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Saavedra et al.

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(54) **HIGH OUTPUT CURRENT TRANSCONDUCTANCE AMPLIFIER**

USPC 330/252–261, 9

[redacted]

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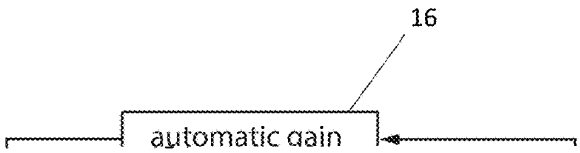
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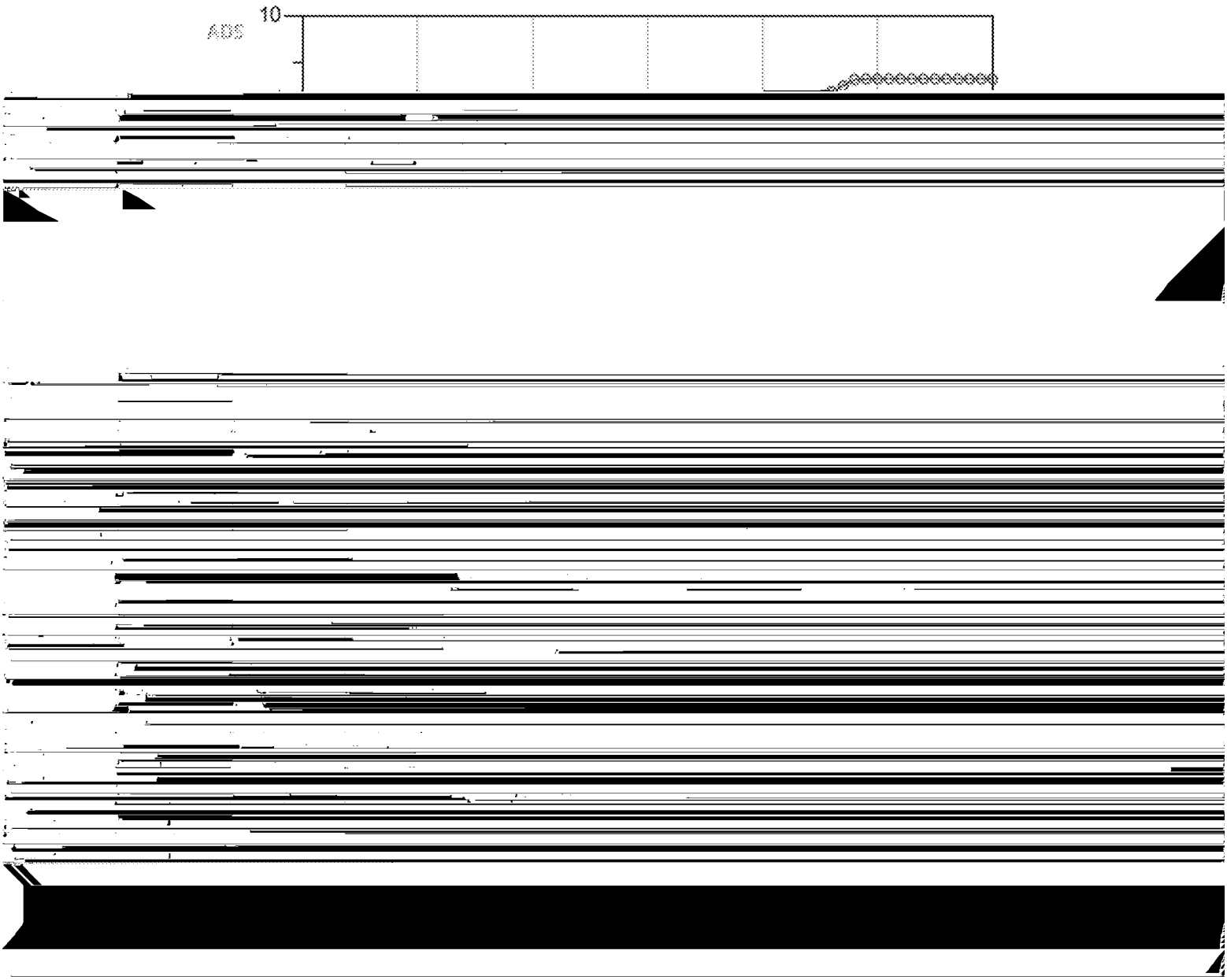
