

H. Gardiner

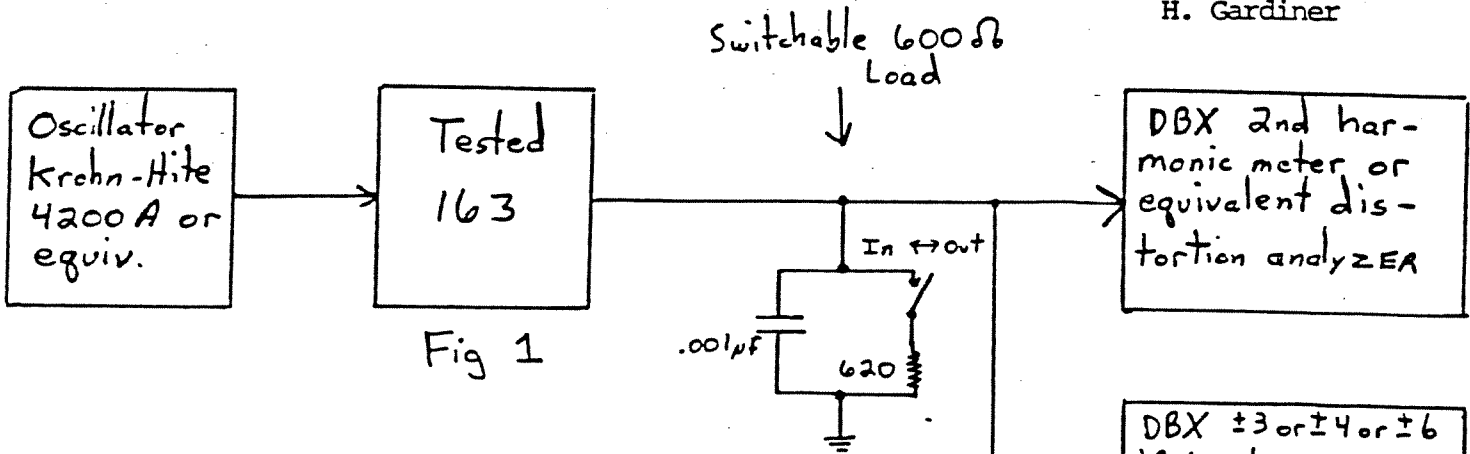


Fig 1

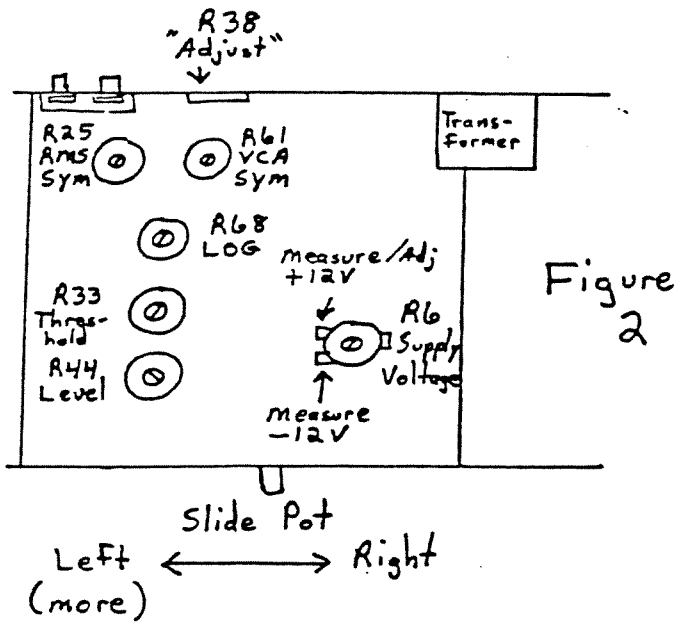


Figure 2

DBX ±3 or ±4 or ±6 dBV meter or equivalent meter capable of reading 0 to +3 dBV.

Oscilloscope

DBX +20 to -100 dBV meter or any meter that can indicate +7 to -82 dBV.

