



Caldwell

Marine International, LLC

CALDWELL MARINE INTERNATIONAL
TECHNICAL PROPOSAL

POSEIDON DC PROJECT
TYPICAL SUBMARINE CABLE INSTALLATION



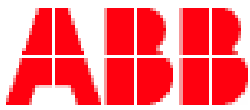


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1 Introduction

Caldwell Marine International is pleased to provide the following preliminary generic proposal for the installation of the HVDC submarine cable circuit, in support of the Poseidon Cable Project. As always, we look forward to providing marine support services for this and all future projects. Based upon our 50 years of marine construction and submarine cable experience *Caldwell Marine International* can provide a highly effective team of professionals experienced with all aspects of submarine cable operations. In addition to our experienced personnel, *Caldwell Marine International* maintains an impressive array of specialized cable handling equipment, cable embedment plows, cable and cable support vessels, and marine facilities.

Caldwell Marine International shall follow the procedure guidelines set forth in this proposal. All work shall be performed in a safe and expedient manner. **No work is so important that safety becomes a secondary issue.**

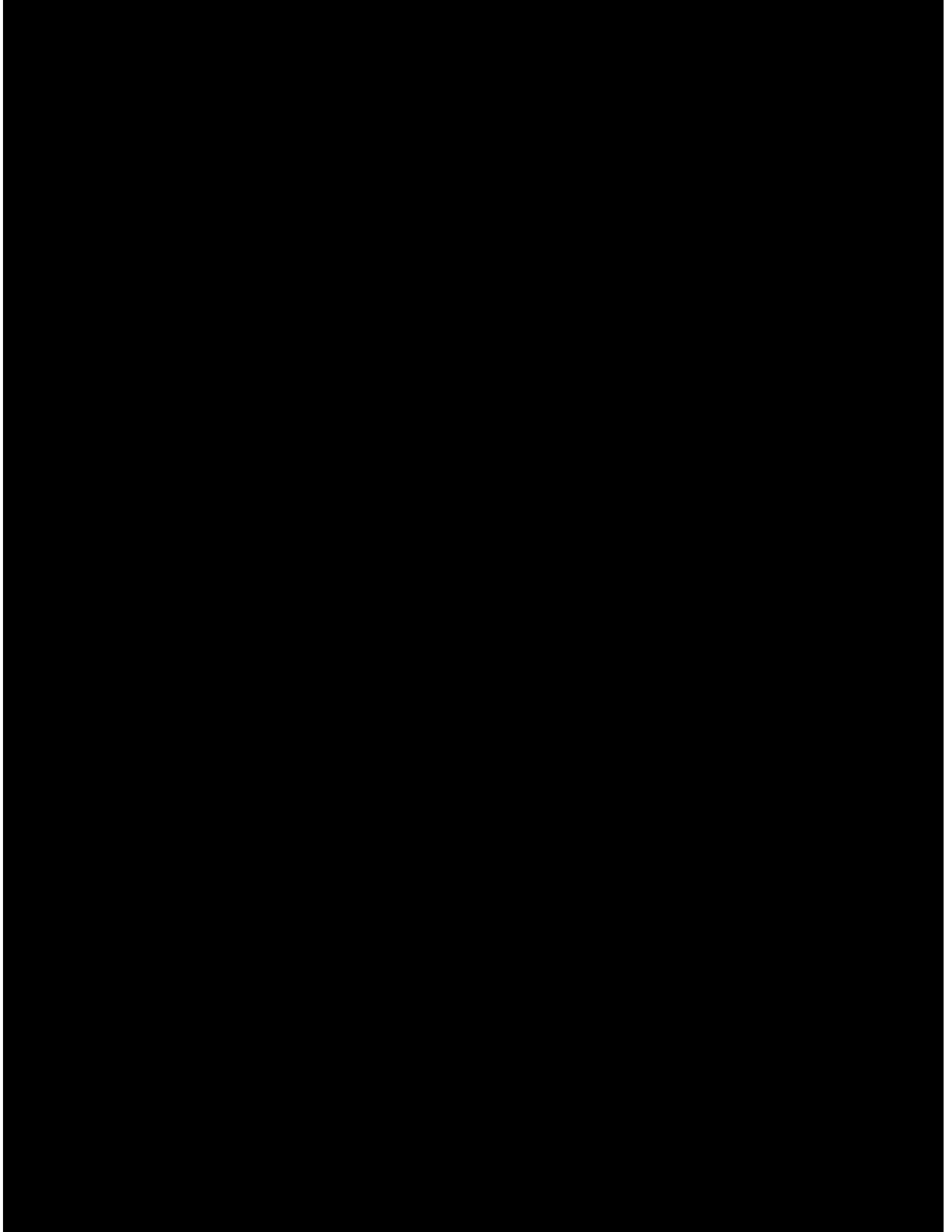
A project specific Method Description can be submitted upon receipt of all information required to complete a firm proposal.

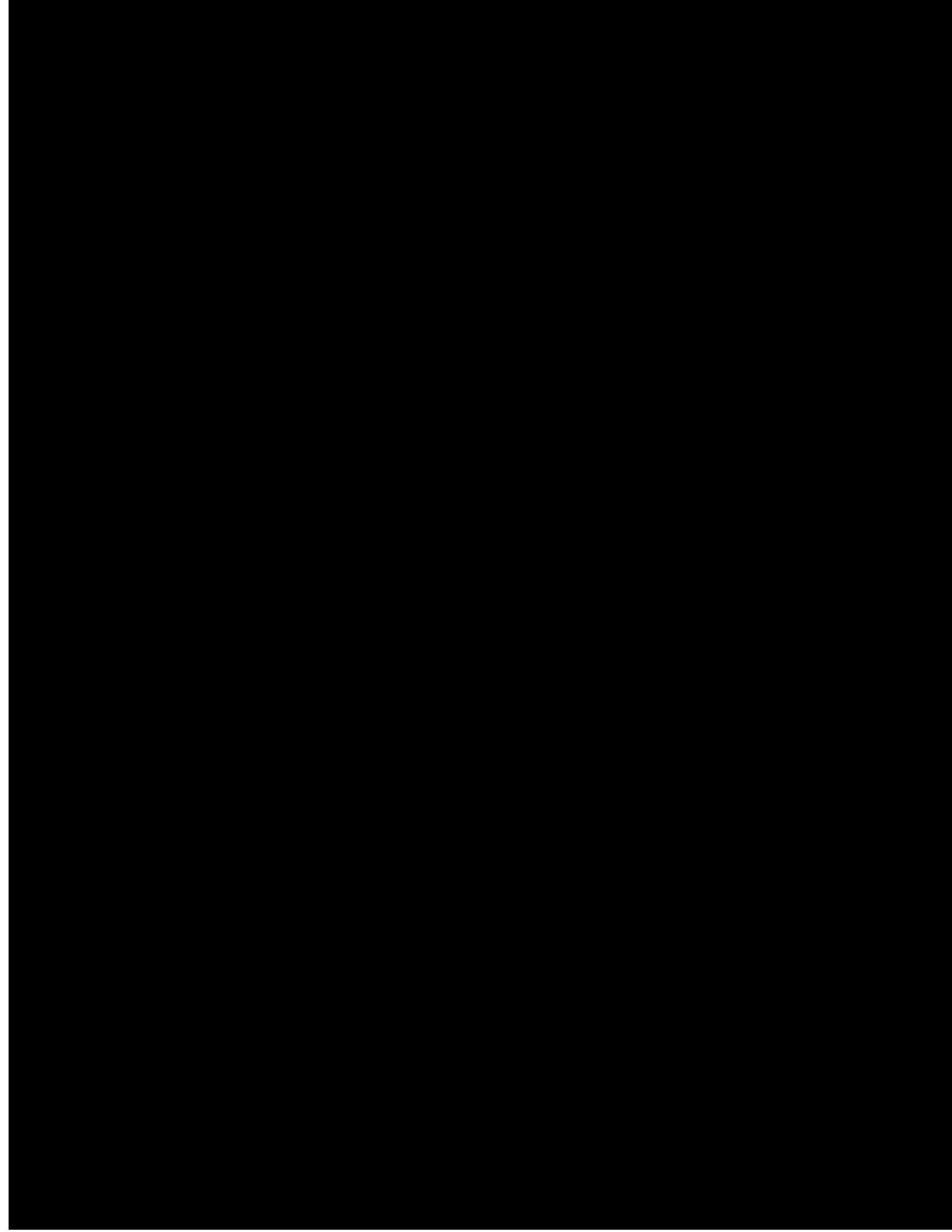
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial statements. This includes not only sales and purchases but also expenses, income, and transfers between accounts.

Next, the document outlines the process of reconciling bank statements with the company's records. This involves comparing the bank's record of transactions with the company's ledger to identify any discrepancies. Common reasons for differences include timing of deposits and withdrawals, as well as potential errors in recording or bank charges.

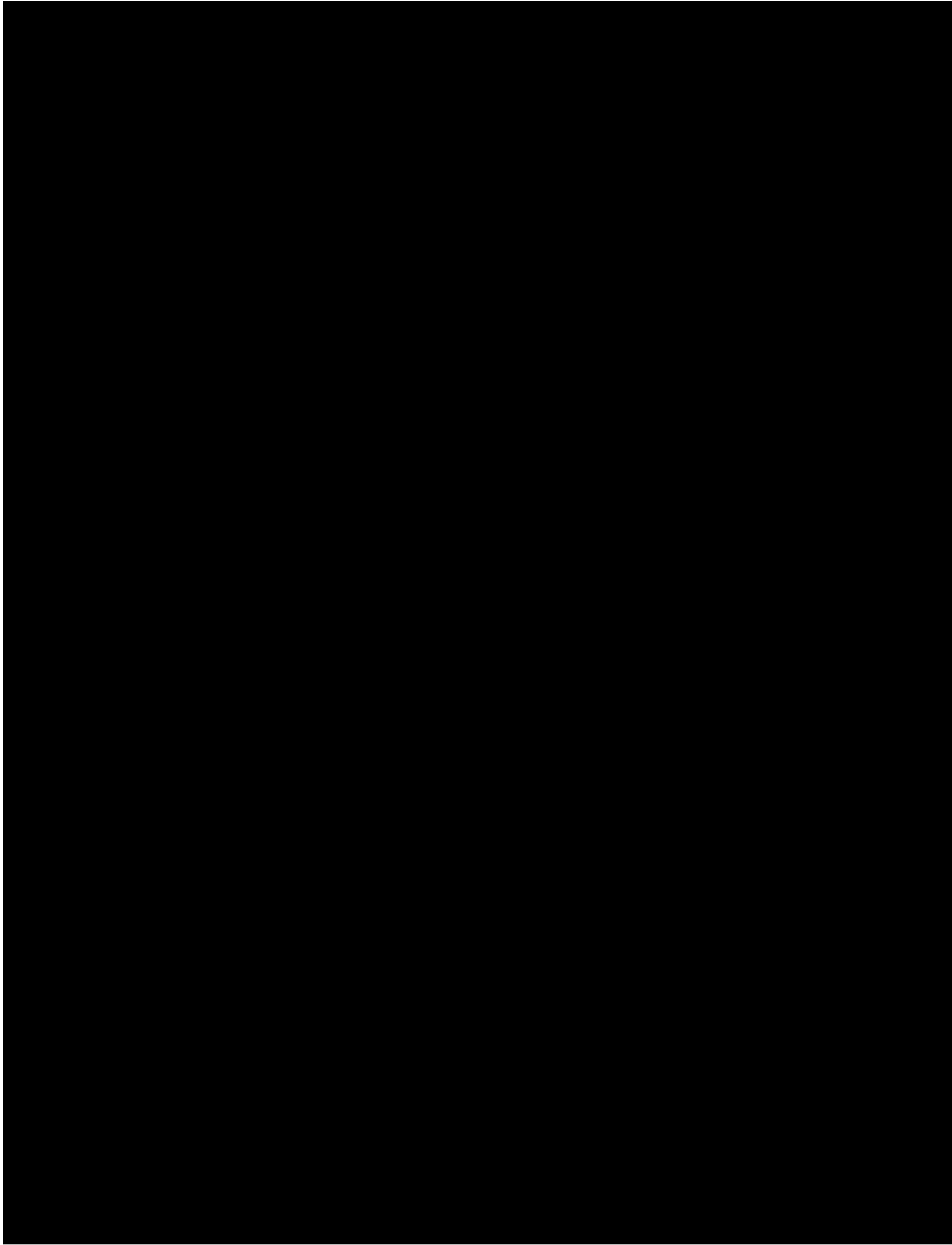
The document then moves on to discuss the preparation of financial statements. It highlights the need for accuracy and transparency in these reports, which are essential for stakeholders to make informed decisions. Key components of these statements include the balance sheet, income statement, and cash flow statement.

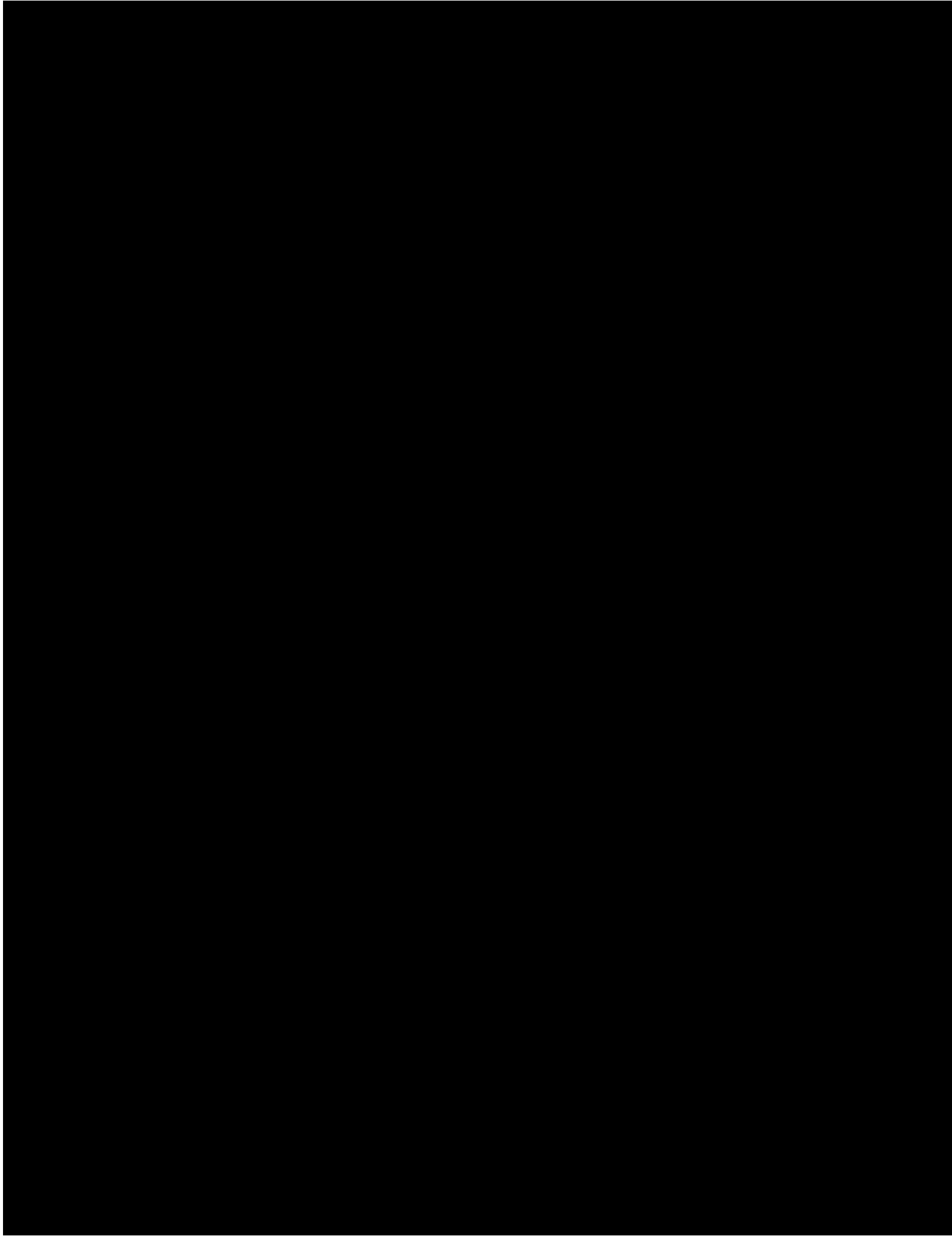
Finally, the document provides guidance on how to analyze these financial statements to assess the company's financial health. It suggests looking for trends over time, comparing performance against industry benchmarks, and identifying areas where costs can be reduced or revenues increased.

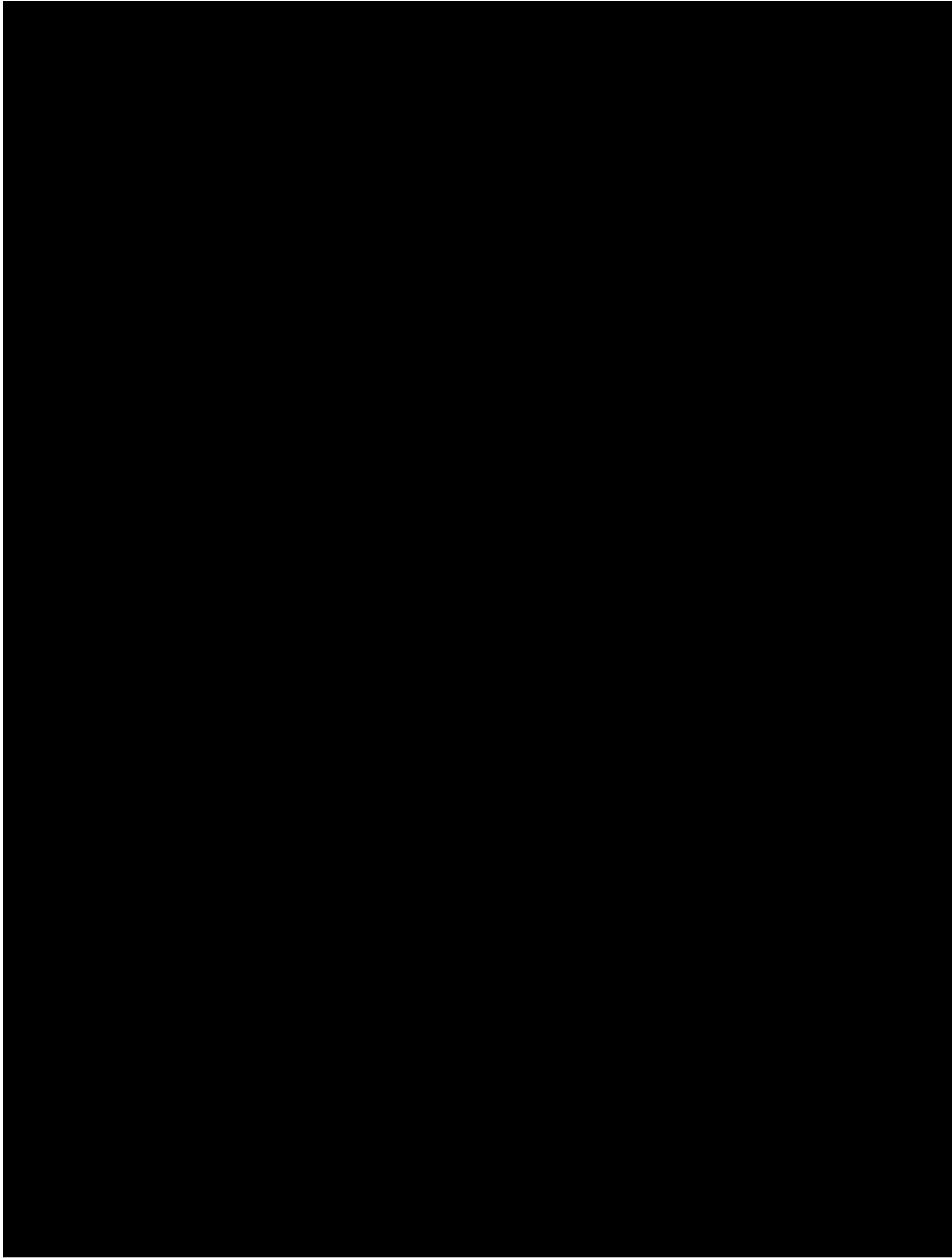


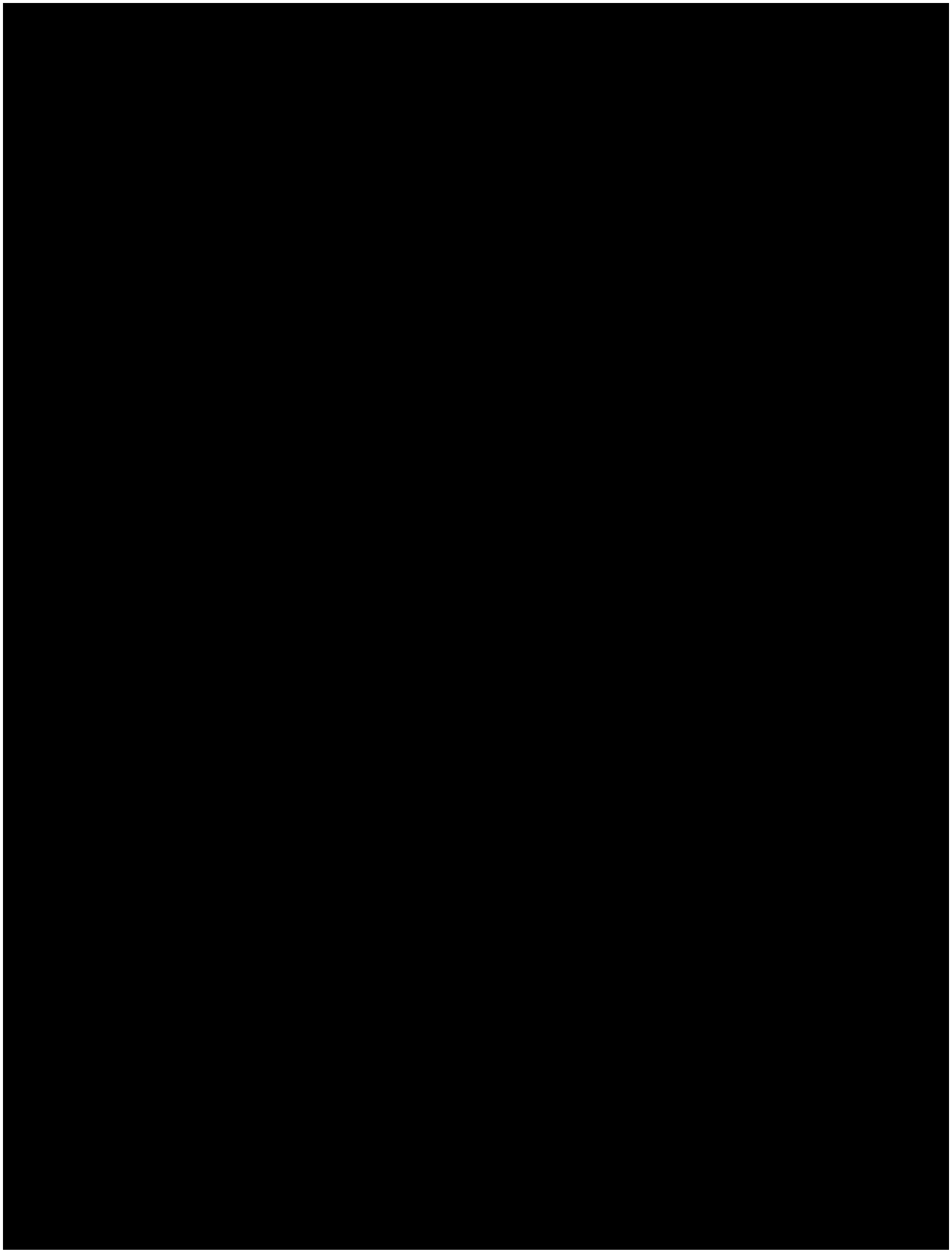




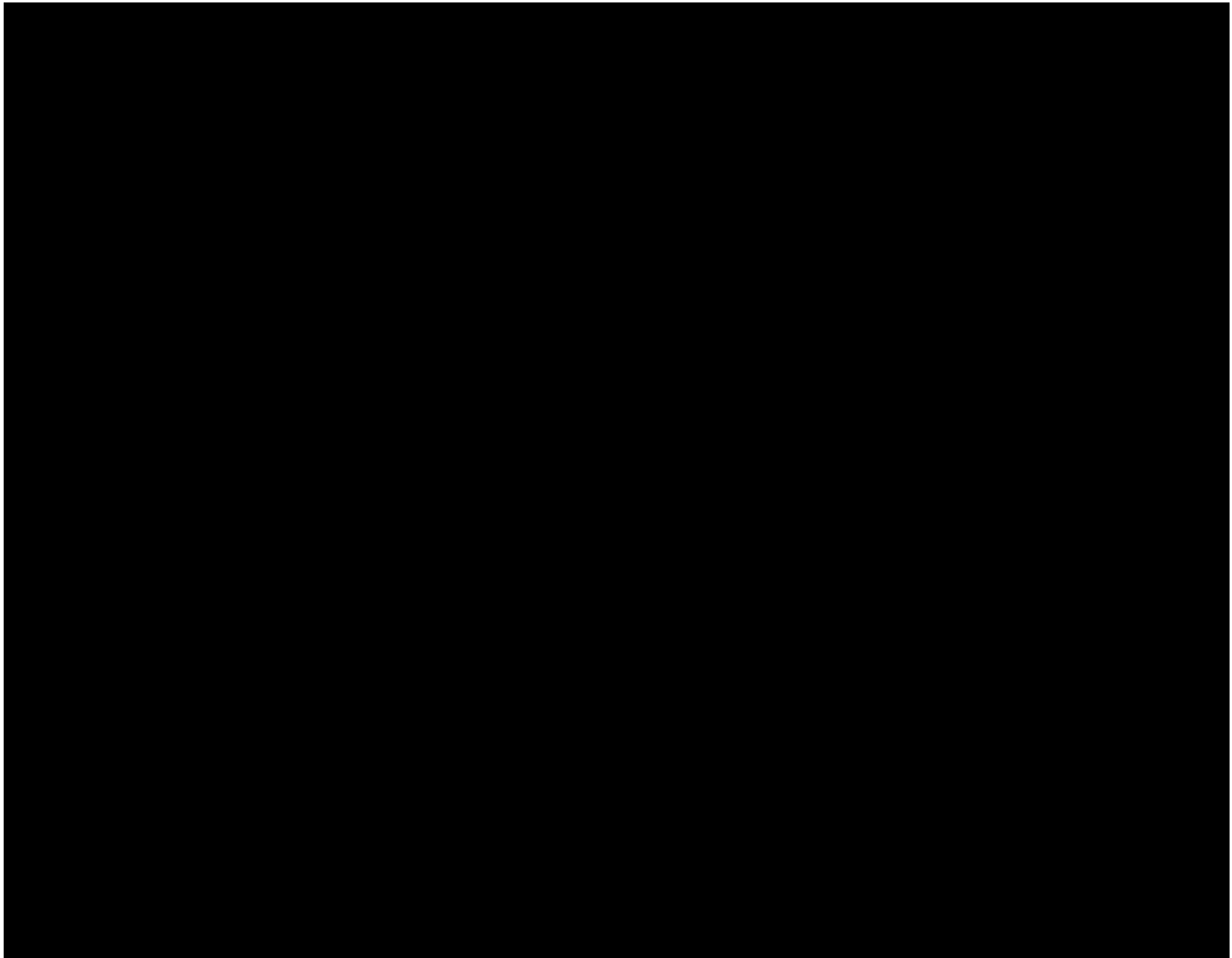








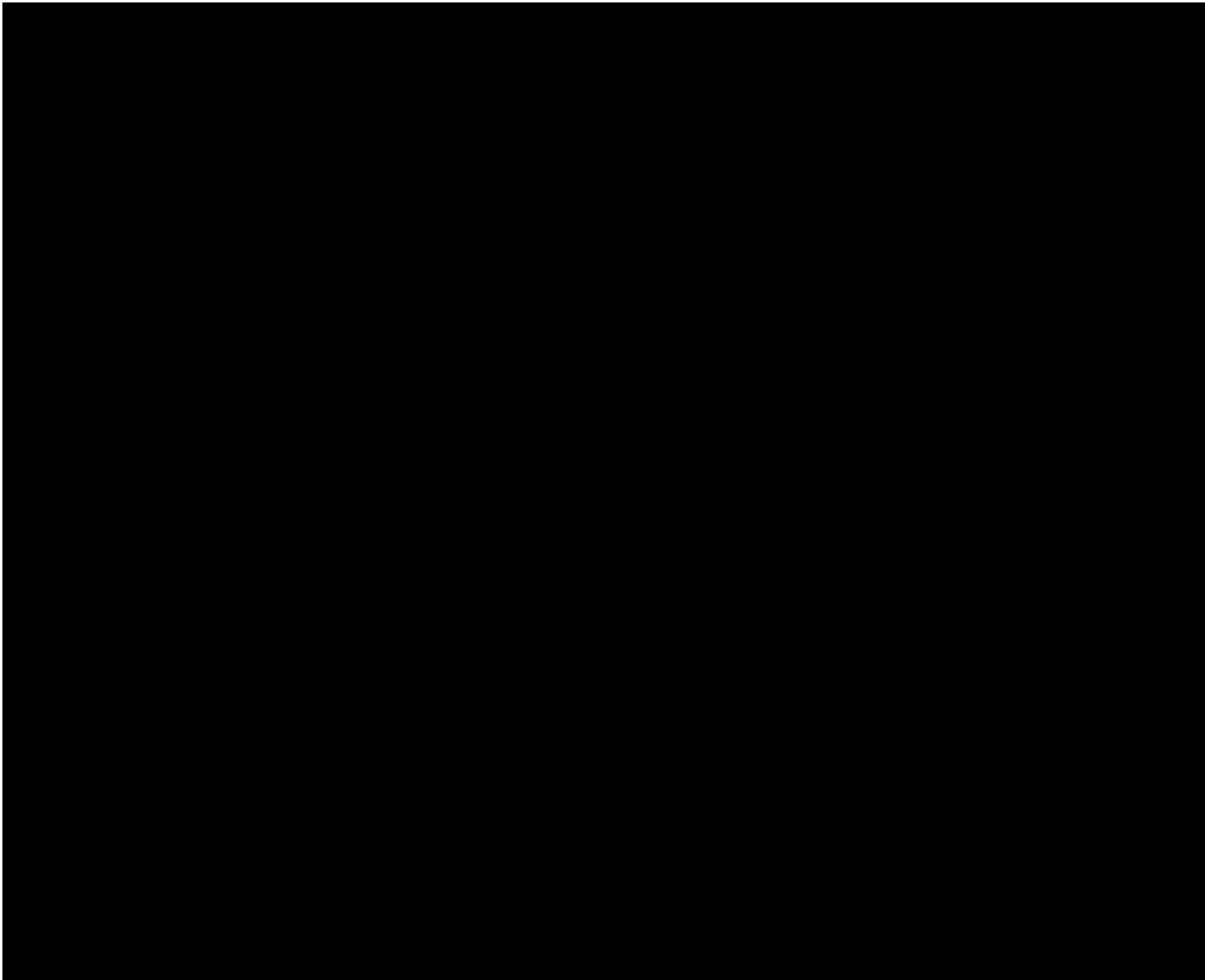


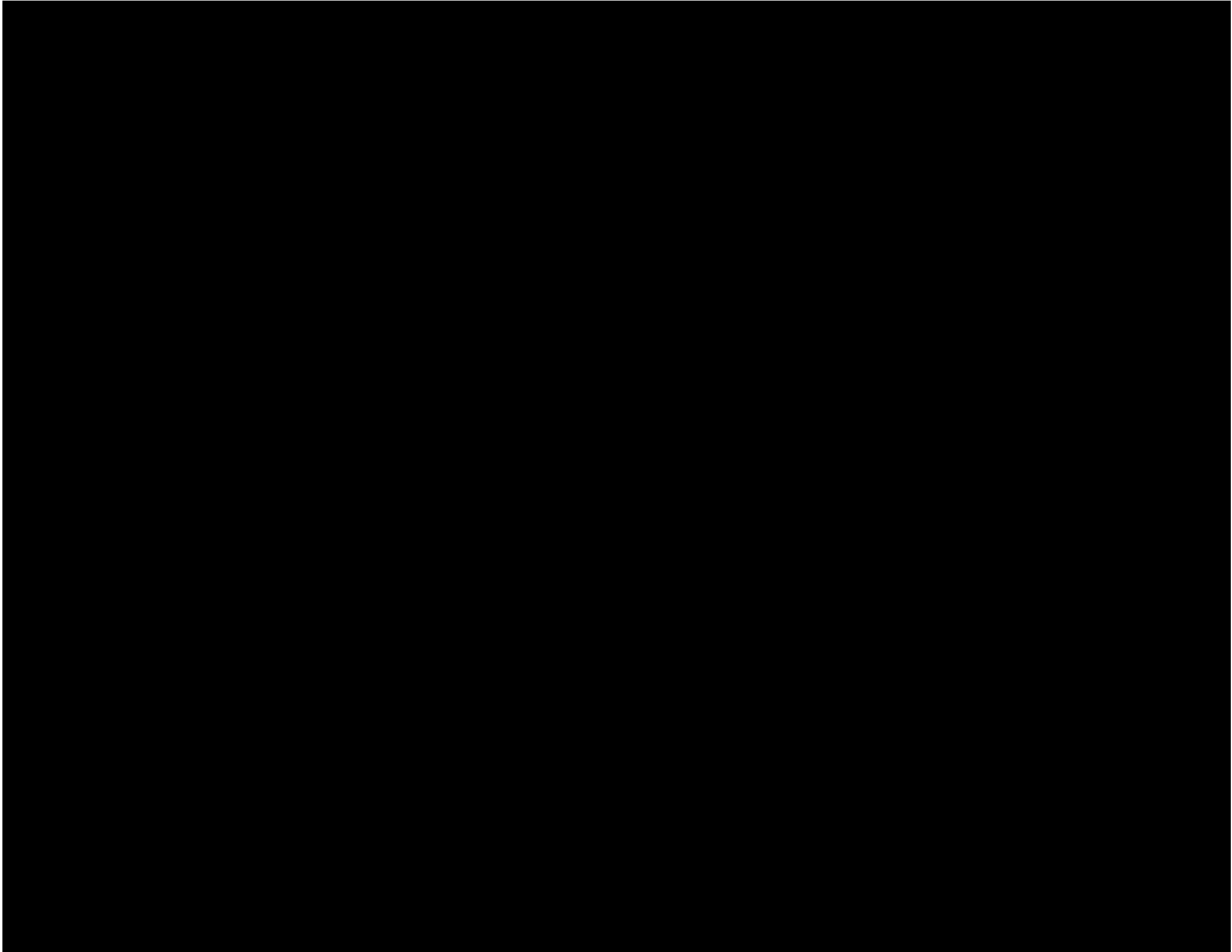


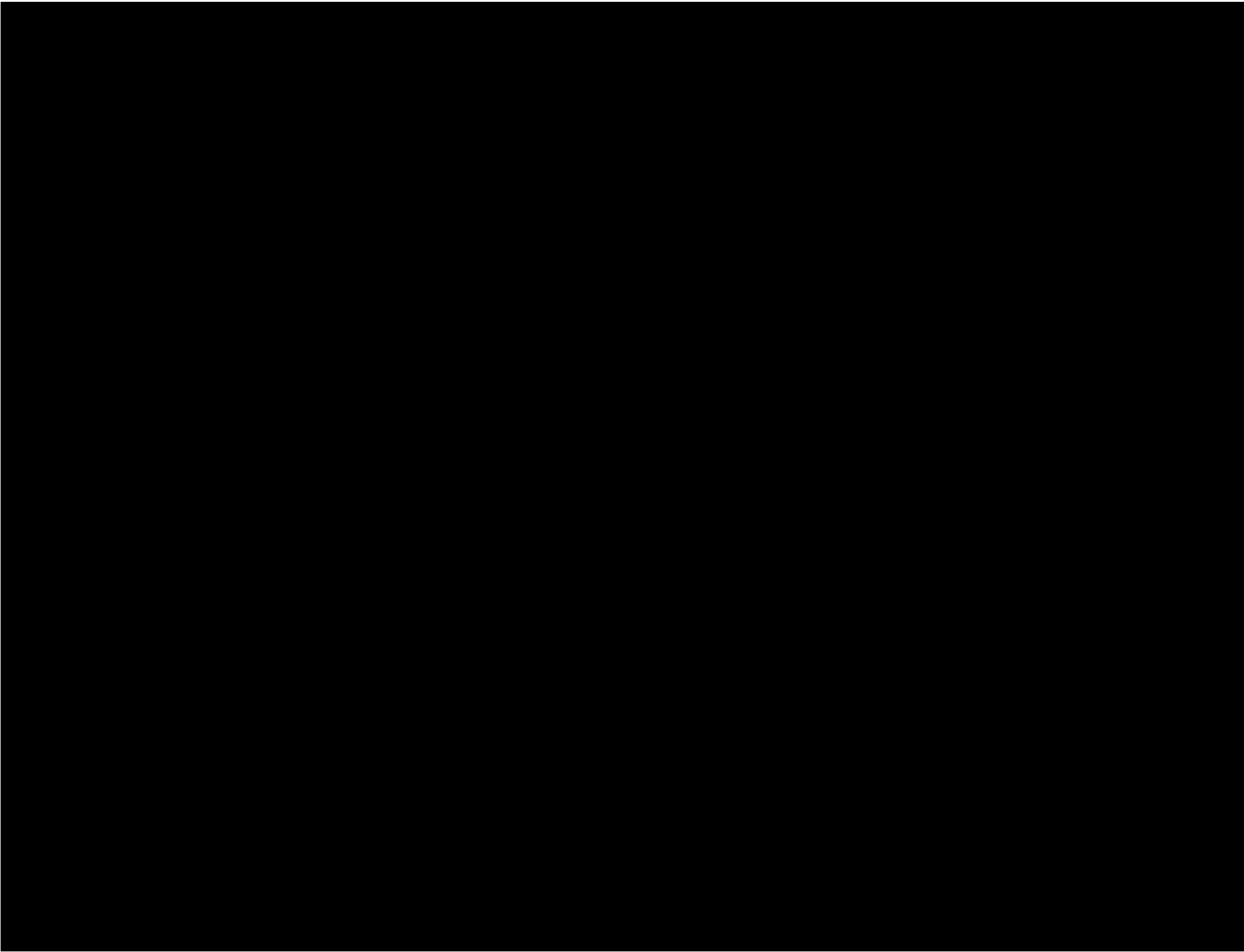










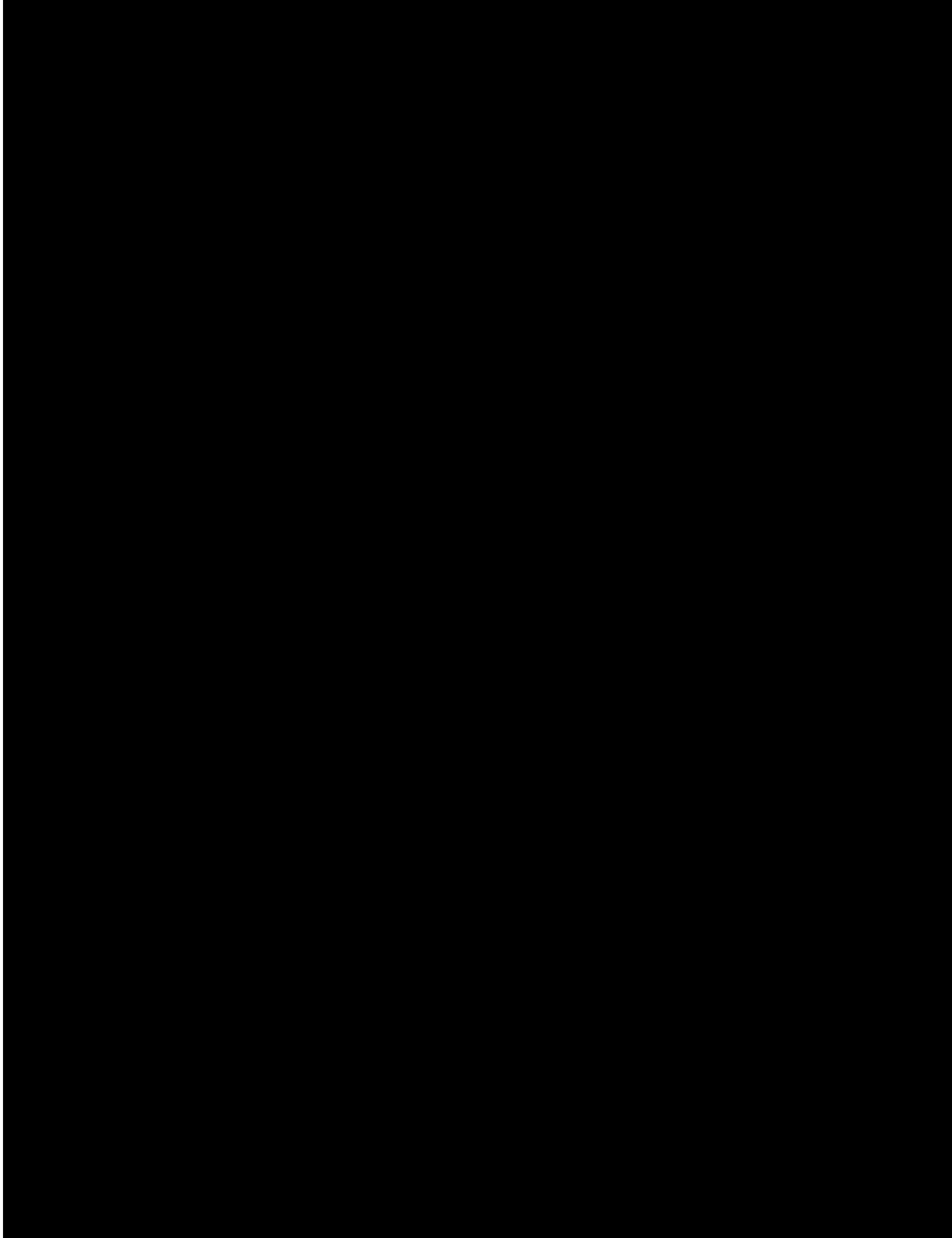


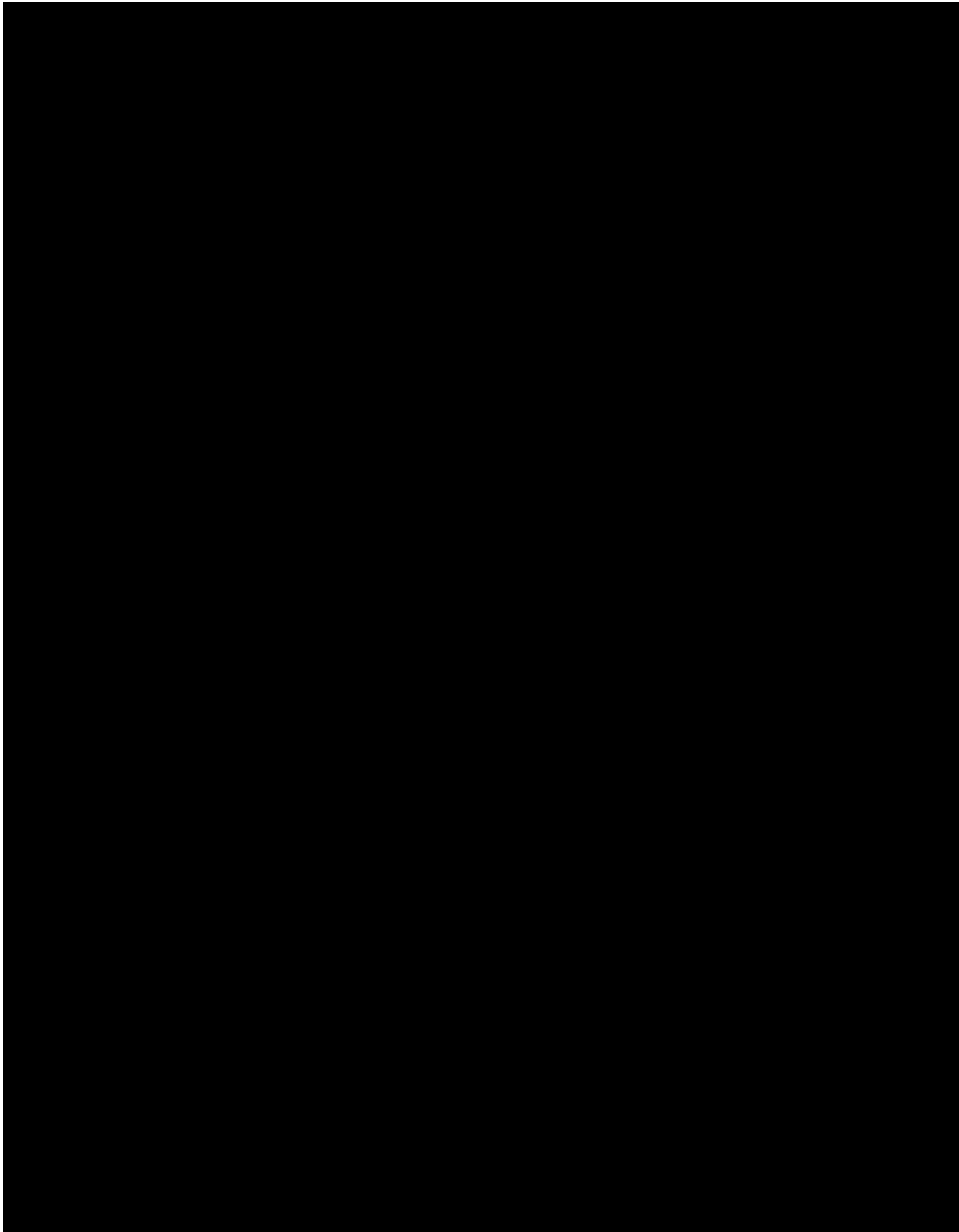


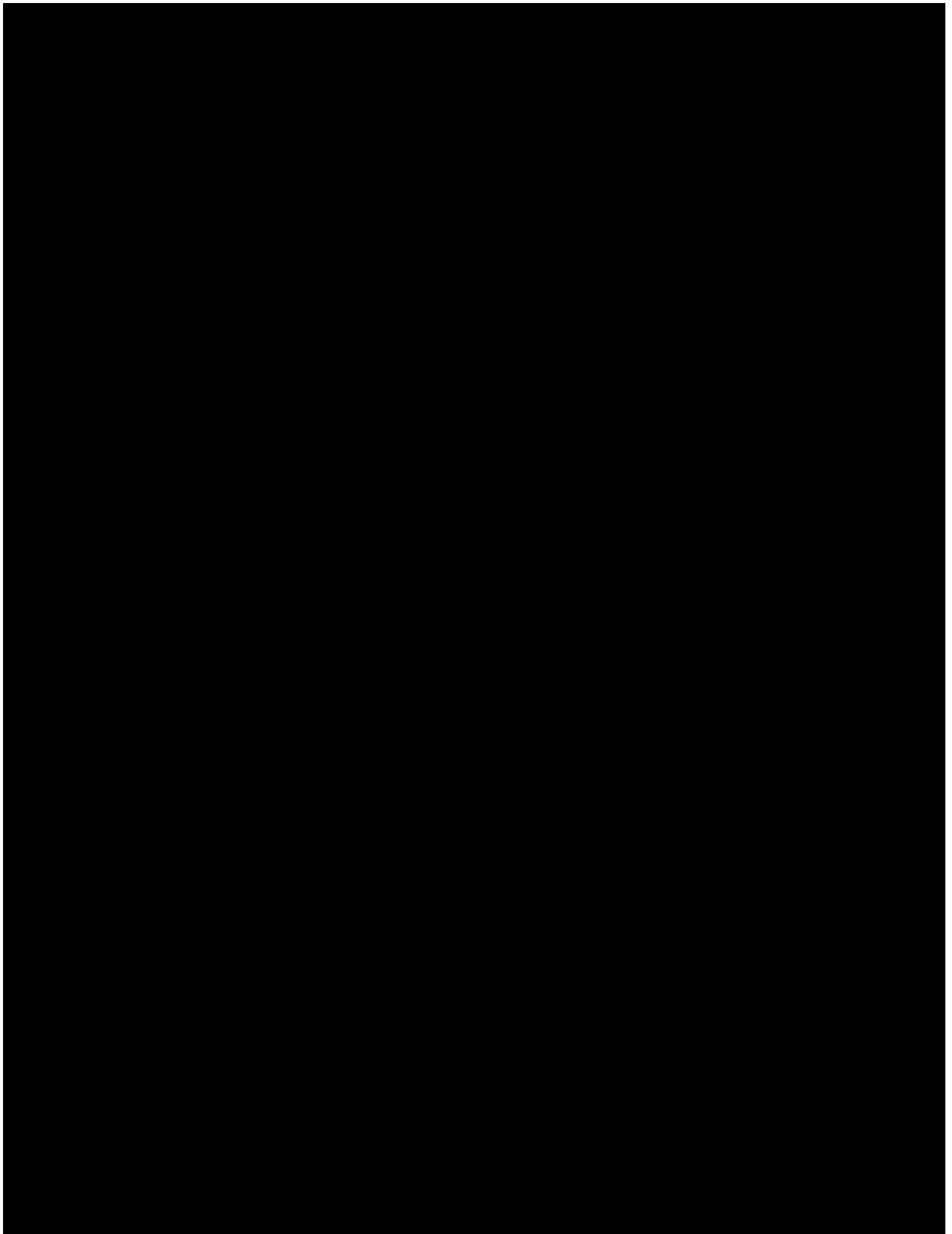
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The document provides a detailed list of items that should be tracked, such as inventory levels, accounts payable, and accounts receivable. It also outlines the procedures for recording these transactions, including the use of double-entry bookkeeping to ensure that the books are balanced.

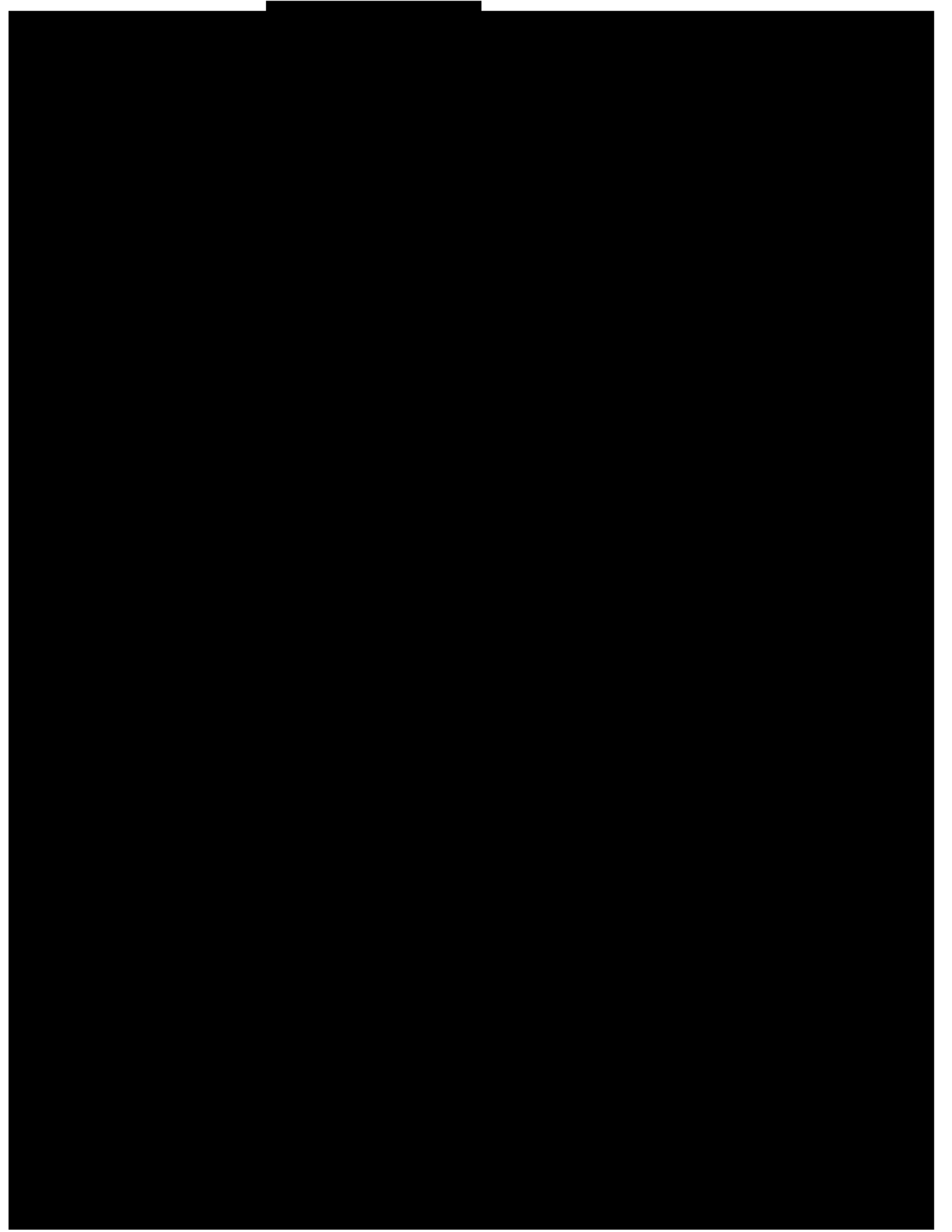
The second part of the document focuses on the analysis of the financial data. It explains how to calculate key financial ratios and metrics, such as the gross profit margin, operating profit margin, and return on equity. These metrics are used to assess the company's performance and identify areas for improvement. The document also discusses the importance of comparing the company's performance to industry benchmarks and providing a clear explanation of any significant variances.

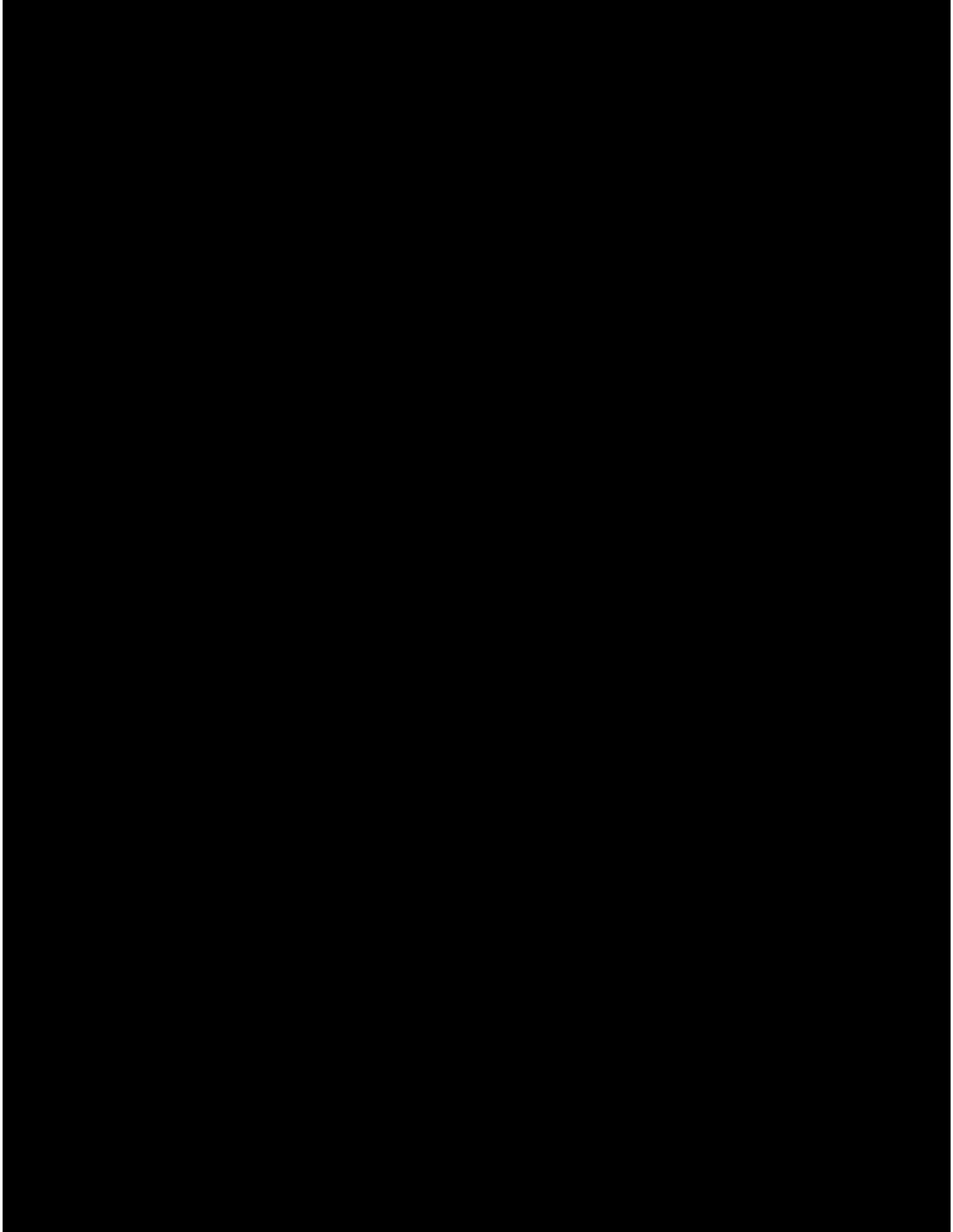
The final part of the document covers the preparation of financial statements. It provides a step-by-step guide to the preparation of the income statement, balance sheet, and cash flow statement. It also discusses the importance of auditing the financial statements to ensure their accuracy and reliability. The document concludes with a summary of the key findings and recommendations for the company's future financial management.

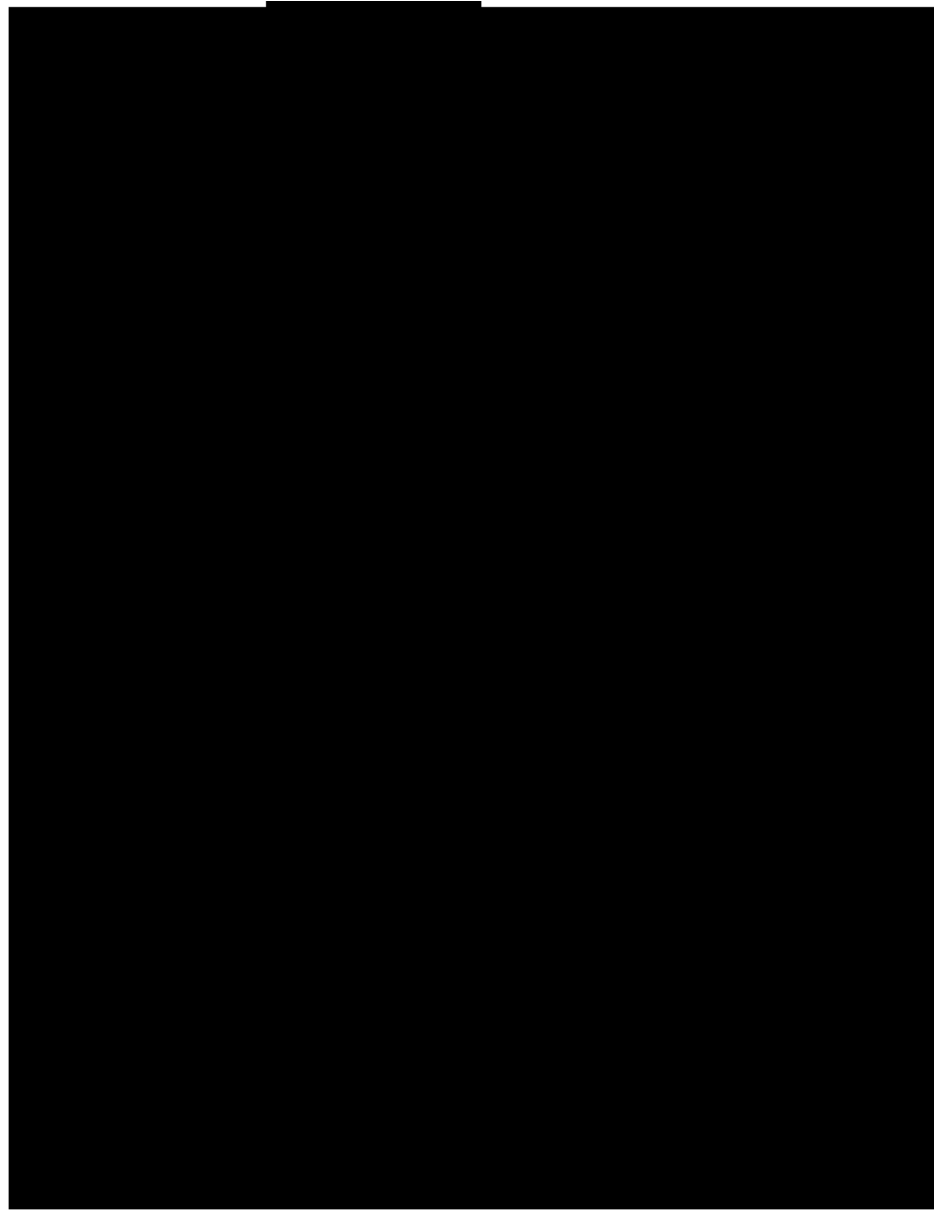


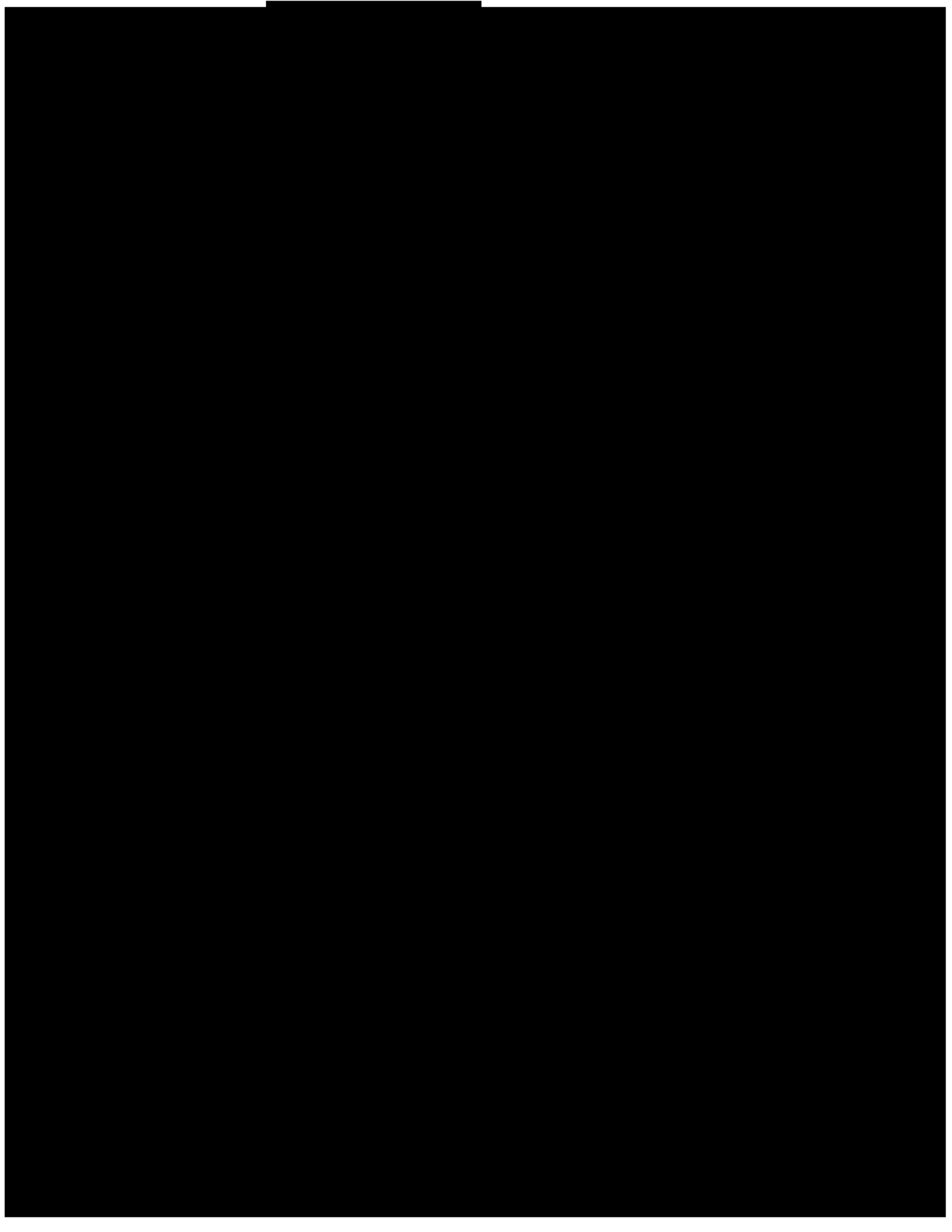


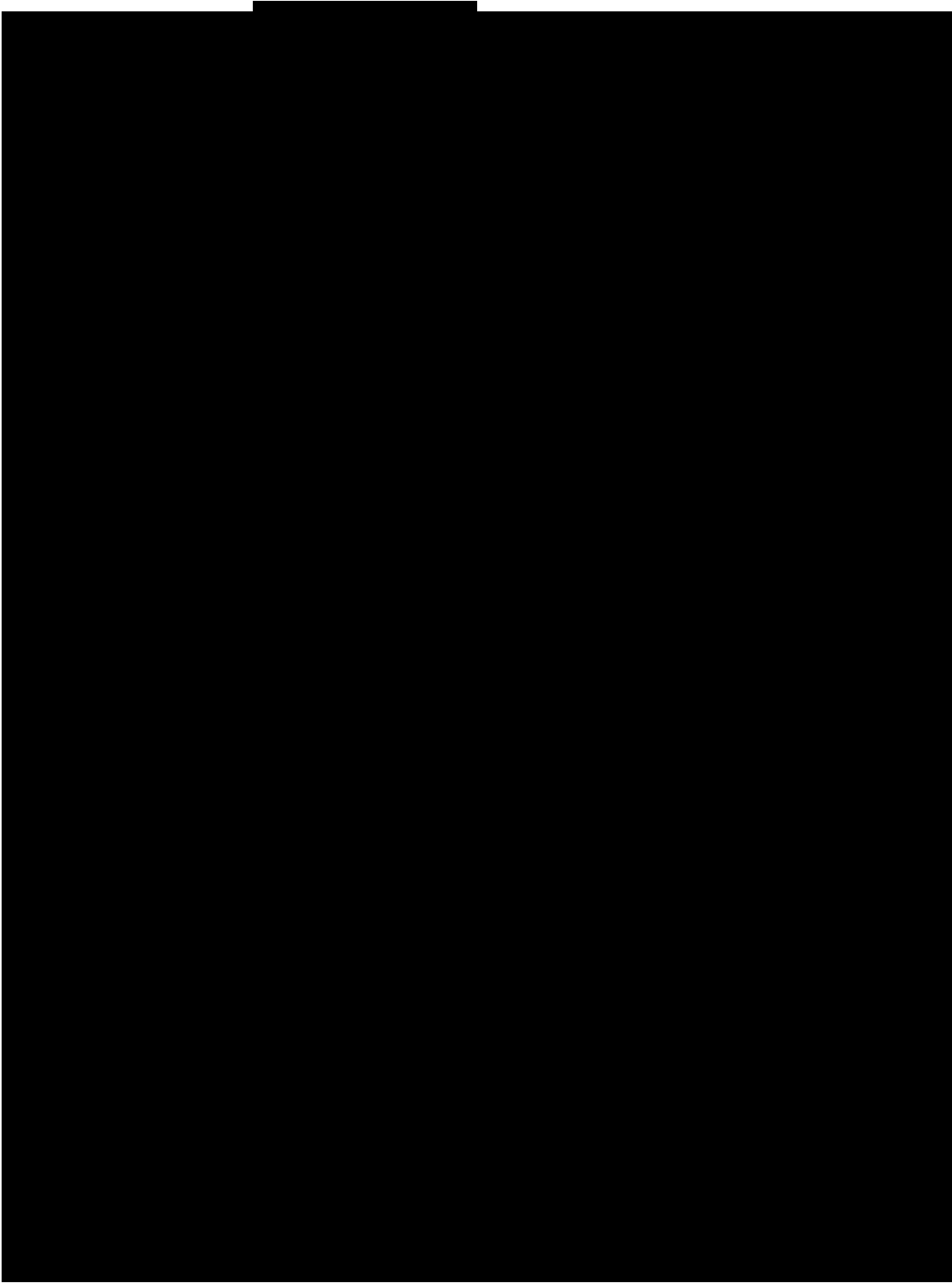


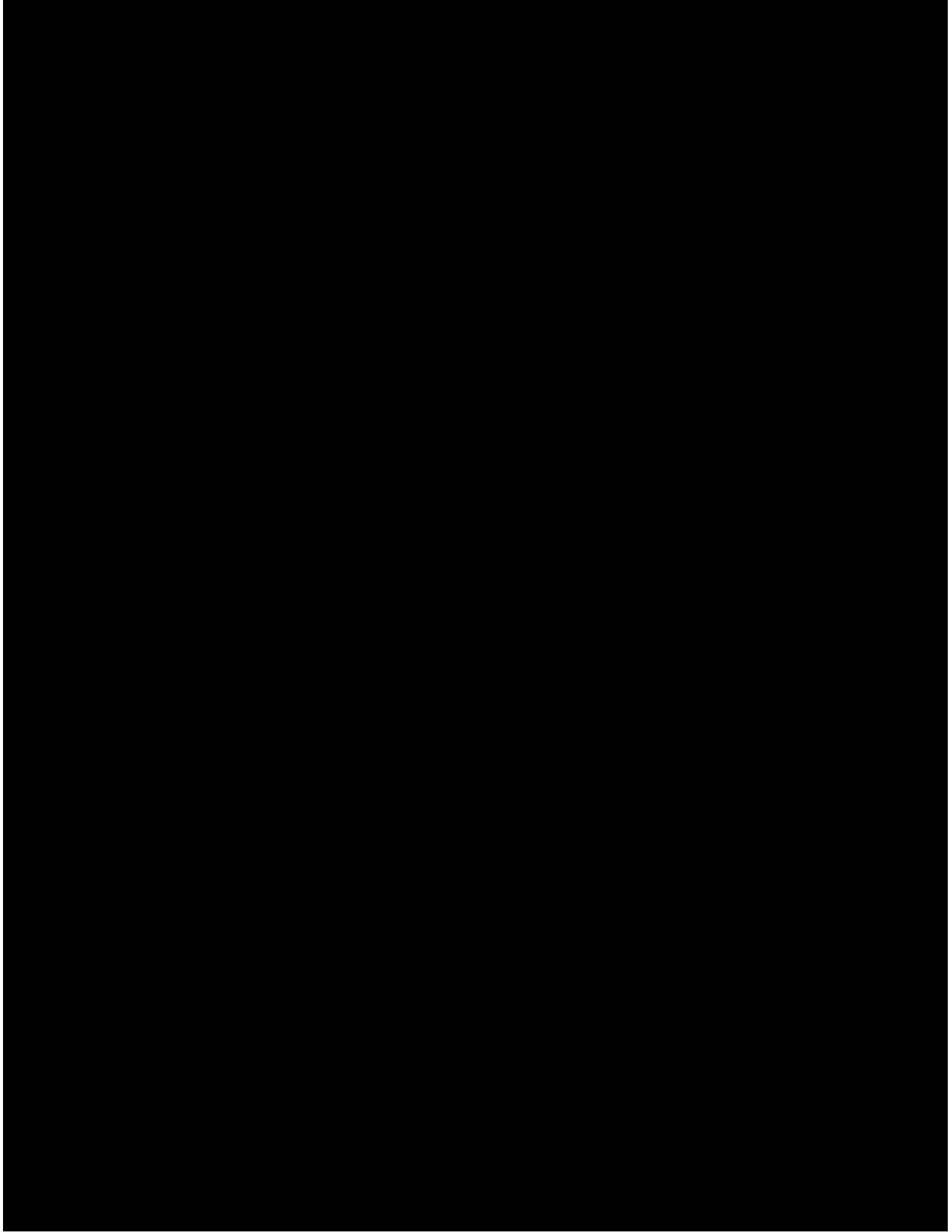


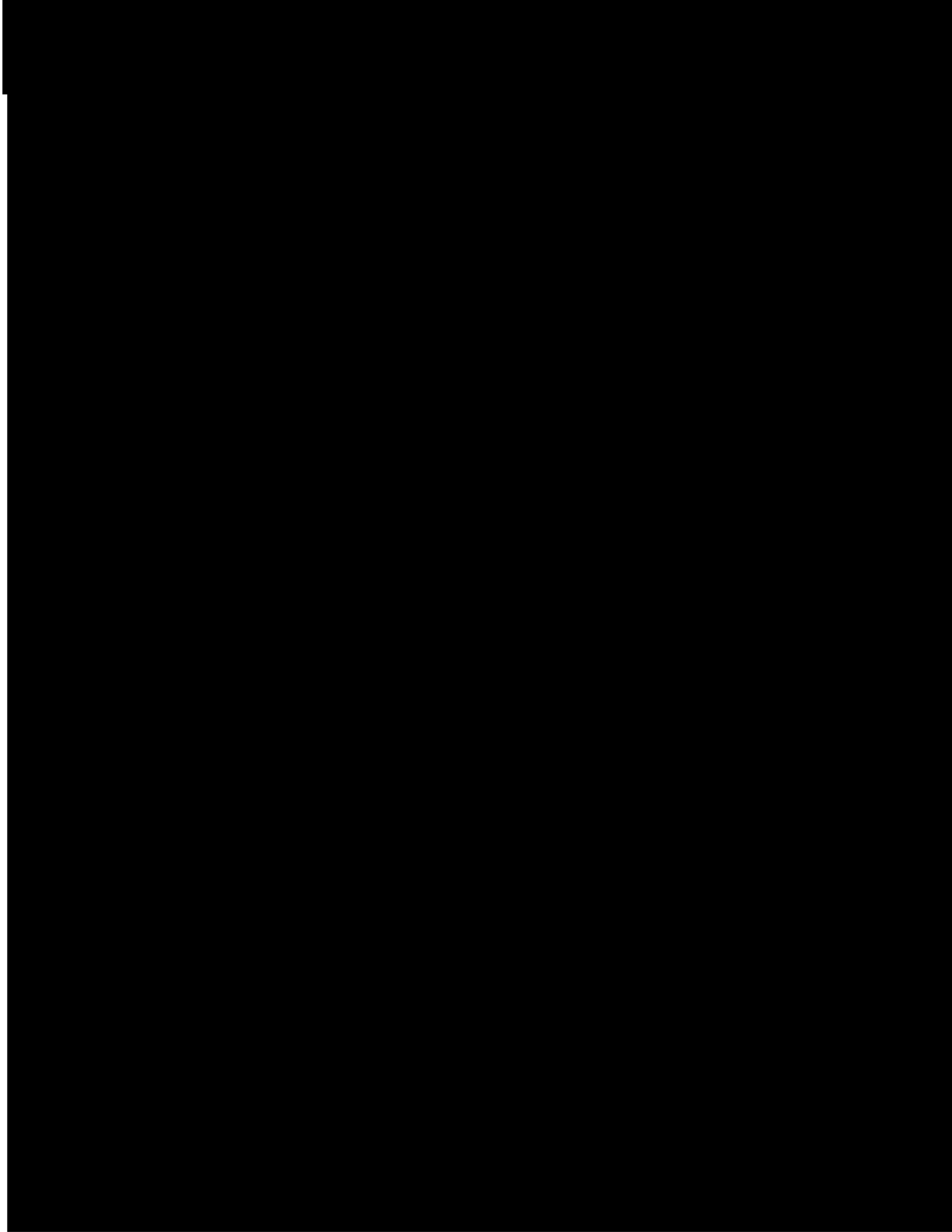


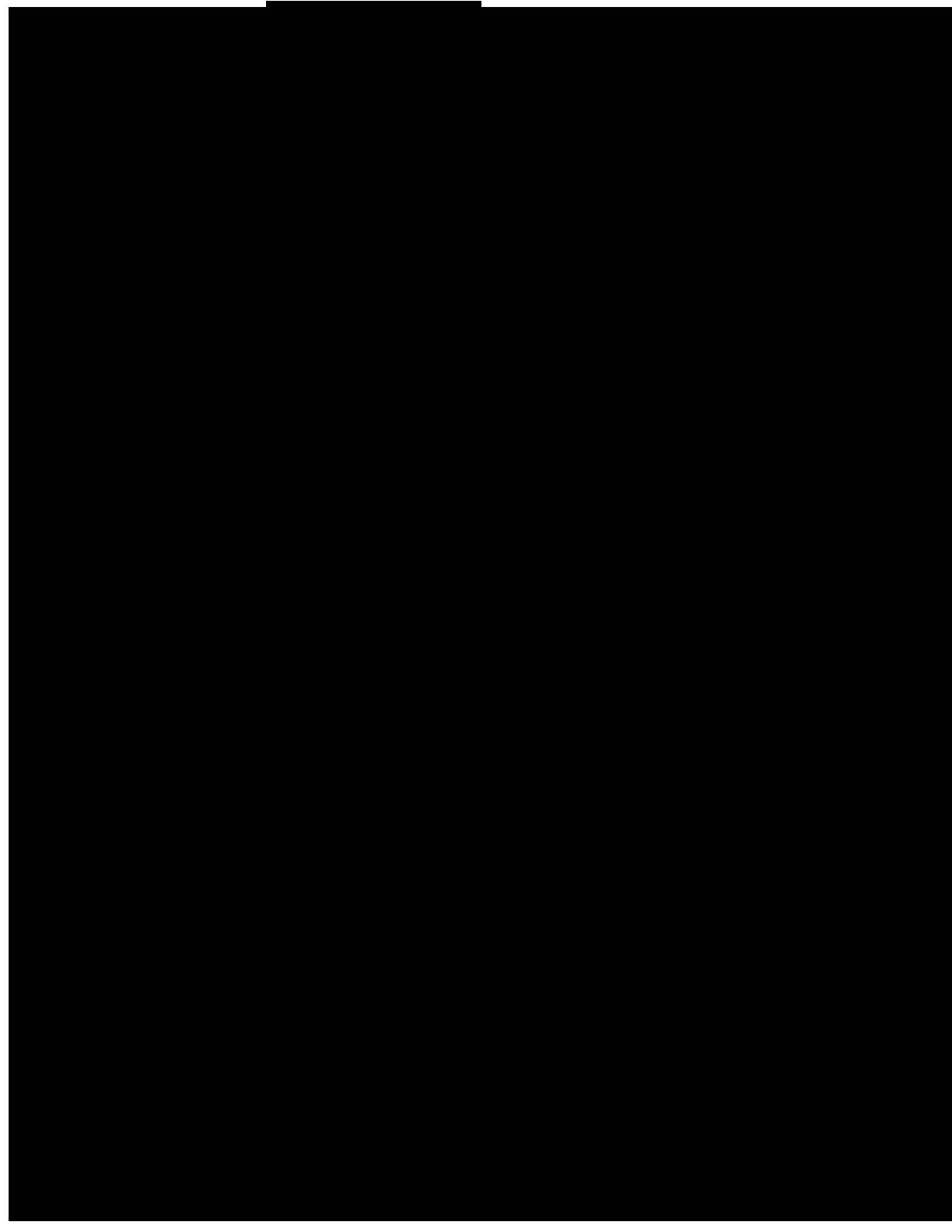


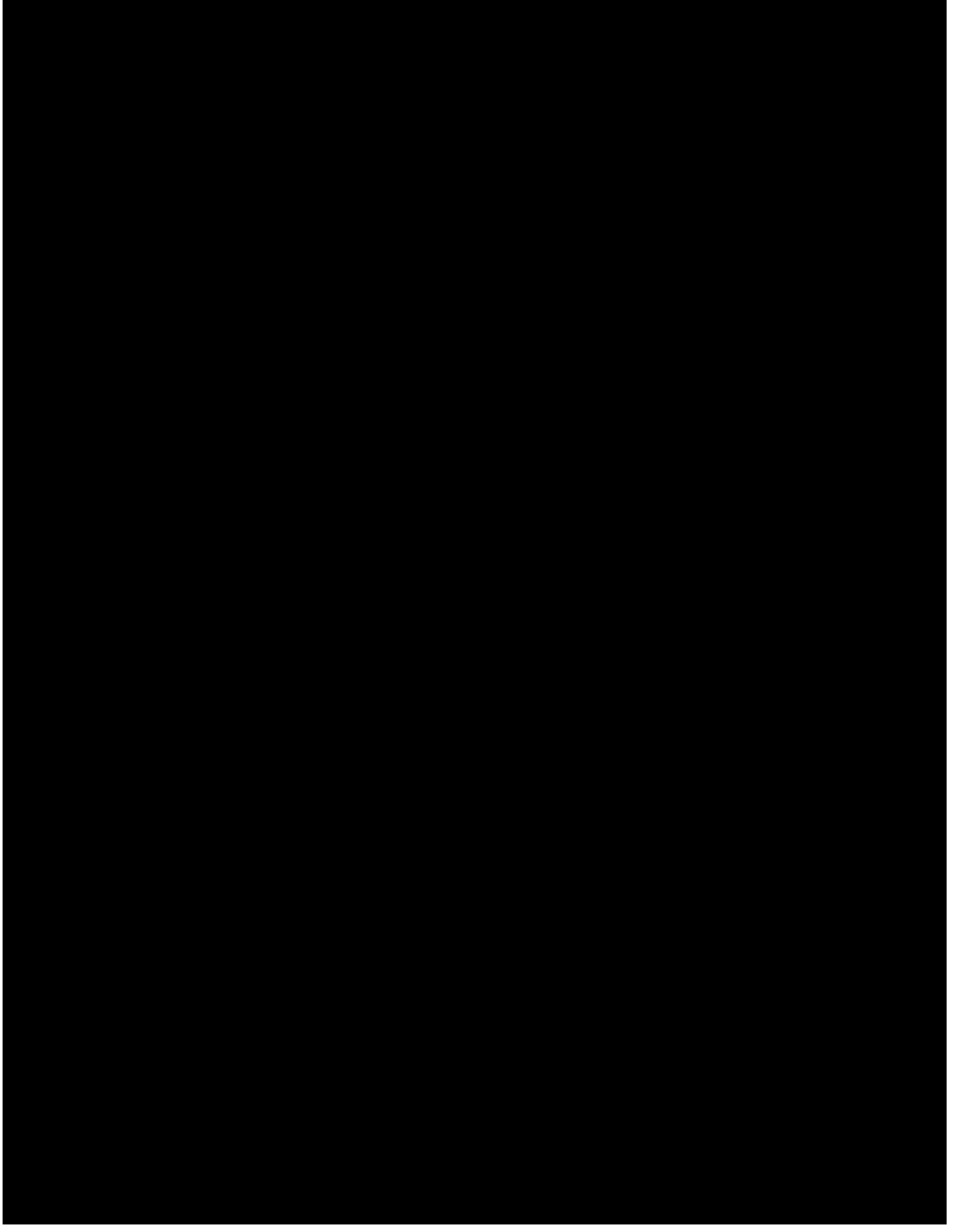


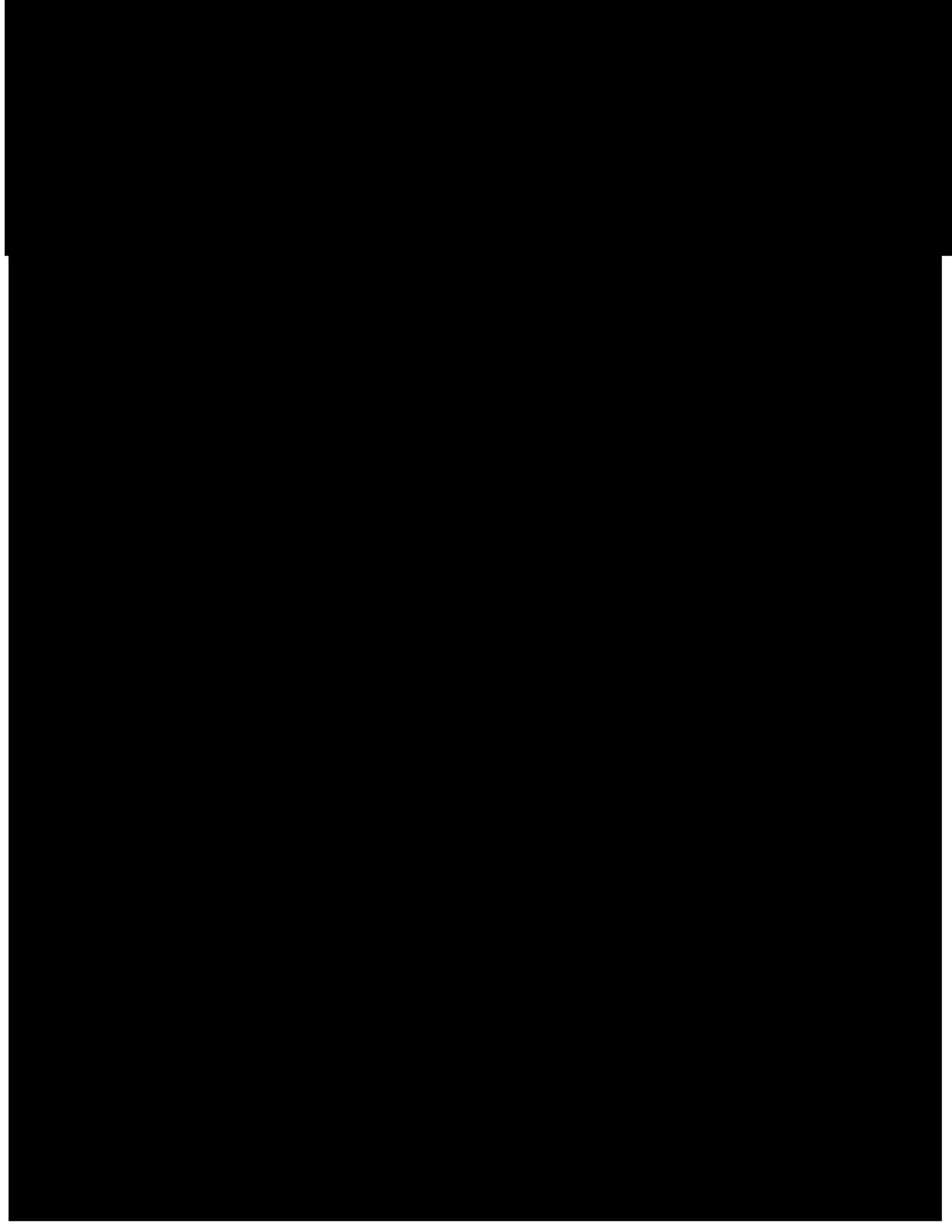


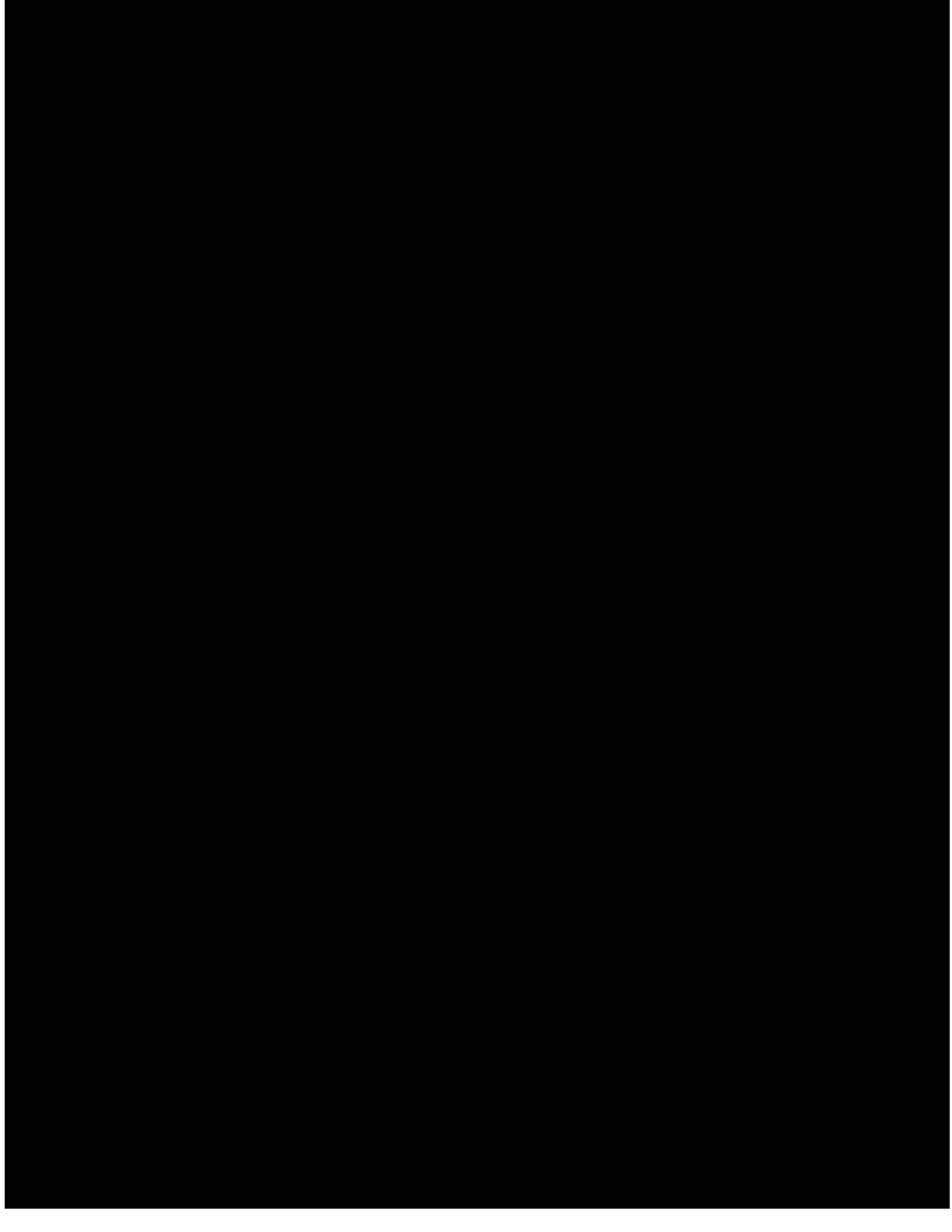










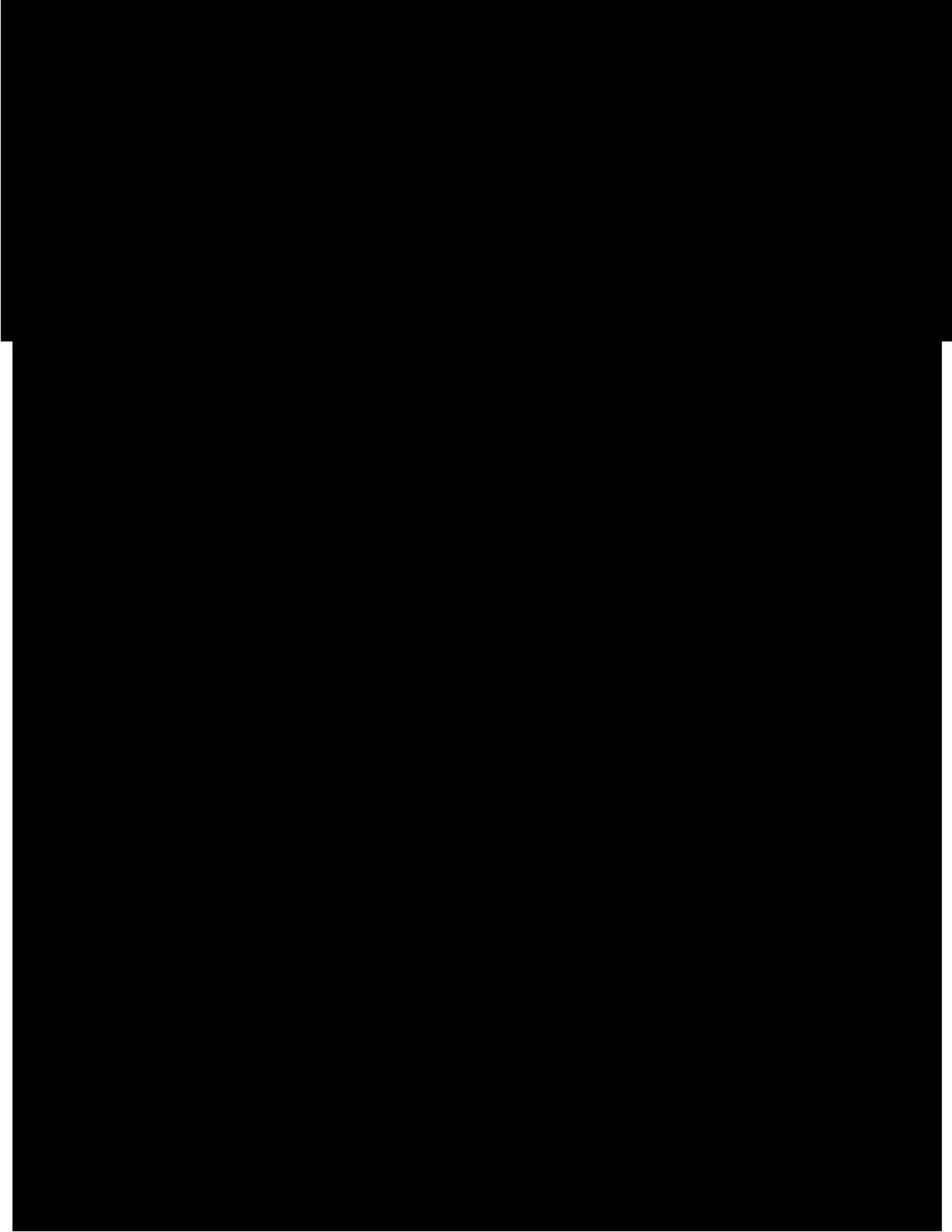


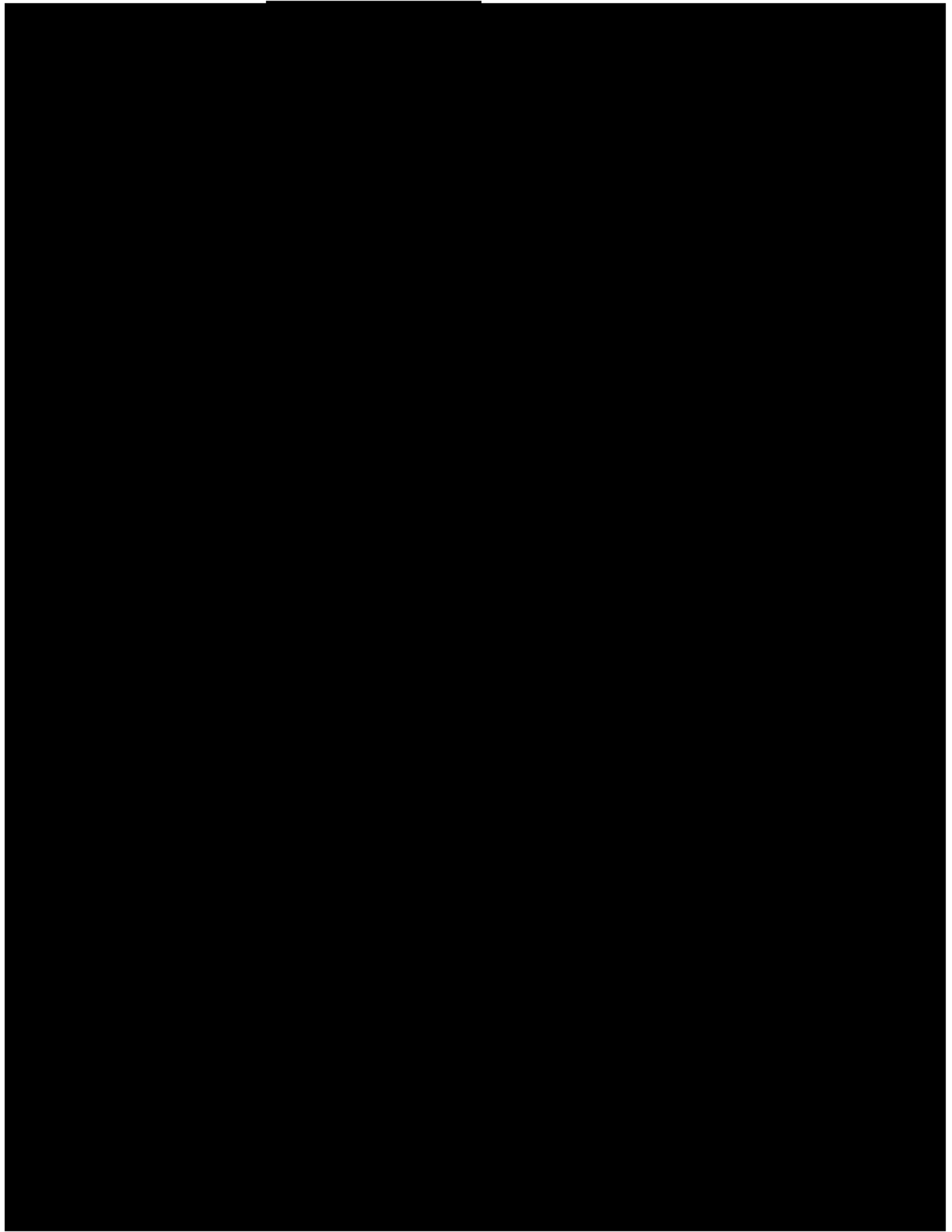
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The text explains that proper record-keeping is essential for identifying trends, managing cash flow, and preparing for tax obligations.

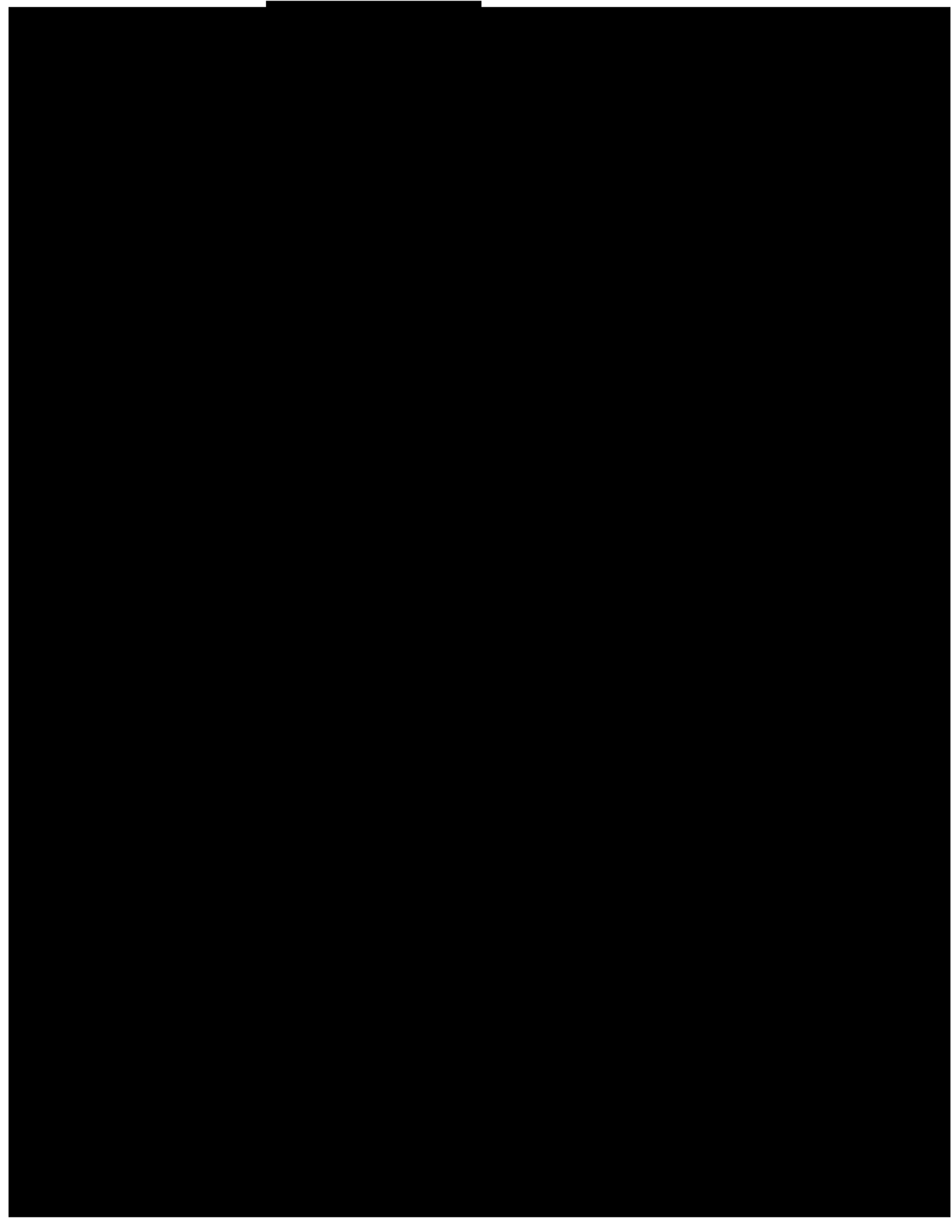
In the second section, the author provides a detailed overview of the accounting cycle. This process involves ten distinct steps, from identifying the accounting entity to preparing financial statements. Each step is explained in detail, with examples provided to illustrate how they are applied in a real-world business context. The author stresses that following these steps consistently is key to producing accurate and reliable financial reports.

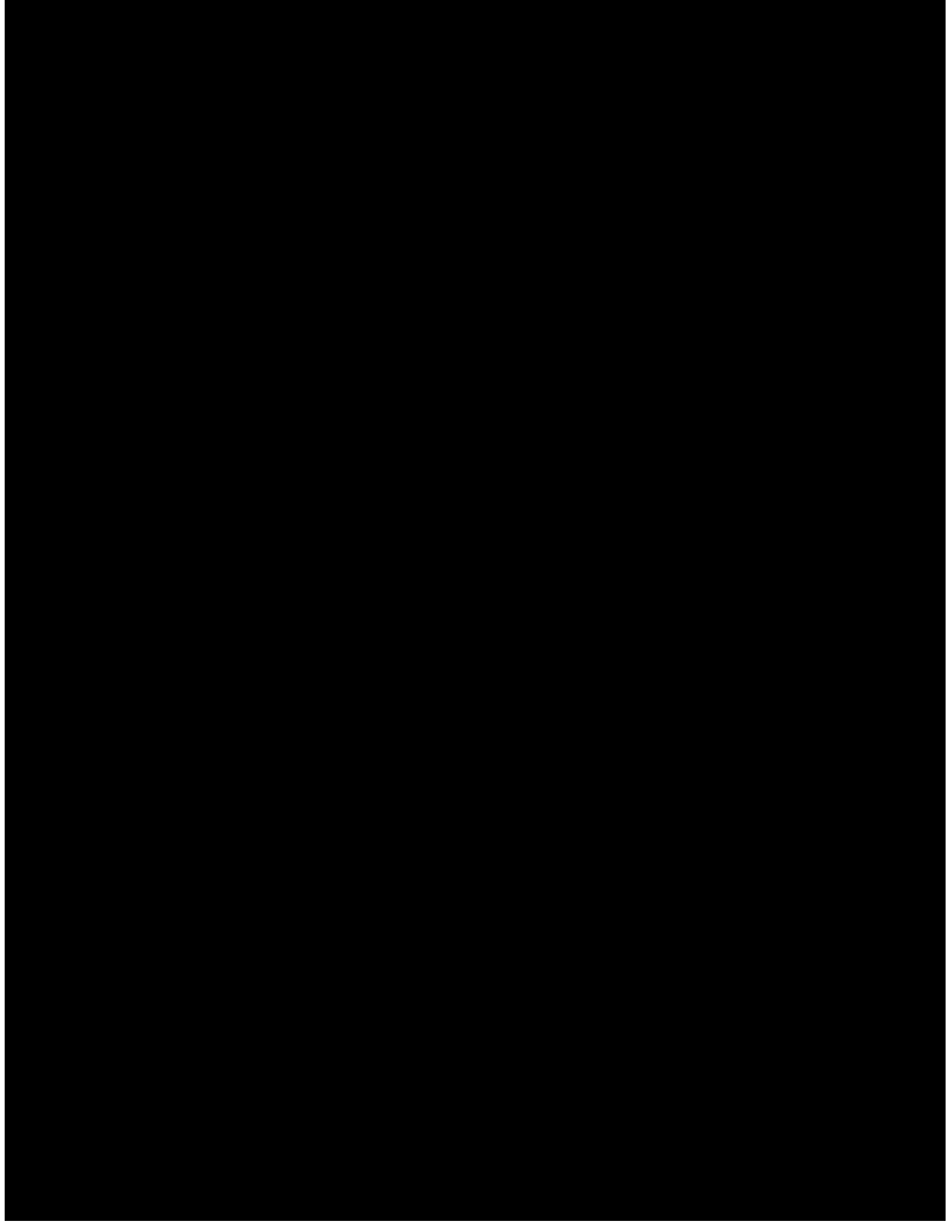
The third section focuses on the classification of accounts. It distinguishes between assets, liabilities, and equity, and further breaks these down into current and non-current categories. The text also covers the classification of revenues and expenses, highlighting the importance of using the correct account codes to ensure that financial data is properly categorized and analyzed.

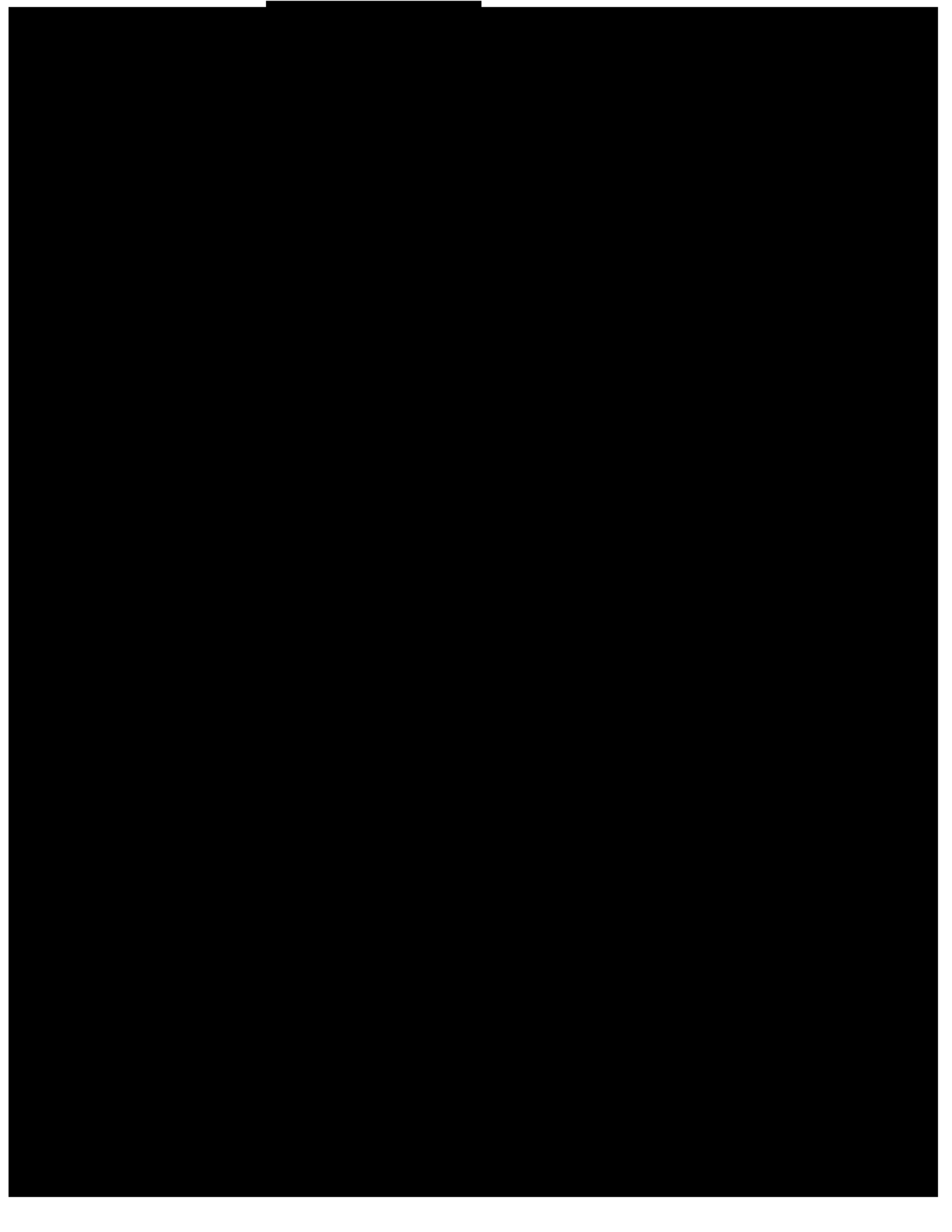
The final part of the document discusses the role of the accounting system in providing valuable insights into a company's performance. It explains how financial statements, such as the balance sheet, income statement, and cash flow statement, are derived from the recorded data and how they can be used to make informed business decisions. The author concludes by emphasizing that a strong accounting system is the foundation of a successful business.

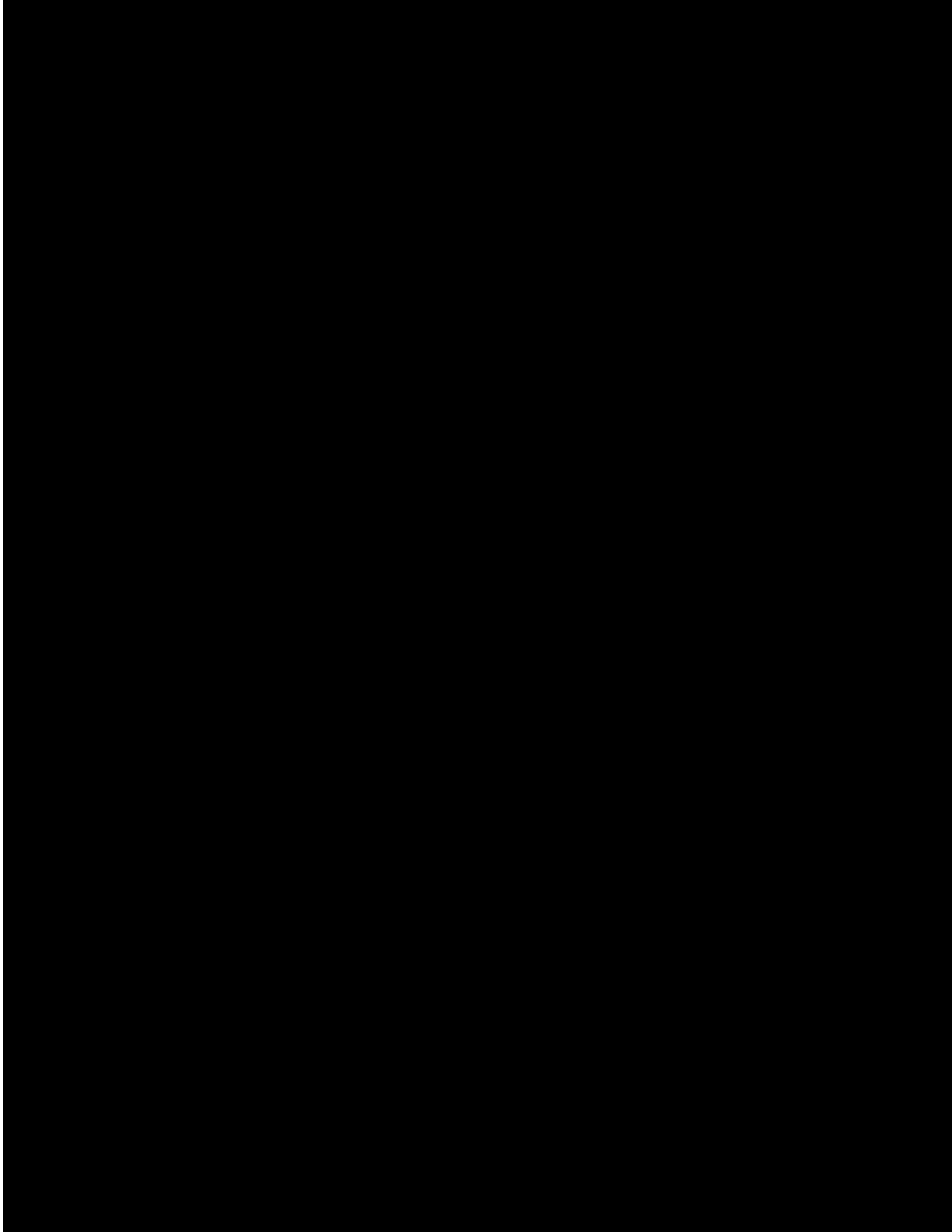


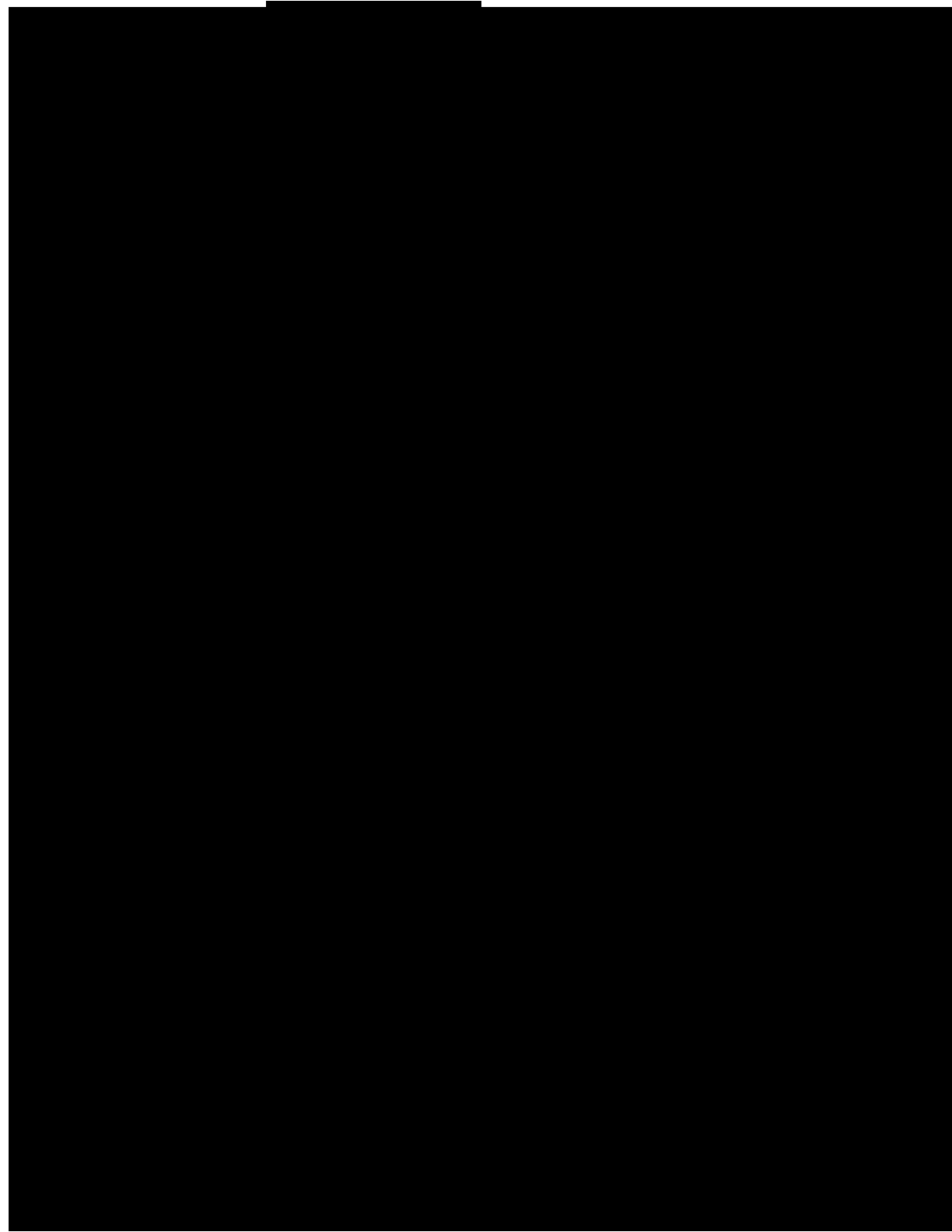


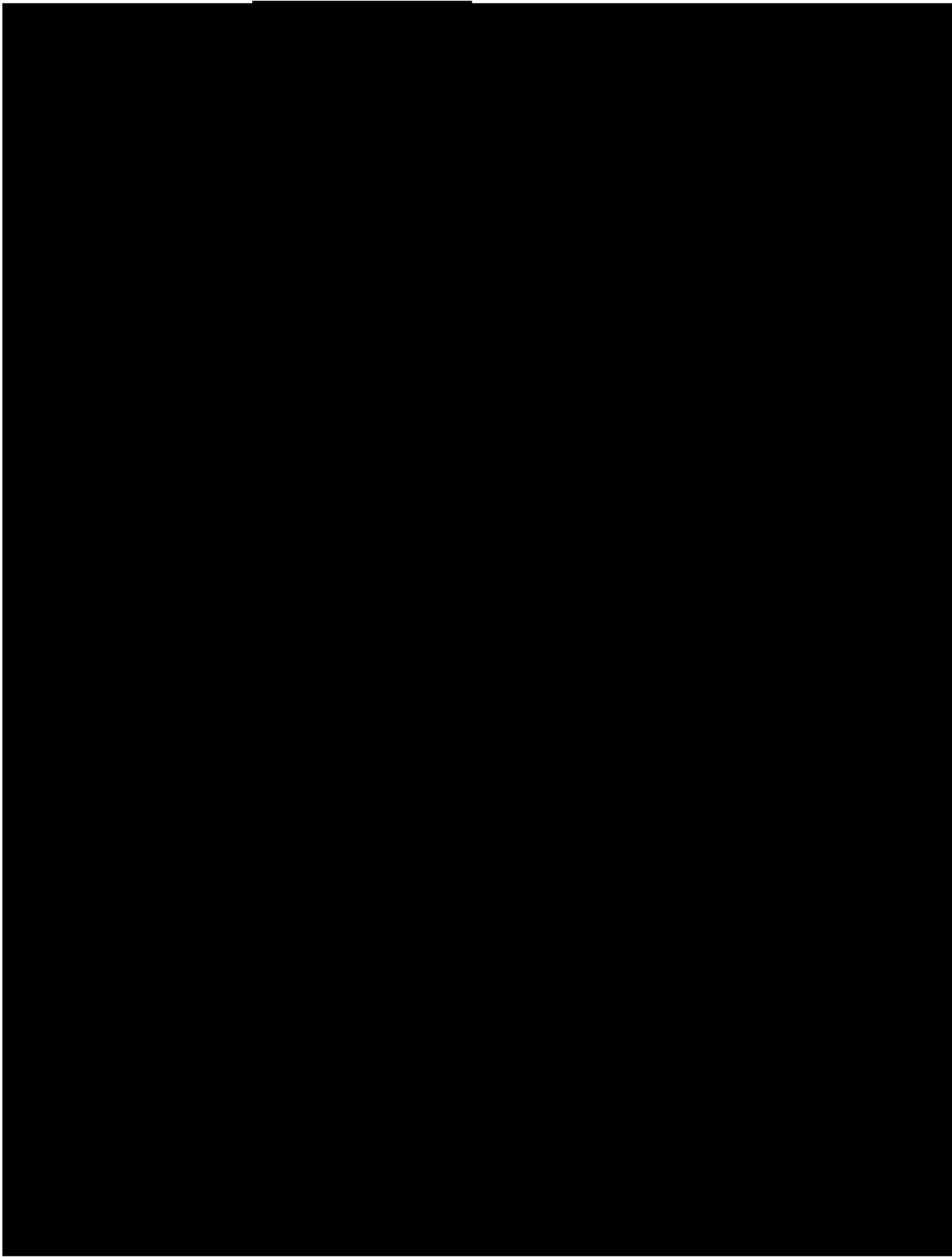


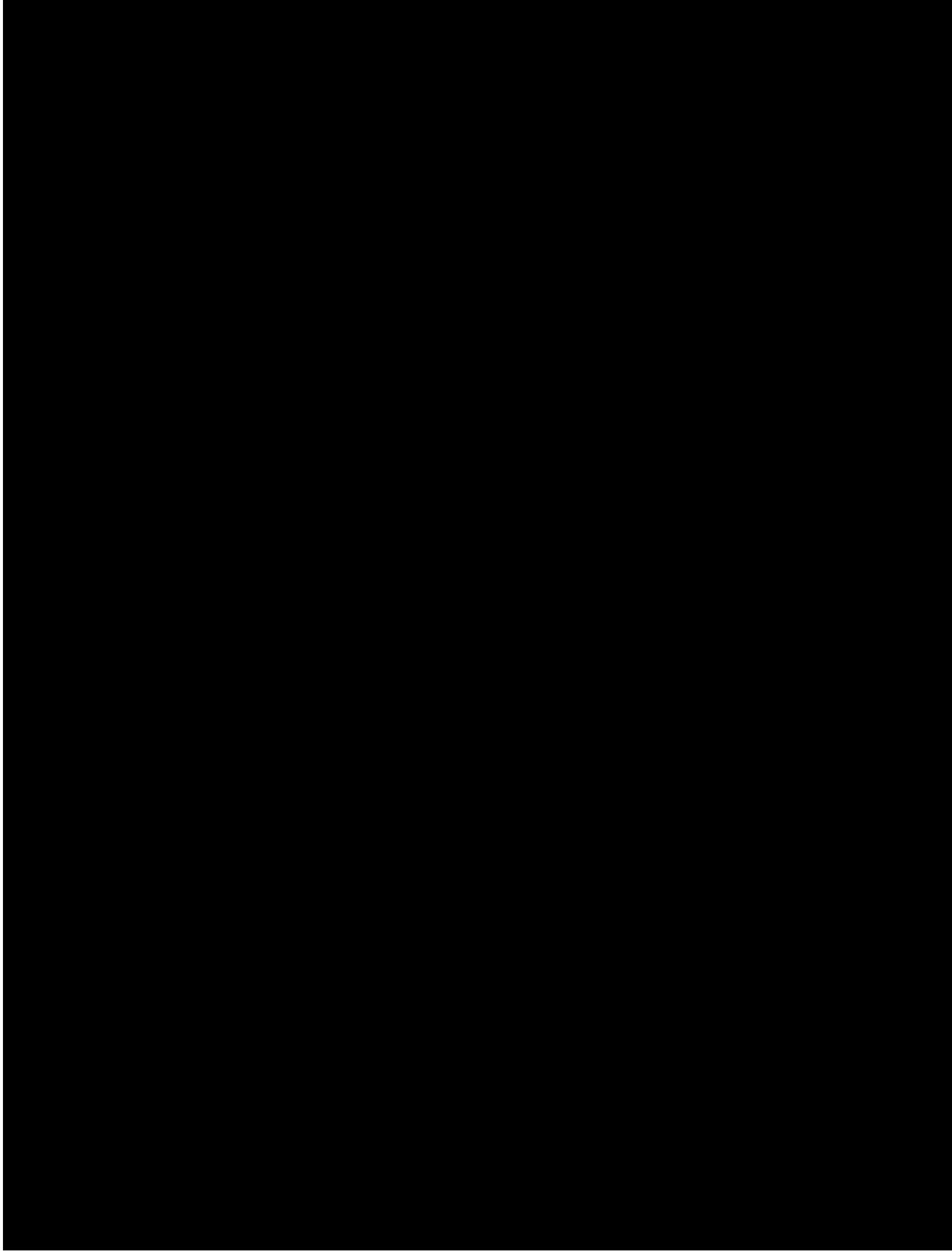


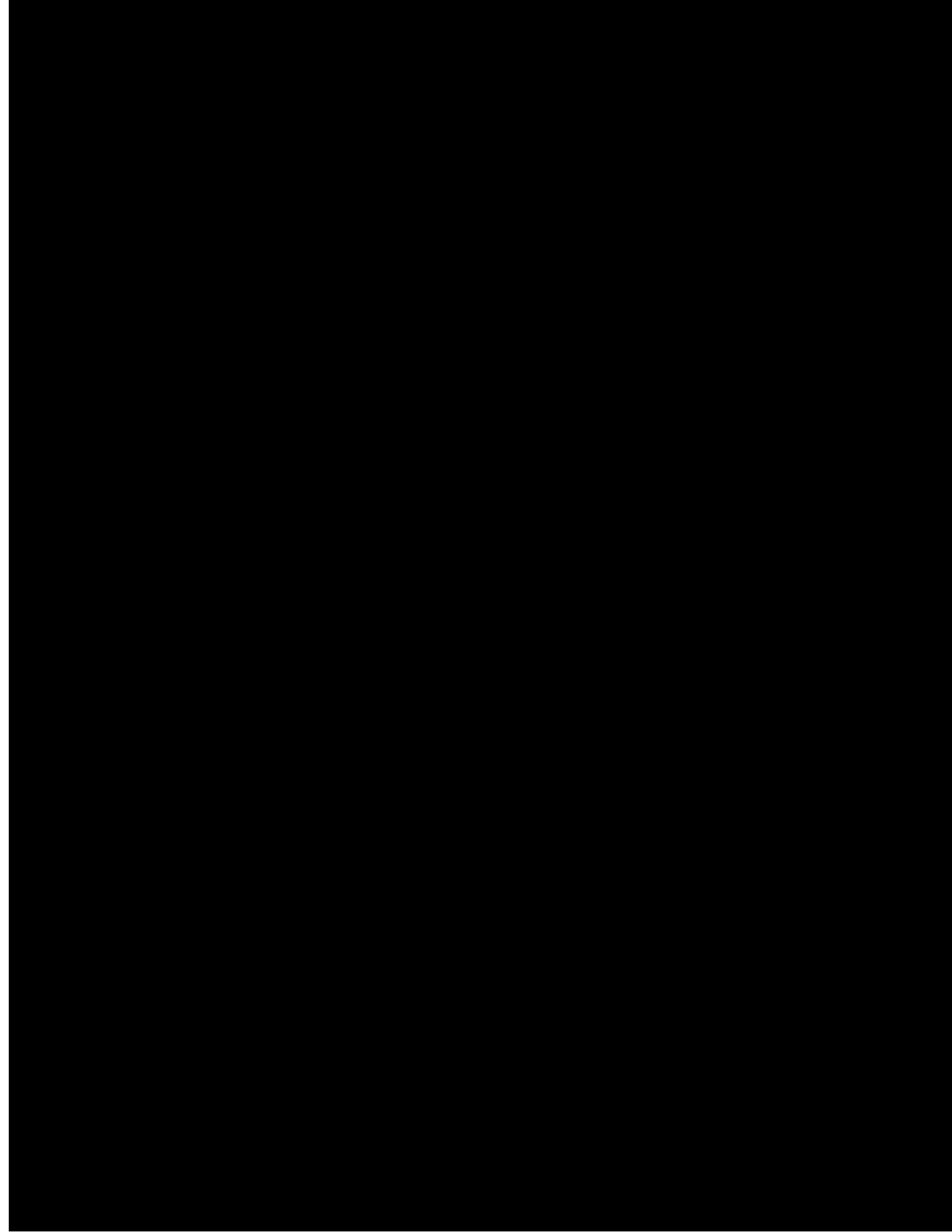


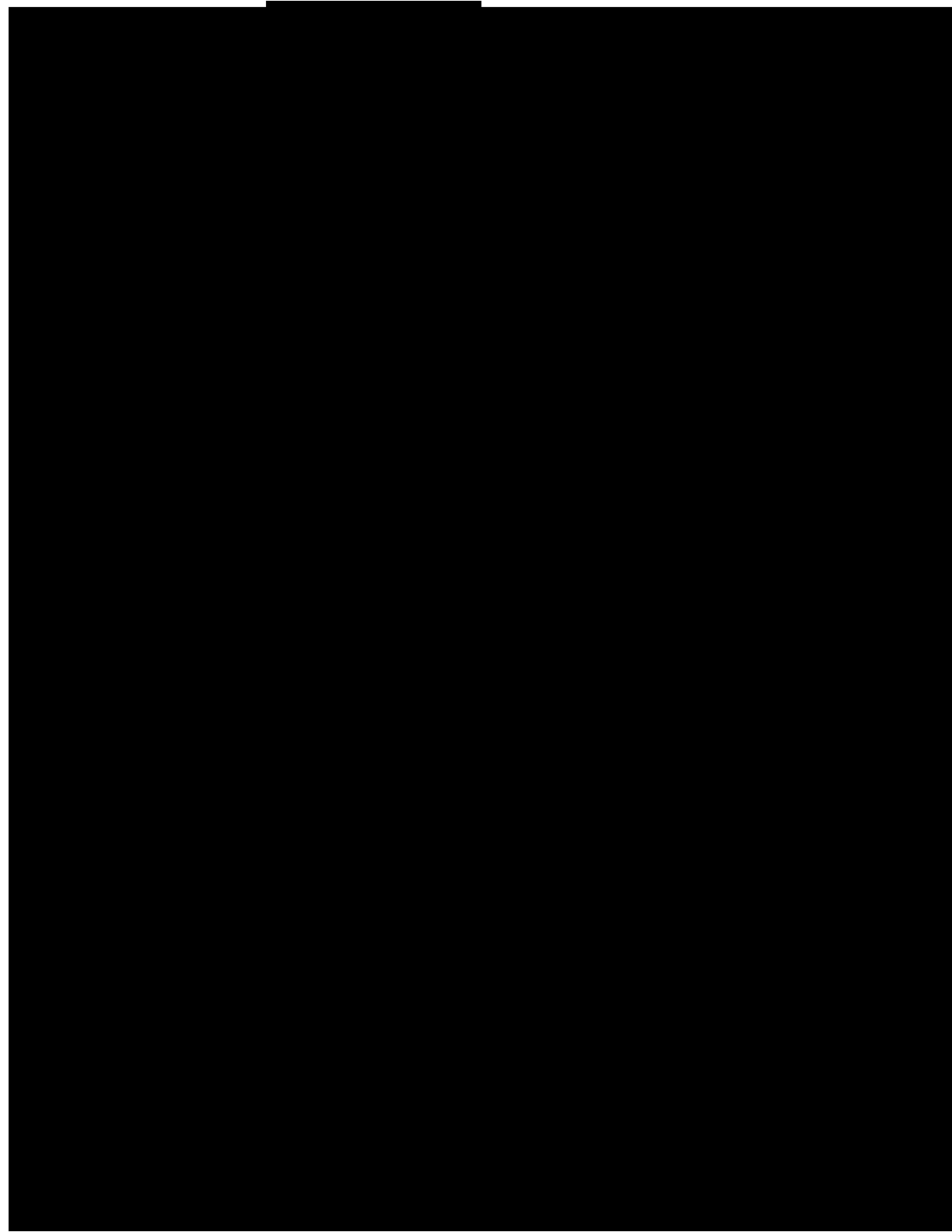


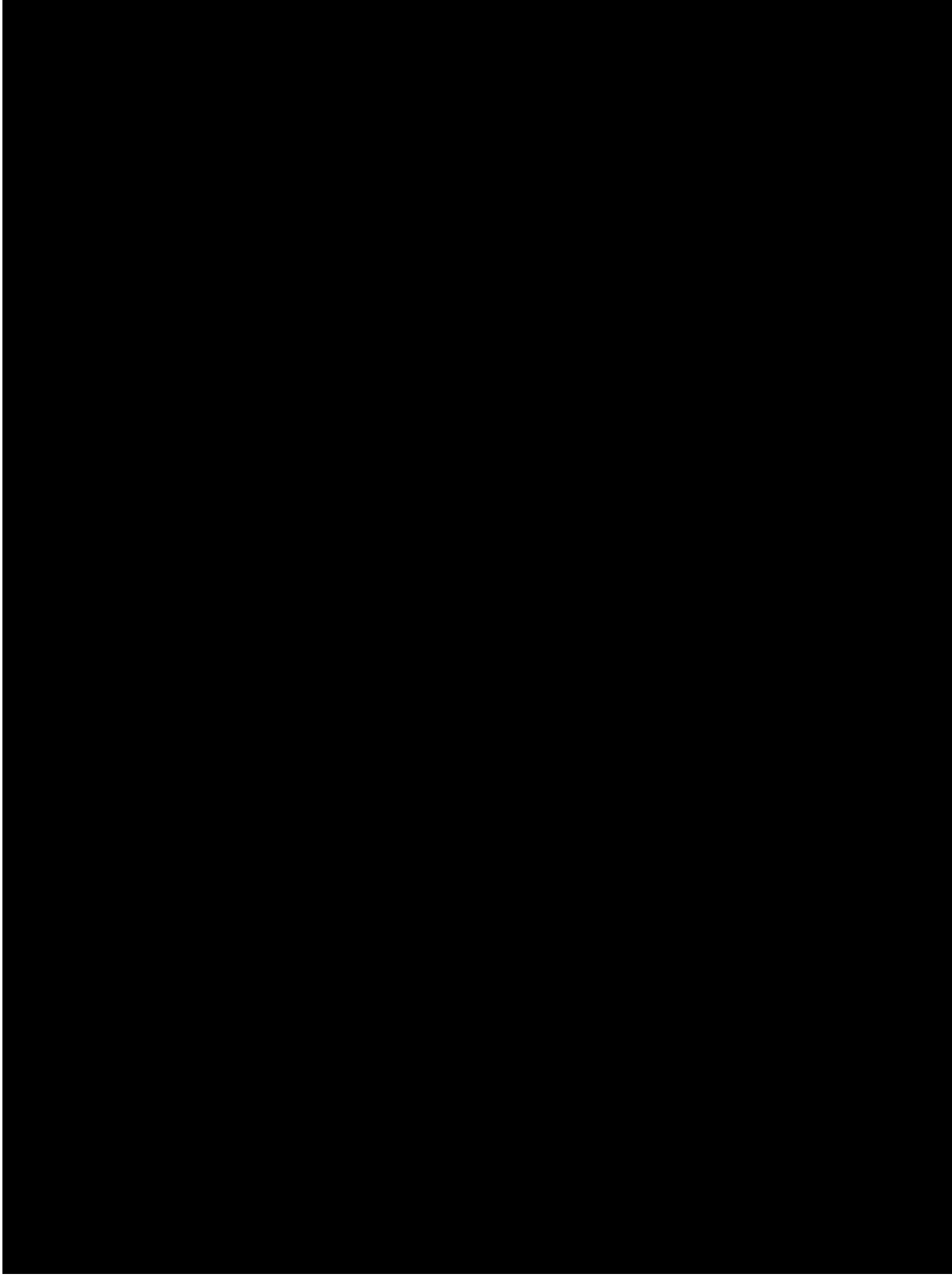












February 25, 2020

ANBARIC DEVELOPMENT PARTNERS


**AC and DC Land & Submarine
Transmission Cable
EMF Study**

Revision A

Project number:
154482

PROJECT CONTACT:
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EMF STUDY

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REVISION HISTORY						
REV.	ISSUE DATE	ISSUED FOR	PREP BY	CHKD BY	APPD BY	NOTES
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"Issued For" Definitions:

- "Prelim" means this document is issued for preliminary review, not for implementation
- "Appvl" means this document is issued for review and approval, not for implementation
- "Impl" means this document is issued for implementation
- "Record" means this document is issued after project completion for project file

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1.0 EXECUTIVE SUMMARY

POWER Engineer Consulting (POWER) has been contracted by Anbaric Development Partners to perform an Electric and Magnetic Field (EMF) study on [REDACTED]. This underground transmission system will include HVDC and HVAC cables. For the length of these cables, there is a section where they come within close proximity of each other.

EMF effects were calculated for five cases in Safe Engineering Service's Current Distribution, Electromagnetic Interference, Grounding and Soil Structure Analysis (CDEGS) HIFREQ software. Separate simulations were created for AC and DC. One simulation was performed for the 1,200 MW AC cable system and one simulation at 320kV and 400kV for each 1,200MW DC cable system. EMF coupling interaction between the HVDC and HVAC cables was not analyzed. The characteristics of the cables can be seen in Appendix A. All cables were considered to be in-service for both AC and DC systems for this investigation. AC configurations will be cross-phased (ABC-CBA top to bottom) to minimize EMF effects. Table 1 shows the maximum magnetic field calculation results for each cable:

Table 1: Magnetic Field Results		
Cable Type	Nominal Voltage (KV)*	Maximum Magnetic Field (mG)
DC Underground	320kV	468.05
DC Underground	400kV	347.44
DC Submarine	320kV	711.35
DC Submarine	400kV	569.07
AC Underground	345kV	37.76

The results section includes plots which indicate the magnetic fields for each of the DC and AC systems. The results for the electric fields above ground were negligible and not included in this report. All the transmission systems are within recommended guidelines and standard (shown in Section 2.2).

2.0 ANALYSIS

2.1 Objectives

The objective of this study was to provide analysis of the EMF values for a specific segment of the [REDACTED] that is being installed and report the results for one meter above grade. The calculated EMF values are compared against the New York Public Service Commission (NYPSC) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) limits to provide a point of comparison.

2.2 EMF

The EMF analyses are performed using Safe Engineering Service's Current Distribution, Electromagnetic Interference, Grounding and Soil Structure Analysis (CDEGS) HIFREQ software. HIFREQ uses the electrical and physical characteristics of the transmission line to calculate EMF from the transmission lines.

The electric fields are primarily a function of the maximum operating voltage of conductors. Magnetic fields are primarily a function of the line current loading, which varies over time. Therefore, the magnetic fields calculations are performed at calculated maximum line current loading.

For the analysis, electric and magnetic fields were analyzed one meter above grade with the AC cable depths based on the plan and profile drawings, see Appendix B, and the DC cable depths were at analyzed at three feet for land and fourteen feet for submarine. The distance between the DC cables is twenty inches for underground and thirty-three feet for submarine. In this analysis, all cables are considered to be in-service.

Once EMF values are calculated, they are compared to recommended guidelines and standards as shown in the results section. The New York Public Service Commission (NYPSC) provides a limit for electric fields of 1.6 kV/m, and a limit for magnetic fields of 200 mG, both at the edge of the ROW for AC transmission systems. The data is per the Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities issued September 11, 1990. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) provides a limit for electric fields at 8.33kV/m, and a limit of 400mT (4 million mG) for magnetic fields on DC transmission systems. The data is per the ICNIRP published in 1998.

2.4 Input Data

Electric and magnetic field performance is all based on the electrical and physical characteristics of the transmission lines. Specifically, these factors are driven by the voltage and current loading of the line, the physical conductor characteristics bundling, and the relationships of each phase conductor to the other phases. As a result, there are several variables that will affect calculated results. These conductors were modeled without the outer shield of the cables grounded as it yields the worst-case results. Should any of the cable or design data change, the results will also change.

3.0 EMF RESULTS

3.1 Magnetic Fields

The reported magnetic field values are the maximum magnetic flux densities at a given point in space. Magnetic flux density is in units of gauss or milligauss (mG). The NYPSC limits the magnetic field to 200 mG at the edge of the ROW for AC transmission systems and the ICNIRP limits the magnetic field to 400mT (4 million mG) at the edge of the ROW for DC transmission systems. Table 2 shows the maximum magnetic fields for the AC and DC underground transmission systems.

Table 2: Magnetic Field Results		
Cable Type	Nominal Voltage (KV)*	Maximum Magnetic Field (mG)
DC Underground	320kV	468.05
DC Underground	400kV	347.44
DC Submarine	320kV	711.35
DC Submarine	400kV	569.07
AC Underground	345kV	37.76

The calculated edge of ROW magnetic fields are within the recommended guidelines and standards limits.

The following figures show the calculated magnetic fields within the ROW:

- Figure 1: DC Underground at 320kV
- Figure 2: DC Underground at 400kV
- Figure 3: DC Submarine at 320kV
- Figure 4: DC Submarine 400kV
- Figure 5: AC Underground 345kV

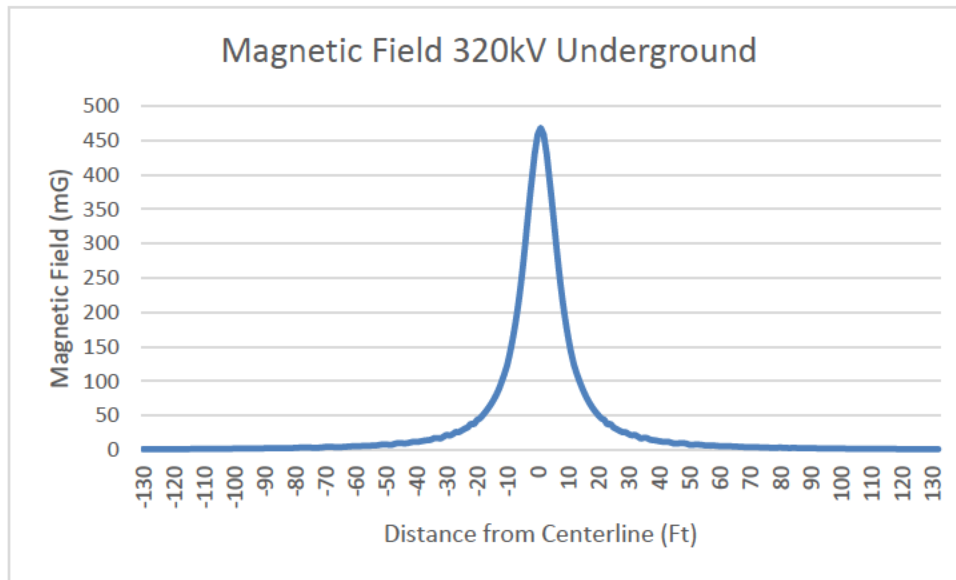


Figure 1: Magnetic Field for Underground Cable At 320kV, 1,200MW Nominal DC

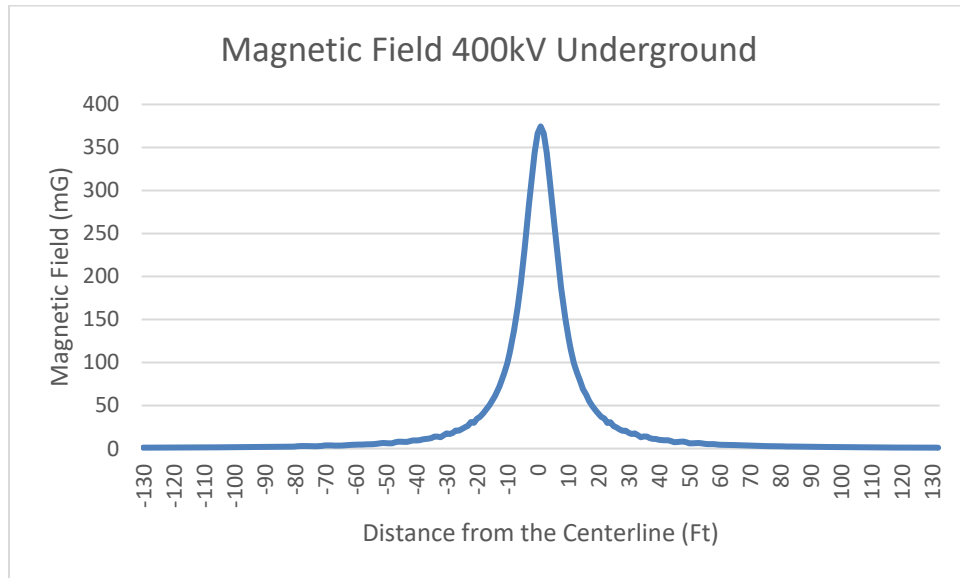


Figure 2: Magnetic Field for Underground Cable At 400kV, 1,200MW Nominal DC

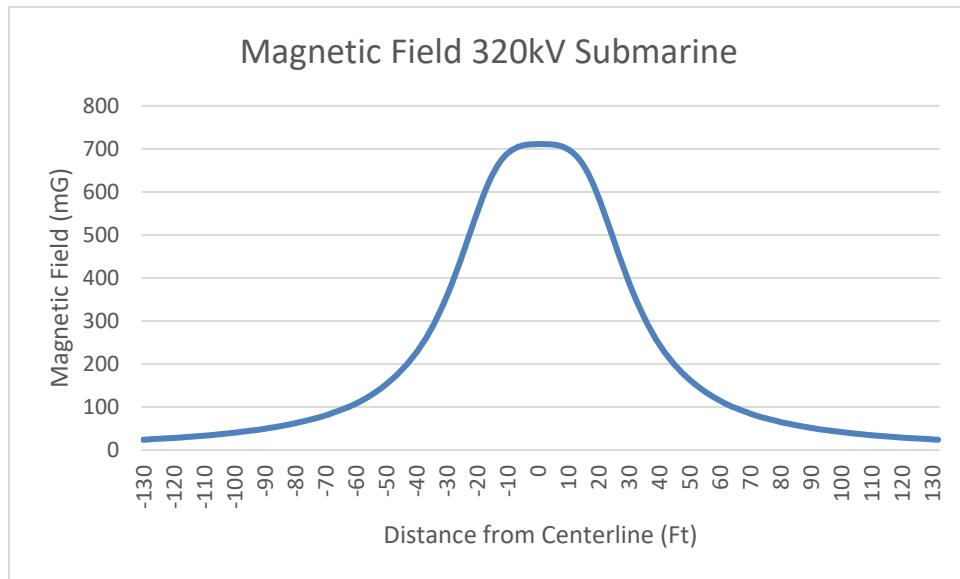


Figure 3: Magnetic Field for Submarine Cable At 320kV, 1,200MW Nominal DC

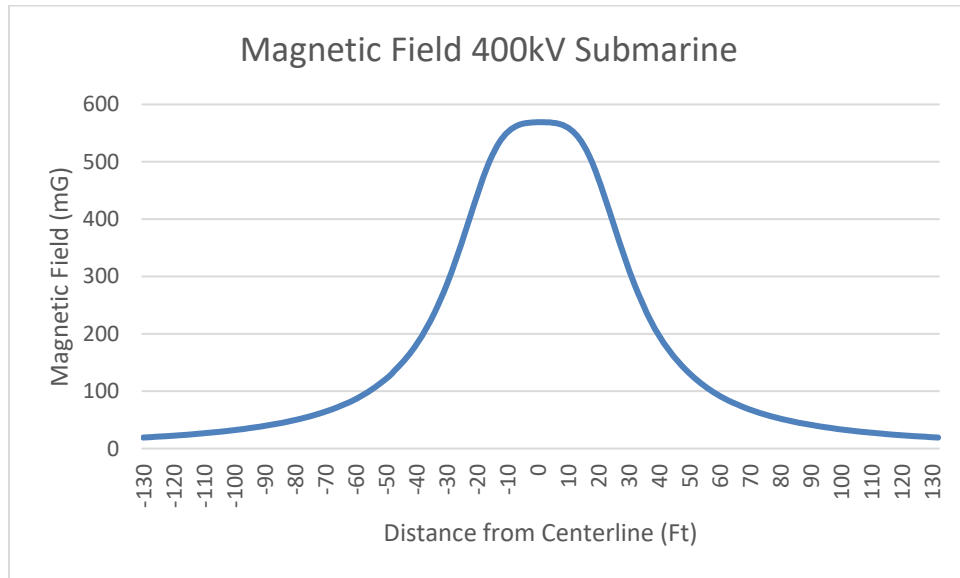


Figure 4: Magnetic Field for Submarine Cable At 400kV, 1,200MW Nominal DC

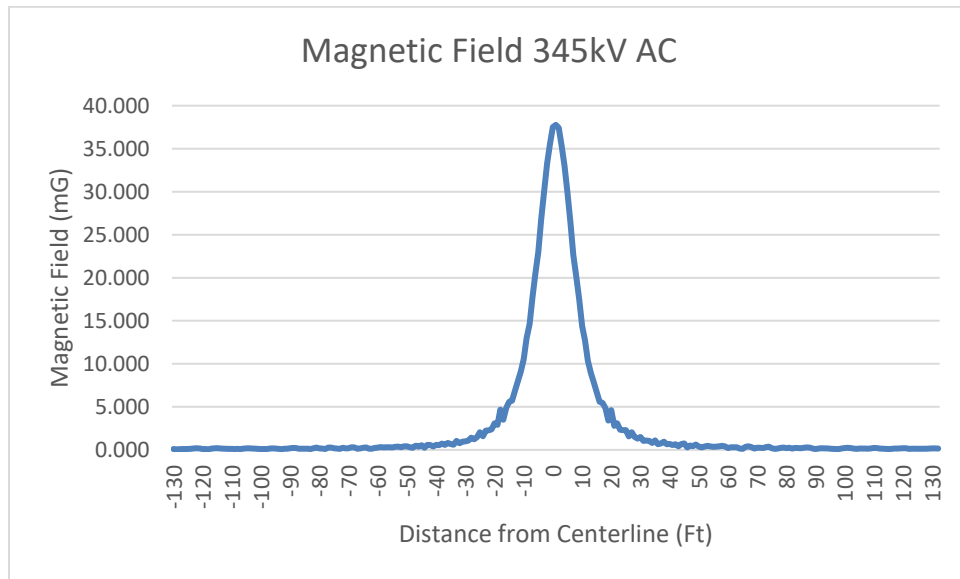


Figure 5: Magnetic Field for 345kV, 1,200MW Nominal AC

4.0 GENERAL SUMMARY OF RESULTS

The calculated EMF effect results for the [REDACTED] are as follows:

- The calculated magnetic field for the DC system is below the limit of 4 million mG.
- The calculated magnetic field for the AC system is below the limit of 200mG
- Electric fields above ground from the underground transmission lines are negligible.



Submarine Cable Route Field Evaluations Report

Boardwalk Power Link Project
New Jersey State Waters

PREPARED FOR:

Boardwalk Transmission LLC
401 Edgewater Place, Suite 680
Wakefield, MA 01880

PREPARED BY:

ESS Group, Inc.
404 Wyman Street, Suite 375
Waltham, Massachusetts 02451

ESS Project No. A592-003.20

June 2021



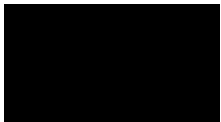


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Appendix E	Alpha Analytical Report (Bulk Physical and Chemical Testing)
Appendix F	GeoTesting Express Report (Thermal Conductivity Testing)
Appendix G	ESS Benthic Community Assessment Report



1.0 INTRODUCTION

Boardwalk Powerlink LLC is proposing the Boardwalk Power Link Project (Project), which is a component of the larger proposed New York/New Jersey Ocean Grid Project, which is a proposed offshore subsea electric transmission system designed to transmit renewable energy from offshore wind turbine generators planned to be installed offshore of the New York and New Jersey coasts in Bureau of Ocean Energy Management (BOEM) - authorized Wind Energy Areas (WEA's) and connected to the NY/NJ land-based transmission grid. The planned offshore transmission system is designed to efficiently deliver offshore wind energy generation from its specifically located offshore collector platforms (OCPs) to be located in the Outer Continental Shelf (OCS). These OCP's will serve as the interconnection point between the installed WEA's and this new offshore transmission grid connection to existing electric substations New Jersey and New York.

The Boardwalk Power Link Project component, the subject of this report, includes installation (direct seabed burial via jet plow device) of over 33 nautical miles of offshore subsea electric transmission cable from southern New Jersey offshore areas northward in New Jersey waters to Raritan Bay and Keyport Harbor where the subsea cable system will be pulled and installed in an underground transition vault located at the cable's shoreline landfall location.

To obtain route-specific information on the sediment conditions for this alignment, ESS Group, Inc. (ESS) completed sediment sampling field investigations (the "Study") to collect and analyze sediment samples along the Submarine Cable Route, as illustrated in Figure 1. The Study included a sediment sampling program developed to assess sediment bulk physical and chemical properties as well as provide a benthic macroinvertebrate community assessment for seabed sediments along the proposed submarine cable route survey area. The sediment sampling program was preceded by remote-sensing geophysical surveys to acquire hydrography, side-scan sonar, sub-bottom profile, and magnetometer data for the selected survey corridor. The investigation was completed to support associated environmental impact assessments for:

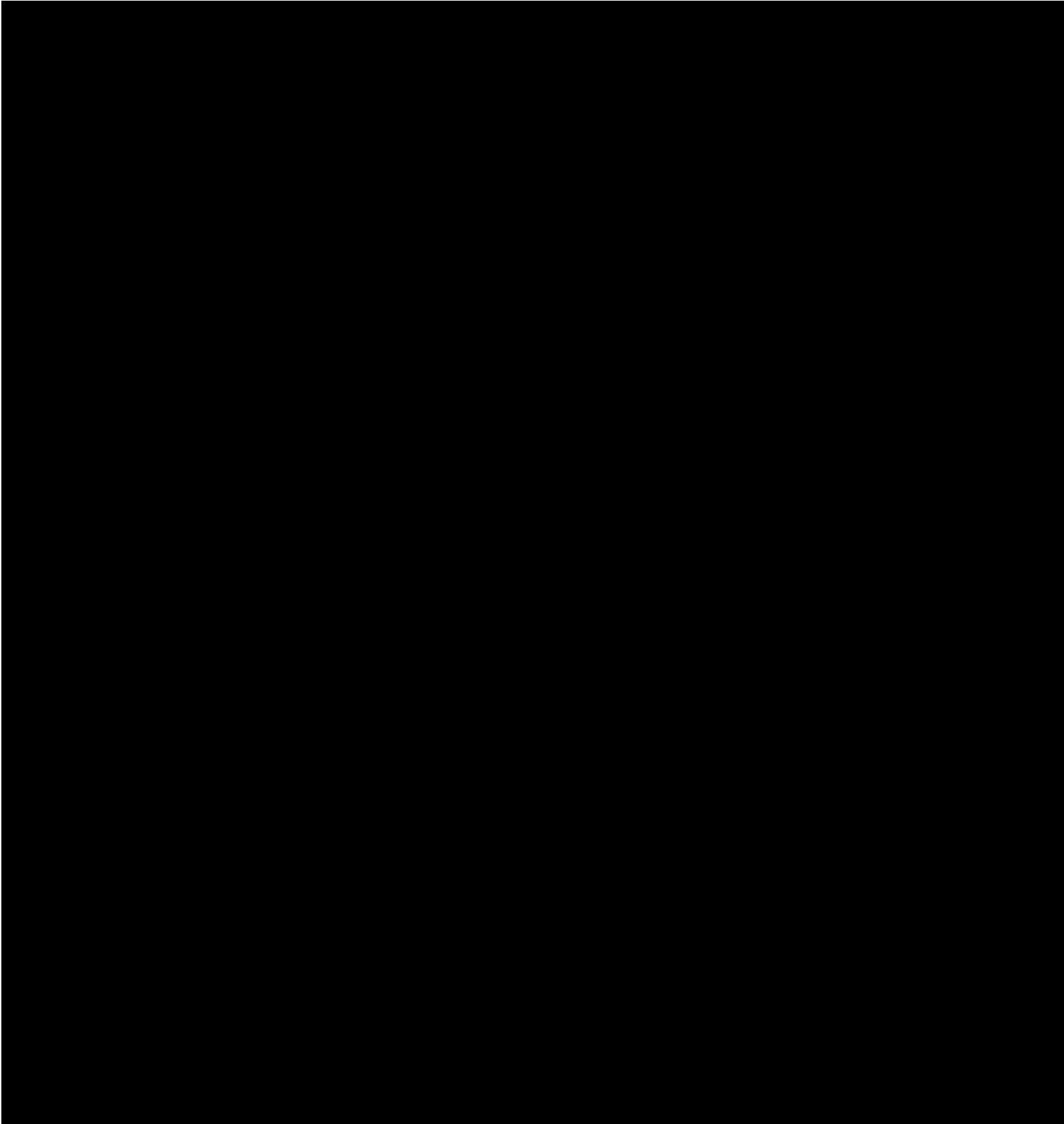
- Environmental regulatory permitting; and
- Preliminary engineering design and installer constructability assessments.

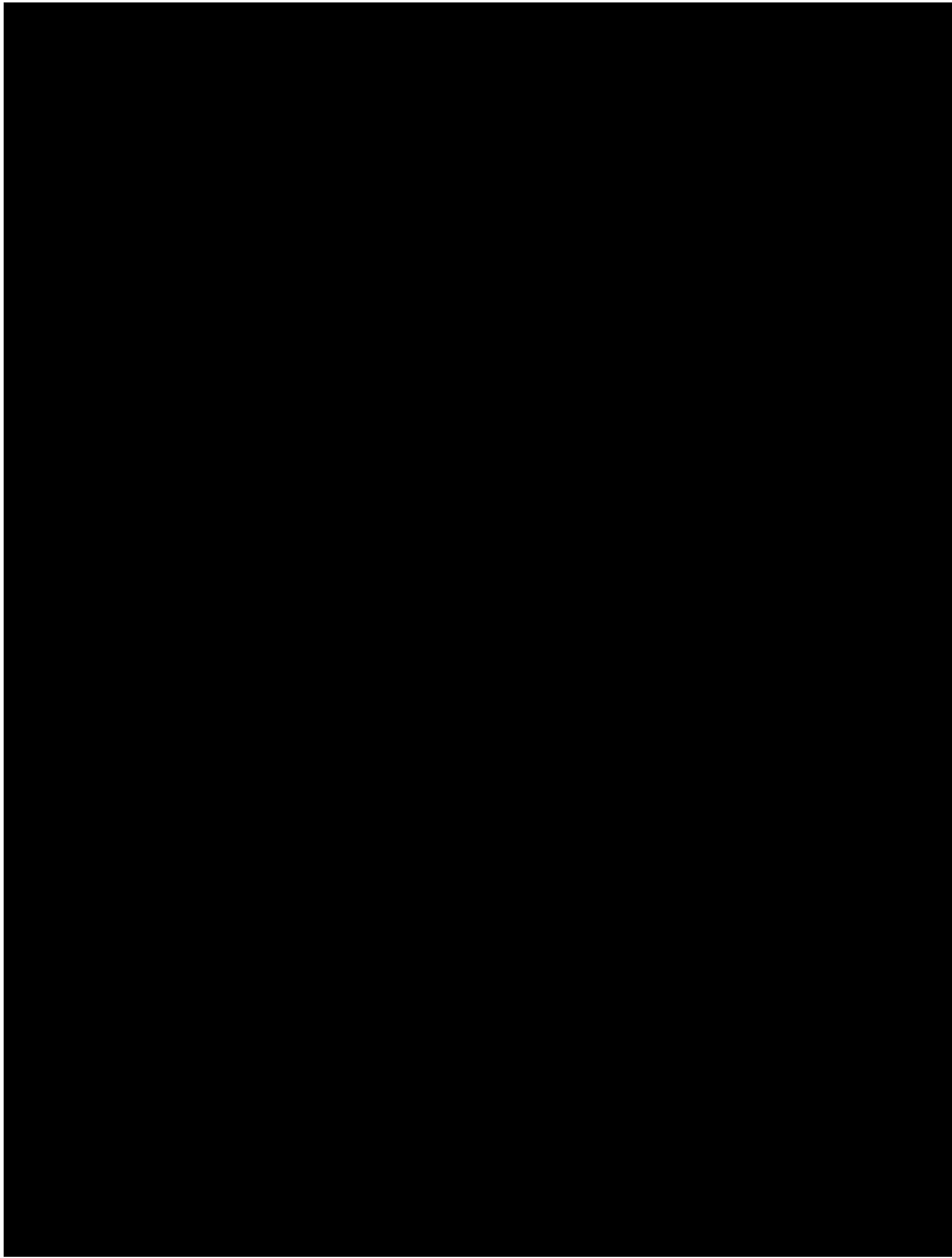
The Sediment Sampling and Analysis Plan (SSAP) to support the overall design of the project and preparation of permit applications was submitted in March 2020 to the New Jersey Department of Environmental Protection (NJDEP). The SSAP was approved by the NJDEP Office of Dredging and Sediment Technology in April 2020 with conditions to run chemical analysis on four locations regardless of grain size composition due to proximity to Historic Area Remediation Site (HARS). The SSAP field work was scheduled to begin in May 2020 but due to Covid-19 restrictions the field work was postponed. The SSAP field work was completed in April 2021. The Project Area was just inside of 3 miles offshore from Sandy Hook New Jersey south to Sea Girt, New Jersey. The sediment sampling performed in April 2021 adds to the previous sampling performed for the Project from 2013-2016.

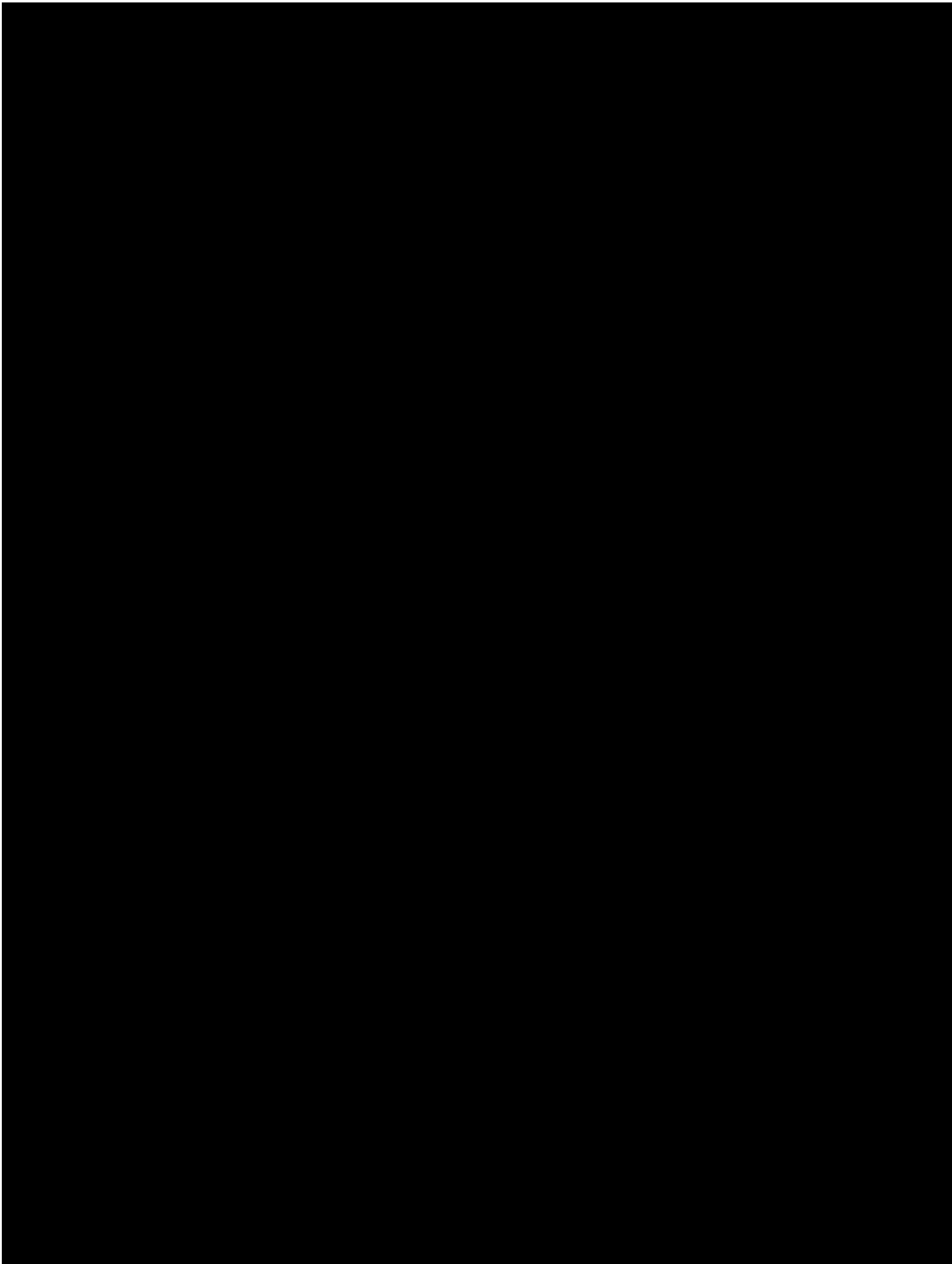
Ocean Surveys Inc. ("OSI") was responsible for field operations (i.e., advancement and collection of vibracores and benthic grabs) and establishing horizontal control. ESS was responsible for directing and observing field activities; splitting, logging, and sampling sediment cores; and coordinating activities with OSI and the analytical laboratories. ESS performed quantitative macroinvertebrate analysis on the benthic samples for evaluation and reporting. OSI contracted the R/V *Connecticut* through the University of Connecticut to support the field program that implemented the SSAP.

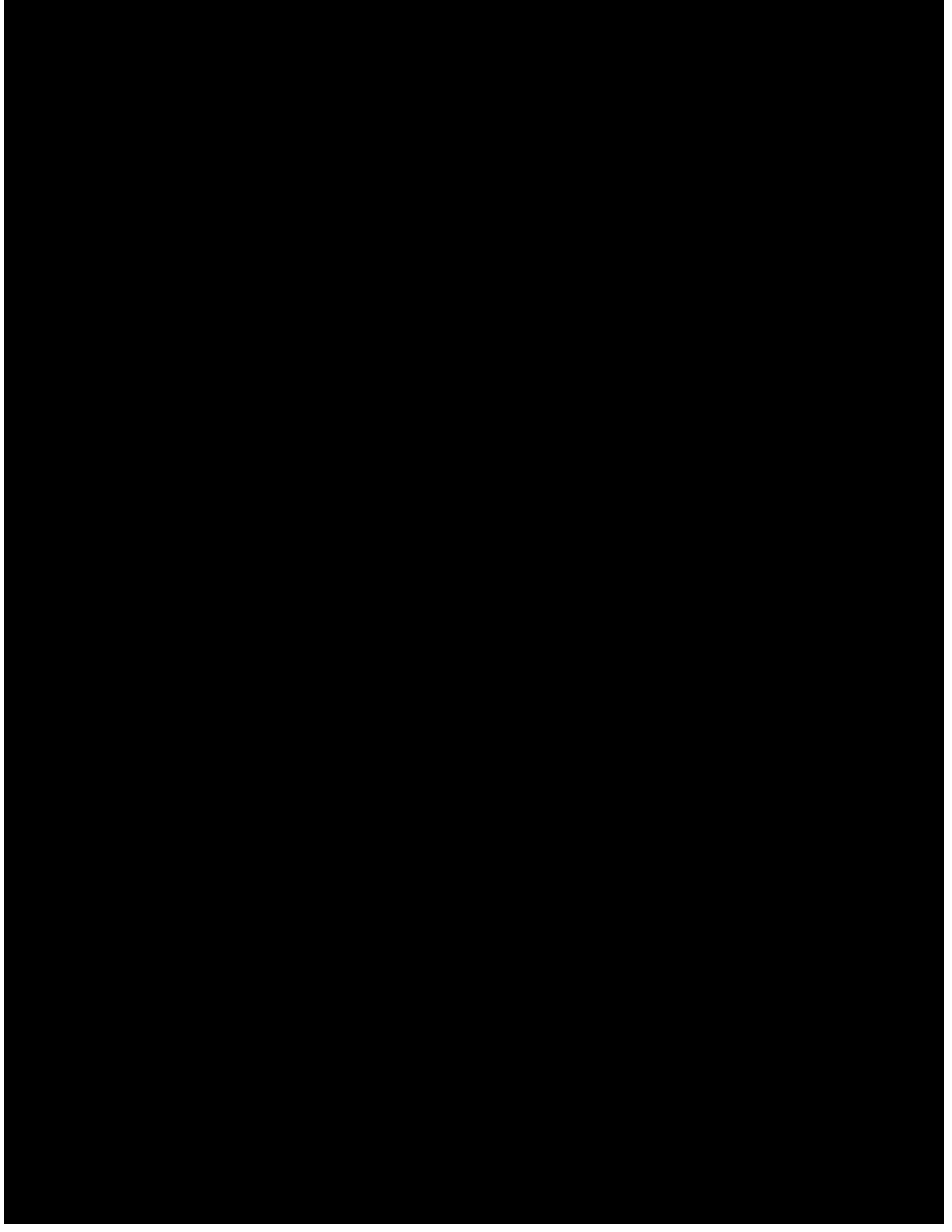


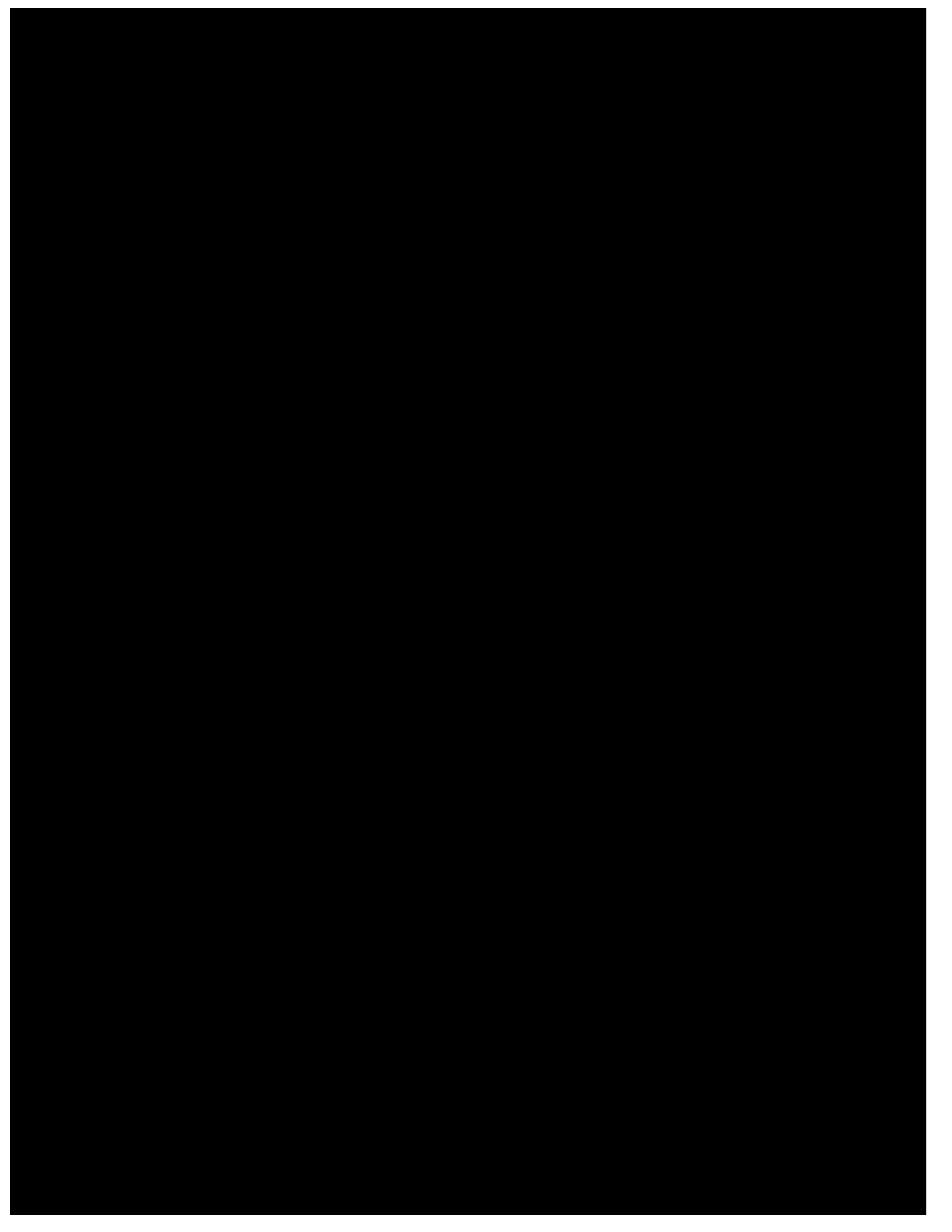
The following sections summarize the methods and findings of the vibracore sediment sampling and analysis portion of the Study. The OSI Operations Report for the field program is provided as Appendix D. A separate ESS report provides the results of the benthic macroinvertebrate sampling is presented in Appendix G.

