

1. **Bias and Balance Settings and Voltage Checks**
Turn unit ON - watch carefully for any signs of voltage shorts. With bias pots (1k) still full ccw (from top of unit), check supply for 48 to 50. Now adjust balance pots (10k) for app. 25 volts from GEM each 1000/50 to ground. Adjust bias pots for .8 ma. current from each test point in the rear of the unit to ground
Check tone control supply for 25V ($\pm 10\%$)
2. **Sensitivity Check**
 - a. Audio Oscillator to EXTRA at .3 (± 2 db) input. Connect 8 ohm load to Main speaker taps. Turn loudness pot to maximum. Observe output of 18 watts (12V). Check tape output jack with trouble shooting lead for the same output as input signal. At this point recheck bias for .8 ma.
 - b. Audio Oscillator to Tuner at .35 (± 2 db) input. Connect 8 ohm to Main Speaker taps. Turn Loudness pot to maximum. Observe Output of 18 watts (12V).
3. **Distortion Check**
At 12V output, max. distortion .6%.
4. **Tape Monitor Switch Check**
Audio Oscillator to EXTRA at .3 input to L channel. Note output at left channel speaker terminal. Put Tape Monitor switch in the IN position. Note loss of output. Connect cable from L channel tape out to L channel tape in. Note restoration of signal out. Repeat process for R channel then return tape monitor to OUT position.
5. **Speakers Switch Check and Phone Jack Check**
Speakers switch to OFF position. Note complete loss of signal. Loudness to min., insert phone plug to phone jacks, remove speaker leads and connect to phone plug leads. Loudness to max., note drop of 26 ± 2 db. Switch main speakers on, note restoration of signal. Switch remote speakers on, note drop in output of 1 to 2 db. Repeat for remote speaker terminals.
6. **Crosstalk and Stereo Switch Check**
At 1kc, turn loudness pot to #10 flat - return input voltage to .3. Mono-Stereo switch to Stereo. Balance switch to bal. L, note drop of 0 db. Balance switch to bal. R, note additional drop of 50 db. Return input voltage to previous setting Loudness pot to max., output to 0 db on Lv scale.
7. **Tone Control Check ("0" db lv scale)**

