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LAG-125  
AUDIO GENERATOR  
SERVICE MANUAL

Adjustment and Calibration Procedure for LAG-125

1. Adjustment of Power Supply Voltage

a) +20V

Set VTVM or digital voltmeter to Q<sub>501</sub> 2SD315 Emitter.  
Check Emitter Voltage is +20V. (tolerance: within  $\pm 1\%$ )  
If not correct, adjust VR<sub>401</sub> 3k $\Omega$  for Emitter voltage of  
 $+20V \pm 1\%$ .

b) -20V

Set VTVM or digital voltmeter to Q<sub>502</sub> 2SD315 Collector.  
Check collector voltage is -20V. (tolerance: within  $\pm 1\%$ )  
If not correct, adjust VR<sub>402</sub> 5k $\Omega$  for collector voltage  
of  $-20V \pm 1\%$ .

c) -5V

Connect VTVM or digital voltmeter to Pin No.19 in T-861  
main board connector. Check voltage at Pin No.19 is  
-5V. (tolerance: within  $\pm 1\%$ )

If not correct, adjust VR<sub>404</sub> 1k $\Omega$  for  $-5V \pm 1\%$ .

Note: Checking and adjusting procedure for power supply  
should proceed with the above steps.

Adjustments of a) and b) interact. Therefore, it  
may be necessary to repeat.


2. OFF set voltage check

Connect VTVM or digital voltmeter to Pin No.10 in T-895 OSC  
amp and AGC circuit board connector.

Check the voltage at Pin No.10 is exactly within  $\pm 0.5V$ .

If out of this, change transistor Q<sub>202</sub>, Q<sub>204</sub>, or value of  
R<sub>238</sub>.

3. Adjustment of CDS voltage

Set. Frequency Range	x 1k
Dial position	1
Function Sw.	
Attenuator	fully clockwise
600 $\Omega$	off

Connect digital voltmeter to the point  $\diamond 13'$  of CDS shown on the schematic diagram and furthermore connect frequency counter, Oscilloscope and millivoltmeter to LAG-125 Input terminal.

Check CDS voltage at the point  $\diamond 13'$  is exactly  $7V \pm 0.05V$ . If out of this value, adjust  $VR_{203}$   $1k\Omega$  for CDS voltage of  $7V \pm 0.05V$  exactly.

Check output voltage is 6.6 V rms.

Note: Output voltage should never be lower than 6.6 V rms. If not correct, adjust  $VR_{202}$   $3k\Omega$  for output voltage of 6.6 V rms.

Note: Adjustments of  $VR_{203}$  and  $VR_{202}$  interact. Therefore it may be necessary to repeat the two adjustments to bring respective correct voltage.

In this case, check frequency counter indicates approximately oscillator frequency 1kHz, and after checking, adjust Frequency dial vernier for 1.00 kHz exactly.

Check dial scale 1 agrees with LAG 125 Indicator. If doesn't agree, adjust mechanically dial scale.

In case of proceeding with the following steps, be careful not to change the above setup.

a) Adjustment of 10 Hz

Set Frequency Range to x10 and dial scale to 1.

Check frequency counter indicates  $10 \text{ Hz} \pm 2 \text{ Hz}$ .

(tolerance:  $\pm 2\%$ )

Adjust  $VR_{301}$   $1M\Omega$  and  $VR_{302}$  for frequency of  $10 \text{ Hz} \pm 0.2 \text{ Hz}$ .

b) 100 Hz check

Set frequency range to x100 and dial scale to 1.

Check frequency counter indicates  $100 \text{ Hz} \pm 2 \text{ Hz}$ .

(tolerance:  $\pm 2\%$ )

c) 1 kHz check

Set frequency range to x1k and dial scale to 1.

Check frequency counter indicates  $1 \text{ kHz} \pm 20 \text{ Hz}$ .

(tolerance:  $\pm 2\%$ )

d) 10 kHz check

Set frequency range to x10k and dial scale to 1.  
Check frequency counter indicates  $10 \text{ kHz} \pm 200 \text{ Hz}$ .  
(tolerance:  $\pm 2\%$ )

e) 100 kHz check is same as in above steps.