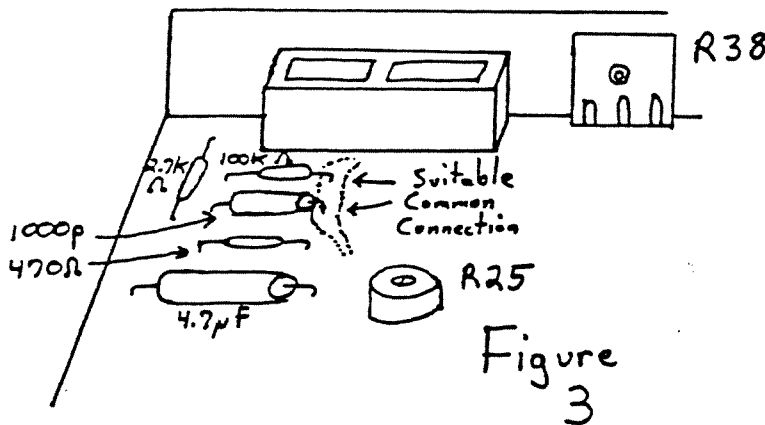


Figure 3

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In addition to equipment shown on first page, use a known good 163 as a visual reference for repair purposes.

Switchable load can be built on banana plug such as Pomona MDP.

Test Phase Prior to Burn-In

Preparation

- a) Connect equipment as shown in Figure 1.
- b) Adjust oscillator for 1 kHz and 1.26 VRMS (+2 dBv) using a voltmeter.
- c) Determine frequency response errors of dB meters at 20 Hz, 200 Hz and 20kHz using 2 kHz as reference. If the meters read low at a particular frequency expect them to read low by the same amount when fed through a flatly responding 163.

1) 163 Preparation

Set R25 (RMS Sym), R61 (VCA Sym), and R68 (Log) to midrange.

2) Supply Voltage

- a) Adjust R6 (Supply Voltage) for +12 +/- .1 VDC at point indicated in Figure 2. Common lead of voltmeter can be connected to point shown in Figure 3.
- b) Measure for -12 +/- .4 VDC at point shown in Figure 2.

3) Distortion

- a) Set oscillator to 100 Hz and +2 dBv.
- b) Set rear panel switch to +4.
- c) Switch out 600 ohm load.
- d) Set sliding pot to right (less). See Figure 2.
- e) Adjust R33 (Threshold) so that the -6 dB lamp just lights.
- f) Set R44 (Level) for +2 dBv out.
- g) Set sliding pot to left.
- h) Alternate between R61 (VCA Sym) and R25 (RMS Sym) as you adjust for minimum distortion. Two passes is usually enough.
- i) Reduce oscillator output by about 20 dB.
- j) Adjust R68 (Log) for minimum distortion.
- k) Set oscillator to +2 dBv.
- l) Adjust R61 (VCA Sym) for distortion less than .056%.

4) DC Tracking

- a) Set oscillator to 2 kHz and +2 dBv.
- b) Switch in 600 ohm load.
- c) Set sliding pot to right.
- d) Adjust R33 (Threshold) so that -6 dB light just comes on.
- e) Adjust R44 (Level) for +2 dBv out.
- f) Set sliding pot to left. Observe that leds all light.
- g) Suddenly reduce oscillator output to below -50 dBv. Observe that leds extinguish at a uniform rate.
- h) Set oscillator to +2 dBv.
- i) Reduce oscillator output by 40 dB. The -4 dB lamp must be on and the -8 dB lamp must be off.