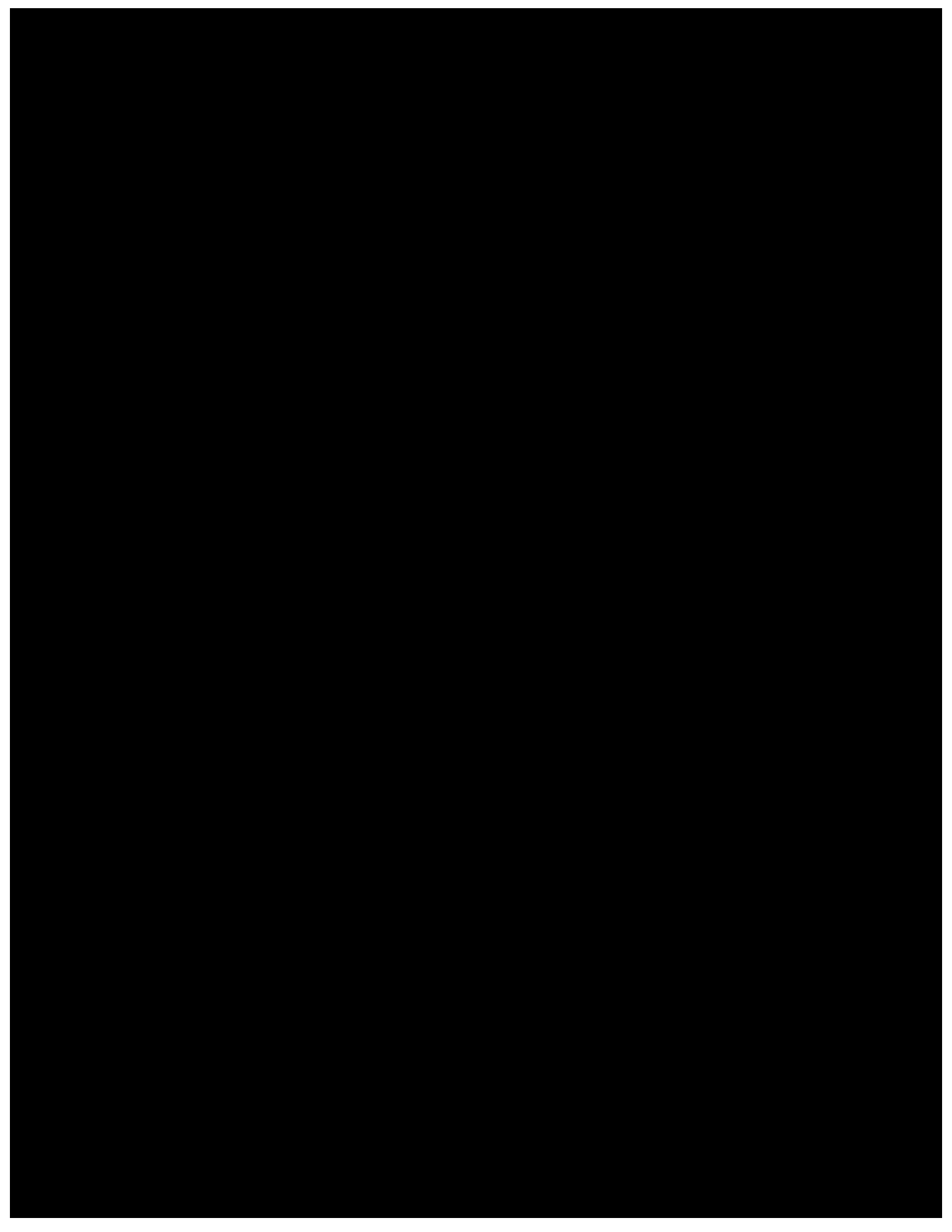






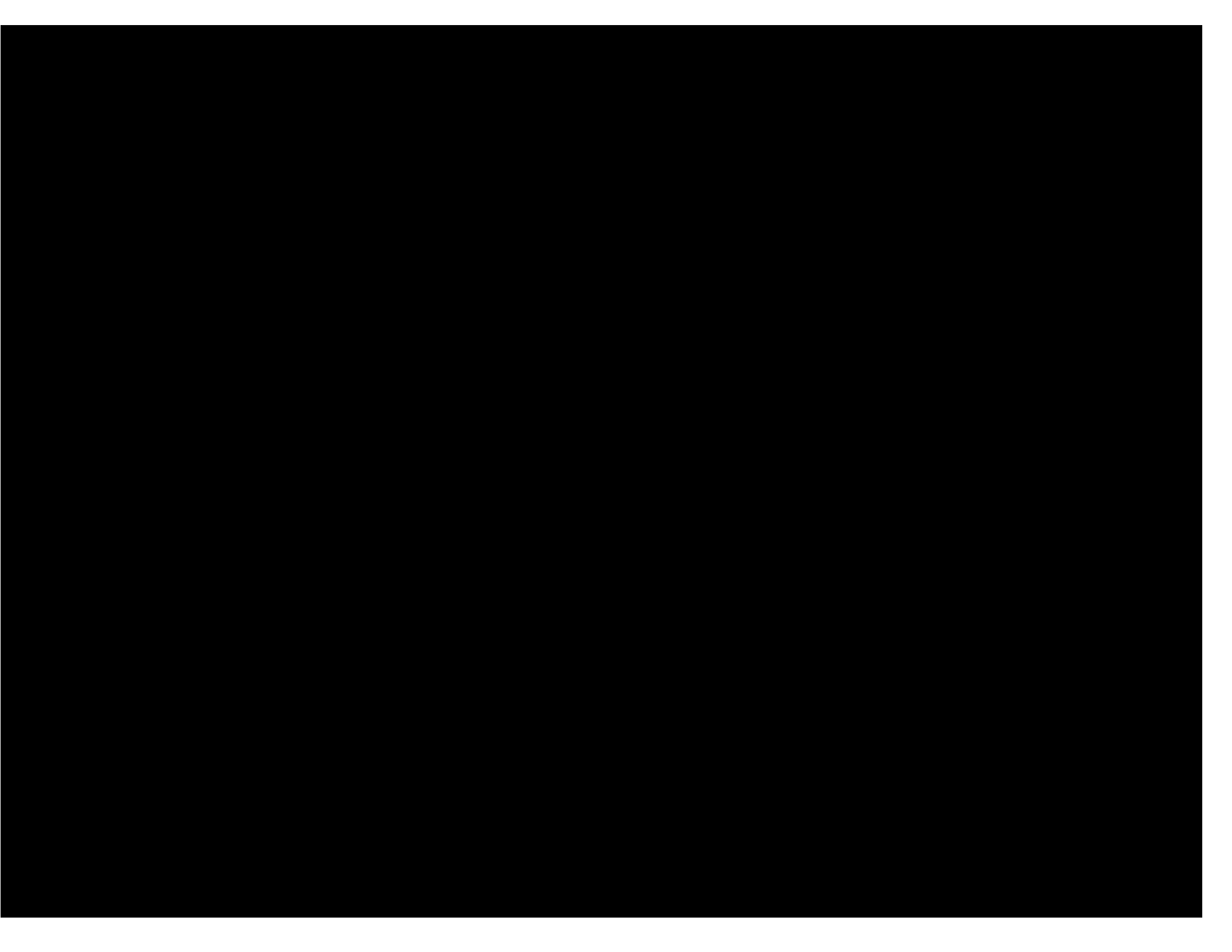


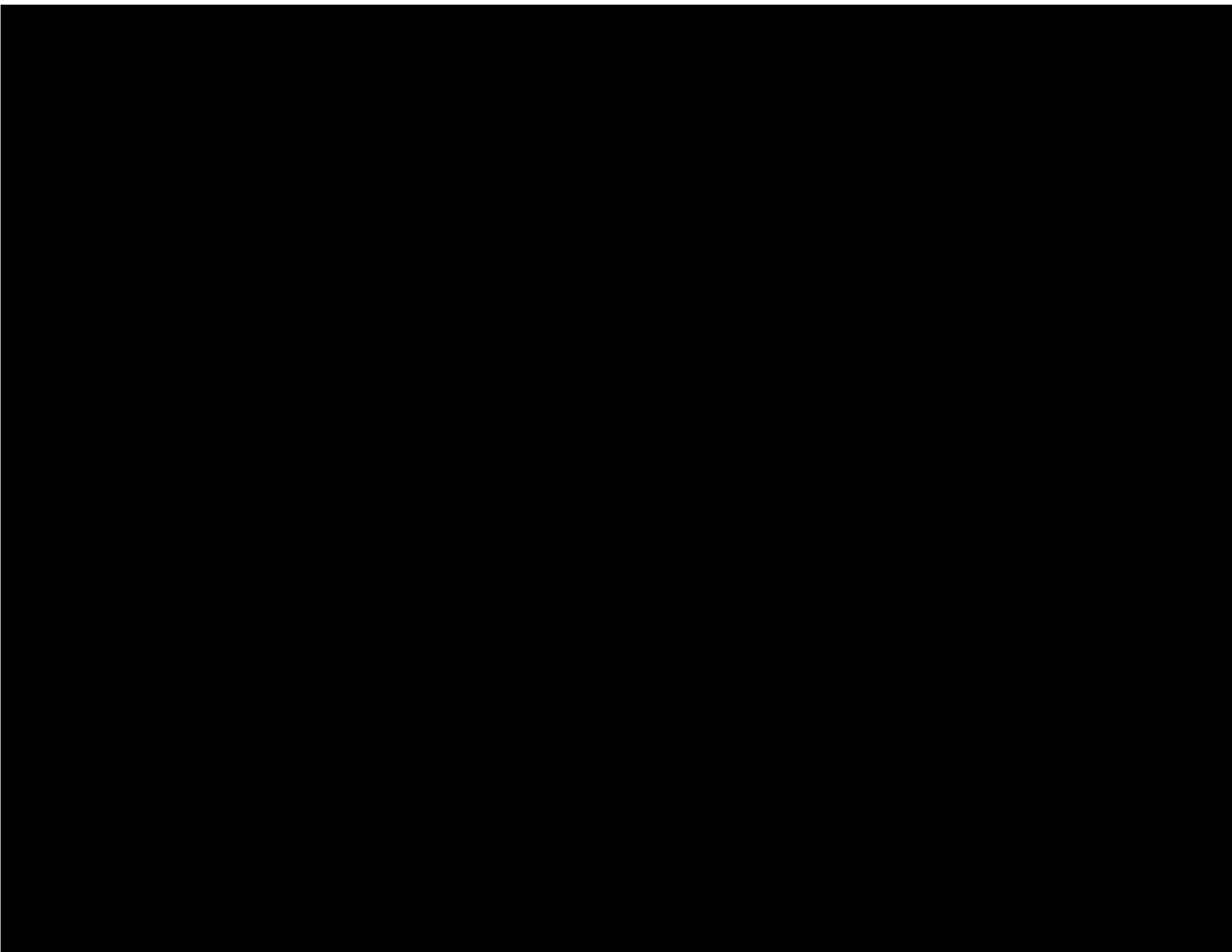


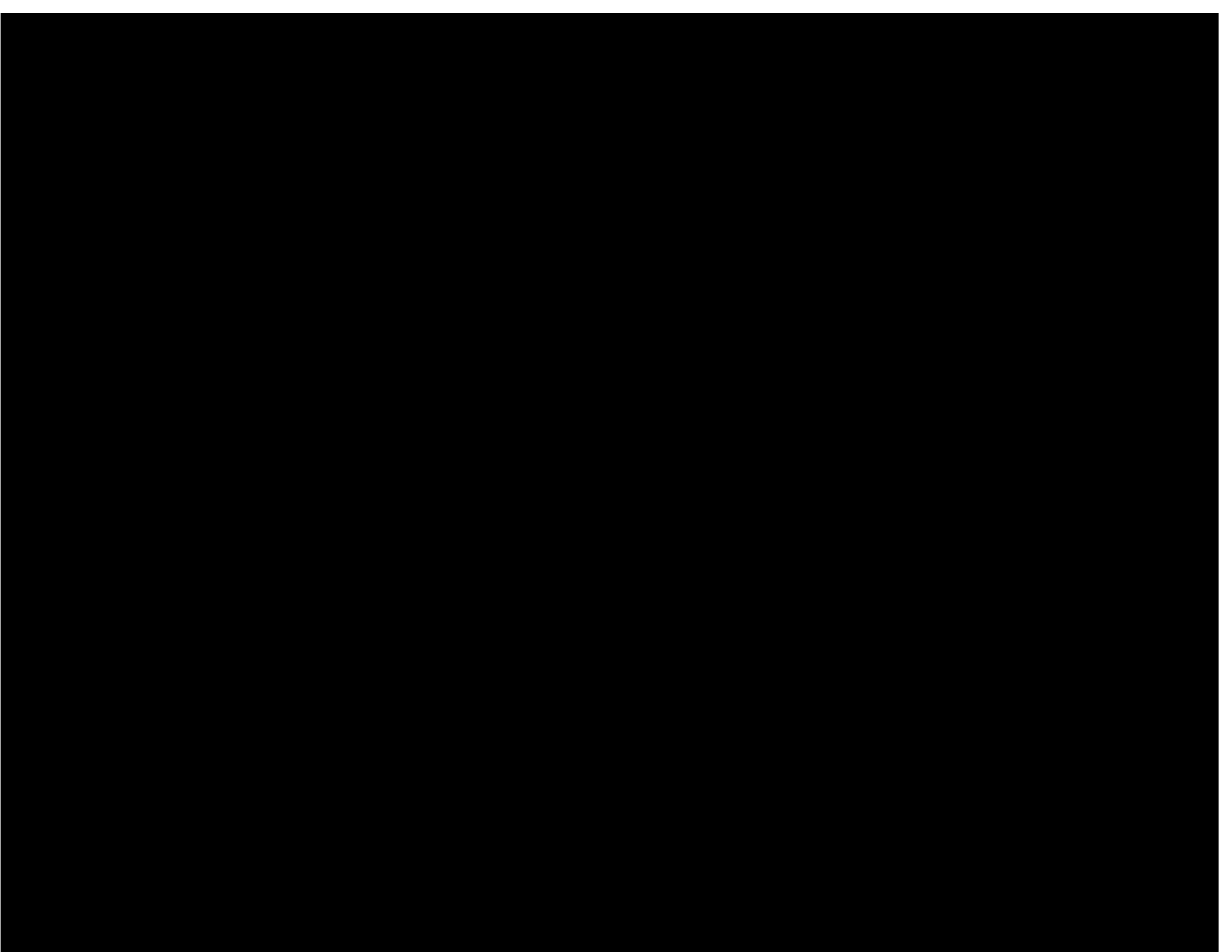


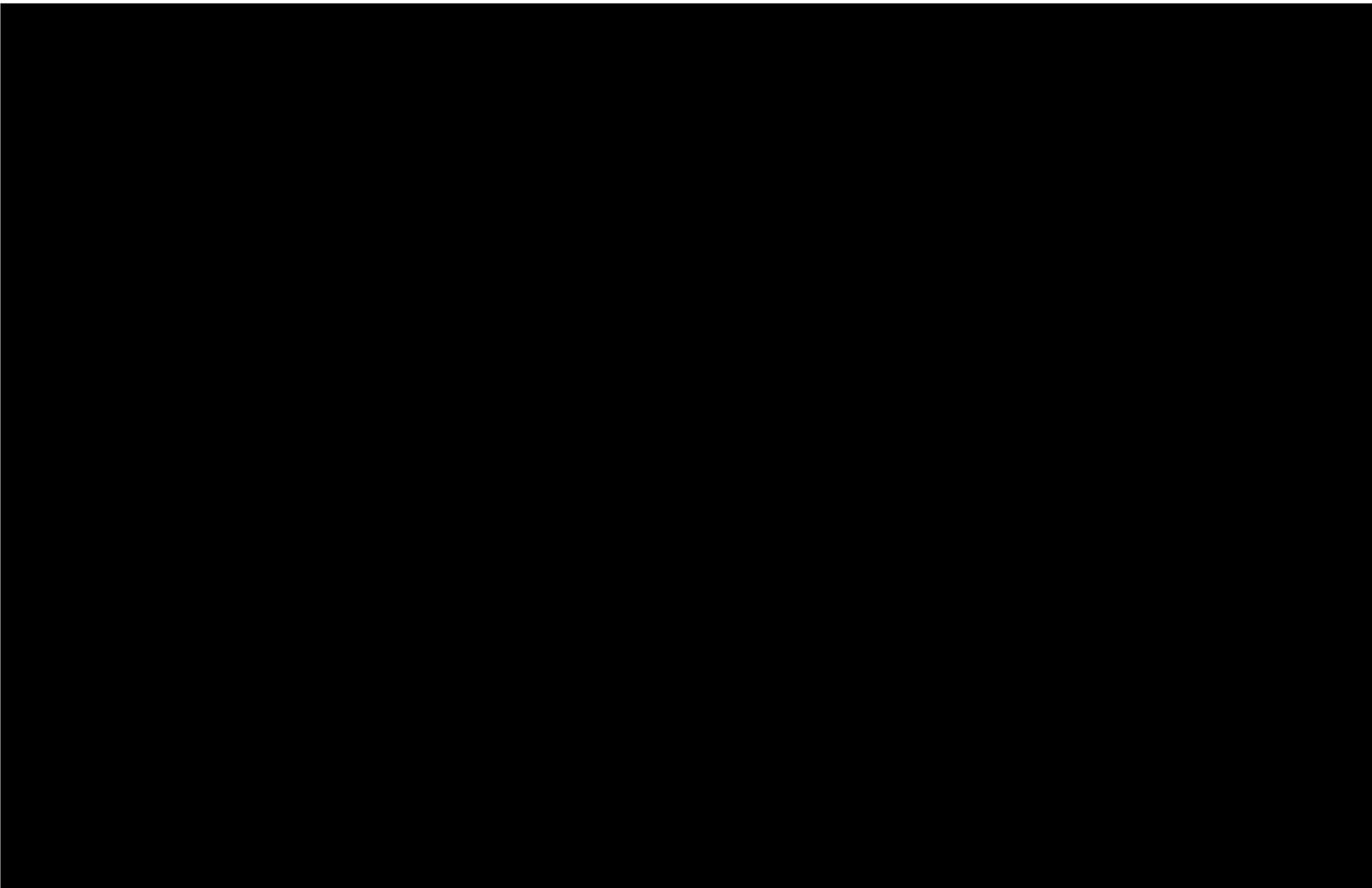


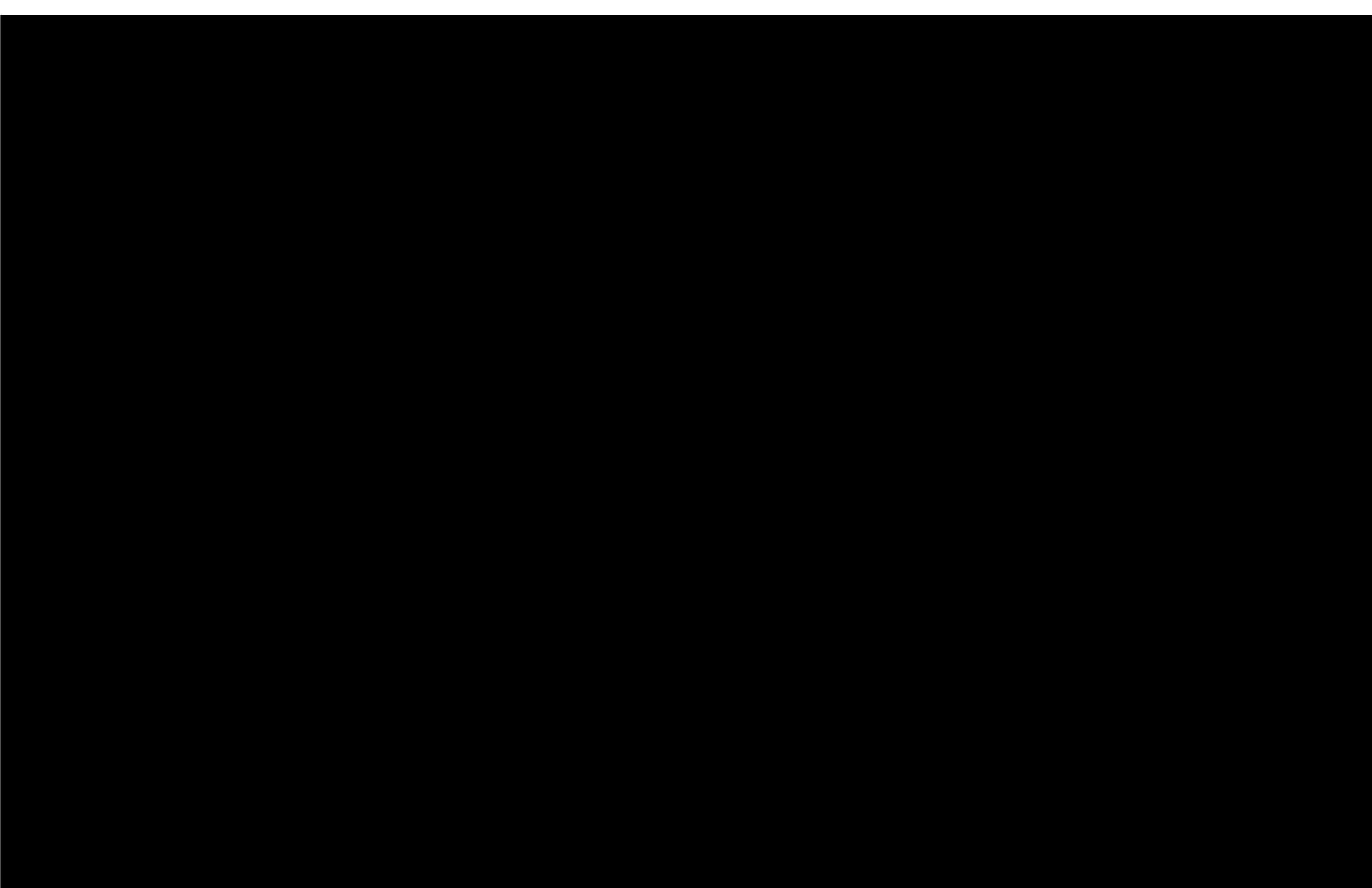


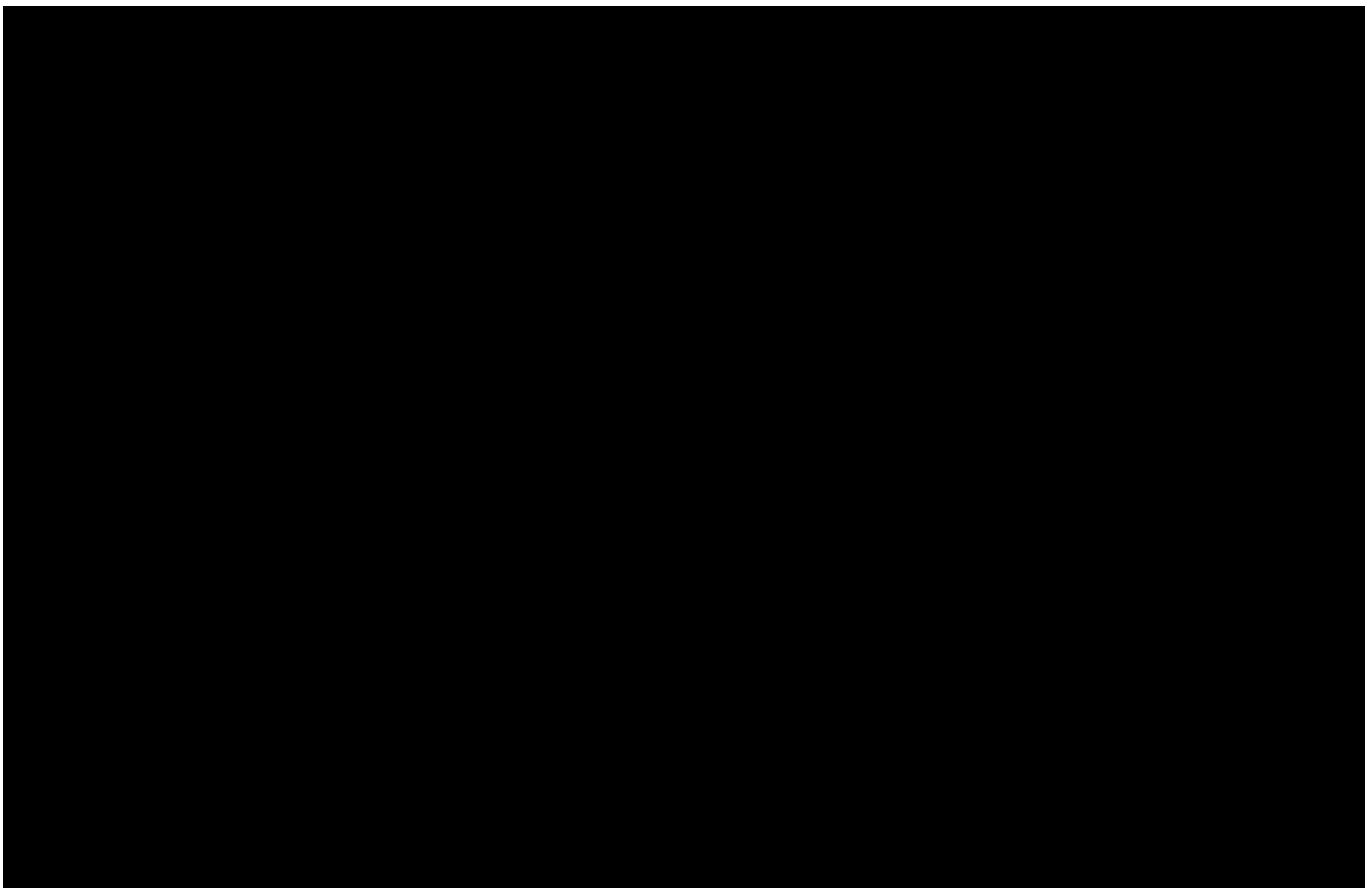


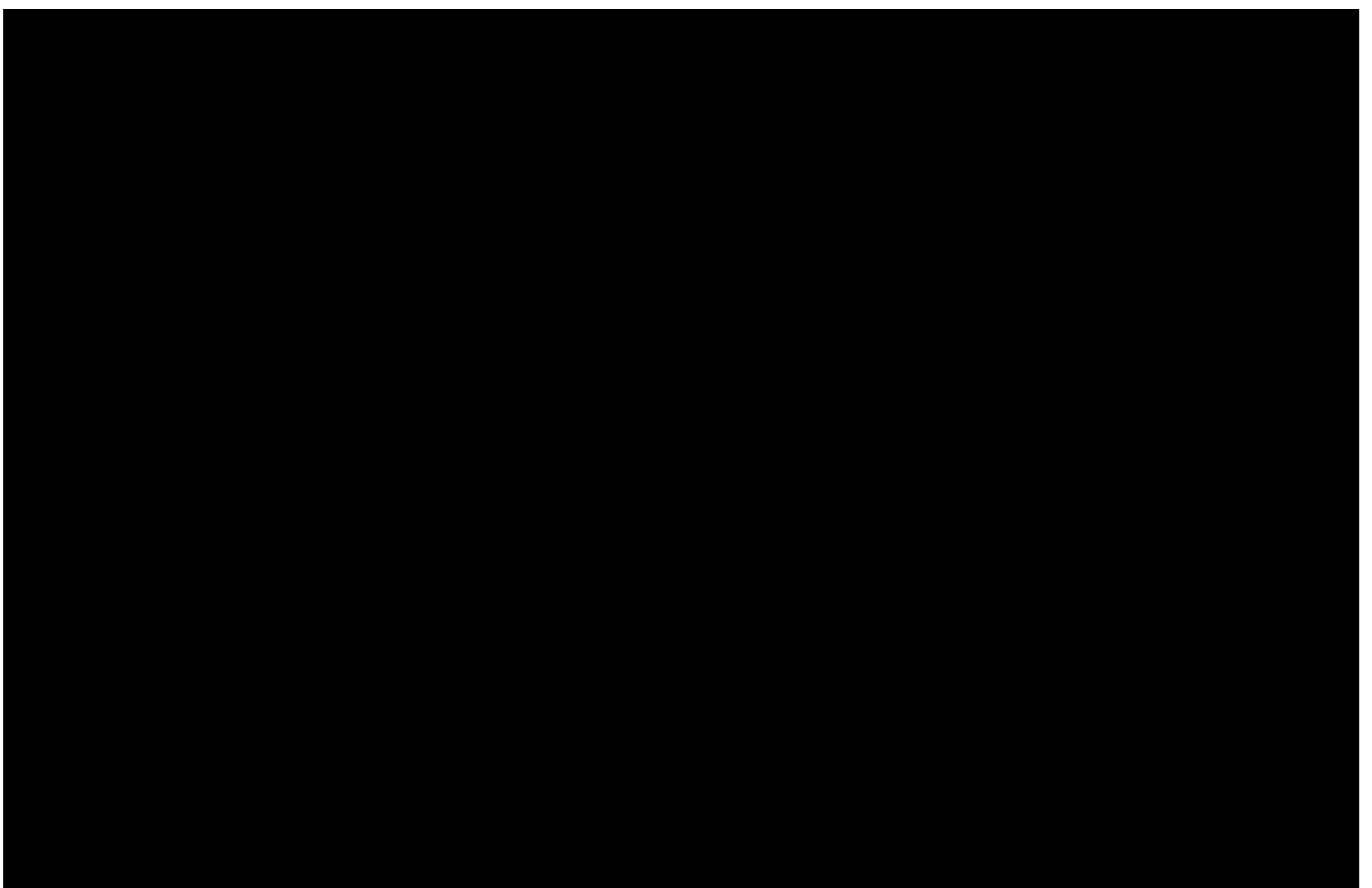


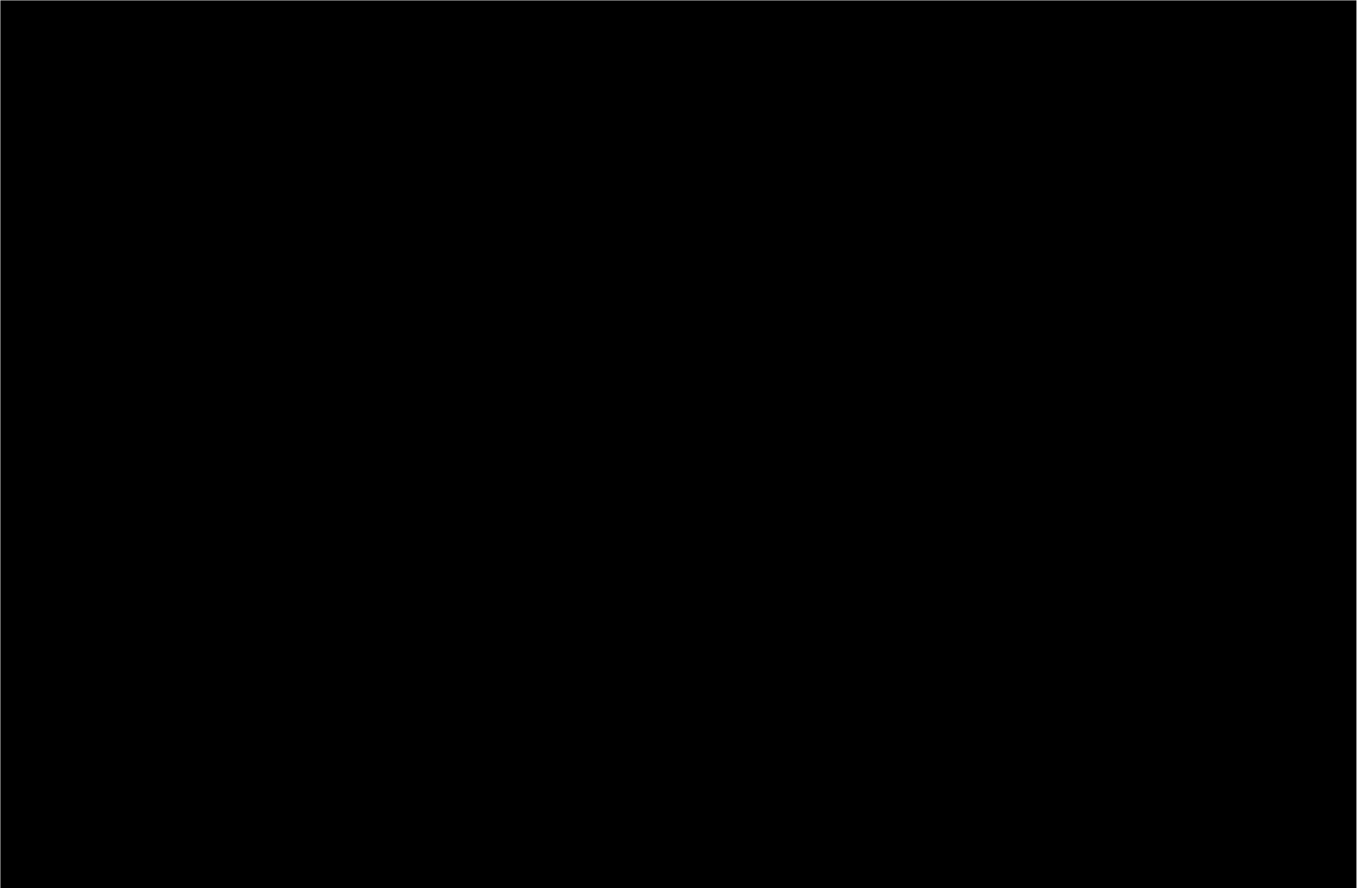


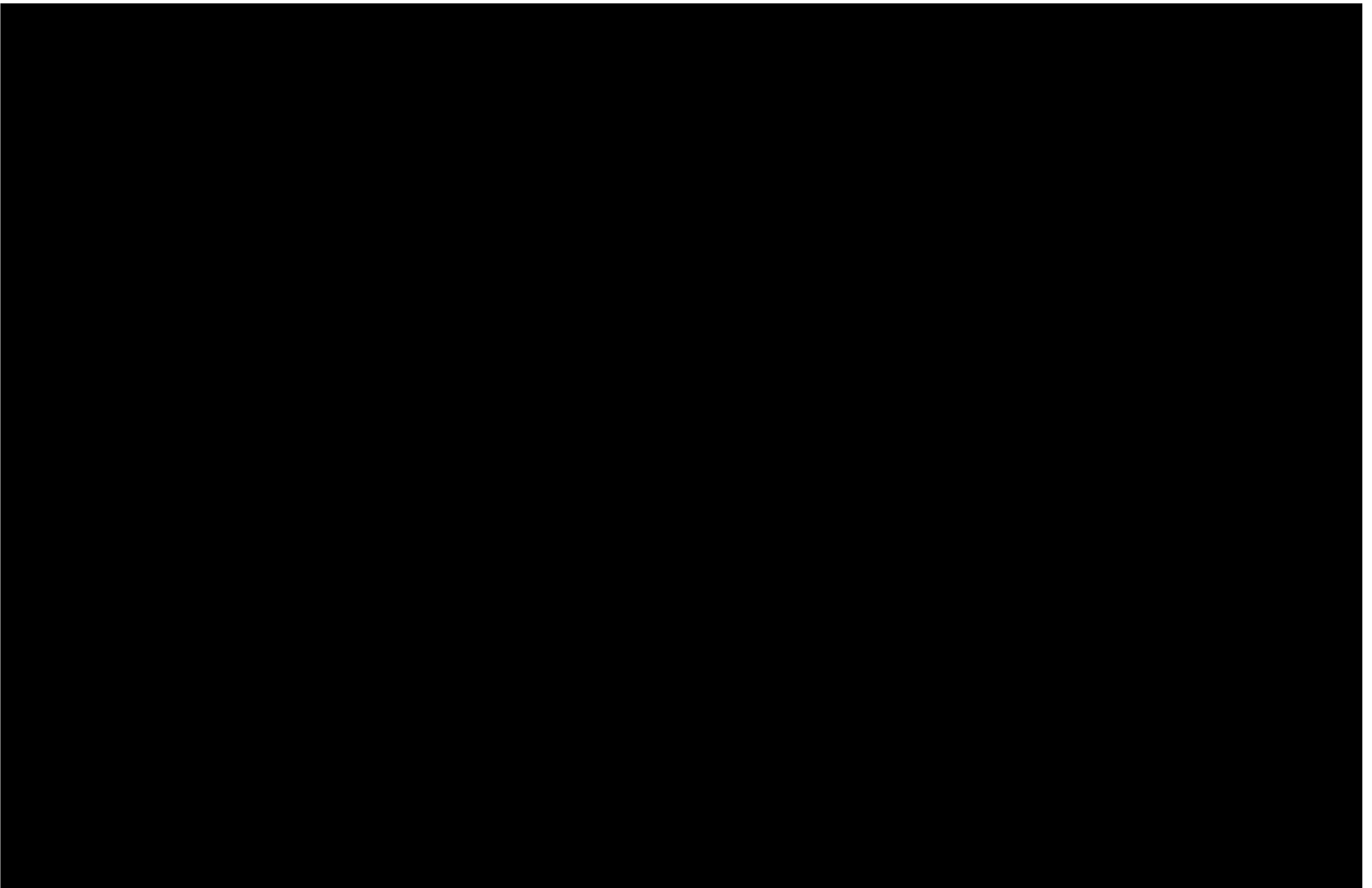


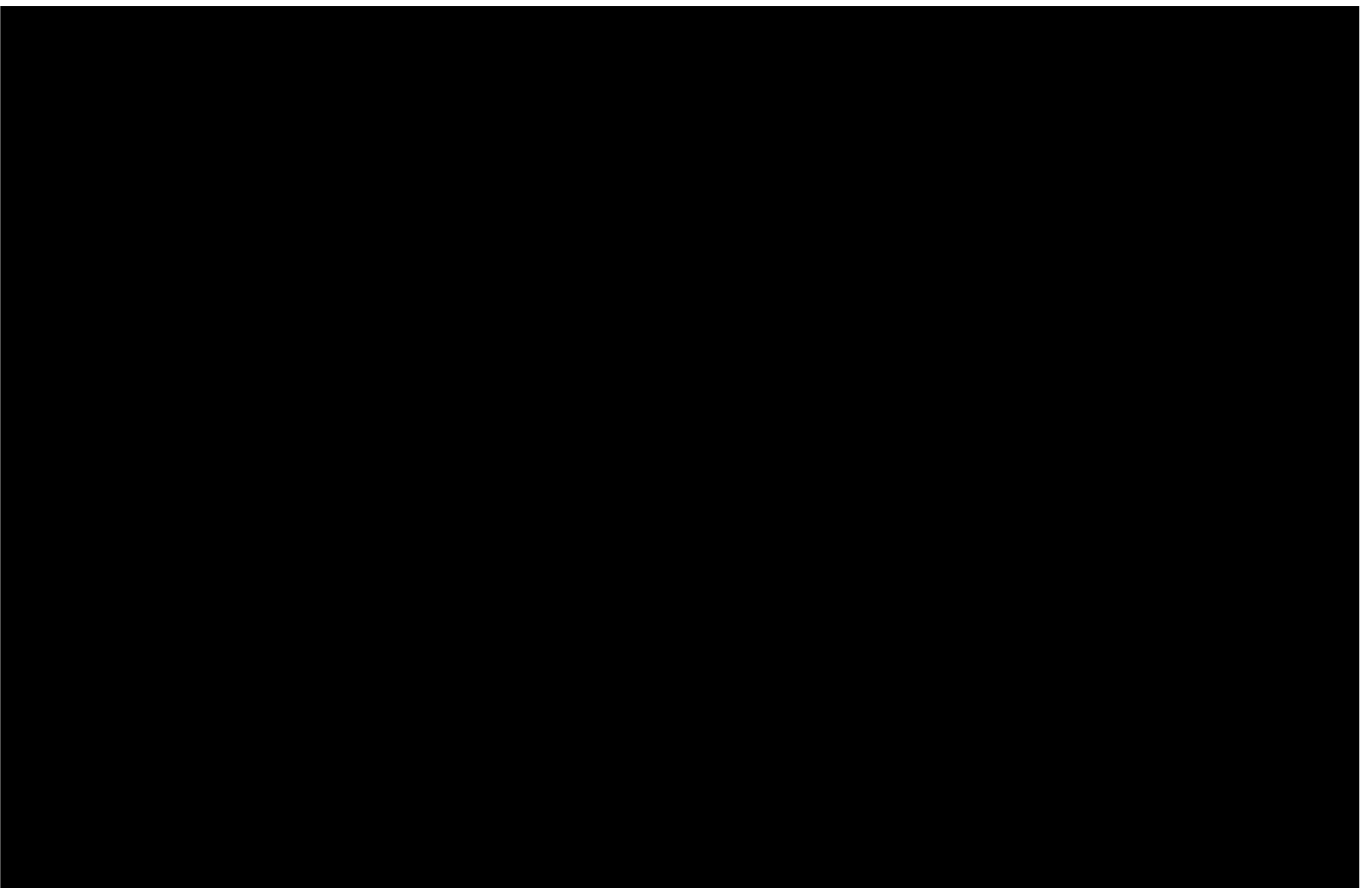


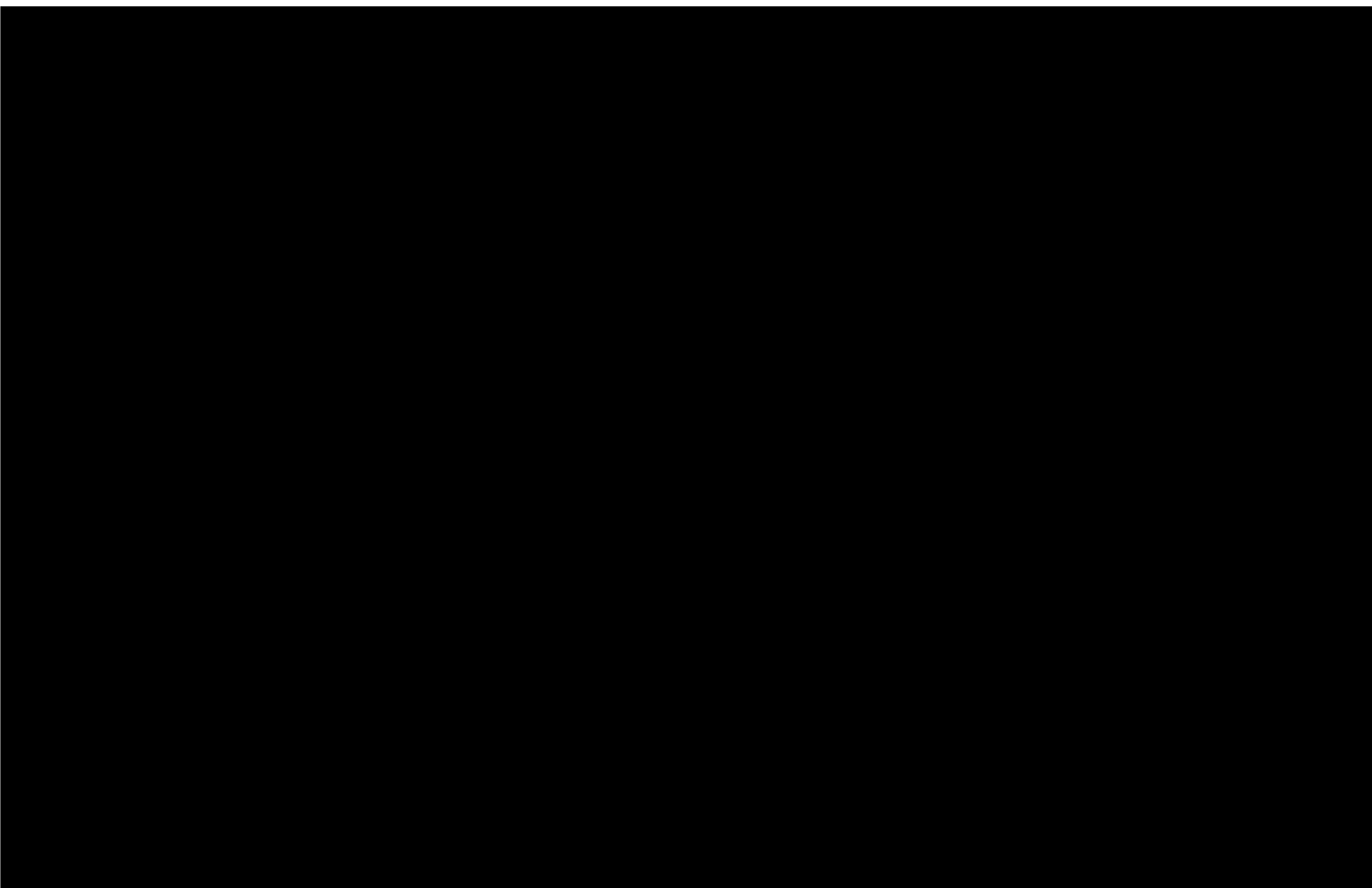


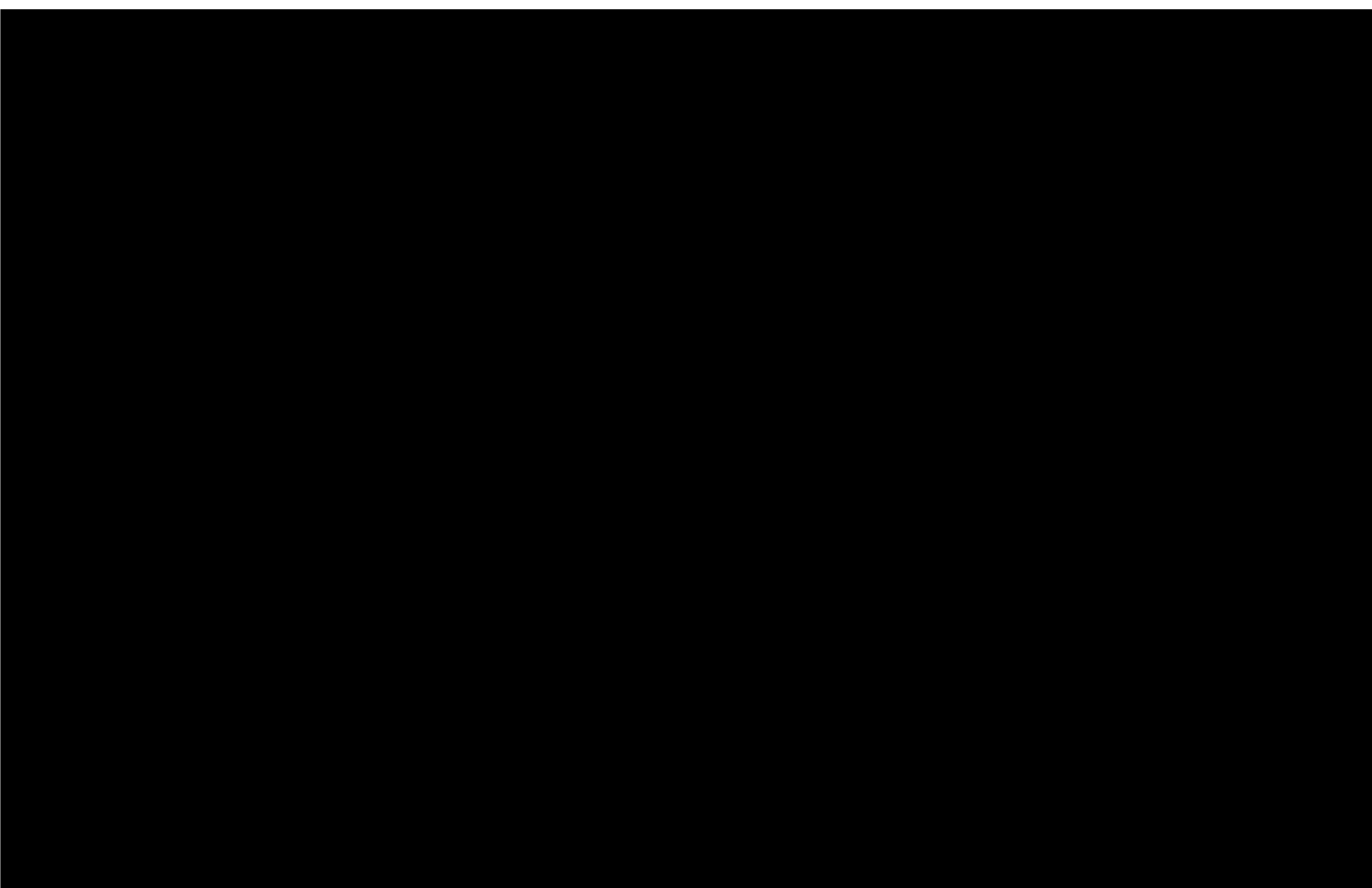


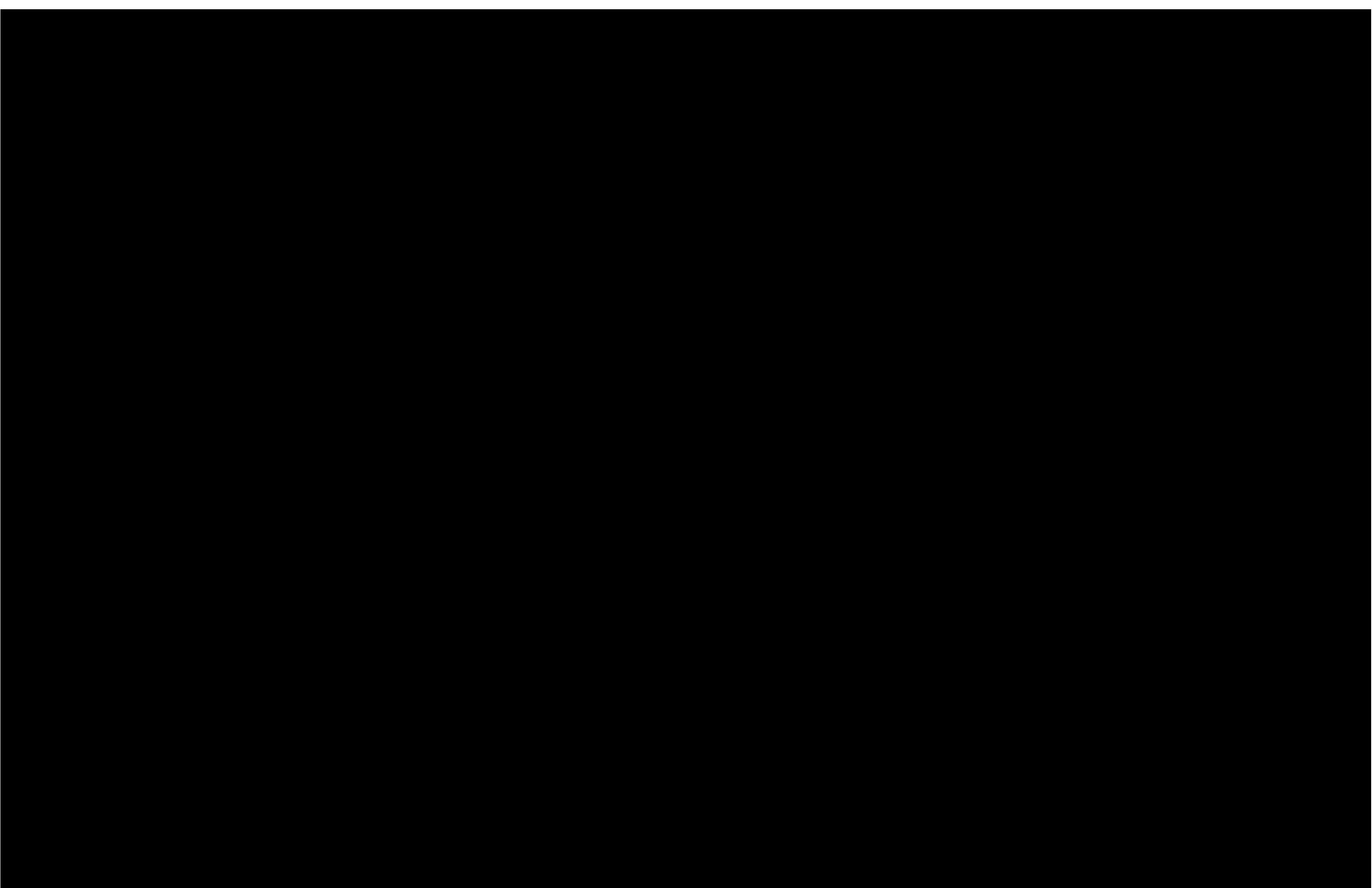


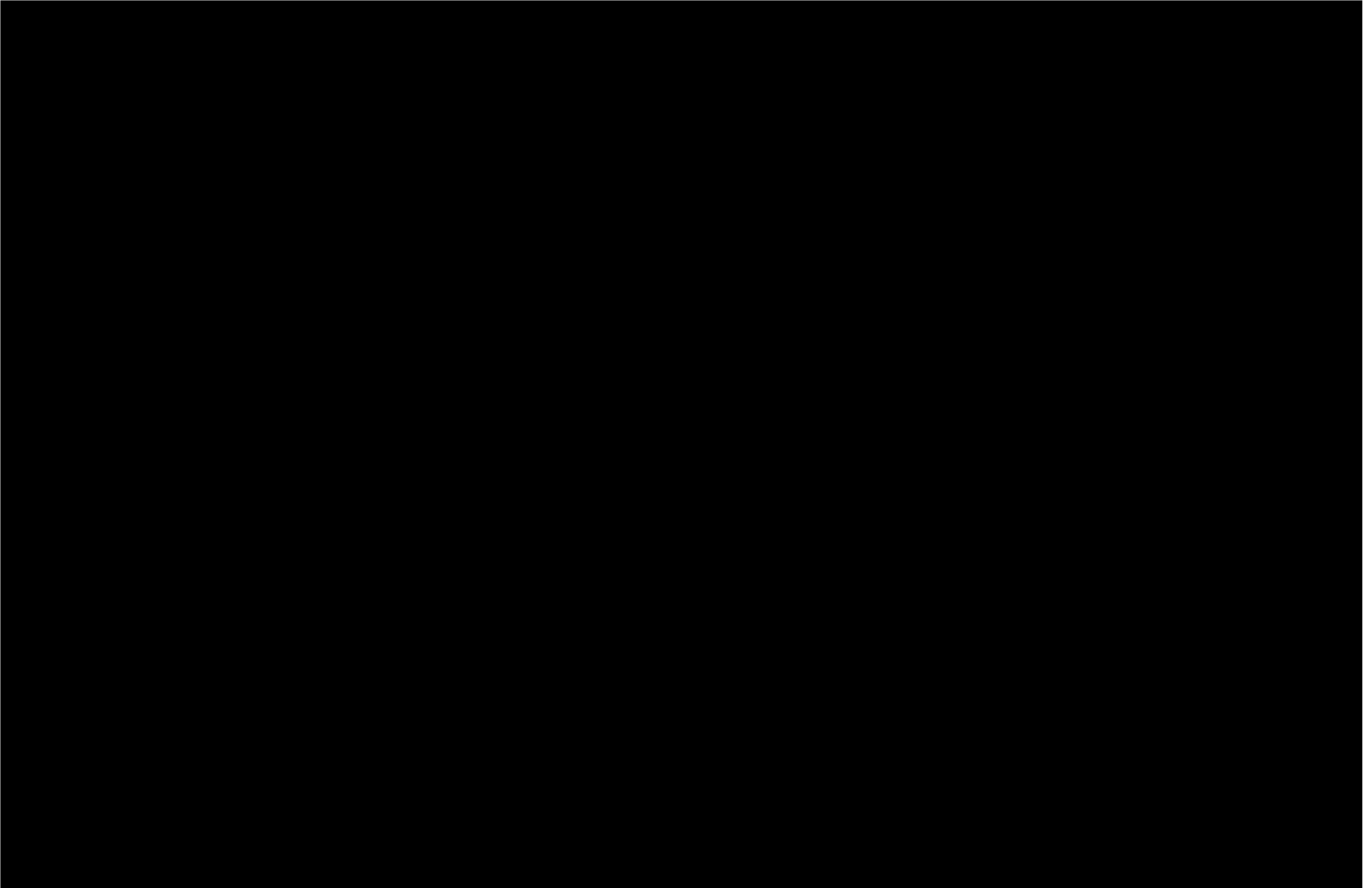


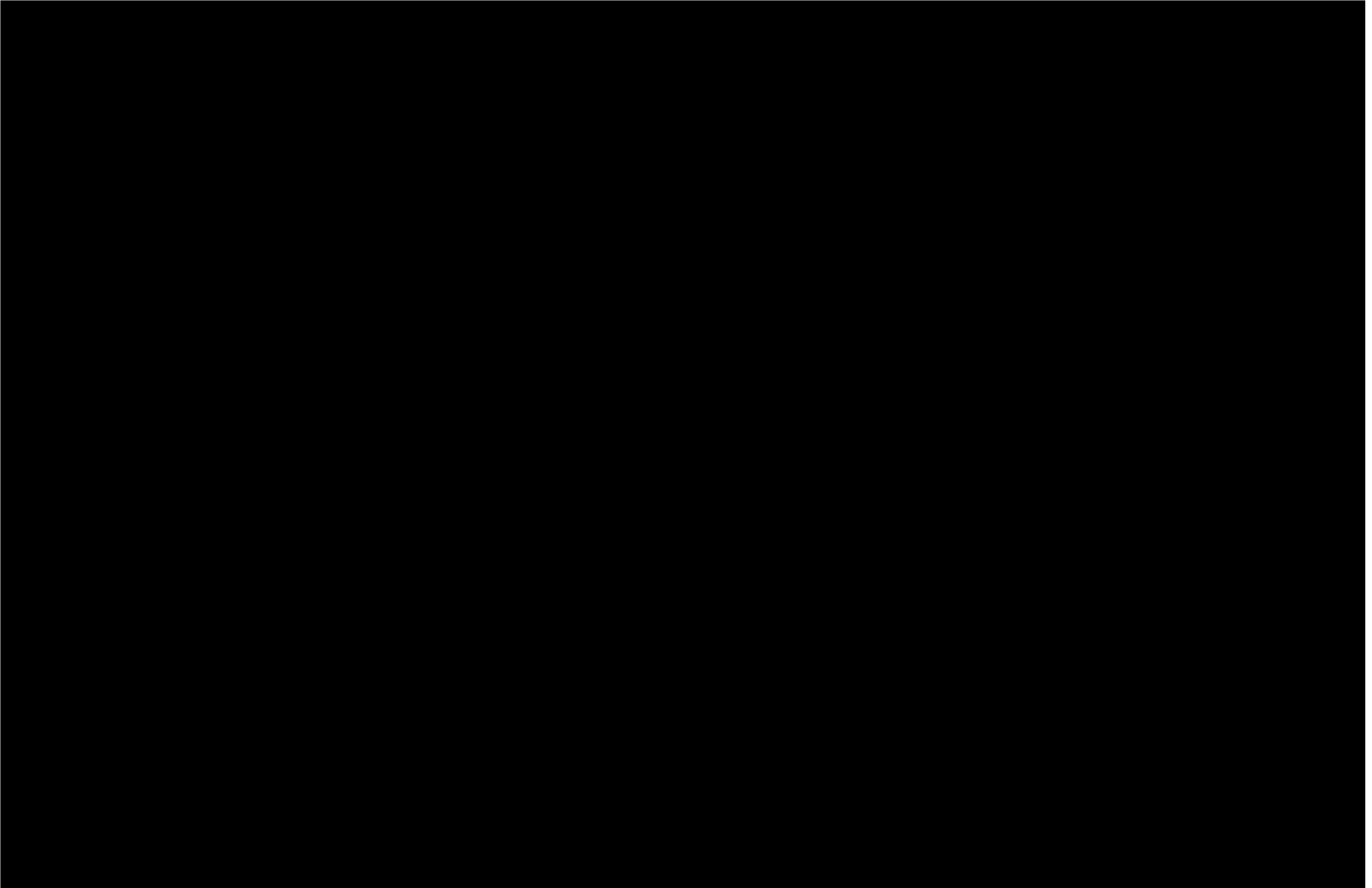


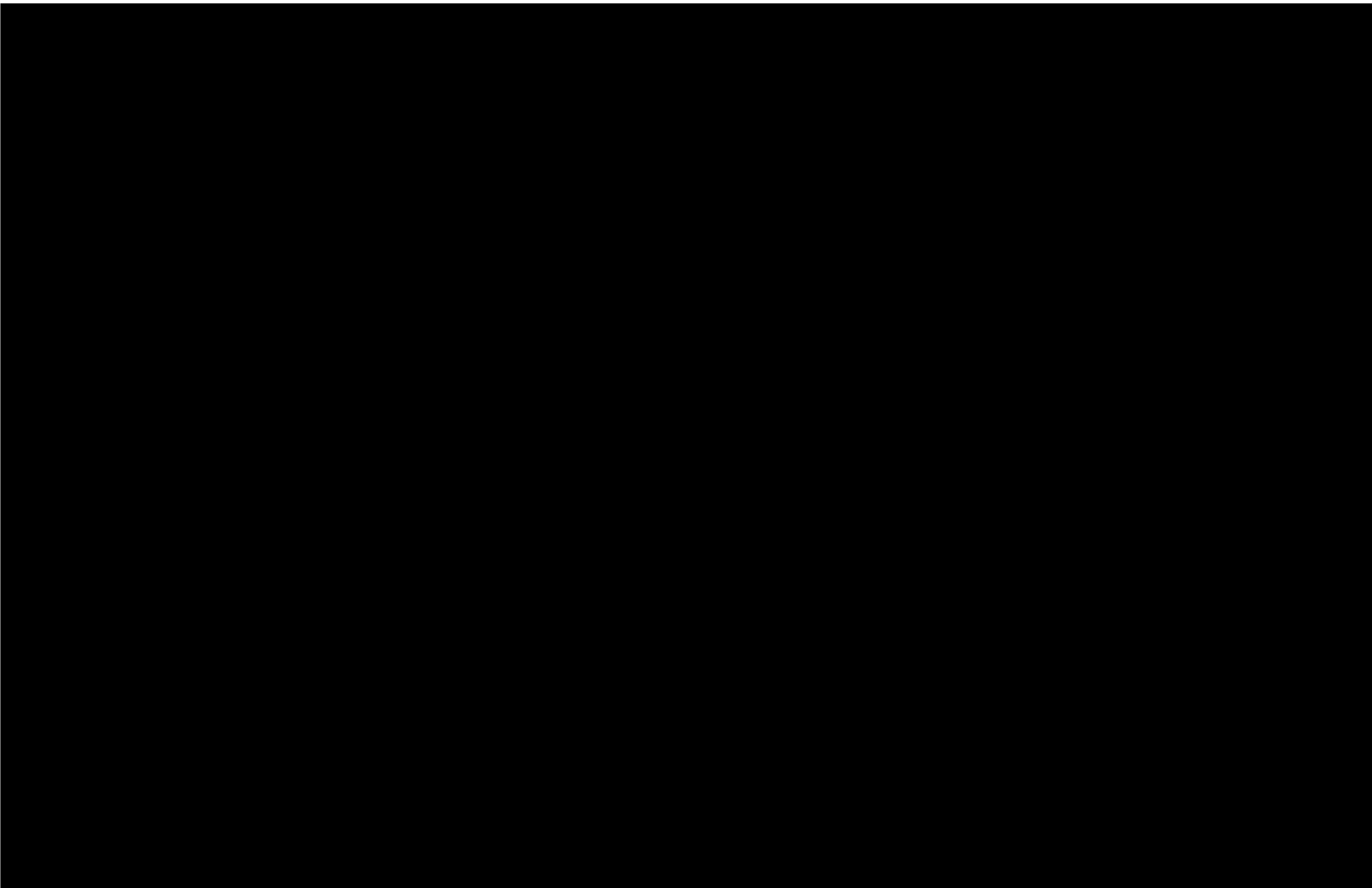






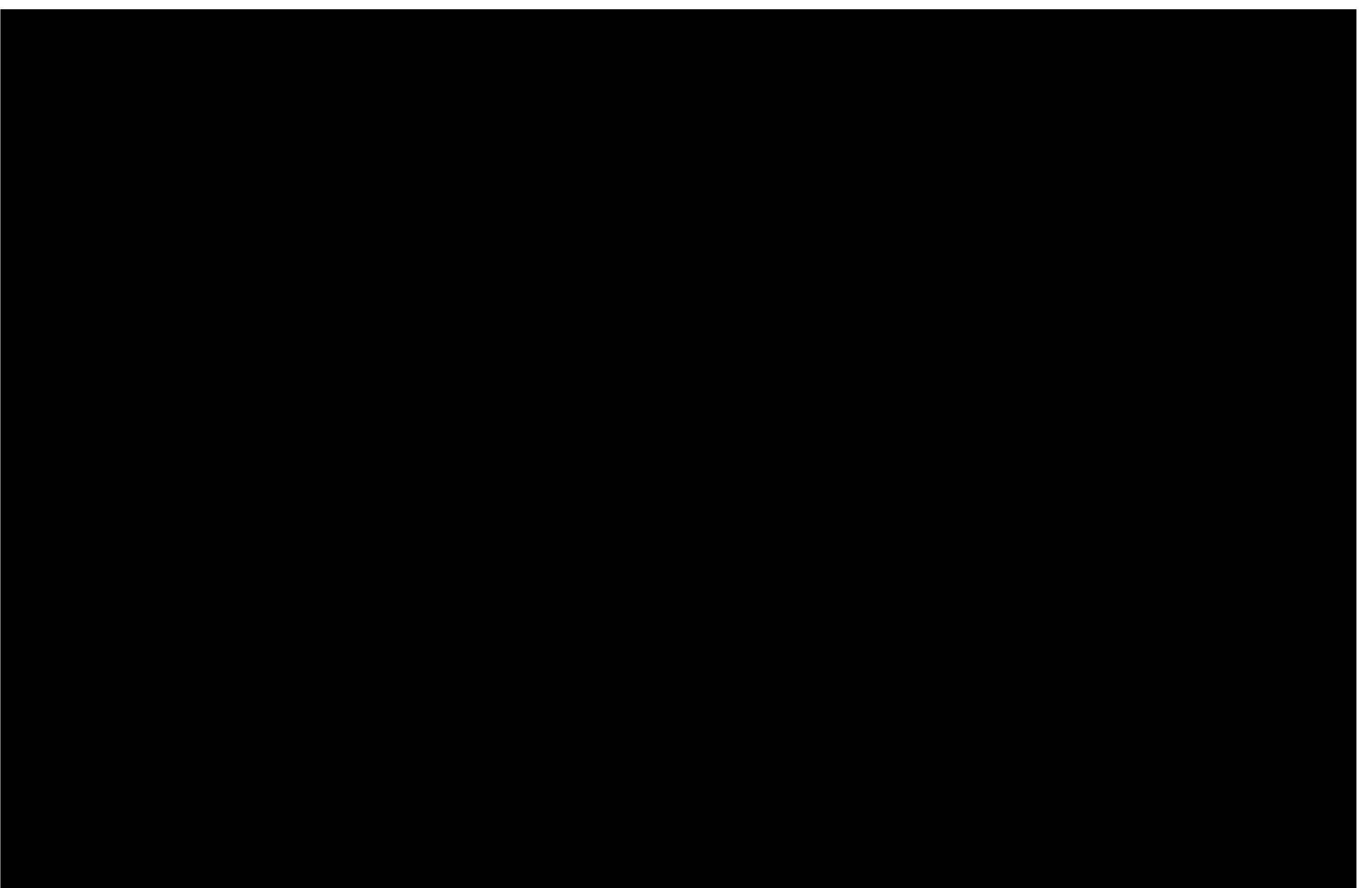


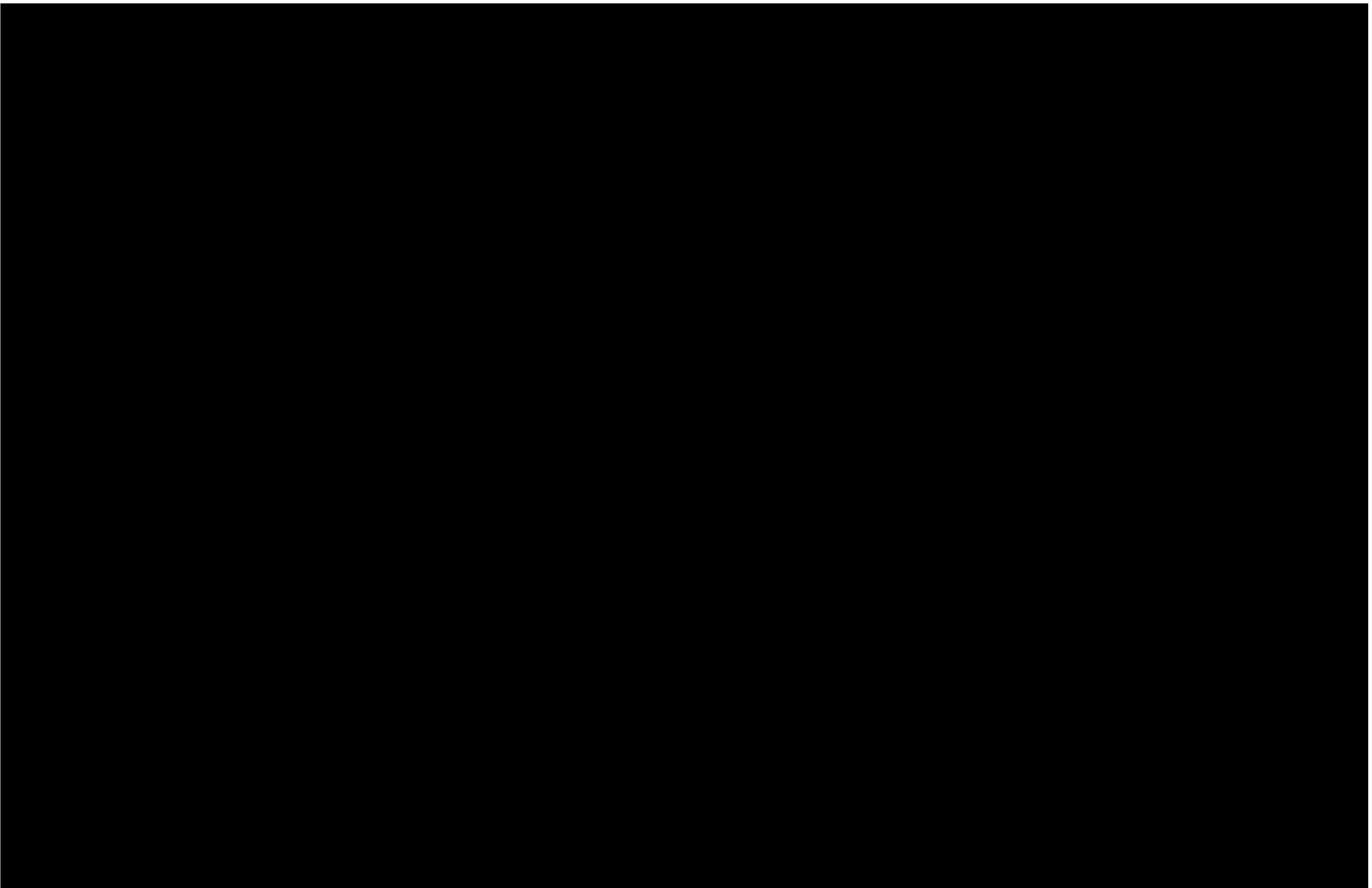


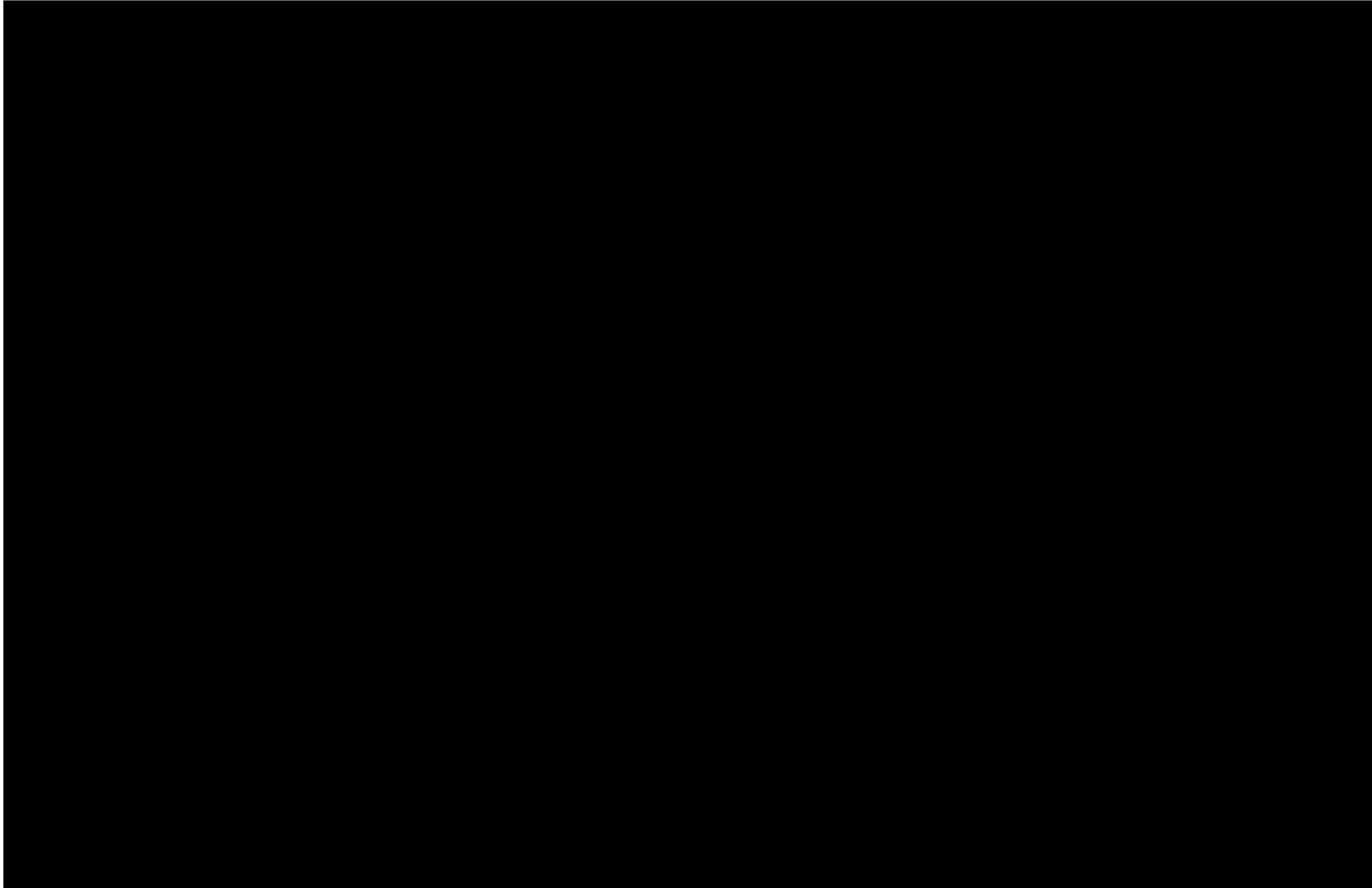


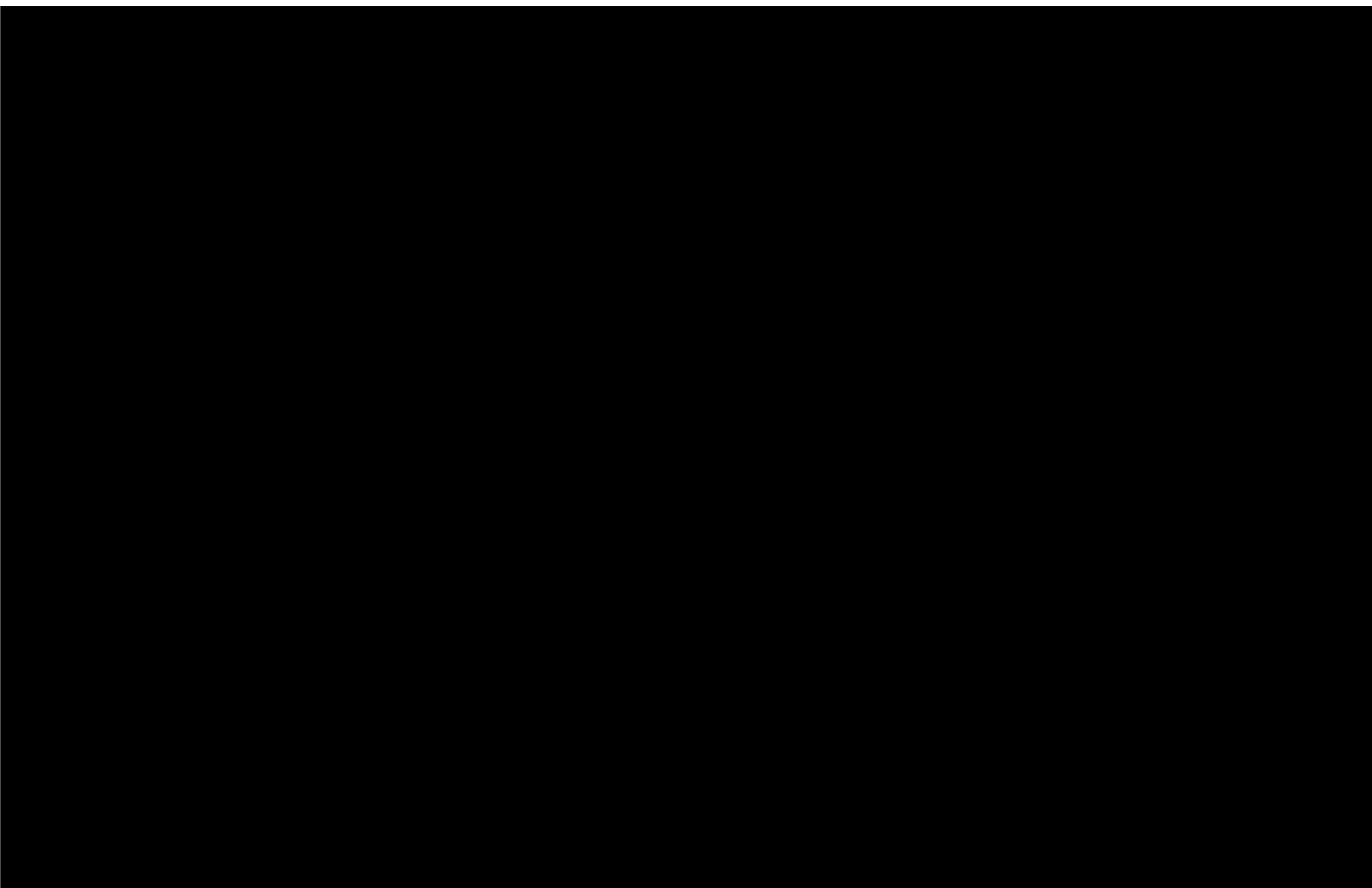


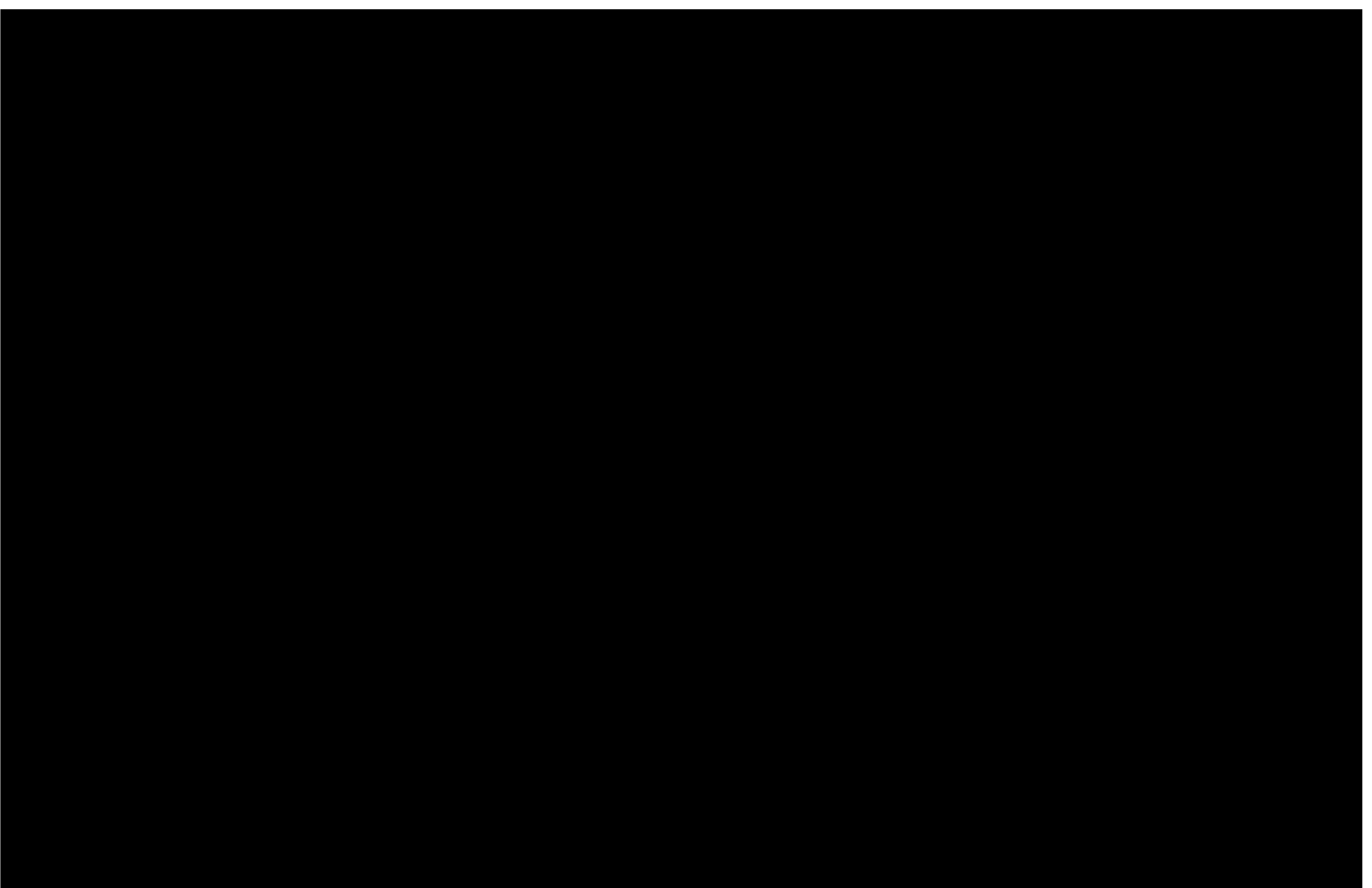


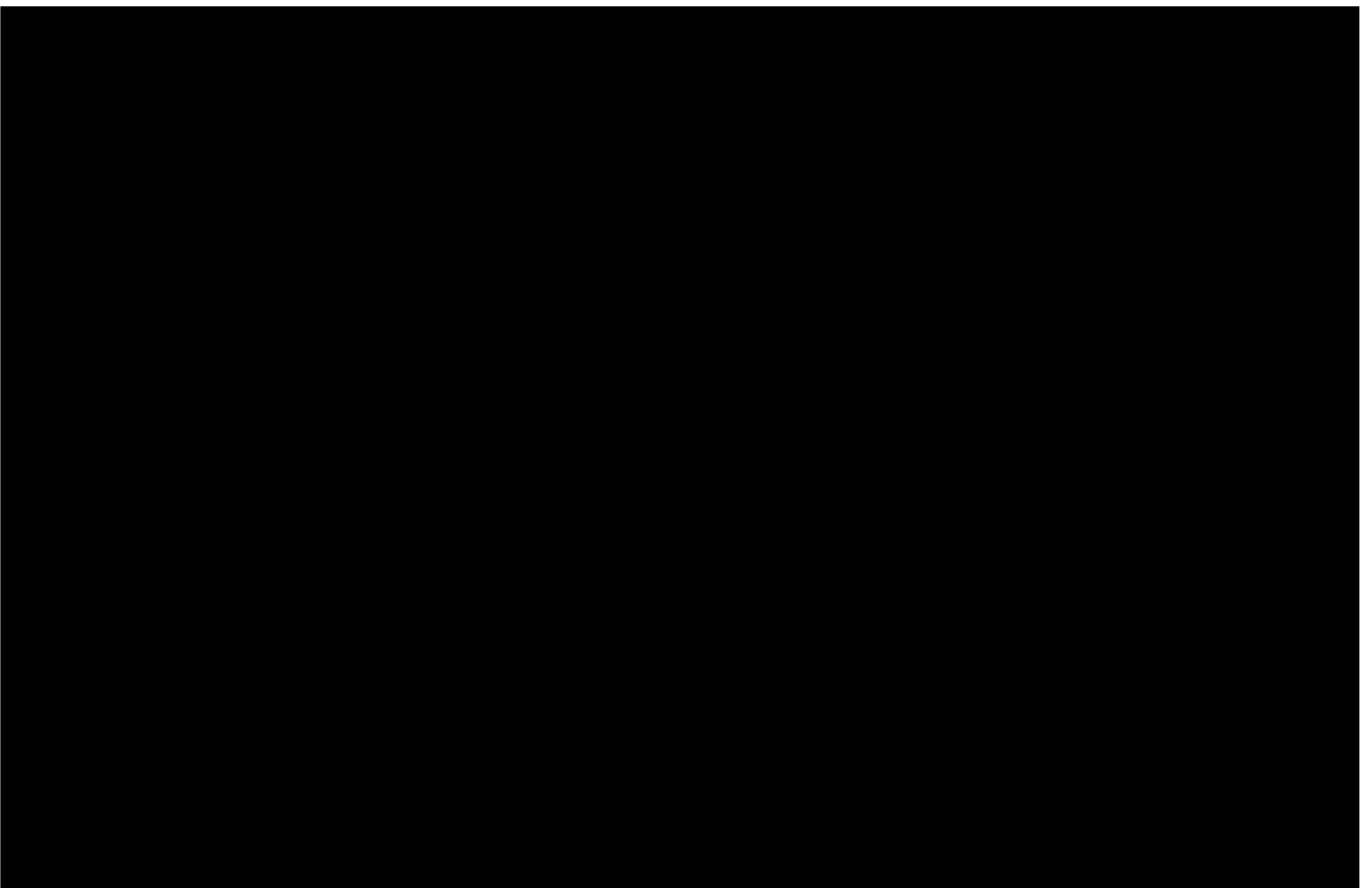


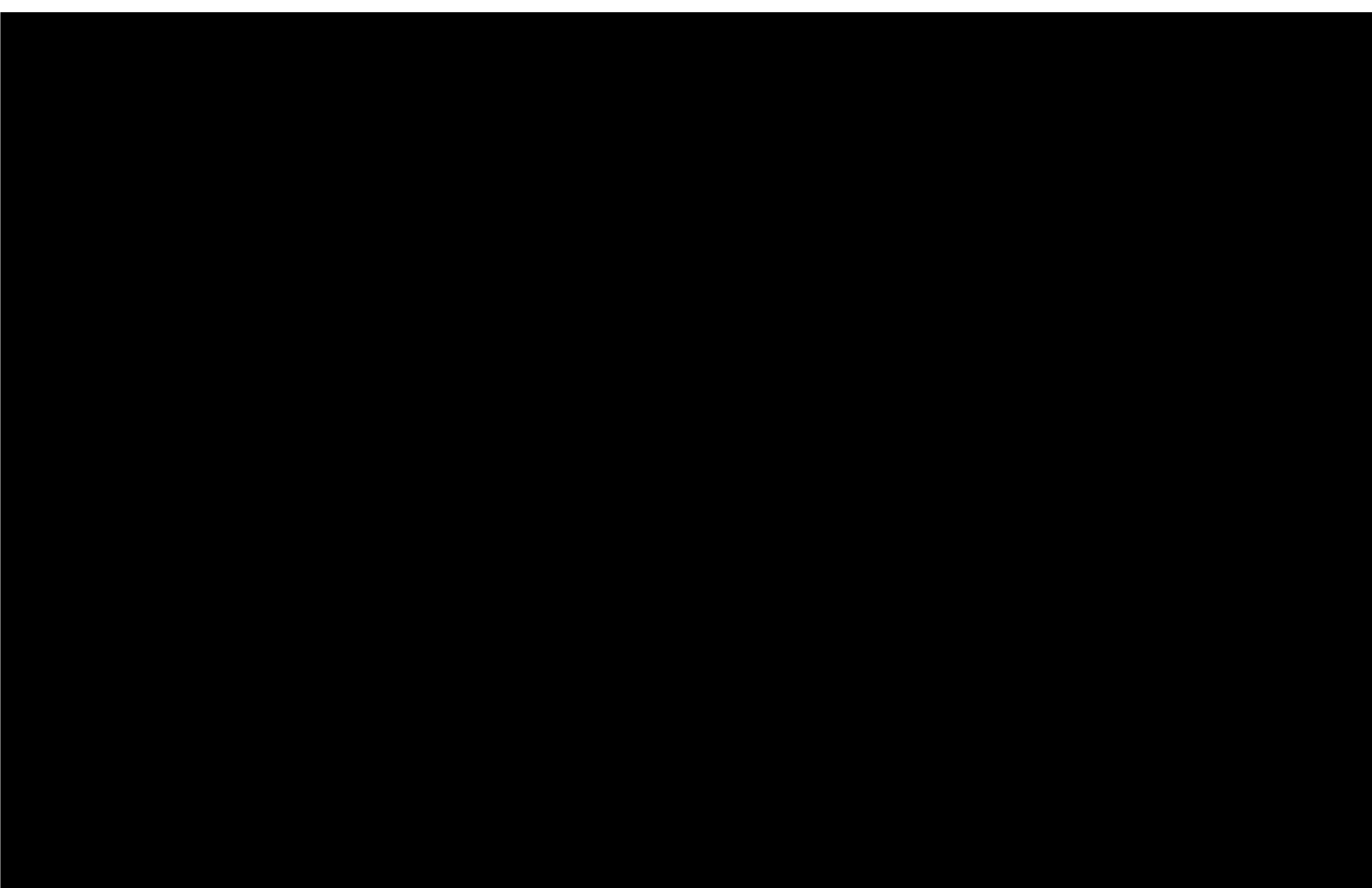


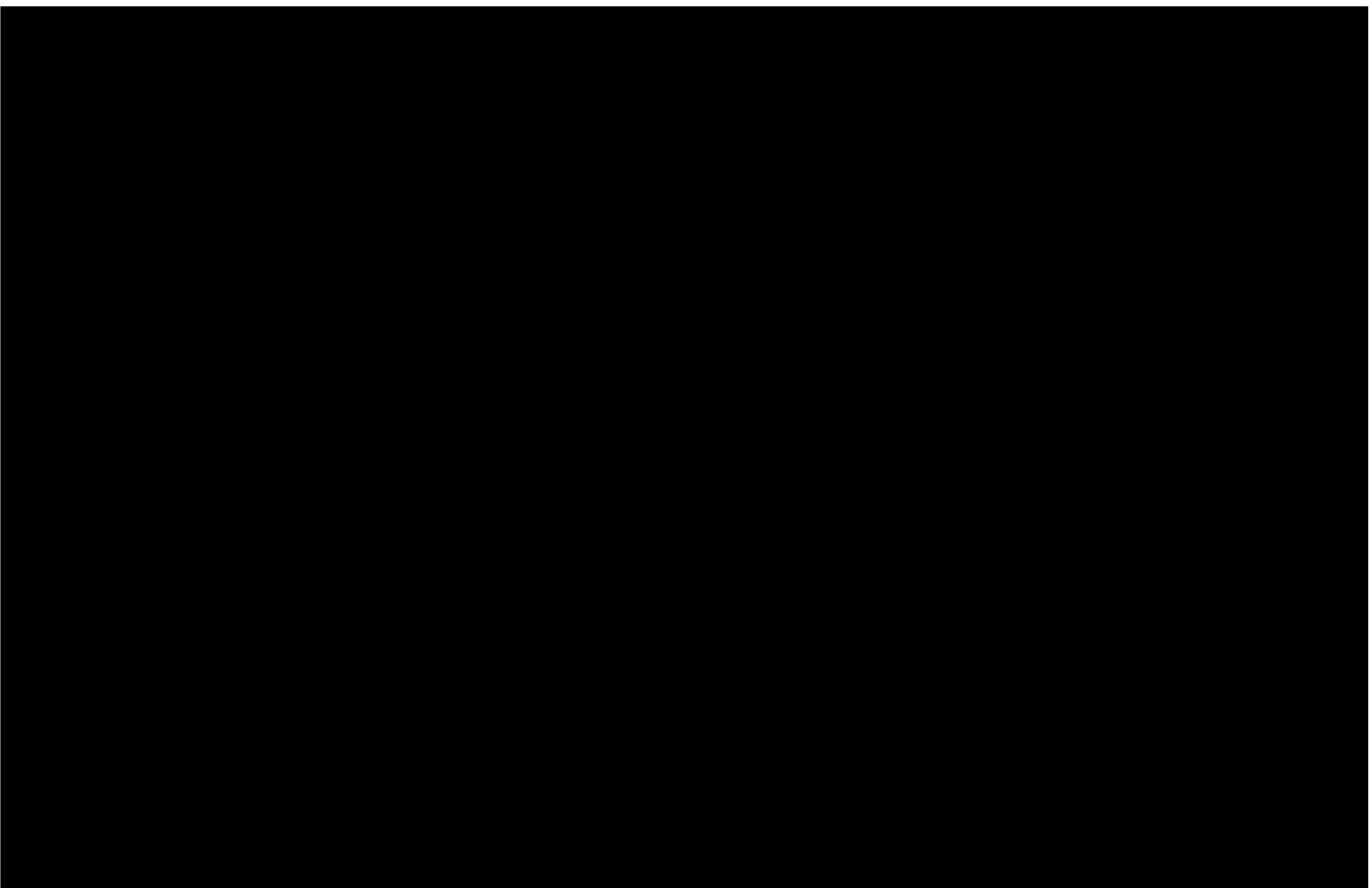


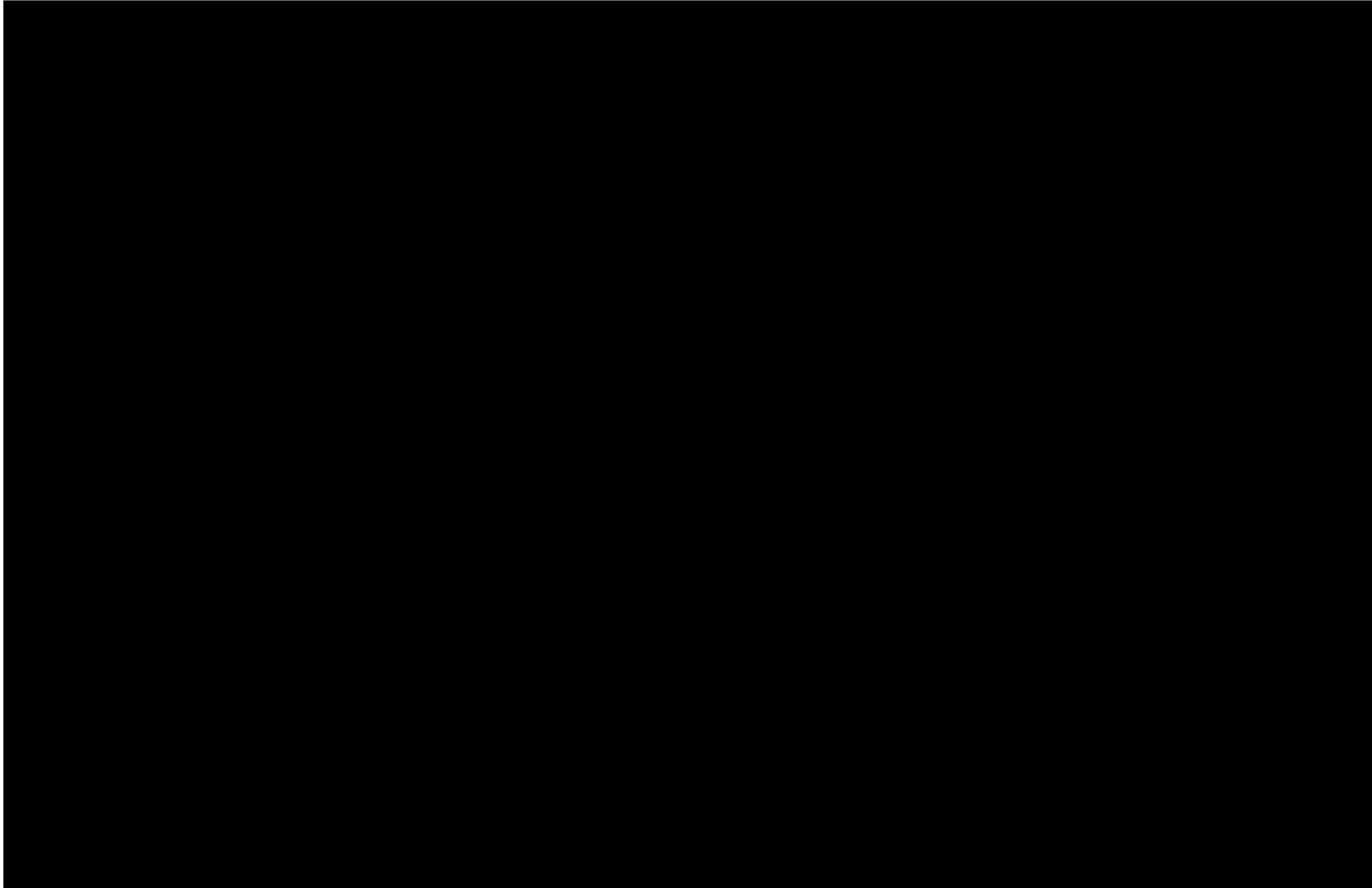


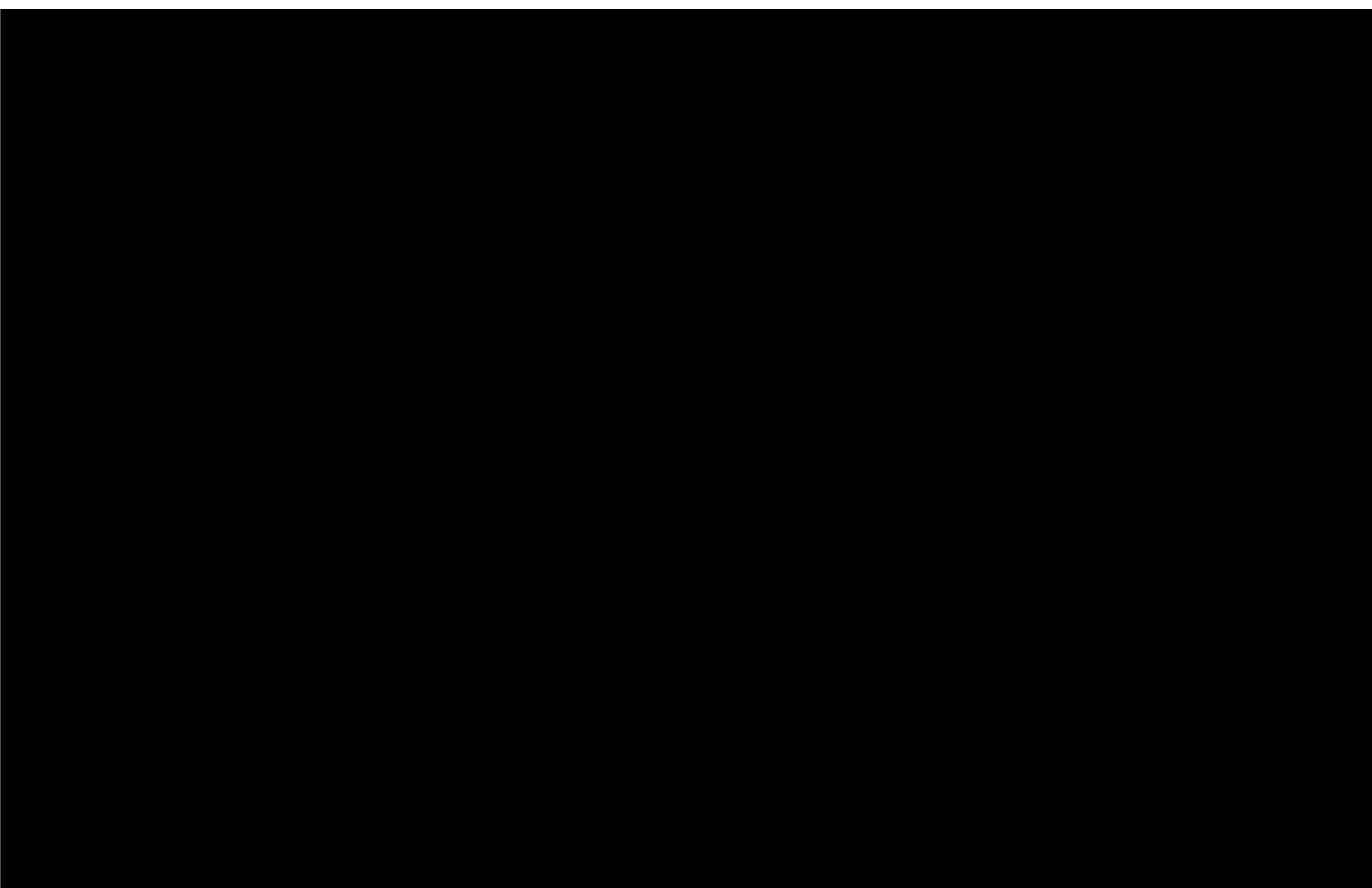


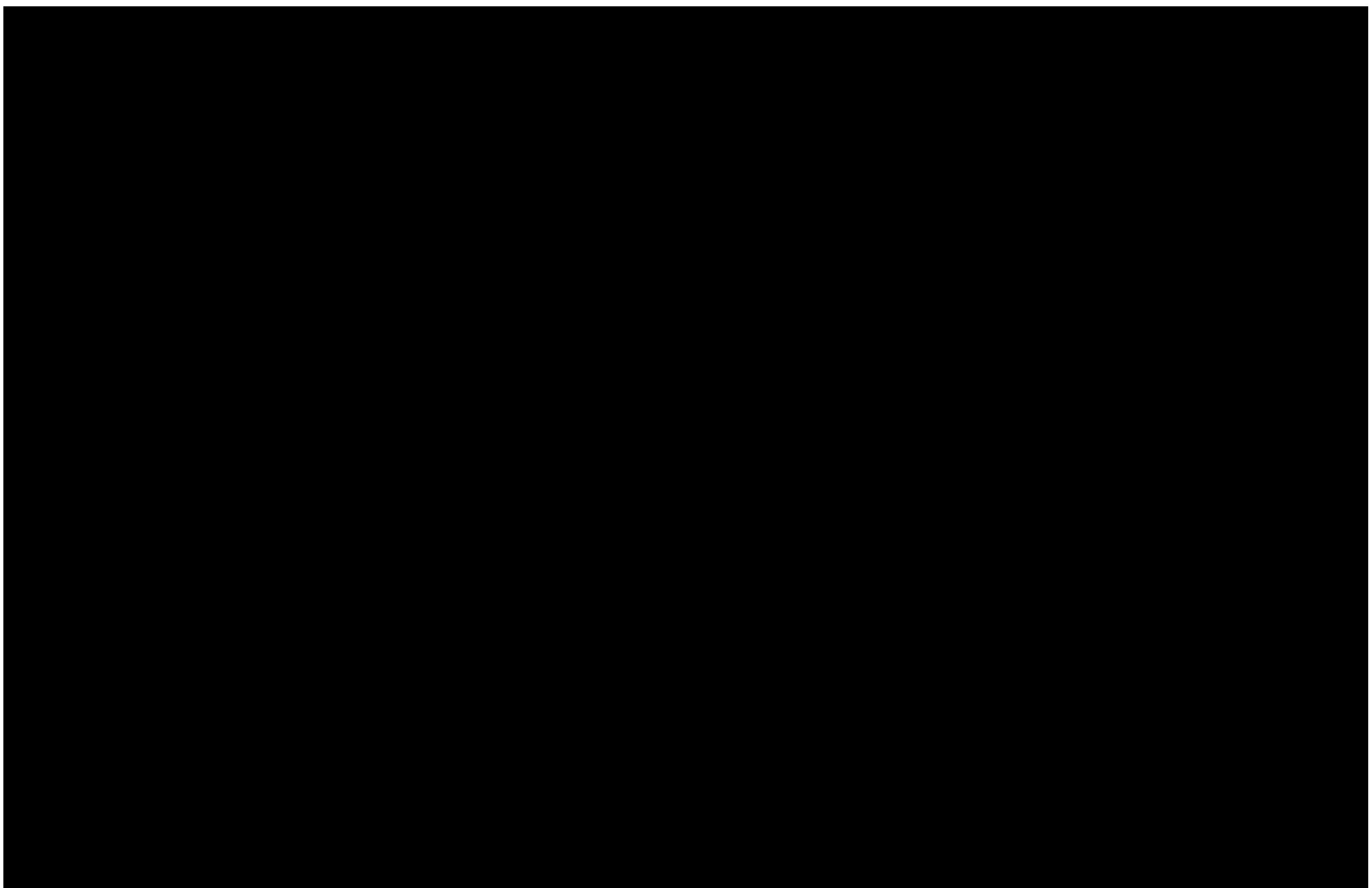


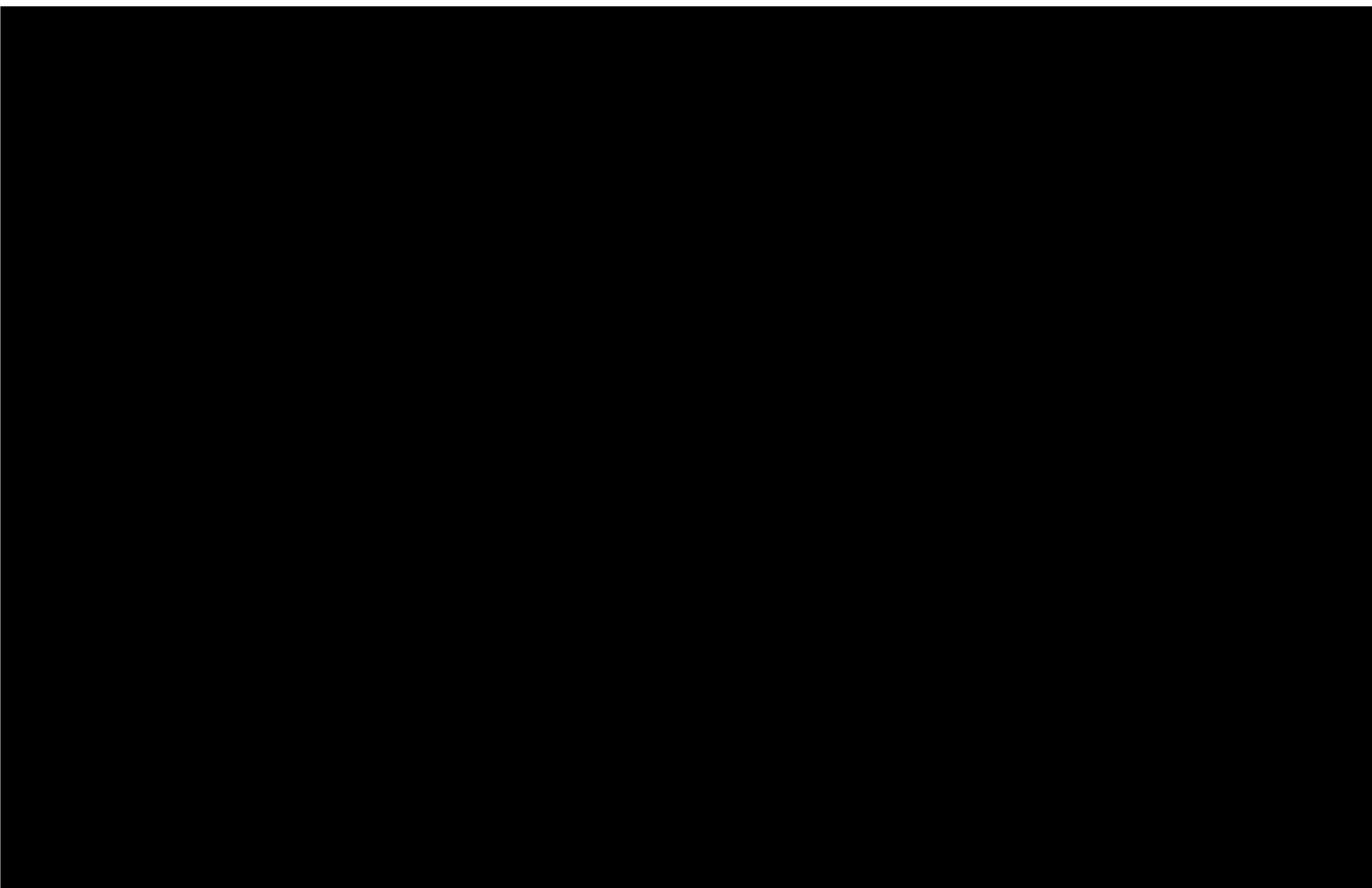


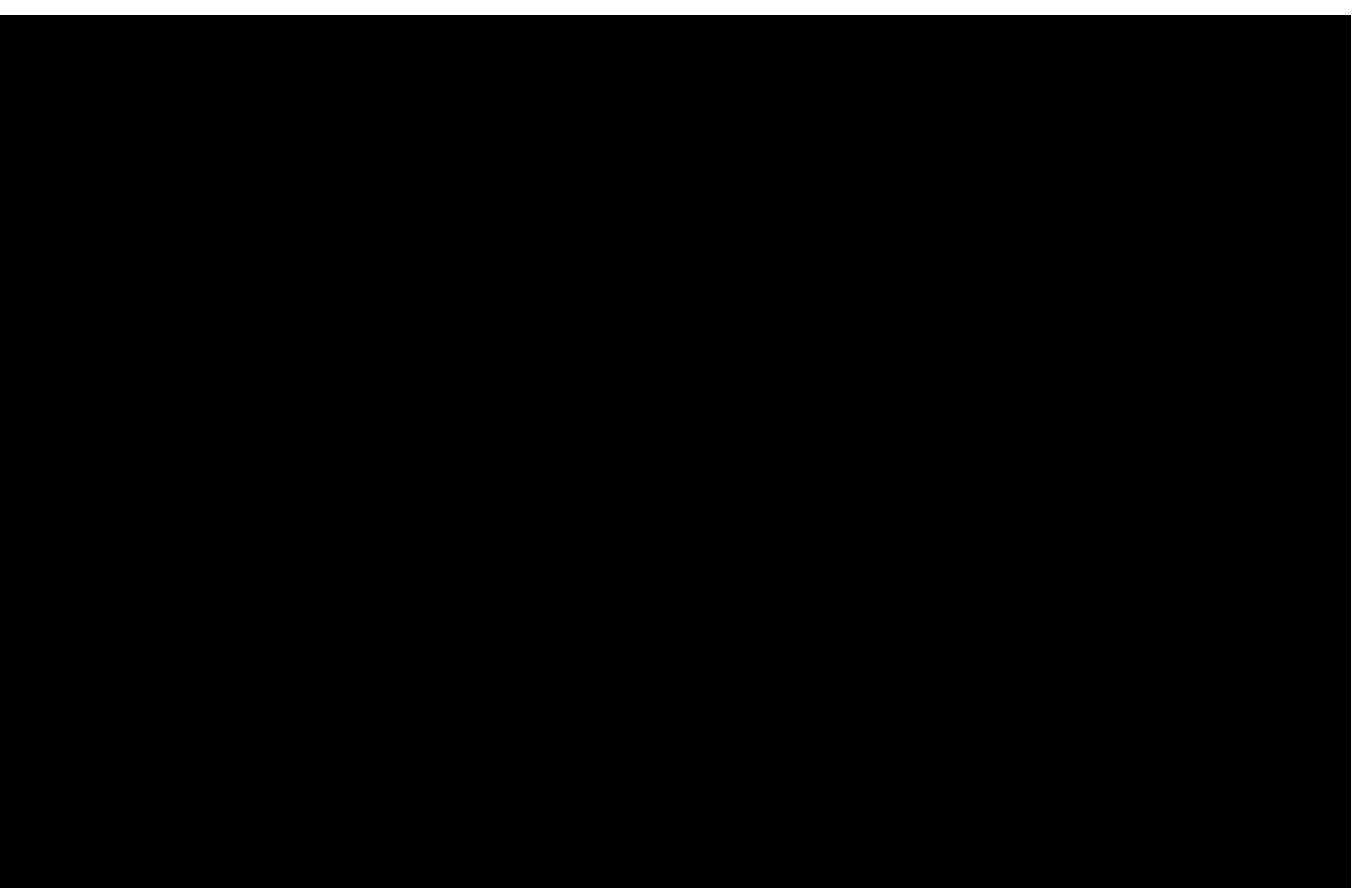


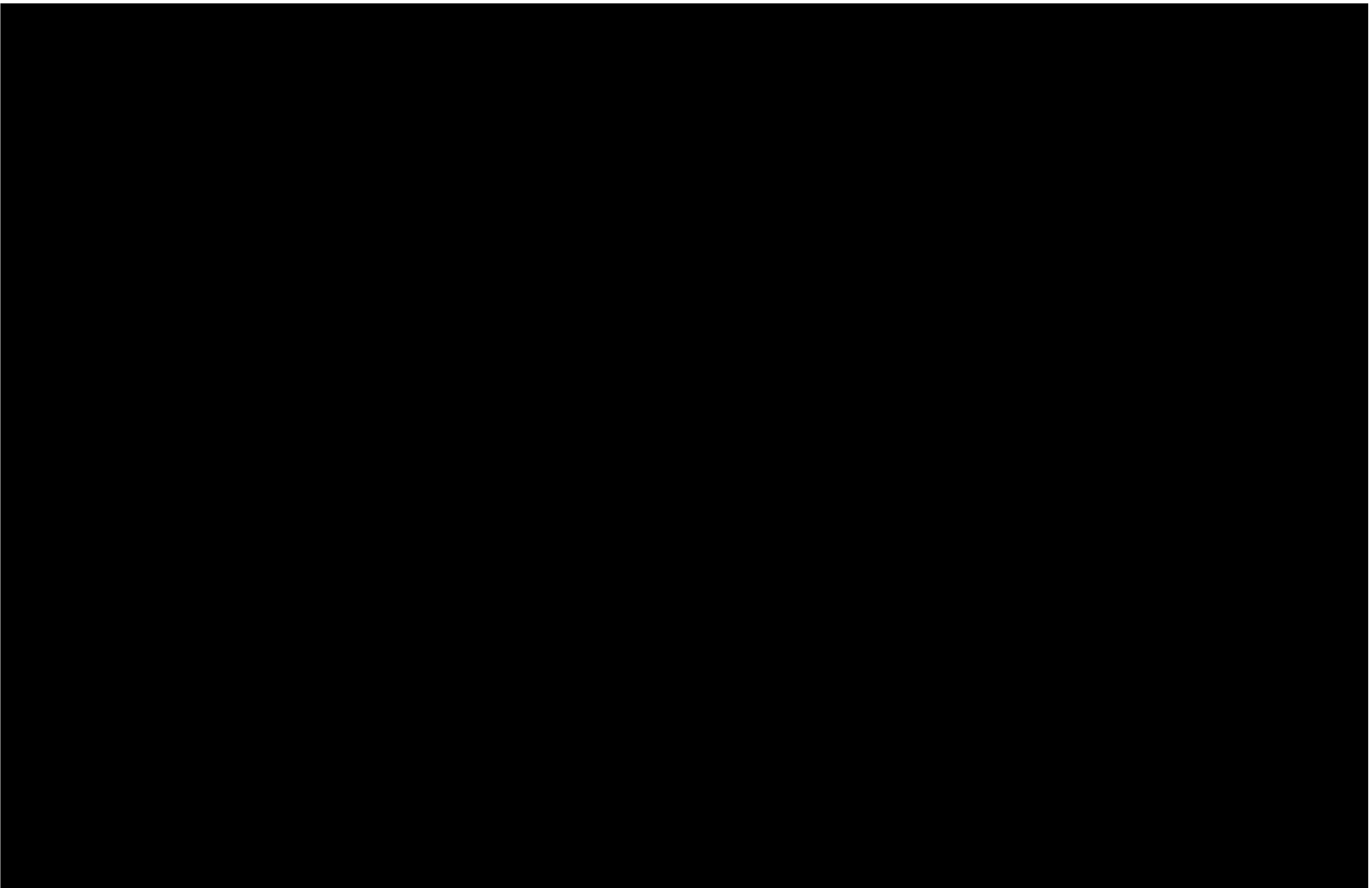


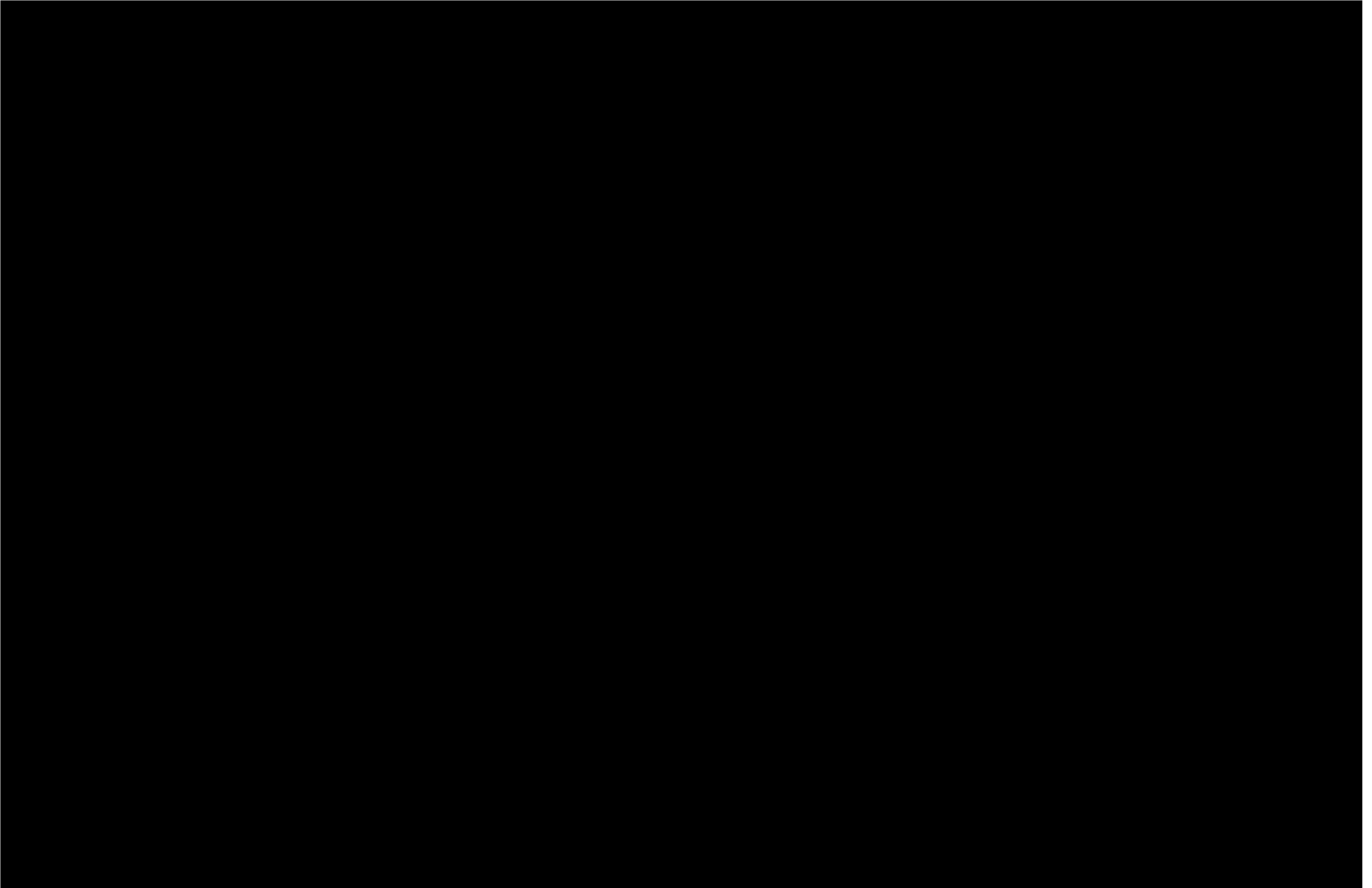


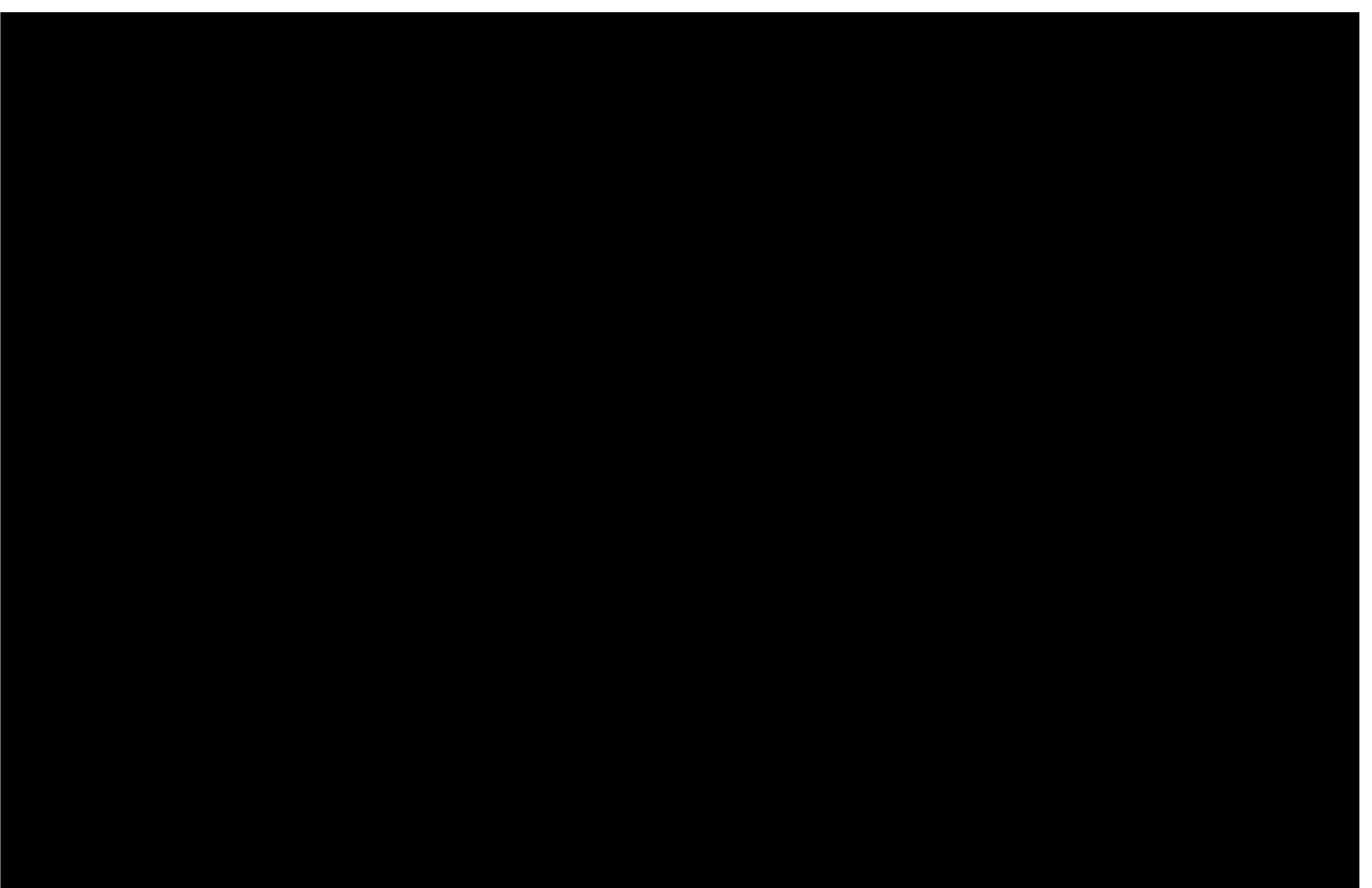


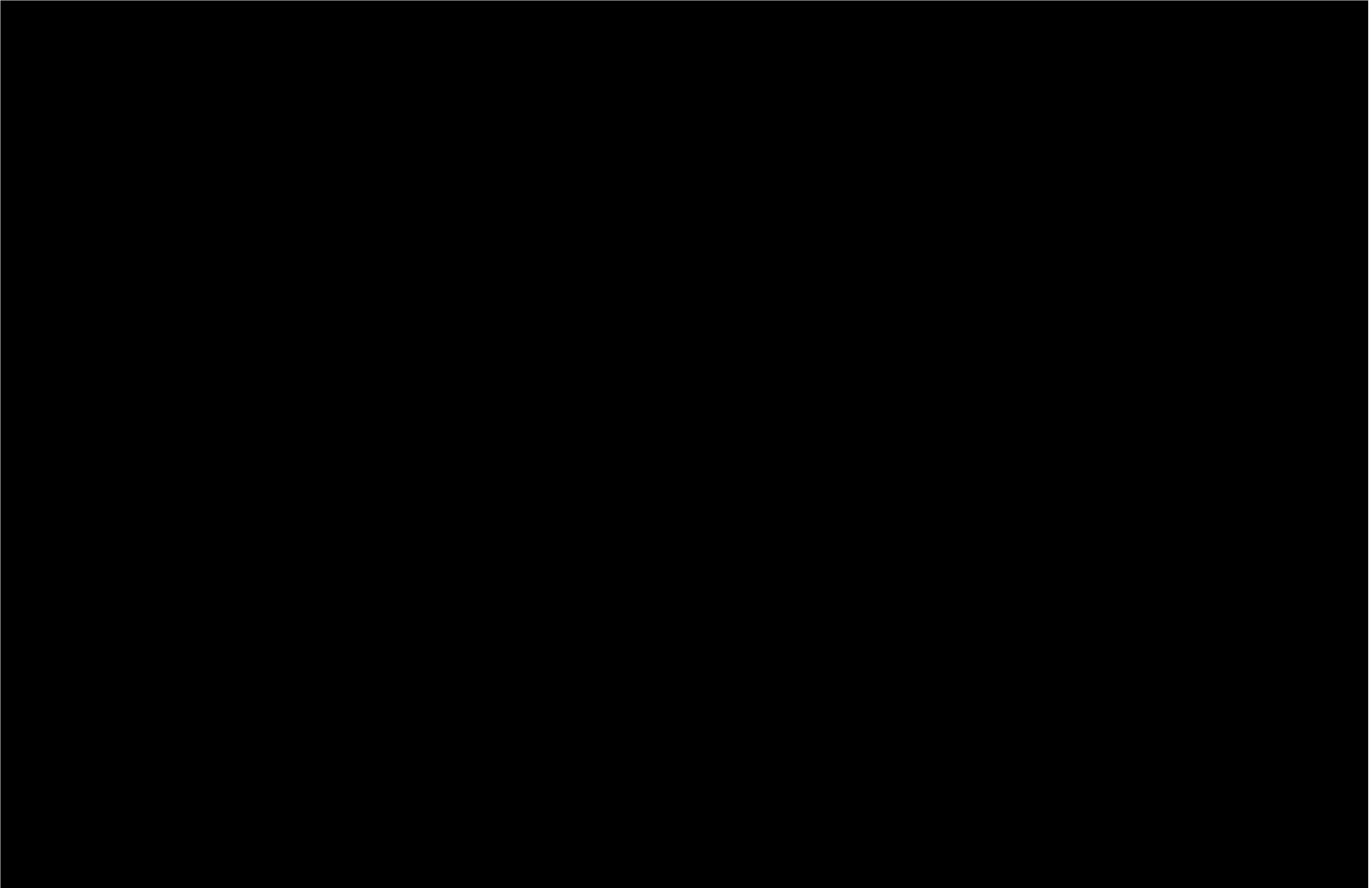


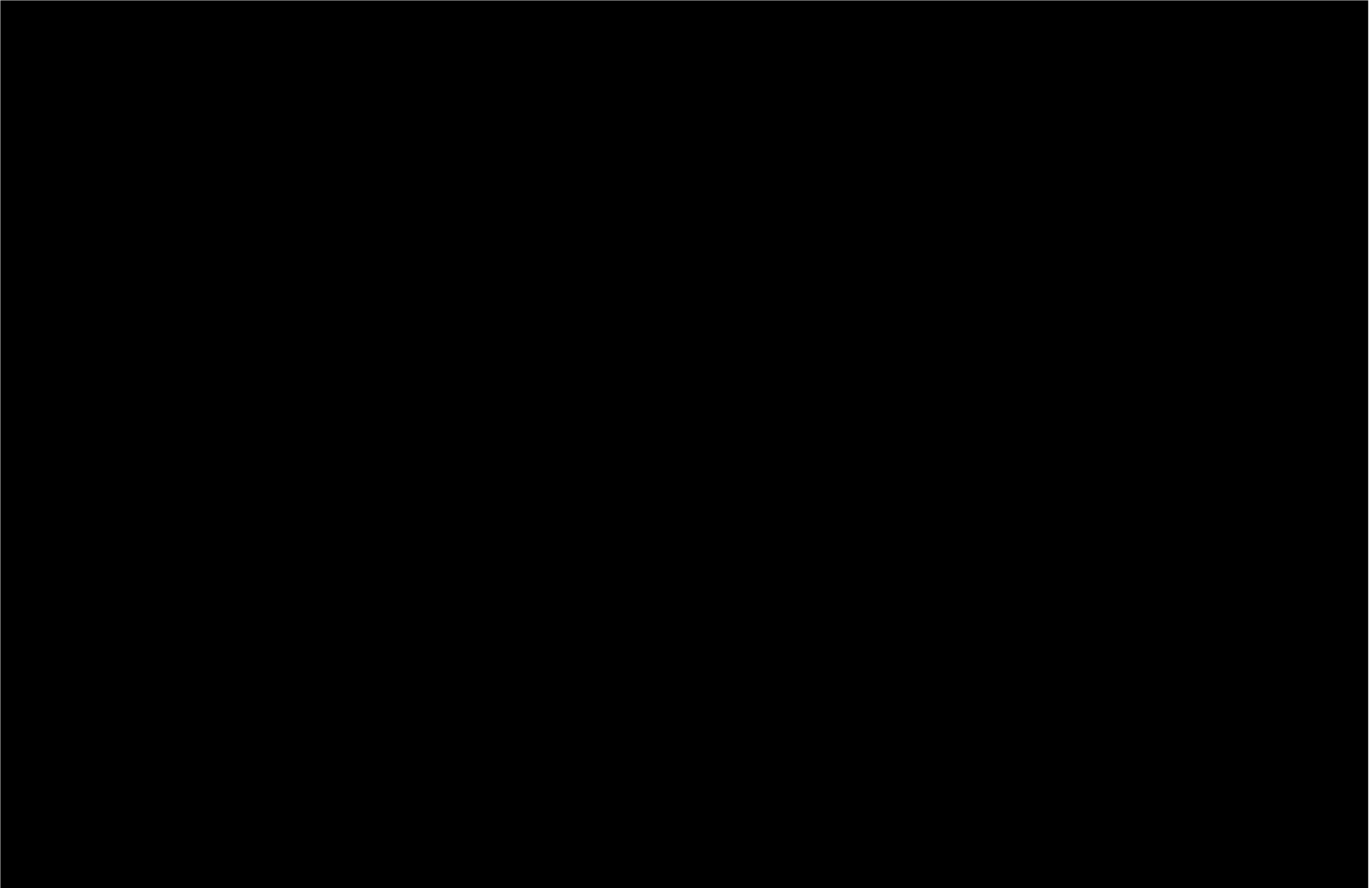


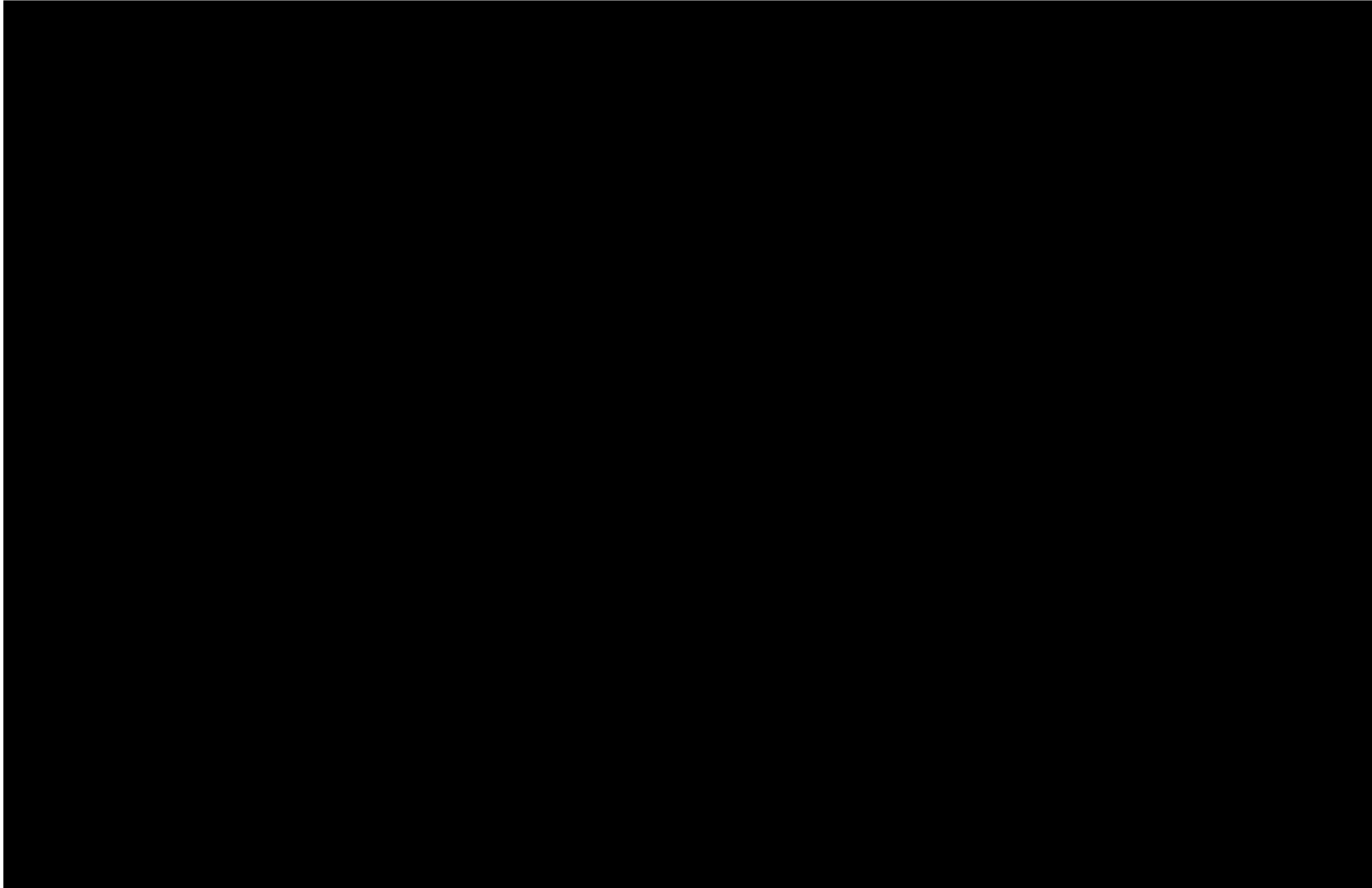


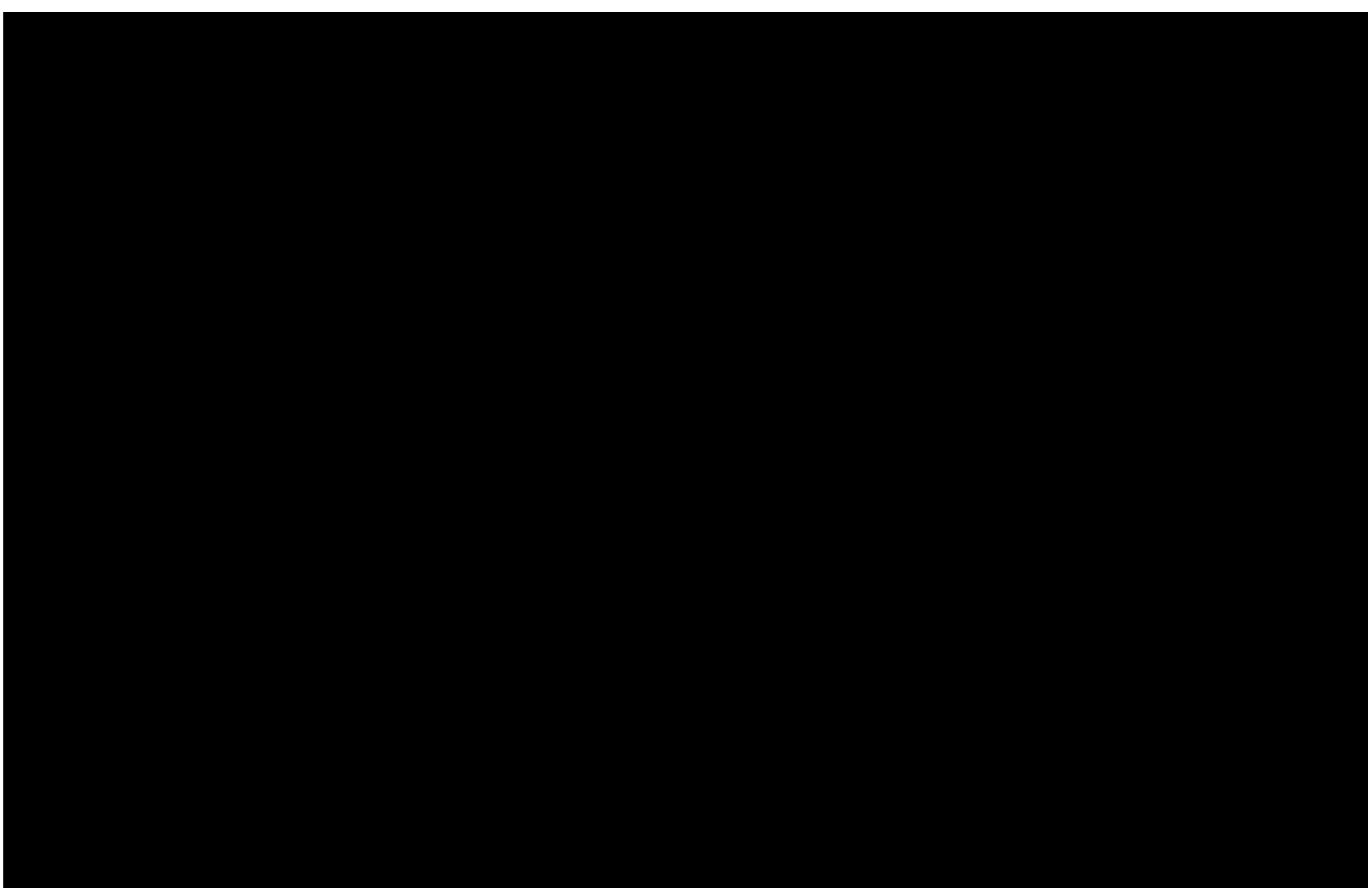


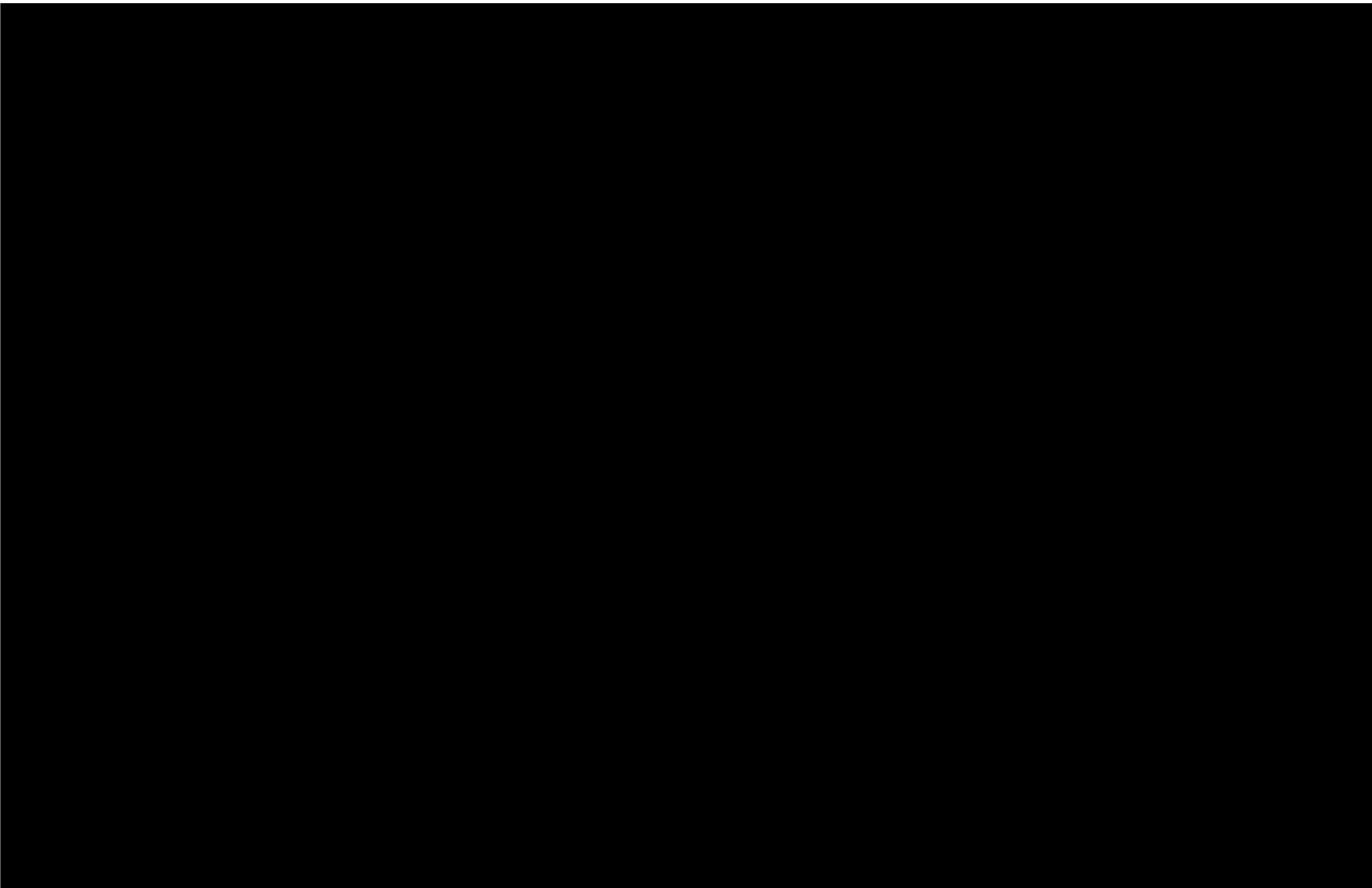


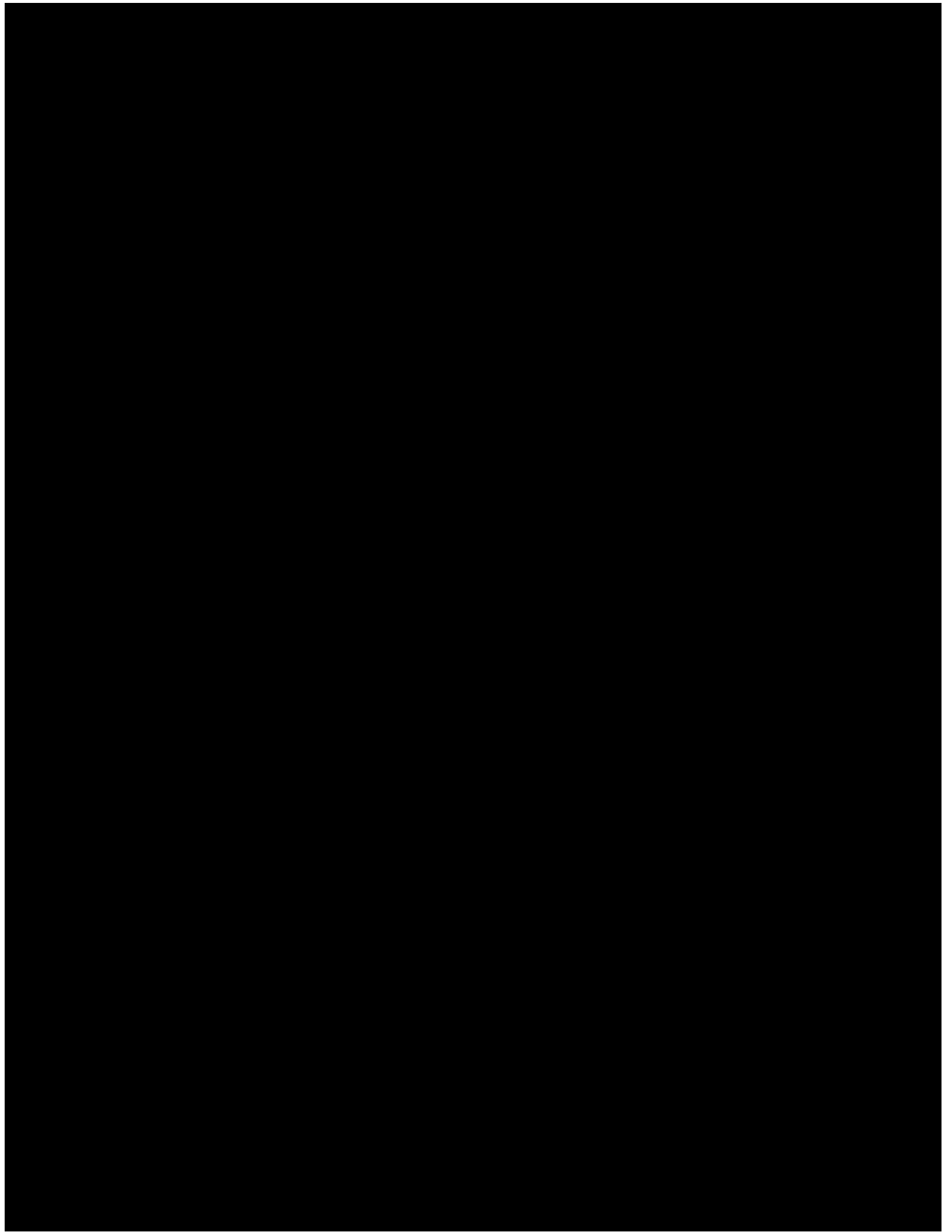












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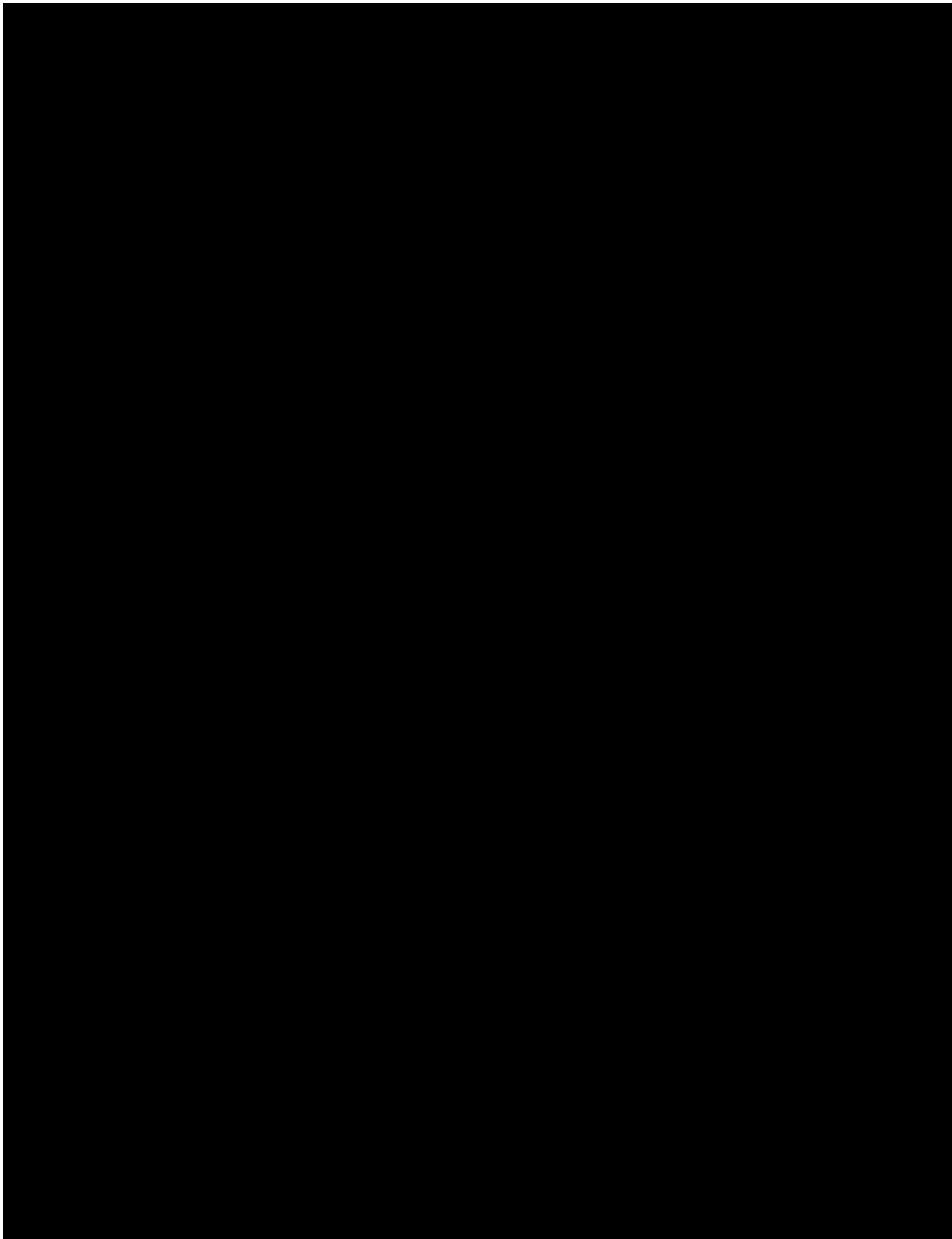
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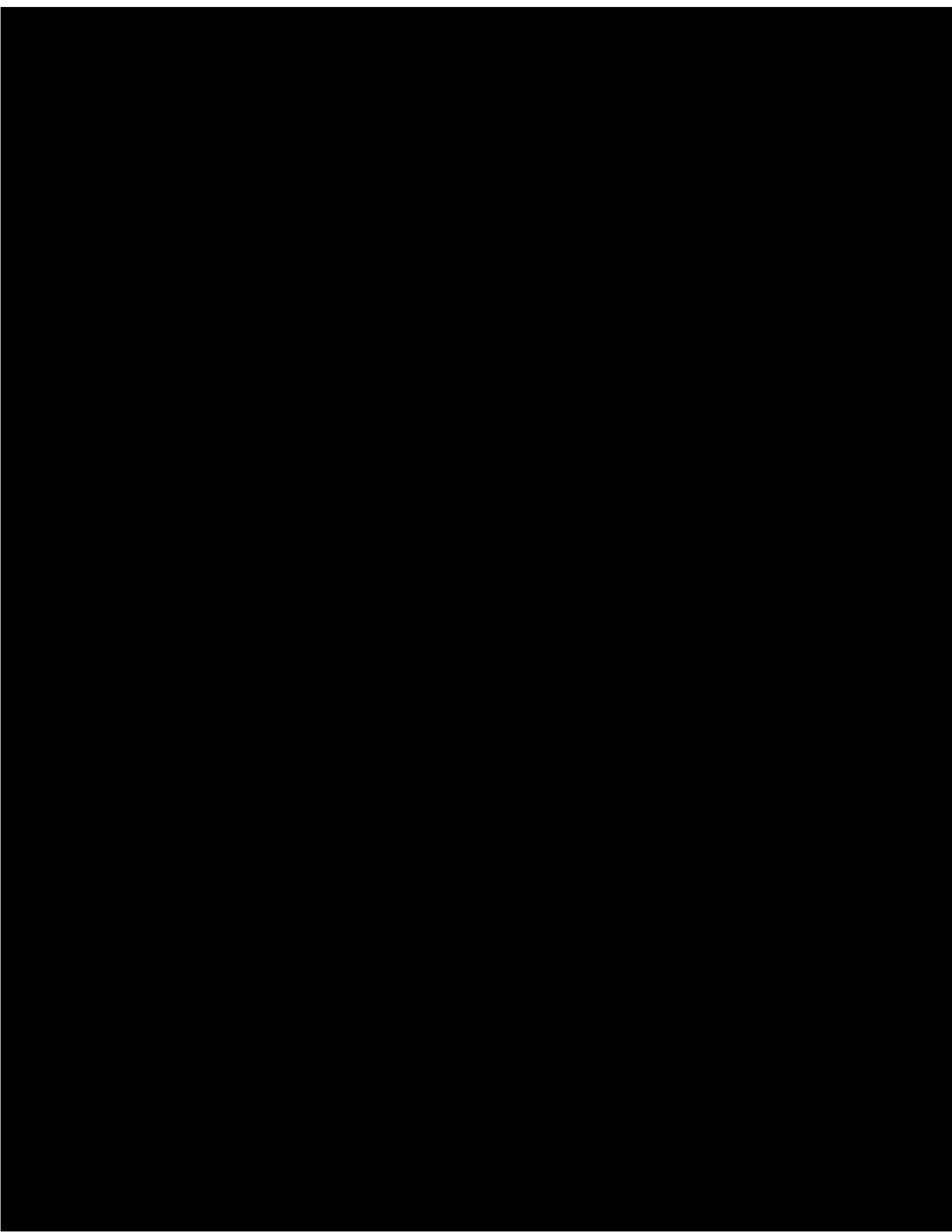


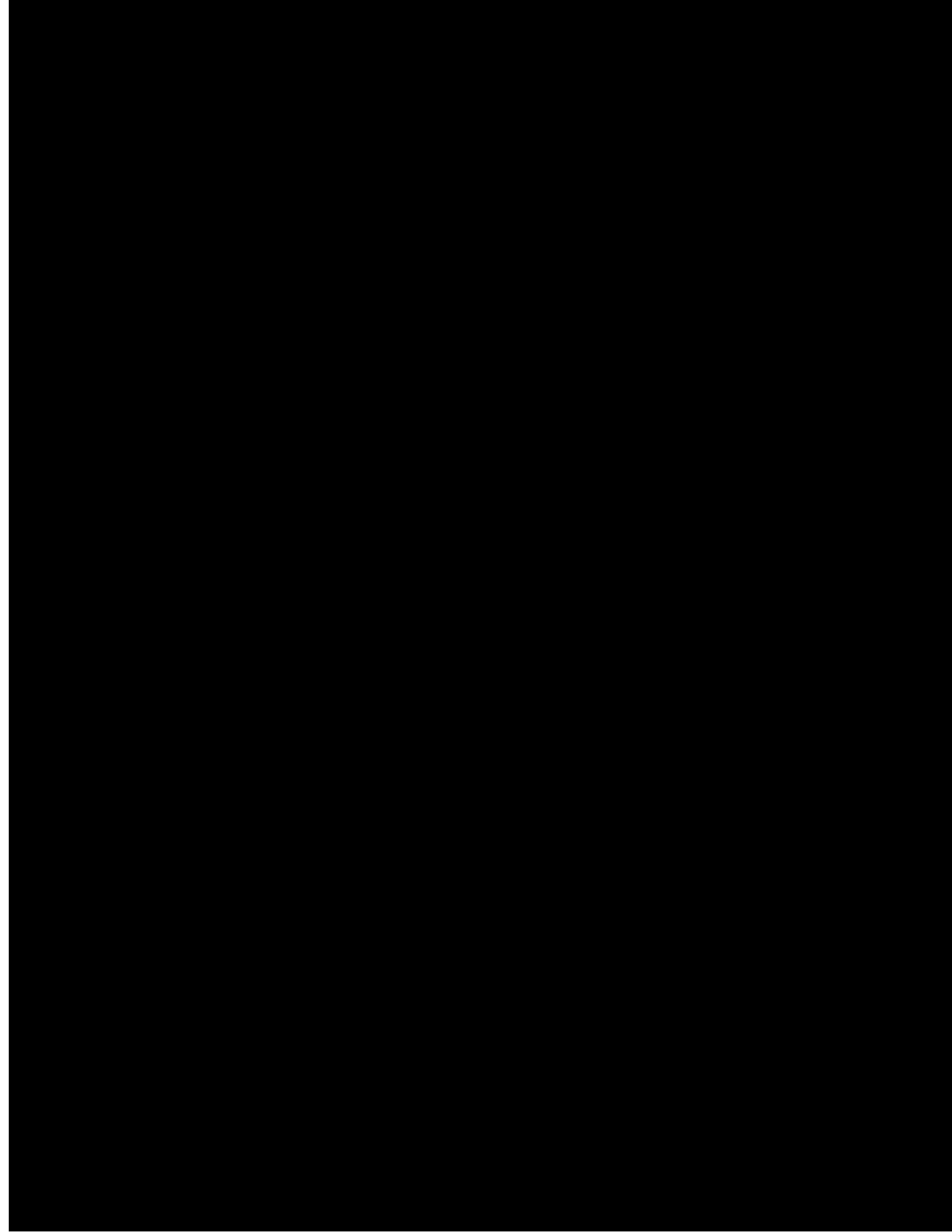
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and expense must be properly documented to ensure compliance with tax laws and to provide a clear audit trail. The text highlights the need for consistency in recording and the importance of retaining records for the required period.

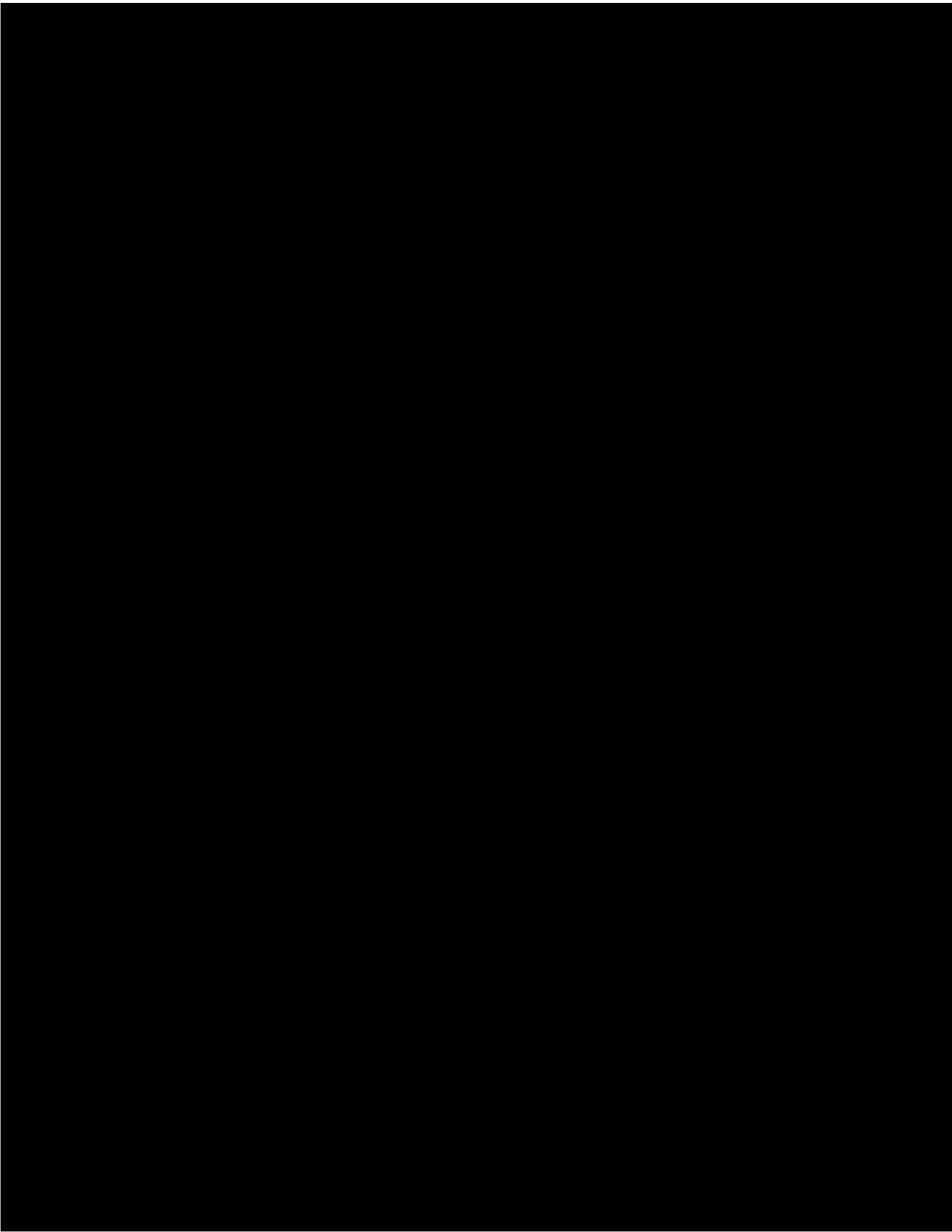
Next, the document addresses the classification of expenses. It explains that certain costs are deductible as business expenses, while others are not. Examples of deductible expenses include rent, utilities, and travel costs. The text provides guidance on how to categorize these expenses correctly to maximize the tax benefits available.

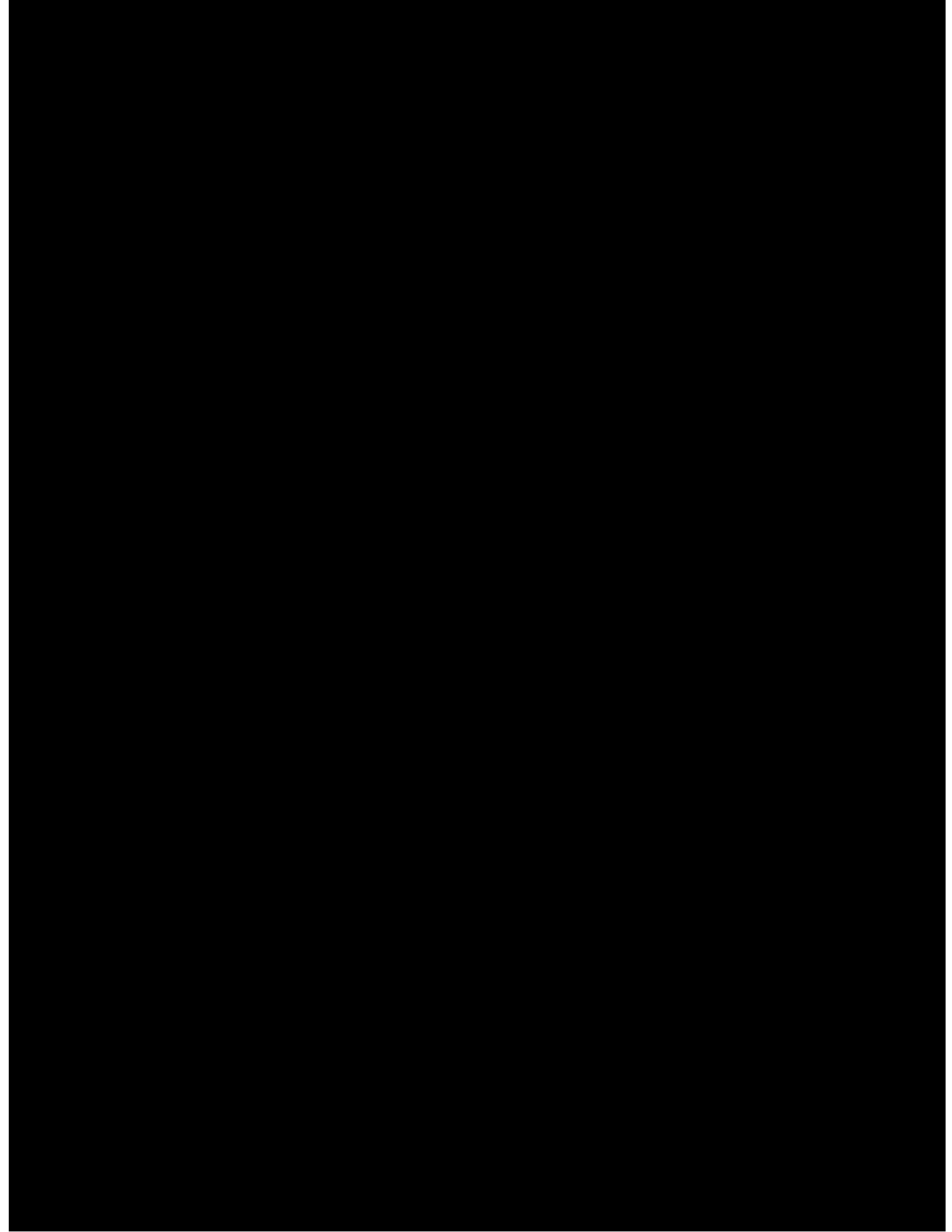
The document also covers the treatment of depreciation. It explains how the cost of long-term assets can be recovered over time through depreciation deductions. The text discusses different depreciation methods and provides examples of how to calculate the annual deduction for a piece of equipment.

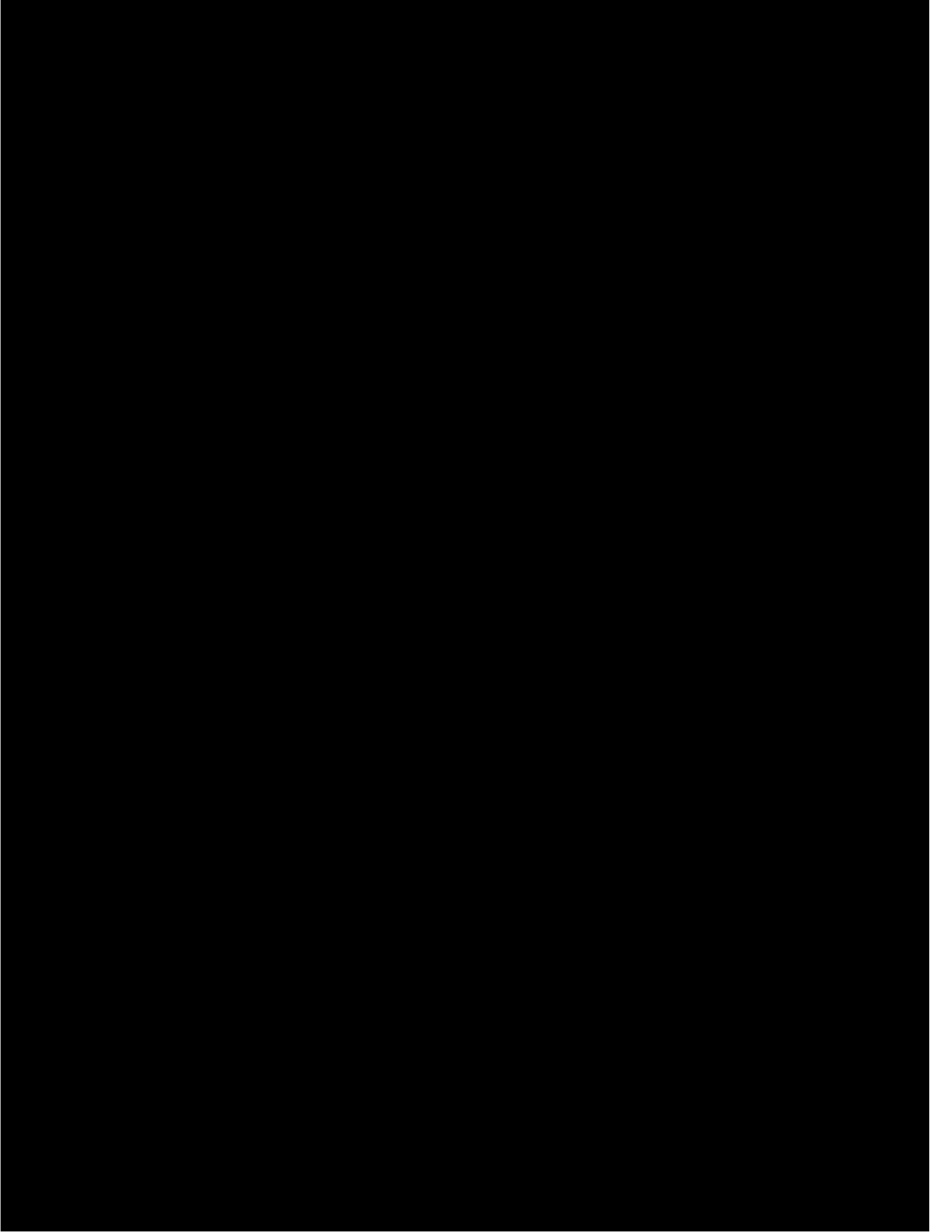
Finally, the document discusses the importance of consulting with a tax professional. It notes that tax laws are complex and constantly changing, and that a professional can provide valuable advice on how to structure transactions and manage tax obligations. The text encourages taxpayers to seek professional help to ensure they are taking full advantage of the tax laws and avoiding any penalties.

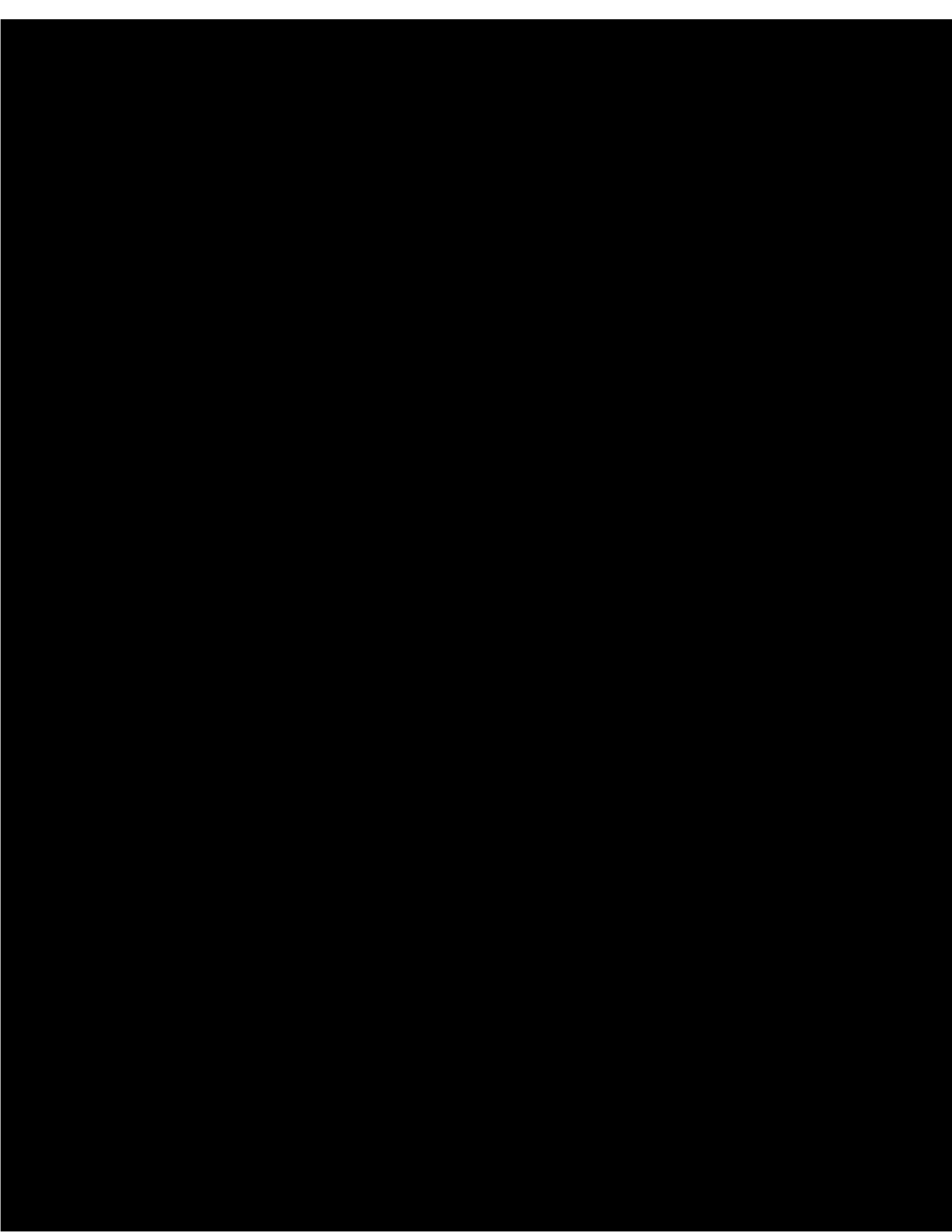


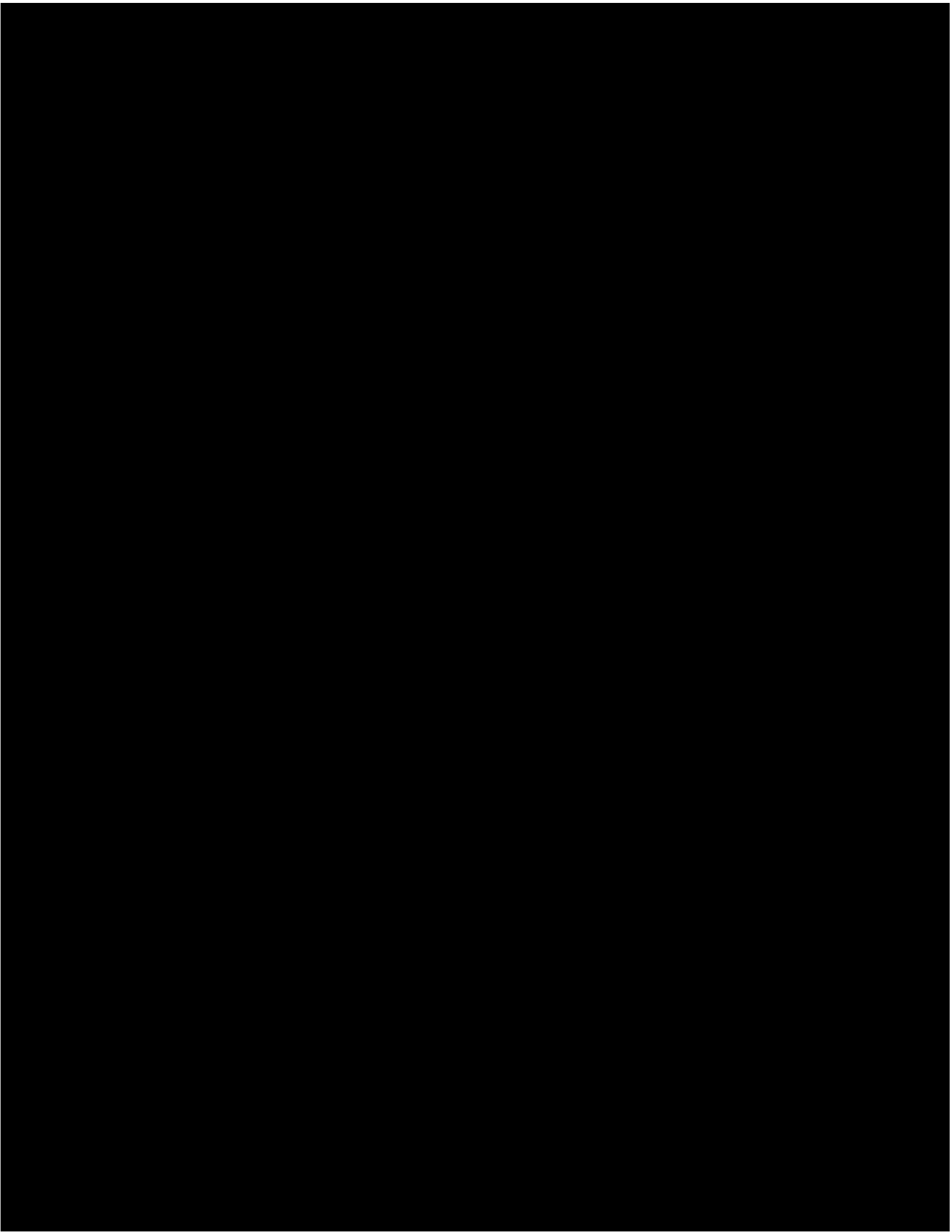


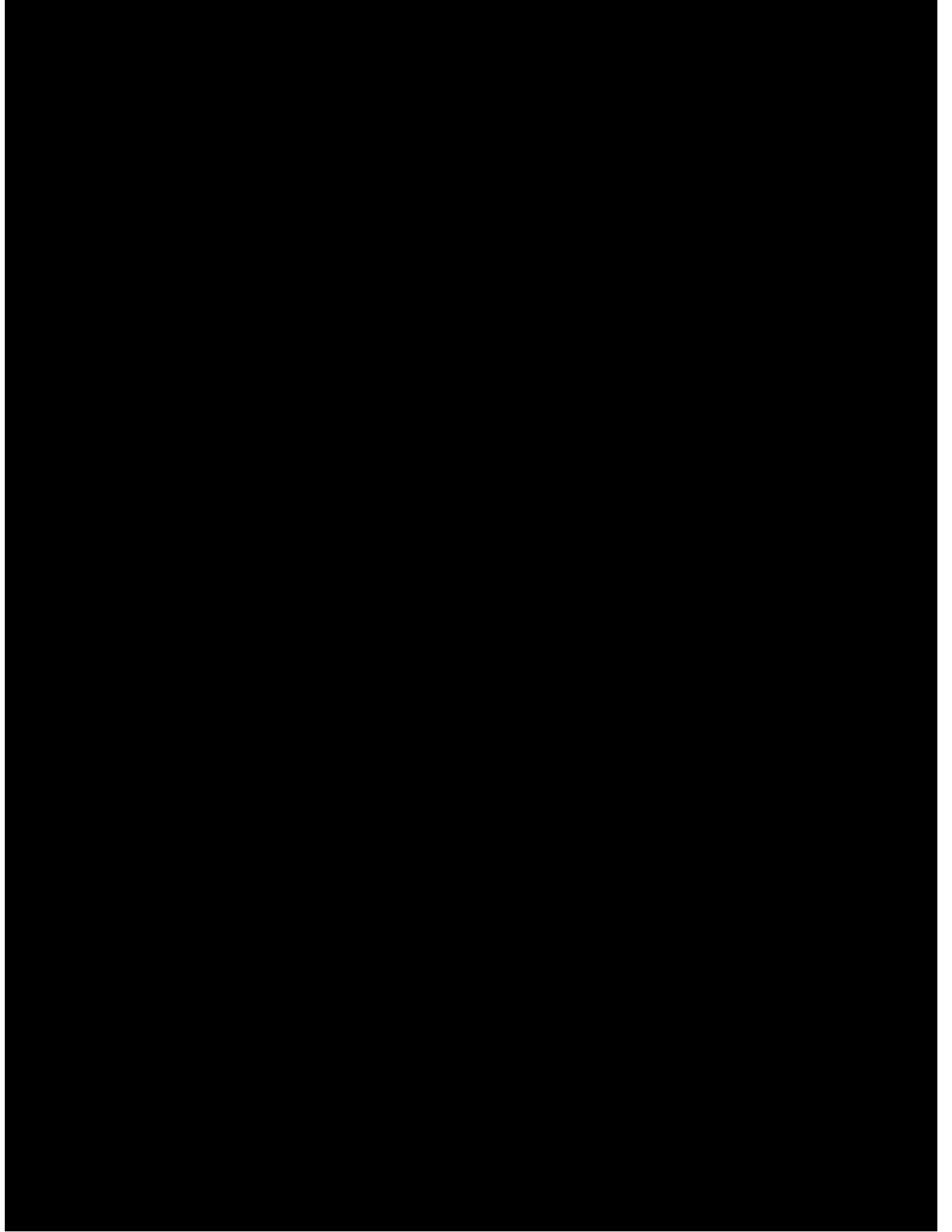


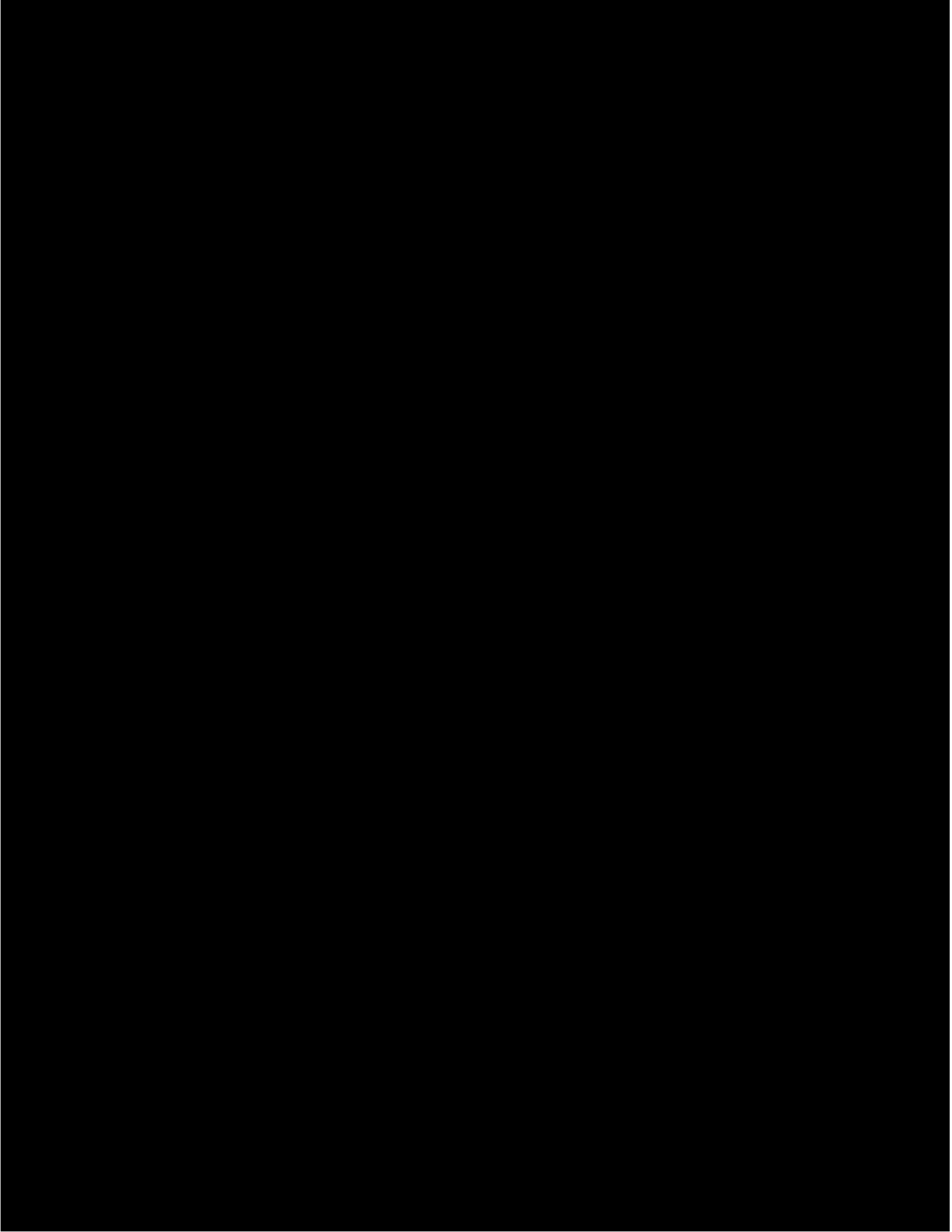


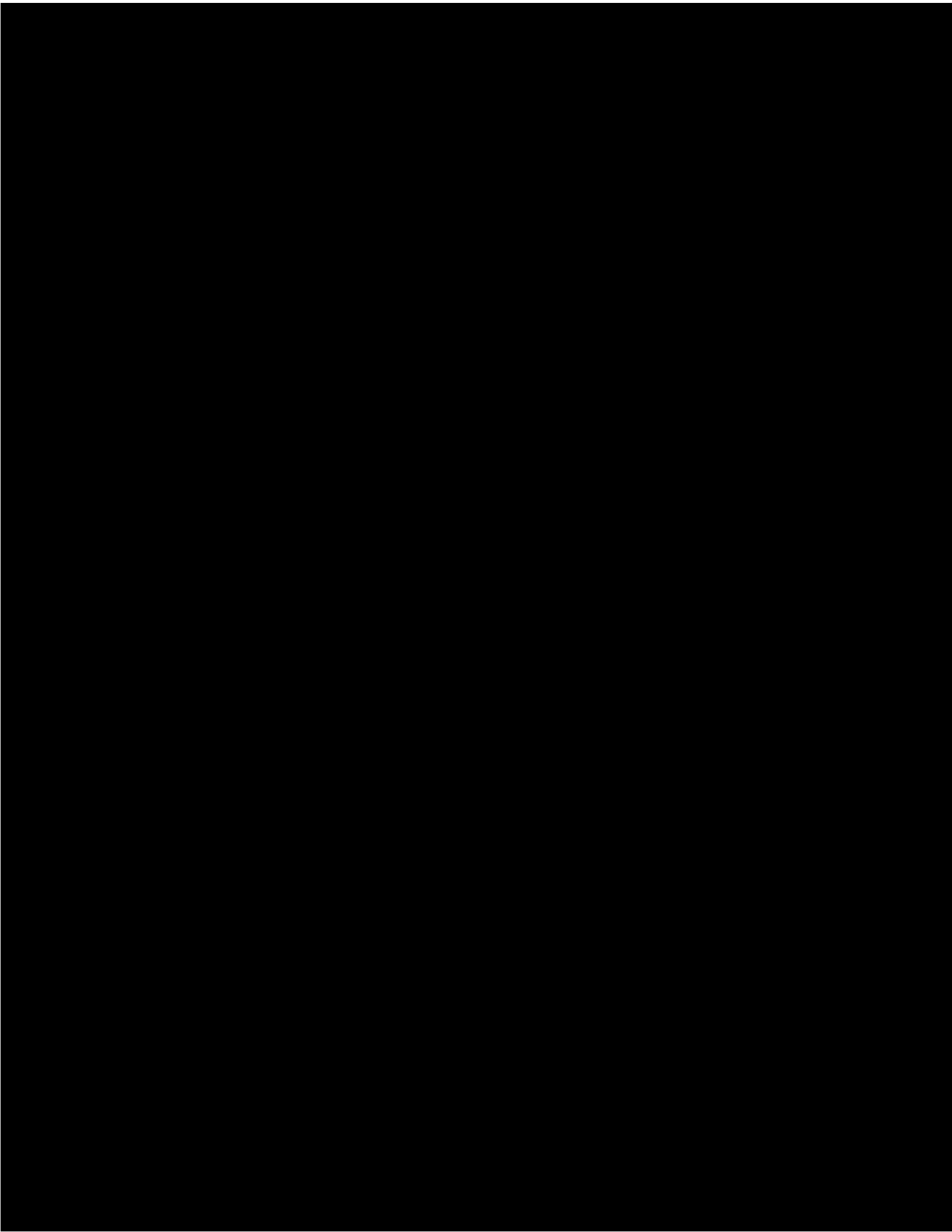


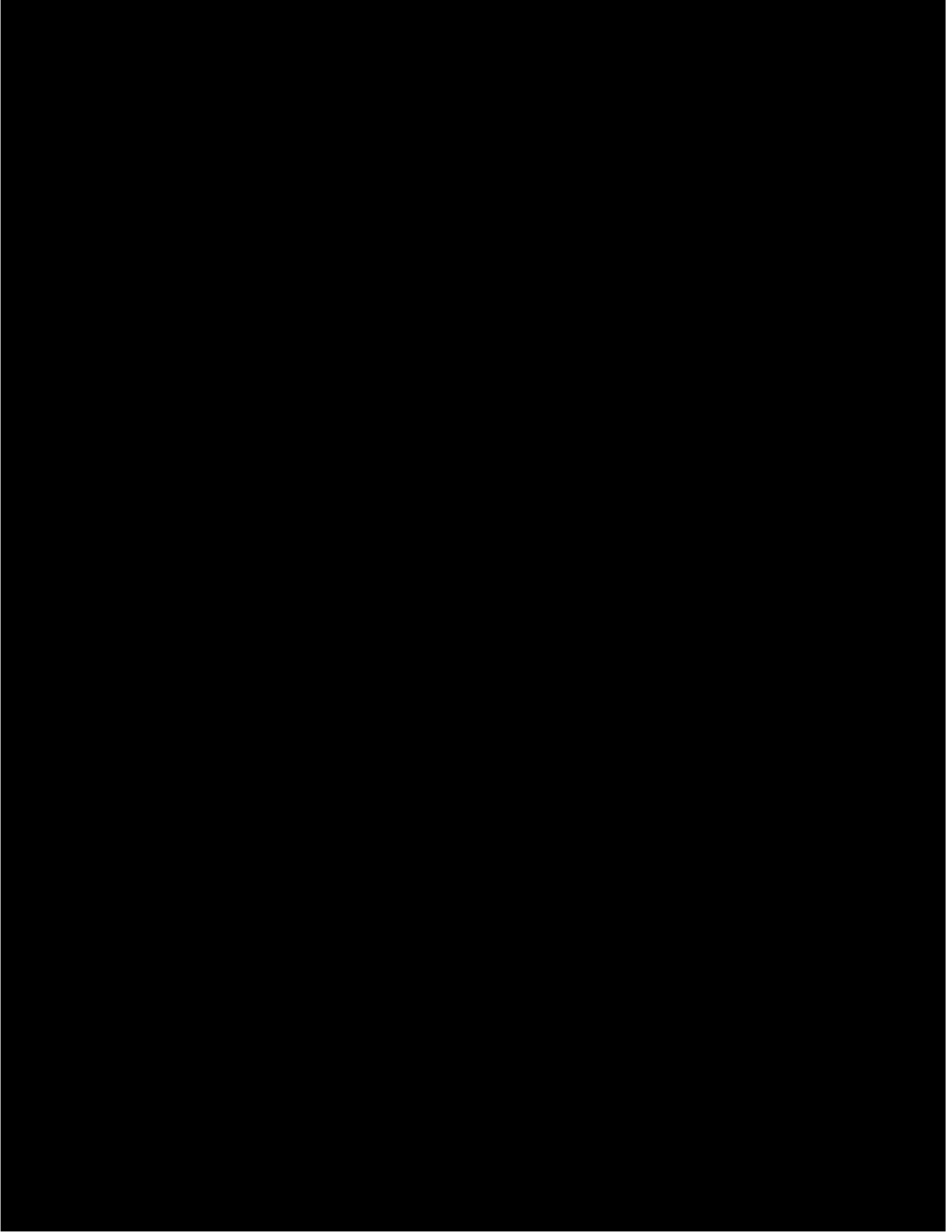


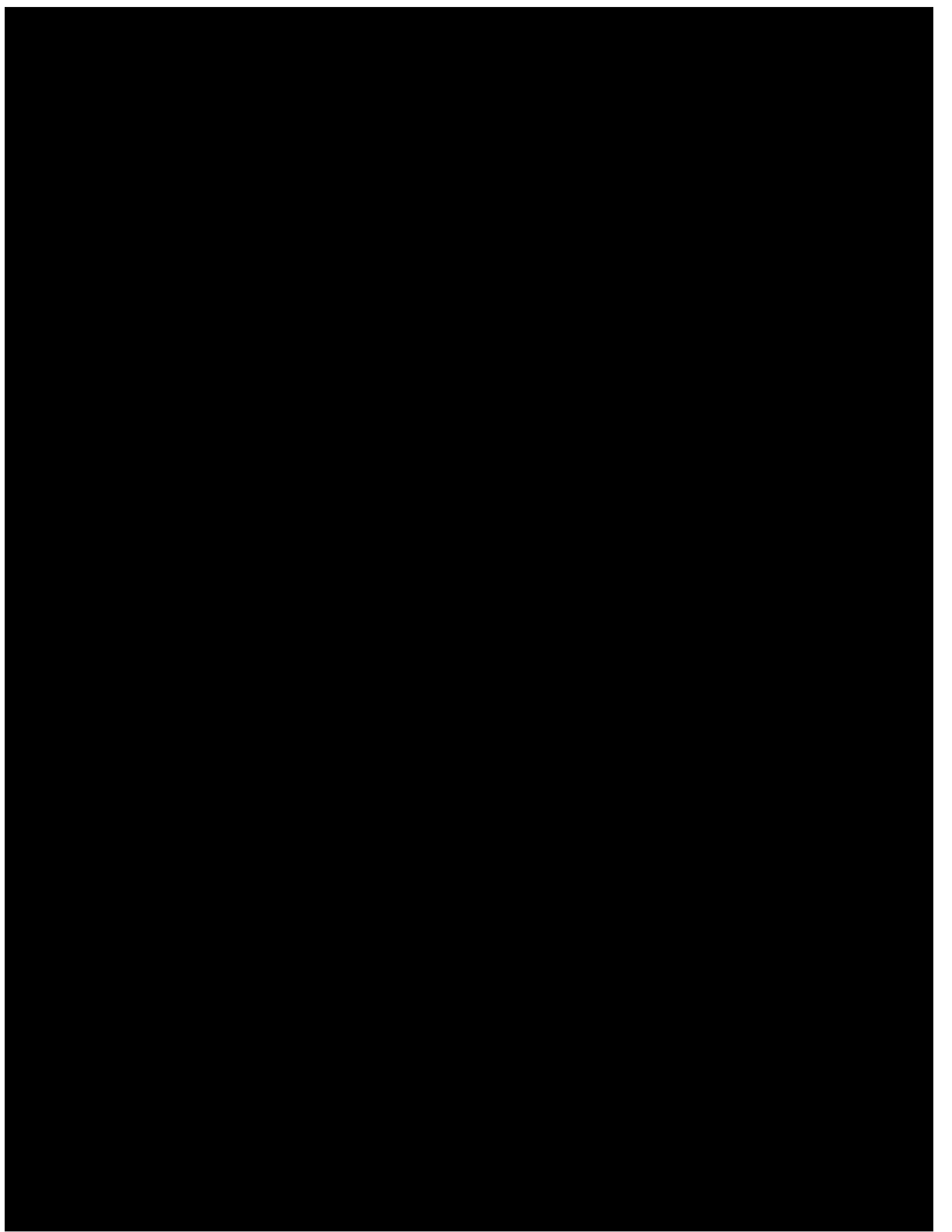


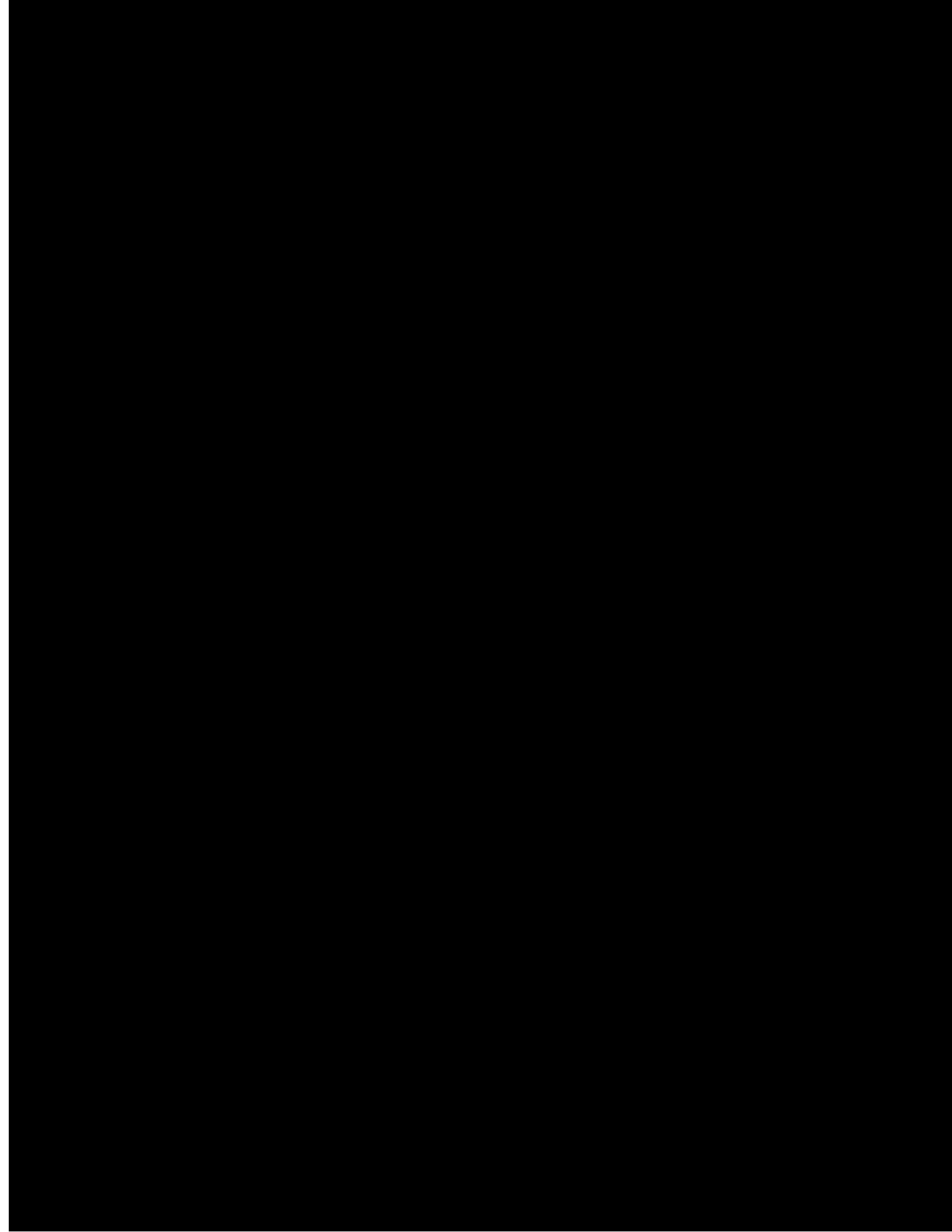


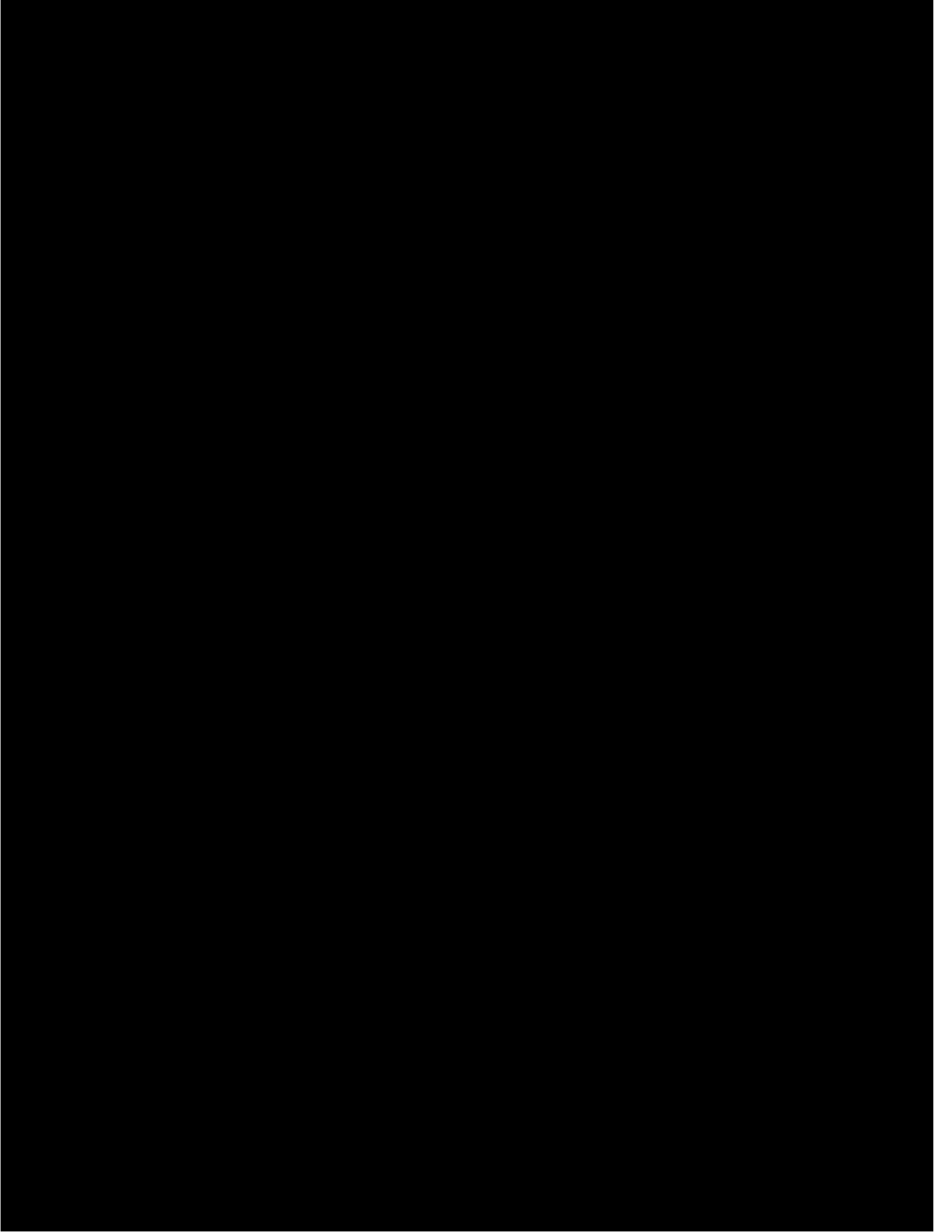


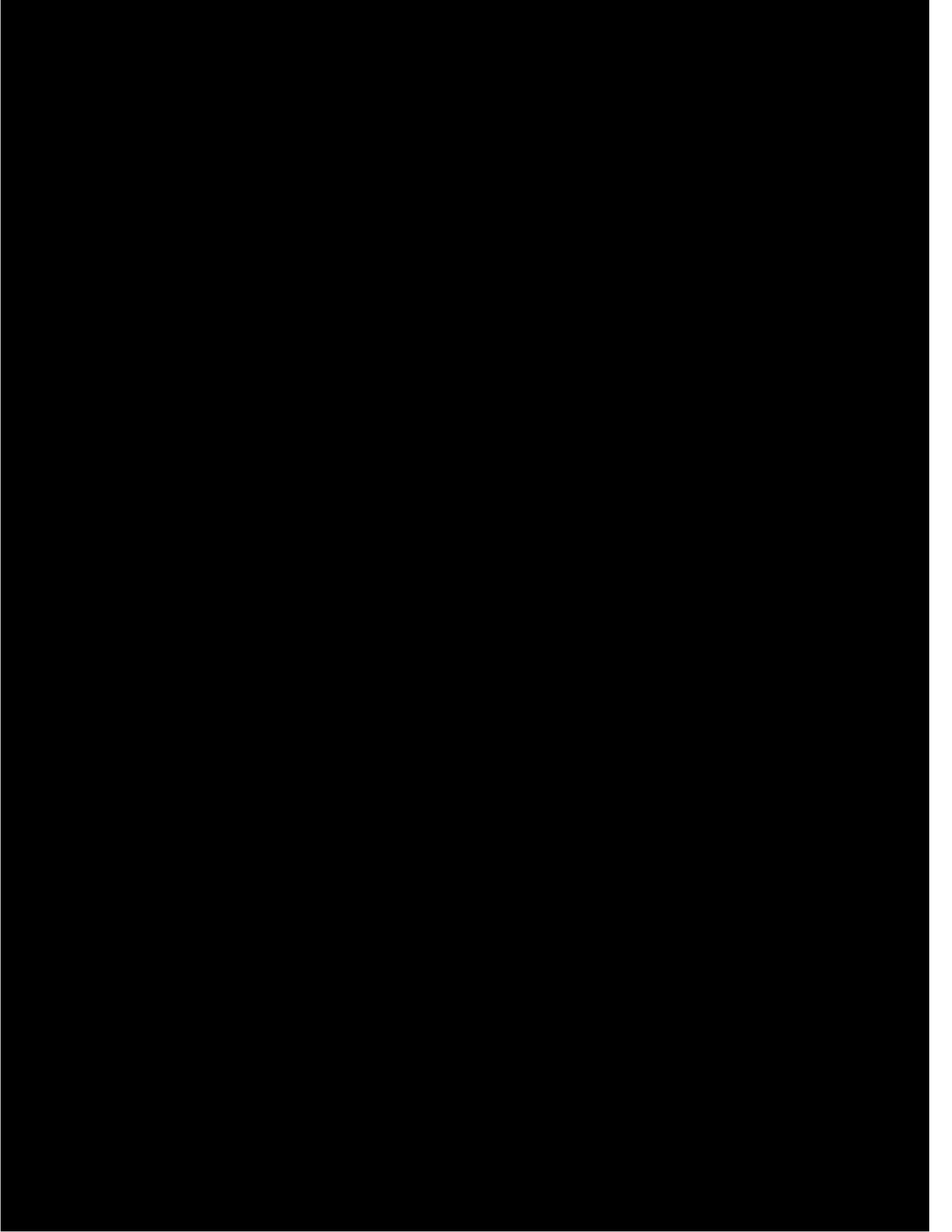


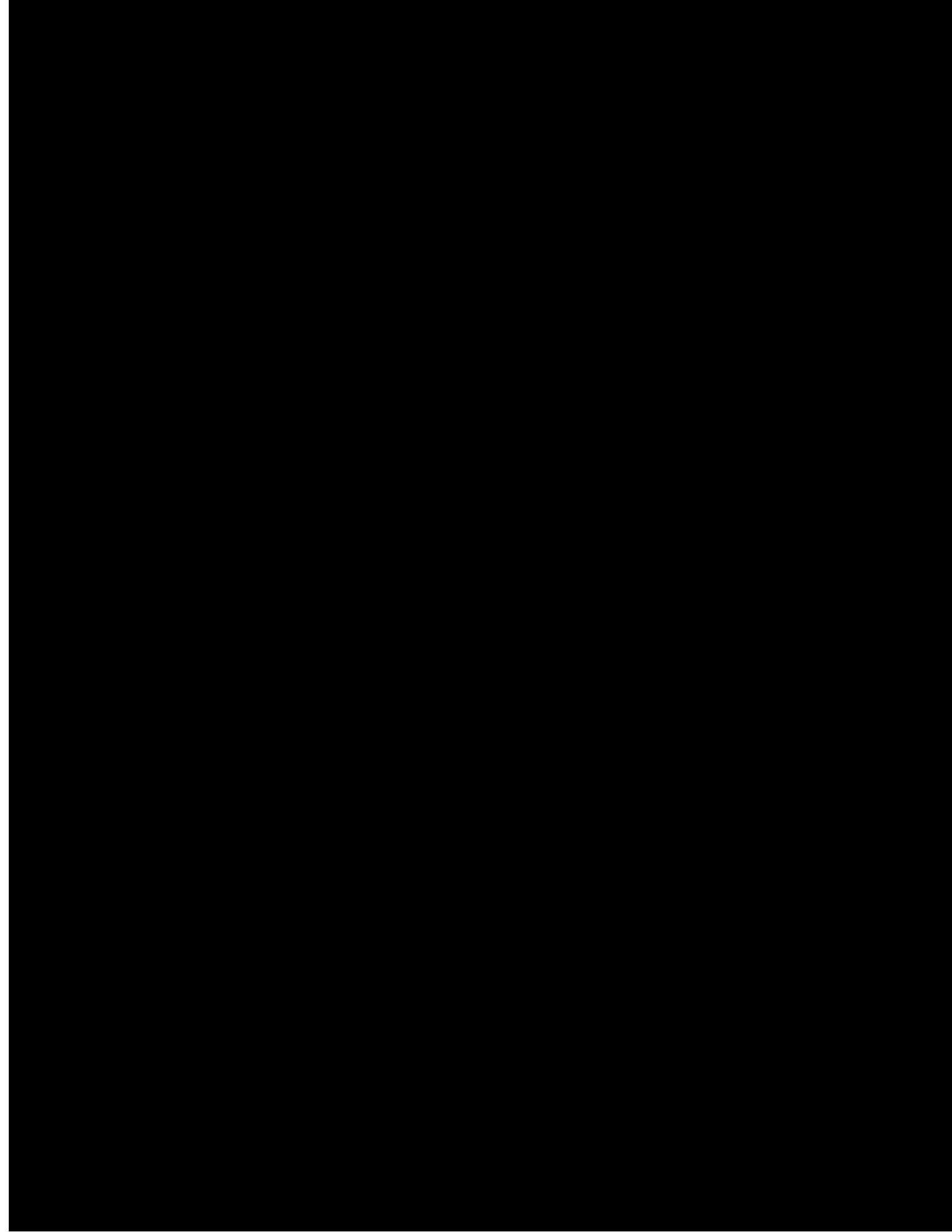


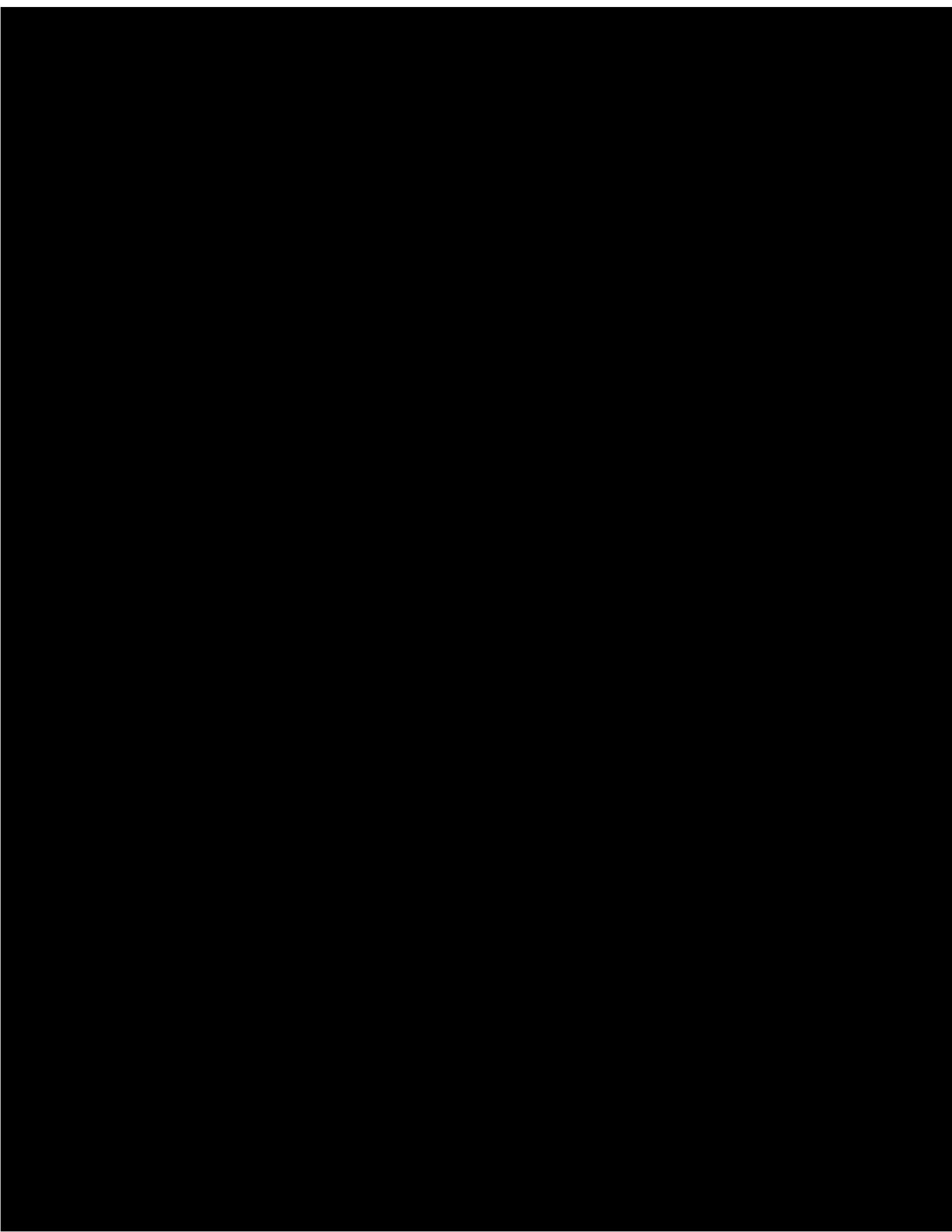


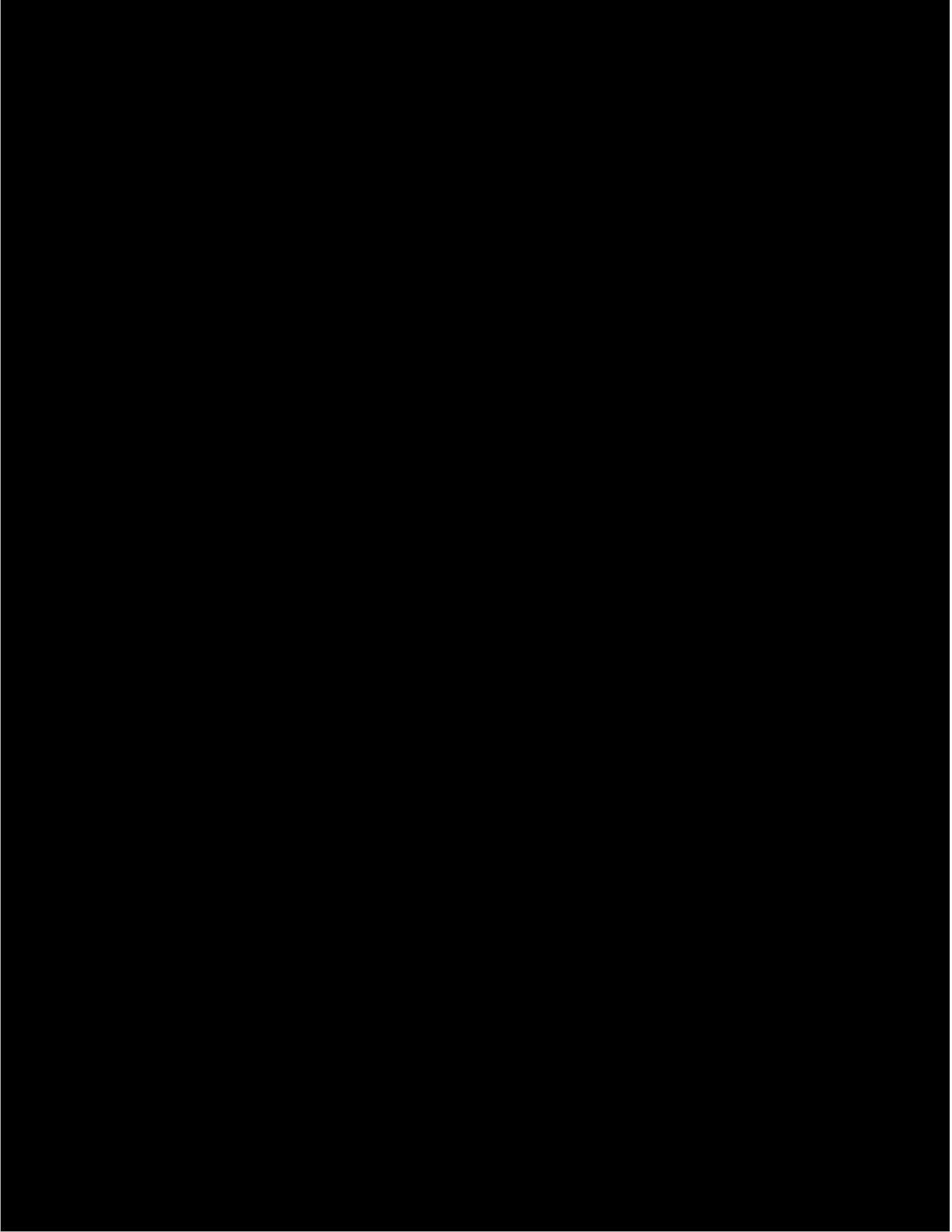


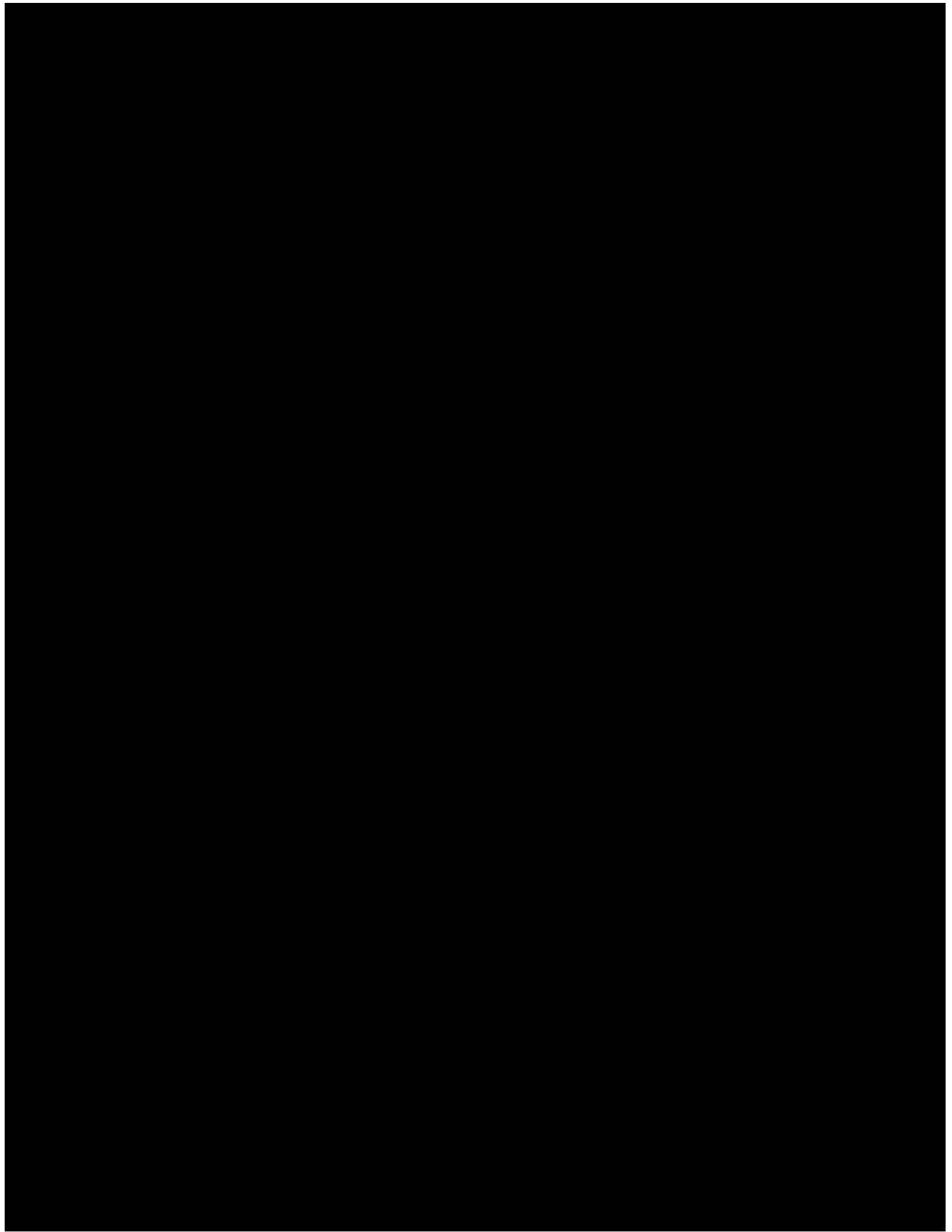


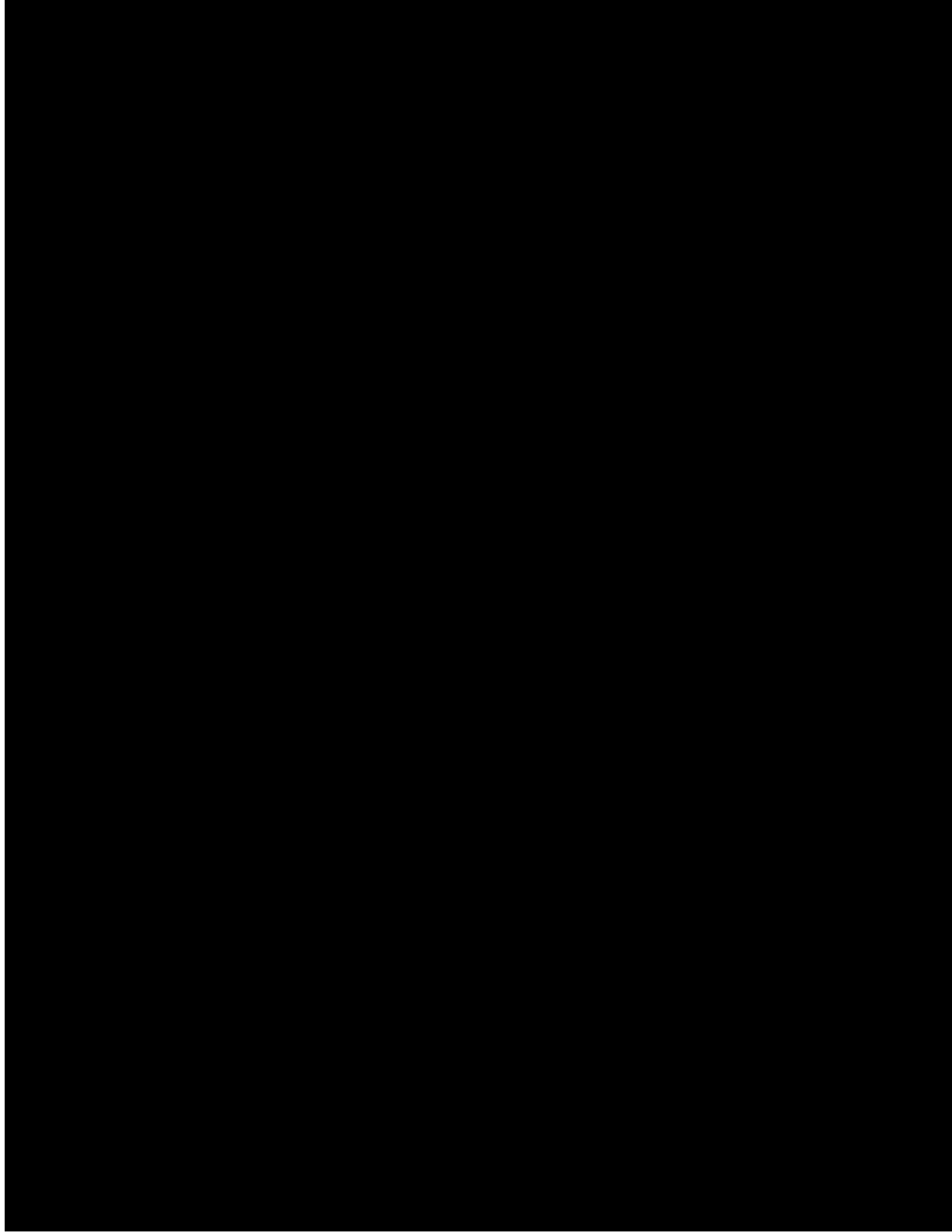


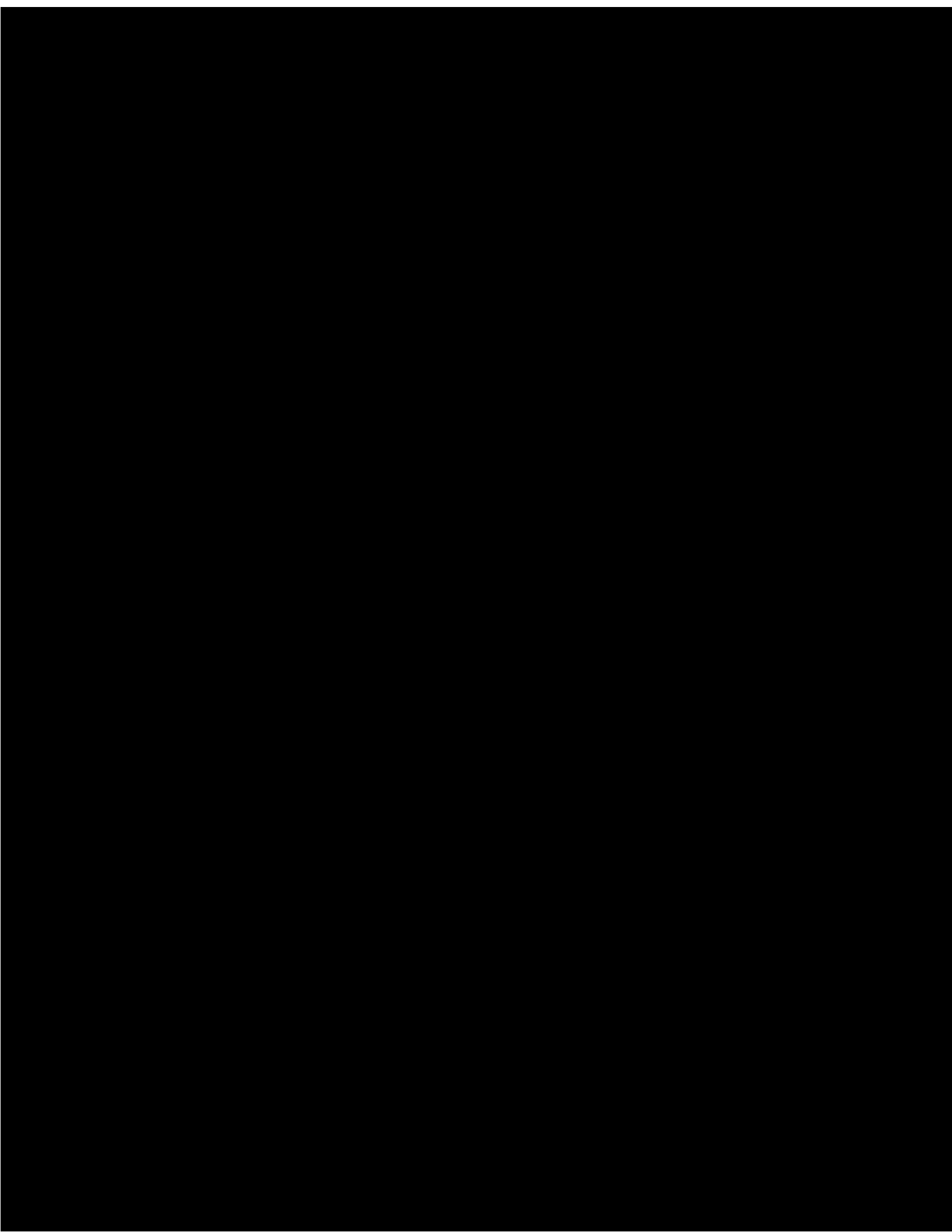












The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and payment must be properly documented to ensure the integrity of the financial statements. This includes recording the date, amount, and purpose of each transaction.

