OSCILLATIONS - Sound Waves

Diagram:
- Two amplifiers labeled OR1310B.
- Connections to Scope CH 1 and CH 2.
- Connections to speakers labeled Speakers 1 & 2 on Amplifier 1 and Speakers 1 & 2 on Separate Amplifiers.
- Connections to a reversing switch to change phase.
- Connections to BOGEN C-60 and BOGEN CHS-60 amplifiers.

Scope Settings:
CH1 - 0.5 VOLTS/DIV
CH2 - 5 VOLTS/DIV
VERT MODE - ADD
A TIME/DIV - 10ms
TRIG MODE - CH1/AUTO
OSCILLATIONS - Sound Waves

Frequency of HP3310A #1 - 400Hz
Frequency of HP3310A #2 - 410Hz

1. HP3310A #1
   R = 100Ω - 200Ω
   STANCORP-B130
   2 AMP FILAMENT TRANSFORMER

2. HP3310A #1
   BNC
   2 Signal Mixer box
   741 OP Amp
   Check Batteries
   Before Using

   TO 465
   SCOPE
   BNC

3. HP3310A #1
   BNC
   To CH A
   TEK 465 Scope
   Use TWO Channel ADD

   HP3310A #2
   BNC
   To CH B

4. HP3310A #1
   BNC
   To CH A - TEK 465
   Use Two Channel ADD

   HP3310A #2
   BNC
   2 Signal Mixer Box
   741 OP Amp
   Check Batteries
   Before Using

   To CH B - TEK 465

   AUX IN
   gnd
   8 ohms

   BOGEN AUDIO AMP.
Assembly & Operation

1. Plug the male Banana / female BNC adapters into the output connectors on the oscillators.

2. Attach a BNC cable to each of the adapters installed in 1.

3. Configuration a

3.2 Place a BNC double female barrel on each of the cables used in 2.

4. Place a male BNC/female banana adapter on each of the barrels installed in 3.

5. Screw a green wire from the transformer to one of the signal wires from an oscillator using the screw connector on the BNC/banana adapter.

6. Do the same for the other green wire of oscillator.

7. Attach the yellow wire from the transformer to the ground from one of the oscillators through a resistor.
   (Use solder)

8. Screw the black wires from the transformer to the remaining female banana/male BNC adapter.


10. Run a BNC cable from the barrel just installed to the scope.
1. Two oscillators, model General Radio model 1310-B, 2 Hz - 2 MHz
2. Two BNC/Banana adapters (male Banana, female BNC)
3. Oscilloscope (w/ Television camera & monitor)
4. Two BNC cables.
   Configuration ① (see diagram)
5. Three BNC/Banana adapters (female Banana, male BNC)
6. Three BNC barrels (double female)
7. Another BNC cable
   Configuration ②

5. Two signal mixer w/ 741 op amp
6. Another BNC cable
   Configuration ③
   — No more parts —
Configuration 3

3. Run a BNC cable from each oscillator's outputs to the inputs of the 741 op-amp mixer.

4. Run a cable from the output of the mixer box to the oscilloscope.

5. The relative amplitude of the waves can be adjusted with the +10 dB knobs on the mixer.

6. Check the batteries in the mixer box.

Configuration 3

3. Run a BNC cable from each oscillator to each input channel of the scope.

4. Use the hold button on the scope.

Settings:

Set each oscillator to 4 kHz.
Set the scope so there are 100 oscillations of one oscillator per screen width.
Set the voltage/div so the entire wave is visible.

Adjust the scope trigger level and one of the oscillators' frequency for stability.

Adjust the one of the oscillator's output level so the envelope 'pinches' to zero.