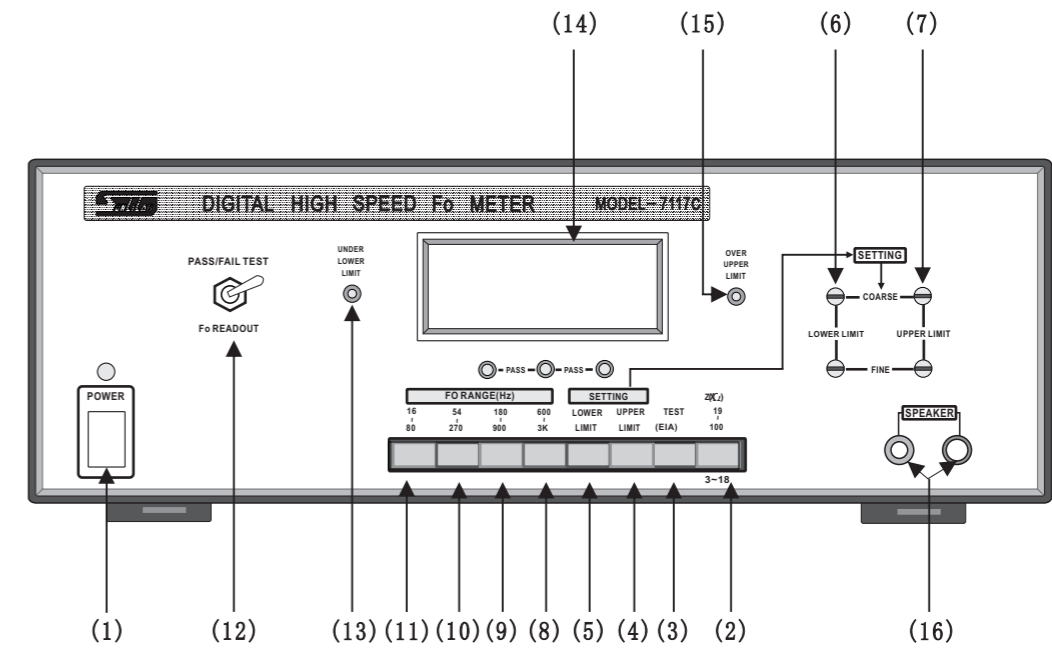
第三种状况：如Fo值低于下限值，则显示窗内仍然不会显示任何数字，但左方的黄色小灯会亮，以表示Fo低于下限。

根据上述(a)、(b)、(c)三种情况，我们就可以高速地判定喇叭Fo值是否合格或太高或太低，这个功能由于是以灯光来表示，故绝对不会像指针显示方式容易造成错误的判断，而且反应比指针式为快。

四、使用之注意事项

1. 不管是测“通行显示”，或测“数字显示”，都必需把所有开关都先调整好之后，才能把待测喇叭接上本机来测Fo这样才能正常工作。否则如先接好喇叭之后才扳动那些开关来测Fo，则很可能不灵，此时应把接续至待测喇叭的两条线中的任一条，断开约半秒后，再接上，它就能正常地测Fo。
2. 上、下限的设定，必须是在“Fo频率范围时按键(8)~(11)选择其中之一按入后始能设定上、下限。如果反过来先设定上、下限而后再下按Fo按键，则原上下限值就会改变。

DIGITAL HIGH SPEED F₀ METER MODEL – 7117C



I . Function:

Model - 7117C has the following two main functions:

- A. Model-7117C can measure the F₀ value of a loudspeaker fully automatically, no need of manual adjustment of the instrument. The correct F₀ value of a loudspeaker is being displayed on the “DISPLAY PANEL” (14) in just 1 to 1.5 seconds. It has many advantages than by using a voltmeter with a meedle indicator for measuring the F₀ value of a loudspeaker:
 - (a) Easy to read;(b) No visual error;(c) High accuracy.
- B. Model-7117C can be used in a production line: , high speed judging if F₀ value of every loudspeaker is within the qualified range, Judging speed is as fast as in just 0.3 to 0.7 second, the “PASS / FAIL Test” functions will be indicated instantly.

II . Specification:

- A. Display: Displayed in $3\frac{3}{4}$ digits.
- B. Accuracy: F₀ readout error less than $\pm (1\% + 1\text{Hz})$
- C. Measuring Range: 4 ranges from 16Hz to 3KHz,
 - (a) 16Hz - 80Hz; (b) 54Hz - 270Hz.
 - (c) 180Hz - 900Hz; (d) 600Hz - 3KHz.
- D. F₀ measuring voltage added on the pre-measure loudspeaker: 1V r.m.s. $\pm 10\%$ (complies with EIA standard).