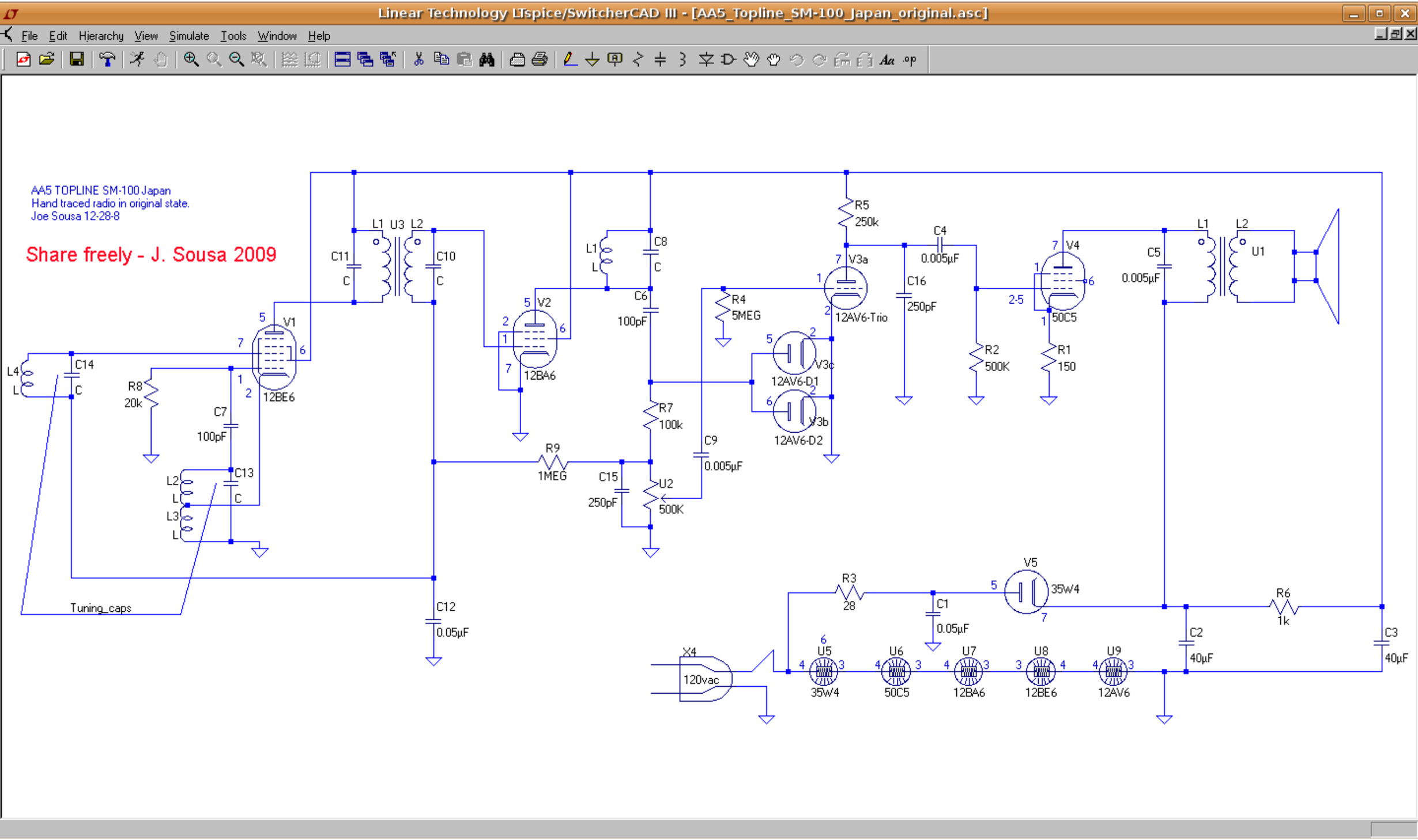
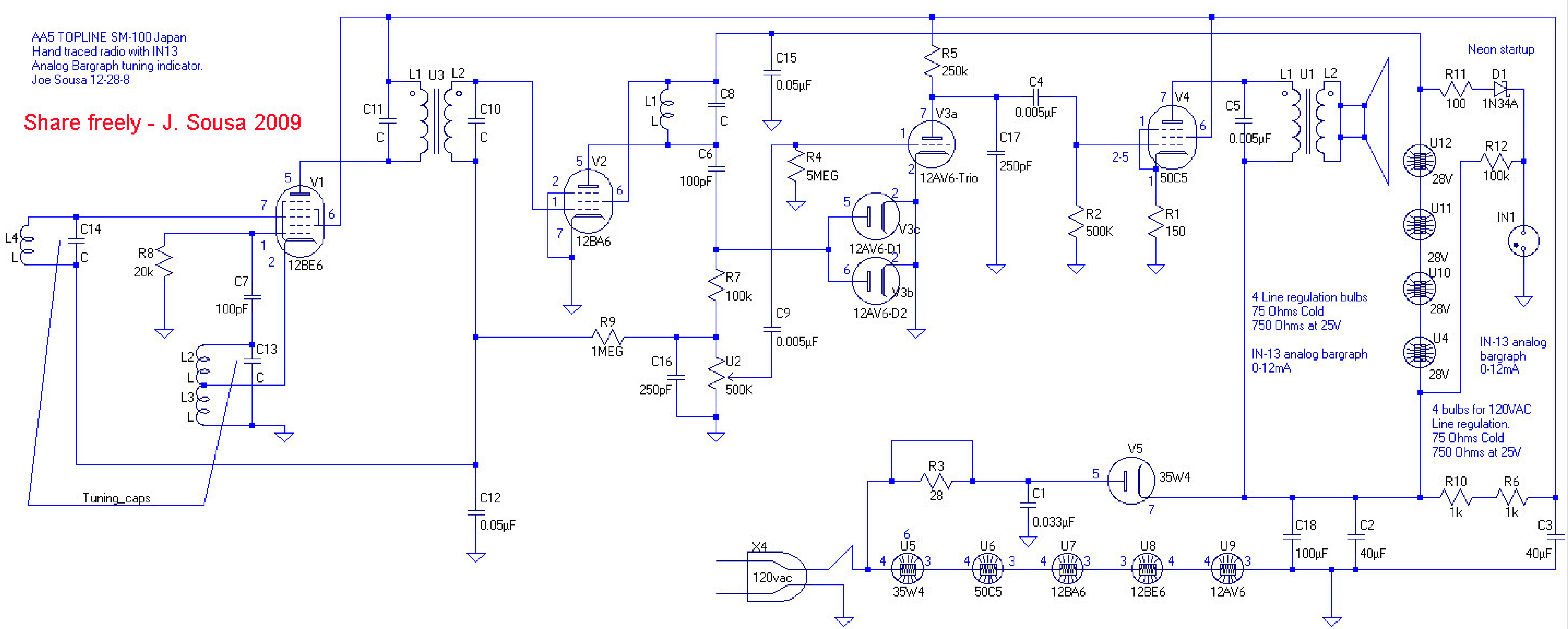

Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_original.asc]
File Edit Hierarchy View Simulate Tools Window Help
AA5 TOPLINE SM-100 Japan
Hand traced radio in original state.
Joe Sousa 12-28-8
Share freely - J. Sousa 2009
L1 U3 L2
C11
C10
C8
C6
100pF
R5
250k
C4
0.005µF
C16
250pF
R4
5MEG
V1
12BE6
V2
12BA6
V3a
12AV6-Trio
V3c
12AV6-D1
V3b
12AV6-D2
V4
50C5
R2
500K
R1
150
C5
0.005µF
L1 L2
U1
L4
C14
R8
20k
C7
100pF
L2
L3
C13
R9
1MEG
C15
250pF
R7
100k
C9
0.005µF
U2
500K
Tuning_caps
C12
0.05µF
V5
35W4
R3
28
C1
0.05µF
R6
1k
C2
40µF
C3
40µF
X4
120vac
U5
35W4
U6
50C5
U7
12BA6
U8
12BE6
U9
12AV6

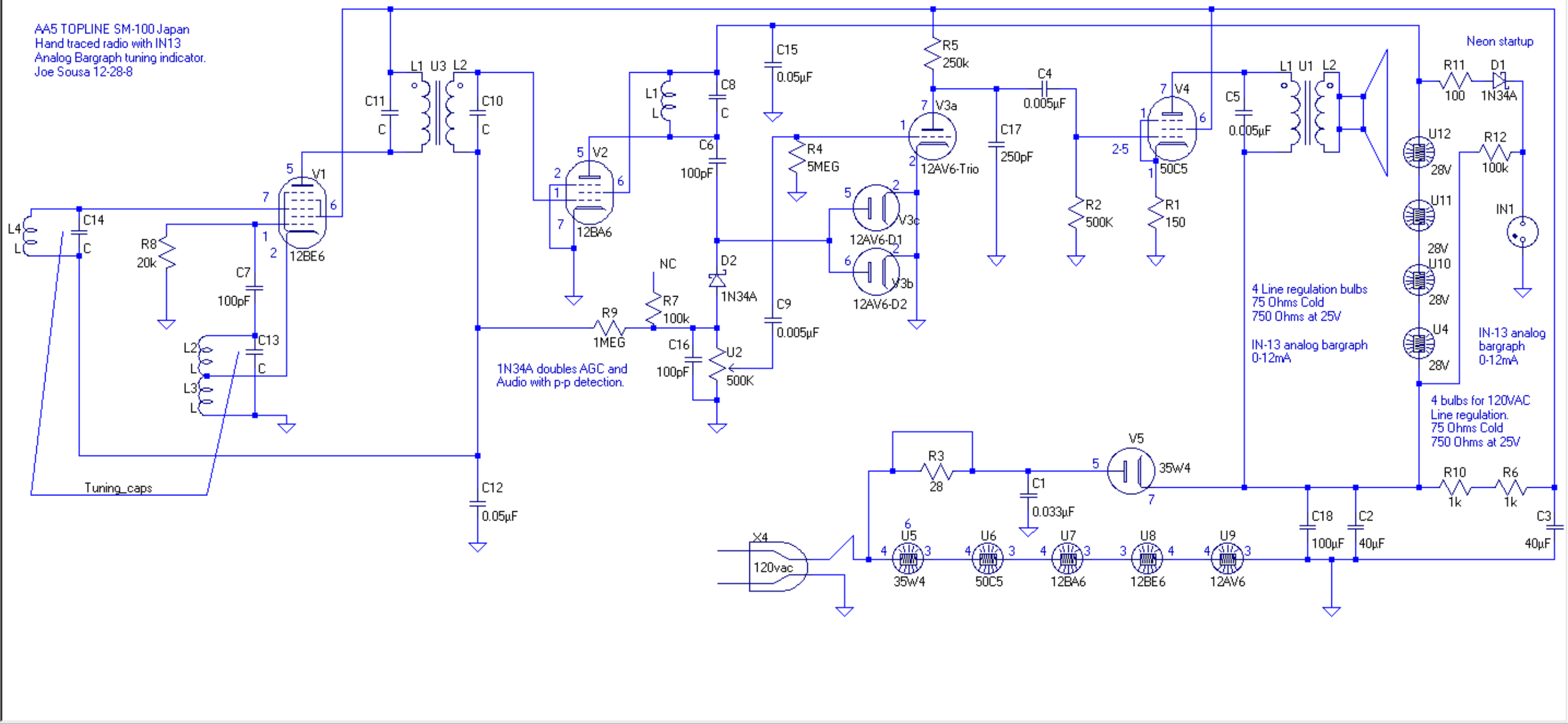
Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13.asc]