The second part of the document provides a detailed breakdown of the company's revenue streams. It identifies the primary sources of income and analyzes their contribution to the overall financial performance. This section also includes a comparison of current revenue trends with historical data to identify any significant changes or patterns.

The third part of the document focuses on the company's operating expenses. It details the various costs incurred in the course of business operations, such as salaries, rent, utilities, and marketing. This analysis helps in understanding the efficiency of the company's spending and identifying areas for potential cost reduction.

The fourth part of the document discusses the company's profit margins. It calculates the gross profit, operating profit, and net profit, providing a clear picture of the company's profitability. This section also includes a discussion on the factors that influence profit margins and the company's strategies to improve them.

The fifth part of the document addresses the company's financial position and liquidity. It examines the balance sheet, showing the company's assets, liabilities, and equity. This analysis is crucial for assessing the company's ability to meet its short-term and long-term obligations.

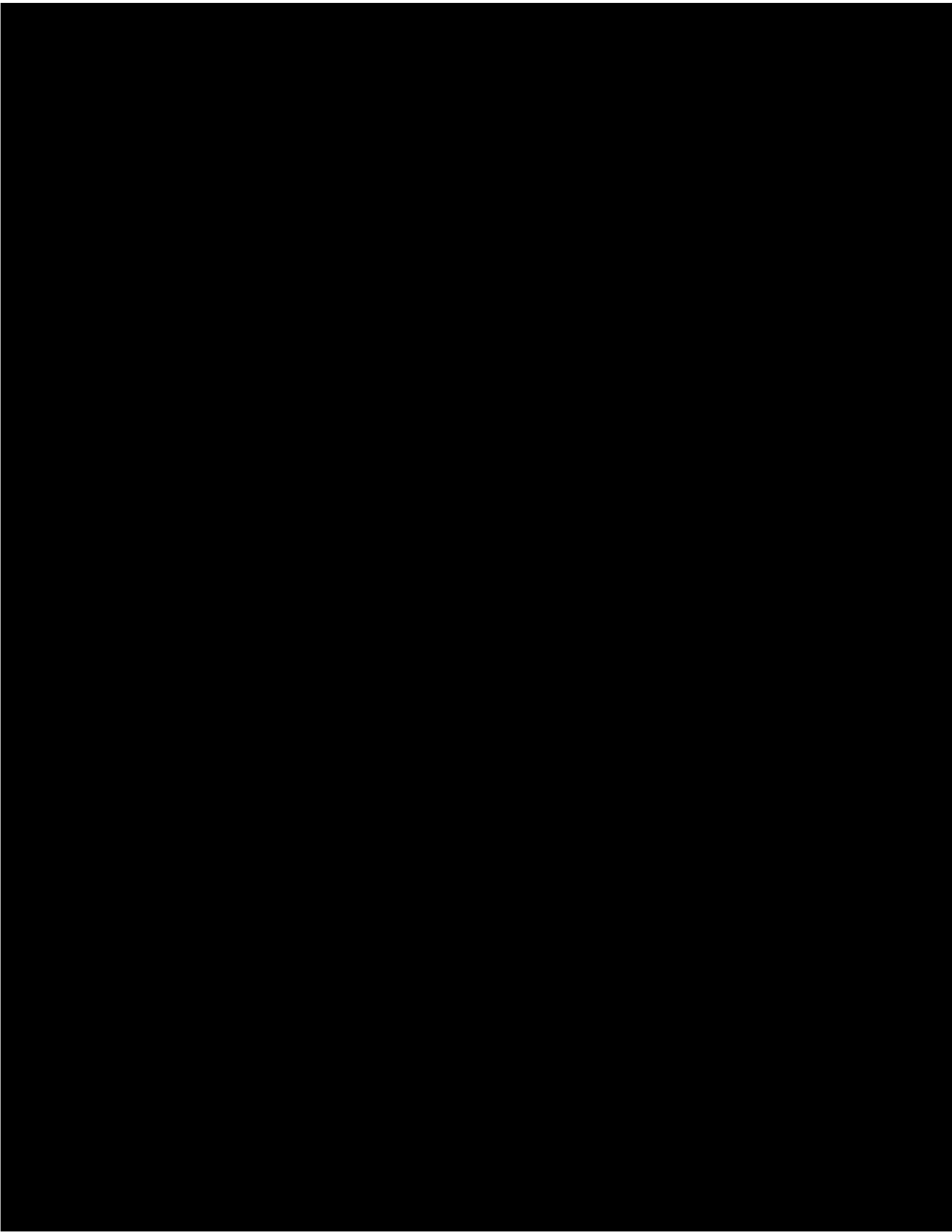
The sixth part of the document discusses the company's cash flow. It details the inflows and outflows of cash, providing insight into the company's ability to generate and manage its cash resources. This section also includes a discussion on the company's financing activities and its impact on the cash flow.

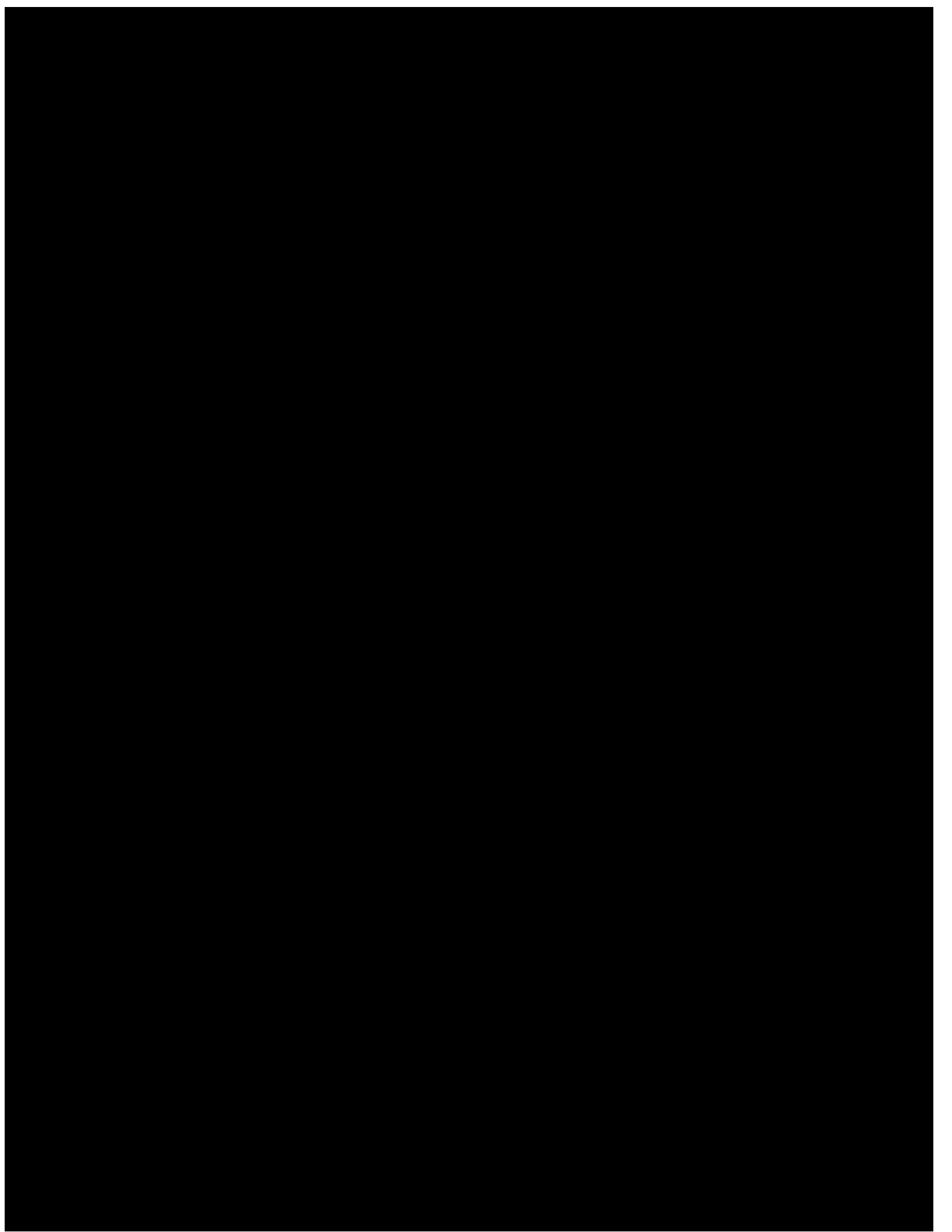
The seventh part of the document provides a summary of the company's financial performance and outlook. It highlights the key findings from the previous sections and offers a perspective on the company's future prospects. This section also includes a discussion on the risks and opportunities that the company faces in the market.

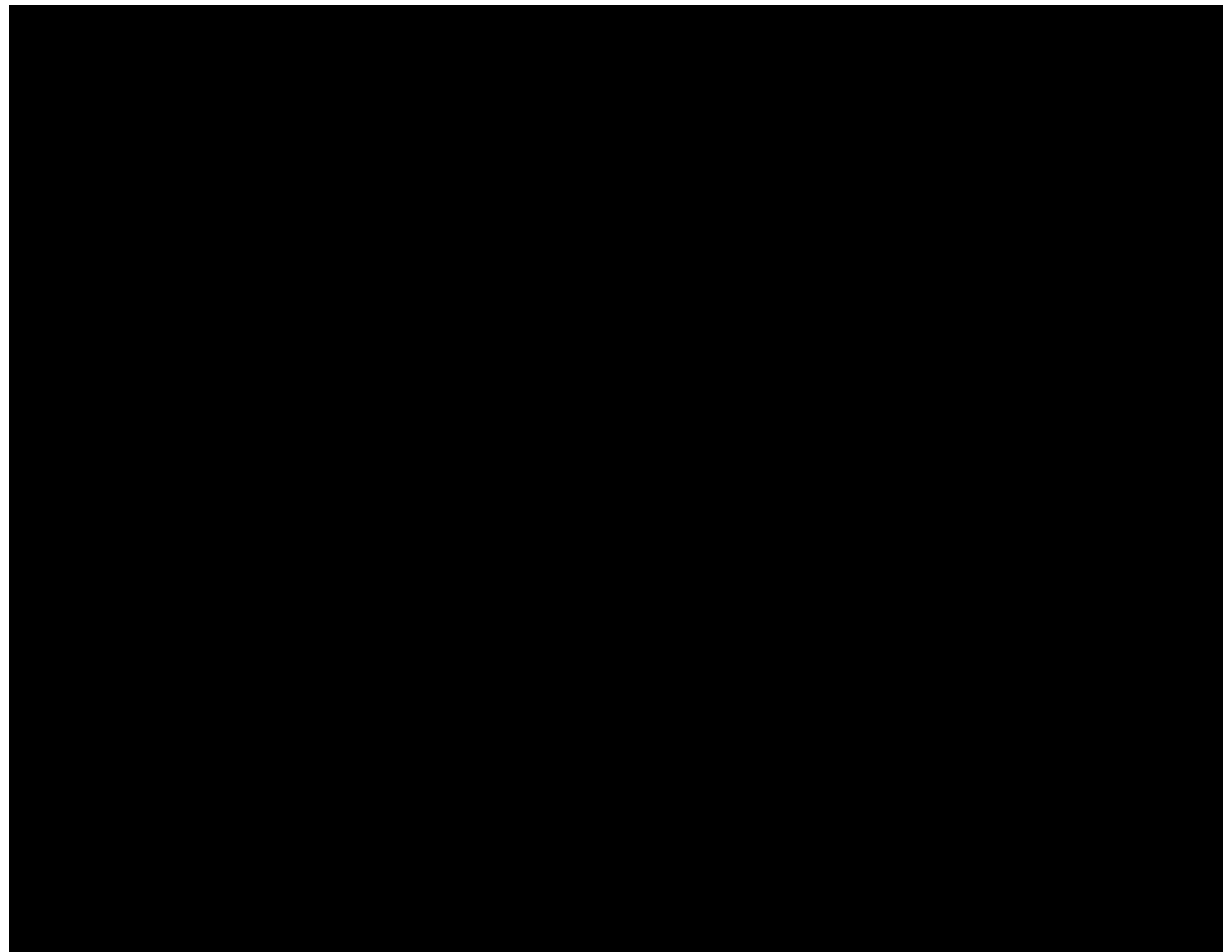
The eighth part of the document contains the company's financial statements, including the income statement, balance sheet, and cash flow statement. These statements provide a comprehensive overview of the company's financial health and are essential for investors and other stakeholders.

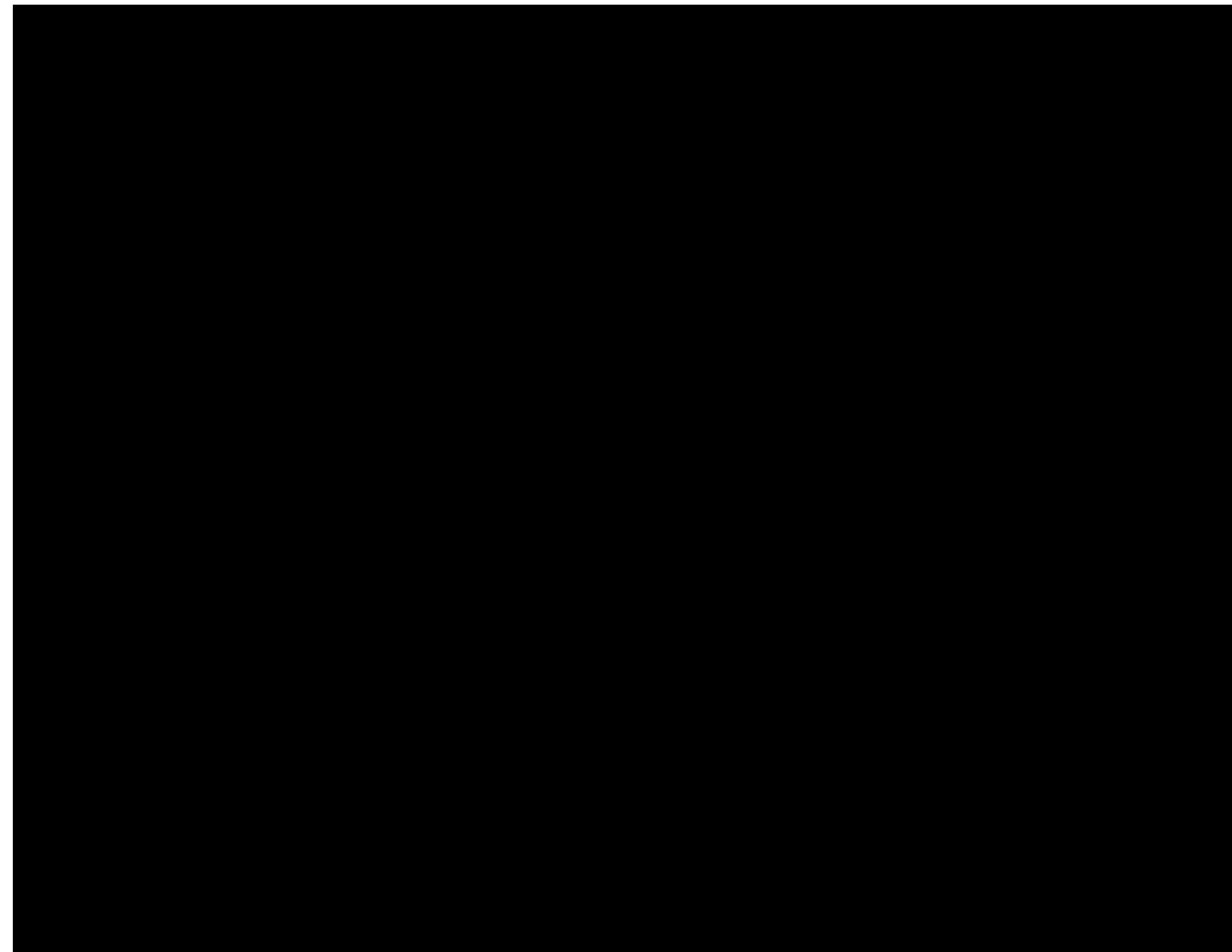
The ninth part of the document discusses the company's compliance with applicable laws and regulations. It details the steps taken to ensure that the company's financial reporting is accurate and transparent, and that it meets all the requirements of the relevant regulatory bodies.

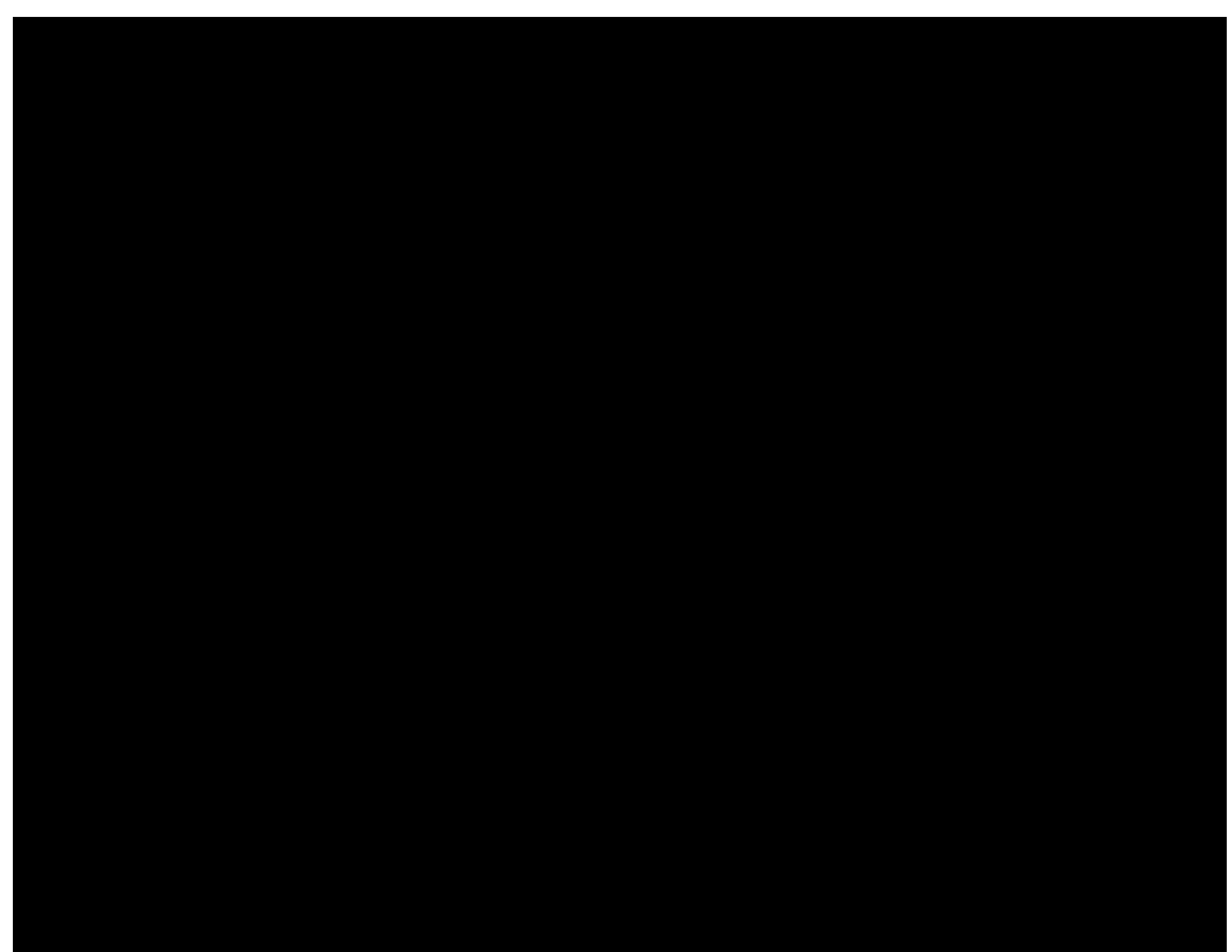
The tenth part of the document provides a conclusion and a list of recommendations. It summarizes the key findings of the financial review and offers suggestions for improving the company's financial performance and overall business operations.

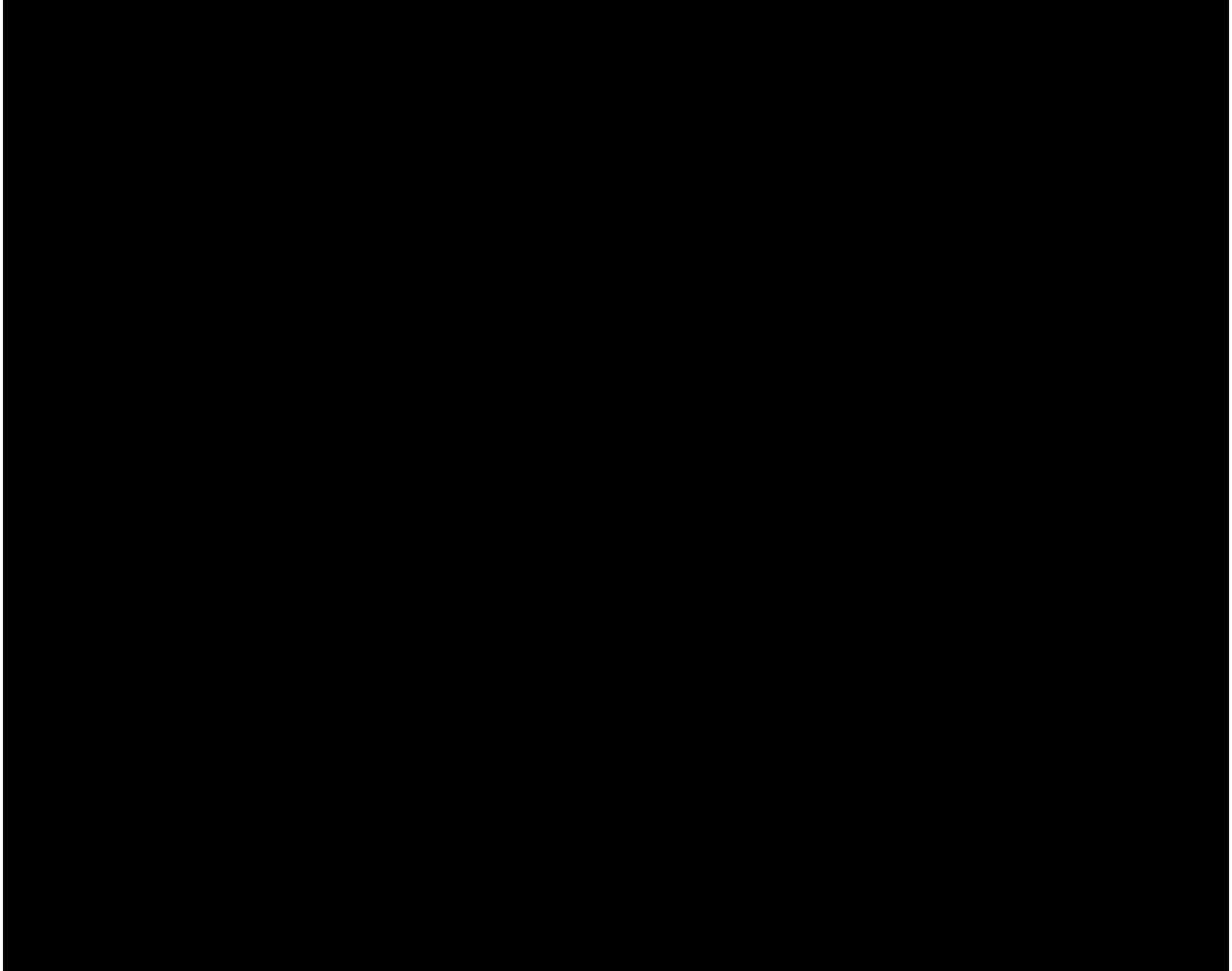






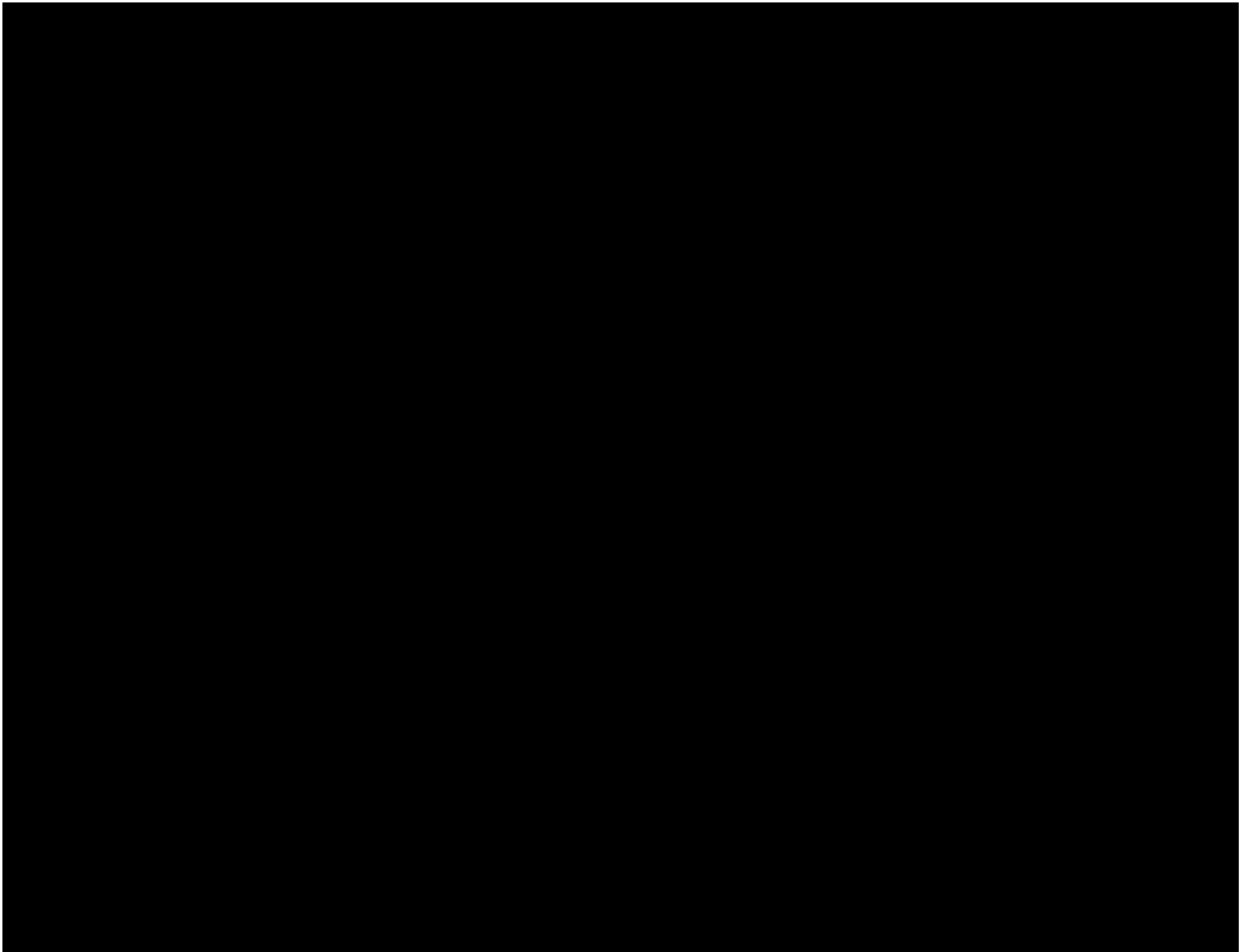


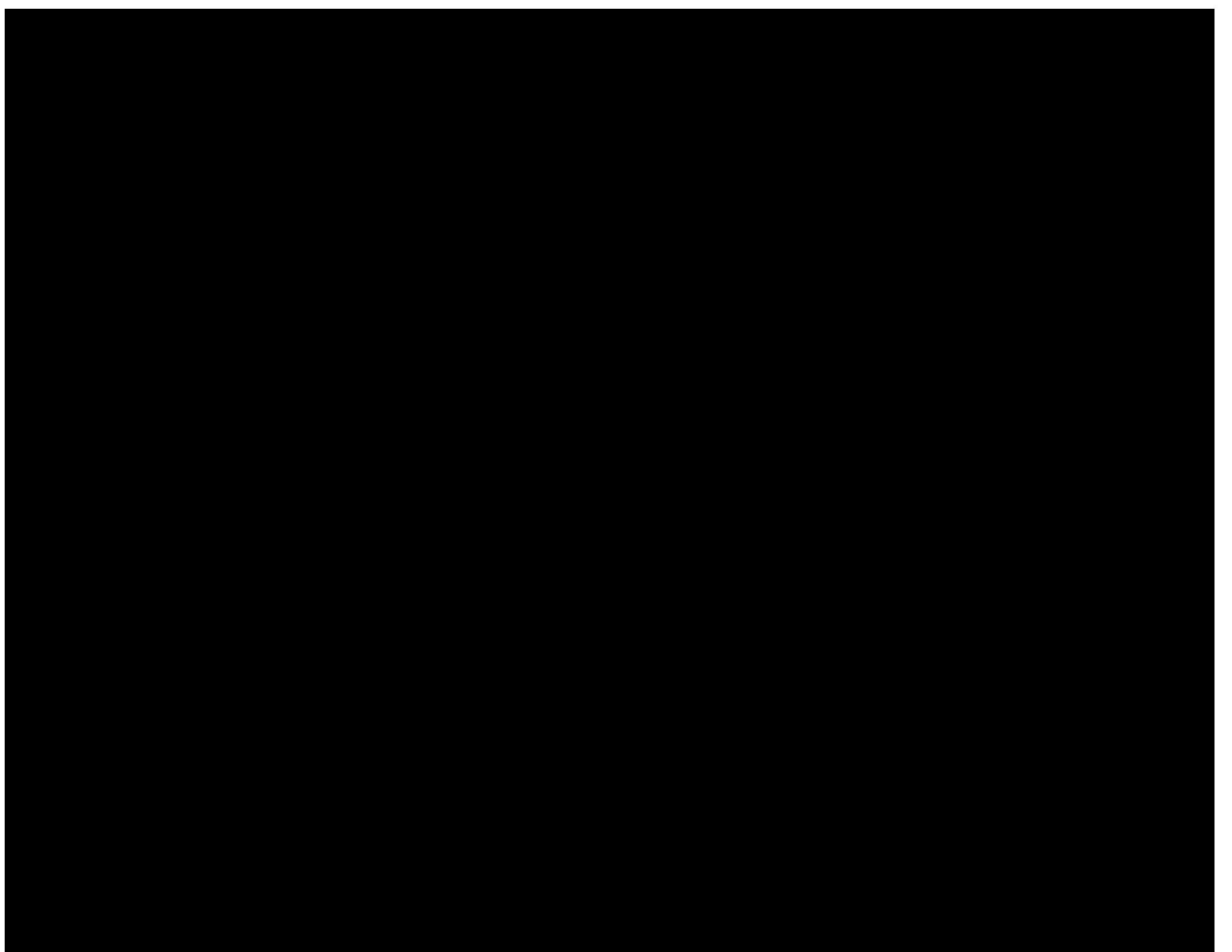


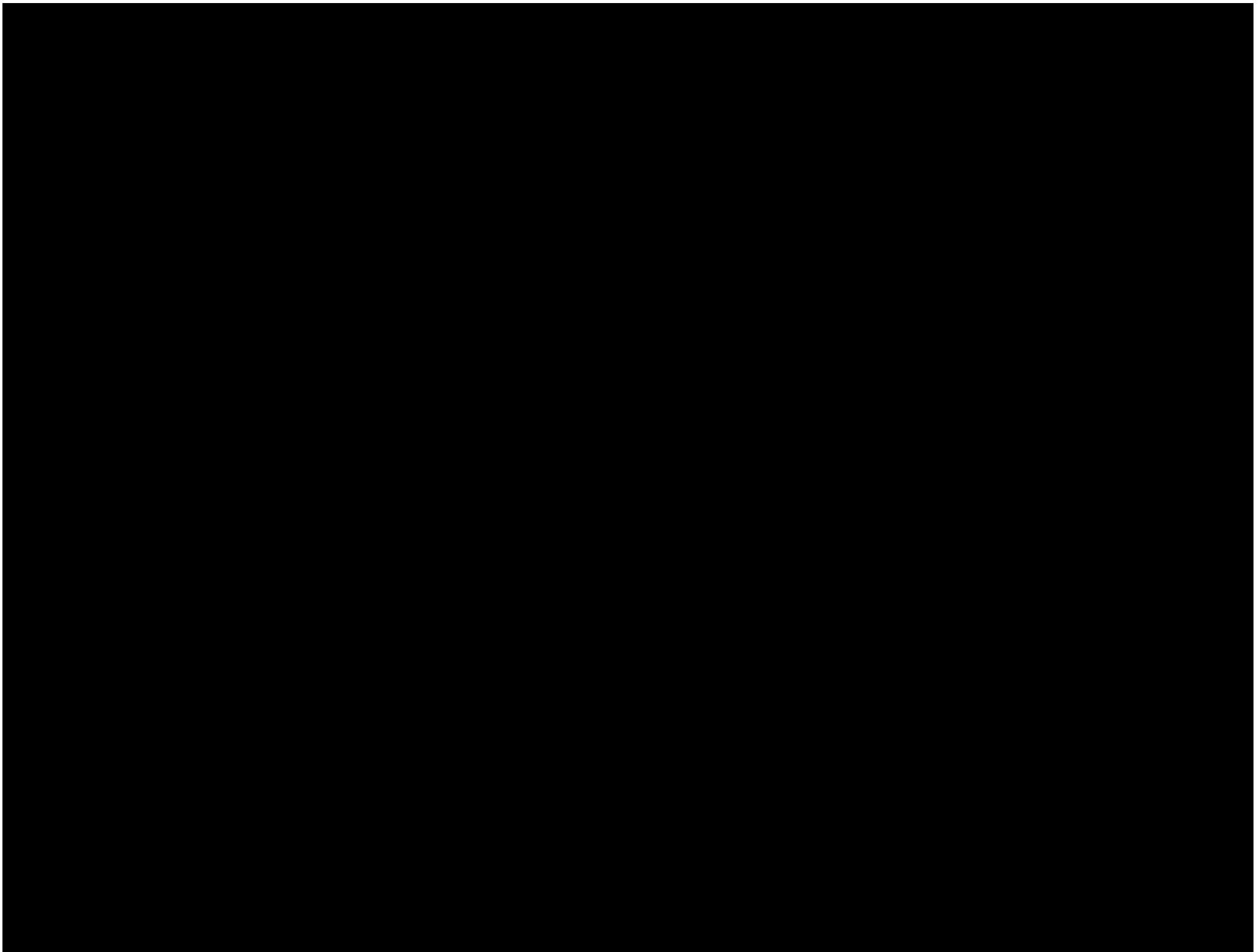


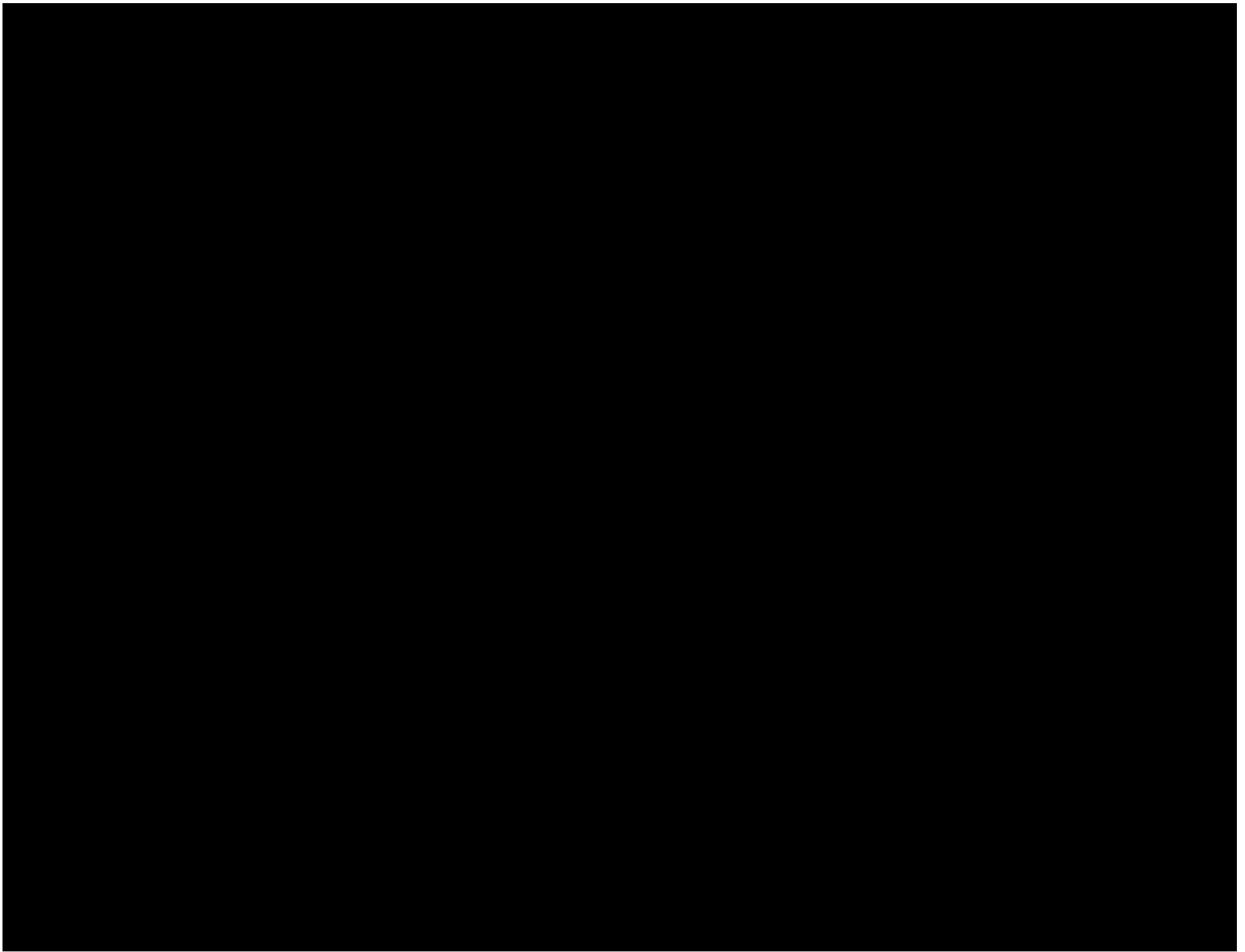


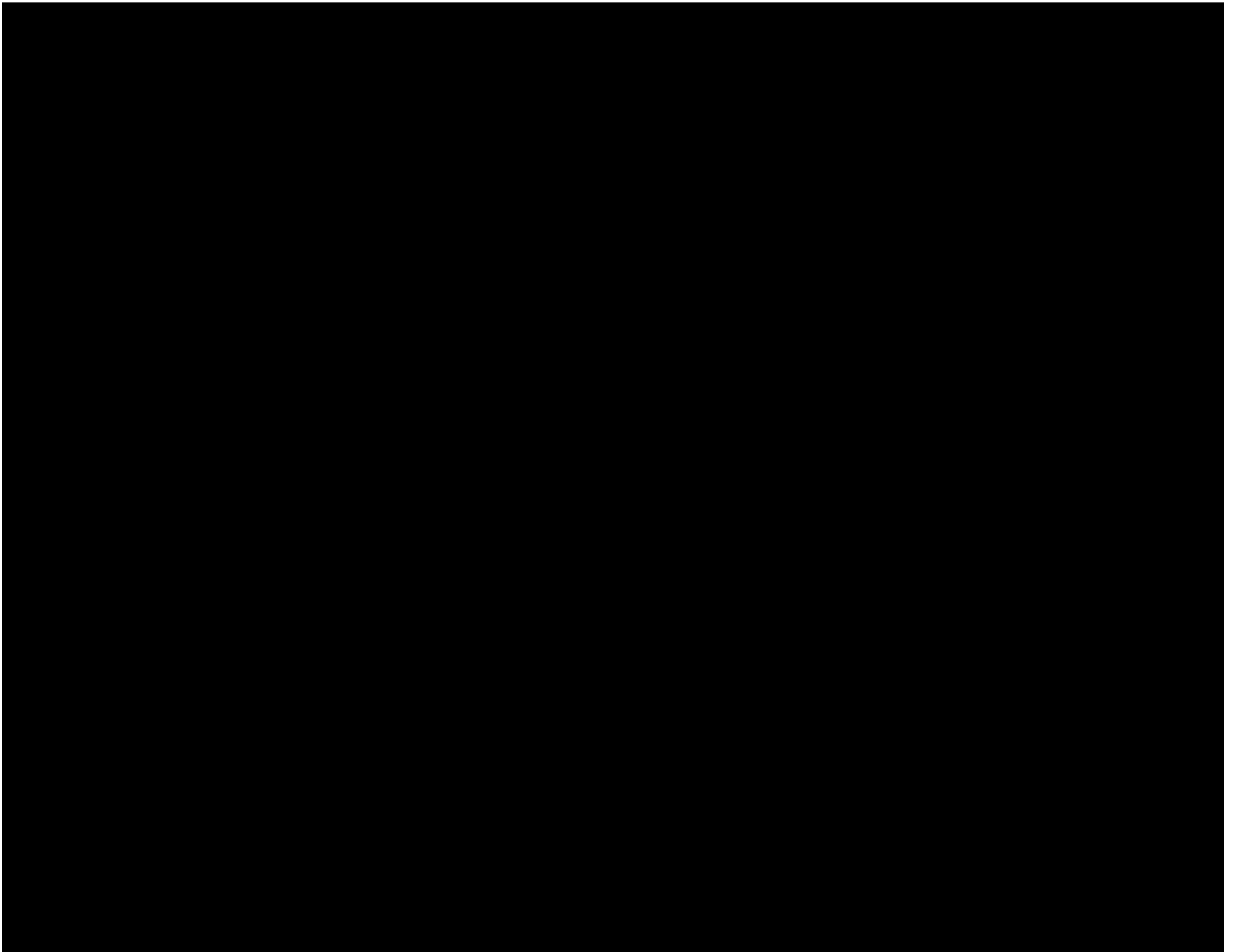


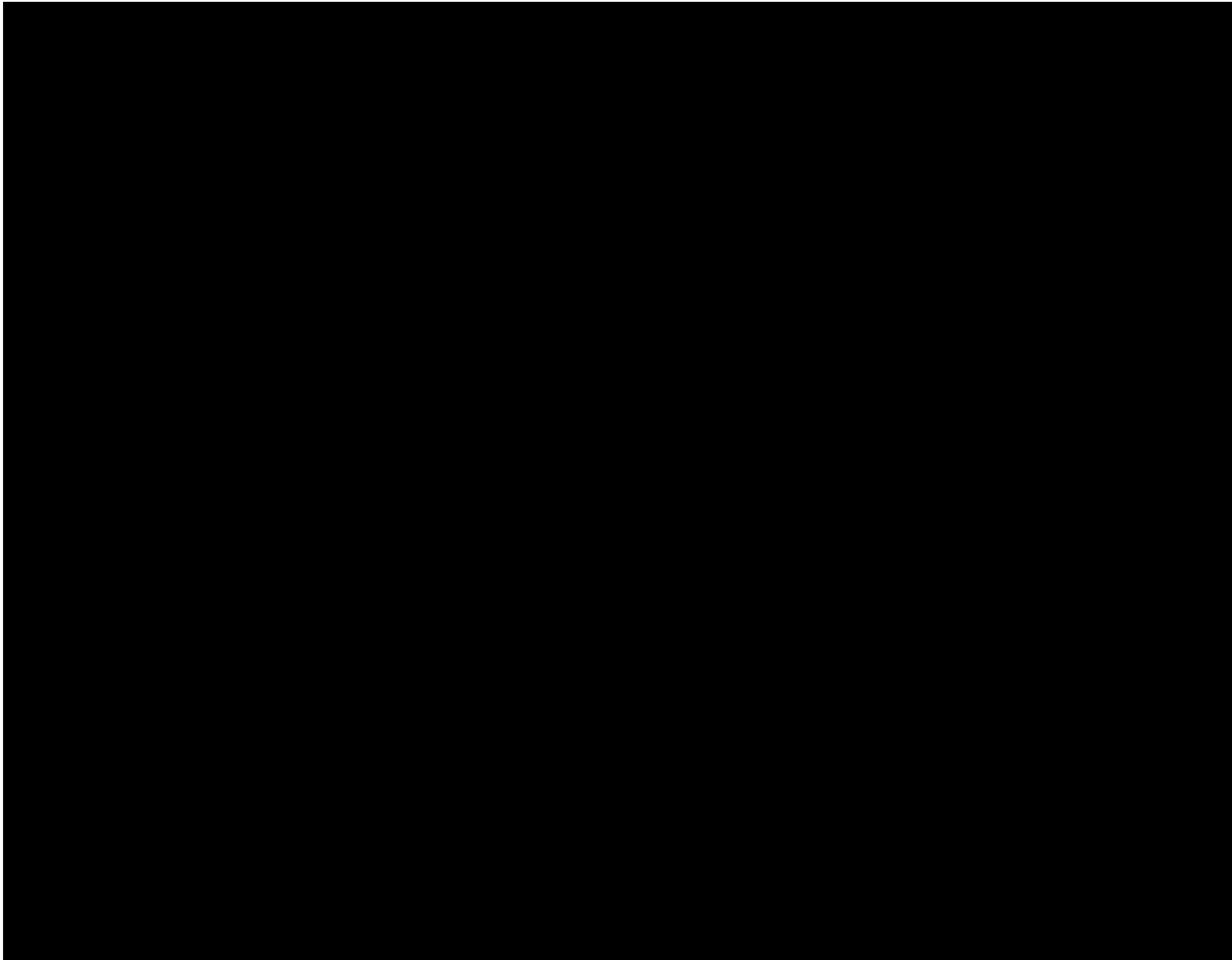


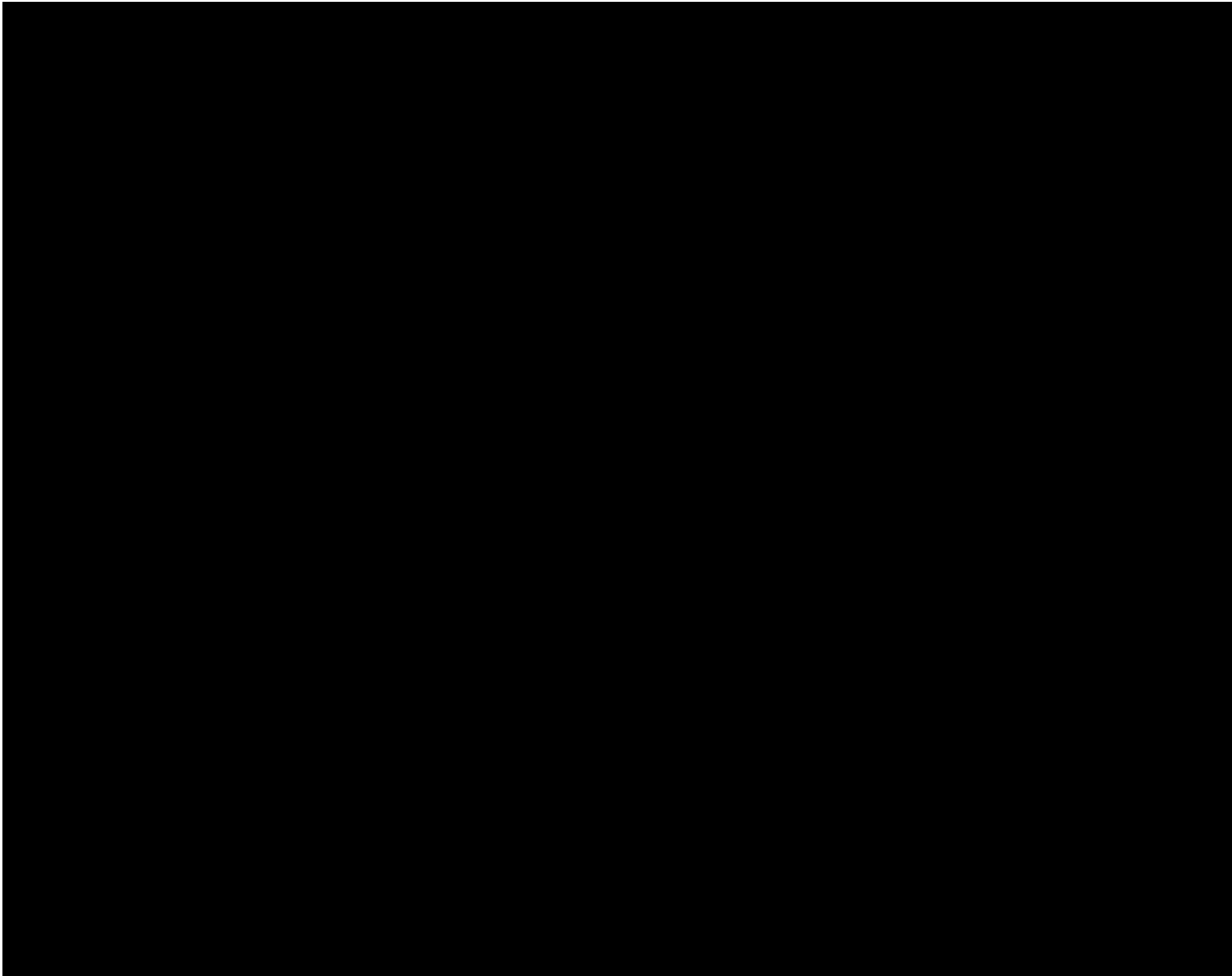


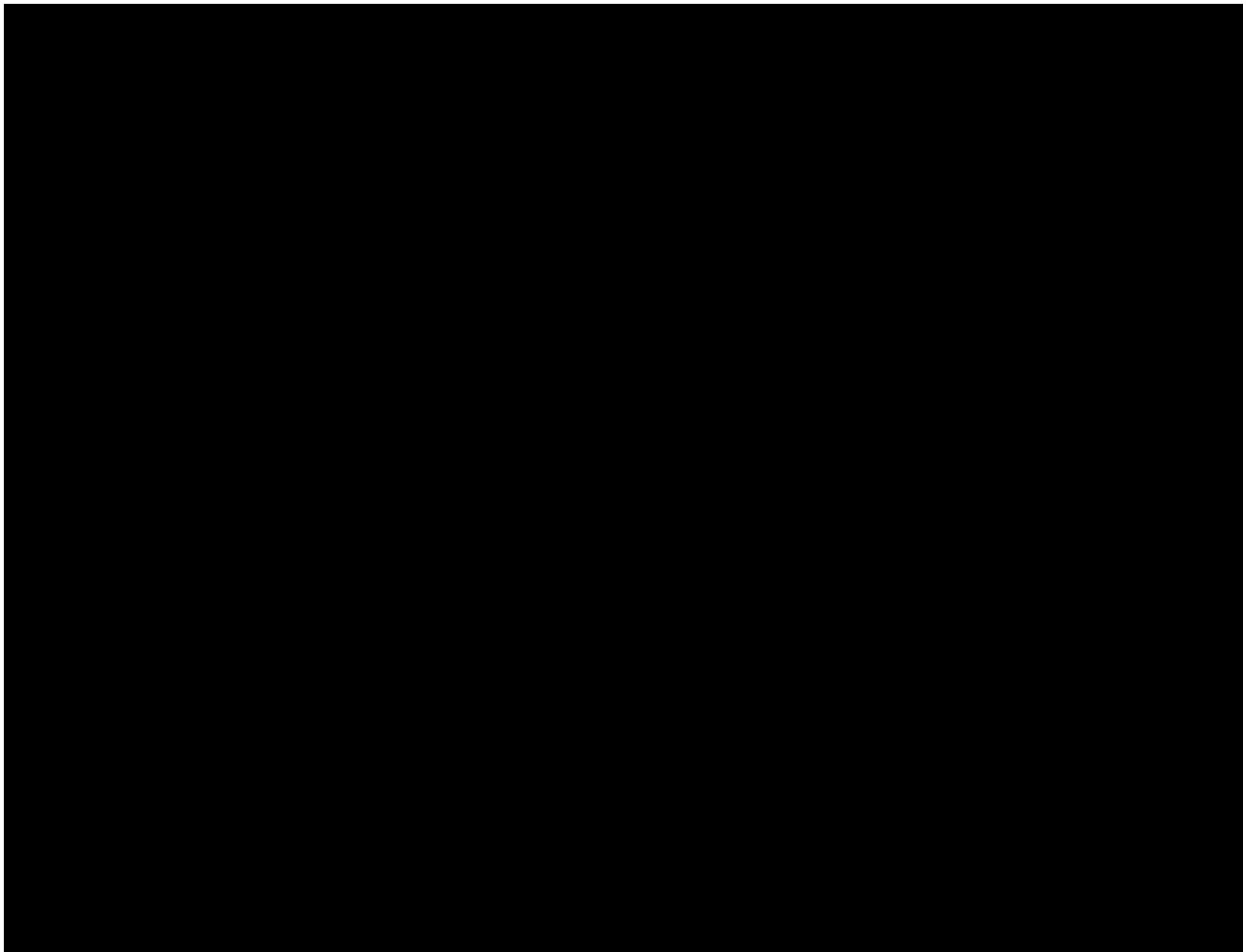


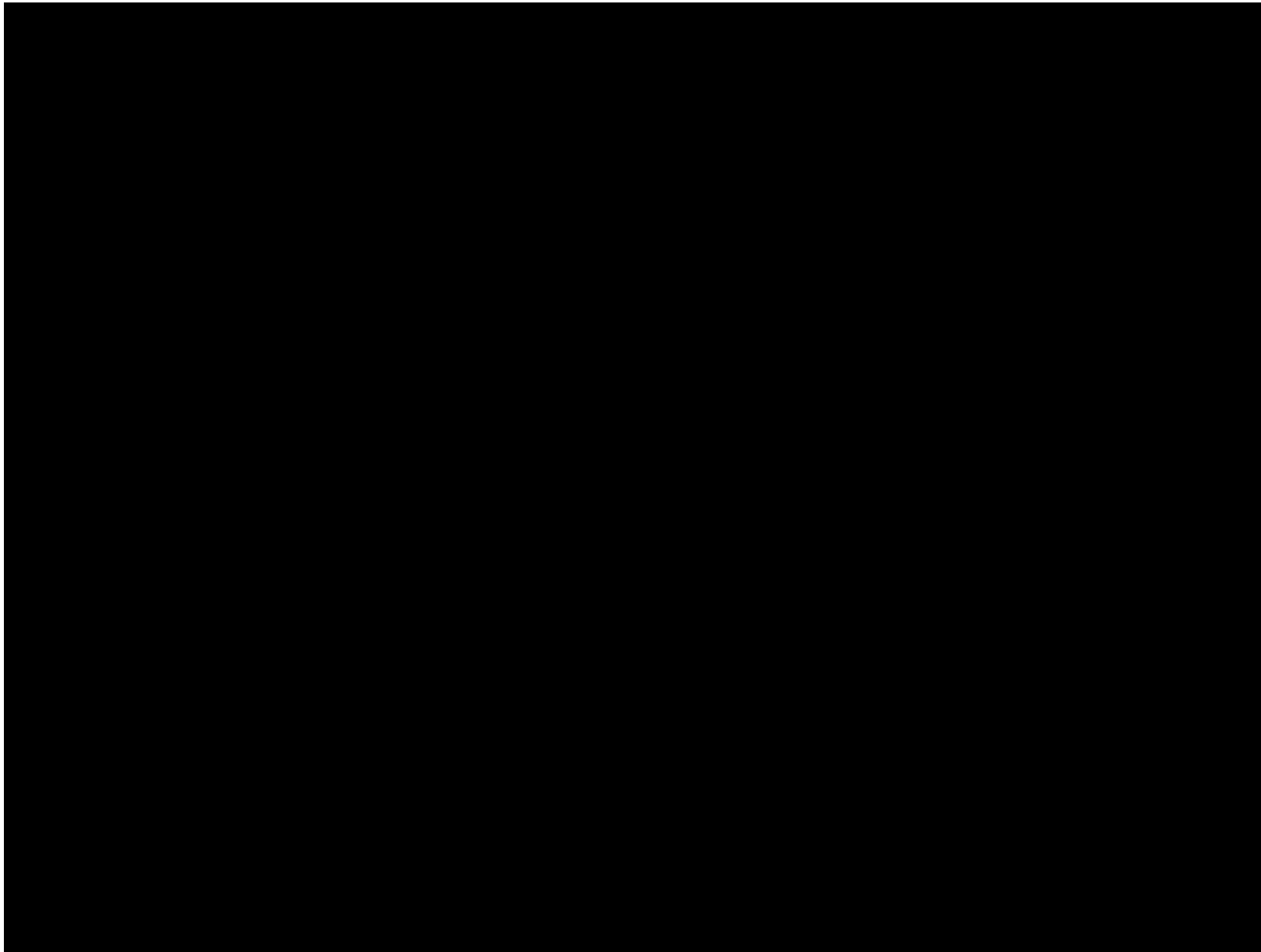


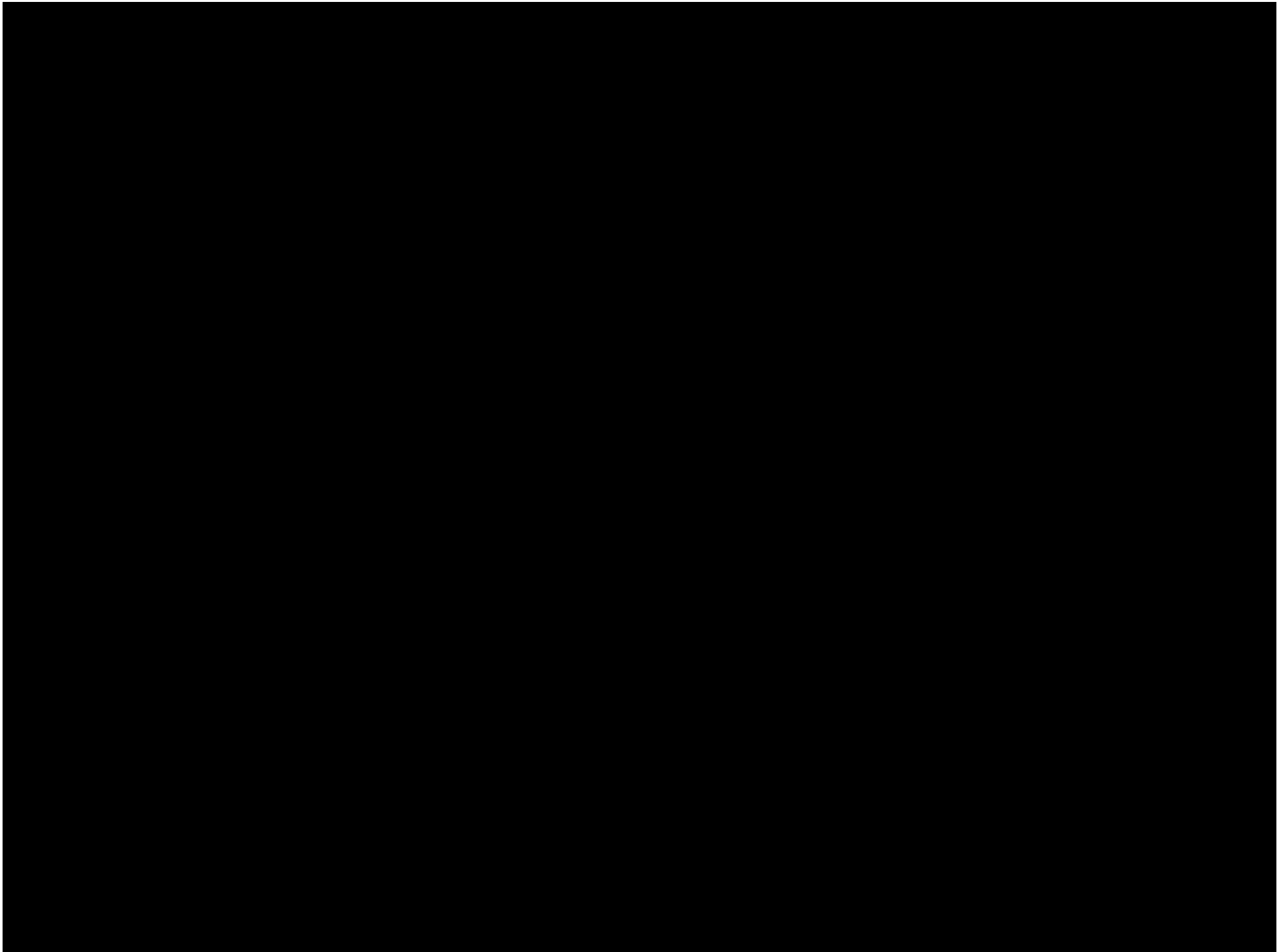


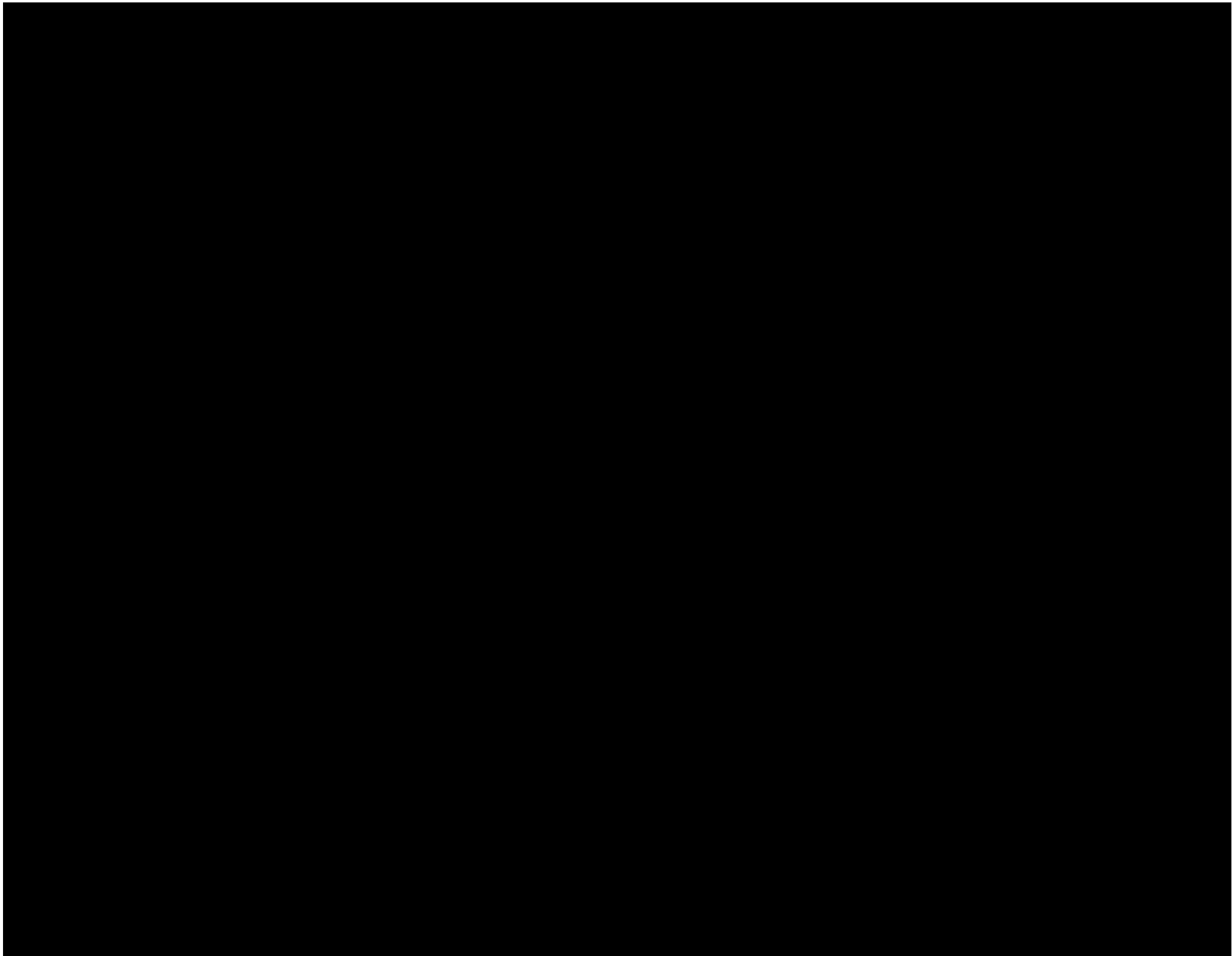


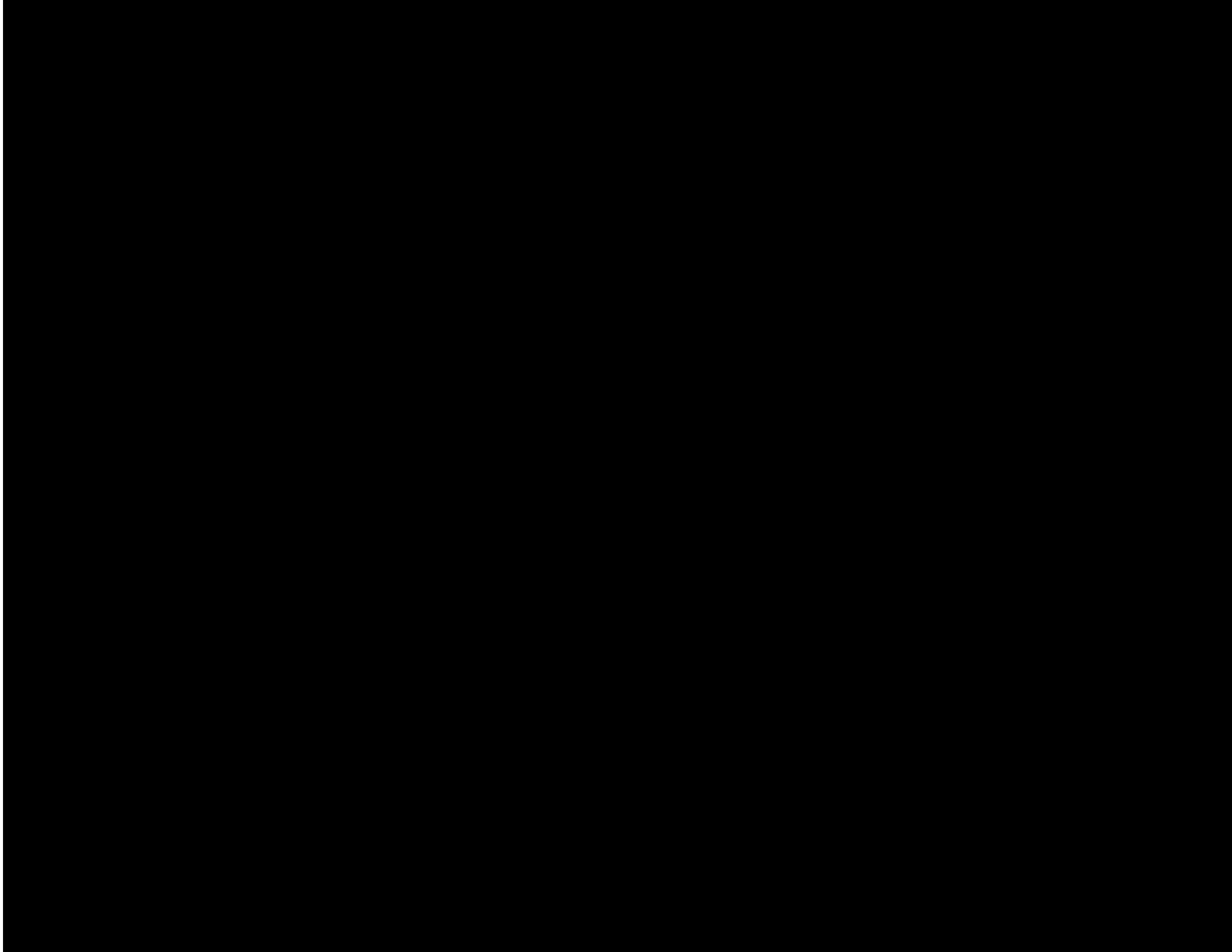


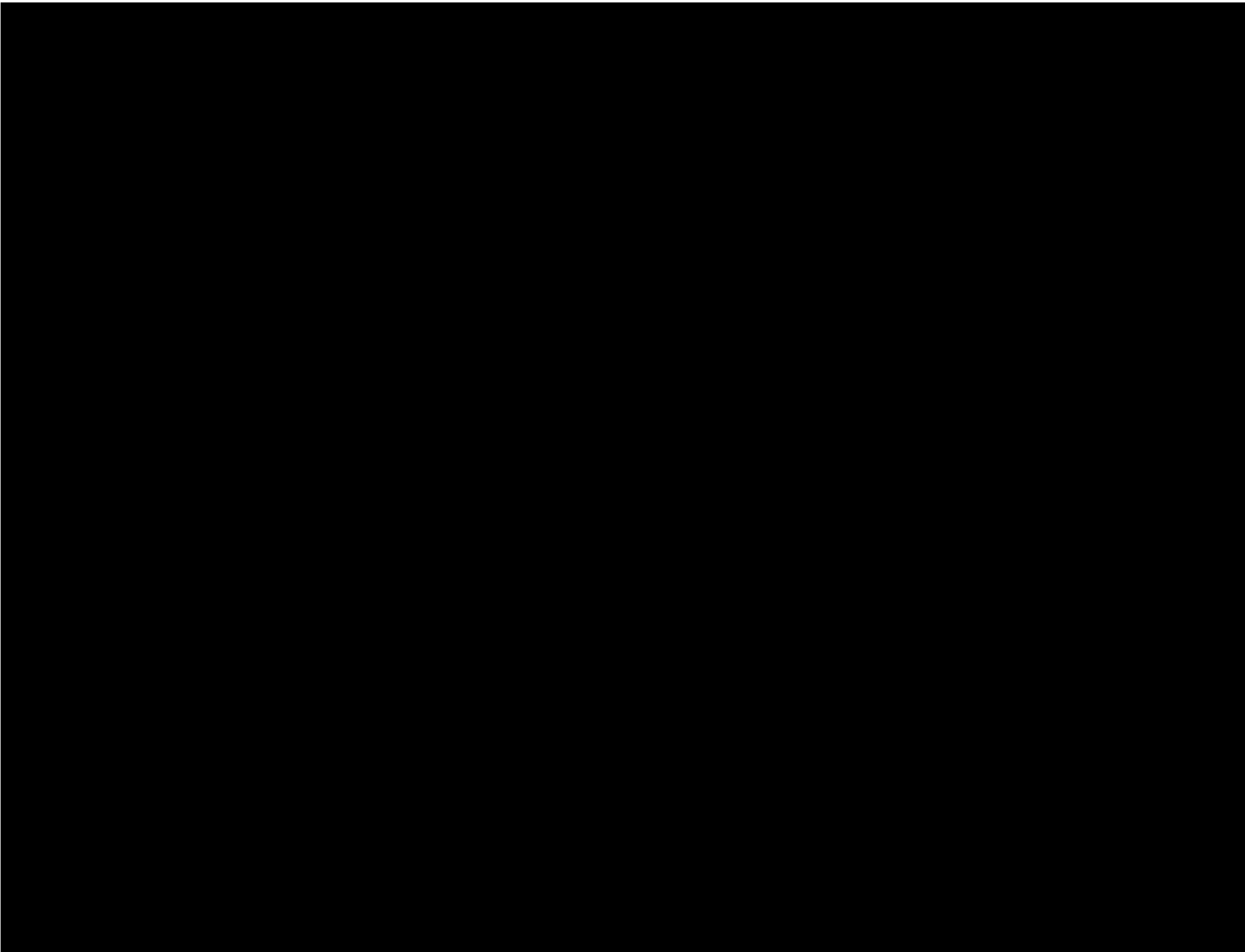


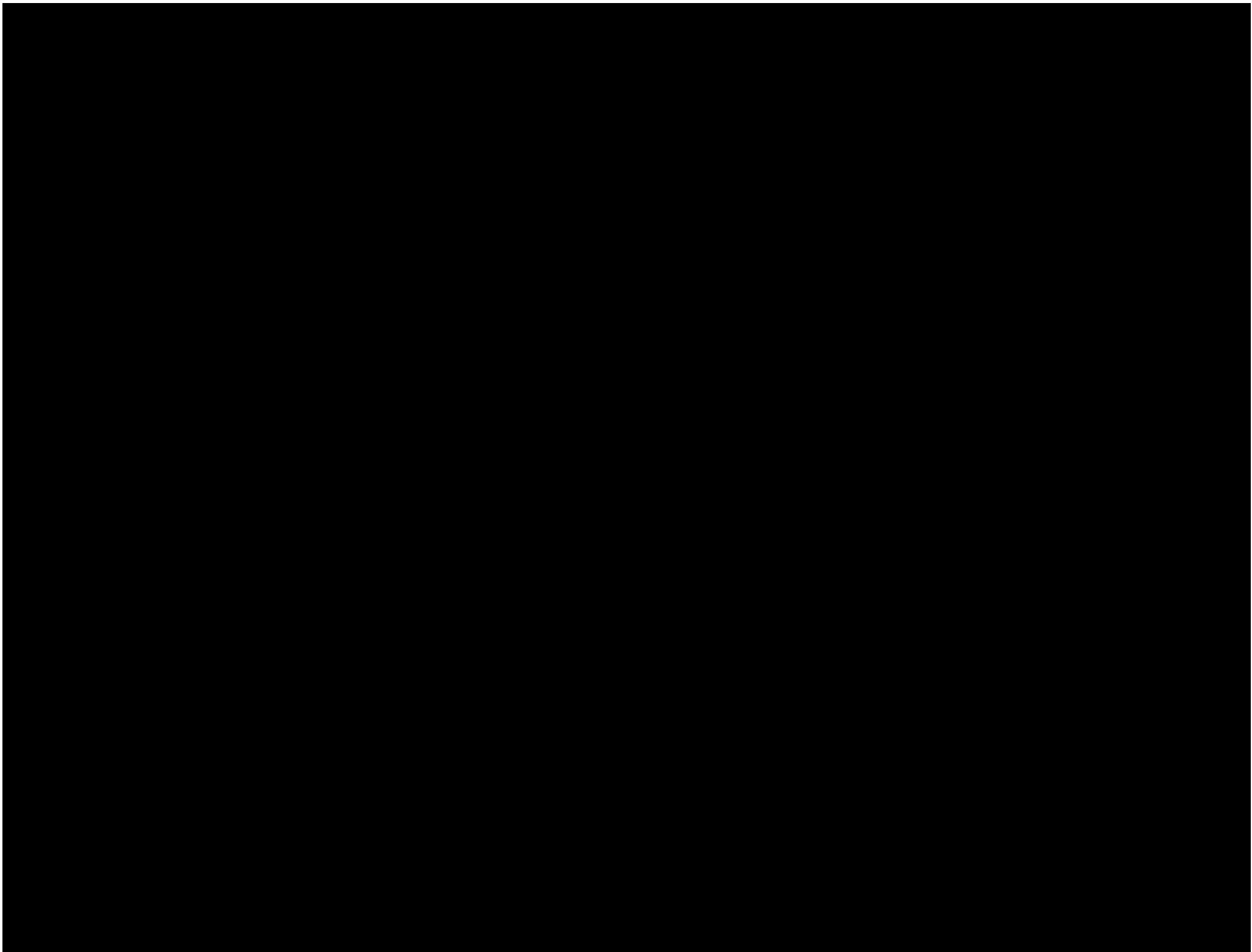






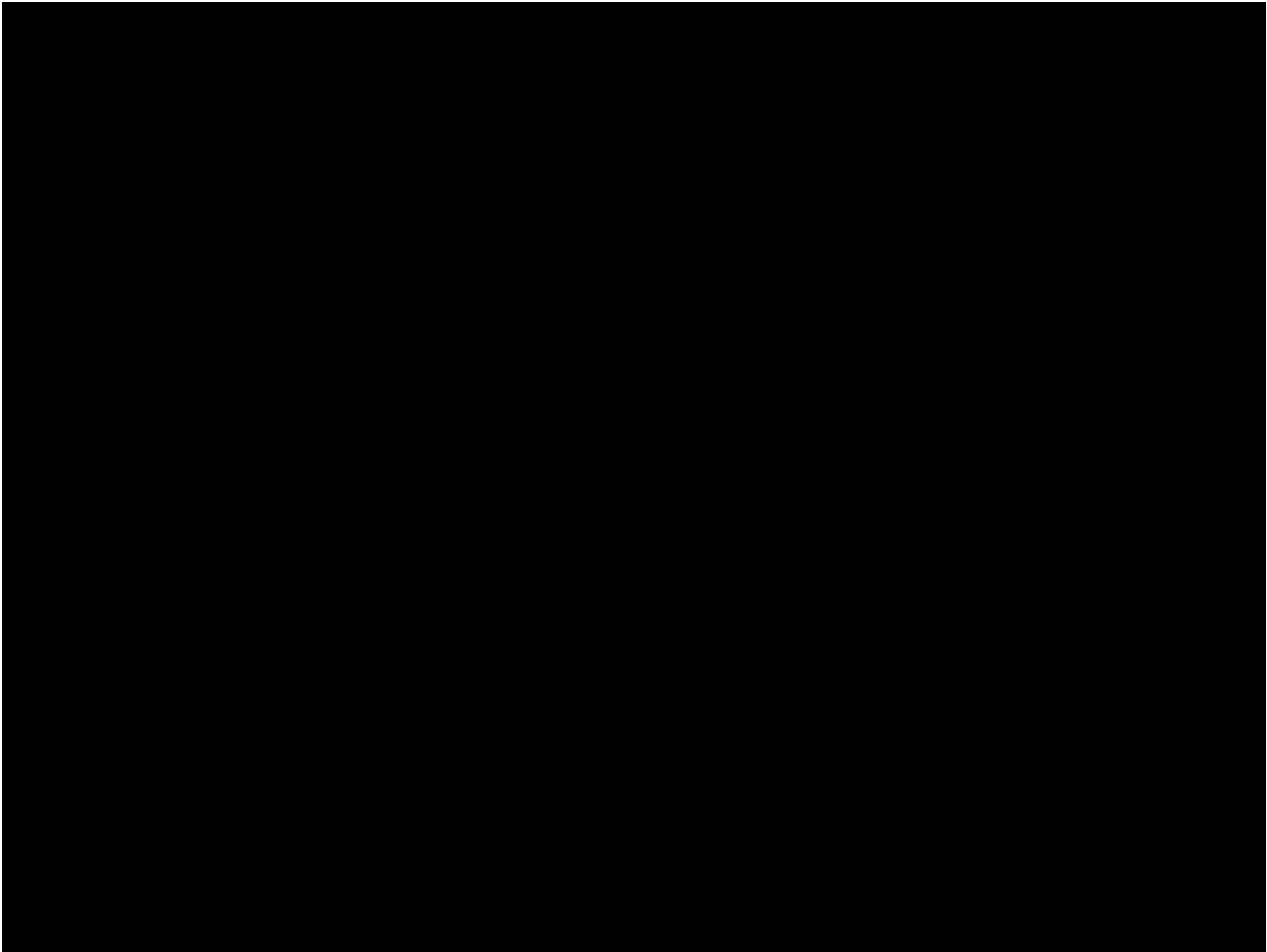




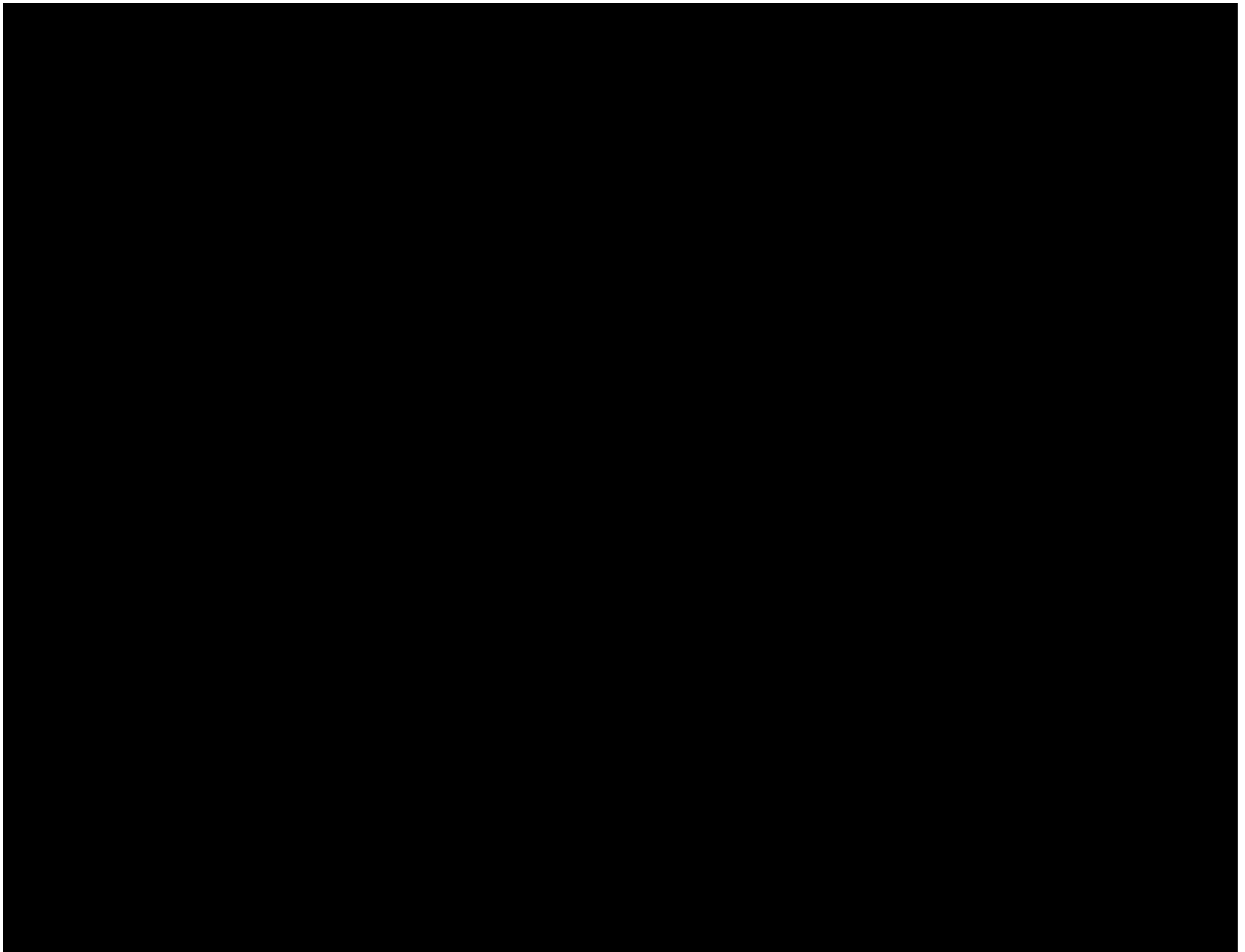


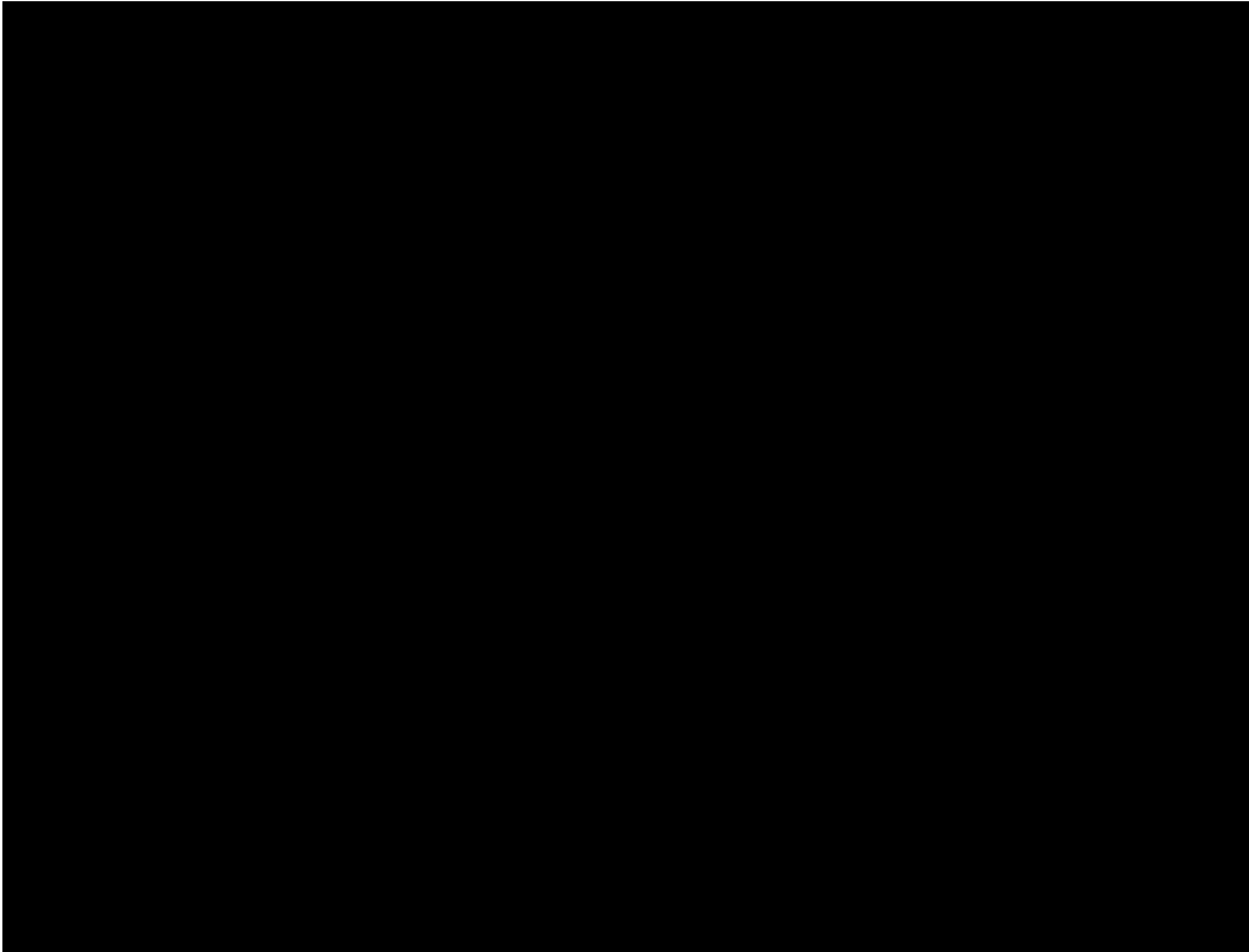


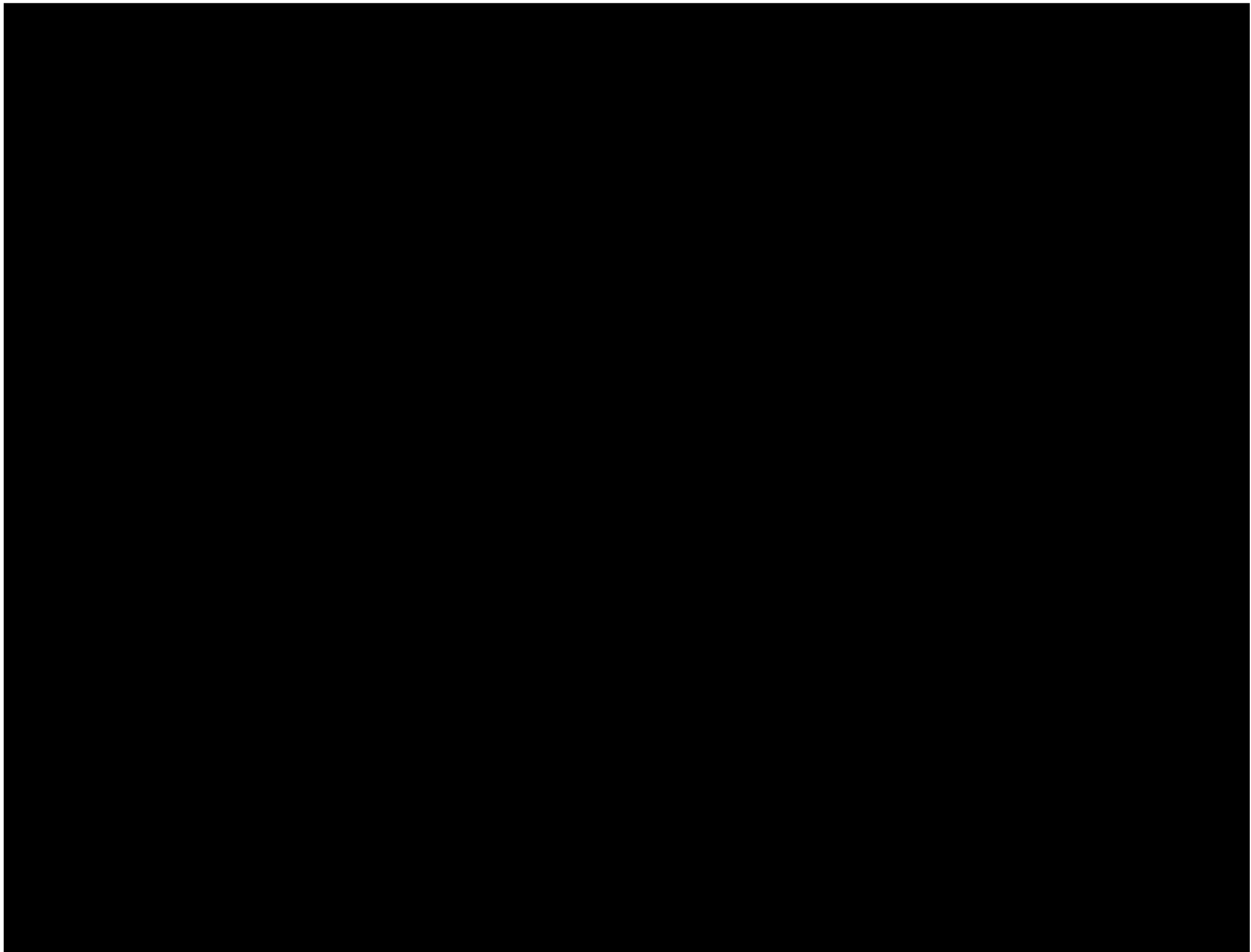


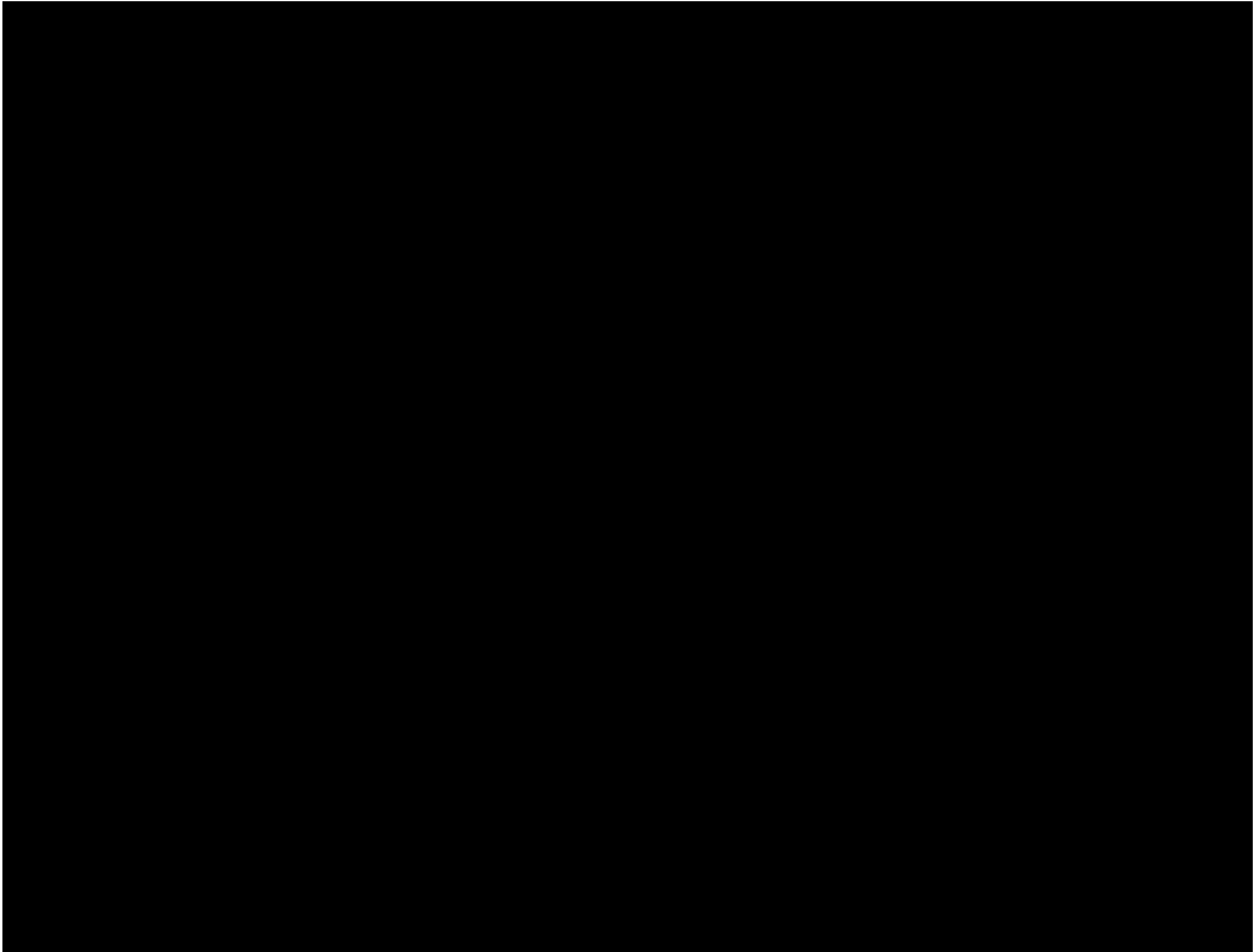


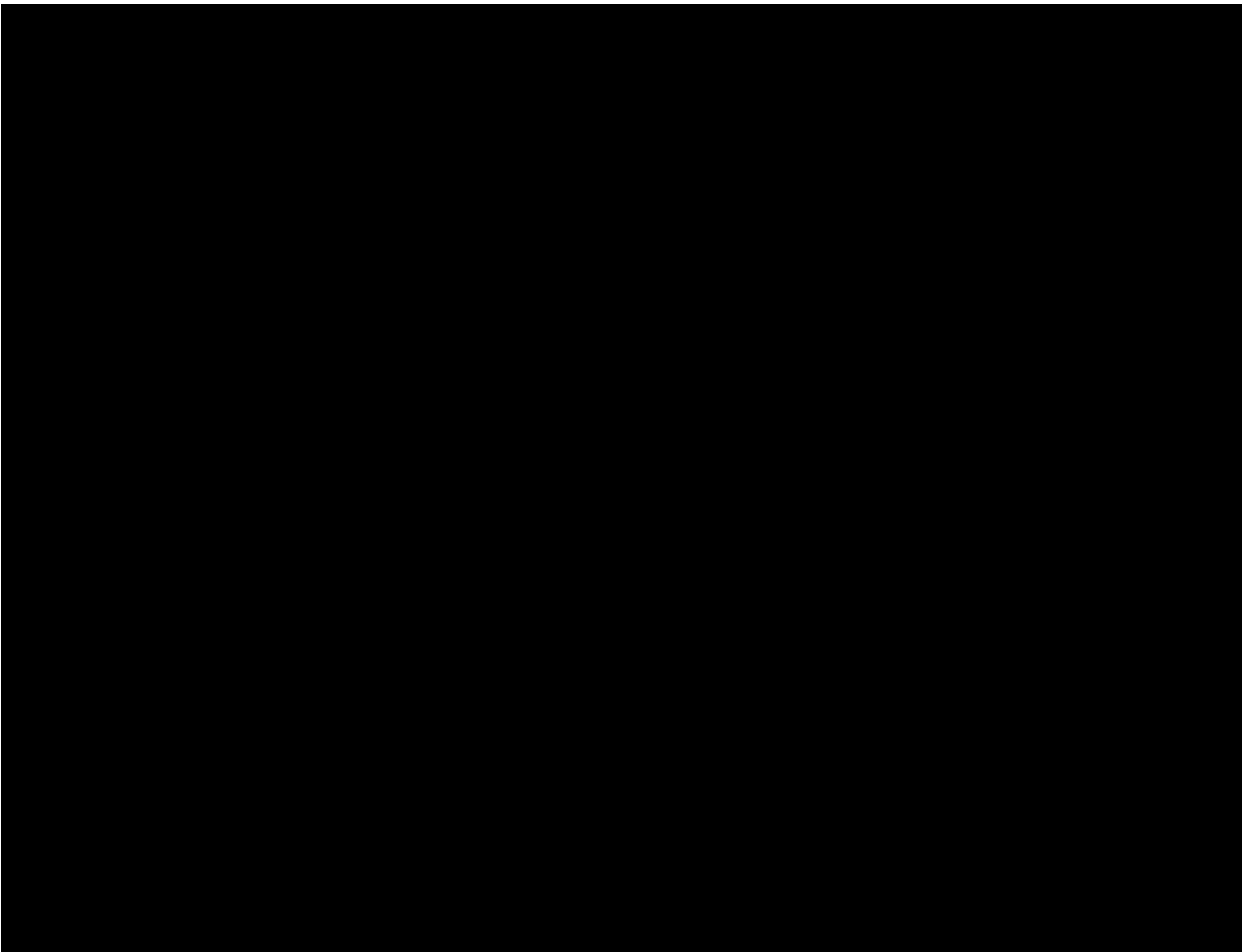


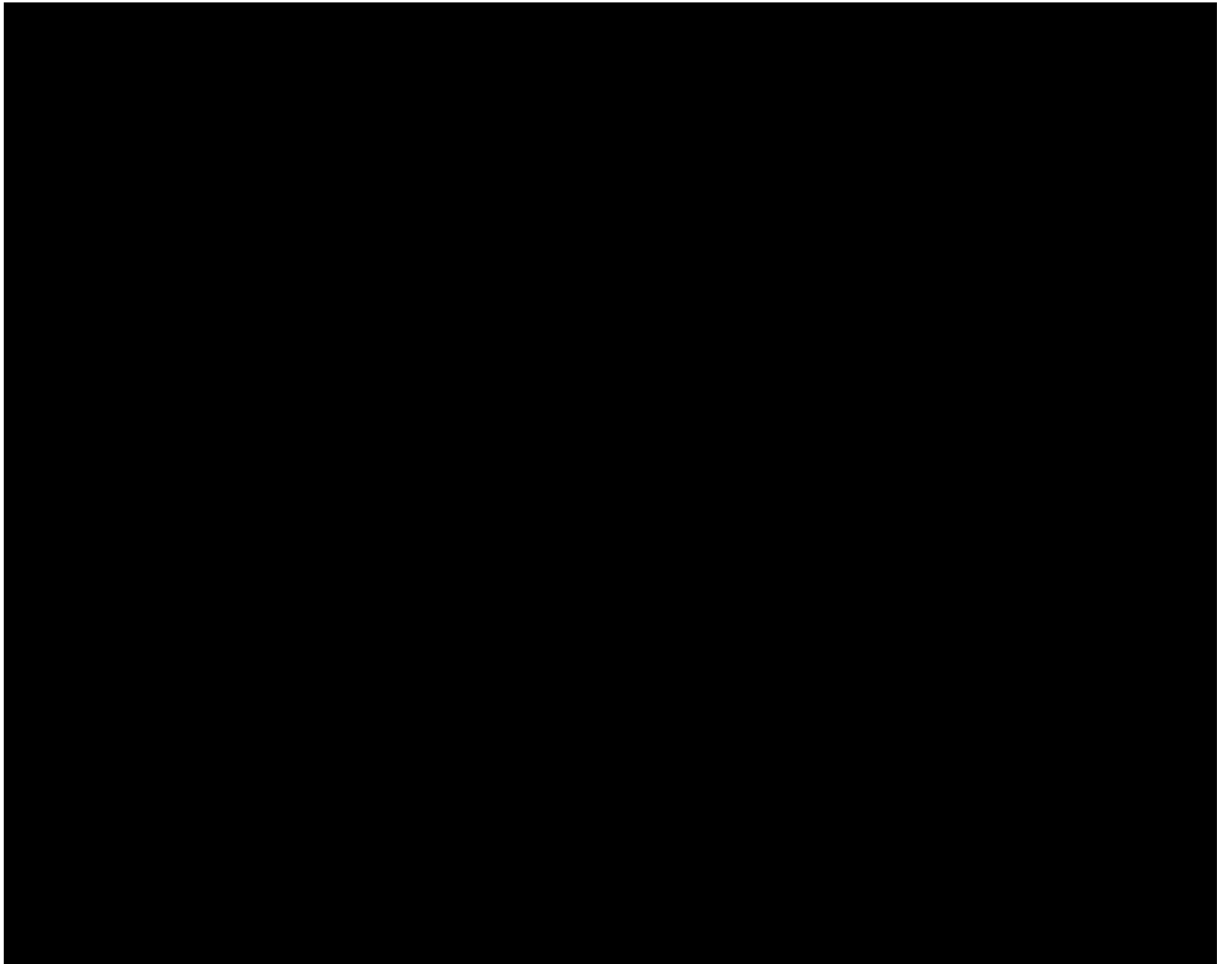


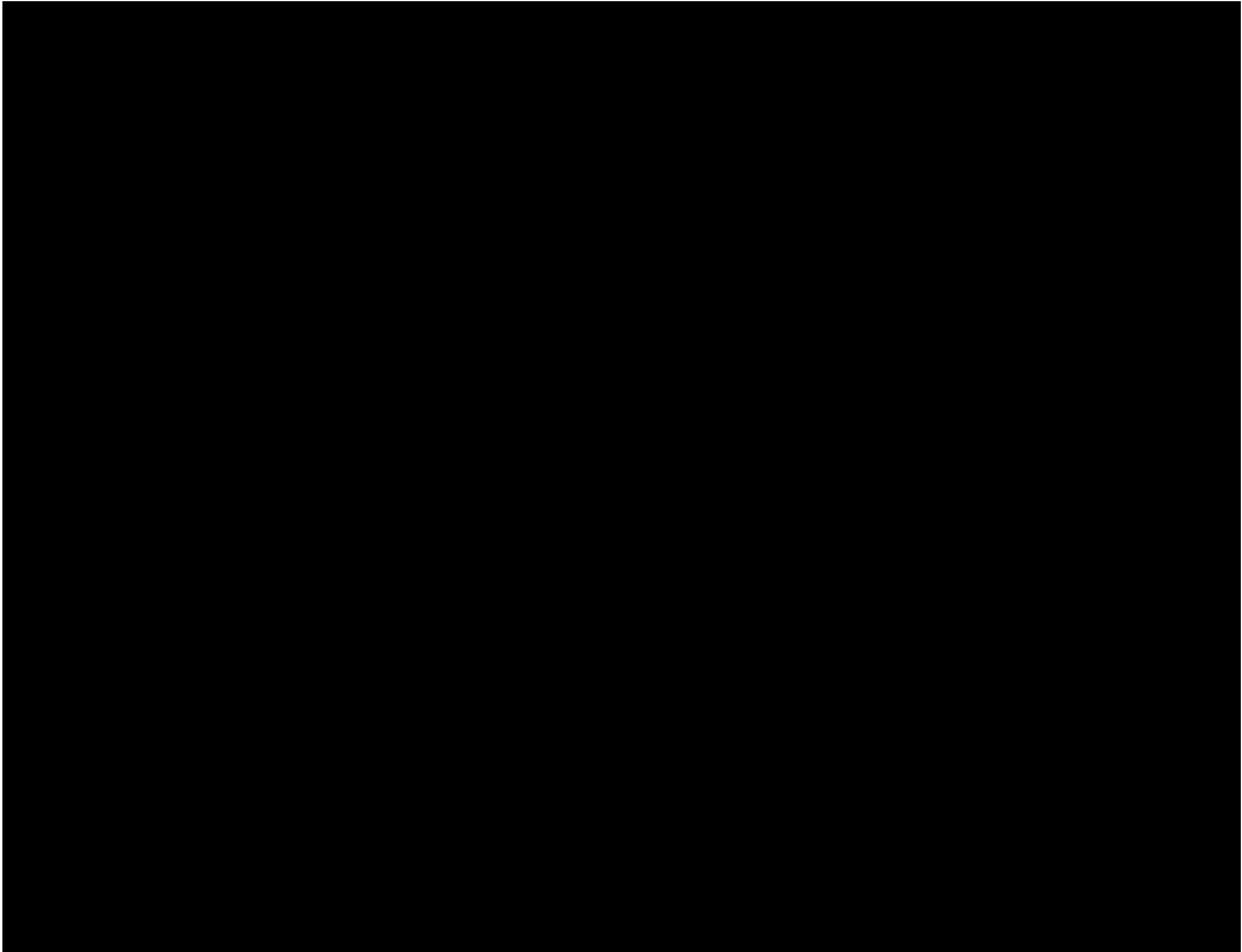


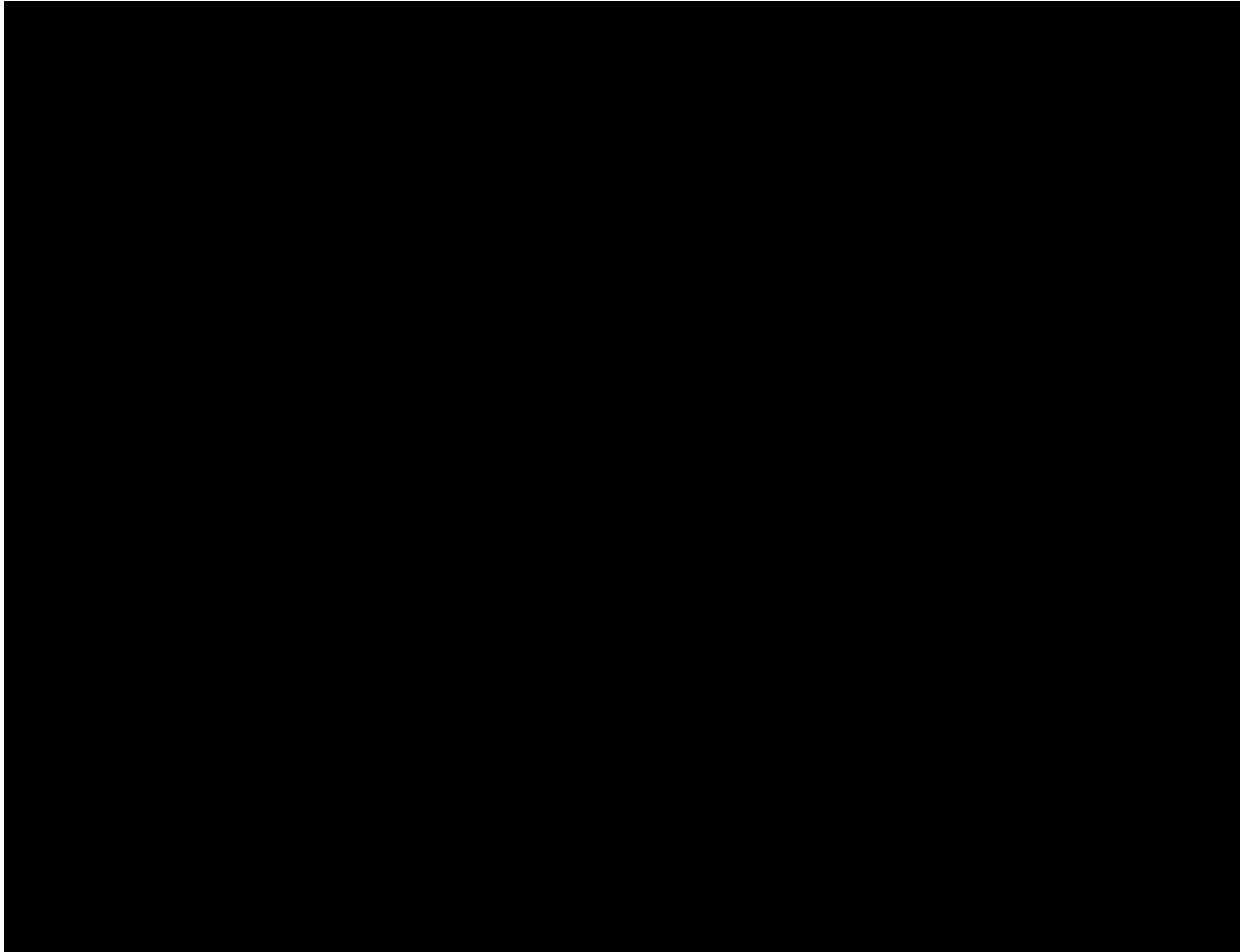




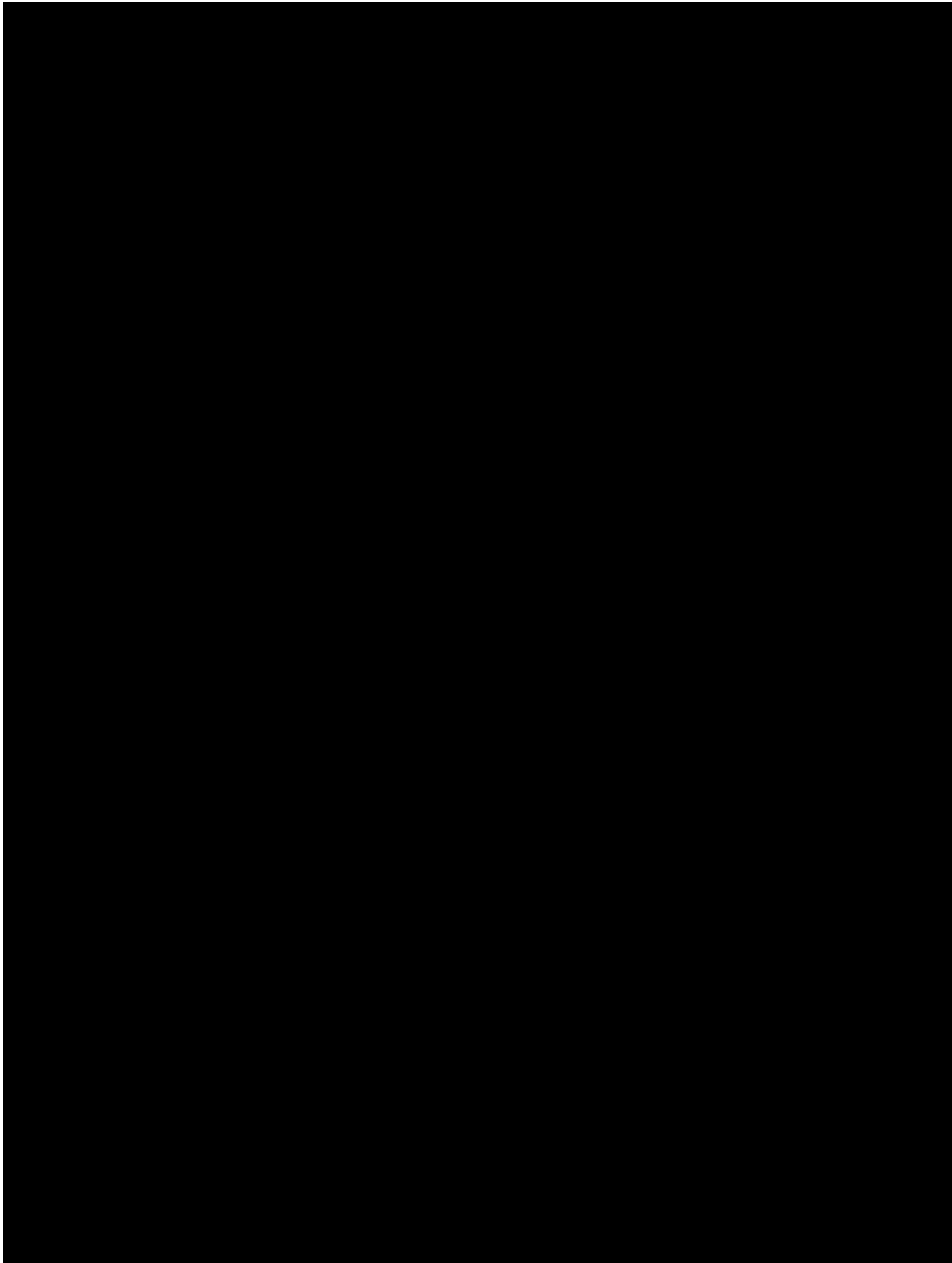










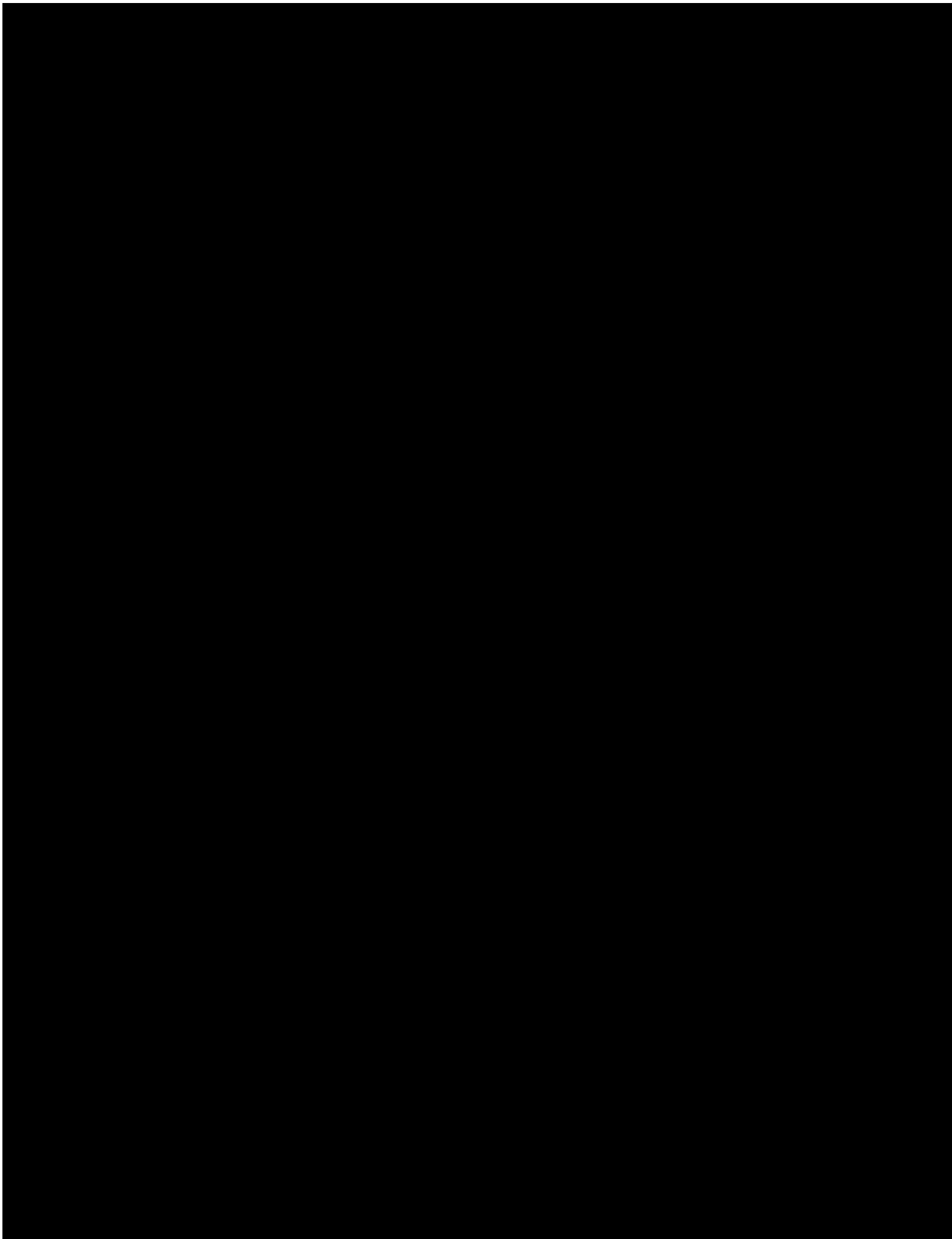


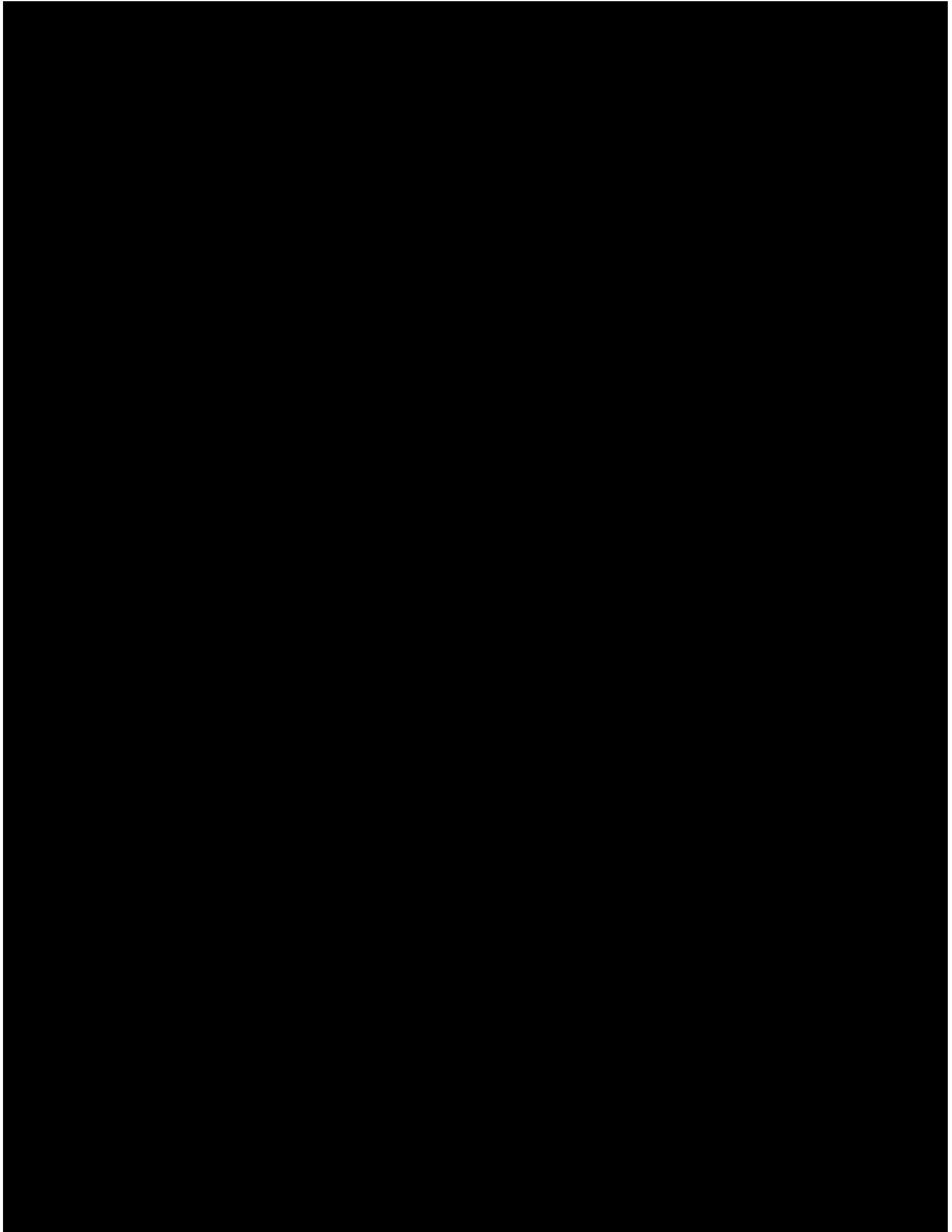
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and expense must be properly documented to ensure the integrity of the financial statements. This includes keeping receipts, invoices, and bank statements in a secure and organized manner.

Next, the document outlines the process of reconciling the books. This involves comparing the company's internal records with the bank statements to identify any discrepancies. If there are differences, the company must investigate the cause and make the necessary adjustments to the accounts. This process is crucial for ensuring that the financial records are accurate and up-to-date.

The document also covers the preparation of the financial statements. This includes the income statement, balance sheet, and cash flow statement. Each of these statements provides a different perspective on the company's financial performance and position. The income statement shows the company's revenues and expenses over a period of time, while the balance sheet shows the company's assets and liabilities at a specific point in time. The cash flow statement shows the company's cash inflows and outflows over a period of time.

Finally, the document discusses the importance of reviewing the financial statements. This involves analyzing the data to identify trends, strengths, and weaknesses. It also involves comparing the company's performance to industry benchmarks and competitors. This review is essential for making informed decisions about the company's future operations and investments.



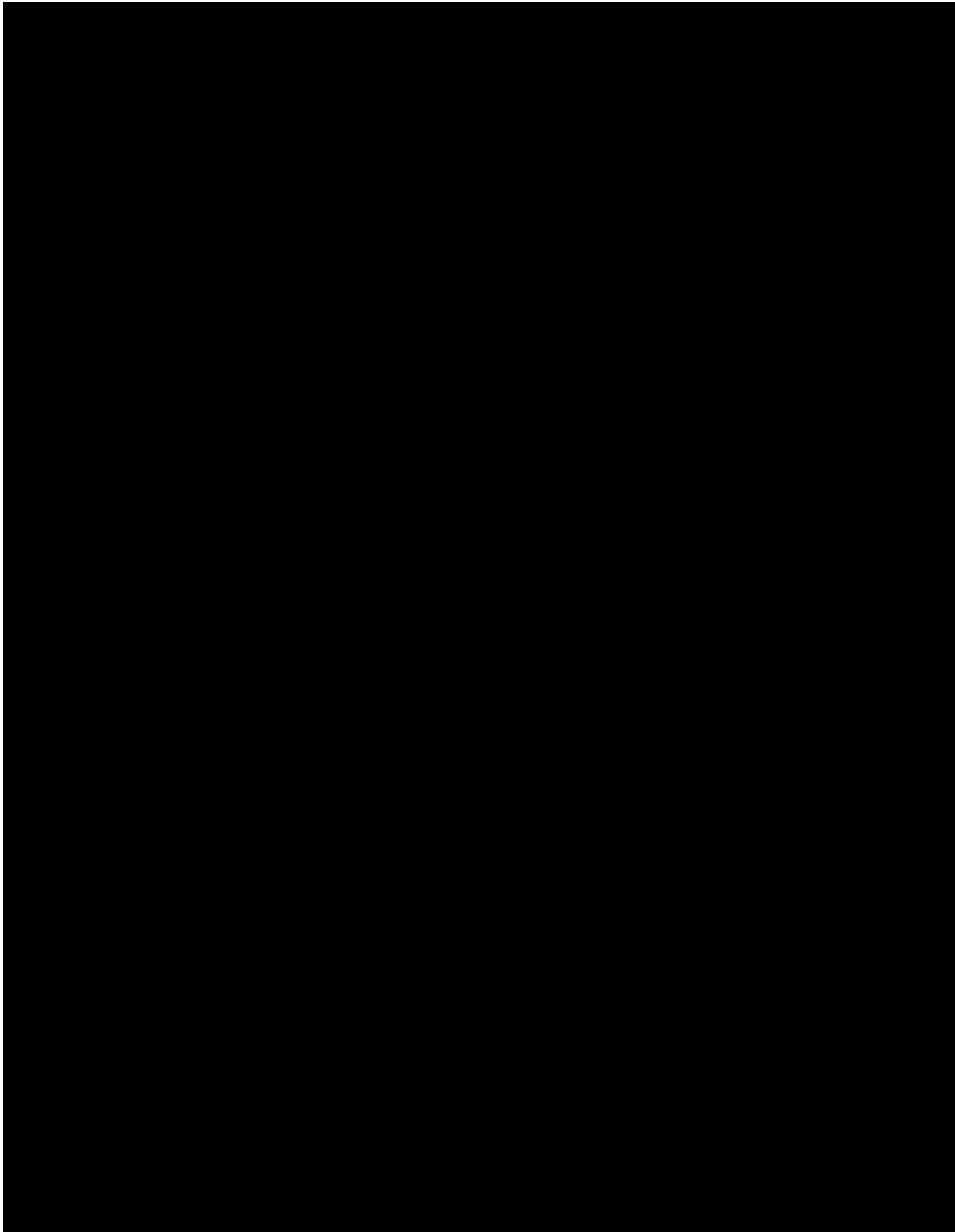


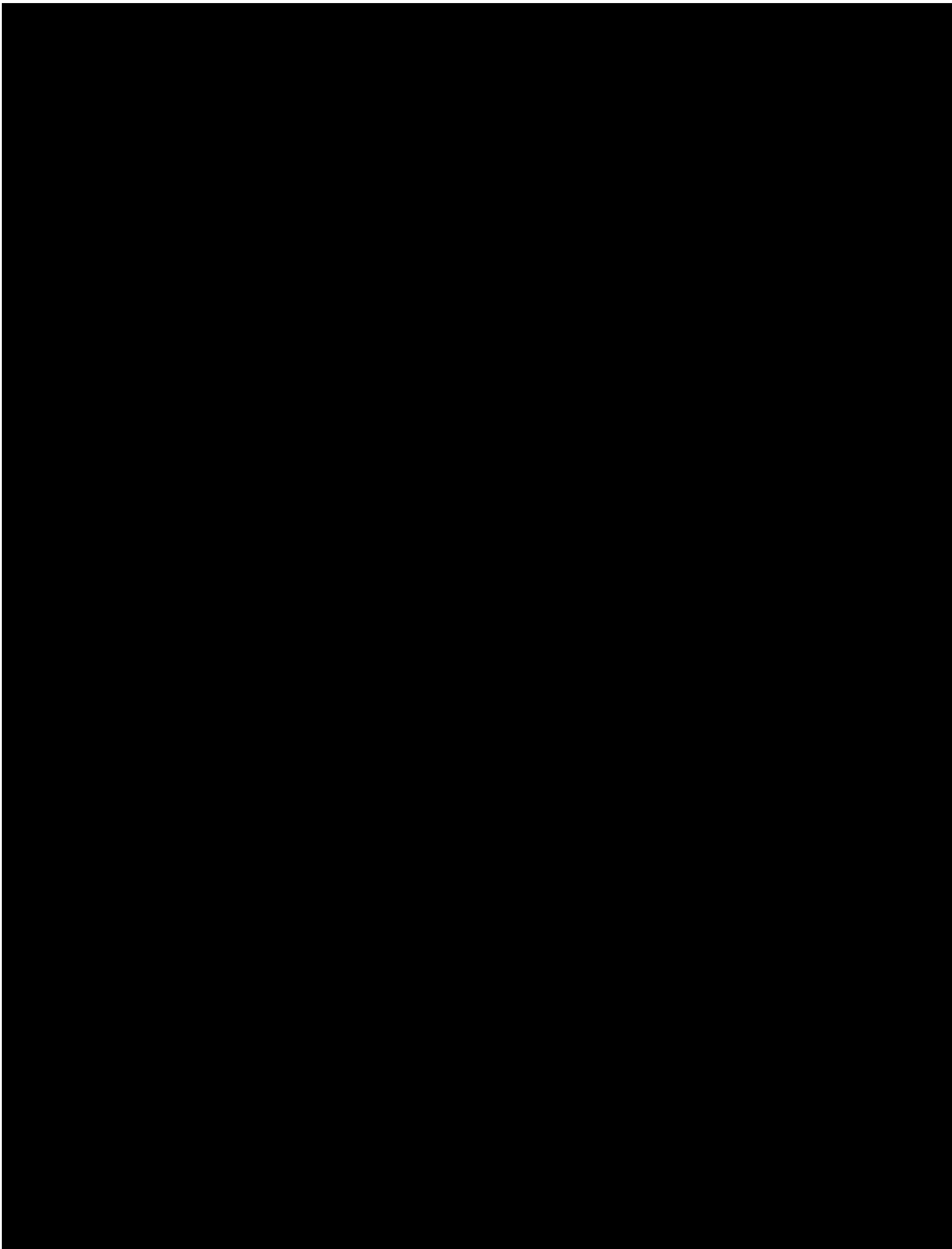
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every receipt, invoice, and bill should be properly filed and indexed for easy retrieval. This not only helps in tracking expenses but also ensures compliance with tax regulations.

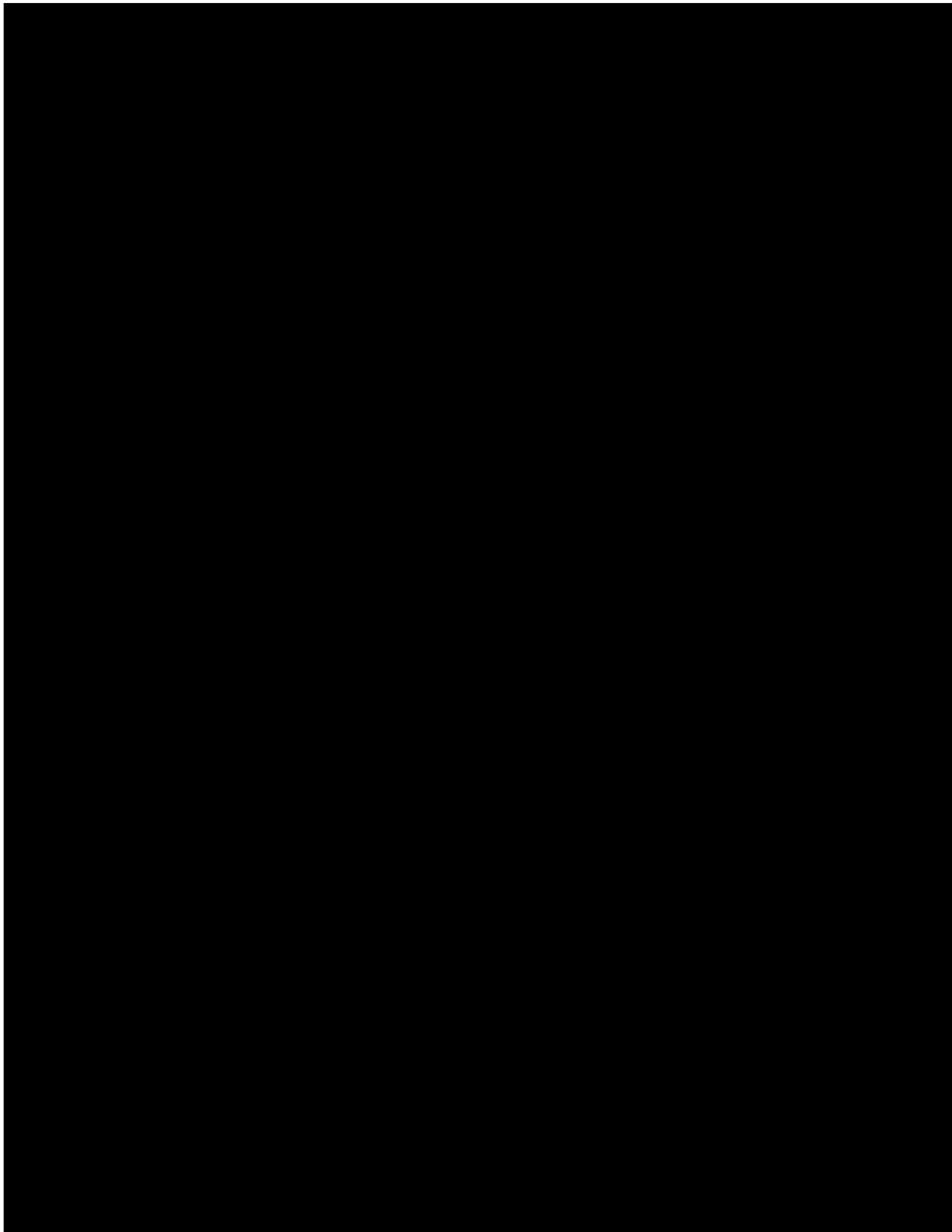
Next, the document outlines the various methods for collecting and organizing financial data. It suggests using spreadsheets or specialized accounting software to input and analyze data. Regularly updating these records is crucial for identifying trends and making informed decisions.

The document also addresses the need for periodic audits. By conducting regular reviews of financial statements, businesses can detect errors, prevent fraud, and ensure that all financial activities are properly documented. This process is essential for maintaining transparency and accountability.

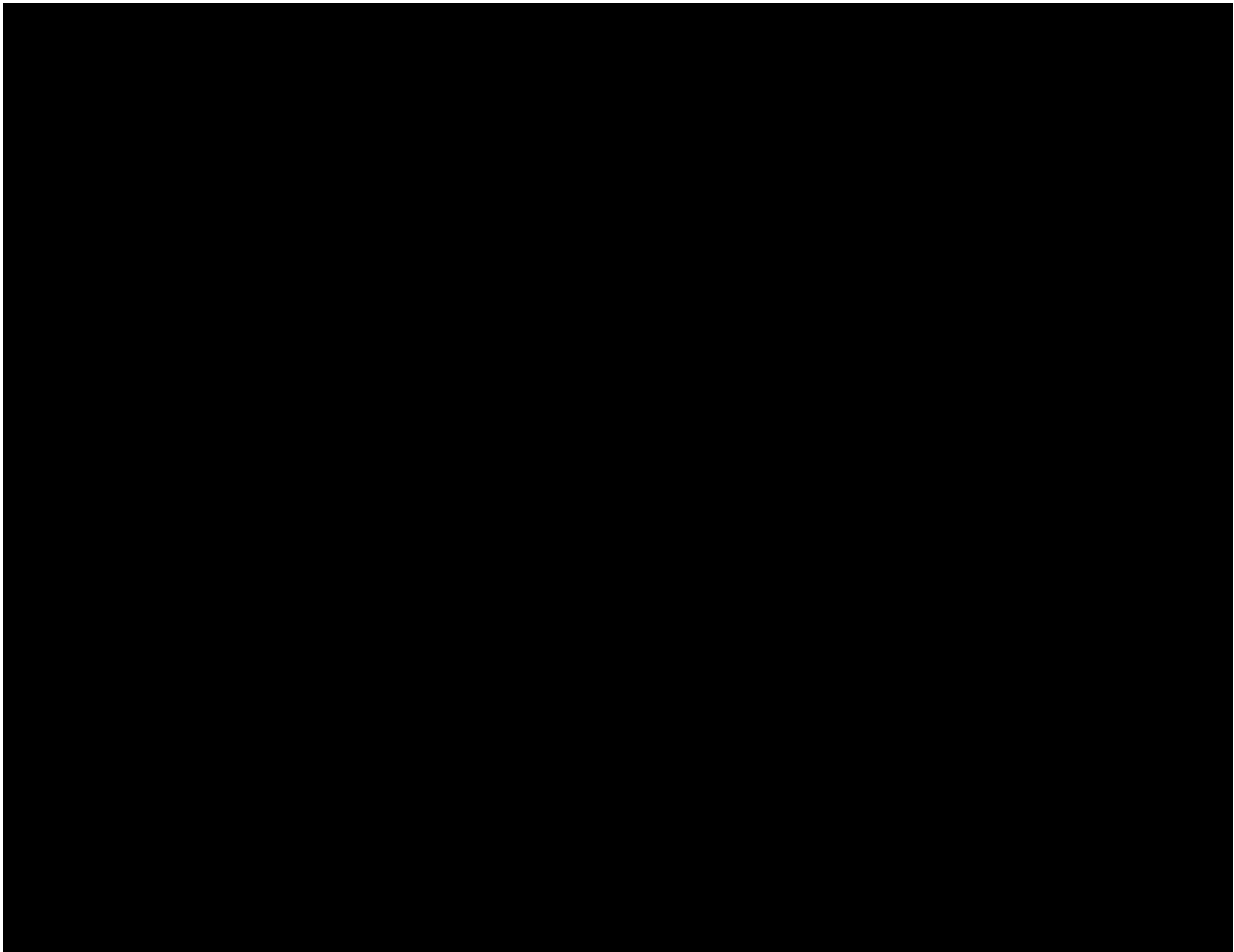
Finally, the document provides guidance on how to present financial information to stakeholders. It recommends using clear, concise language and visual aids like charts and graphs to make complex data more understandable. Consistent reporting formats are also advised to facilitate comparison over time and across different departments.