automatic gain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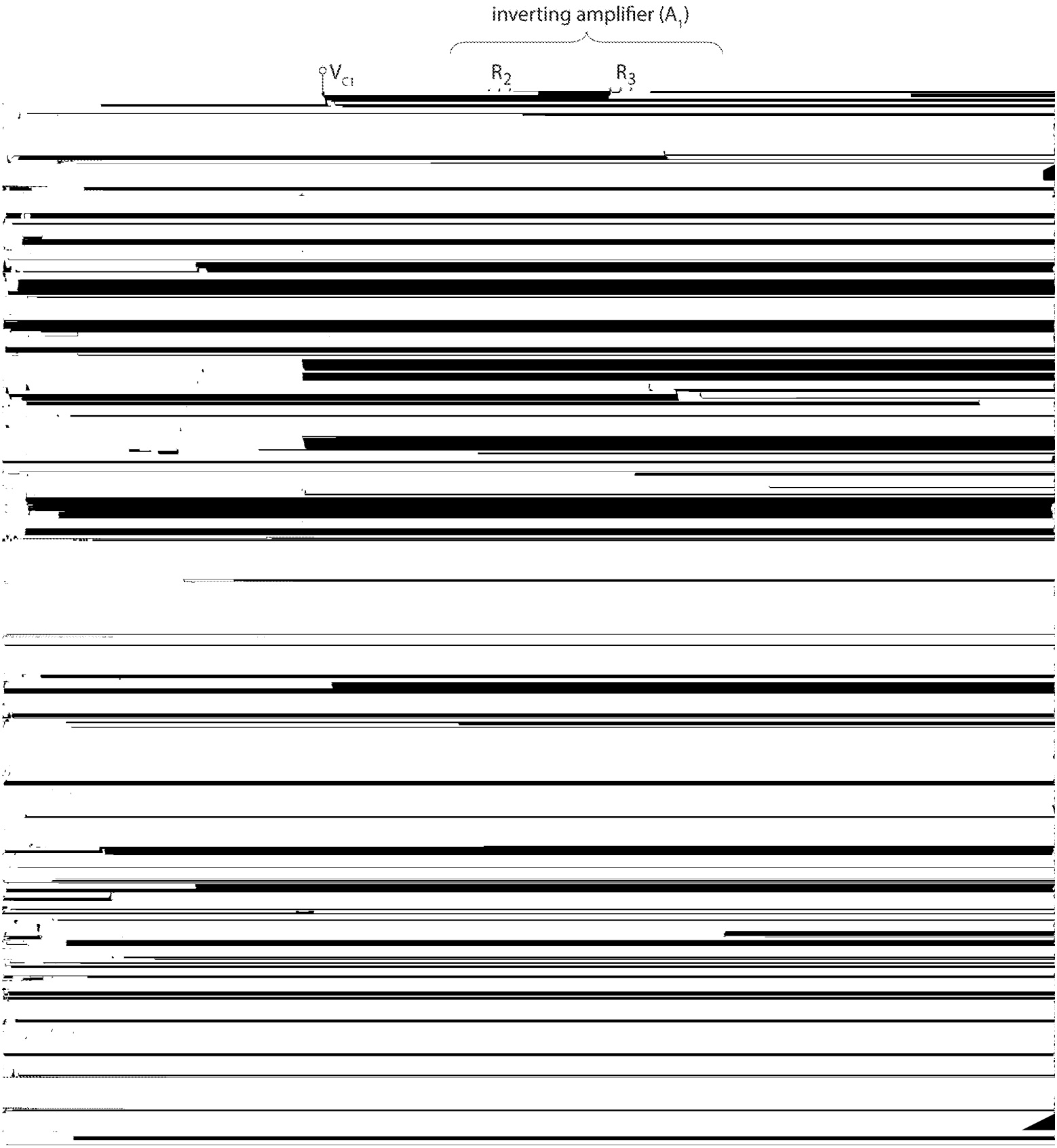
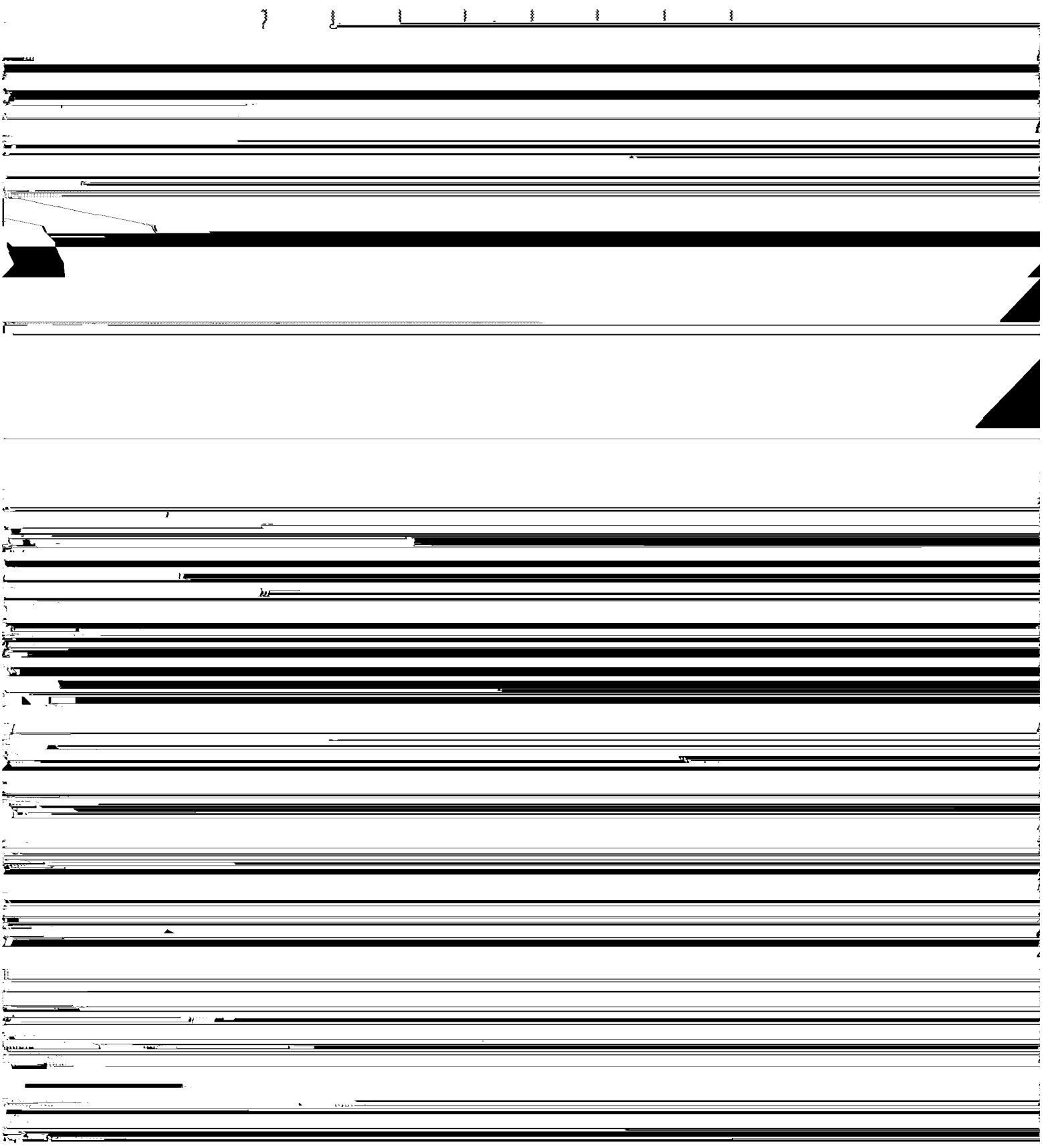
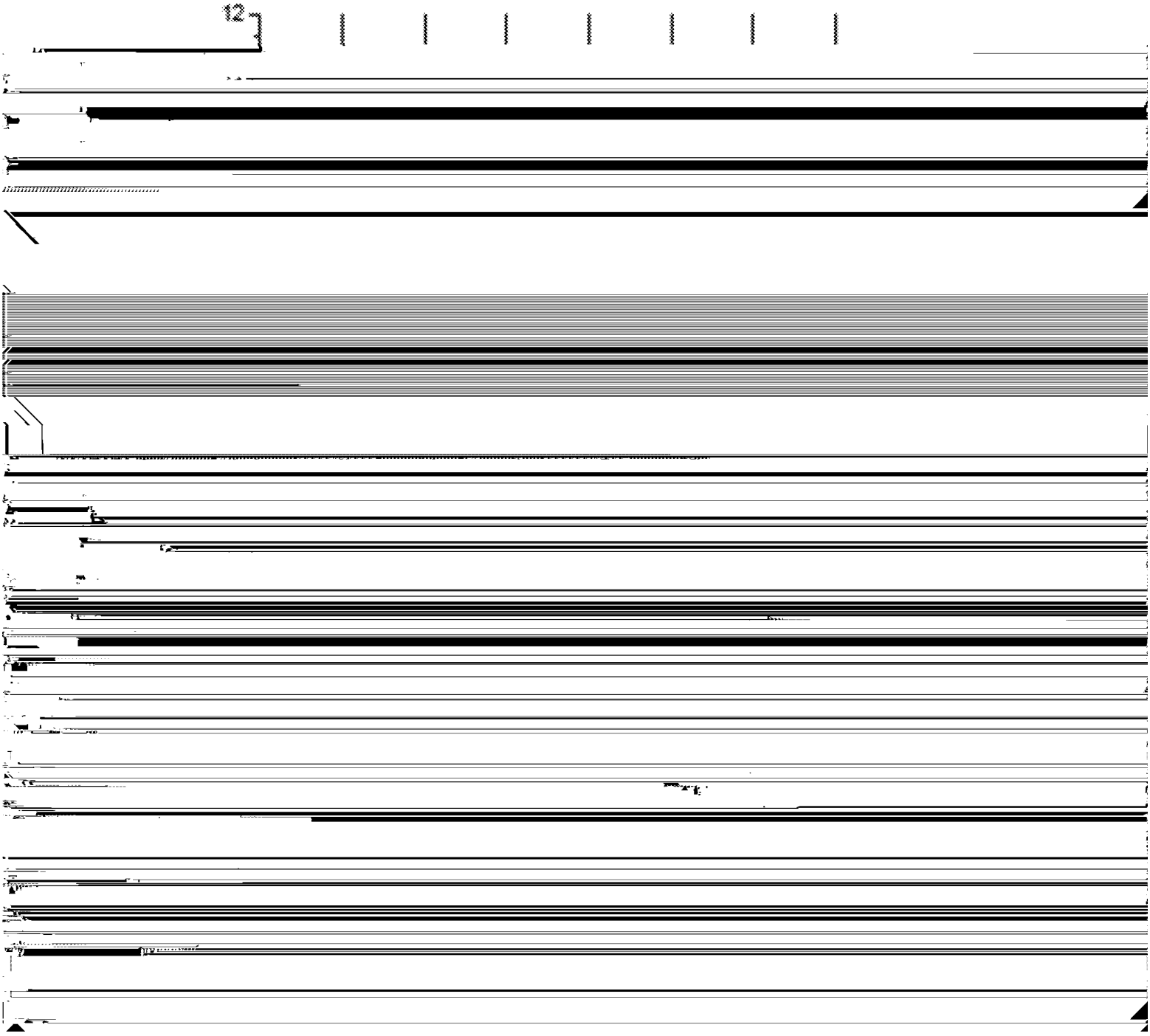
ABS