File Edit Hierarchy View Simulate Tools Window Help



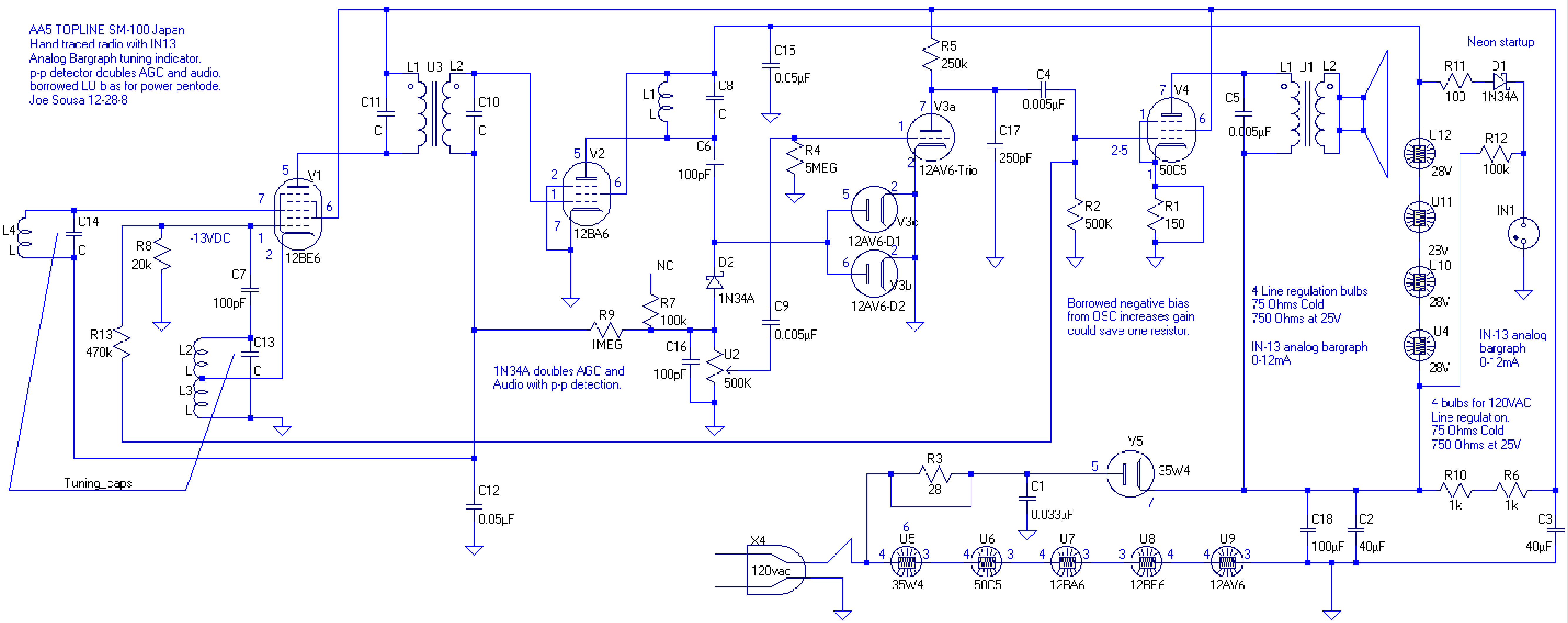
Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13_p-p_detector.asc]