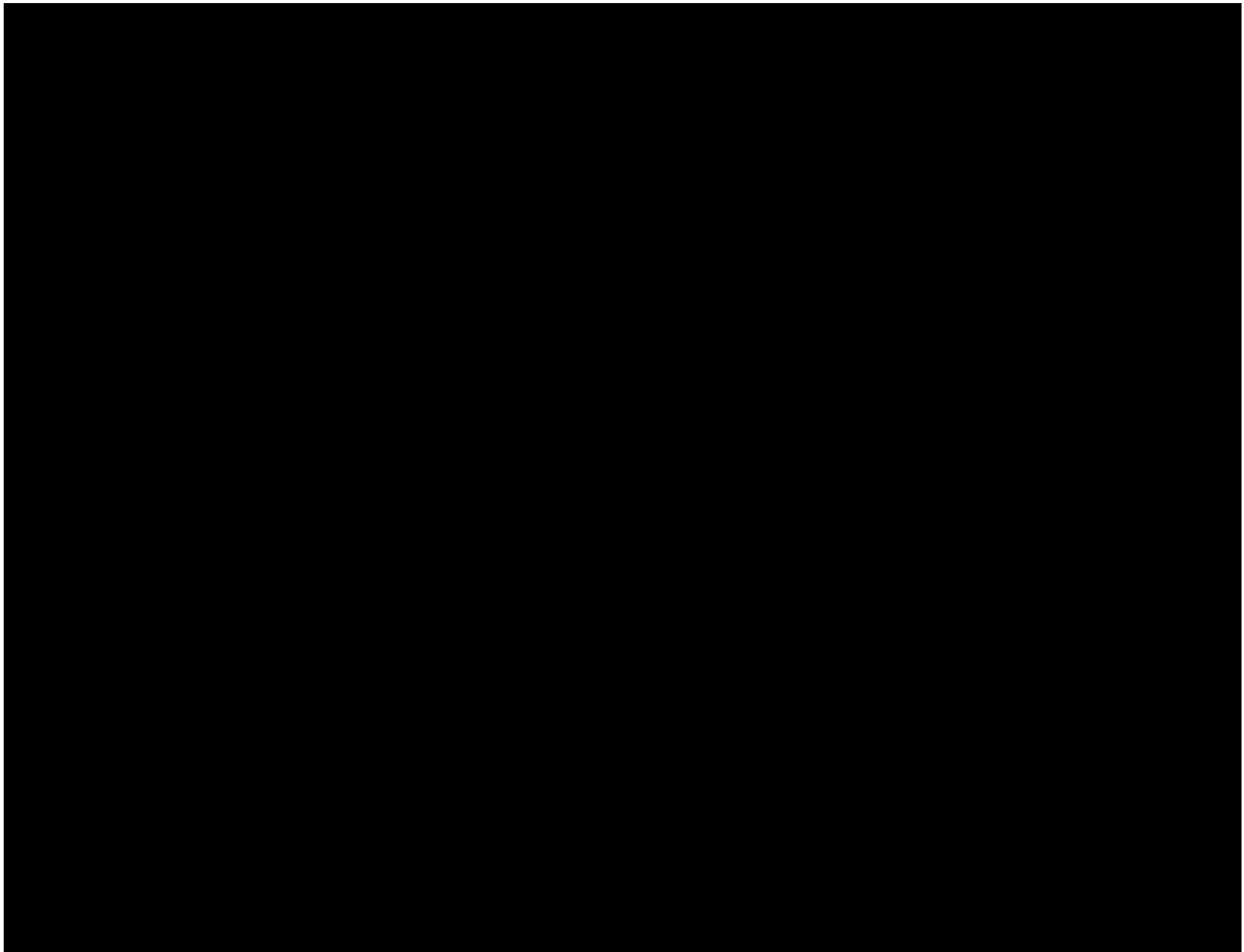


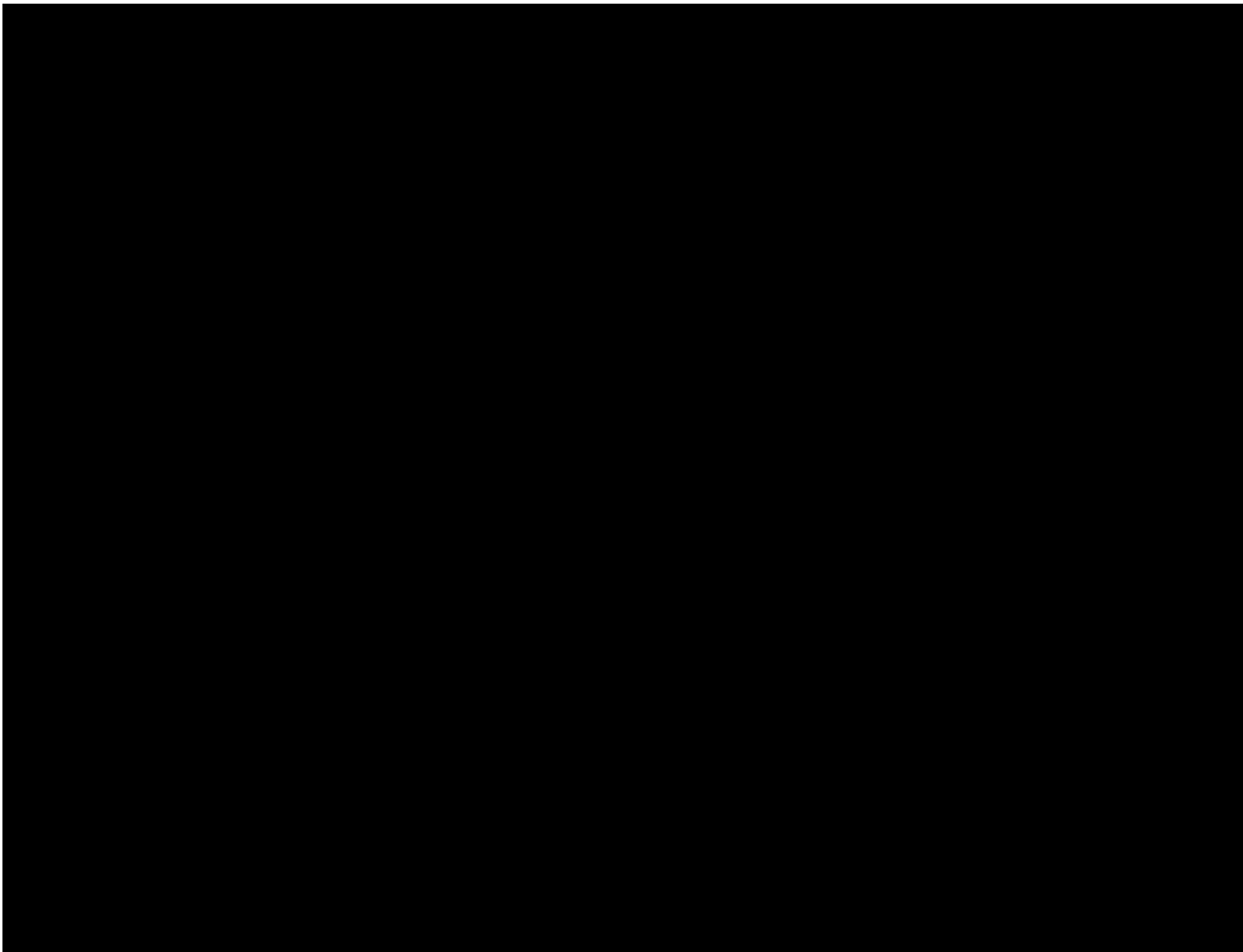


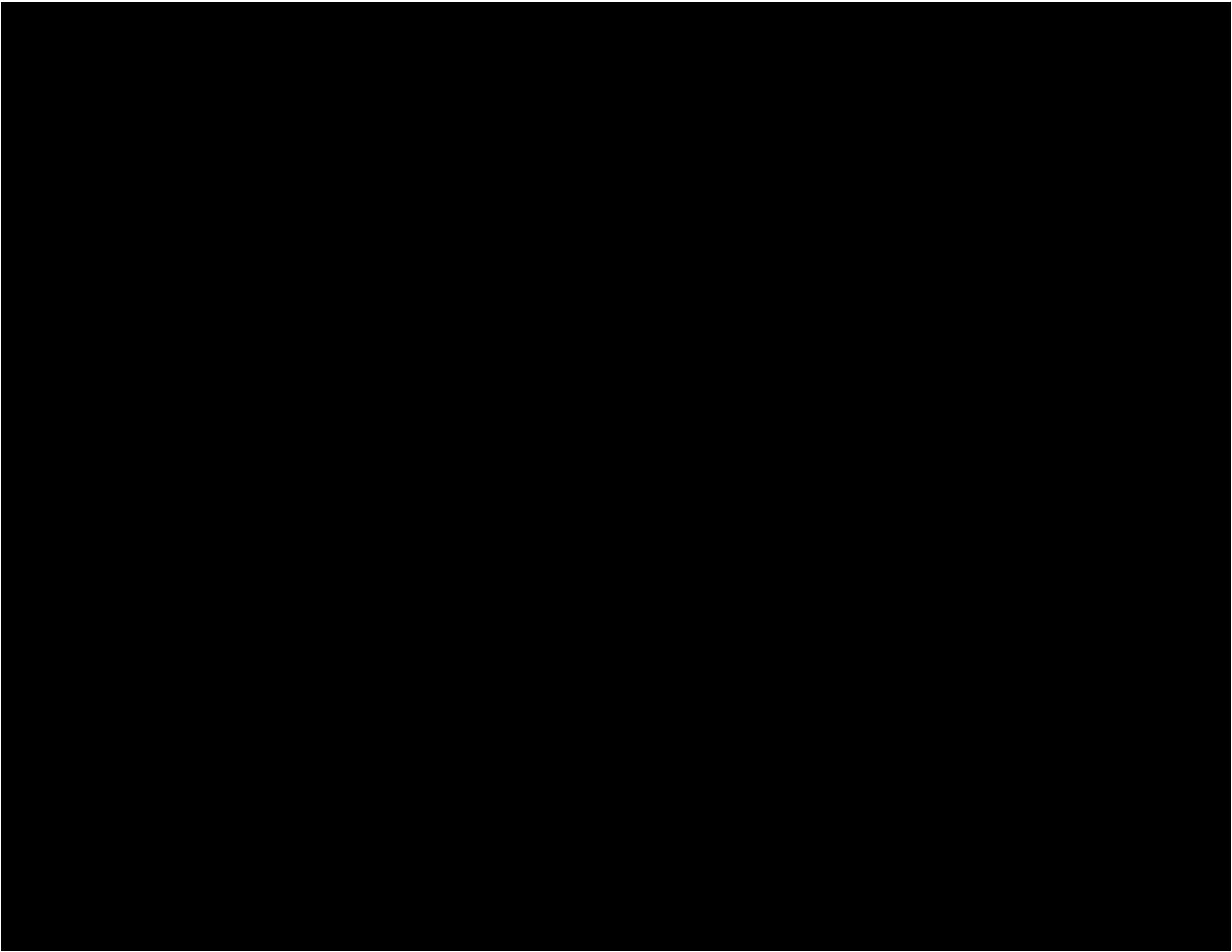


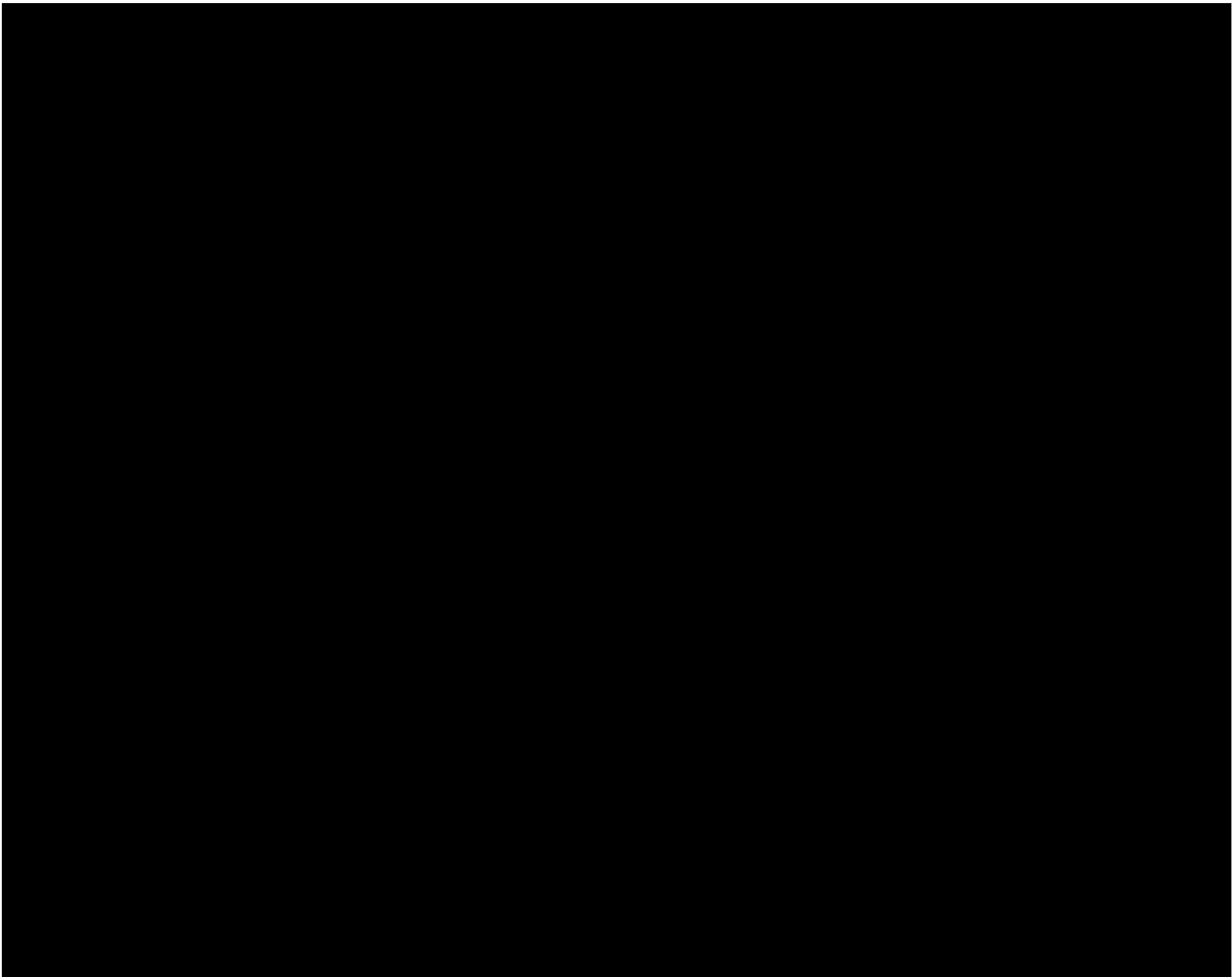


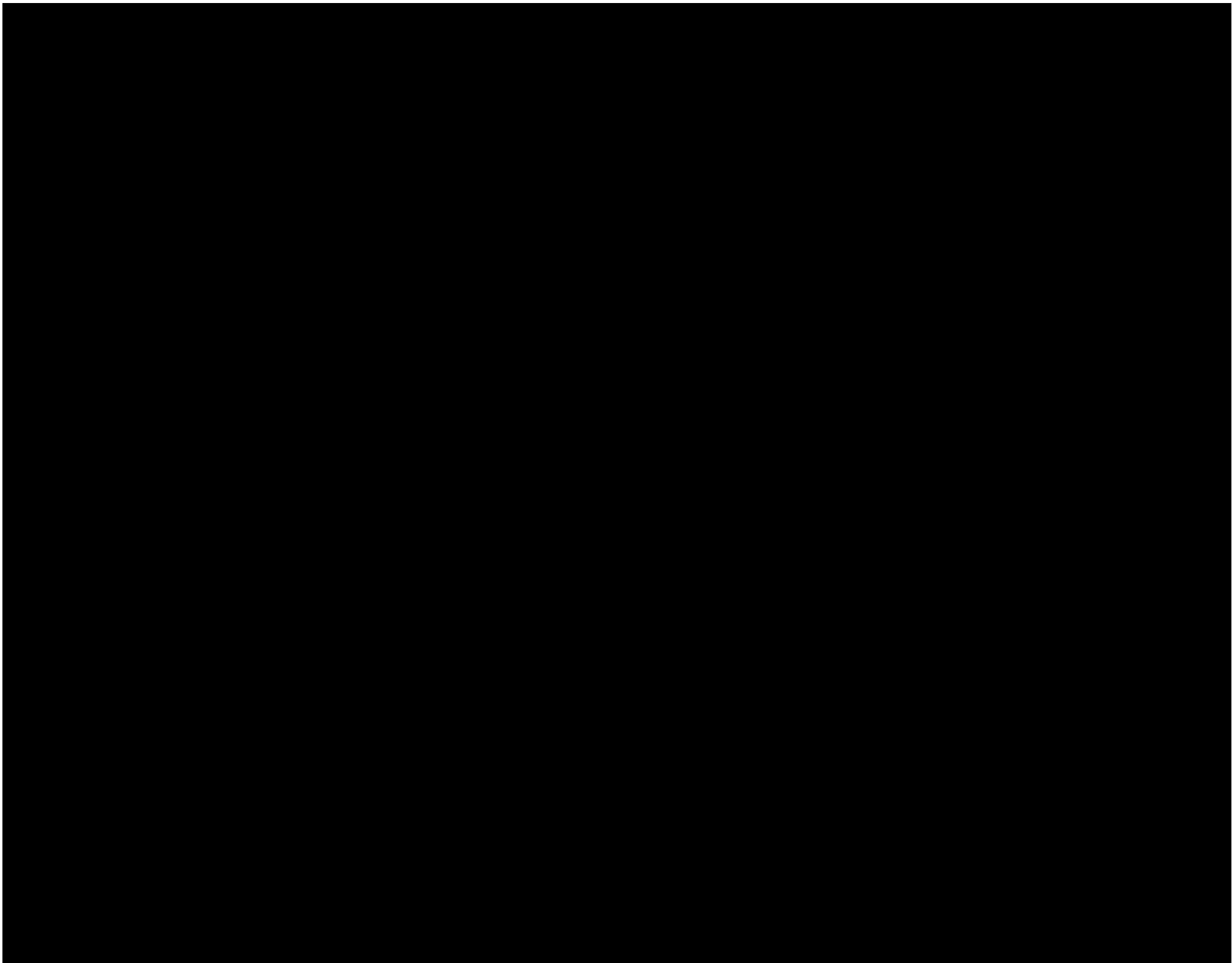


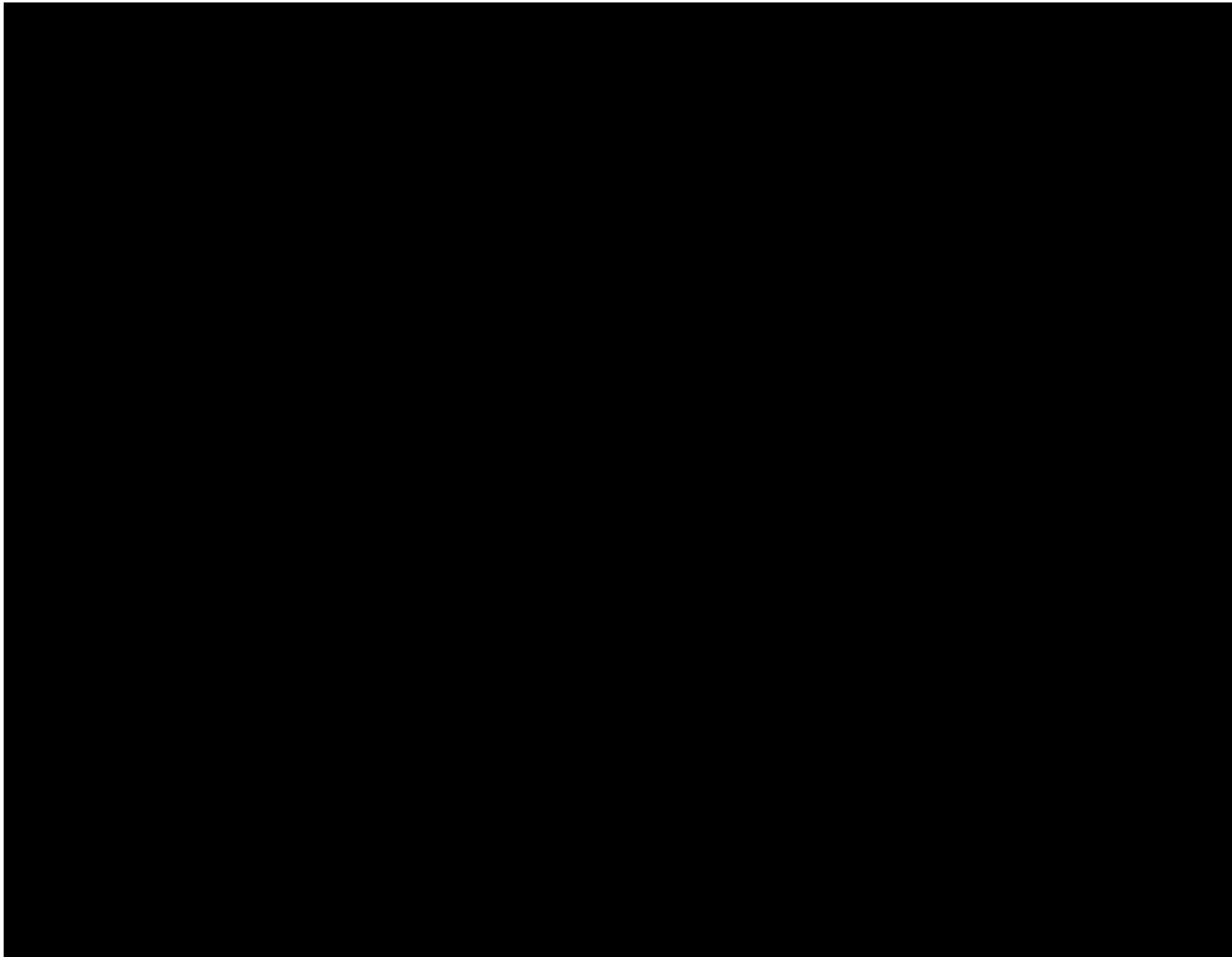


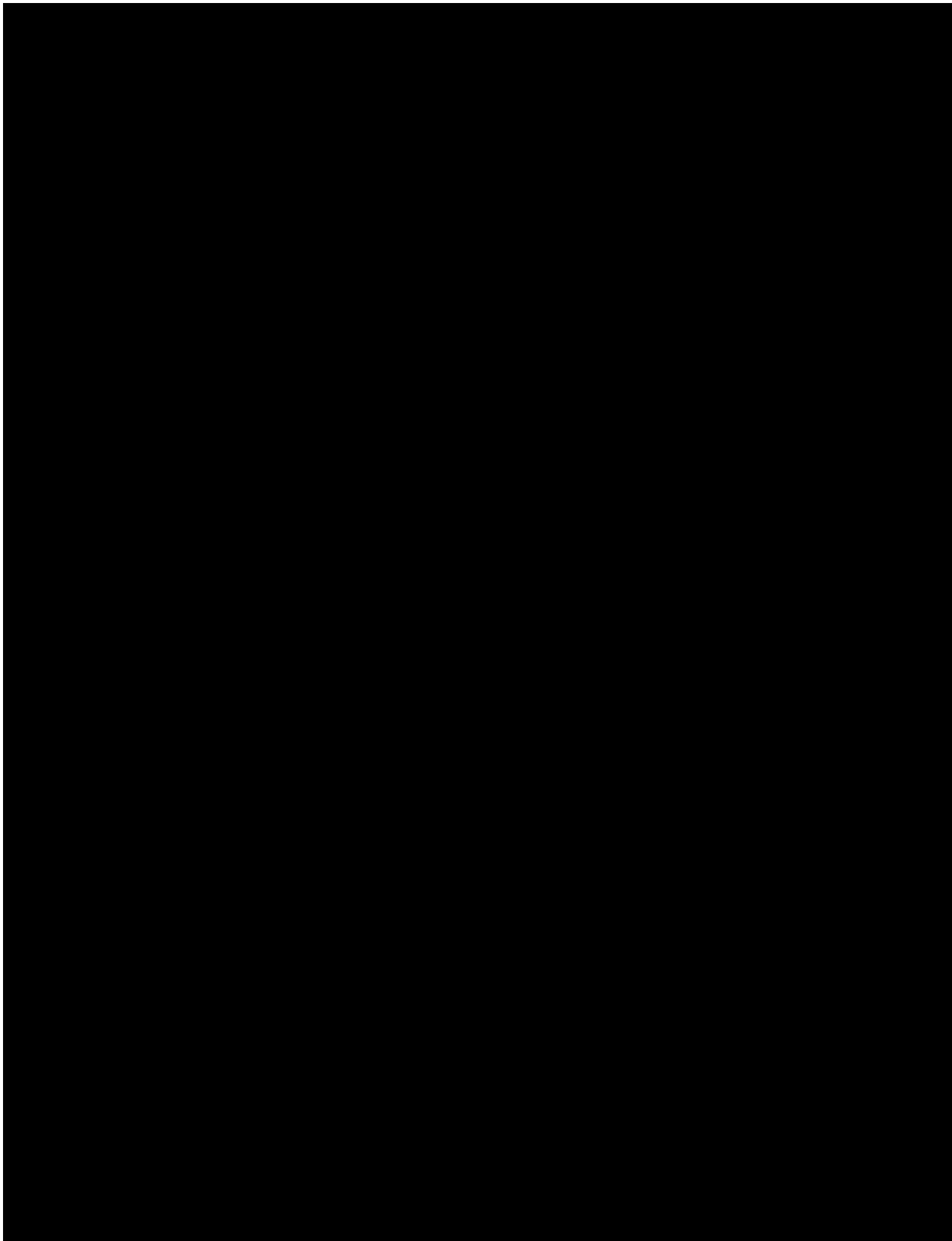




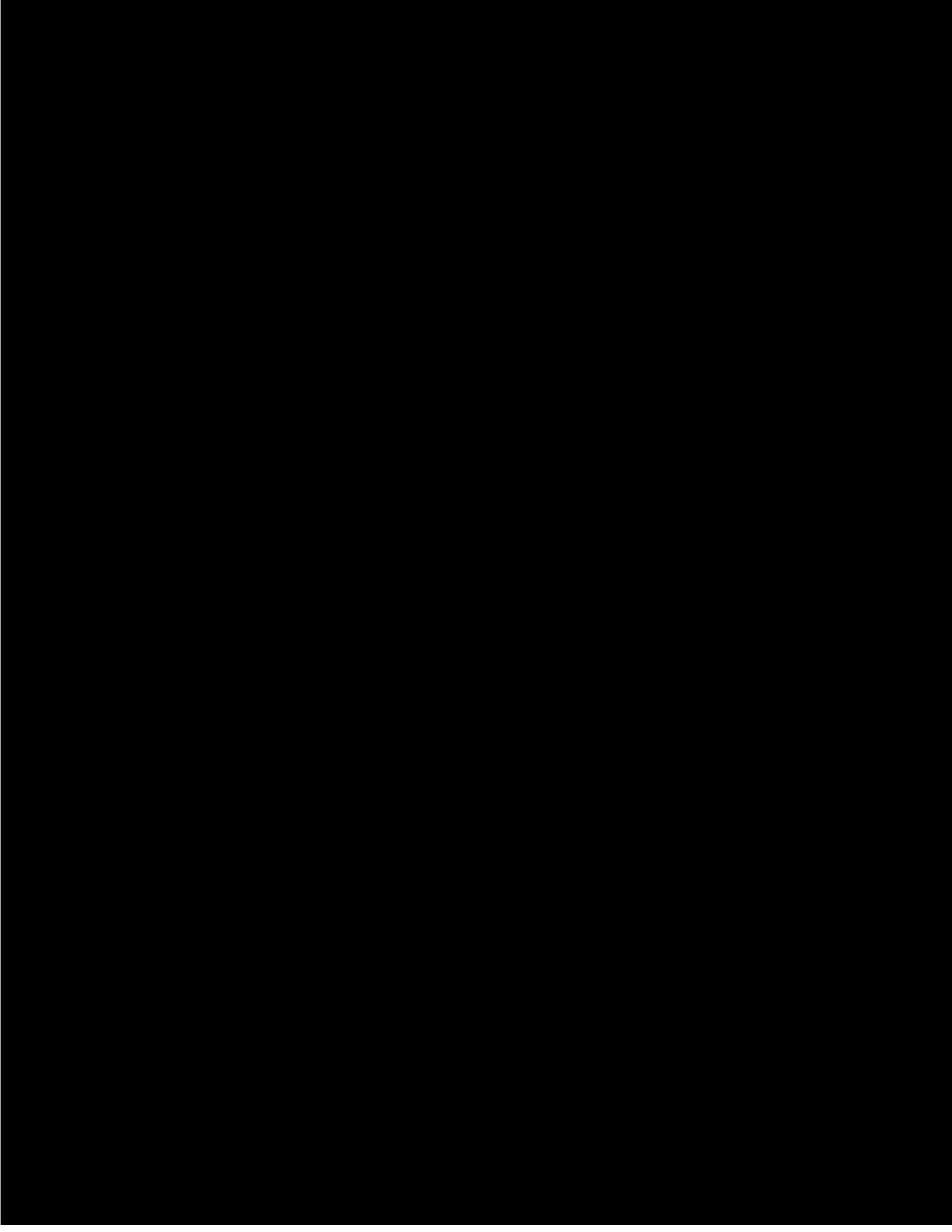


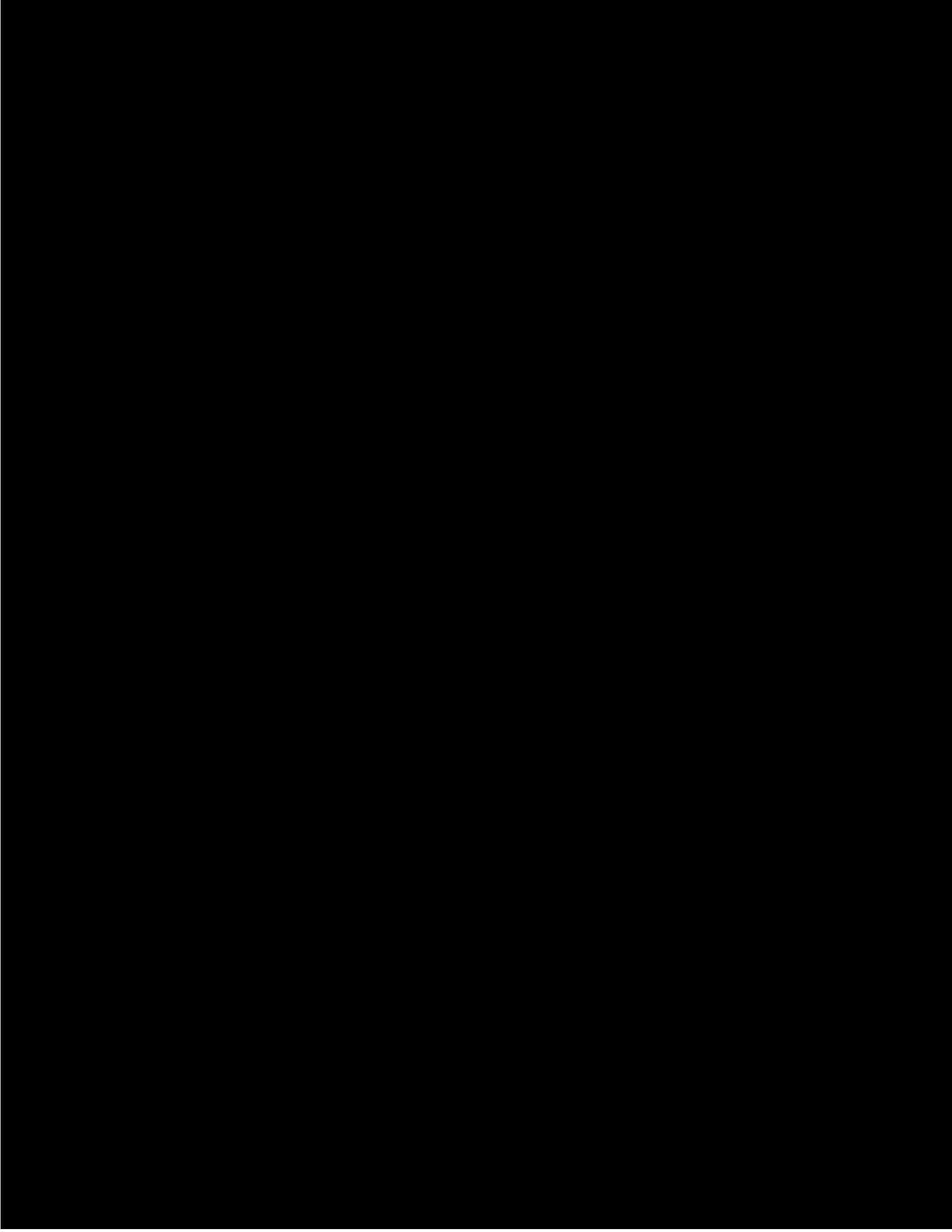


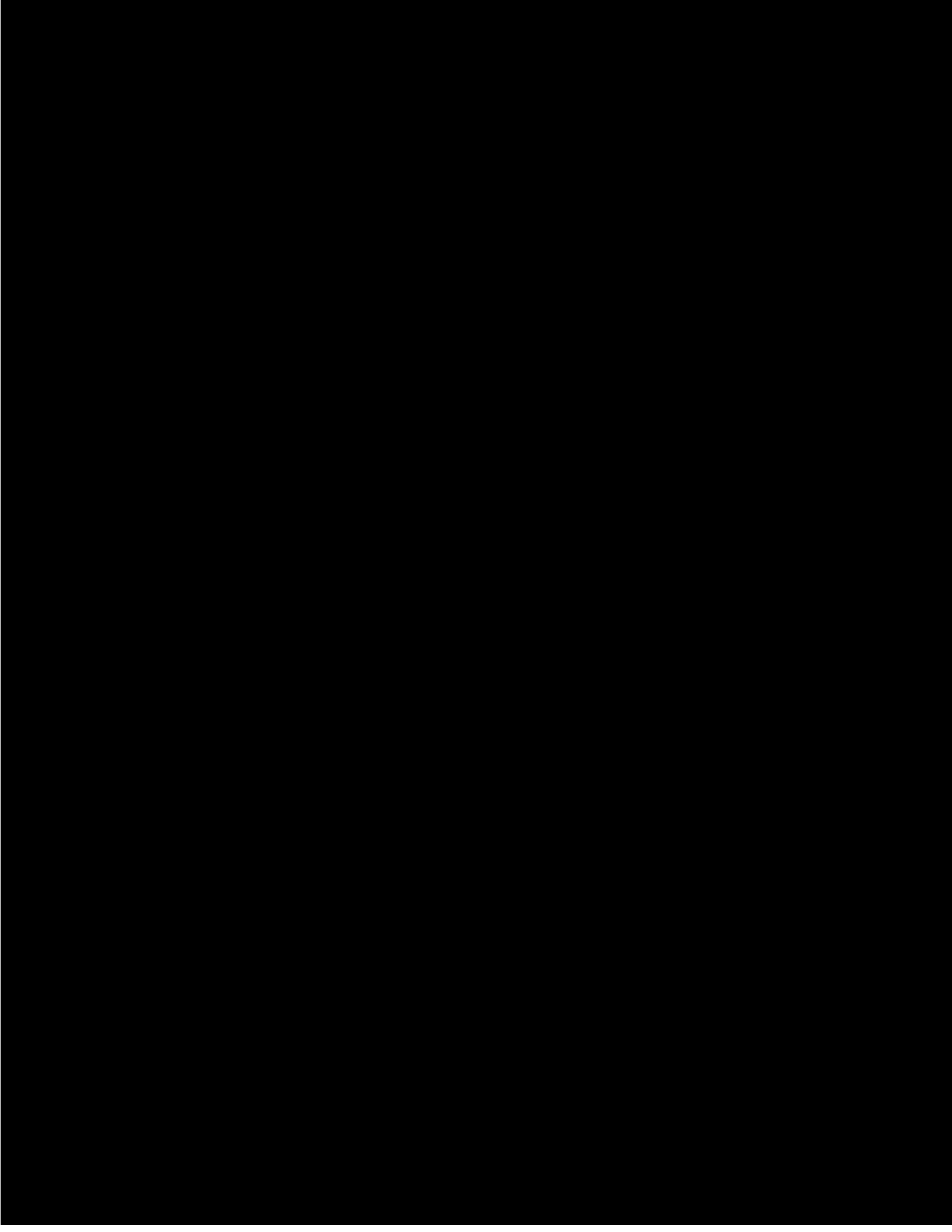


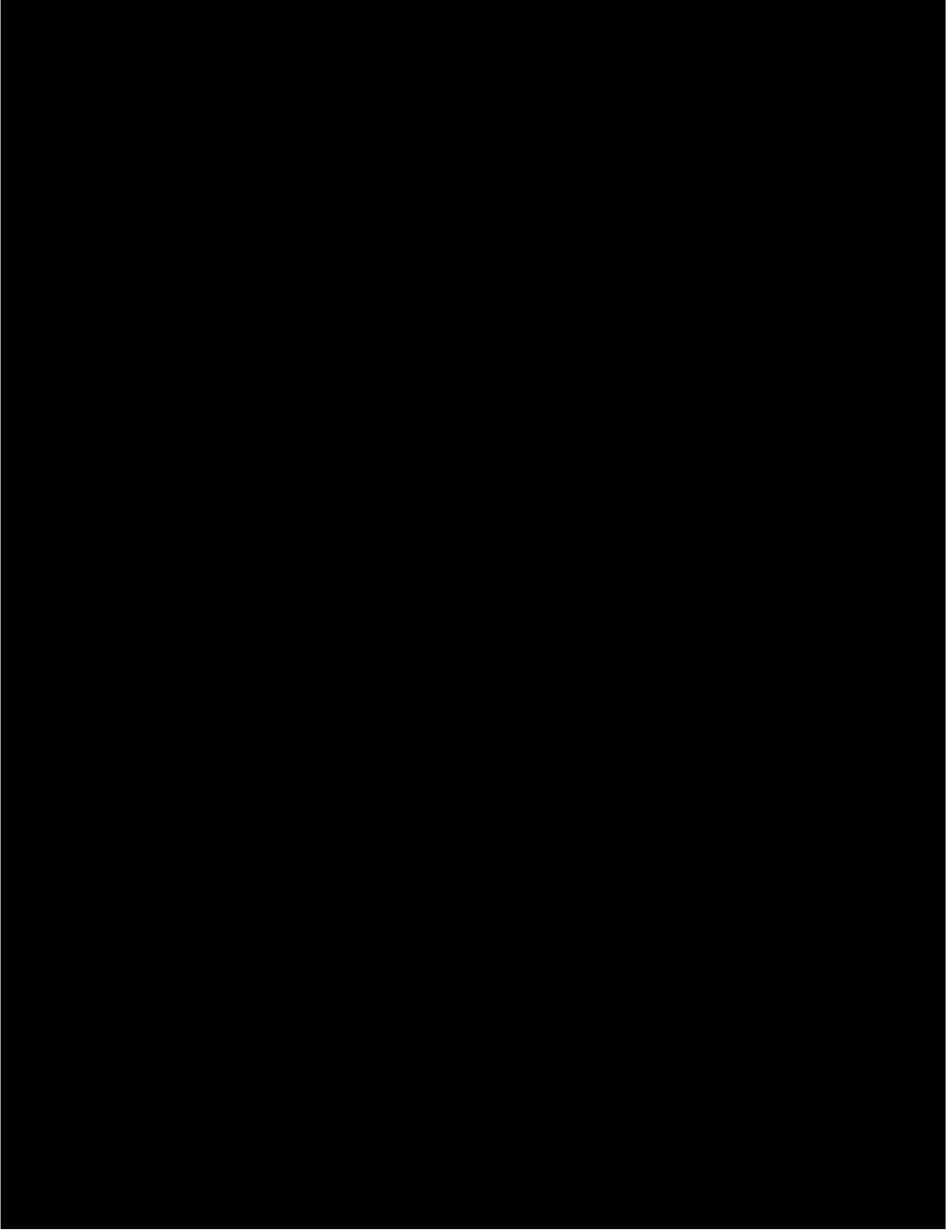


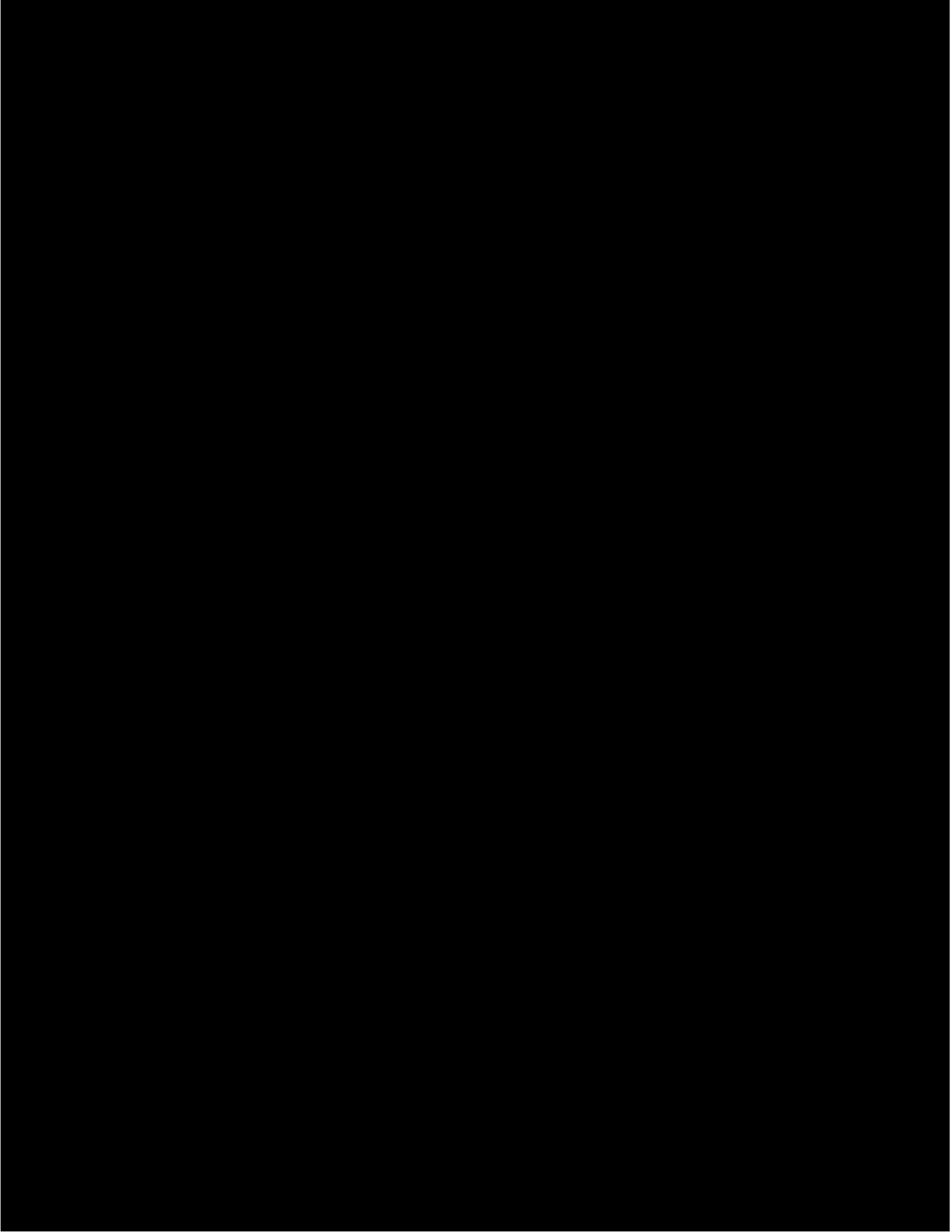


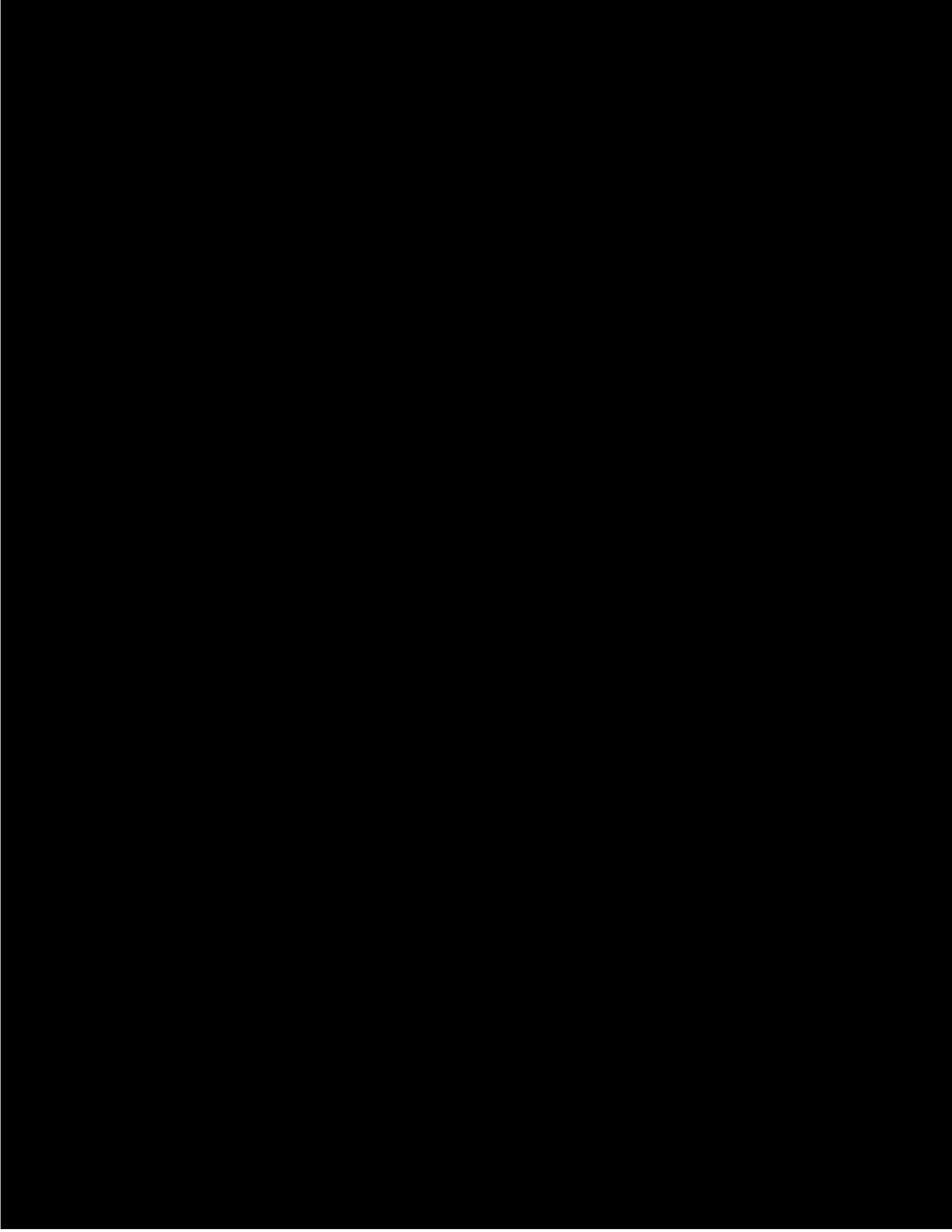


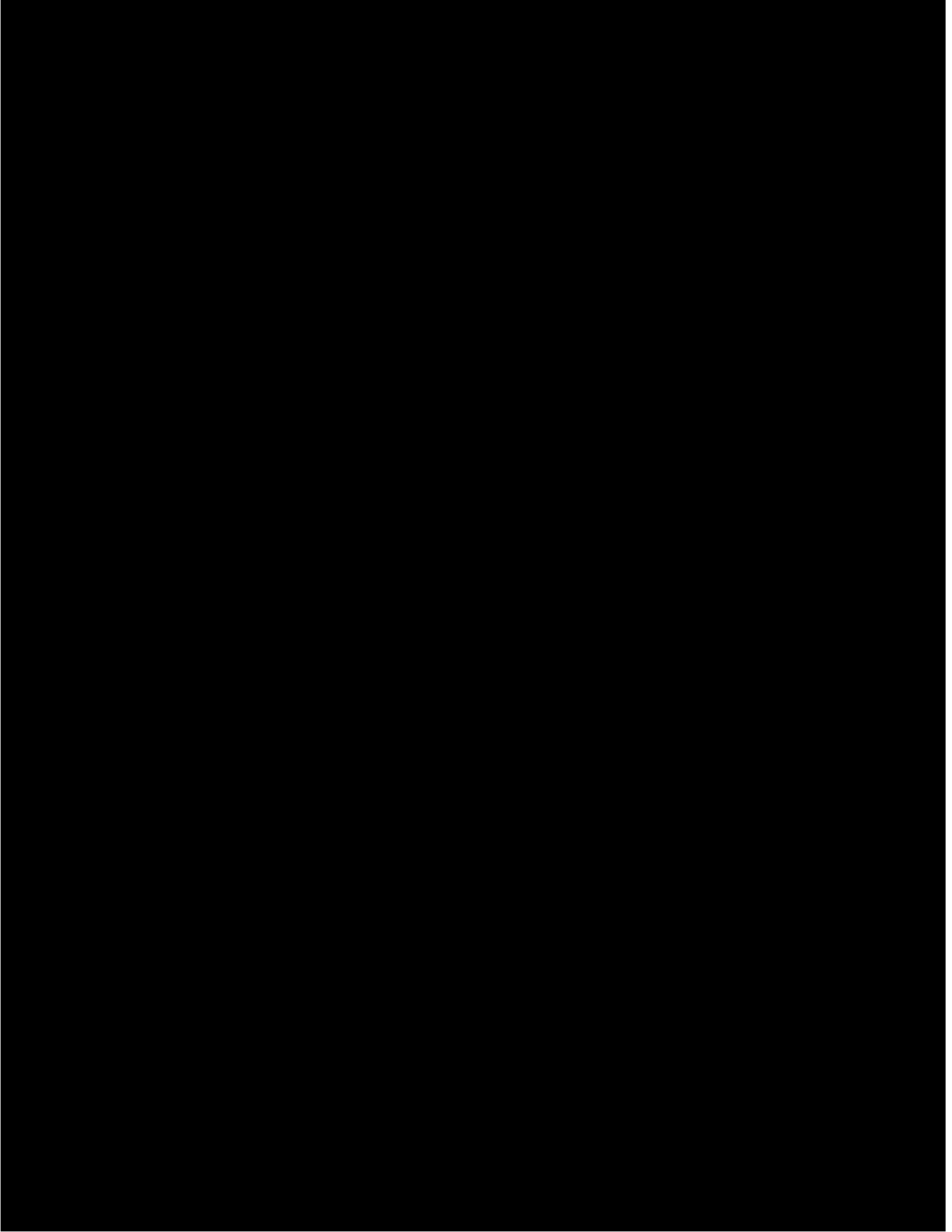


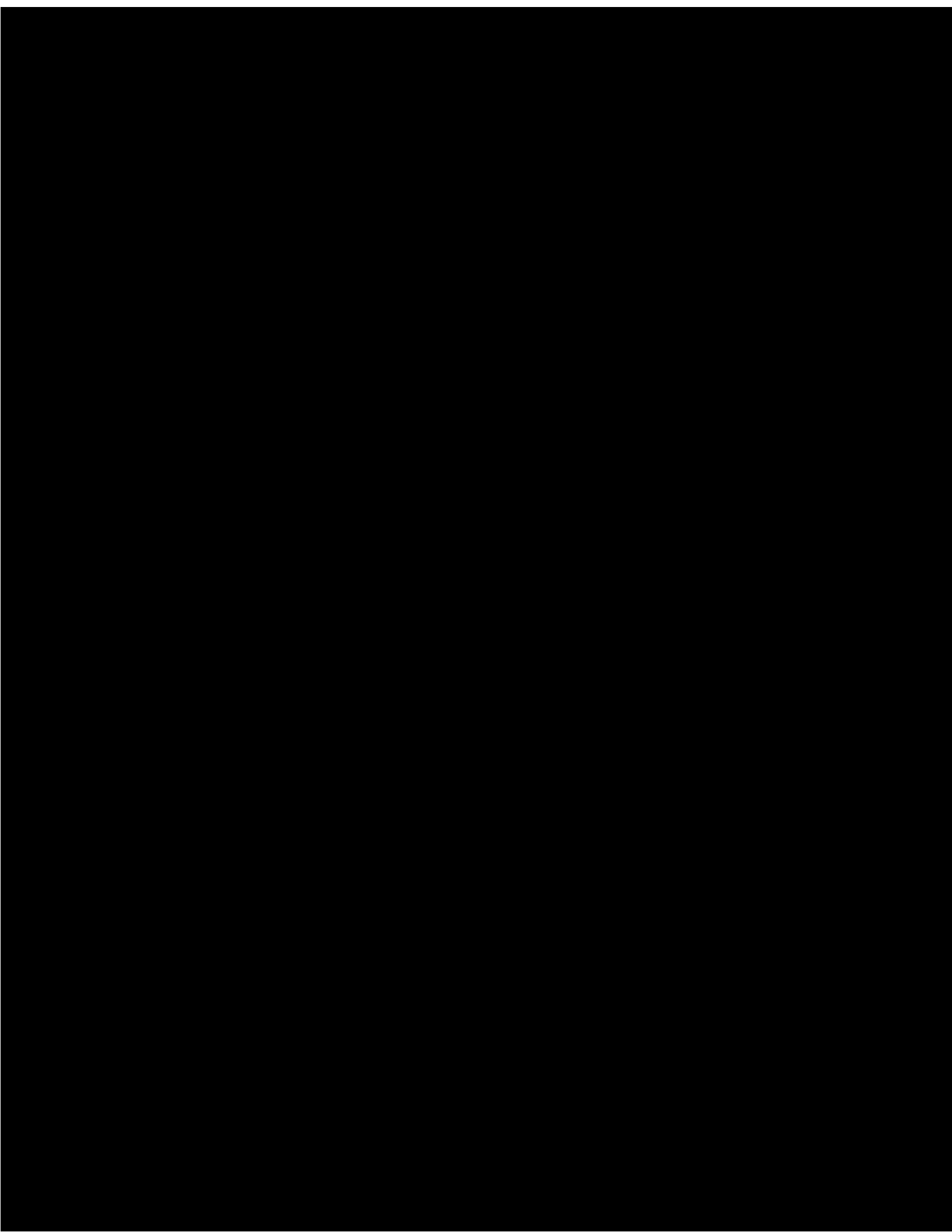


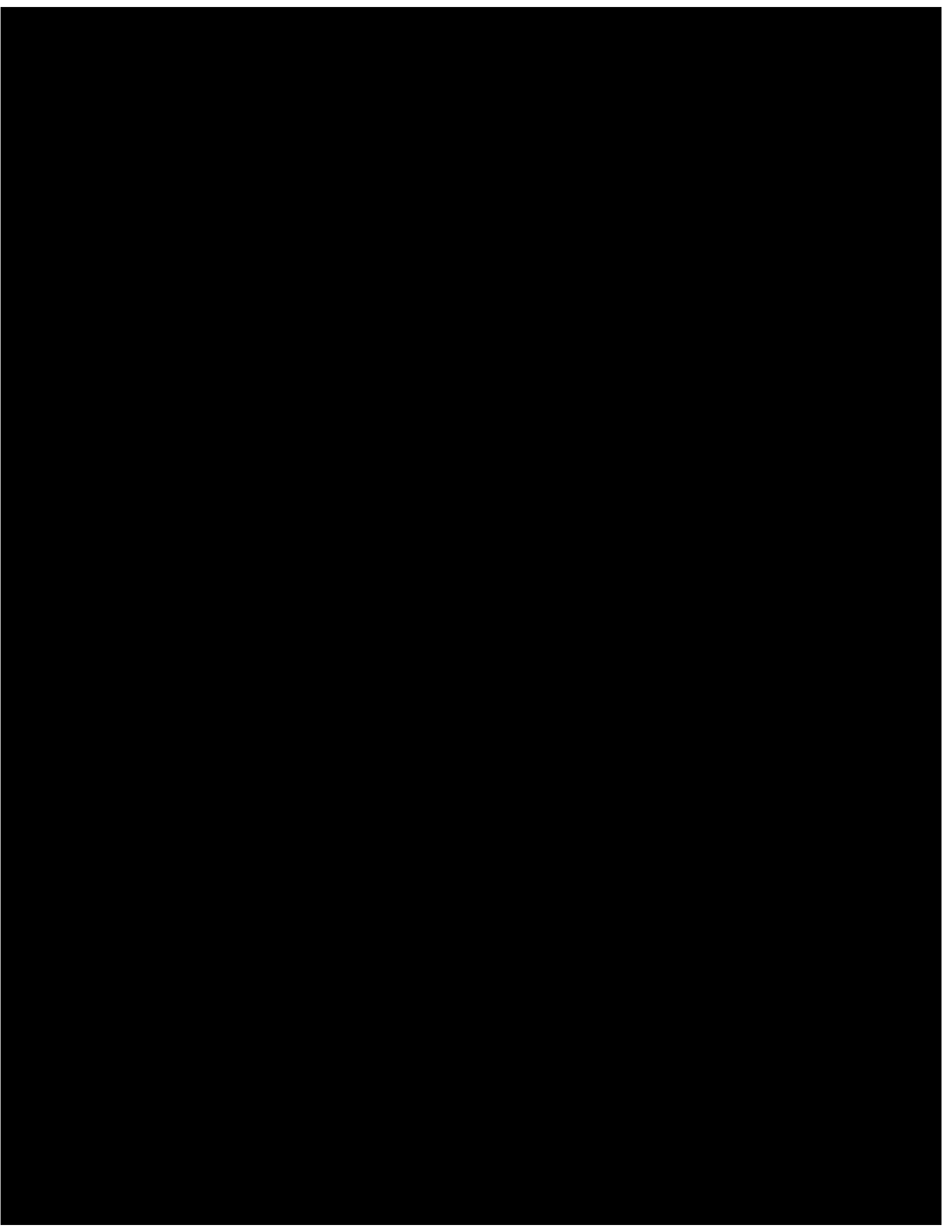


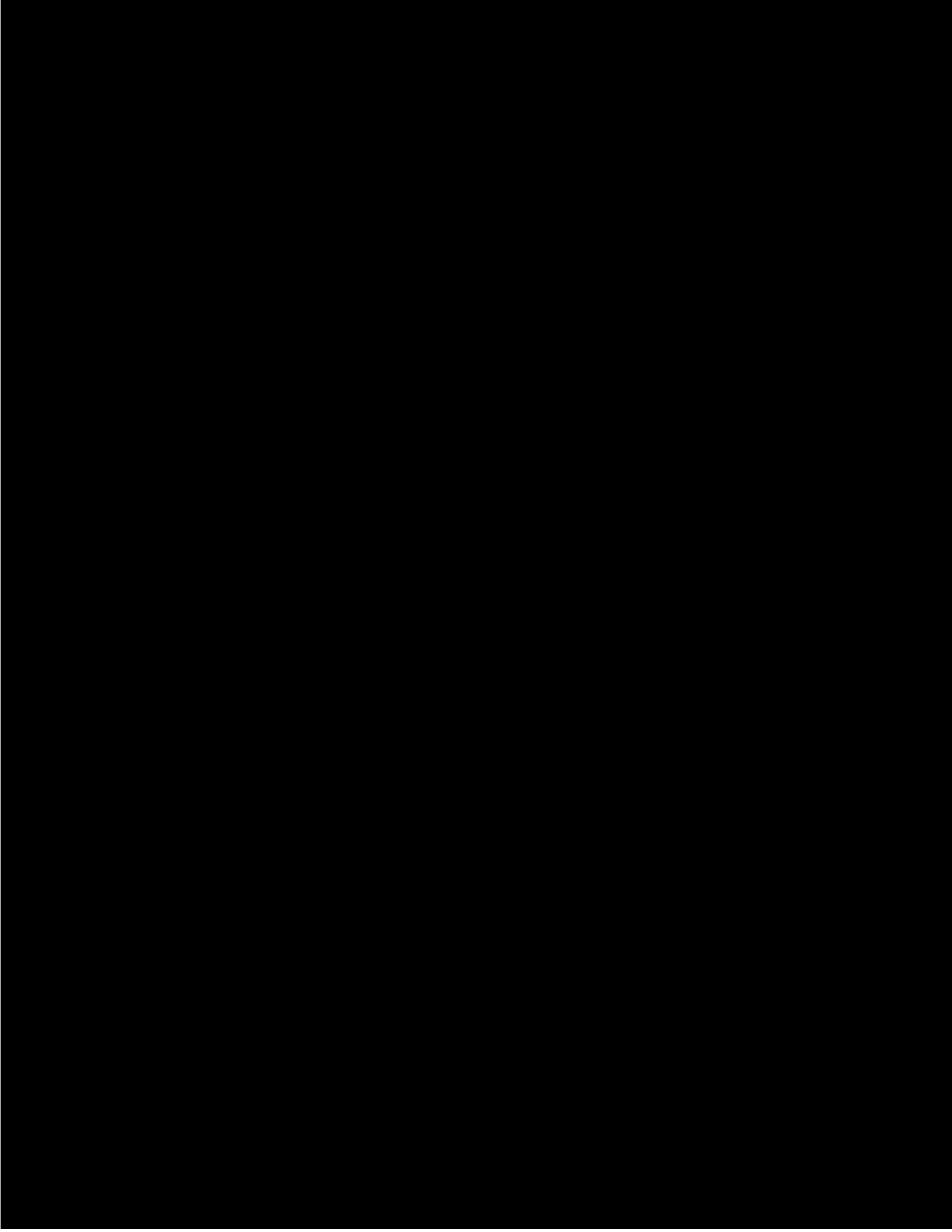


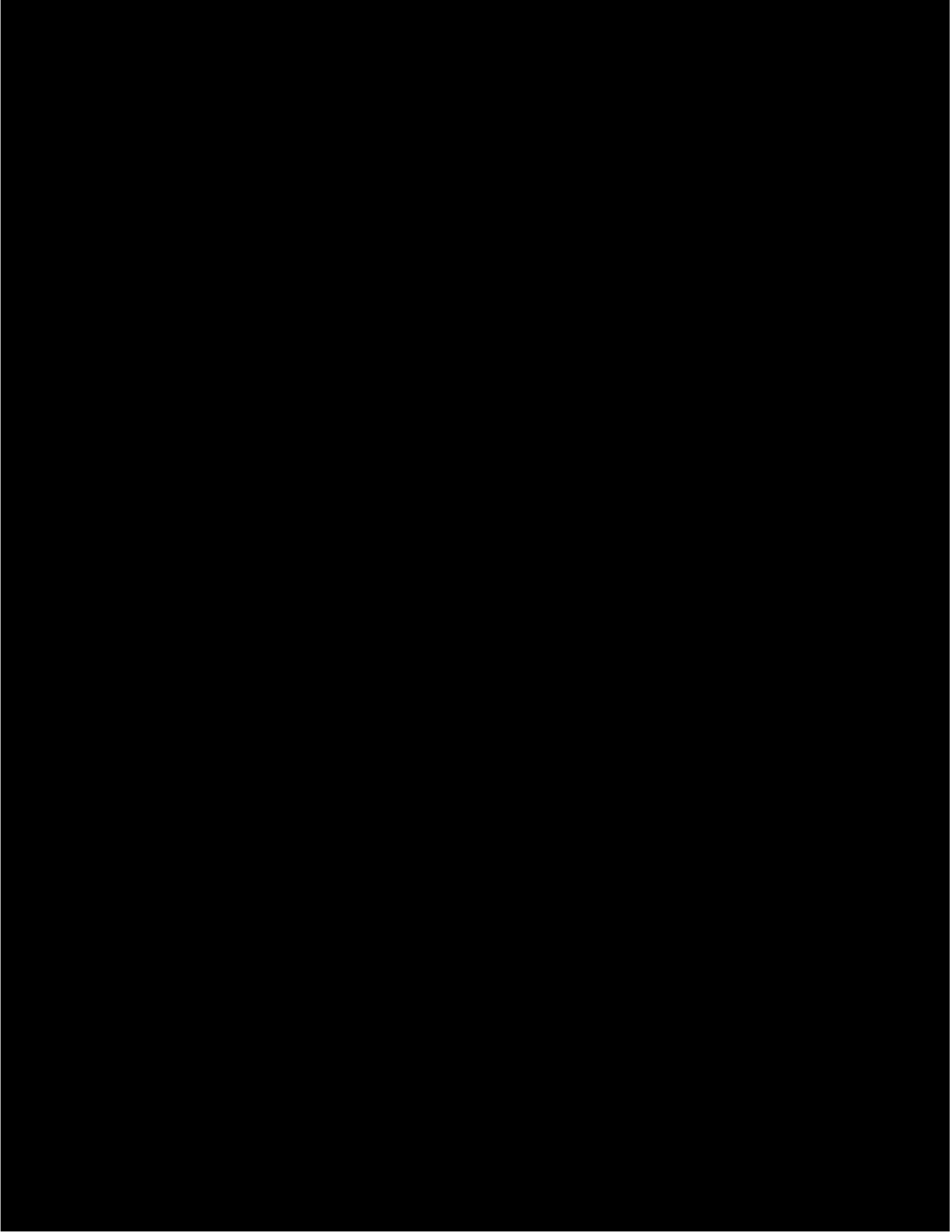


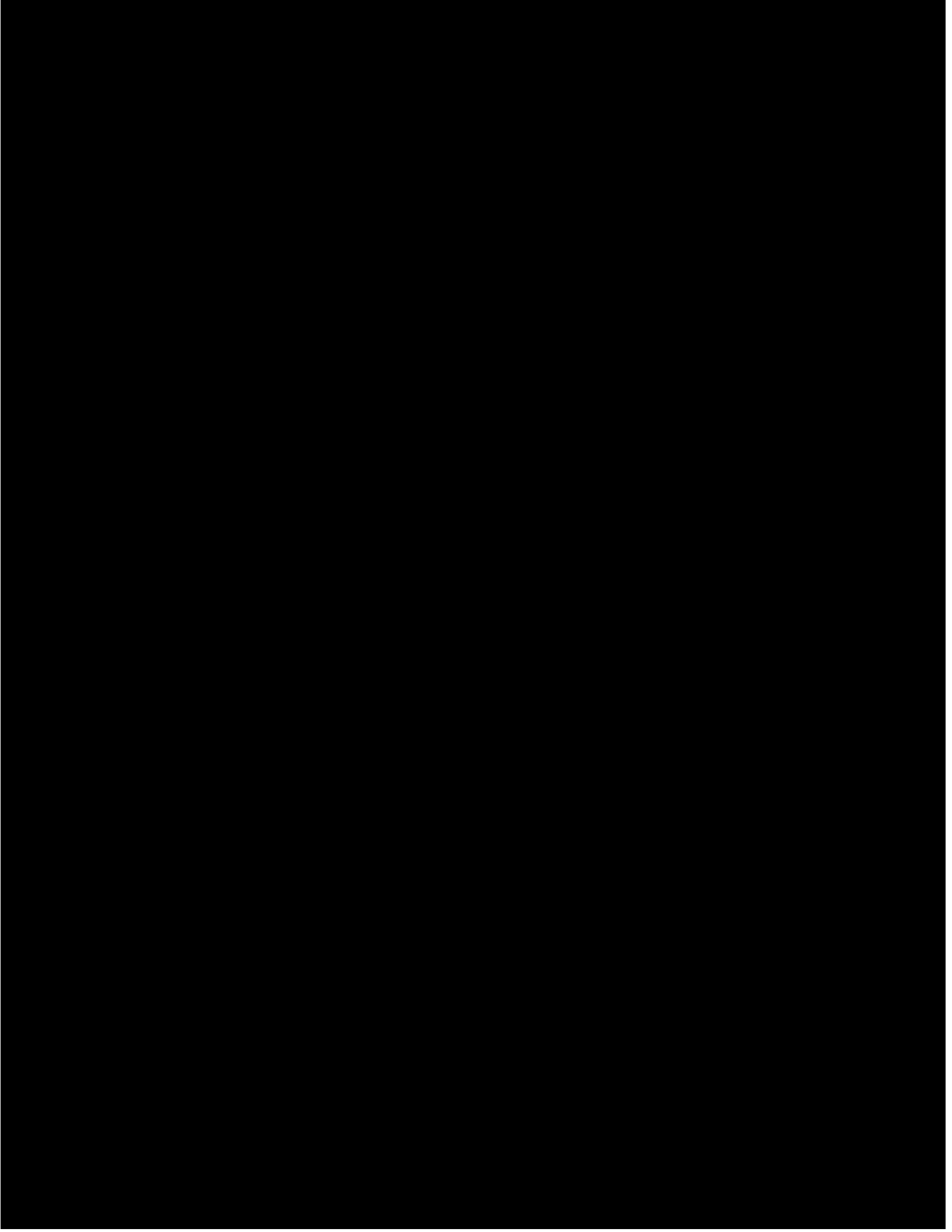


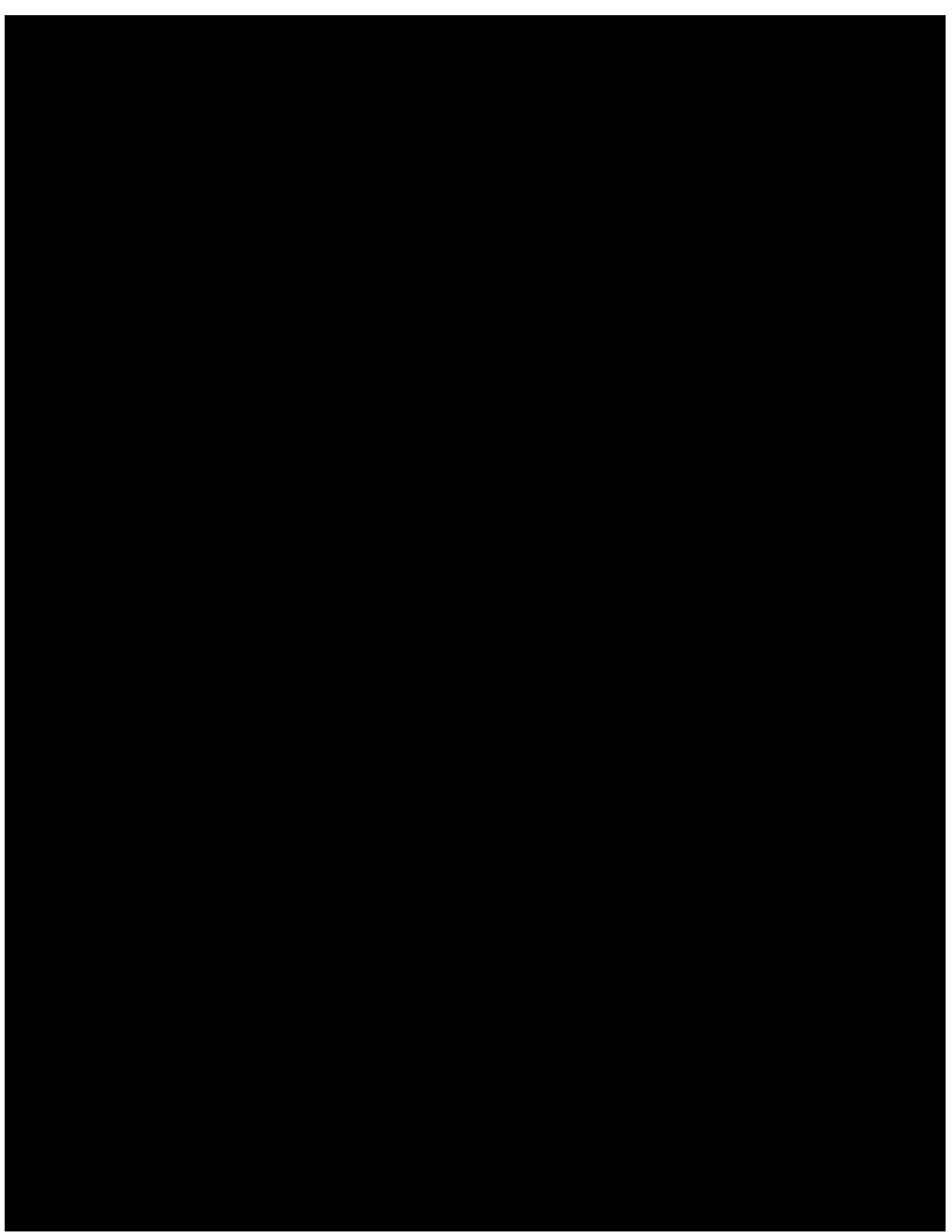


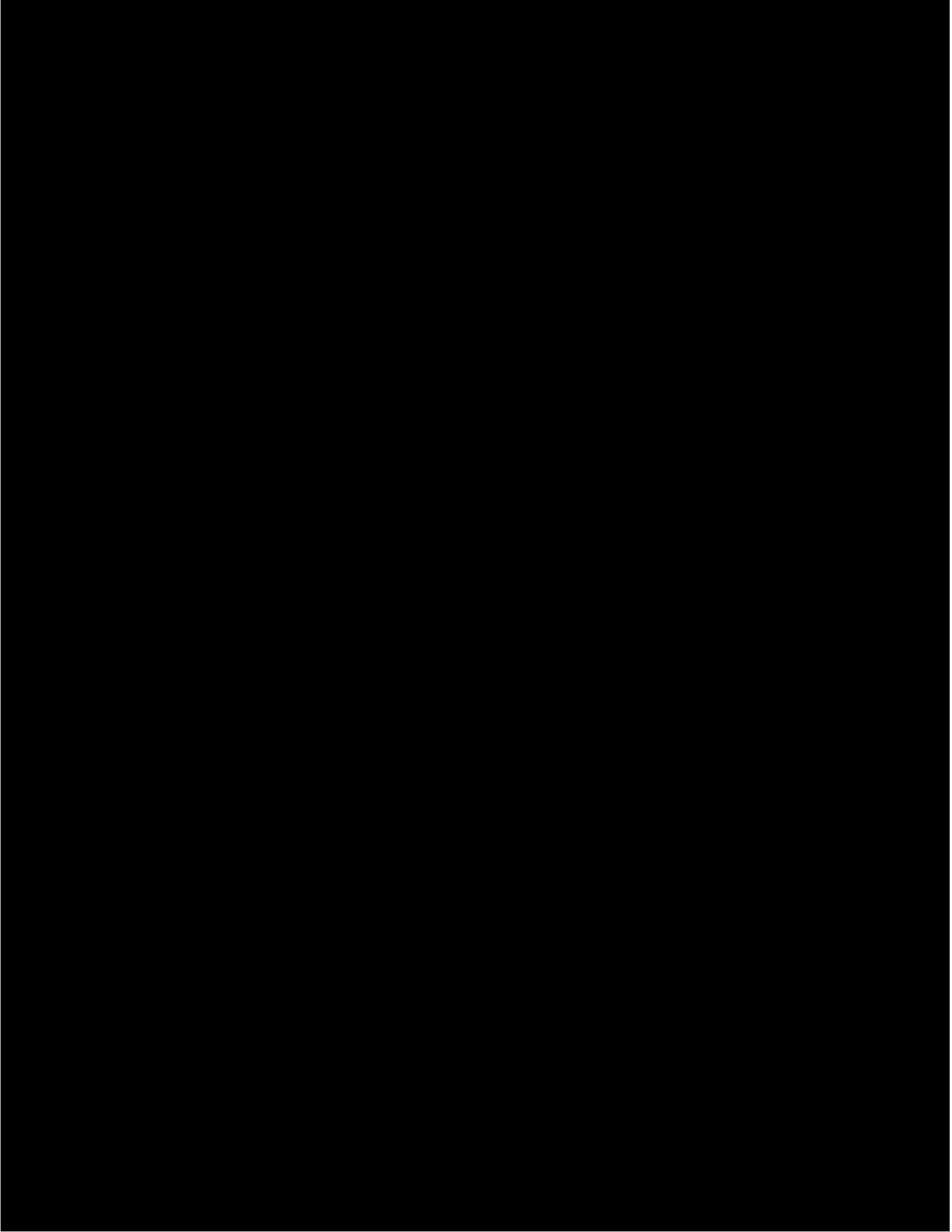


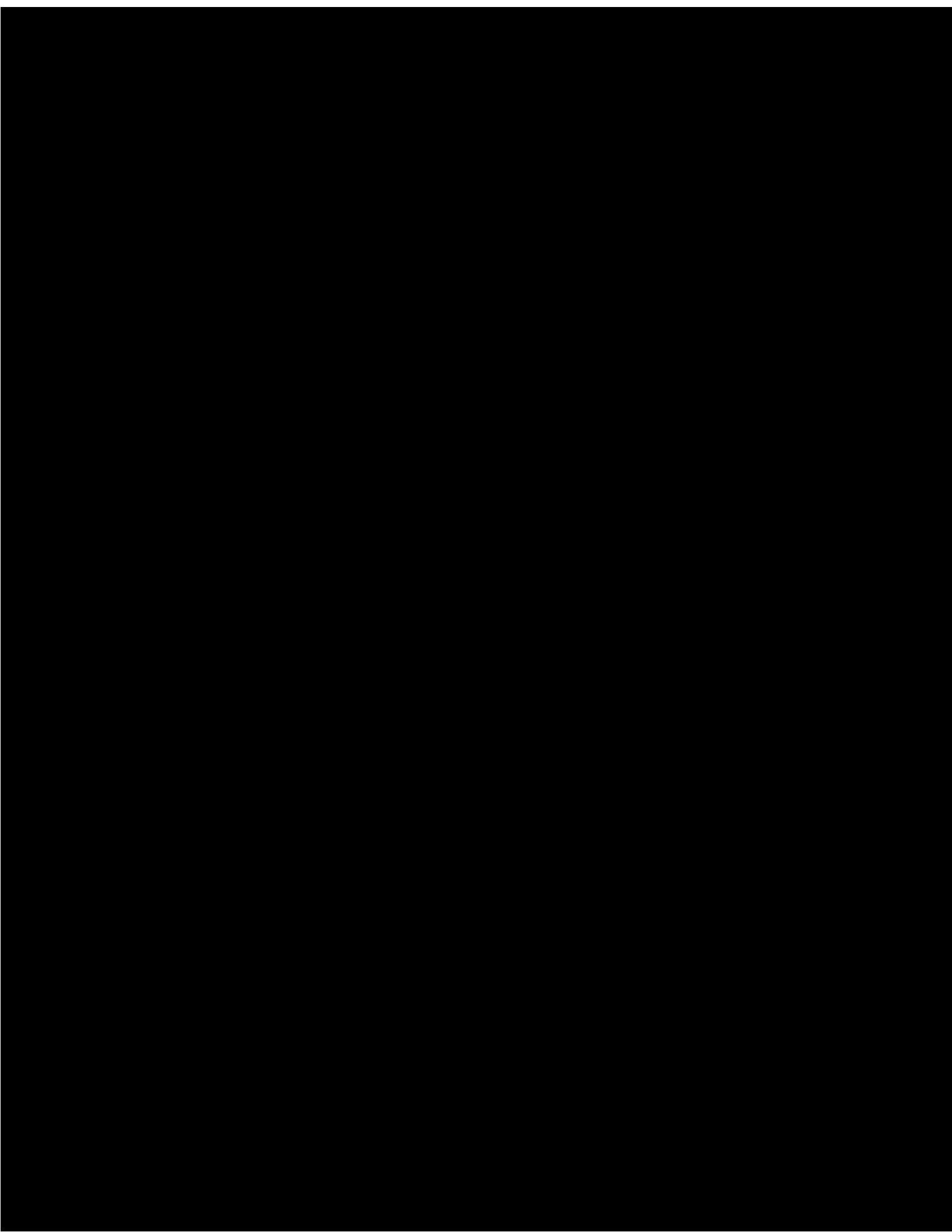


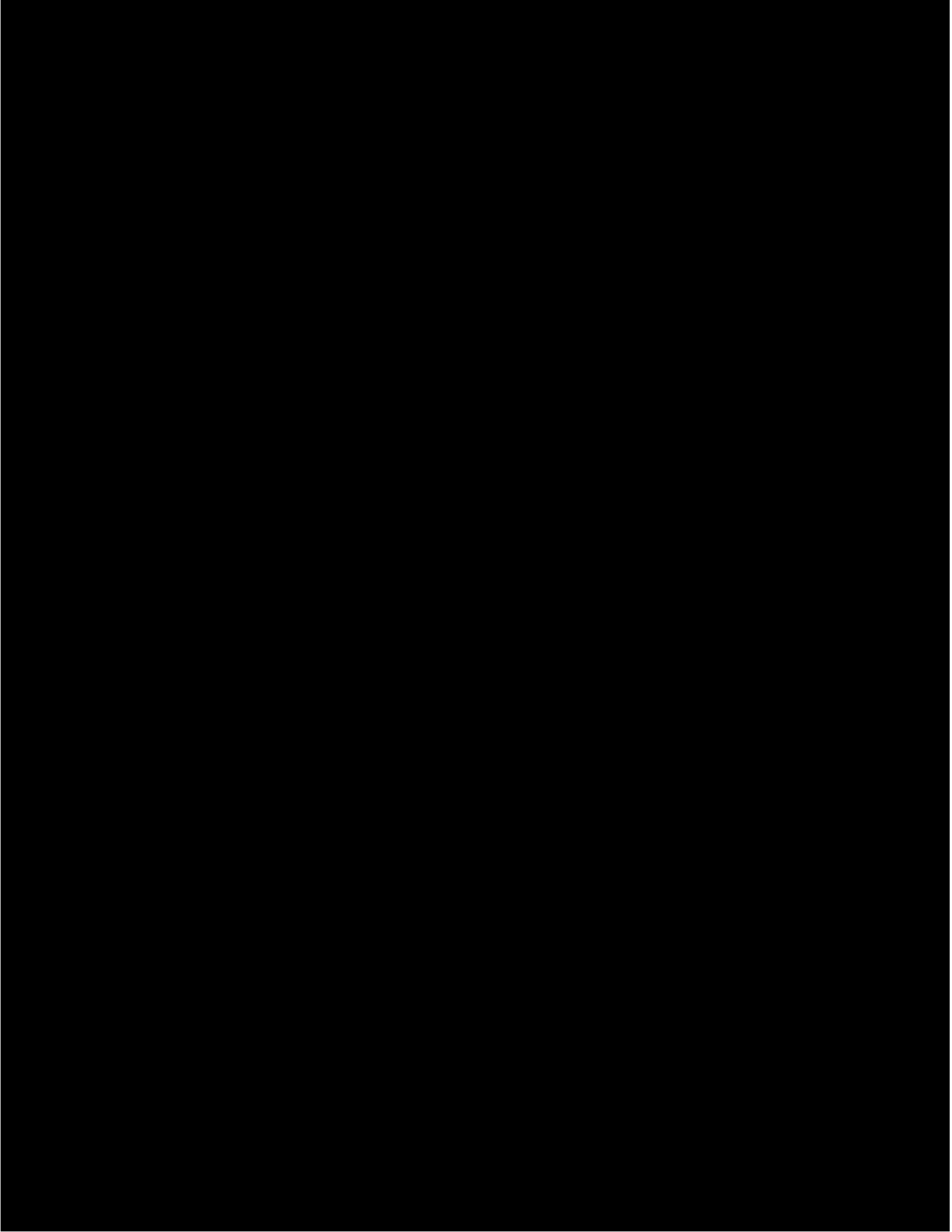


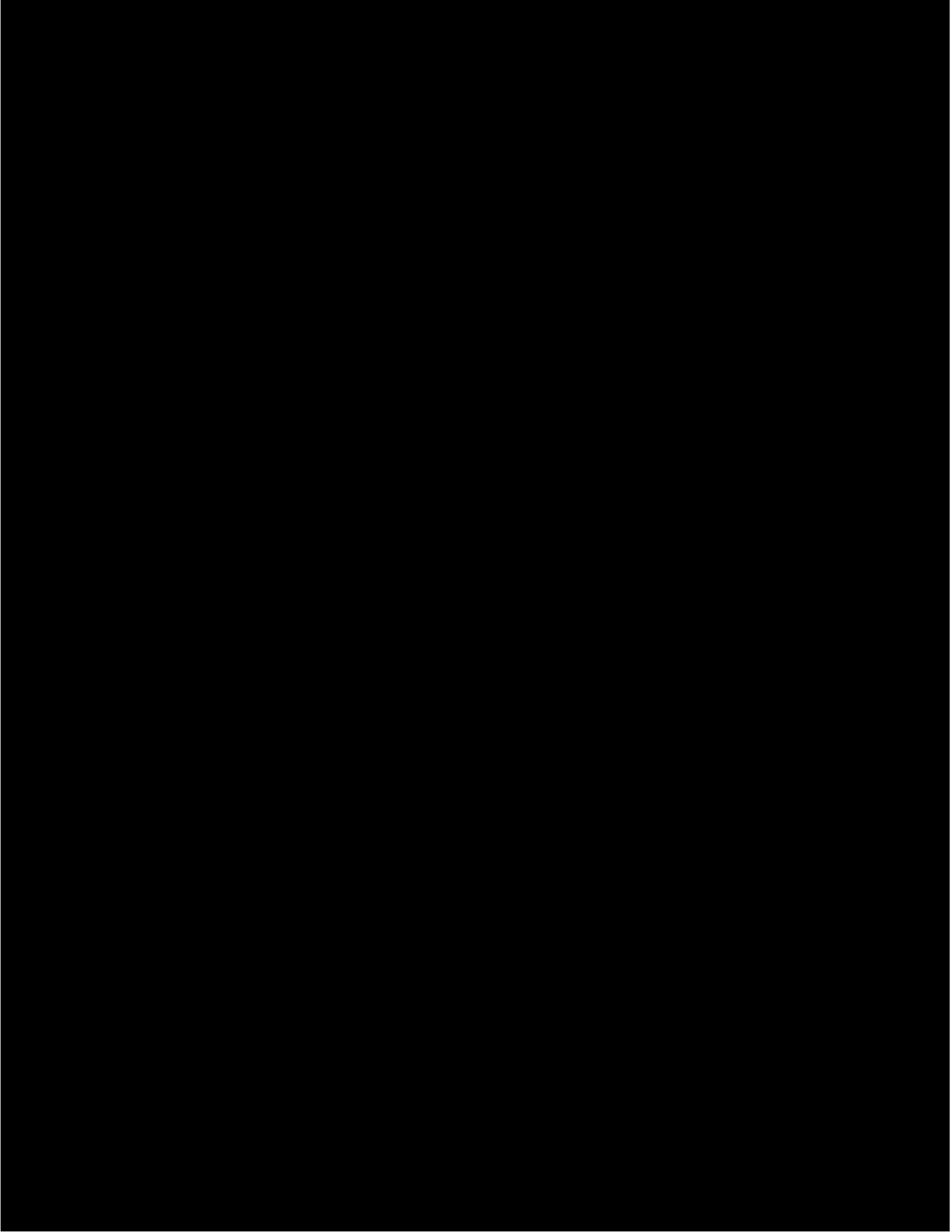


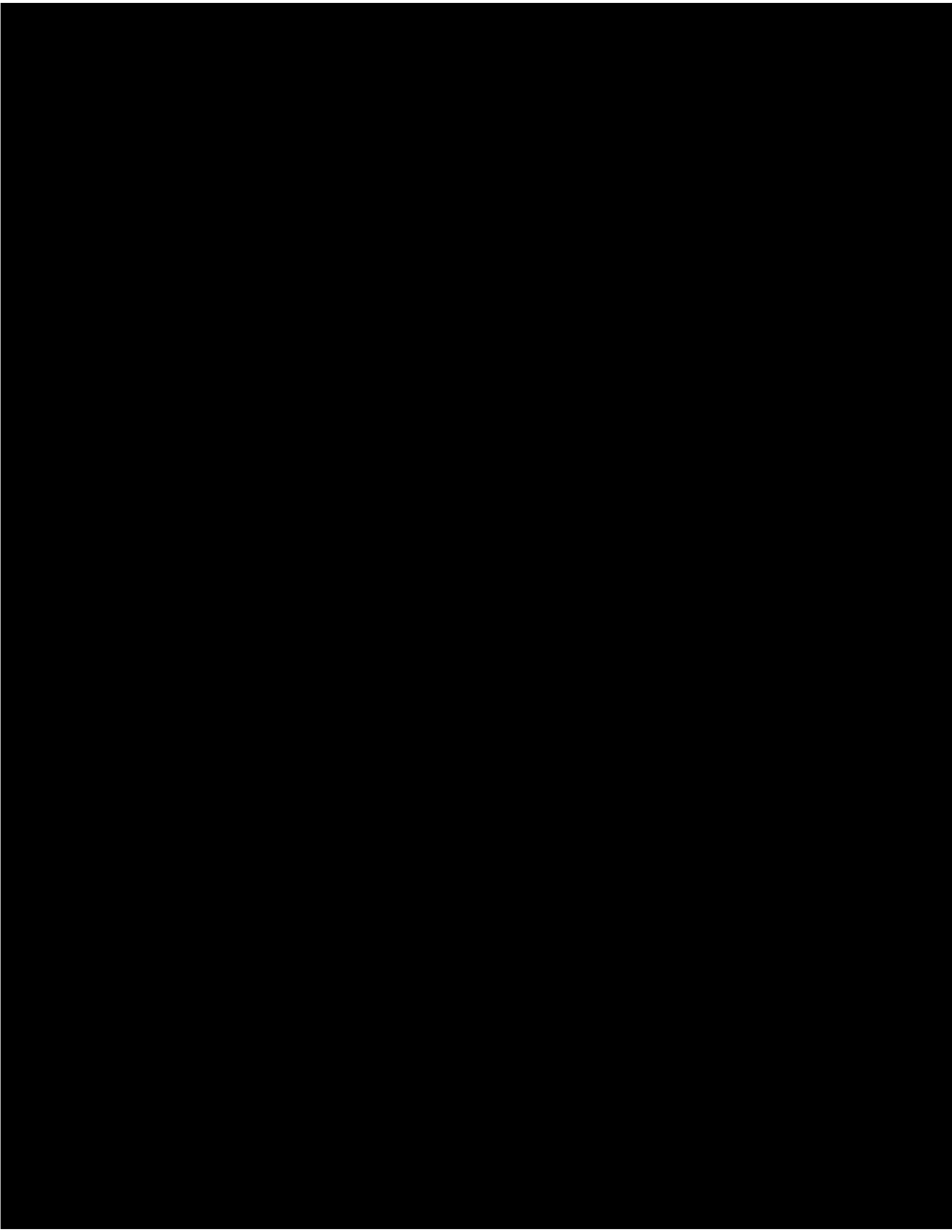


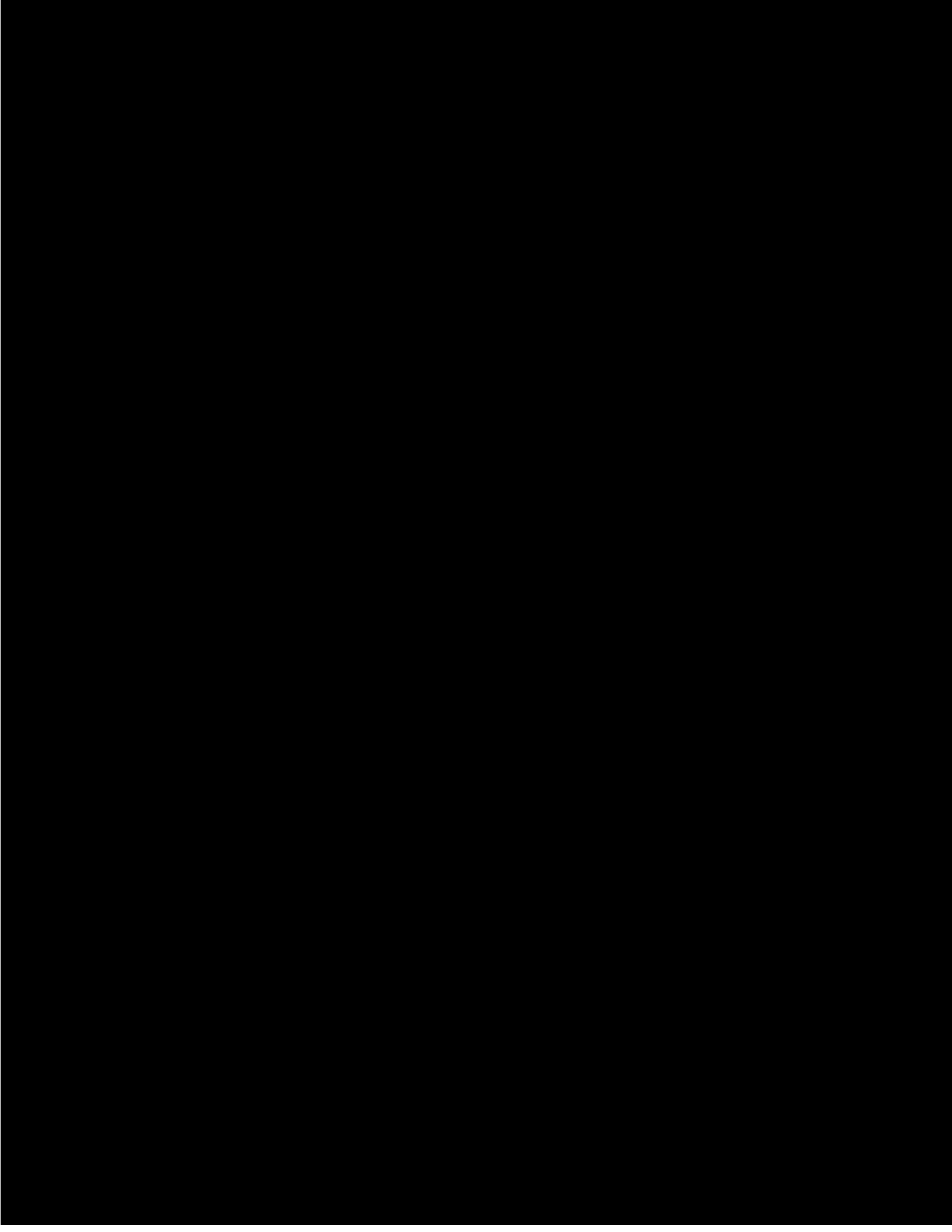


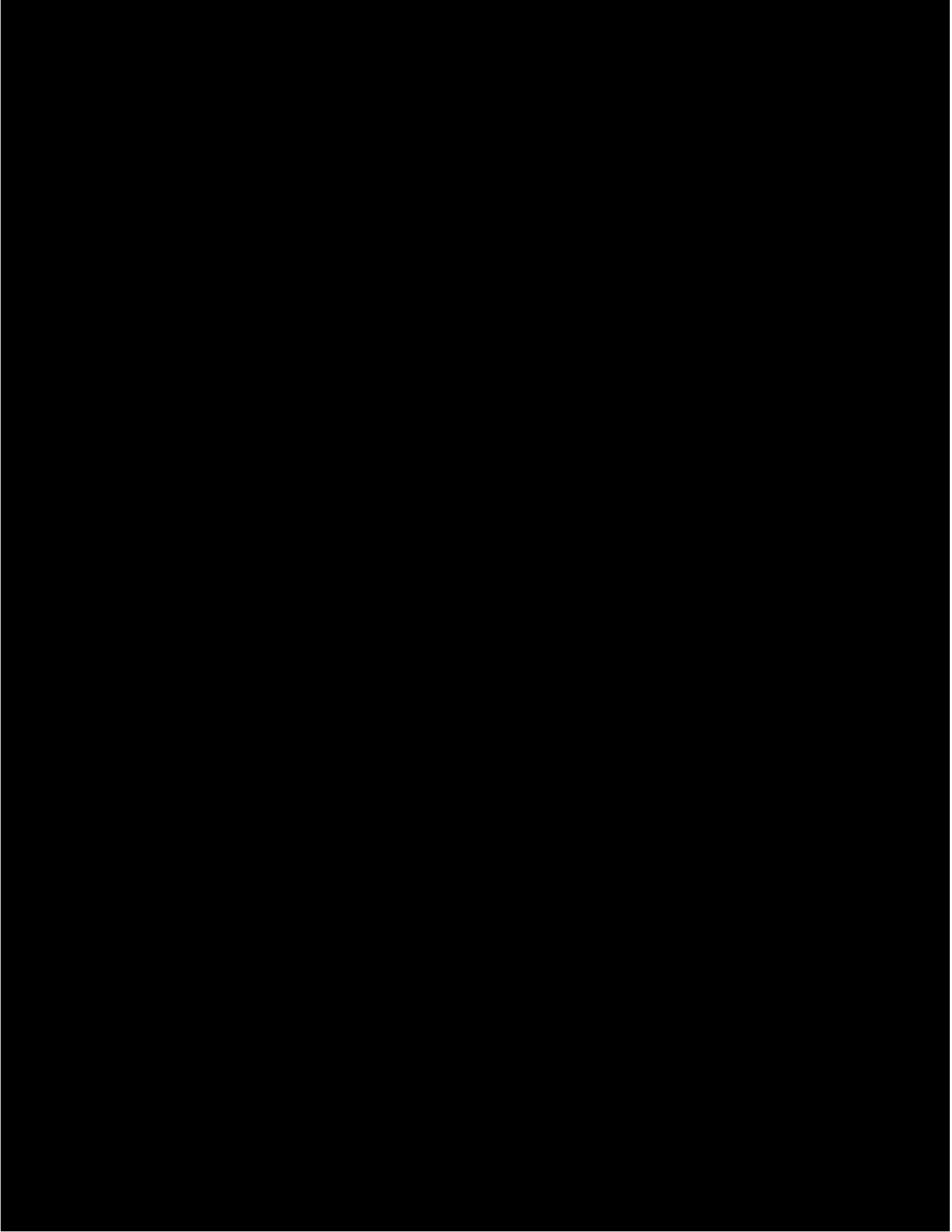


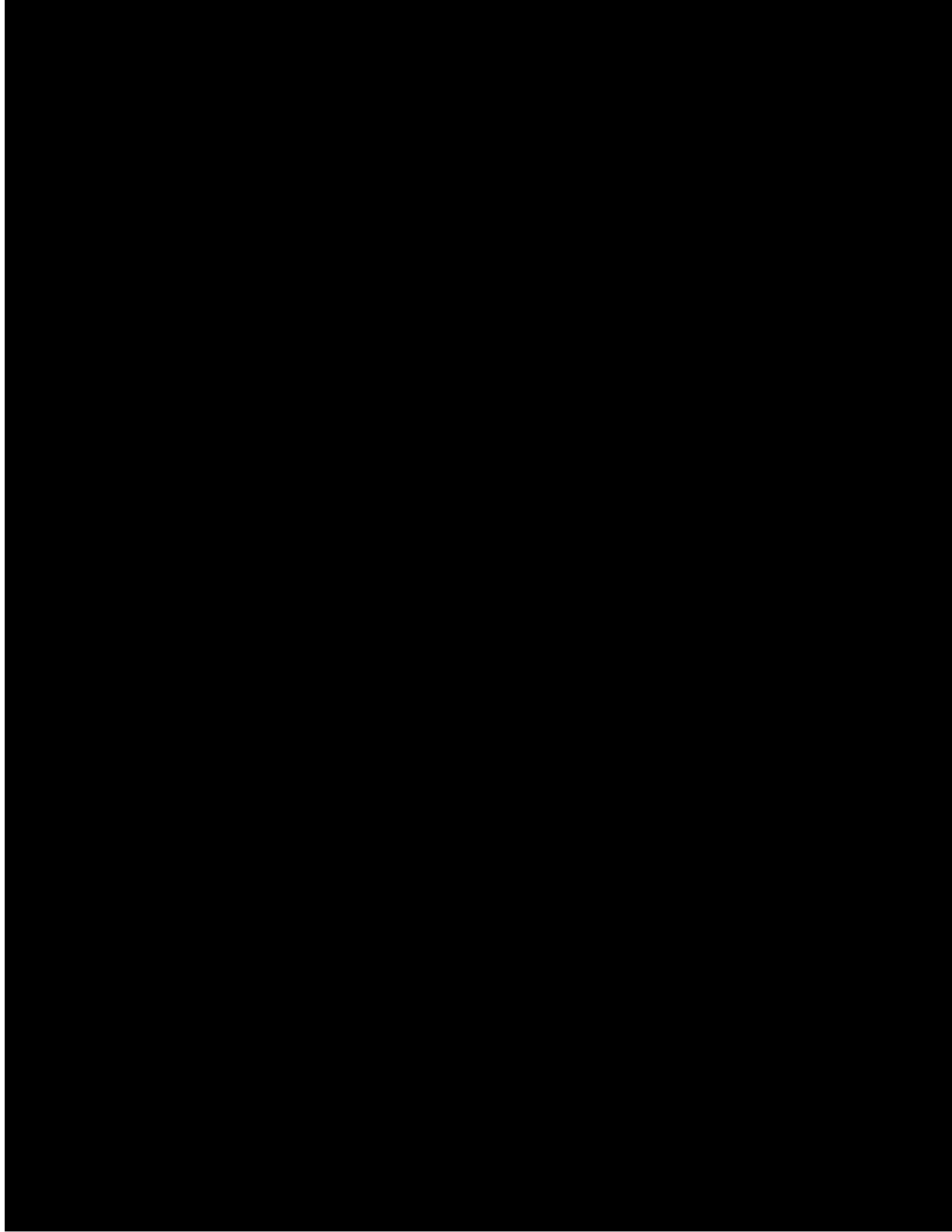


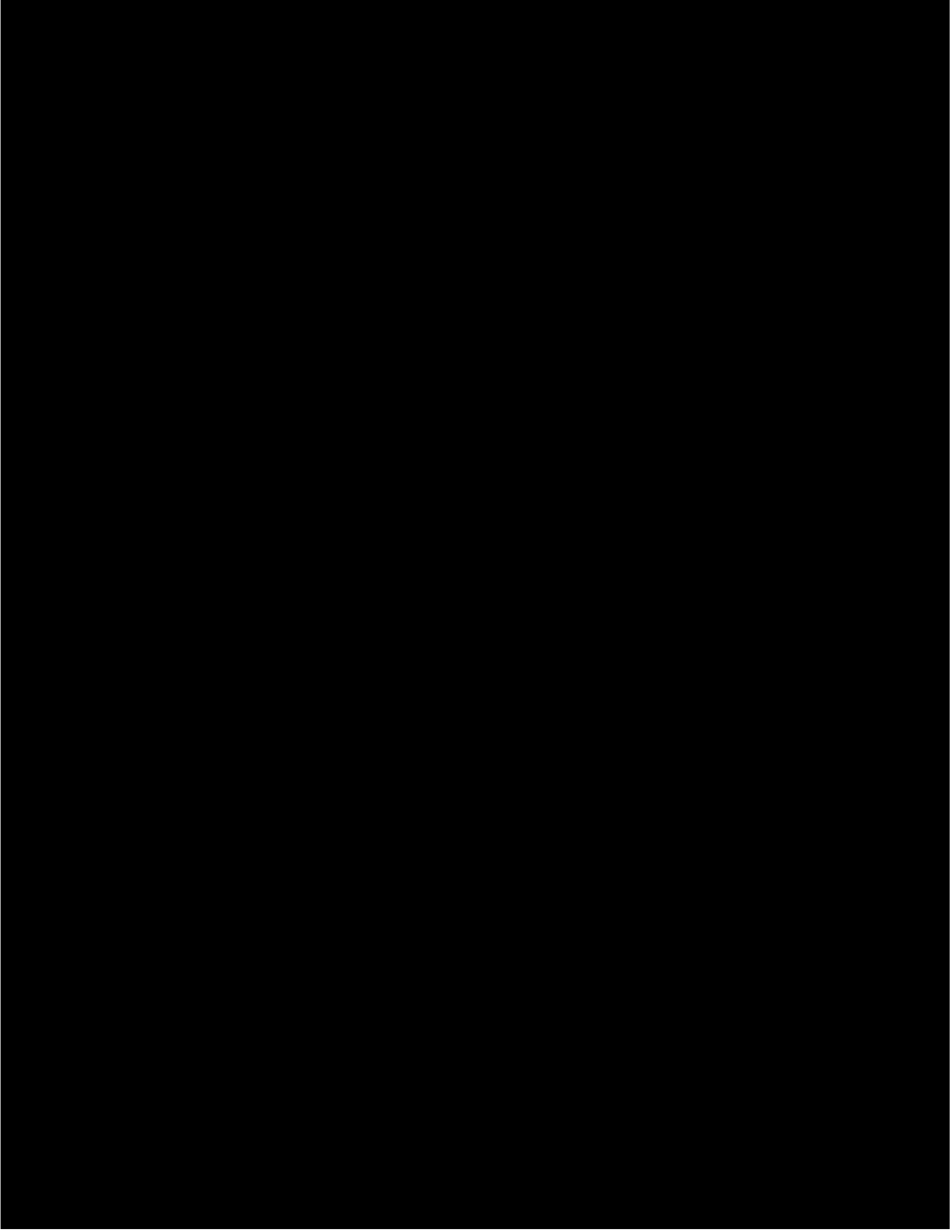


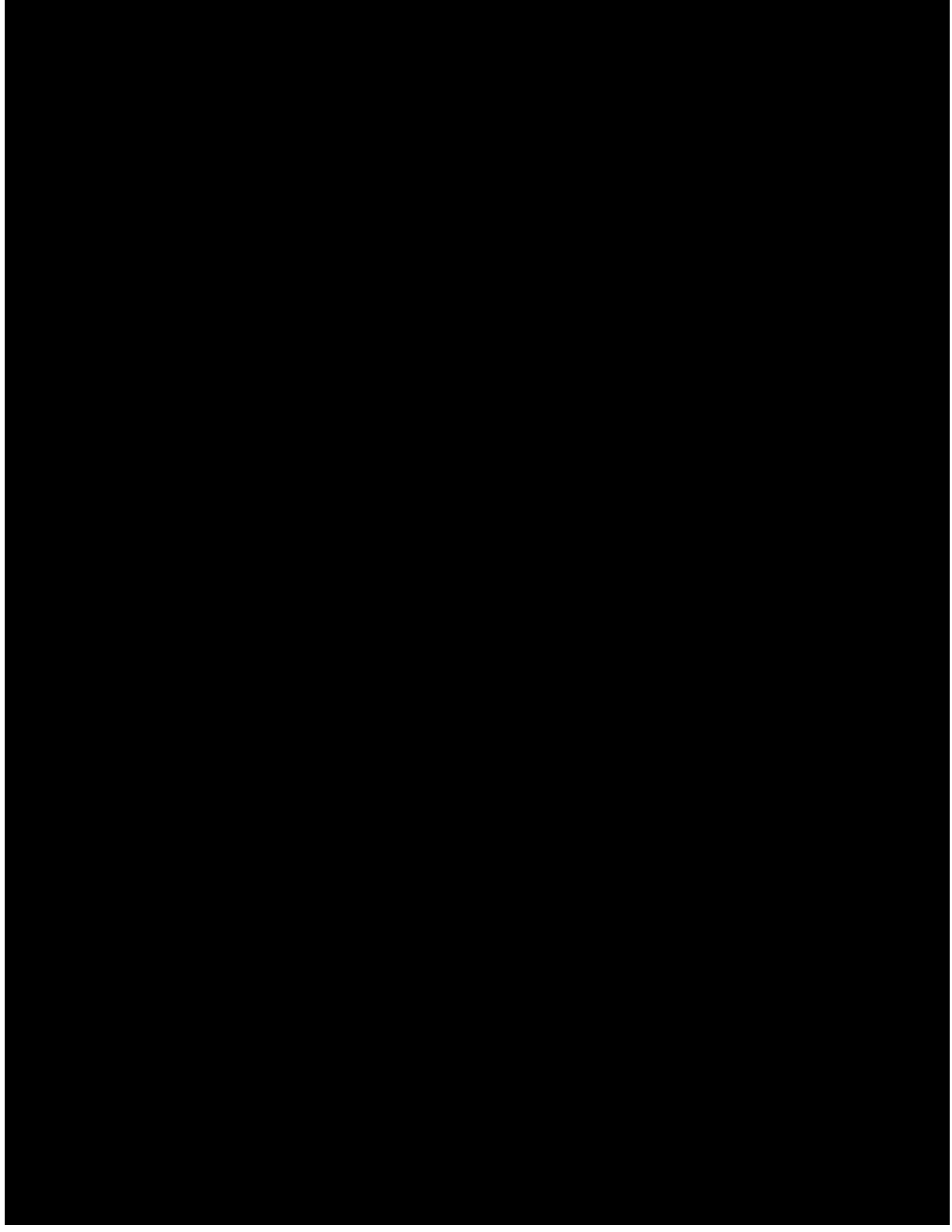


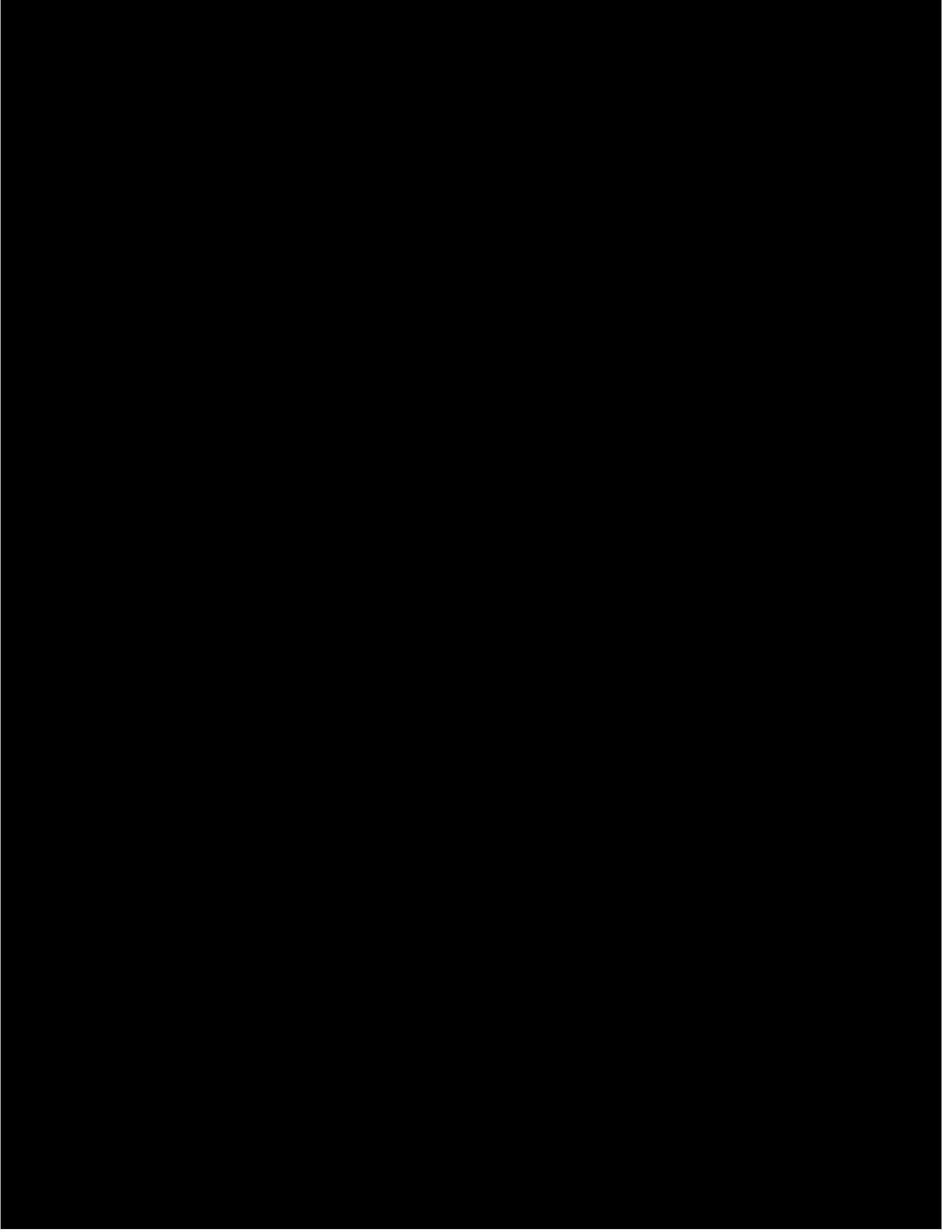


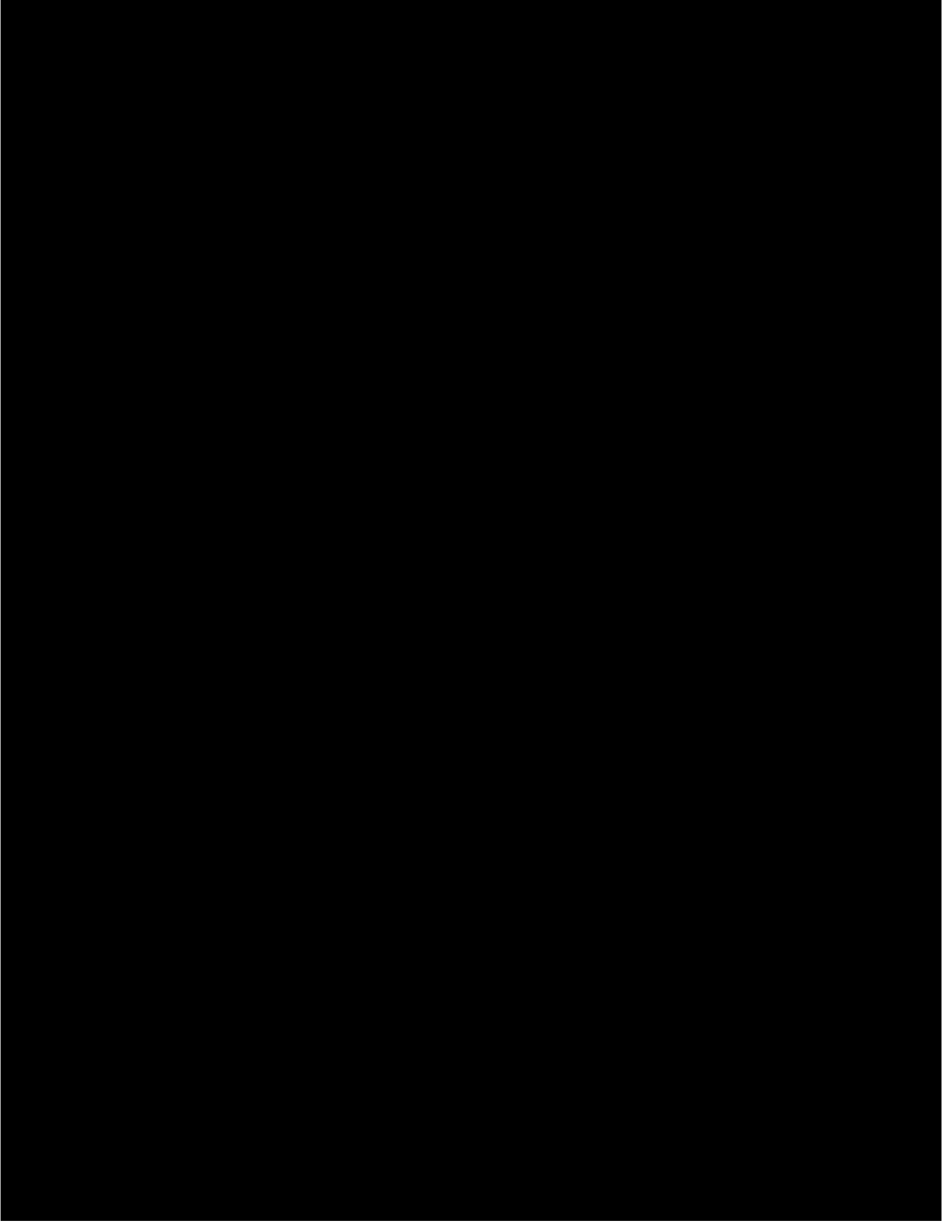


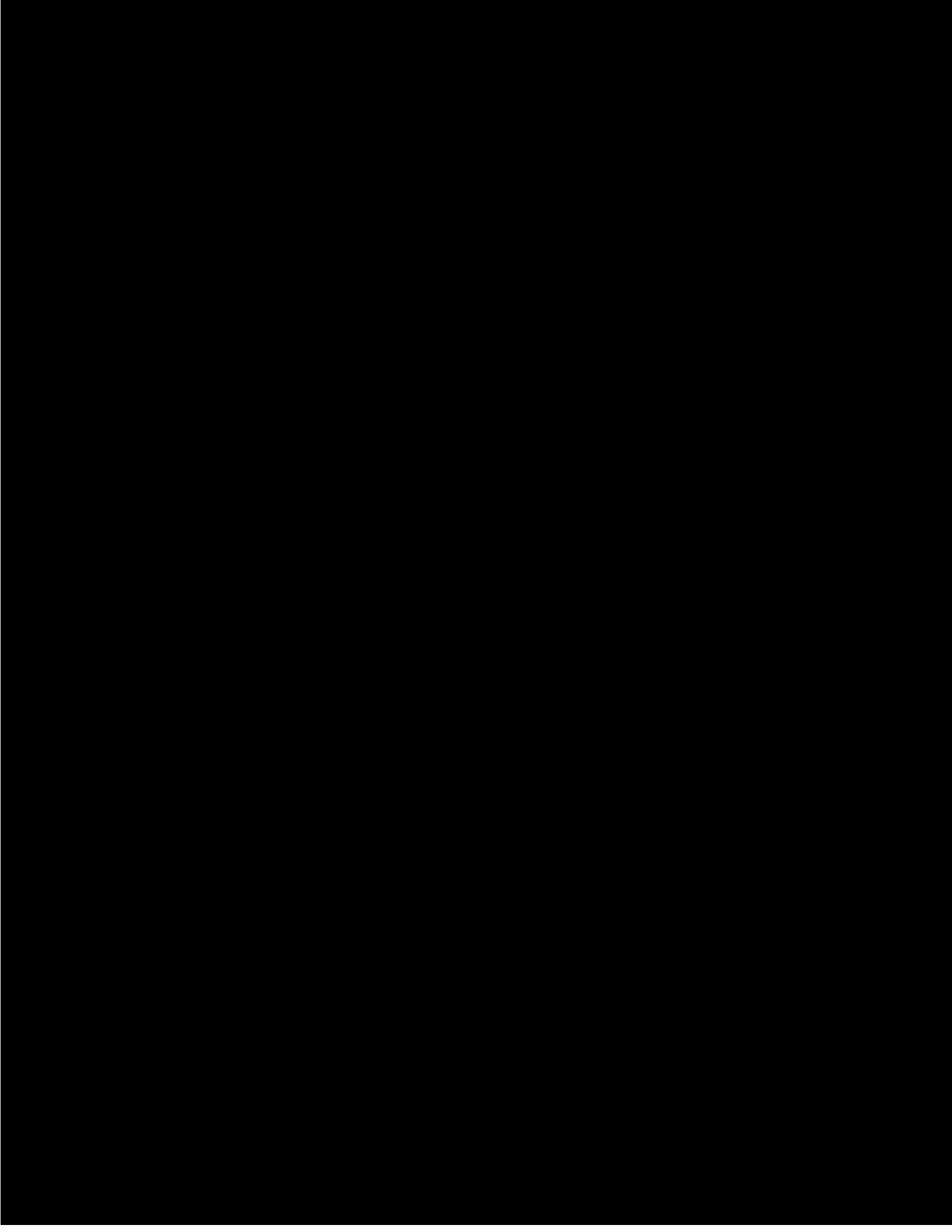


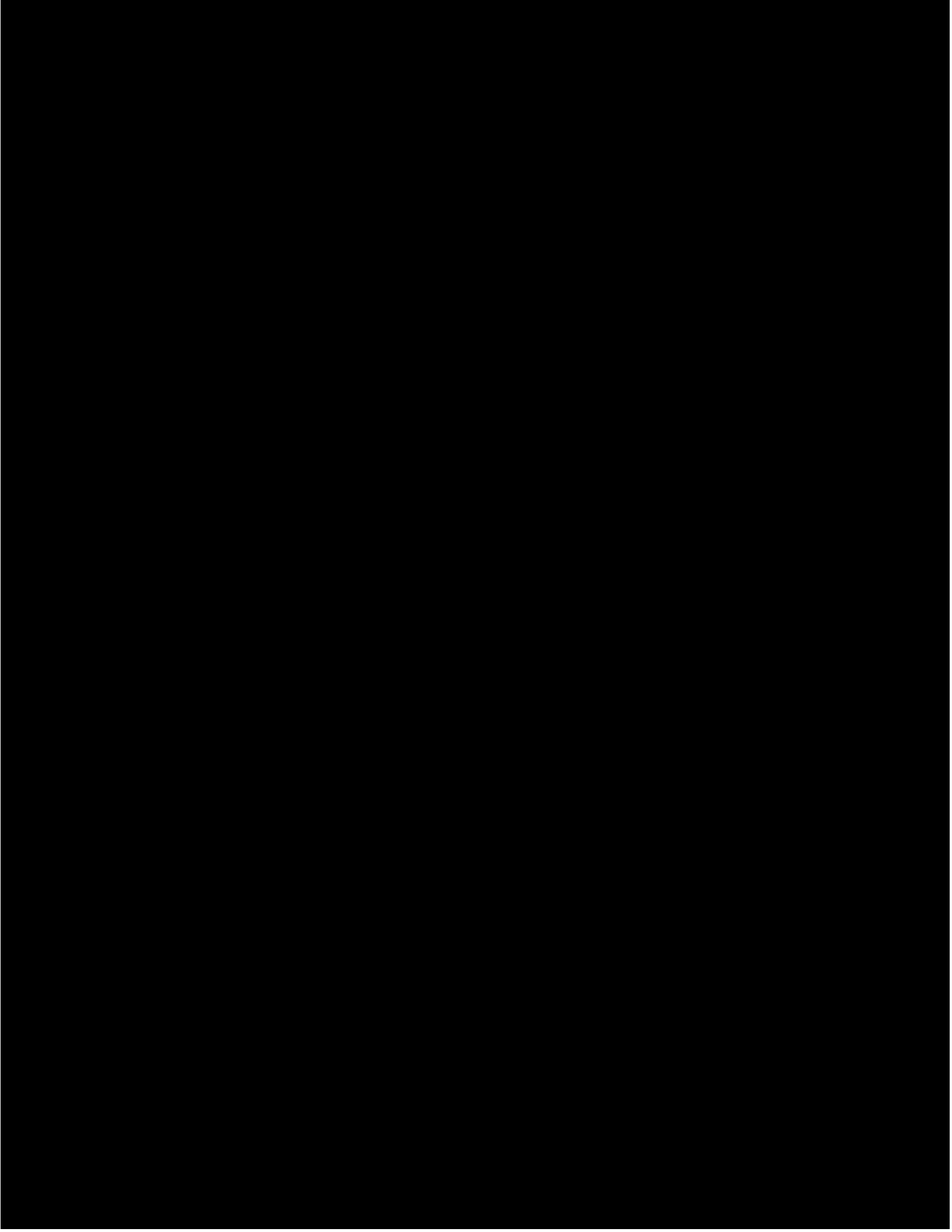


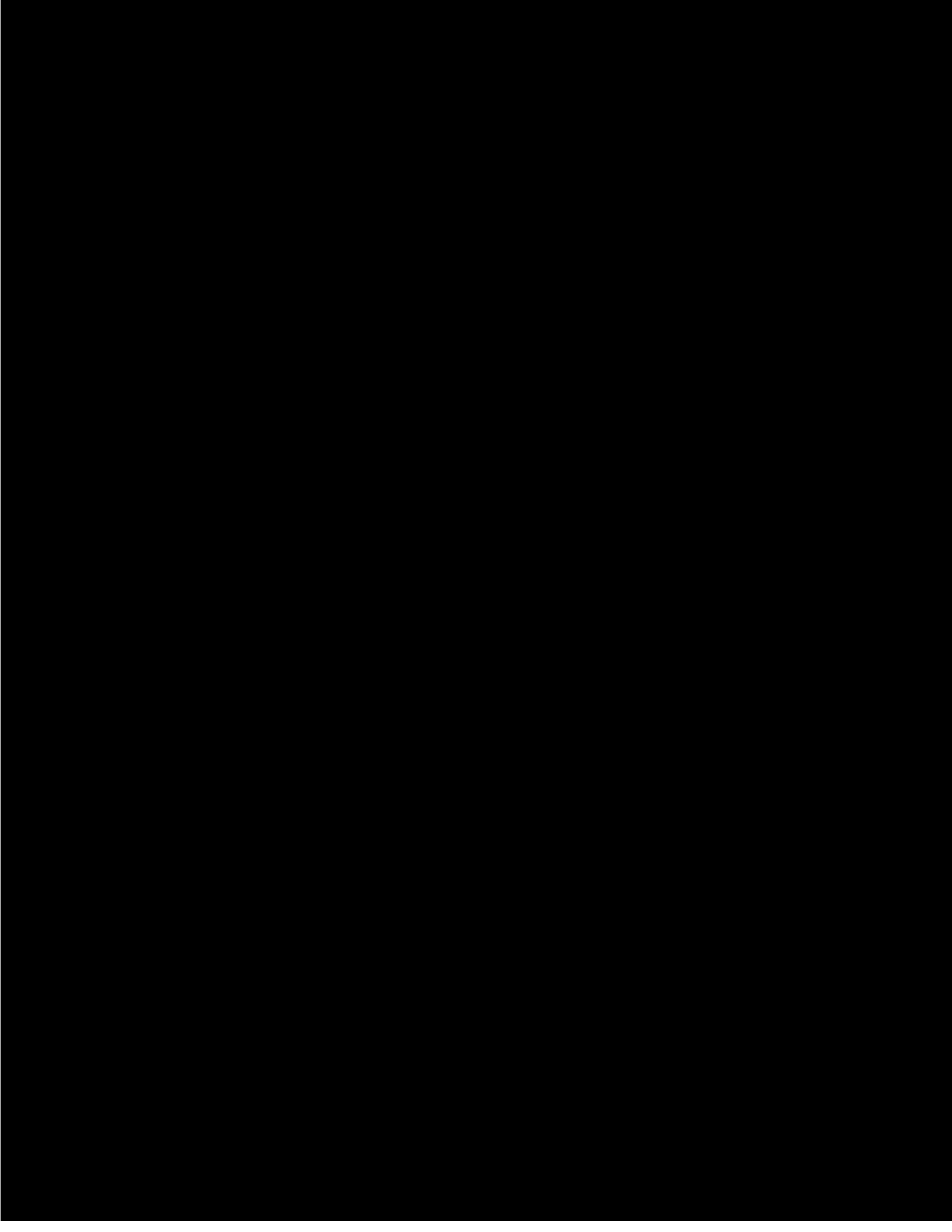


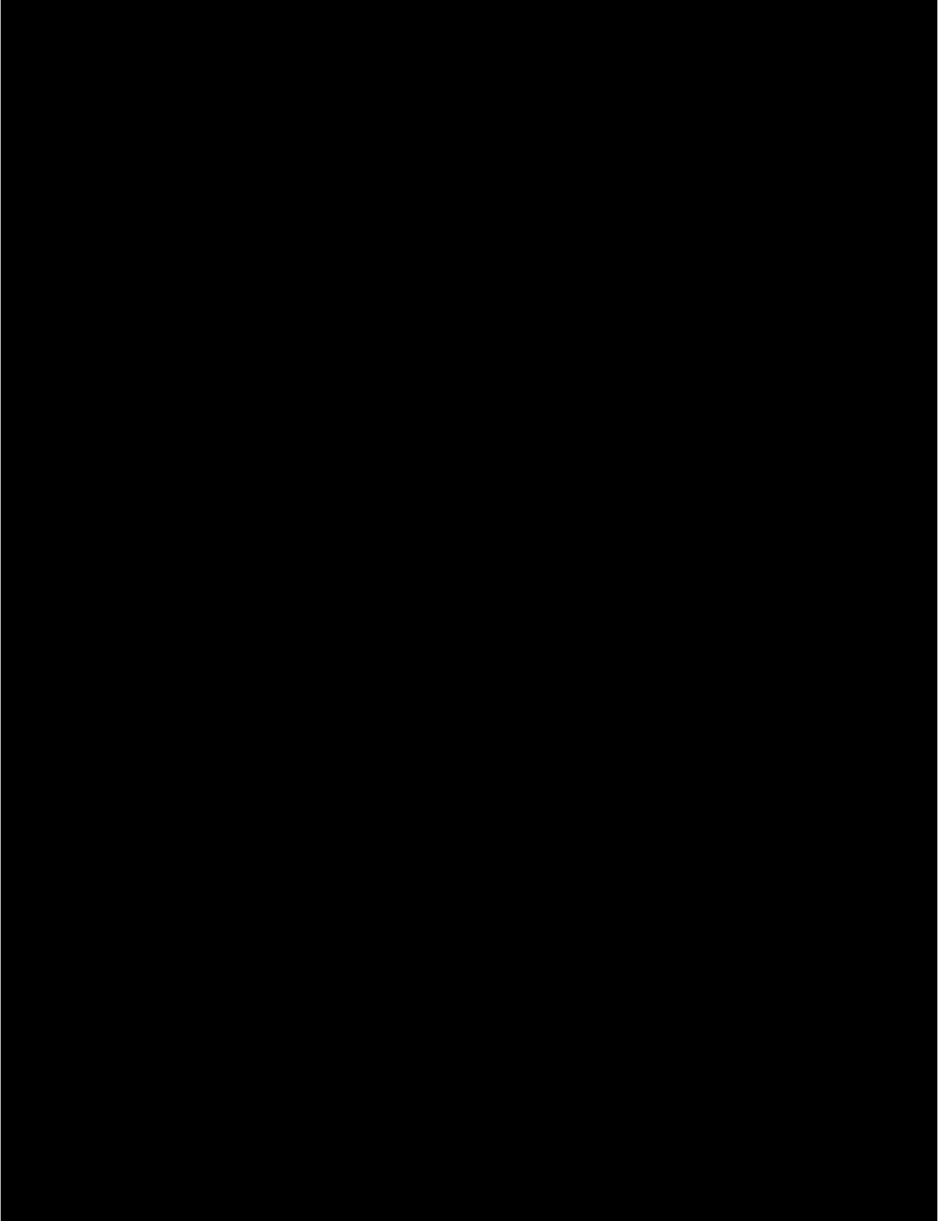


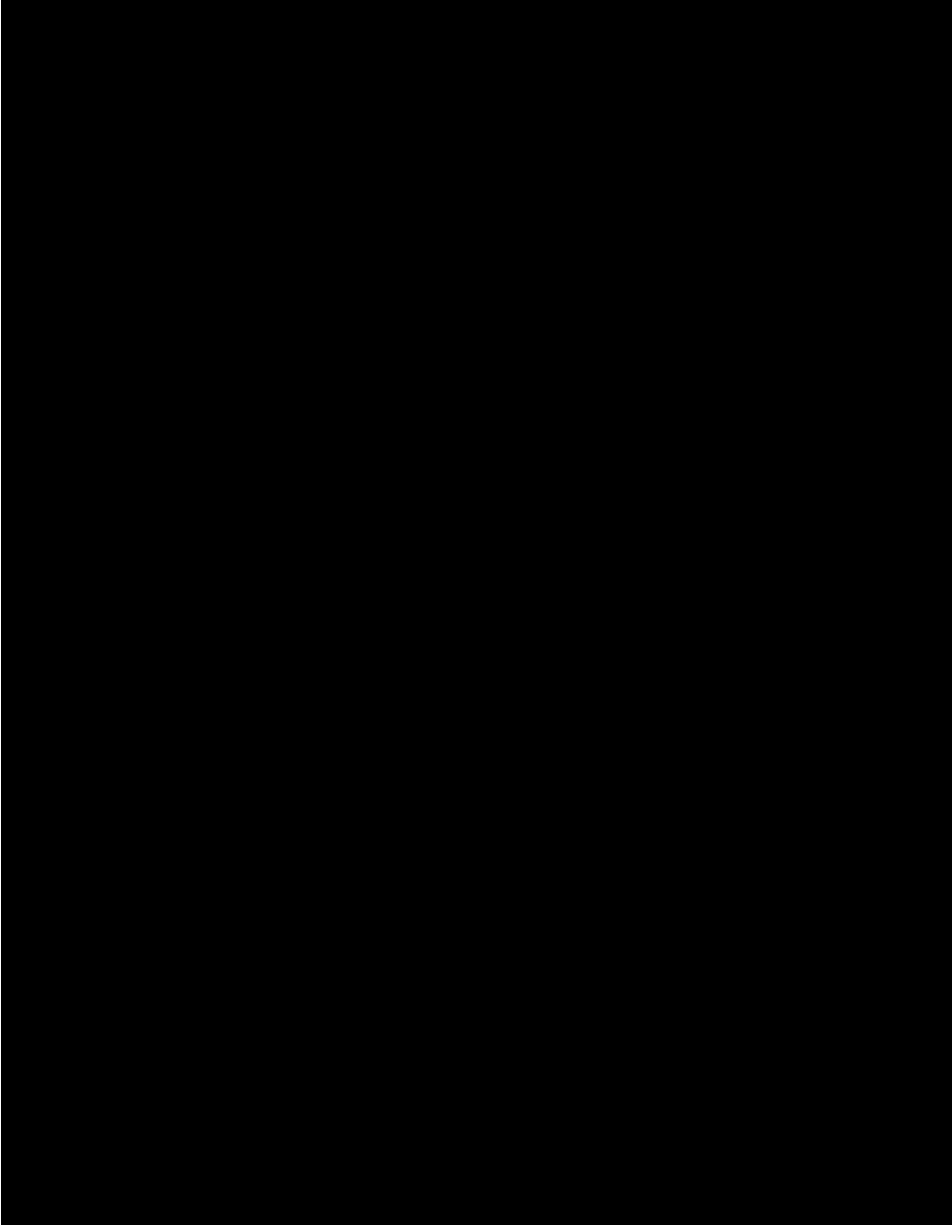


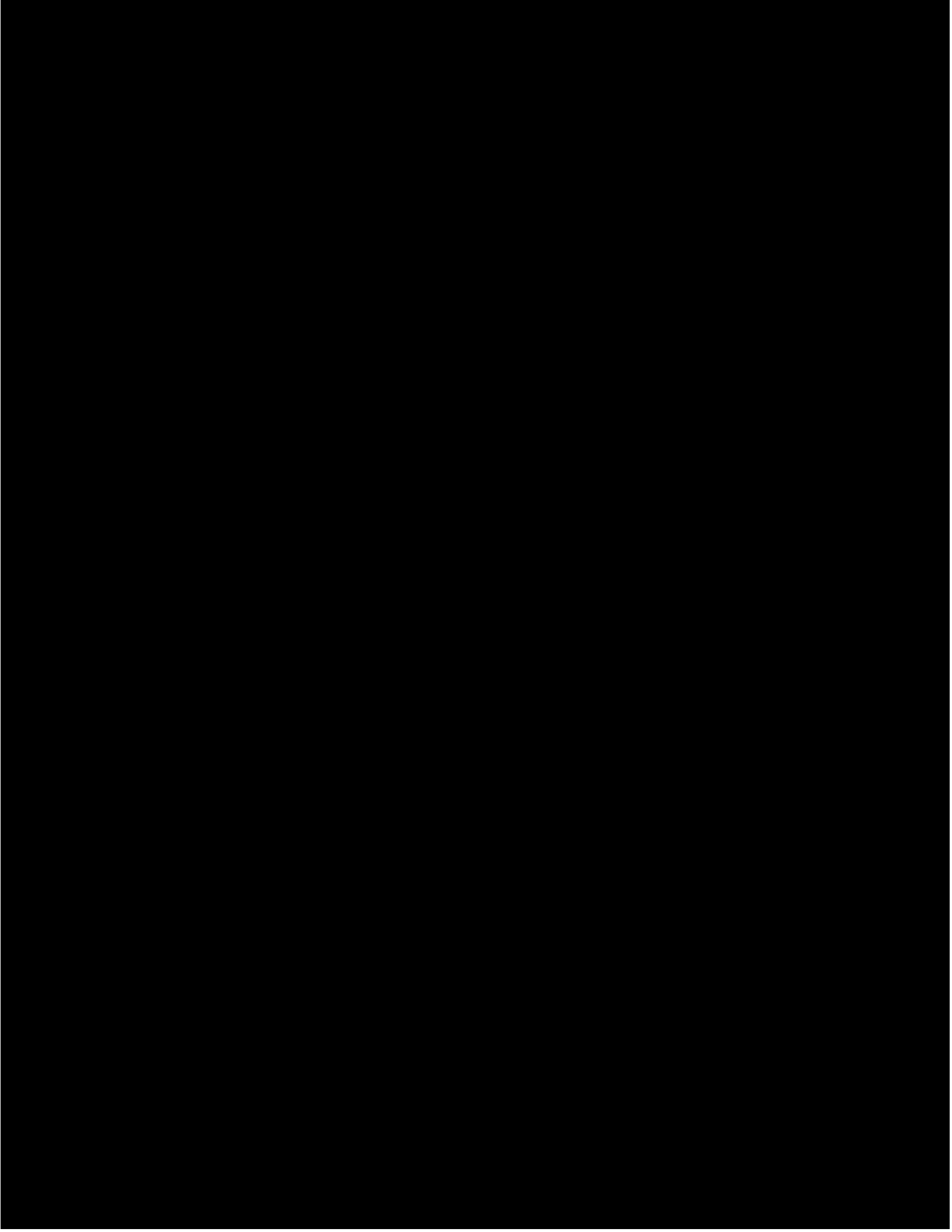


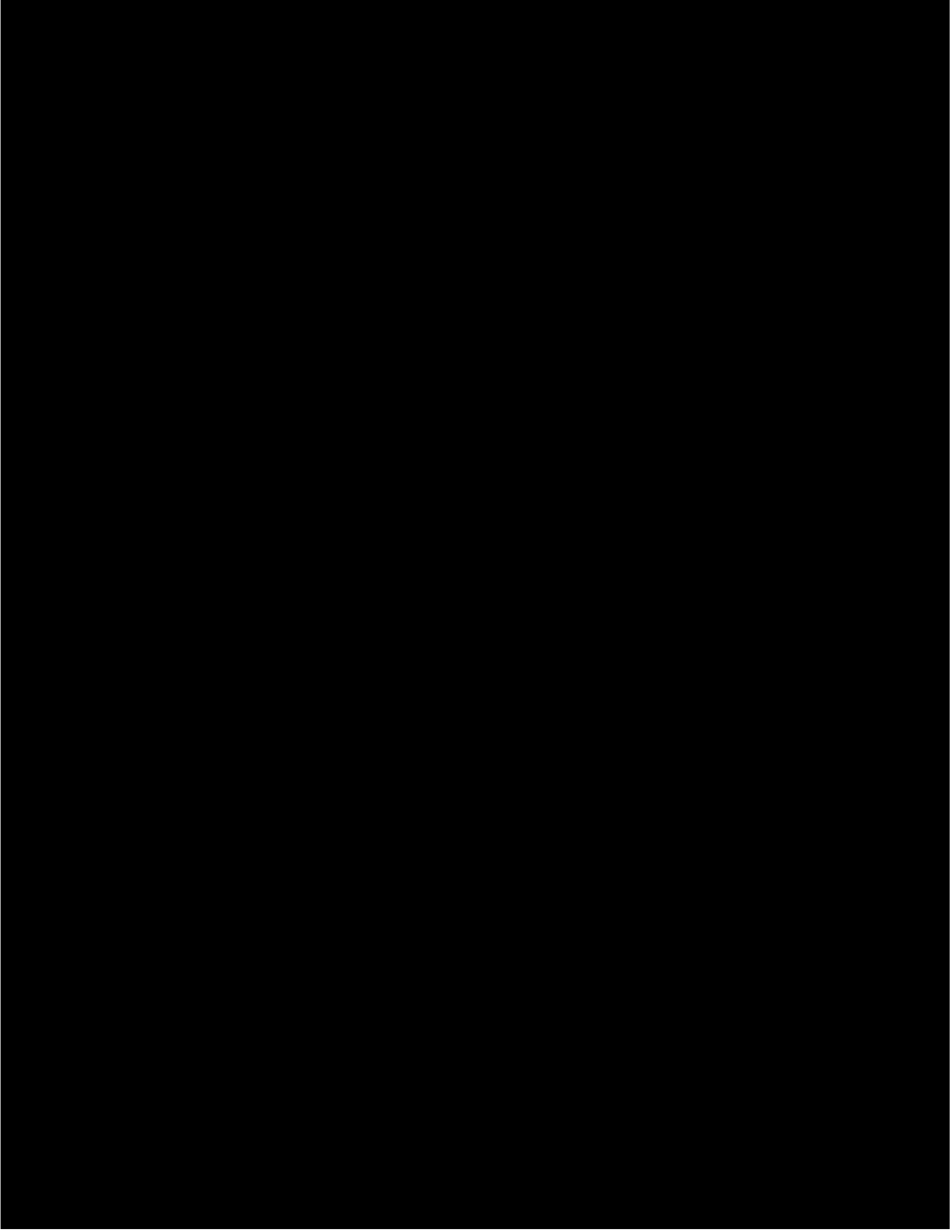


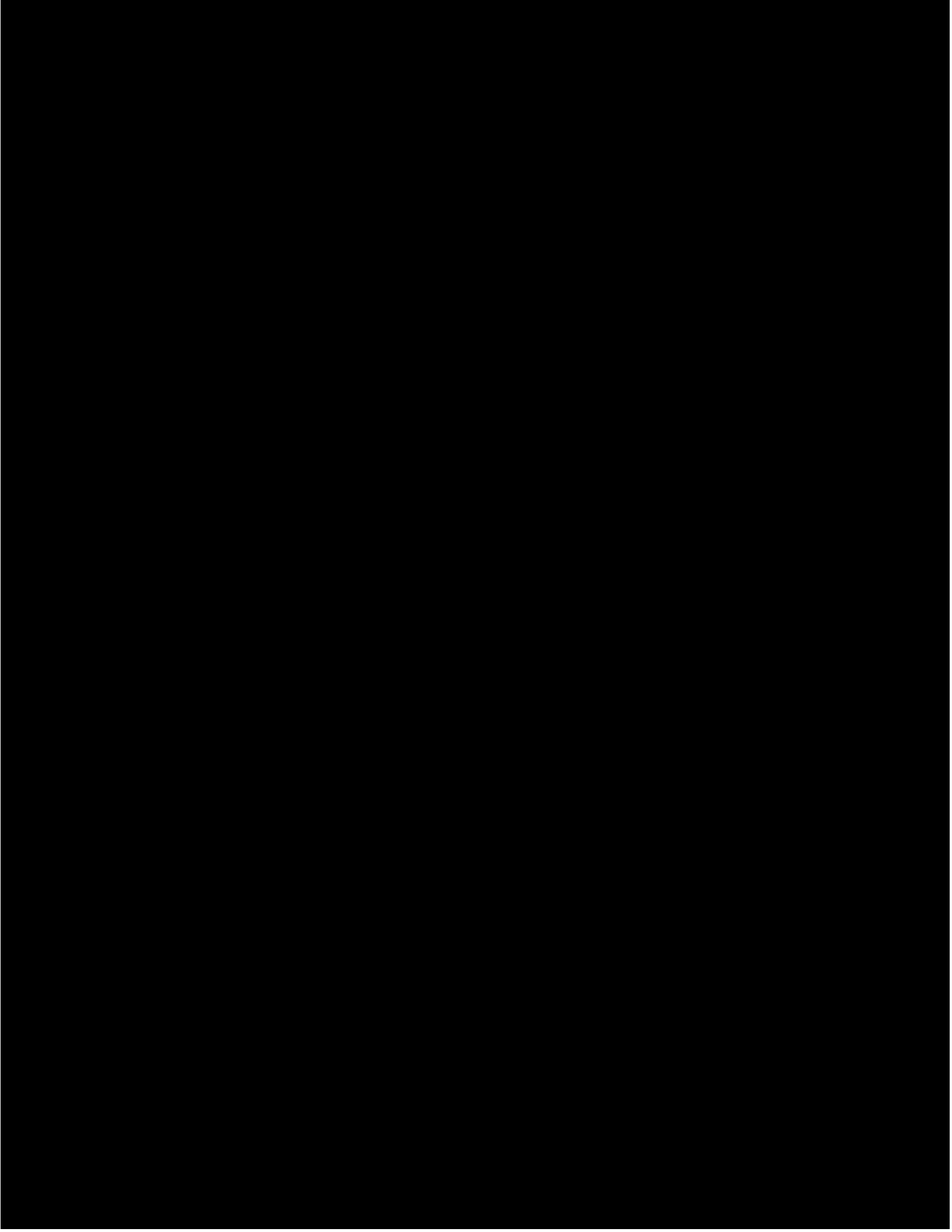


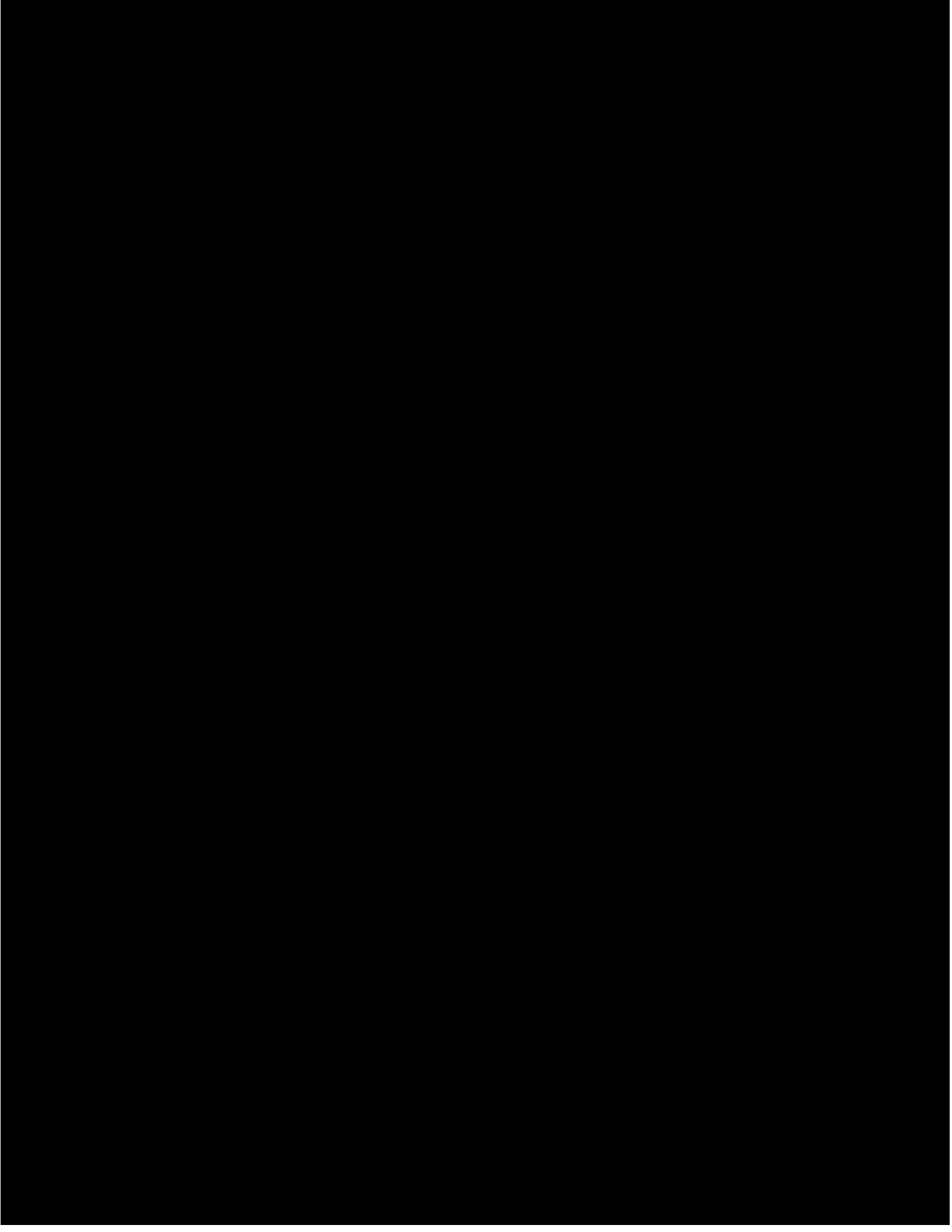


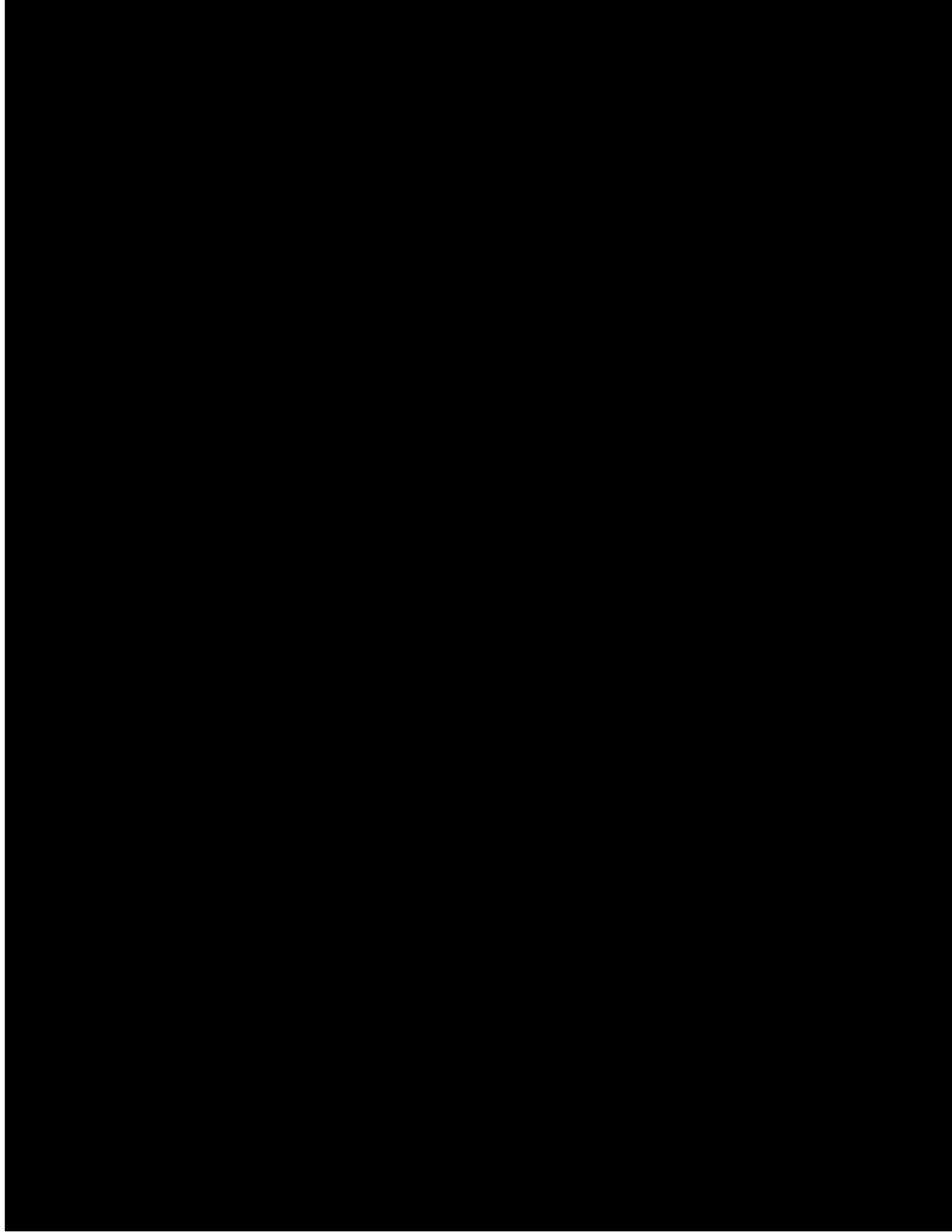


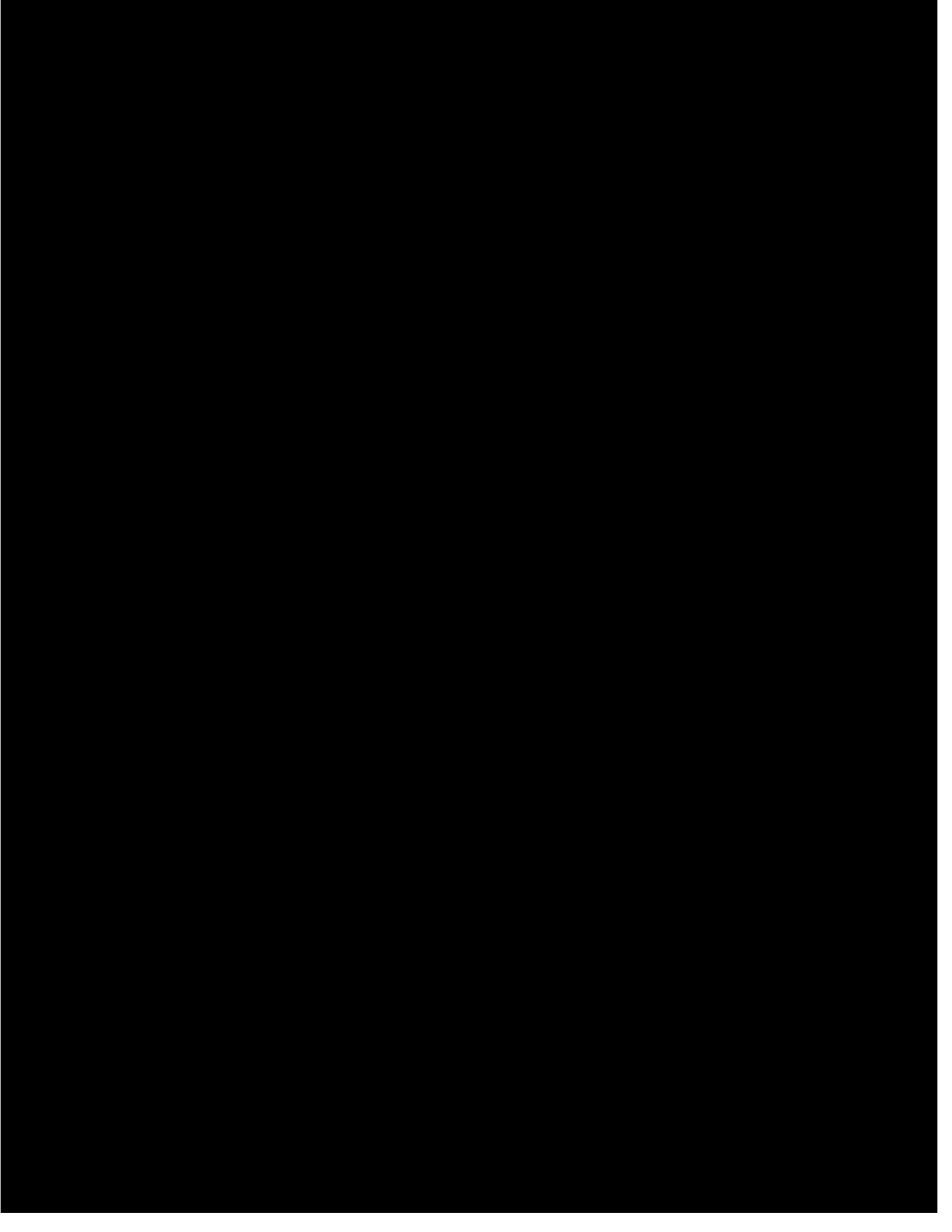


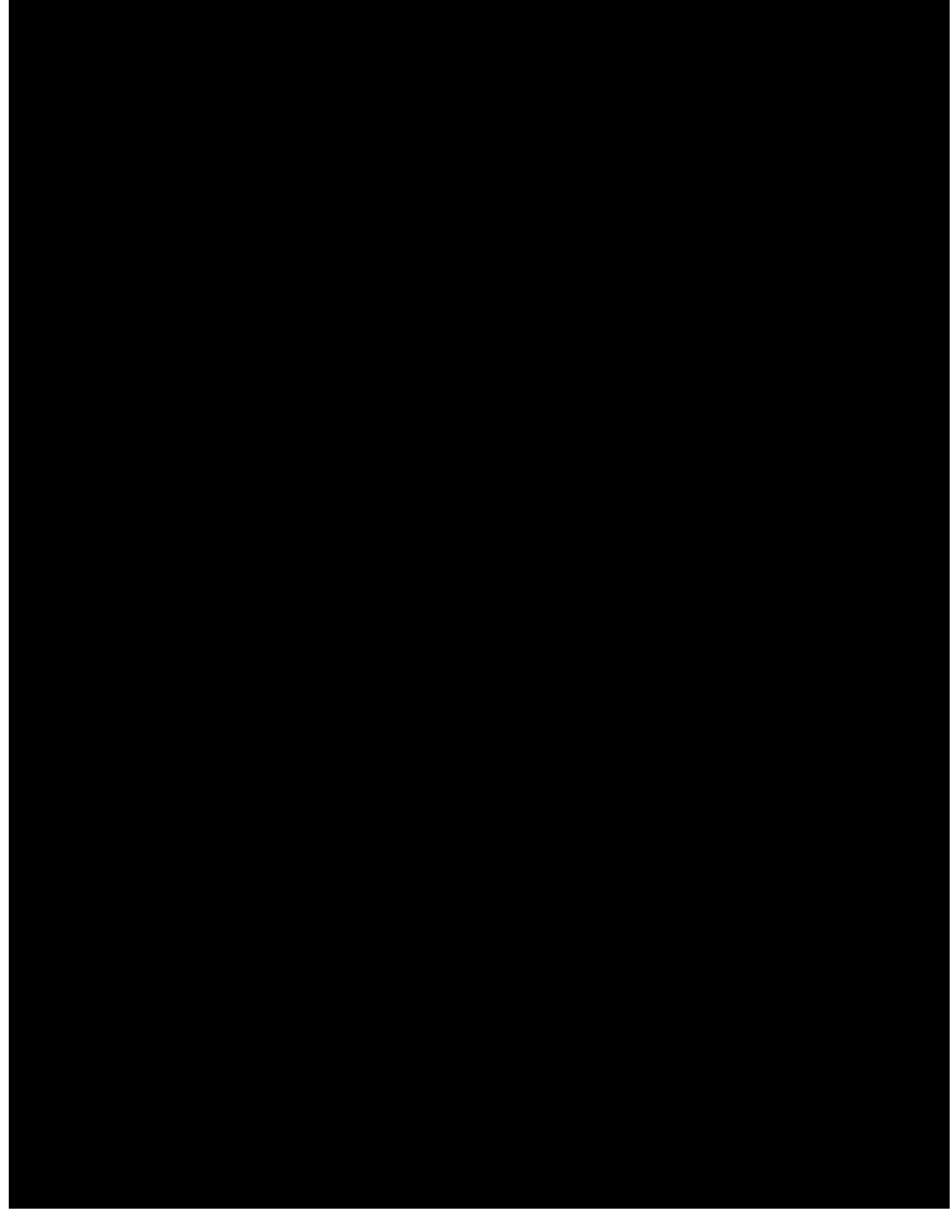


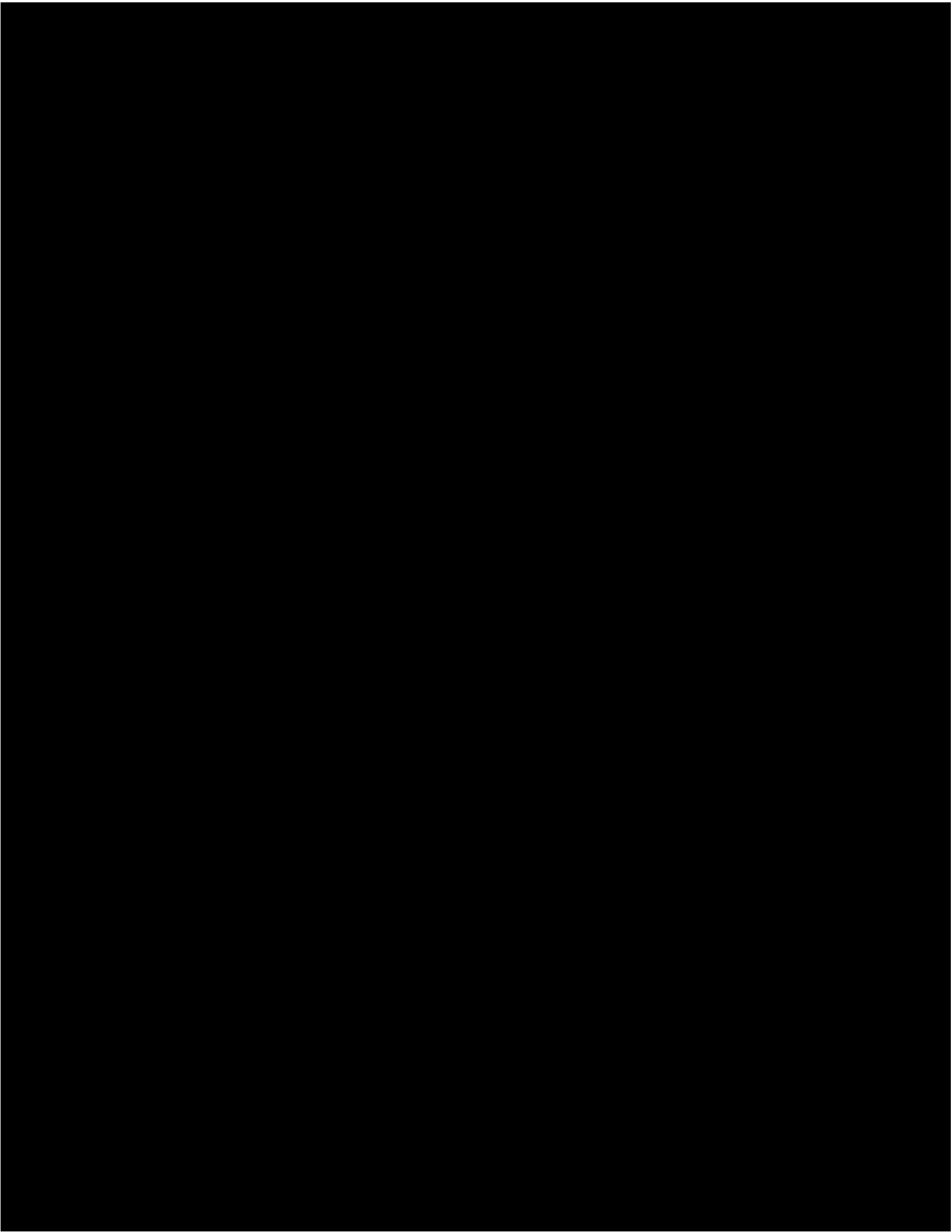


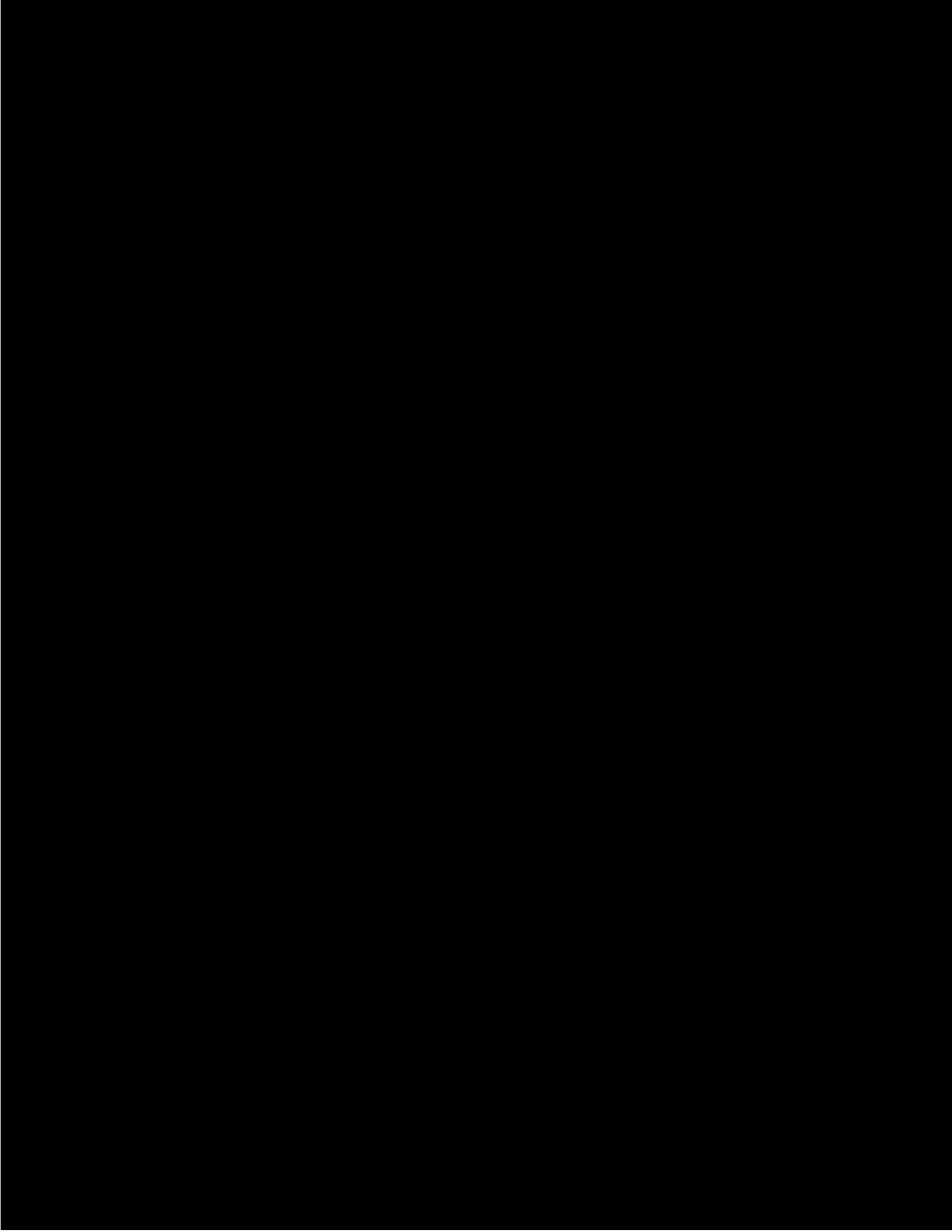


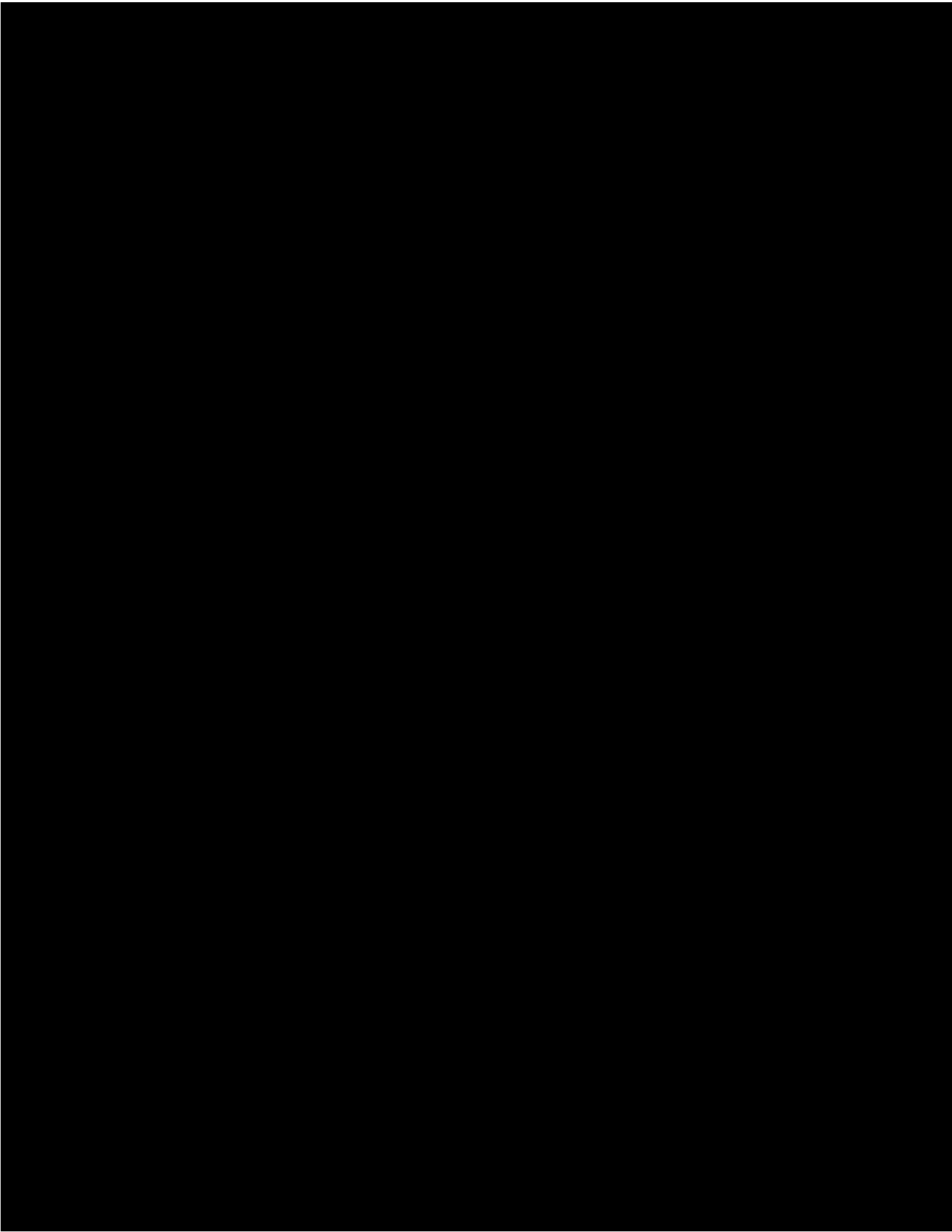


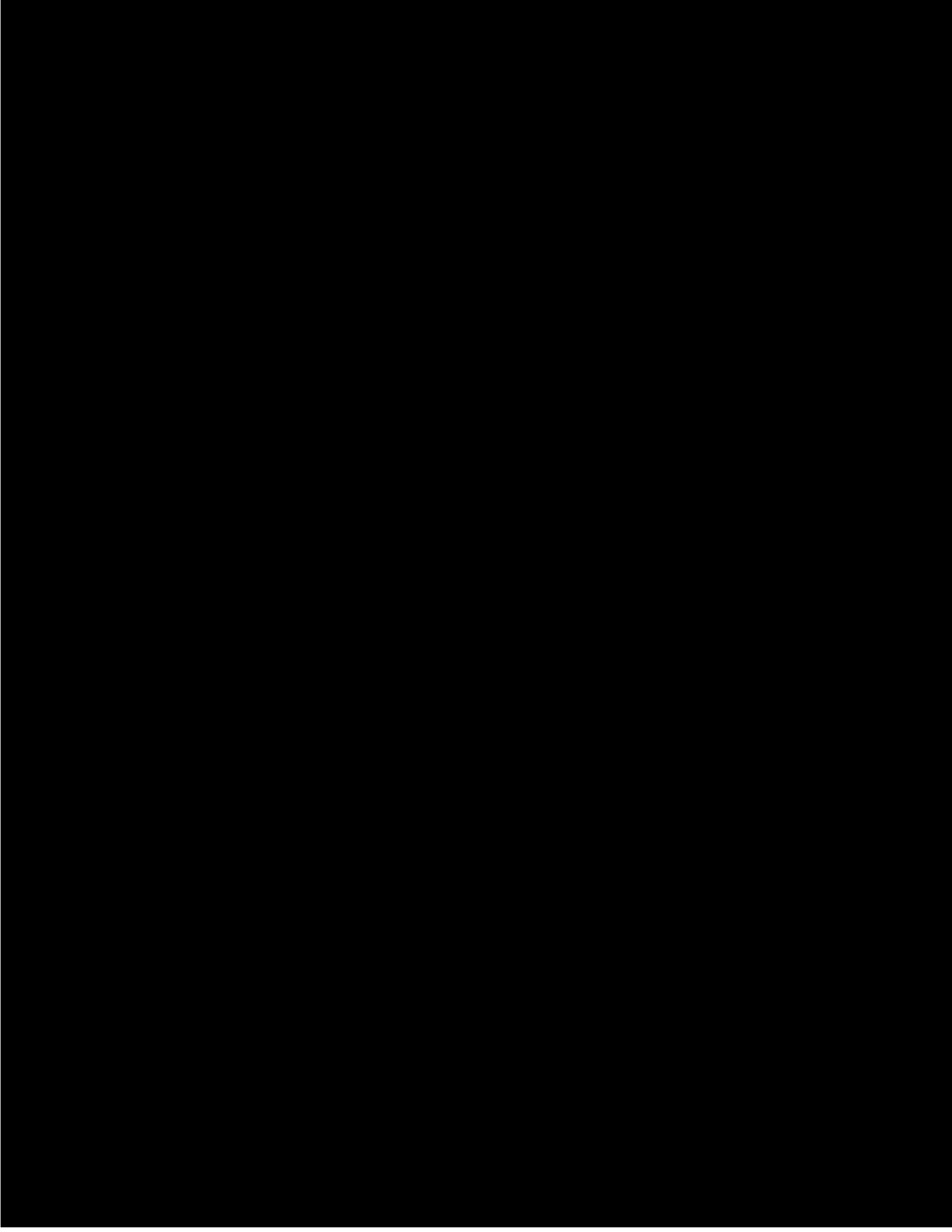


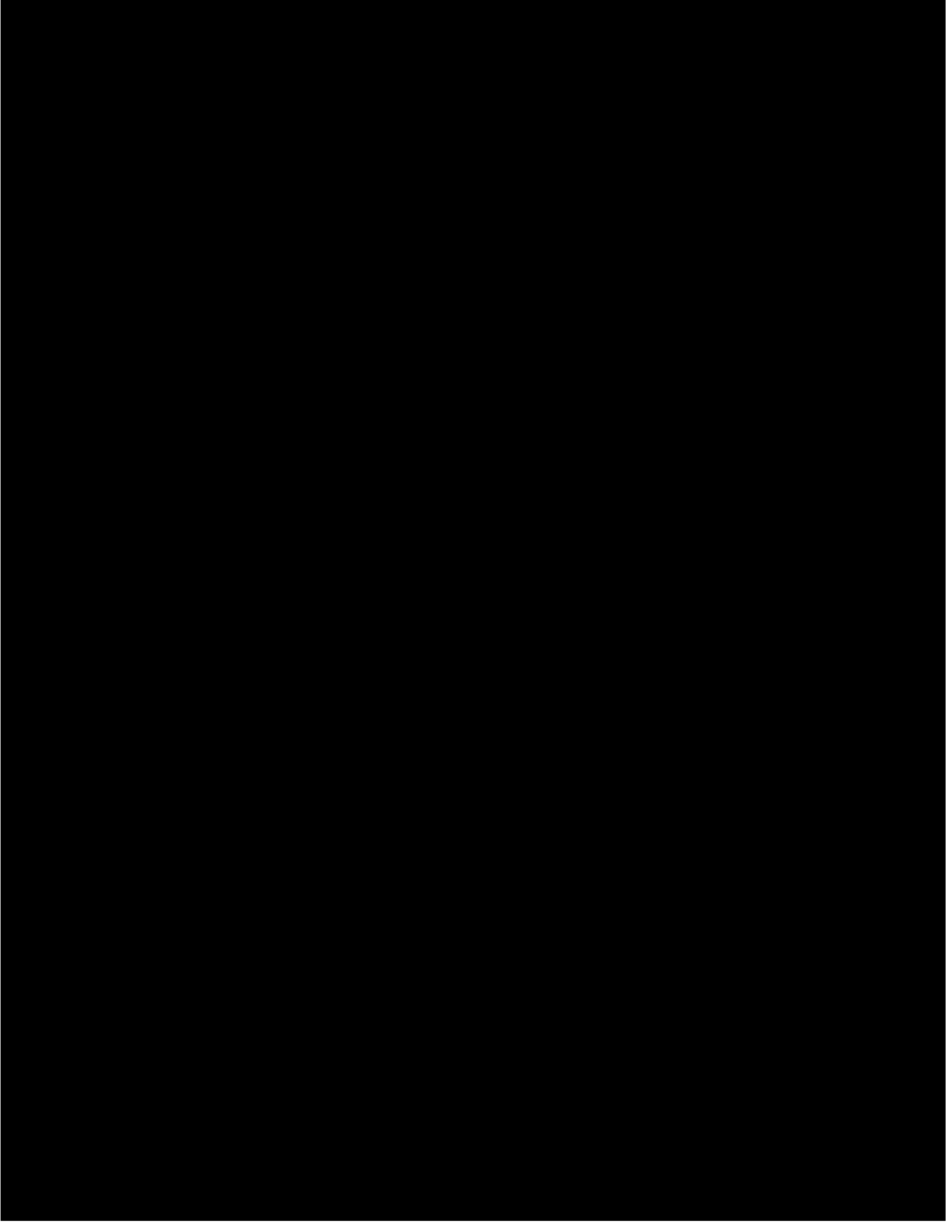


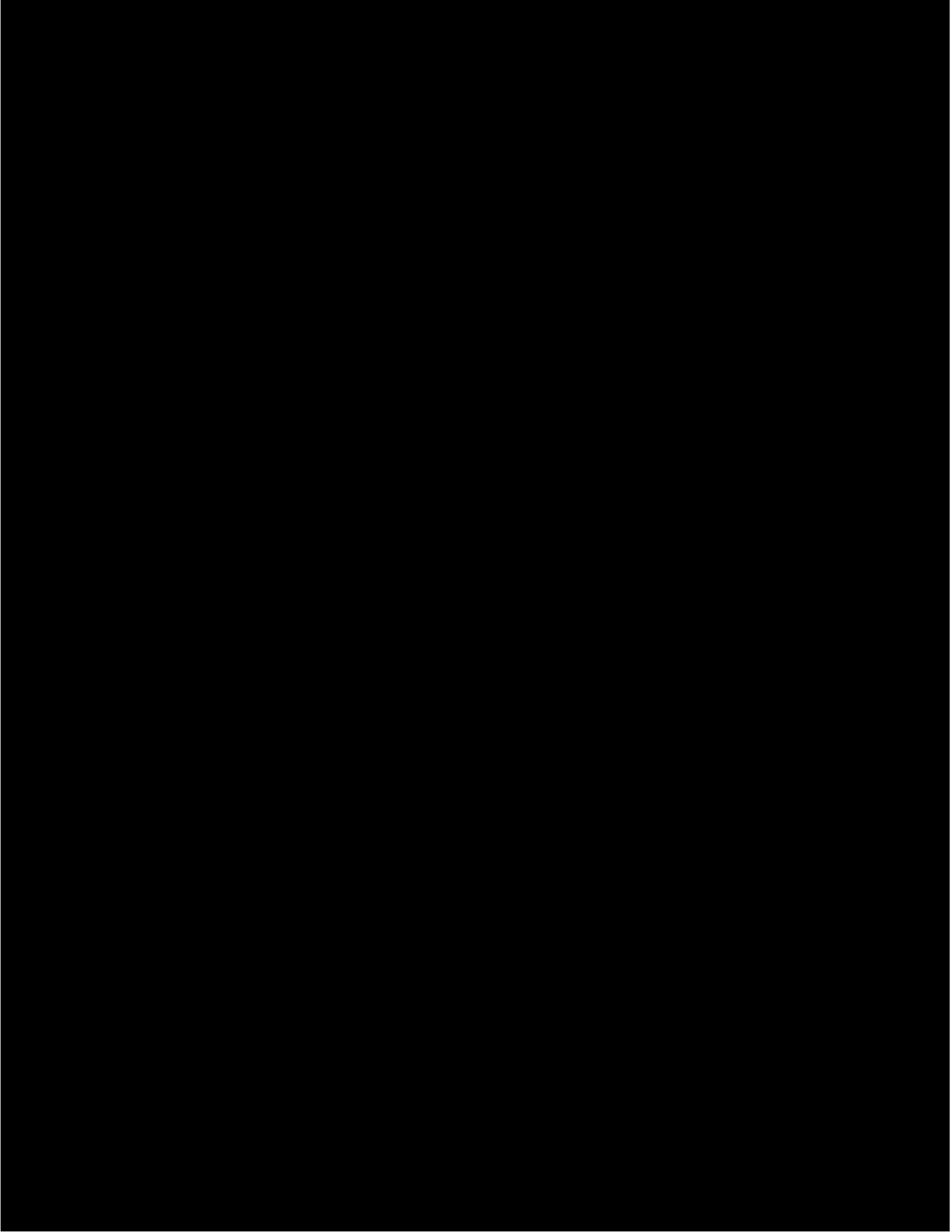


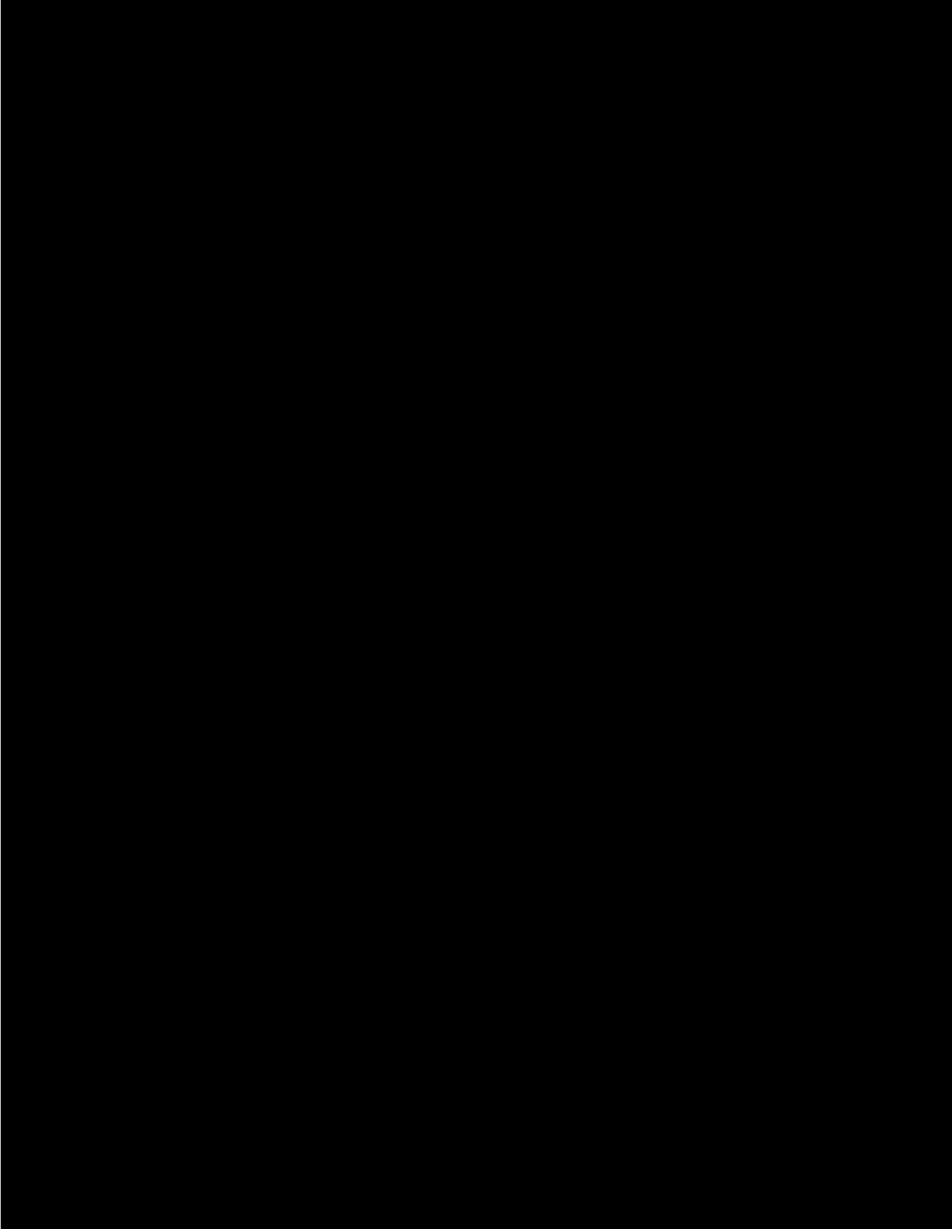


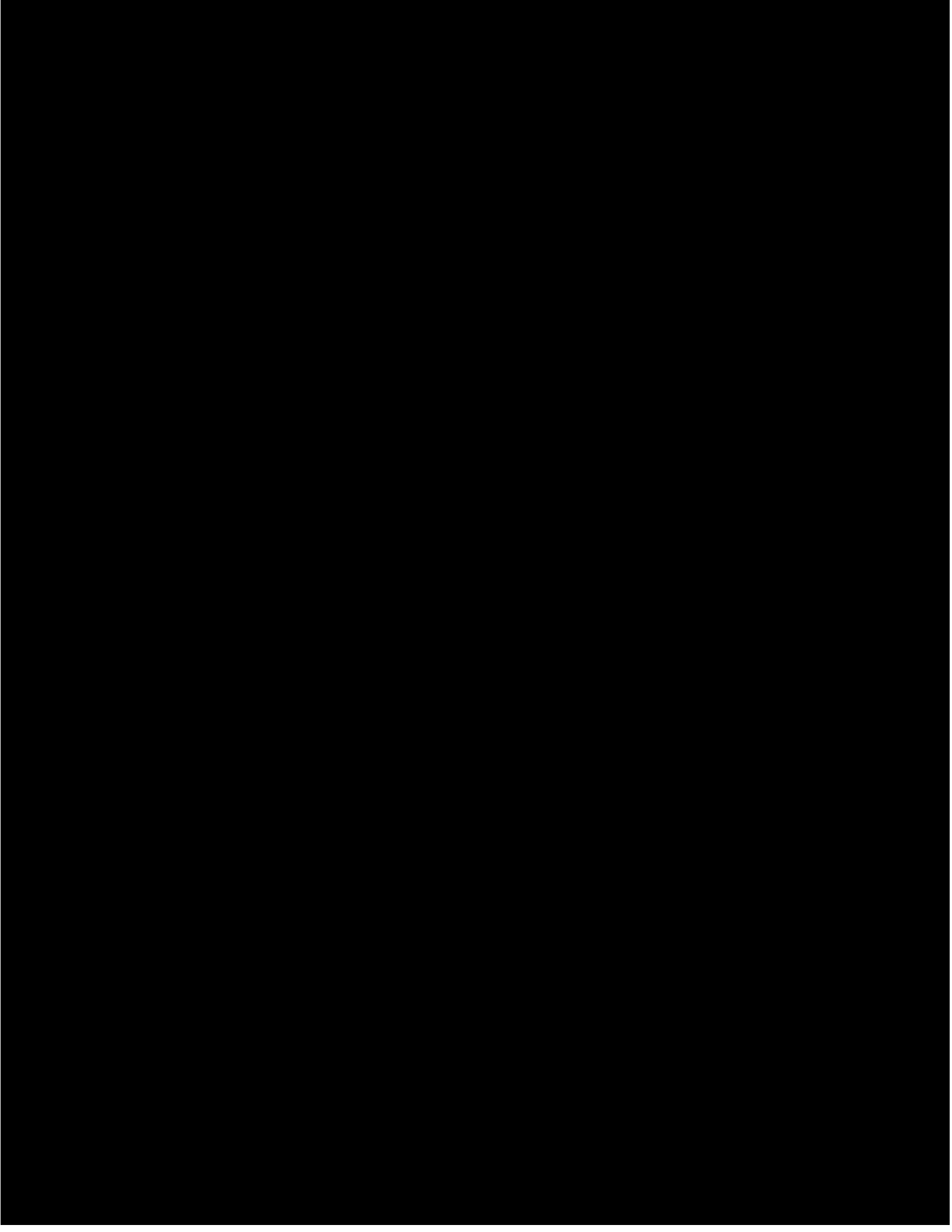


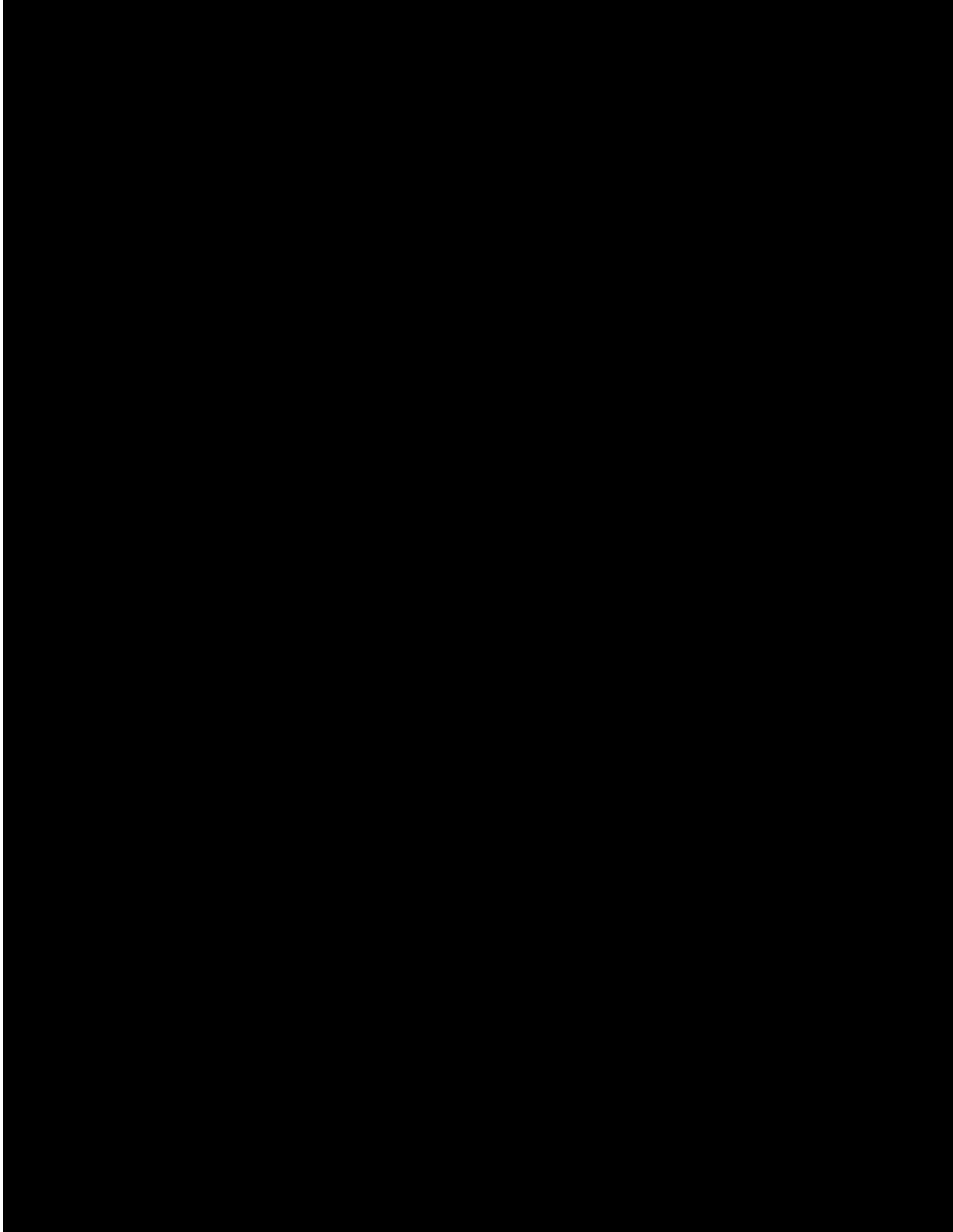


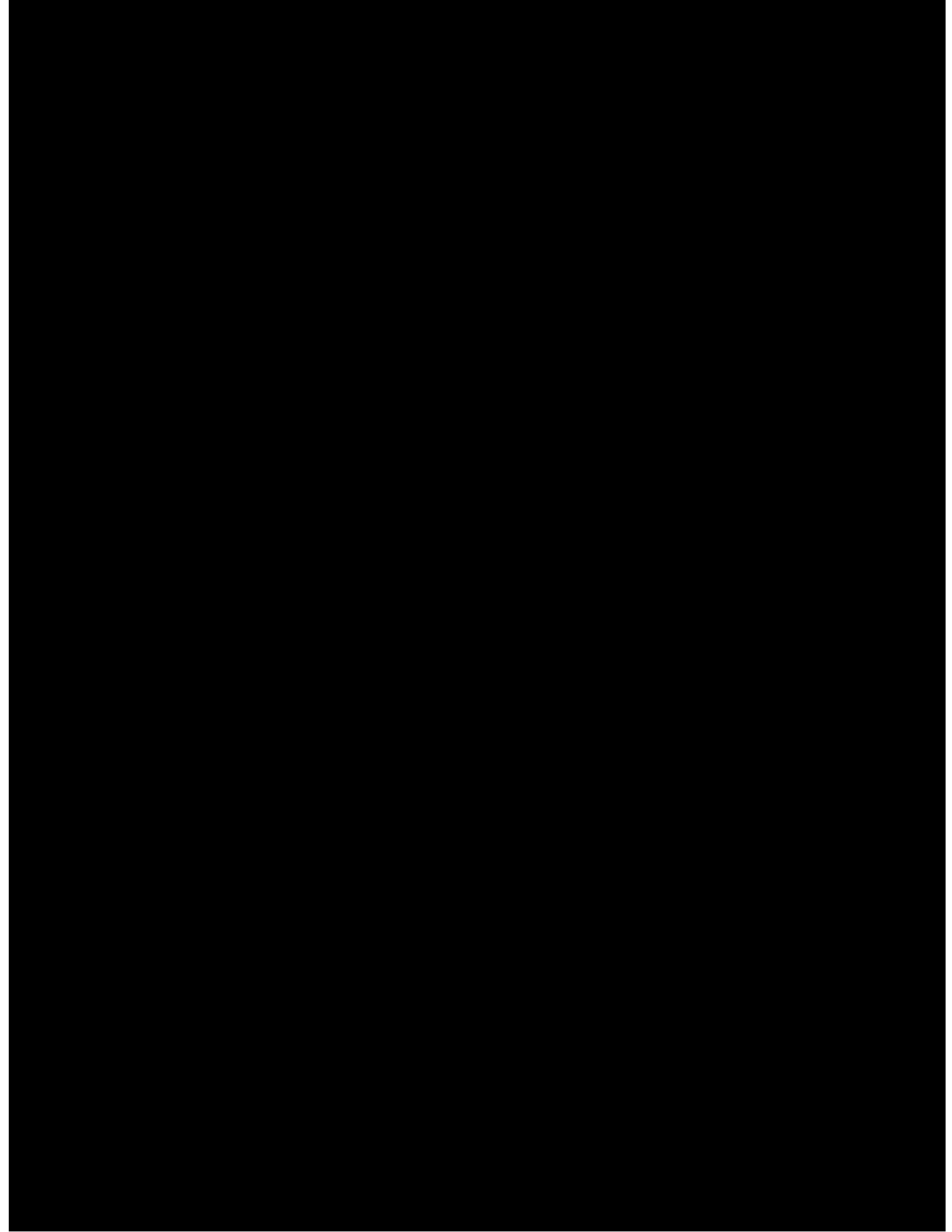


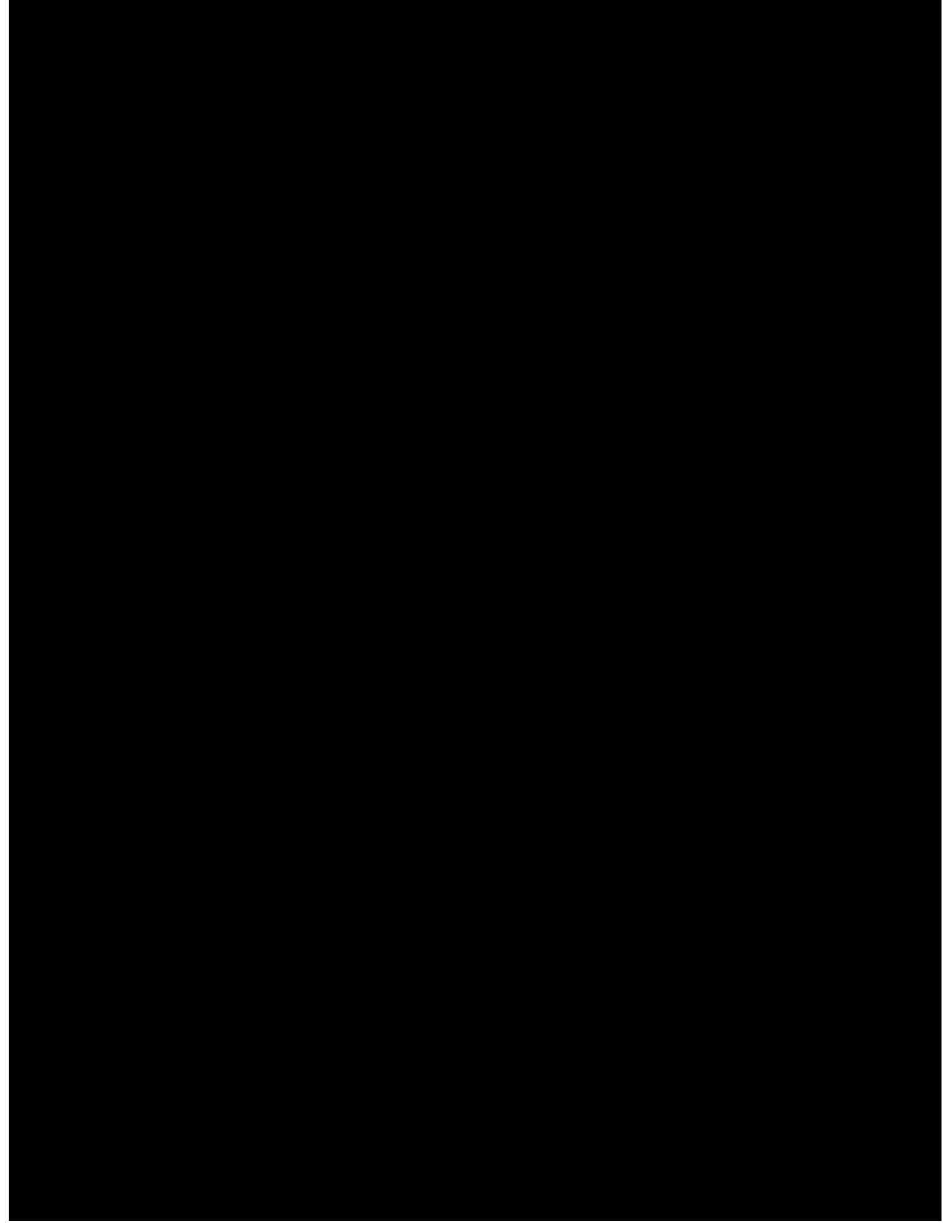


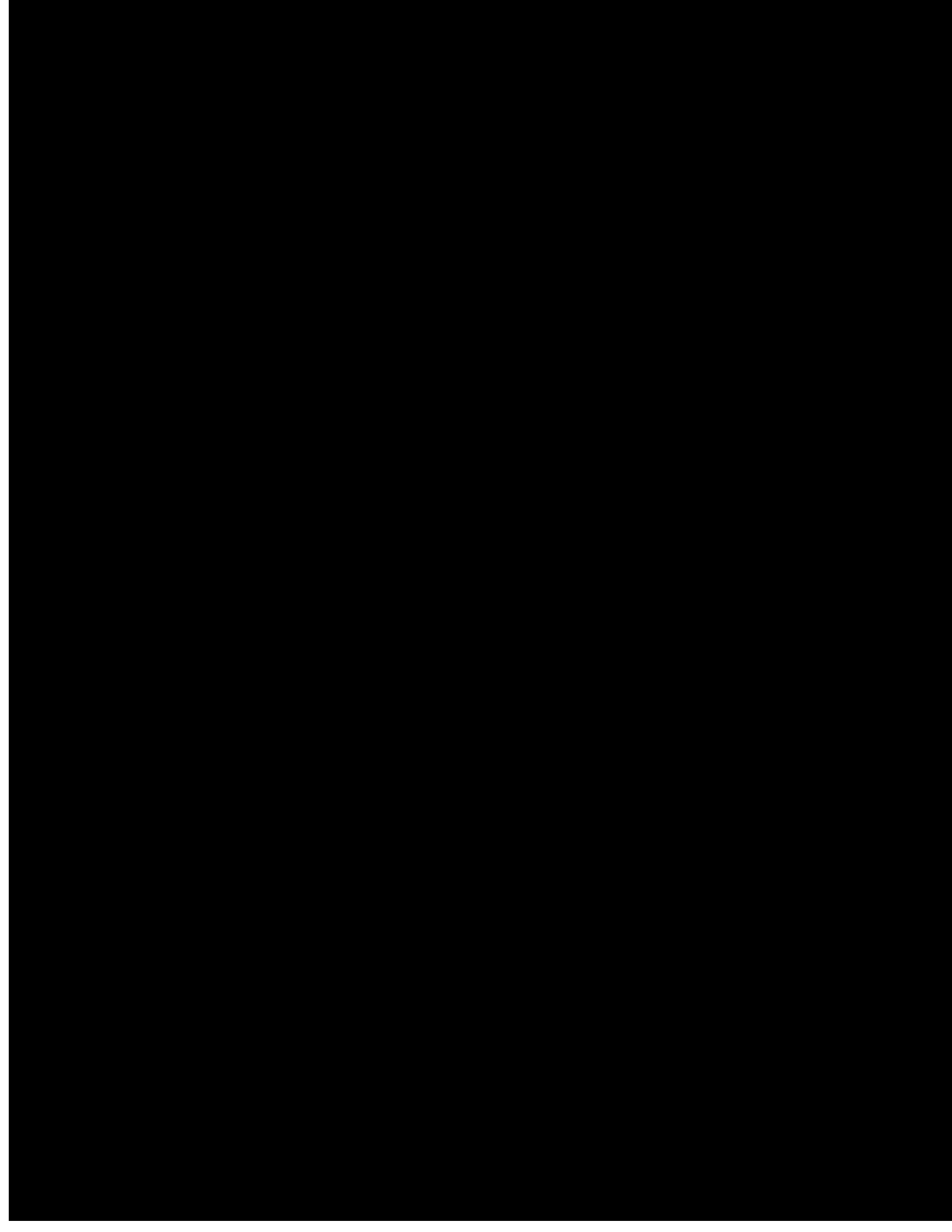


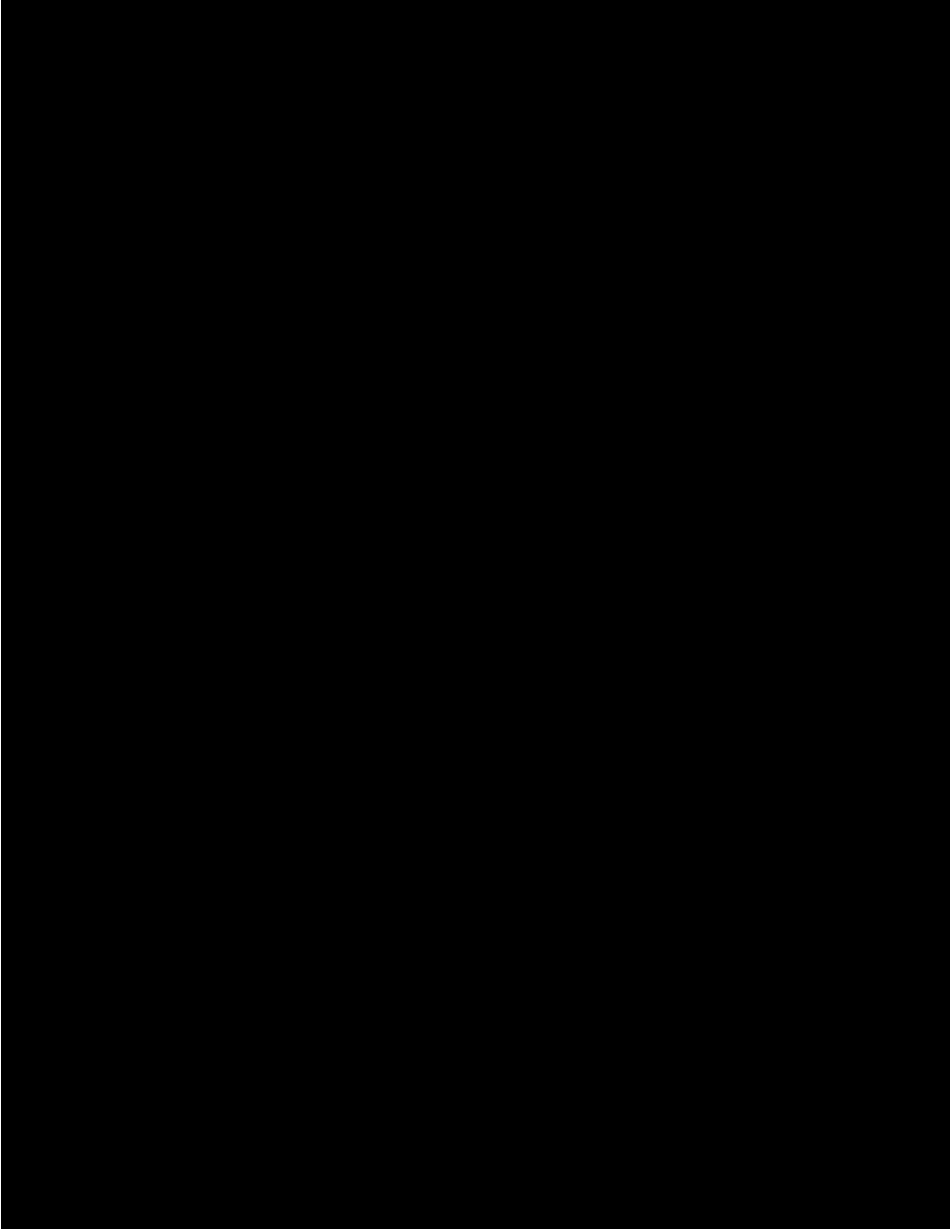


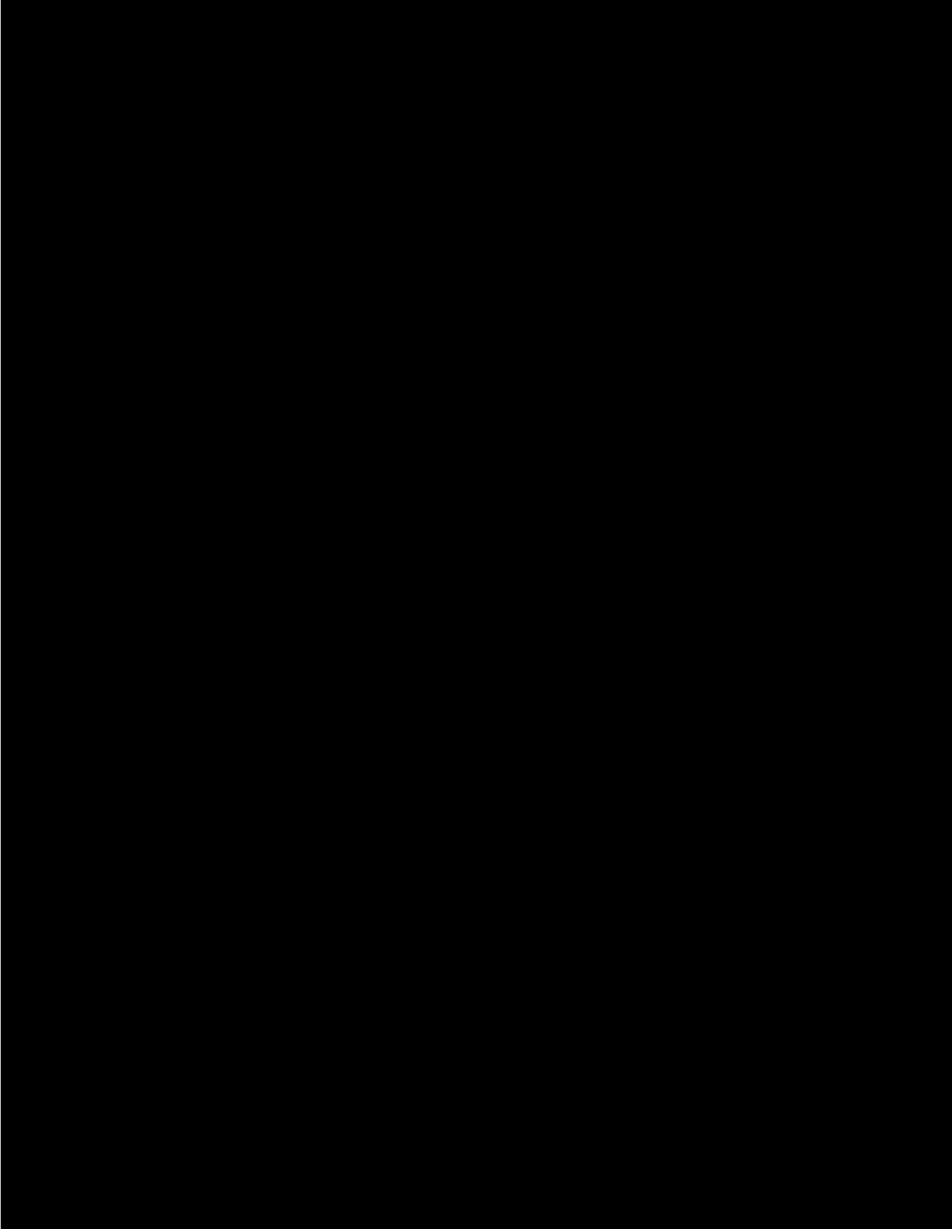


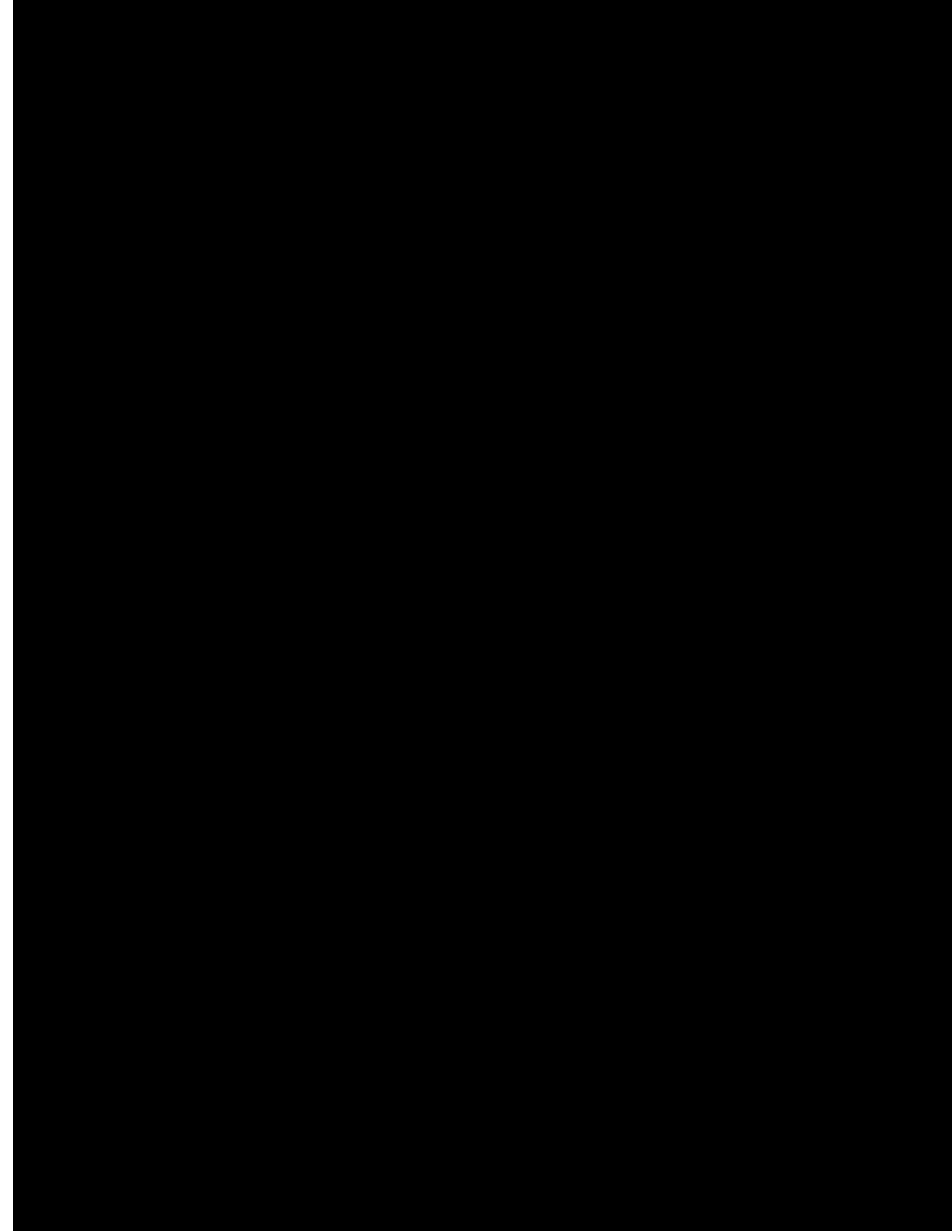


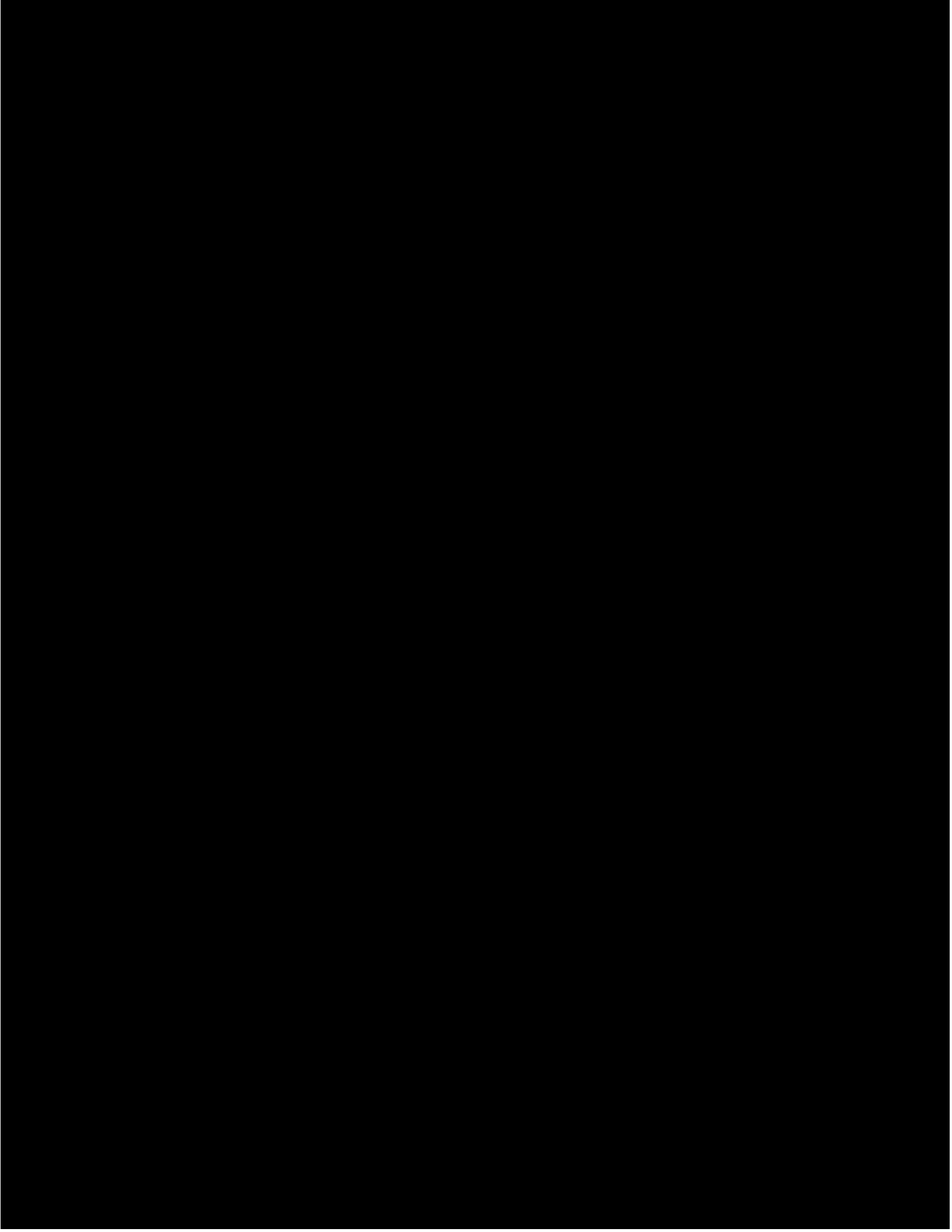


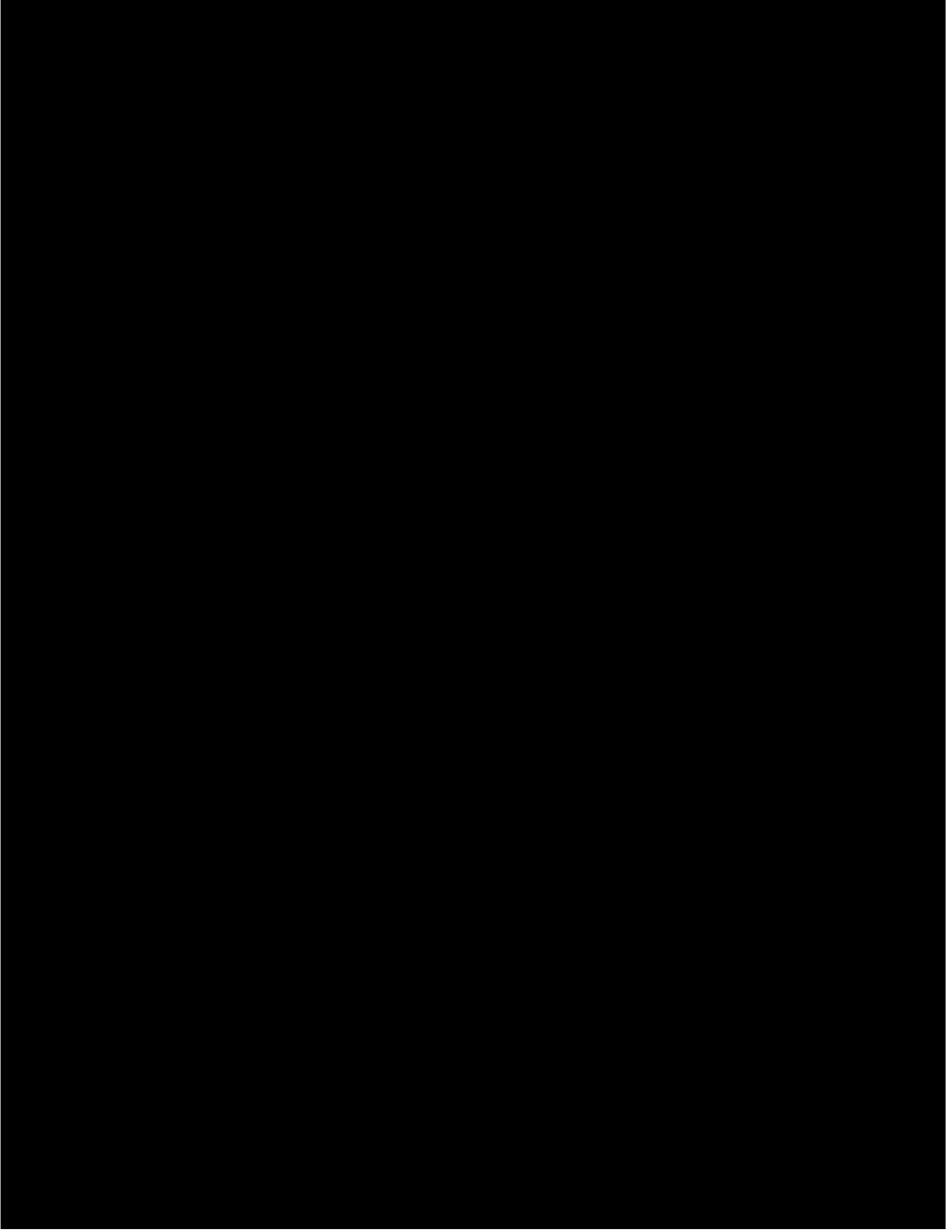


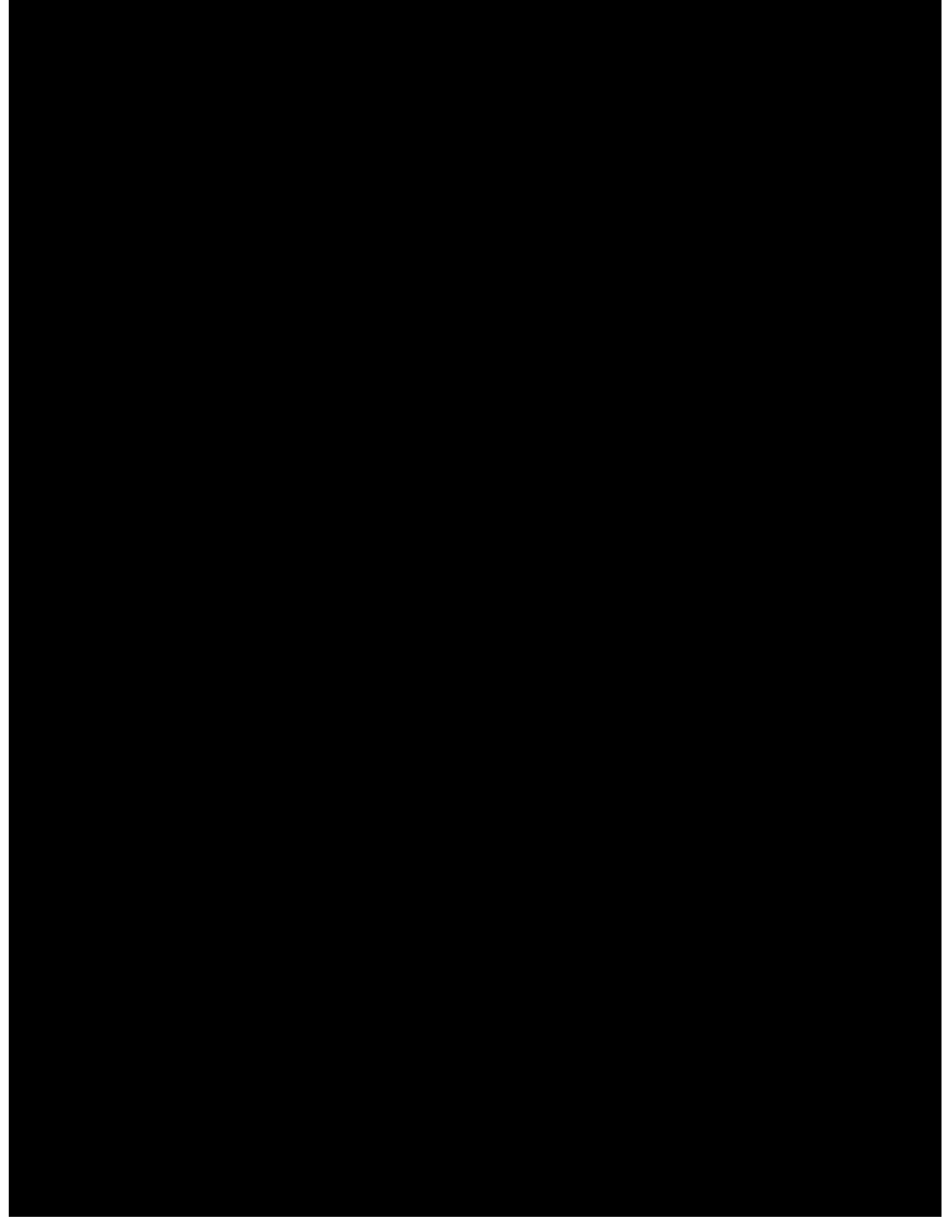


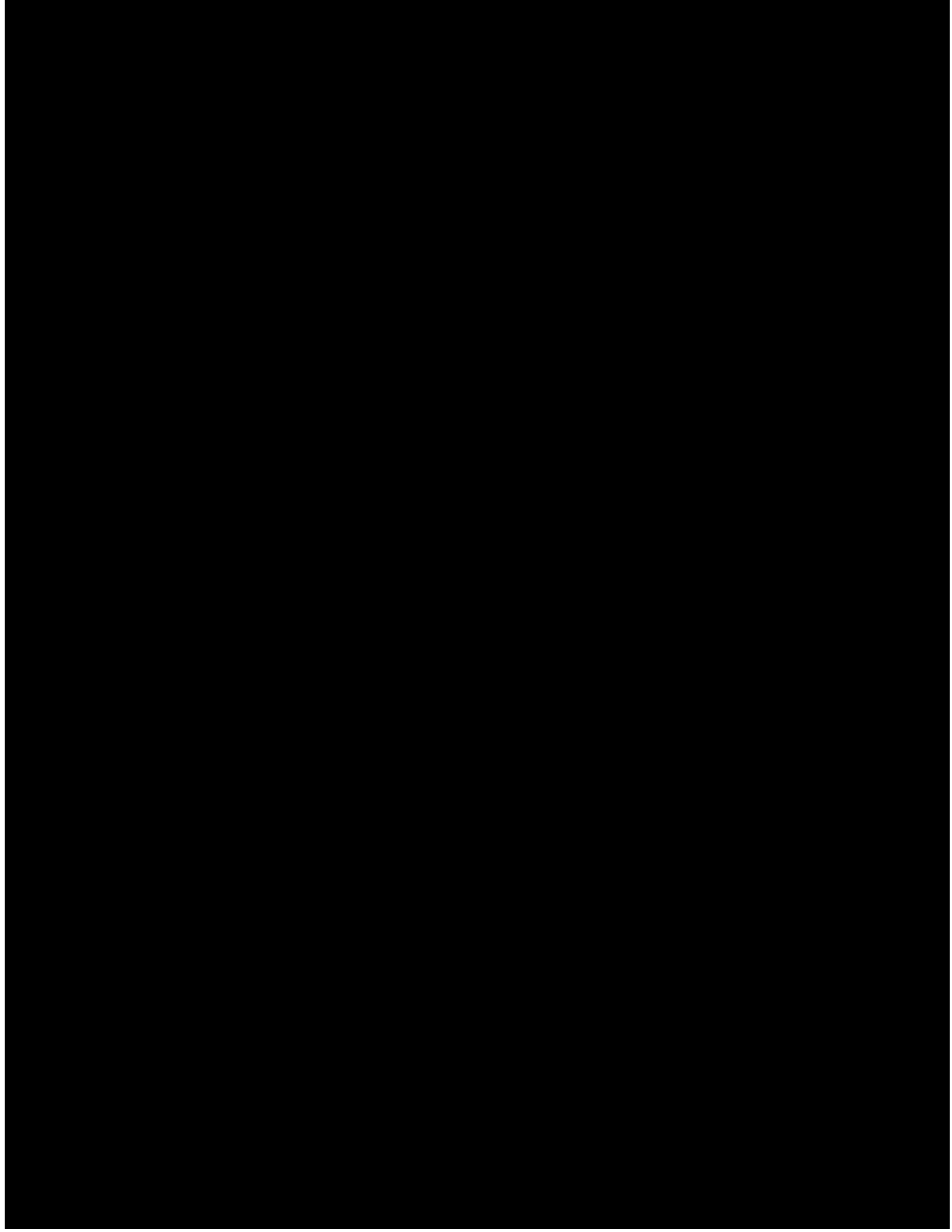


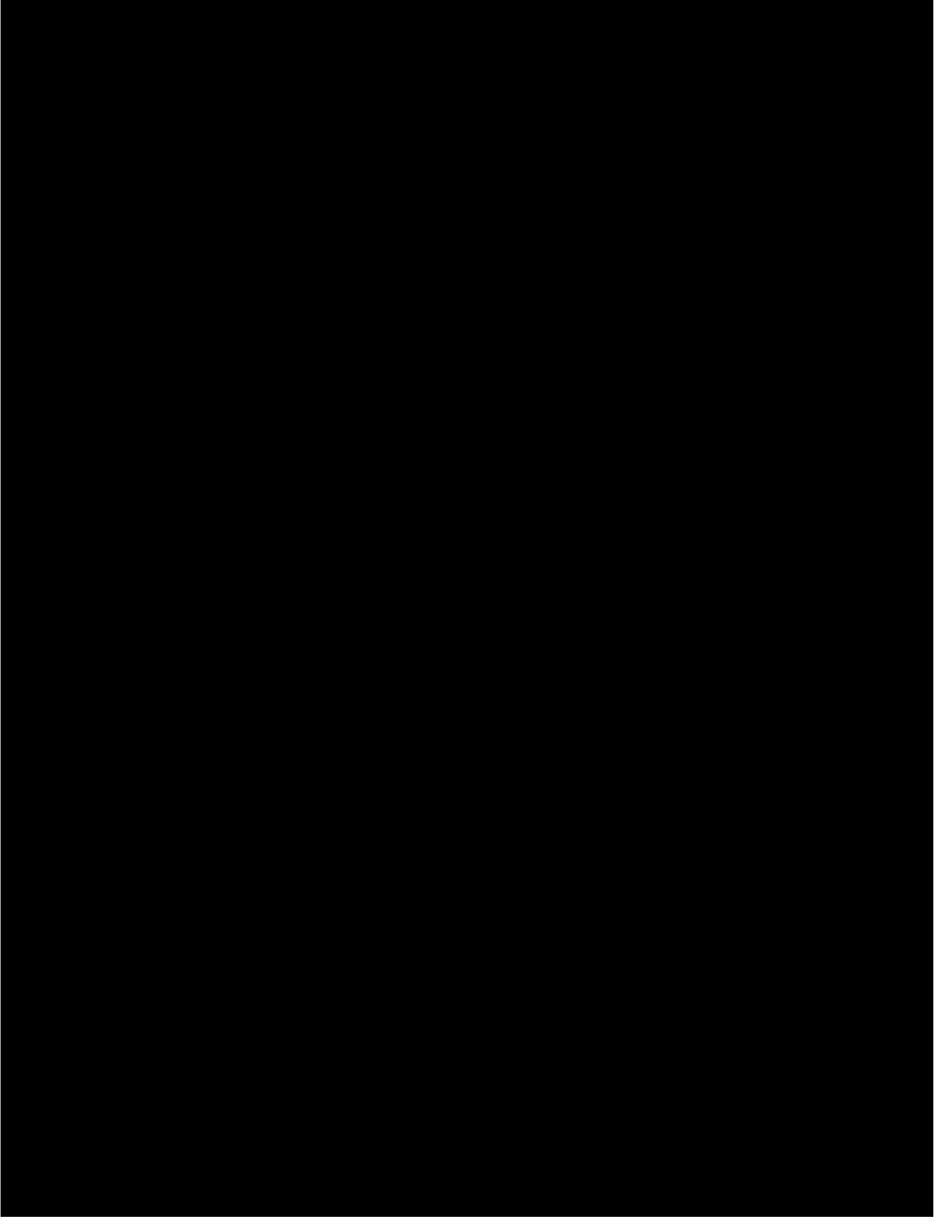


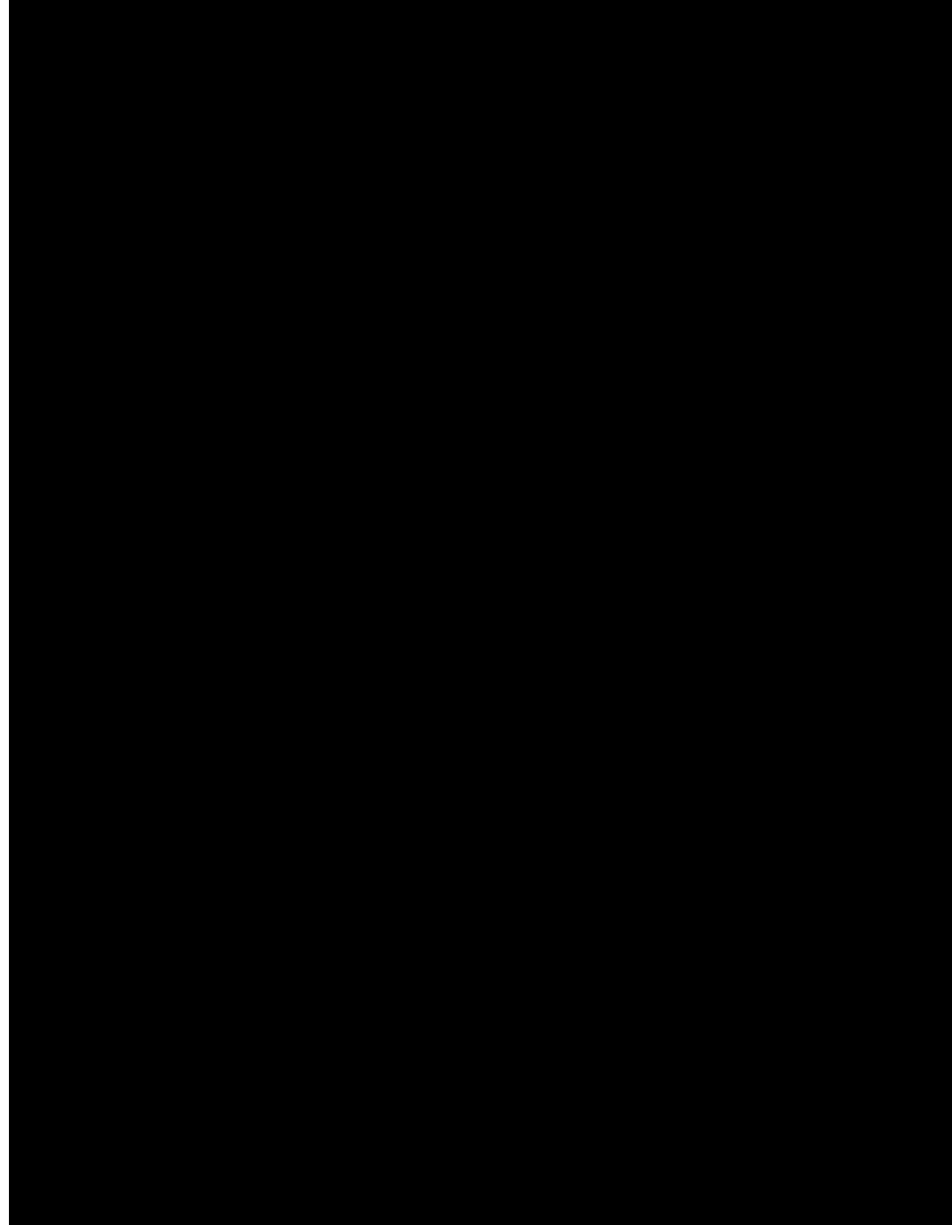


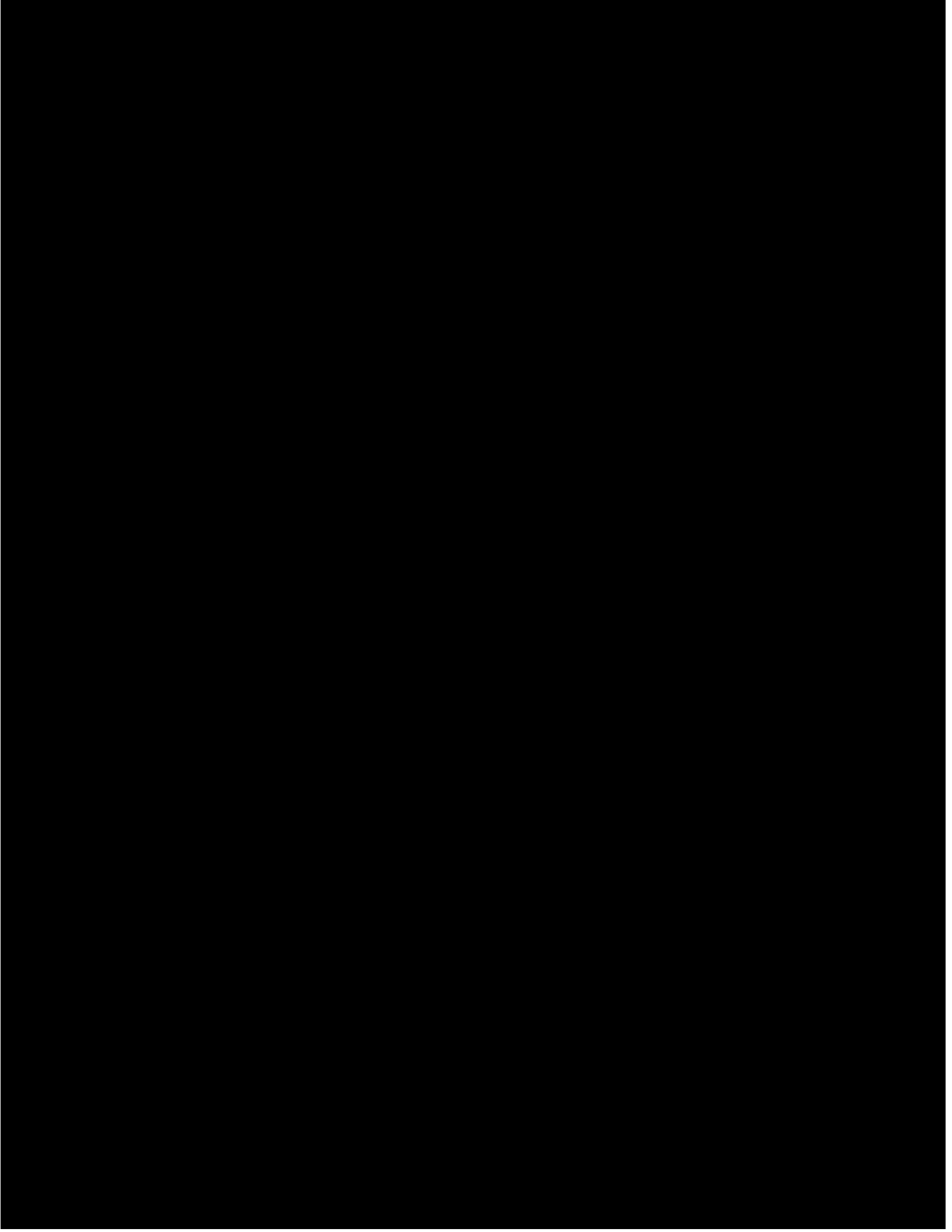


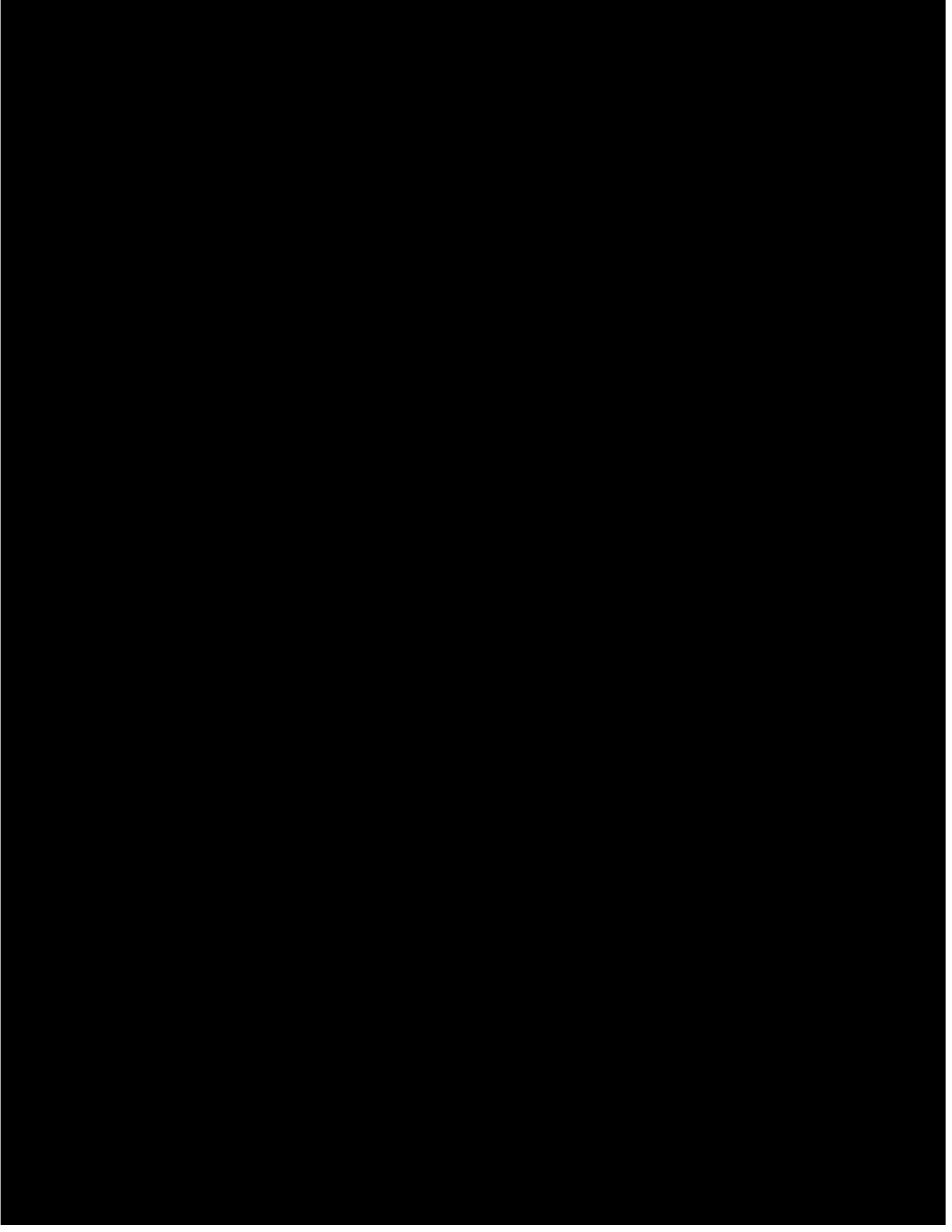


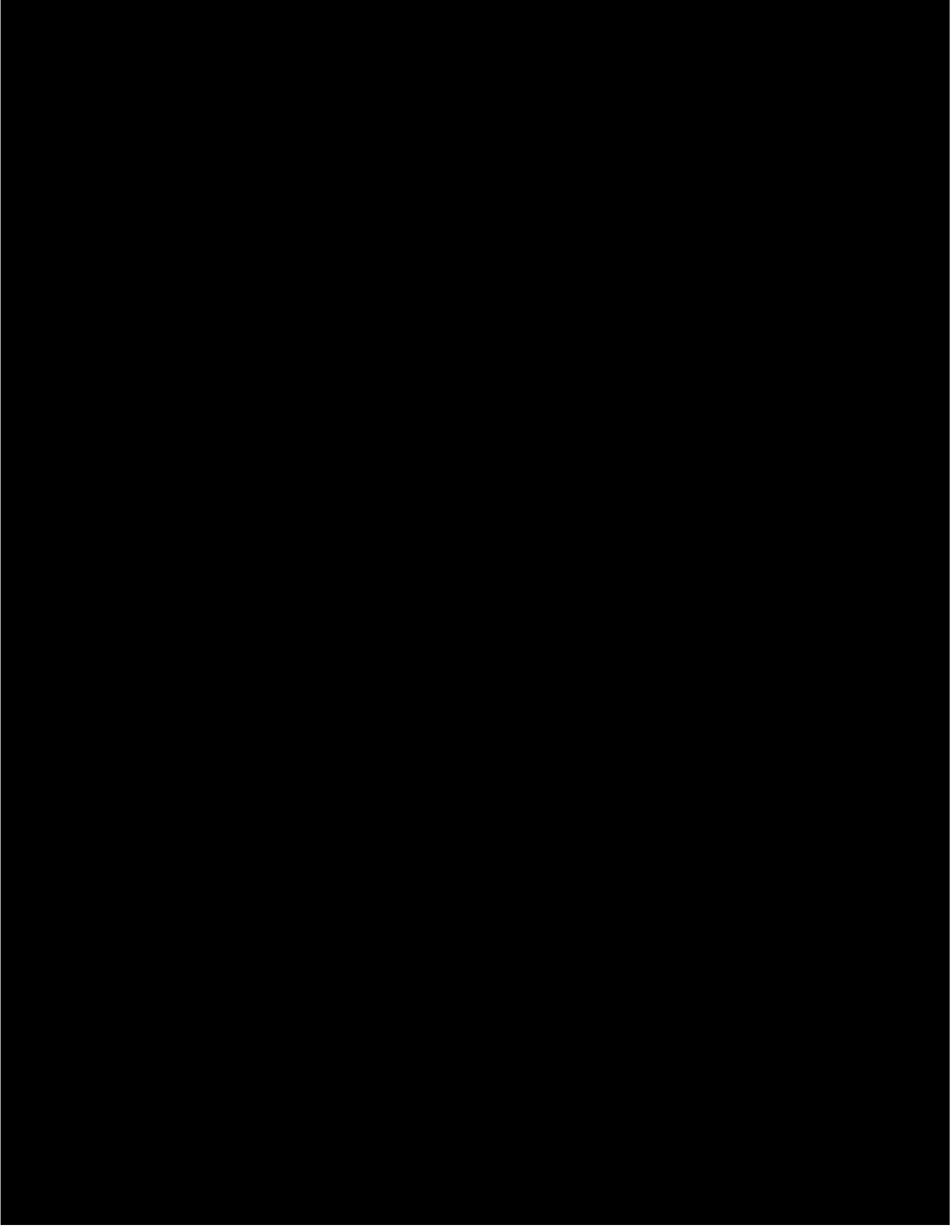


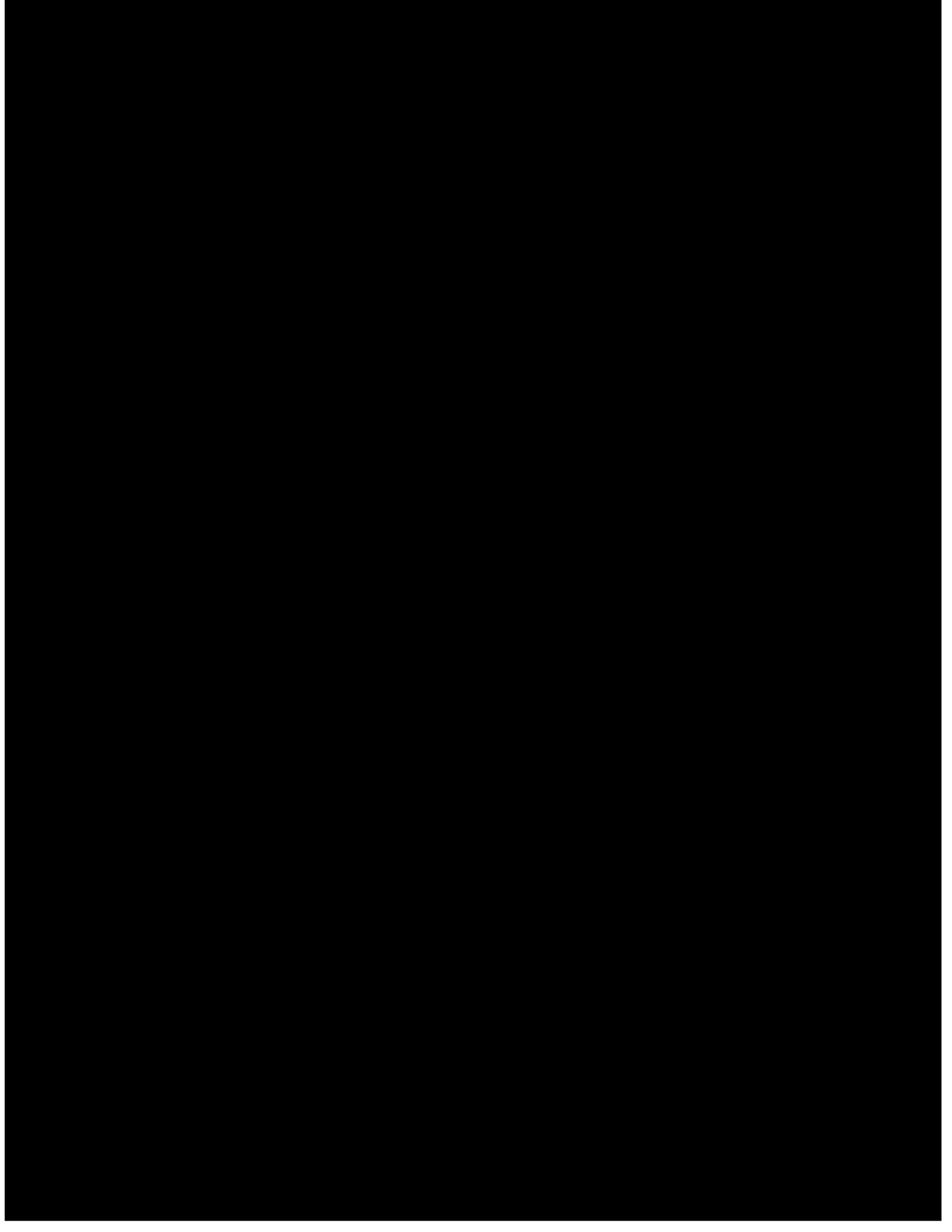


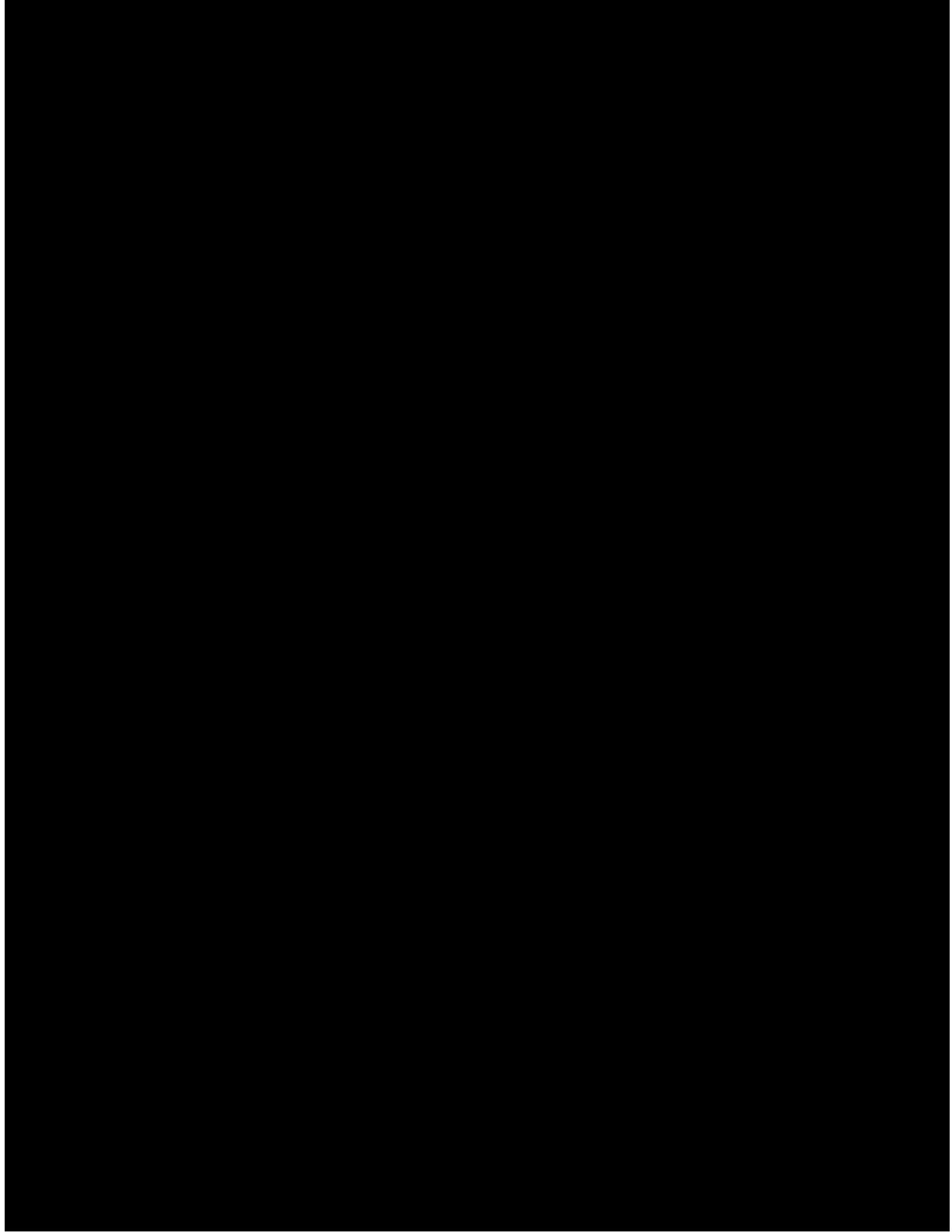