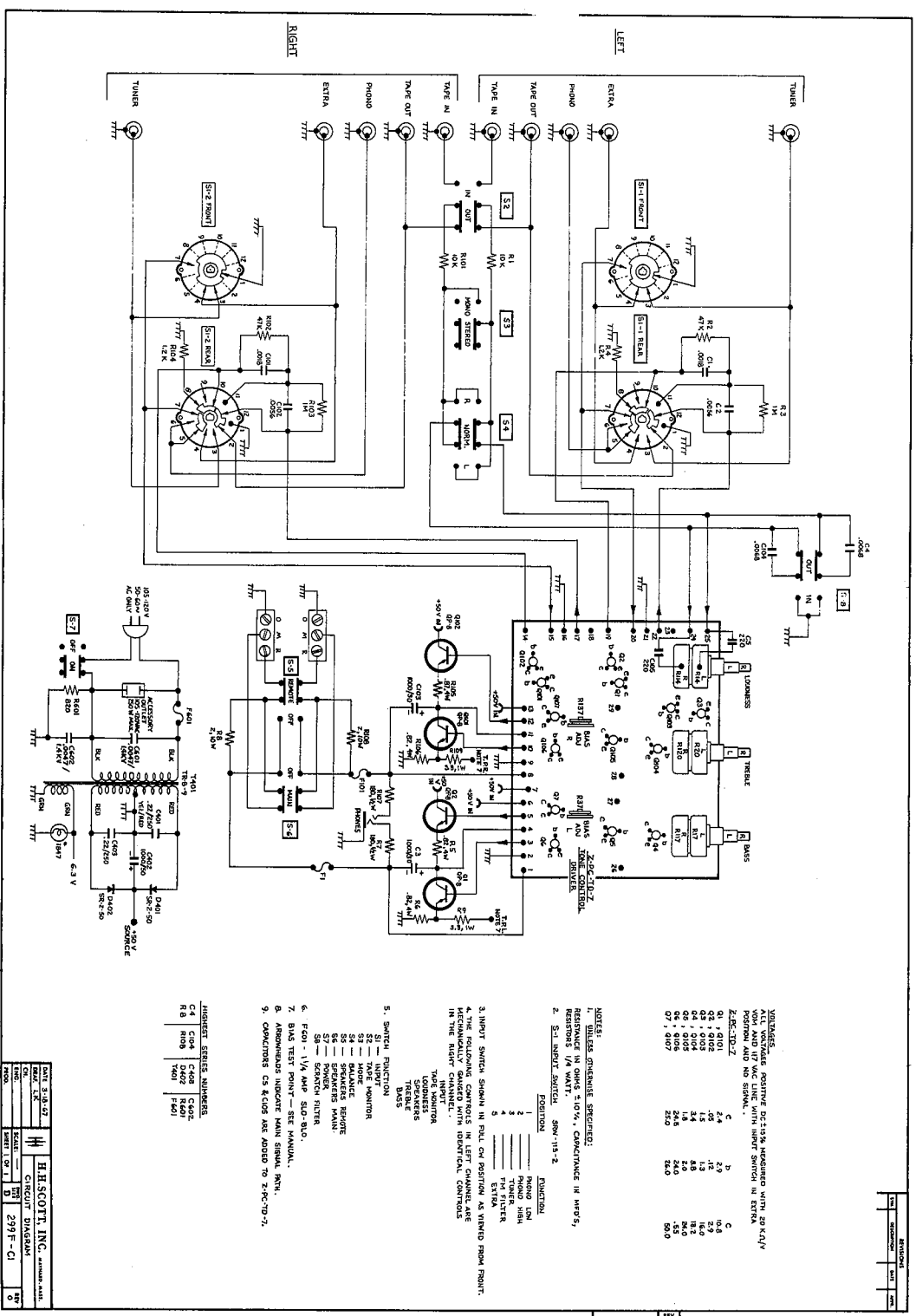
Bass	Treble
Boost 10 db ± 2 db	Boost 10 db ± 2 db
Cut 15 db ± 2 db	Cut 10 db ± 2 db
8. **Frequency Response Check**
3 db down @ 20 cps or lower
3 db down @ 30 kc
9. **Regulation Check**
At 1 kc, load out - output rise 1 db maximum
10. **Noise Filter Check**
At 5 kc noise filter to "in" note 4 ± 2 db drop.
11. **Preamplifier Gain Check**
Attenuate input 35 db from .3 at 1 kc input switch to phono high, input leads to phono, note output of 12v. Attenuate 5 db more, input switch to phono low, note 12V output.
12. **Preamplifier Frequency Response Check**
 - a. **Tuner**
3 db down @ 20 cps or lower, 1 db down @ 15 kc.
Sharp drop off beginning @ 17 to 20 kc bottoming at 35 to 38 kc (approx. 40 db down).
 - b. **Phono**

Position	Loudness Pot	Max. Hum
Extra	0	3 mV
Extra	10	5 mV
Phono High	10	30 mV
Phono Low	10	30 mV
Tuner	10	10 mV
13. **Hum Checks**

Position	Loudness Pot	Max. Hum
Extra	0	3 mV
Extra	10	5 mV
Phono High	10	30 mV
Phono Low	10	30 mV
Tuner	10	10 mV
14. Repeat Steps 2 through 13 for R channel.