File Edit Hierarchy View Simulate Tools Window Help



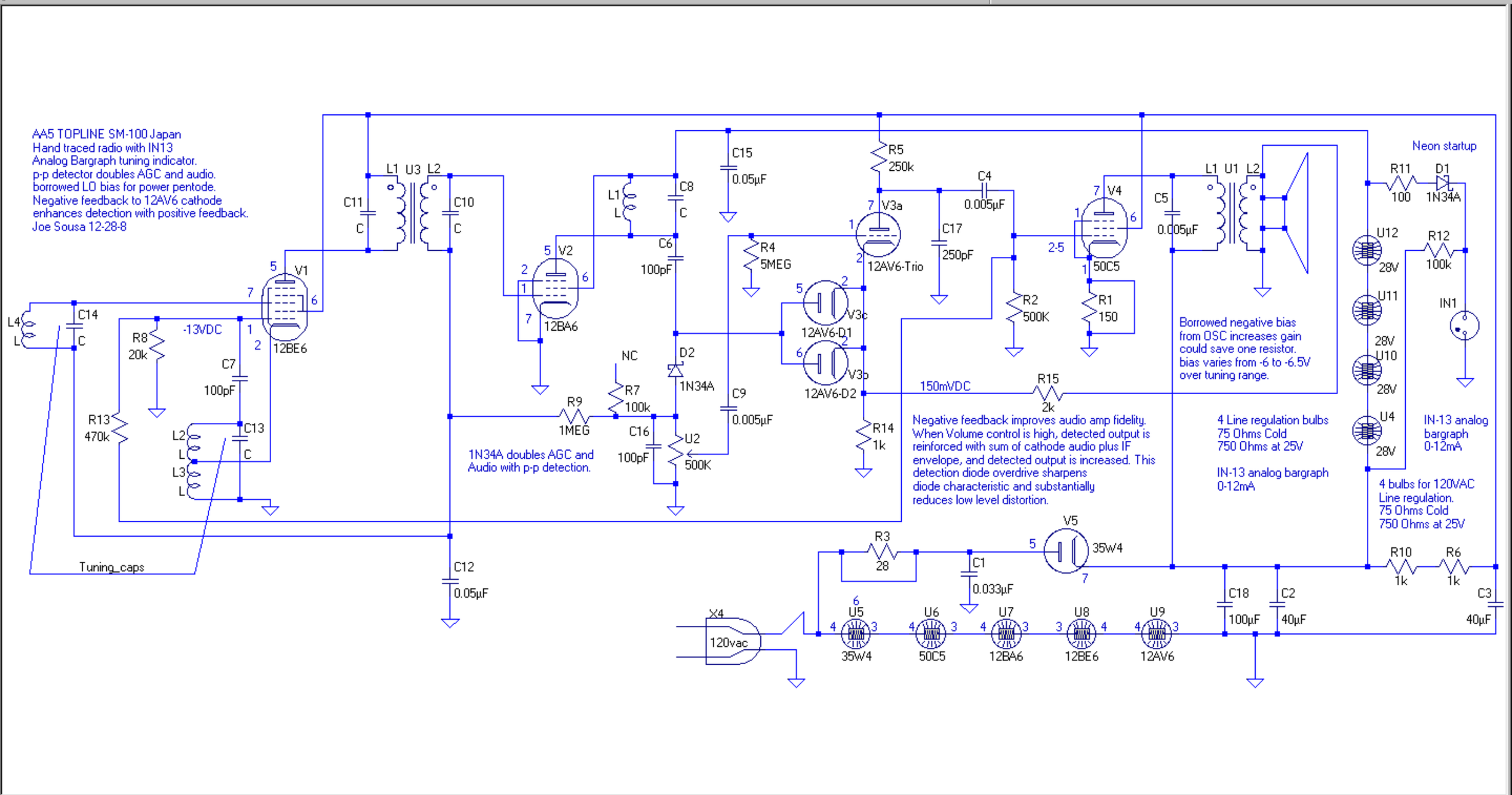
Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13_p-p_detector_OSC_bias.asc]

