An Exploration of Recording Techniques Through the Study Of Big Band

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Abstract

This project will explore how to most appropriately record big band music today, in 2019. Big Band music has such a rich history dating back to some of the first examples of recorded music. Therefore, research into the recording techniques used throughout history will be quite extensive and useful in determining what techniques and concepts, if any, are still applicable to create the best recordings possible in the modern recording era. Techniques explored will include microphone choice and placement, as well as big band arrangement and physical placement within a room. Considerations of musical arrangement and placement in a room must be made in addition to researching recording techniques, since those decisions will help influence what recording techniques can be deemed appropriate for a particular recording. These topics will be explored through analysis of recordings in addition to research, which includes how technology impacted and developed these considerations.

The implementation of these findings will include the preproduction and recording of six big band recordings, and the final mixing and mastering of four songs. All the recordings will compare and contrast the techniques explored during the research. The recordings will include solely ensemble arrangements, instrumental arrangements with vocal features, and instrumental arrangements with featured instrumental soloists, in order to use a wide range of recording techniques. A final analysis of the recordings will be completed to determine what techniques are best for recording big band, as well as other jazz ensembles today.

The Big Band

What is big band?

The history of big band music dates back to the early 1920's, and can truly be traced back even further. However, big band music did not become popular till the 1930's, early 1940's. It is often considered to be dance music, and helped pioneer the swing era, before it was handed over to smaller jazz ensembles. Some of the more famous big band artists include Benny Goodman, Glenn Miller, Count Basie, Frank Sinatra, Nat King Cole, and many others.

The big band is typically comprised with the following instruments:

Five saxophones: two alto, two tenor, one baritone

Four trombones: three tenor, one bass

Four trumpets

Rhythm section: drums, bass, piano, guitar

Vocals

Other instruments such as the vibraphone, clarinet, tuba, French horn, or strings were used throughout the popularity of big band music depending on the arrangement.

MTSU Jazz Ensemble 1

Five saxophones - Four trombones

Five trumpets

Rhythm Section: Drums, bass, piano, guitar

Two Vocalists

The Traditional Approach: The Main System

A long history…

Since big band swing music has been around for so long, and it became popular when audio recording was first beginning, there has been a lot of experimentation with recording techniques on big band music. This started with very early, single microphone recordings of radio broadcast performances. The goal here was to capture the performance as the band played it. That theory is one that drives all types of recording, but becomes more applicable to big band music. In classical music, most engineers will try to capture the performance as natural as possible, where in pop music, engineers may use the recording process to color the sound of a recording. Big band music teeters on this line of trying to sound natural, while also adding something to the sound of the recording. A lot of older big band recordings will lean towards the later, more natural sounding recording, mainly because it is more conducive to the technology of the time. One microphone capturing the entire ensemble, has been referred to today as the main system, and there are a lot of options for producing a strong main system, especially in the age of multitrack recording that now exists.

Main systems now consist of stereo pairs, a few of which are shown to the right. Each type of main system comes with different advantages and disadvantages depending on the types of microphones used. It is common in big band recording today, that a main system like this is used in addition to microphones on individual instruments.

STEREO PICKUP SYSTEMS	MICROPHONE TYPES	MICROPHONE POSITIONS	
X-Y	2 - CARDIOID	AXES OF MAXIMUM RESPONSE AT 135° SPACING: COINCIDENT	
ORTF (FRENCH BROADCASTING ORGANIZATION)	2 - CARDIOID	AXES OF MAXIMUM RESPONSE AT 110° SPACING: NEAR-COINCIDENT (7 IN.)	
NOS (DUTCH BROADCASTING FOUNDATION)	2 - CARDIOID	AXES OF MAXIMUM RESPONSE AT 90° SPACING: NEAR-COINCIDENT (12 IN.)	
MS (MID-SIDE)	1 - CARDIOID 1 - BIDIRECTIONAL	CARDIOID FORWARD-POINTED; BIDIRECTIONAL SIDE-POINTED; SPACING: COINCIDENT	
SPACED	2 - CARDIOID OR 2 - OMNIDIRECTIONAL	ANGLE AS DESIRED SPACING: 3-10 FT.	

The Pros	The Cons
Capture full dynamic range	What you see is what you get
Realistic spatial image	Limited control during post production

A Modern Approach: Step By Step

When multi-tracking big band in a large format recording studio, things are going to be different than when a single main system was used. There are a lot more considerations that need to be made in order to get an accurate recording. A few are categorized here below.

Step 1: The Room

The space in which a recording is made always plays a large role in the outcome of the recording, even more so when microphones are added to the session. Think about for every microphone added to the recording, the engineer is also adding that much room sound to the recording. Since a big band usually encompasses a lot of musicians in one room, usually larger recording spaces are beneficial for the recording process, to accommodate all the musicians as well as the engineer. Below are a few examples of common big band recording spaces.

A few other room considerations:

Isolation - between horns, drums, bass, vocals

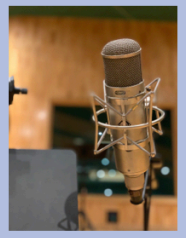
Sight lines among players and conductor

Step 2: Organizing musicians

Musician placement in said studio space is also going to have a large impact on the recording. There are a few common practices. Concert formation, which is seen in some of the pictures in traditional setup, was commonly used in older recordings. The "V" is featured in the above pictures, and so is the "U." These letters describe how the horn players are laid out in the room, and each one is going to create a different sound, with the goal being to capture a natural blend from the band.

Step 3: Microphone choice and placement

As with any recording the choice of microphones and their desired location is going to substantially change the sound of any recording. For big band recordings classic microphones, like the U47 and RCA 44, are commonly used for their color, as they tend to lean towards an "old school" sound, which is desirable for big band music. A big factor in the sound of the microphone is the polar pattern. It not only changes tonal characteristics of the microphone, but also in what direction the microphone will be picking up sound from. Again, with a lot of musicians in the room, big band engineers have to compromise between tonal choices and leakage control. Omnidirectional microphones tend to work best for big band recording. Here you see Sinatra singing into a U47 and Nat King Cole into an RCA 44. The next question is, will everybody get a microphone? In most modern big band recordings that tends to be the preference over single, main systems.



Implementation

With the MTSU Jazz Ensemble 1, I decided to put some of this theory to the test, combining recording techniques from the main system, and a more modern approach.

The Room: The Tracking Room Nashville

The Tracking Room Nashville was used for this project as it is one of the largest spaces in Nashville that can accommodate a large ensemble. In addition, it provides isolation spaces for the entire rhythm section and vocals, as well as good clear sight lines for all the musicians.

Placement:

The musicians were placed in a "V" for this recording as I wanted to capture a true ensemble sound, as well as individual section elements. Drums, piano, bass, and vocals were all placed in individual isolation booths for this recording. That way we could overdub and retract elements as needed throughout the recording session.

Microphones:

The Tracking Room offers a great selection of microphones so I had some vintage, classic microphones at my disposal, as well as newer, modern options. There was a main ORTF set up above the conductor, as well as spaced main systems above the saxophones and brass. I was able to blend these main systems with individual spot microphones.

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