In the above adjustment and checks, frequency dial 1 was held constant and frequency range was changed.

In the following steps, frequency dial is set to 10 and is held constant. Only frequency range is changed.

f) Adjustment of 1 MHz

Set frequency range to x100k.  
Check frequency counter indicates  $1 \text{ MHz} \pm 10 \text{ kHz}$ .  
(tolerance:  $\pm 1\%$ )

Adjust  $VC_{301}$  for frequency of  $1 \text{ MHz} \pm 10 \text{ kHz}$ . At the same time, adjust  $VC_{307}$  for CDS voltage of  $7V \pm 0.5V$  and check output level of  $3 \text{ V rms} \pm 1\%$ .

g) Adjustment of 100 Hz

Set frequency range to x10.  
Check frequency counter indicates  $100 \text{ Hz} \pm 1 \text{ Hz}$ .  
(tolerance:  $\pm 1\%$ )

Adjust  $VC_{303}$  for frequency of  $100 \text{ Hz} \pm 1 \text{ Hz}$ . At the same time, check CDS voltage of  $7V \pm 0.5V$  and output level of  $3 \text{ V rms} \pm 1\%$ .

h) Adjustment of 1 kHz

Set frequency range to x100.  
Check frequency counter indicates  $1 \text{ kHz} \pm 10 \text{ Hz}$ .  
(tolerance:  $\pm 1\%$ )

Adjust  $VC_{304}$  for frequency of  $1 \text{ kHz} \pm 10 \text{ Hz}$ . At the same time, check CDS voltage of  $7V \pm 0.5V$  and output level of  $3 \text{ V rms} \pm 1\%$ .

i) Adjustment of 100 kHz

Set frequency range to x10k.  
Check frequency counter indicates  $100 \text{ kHz} \pm 1 \text{ kHz}$ .  
(tolerance:  $\pm 1\%$ )

Adjust  $VC_{306}$  for frequency of  $100 \text{ kHz} \pm 1 \text{ kHz}$ . At the same time, check CDS voltage of  $7V \pm 0.5V$  and output level of  $3 \text{ V rms} \pm 1\%$ .

j) Adjustment of 100 kHz


Set frequency range to x10k.

Check frequency counter indicates 100 kHz  $\pm$  1 kHz.

(tolerance:  $\pm$  1%).

Adjust VC<sub>306</sub> for frequency of 100 kHz  $\pm$  1 kHz. At the same time, check CDS voltage of 7V  $\pm$  0.5V and output level of 3 V rms  $\pm$  1%.

#### 4. Adjustment of Distortion

Set	Frequency Range	x10
	Dial scale	2
	Function	
	Output Level	+ 10 dB
	Output Level Fine Control	fully clockwise
	Sync.	Short-circuit with a wire or shorting bar

Connect Oscilloscope and Distortion Meter to LAG-125 Input Terminal.

Check distortion meter indicates 0.02% or less.

Adjust VR<sub>201</sub> 500  $\Omega$  for distortion of 0.02% or the minimum distortion of 0.02% less.

Set Same as above except as indicated below.

Frequency Range	X100k
Dial scale	5

Check distortion meter indicates 0.34% less.

Adjust first VR<sub>204</sub> 1 k $\Omega$  for distortion of 0.3%, and furthermore, when changing the frequency of oscillator to more than 1 MHz, check that Hunching is not present.

If Hunching is present, readjust VR<sub>204</sub> 1k $\Omega$  to stop it.


After this adjustment, recheck distortion at 100 kHz is less than 0.34%.

At each respective frequency setting, check the distortion is less than value listed in Table on the next page.