File Edit Hierarchy View Simulate Tools Window Help



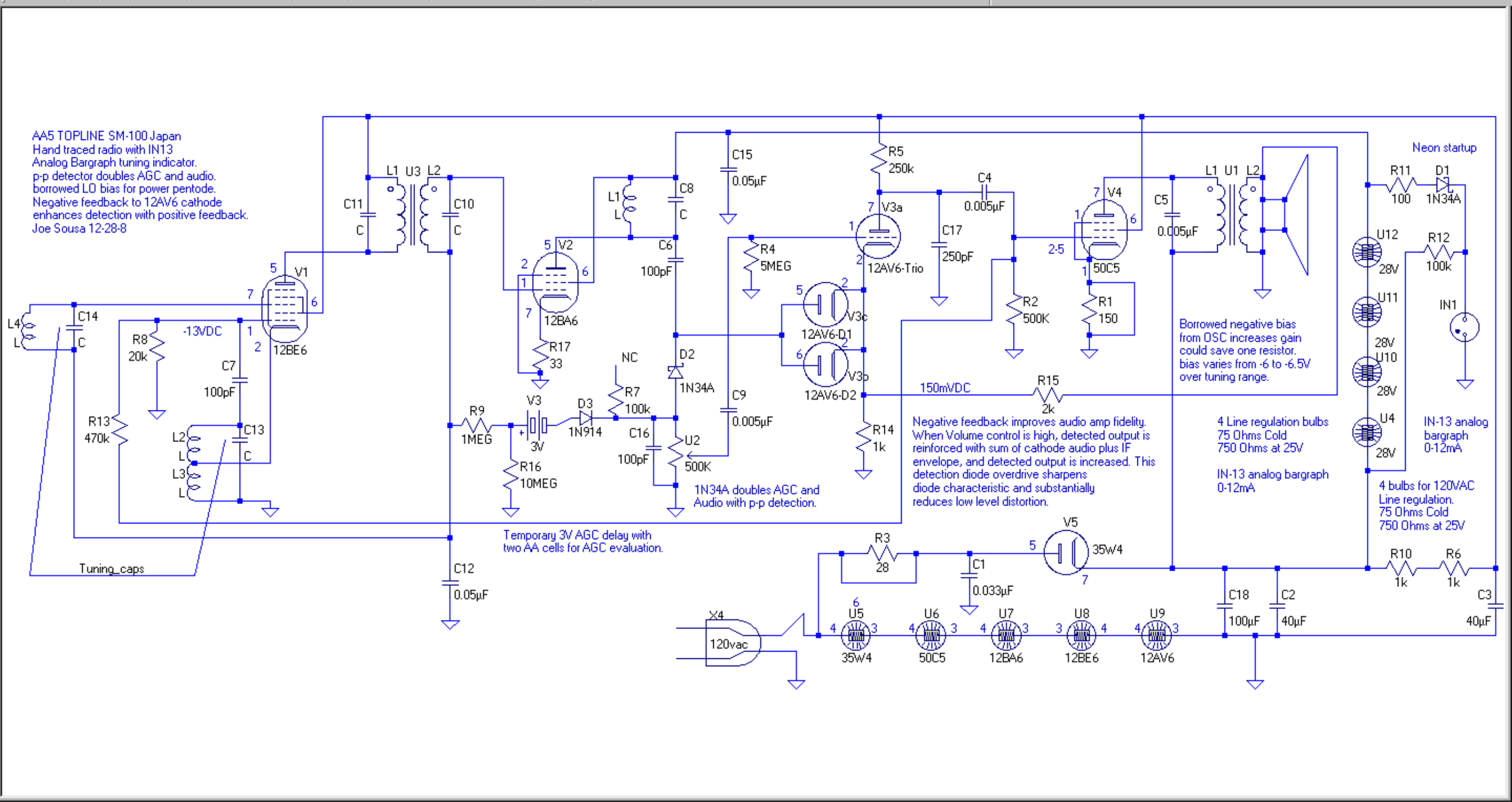
Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13_p-p_detector_OSC_bias_NFB-PFB.asc]

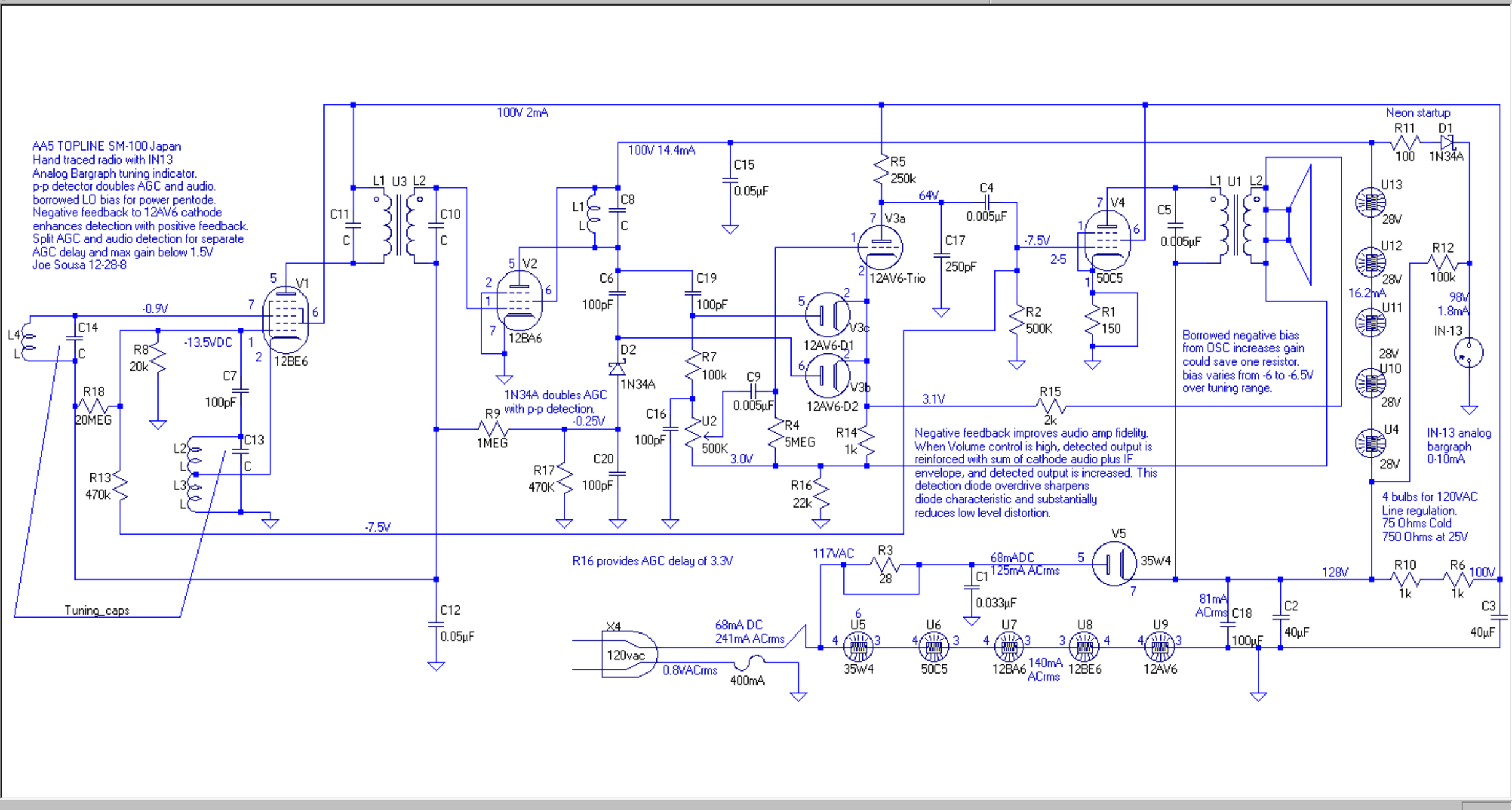
File Edit Hierarchy View Simulate Tools Window Help



Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13_p-p_detector_OSC_bias_NFB-PFB_AGC-3Vdelay.asc]

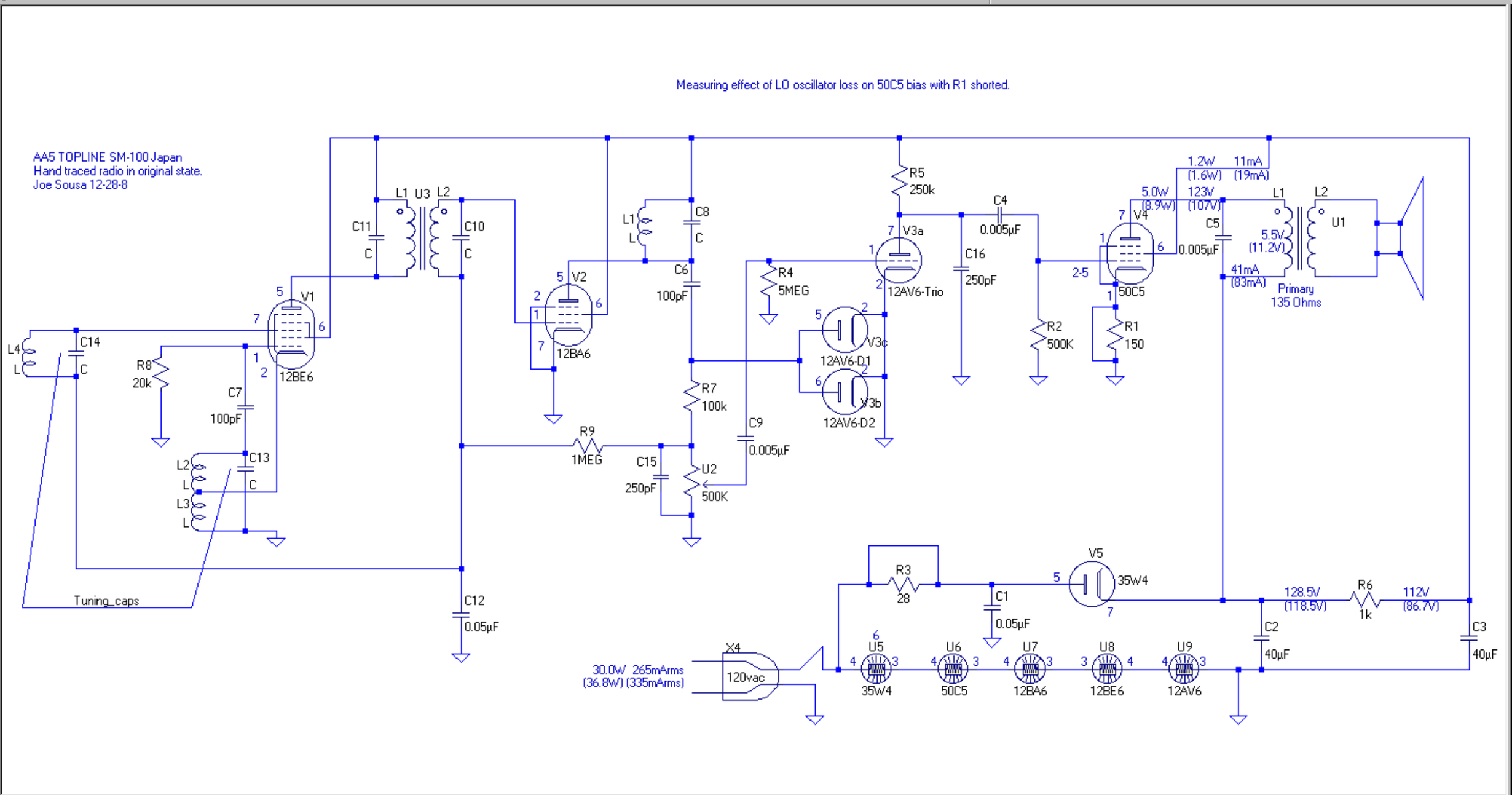
File Edit Hierarchy View Simulate Tools Window Help