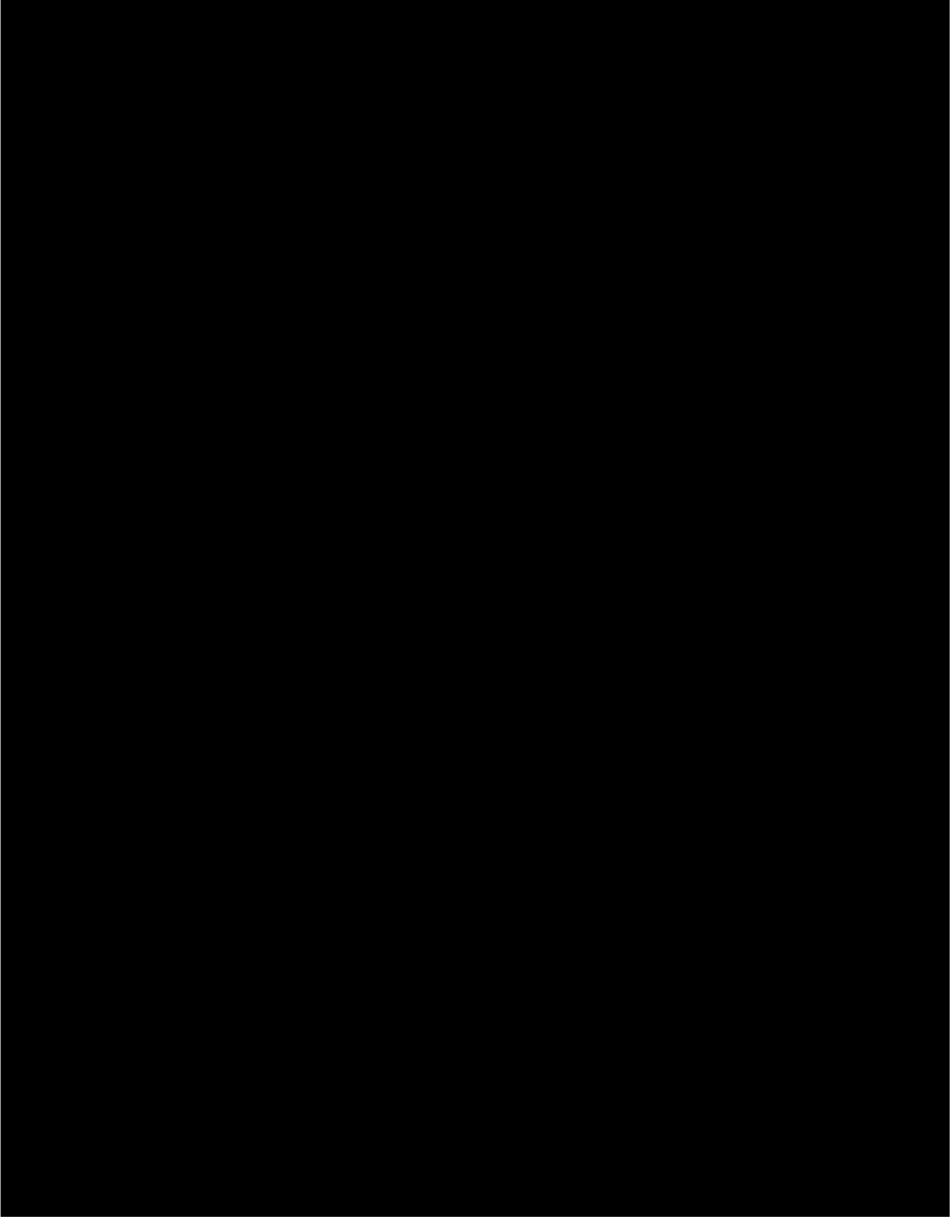


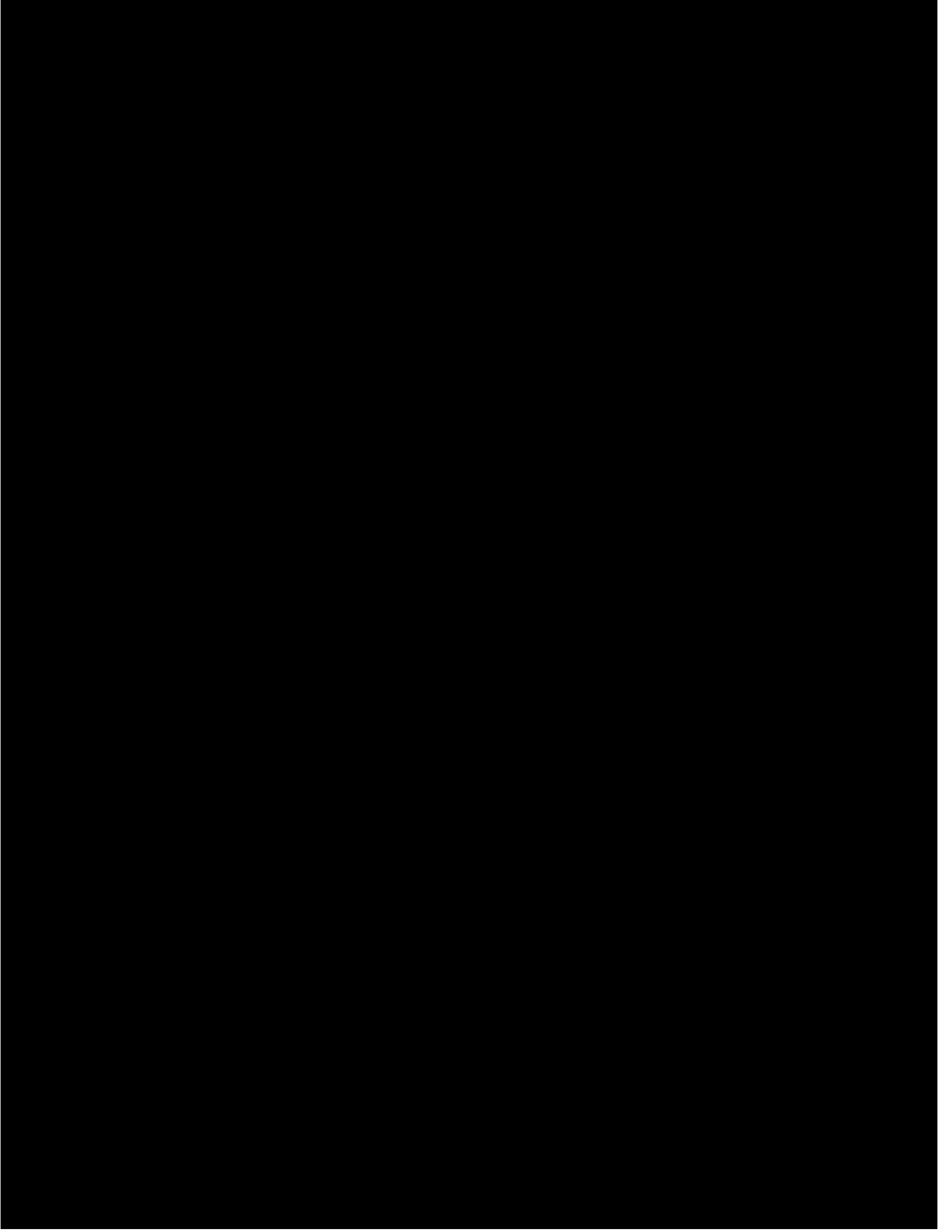


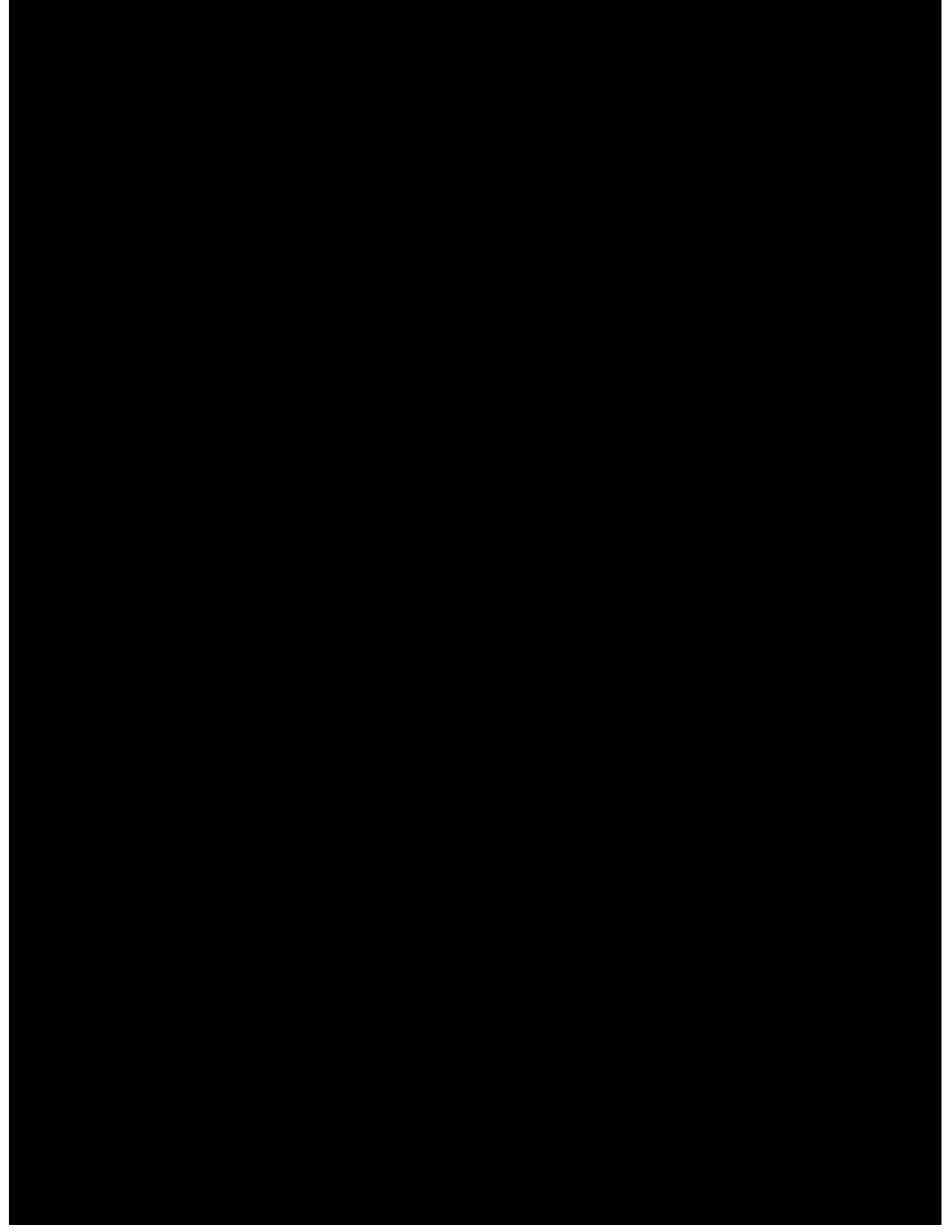


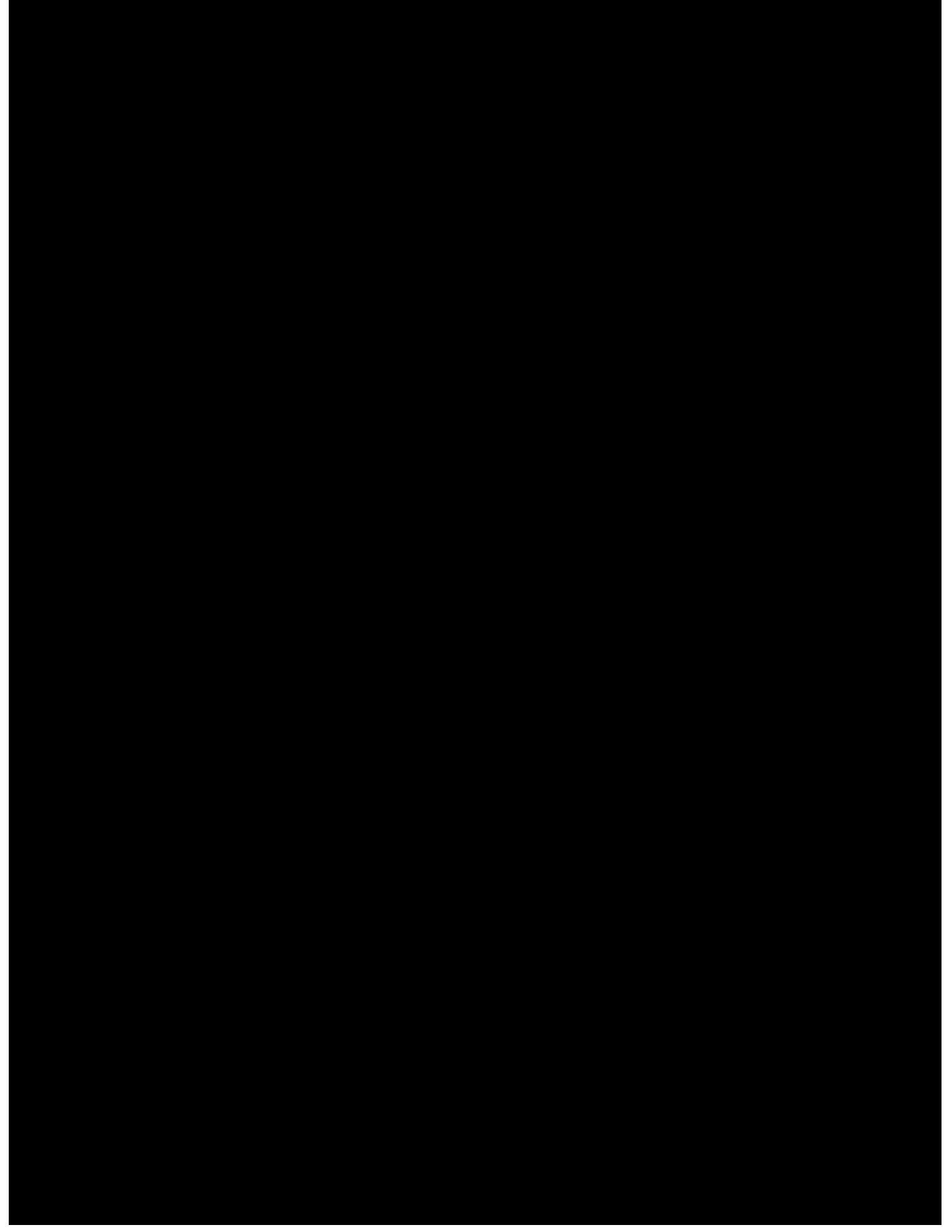


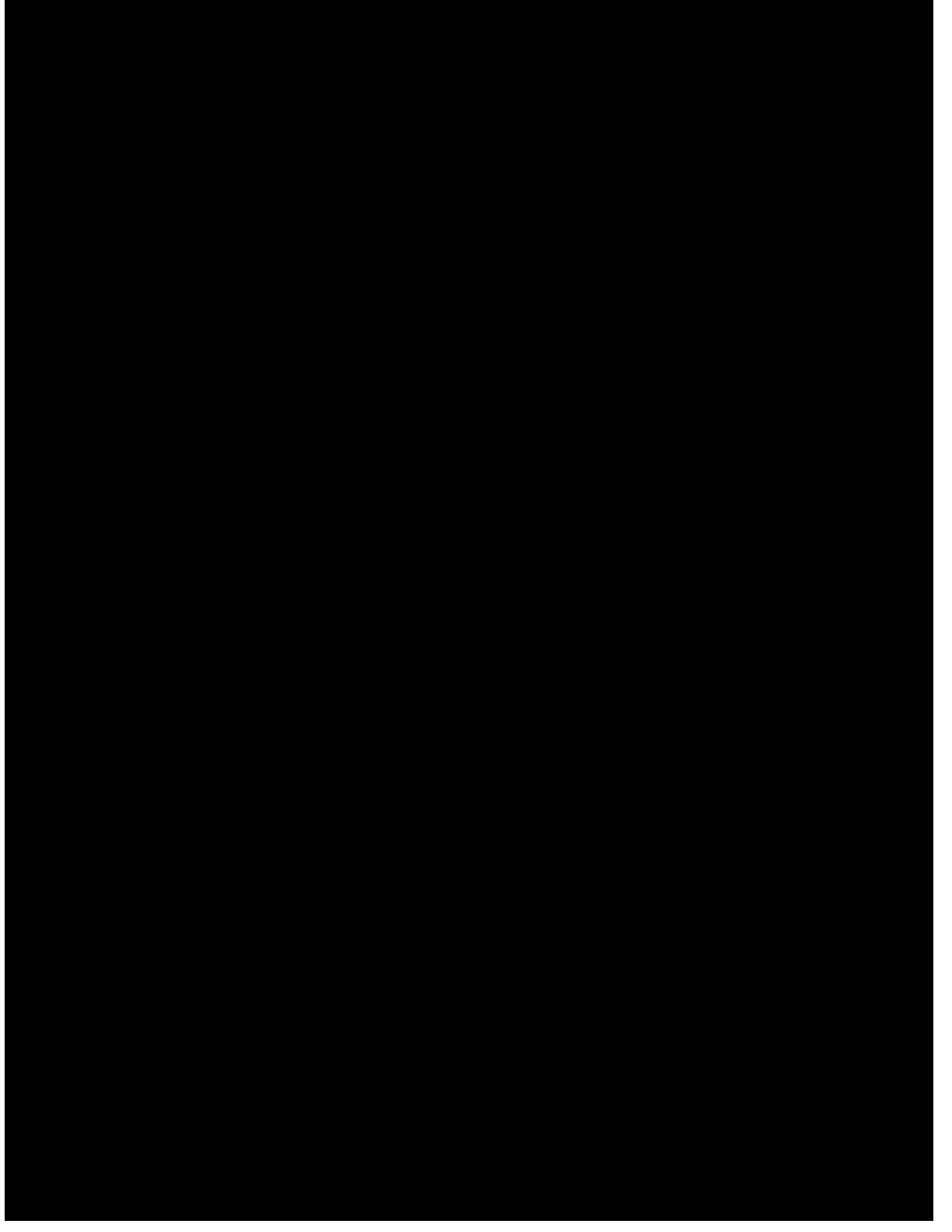


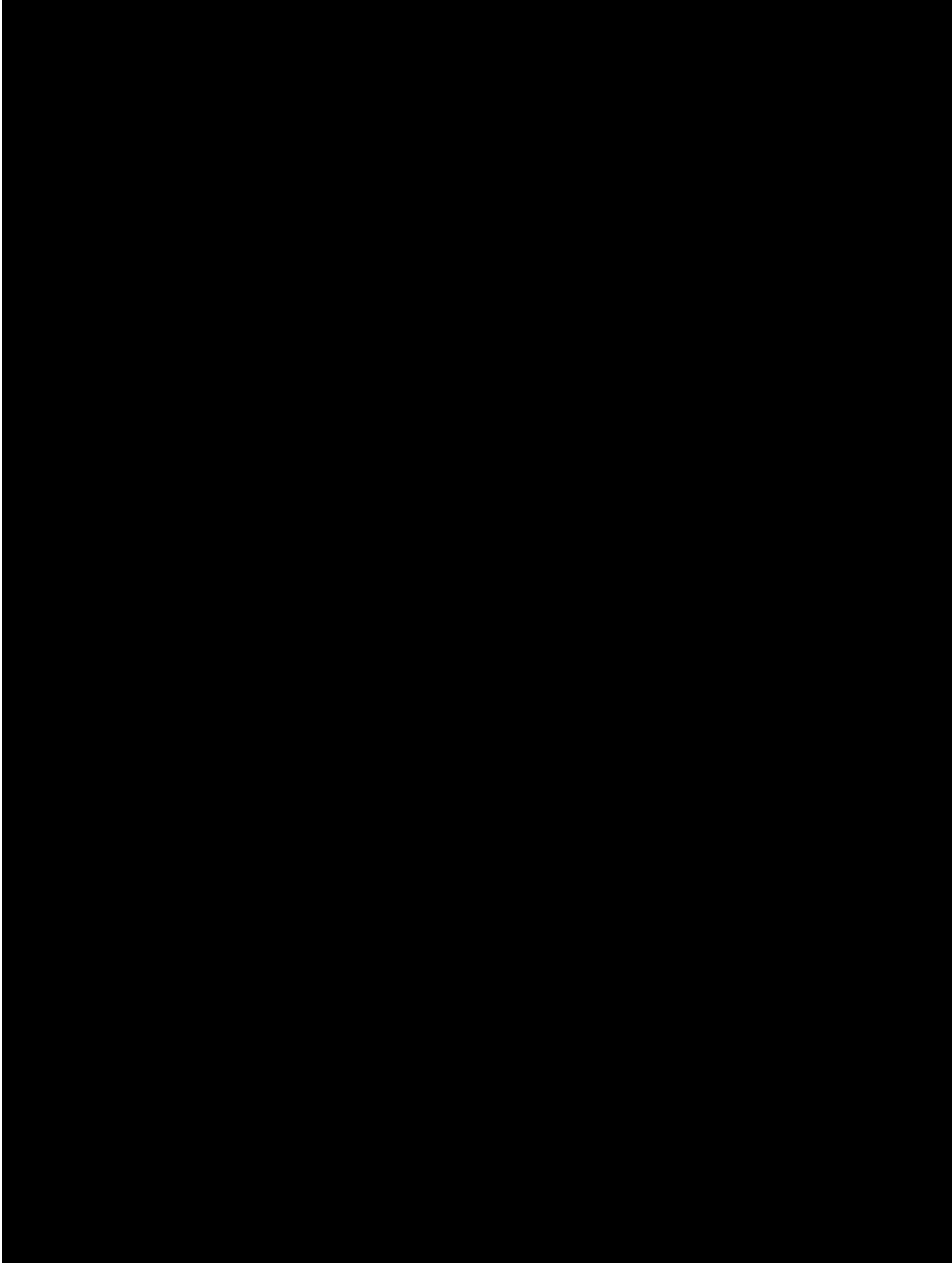


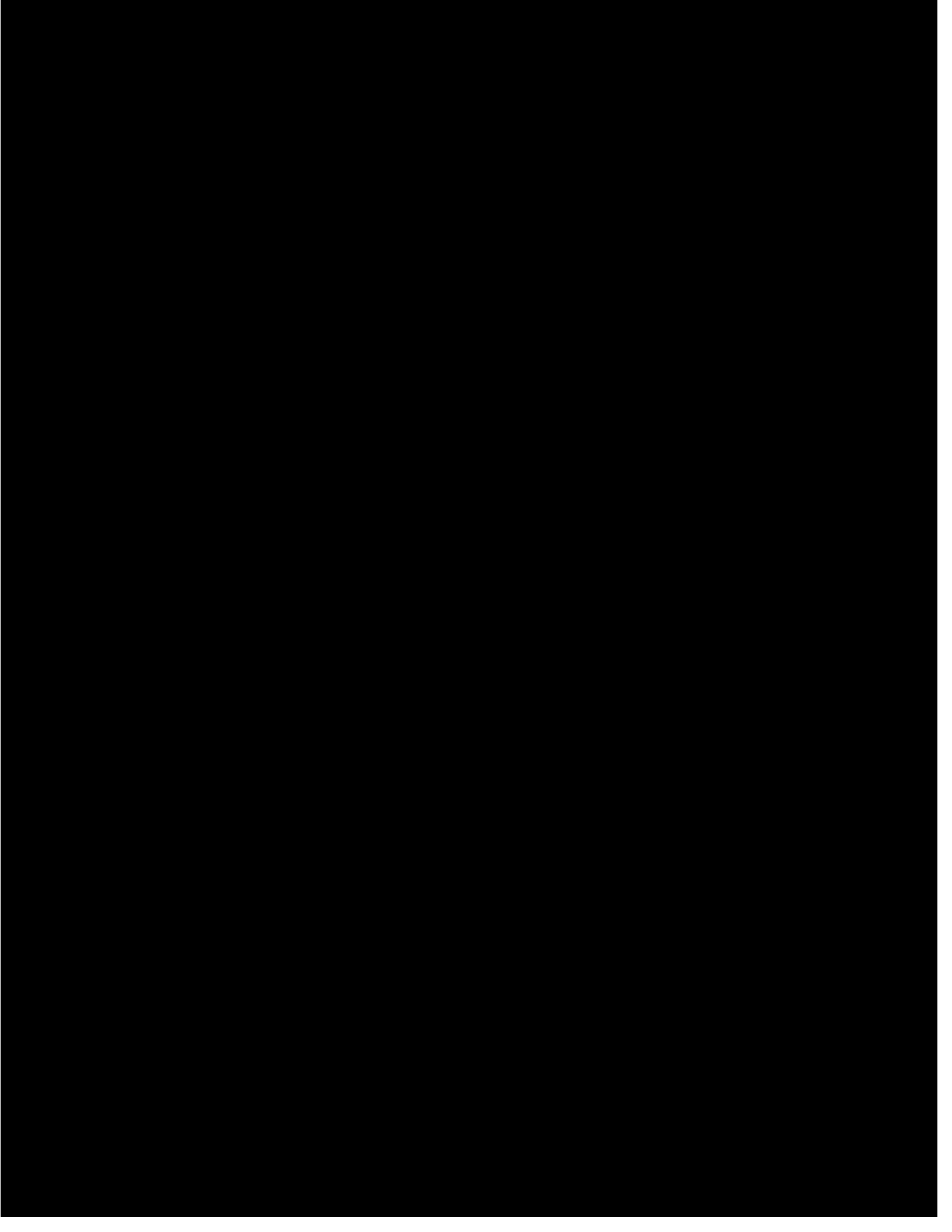


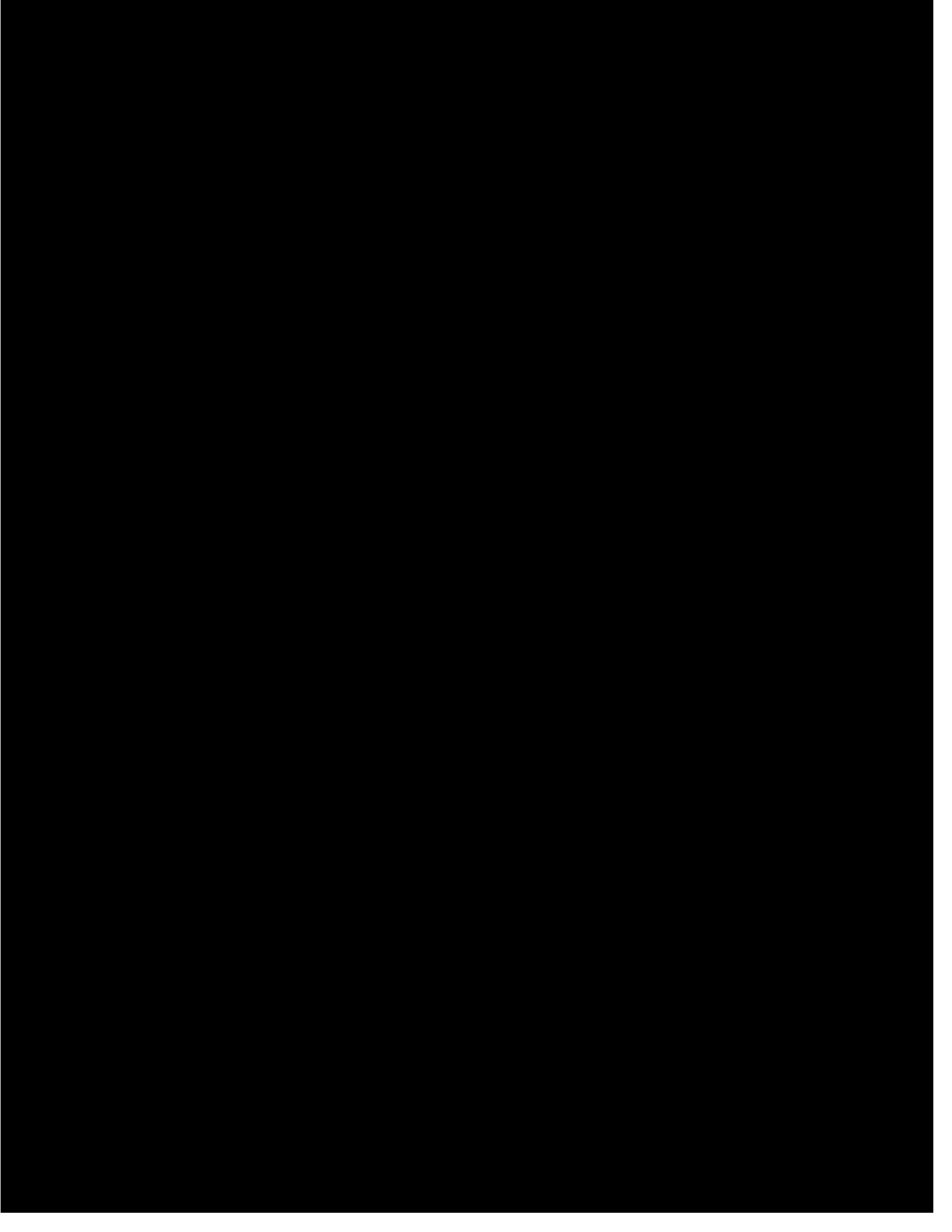


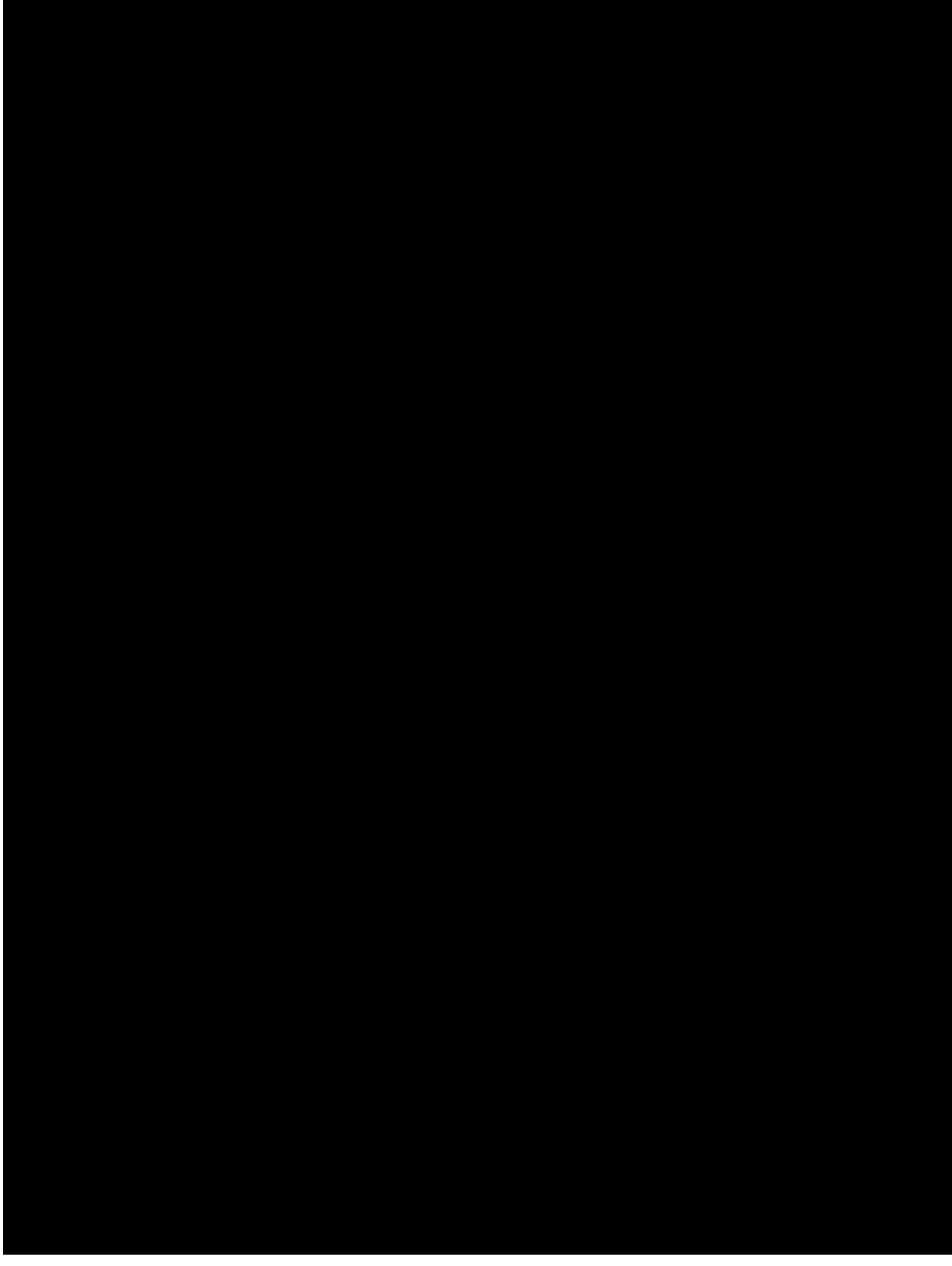


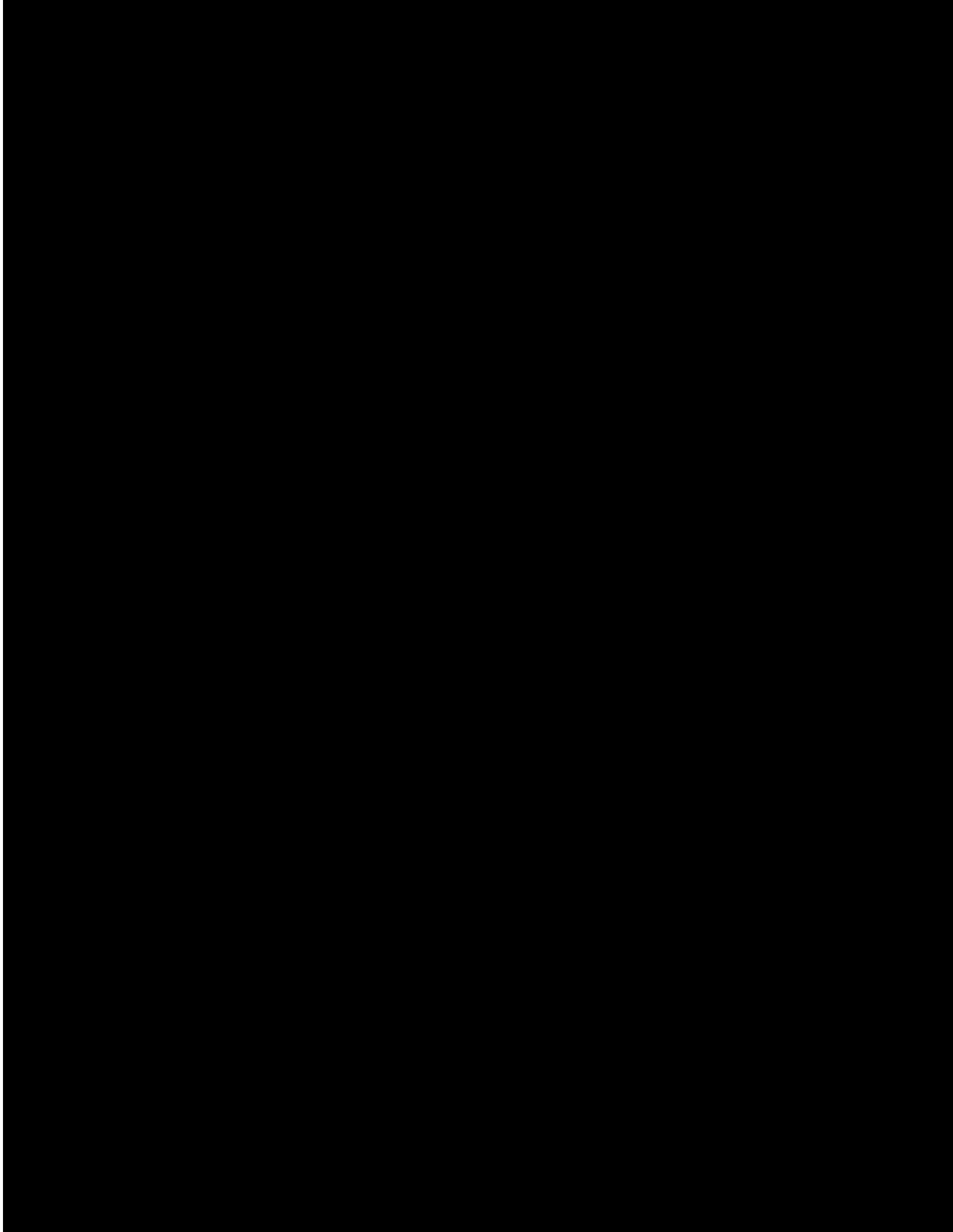


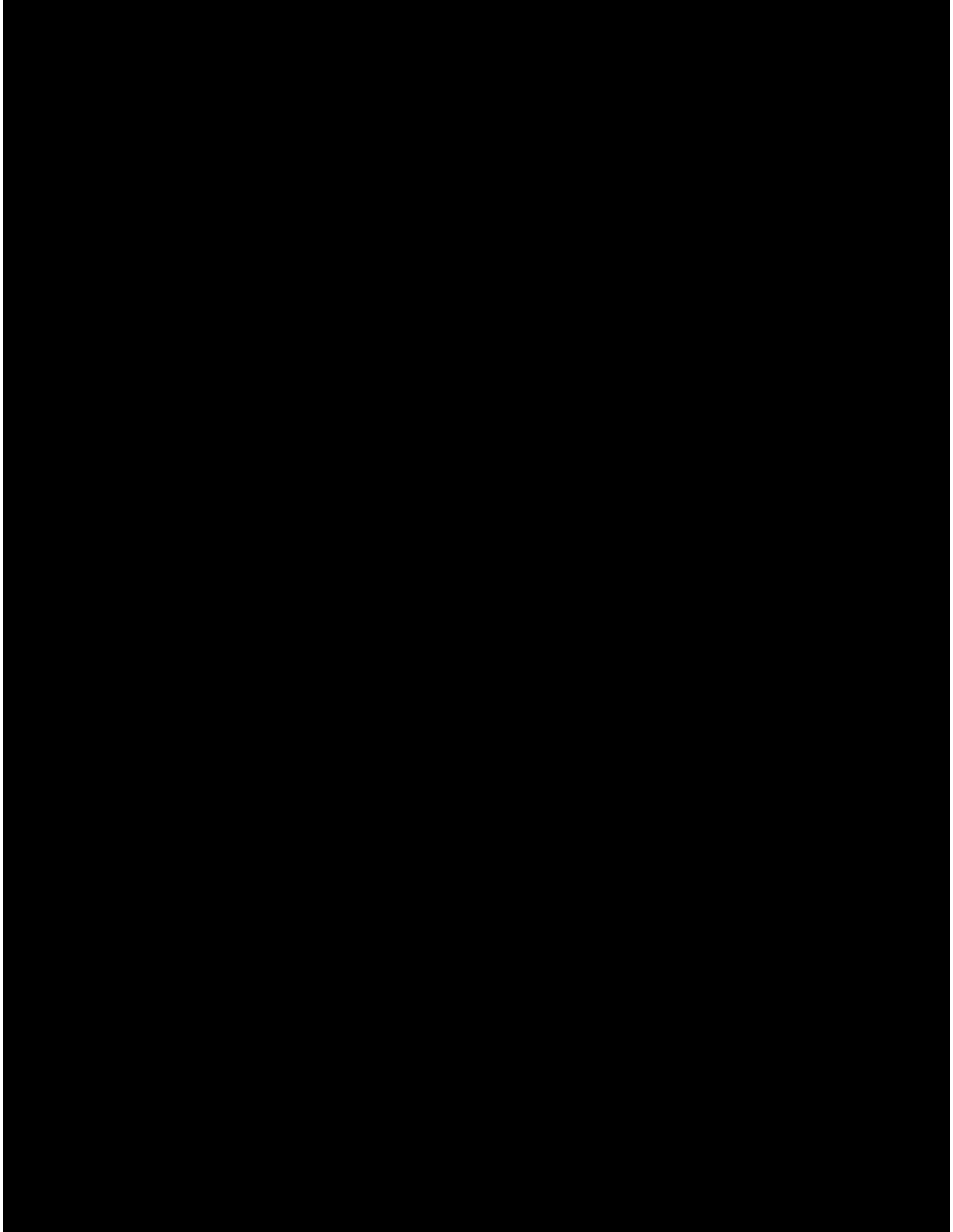


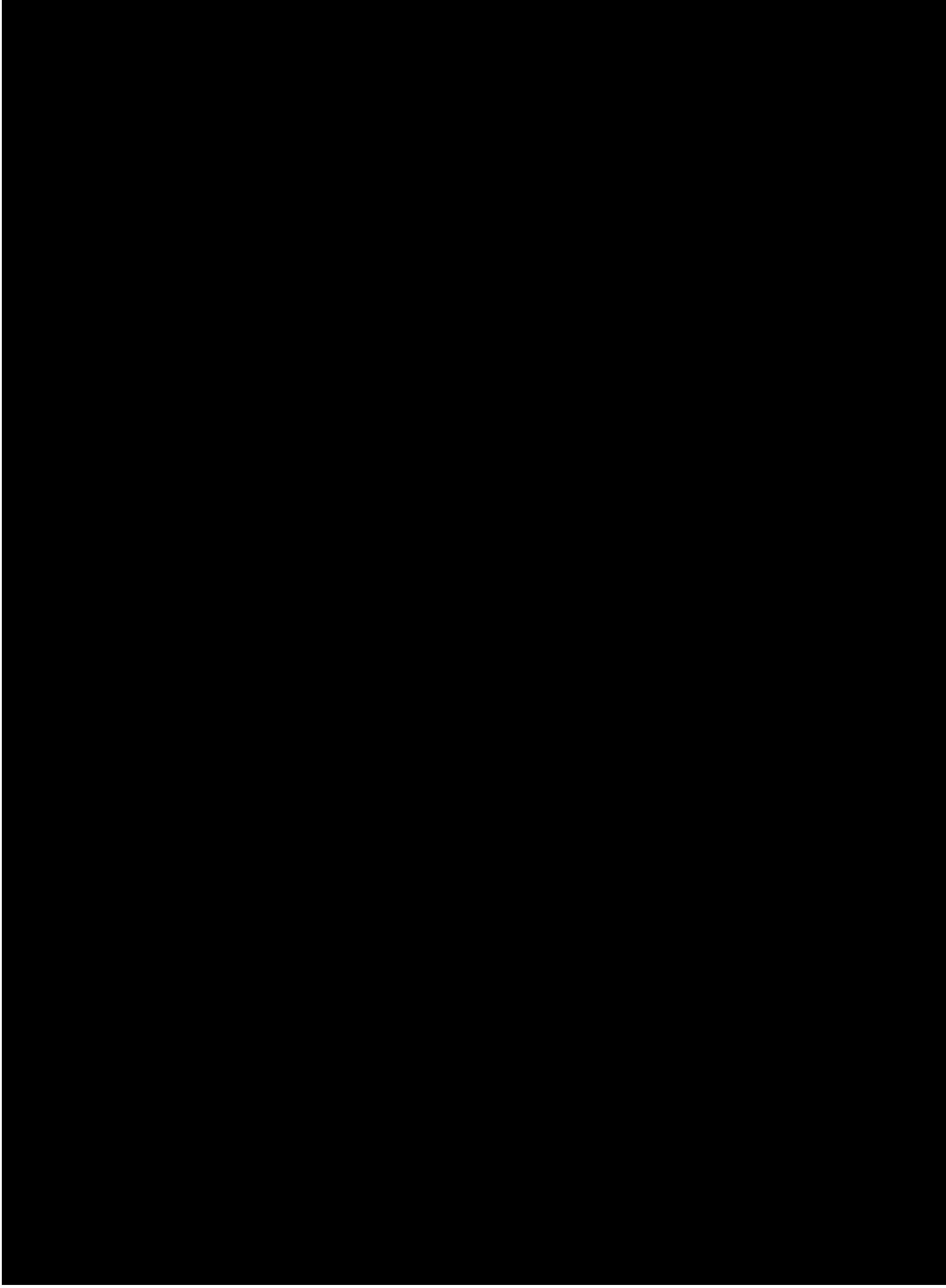


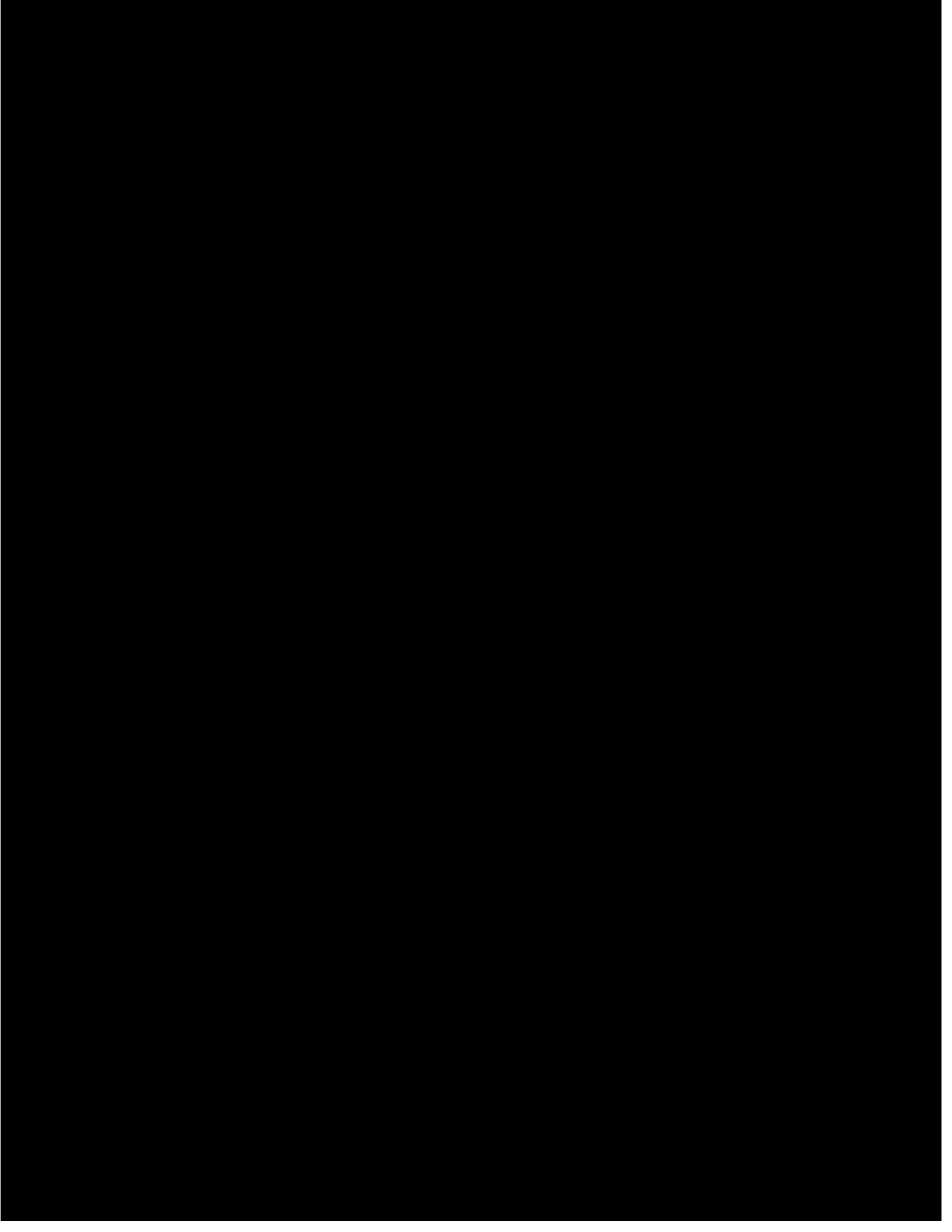


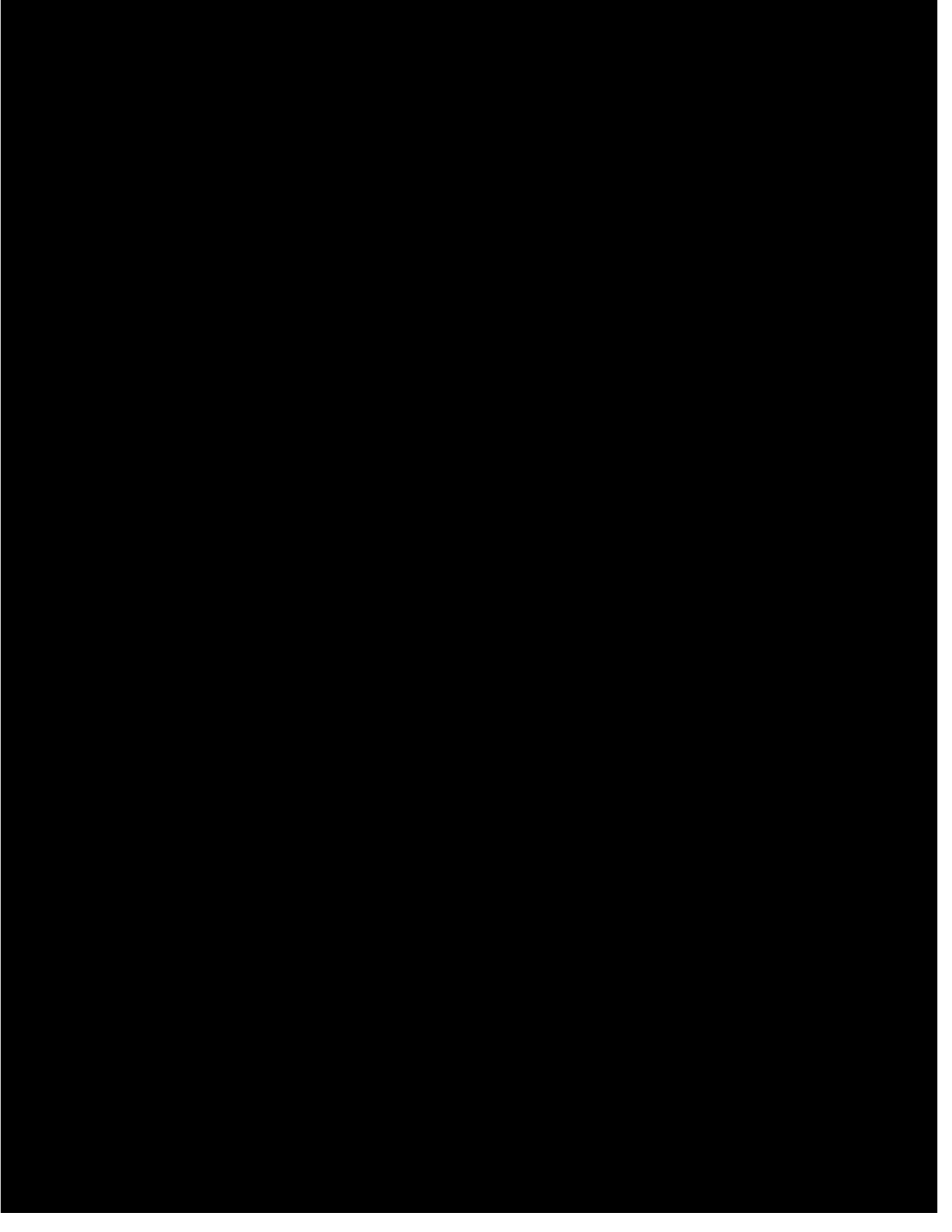


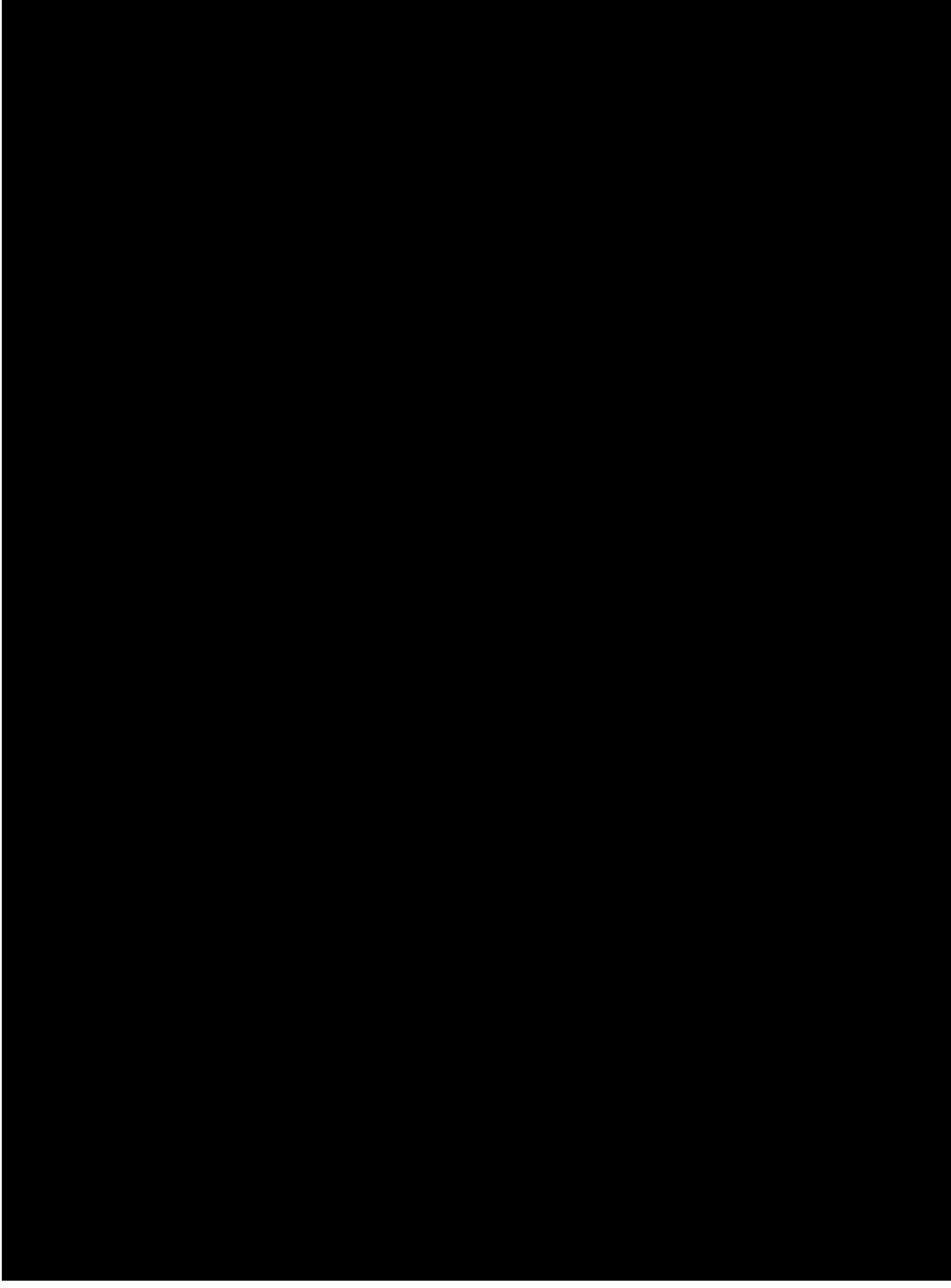


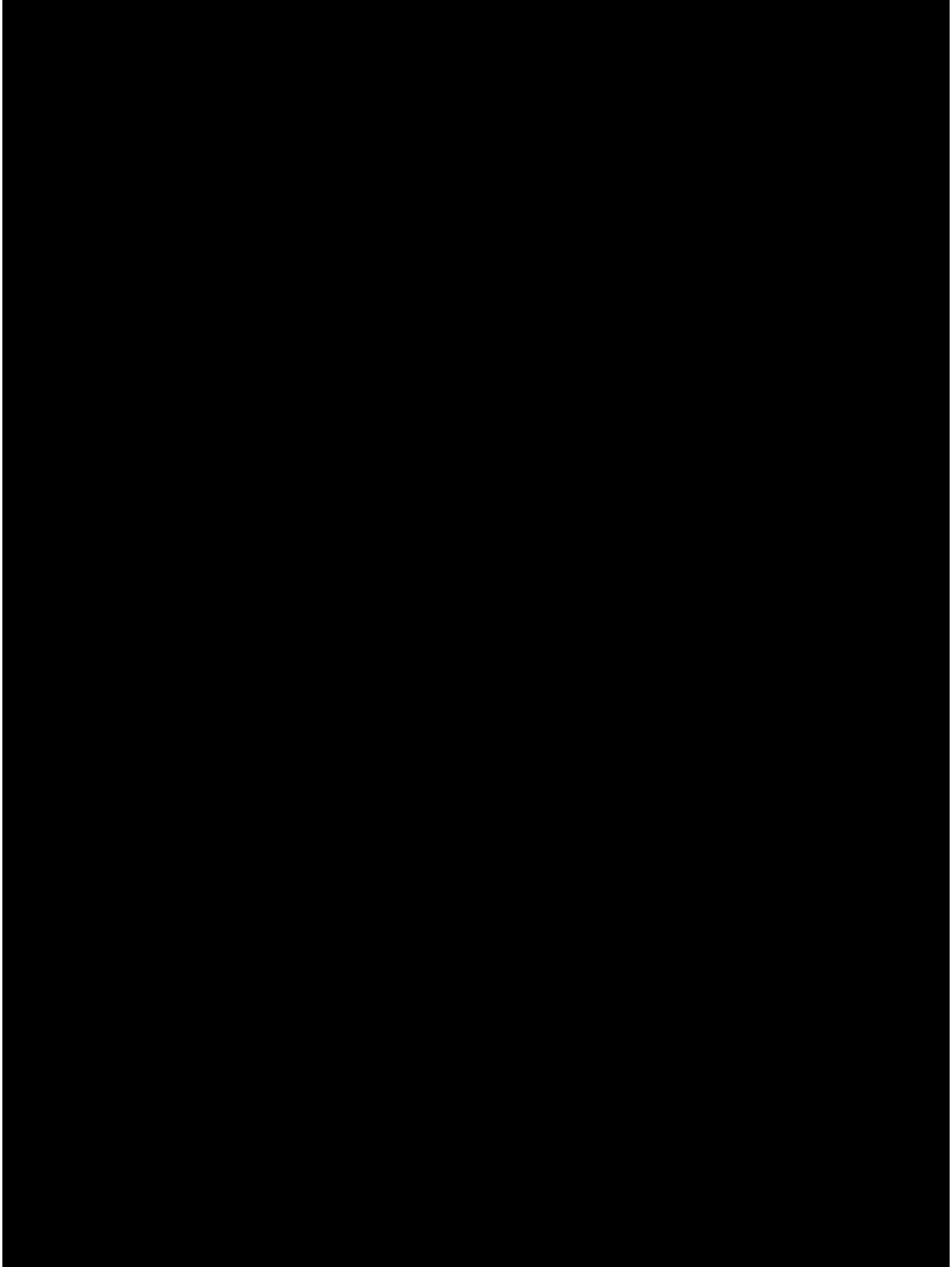


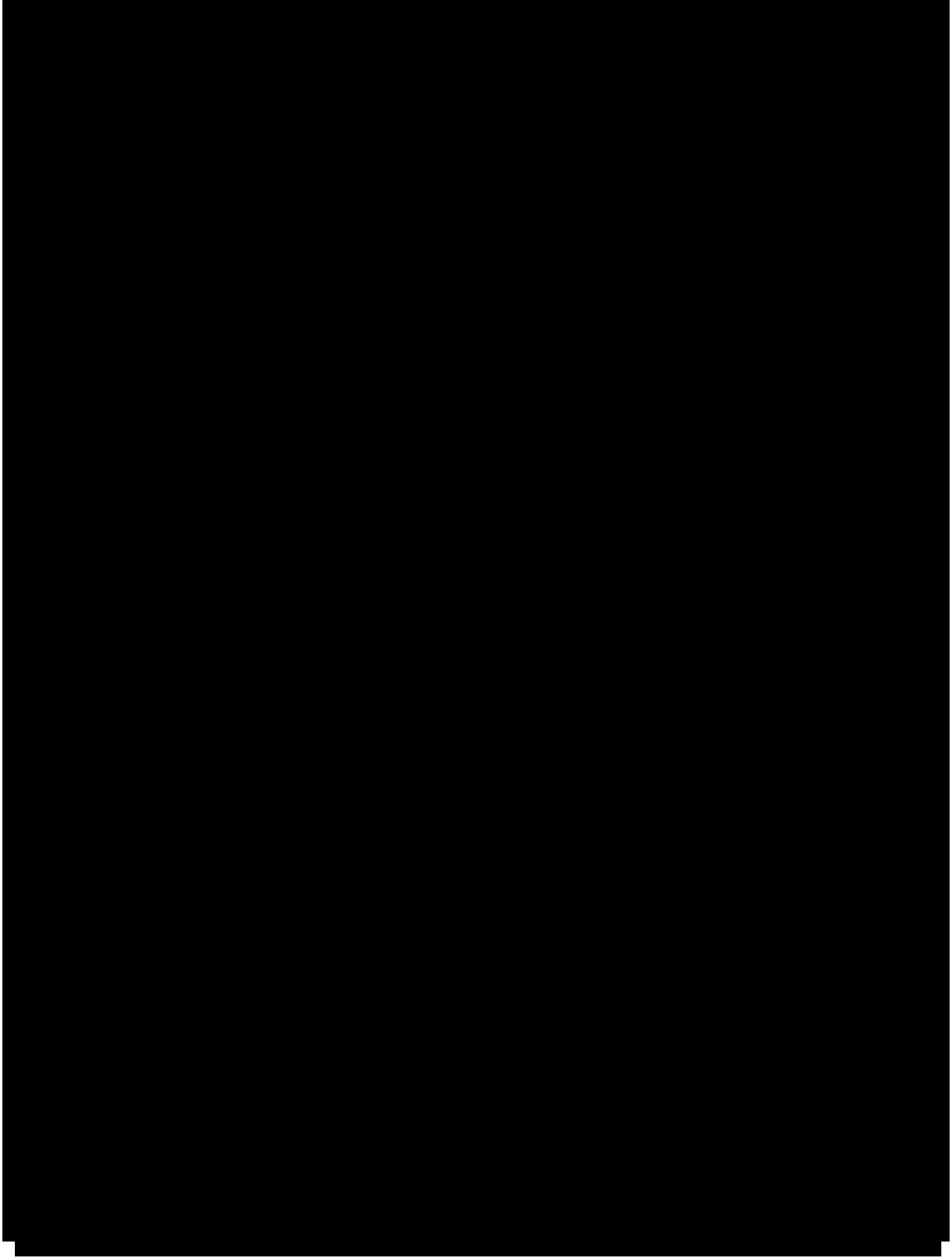


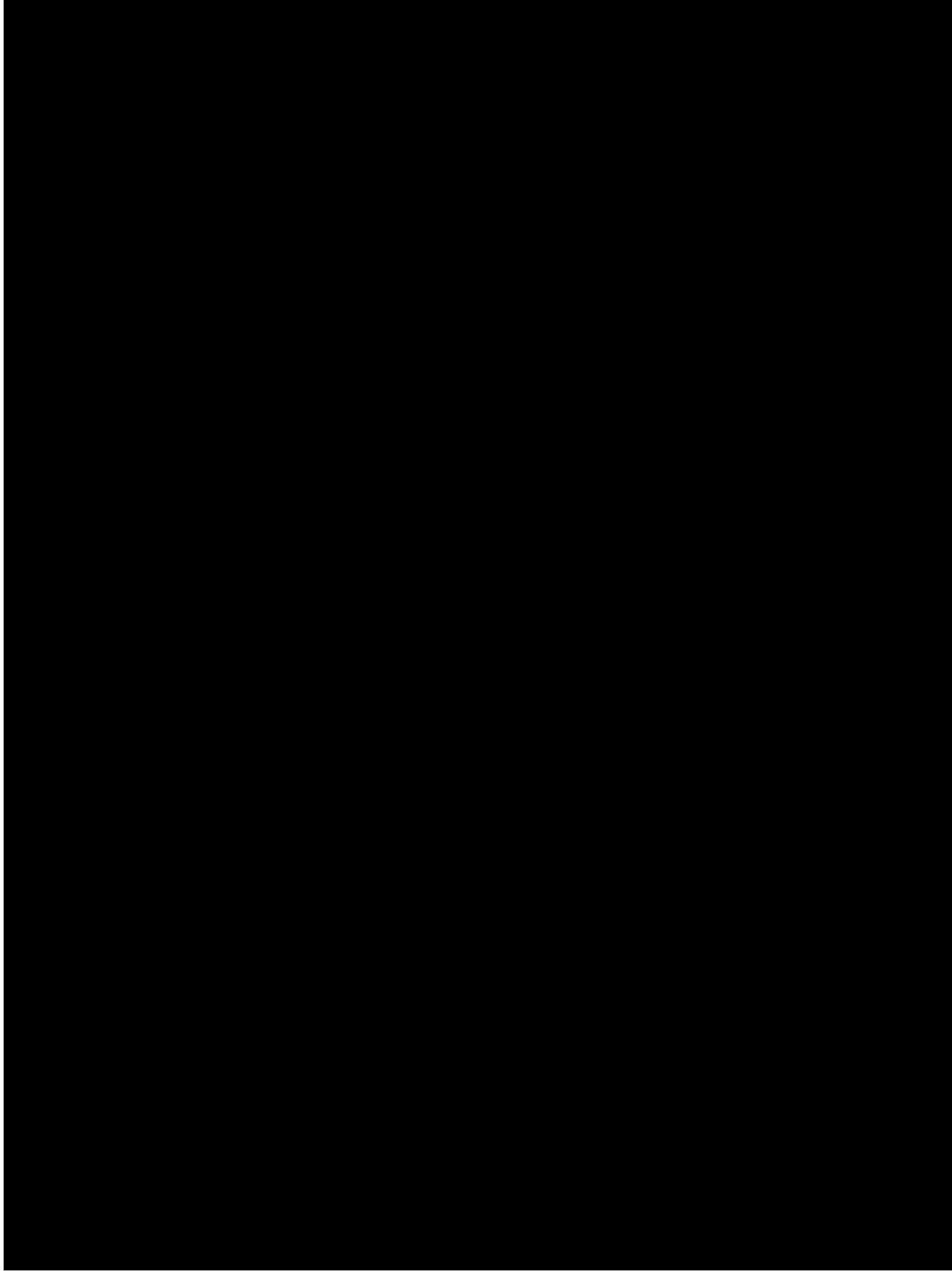


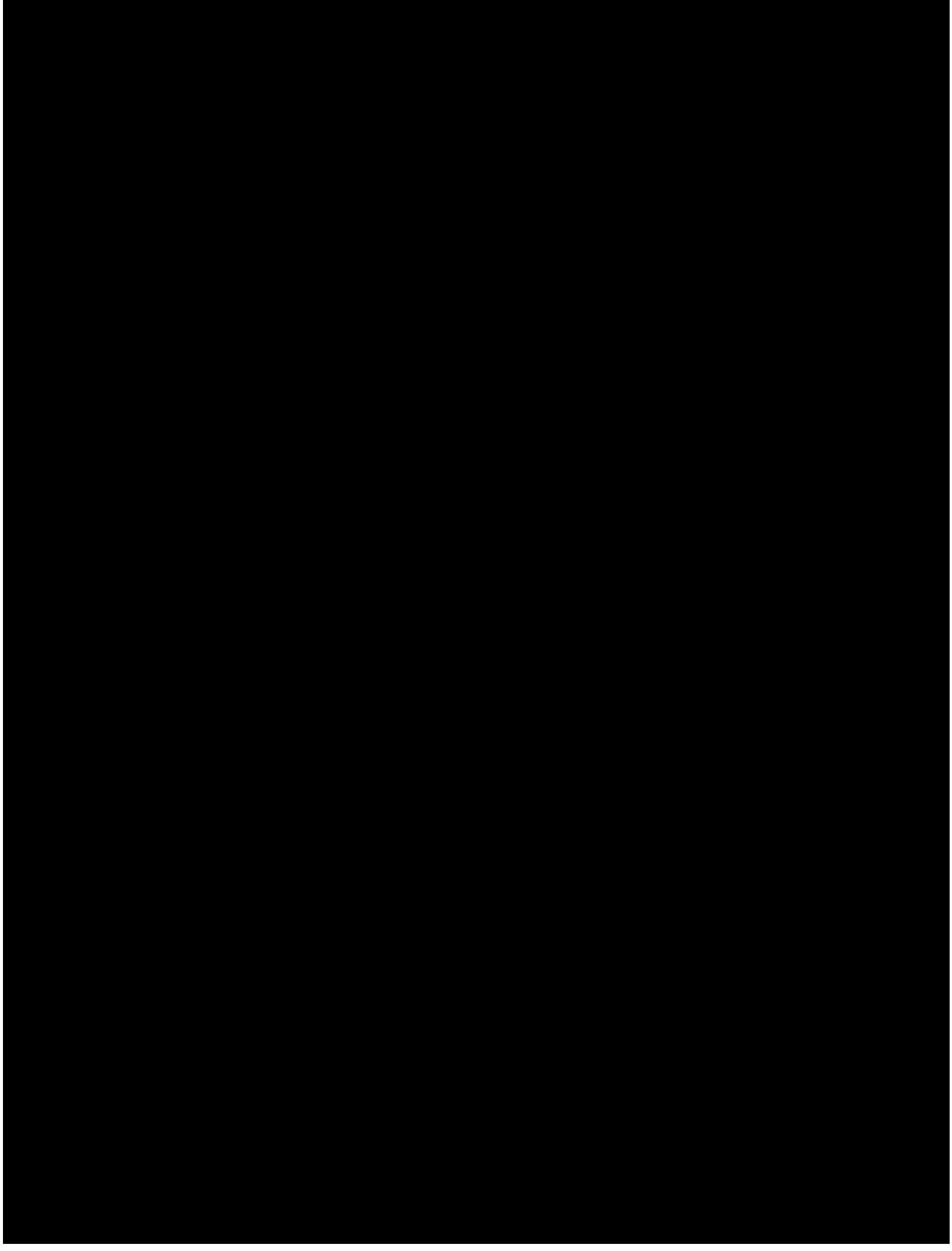


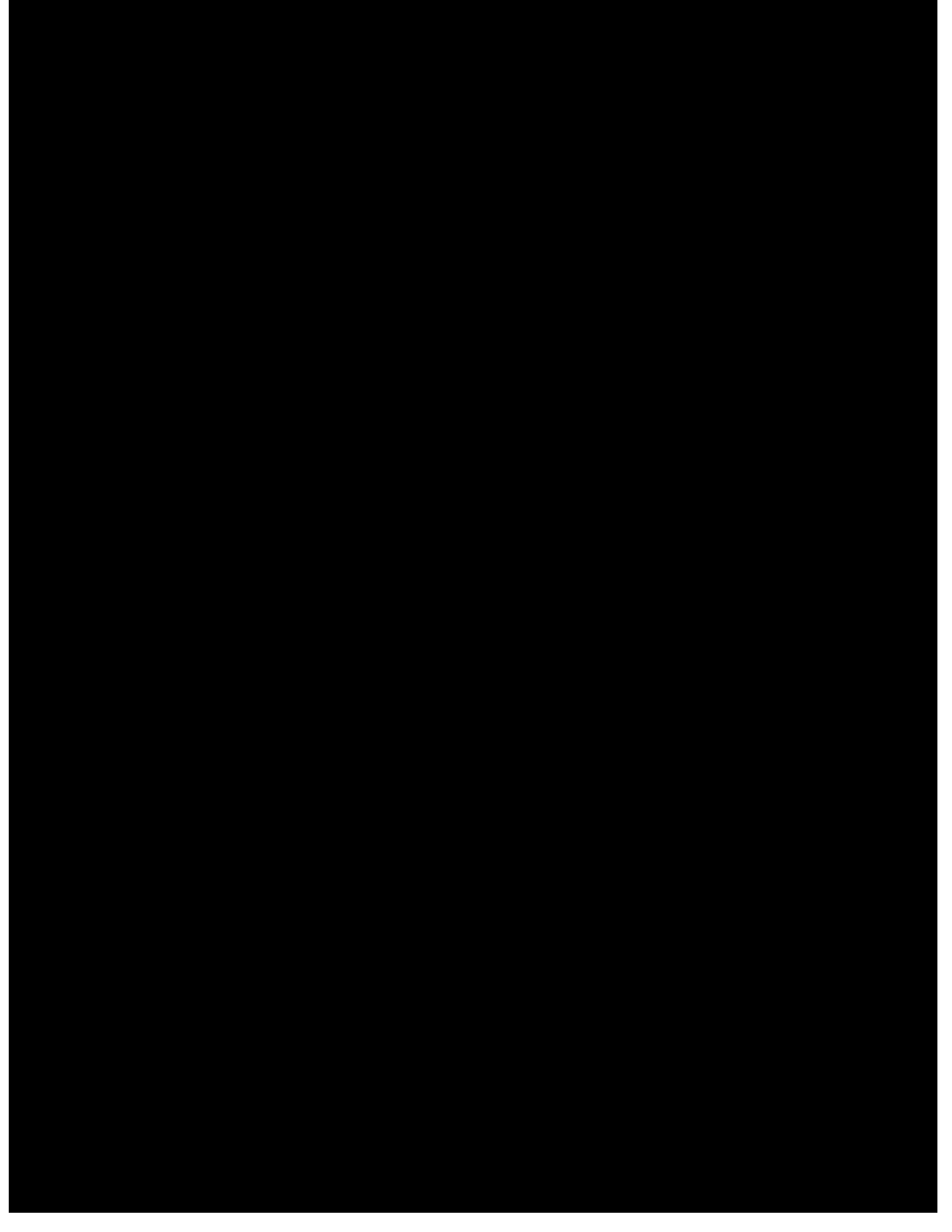


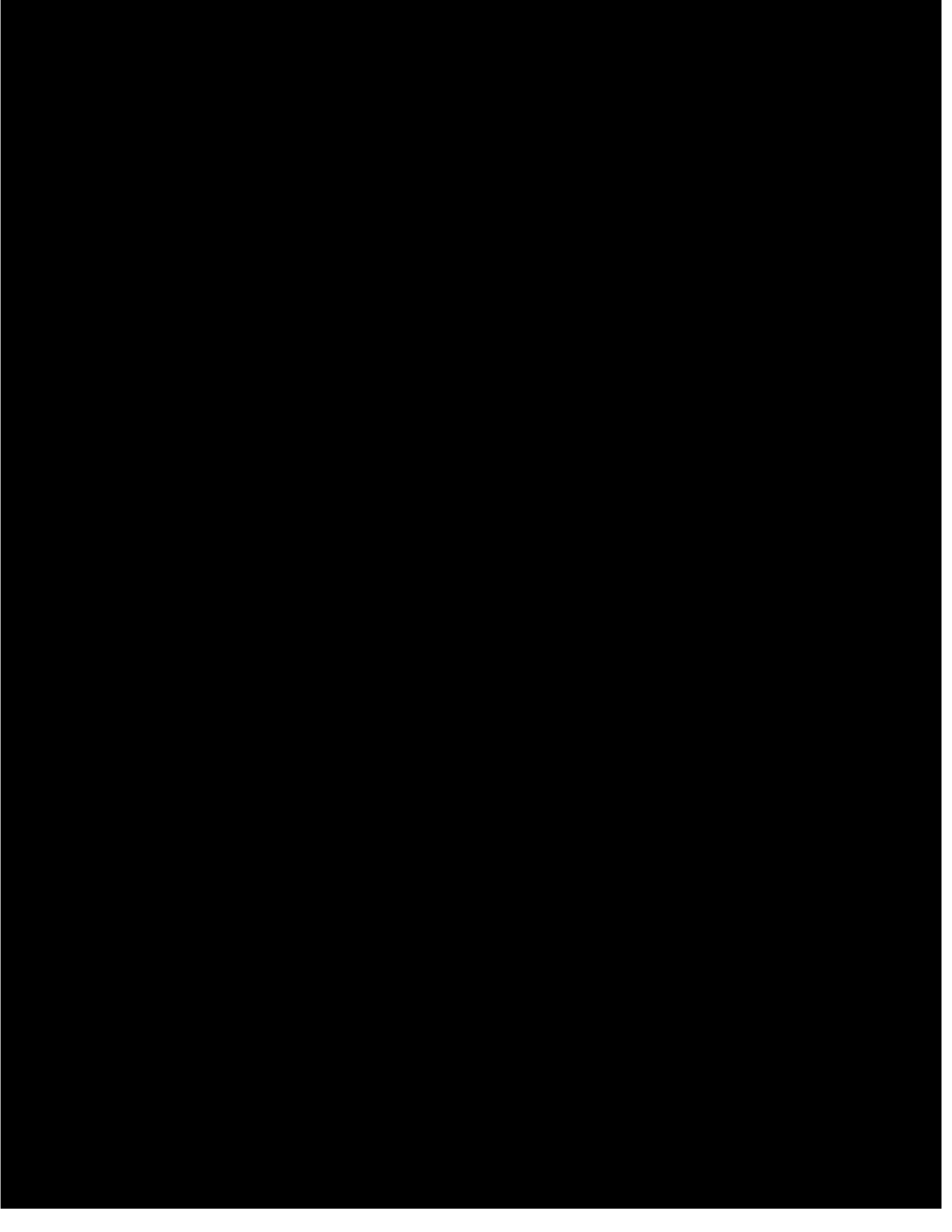


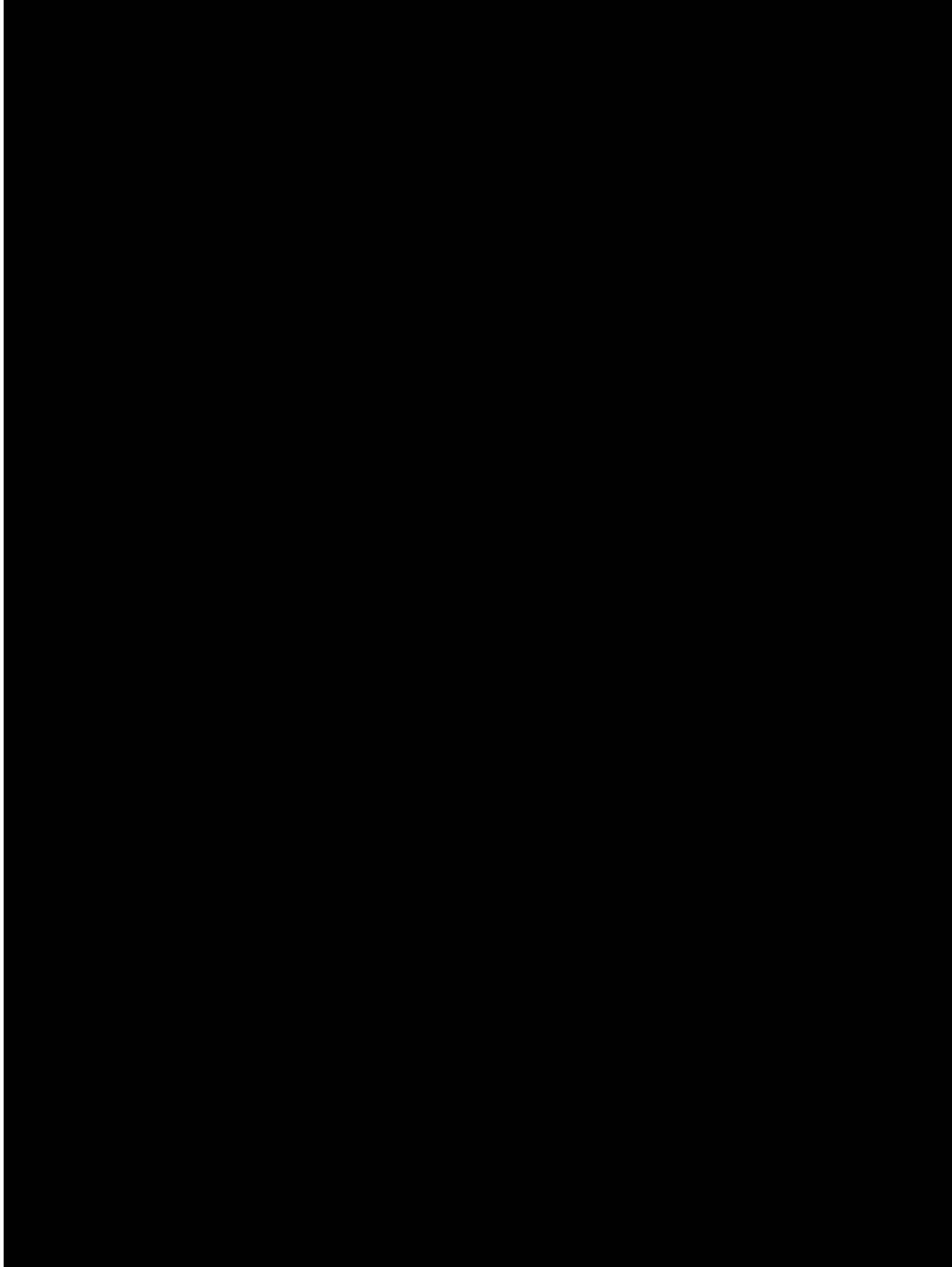


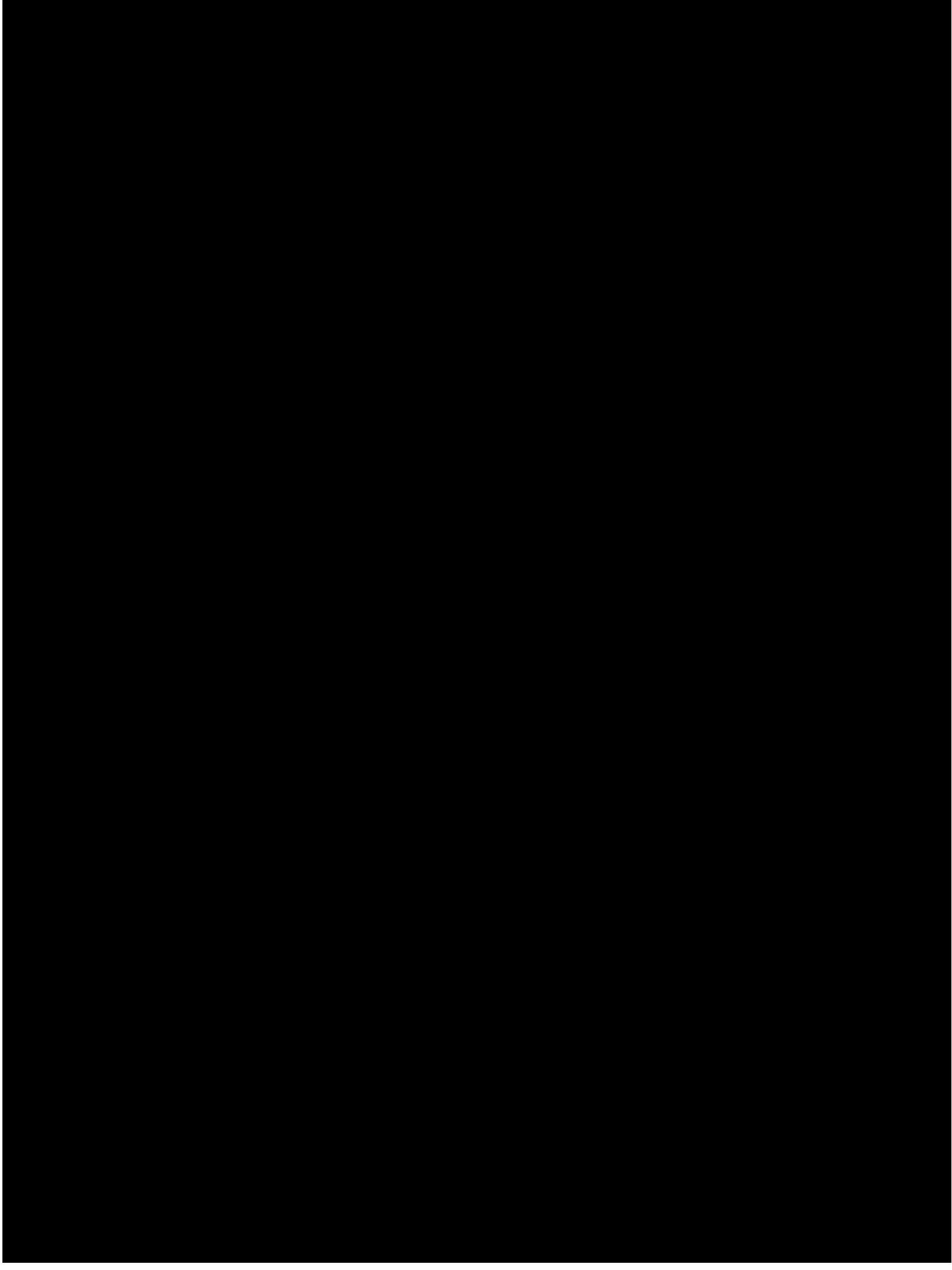


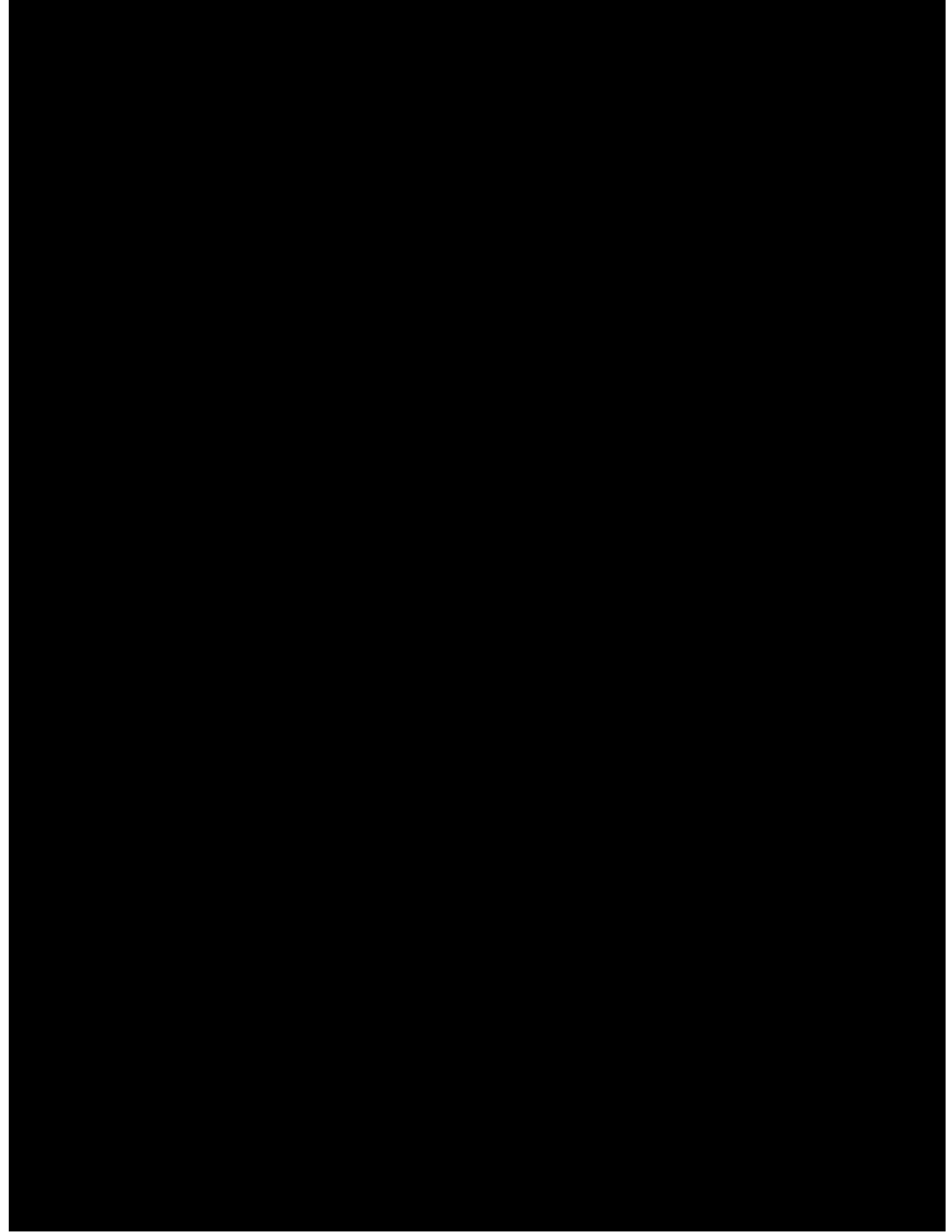


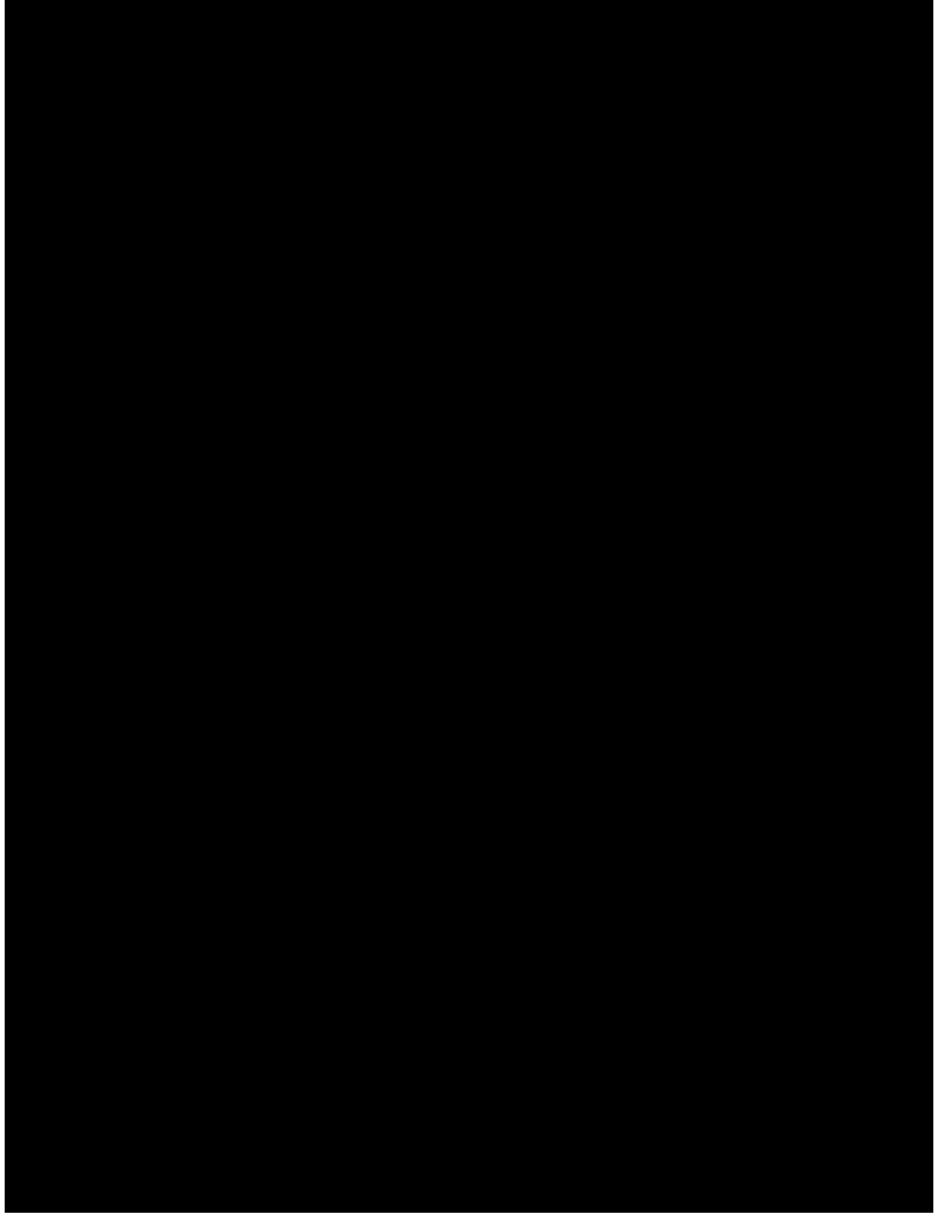


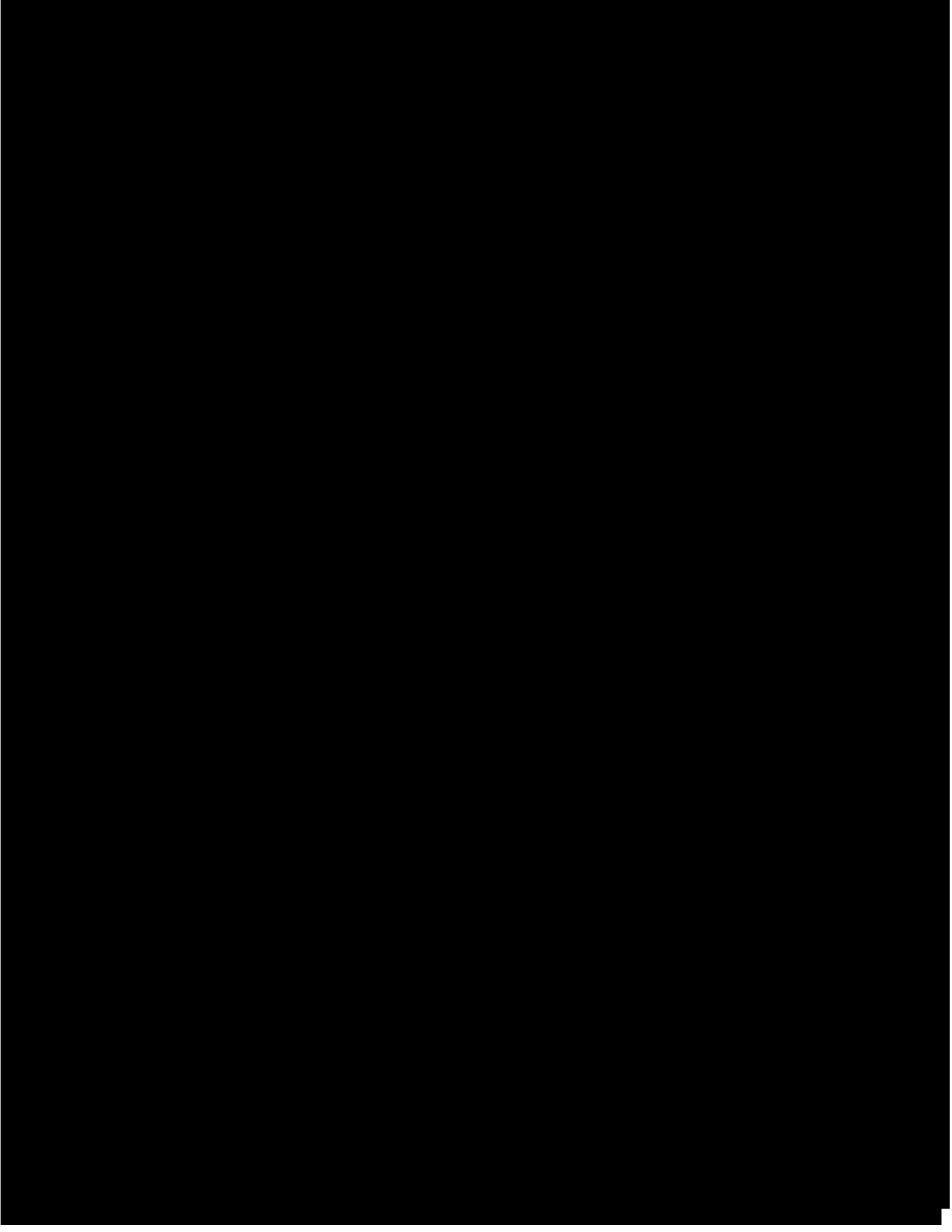


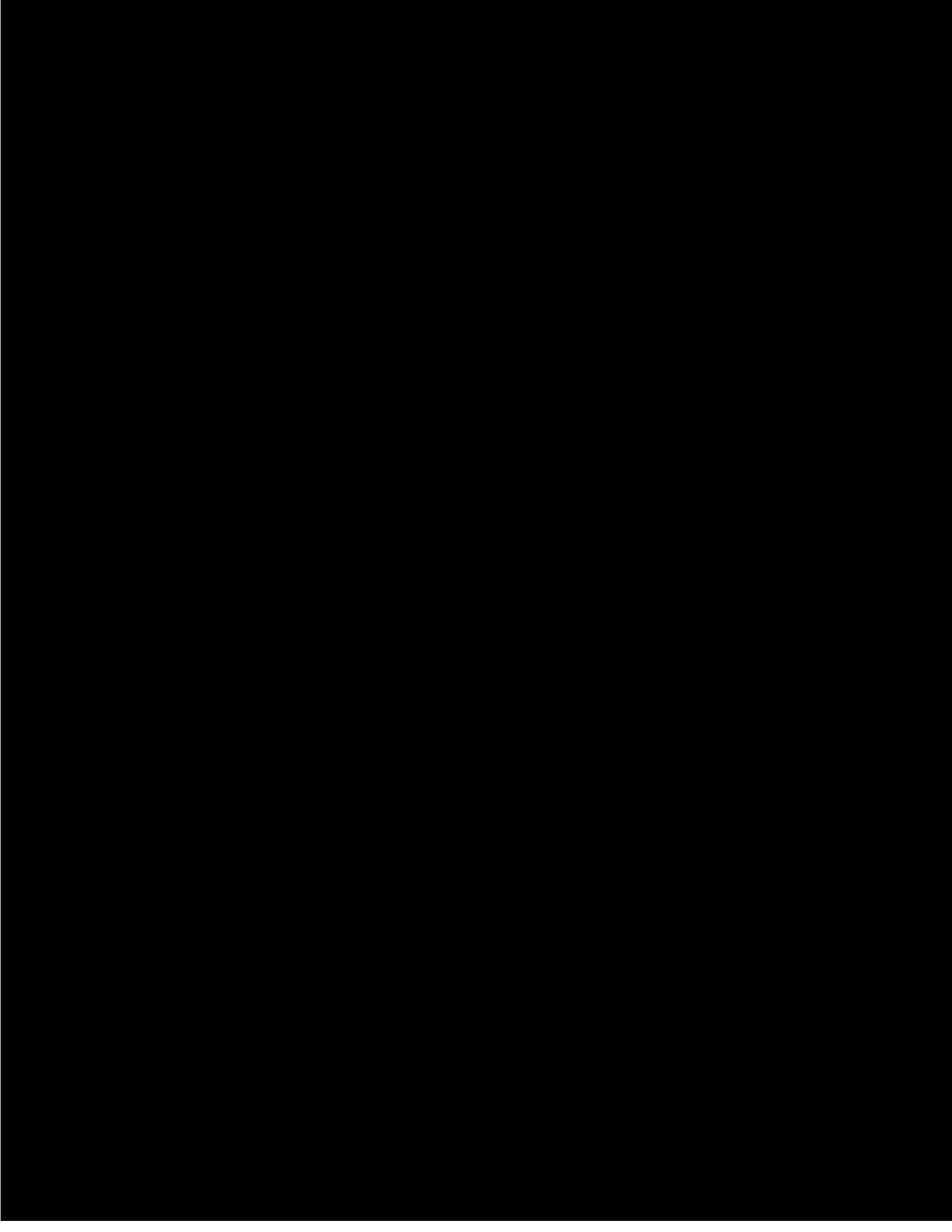


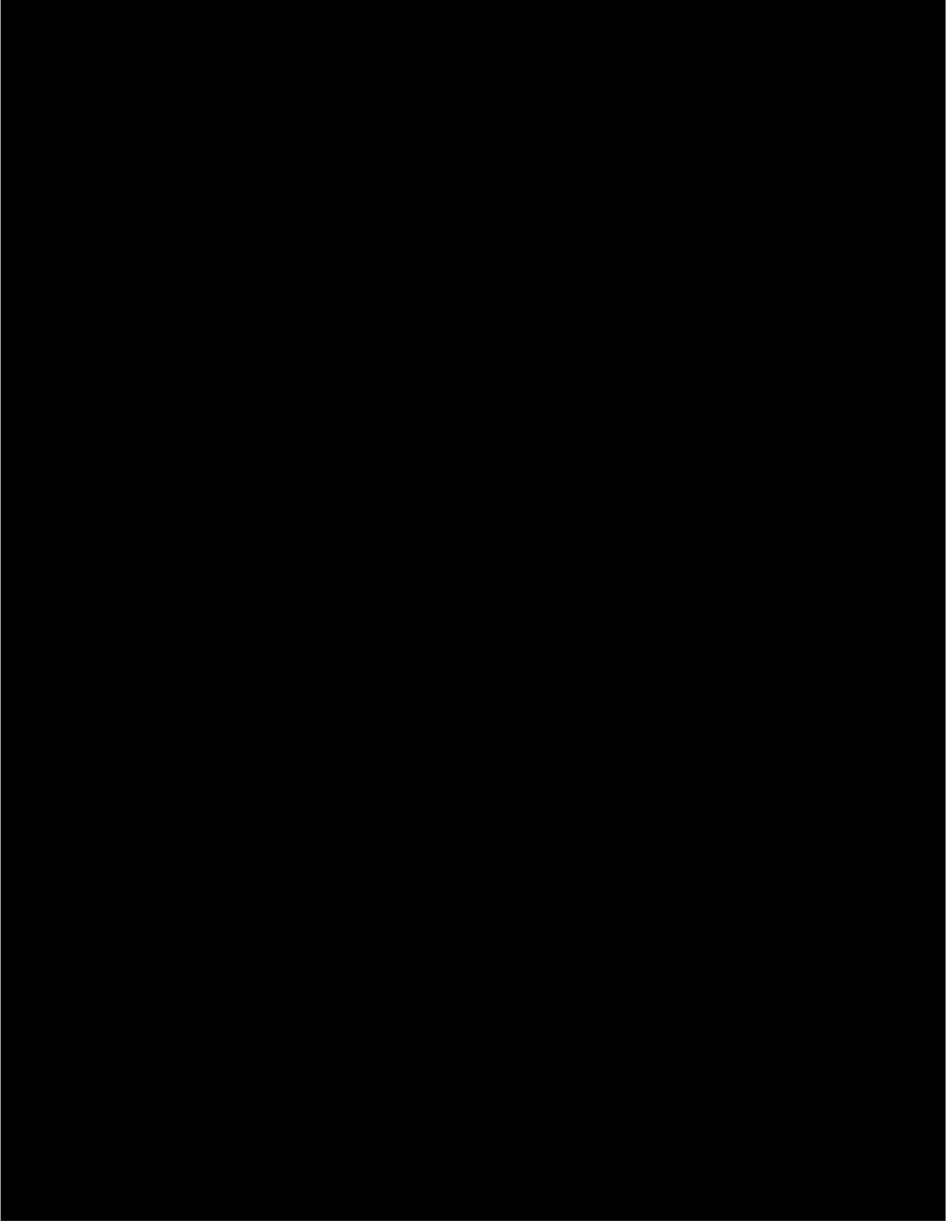


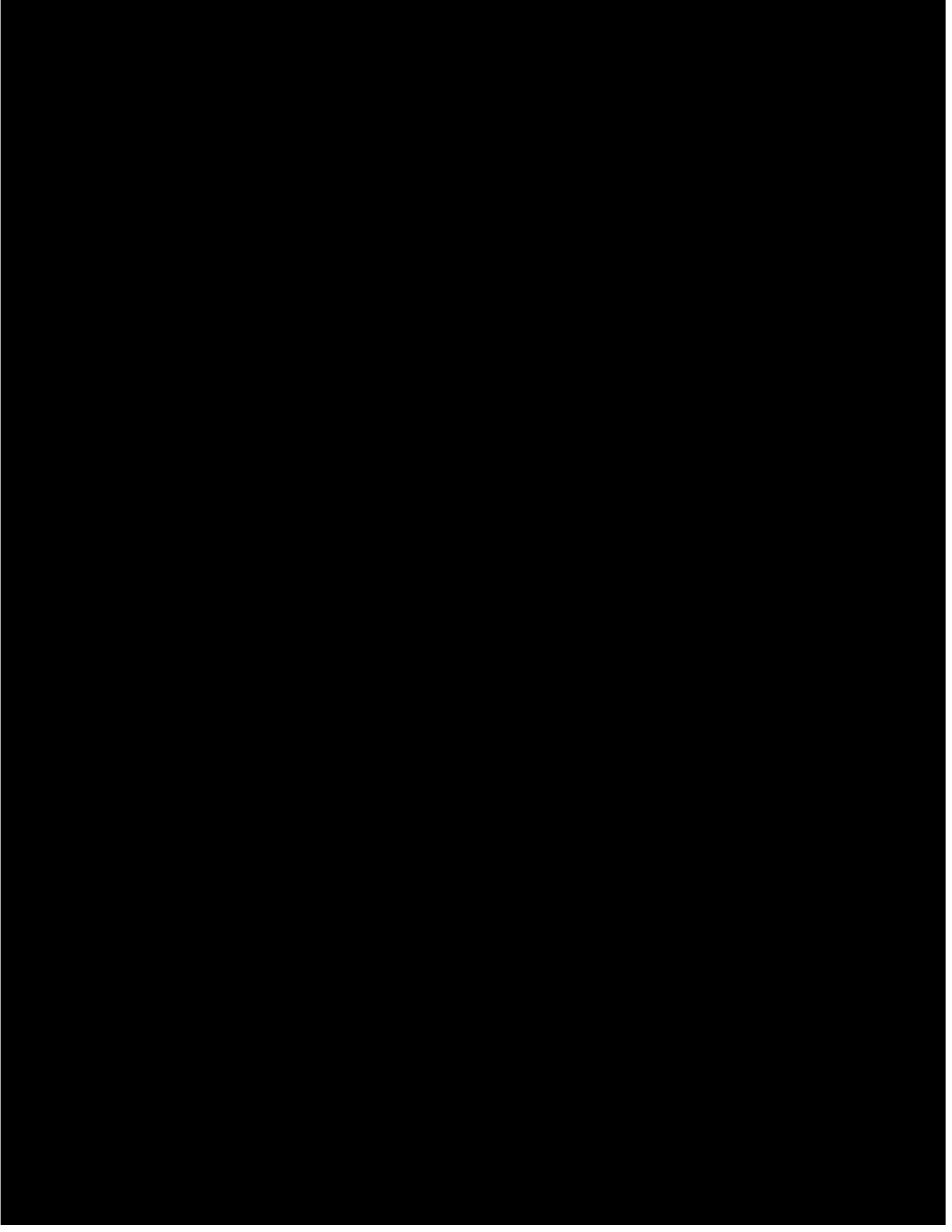


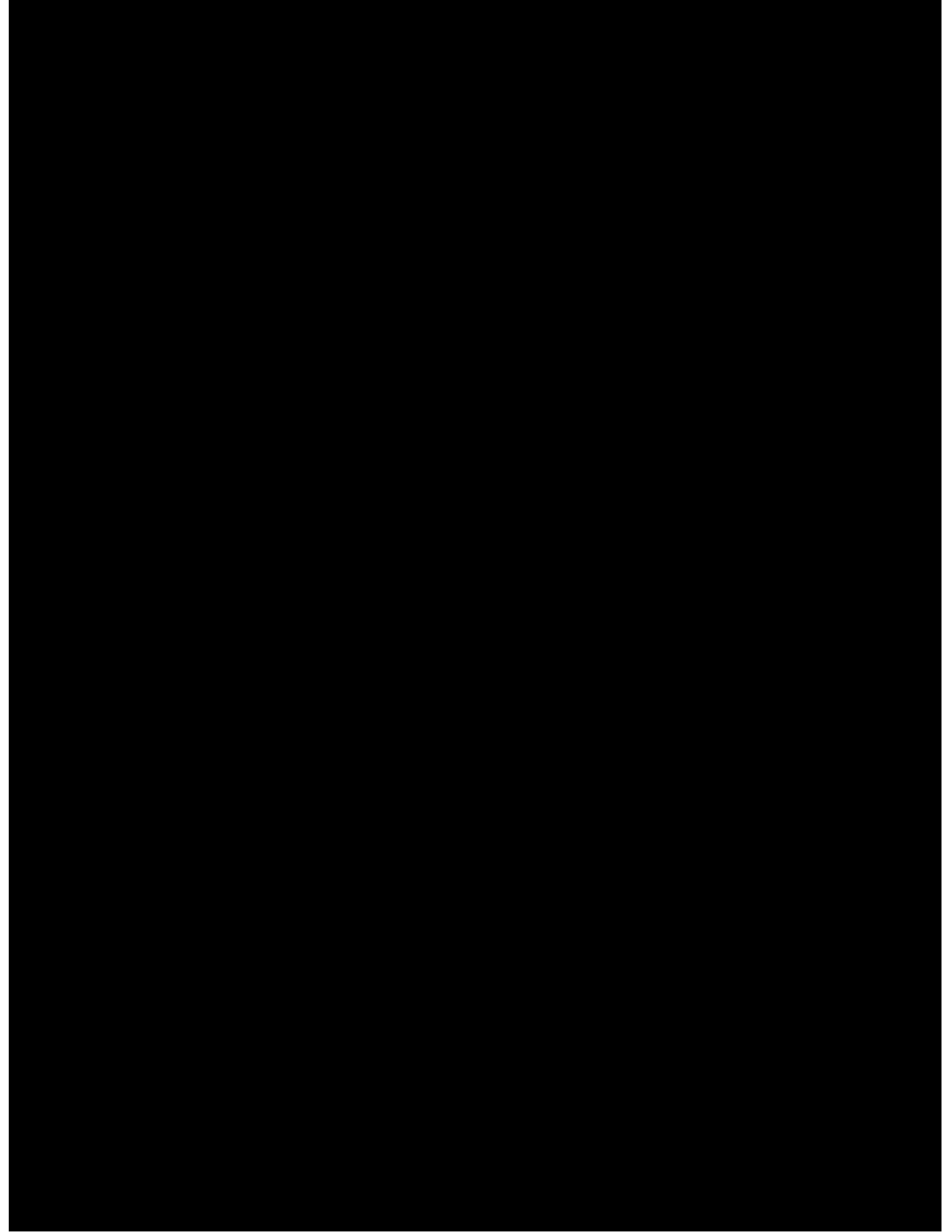


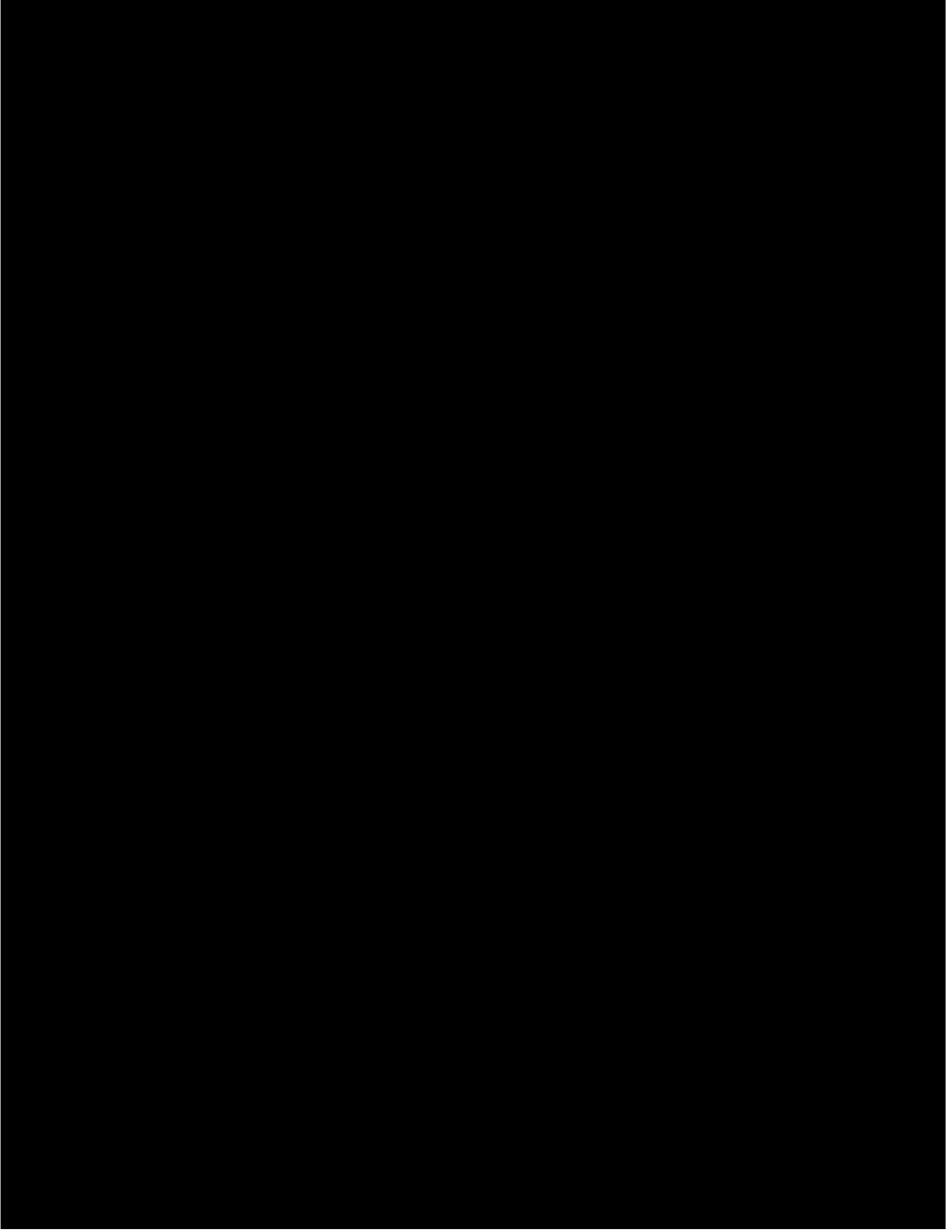


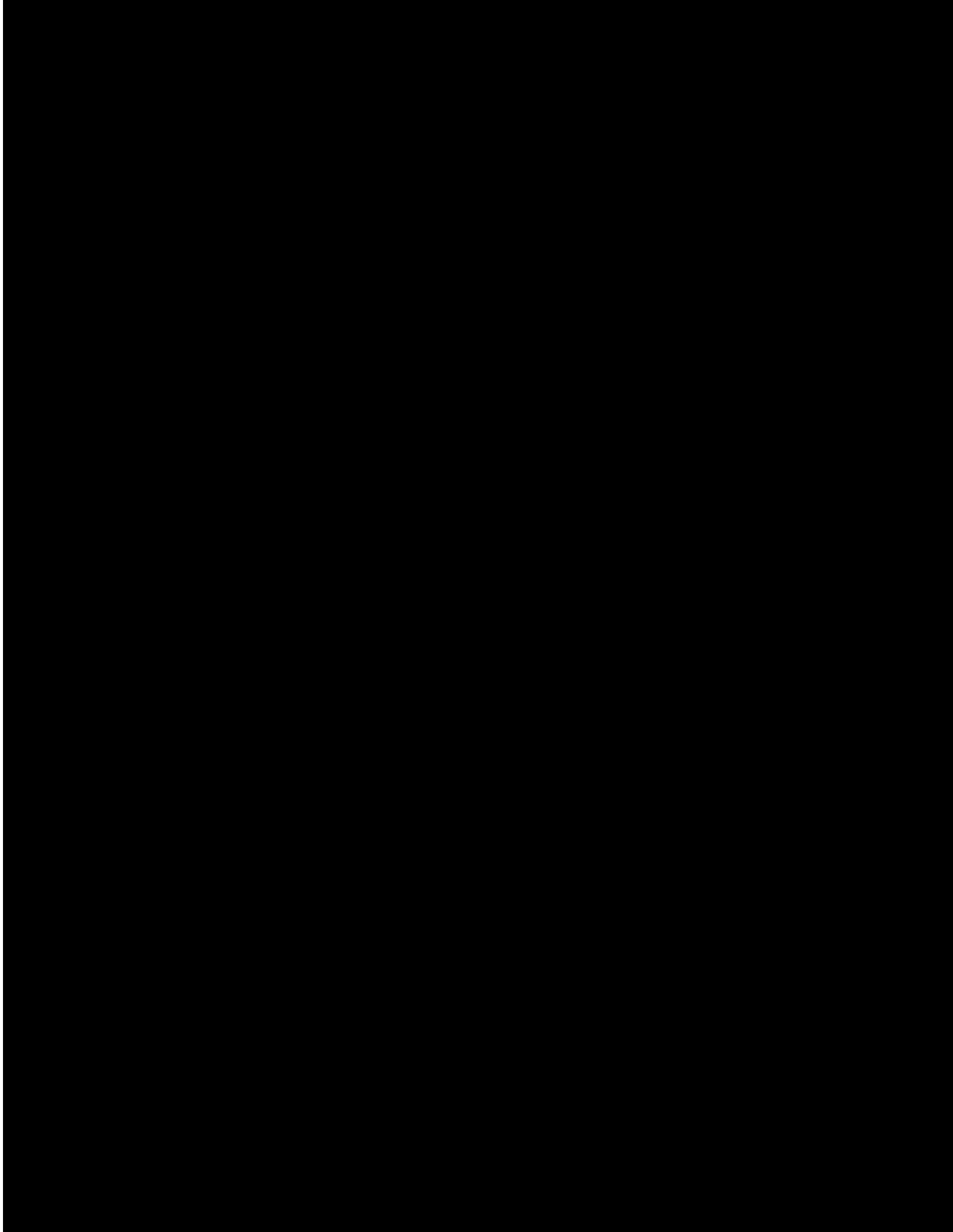


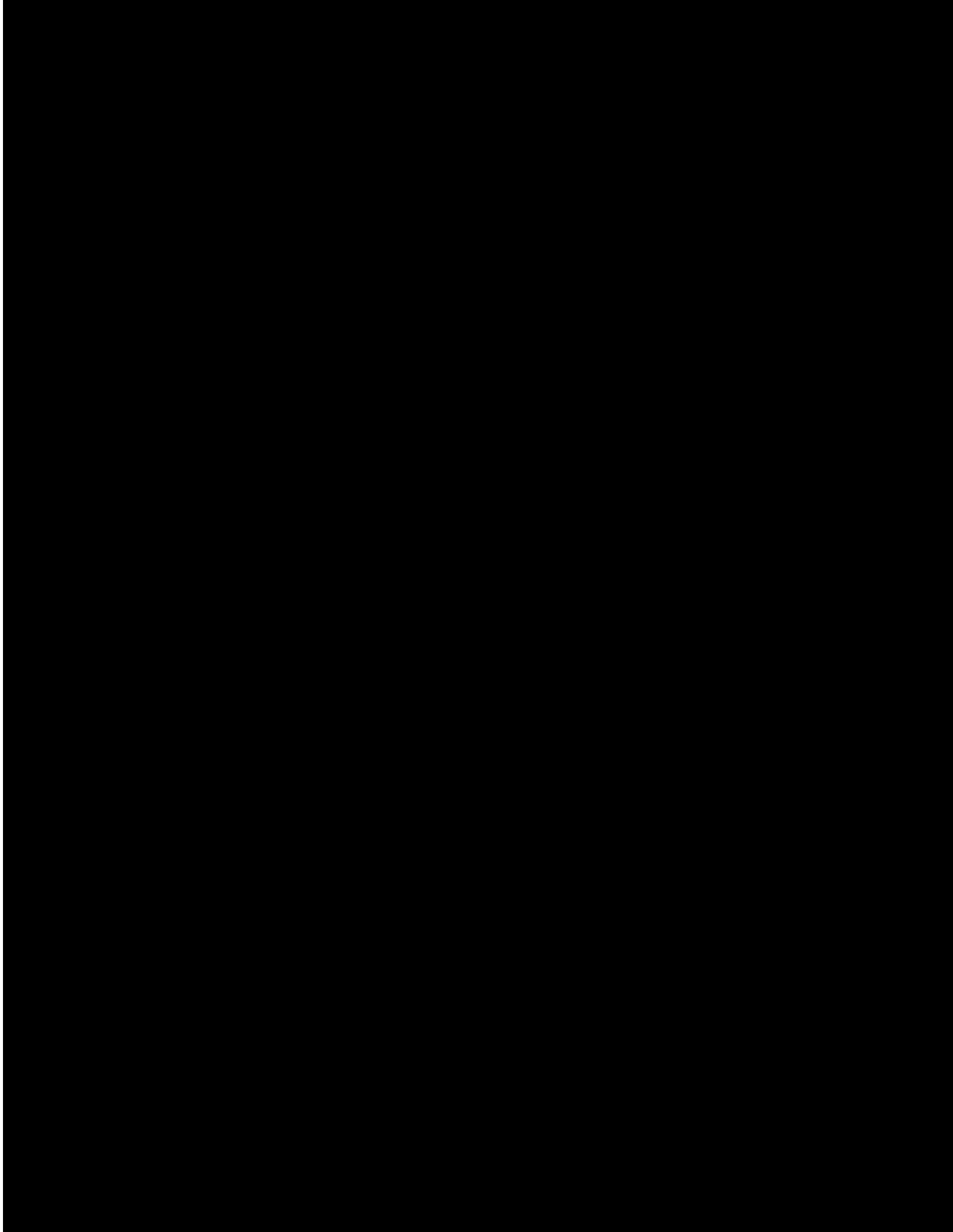


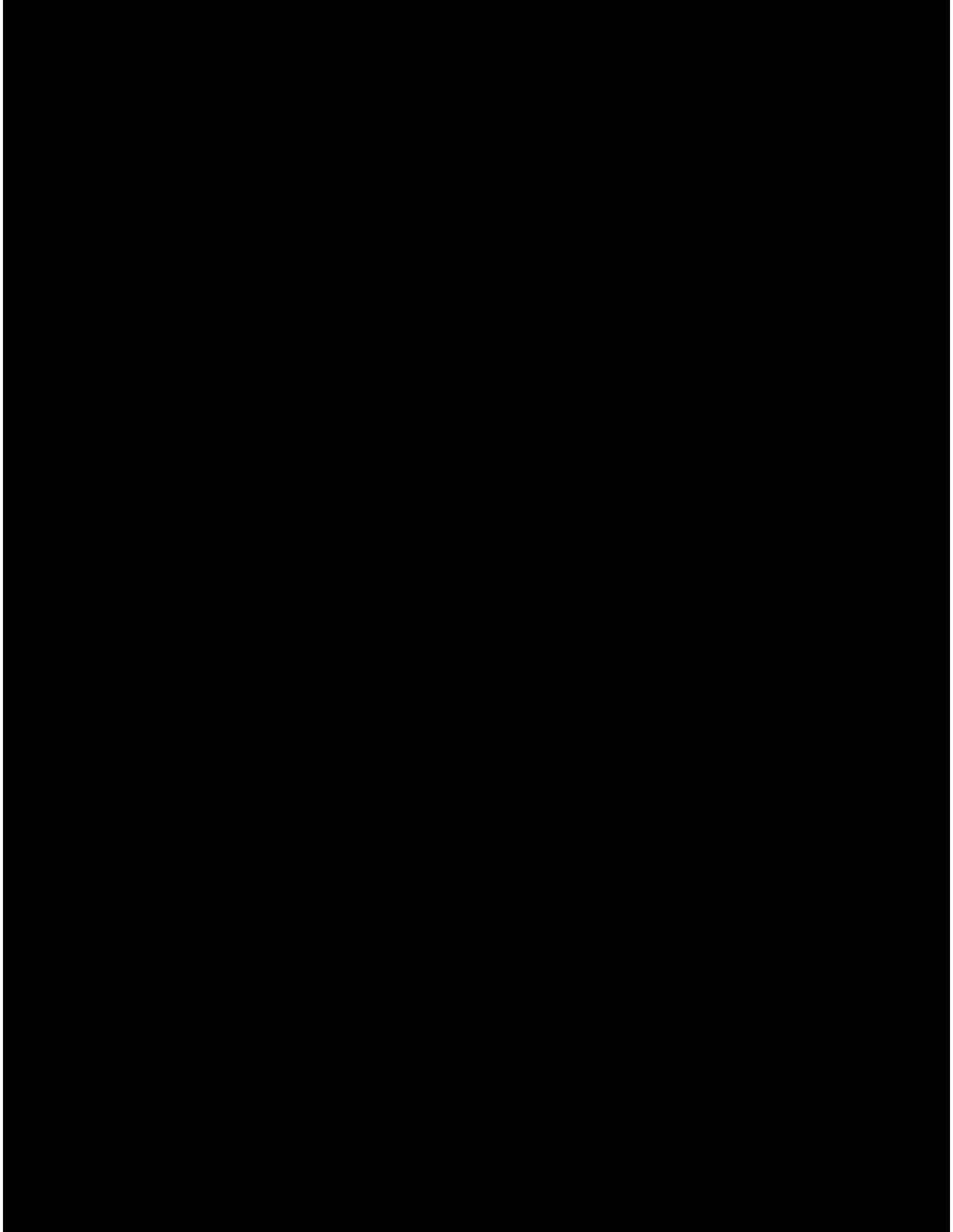


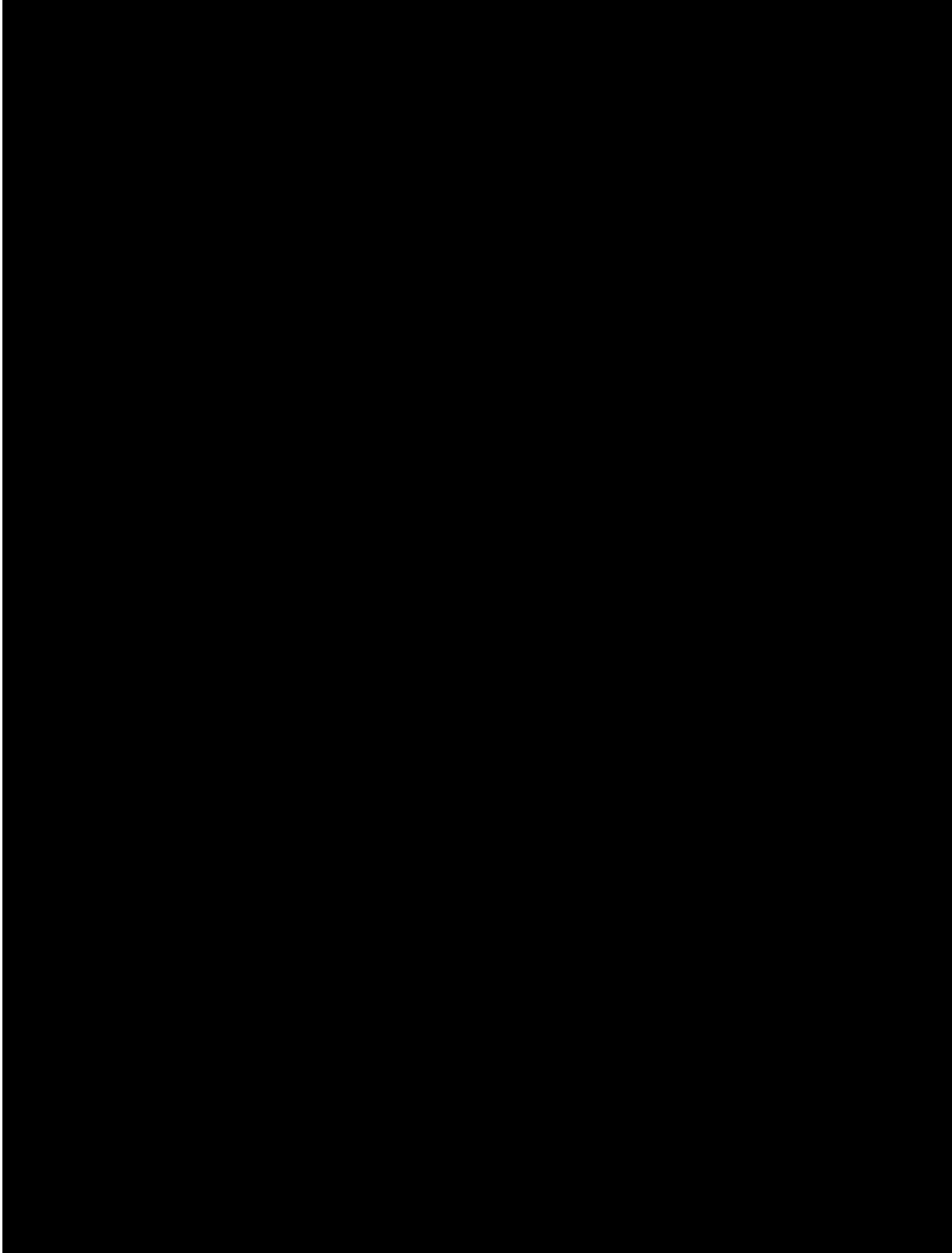


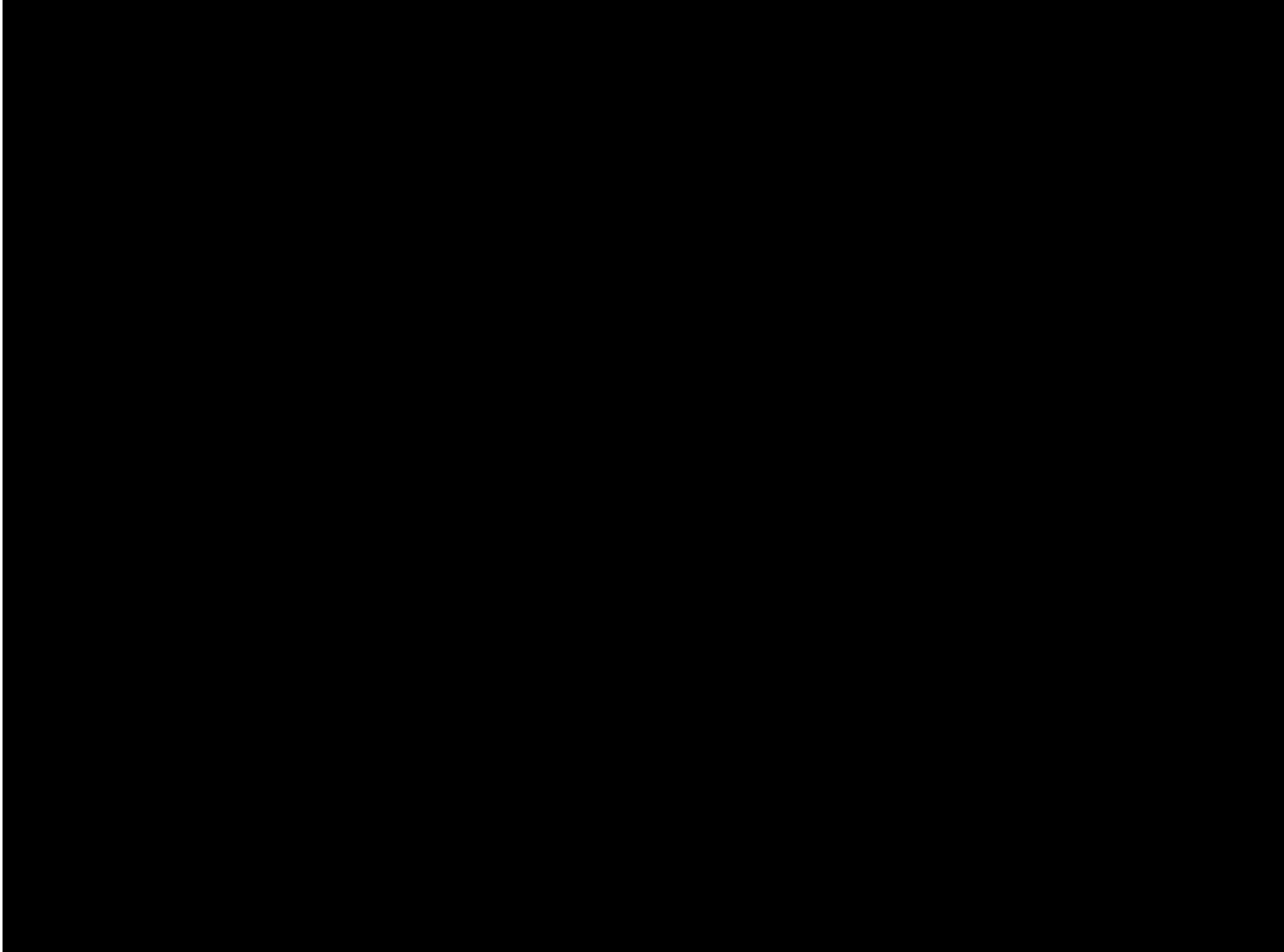


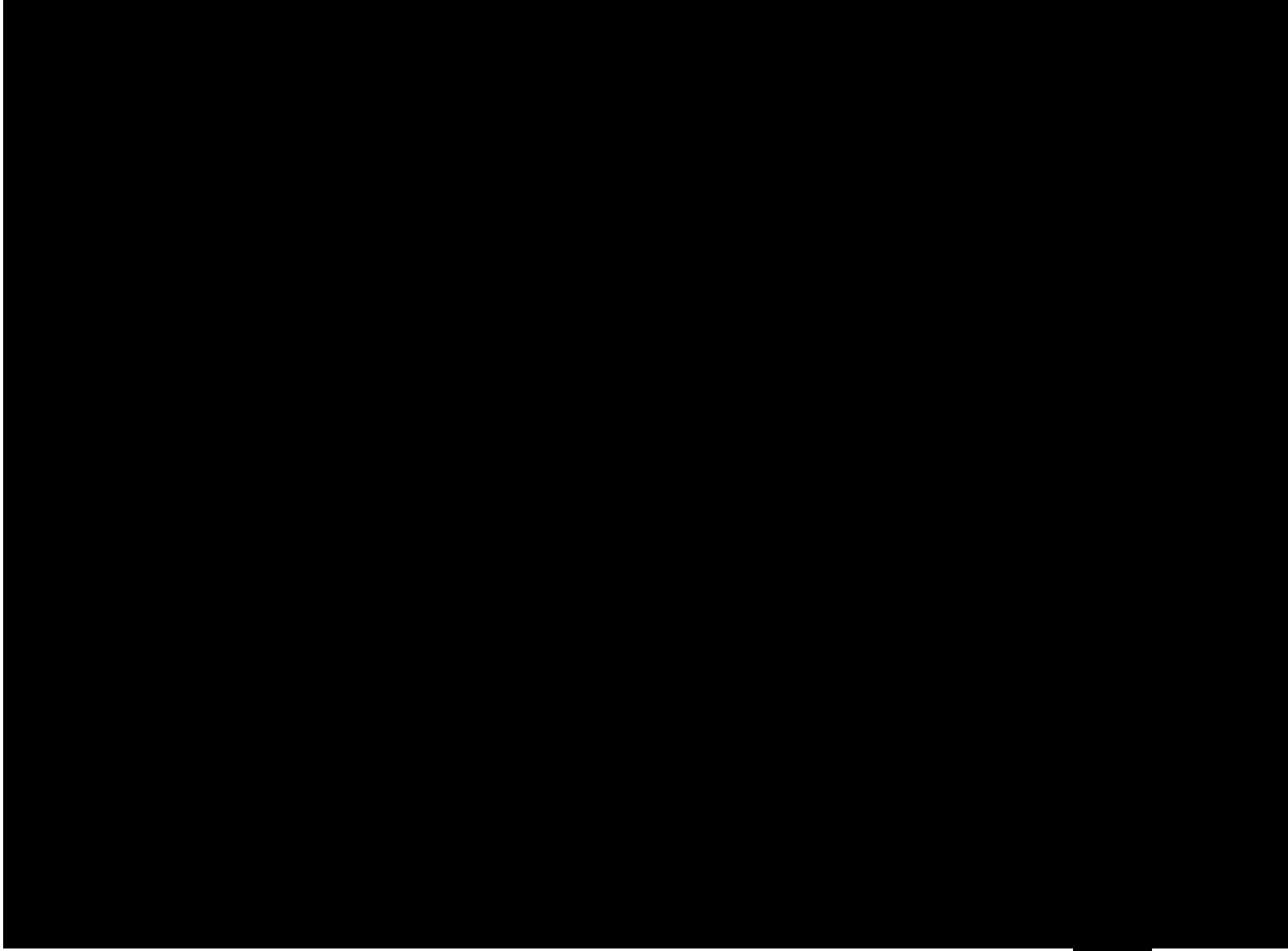


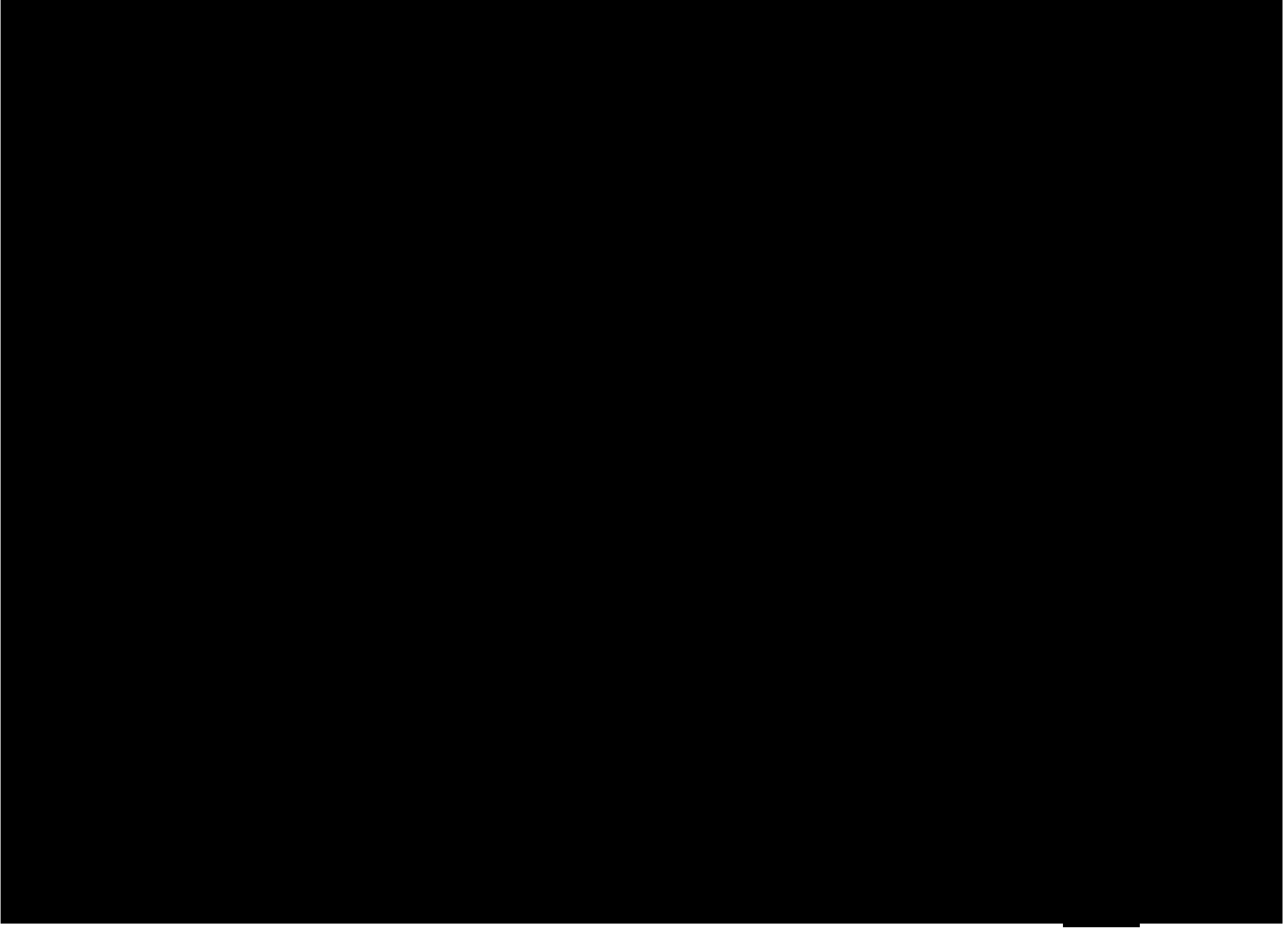


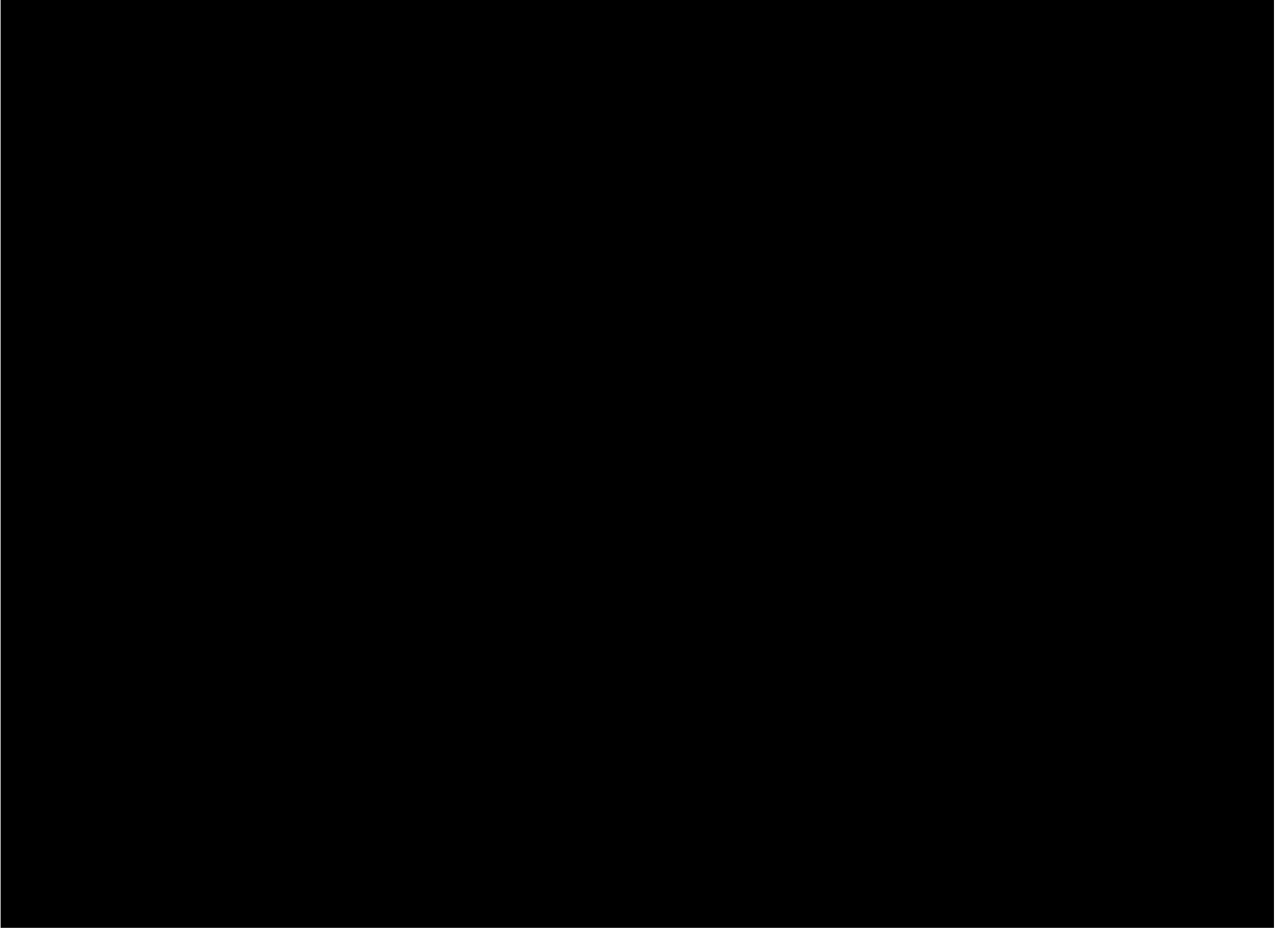


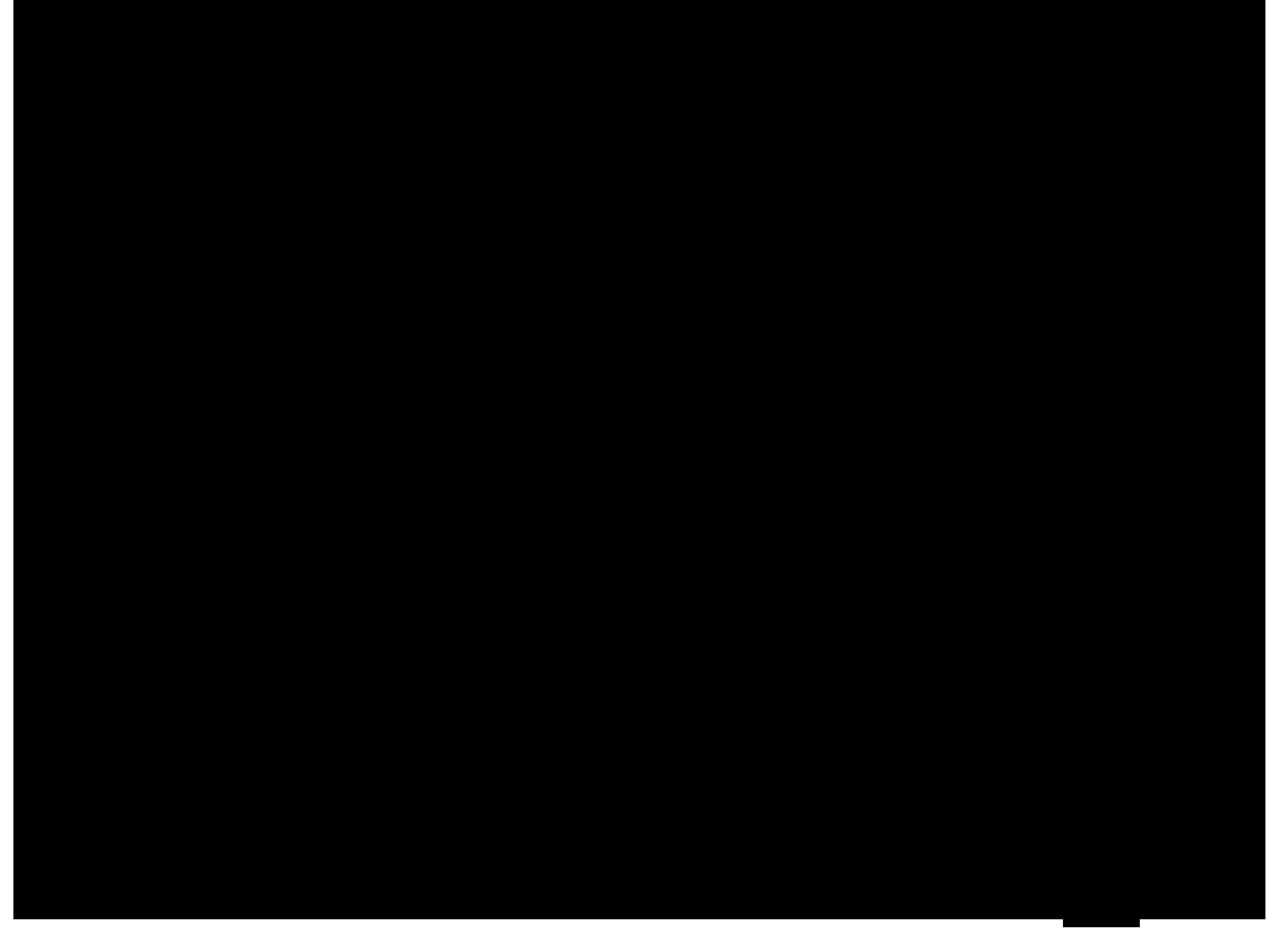


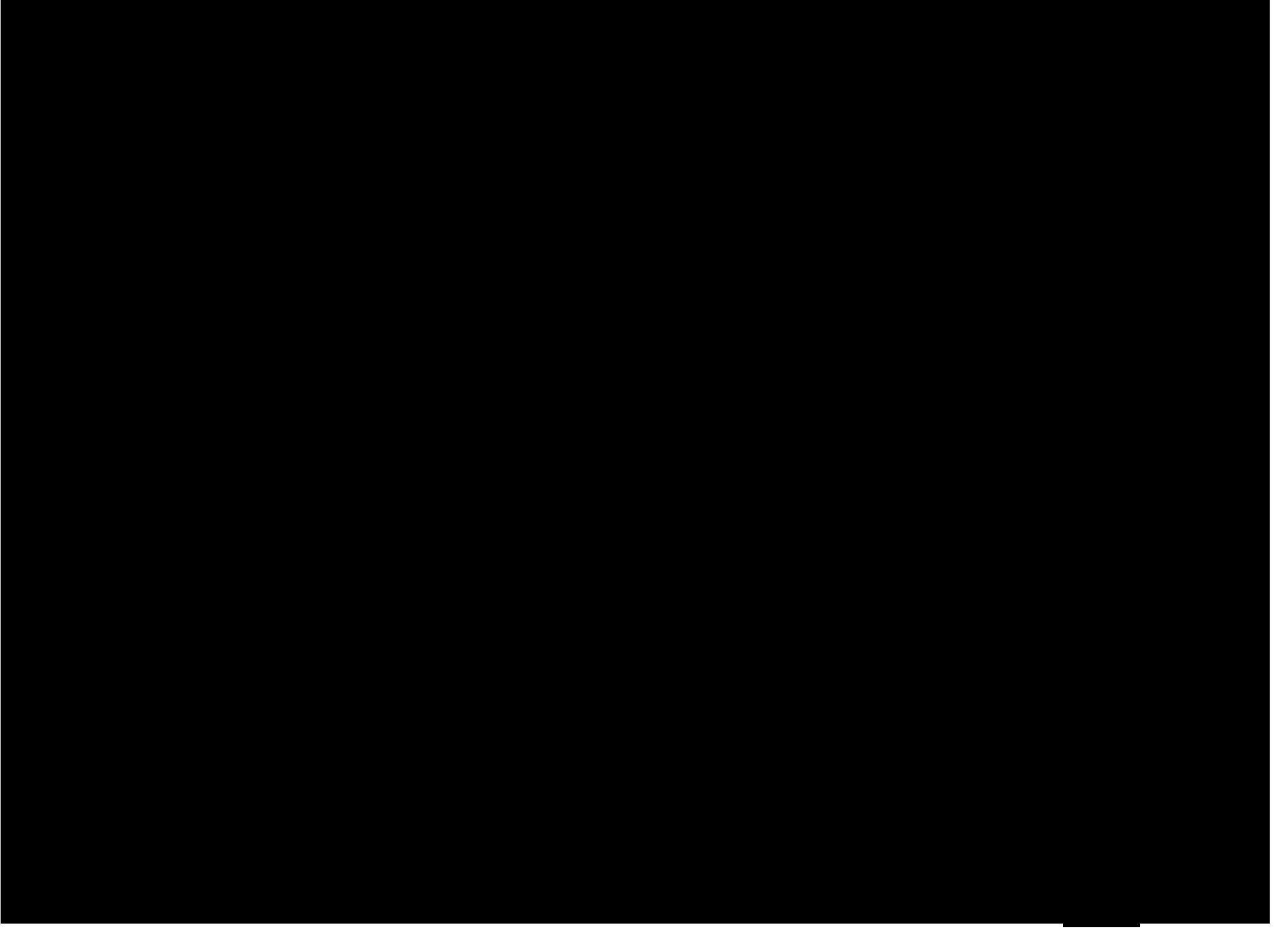


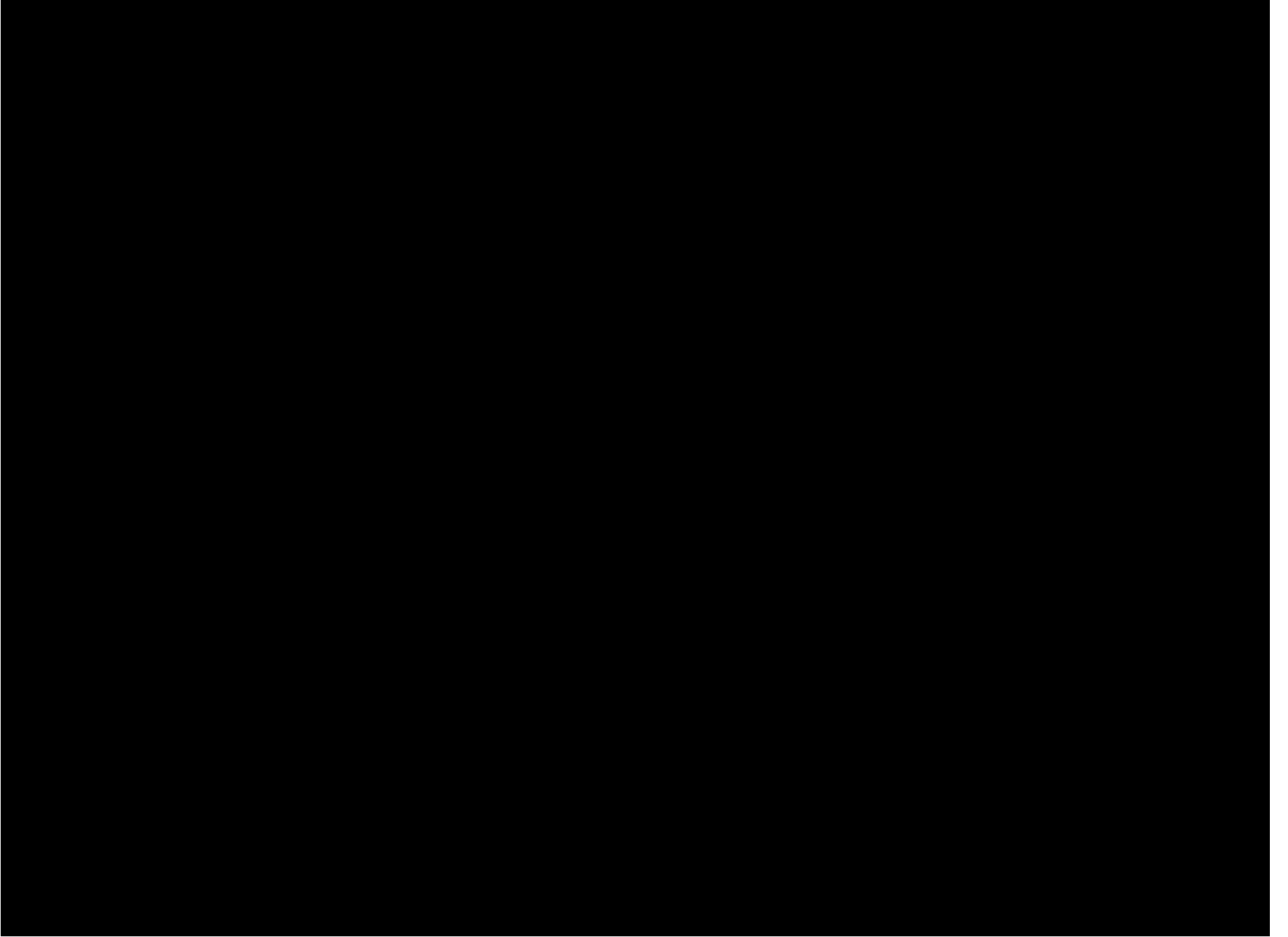


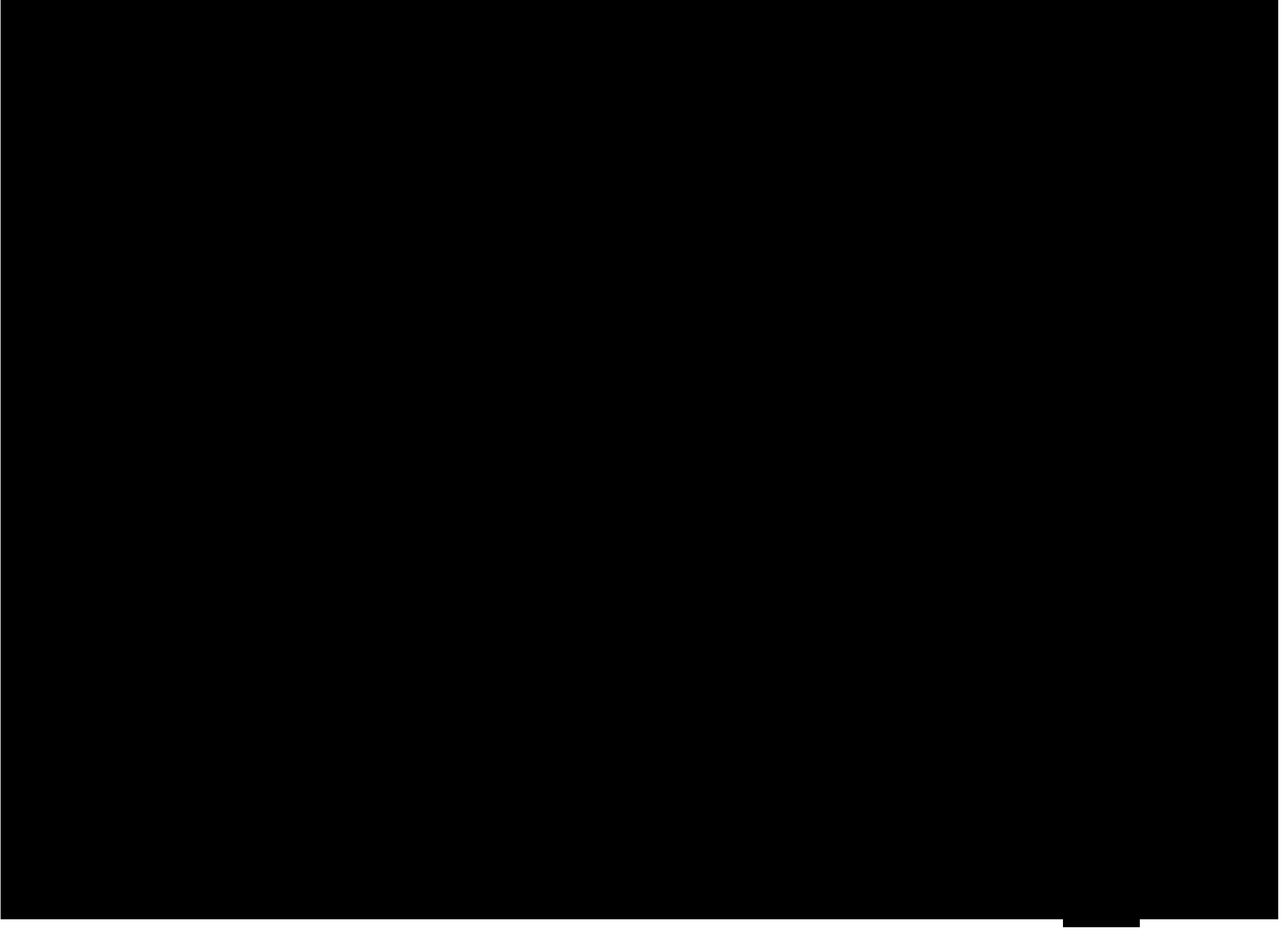


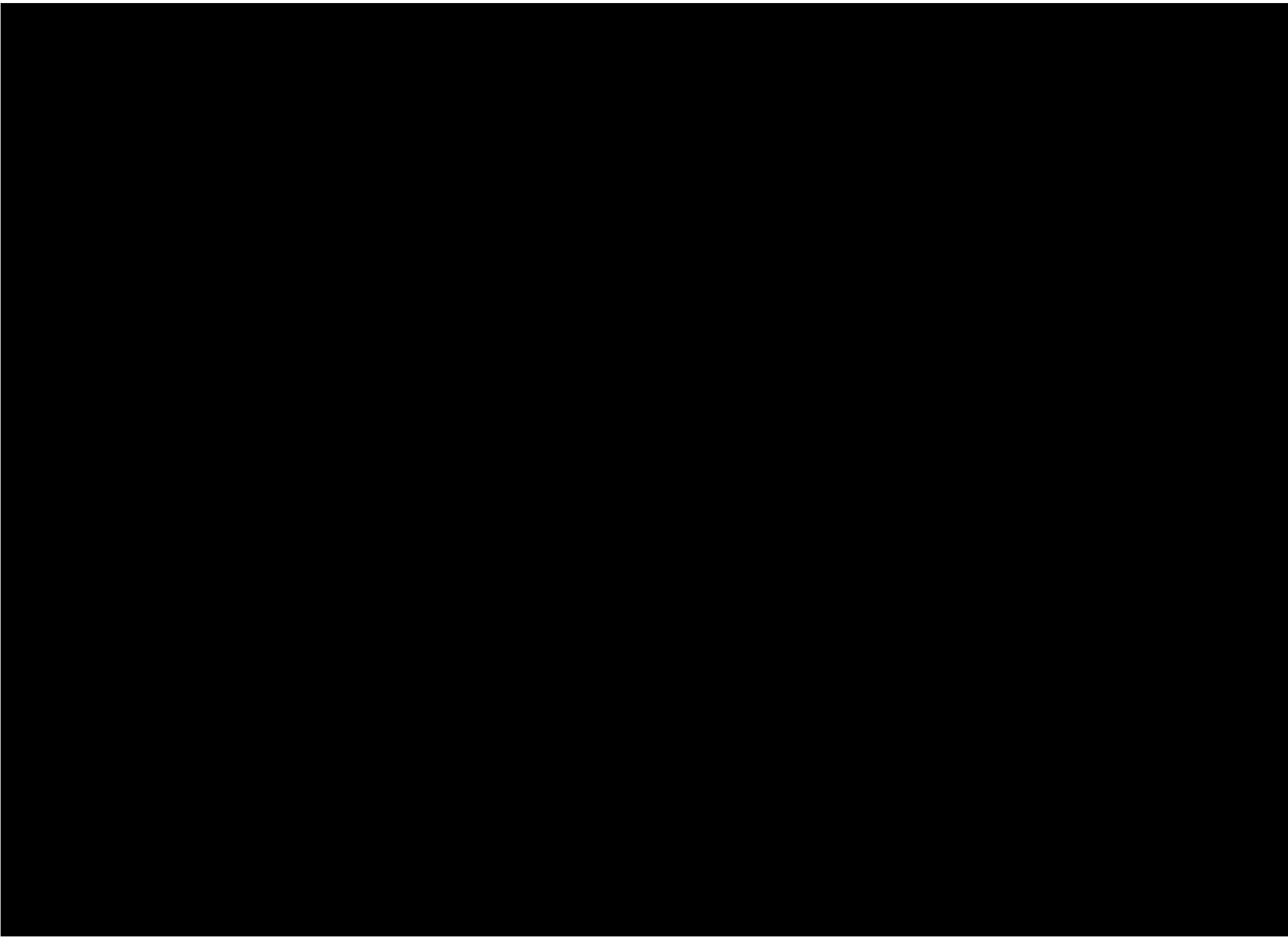


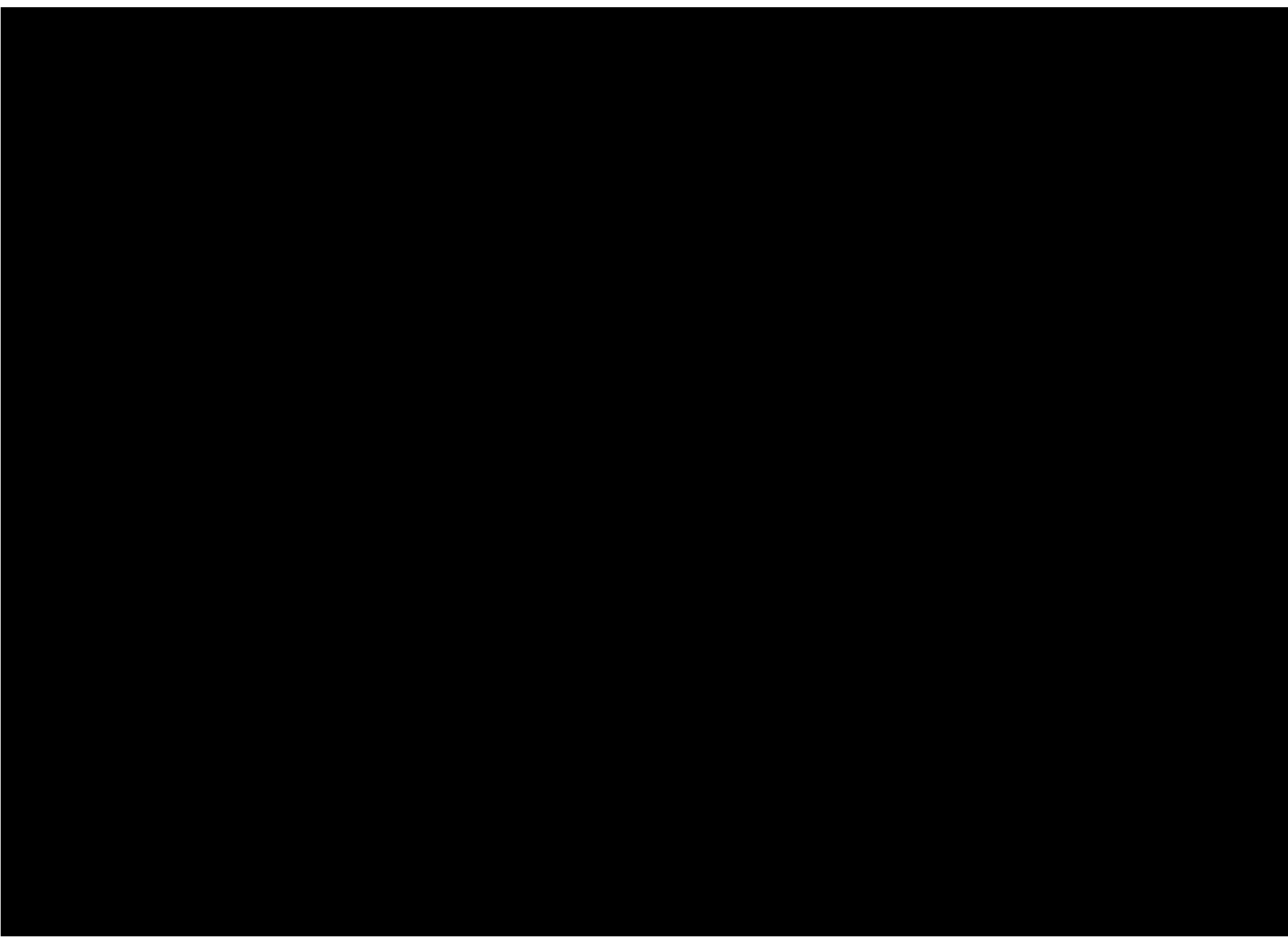


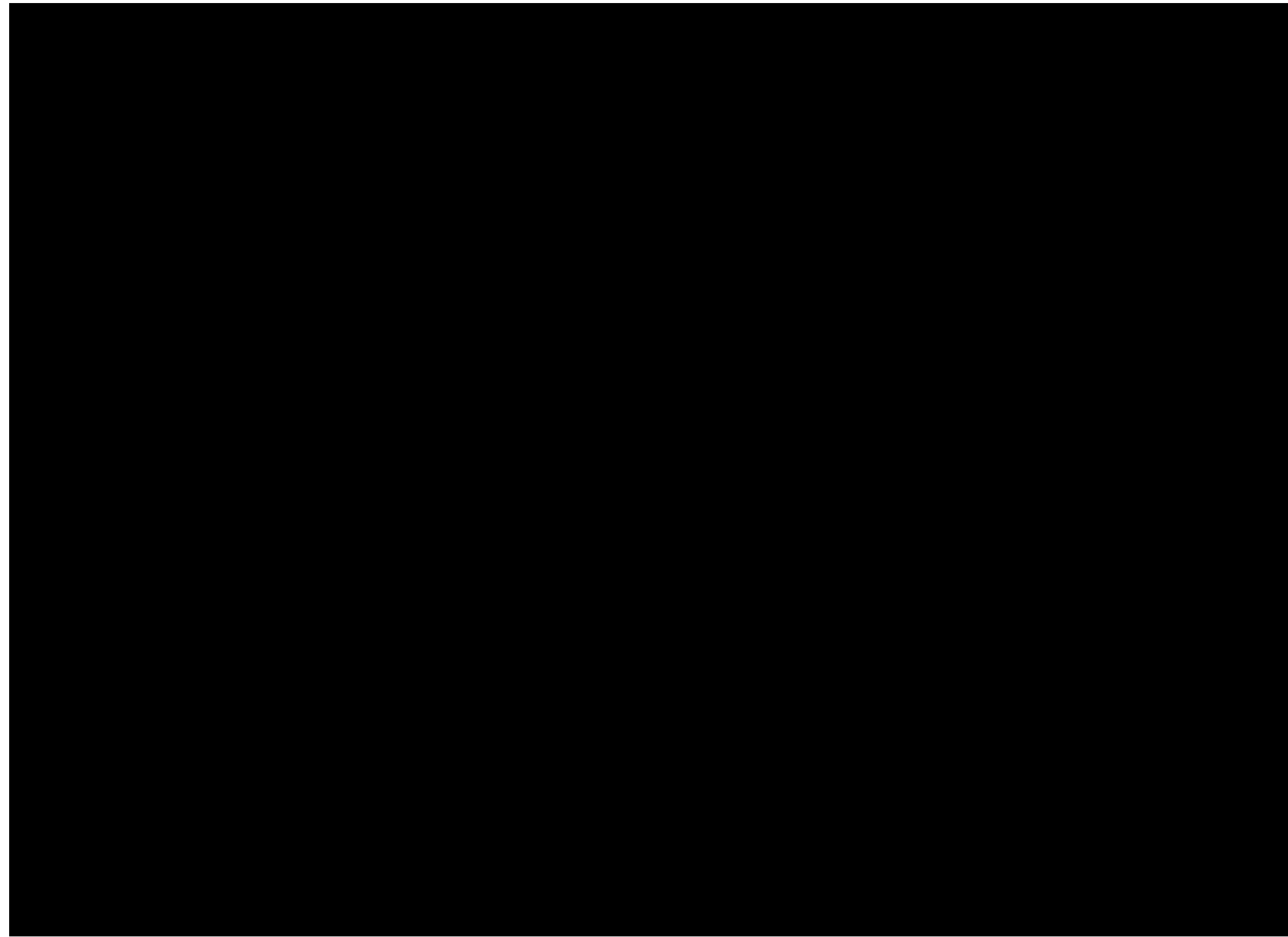


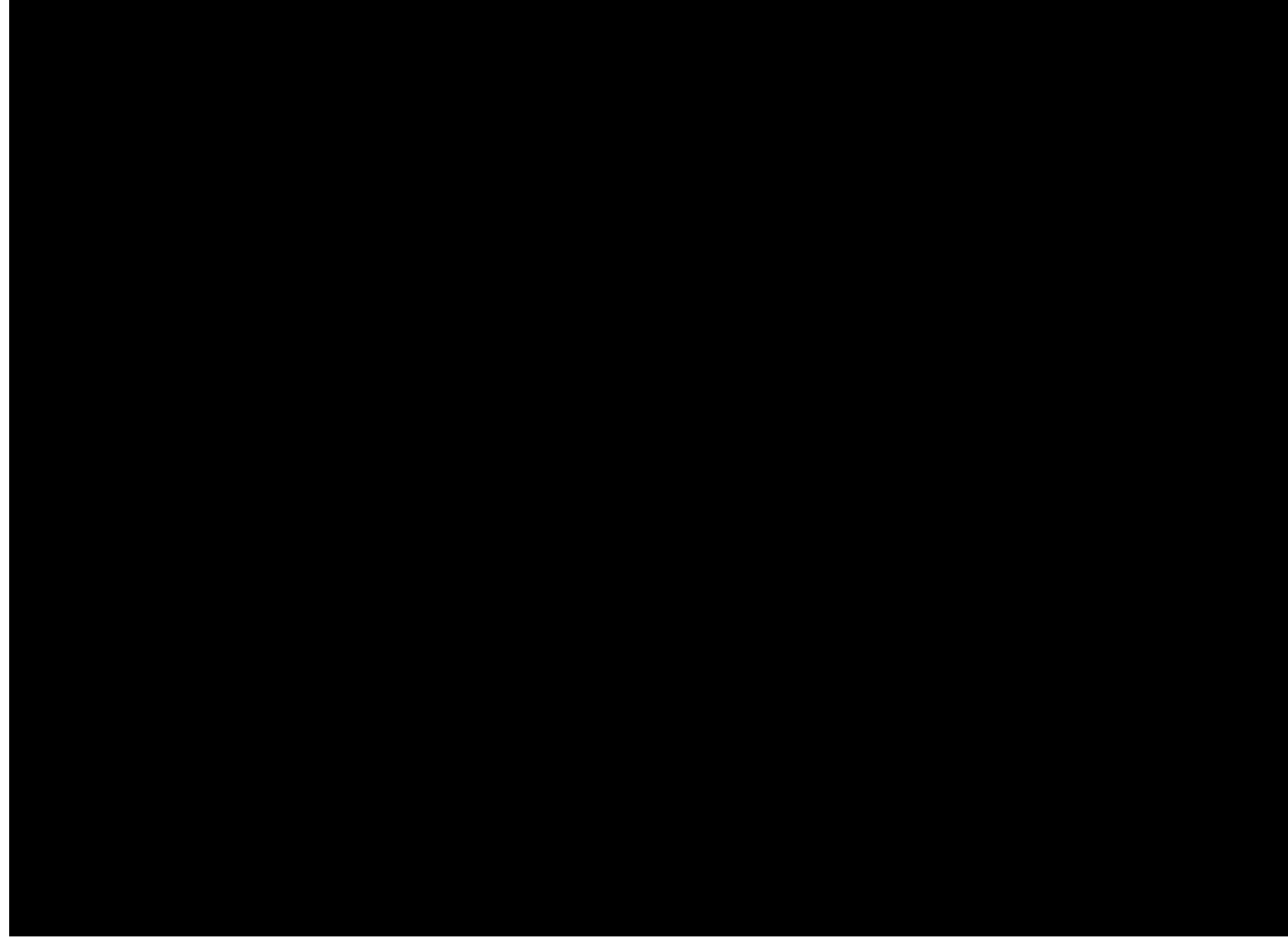


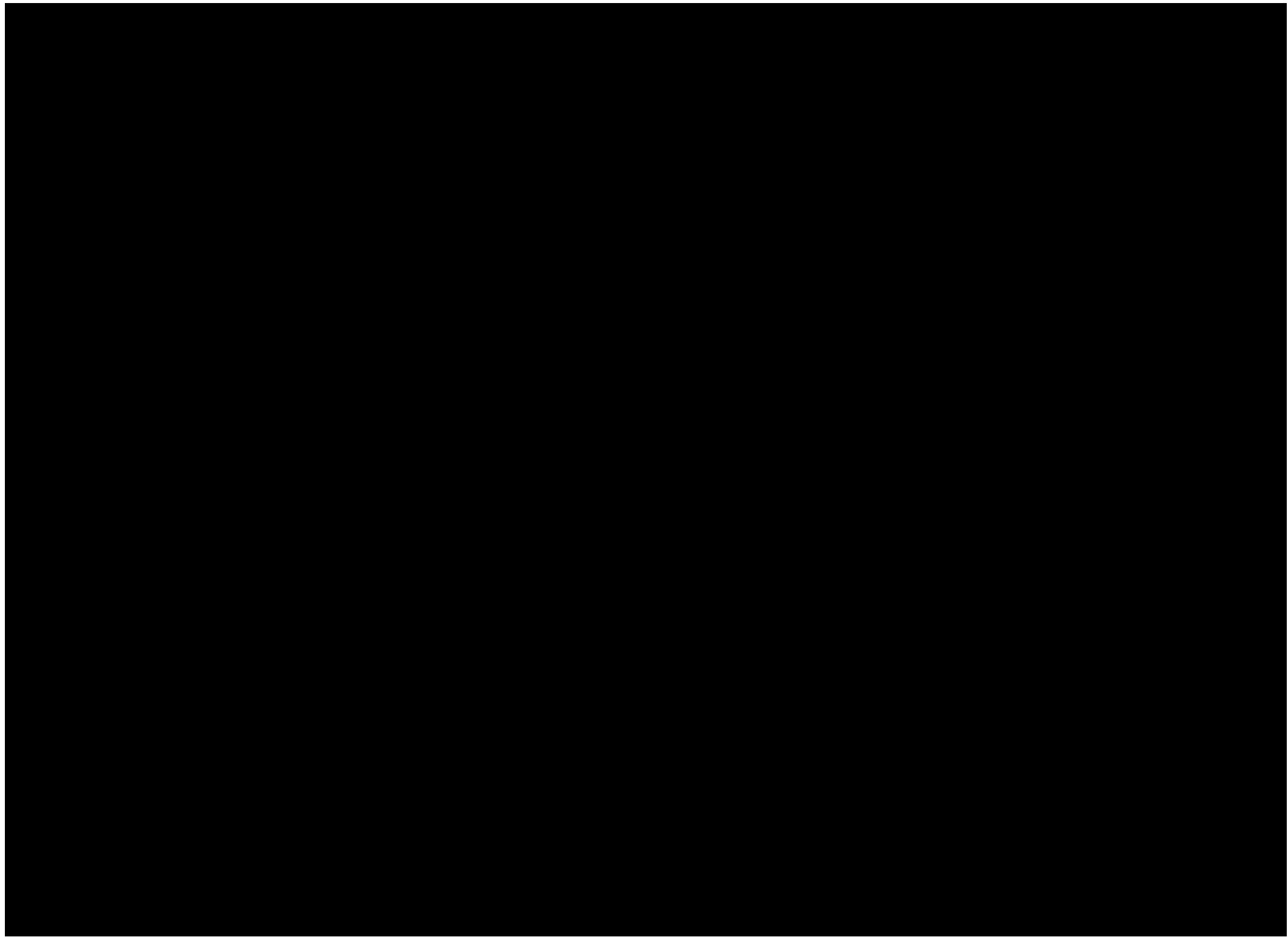




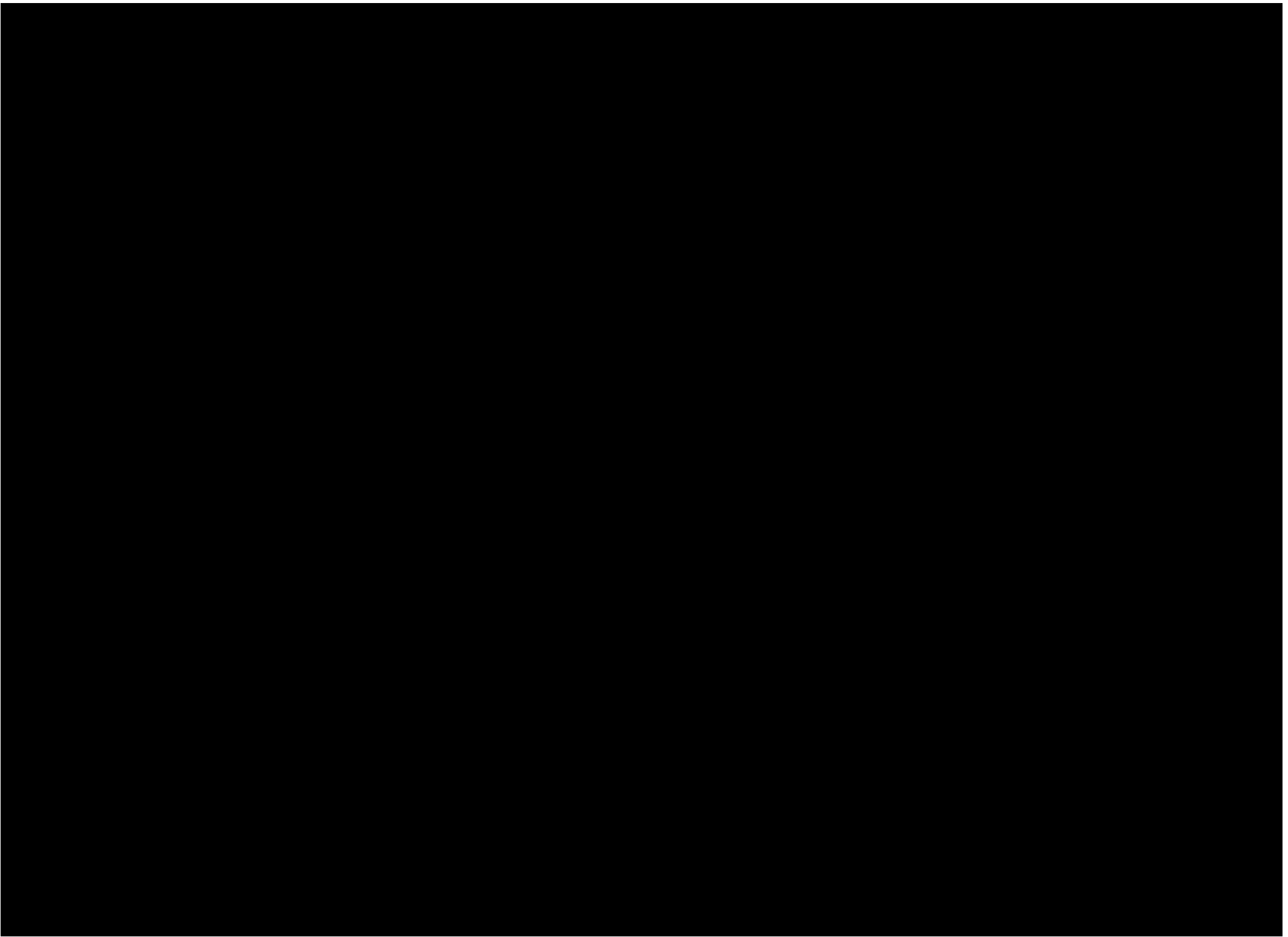


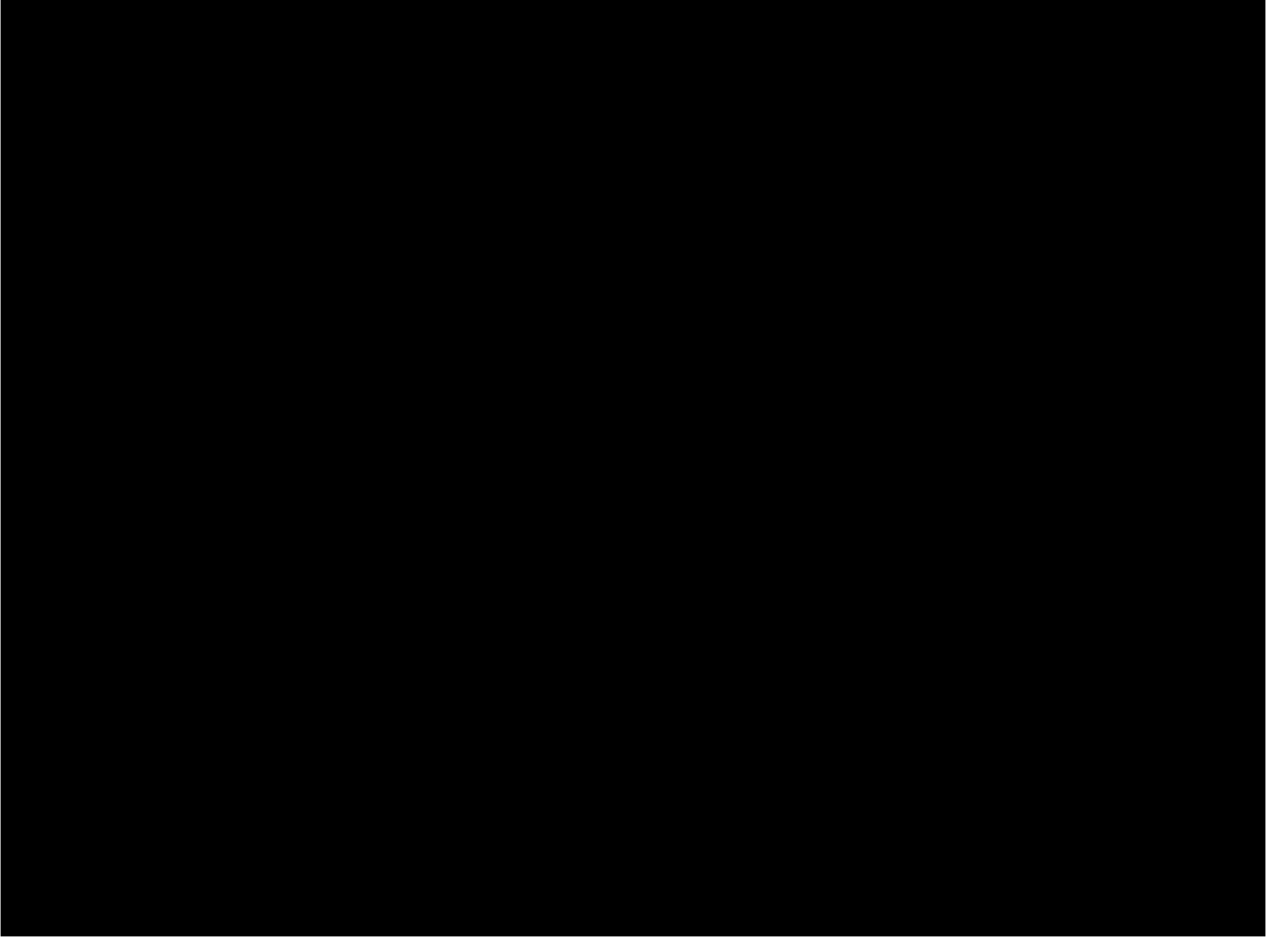


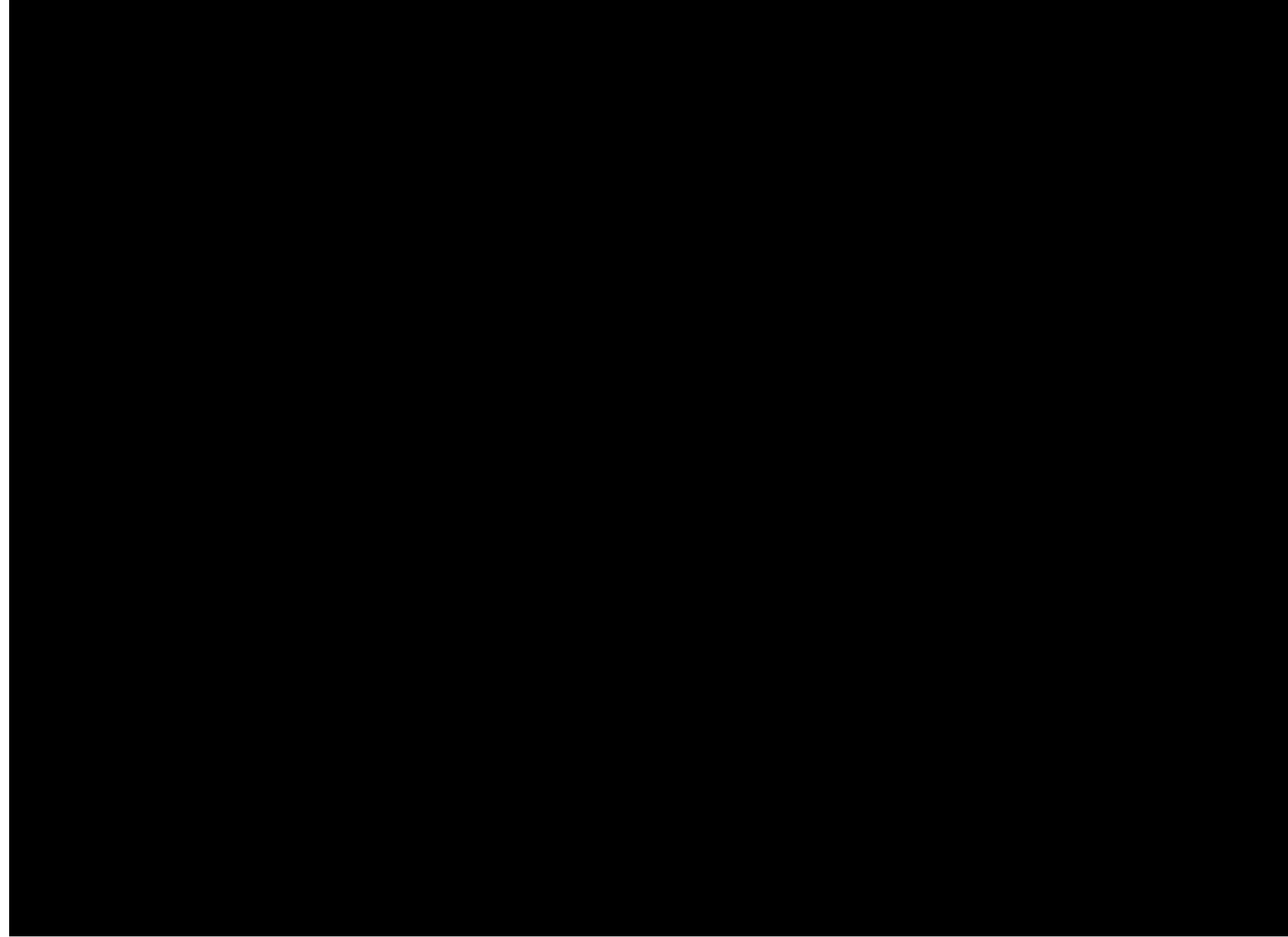


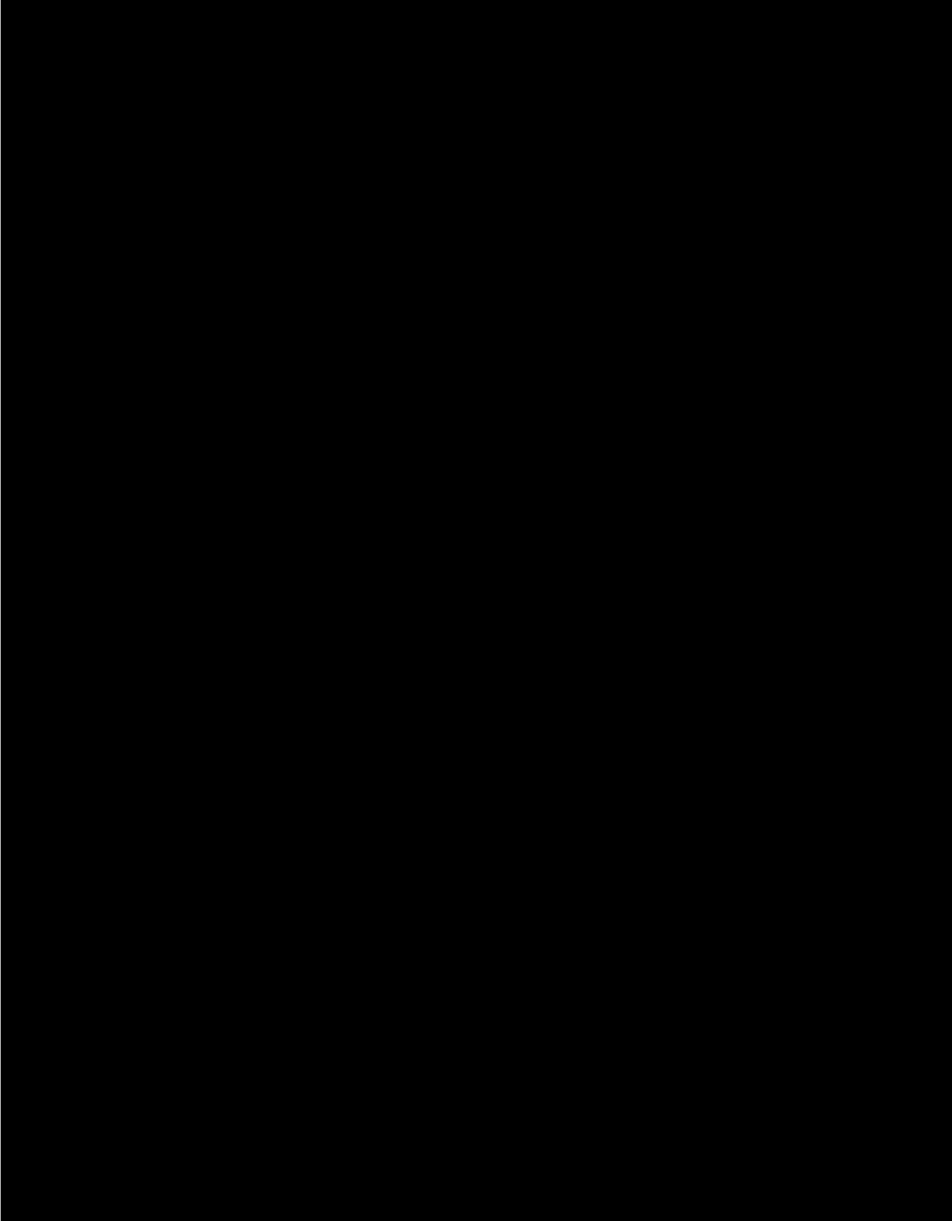


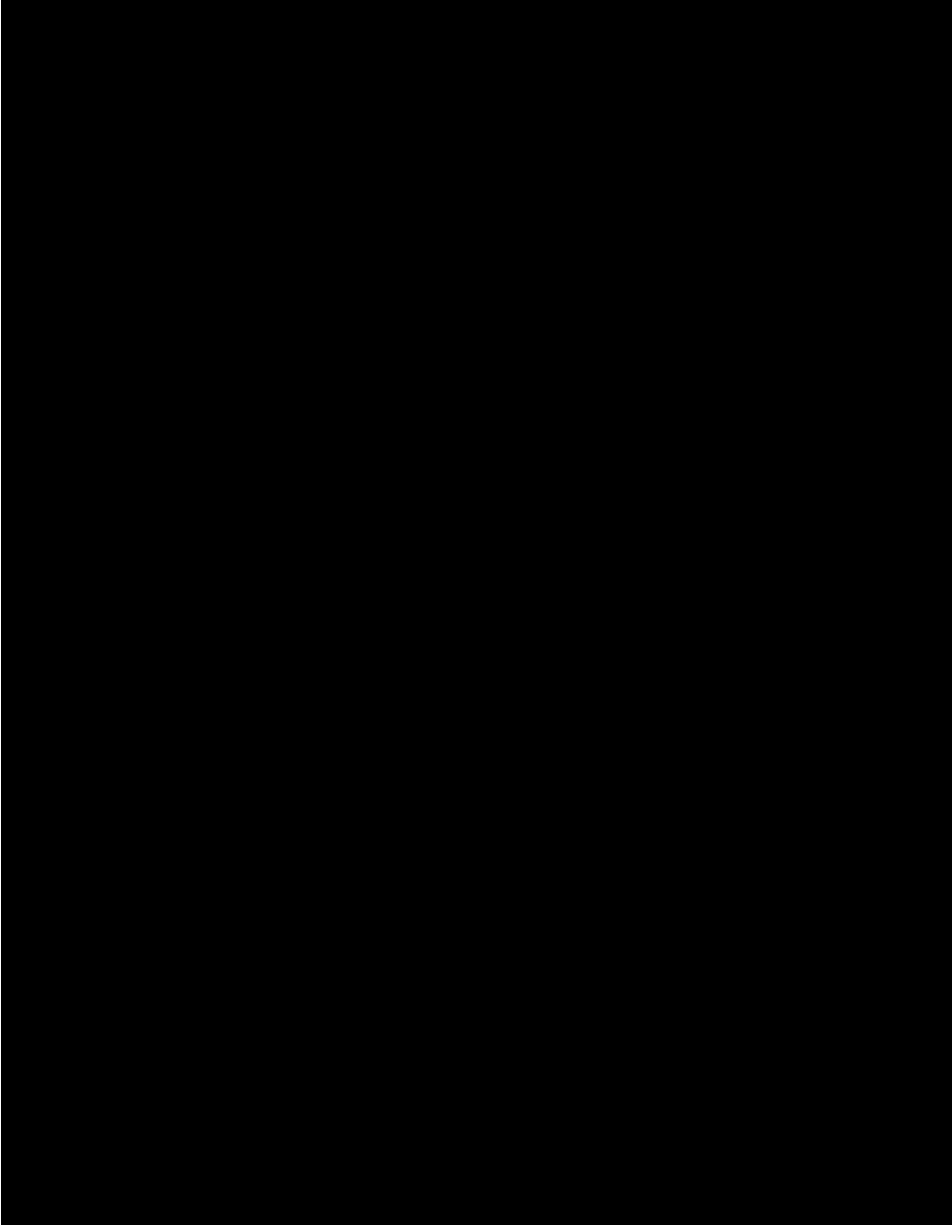


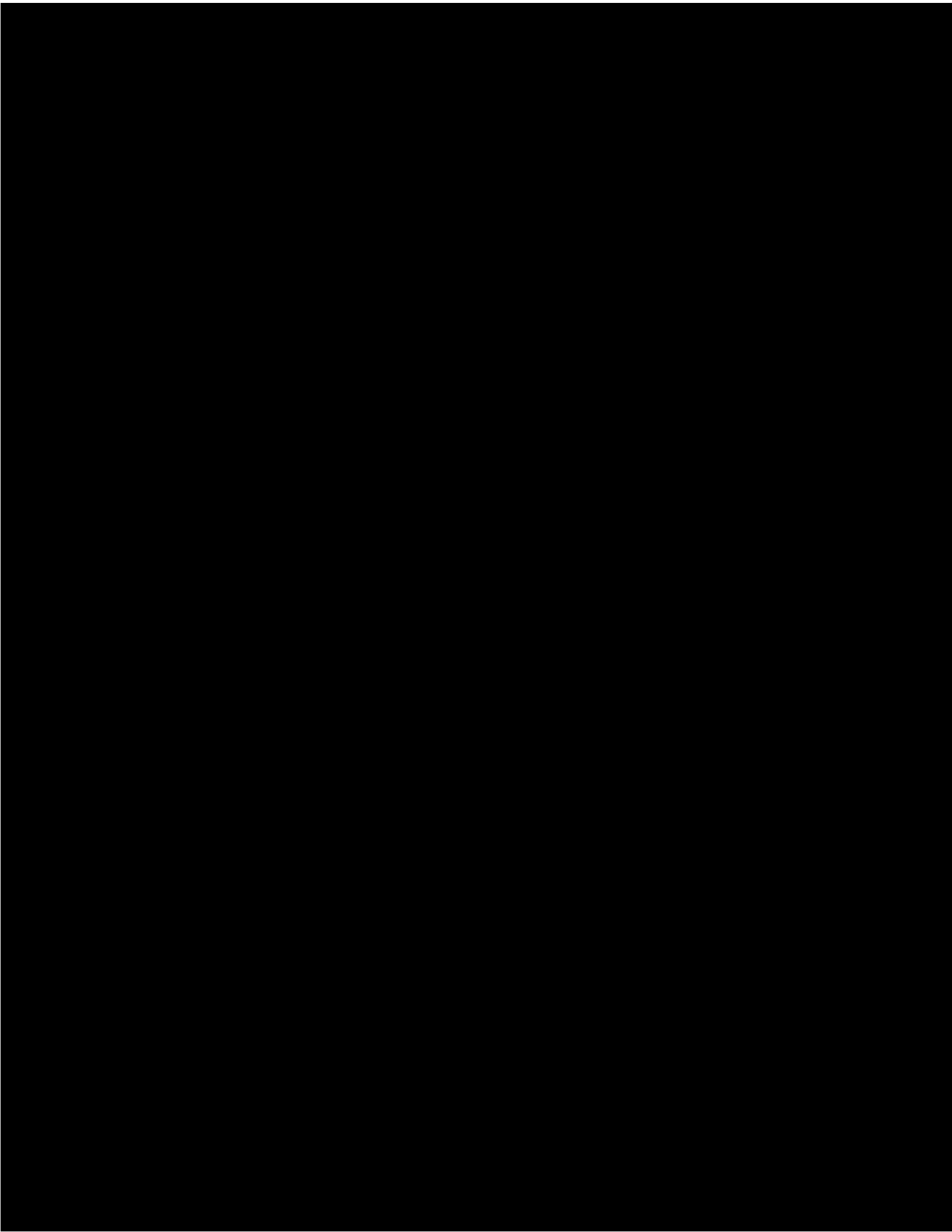


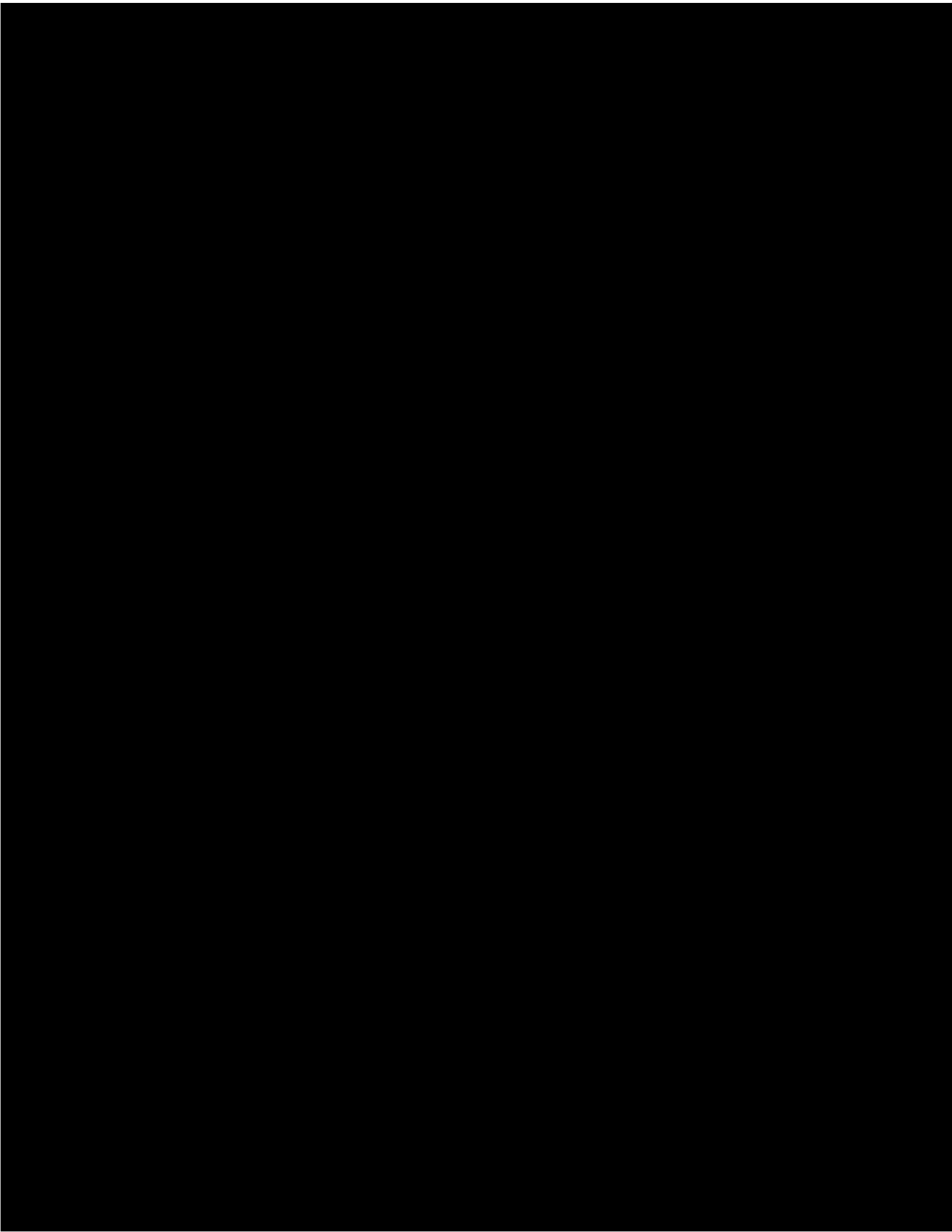


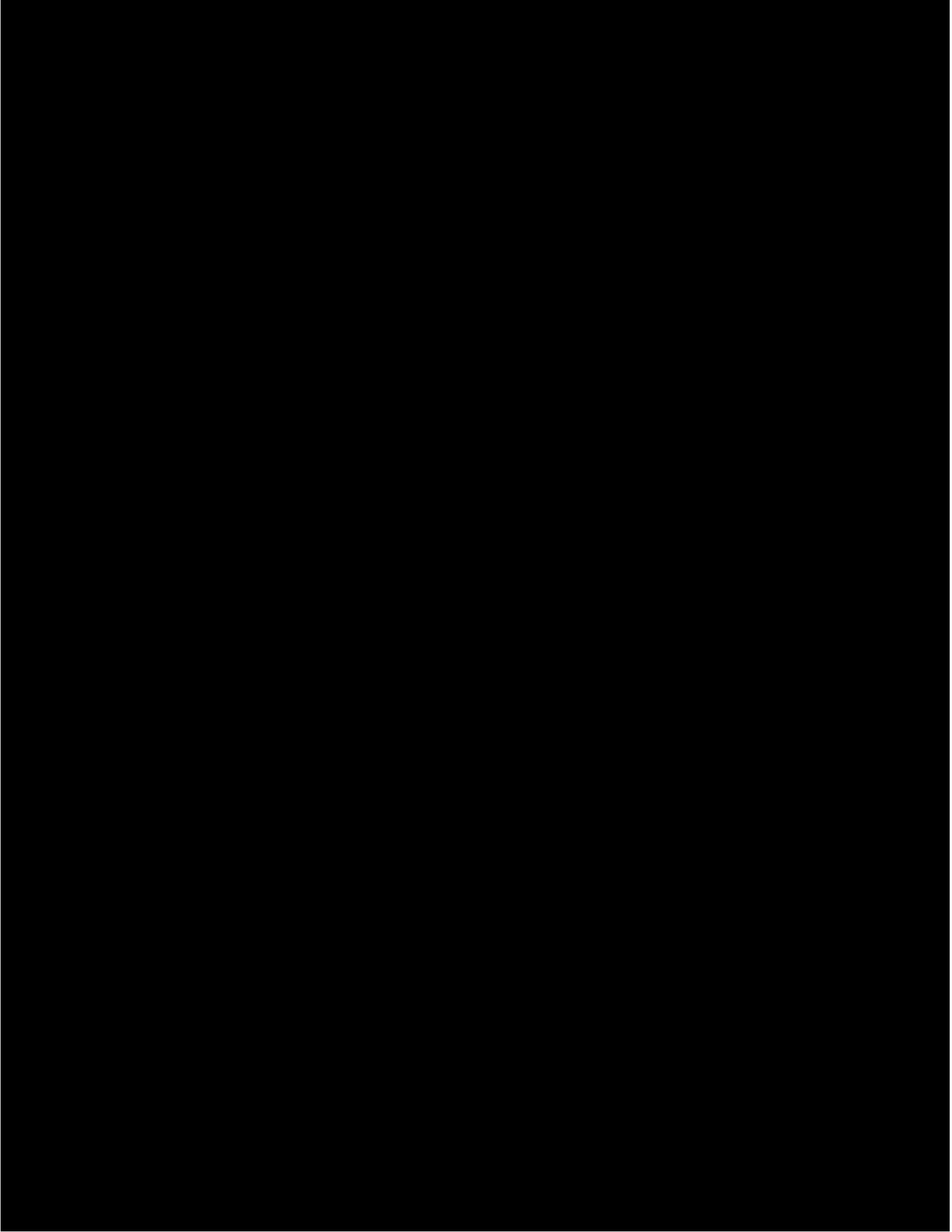


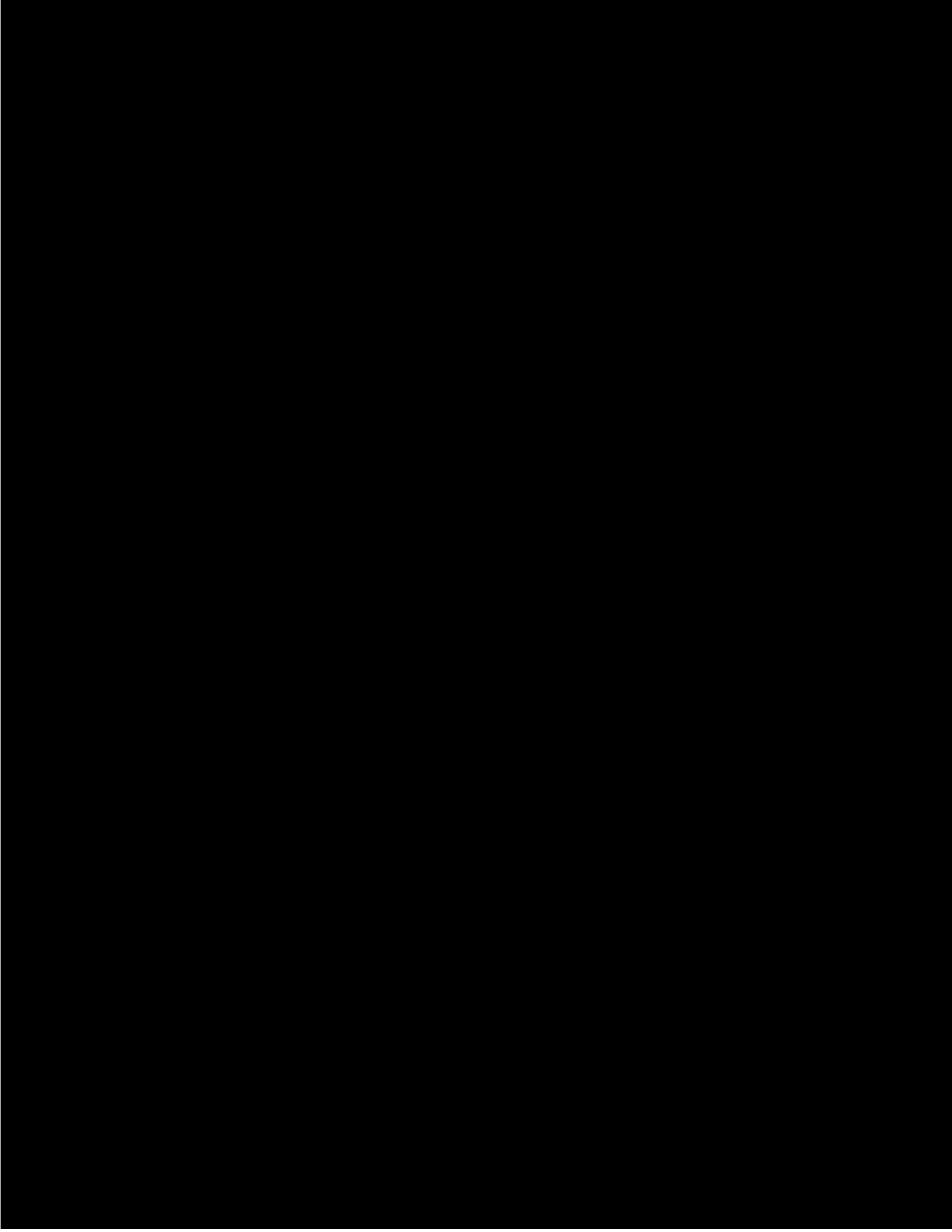


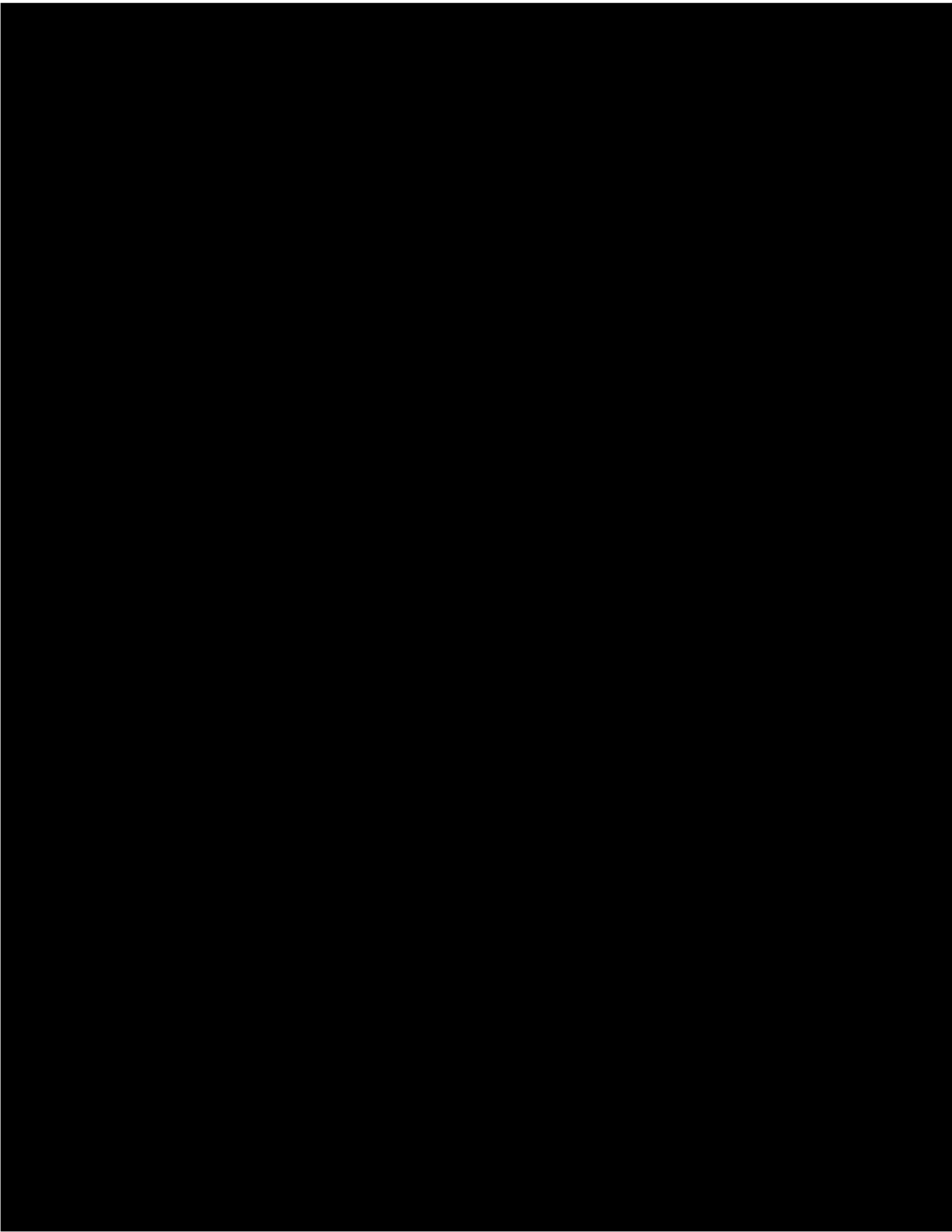


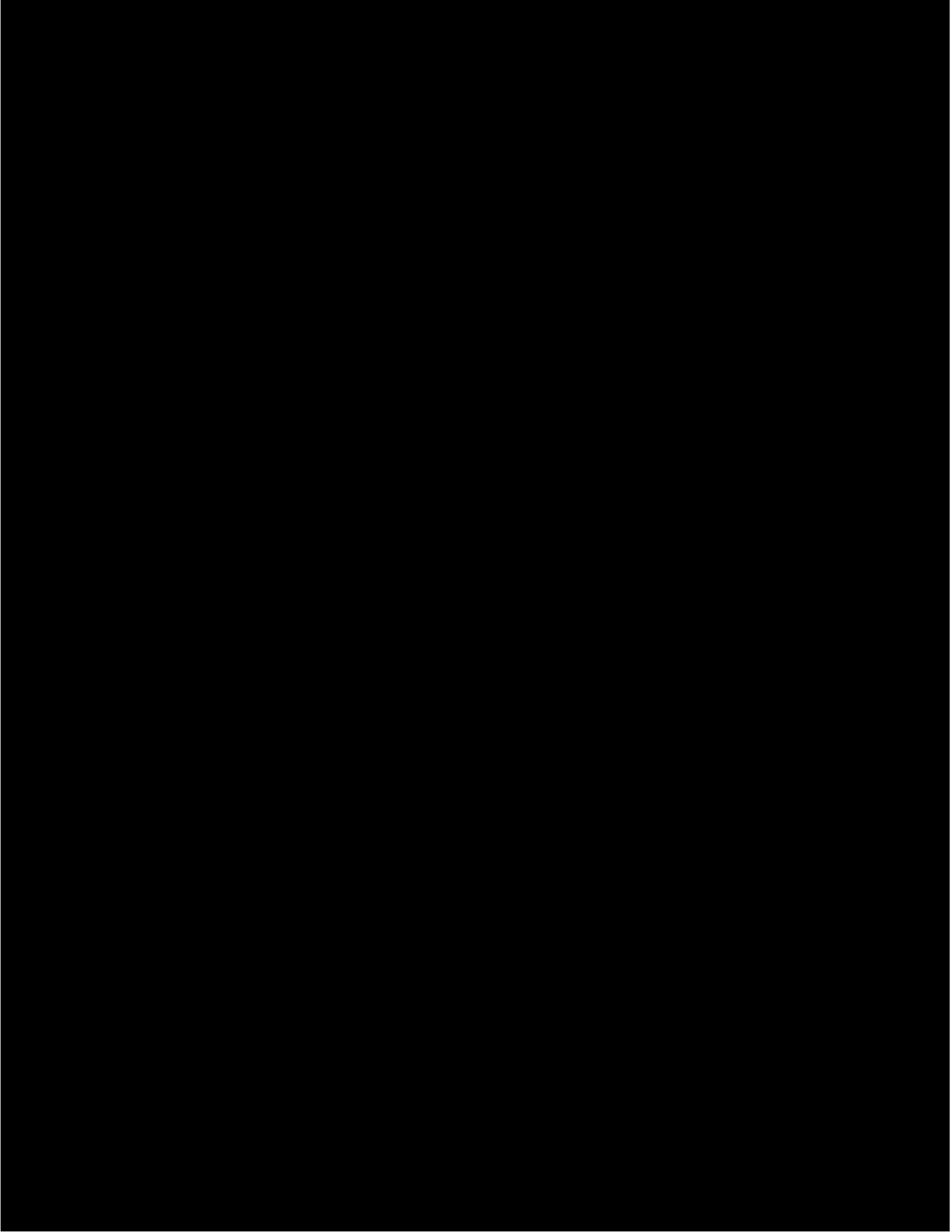


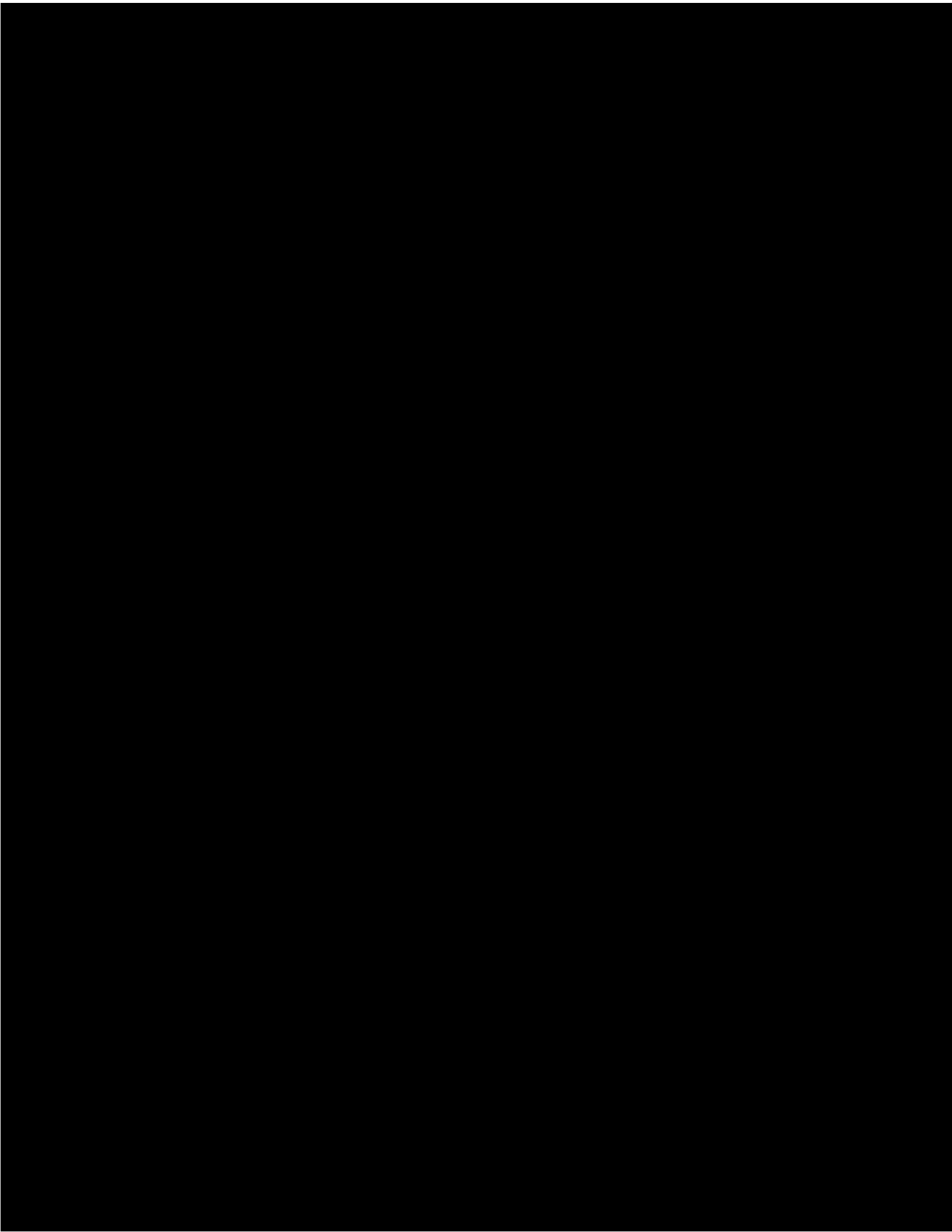


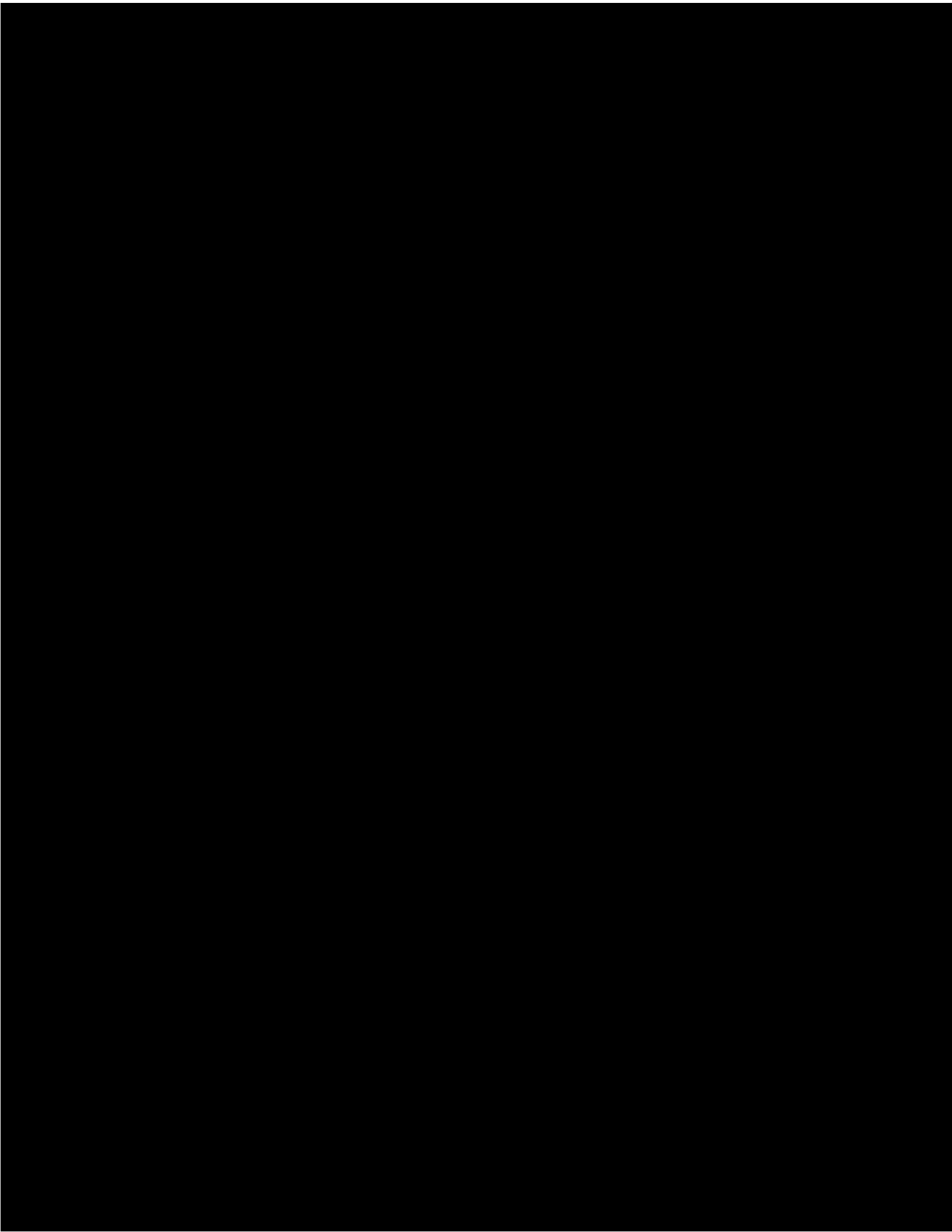


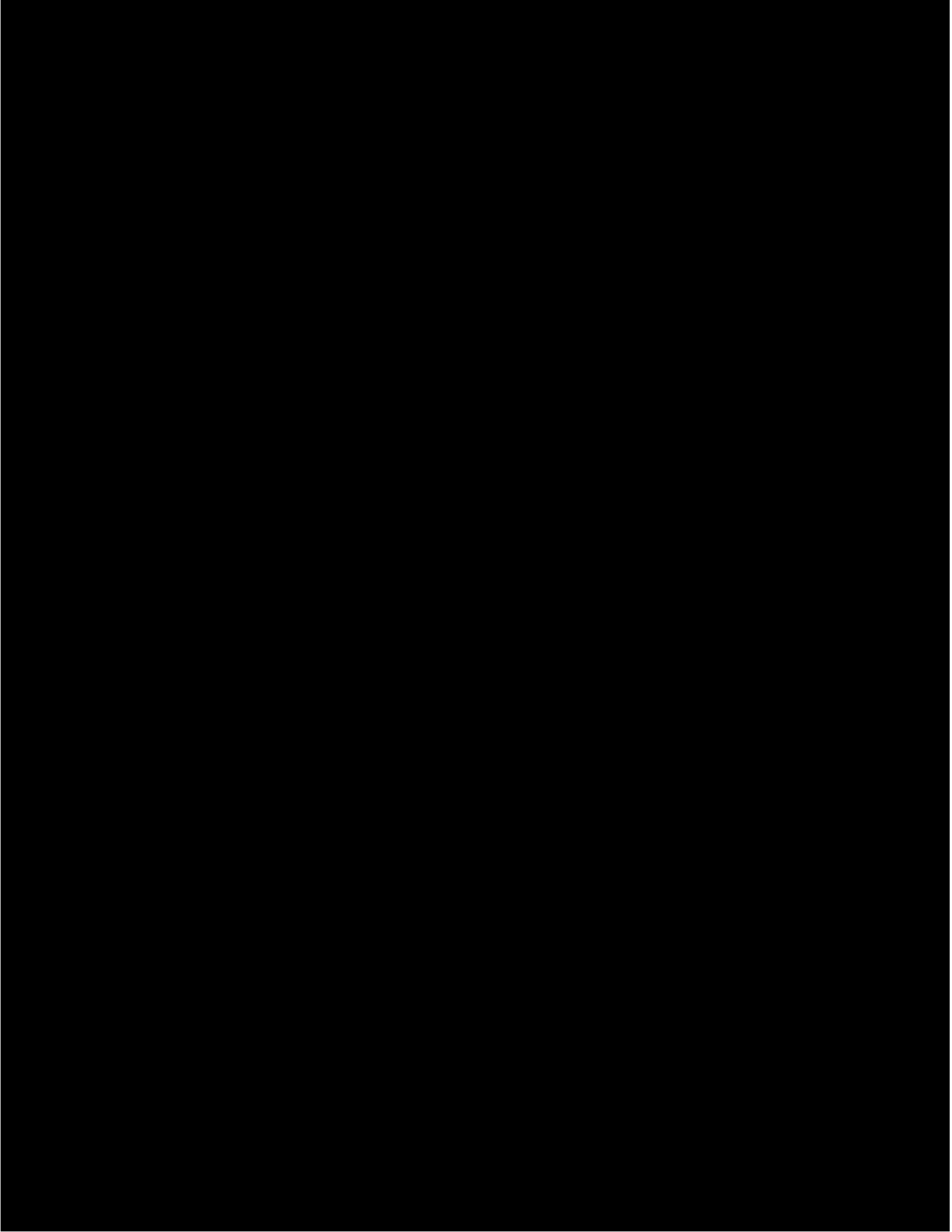


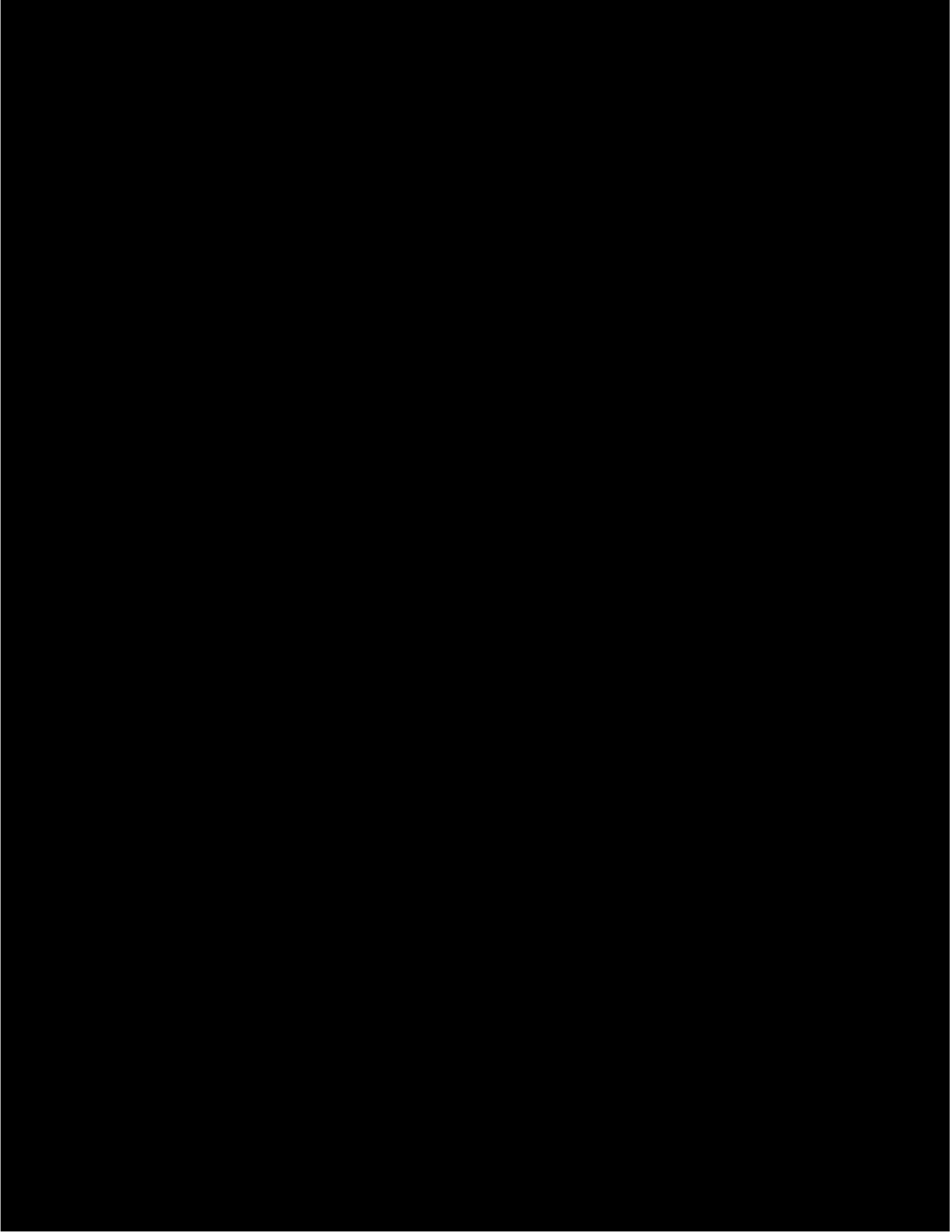


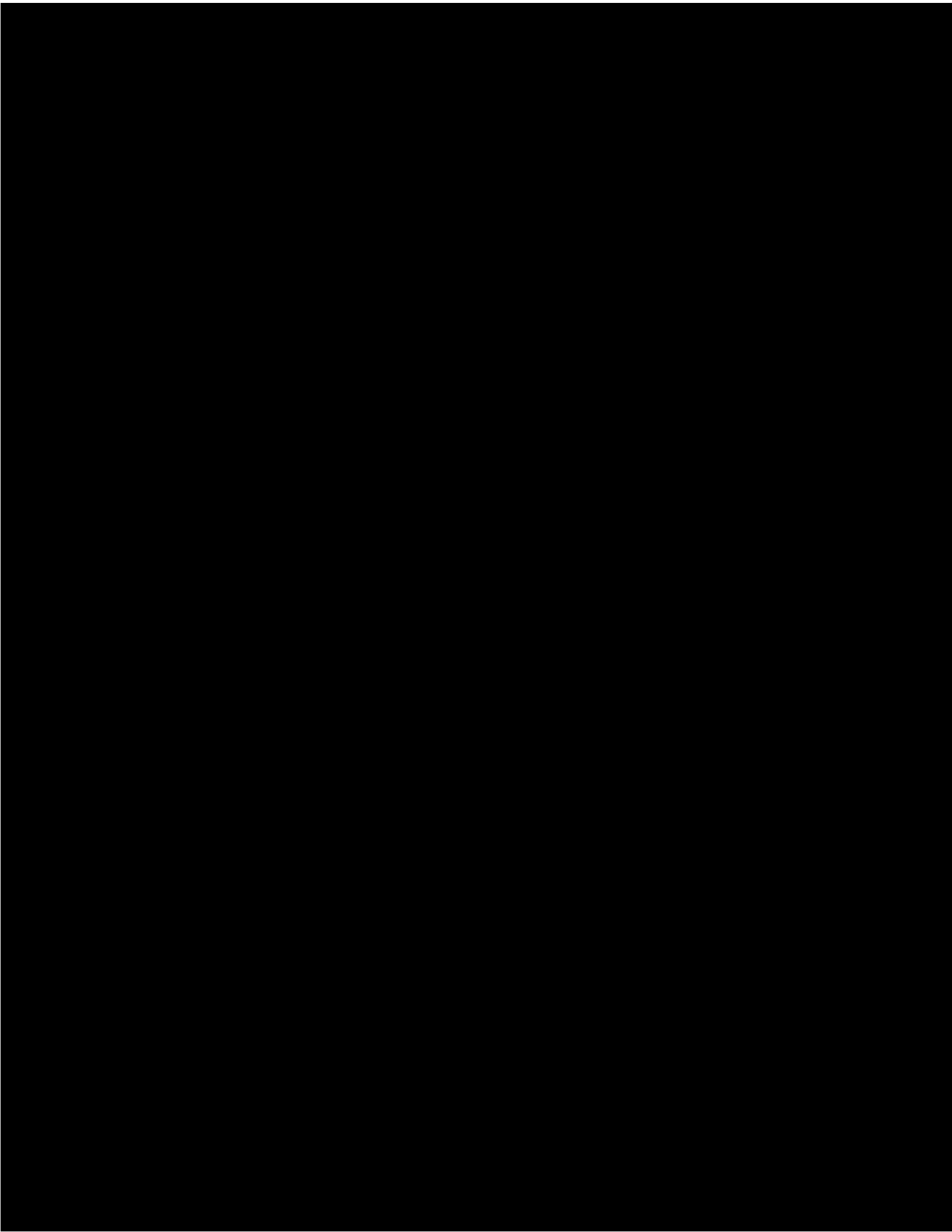


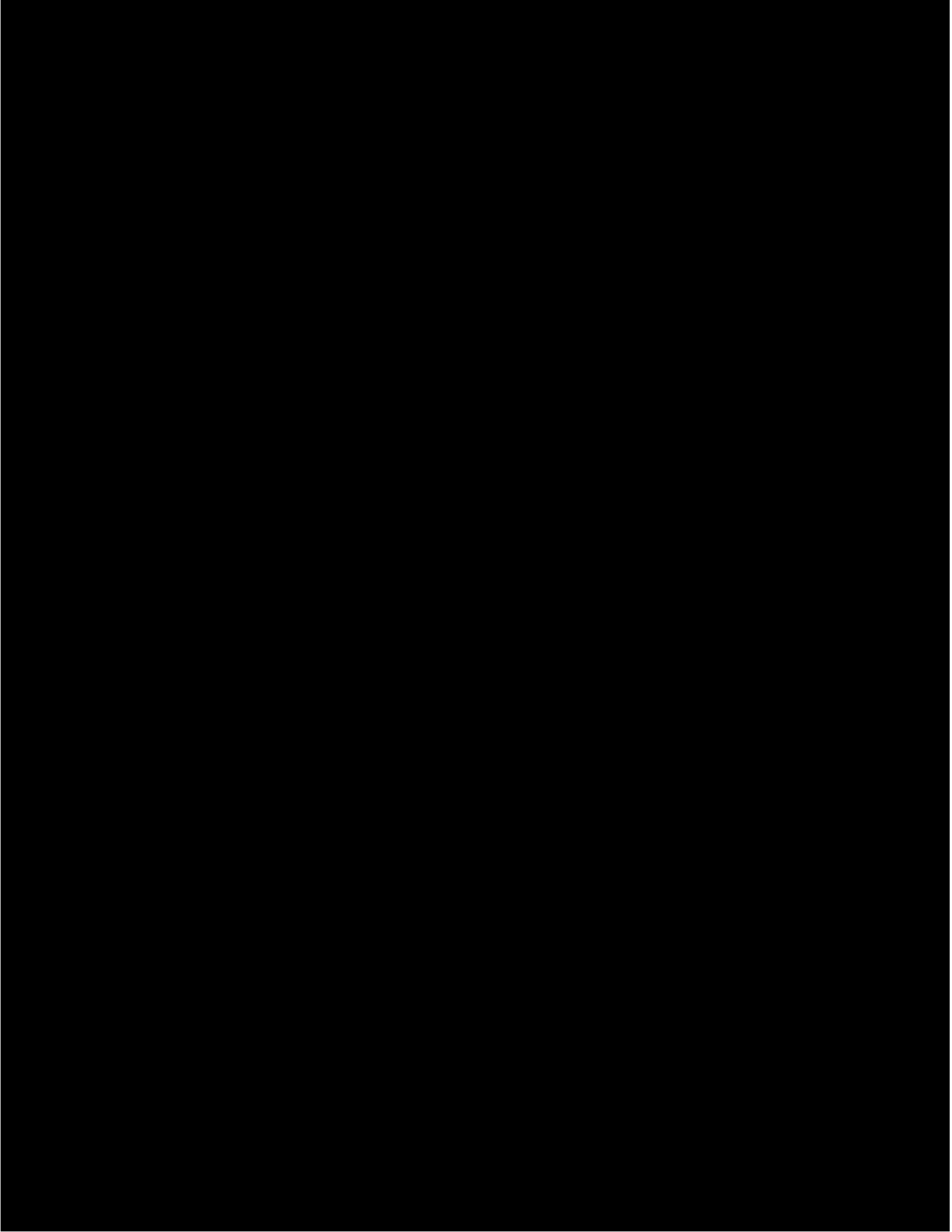


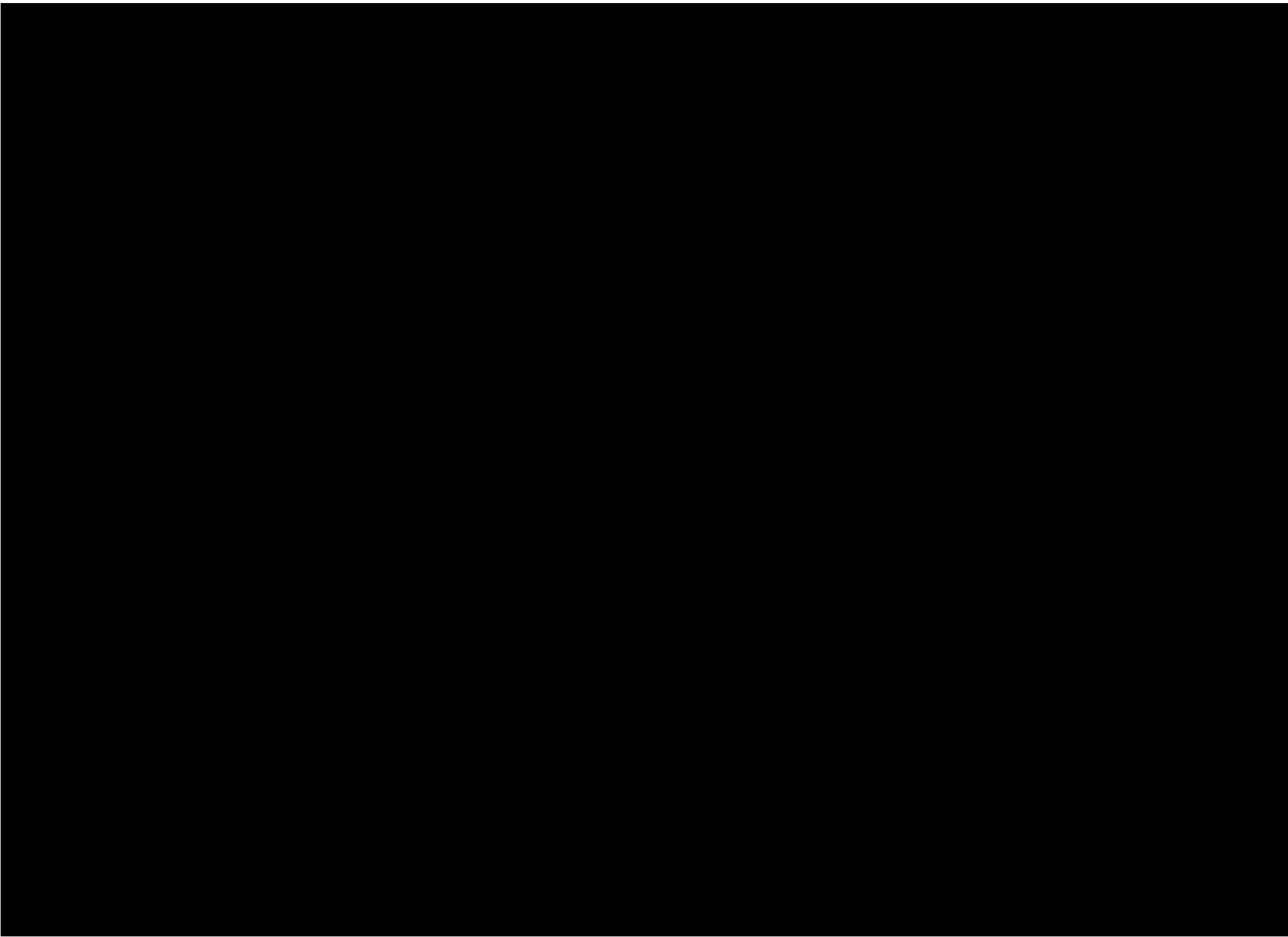


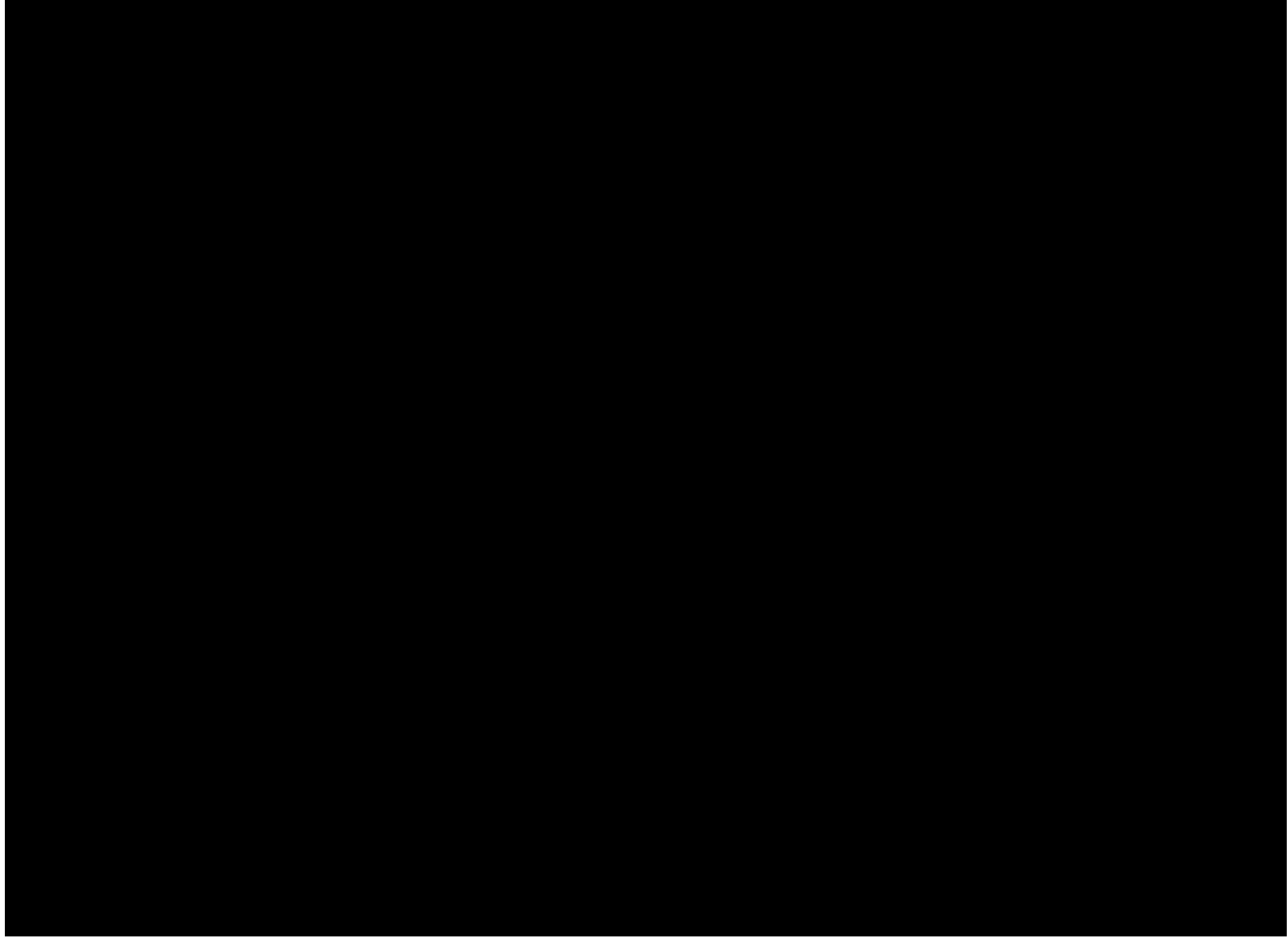


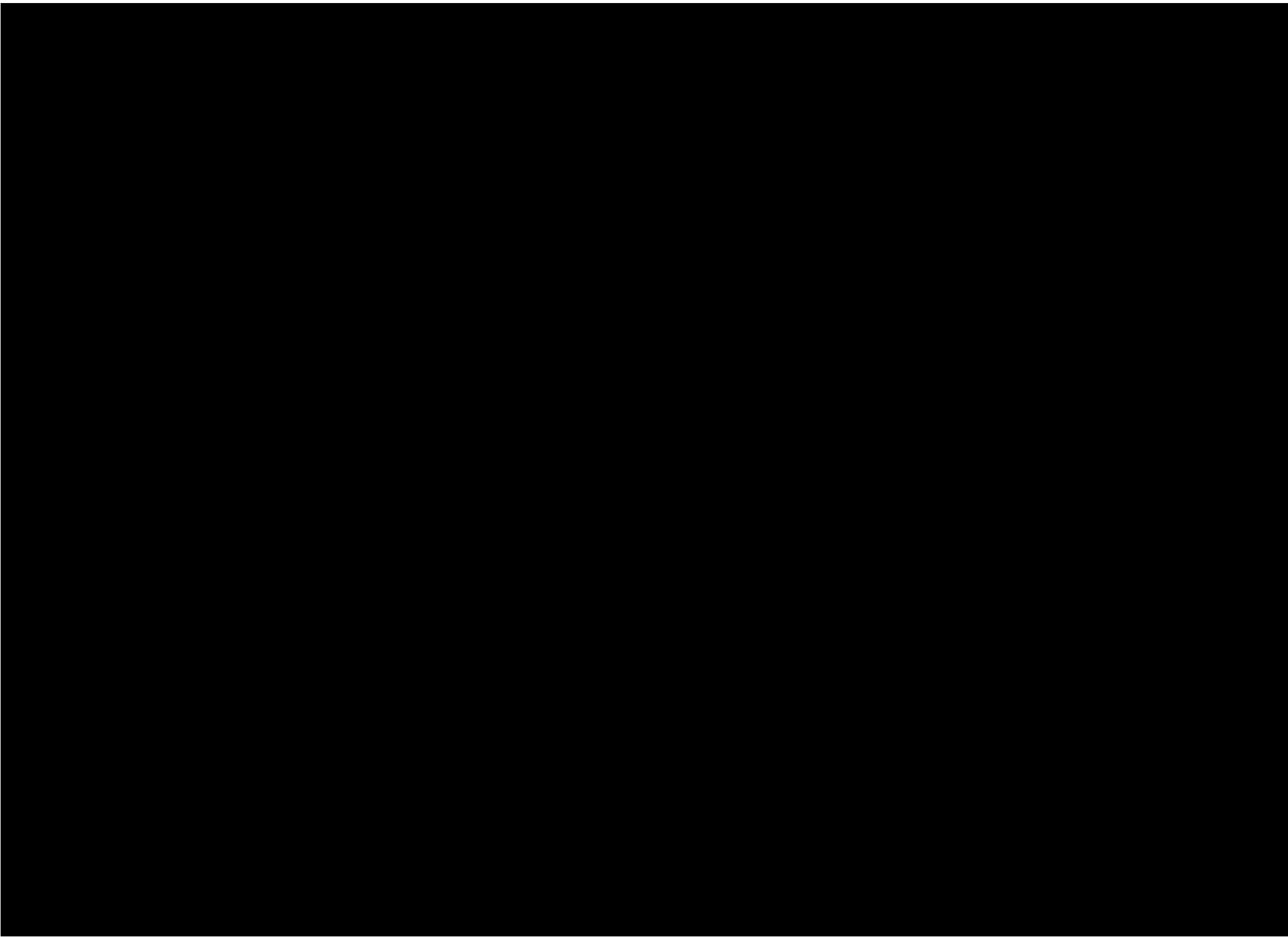




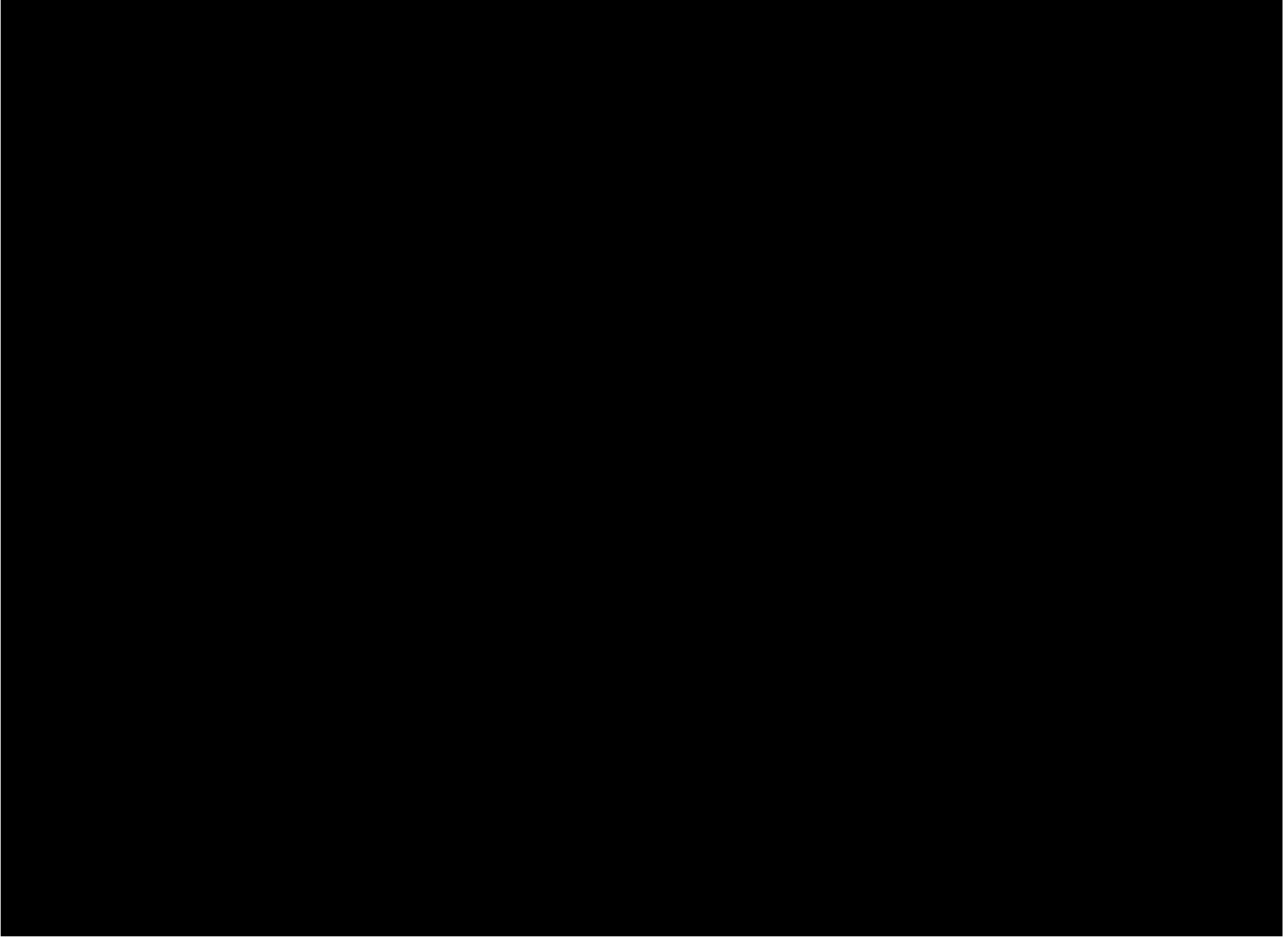