5) Rear Panel Switch

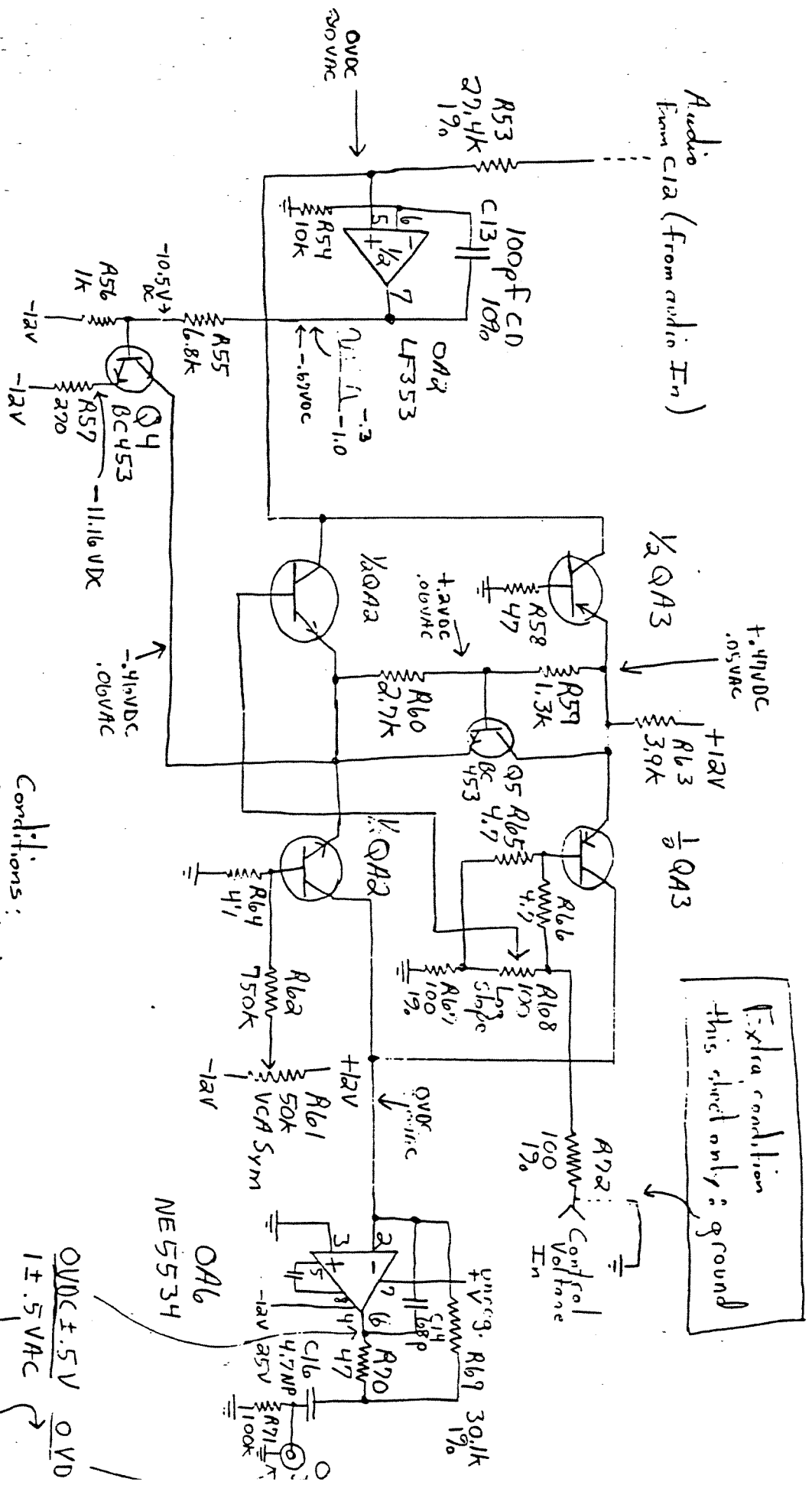
- a) Set oscillator to +2 dBv.
- b) Set sliding pot somewhere in mid-range. Observe output level.
- c) Check that output does not change by more than 1 dB when the sliding pot is moved to either extreme from the center position.

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Underlined entries represent changes from previous step.

	C Freq	C Lev dBV	iding Pot	ar Panel Sw	0 Ohm Load	
Set-up prep	-	-	-	-	-	Attach special load; adjust oscillator for 1.26 VRMS (+2 dBv) at 1 kHz. Check meter accuracy.
163 Prep.	-	-	-	-	-	Set R68, R61 and R25 midrange.
Supply Voltage	-	-	-	-	-	Adjust R6 for +12 +/- .1 VDC, check for -12 +/- .4 VDC.
Distortion	<u>100</u>	<u>+2</u>	<u>R</u>	<u>+4</u>	<u>Out</u>	Adjust R33 so -6 dB lamp just lights, adjust R44 for +2 dBv out.
	100	+2	<u>L</u>	+4	Out	Adjust R61 and R25 for minimum distortion.
	100	<u>↓20</u>	L	+4	Out	Adj R68 for minimum distortion.
	100	<u>+2</u>	L	+4	Out	Adj R61 for minimum distortion less than .056%.
DC Tracking	<u>2kHz</u>	+2	<u>R</u>	+4	<u>In</u>	Adj R33 so -6 lamp just lights, R44 for +2 dBv out.
	2kHz	+2	<u>L</u>	+4	In	All lamps evenly lit.
	2kHz	<u>Off</u>	L	+4	In	Lamps extinguish at even rate.
	2kHz	<u>+2</u>	L	+4	In	-
	2kHz	<u>↓40</u>	L	+4	In	-4 lamp on, -8 lamp off.
	2kHz	<u>+2</u>	<u>L--R</u>	+4	In	Output within 1 dB from that at slider pots center position.
Rear Switch	2kHz	+2	<u>L</u>	<u>-10</u>	In	Output -11 +/- 3 dBv.
	2kHz	+2	L	<u>Adj.</u>	In	Rotate R38 rear panel cw; Output +6 +/- 3 dBv.
	2kHz	+2	L	<u>Adj.</u>	In	Rotate R38 rear panel ccw; output -19 +/- 3 dBv.
Freq. Resp.	2kHz	+2	<u>R</u>	<u>+4</u>	In	Output is reference level.
	<u>20k</u>	+2	R	+4	In	Reference level +/- 1 dB.
	<u>20Hz</u>	+2	R	+4	<u>Out</u>	"
	<u>200</u>	+2	R	+4	<u>In</u>	"
Noise	200	+2	R	+4	In	Short input after disconnecting from oscillator. Output less than -82 dBv. Reconnect to oscillator.
Repeat Distortion						Wax pots.