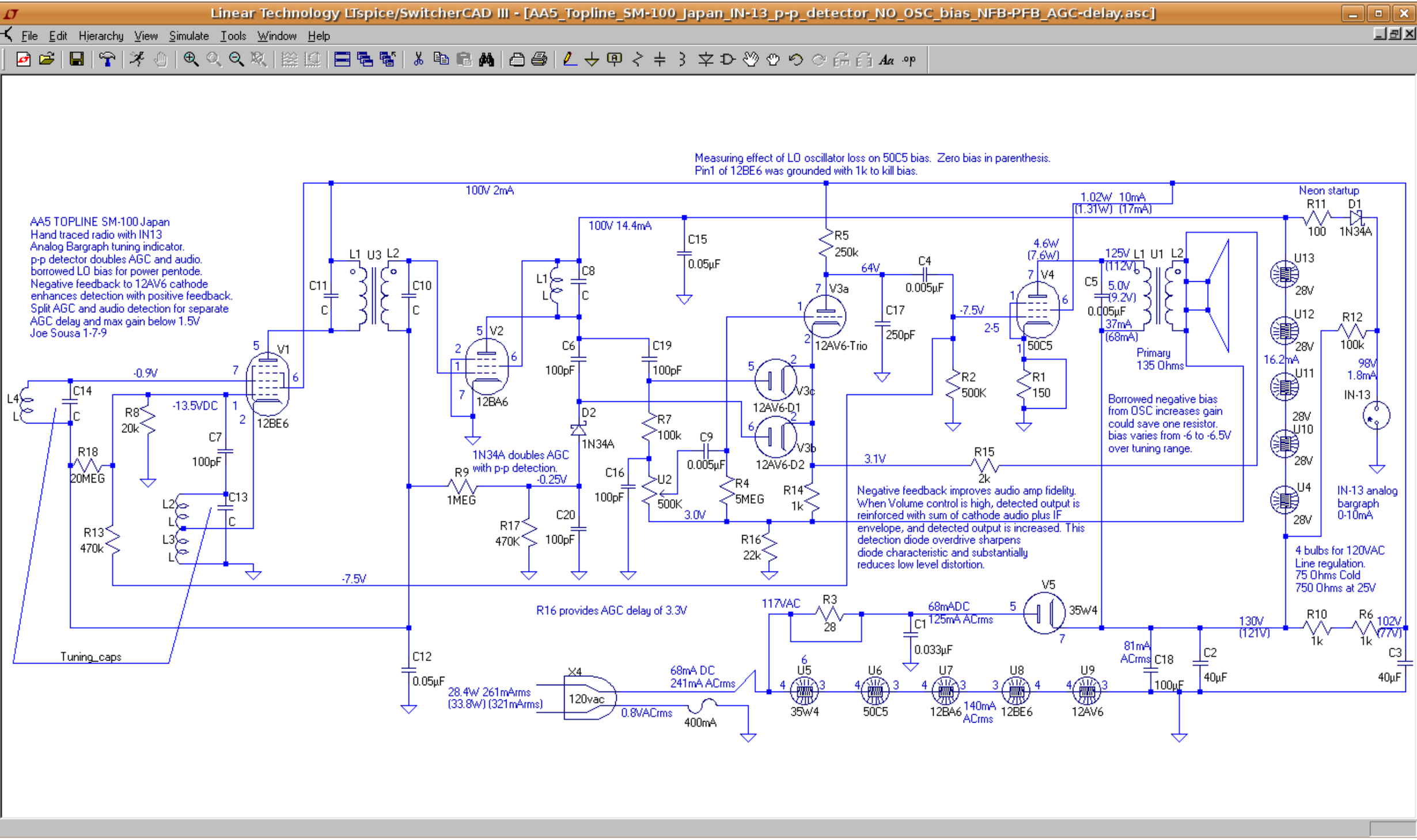



Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13_p-p_detector_OSC_bias_NFB-PFB_AGC-delay.asc]
File Edit Hierarchy View Simulate Tools Window Help
AA5 TOPLINE SM-100 Japan
Hand traced radio with IN13
Analog Bargraph tuning indicator.
p-p detector doubles AGC and audio.
borrowed LO bias for power pentode.
Negative feedback to 12AV6 cathode
enhances detection with positive feedback.
Split AGC and audio detection for separate
AGC delay and max gain below 1.5V
Joe Sousa 12-28-8
100V 2mA
100V 14.4mA
Neon startup
R11 100
D1 1N34A
L1 U3 L2
C11 C
C10 C
C15 0.05µF
L1 C8 C
R5 250k
64V
C4 0.005µF
C17 250pF
V3a 12AV6-Trio
-7.5V
2-5
V4 50C5
C5 0.005µF
L1 U1 L2
R2 500K
R1 150
Borrowed negative bias
from OSC increases gain
could save one resistor.
bias varies from -6 to -6.5V
over tuning range.
U13 28V
U12 28V
16.2mA
U11 28V
U10 28V
U4 28V
R12 100k
98V
1.8mA
IN-13
IN-13 analog
bargraph
0-10mA
V1 12BE6
-0.9V
-13.5VDC
L4 L
C14 C
R8 20k
R18 20MEG
R13 470k
C7 100pF
L2 L
L3 L
C13 C
C6 100pF
C19 100pF
V2 12BA6
D2 1N34A
1N34A doubles AGC
with p-p detection.
-0.25V
R9 1MEG
R17 470K
C20 100pF
R7 100k
C9 0.005µF
C16 100pF
U2 500K
3.0V
R4 5MEG
R14 1k
R16 22k
V3c 12AV6-D1
V3b 12AV6-D2
3.1V
R15 2k
Negative feedback improves audio amp fidelity.
When Volume control is high, detected output is
reinforced with sum of cathode audio plus IF
envelope, and detected output is increased. This
detection diode overdrive sharpens
diode characteristic and substantially
reduces low level distortion.
4 bulbs for 120VAC
Line regulation.
75 Ohms Cold
750 Ohms at 25V
R16 provides AGC delay of 3.3V
117VAC
R3 28
C1 0.033µF
68mADC
125mA ACrms
V5 35W4
128V
R10 1k
R6 1k
100V
C3 40µF
C2 40µF
81mA
ACrms
C18 100µF
X4
120vac
0.8VACrms
400mA
68mA DC
241mA ACrms
U5 35W4
U6 50C5
U7 12BA6
140mA
ACrms
U8 12BE6
U9 12AV6
C12 0.05µF
Tuning_caps
-7.5V

Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_original_no_50C5_bias.asc]

File Edit Hierarchy View Simulate Tools Window Help