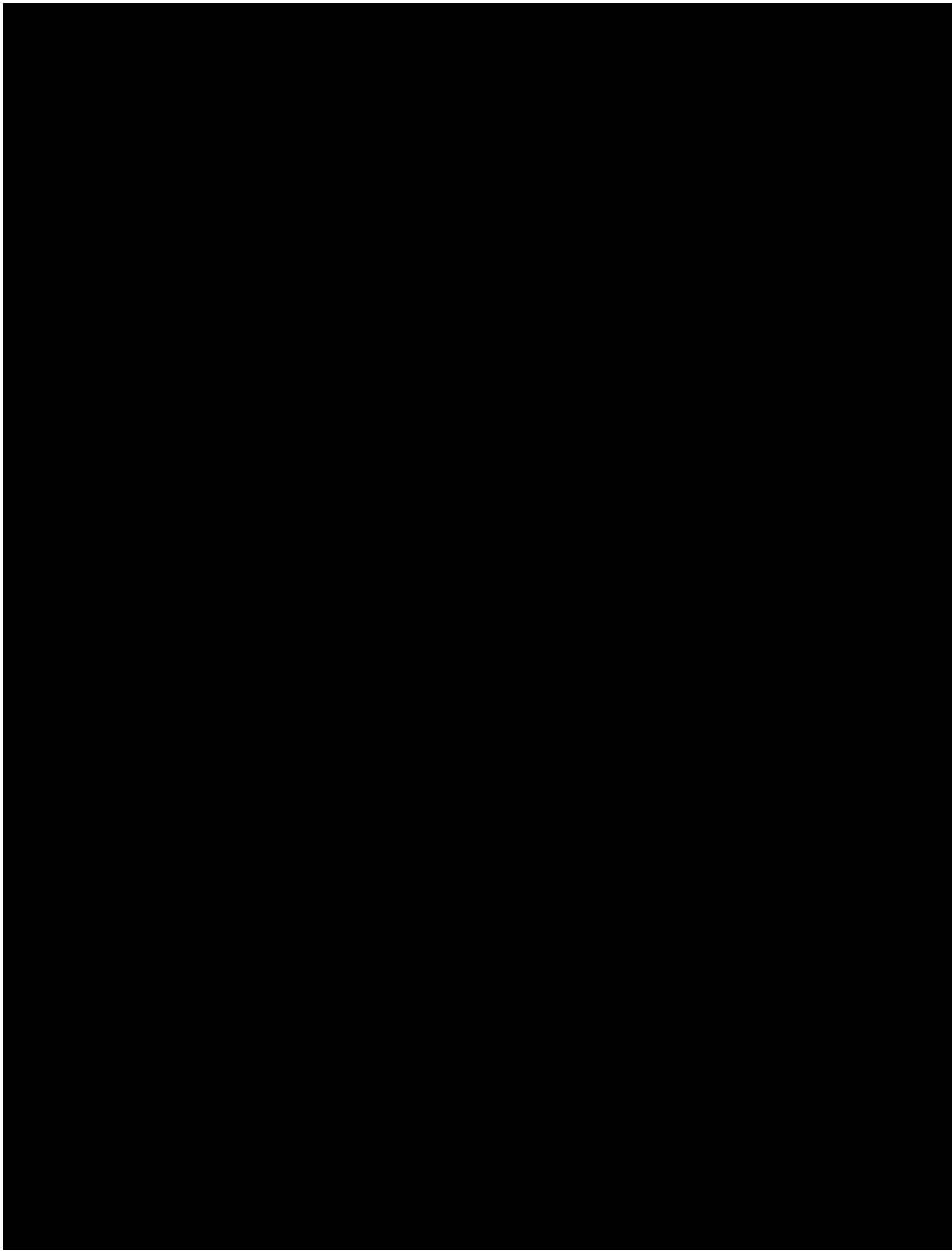


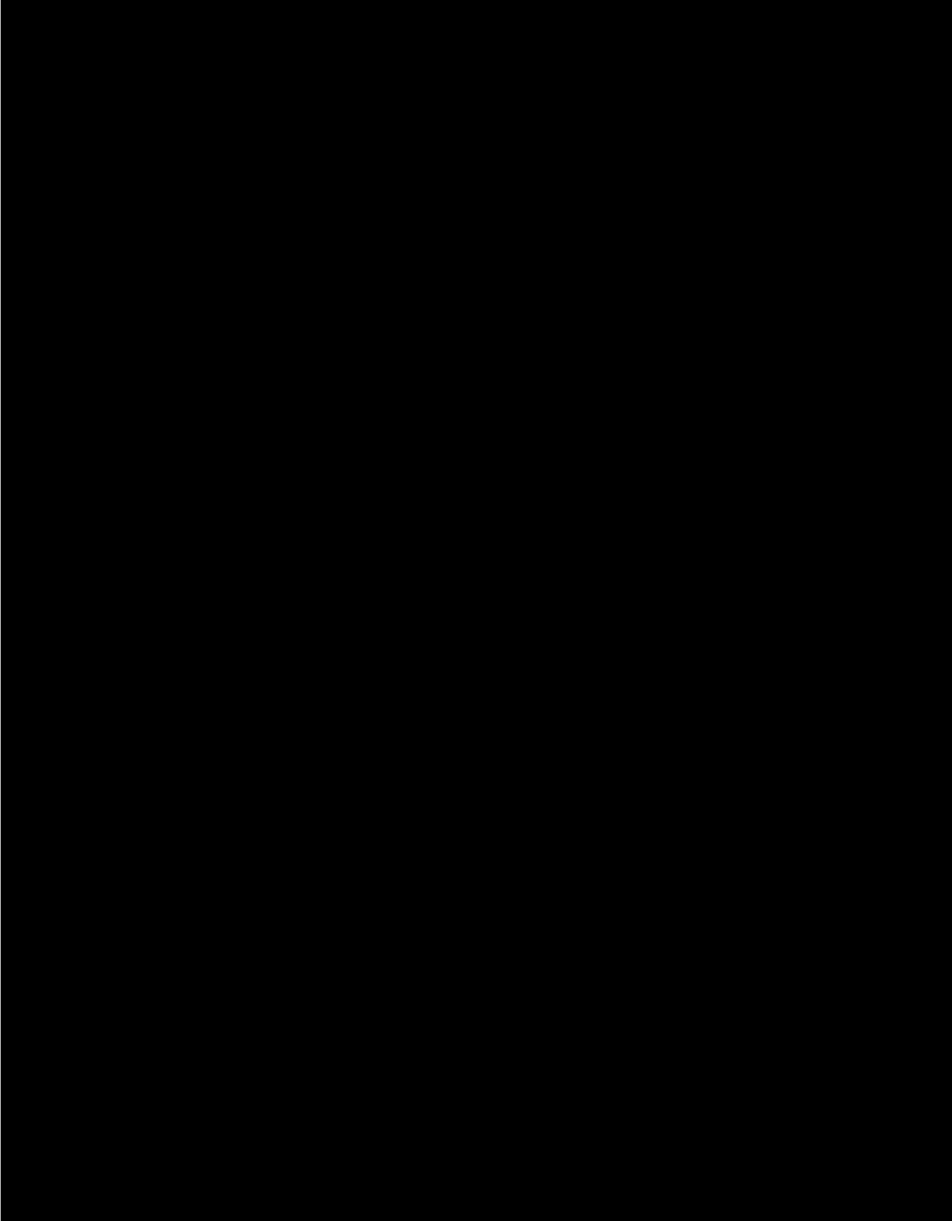


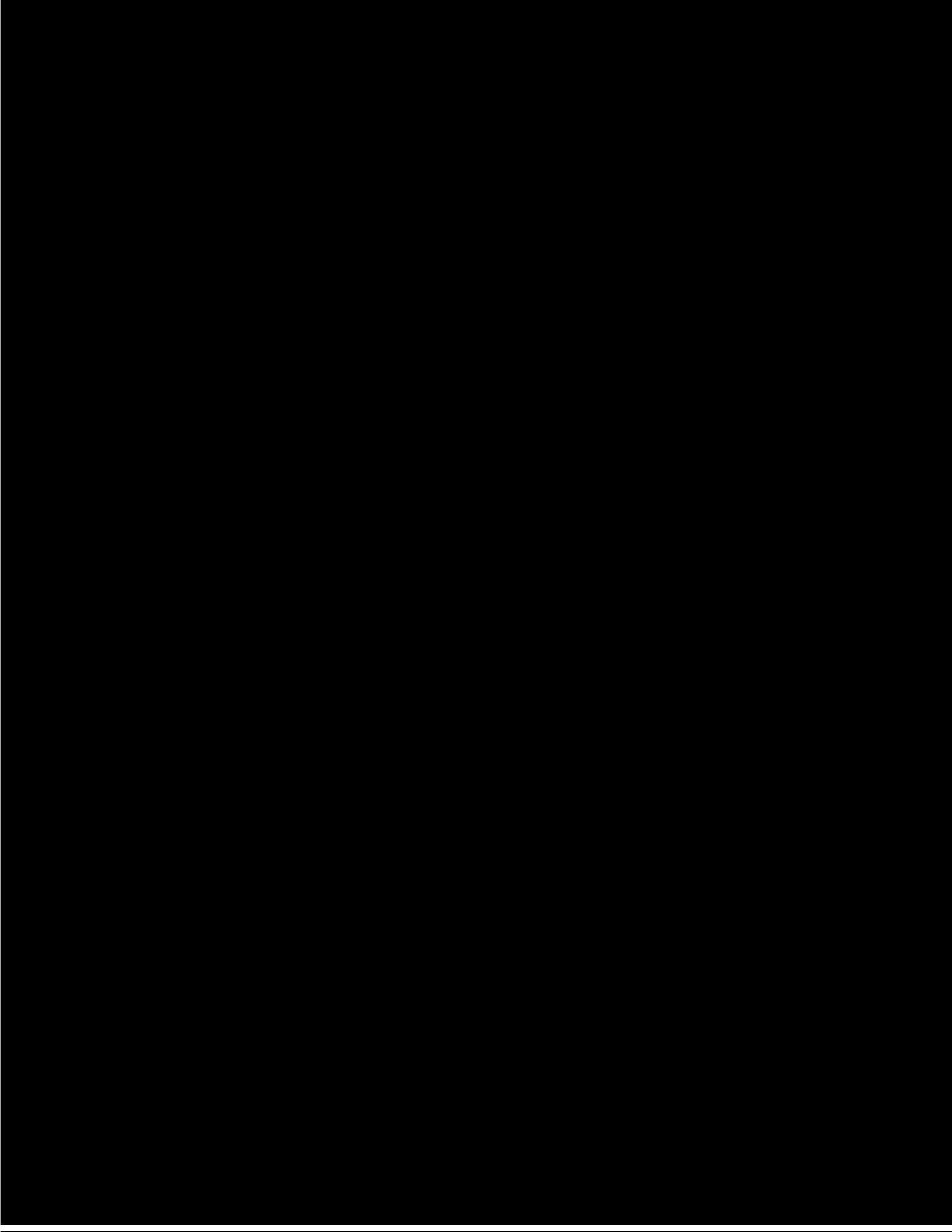


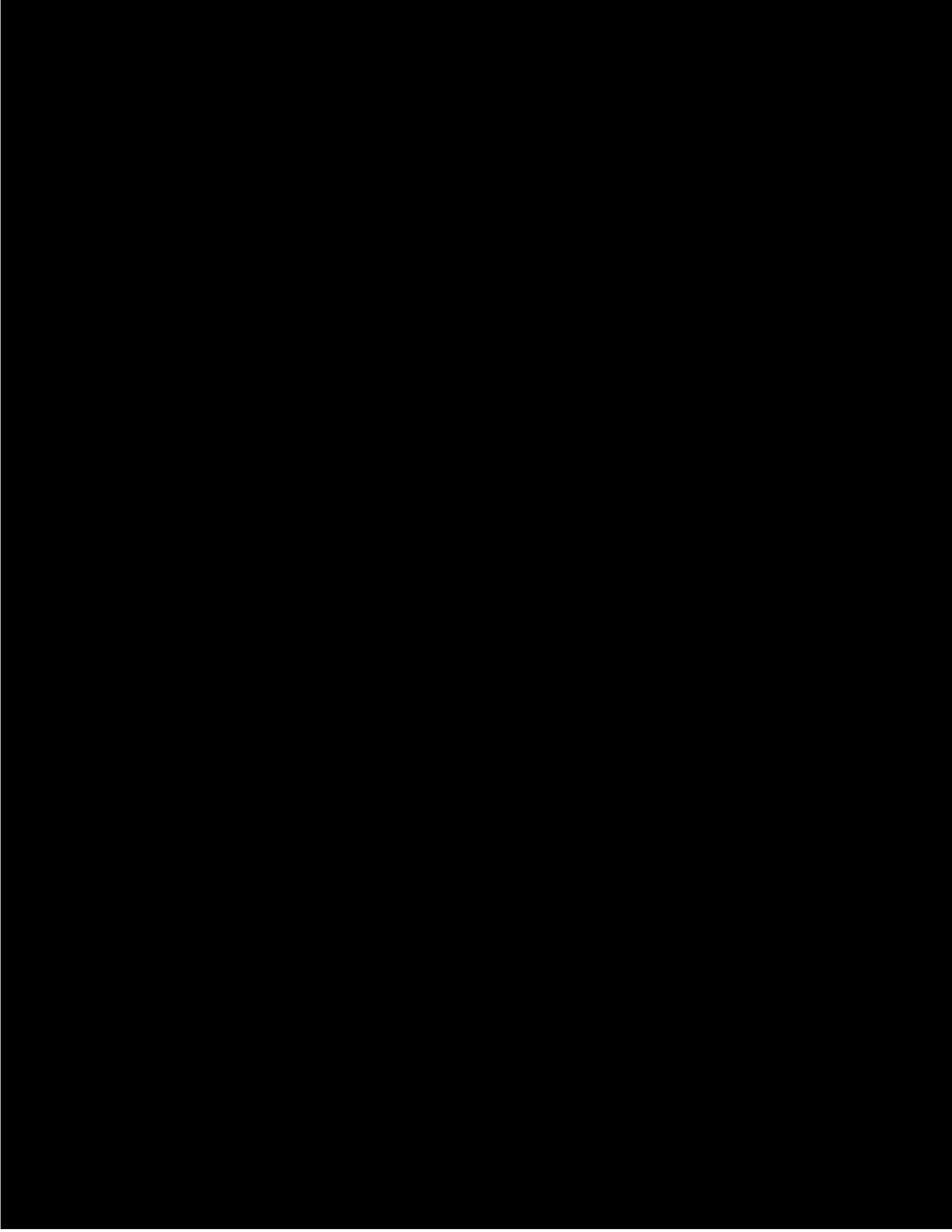


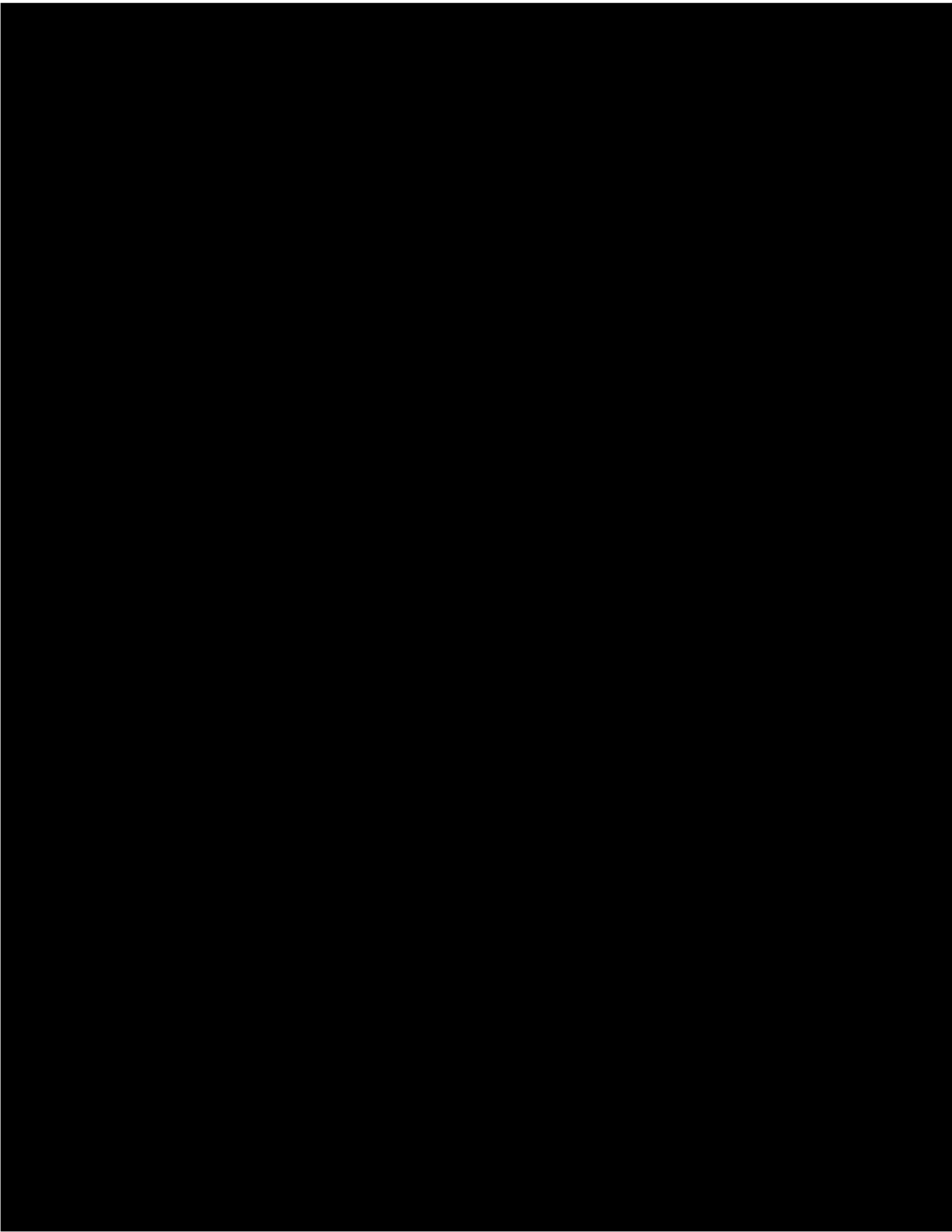


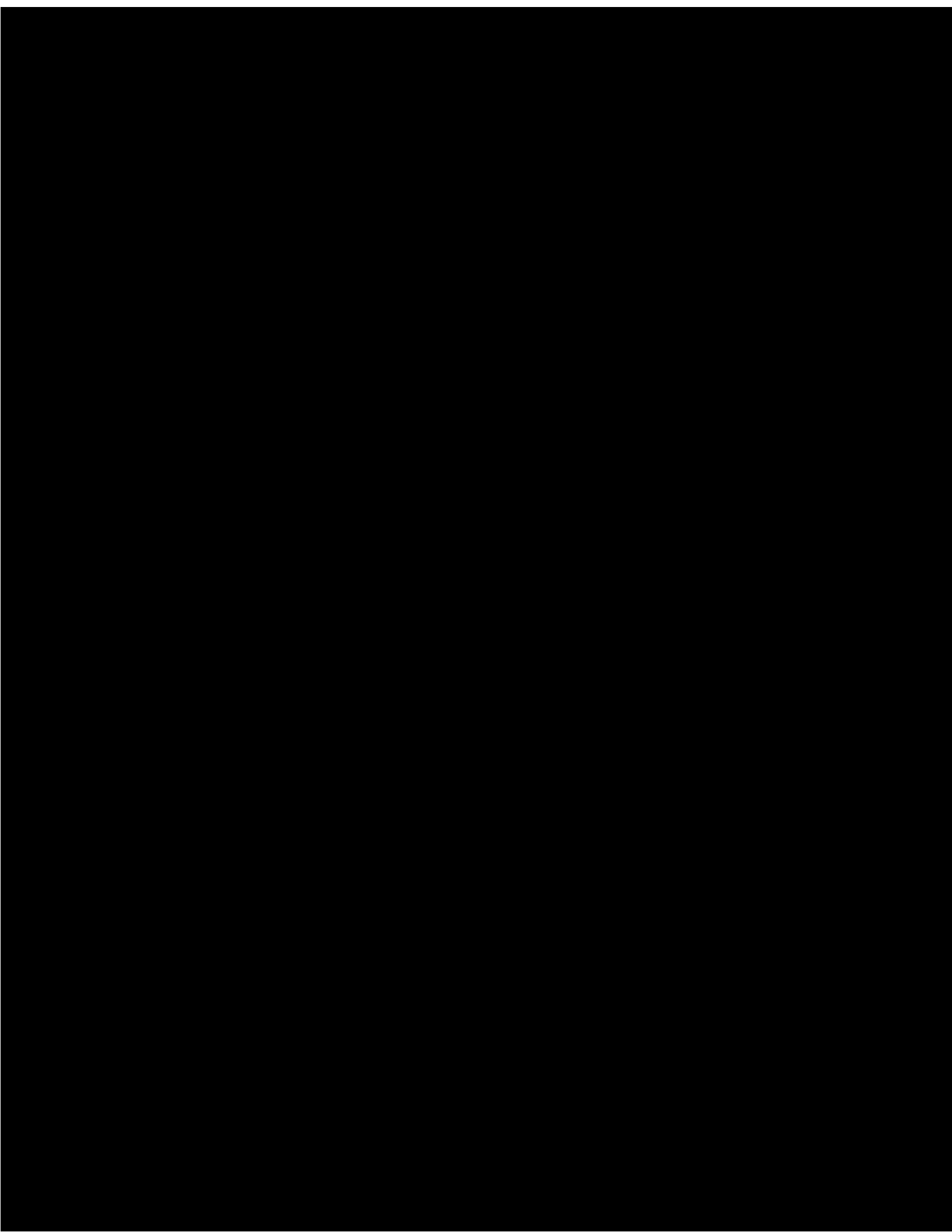


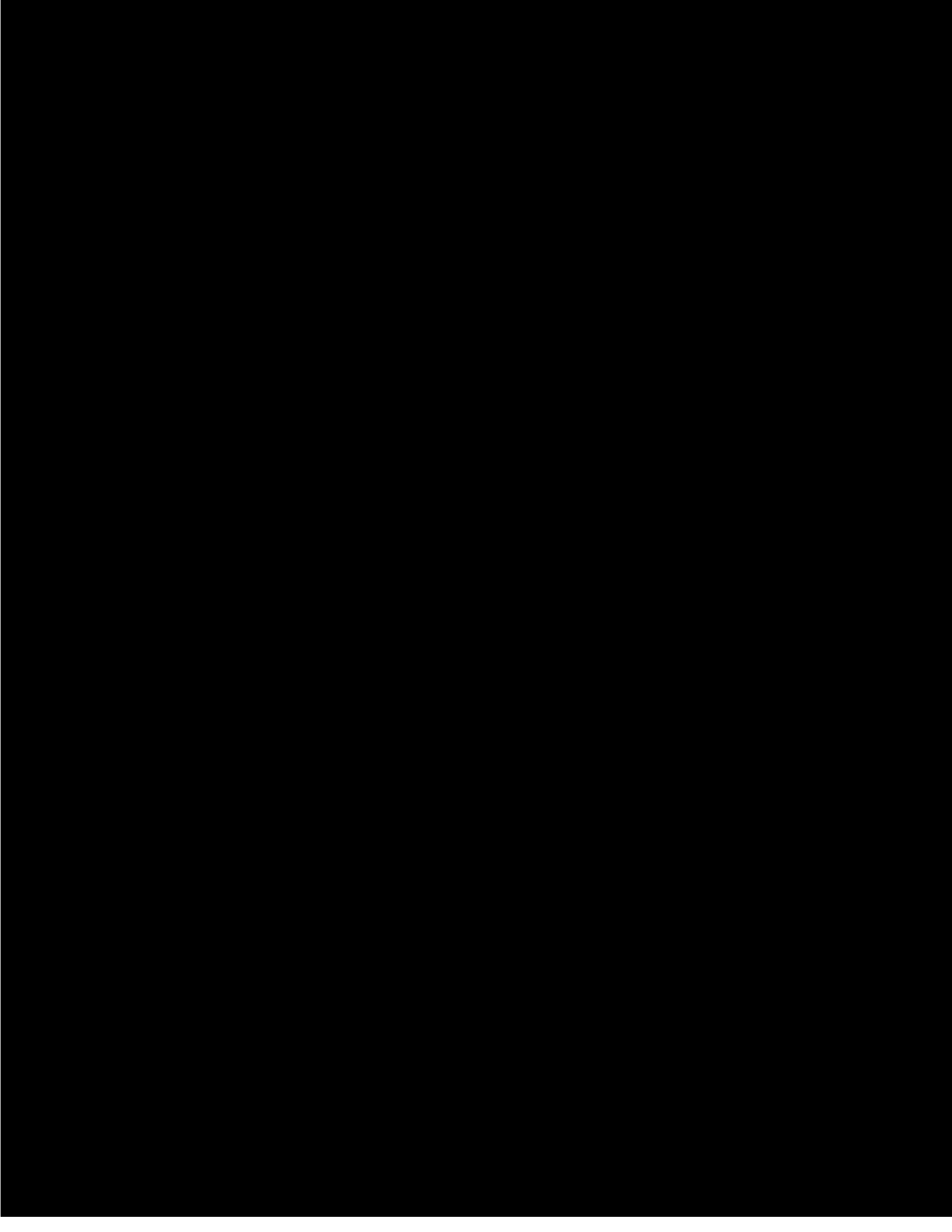


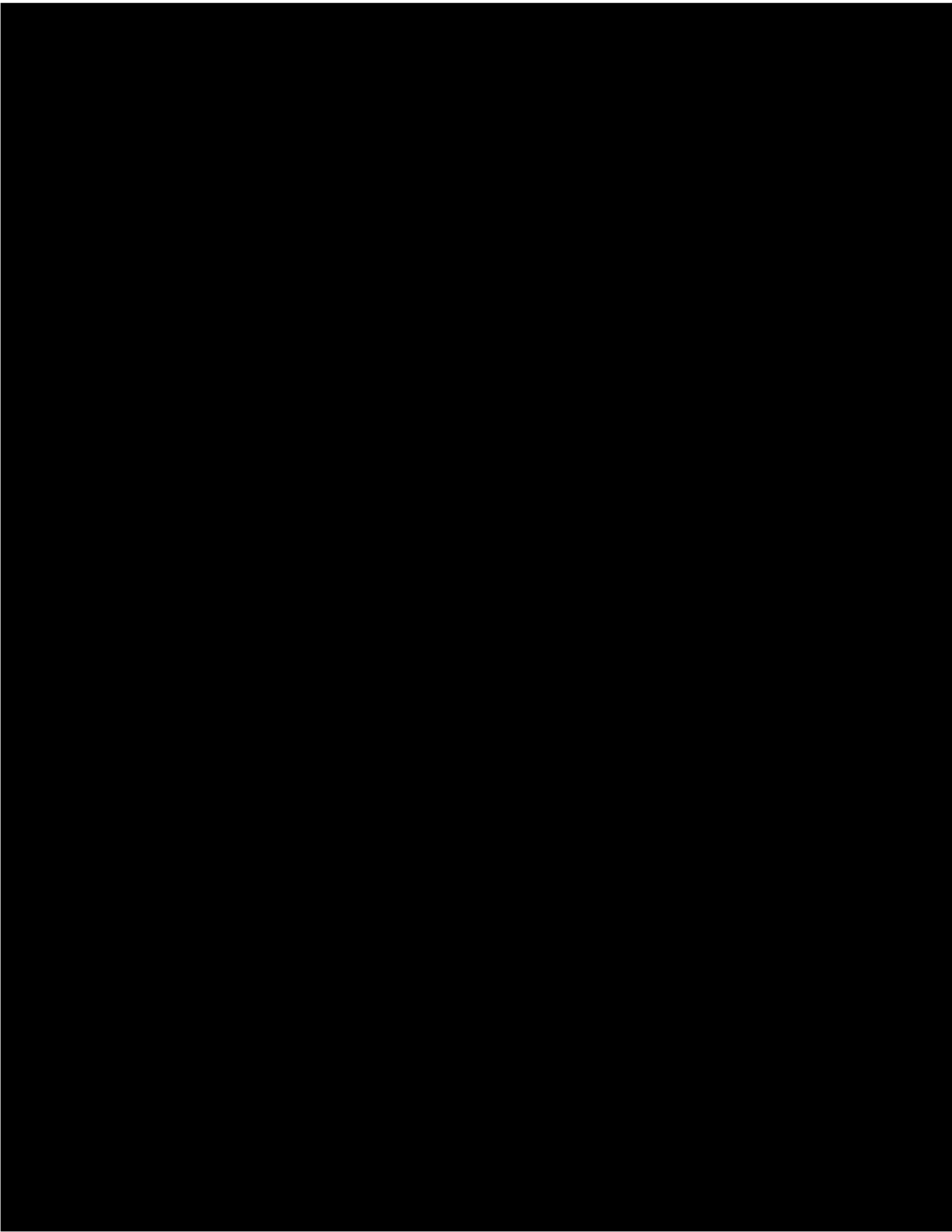


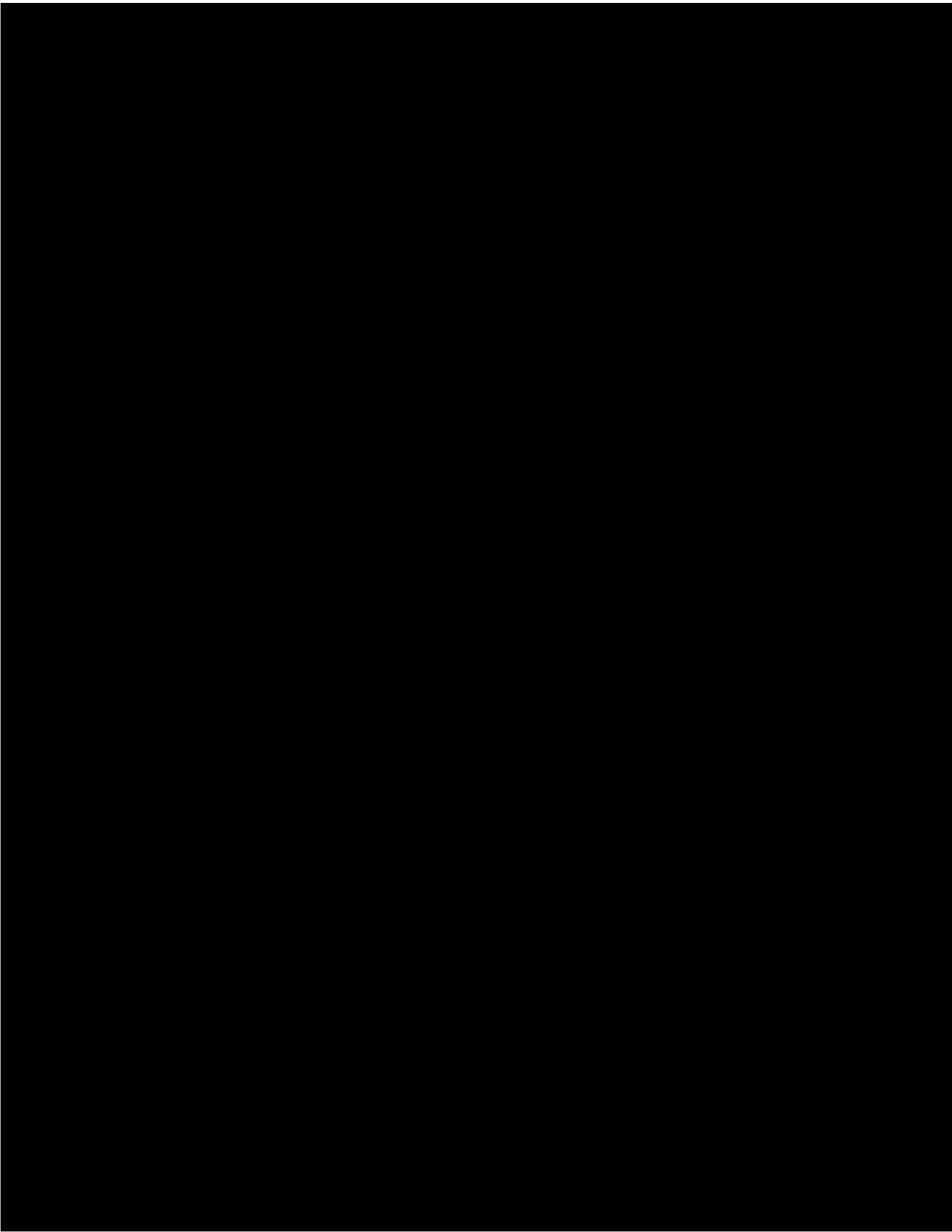


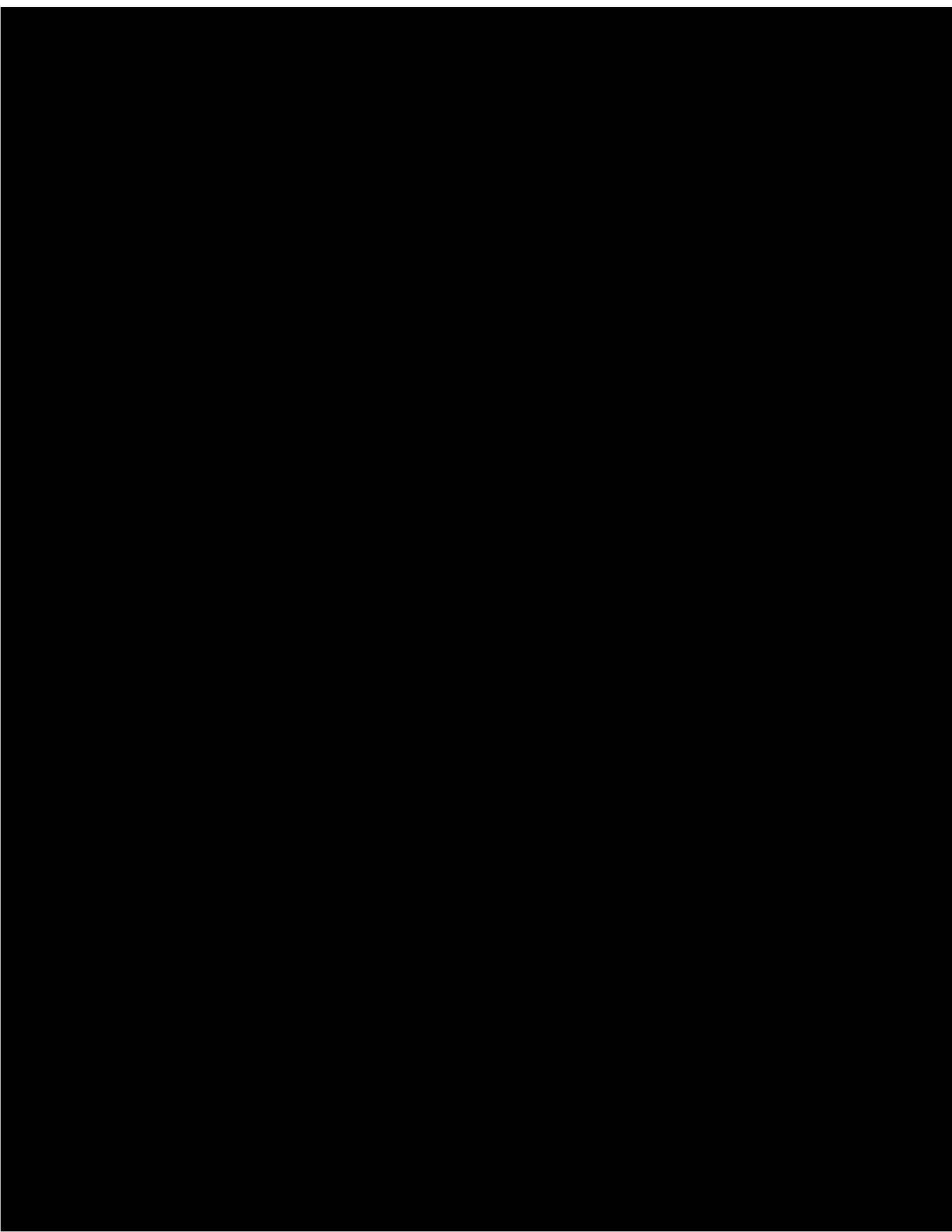


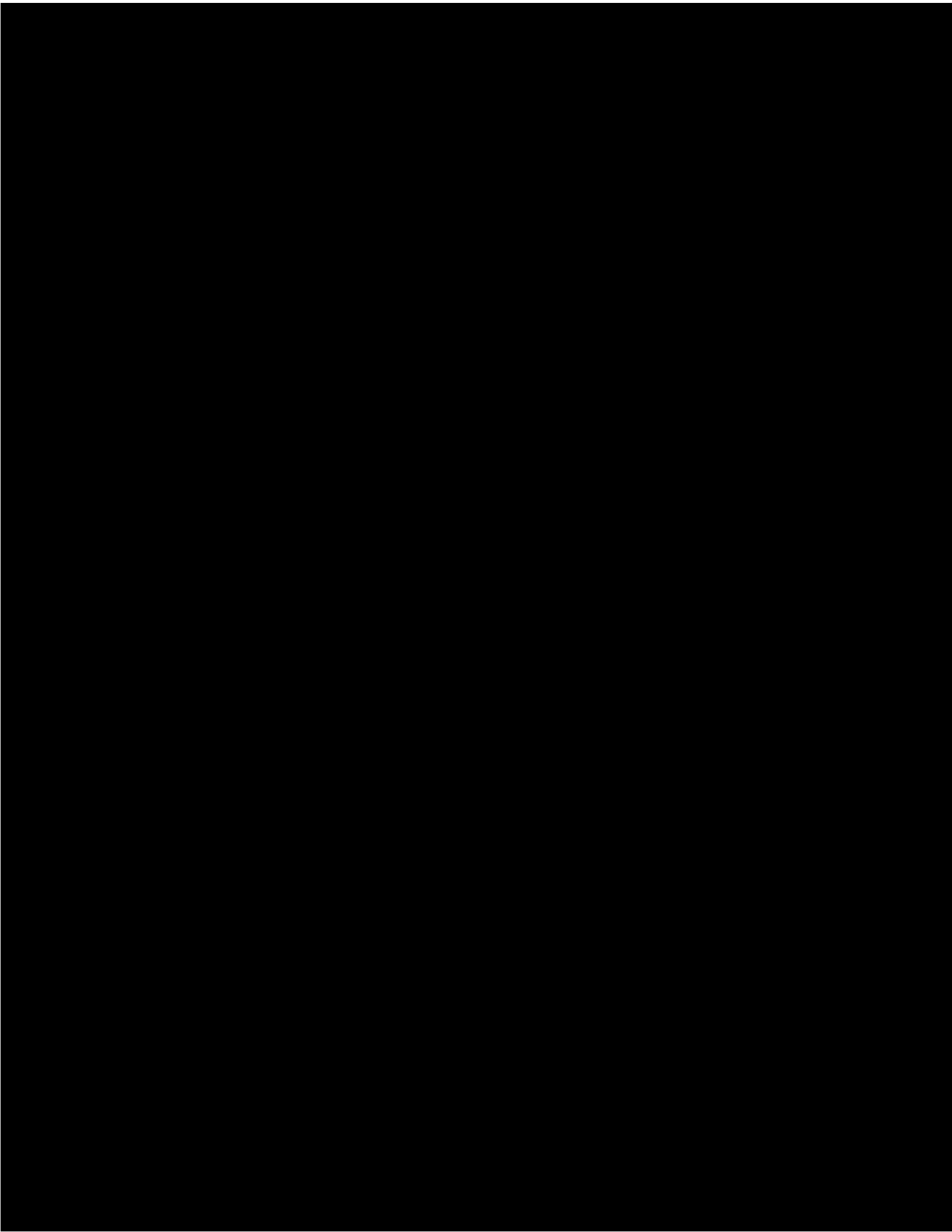


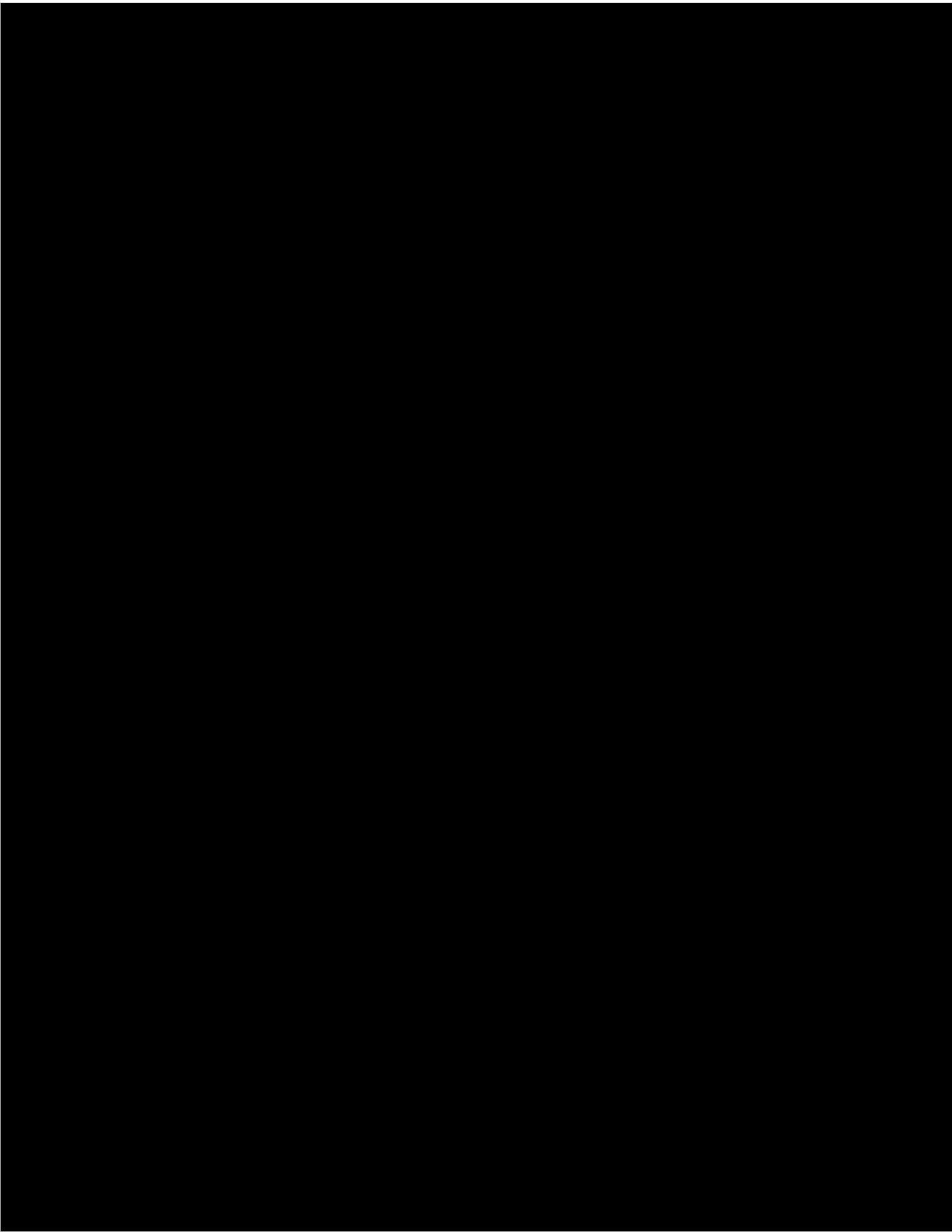


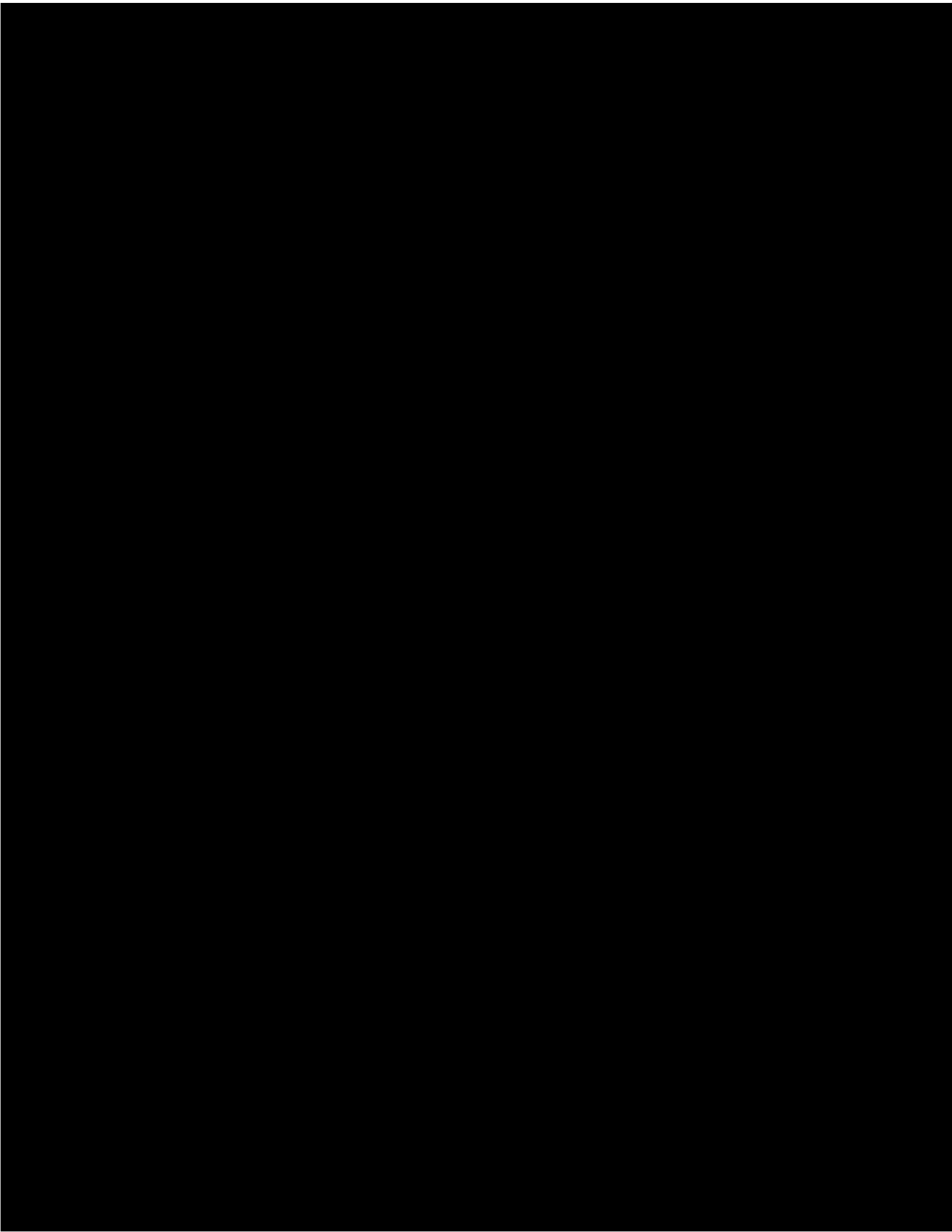


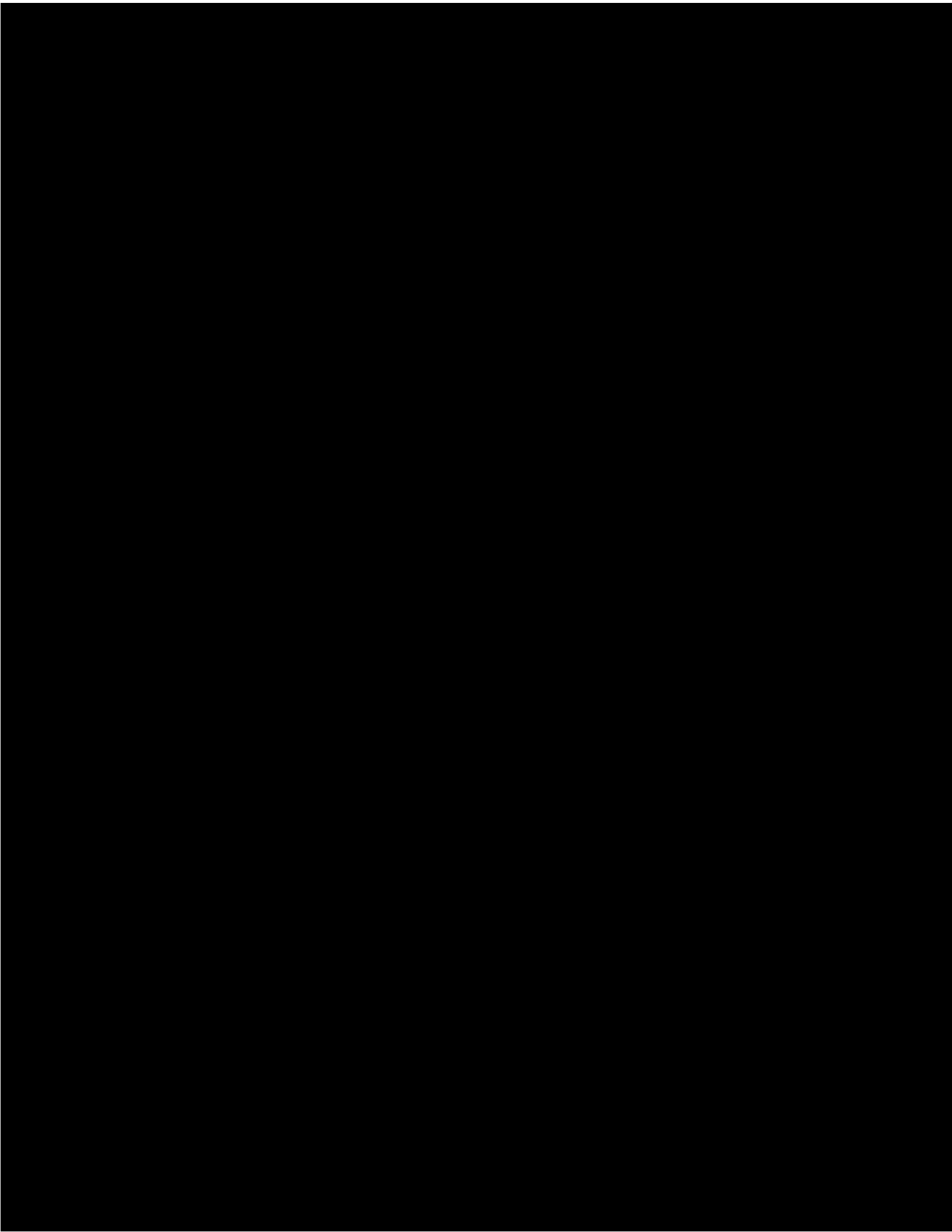


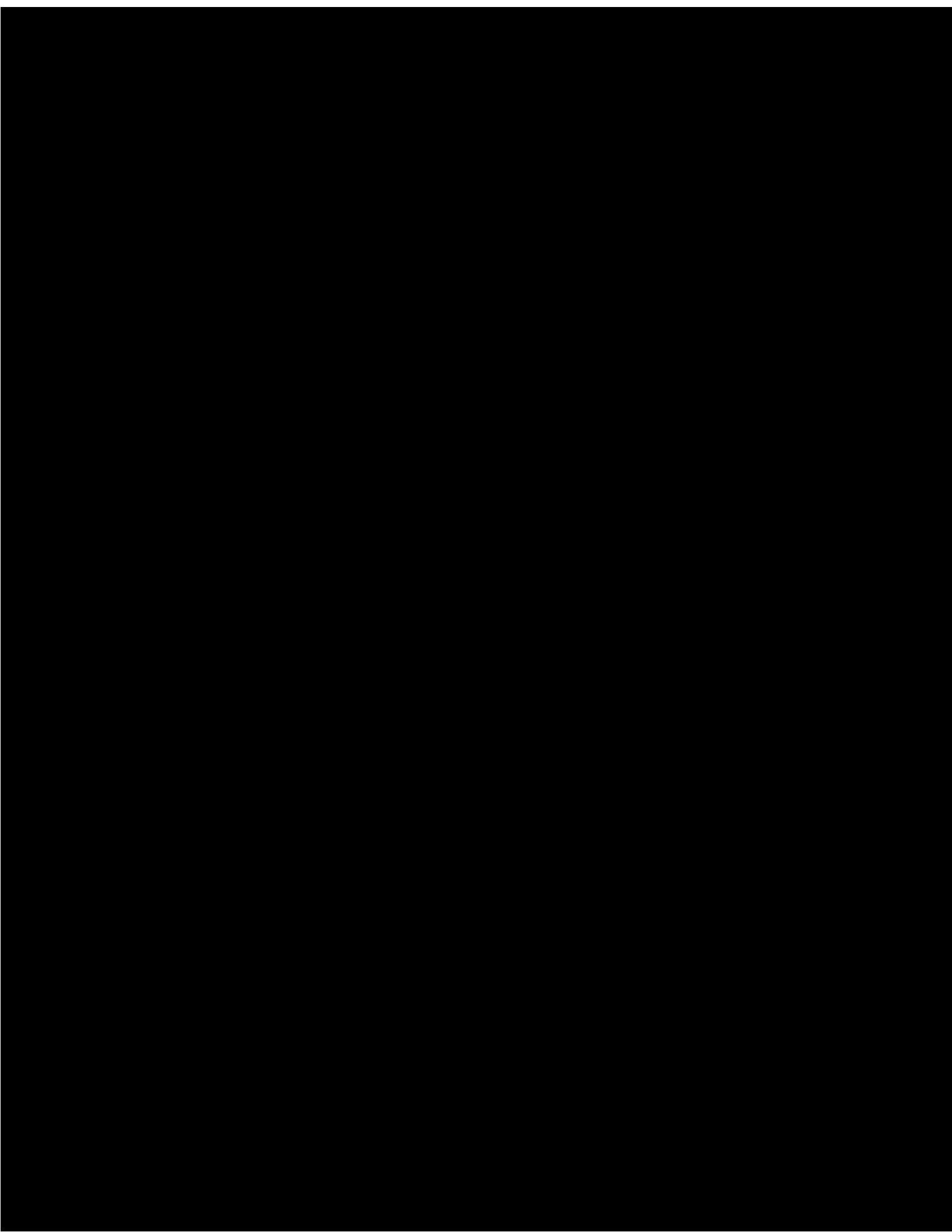


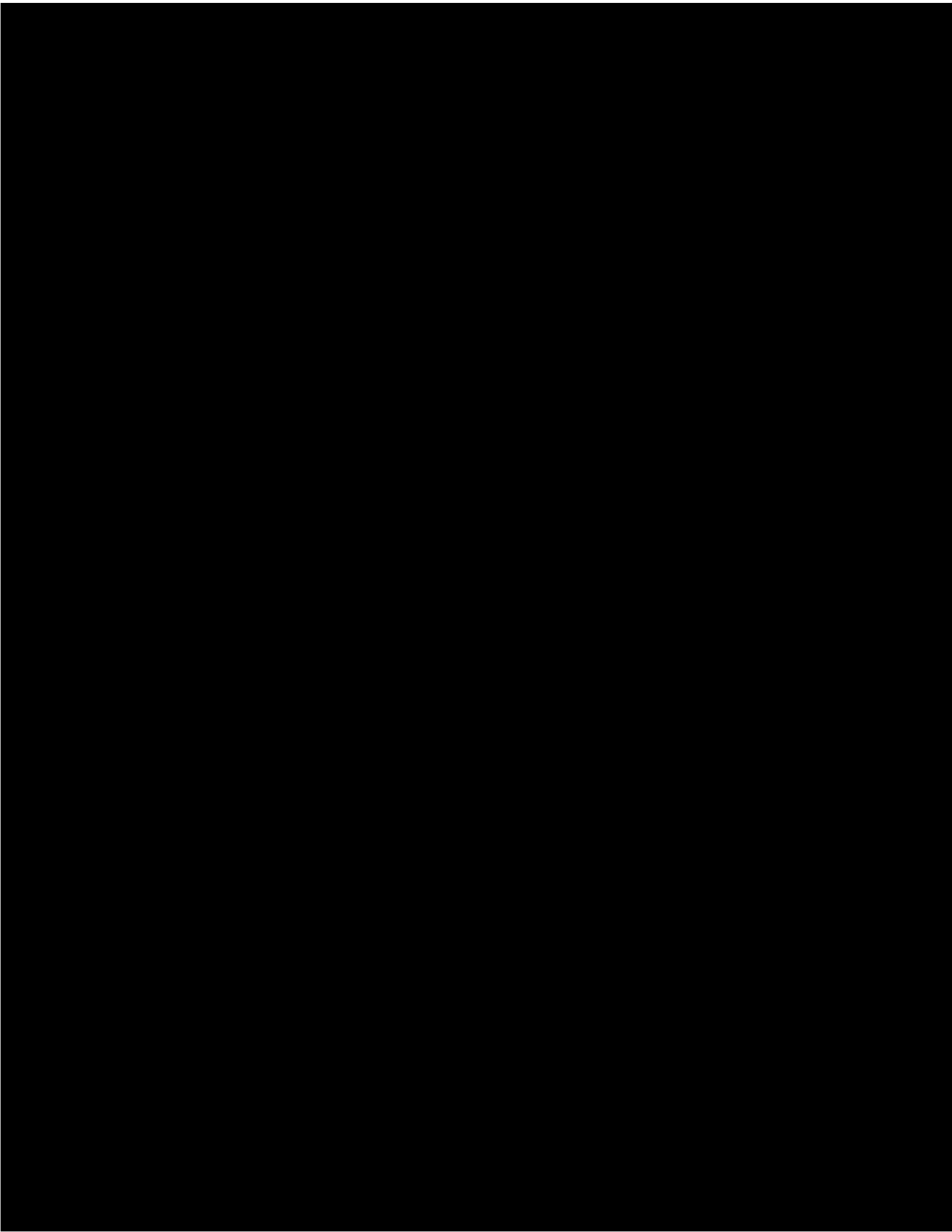


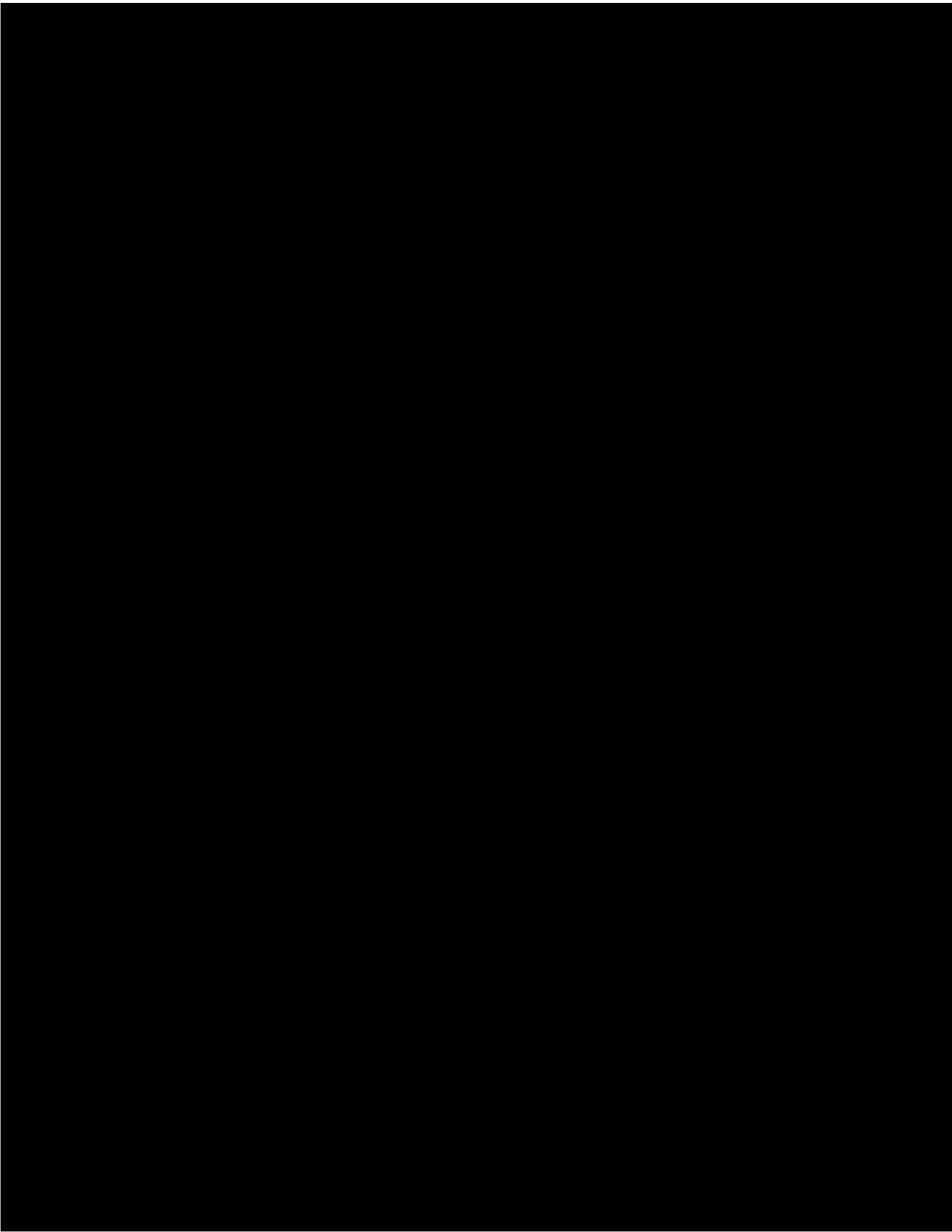


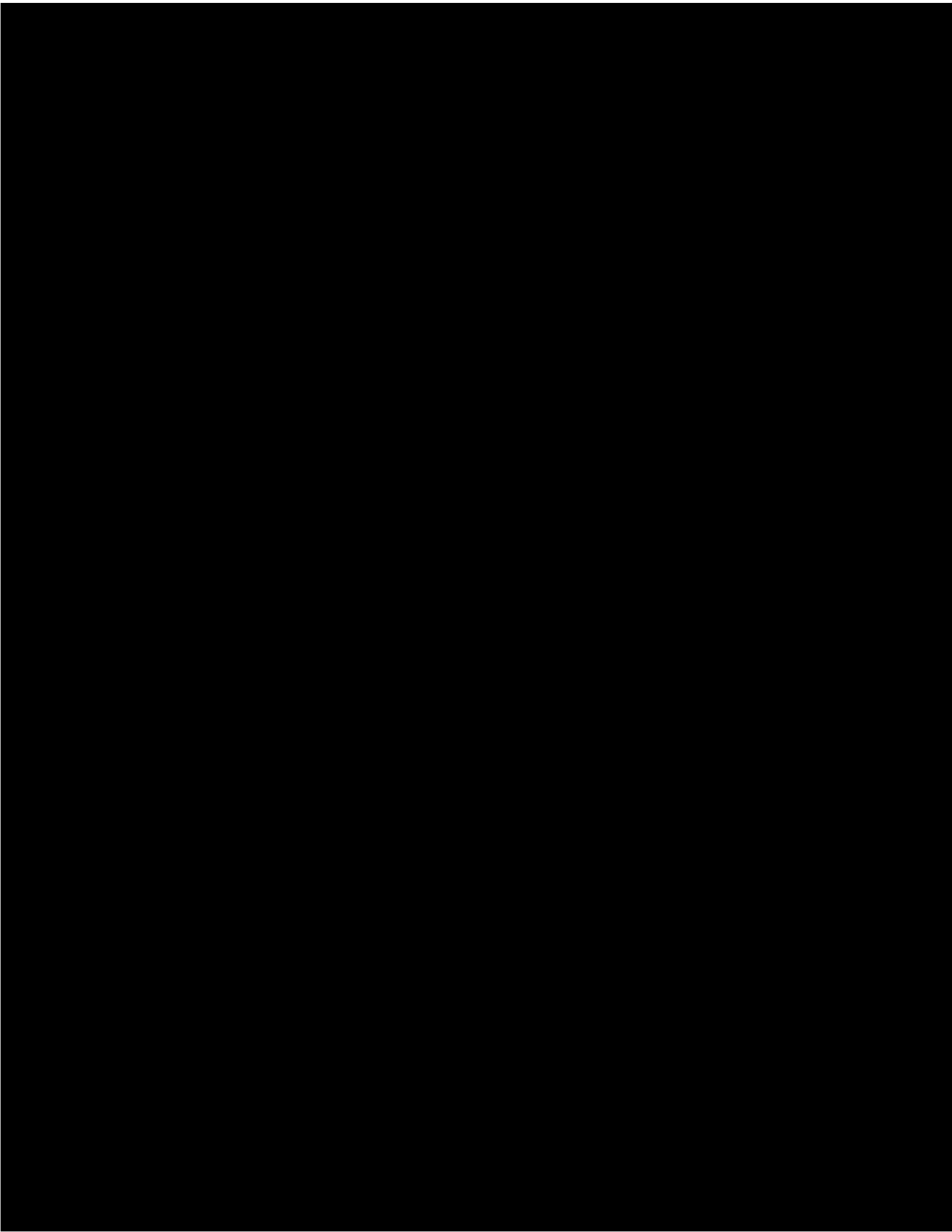


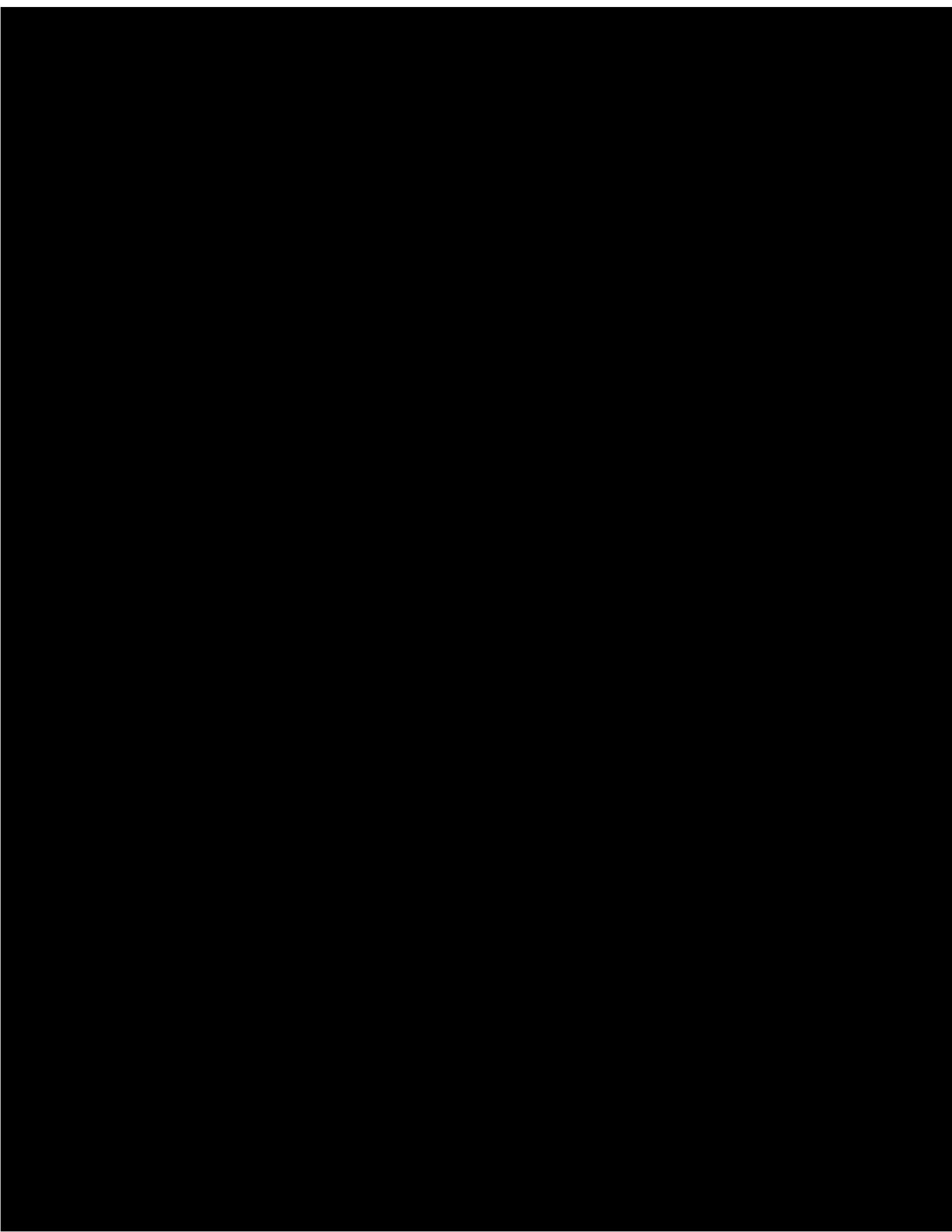


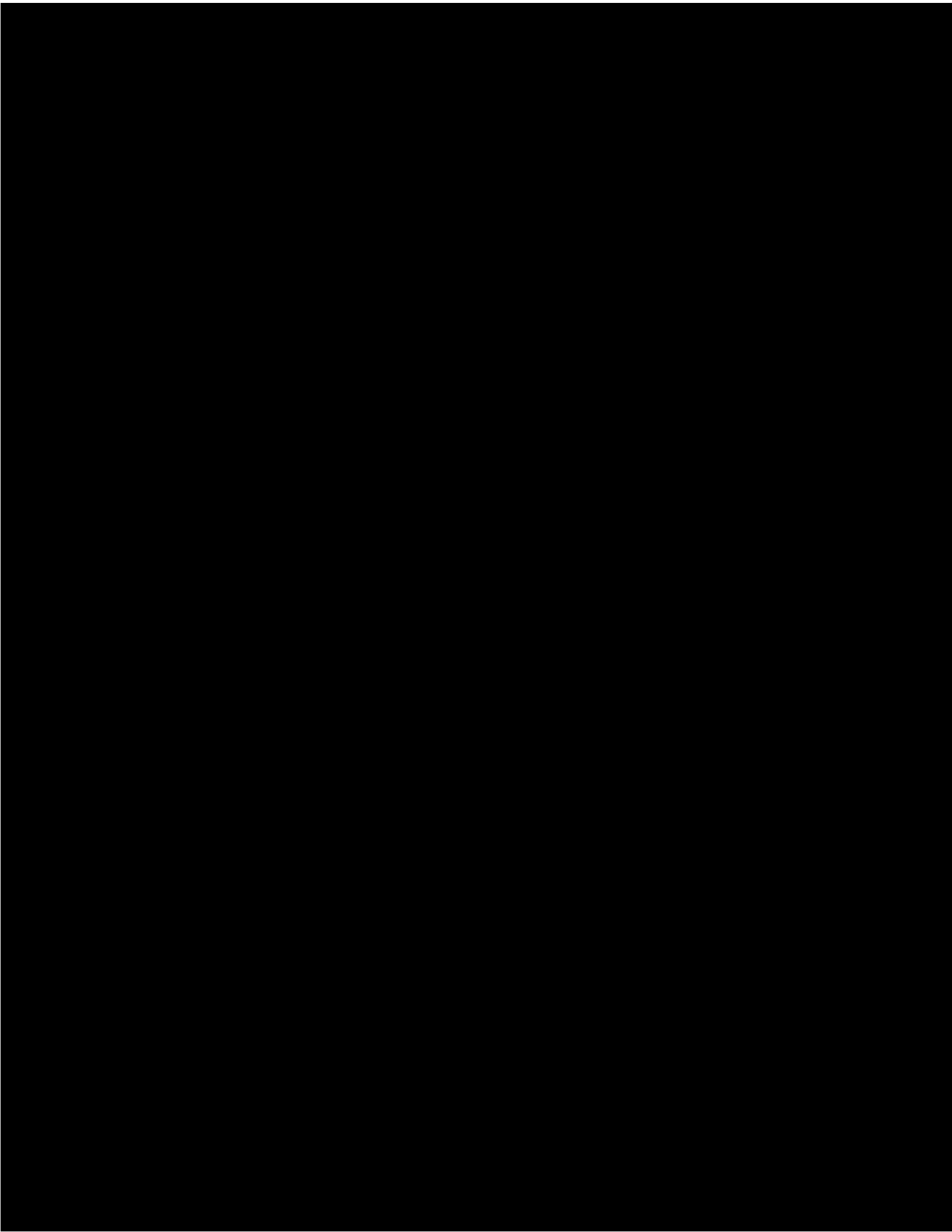


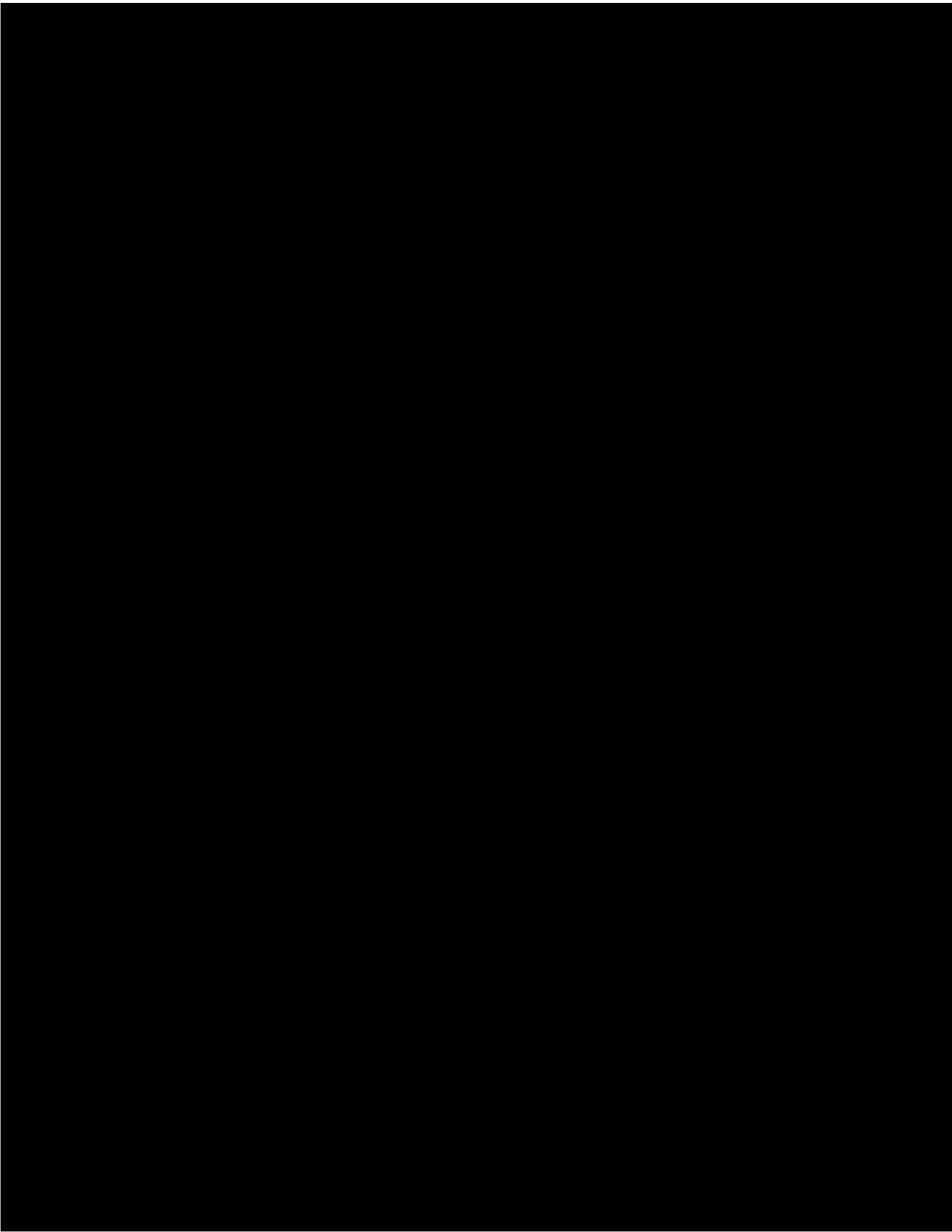


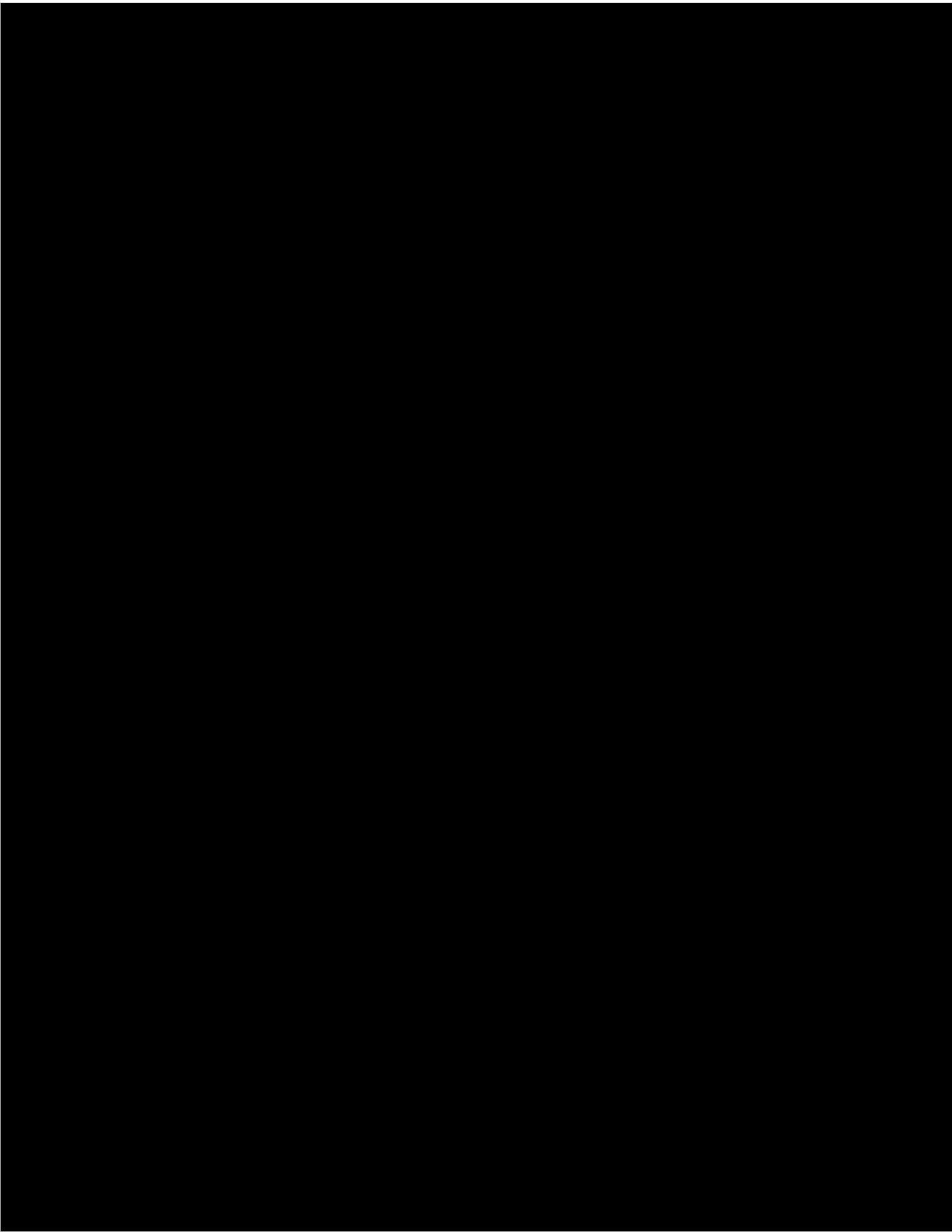


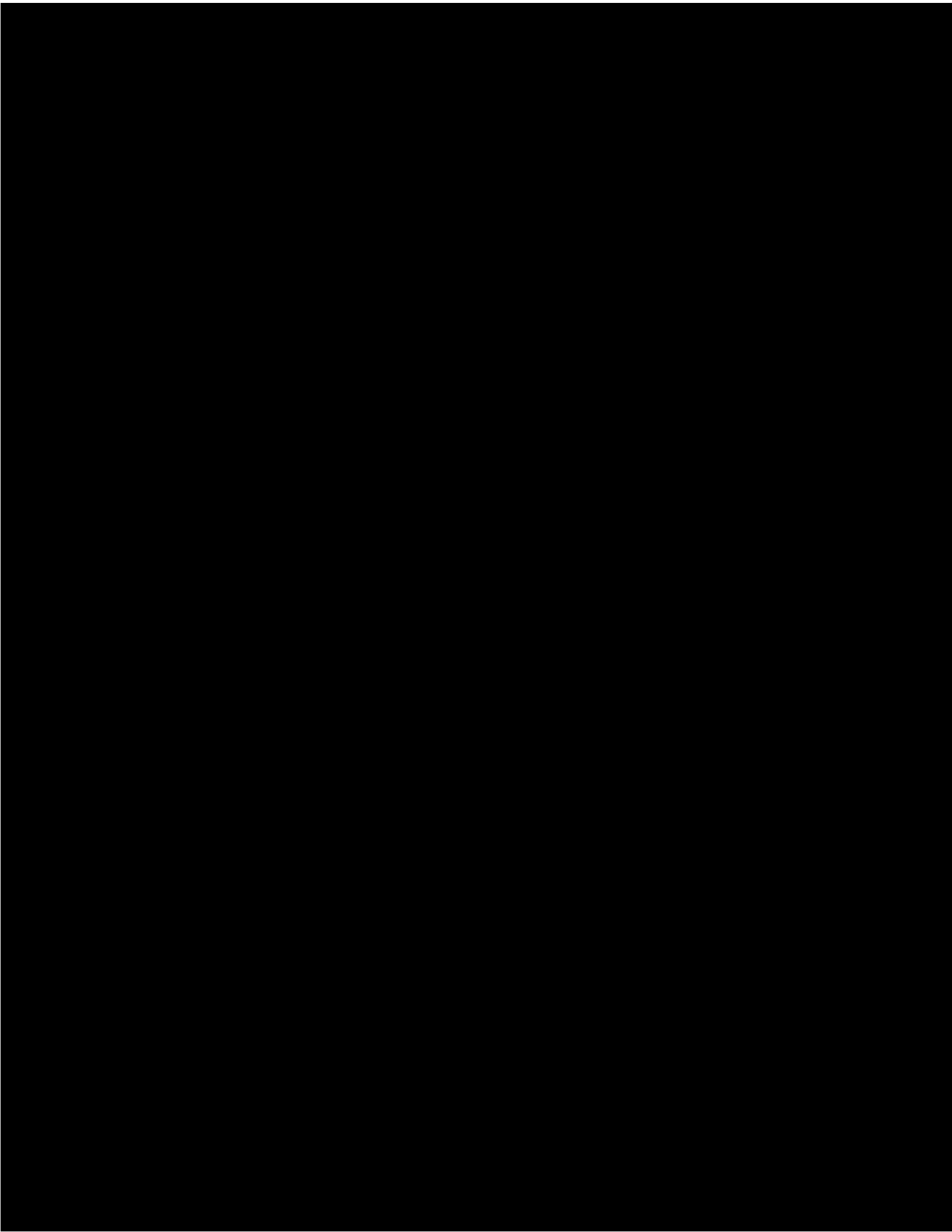


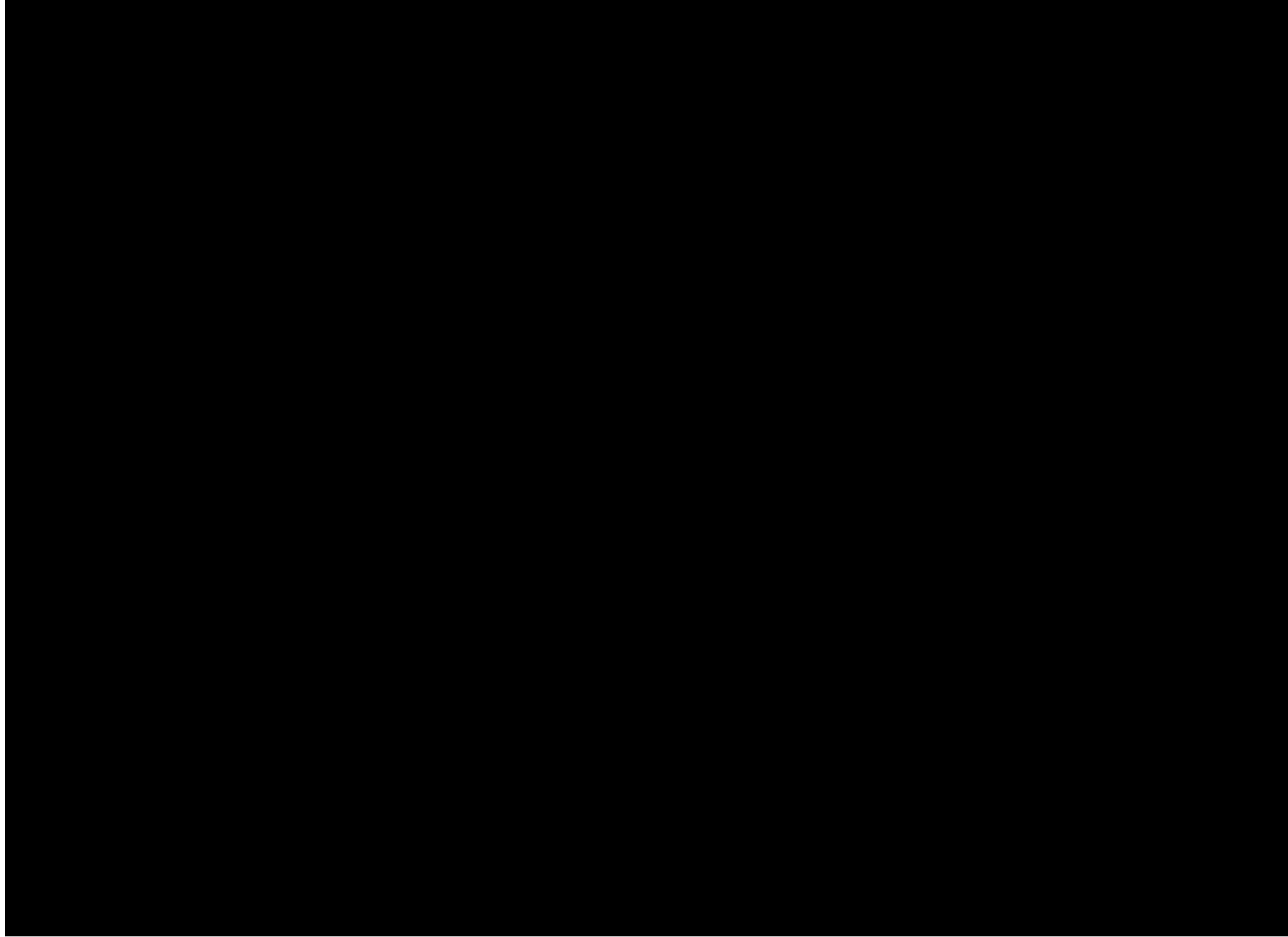


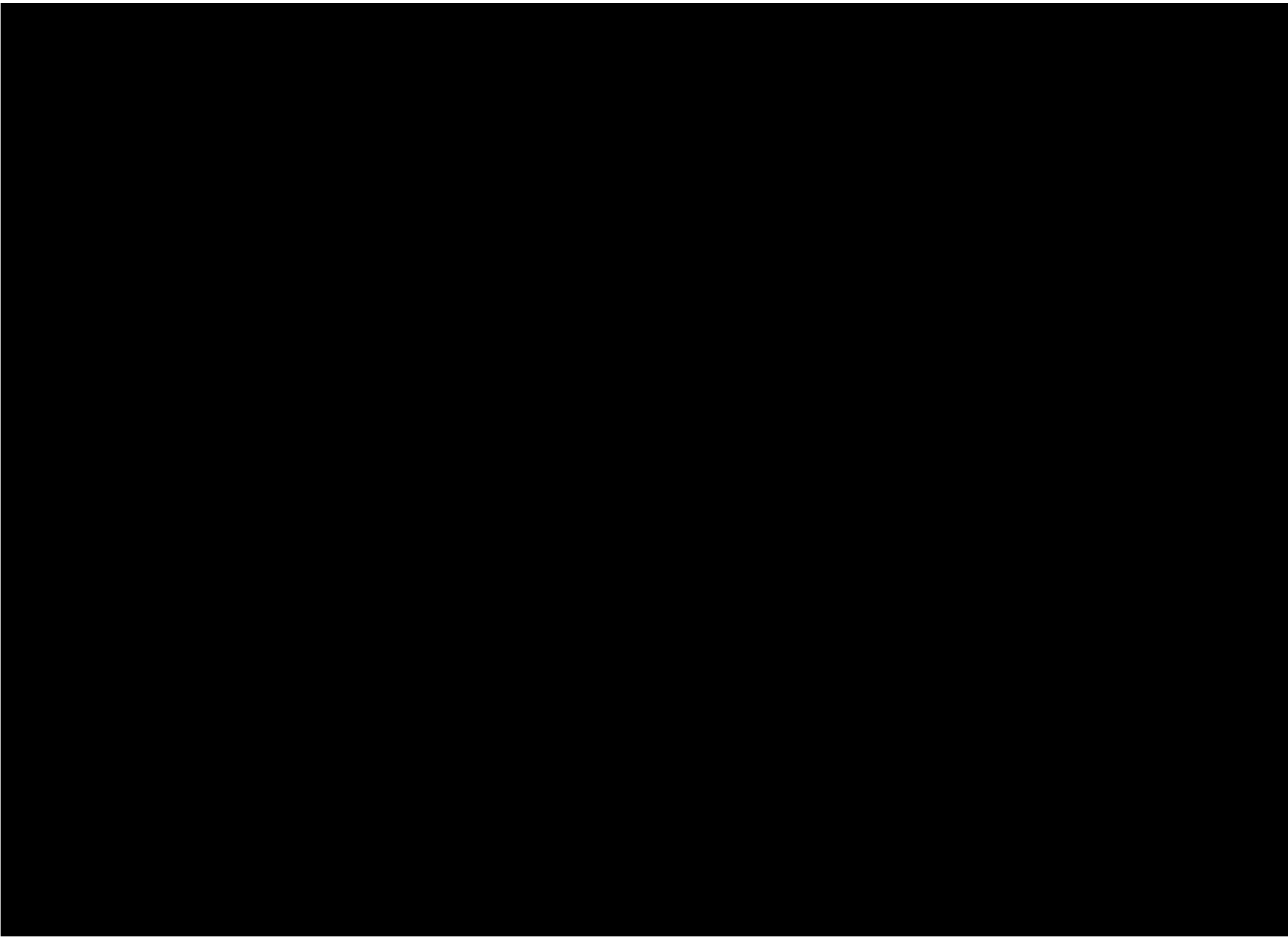


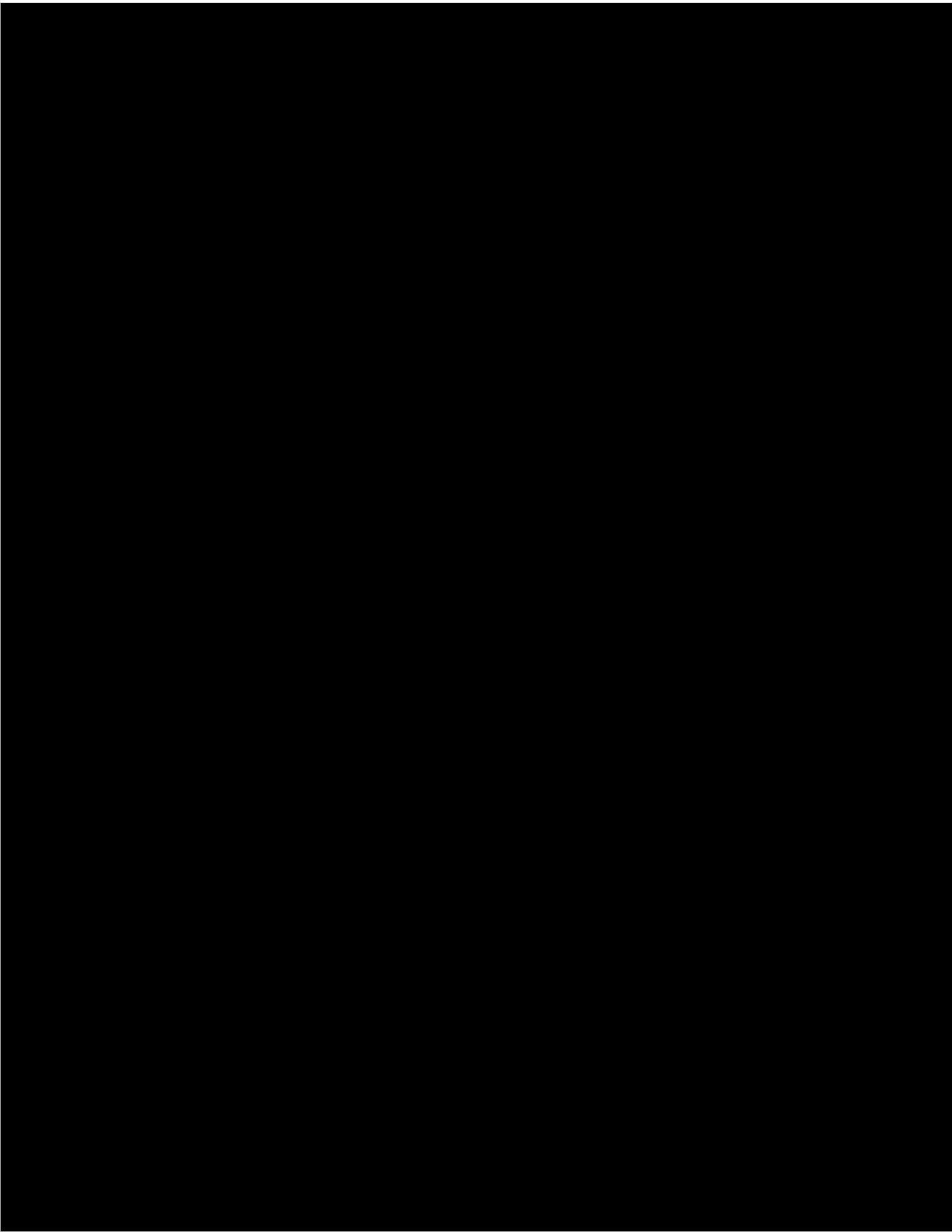


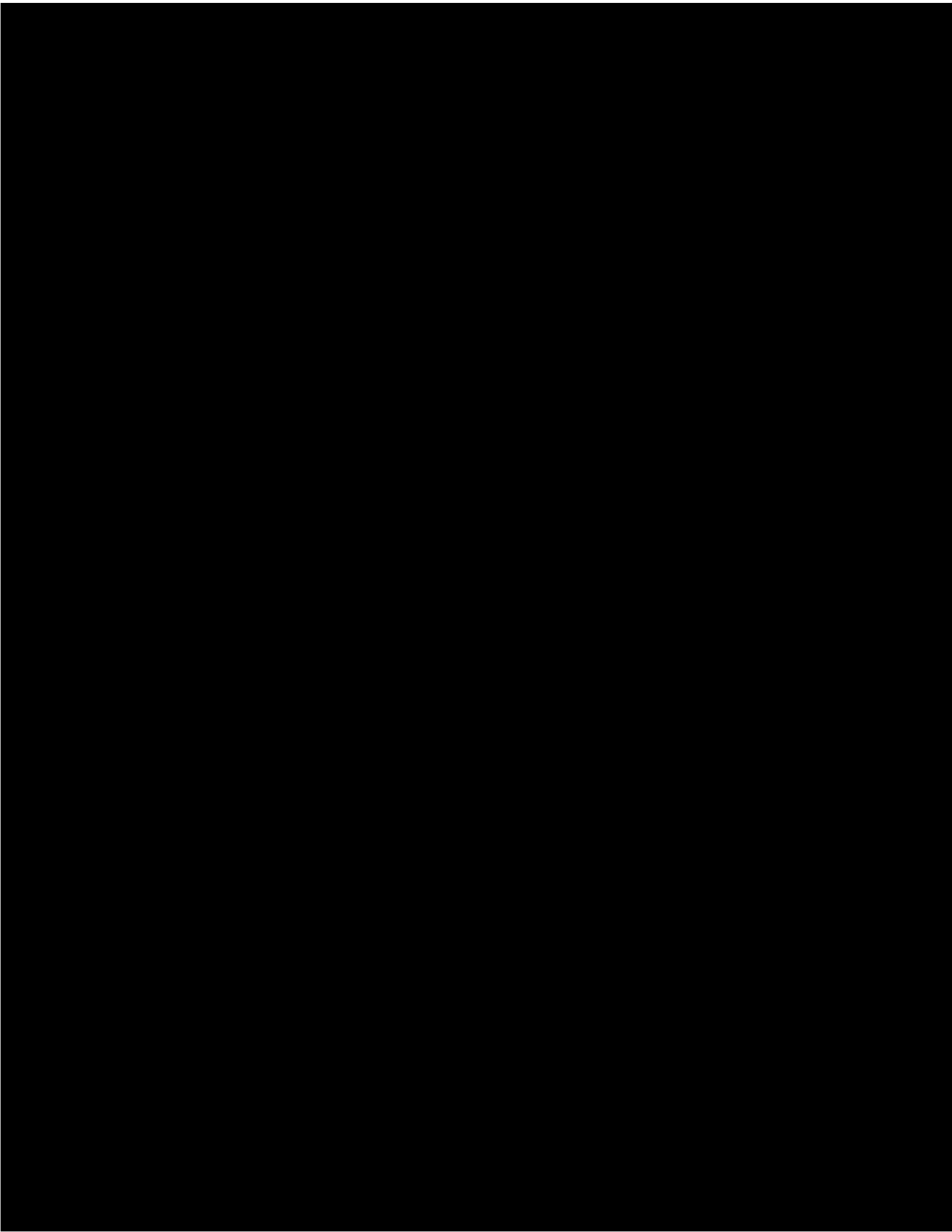


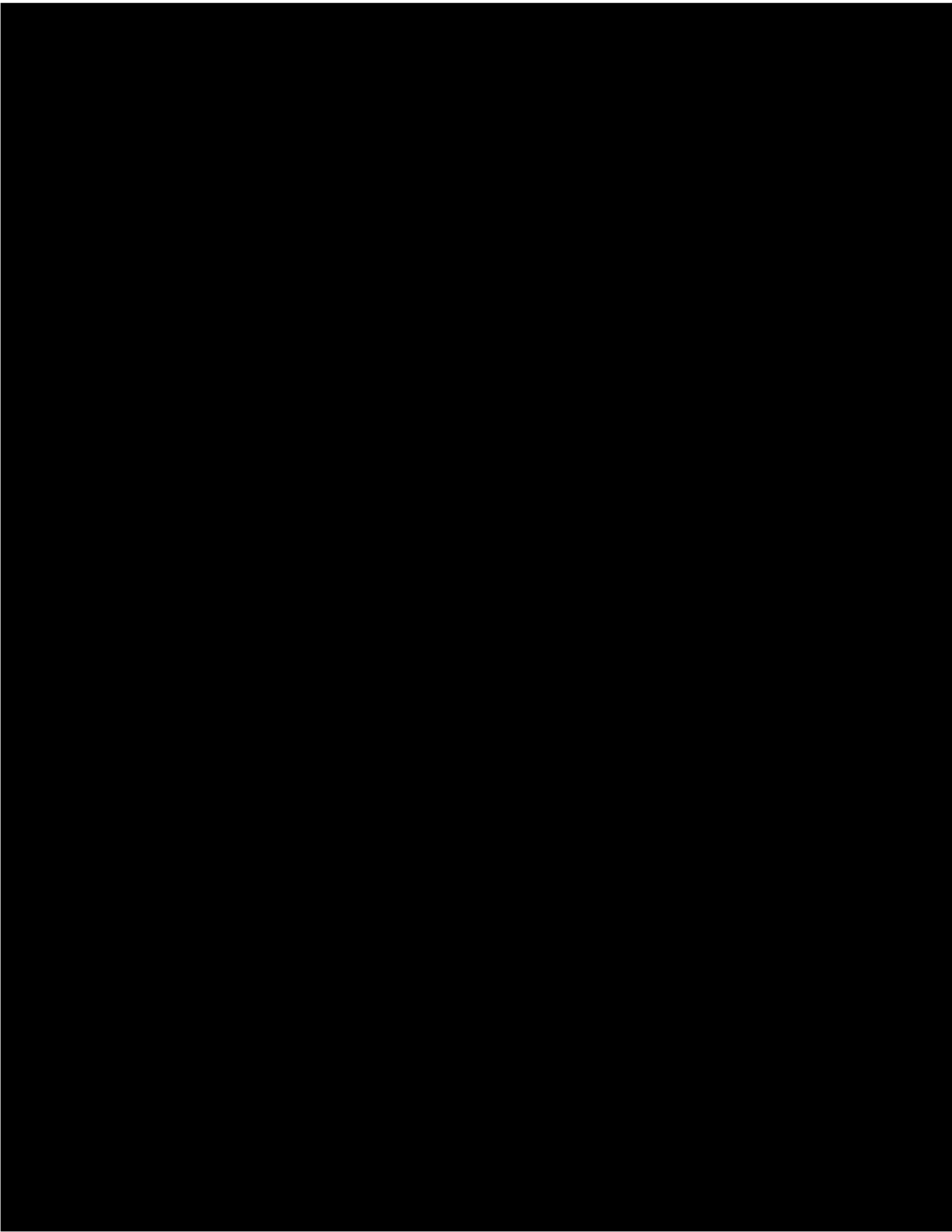


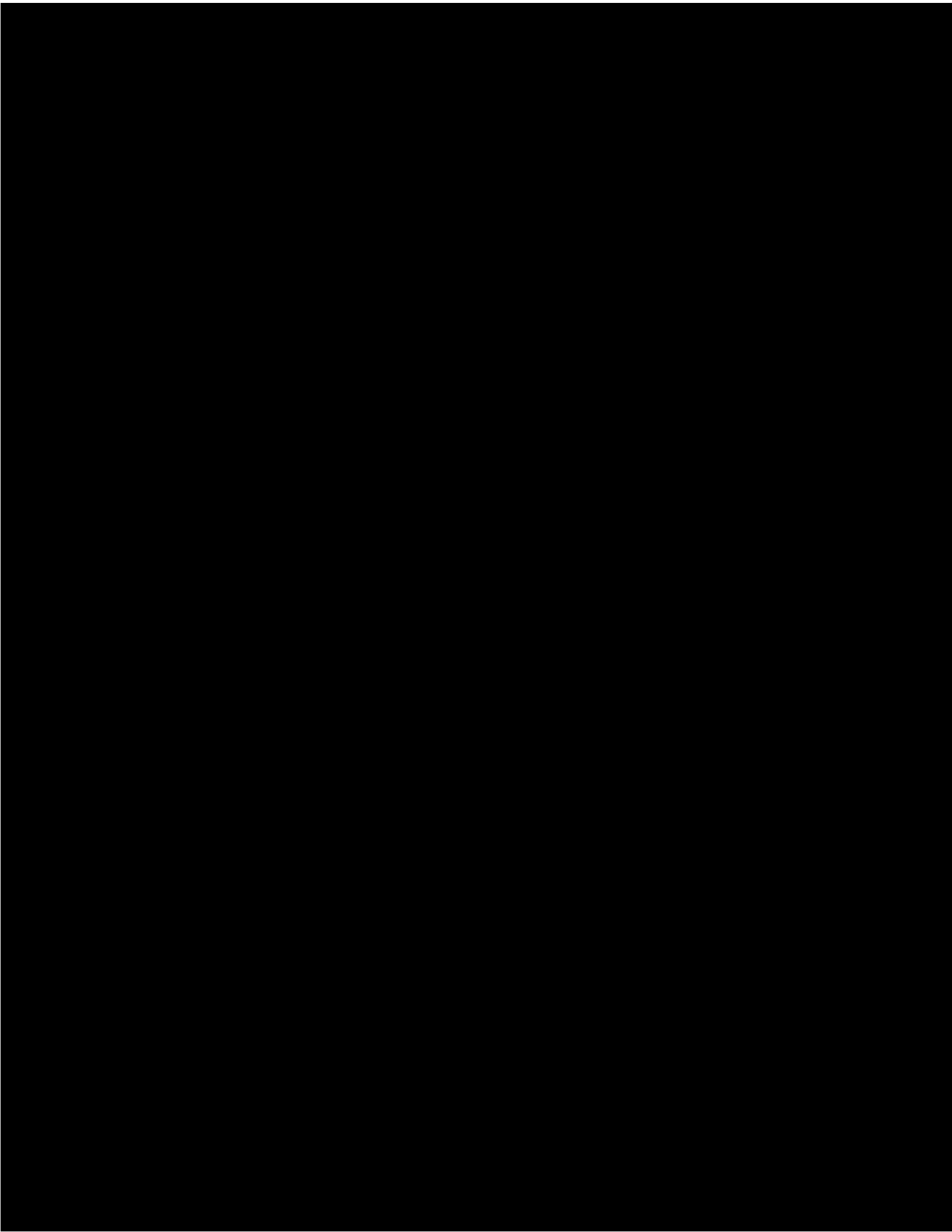


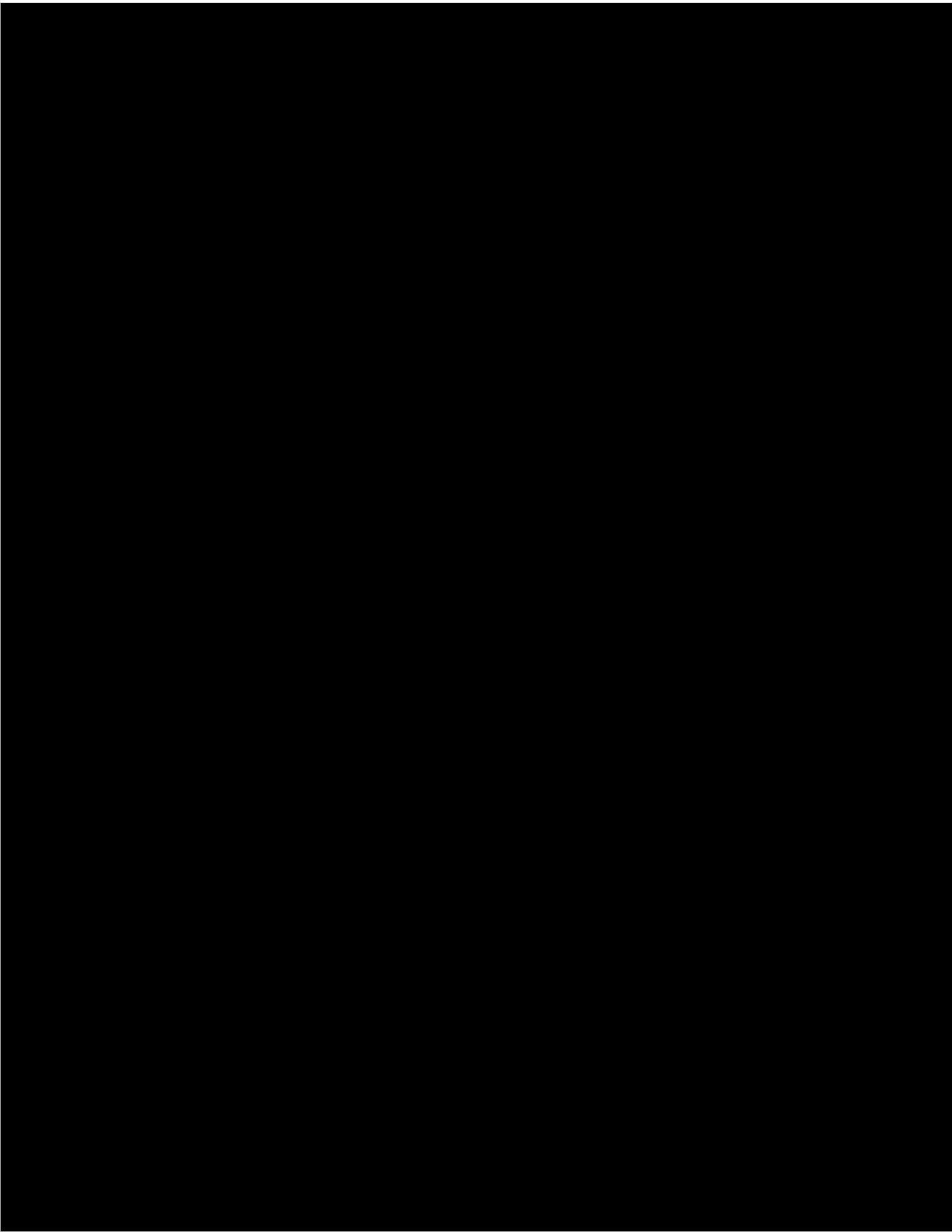


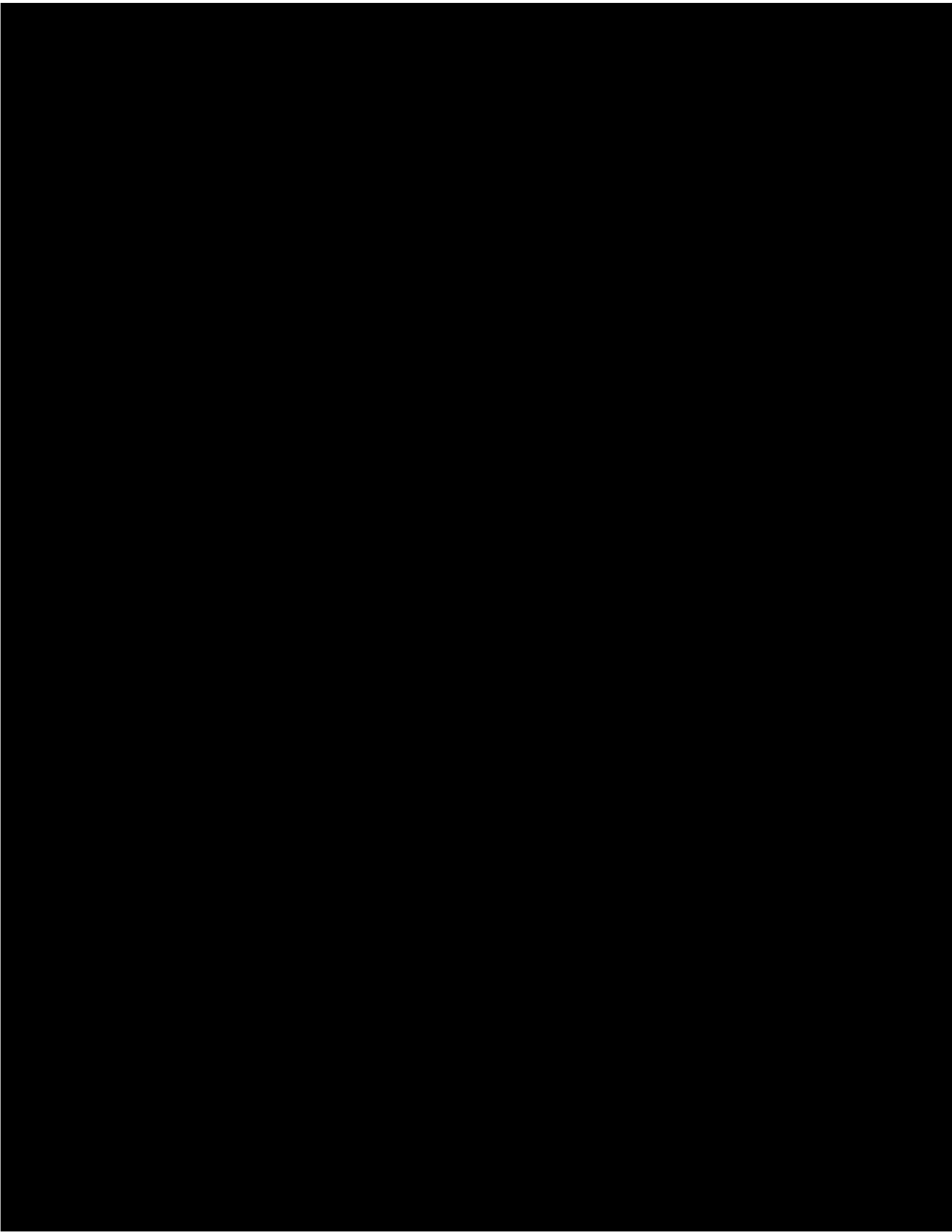


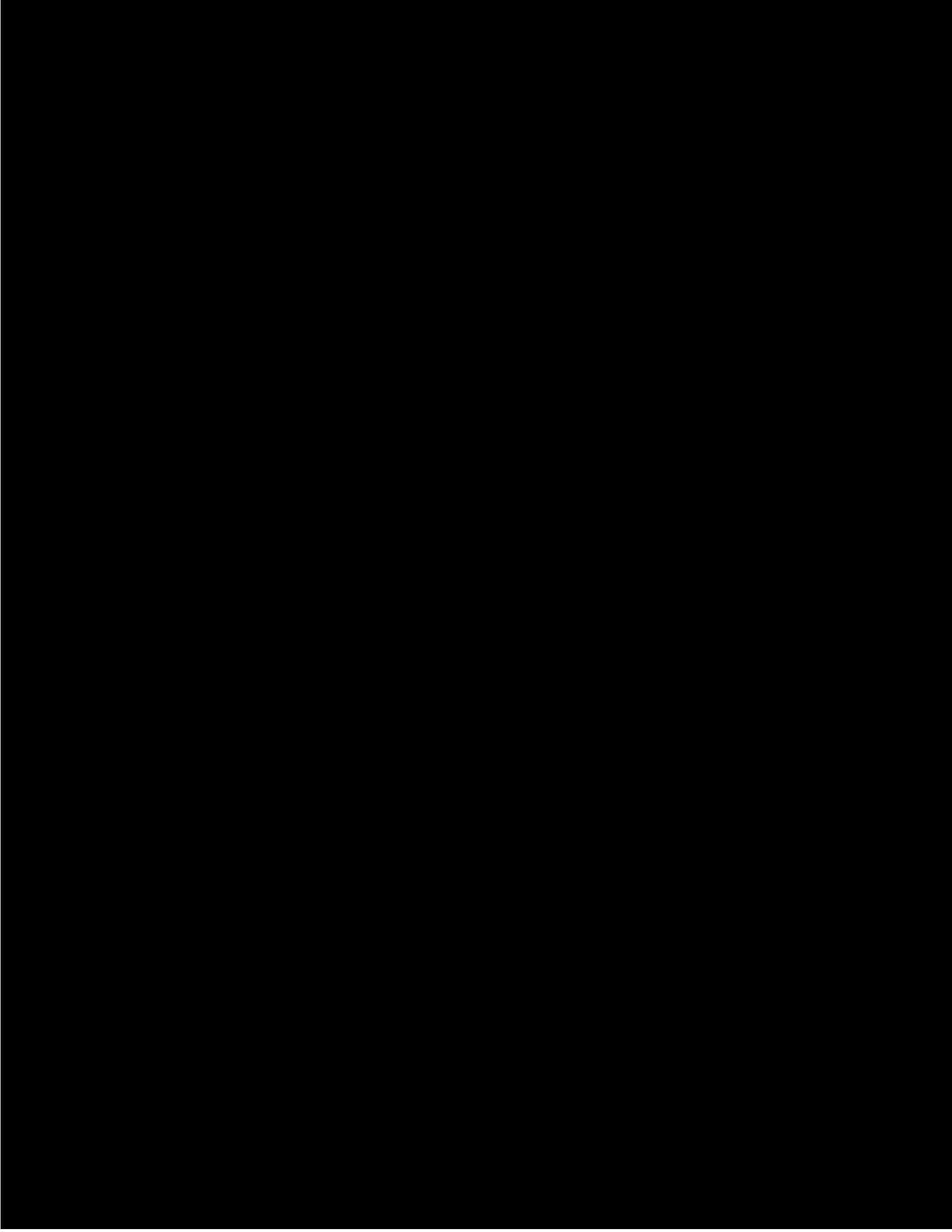


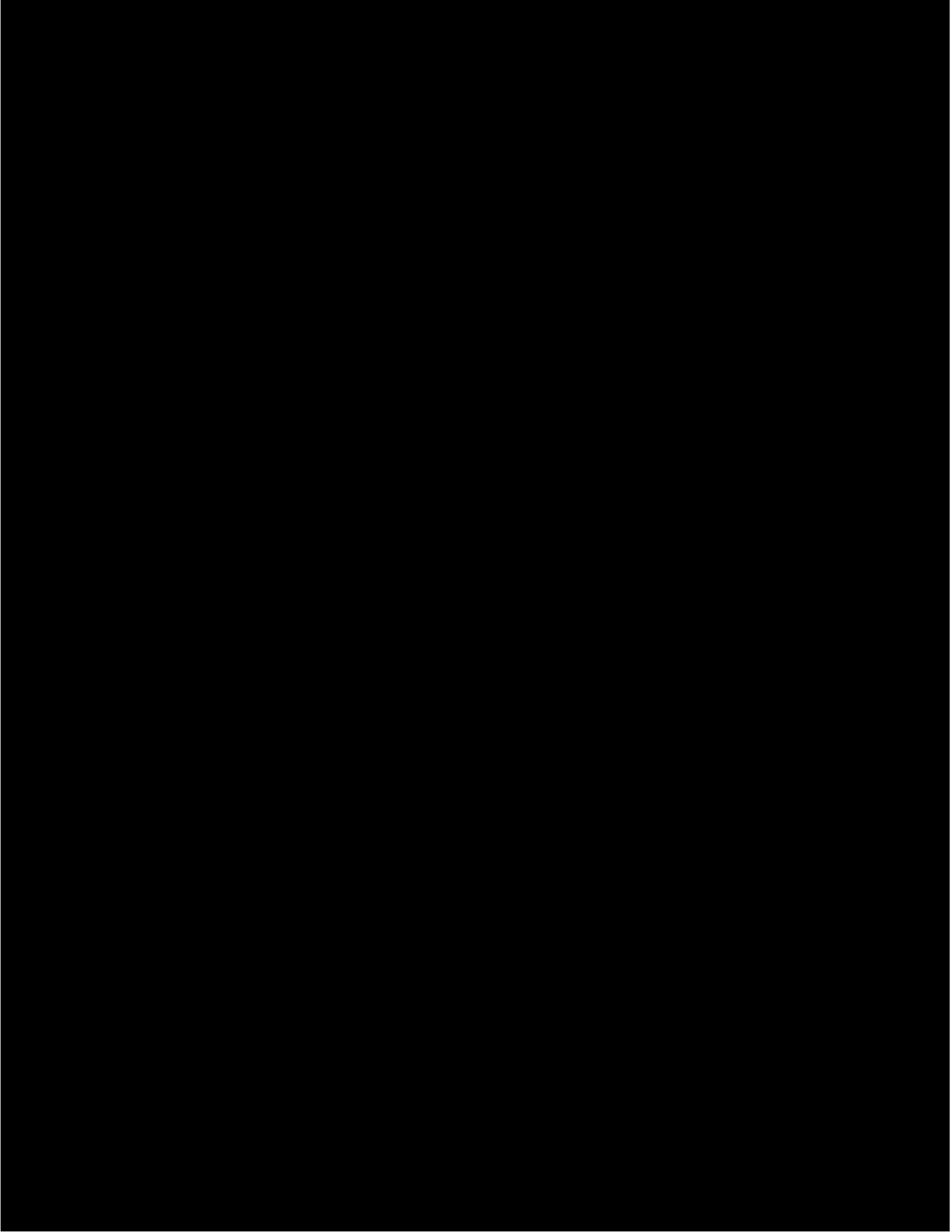


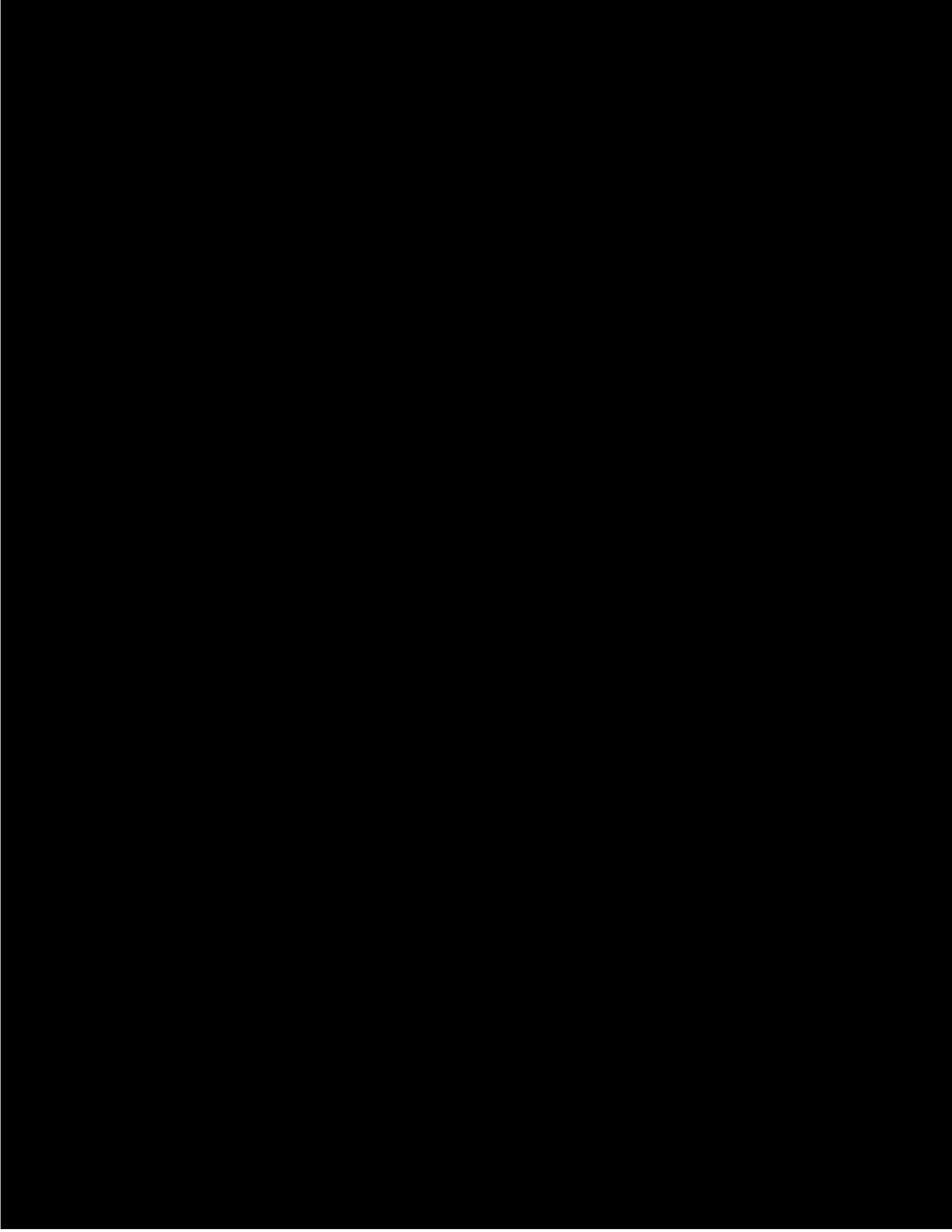


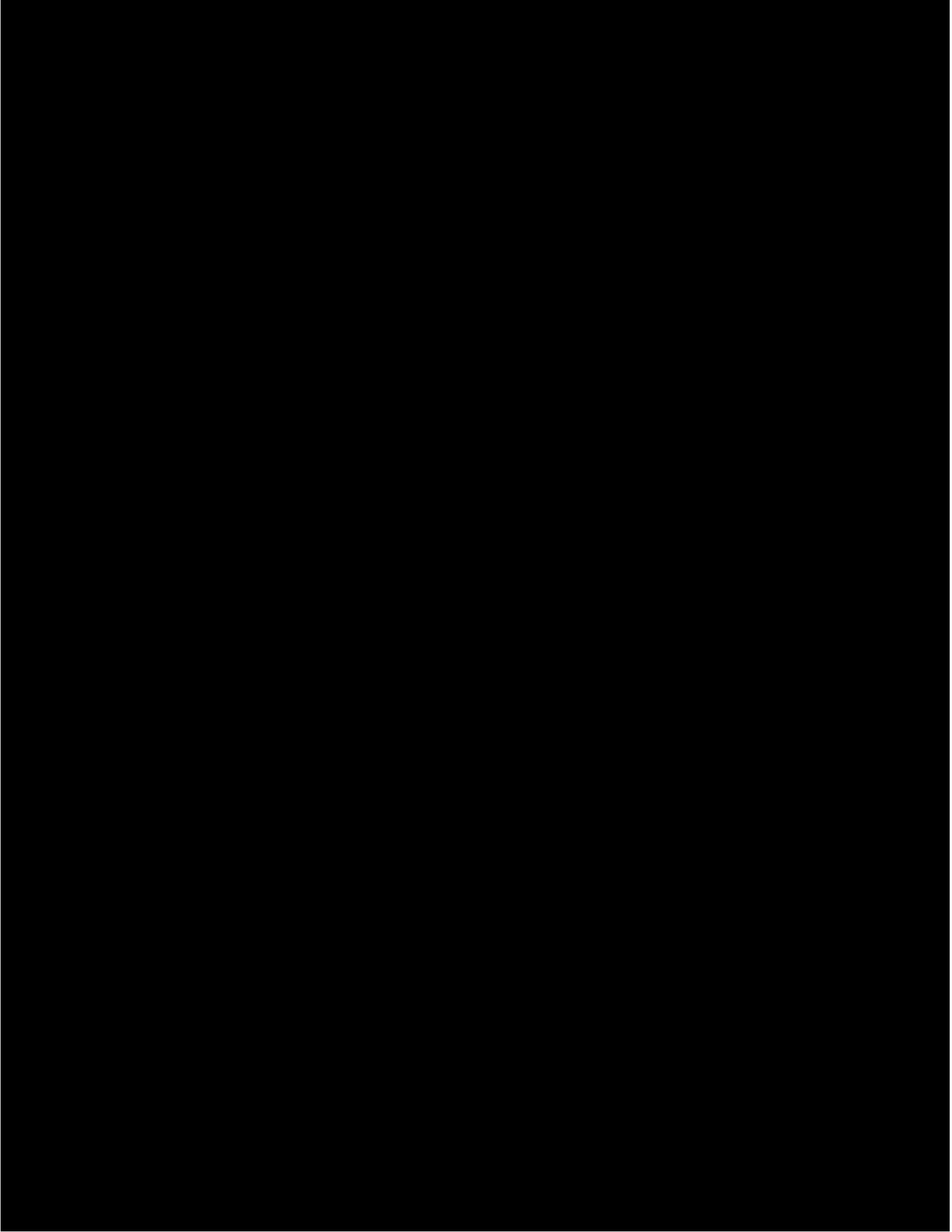


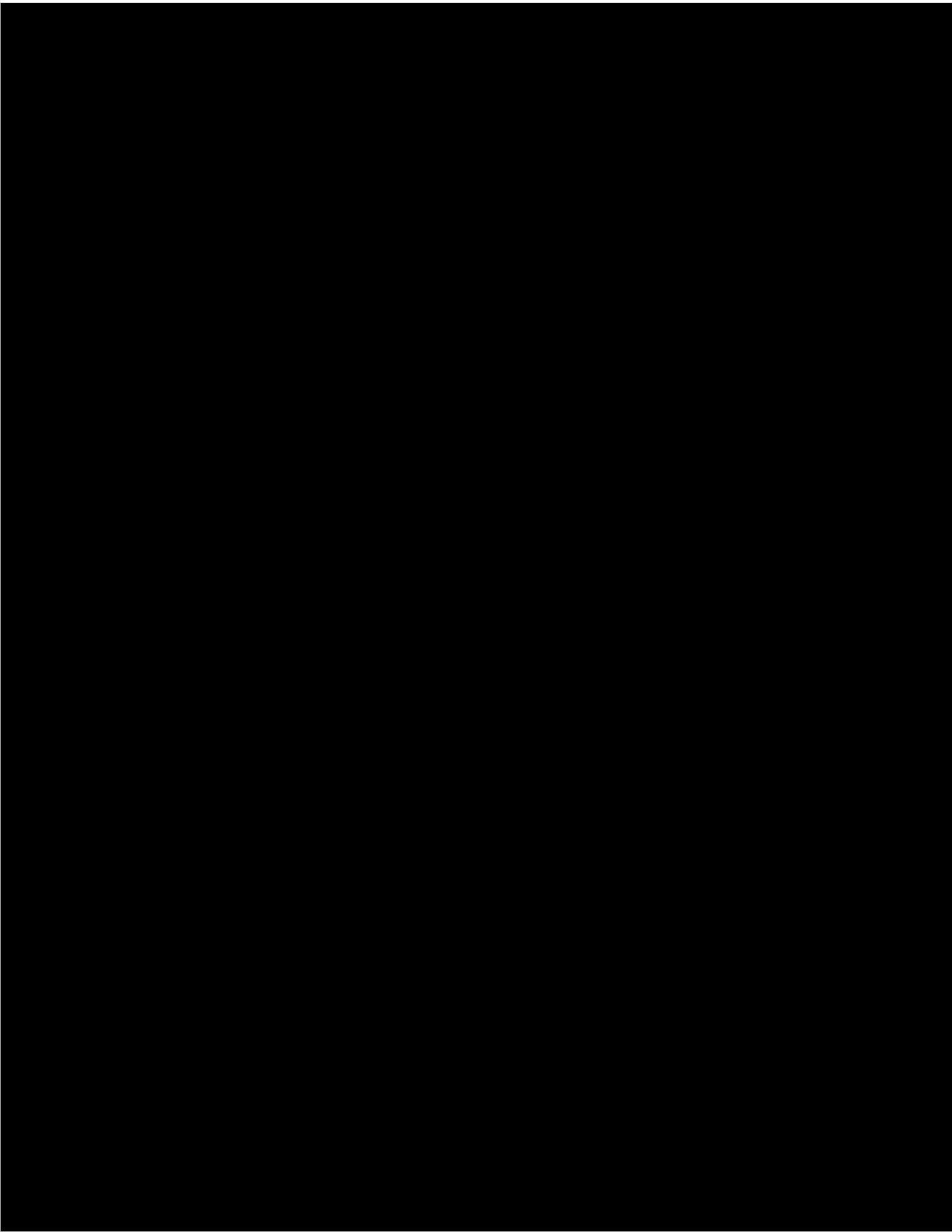


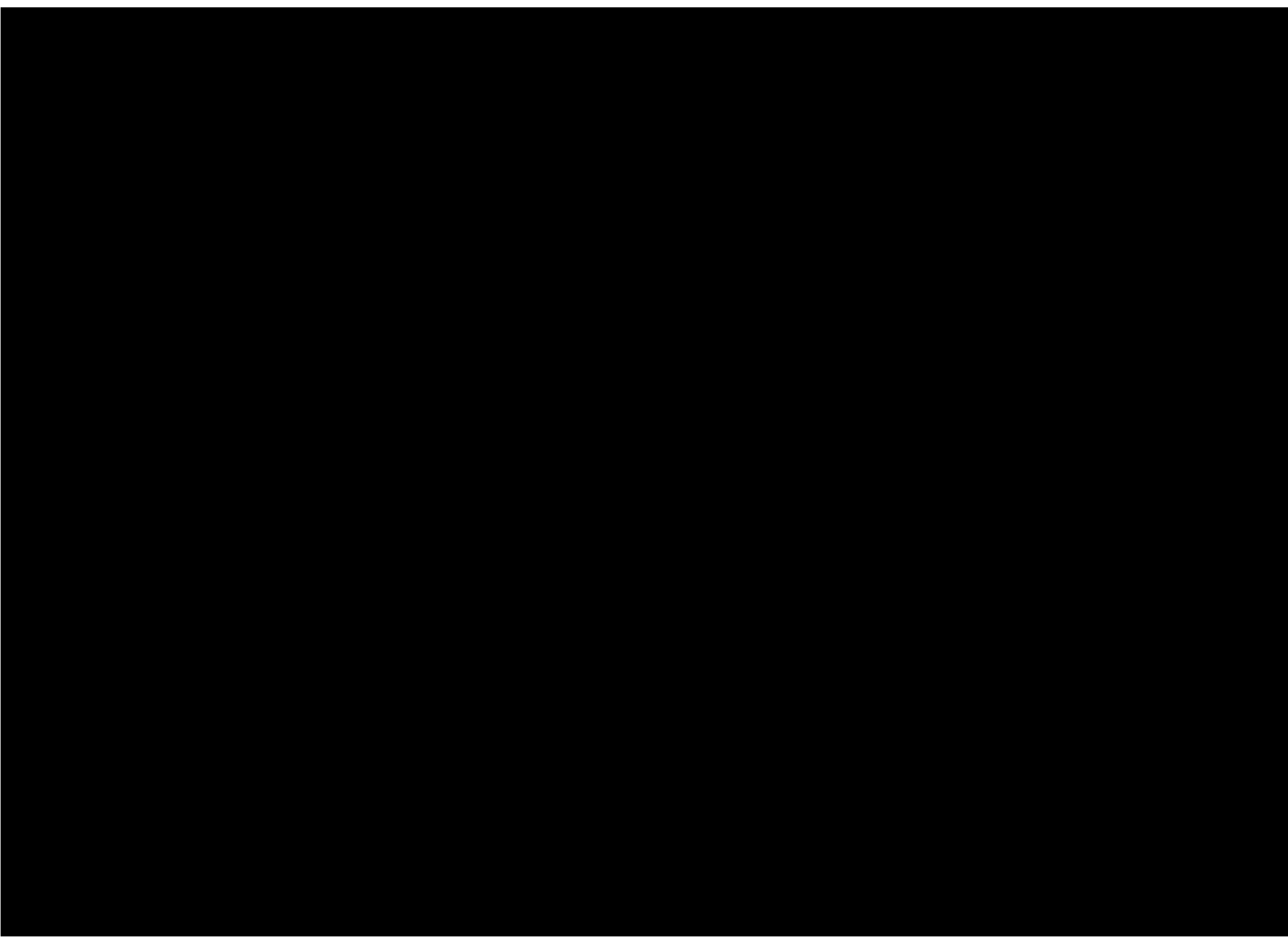


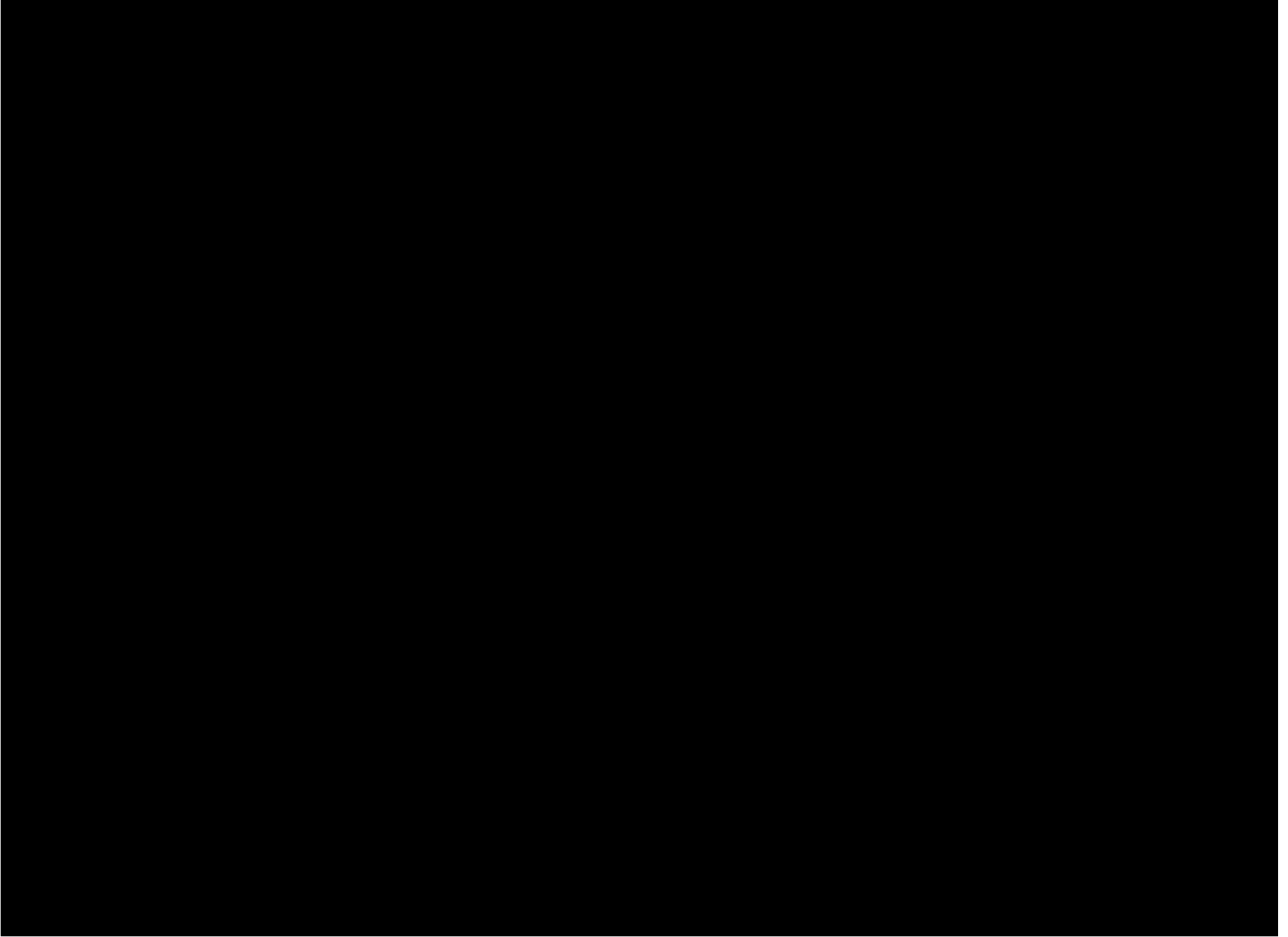


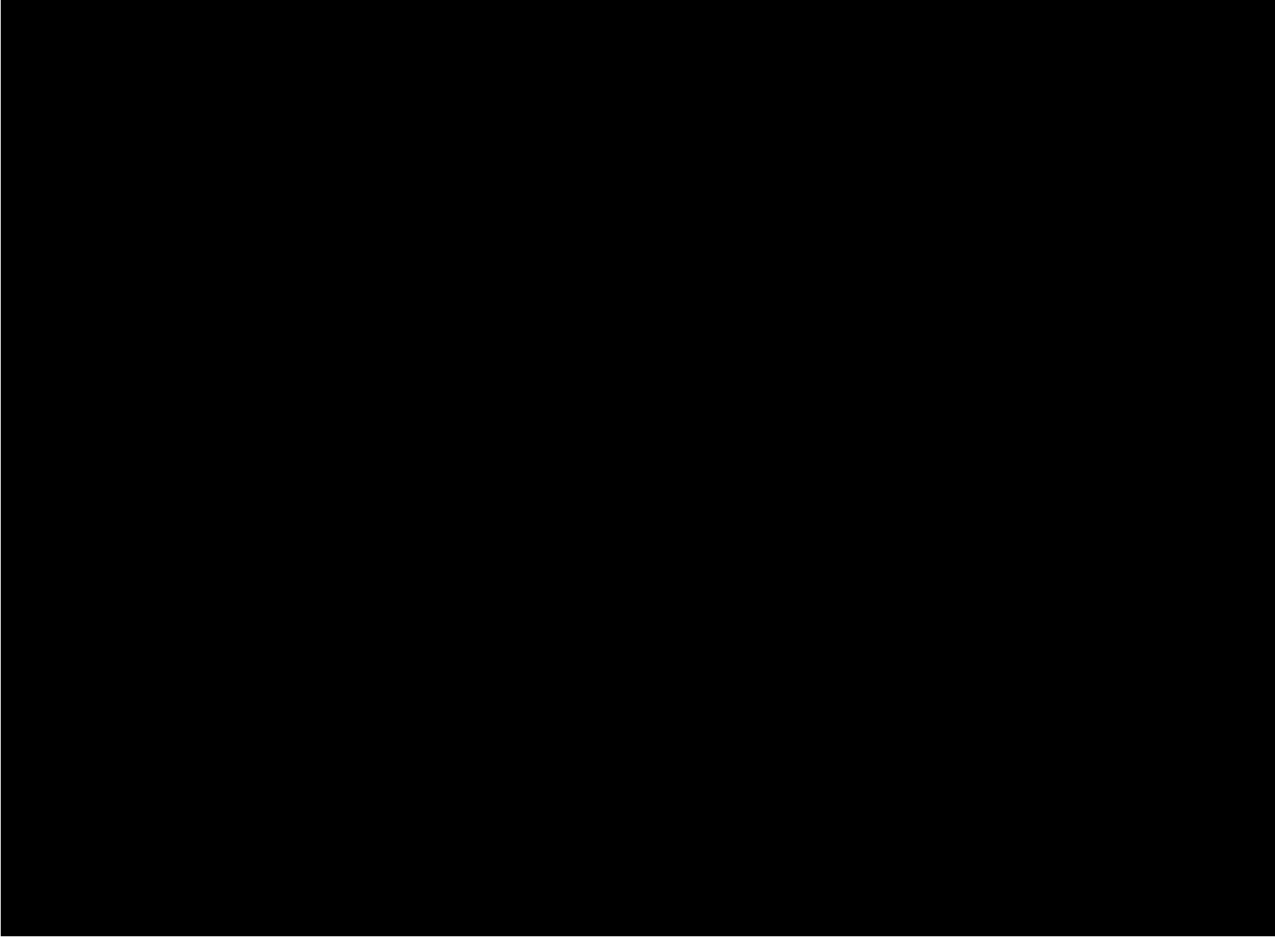


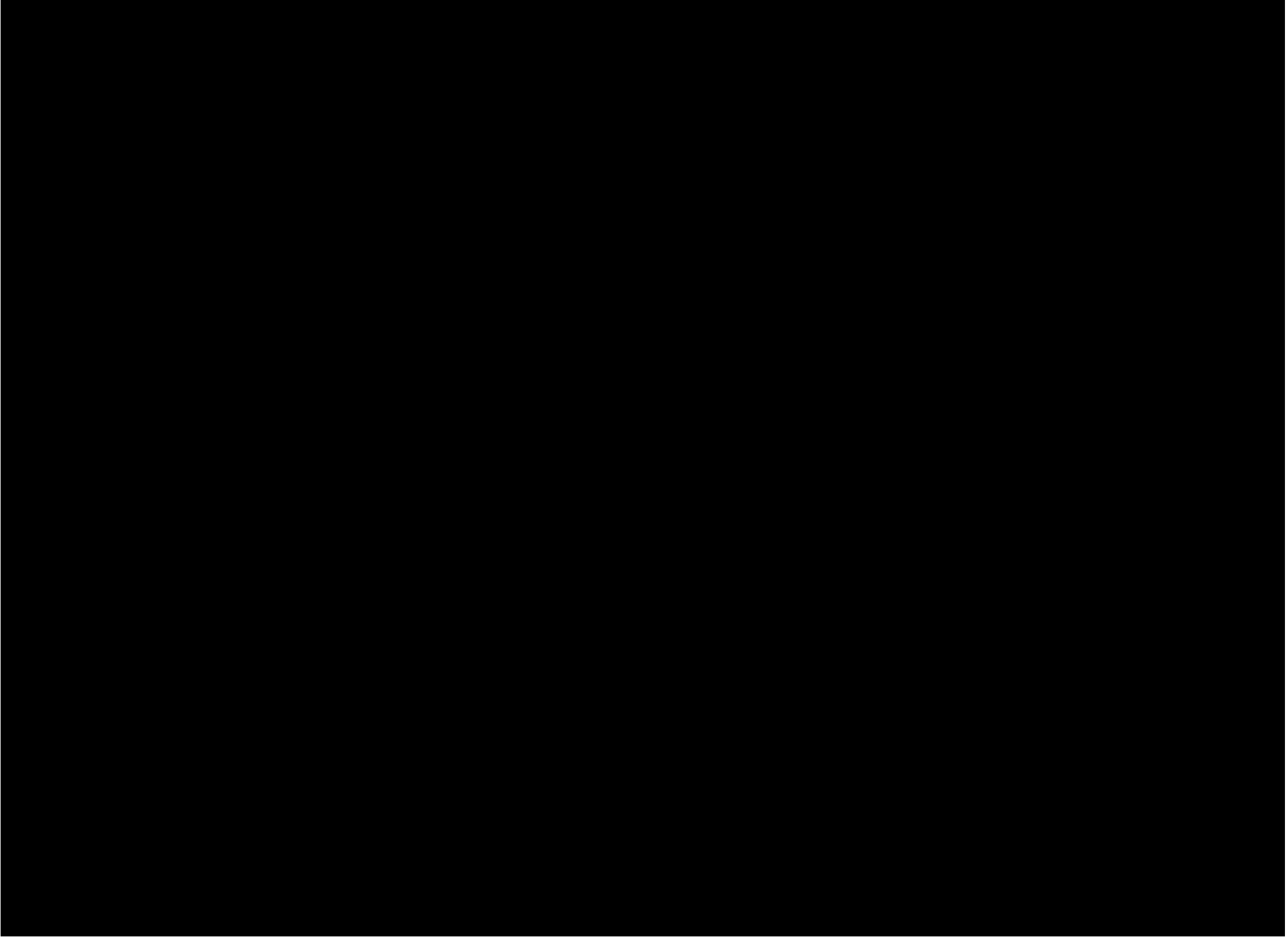


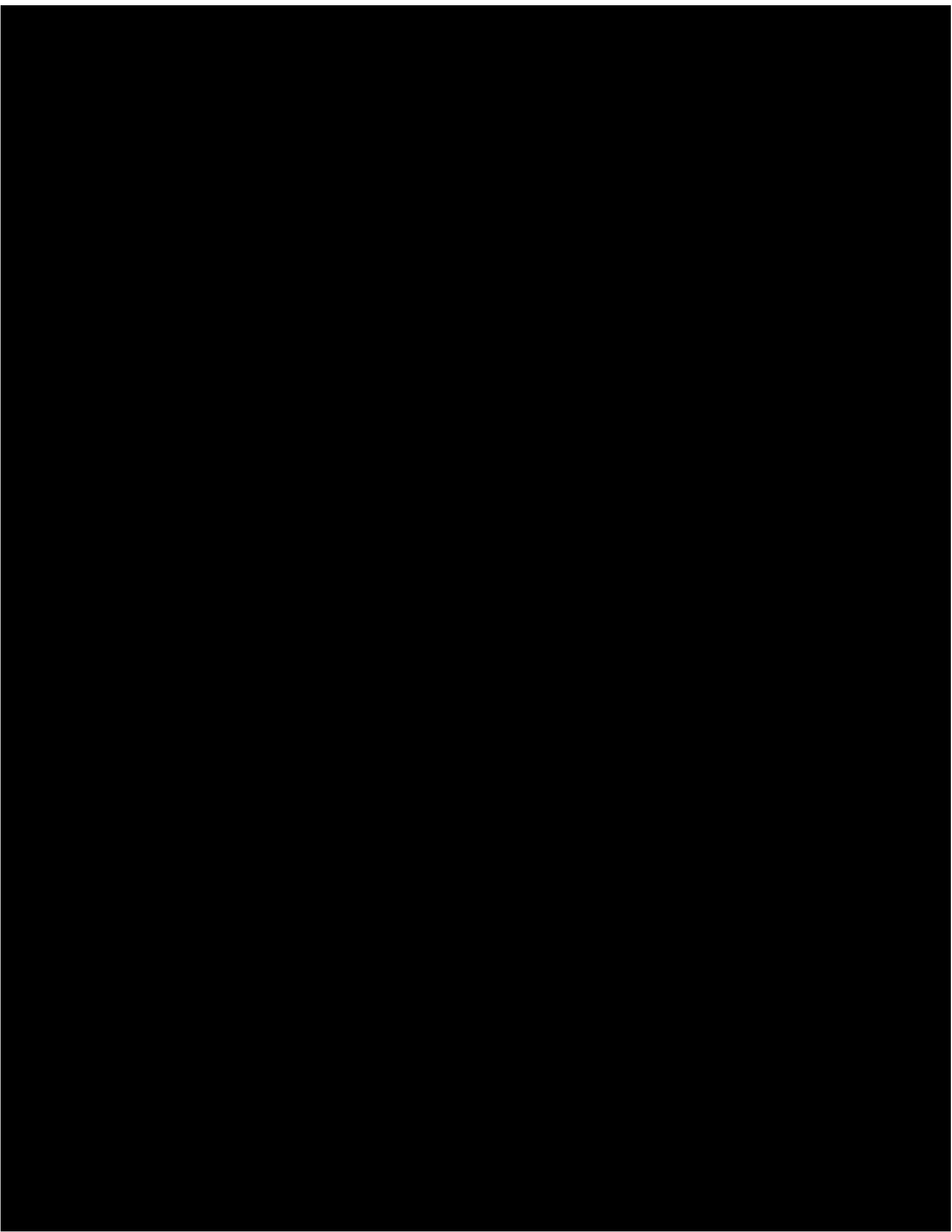


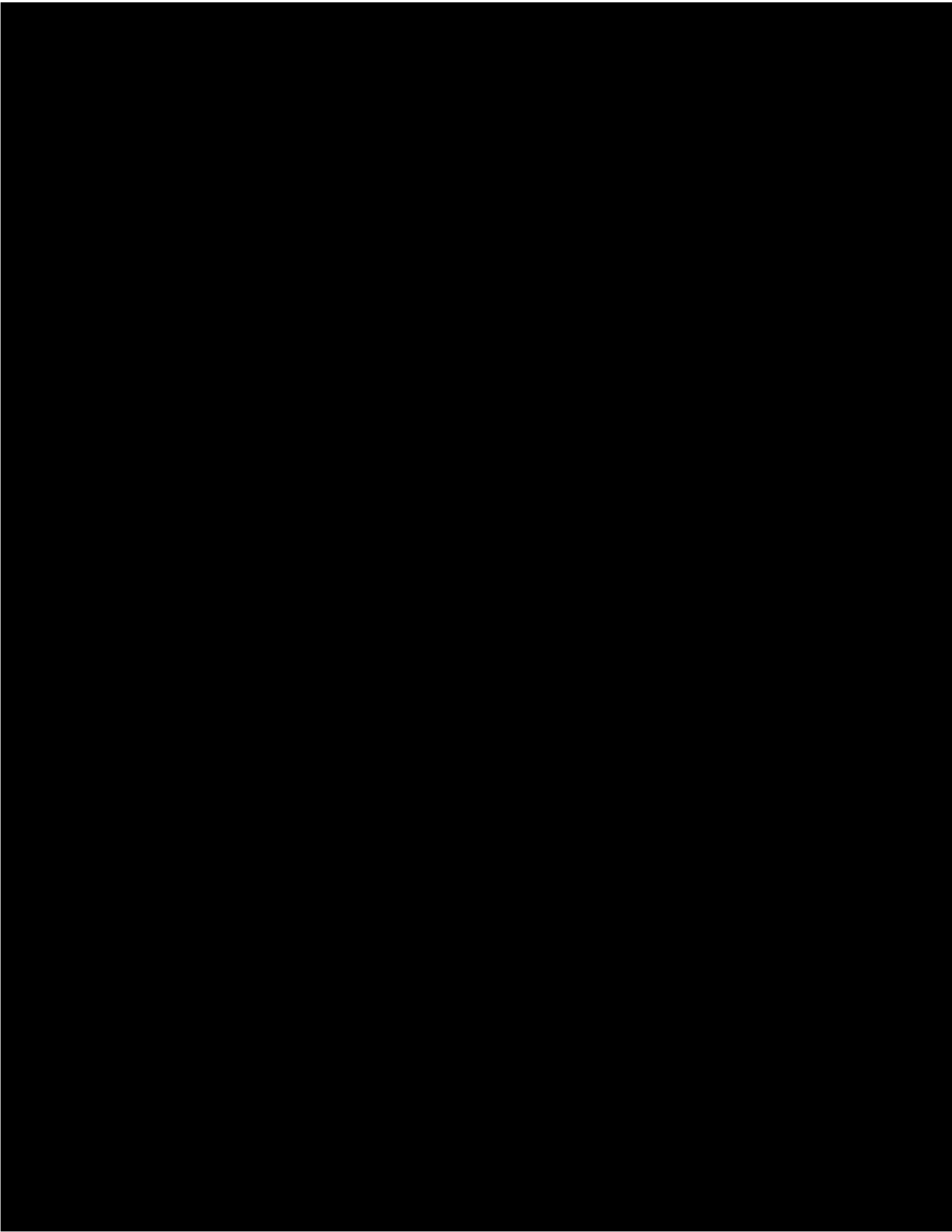


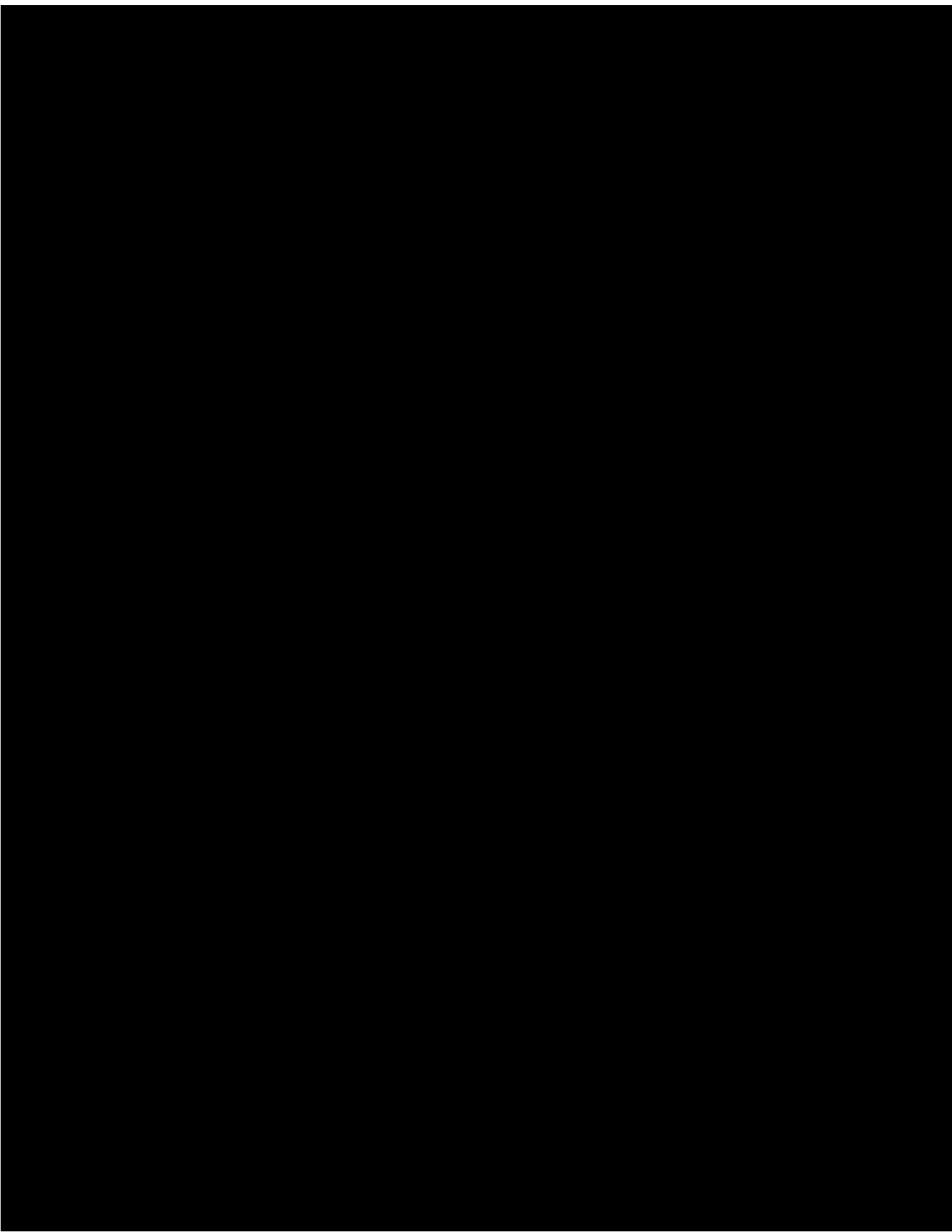


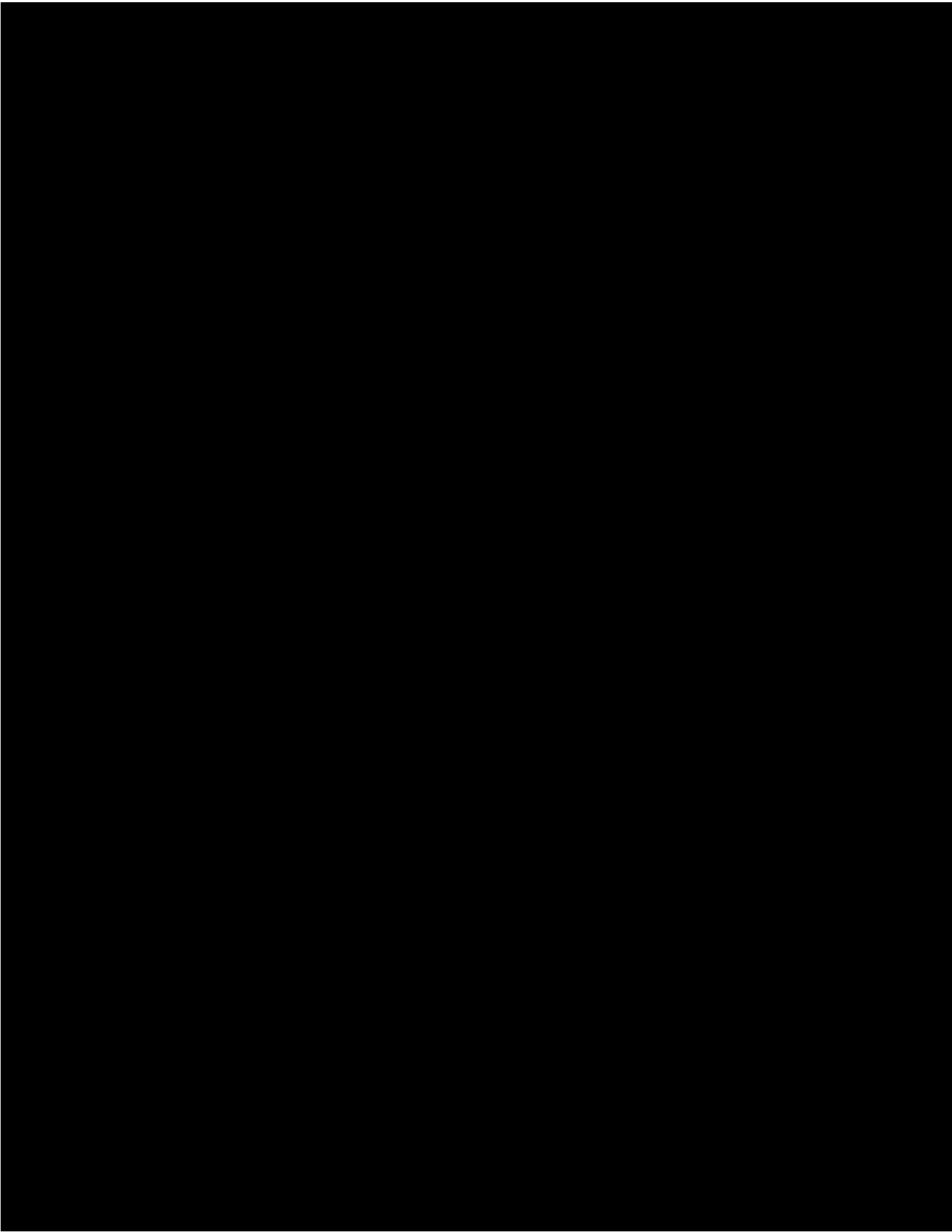


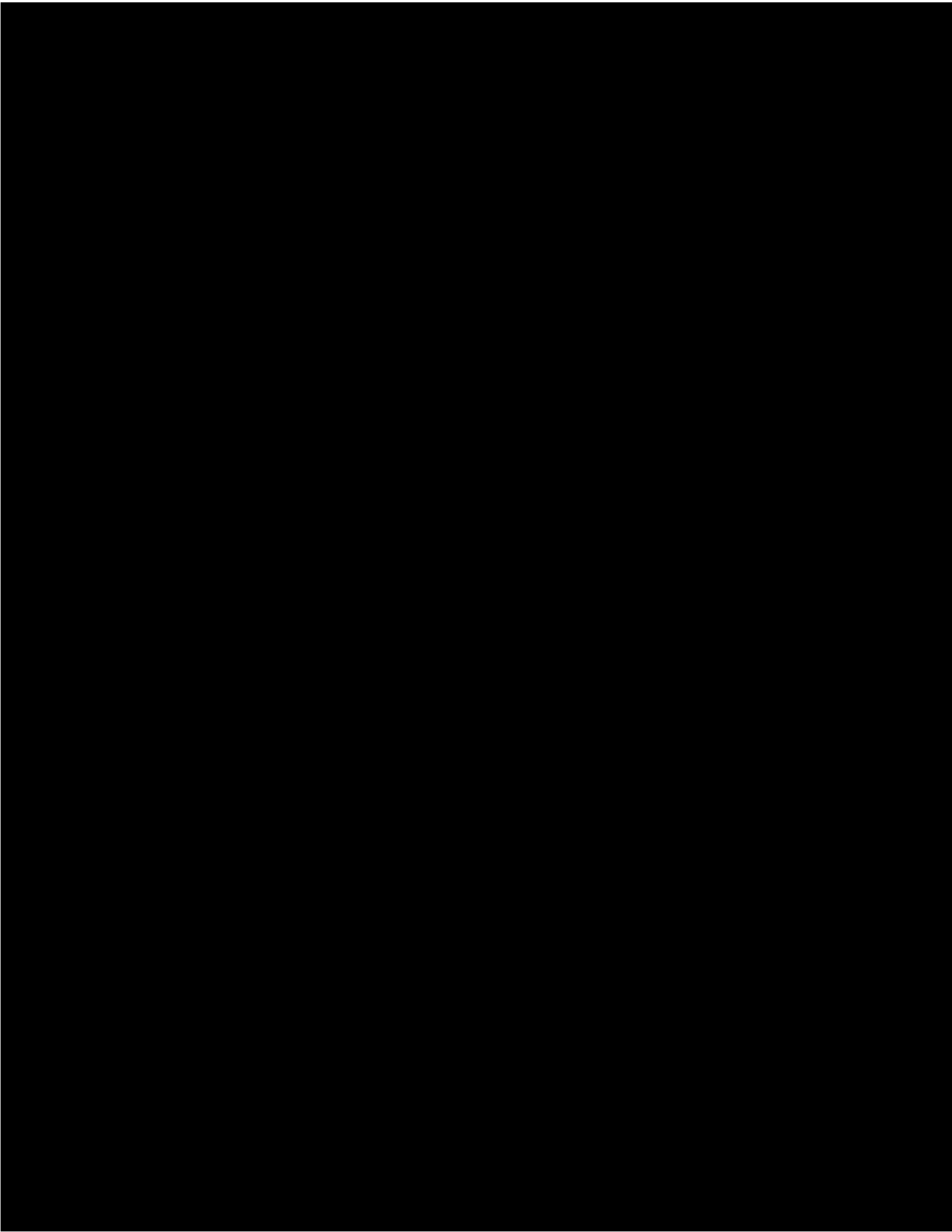


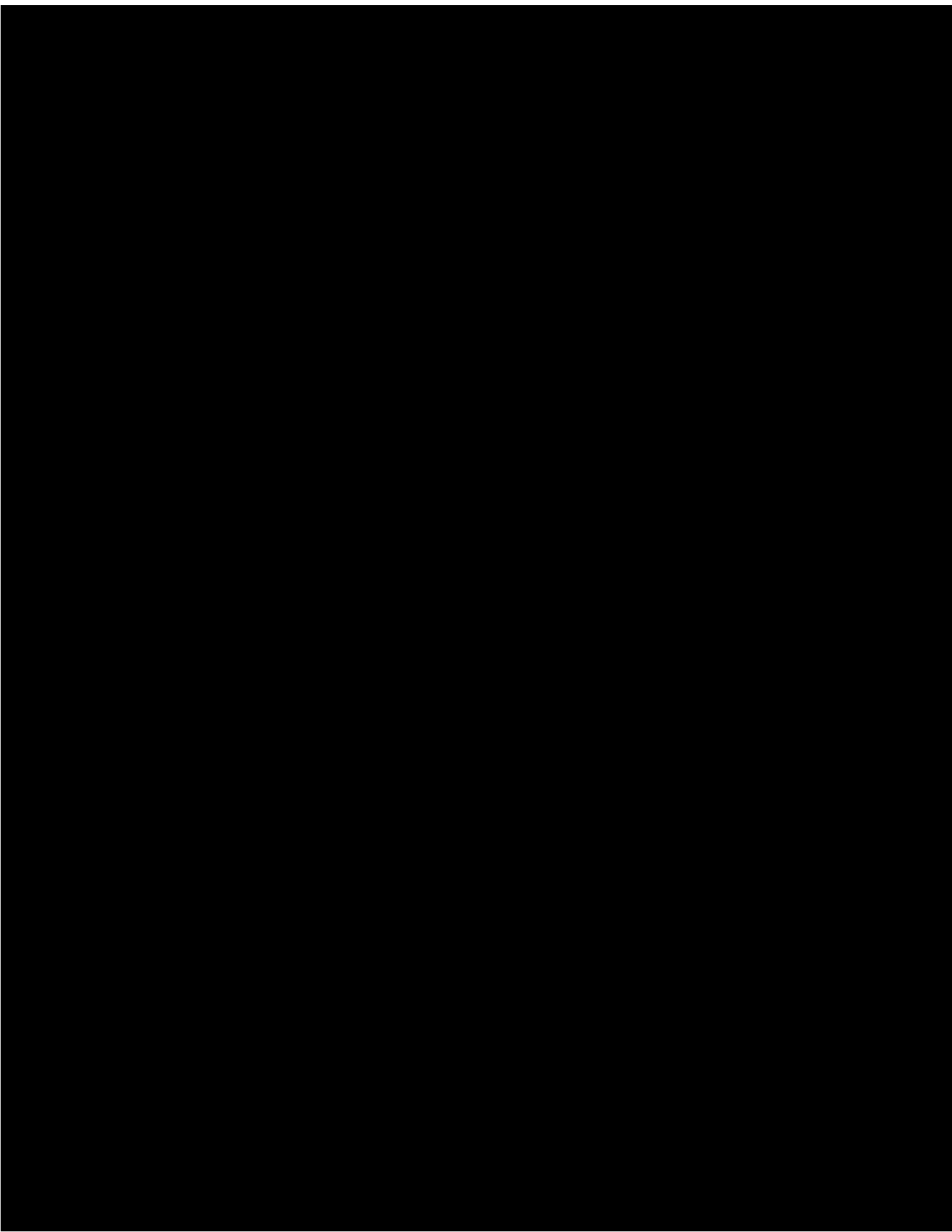


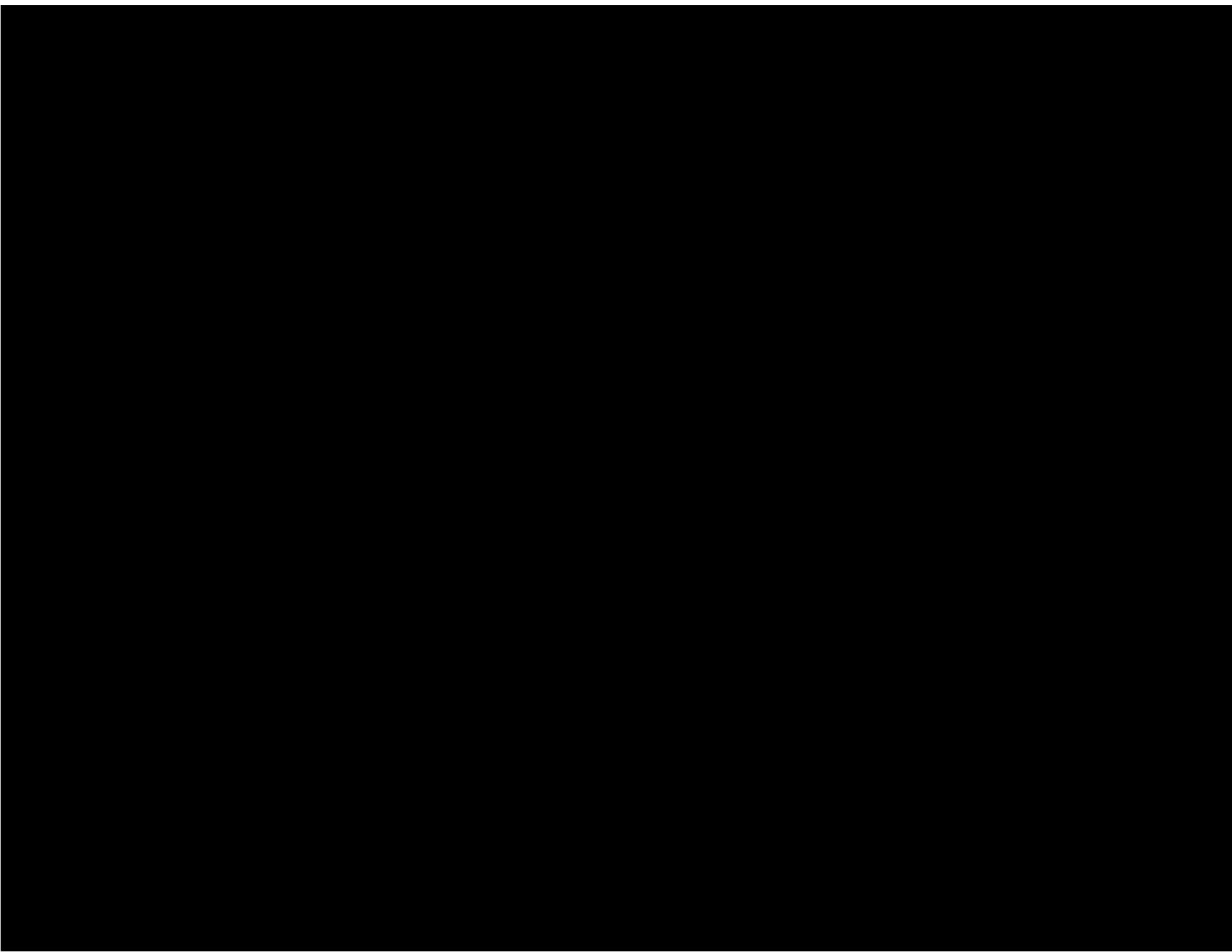


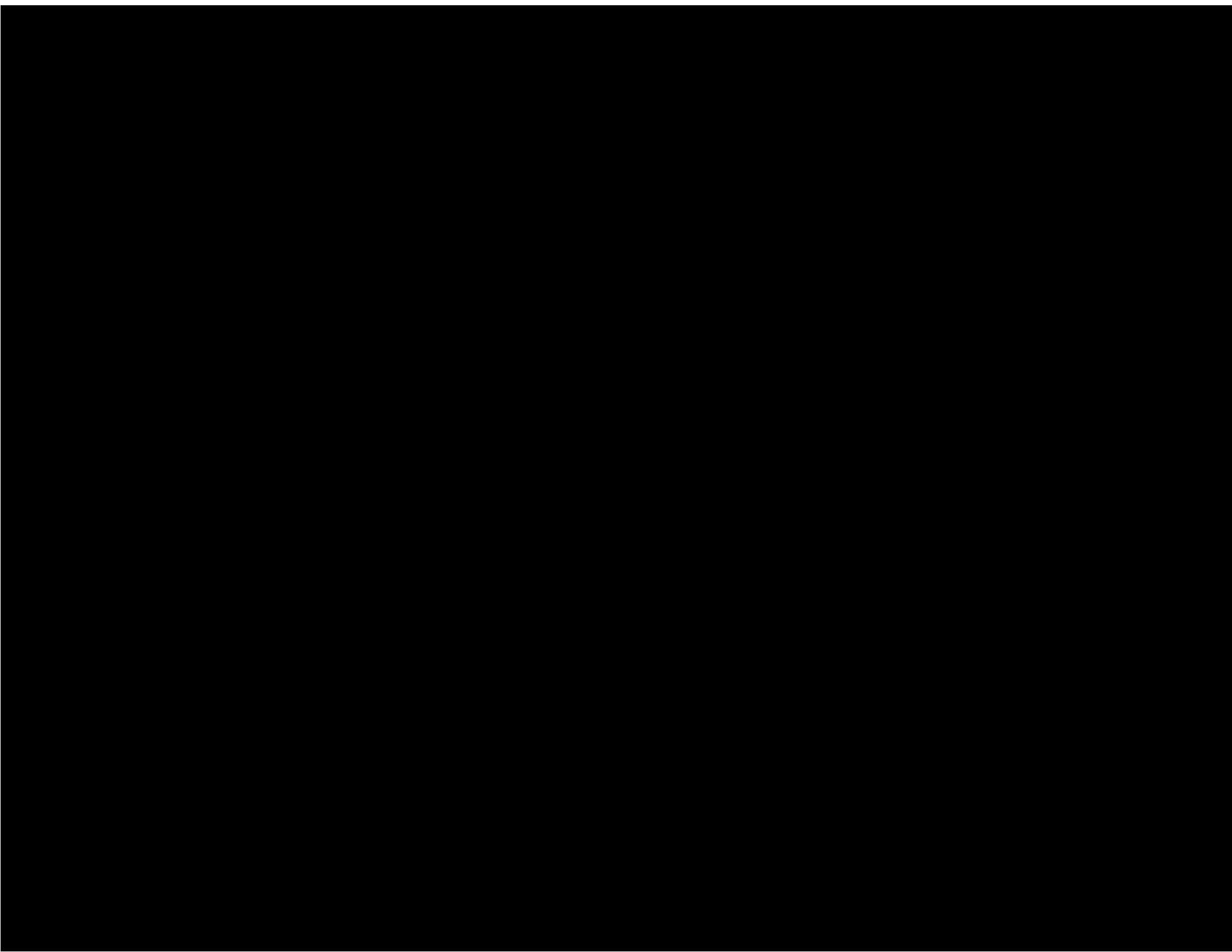


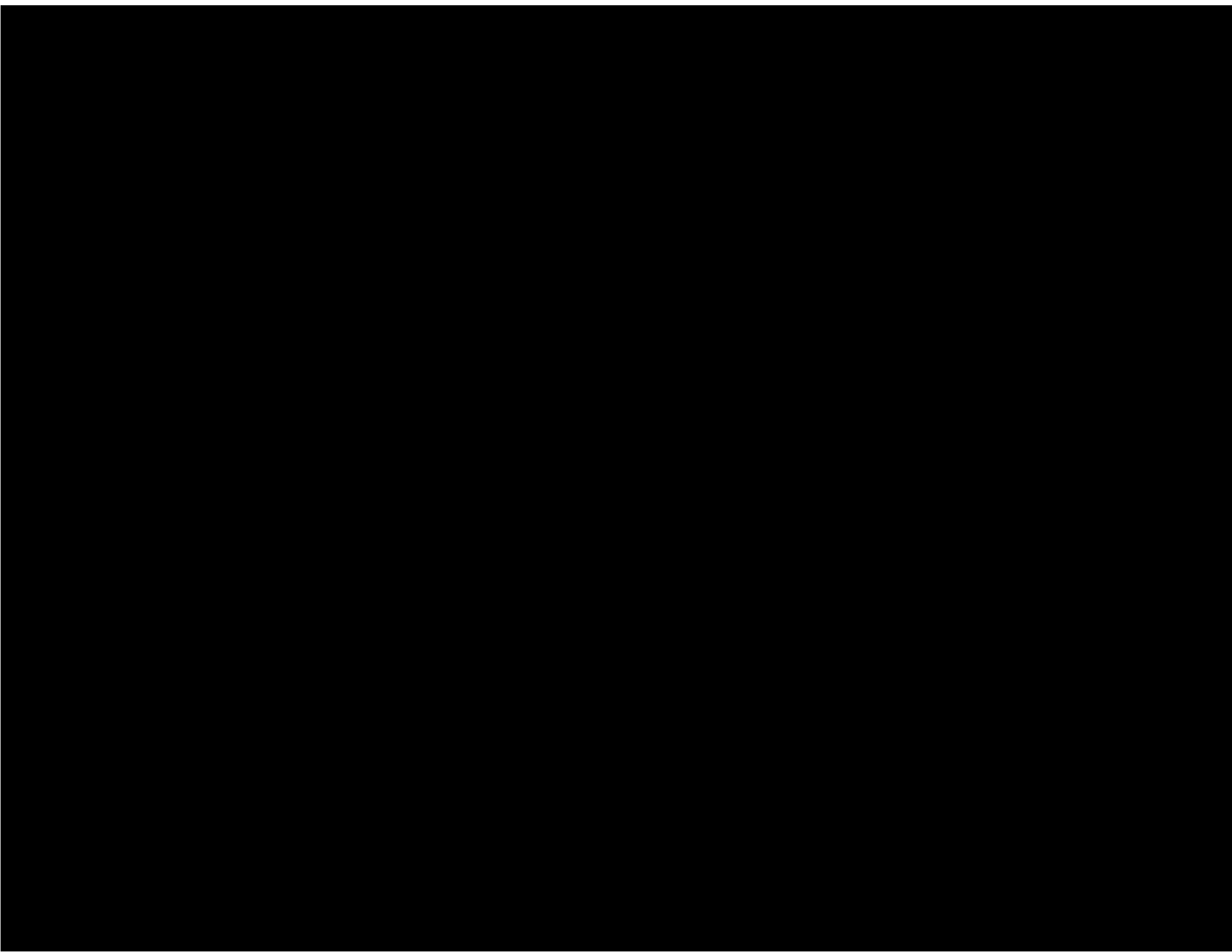




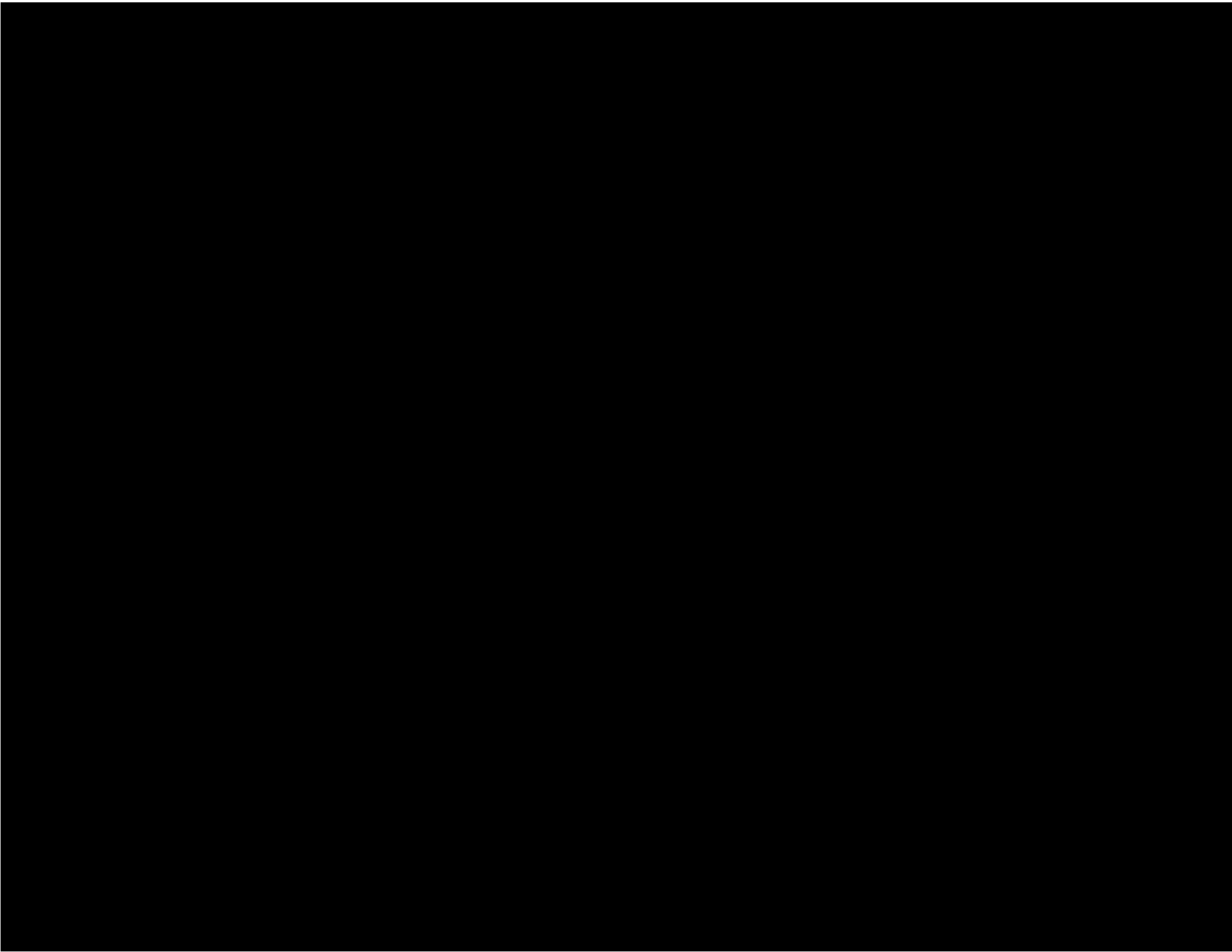


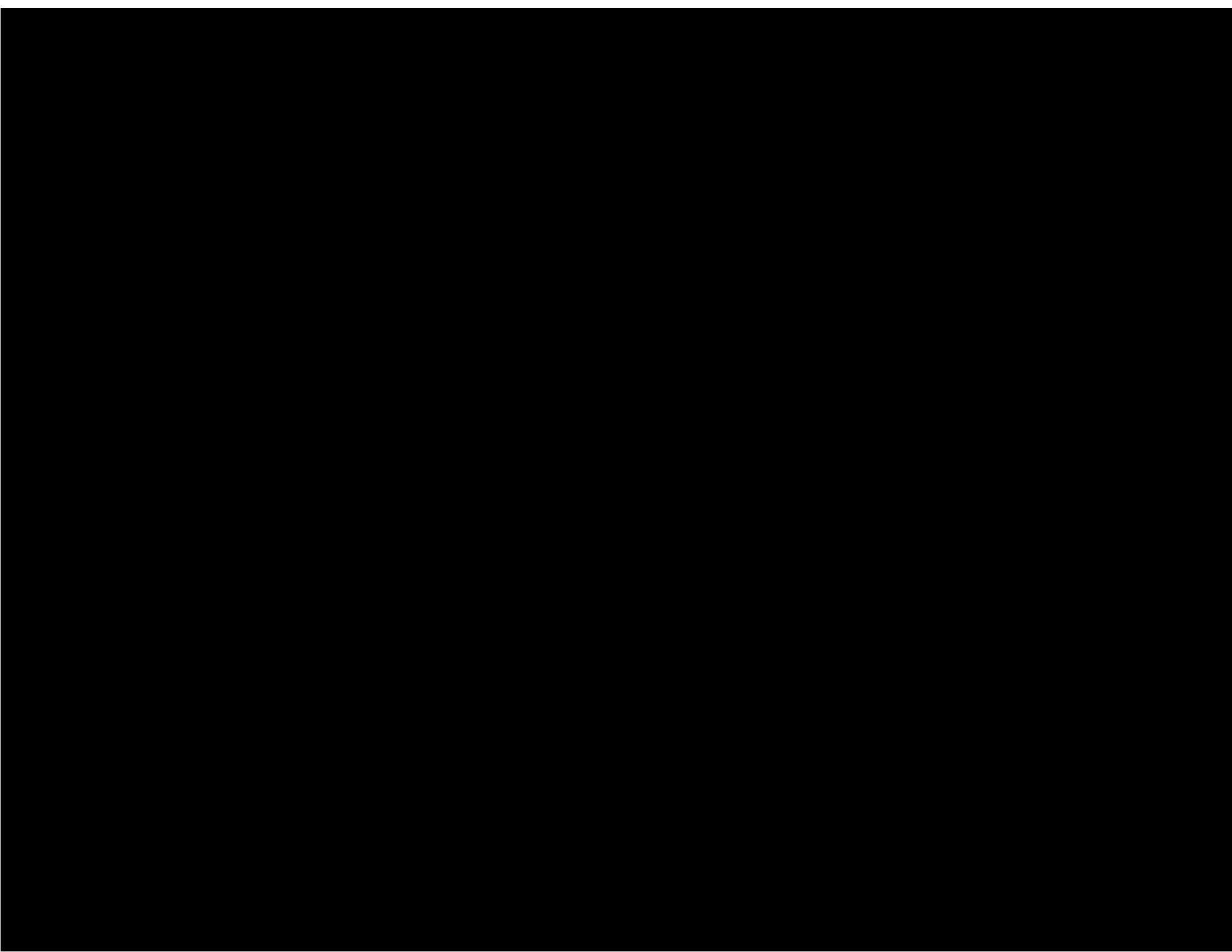


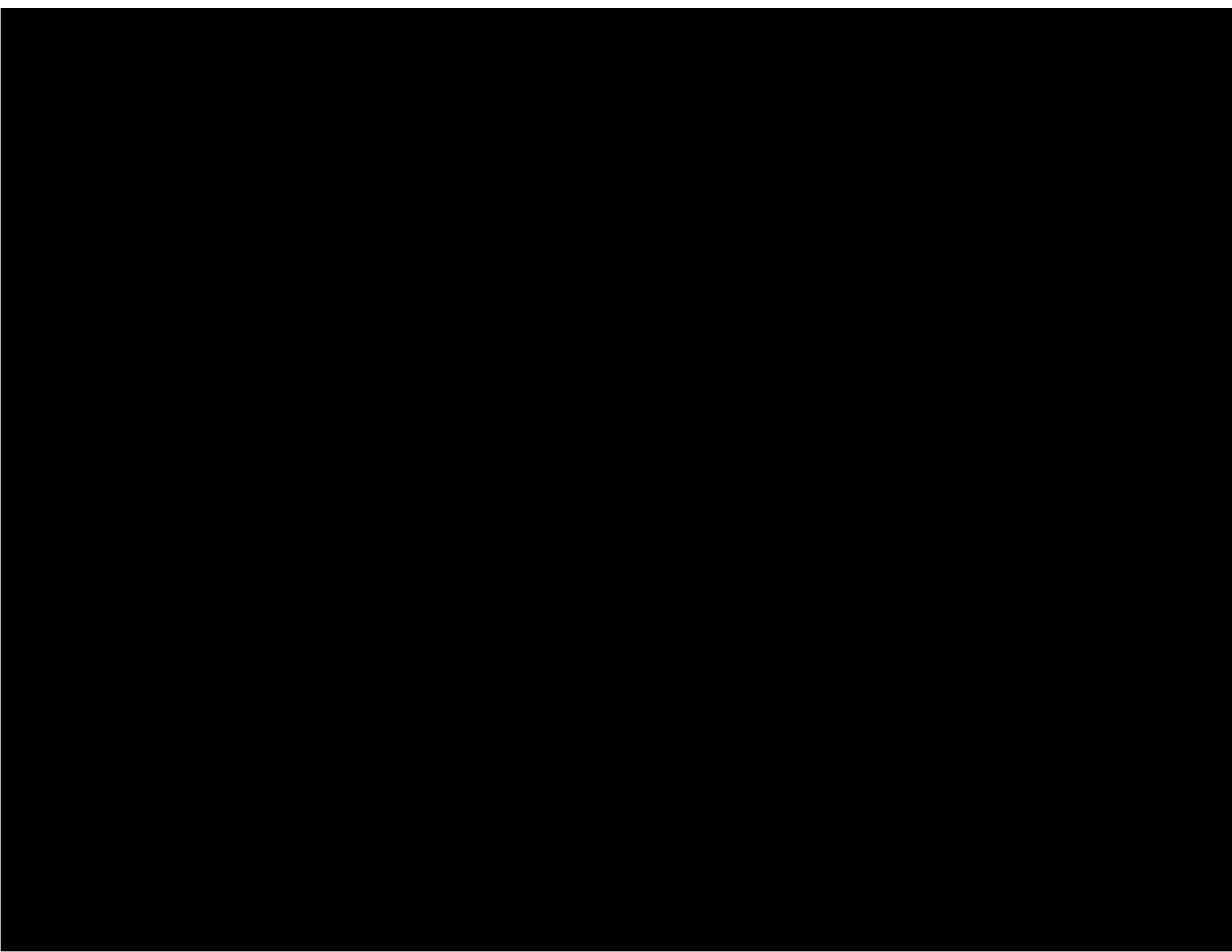


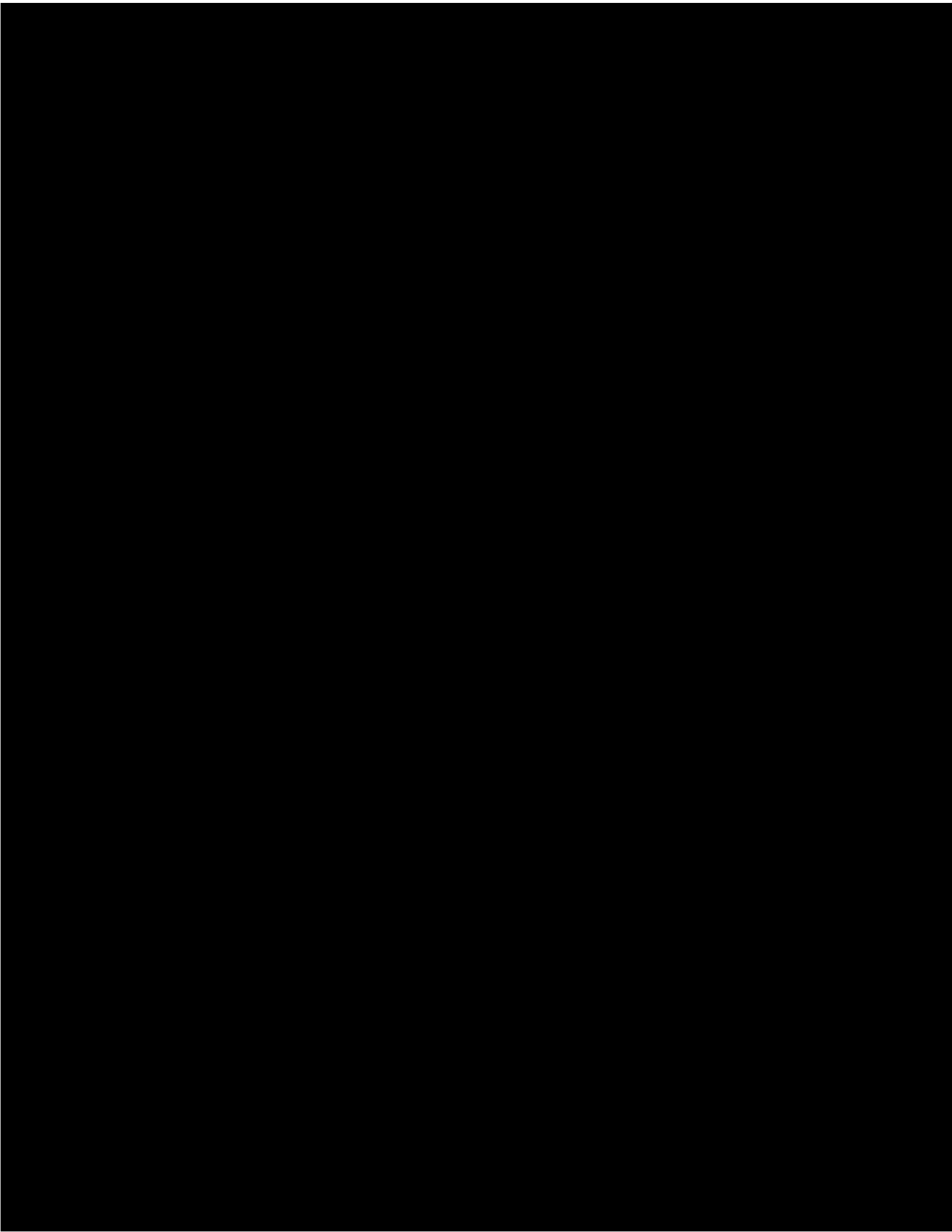


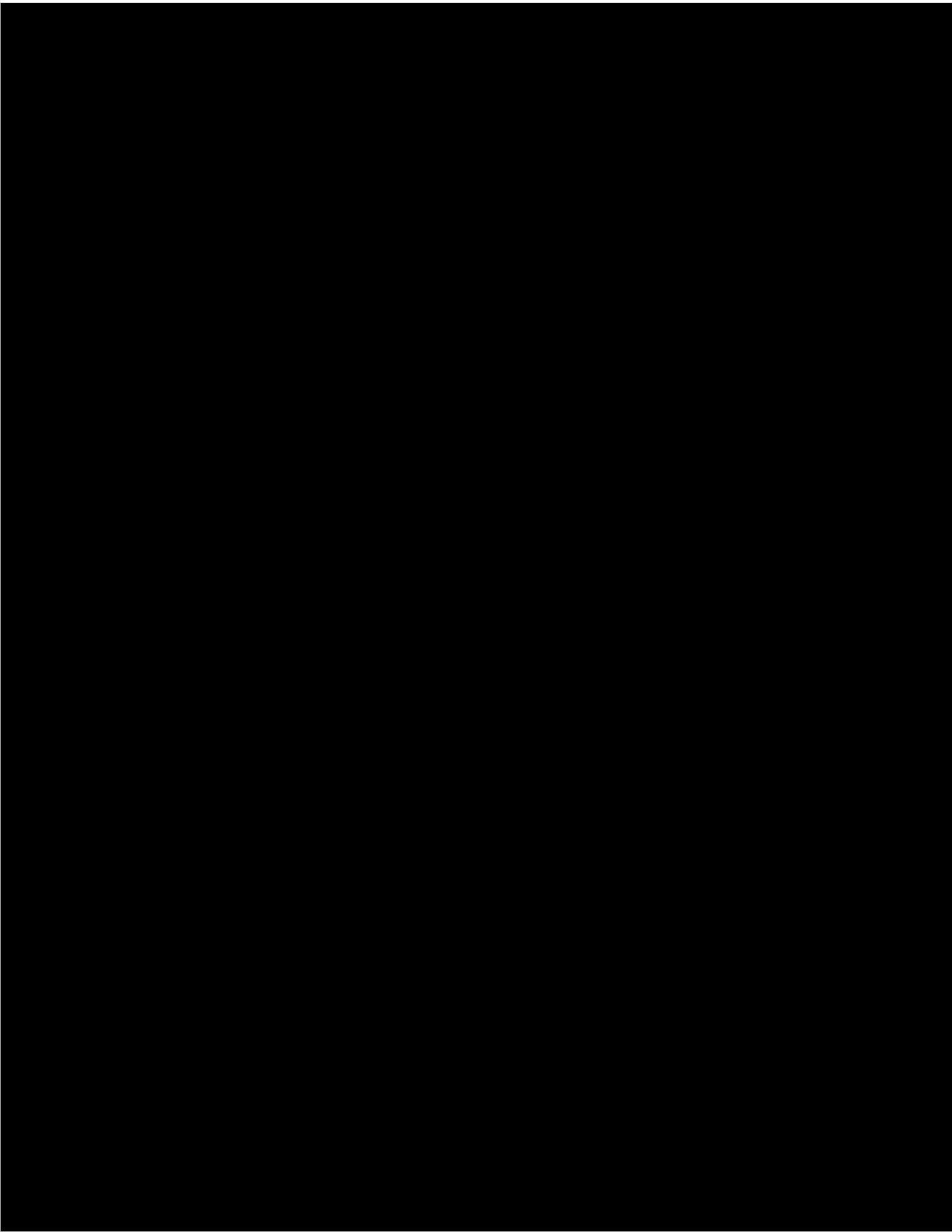


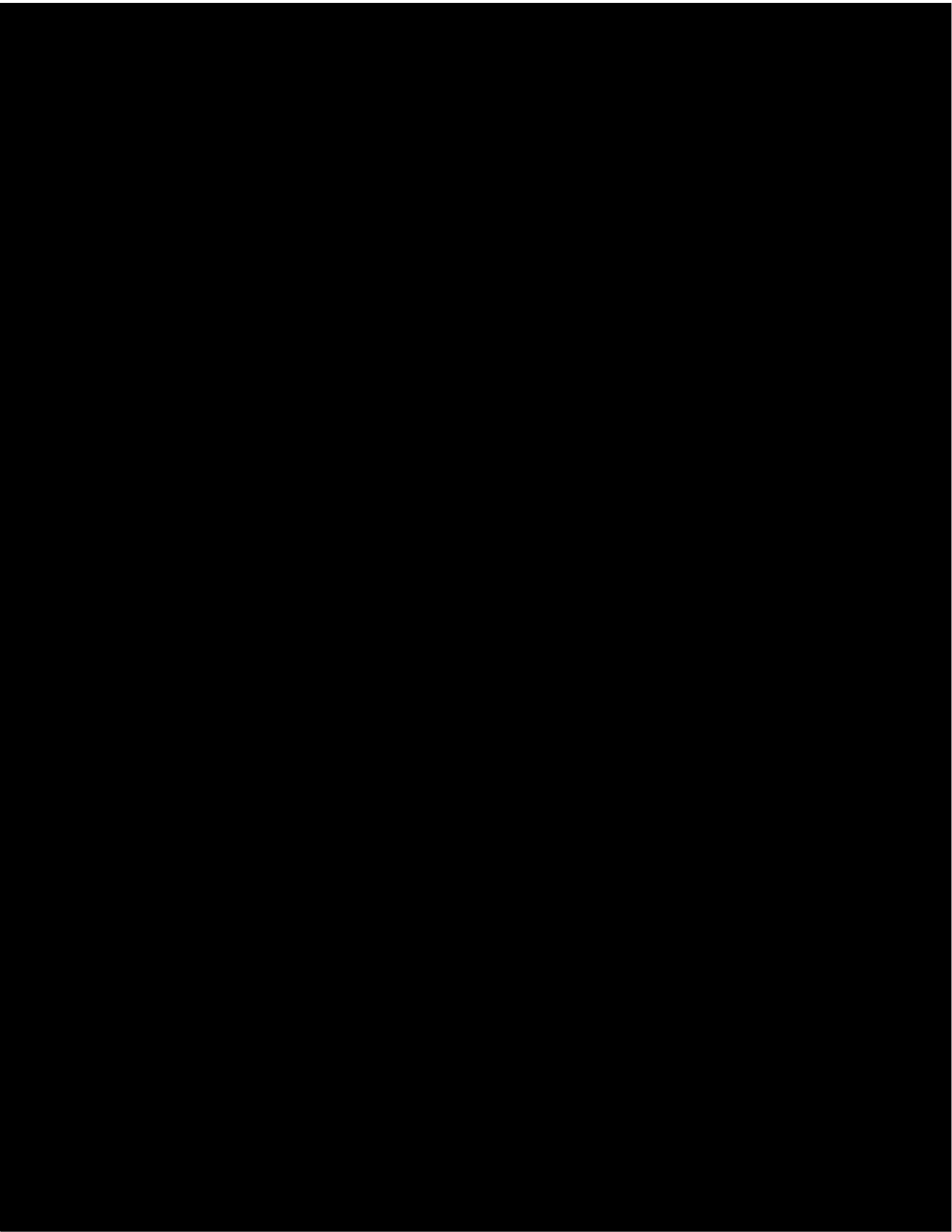


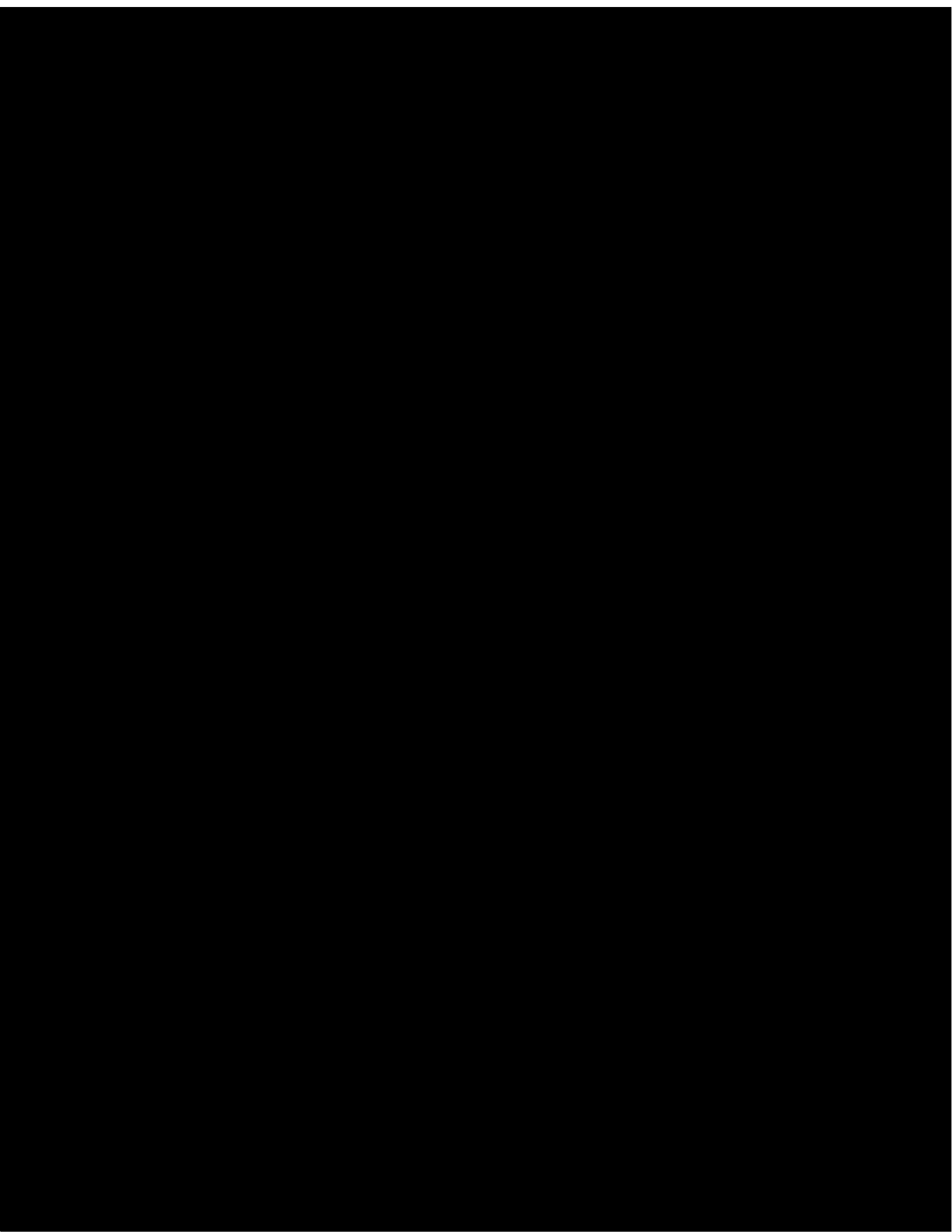


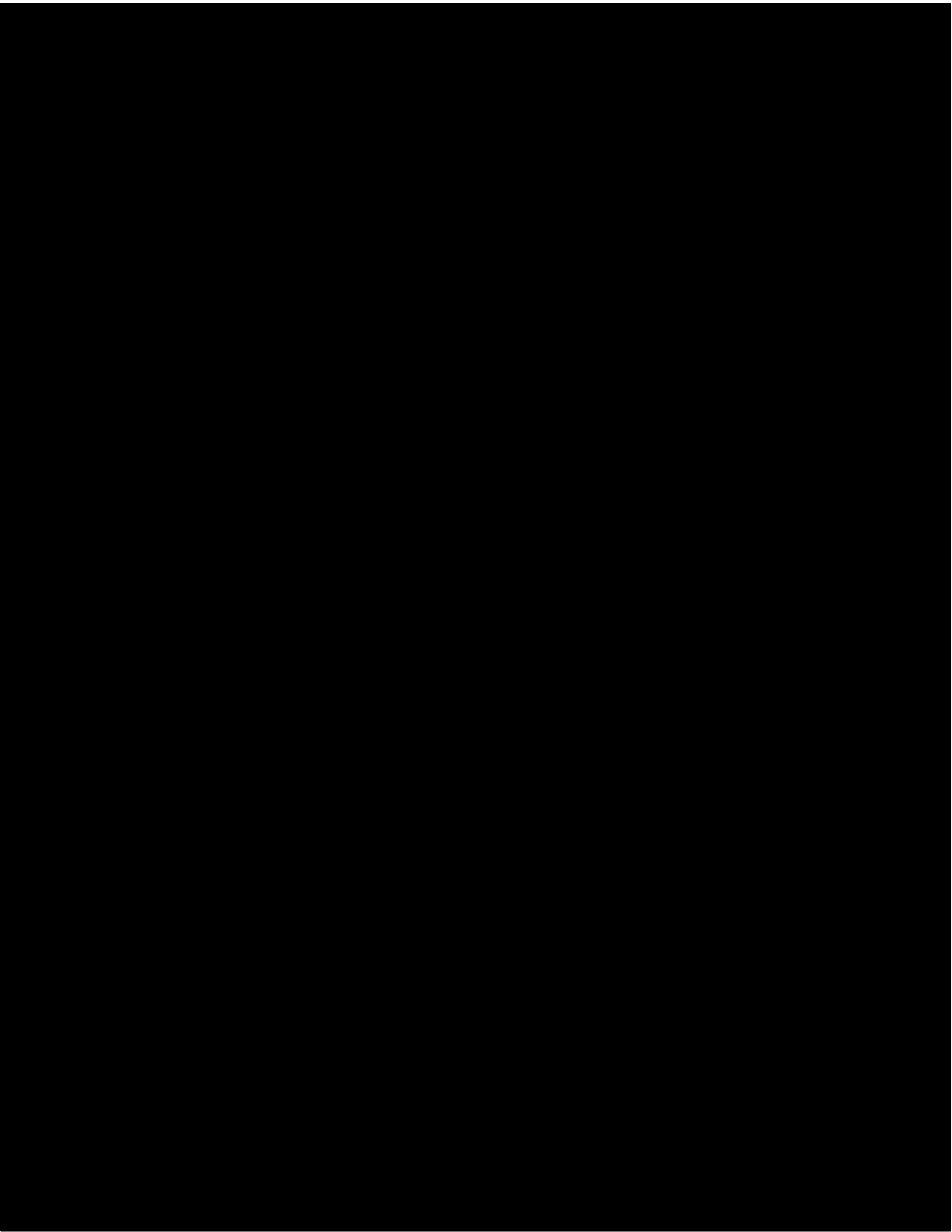


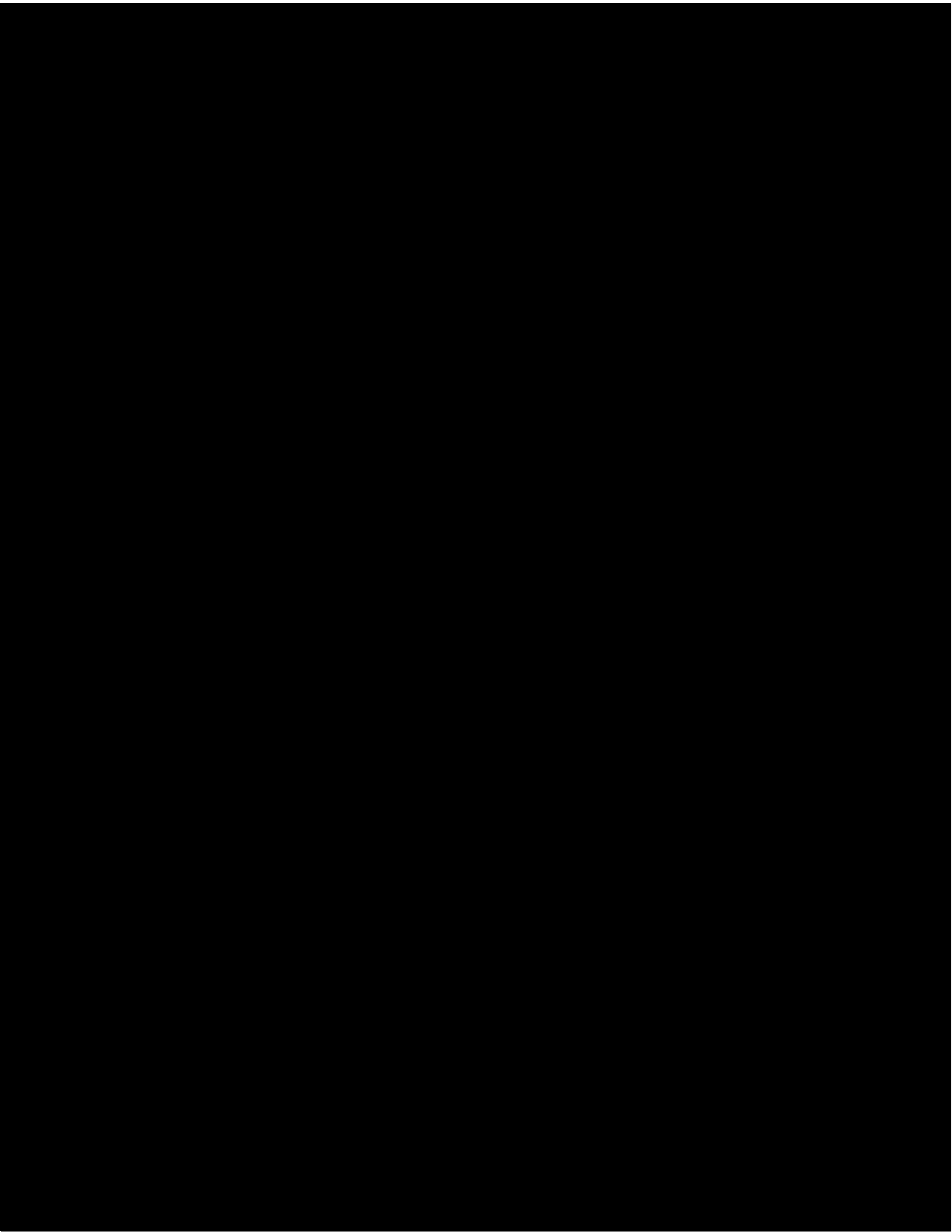


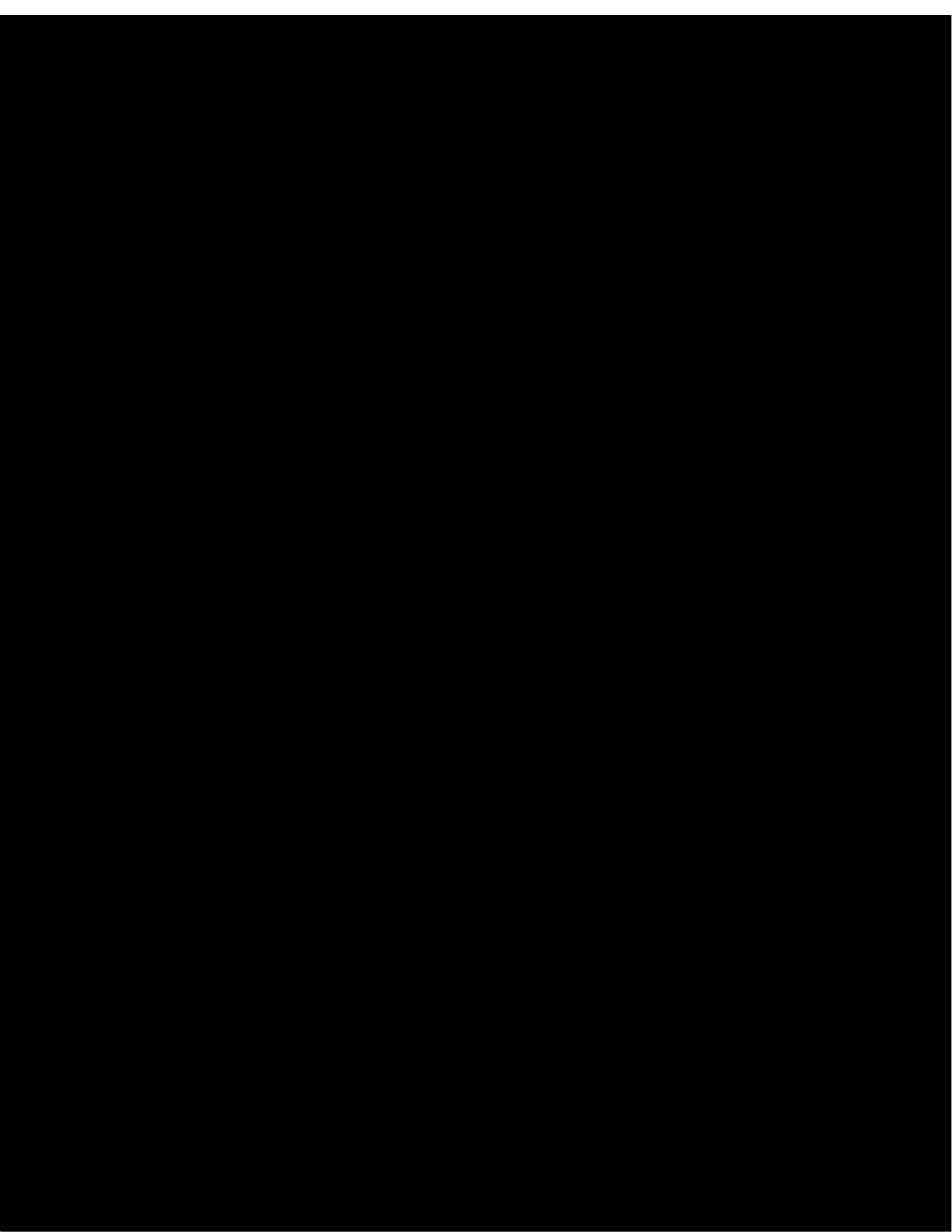


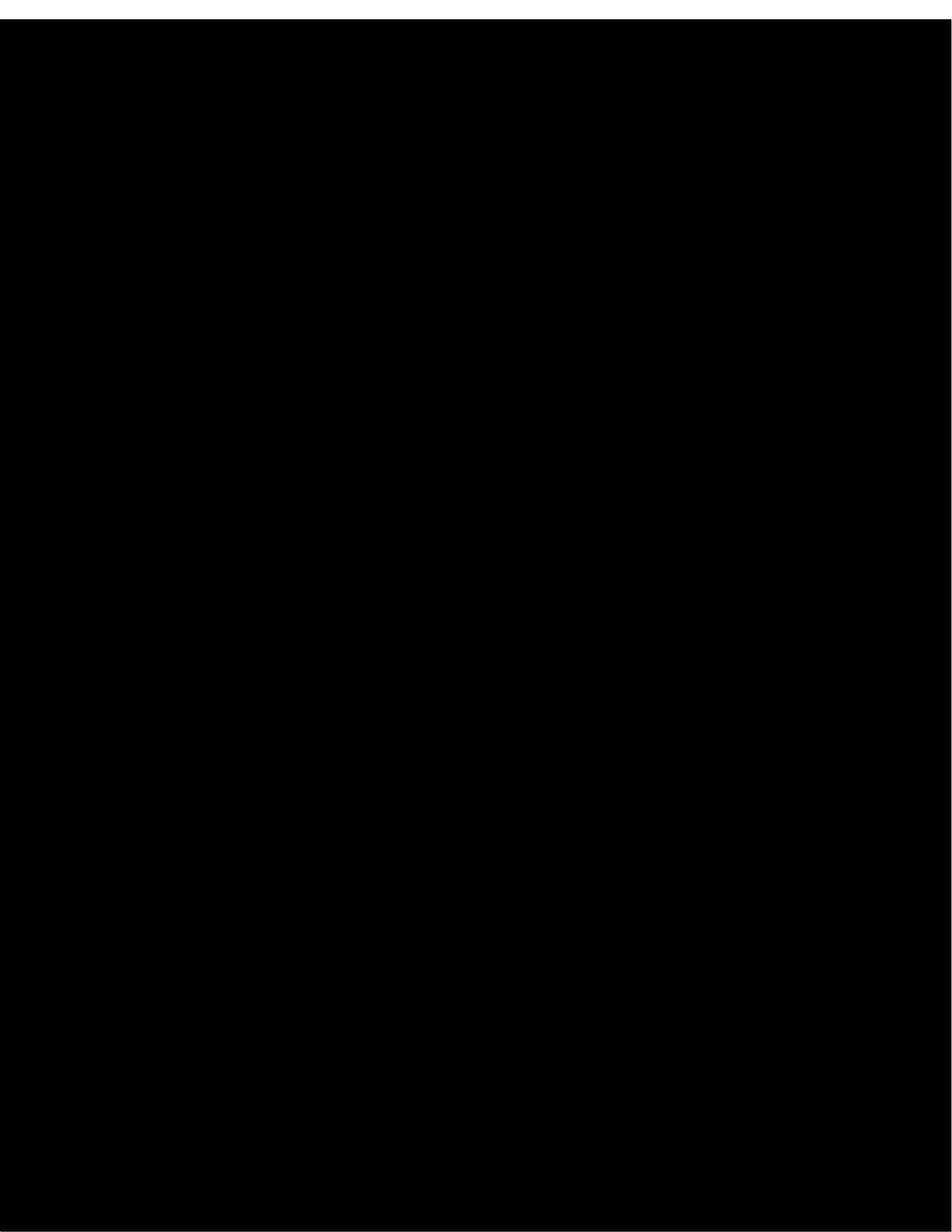


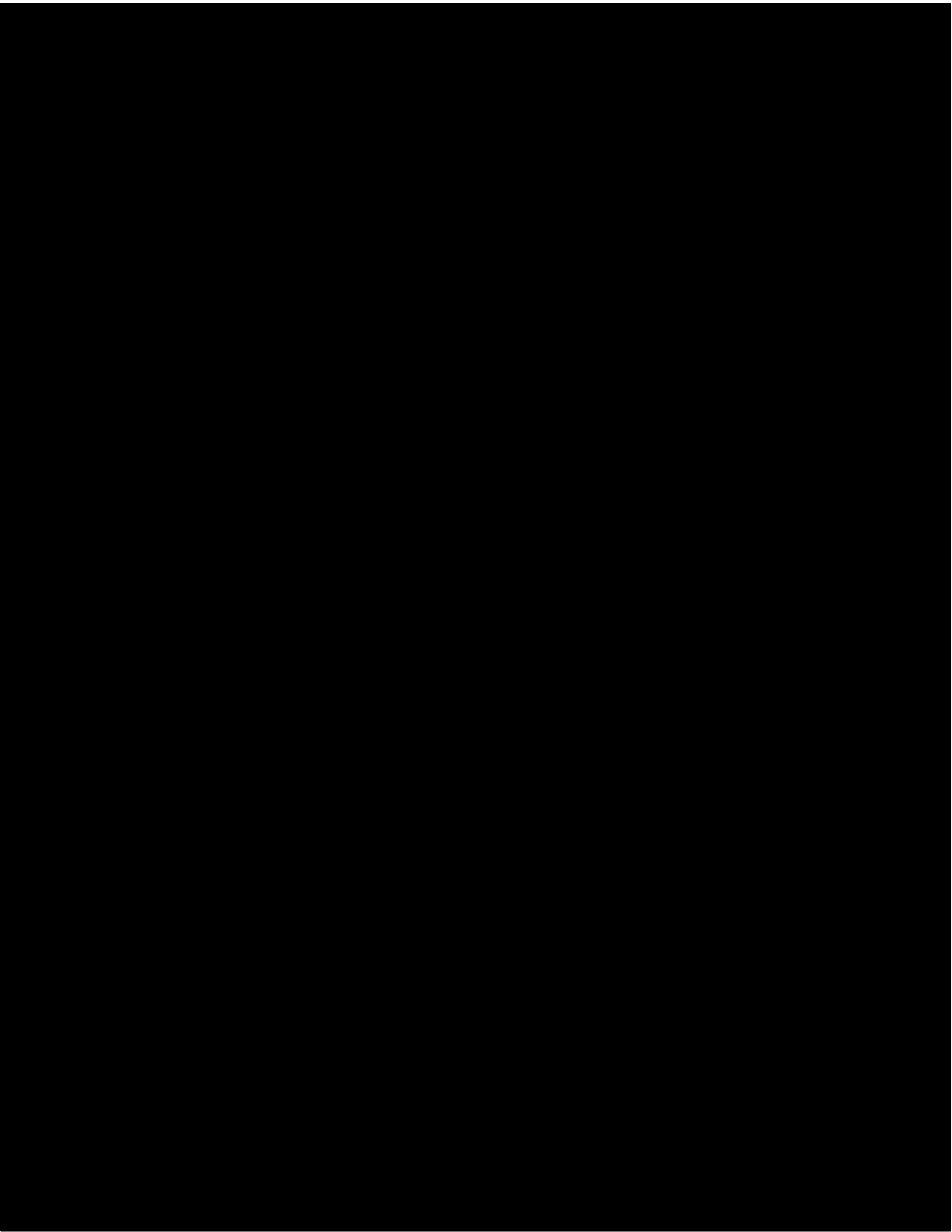


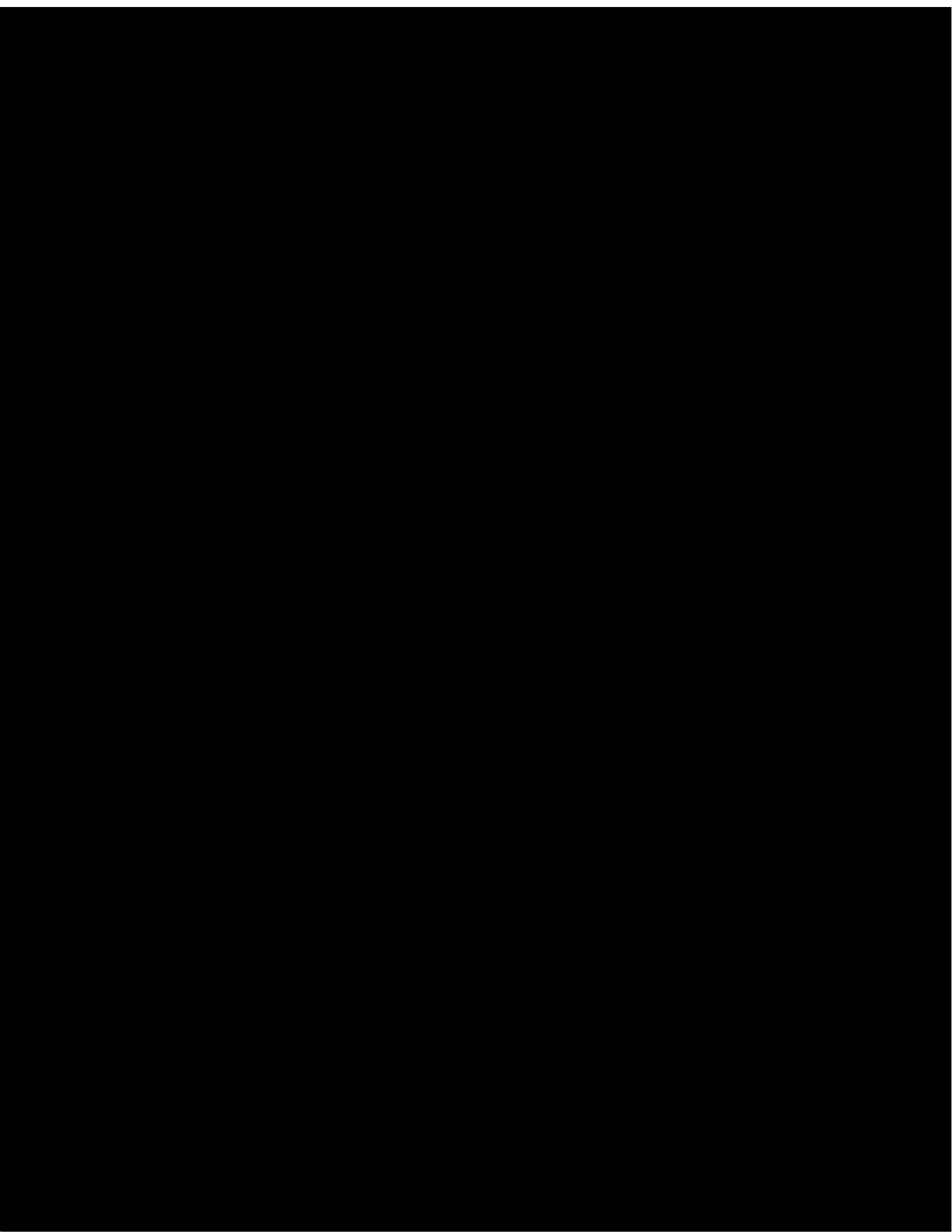


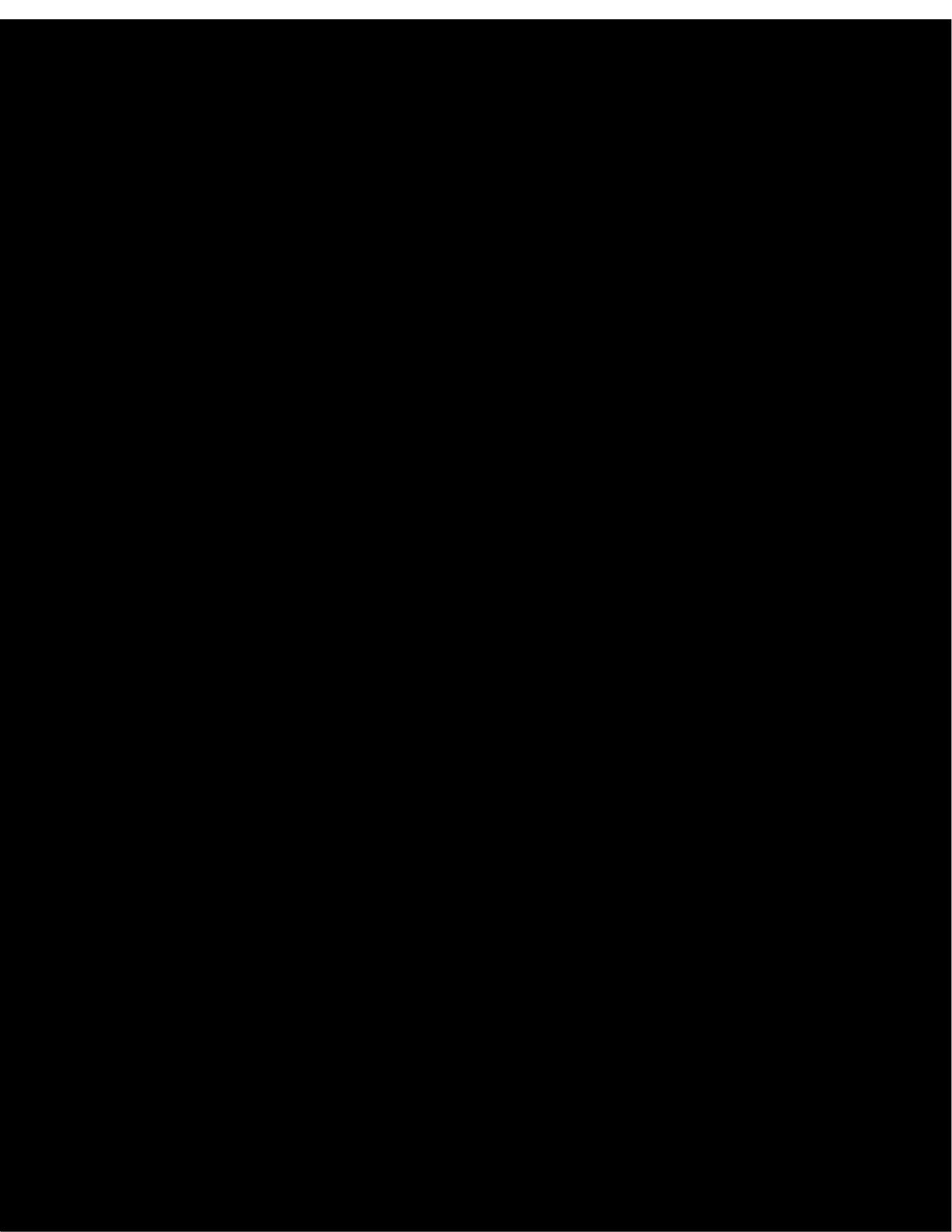


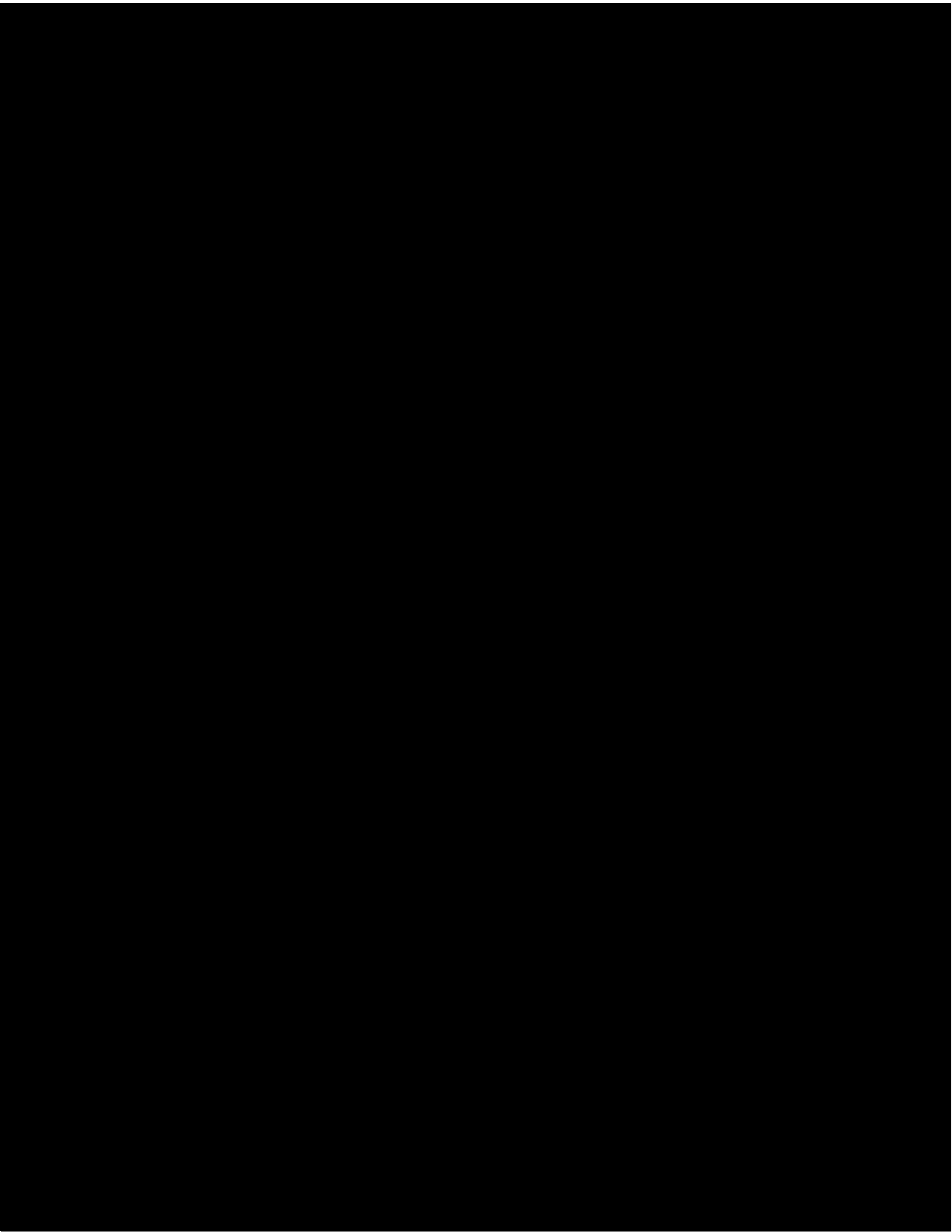


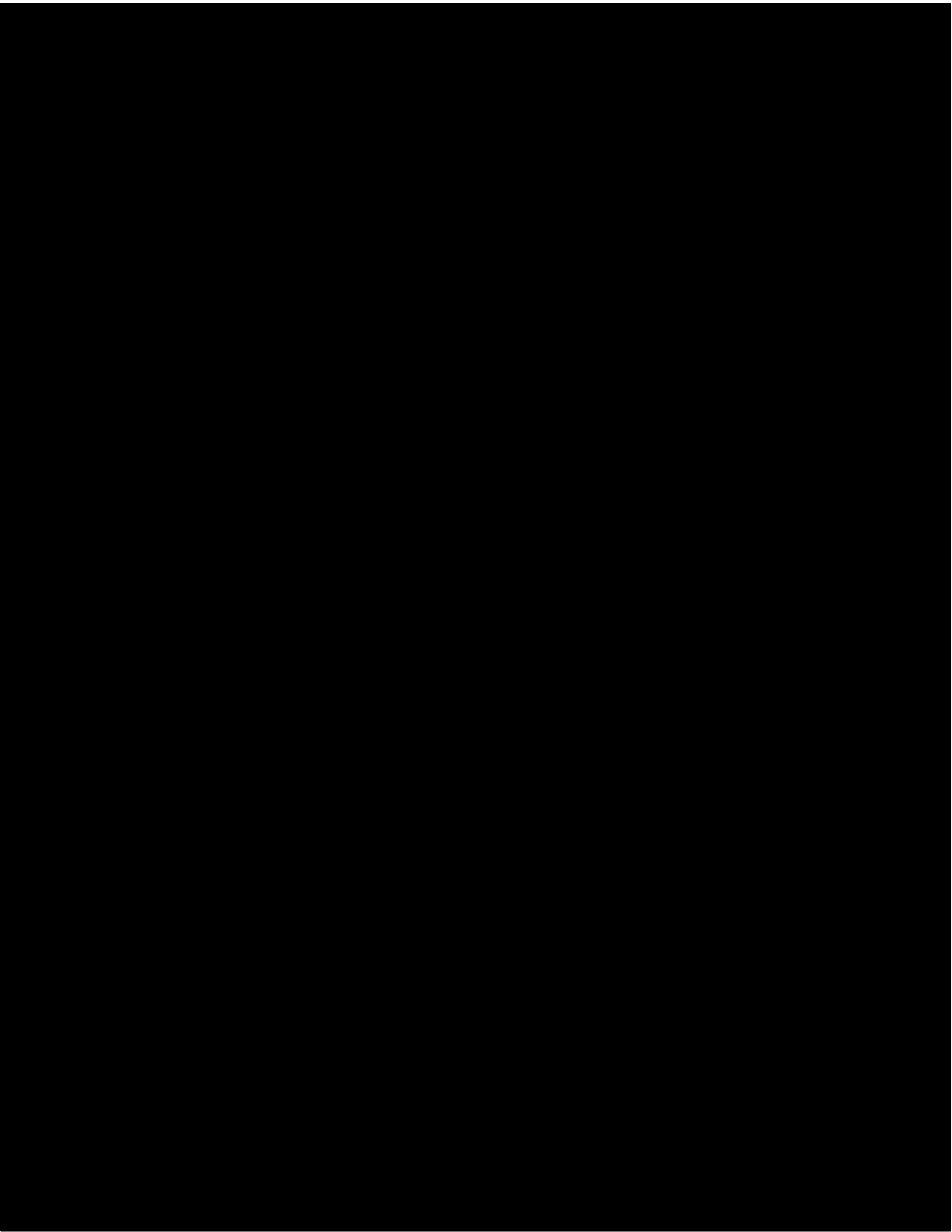


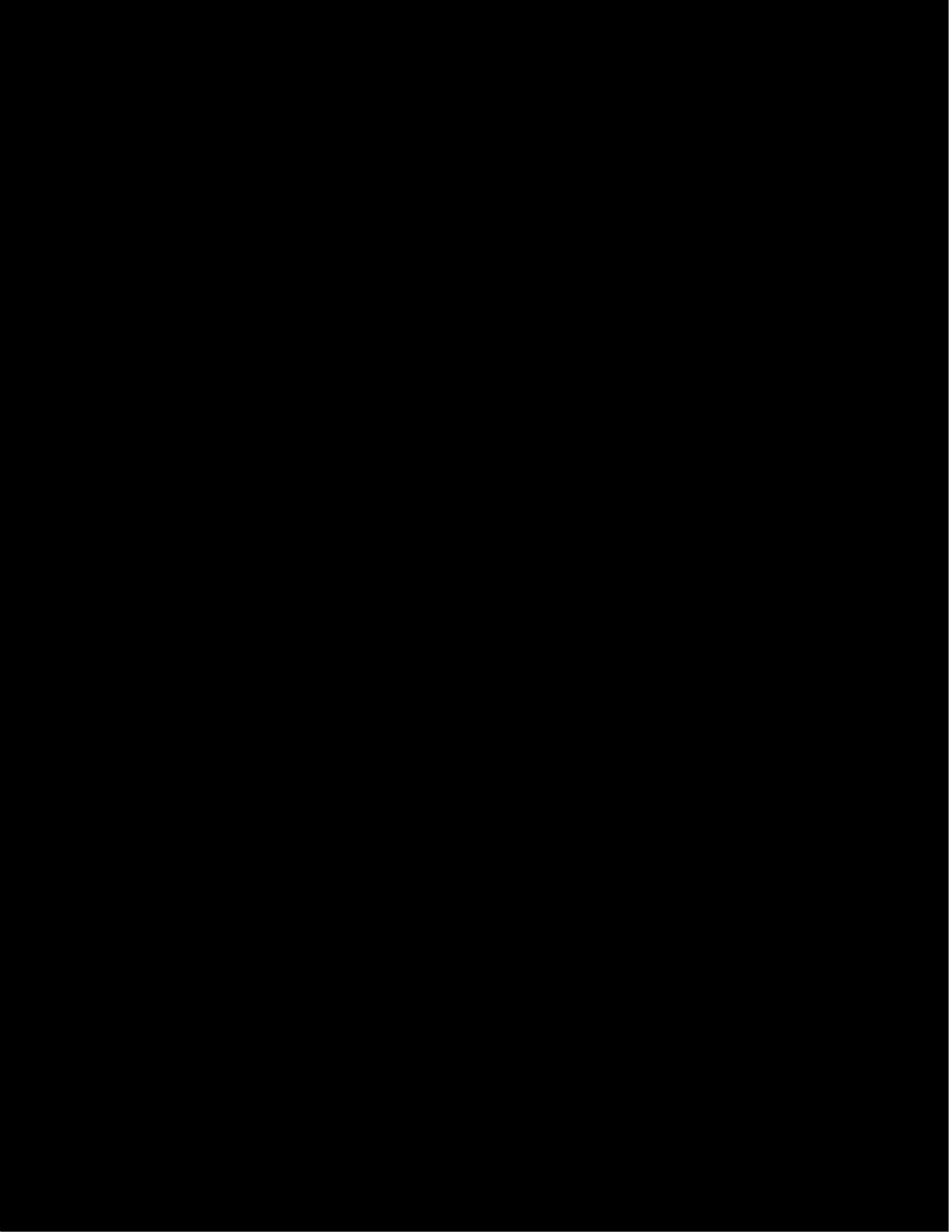


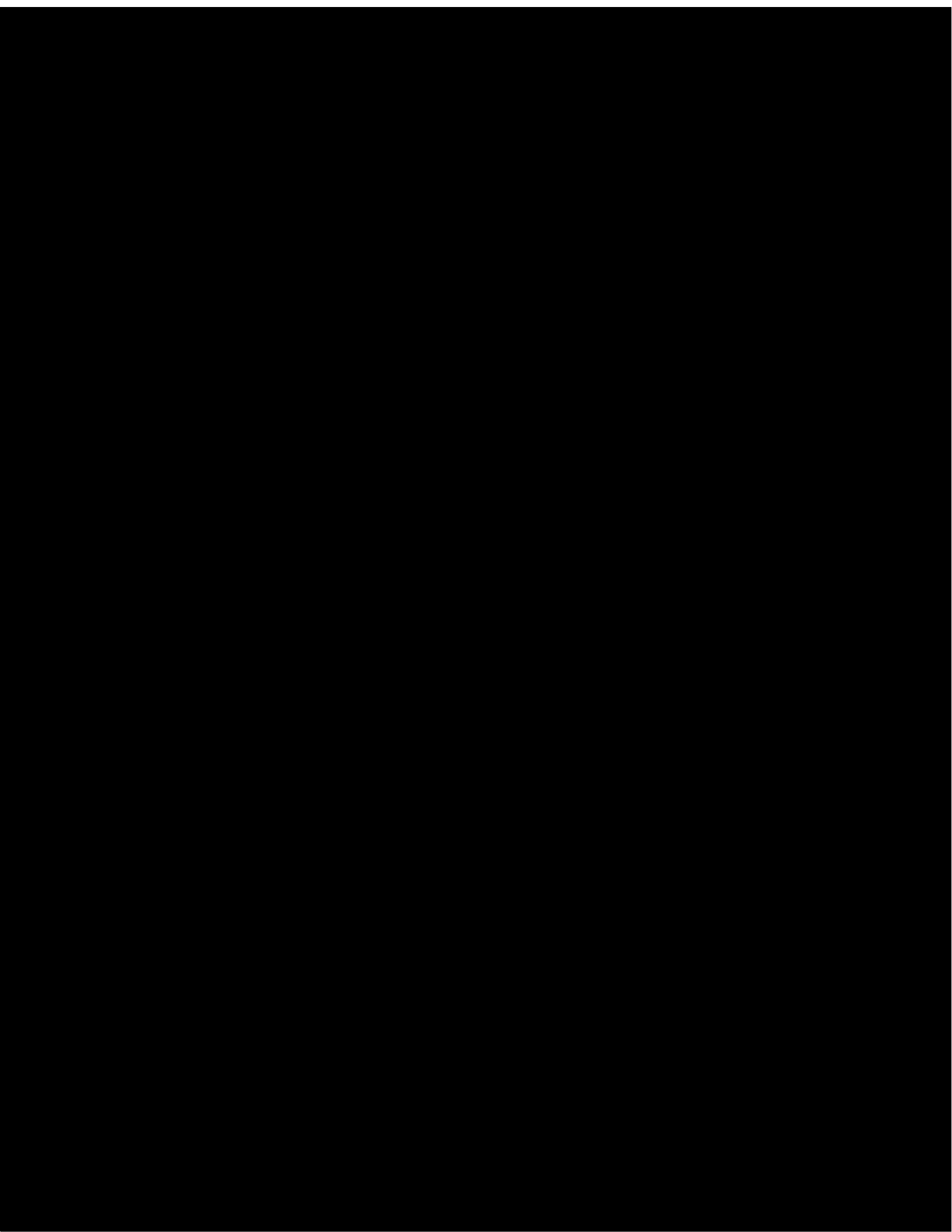


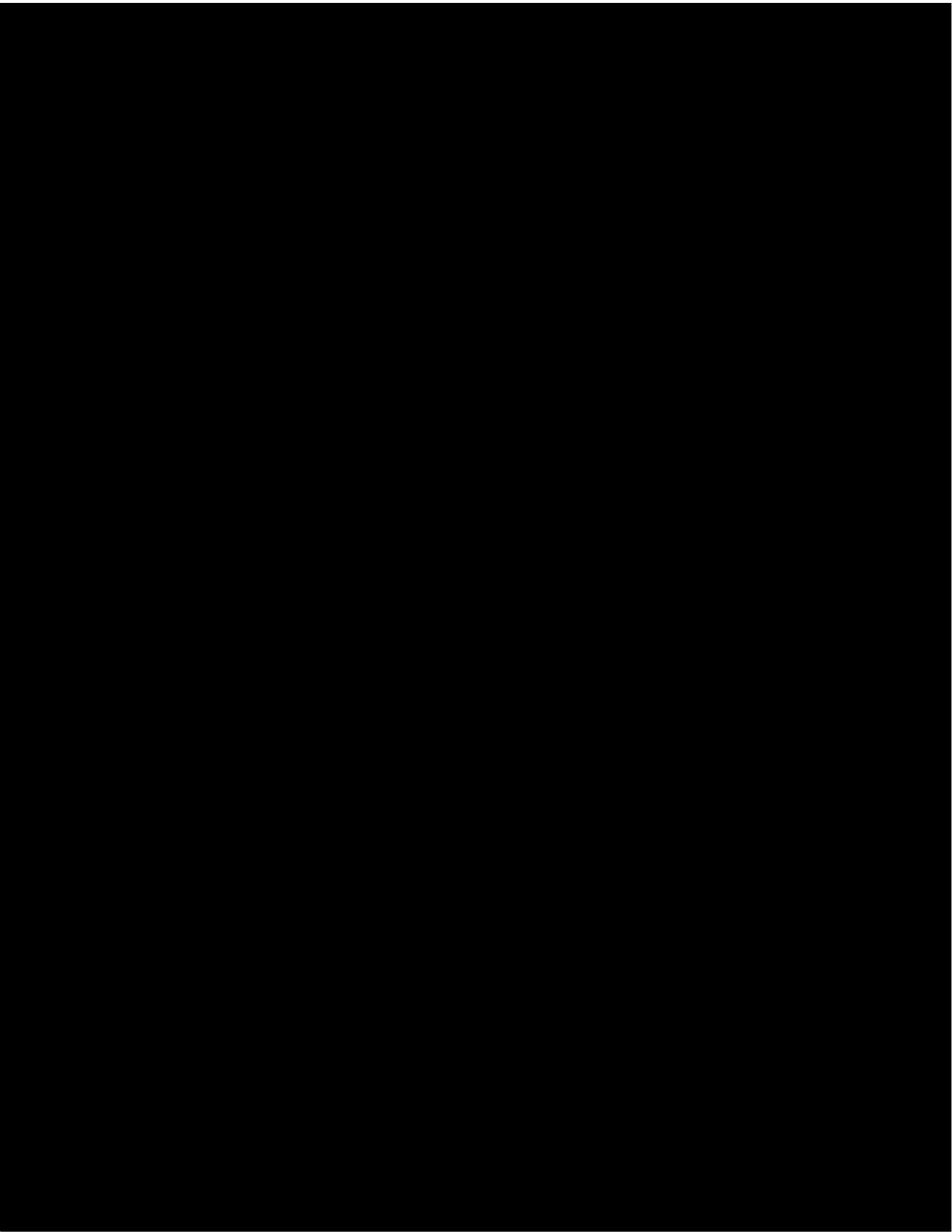


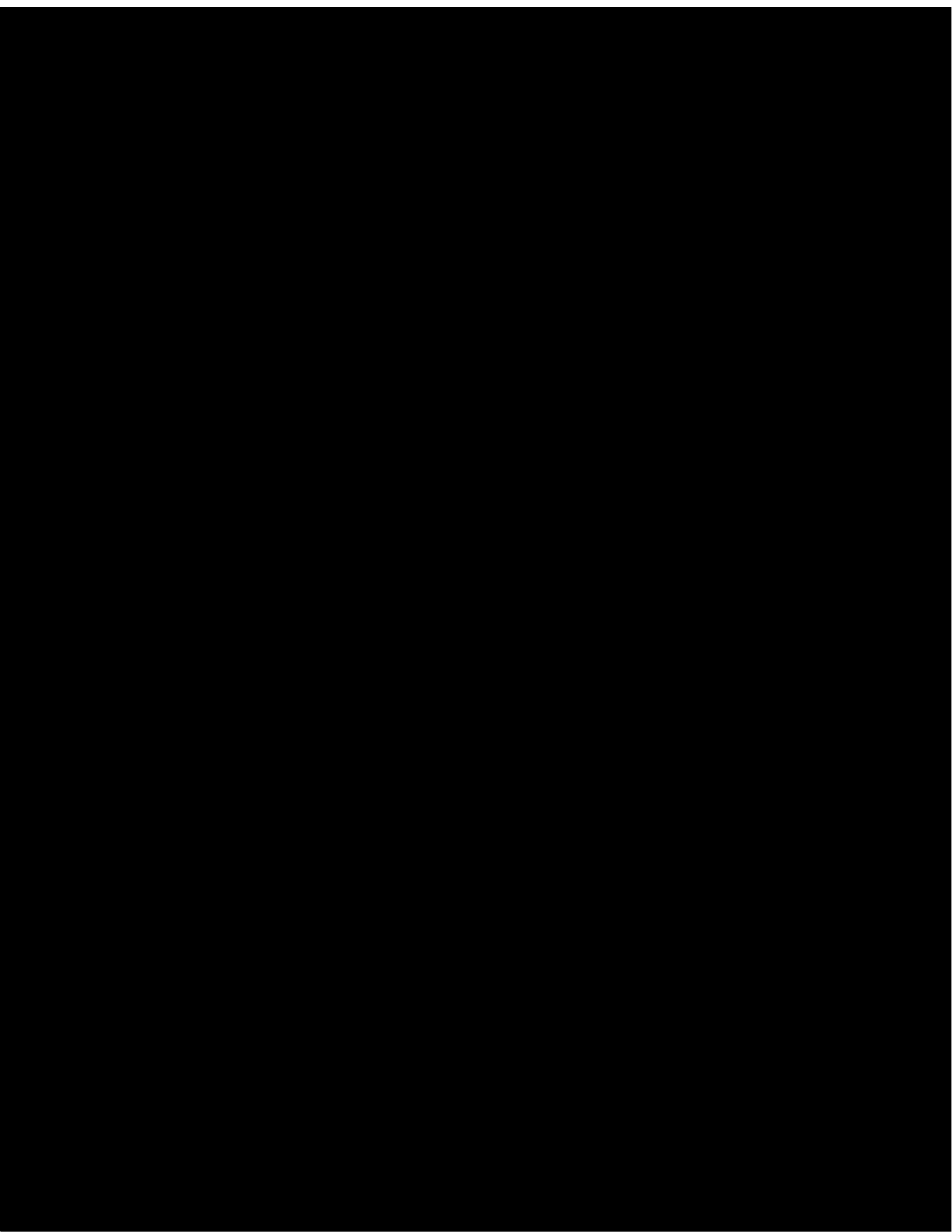