Frequency Range	Dial Scale	Frequency of Oscillator	Distortion % less
x 10	1	10 Hz	0.6
x 100	1	100 Hz	0.06
x 1k	1	1 kHz	0.02
x 10k	1	10 kHz	0.02
x 100k	1	100 kHz	0.06
x 100	5	500 Hz	0.02
x 100k	5	500 kHz	0.34
x 1k	10	10 kHz	0.02
x 10k	10	100 kHz	0.06

## 5. Adjustment of Schmitt Circuit

### 1) Set

Function  (square wave)  
 Frequency Range 1 k  
 Dial Position 1  
 600  $\Omega$  Shunt ON  
 Output Level + 10 dB  
 Output Level Fine Control fully clockwise

Connect oscilloscope to LAG-125 output.

Check square wave with the duty ratio of 1 is present and output level is more than 3 V p-p. If square wave is not present, adjust VR<sub>405</sub>.

### 2) Set


Same as above, except as indicated below.

Frequency Range 10k  
 Dial Position 10

Check that the duty ratio and output level are same as above.

## 6. Adjustment of Meter

### Set

Frequency Range x1 k  
 Dial Position 1  
 Function   
 Output Level Sw. + 10 dB

Connect AC voltmeter to LAG-125 INPUT terminal.  
 Set Output Level Fine Control for AC voltmeter  
 indication of 3 V rms.

Check that LAG-125 output meter indicates 3 V rms.  
 (within  $\pm 0.1$  V rms)

Adjust VR<sub>403</sub> 10 k $\Omega$  for output meter of 3V rms.

When setting Output Level Fine Control for each  
 respective AC voltmeter indication of 2 V rms, 1V rms,  
 0 V rms, check that tolerance on output meter reading  
 is within  $\pm 0.1$  V rms at each respective indication.

Set

Same as above, except as indicated below.

Frequency Range 100 k

Set Output Level Fine Control for AC Voltmeter indica-  
 tion of 3 V rms.

Check Output Level Meter indication of 3 V rms.

Adjust VC<sub>401</sub> 20 pF for output level meter indication  
 of 3 V rms.

#### 7. Output Level Tolerance Check

Set Frequency Range to xl k and Output Level Fine Control  
 for Level Meter indication of +10 dB.

Check that Level Meter indication is 10 dB within  $\pm 0.3$  dB  
 at each respective frequency listed in the following table.  
 This checks that output level is held constant in case of  
 varying the frequency.

Frequency Range	Frequency	Level Meter Indication	Tolerance
x 10	10 Hz	10 dB	$\pm 0.3$ dB
x 100	100 Hz	"	"
x 1k	1 kHz	"	"
x 10k	10 kHz	"	"
x 100k	100 kHz	"	"
x 1000k	1 MHz	"	"

Don't change dial position from 1.

8. 600  $\Omega$  Shunt Switch Check

Set

Frequency Range	x1 k
Output Level	+ 10 dBm
Shunt Switch	ON

Connect millivoltmeter to LAG-125 Output terminal.

When setting Shunt Switch to OFF, millivoltmeter should indicate + 20 dBm.