Linear Technology LTspice/SwitcherCAD III - [AA5_Topline_SM-100_Japan_IN-13_p-p_detector_NO_OSC_bias_NFB-PFB_AGC-delay.asc]
File Edit Hierarchy View Simulate Tools Window Help
Measuring effect of LO oscillator loss on 50C5 bias. Zero bias in parenthesis.
Pin1 of 12BE6 was grounded with 1k to kill bias.
AA5 TOPLINE SM-100 Japan
Hand traced radio with IN13
Analog Bargraph tuning indicator.
p-p detector doubles AGC and audio.
borrowed LO bias for power pentode.
Negative feedback to 12AV6 cathode
enhances detection with positive feedback.
Split AGC and audio detection for separate
AGC delay and max gain below 1.5V
Joe Sousa 1-7-9
100V 2mA
100V 14.4mA
1.02W 10mA
(1.31W) (17mA)
Neon startup
4.6W
(7.6W)
125V (112V)
5.0V
(9.2V)
37mA
(68mA)
Primary
135 Ohms
16.2mA
98V
1.8mA
IN-13
IN-13 analog
bargraph
0-10mA
Borrowed negative bias
from OSC increases gain
could save one resistor.
bias varies from -6 to -6.5V
over tuning range.
1N34A doubles AGC
with p-p detection.
Negative feedback improves audio amp fidelity.
When Volume control is high, detected output is
reinforced with sum of cathode audio plus IF
envelope, and detected output is increased. This
detection diode overdrive sharpens
diode characteristic and substantially
reduces low level distortion.
4 bulbs for 120VAC
Line regulation.
75 Ohms Cold
750 Ohms at 25V
R16 provides AGC delay of 3.3V
Tuning_caps
117VAC
68mADC
125mA ACrms
130V
(121V)
102V
(77V)
81mA
ACrms
68mA DC
241mA ACrms
28.4W 261mArms
(33.8W) (321mArms)
0.8VACrms
400mA
140mA
ACrms
-0.9V
-13.5VDC
-0.25V
-7.5V
3.1V
3.0V
64V
2-5
V1
12BE6
V2
12BA6
V3a
V3b
V3c
12AV6-Trio
12AV6-D1
12AV6-D2
V4
50C5
V5
35w4
U1
U2
U3
U4
U5
U6
U7
U8
U9
U10
U11
U12
U13
X4
120vac
35W4
50C5
12BA6
12BE6
12AV6
28V
16.2mA
L1
L2
L3
L4
C1 0.033µF
C2 40µF
C3 40µF
C4 0.005µF
C5 0.005µF
C6 100pF
C7 100pF
C8
C9 0.005µF
C10
C11
C12 0.05µF
C13
C14
C15 0.05µF
C16 100pF
C17 250pF
C18 100µF
C19 100pF
C20 100pF
D1 1N34A
D2 1N34A
R1 150
R2 500K
R3 28
R4 5MEG
R5 250k
R6 1k
R7 100k
R8 20k
R9 1MEG
R10 1k
R11 100
R12 100k
R13 470k
R14 1k
R15 2k
R16 22k
R17 470K
R18 20MEG
U2 500K