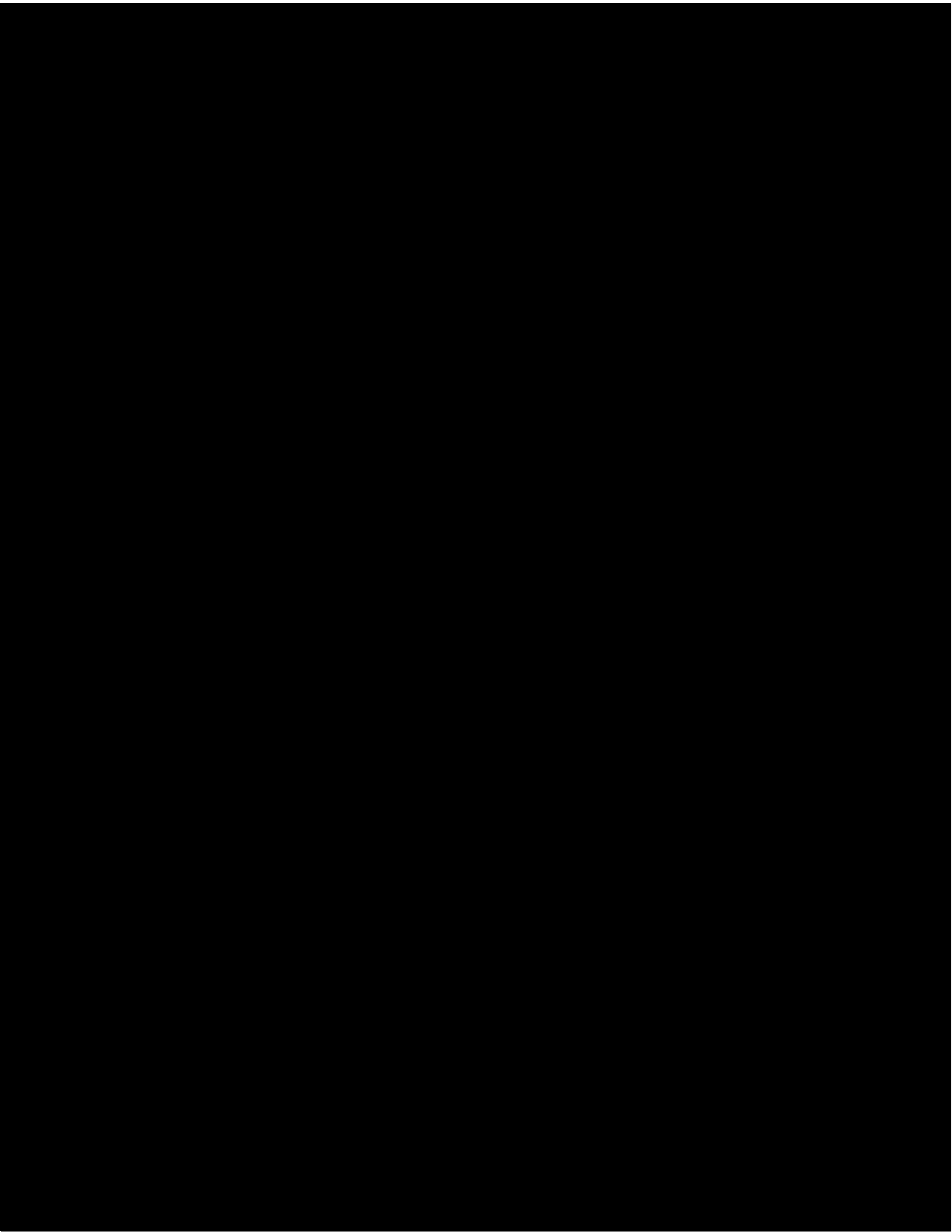


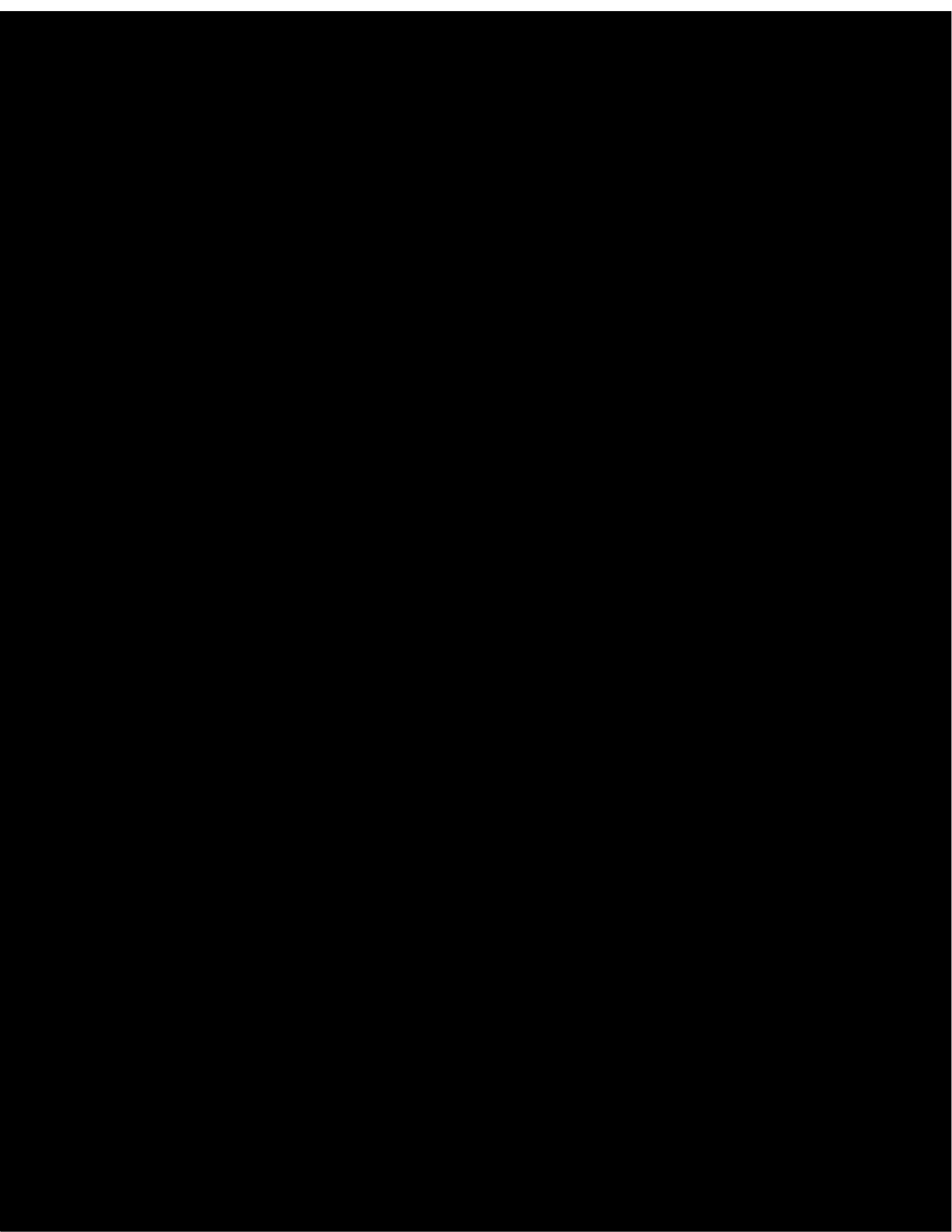
The first part of the document discusses the importance of maintaining accurate records in a business setting. It highlights how proper record-keeping can help in decision-making, legal compliance, and financial management. The text emphasizes that records should be organized, up-to-date, and easily accessible.

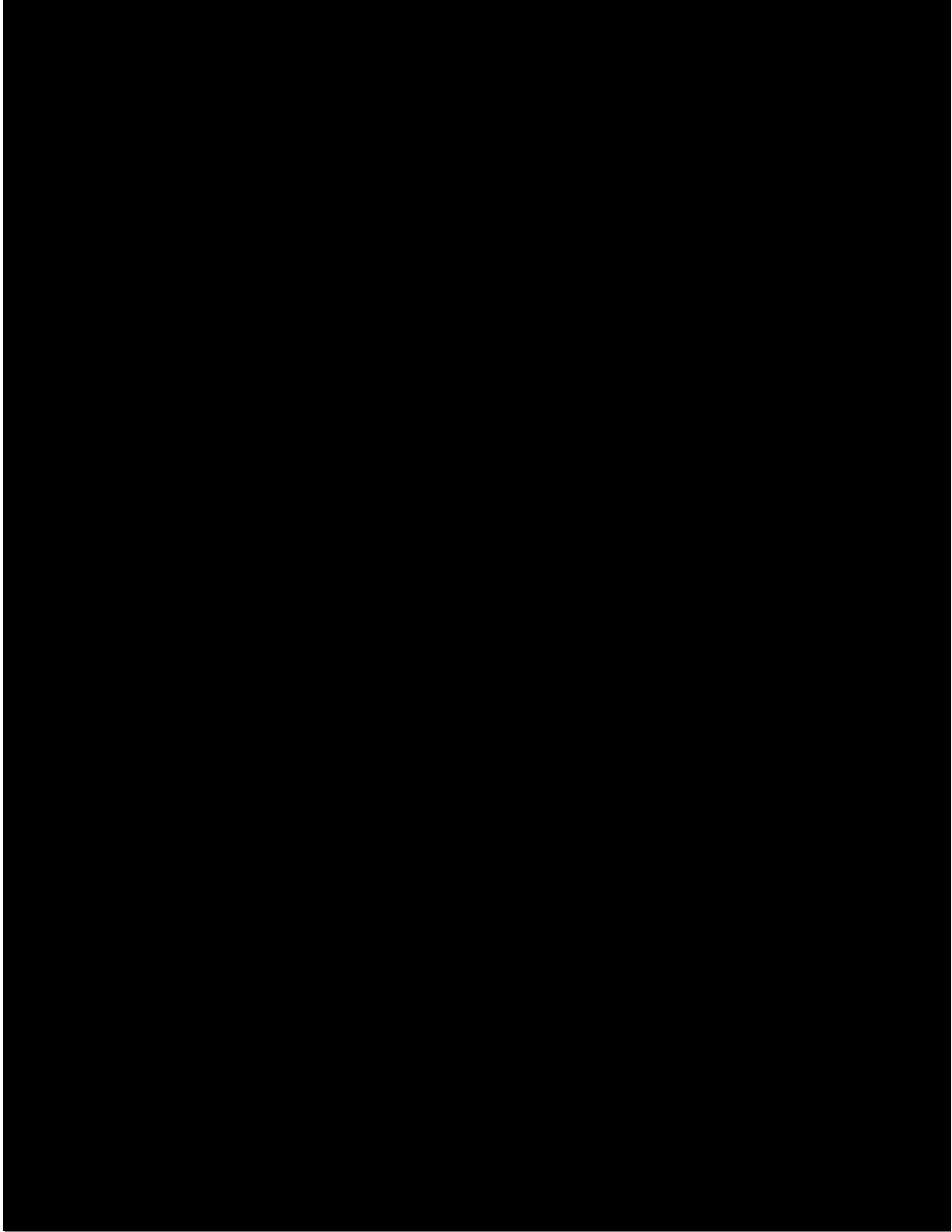
Next, the document addresses the challenges of data management in the digital age. It notes that while digital storage offers convenience, it also introduces risks such as data loss, security breaches, and information overload. Solutions like cloud storage, encryption, and regular backups are suggested to mitigate these risks.

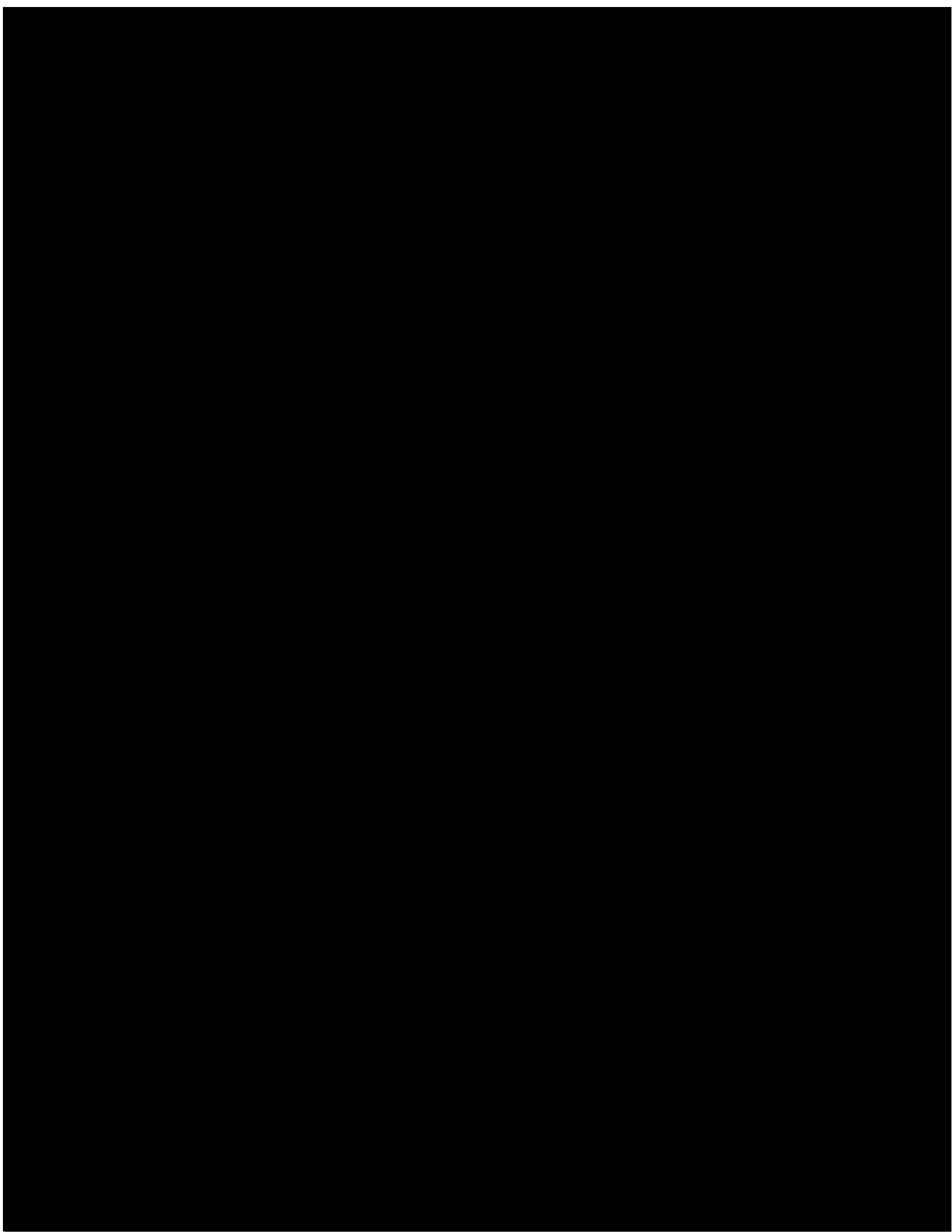
The third section focuses on the role of technology in streamlining business processes. It describes how automation tools can reduce manual errors and save time. Examples include using software for invoicing, inventory tracking, and customer relationship management. The text encourages businesses to invest in technology that aligns with their goals and scale.

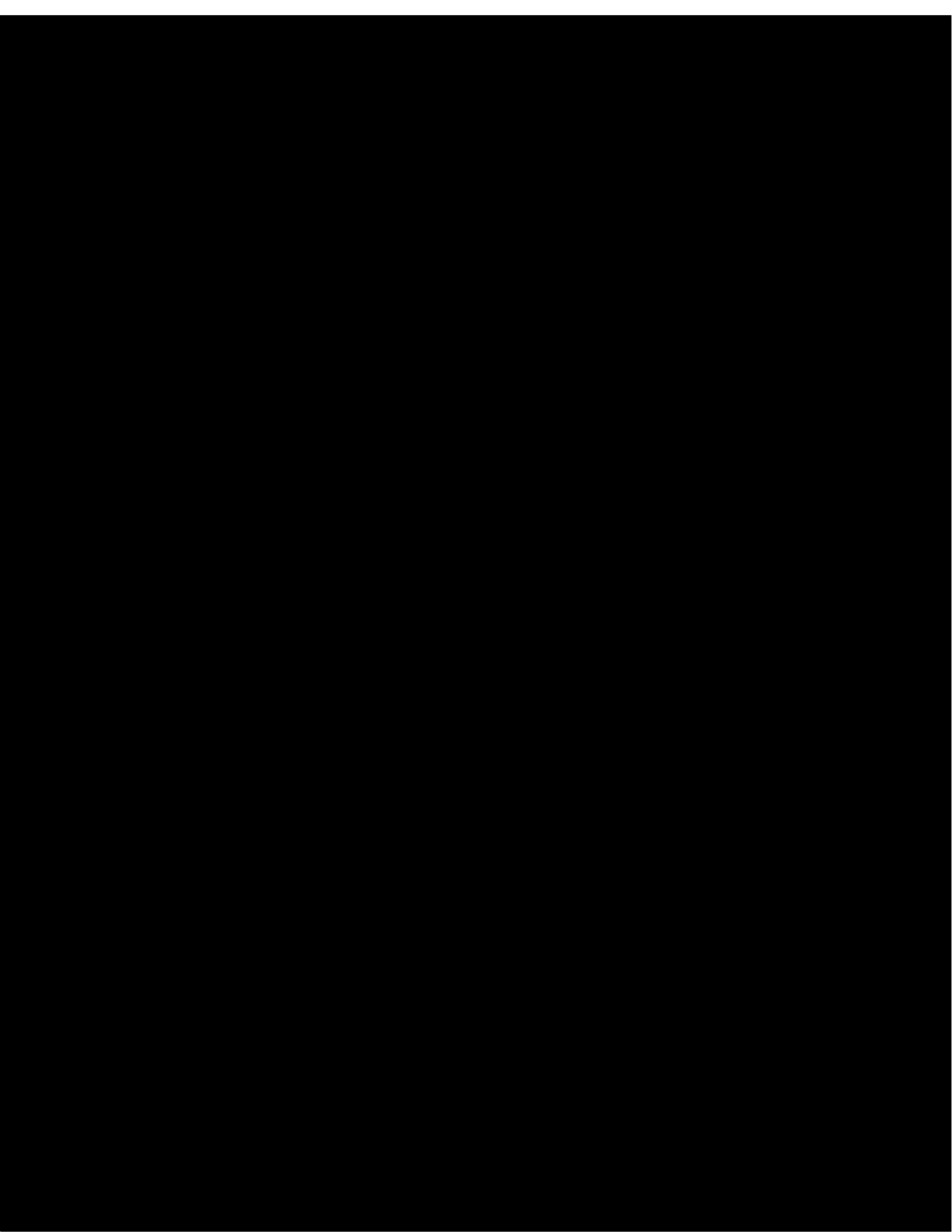
Finally, the document concludes with a call to action for businesses to prioritize data integrity and security. It stresses that in today's competitive market, having reliable and secure information is a key to long-term success. Regular audits and updates to data management policies are recommended to ensure ongoing compliance and efficiency.

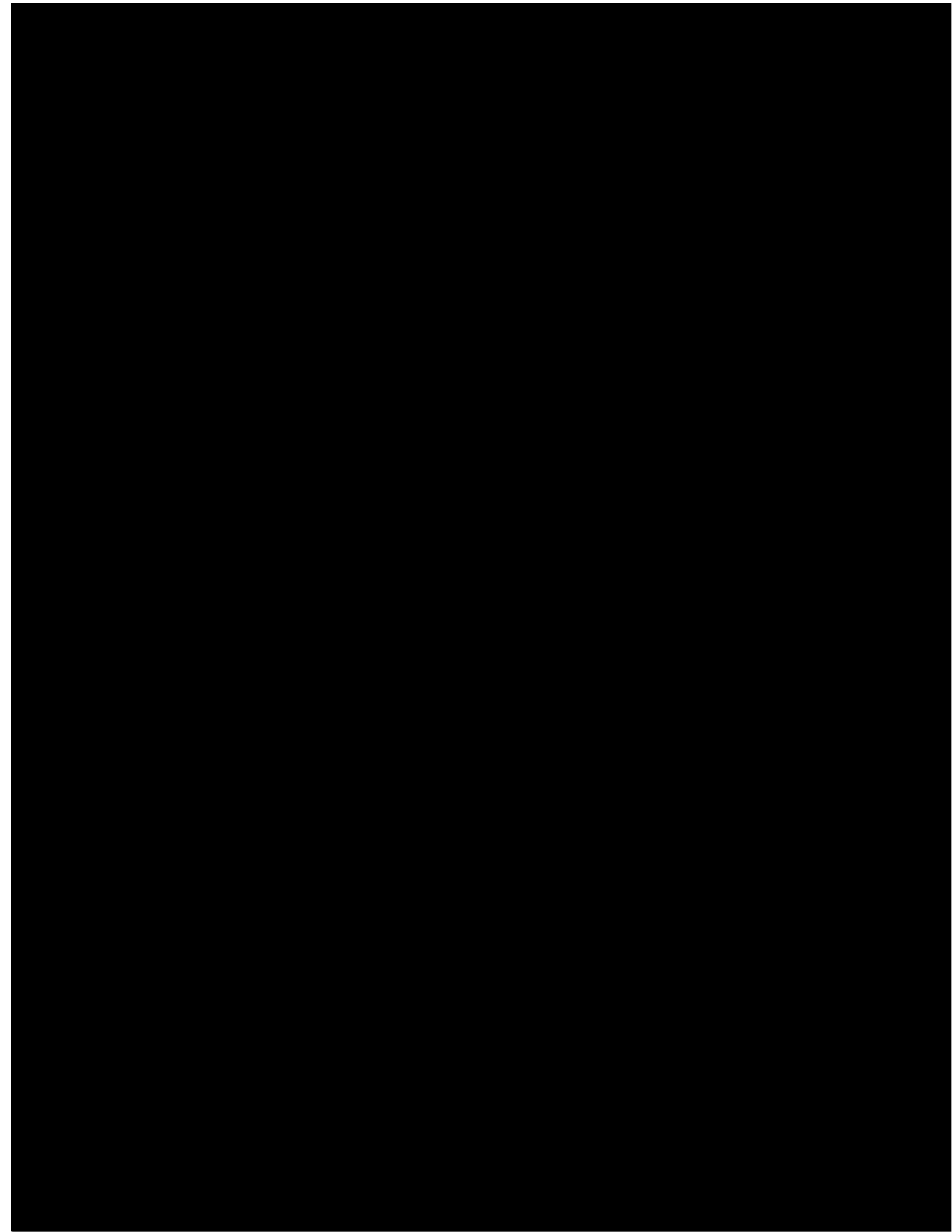


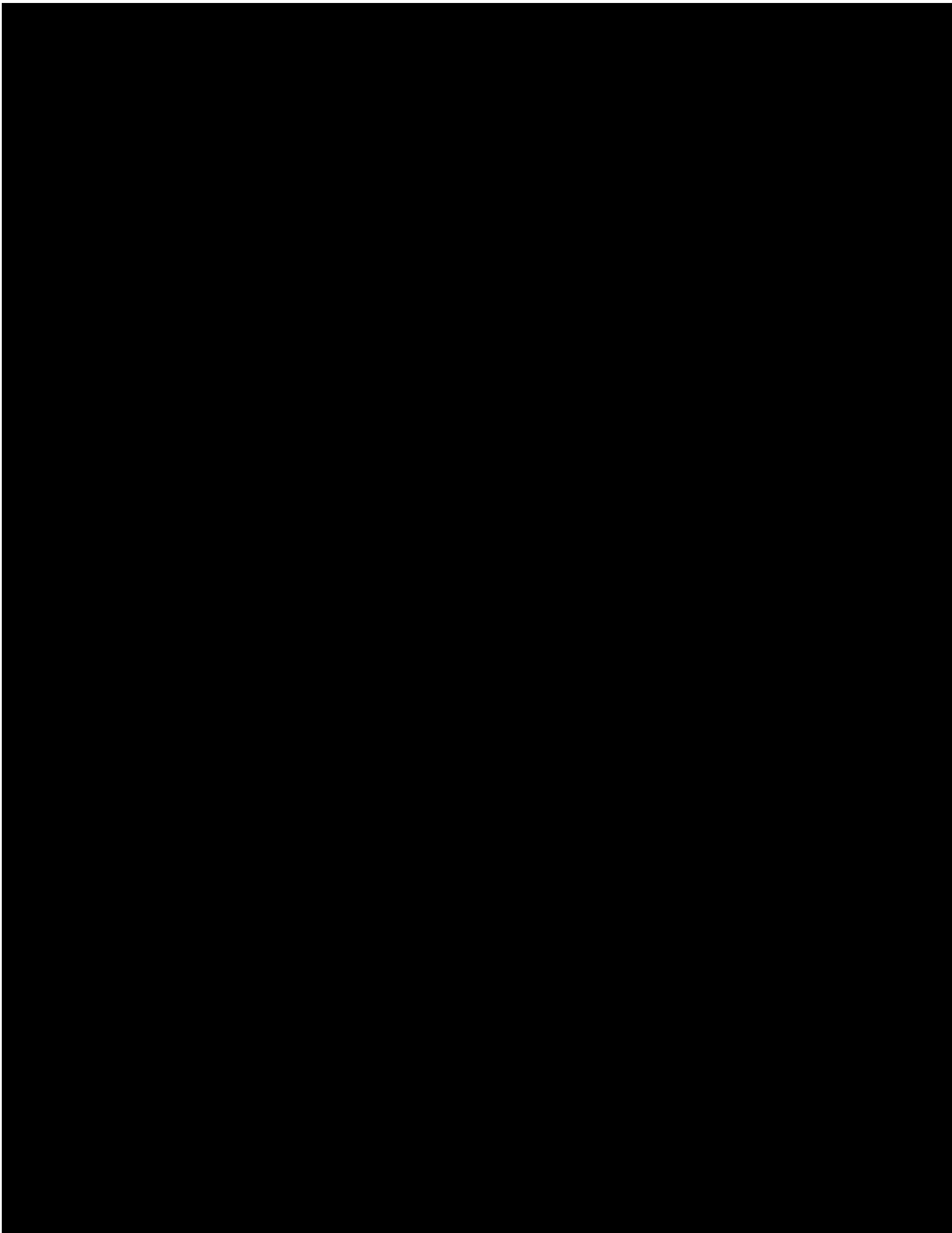


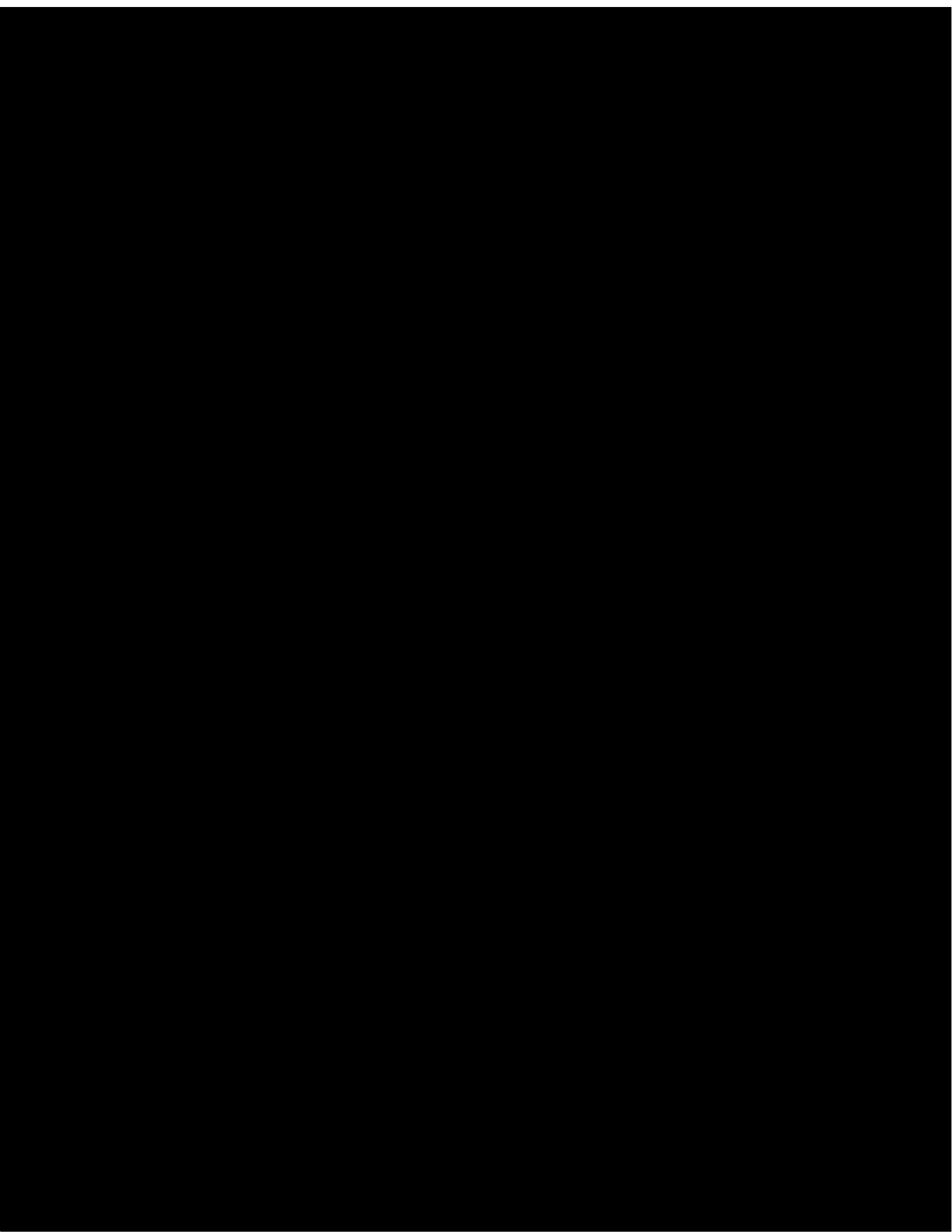










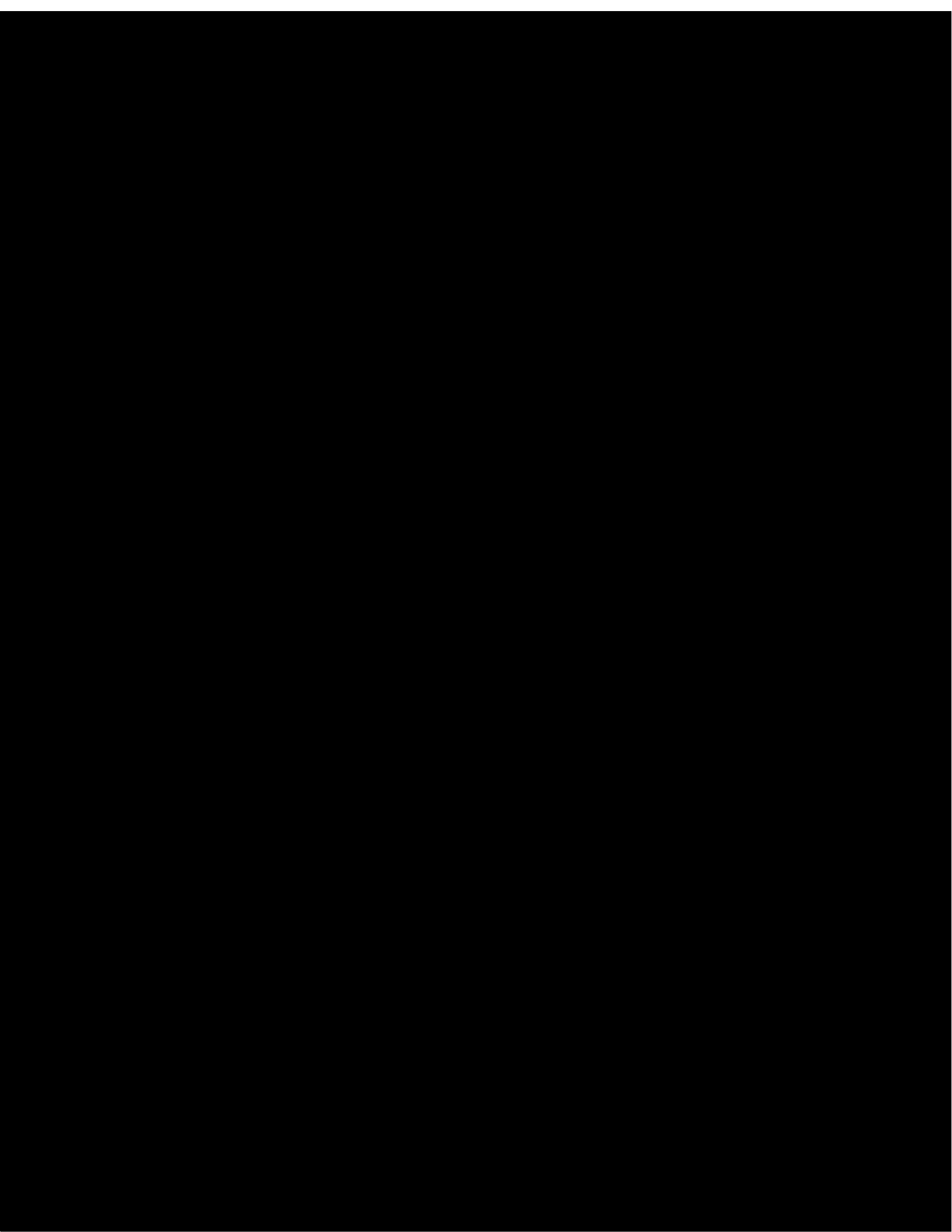


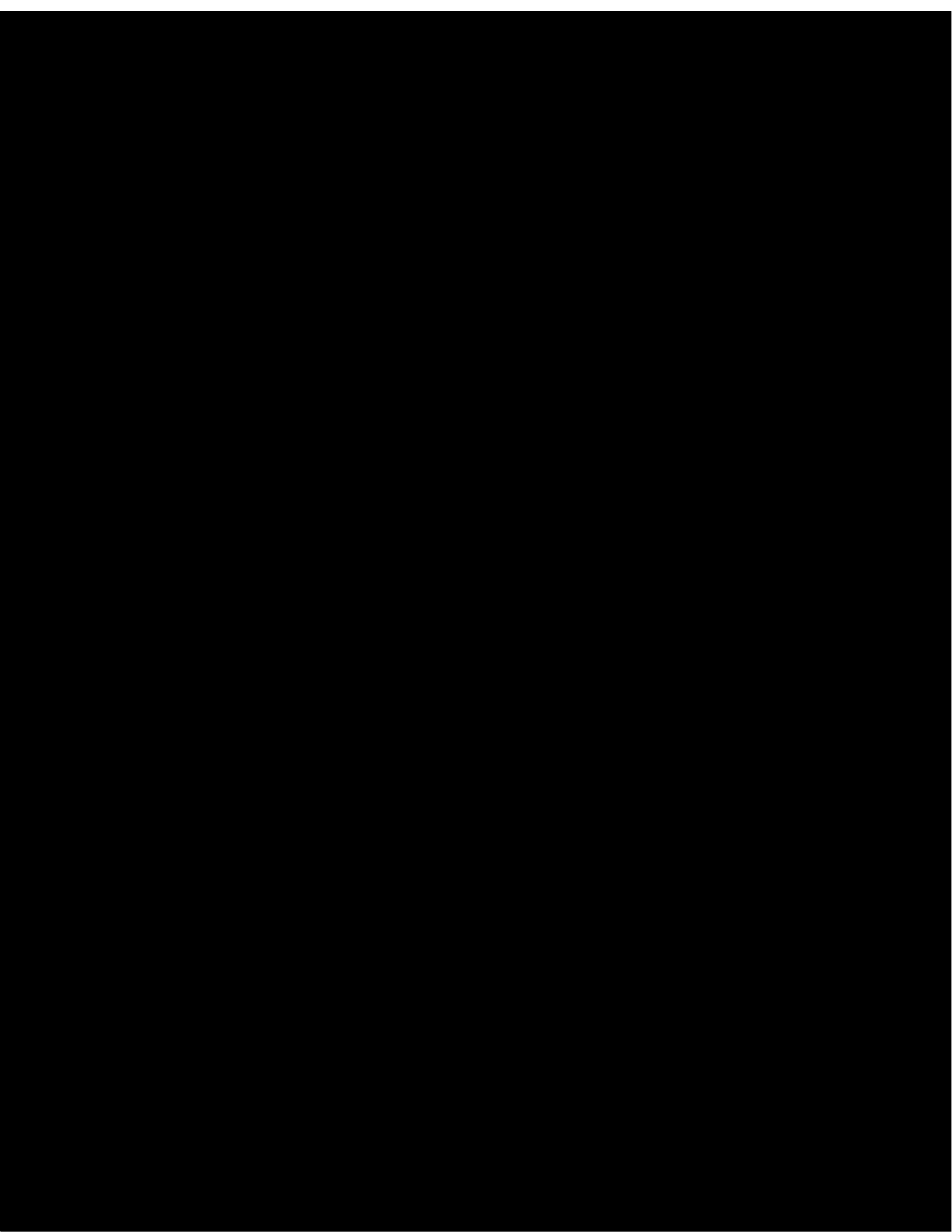
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every receipt, invoice, and bill should be properly filed and indexed for easy retrieval. This not only helps in tracking expenses but also ensures compliance with tax regulations.

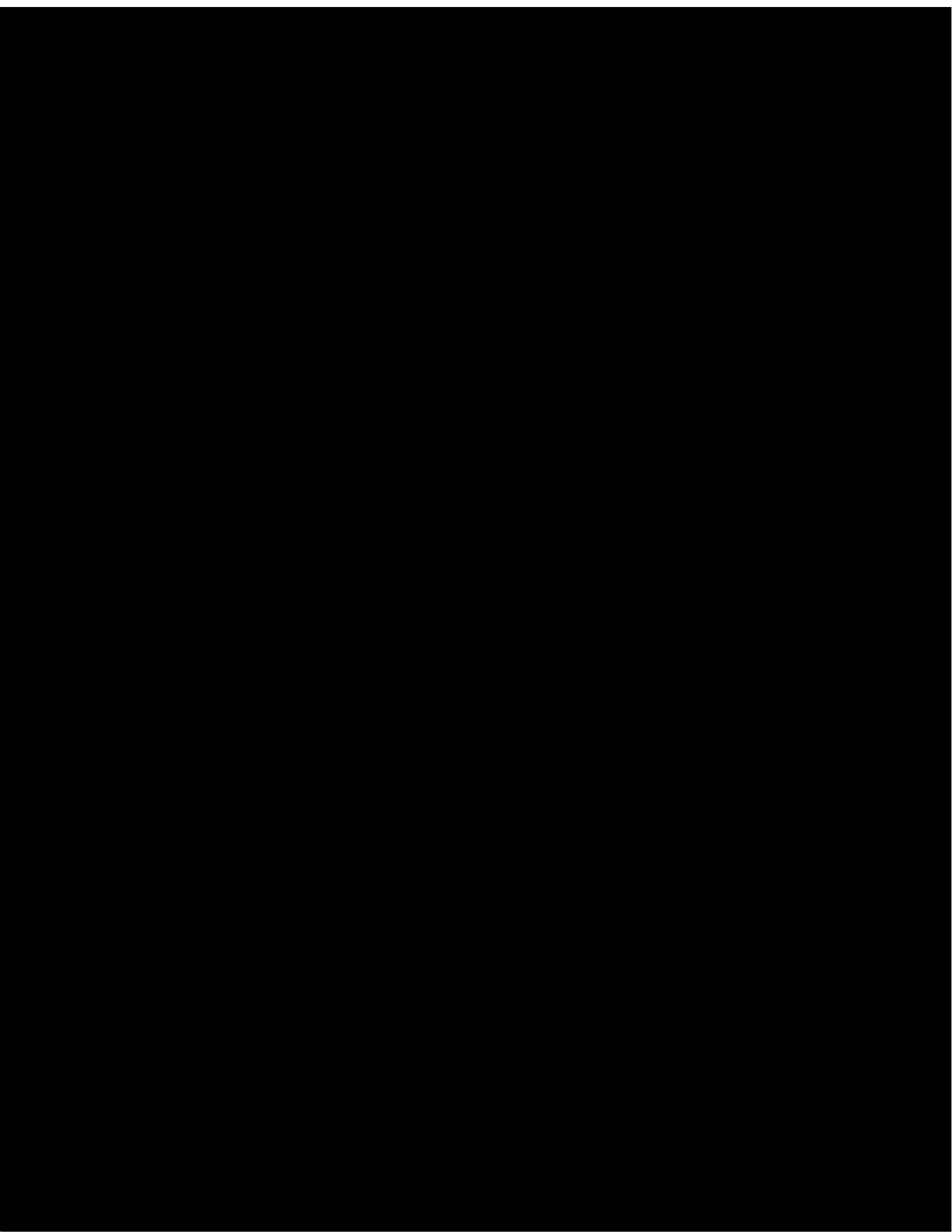
Next, the document outlines the process of reconciling bank statements with the company's financial records. It stresses the need to identify and resolve any discrepancies between the two sources of data. Regular reconciliation is crucial for maintaining the integrity of the financial statements.

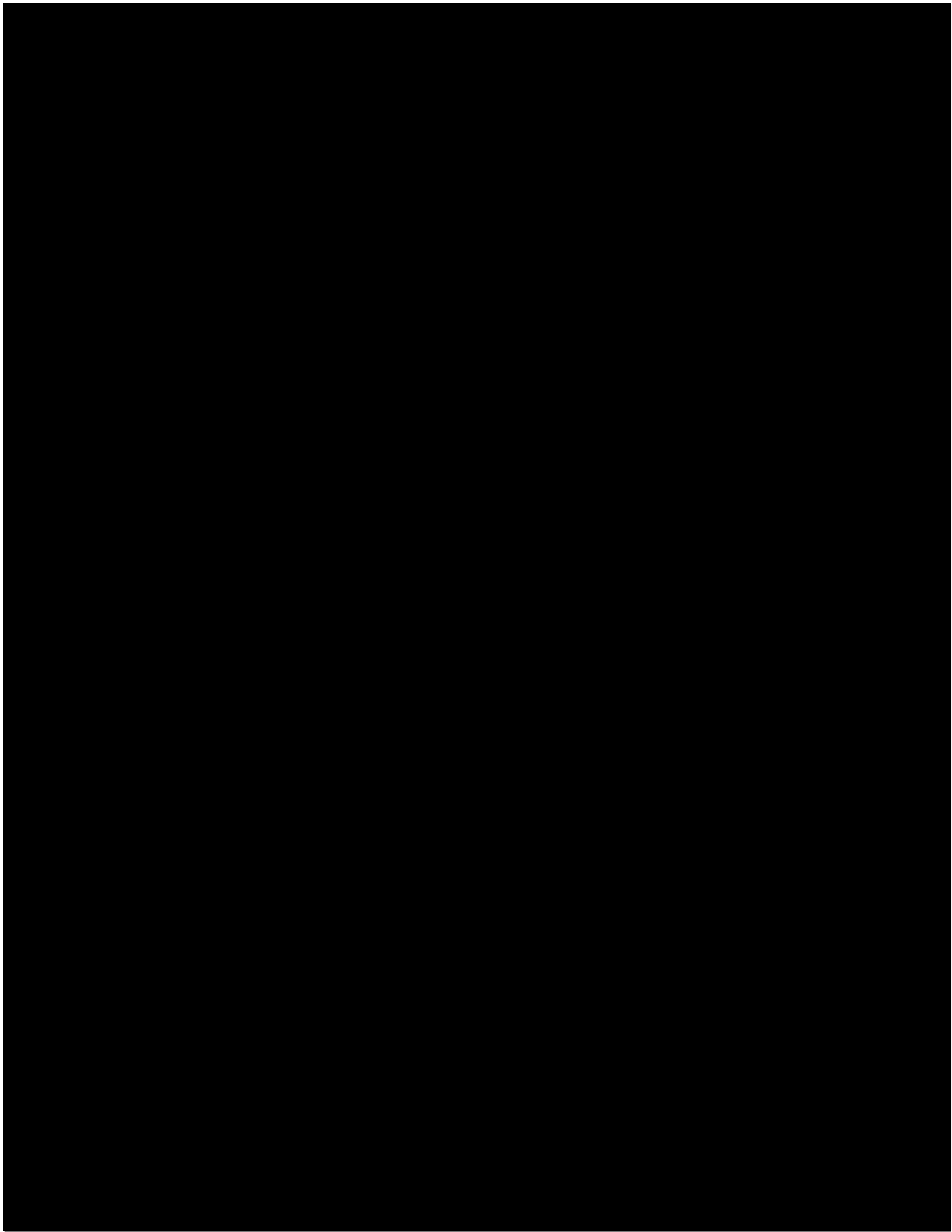
The following section addresses the issue of budgeting and cost control. It provides a framework for setting realistic budgets and monitoring actual performance against these targets. Key areas of focus include personnel costs, materials, and overhead expenses.

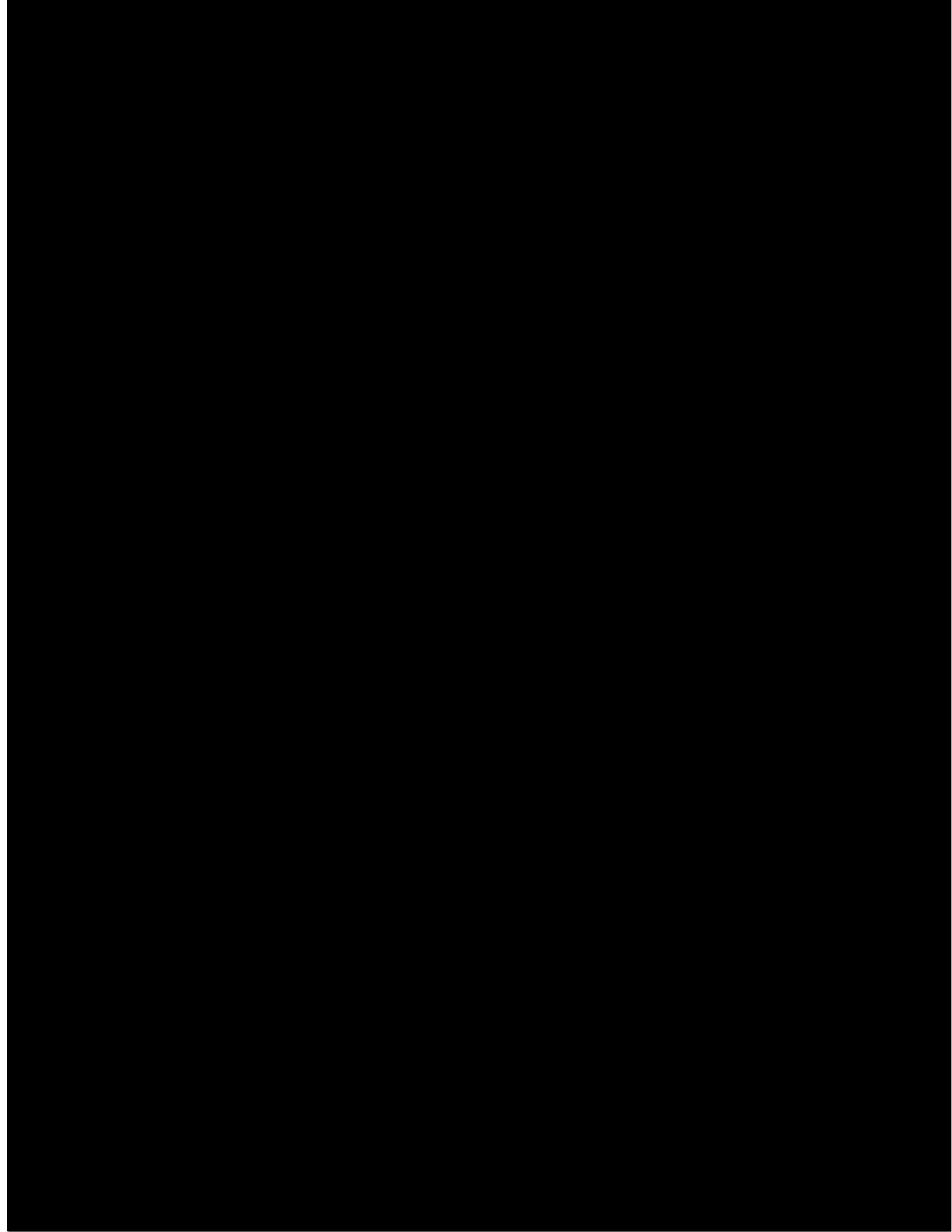
In the final part of the document, the author discusses the importance of regular financial reporting. This involves preparing timely and accurate statements of income, balance sheets, and cash flow. These reports are essential for management decision-making and for providing transparency to stakeholders.