inverting amplifier (A_1)
V_{C1}
R_2
R_3

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HIGH OUTPUT CURRENT

TRANSCONDUCTANCE AMPLIFIER

RELATED APPLICATION

This application claims the benefit of the filing date of Application No. 62/857,583, filed on Jun. 5, 2019, the contents of which are incorporated herein by reference in their entirety

In one embodiment, the control signals for the first and second VGAs are produced according to a low pass filter transfer function.

In one embodiment, the transconductance amplifier has a current up to at least 7 A peak magnitude

According to embodiments, the at least two HEMTs may comprise a semiconductor material selected from gallium nitride (GaN), gallium arsenide (GaAs), and indium phos-

cannot be implemented in a complementary push-pull configuration as in silicon based designs using NPN and PNP

different time frames. The drivers may also provide voltage amplification and they may provide gate bias voltage to the

bipolar transistors or CMOS transistors. Embodiments HBMTs in the output stage

described herein overcome the limitation imposed by

A schematic diagram of a driver circuitry example accord-

In FIG. **5** the error amplifiers **57***a*, **57***b* are differential amplifiers which may be implemented with OPAMPs. They

buildings, etc., are also used for landmine detection. Such detectors constitute an important application for TGAs

produce a voltage that is the difference between the log of

because they are current pulses applied to large conducting

the peak detector output voltage, $A_{pp} \cdot \log(v_{pp})$ and a ref-

coils to produce a time-varying magnetic field. When a

loop measurements was to evaluate the TCA output current, bandwidth, and output current magnitude control using the TCA input voltage.

a transconductance stage comprising at least two high electron mobility transistors (HEMTs) configured in a non-complementary push-pull arrangement; and

14. The method of claim 10, wherein the AGC feedback network senses a transconductance amplifier output current

[redacted]

and produces control signals for the first and second VGAs.

15. The method of claim 14, wherein the control signals for the first and second VGAs are produced according to a

[redacted]

low pass filter transfer function.

16. The method of claim 10, wherein the transconduc-

[redacted]

tance amplifier has a bandwidth from DC to at least 100 MHz.

17. The method of claim 10, wherein the at least two

[redacted]

HEMTs comprise a semiconductor material selected from gallium nitride (GaN), gallium arsenide (GaAs), and indium phosphide (InP).

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