9. Sync. terminal Check

Set

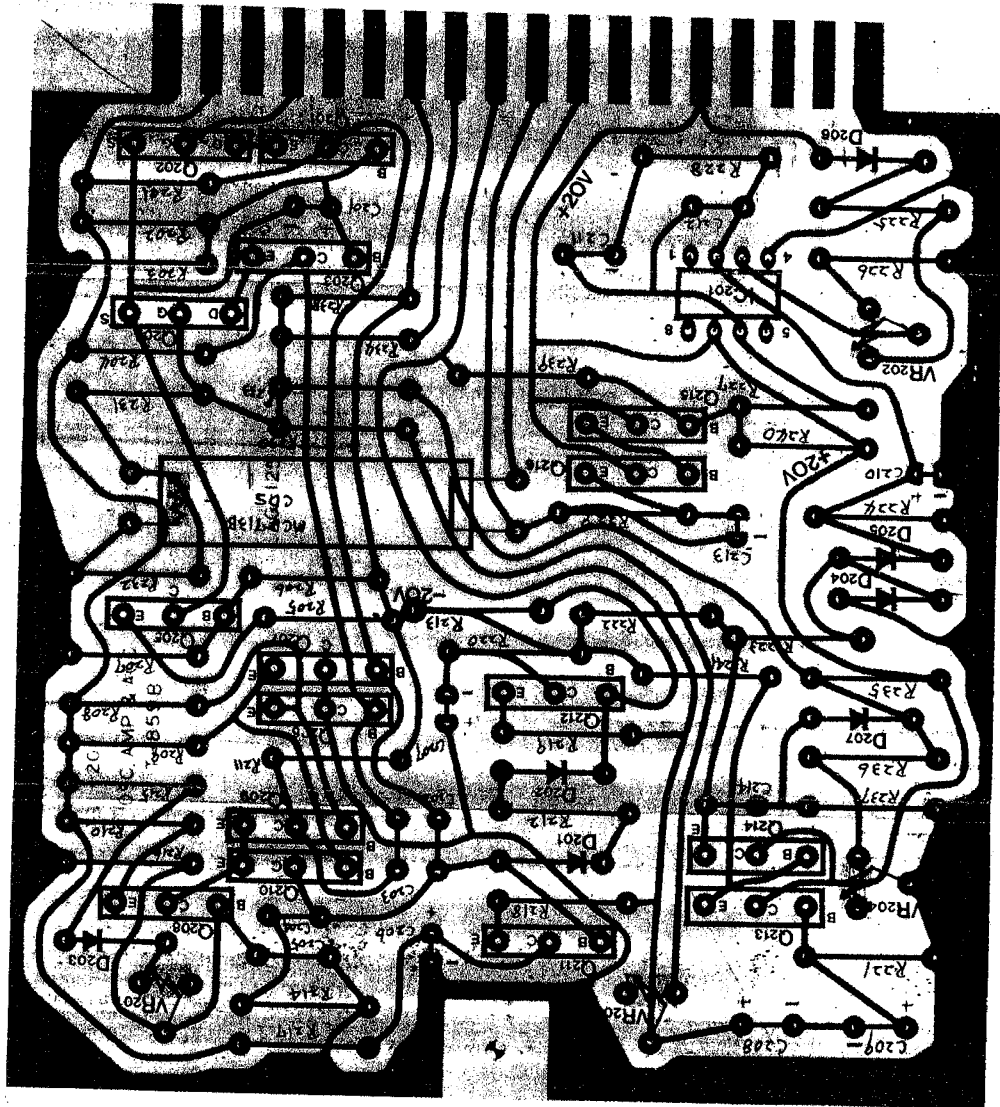
Frequency Range	x 1 k
Dial Position	1
Output Level	+ 10 dB
Output Level Fine Control	fully clockwise

Connect AC voltmeter to Sync. terminal.

Check AC voltmeter reading is within 1.65 V rms  $\pm$  20%.

