

## Application of Acoustics Balance of Modern National Orchestra in Practical Training

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### Abstract

Modern orchestra forms through fusing with western orchestra based on development of China's traditional national instrument. In the continuous development process, arrangement, composition, instrument and relevant playing modes of modern orchestra have changed. In practical training process, how to fuse and balance various kinds of acoustics of national instrument as well as boost application of national instruments in practical training becomes the first problem of modern orchestra. Modern orchestra owns distinct national features. In the playing process, the key points of national orchestra include acoustics fusion and balance. This paper proceeds with overview of modern national orchestra and analyzes development, current situation and playing of modern national orchestra. Besides, this paper analyzes and handles the balance problem of modern national orchestra as well as effectively promotes development of modern national orchestra.

**Key words:** Modern orchestra; Acoustics balance; Practical training; Application

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### INTRODUCTION

National orchestra adopts ensemble form based on Chinese national instruments which own distinct

individuality and is charming. But when they are played together, how to fuse individuality becomes the key point of national orchestra. Thus, in the playing process of orchestra, orchestra fusion and acoustics balance become very important.

In continuous development of the national orchestra, many excellent artists actively throw themselves into national orchestral music and have gained good achievements. But, Chinese national orchestra also has certain gap with western orchestra. Thus, relevant personnel should actively throw themselves into development of national orchestral music. In the development of national orchestral music, favorable fusion and balance are the root of national orchestral music development. Hence, continuous enhancement of application of fusion and balance in practical training can effectively promote development of Chinese national orchestra.

### 1. FORMATION AND DEVELOPMENT OF CHINESE NATIONAL ORCHESTRA

#### 1.1 Formation of National Orchestra

In the development of Chinese music history, the formation and development of national orchestra are significant and lead the new direction of China's music development. Initial formation mark of Chinese national orchestra is "Datong Music Association" founded by Mr. Zheng Jinwen. The initial national orchestra formed through reform and exploration of Chinese traditional music. The orchestra was mainly composed of string instruments, plucked instruments, wind instruments and percussion instruments. Such form initiated the playing form of modern national orchestra. Besides, "Datong Music Association" also actively recomposed relevant works and effectively promoted development of national orchestra.

## 1.2 Development Process of National Orchestra

As Chinese traditional music develops continuously, farsighted persons have gradually specified the formation of Chinese national orchestra through continuous efforts and innovations. Besides, they increase a large number of playing works and effectively drive development of modern national orchestra. In the development of national orchestra, excellent achievements of “Datong Music Association” were absorbed, i.e. four major structures of national orchestra: formation of string instrument, plucked instrument, wind instrument and percussion instrument. In addition, development of Chinese national orchestra was effectively promoted; the range of orchestra was expanded and tone quality improved. As well, the first national orchestra was set up in China—China Broadcasting National Orchestra. Its setup is not just effectively achieved scientization and standardization of Chinese national orchestra, but also made development of Chinese national orchestra reach a new height. Therefore, its setup has important significance for development of Chinese national orchestra, lays the foundation for development of Chinese national orchestra and offers extensive space for its development. When modern national orchestra plays, the seat arrangement mode of China Broadcasting National Orchestra is still adopted now.

As orchestra playing form and scale change, relevant playing works of national orchestra also alter greatly. In 1950s, brand-new Chinese national orchestra praised as “Peng Xiuwen Mode” was a representative orchestra form. Peng Xiuwen mainly fused harmonics, orchestration and relevant musical instrument making standards of western classical music with Chinese traditional music. It is said he recomposed over 400 works. His representative works in 1950s include: Cai Yun Zhui Yue, Dance Music of Yao Nationality and Qin Xianglian; his representative works in 1960s include: Yue Er Gao, Rhapsody of Anti-Japanese War Songs; his representative works in 1970s include: Feng Shou Luo Gu, Erhu concerto Luan Yun Fei and symphonic poem Liu Shui Cao etc.; his representative works in 1980s include: Yun Zhong He, symphonic poem Huai, and the fantasia Terracotta Warriors in Qin Dynasty. His representative works in 1990s include: divertimento December, and the first symphony Jin Ling. In addition, he also actively fused some classical works. For example, he recomposed Mozart’s Serenades & Divertimenti, Beethoven’s Third Symphony, Maurice Ravel’s Tzigane, Bizet’s Carmen and Firebird in Eugene Mravinsky into playing works of Chinese orchestral music. This indicates compatibility and fusion of Chinese orchestral music.