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SERVICE BULLETIN
FOR
MODEL 299F SOLID STATE STEREO AMPLIFIER



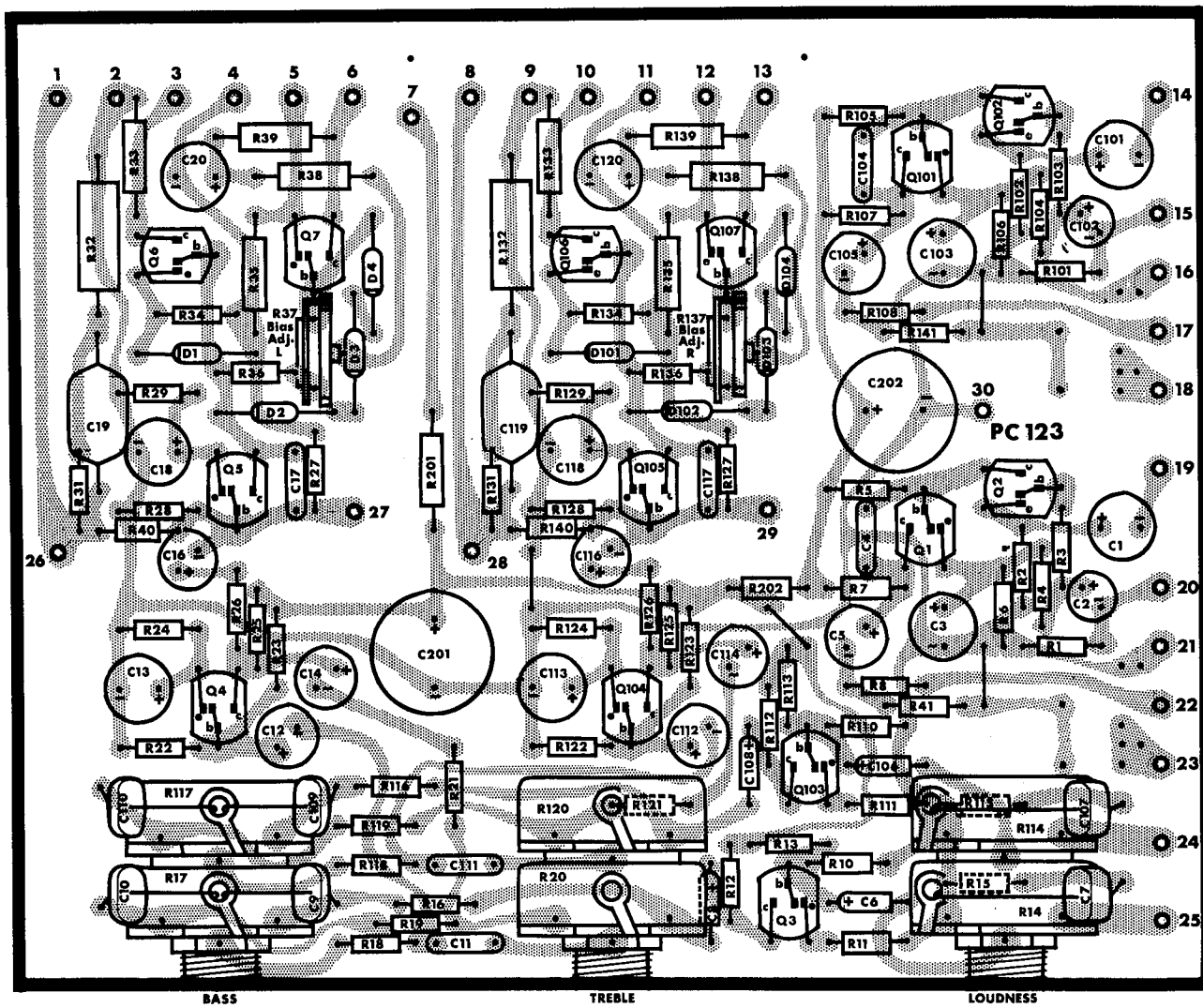
NOTES: RESISTORS SHOWN IN FULL OHM POSITION AS VIEWED FROM FRONT.

RESISTOR	POSITION	FUNCTION
R1	1	TUNER
R2	2	PHONO
R3	3	EXTRA
R4	4	PHONO
R5	5	PHONO
R6	6	PHONO
R7	7	PHONO
R8	8	PHONO
R9	9	PHONO
R10	10	PHONO

1. INPUT SWITCH SHOWN IN FULL OHM POSITION AS VIEWED FROM FRONT.
2. INPUT VOLTAGES COMPARE IN LEFT CHANNEL AND IN THE RIGHT CHANNEL.
3. TAPES MONITOR SWITCH, 299F-115-2.
4. BALANCE POT, 299F-115-3.
5. SWITCH FUNCTION:
S1 - TUNER
S2 - PHONO
S3 - PHONO
S4 - PHONO
6. PHONO - 1/4 AMP SLD-SLD.
7. BAL TEST POINT - SEE MANUAL.
8. AMPHIBIOUS INDICATE MAIN SIGNAL, NPN.
9. COMPONENTS C2 & C10 ARE ADDED TO 299F-7.