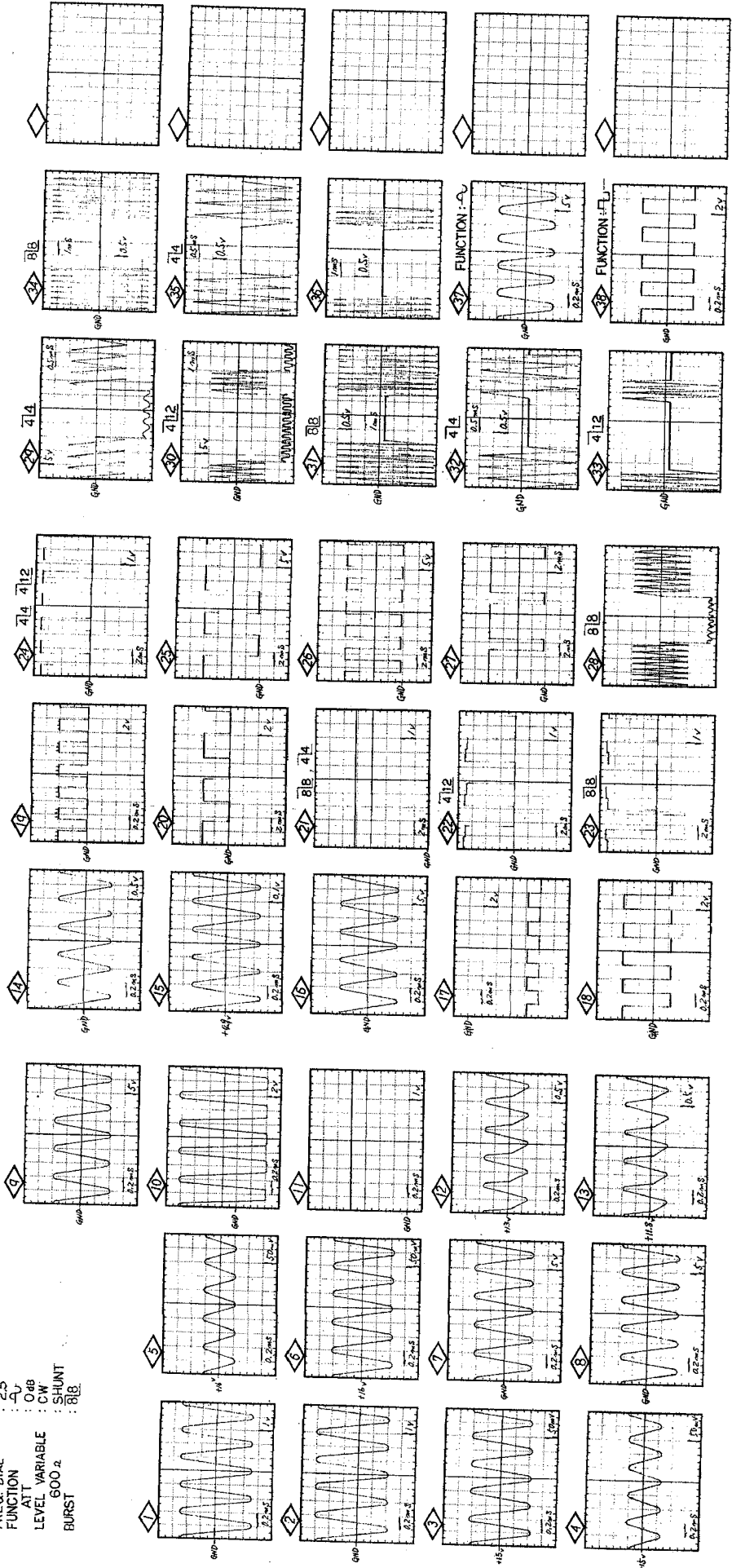


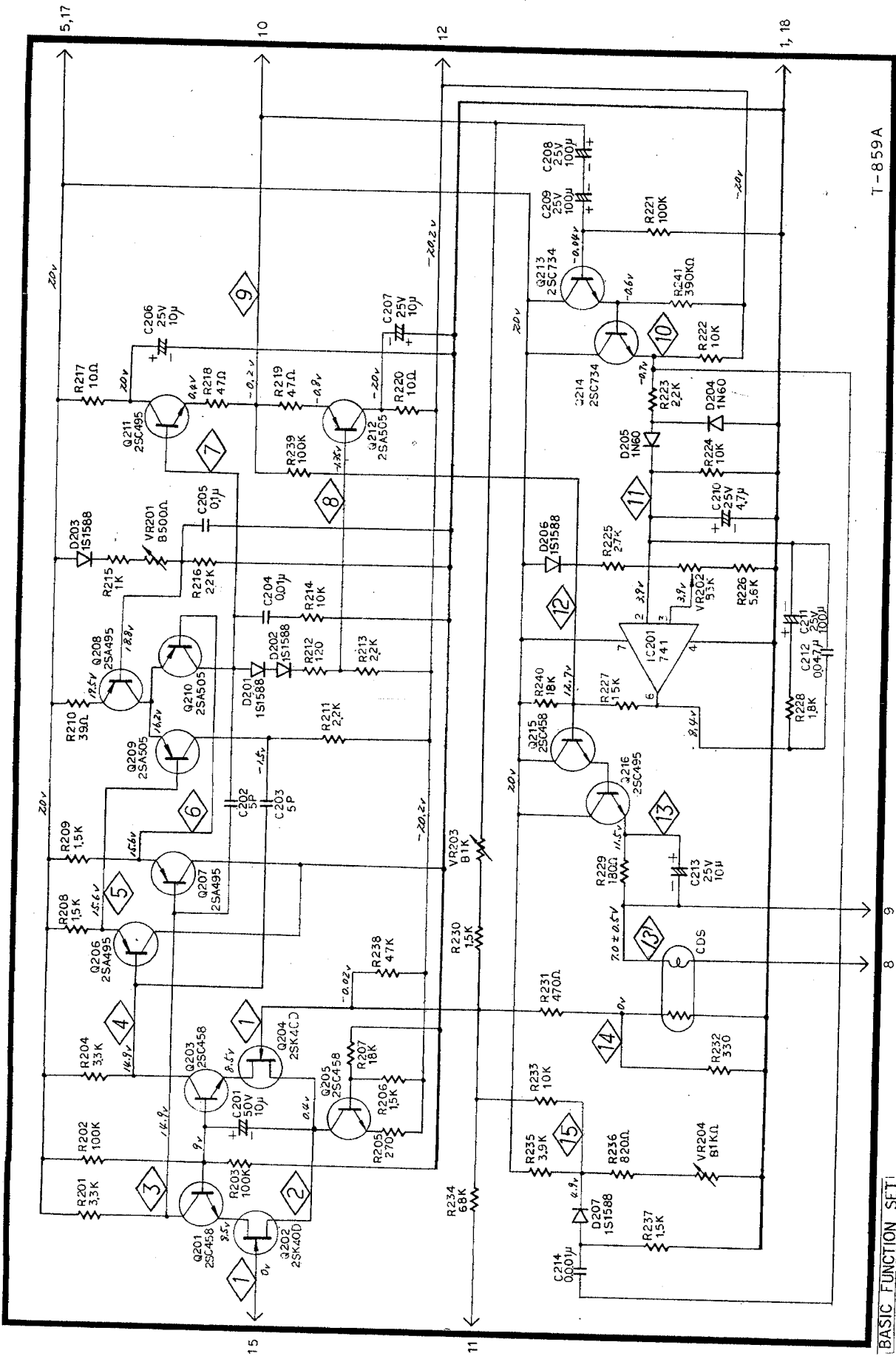




**BASIC FUNCTION SET (LAG-125)**

- FREQ. RANGE : X1K