VCA

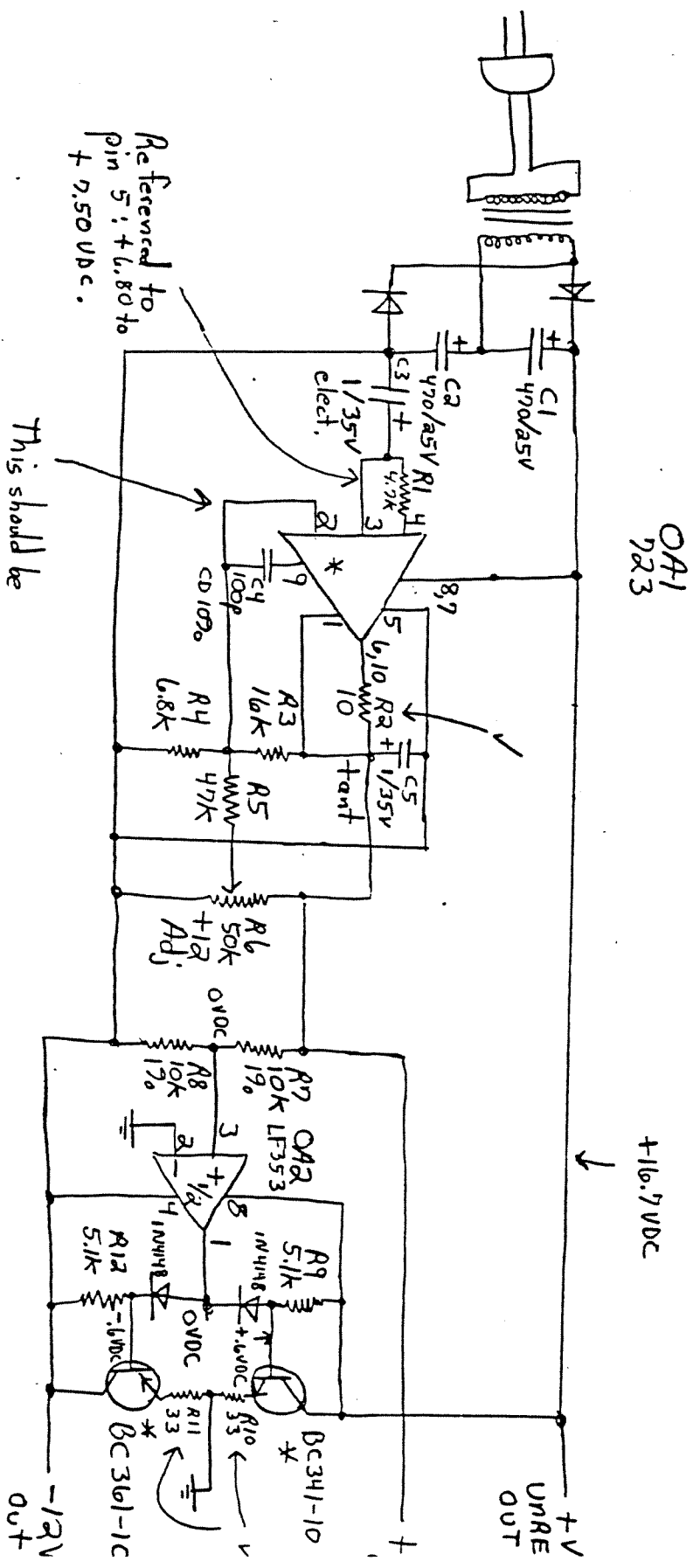


Conditions:
 Power supply is OK.
 R68 centered.
 Signal In 2kHz +4dbm or +2dbV
 Back Panel Switch +4.
 600 ohm load attached.
 RA9 (slide pot), RA5, RB1, R33, R44 wipers set to 0 ± .1 VDC.

0VDC ± .5V
 1 ± .5 VAC
 X.9

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165 Voltage Supply



Referenced to pin 5: +6.80 to +7.50VDC.

This should be same as pin 3 ±.1VDC.

Unless specified otherwise:
Resistors 5% 1/4W.
Capacitors in microfarads.

* Indicates heat sink on device.

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