## 2. DEVELOPMENT STATUS OF CHINESE ORCHESTRA

Although the development duration of Chinese orchestra is short, it shows strong development trend. At present,

development of Chinese national orchestra has a small gap with some western orchestras. Some western non-professional orchestras entirely fall behind development of Chinese national orchestra. Chinese national orchestra shows diversity development trend.

This paper mainly carries out case study of Hong Kong professional national orchestra – Hong Kong Chinese Orchestra. Hong Kong Chinese Orchestra was founded in 1977 and employees 85 personnel, including four parts: string instruments, plucked instruments, wind instruments and percussion instruments. String instruments group includes: Gaohu (8), Erhu (12), Zhonghu (8), Gehu (8) and low-pitch Gehu (5). Plucked instrument group includes: Guzheng (1), high-pitch Ruan (2), dulcimer (2), Pipa (2), Zhongruan (5), Daruan (2), Sanxian (1) and Konghou (1). Wind instrument group includes: Bangdi (2), Qudi (2), Xindi (2), high-pitch Sheng (2), mid-pitch Sheng (2), low-pitch Sheng (1), high-pitch Siona (2) and mid-pitch Suona (2), tenor Suona (1), low-pitch Suona (1), high-pitch pipe (10), mid-pitch pipe (1), low-pitch pipe and relevant percussion instruments. Hong Kong Chinese Orchestra can effectively play all kinds of melodies, continuously reforms musical instruments, gains good effects and effectively promotes development of Chinese national orchestral instruments.

## 3. BALANCE OF NATIONAL ORCHESTRA

### 3.1 Definition of National Orchestra

Balance of national orchestra is a very extensive concept. Balance refers to the balance of sound loudness and volume and also refers to balance of each sound part in the playing process. Moreover, it also refers to color balance in the works. This paper mainly states acoustics balance in the playing process.

Generally speaking, the concept of balance refers to the concept of physical mechanics and owns certain relativity. It also owns certain relativity and fusion nature in music. To guarantee balance among each sound part, the balance in terms of music loudness, color, mode, speed and rate should be ensured in the playing process.

### 3.2 Significance of National Orchestra

In the development process of national orchestra, balance is important. It is the root that makes sure each sound part can cooperate well. Balance involves horizontal and longitudinal aspects. In the playing process, horizontal balance refers to the proportion of sound effects among each sound part and each level. Longitudinal balance refers to the relationship between acoustics and intensity among each sound part when each sound part fuses. This is the key point of sound effect balance. In the playing process of orchestra, both balance and imbalance get involved. The two have opposite relationship and have important significance for development of the whole

orchestra. Certain imbalance exists in the playing process of all orchestras, which is mainly reflected in sound of different orchestras. In the playing process, it is required to reach balance of playing effect of orchestra through relevant art form and playing skills according to the color and laying requirements of the works. In this way, the connotation of works can be better displayed.

In the development process of modern national orchestra, it is very significant for orchestra development to actively handle balance in daily training. Meanwhile, it is an important link in training process. Moreover, in playing process, the personnel arrangement of relevant orchestras will be adjusted according to different works.

## 4. APPLICATION OF BALANCE OF ORCHESTRA IN PRACTICAL TRAINING

### 4.1 Music Instrument Making

In development of Chinese traditional music, national instruments have certain characteristics. Certain differences exist in the making materials of different instruments, making personnel, and making time. Thus, certain differences exist in the plying process. Some orchestras adopt the uniform making method to effectively reduce differences among musical instruments and effectively cut down imbalance in the playing process.

### 4.2 Analysis of Practical Training of Each Music Instrument Group in an Orchestra

National orchestra is composed of four parts. Each group of musical instruments has different characteristics. Balance fusion should be valued in the playing process.

#### 4.2.1 Practical Training of String Instrument Group

In this paper, individual musical instruments in the string instrument group are illustrated and analyzed, including Gaohu, Erhu, Zhonghu and Banhu. In national orchestra, sound production volume should be the lowest according to the relevant proportion. Meanwhile, it is also the most important part in sound balance. For example, during playing Awa Mountain, the author regarded the three kinds of Huqin as a sound par, and effectively fused three different kinds of tones. In practical application, the author spanned two octaves in terms of melody trend of three kinds of musical instruments, and fully utilized characteristics of the three kinds of musical instruments so that the whole music was full of strength and reached a good fusion effect. This is a very successful case. In practical training, related personnel should concentrate on connection of each sound part, and makes sure the fusion of range and tone has no trace and they can be perfectly fused so as to realize balance and tone coordination.