LARGEST SERIES NUMBERS

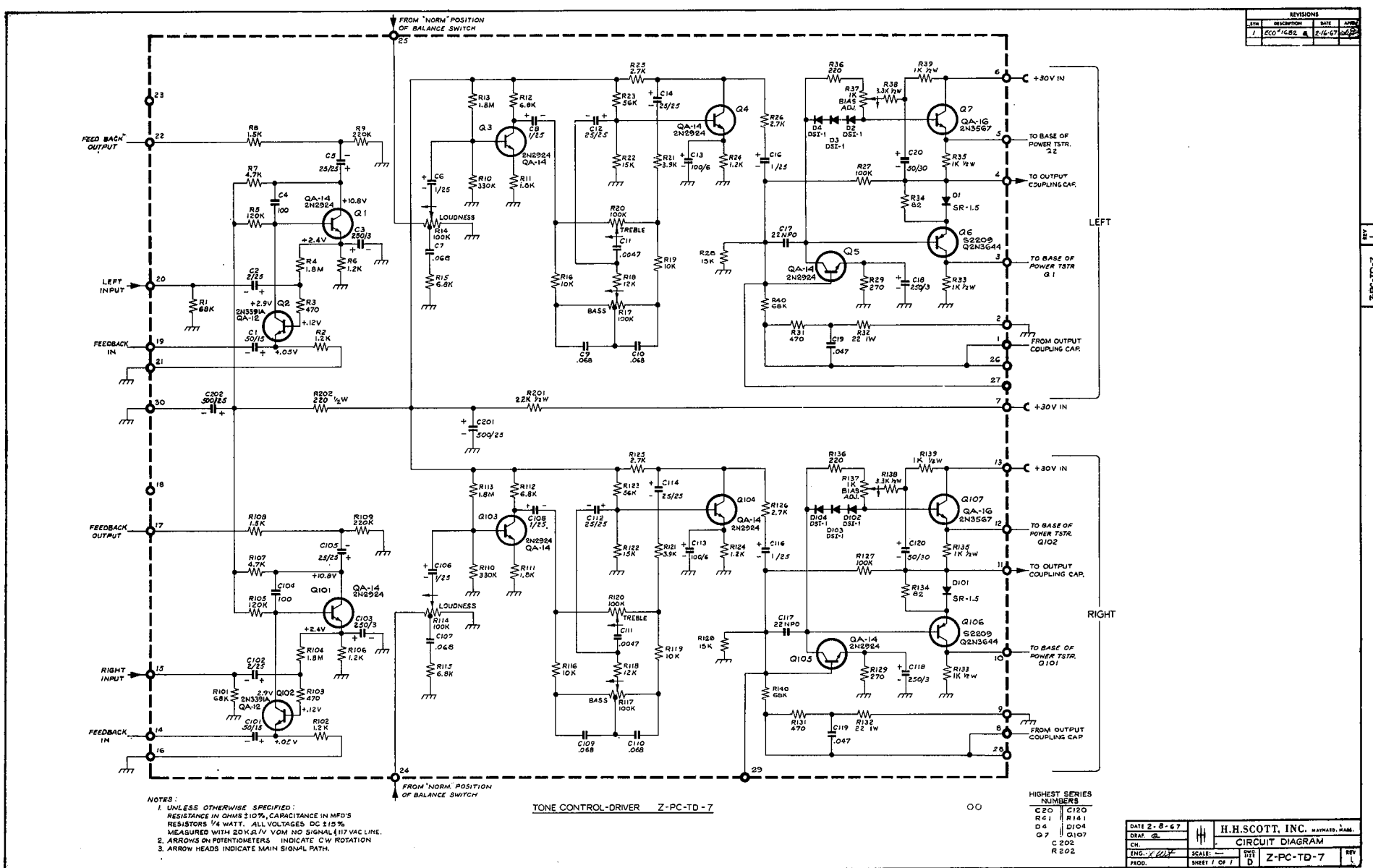
COMPONENT	VALUE	FUNCTION
C1	100K	PHONO
C2	100K	PHONO
C3	100K	PHONO
C4	100K	PHONO
C5	100K	PHONO
C6	100K	PHONO
C7	100K	PHONO
C8	100K	PHONO
C9	100K	PHONO
C10	100K	PHONO



- Q1 QA-14
- Q101 QA-14
- Q2 QA-12
- Q102 QA-12
- Q3 QA-14
- Q103 QA-14
- Q4 QA-14
- Q104 QA-14
- Q5 QA-16
- Q105 QA-16
- Q6 QA-11
- Q106 QA-11
- Q7 QA-10
- Q107 QA-10

TONE CONTROL-DRIVER Z-PC-TD-7

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NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 RESISTANCE IN OHMS ±10%, CAPACITANCE IN MFD'S
 RESISTORS 1/4 WATT, ALL VOLTAGES DC ±10%
 MEASURED WITH 20K R/V VOM NO SIGNAL (117 VAC LINE).
 2. ARROWS ON POTENTIOMETERS INDICATE C.W. ROTATION
 3. ARROW HEADS INDICATE MAIN SIGNAL PATH.

TONE CONTROL-DRIVER Z-PC-TD-7

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HIGHEST SERIES
 NUMBERS
 C20 C190
 R41 R141
 D4 D104
 G7 G107
 C202
 R202

DATE 2-8-67	H.H. SCOTT, INC. WATSON, MASS.
DESIGNER	CIRCUIT DIAGRAM
ENG. J. J. J.	SCALE: 1" = 1"
PROD.	SHEET 1 OF 1

Z-PC-TD-7