- FREQ. DIAL : 2.5
- FUNCTION : CW
- ATT : 0dB
- LEVEL VARIABLE : SHUNT
- BURST : 800.2



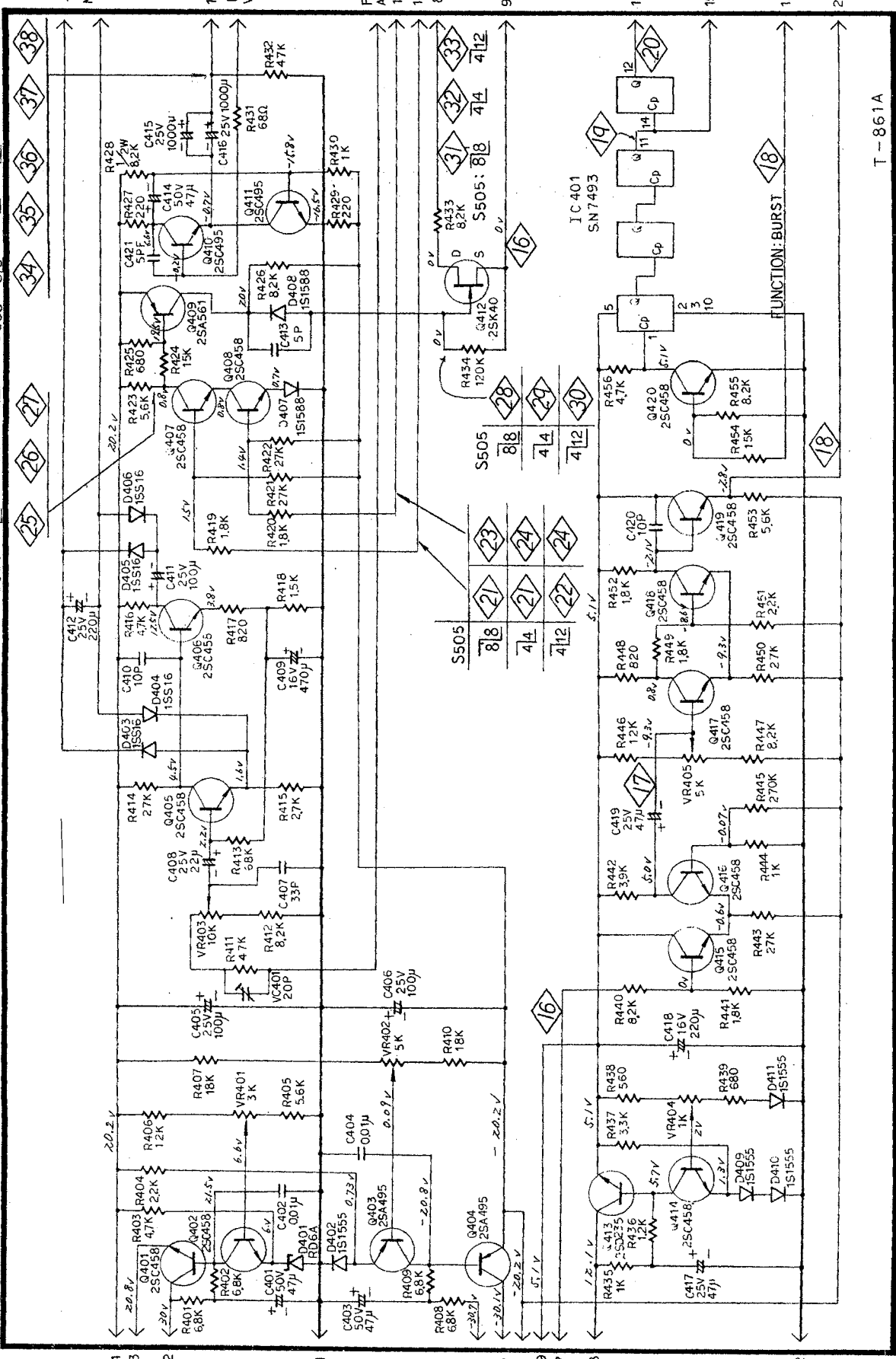


**BASIC FUNCTION SET:**  
 FREQ. RANGE : X1K  
 " DIAL : 2.5  
 FUNCTION : OdB  
 ATT :   
 LEVEL VARIABLE : CW  
 600<sub>a</sub> : SHUNT  
 BURST : 81B