On the other hand, the bow also influences balance of string instruments to some extent. In national orchestra, when the intensity and speed of string instrument group are same, the lower the range is, the louder the volume,

this is a natural property. In practical training, relevant personnel should focus on it. Meanwhile, when one pulls the string with the left hand, this also affects balance. In Chinese traditional instruments, there is no fixed finger plate. Hence, there is certain difficulty in the playing process. In daily training, we should enhance control of intonation in order to ensure sound balance.

#### 4.2.2 Balance of Plucked Instrument Group

The formation of plucked instruments in national orchestral instruments is divided into horizontal playing and vertical playing. Horizontal playing mainly involves Guzheng and Yangqin. Vertical playing involves Liuqin and Pipa. They not just have the same shape, but also own the same principle of sound production. In practical playing, the performers may properly change to give full play to the advantages of plucked instruments. In actual training, the performers should adopt the uniform playing method to ensure consistent playing rhythm, rhythm and balance of sound production of musical instruments.

Furthermore, rhythm of plucked instruments also imposes certain impacts on sound effect balance. In the playing process, the advantages of plucked instruments are as follows: high pitch part and intonation can be controlled most easily and it is most stable. Besides, the rhythm control should be enhanced. In practical training, intonation should be well controlled to ensure accuracy of harmonic. Meanwhile, more attention should be paid to rhythm counterpoint. Only when empty string and the pitch are accurate, and rhythm is well controlled can the playing be fluent.

#### 4.2.3 Balance of Wind Instrument Group

Among Chinese national instruments, wind instruments are extensive. National orchestras often adopt the flute, Sheng, Suona and pipe. They are also the most instruments in national orchestra in terms of the quantity. In the continuous development process, some western playing methods are absorbed, such as the use of “additional key” and modulation flexibility in playing process. Meanwhile, the application of lever linkage improves performance of musical instruments. For instance, in Chun Qiu, the author mainly utilizes transition mode. Since this is difficult (mainly because of range and register, good balance cannot be reached). Through the use of additional key, the above problem can be solved effectively. In the above example, the performers should pay attention to accuracy of harmonic so as to better ensure playing balance.

The features of wind instruments also have certain influence on balance of sound effect. In national orchestra, wind instruments own very strong signing property and sense of breathing. Meanwhile, they also have certain high-highlighting property in acoustics and can well render the atmosphere. For example, in The Legend of Shadier, the third part is mainly played with wind instruments to render the atmosphere. It mainly tells the glorious deeds of a hero—Shadier from Wei nationality. Thus, a kind of

hero atmosphere should be rendered. In practical training, playing balance and melody flow should be enhanced. In the aspect of sound effect balance, the flute and high-pitch Sheng needs to use f intensity and Suona adopts mf. Only in this way, the clearness of theme can be guaranteed.

#### 4.2.4 Practical Training of Percussion Instrument Group

The number of performers playing the percussion instrument is the smallest, but there is a great variety of percussion instruments. With continuous development of national orchestra, the varieties of percussion instruments and relevant playing methods change greatly.

Change in the varieties of percussion instruments: national orchestra adopts dozens of percussion instruments and covers all varieties of percussion instruments in the world. During playing the percussion instruments, balance of percussion instruments covers the balance of sound part of the whole percussion music and orchestra. The ideal balance can reach only through continuous training. Generally speaking, percussion instruments are used to render the atmosphere and add color of works. In practical training, solid mastery of strength and weakness time can effectively promote balance of national orchestra. Besides, in playing process, other sound parts will be connected through percussion music before they tend to saturation. In this way, good balance effect can be reached.

### 5. INFLUENCE OF POSITION OF EACH INSTRUMENT GROUP ON SOUND EFFECT OF THE WHOLE ORCHESTRA

Regardless of modern orchestra or national orchestra, the position of each sound part has very important influence on the sound effect of the whole orchestra. At present, national orchestra does not own fixed sound part positioning mode. Usually, sound part positioning mode includes two categories: a) based on string instruments; b) based on string instruments and plucked instruments. Different sound part positioning modes have very important influence on sound and balance of the whole orchestra. Therefore, practical seat positioning should be based on actual conditions.

## SUMMARY

In conclusion, this paper analyzes application of sound effect balance of modern national orchestra in practical training, and expounds how to effectively improve fusion of national orchestra from various aspects. In continuous development of national orchestra, continuous fusion and innovation can effectively facilitate development of national orchestra.

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