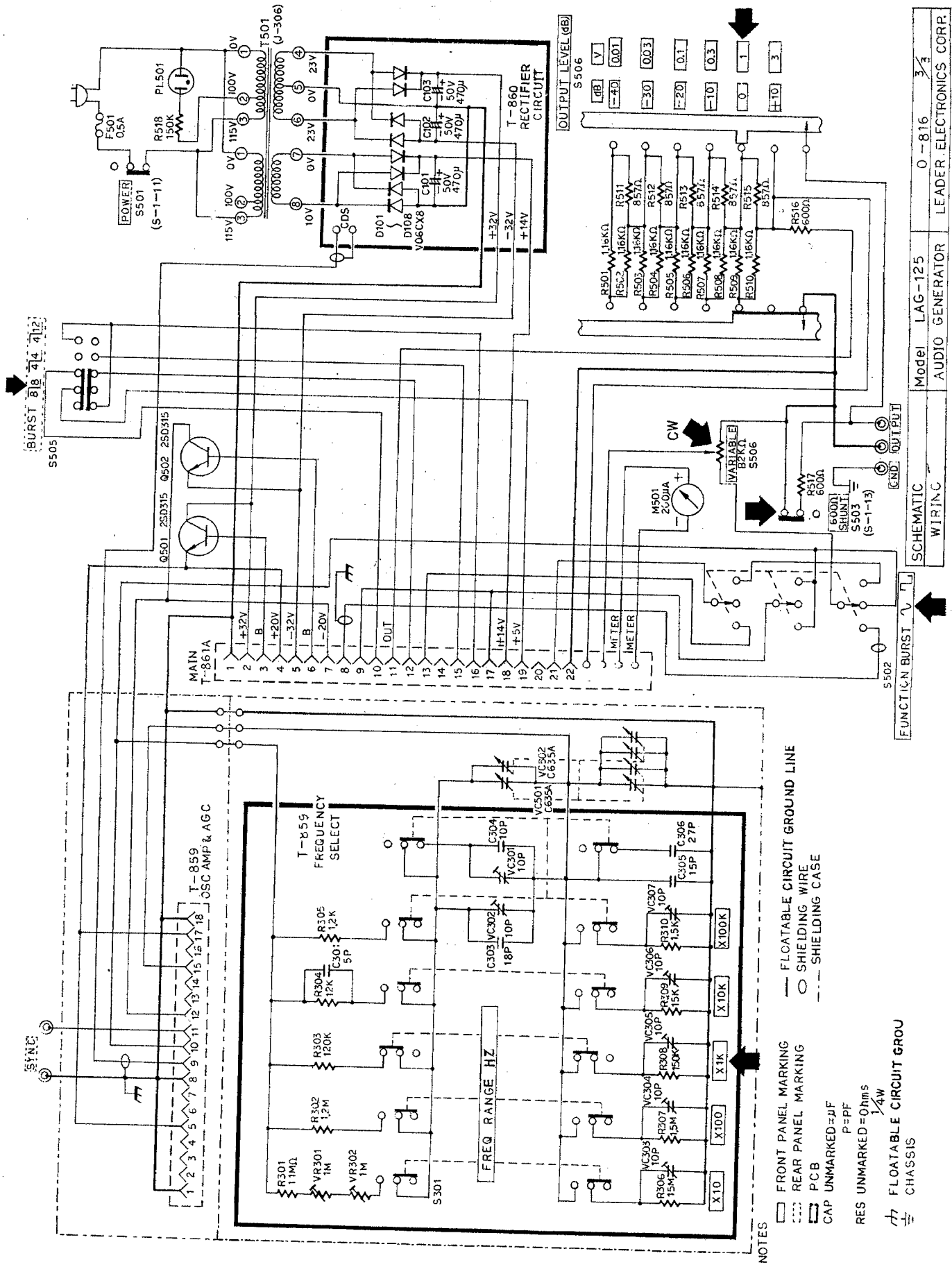
SCHEMATIC	Model	LAG 125	0-816	1/3
OSCAMP & AGC		AUDIO GENERATOR	LEADER	ELECTRONICS CORP.

T-859A

FUNCTION BURST  
 S505 8/8 4/4 4/12 4/12 4/12  
 S505 8/8 4/4 4/12 4/12 4/12



SCHMATIC	Model - LAG 125	0-816	2/3
MAIN	AUDIO GENERATOR	LEADER ELECTRONICS CORP.	



Model LAG-125  
AUDIO GENERATOR

Model 0-816  
3/3

SCHEMATIC  
WIRING

LEADER ELECTRONICS CORP.

- NOTES
- FRONT PANEL MARKING
  - REAR PANEL MARKING
  - SHIELDING WIRE
  - SHIELDING CASE
  - PCB
  - UNMARKED
  - RES UNMARKED = 0hms
  - P = PF
  - 1/4W
  - /// FLOATABLE CIRCUIT GROU
  - ⊥ CHASSIS