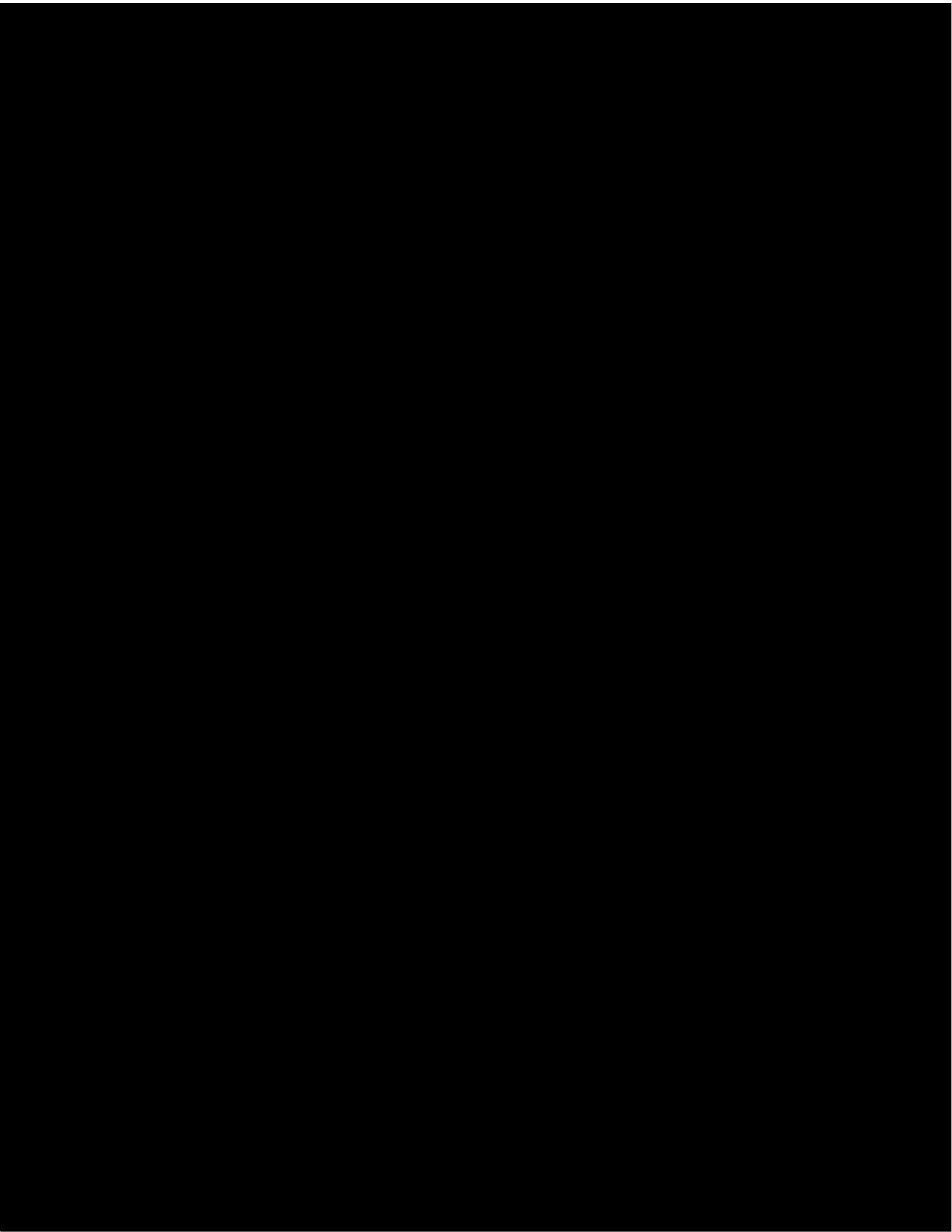


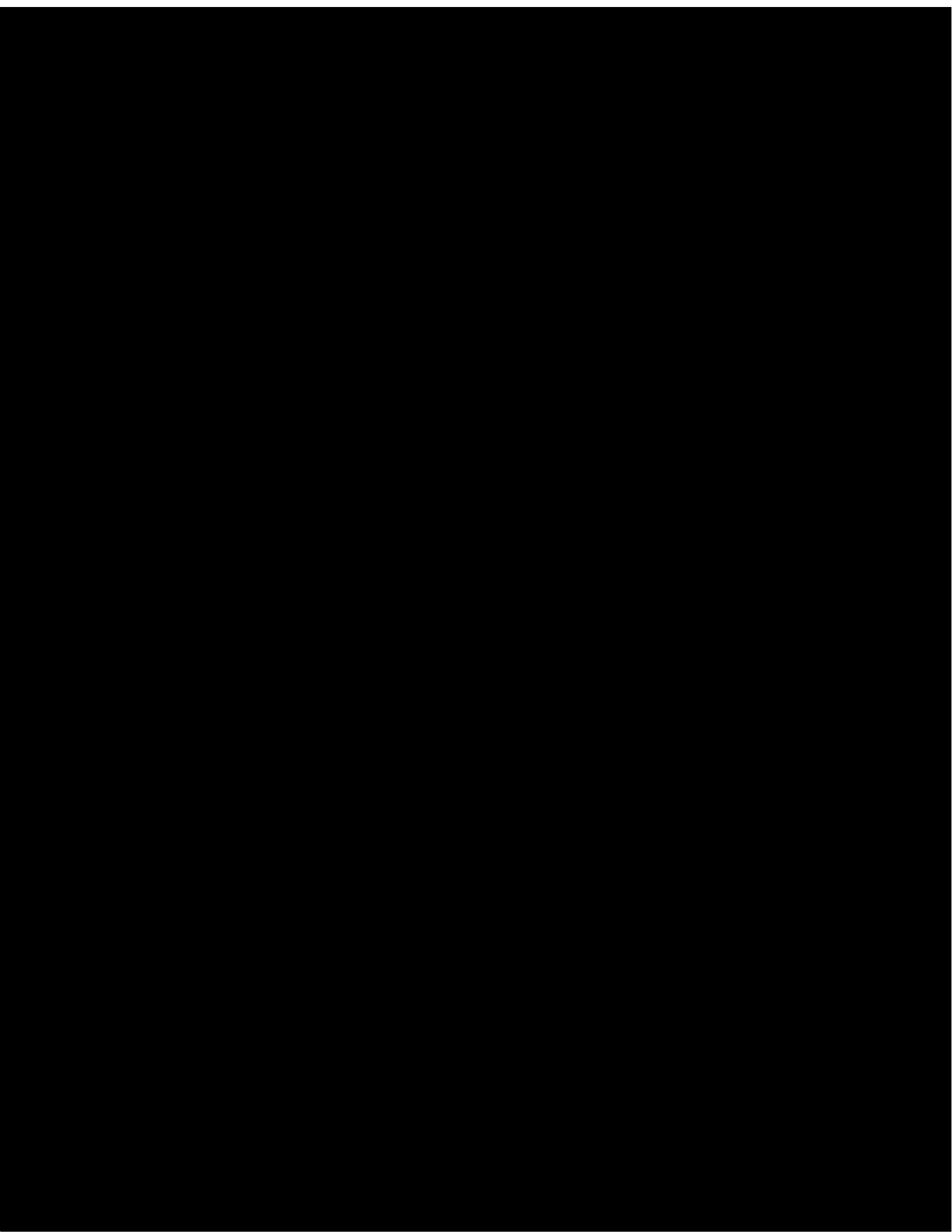


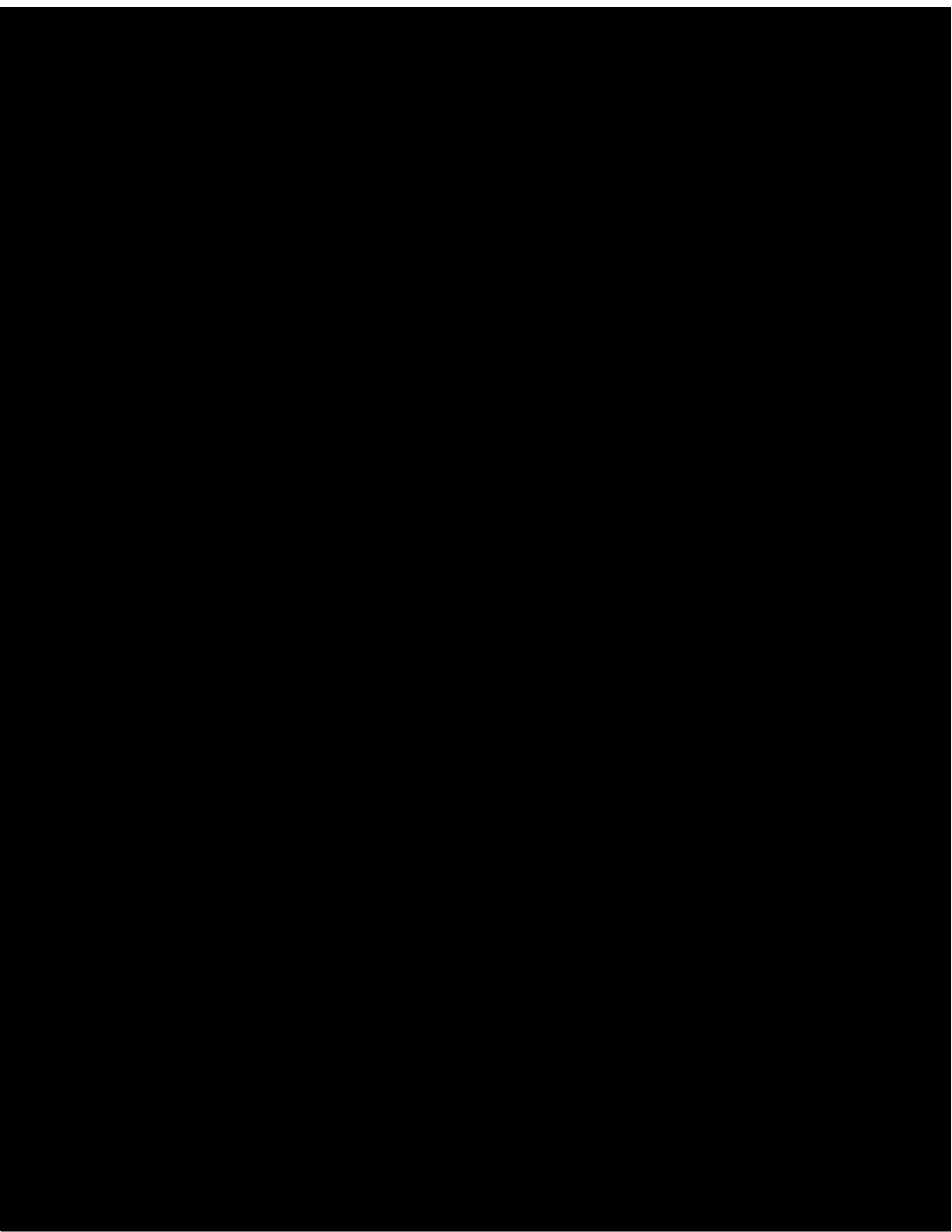


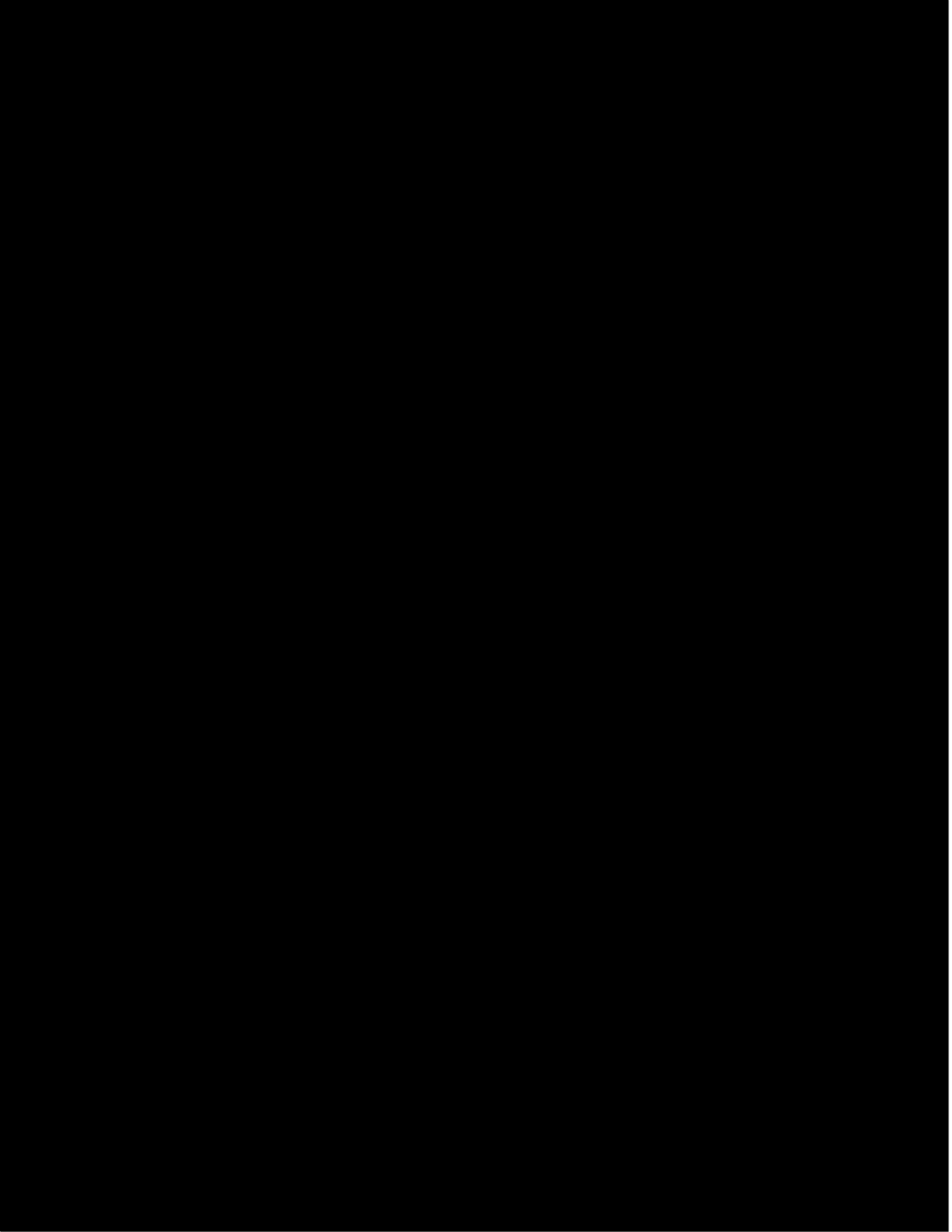


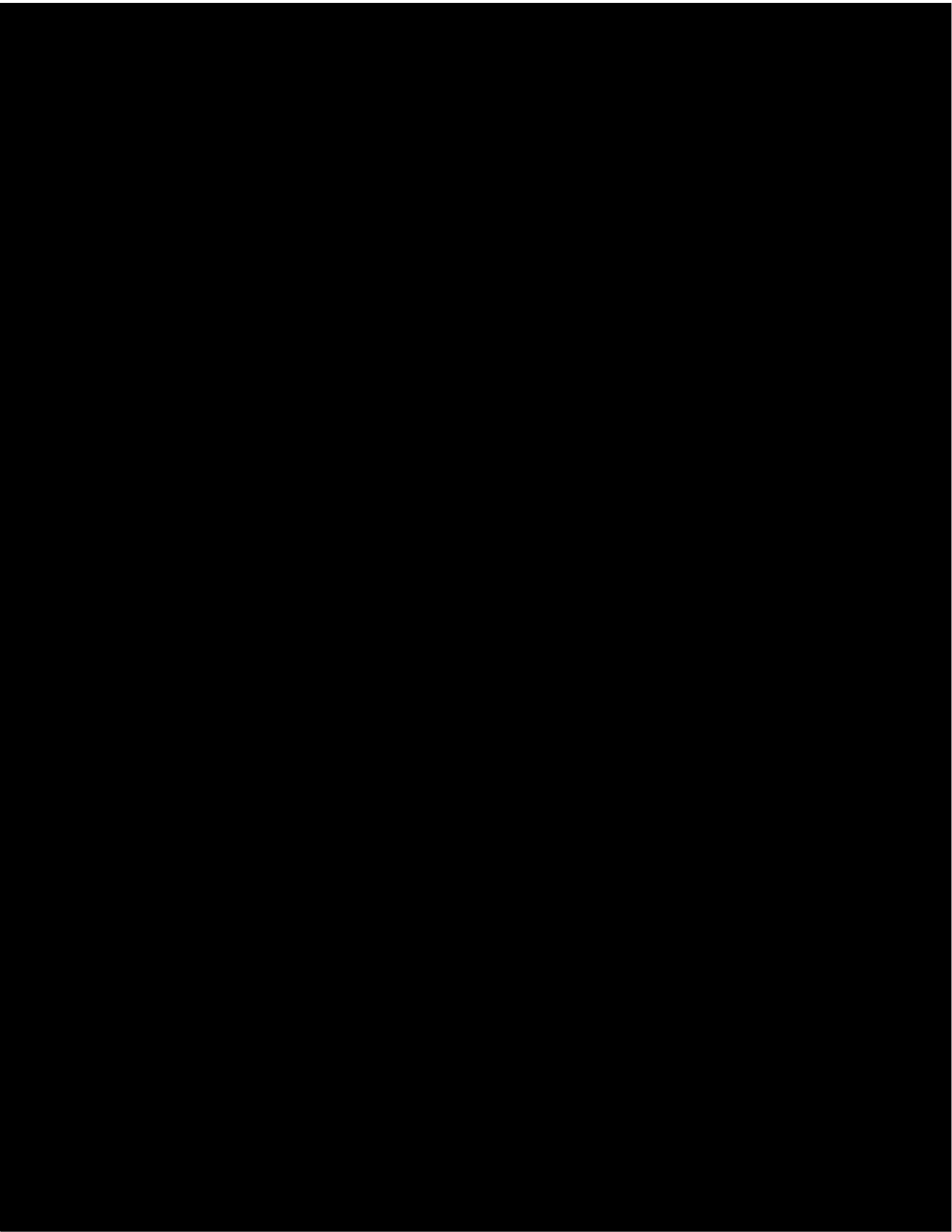


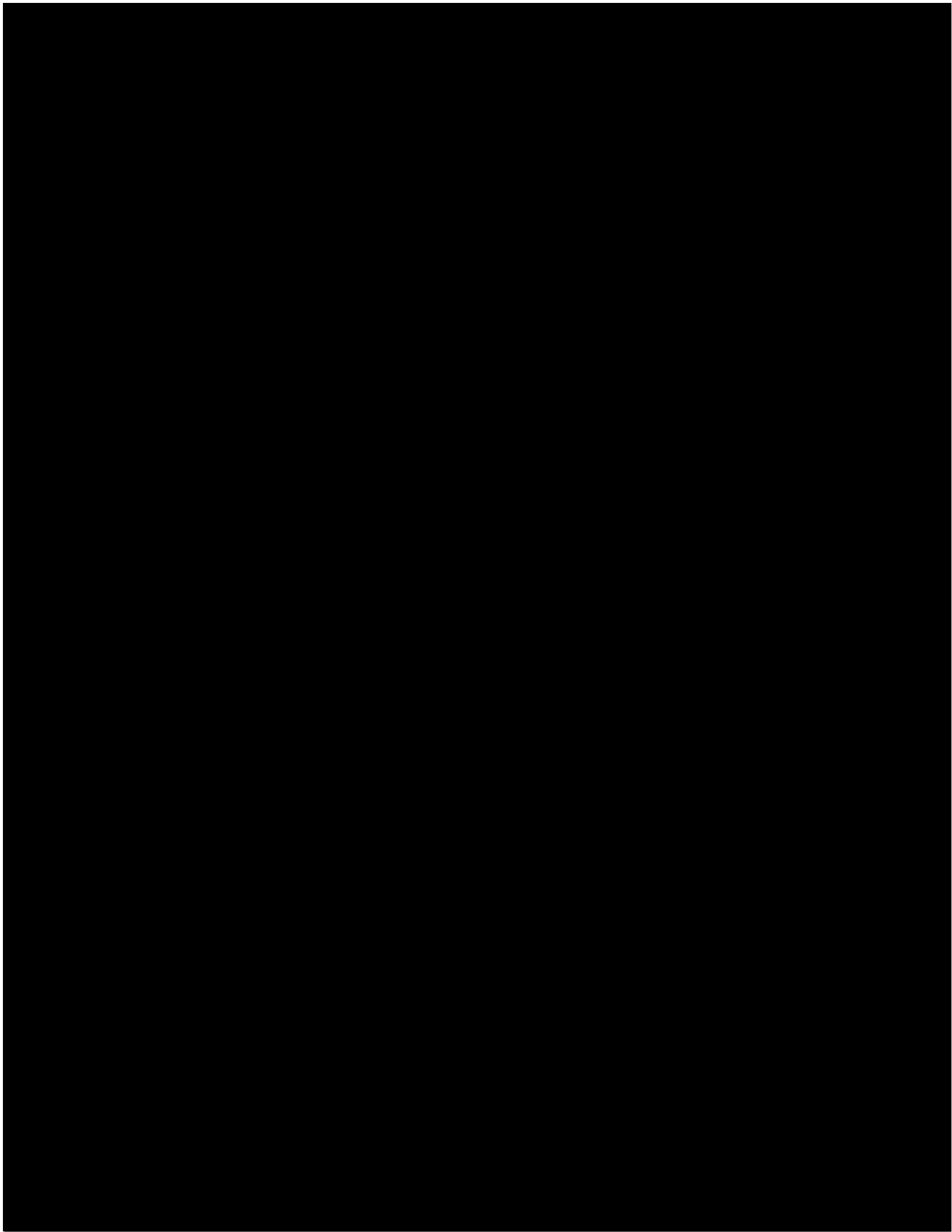


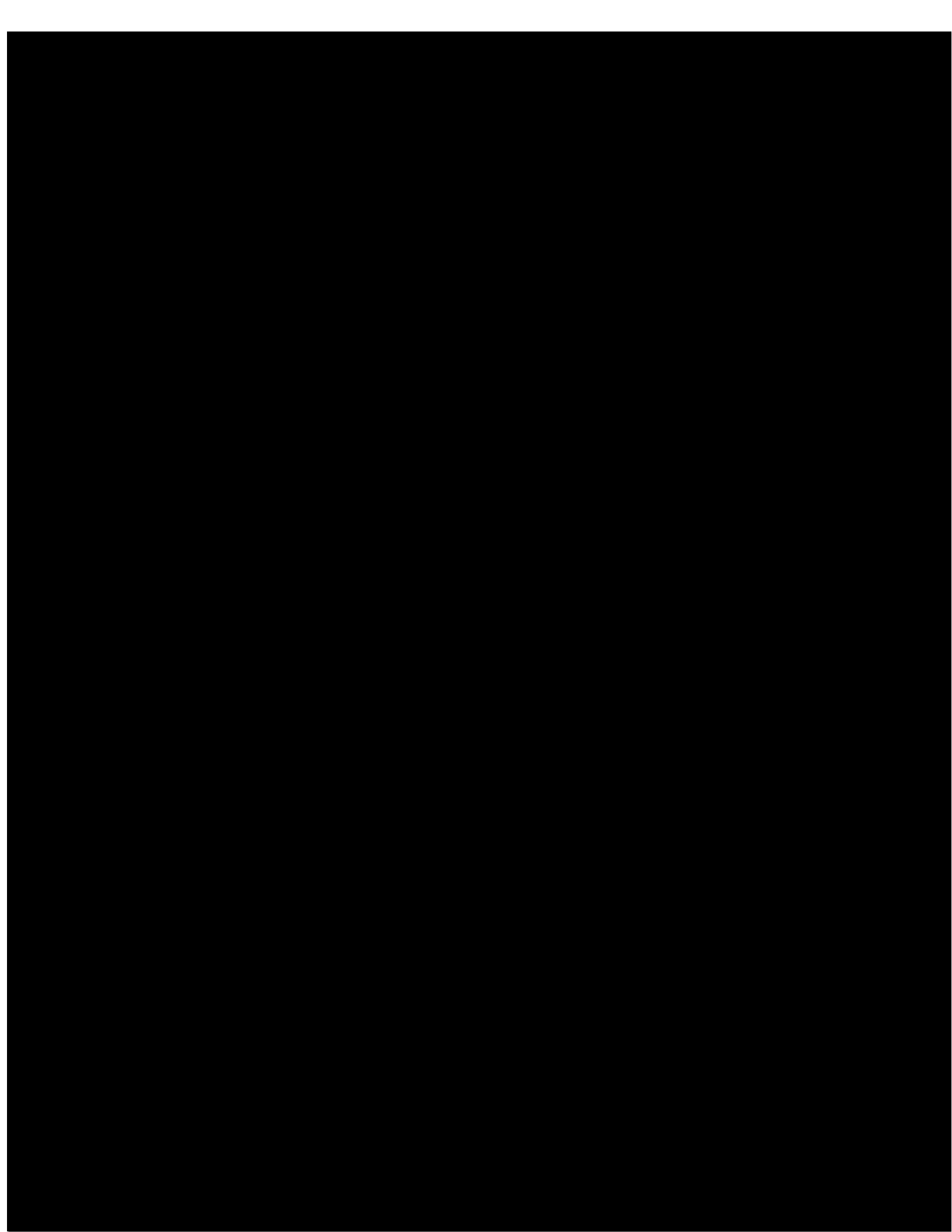


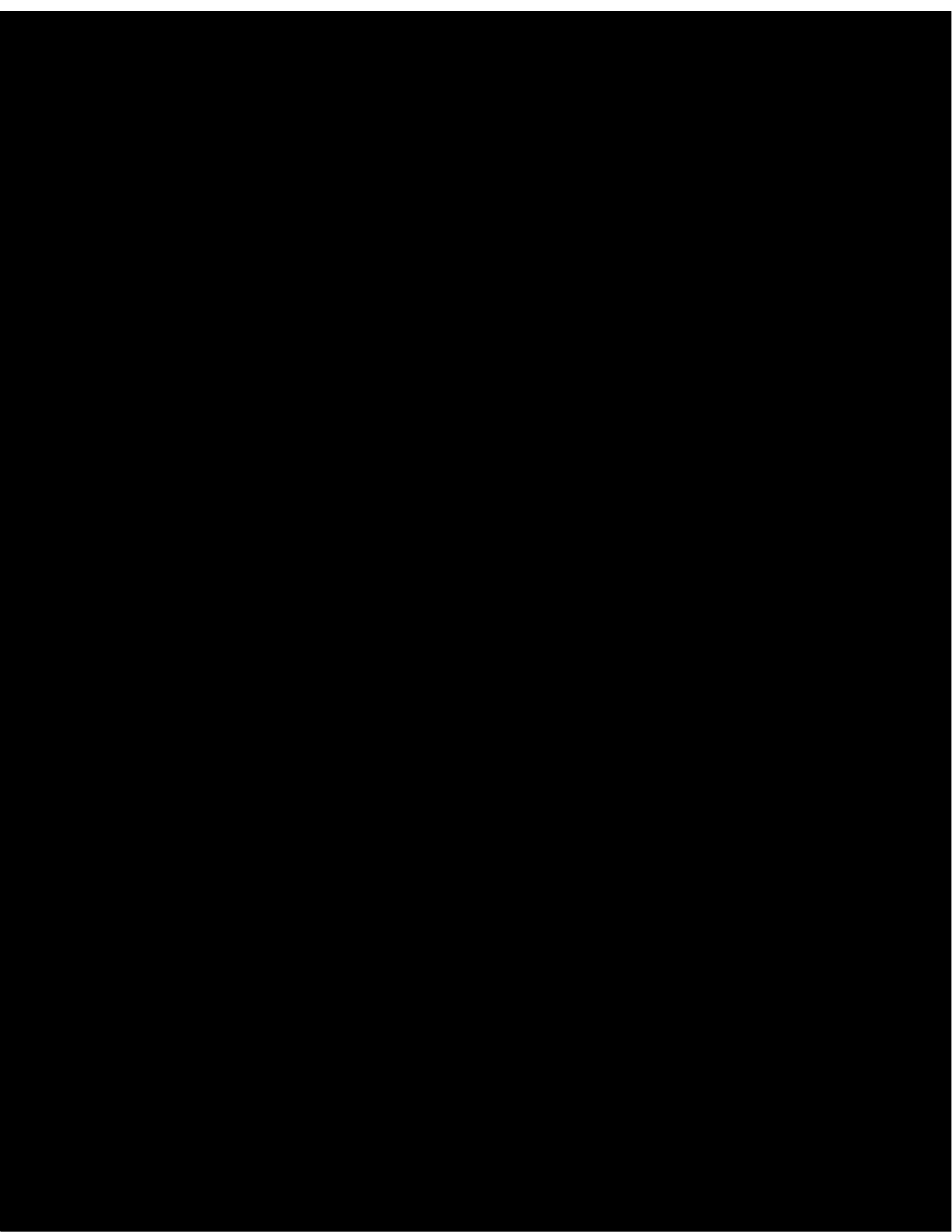


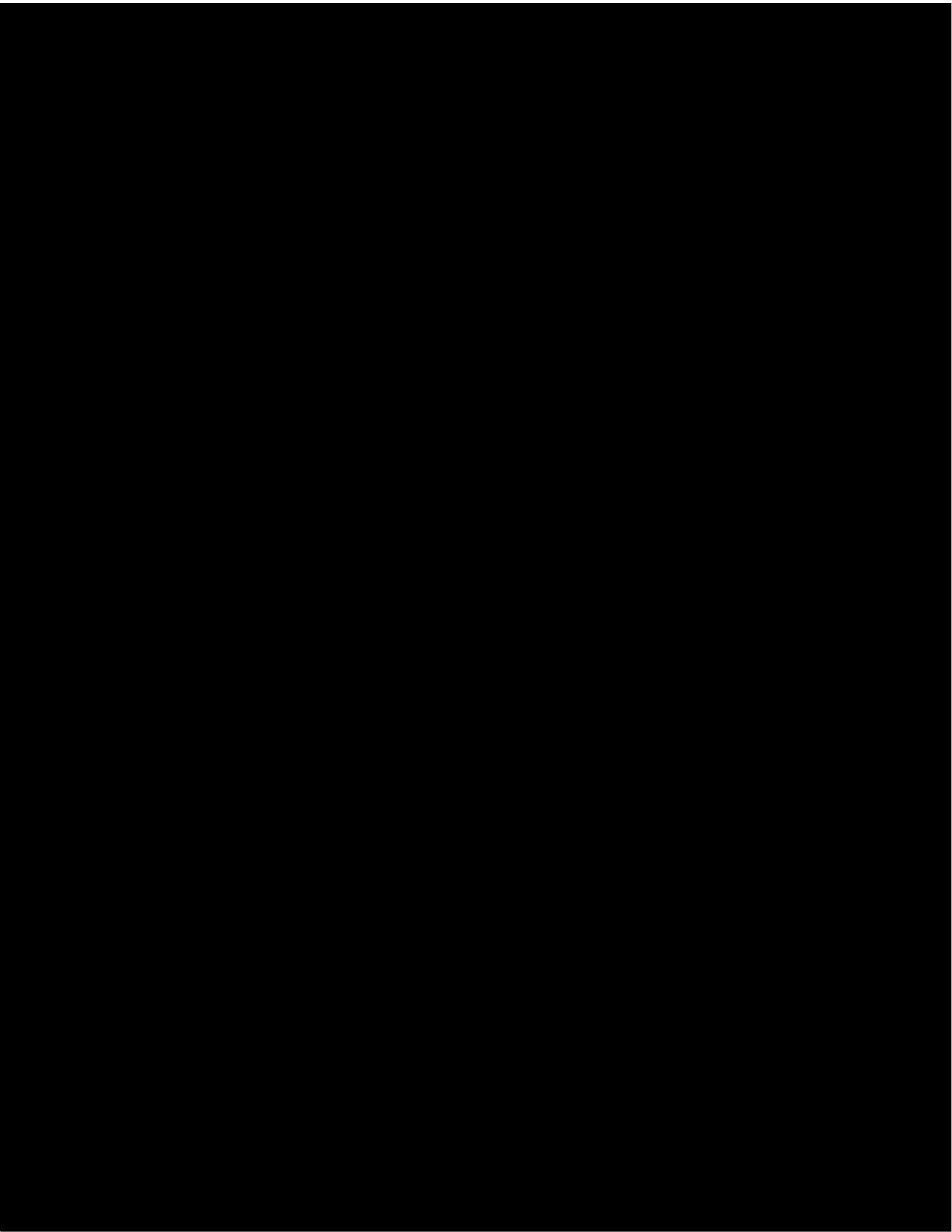


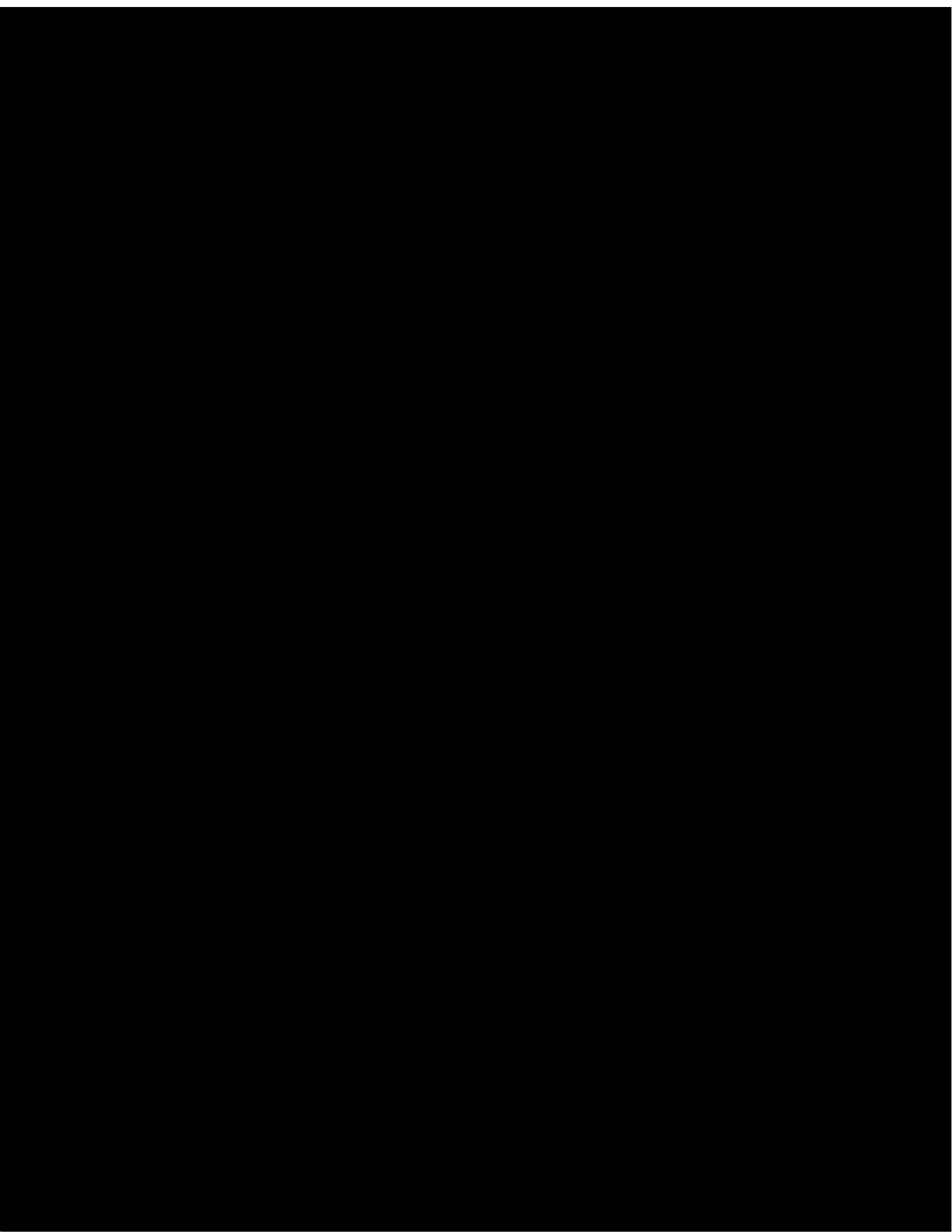


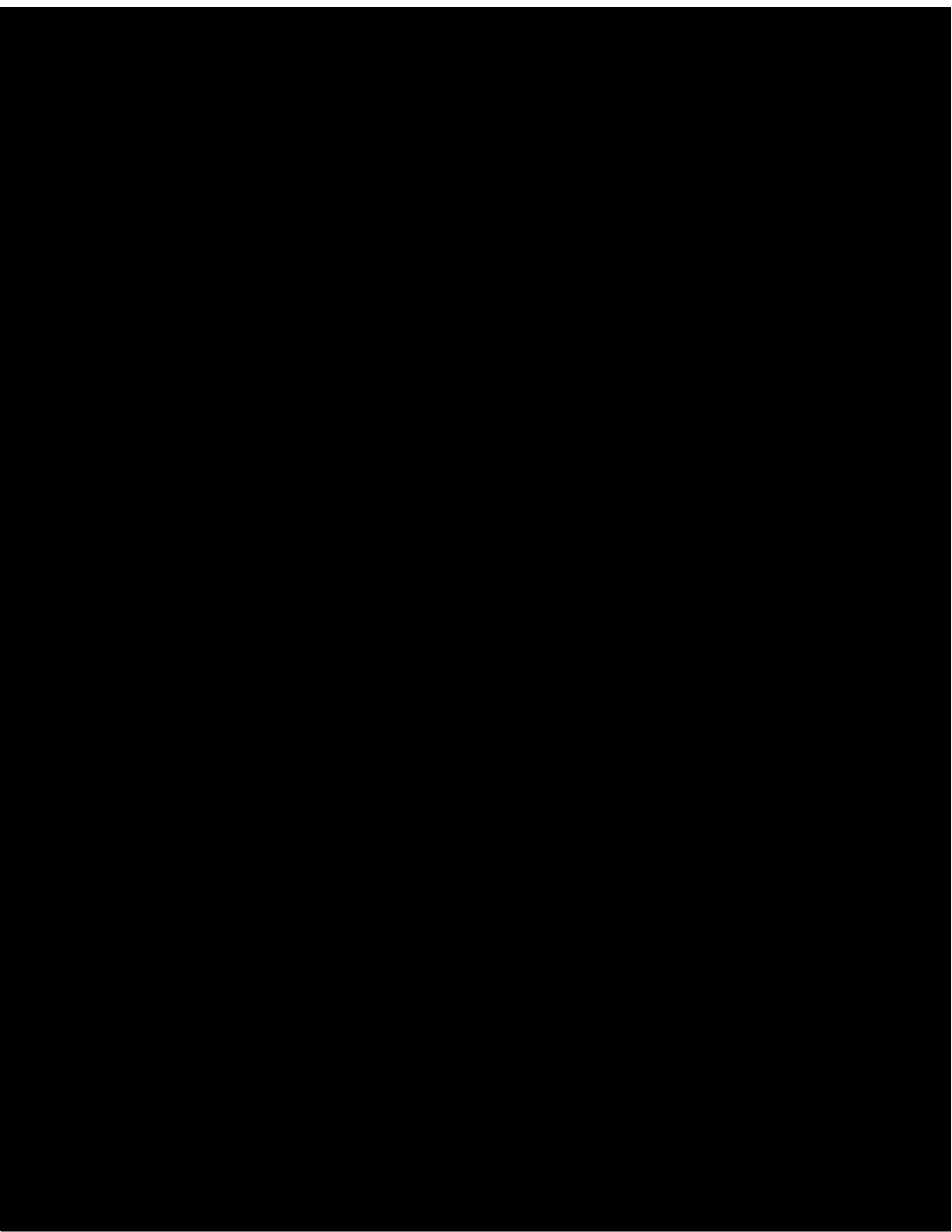


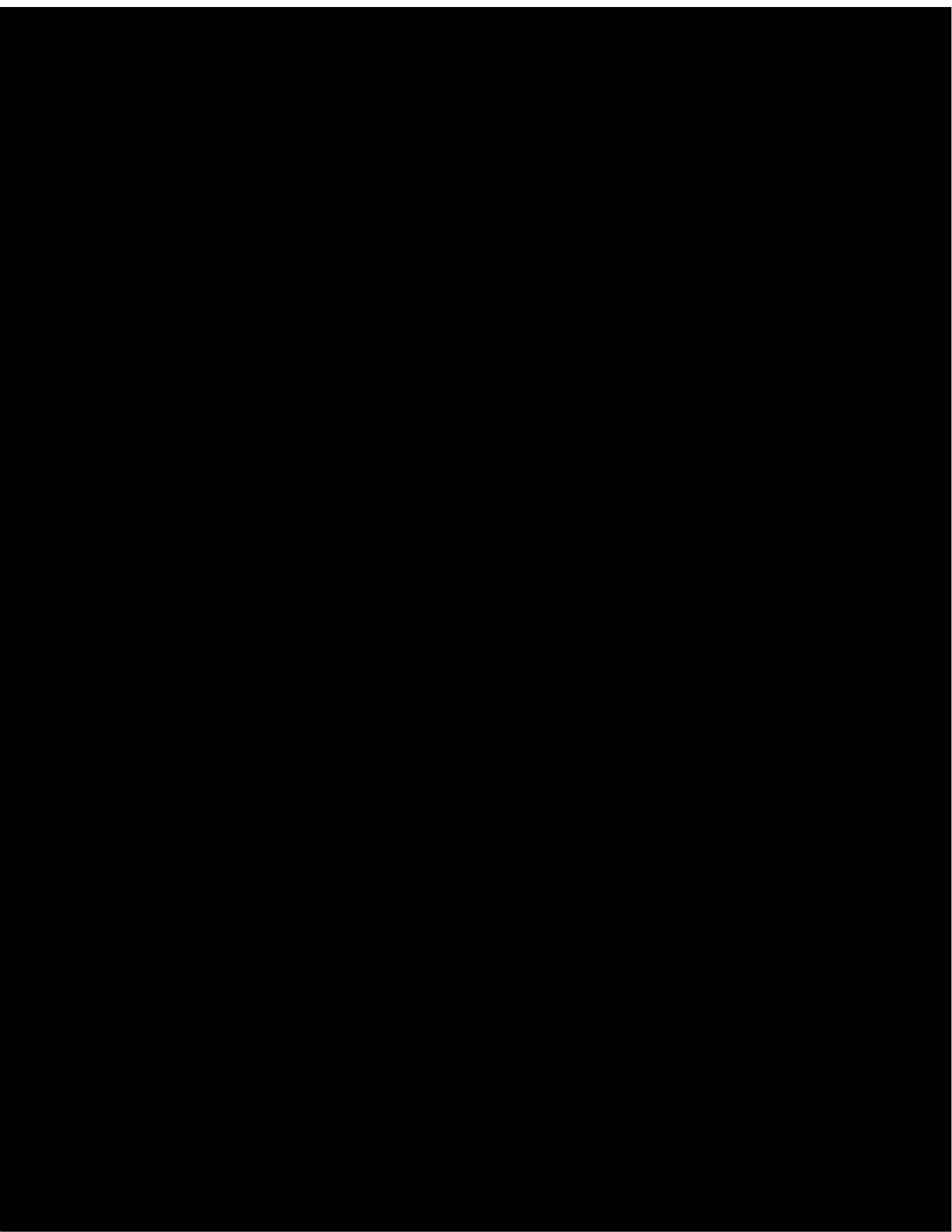


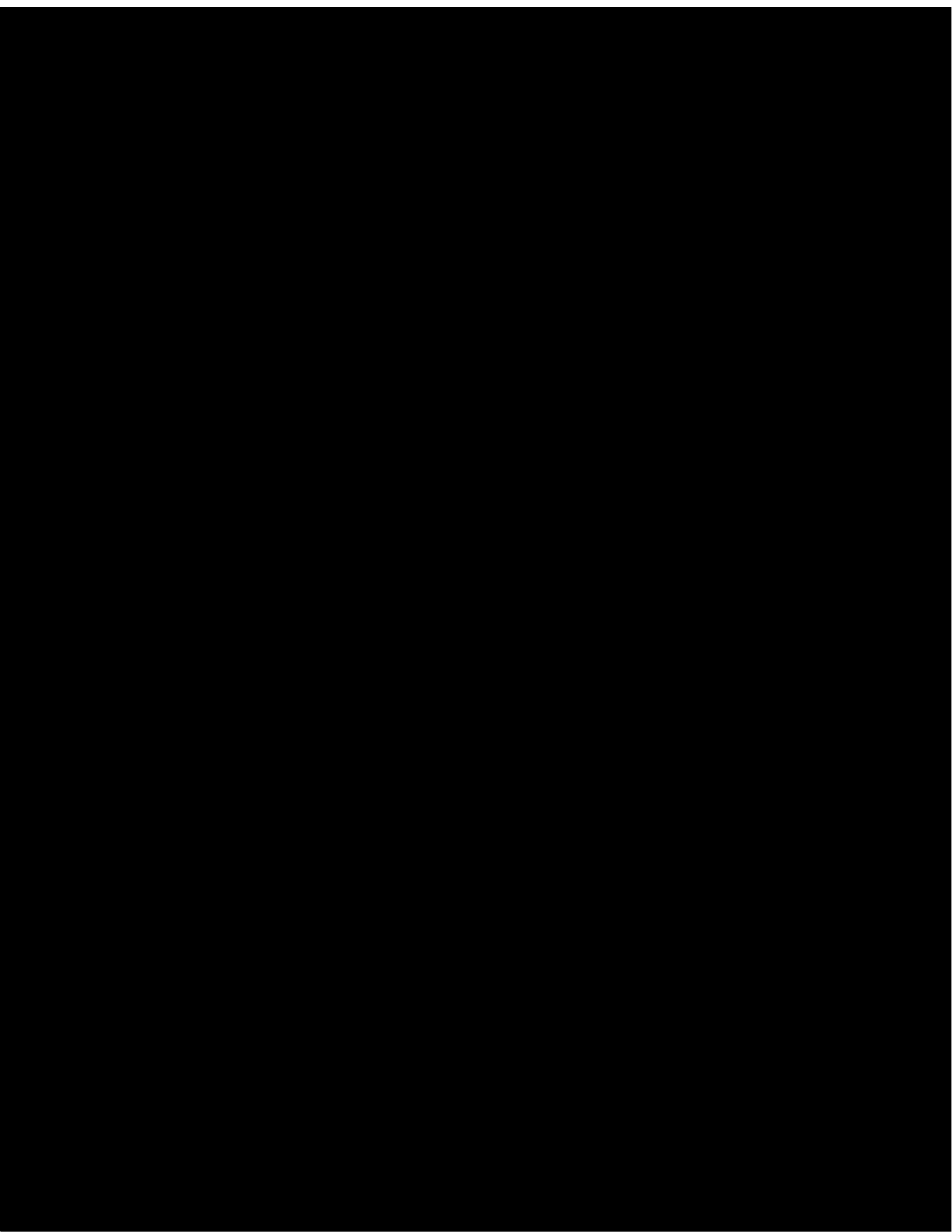










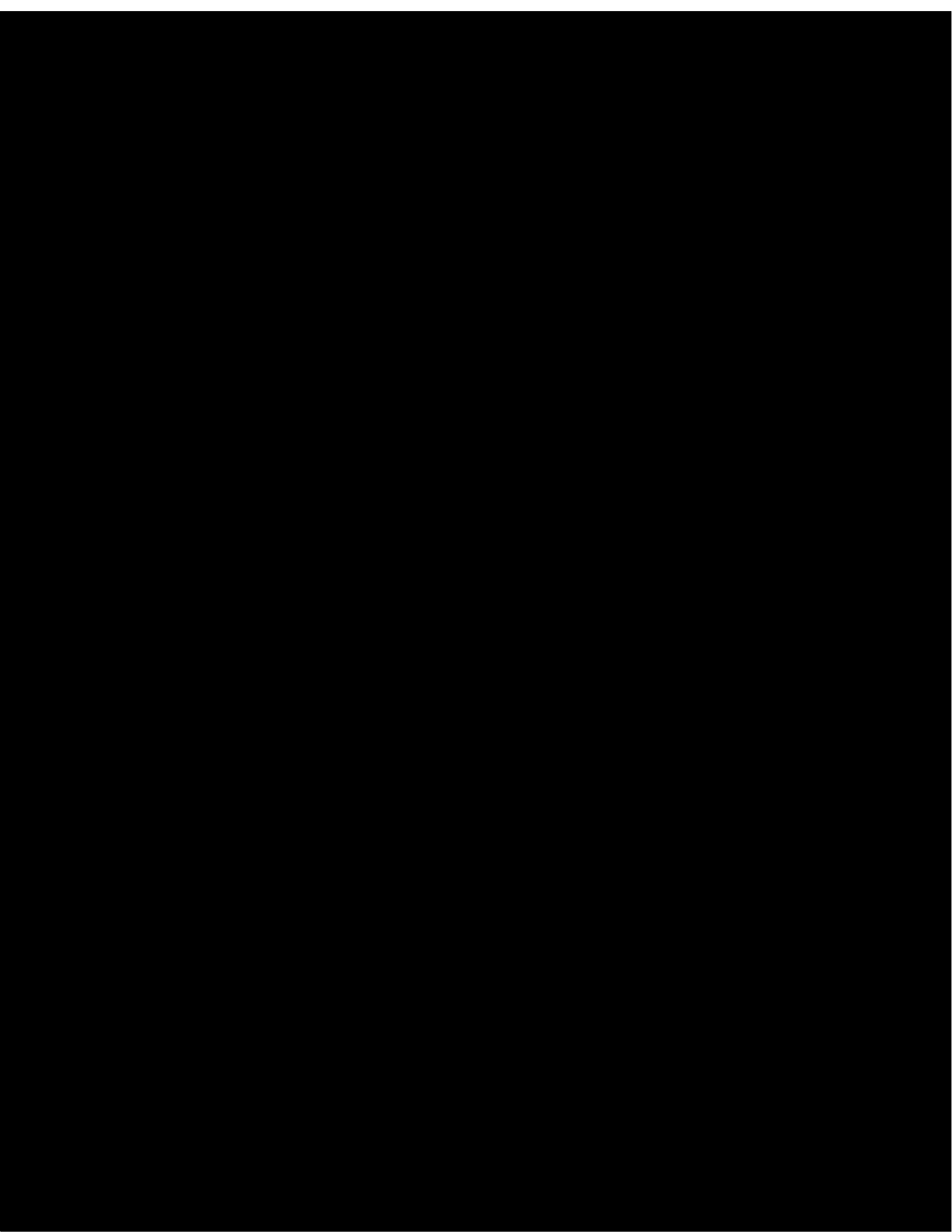


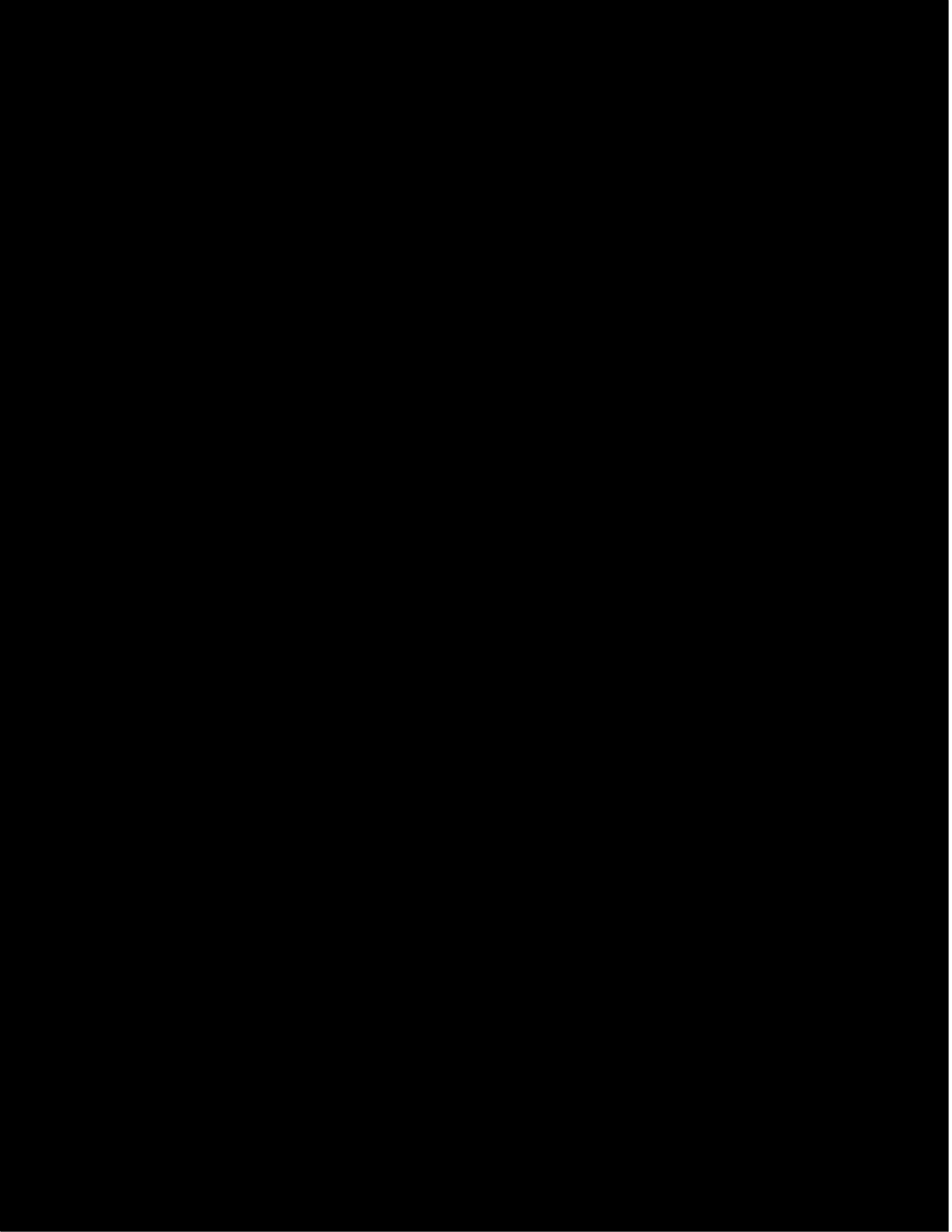
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The text suggests that a systematic approach to record-keeping is essential for identifying trends and making informed decisions.

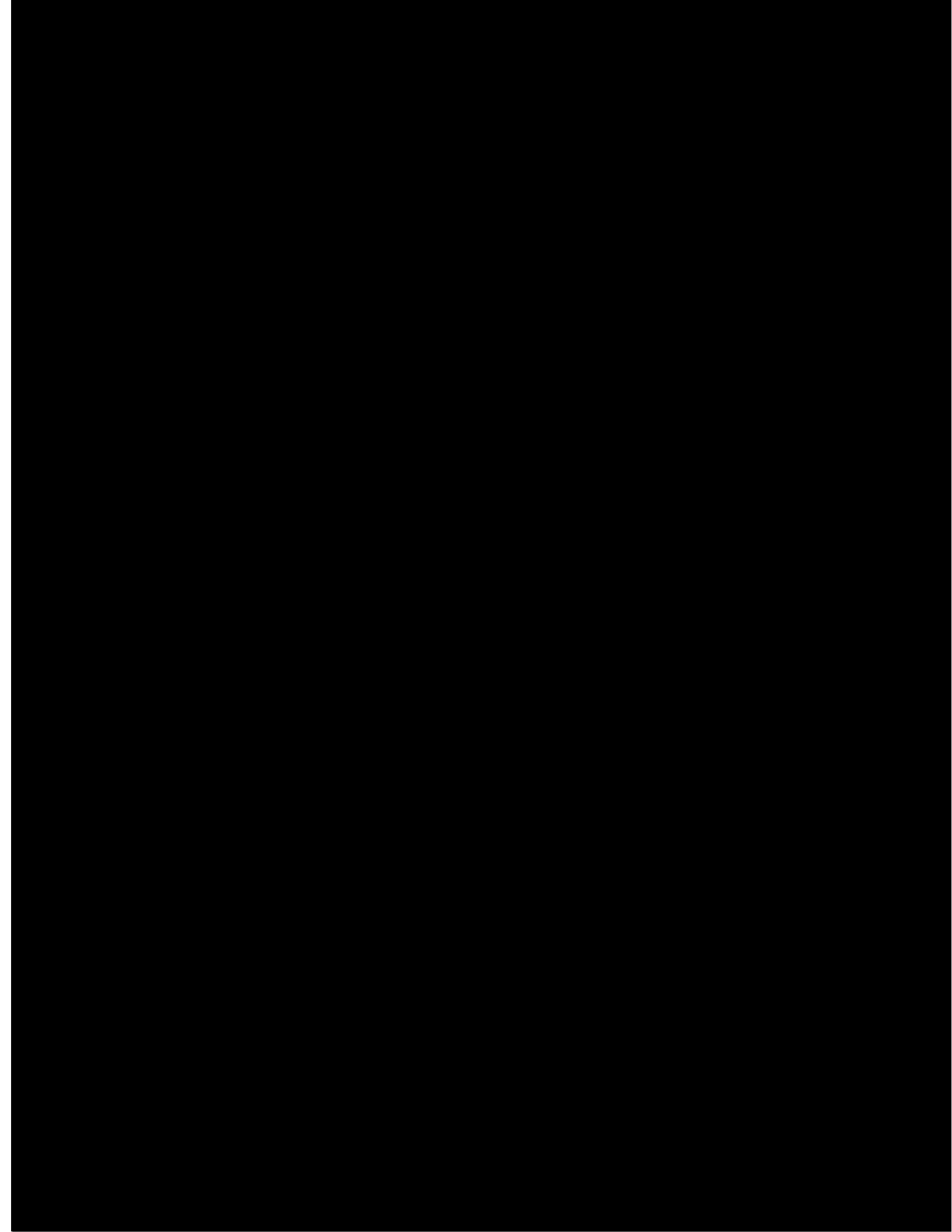
Next, the document addresses the issue of budgeting. It states that a well-defined budget is crucial for controlling costs and maximizing profit. The author provides a step-by-step guide to creating a budget, starting with identifying all sources of income and then listing all expenses. The goal is to ensure that expenses do not exceed income, which is a key indicator of financial health.

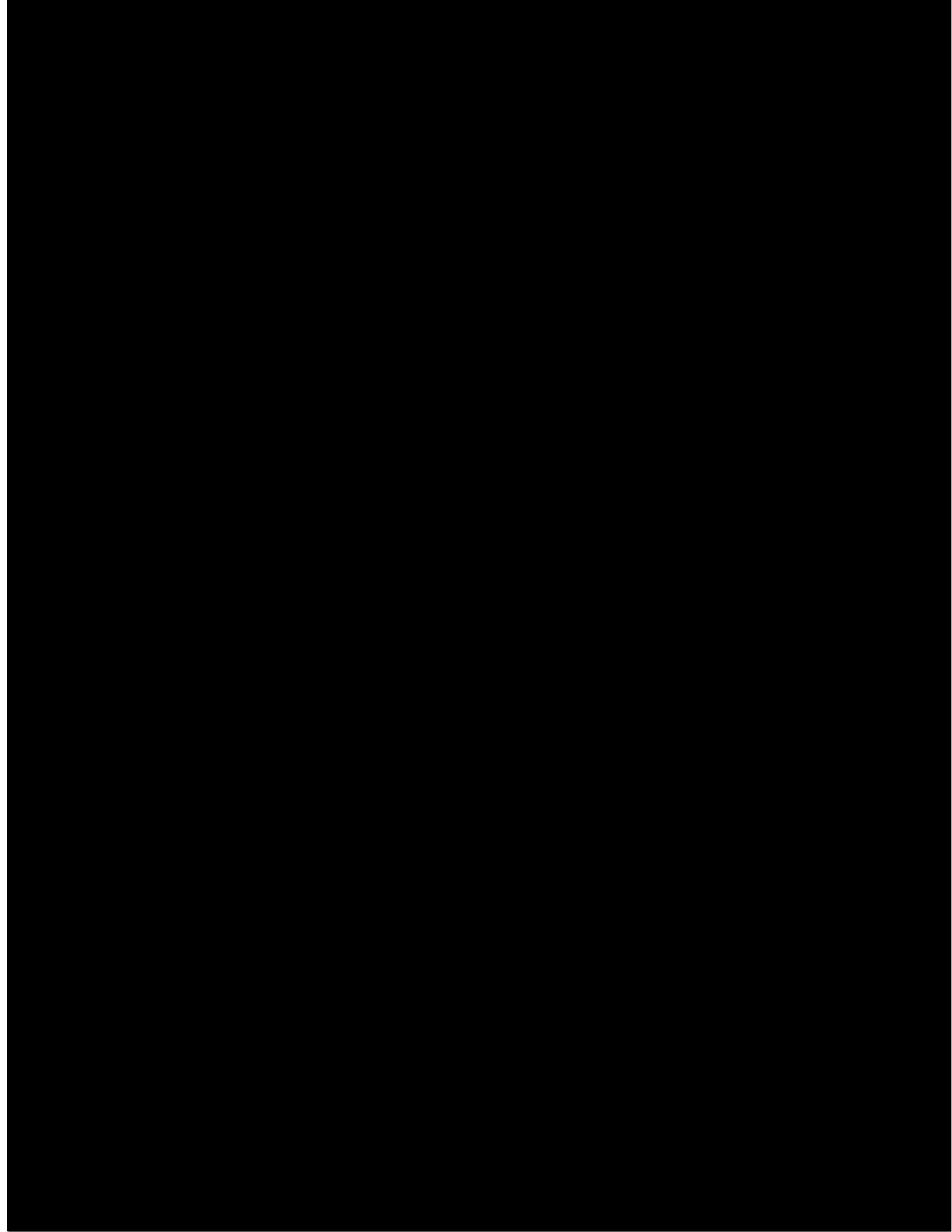
The third section focuses on the importance of regular financial reviews. It argues that businesses should conduct a thorough review of their financial statements at least once a month. This allows the owner to catch any discrepancies early and take corrective action. The text also mentions that regular reviews can help in forecasting future performance and adjusting the business strategy accordingly.

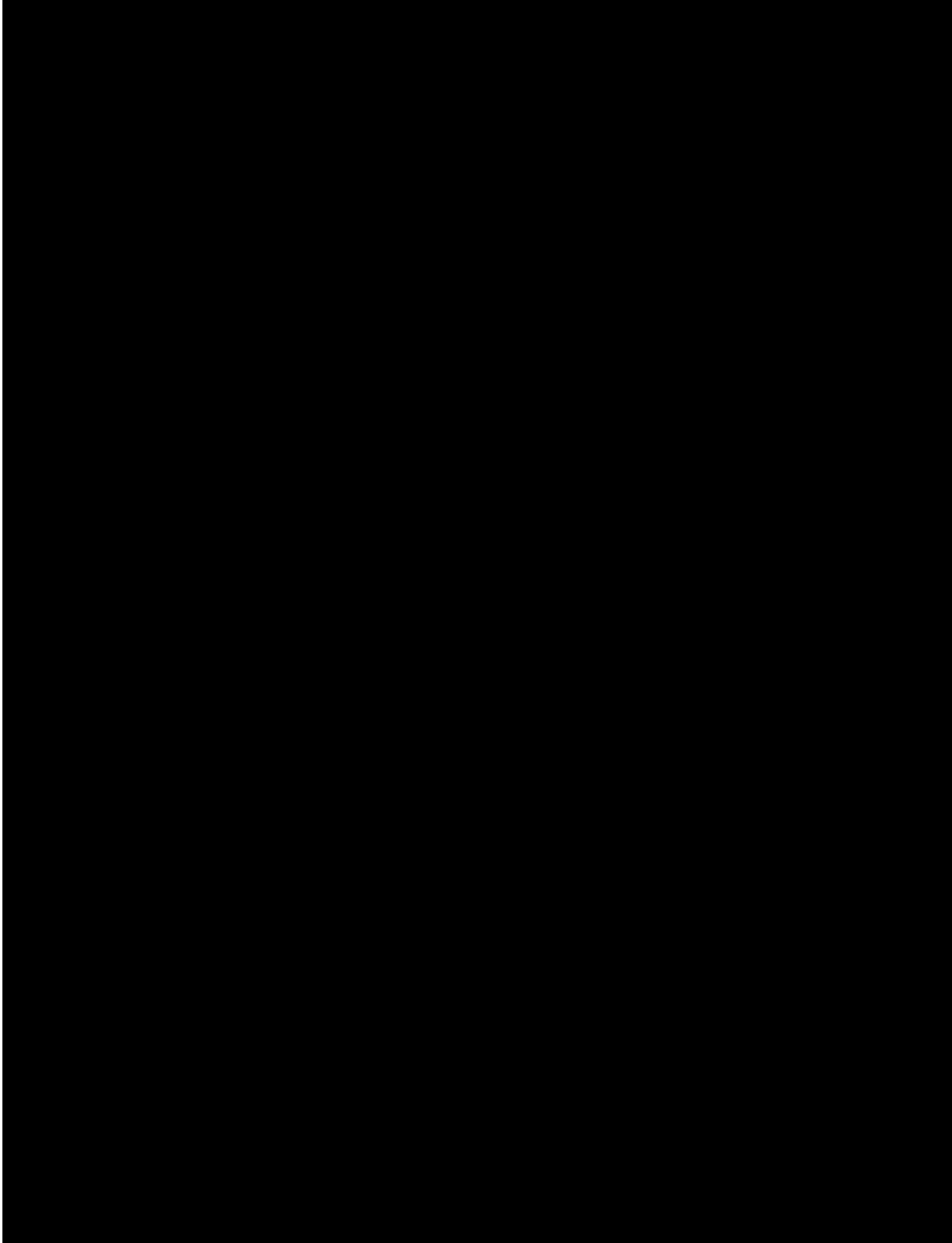
Finally, the document discusses the role of technology in modern accounting. It highlights how accounting software can streamline the record-keeping process, reduce the risk of errors, and provide real-time access to financial data. The author recommends that businesses invest in reliable accounting software to improve their financial management and overall operational efficiency.

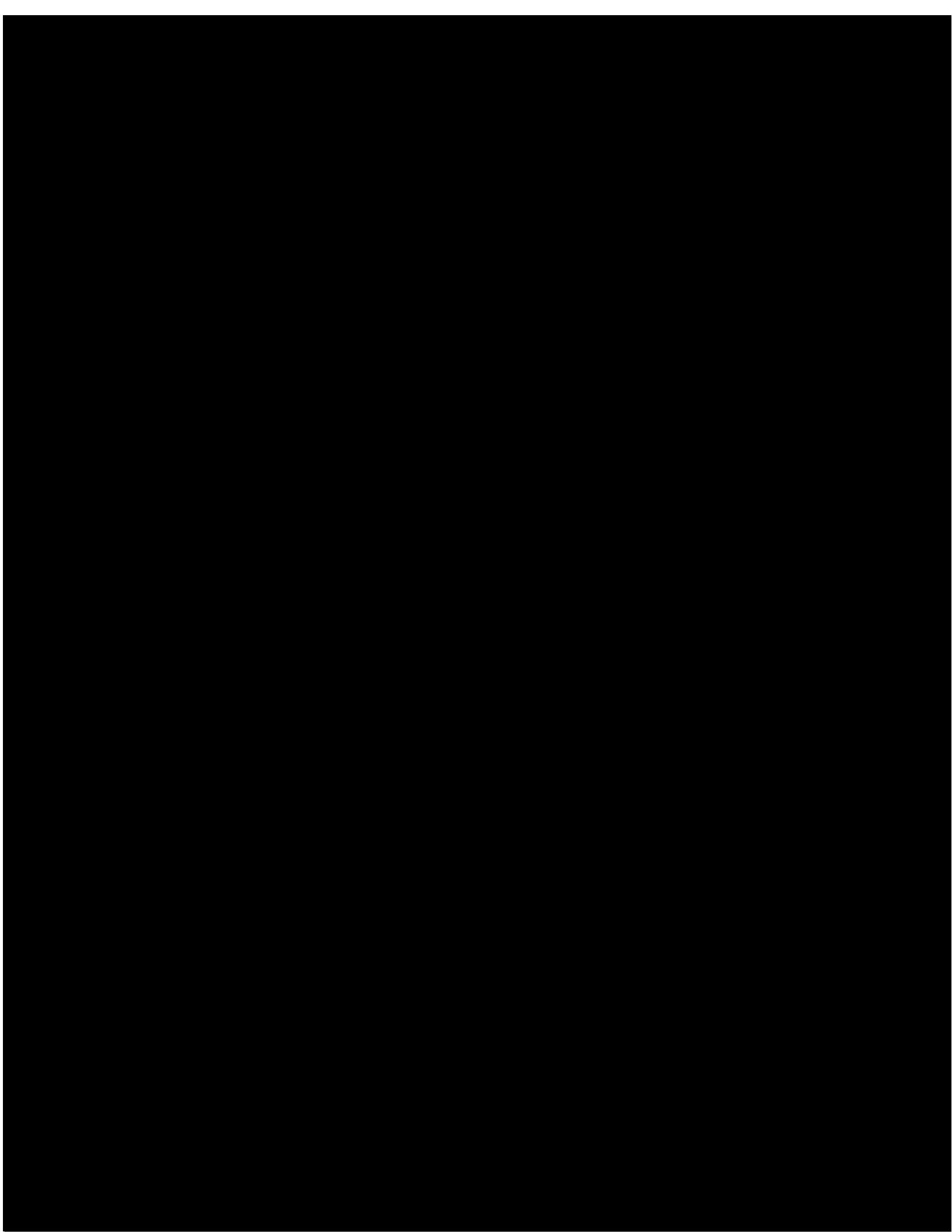


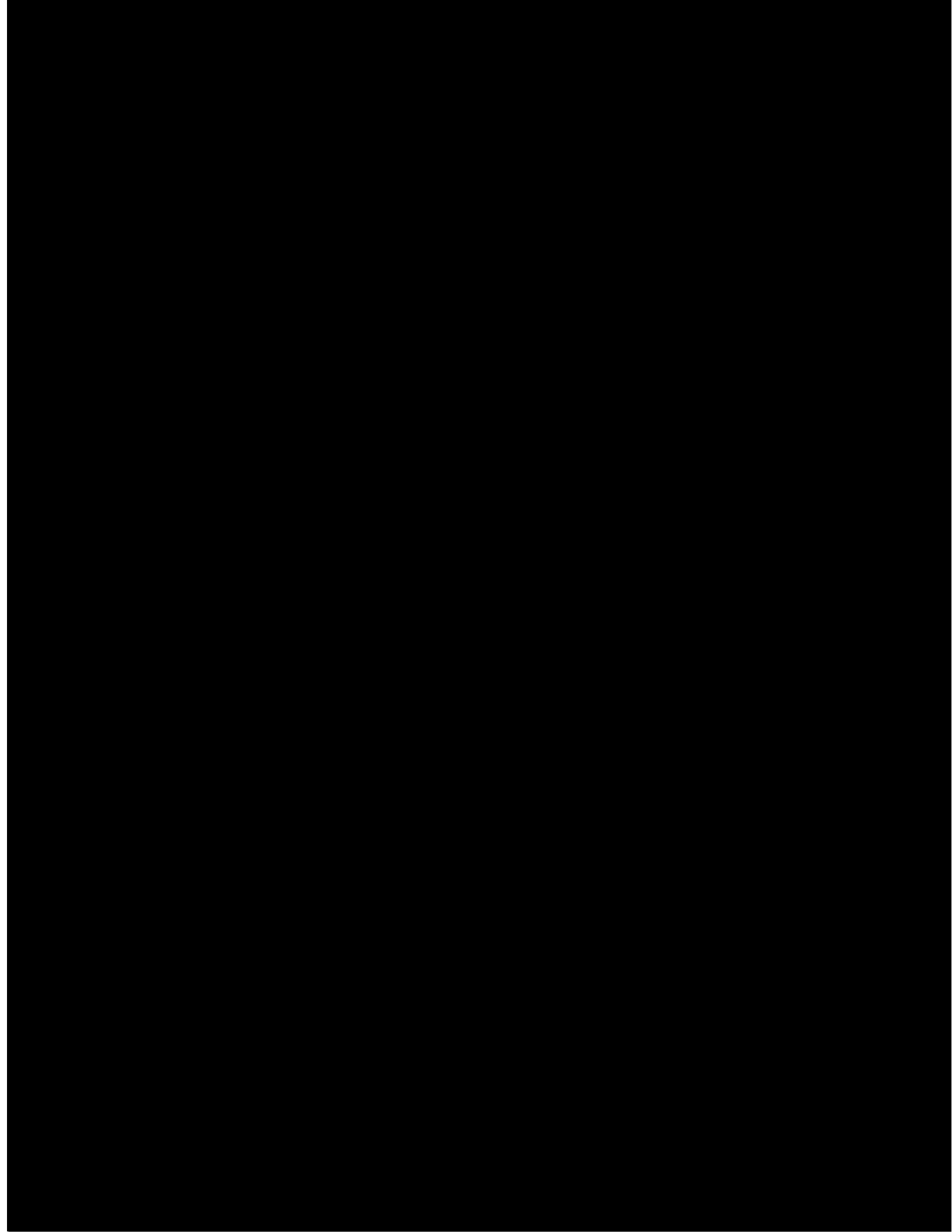


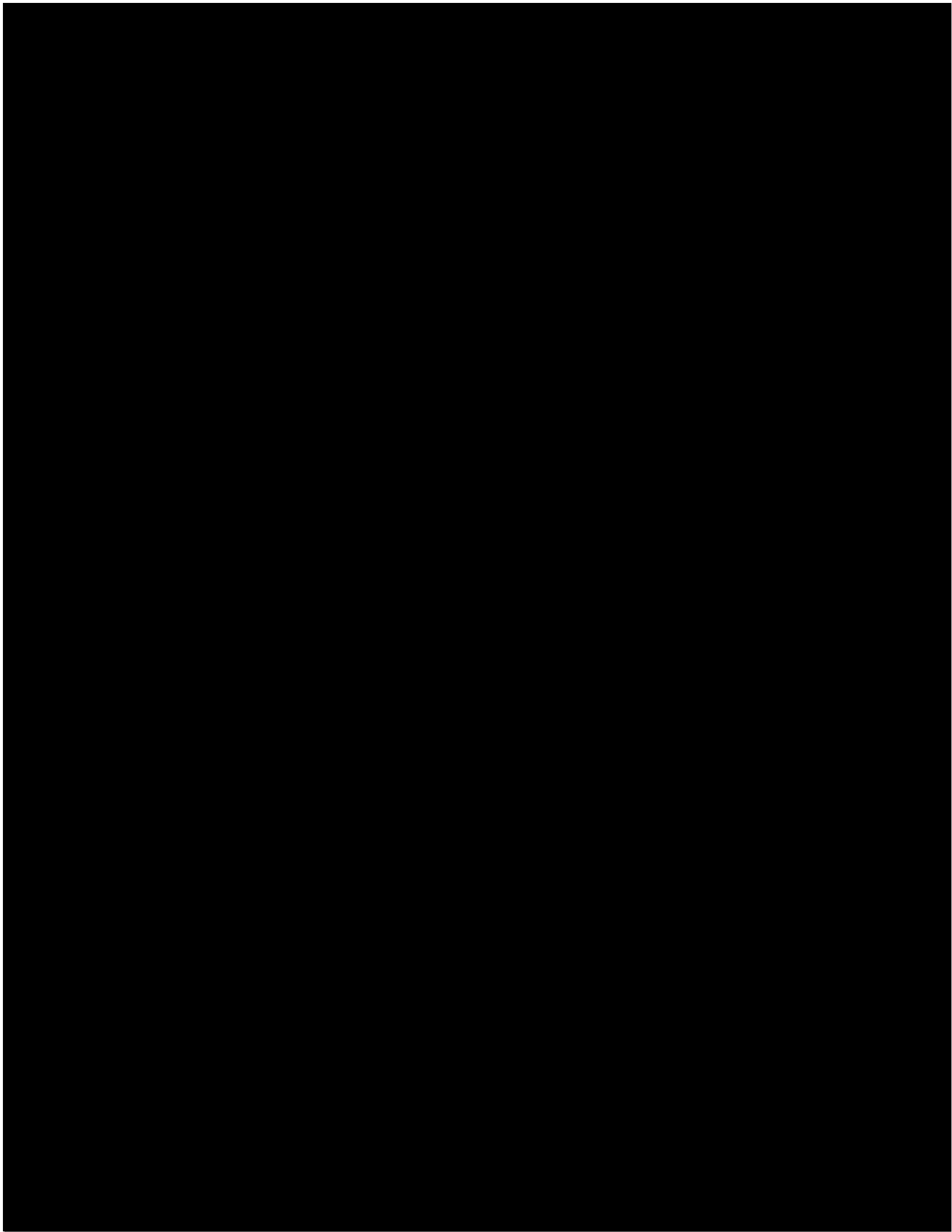


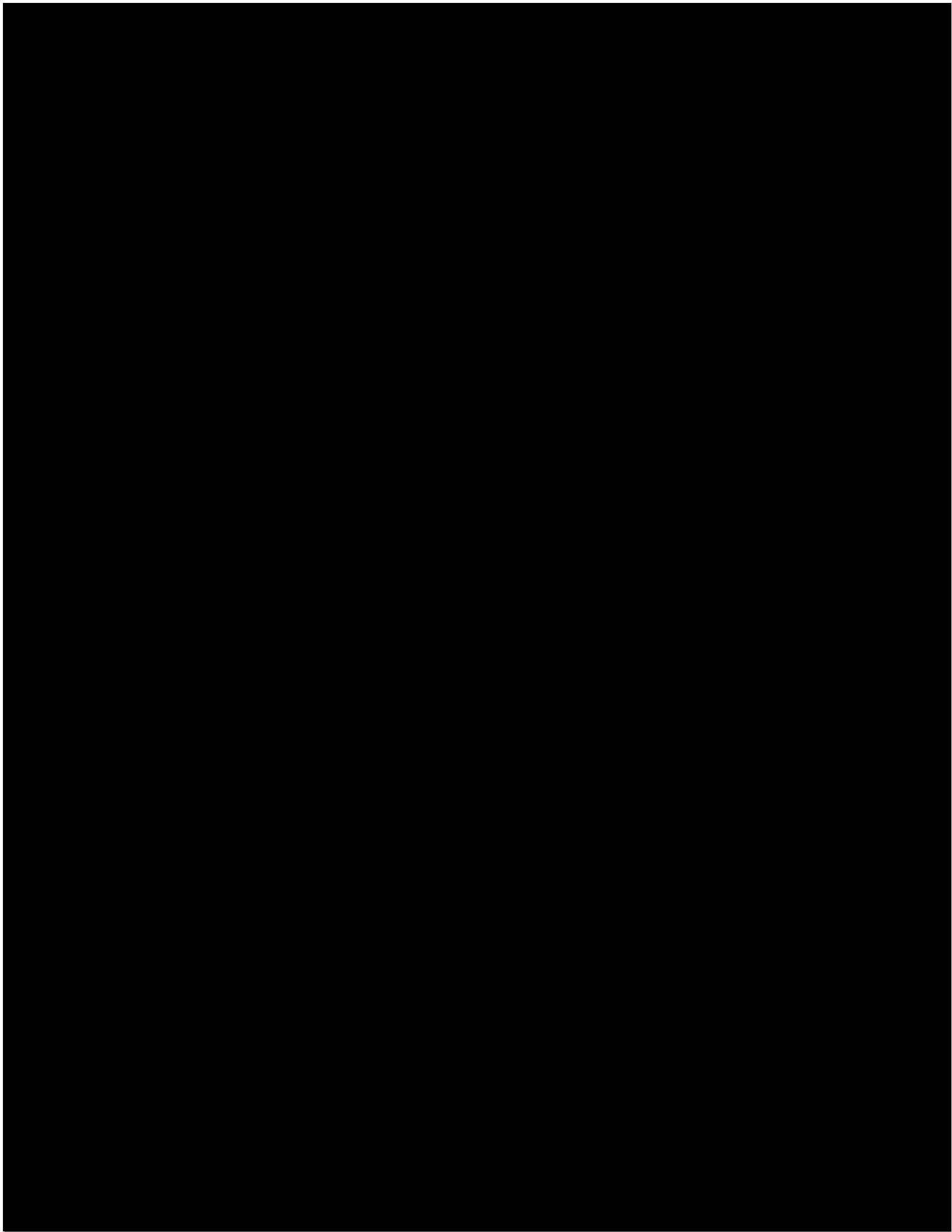


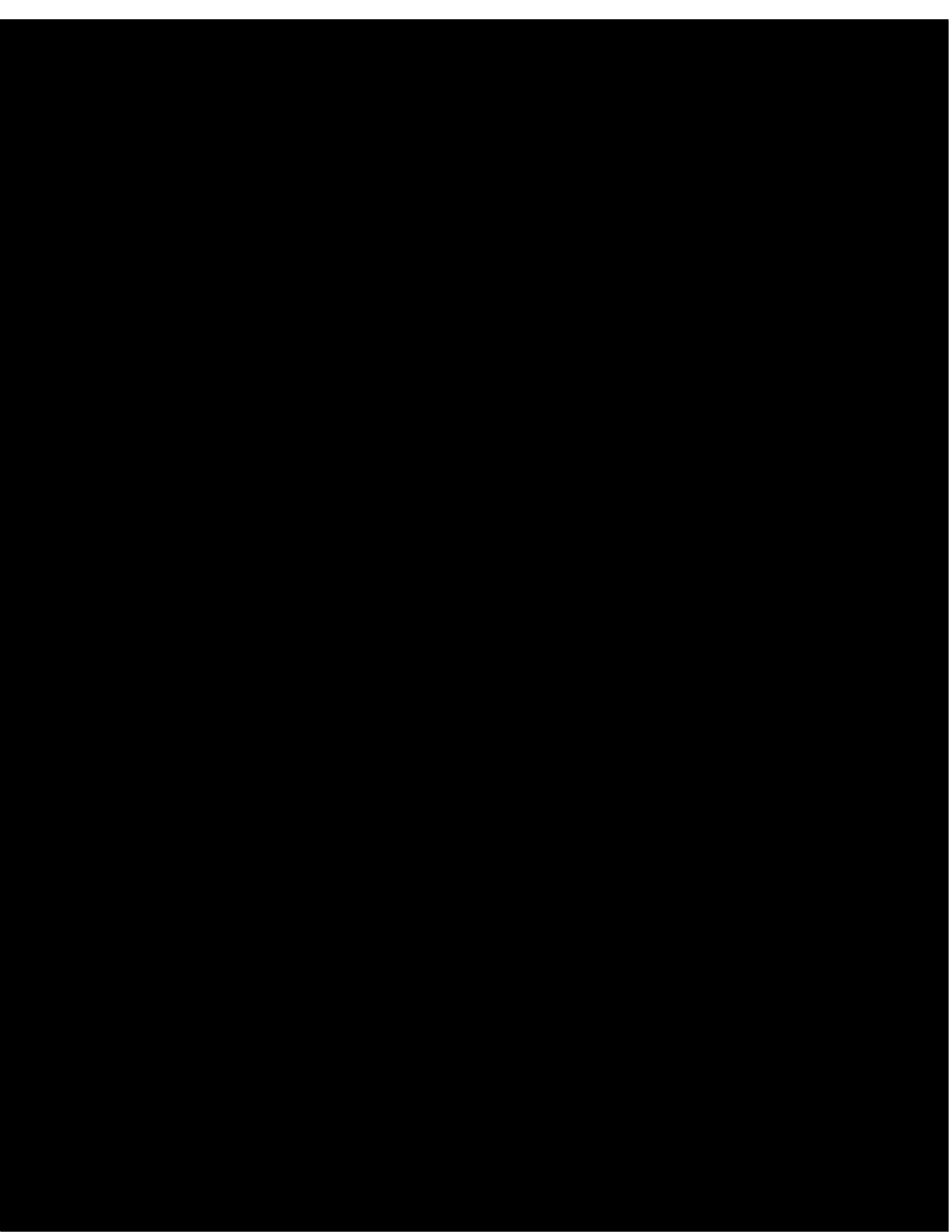


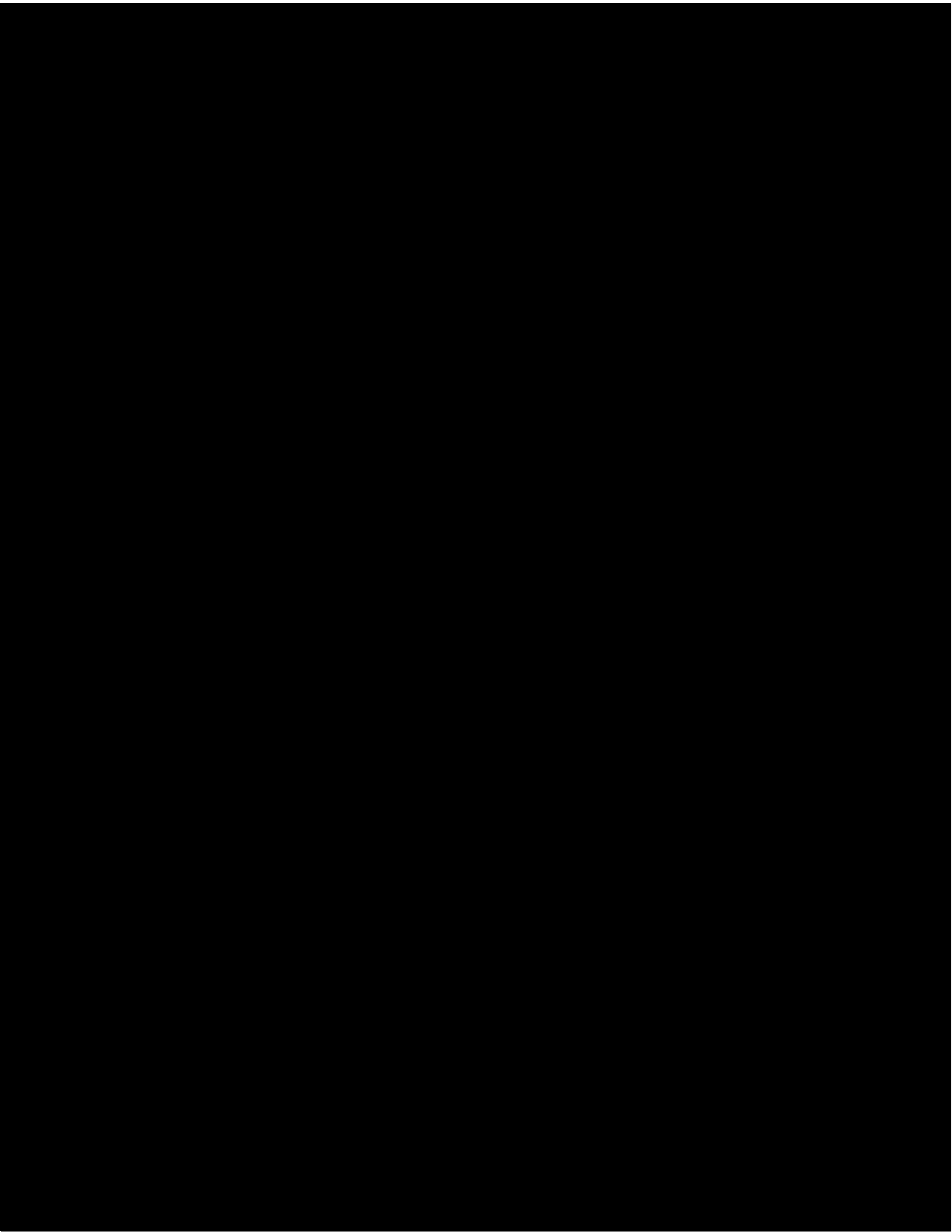


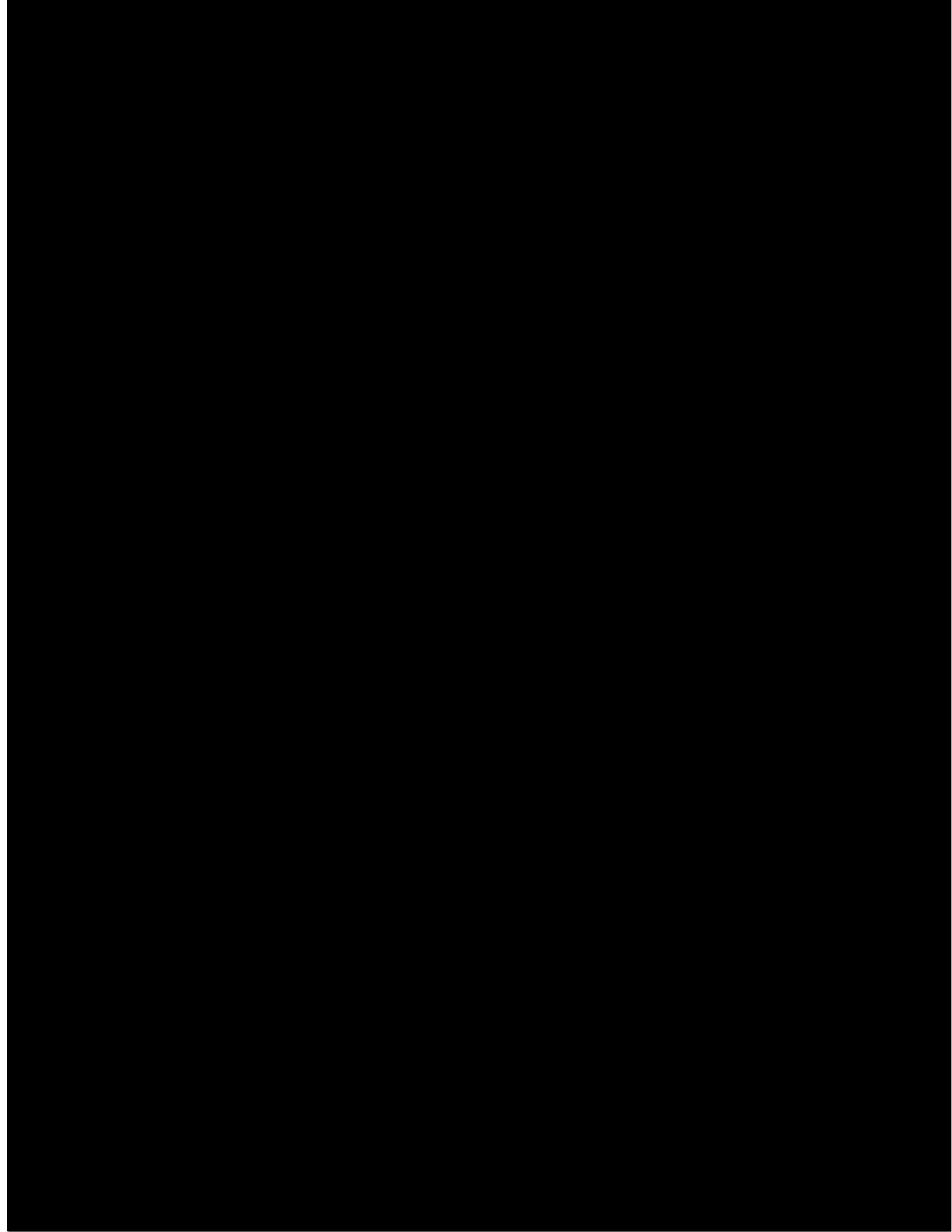


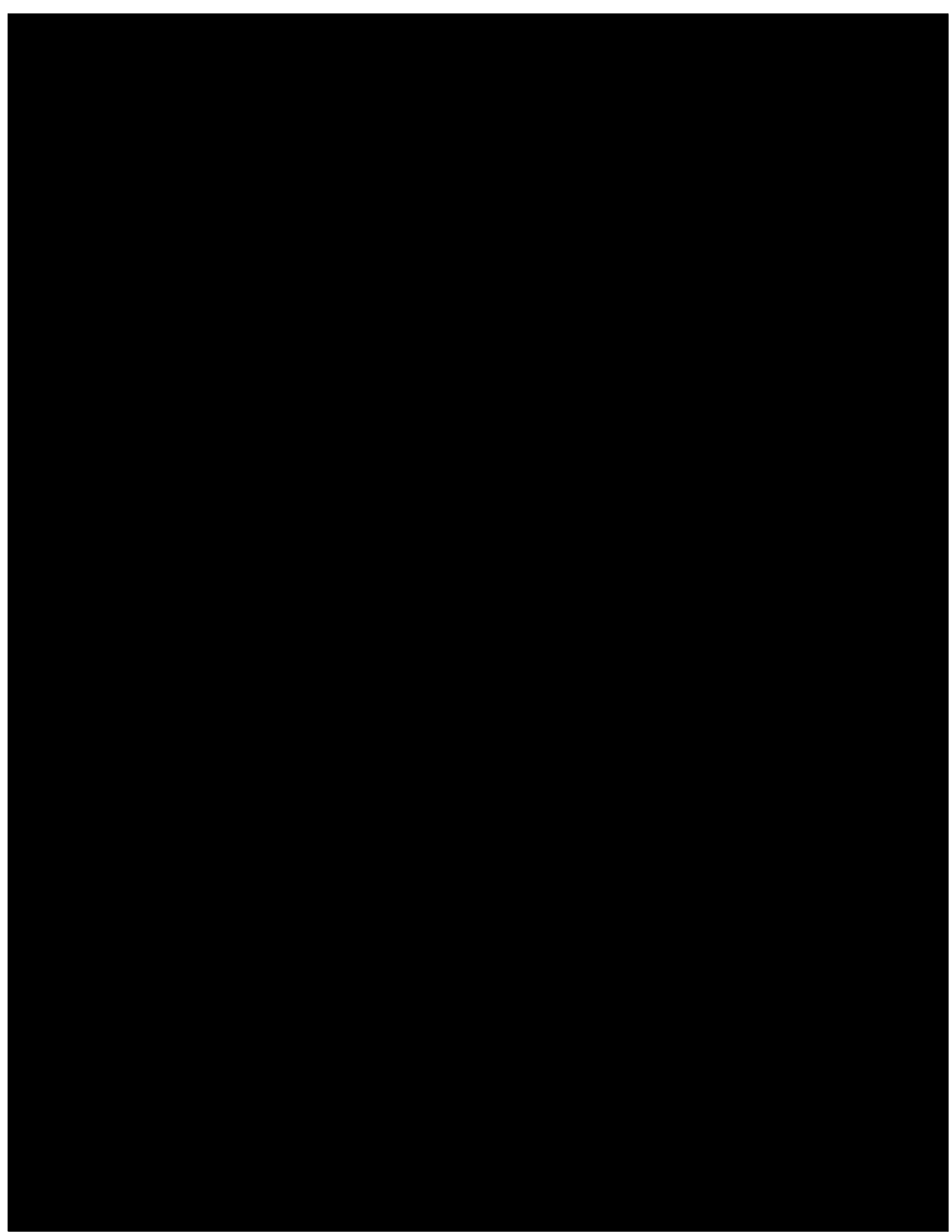


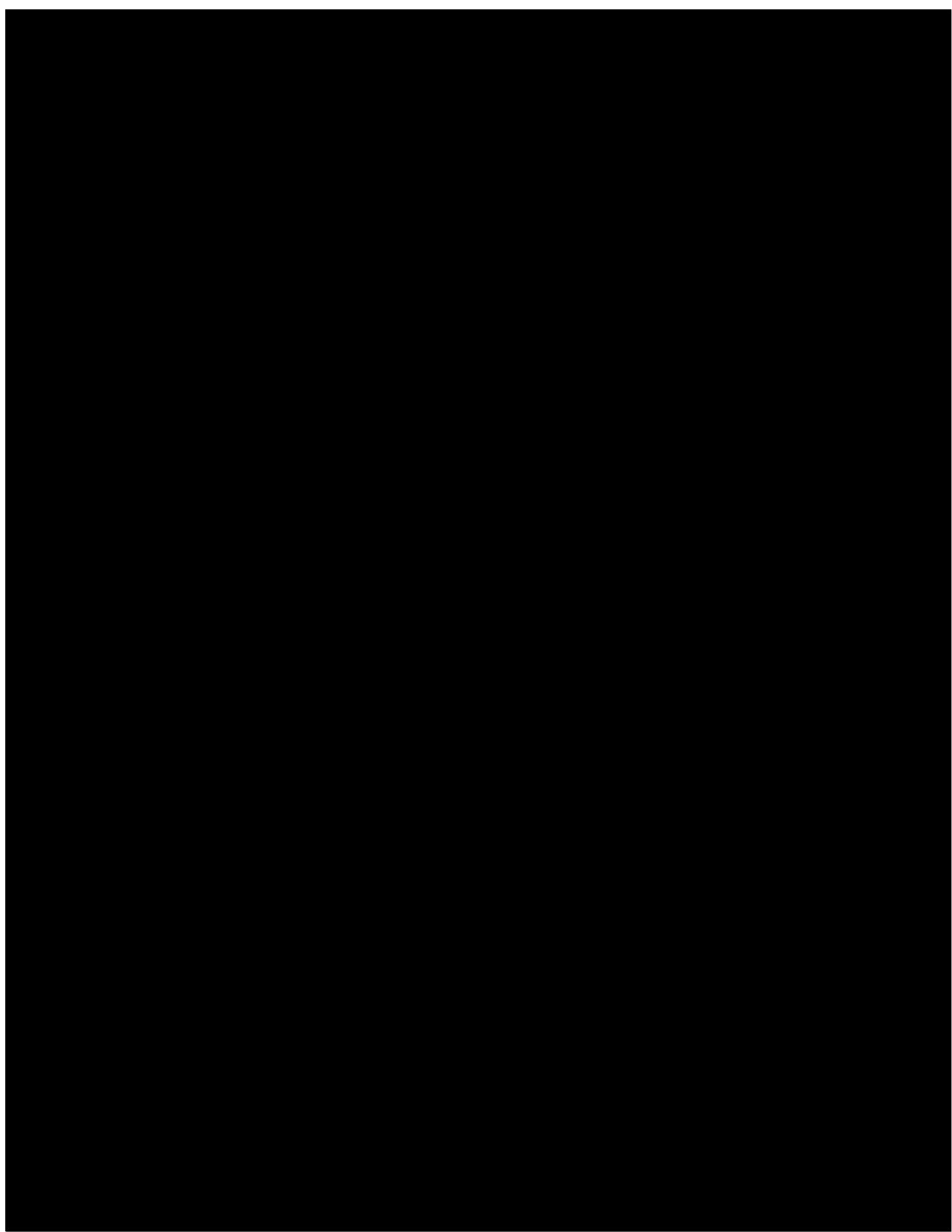


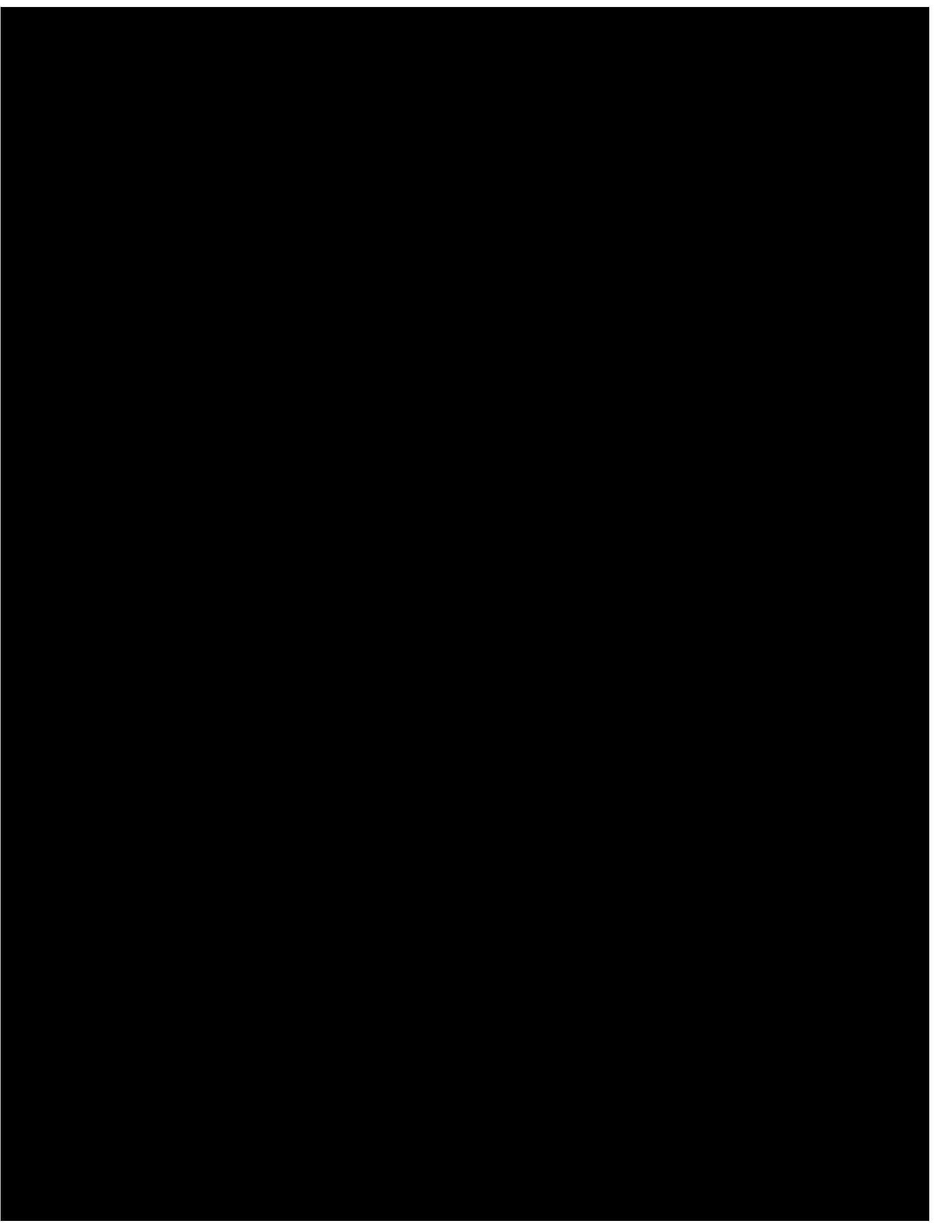


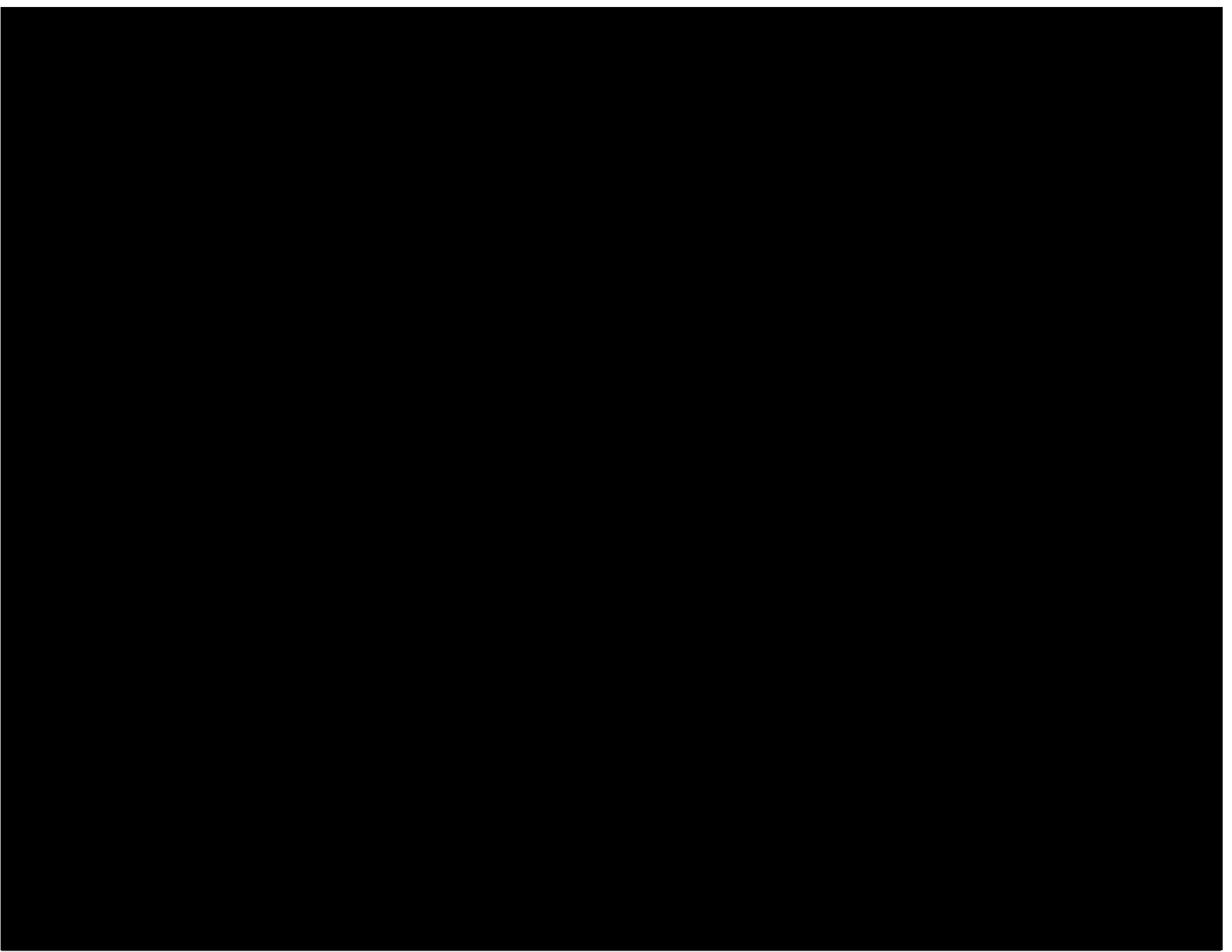




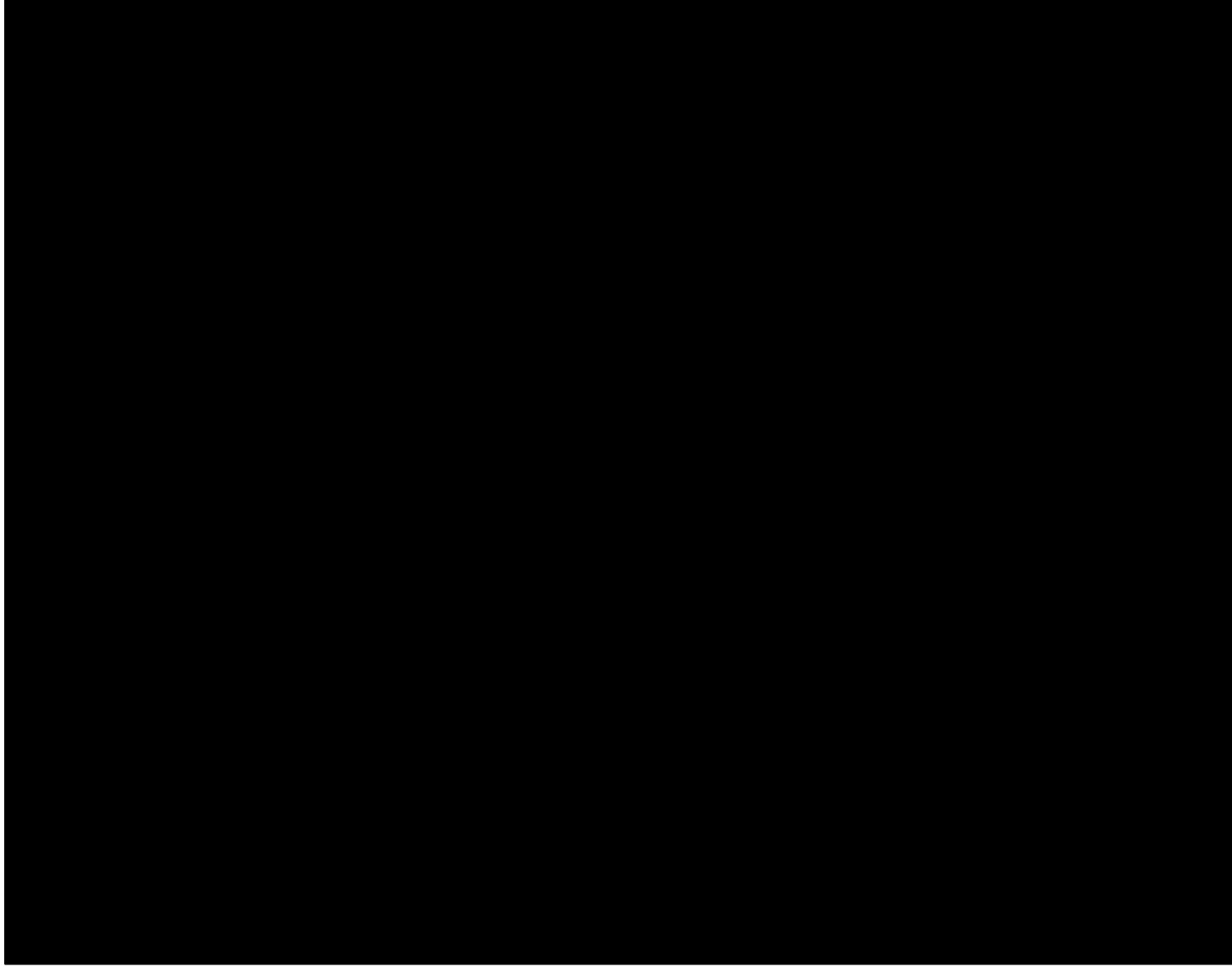




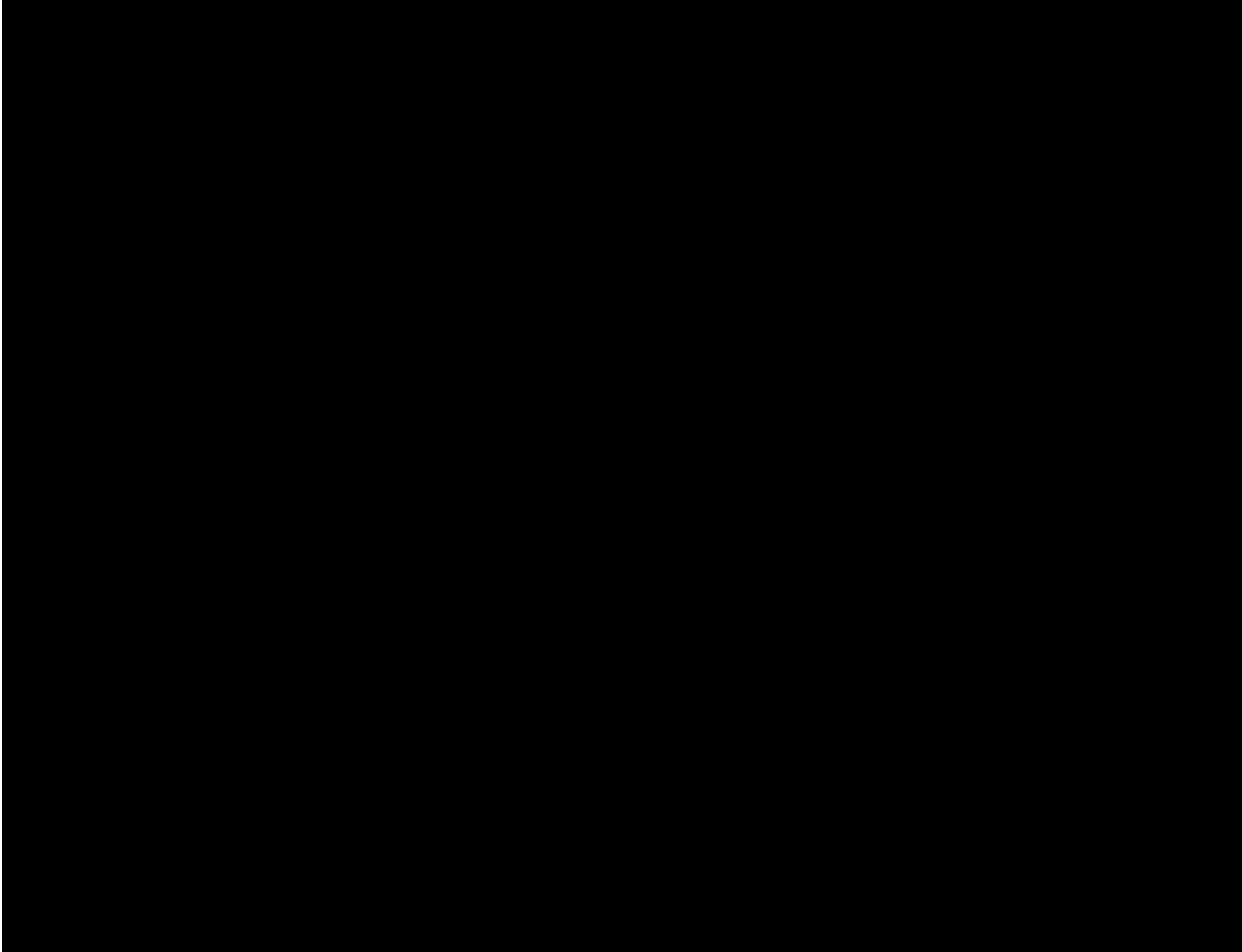


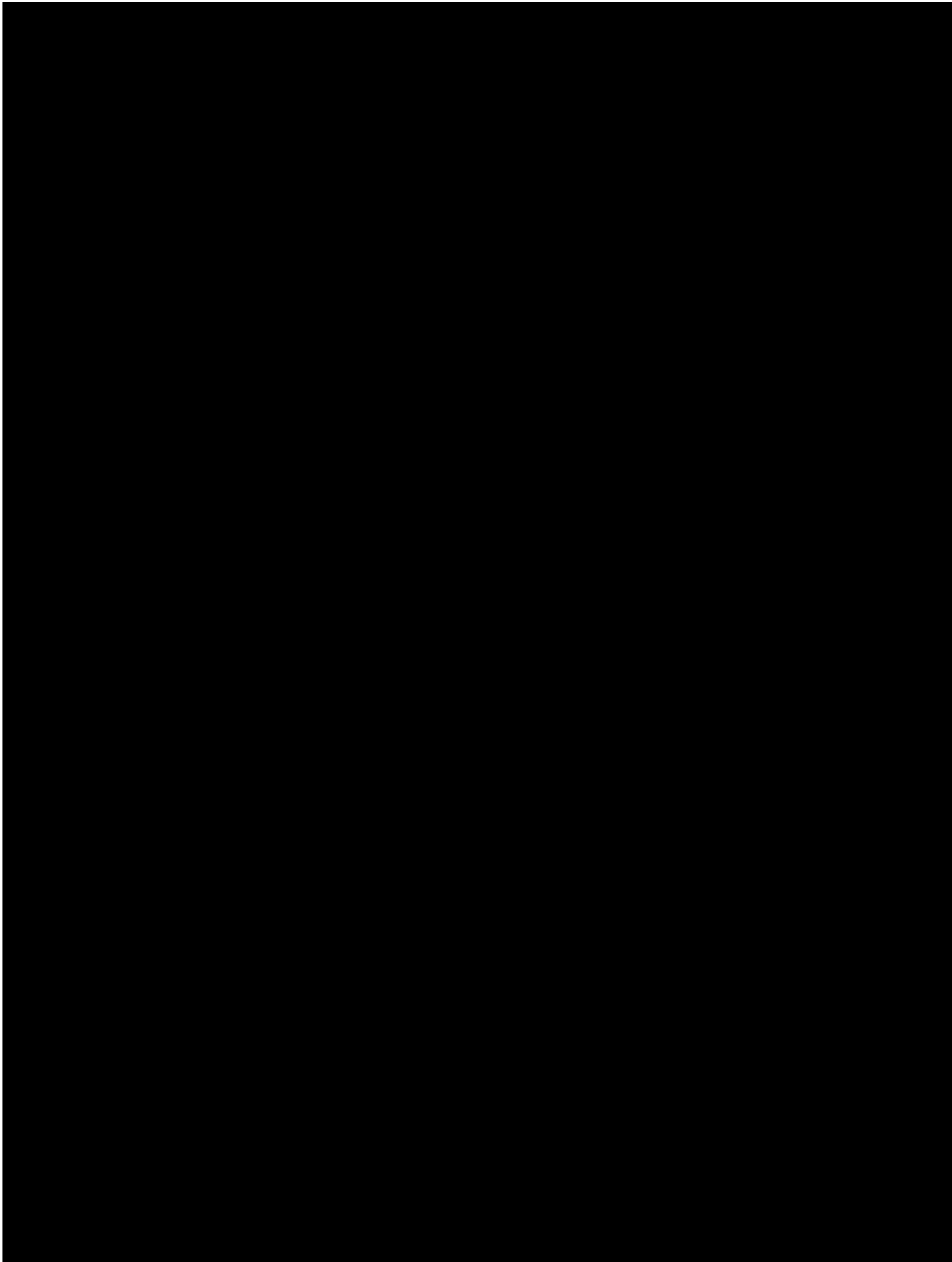


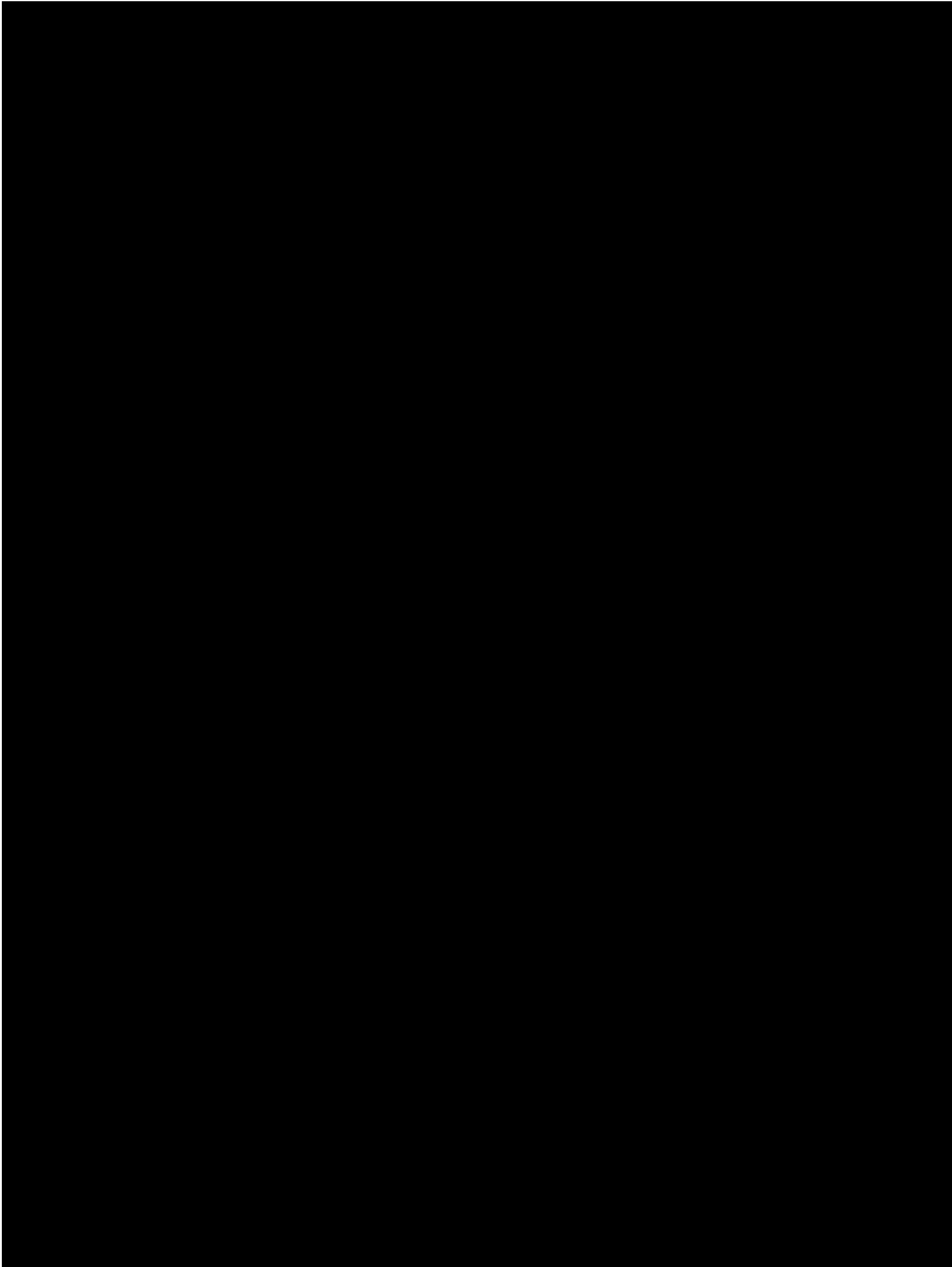


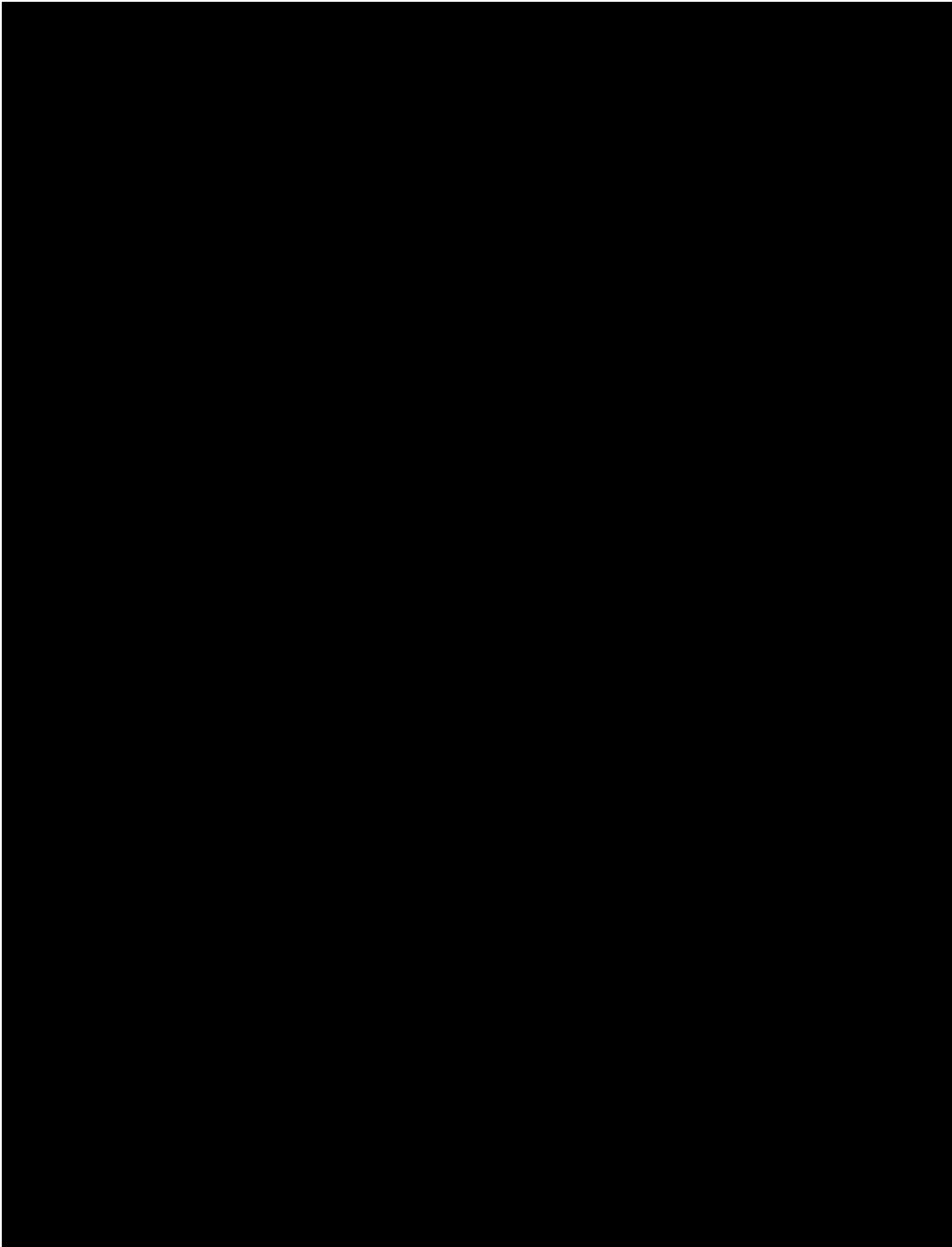










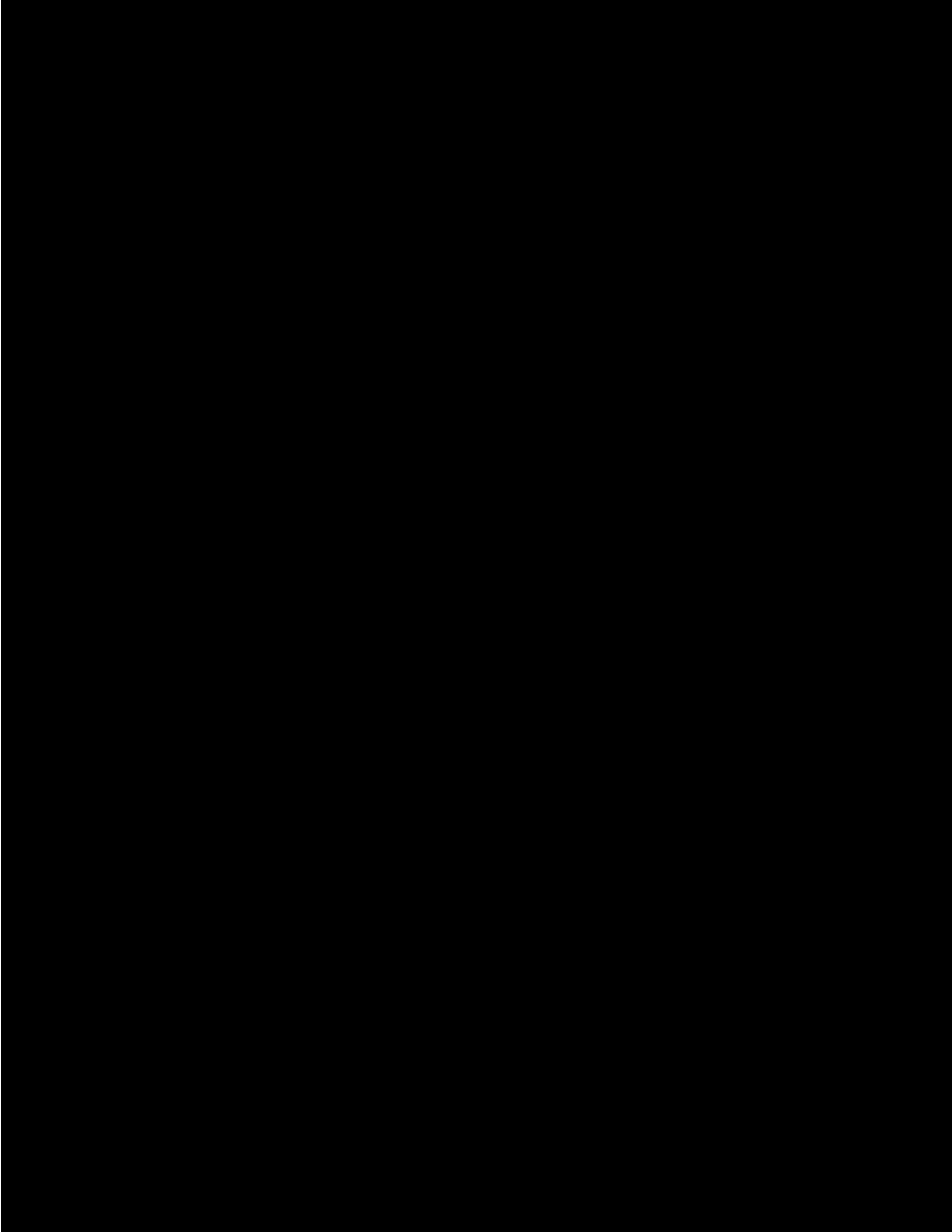


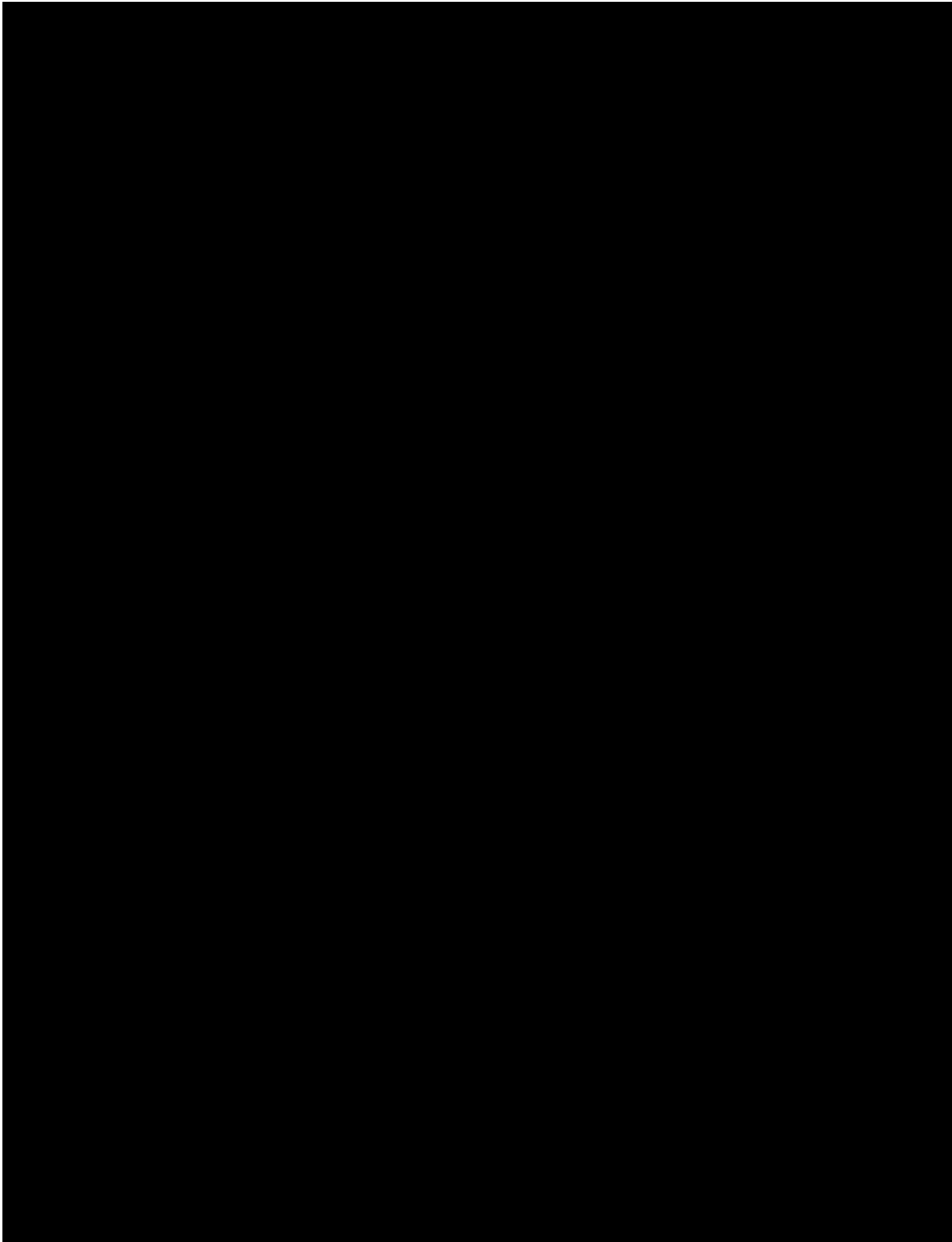
The first part of the document discusses the importance of maintaining accurate records in a business setting. It highlights how proper record-keeping can help in decision-making, legal compliance, and financial management. The text emphasizes that records should be organized, up-to-date, and easily accessible.

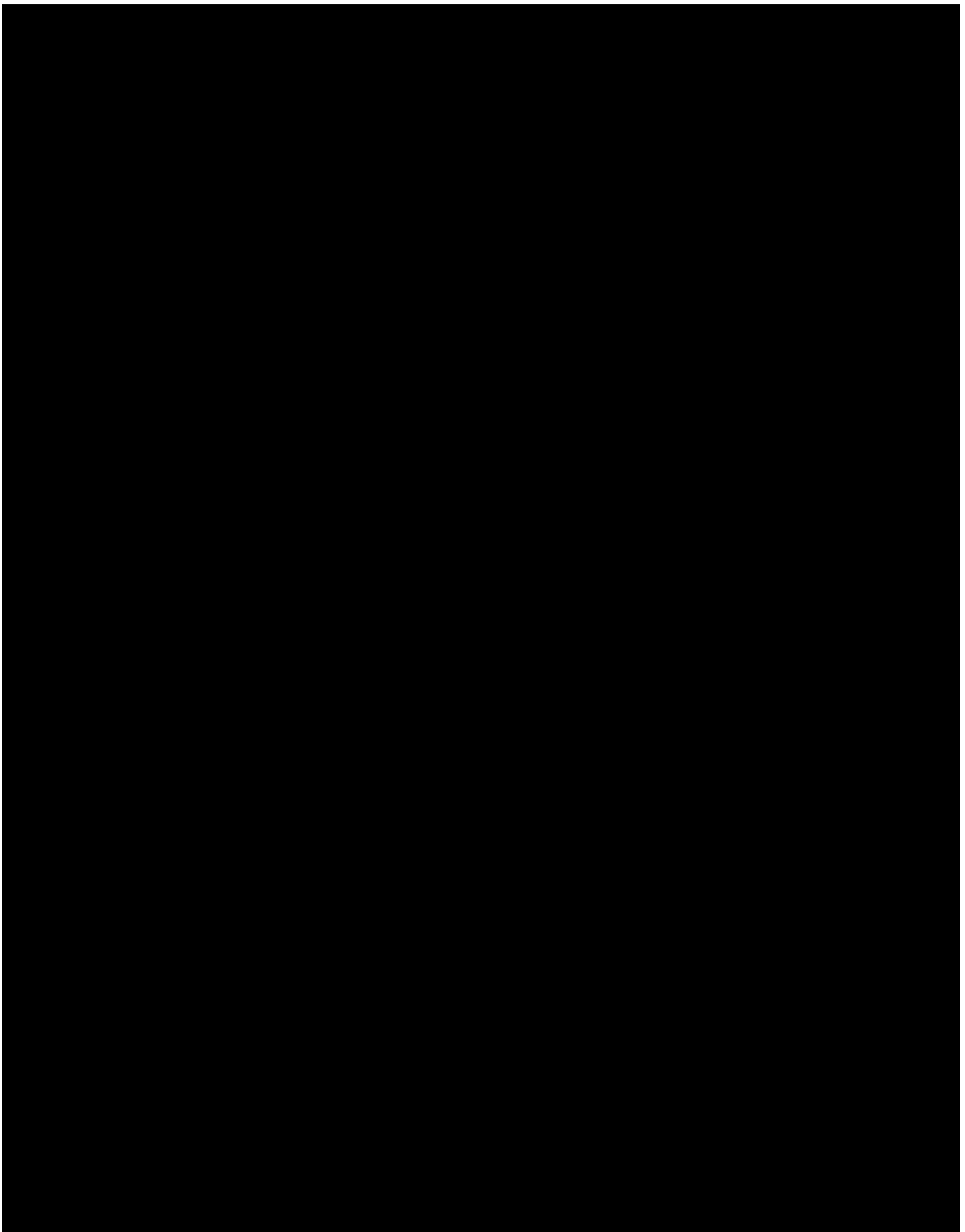
Next, the document addresses the challenges of data management in the digital age. It notes that while digital storage offers convenience, it also introduces risks such as data loss, security breaches, and information overload. Solutions like cloud storage, encryption, and regular backups are suggested to mitigate these risks.

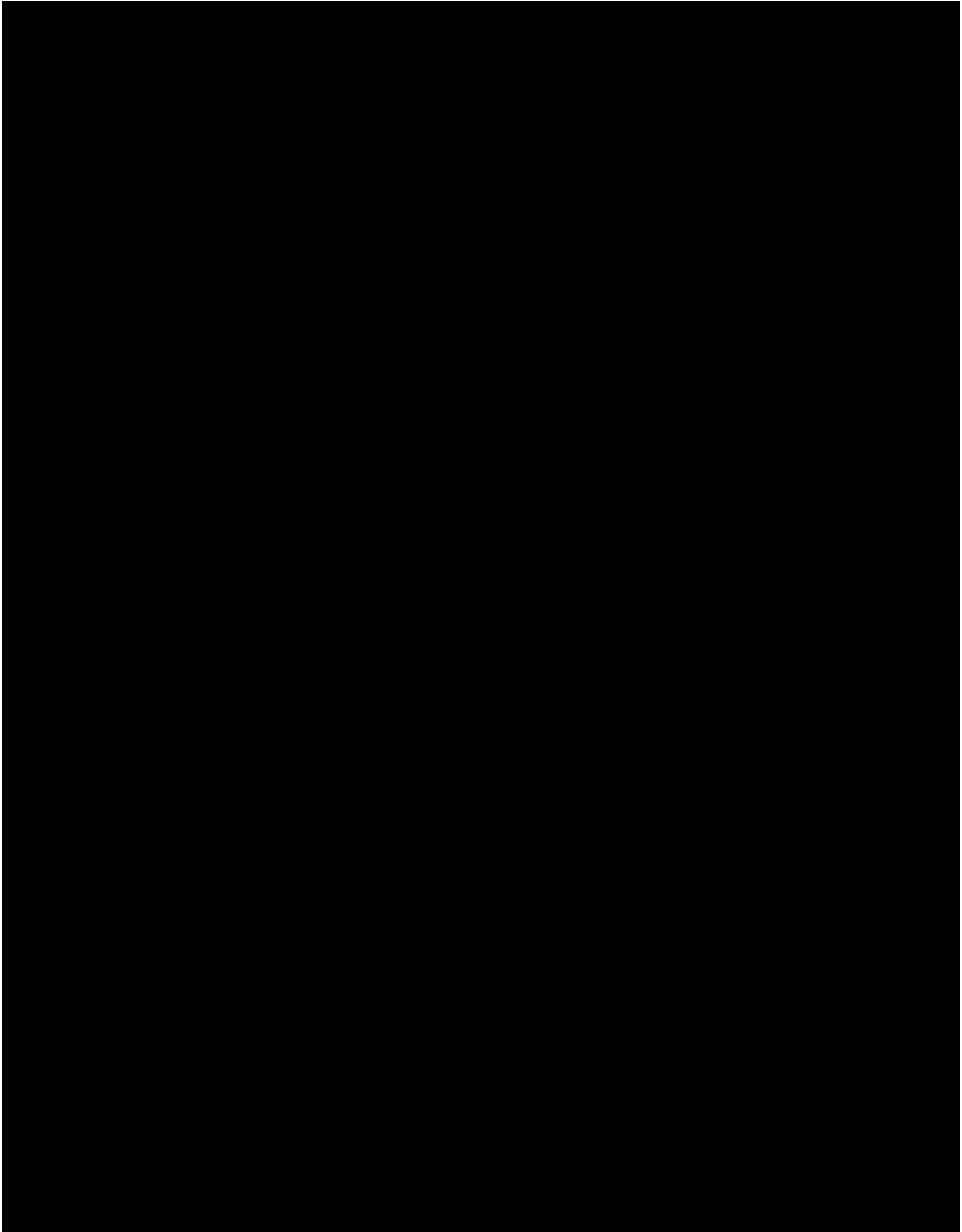
The third section focuses on the role of technology in streamlining business processes. It describes how automation and software tools can reduce manual errors, save time, and improve overall efficiency. Examples include using accounting software for invoicing and project management tools for task delegation.

Finally, the document concludes by stressing the importance of employee training and awareness. It suggests that investing in education and providing clear guidelines can ensure that all staff members understand the correct procedures for handling data and records, leading to a more professional and organized business environment.







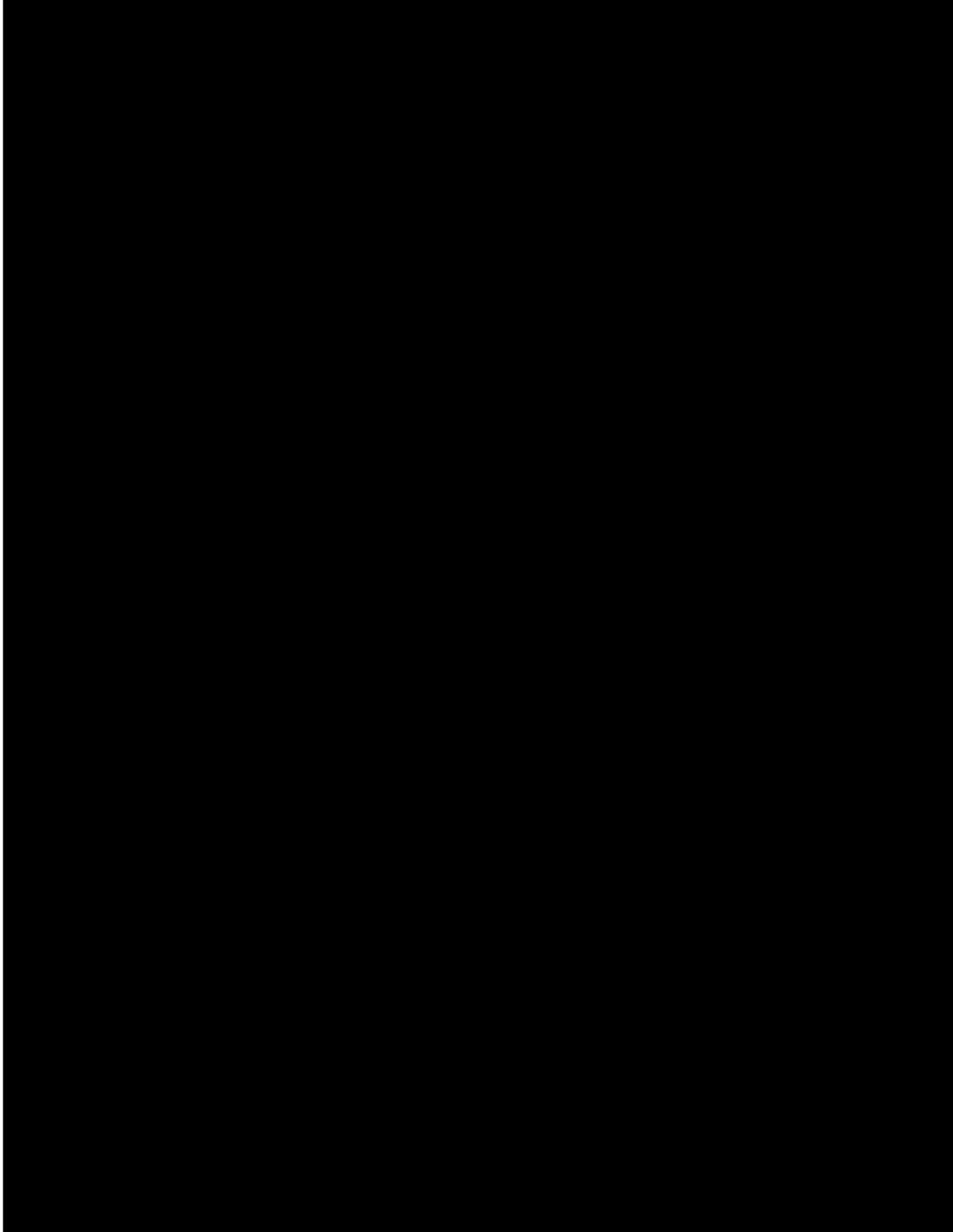


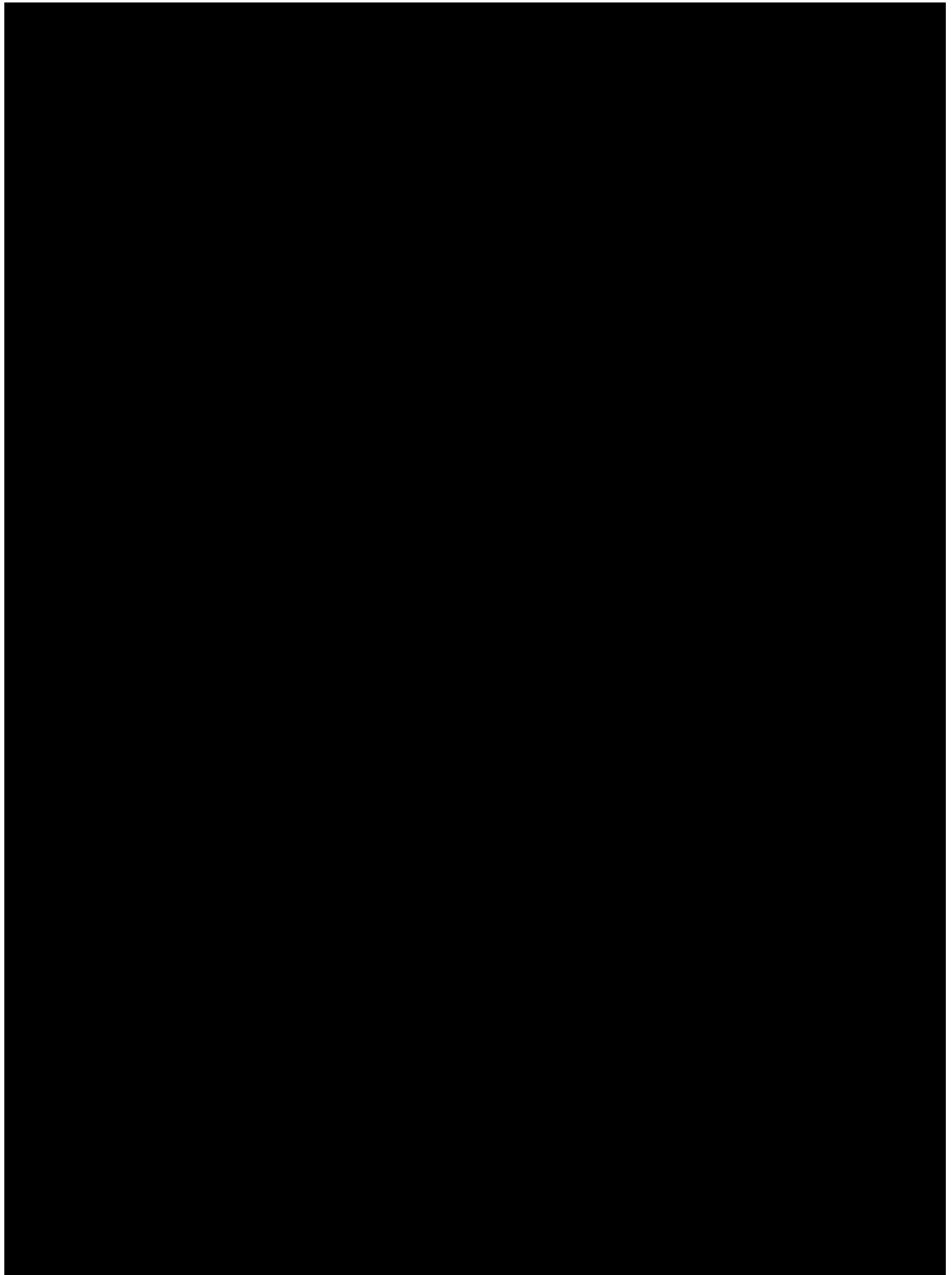
...and the other side of the mountain, the mountainside was covered in a dense forest of tall, thin trees, their branches reaching up towards the sky. The forest was so thick that it seemed like a wall of green, and the only sound that could be heard was the rustling of leaves and the chirping of birds. The sun was shining brightly, and the air was warm and pleasant. It was a beautiful day, and the view was truly breathtaking.

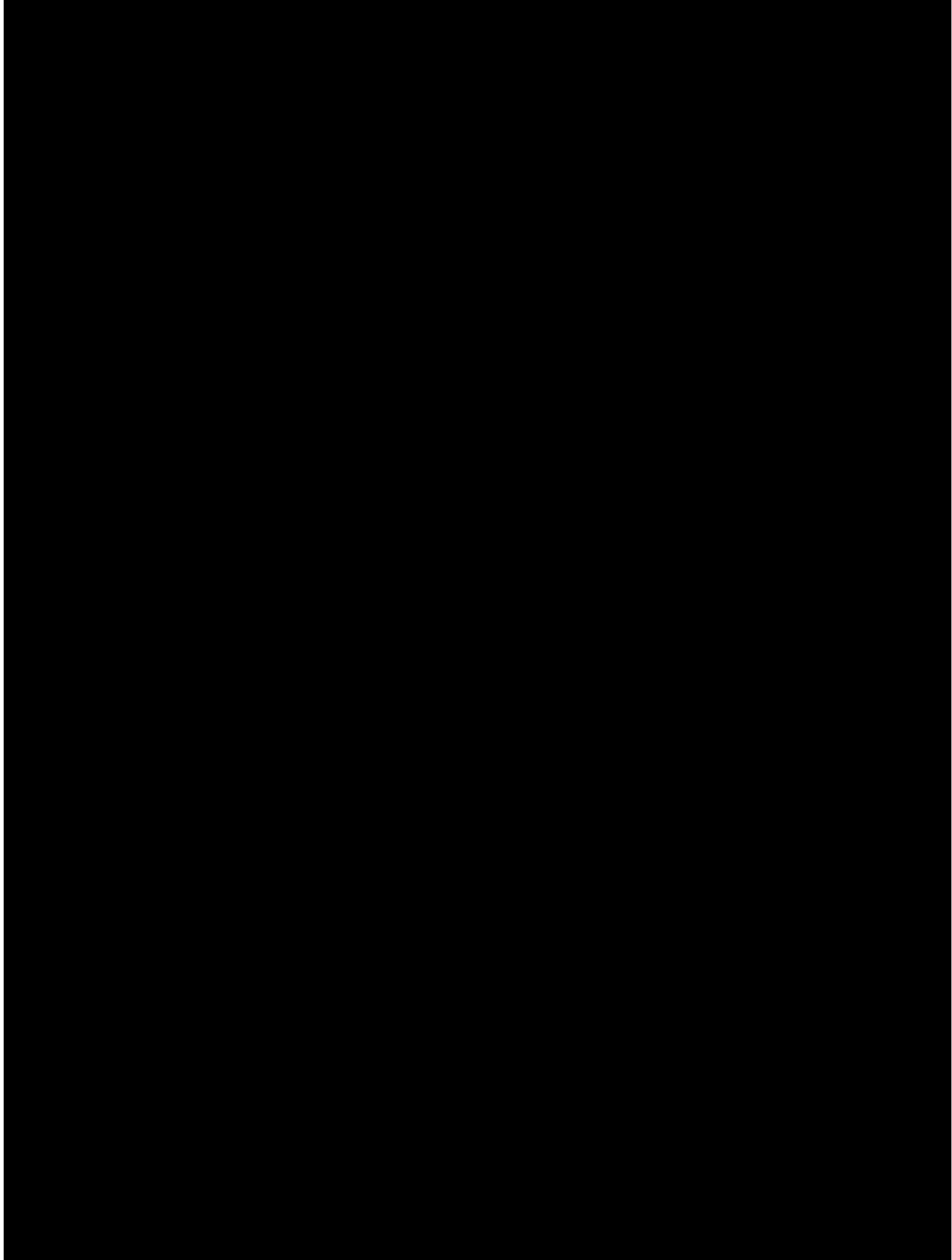
As they walked through the forest, they noticed many small details that they had never noticed before. There were small streams of water flowing through the trees, and the ground was covered in a thick layer of fallen leaves and twigs. The trees were so tall and thin that they seemed like sentinels, standing guard over the forest. The air was so fresh and clean that it felt like they were breathing life. It was a magical experience, and they were both in awe of the beauty of the world around them.

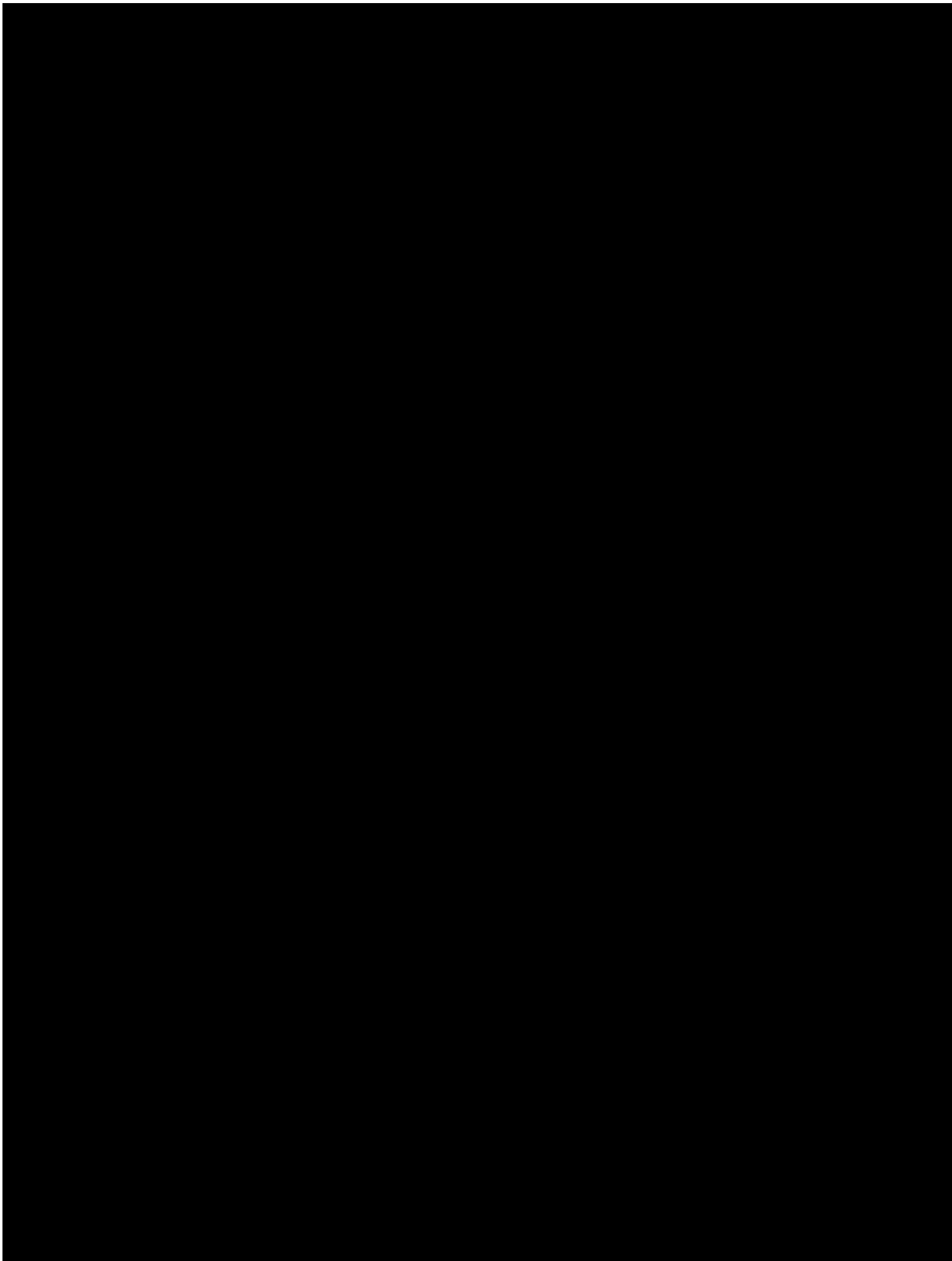
They continued to walk through the forest, and the sun began to set. The sky was a beautiful mix of orange, red, and purple, and the trees were silhouetted against the bright colors. The forest was so quiet now that they could hear the sound of their own breathing. They were both feeling a sense of peace and tranquility, and they knew that this was a special moment in their lives. They had found a place where they could truly relax and enjoy the beauty of the world.

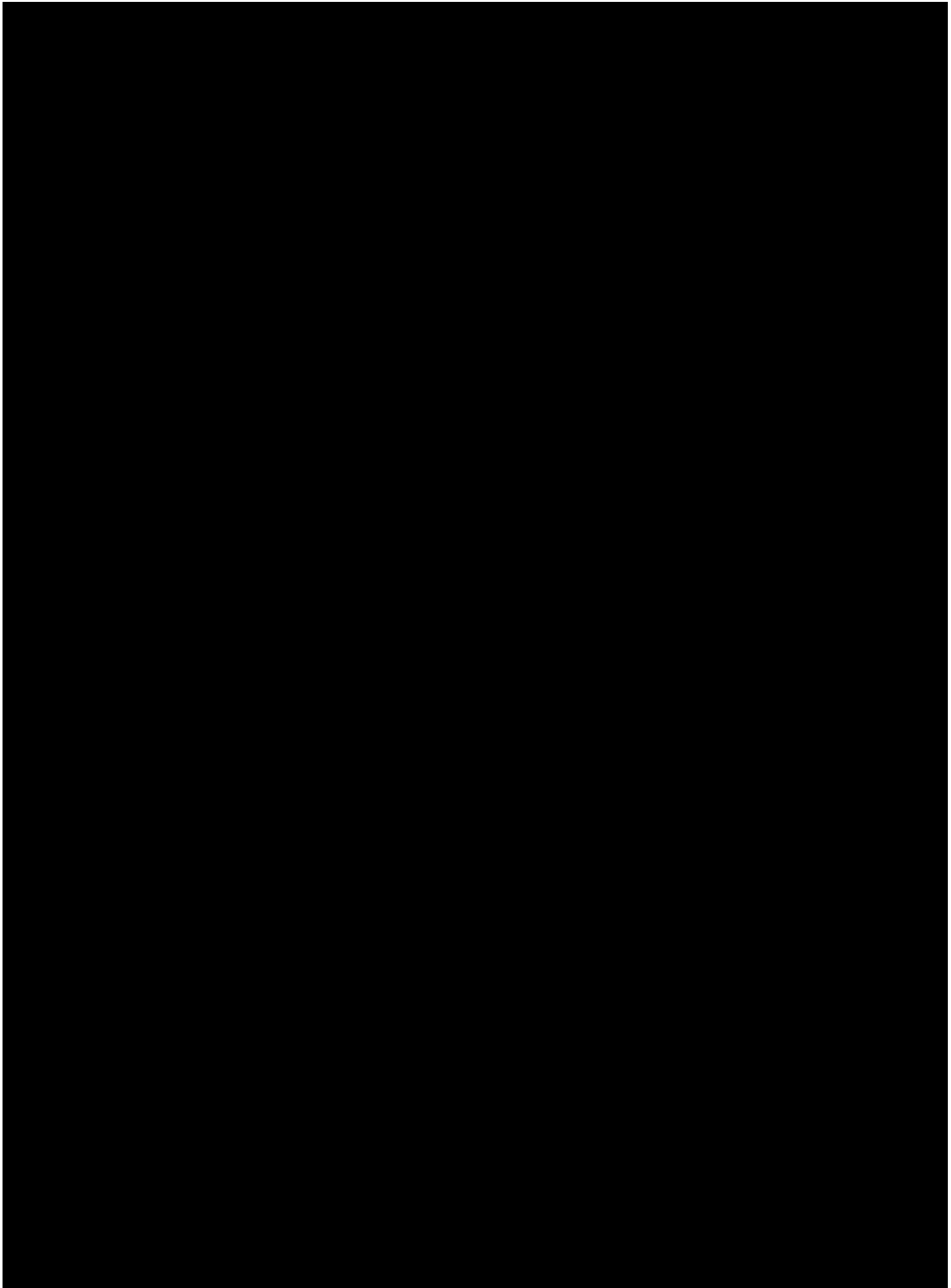
As they walked away from the forest, they looked back over their shoulders and saw the forest in a new light. The trees were no longer just a wall of green, but a world of their own. They had discovered a hidden gem, a place where they could find peace and tranquility. They were both so happy and grateful for what they had found, and they knew that they would never forget this day. It was a truly magical experience, and they were both in awe of the beauty of the world around them.

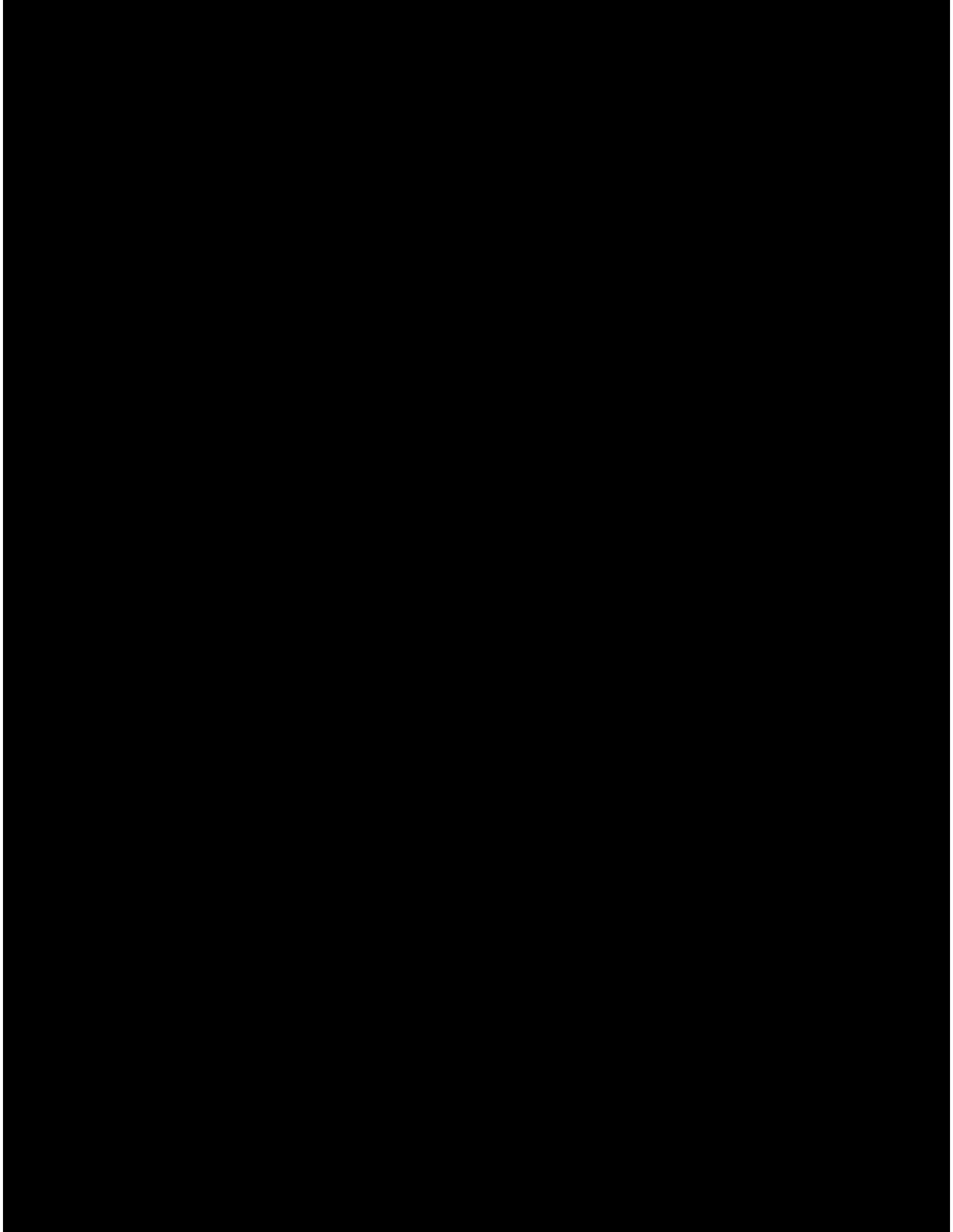


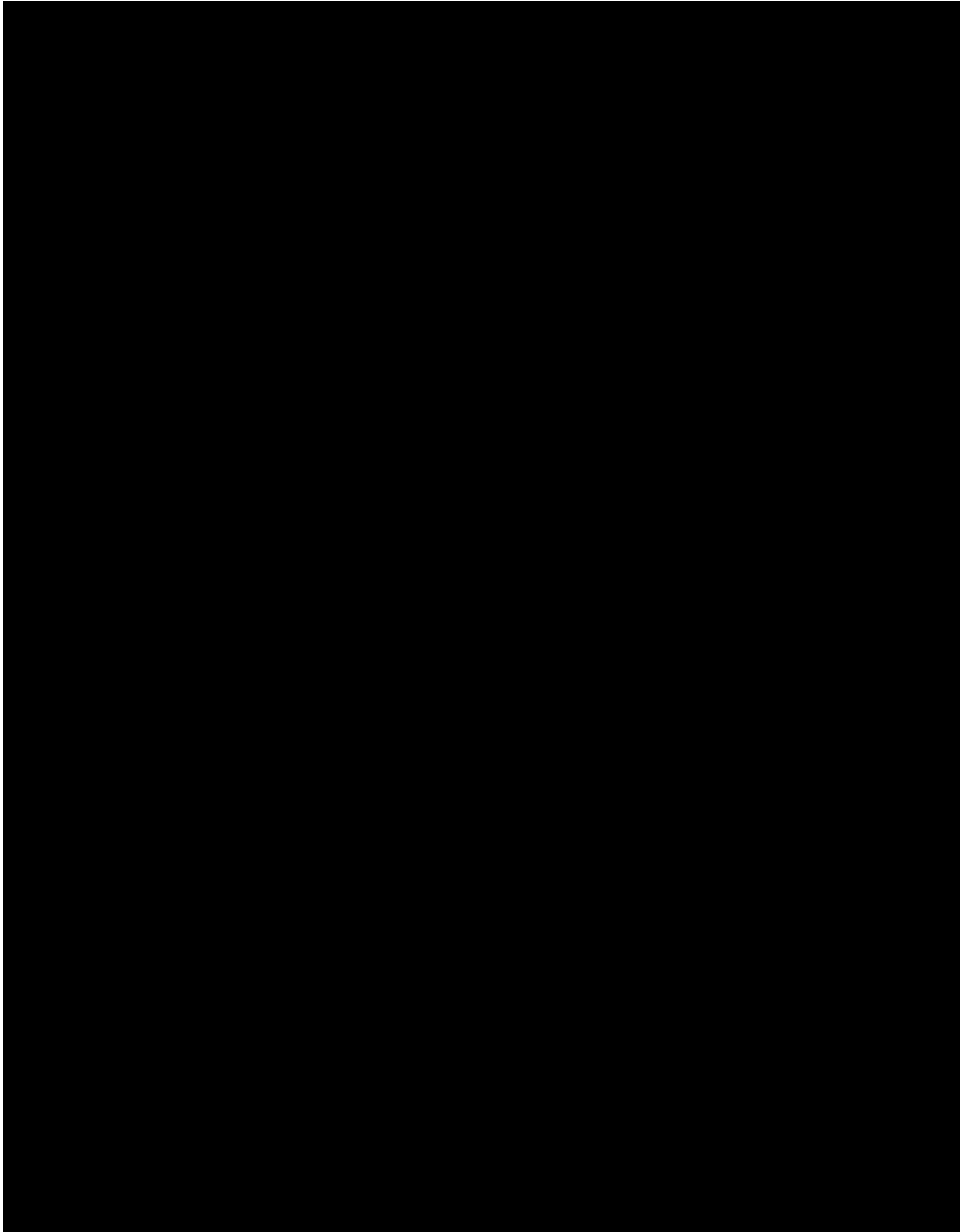


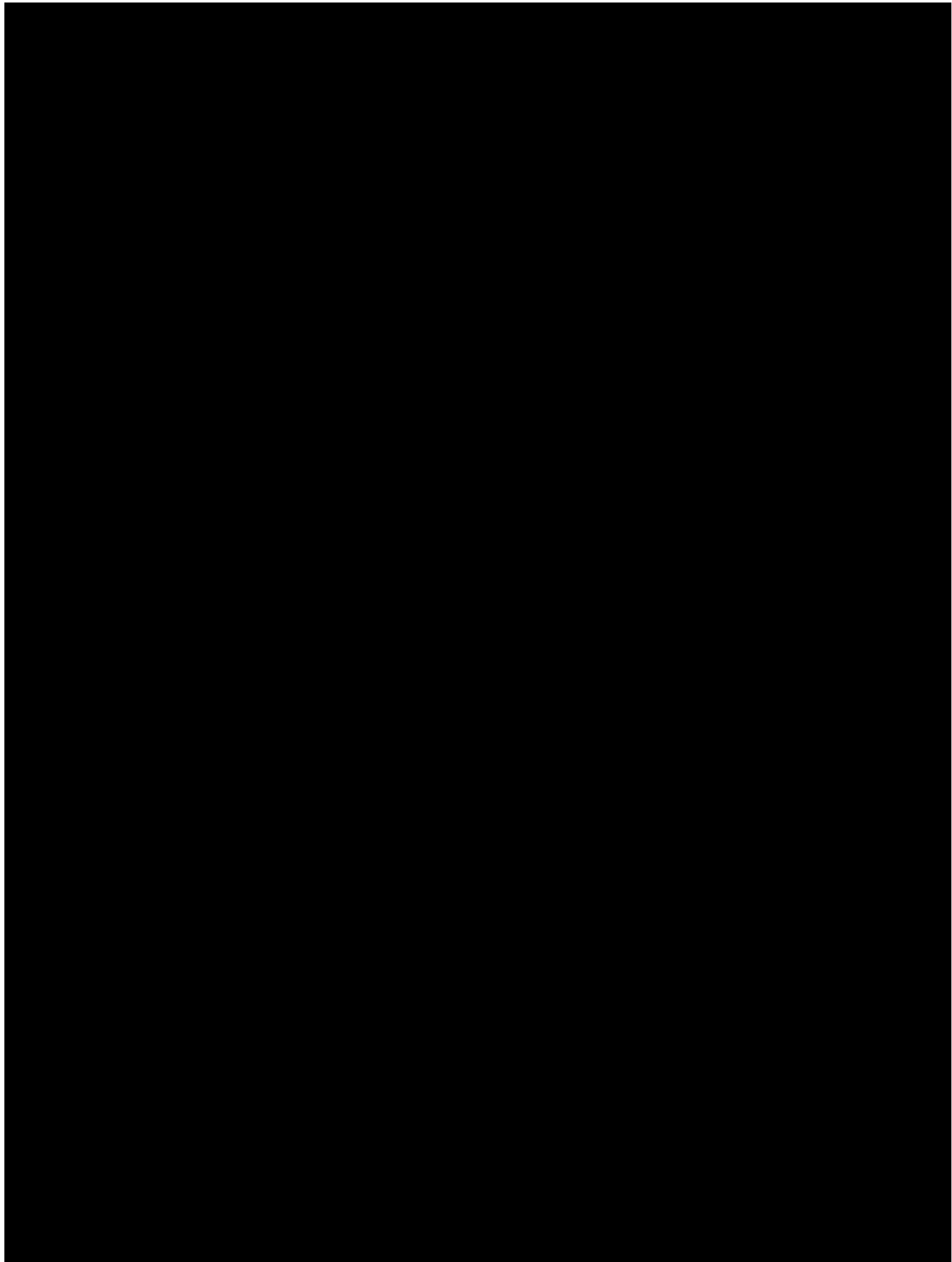


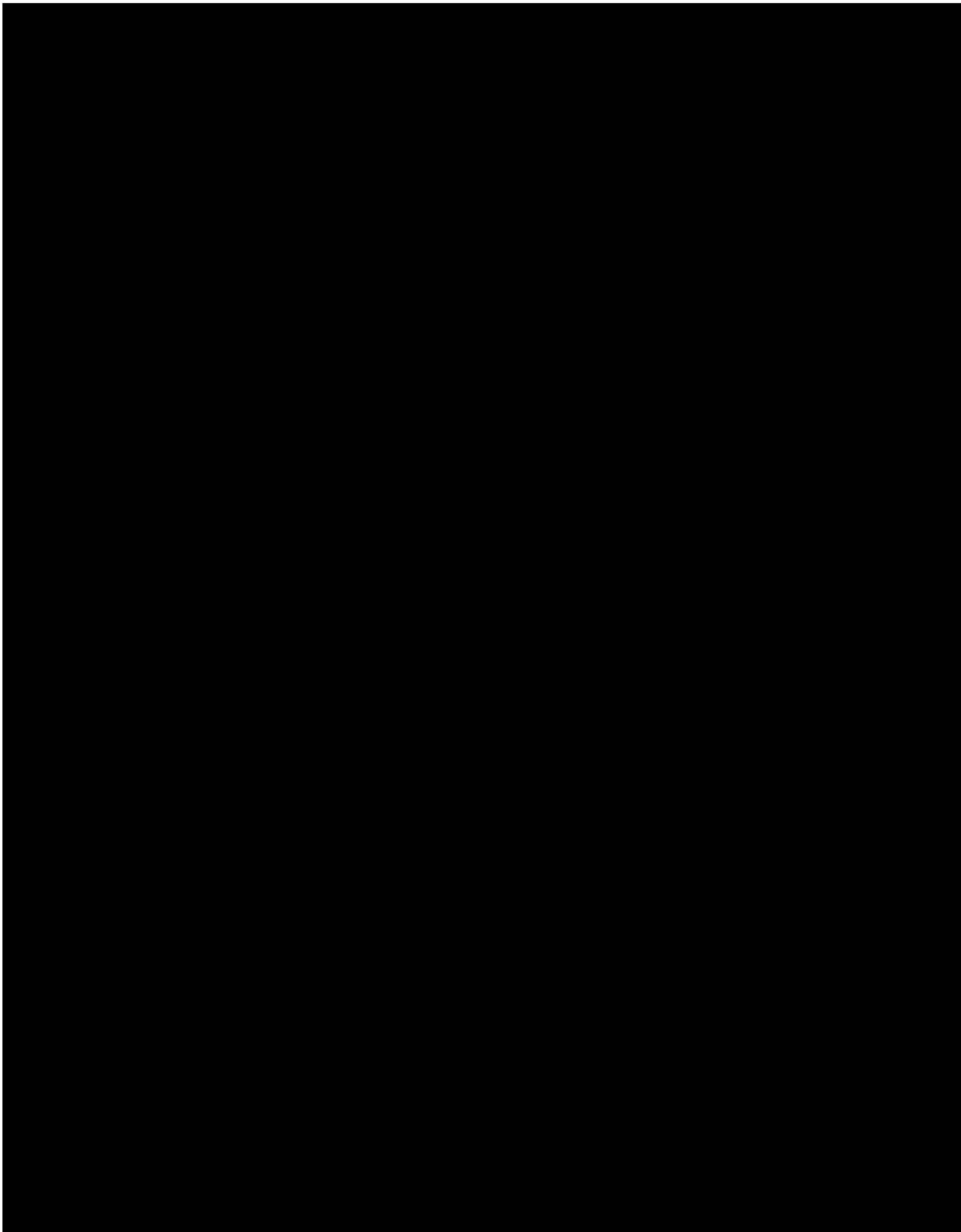


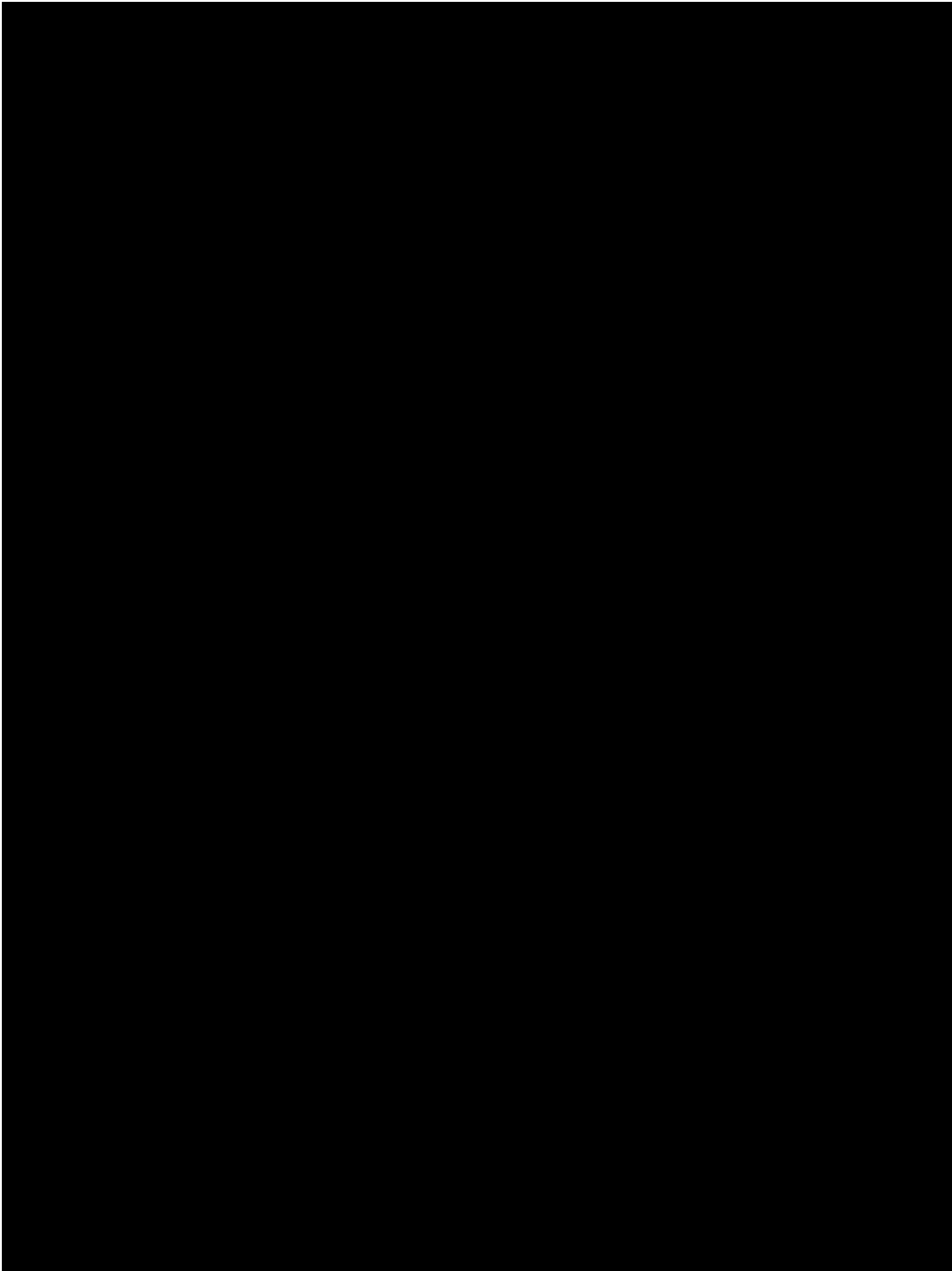


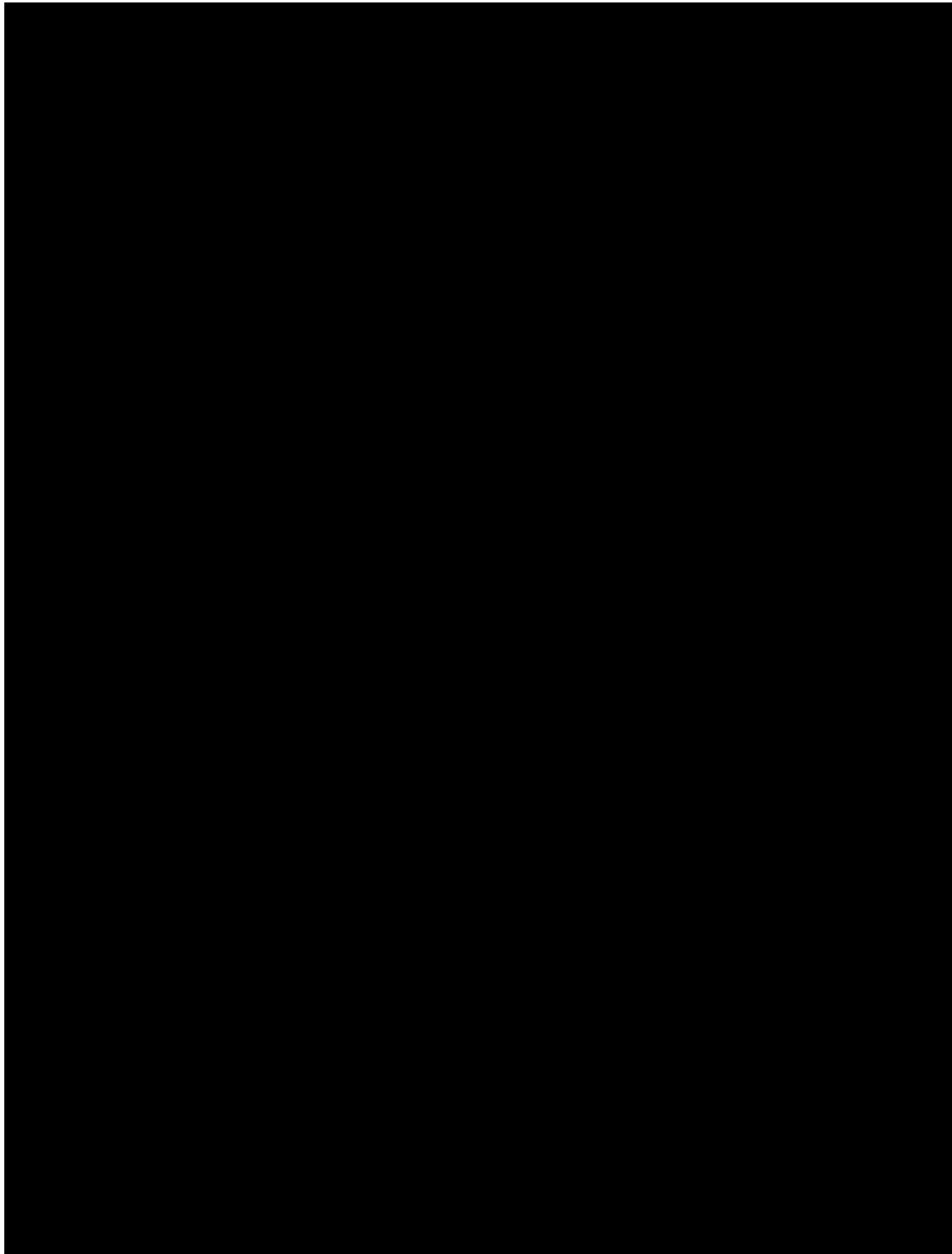


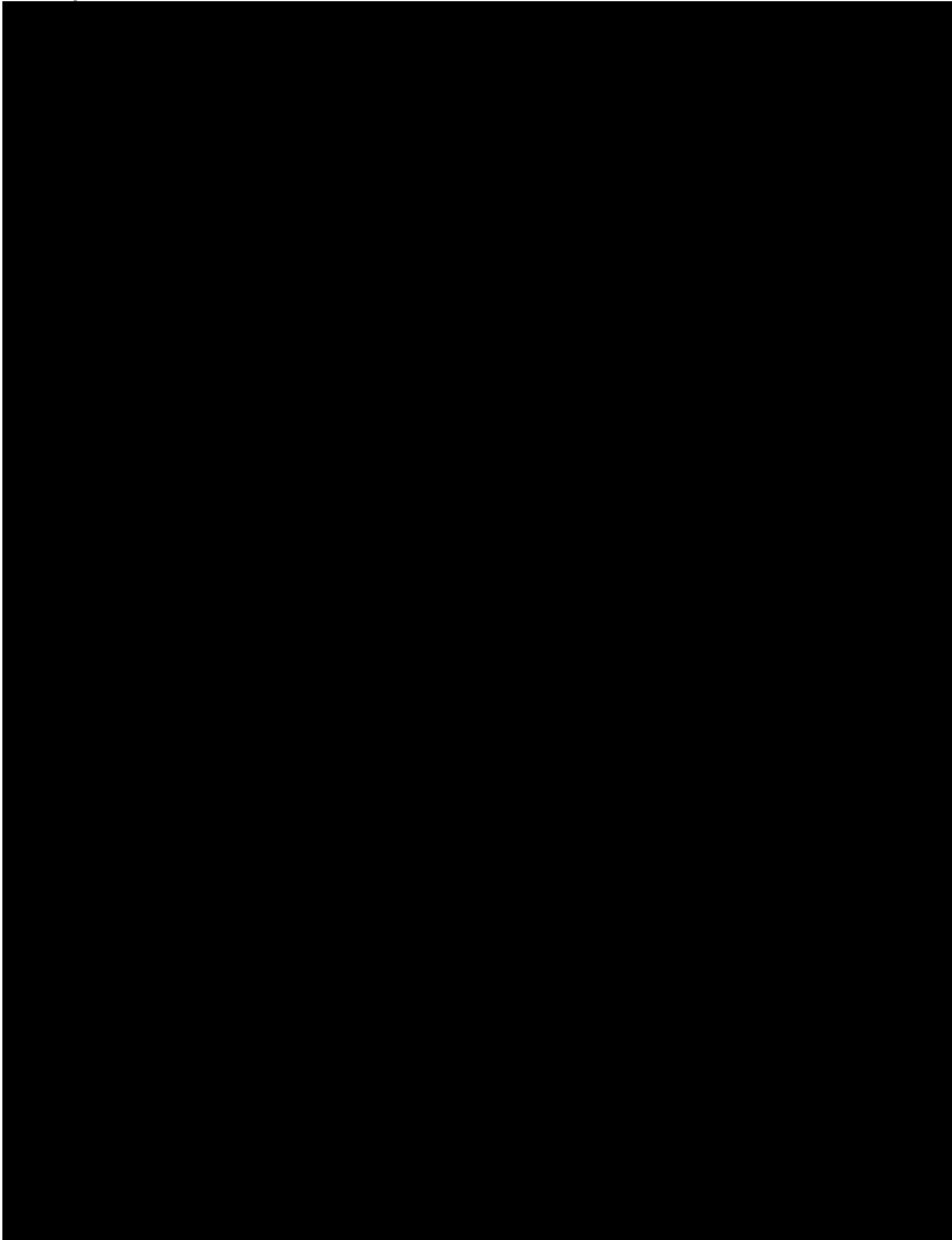


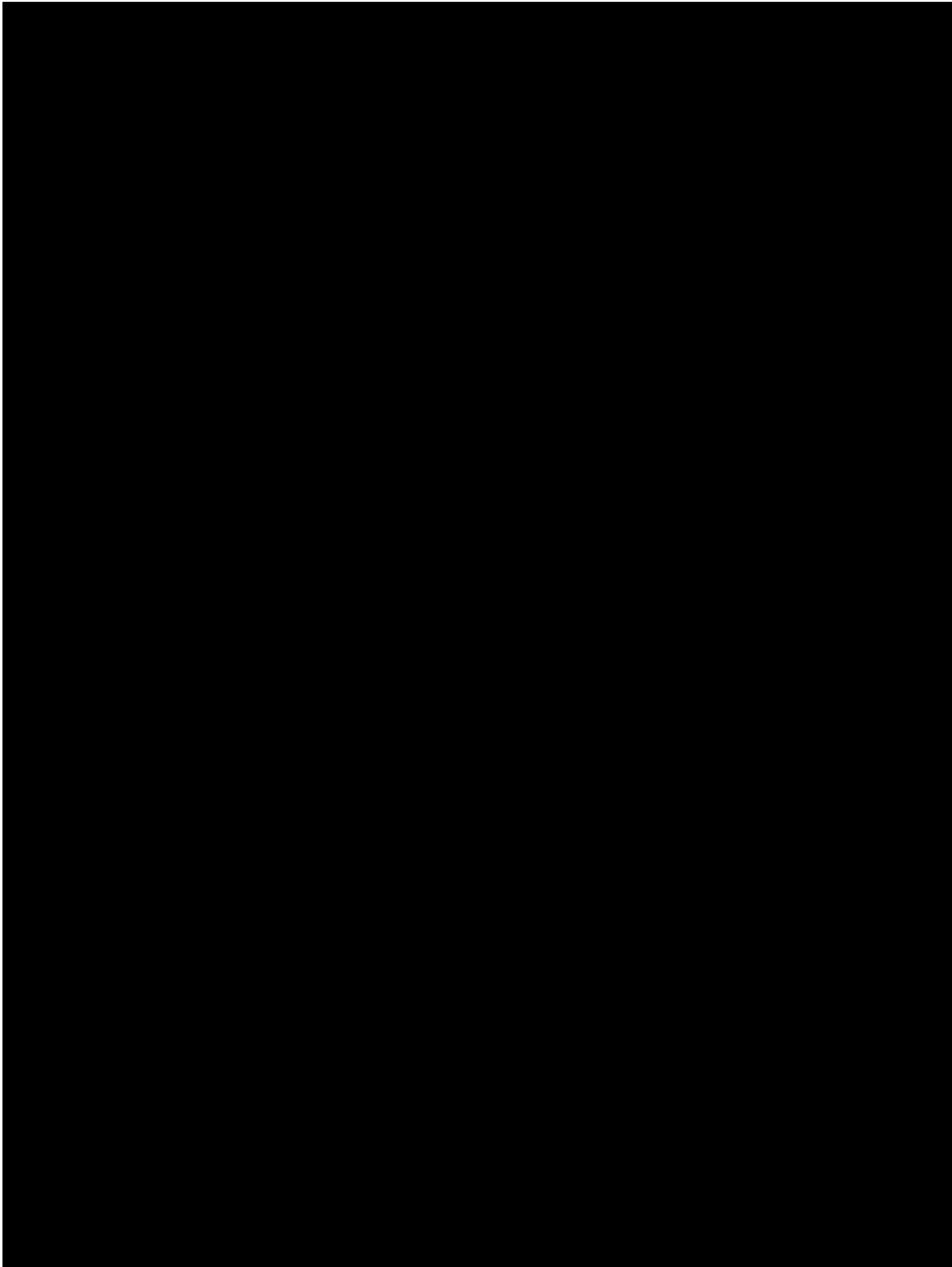


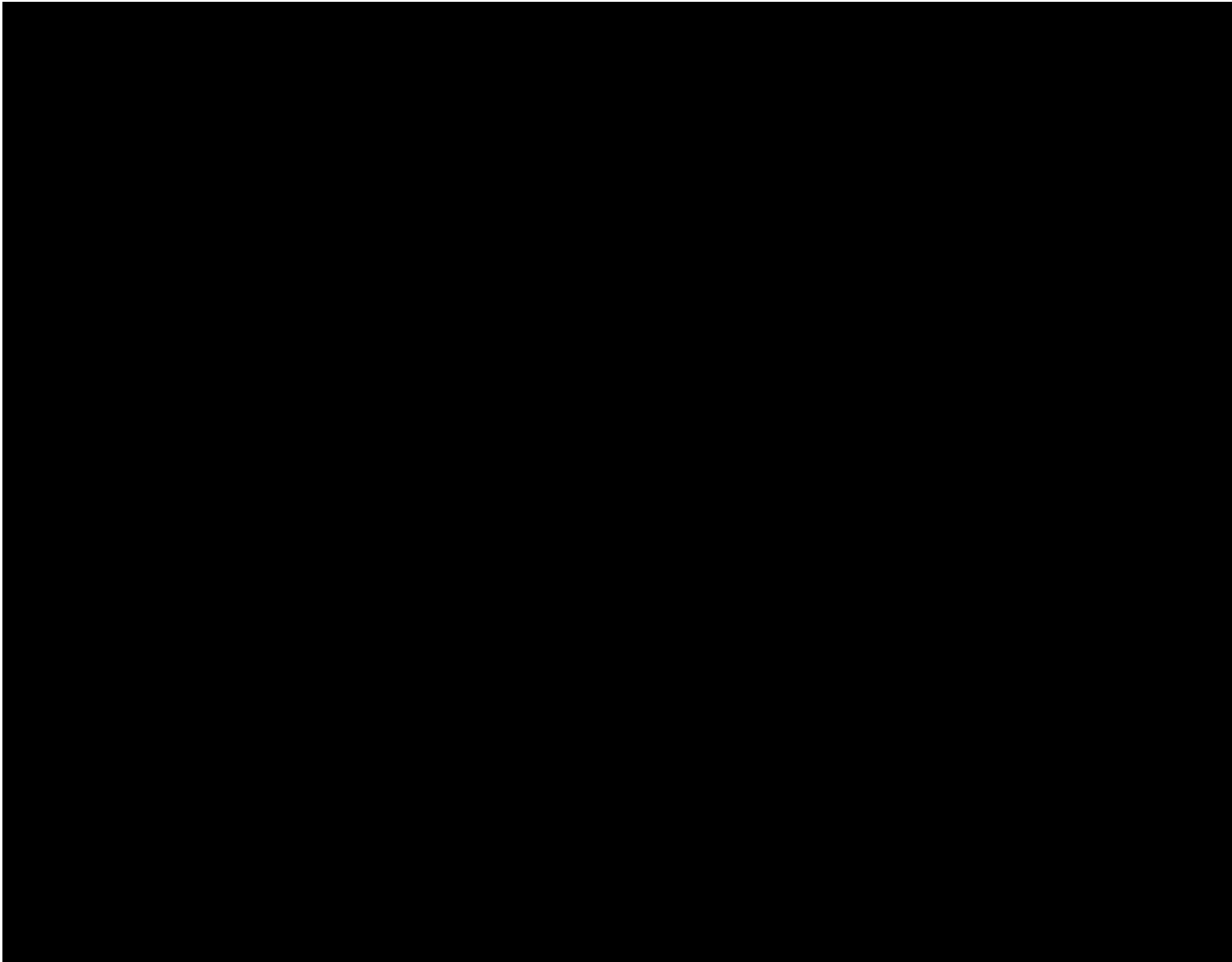


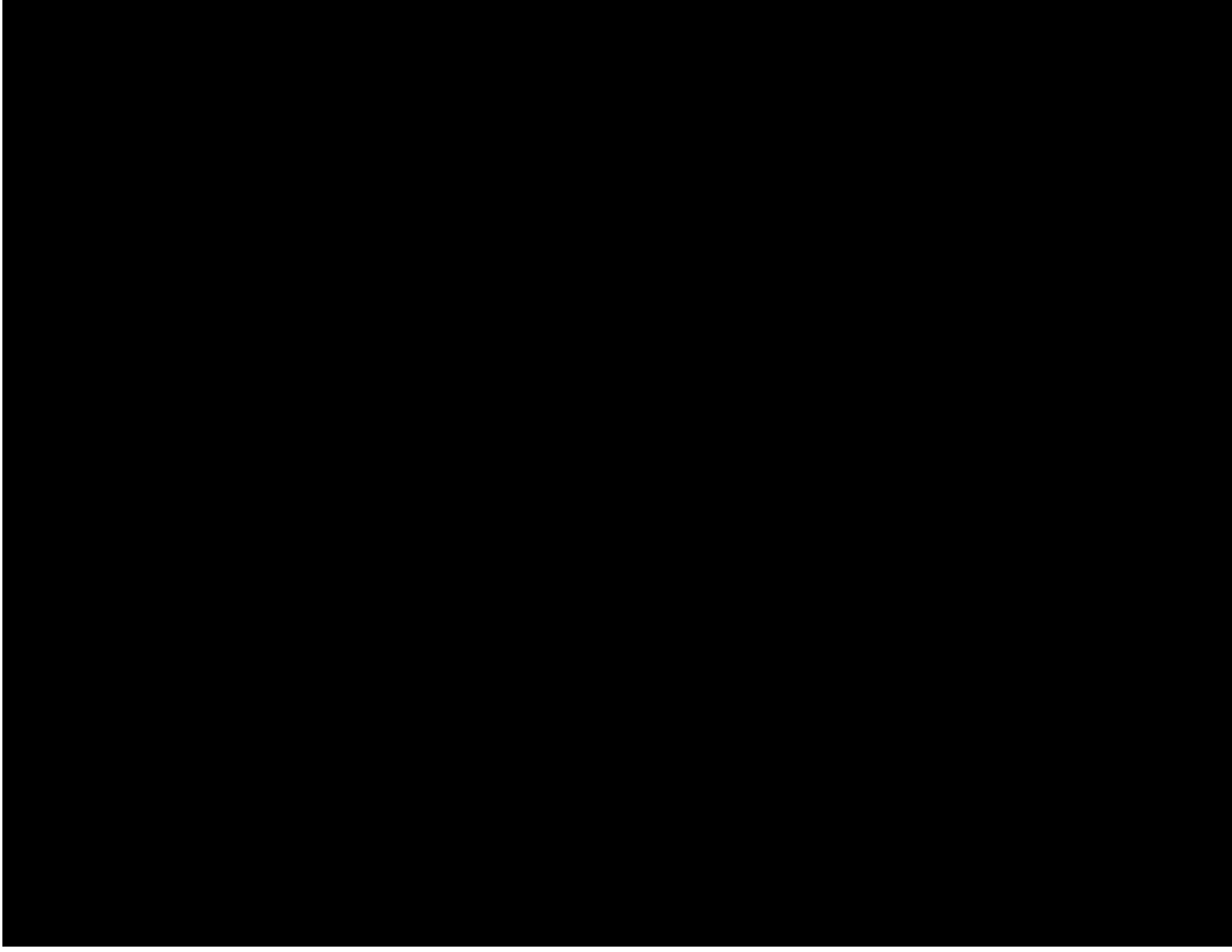


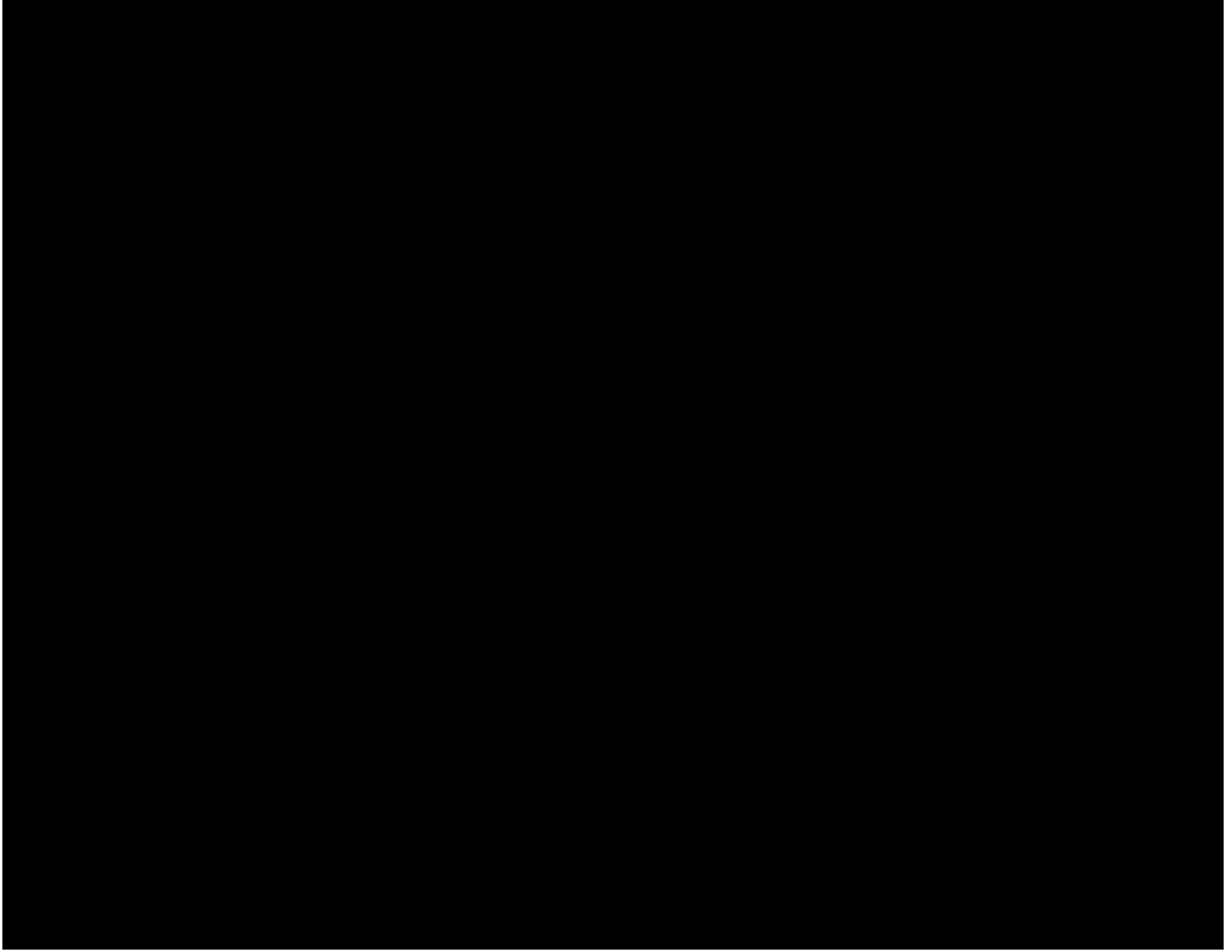










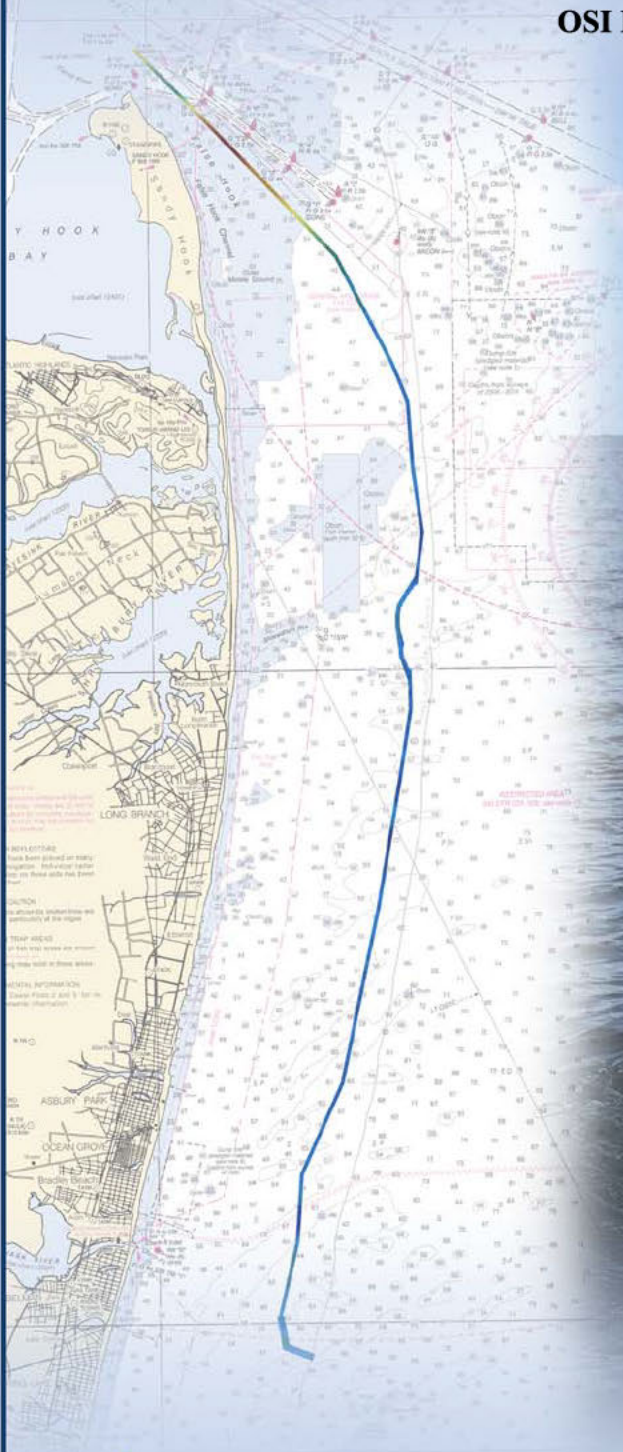


Survey Report

Marine Geophysical Investigation Anbaric Boardwalk Power Link Project

Atlantic Ocean NJ State Waters

OSI Report No. 19ES024



Prepared For:
ESS Group, Inc.



Prepared By:
Ocean Surveys, Inc.

SURVEY REPORT

MARINE GEOPHYSICAL INVESTIGATION
ANBARIC BOARDWALK POWER LINK PROJECT
ATLANTIC OCEAN NJ STATE WATERS

OSI REPORT NO. 19ES024

Prepared For: ESS Group, Inc.
10 Hemingway Drive
East Providence, RI 02915

Prepared By: Ocean Surveys, Inc.
129 Mill Rock Road E.
Old Saybrook, CT 06475

Submitted: 12 September 2019
Revised: 15 October 2019

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- 1 Summary Table of Magnetic Anomalies
- 2 Summary Table of Side Scan Sonar Targets &
Side Scan Sonar Target Reports
- 3 Table of Proposed Vibratory Core Locations
- 4 Reduced Scale Project Drawings (11”by17”)

Digital Appendix – Final report and project drawing files, daily client signoff daily field logs, chirp subbottom profiles (jpg format) and a survey trackline log (PDF format).



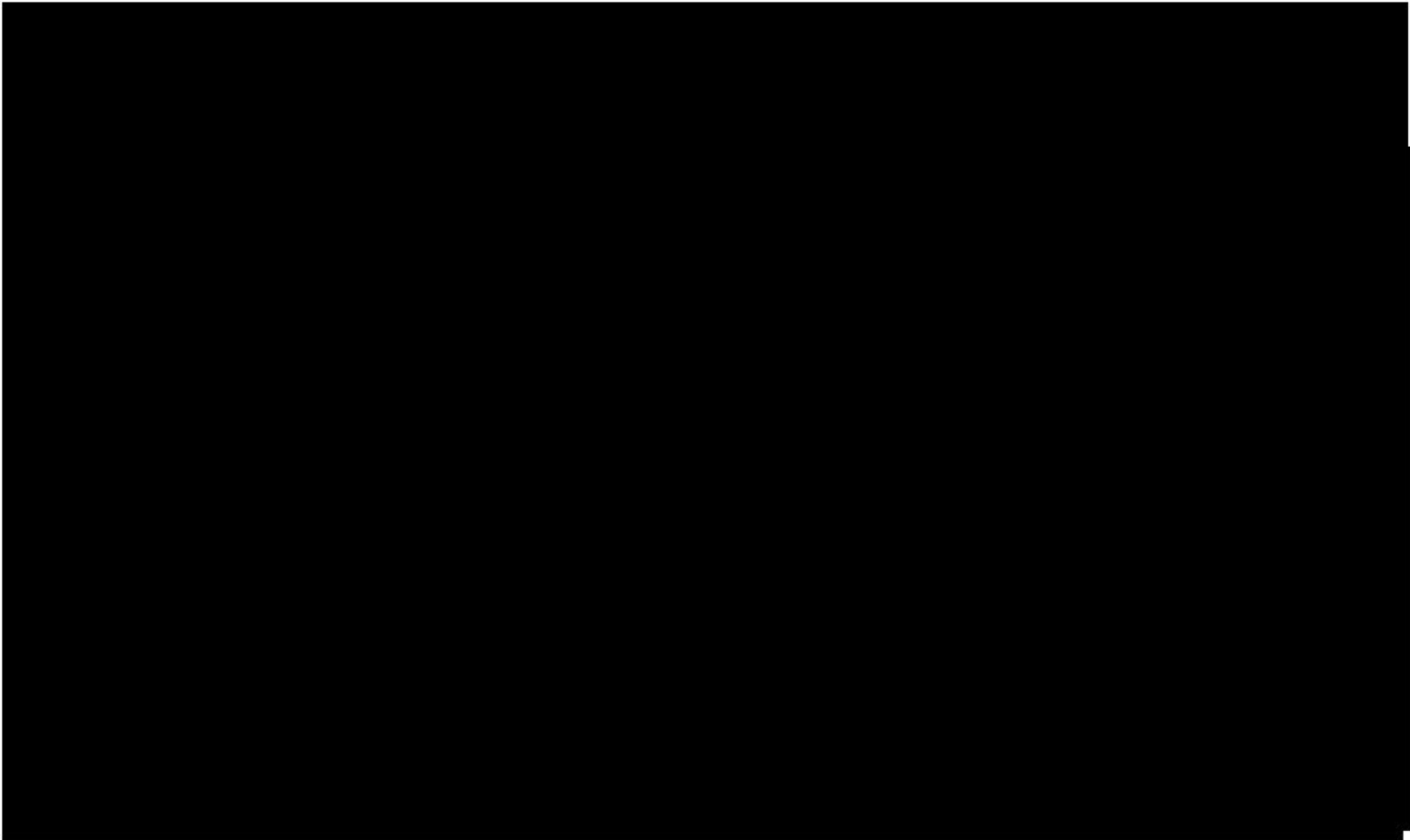
John D. Sullivan, P.G.
Manager Geophysical Surveys
OCEAN SURVEYS, INC.

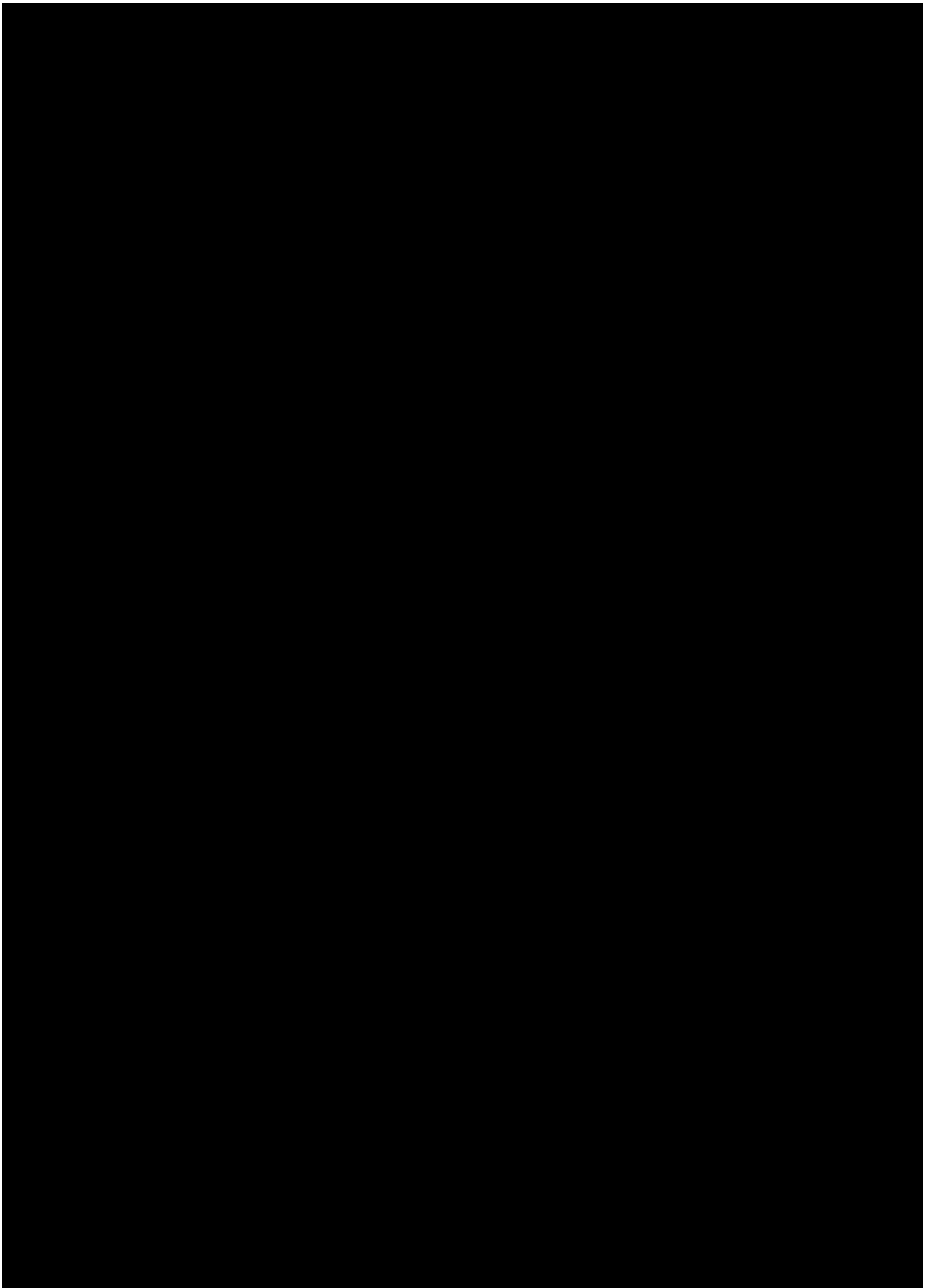
SURVEY REPORT

MARINE GEOPHYSICAL INVESTIGATION ANBARIC BOARDWALK POWER LINK PROJECT ATLANTIC OCEAN NJ STATE WATERS

1.0 INTRODUCTION

During the period 19-29 July 2019, Ocean Surveys, Inc. (OSI) performed a multi-sensor marine geophysical survey in the Atlantic Ocean offshore New Jersey (NJ). This survey was completed under subcontract to ESS Group, Inc. (ESS) for the Anbaric Development Partners (ADP) to support the development and permitting of a proposed submarine transmission system which will provide a means to interconnect future offshore wind energy generation projects to the onshore electric grid in NJ. The proposed transmission system, referred to as the Boardwalk Power Link Project (Boardwalk), will tie-into a previously investigated transmission project offshore Sandy Hook NJ, run south in NJ state waters and provide a means to interconnect to projects in federal waters offshore of New Jersey (Figure 1). Future planned investigations will include a geotechnical sampling program to ground-truth the geophysical interpretation presented herein and to assist in permitting the Project.



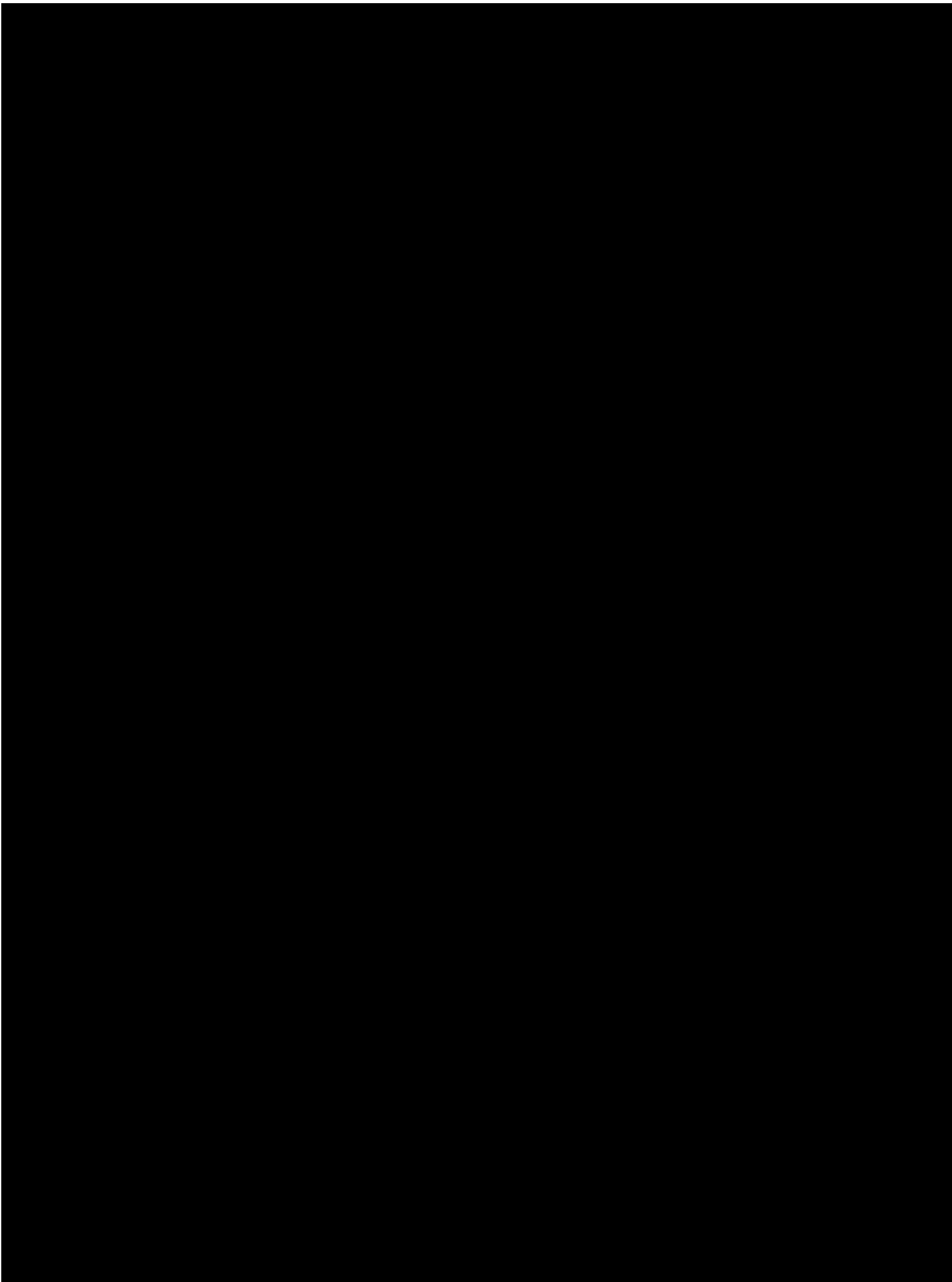


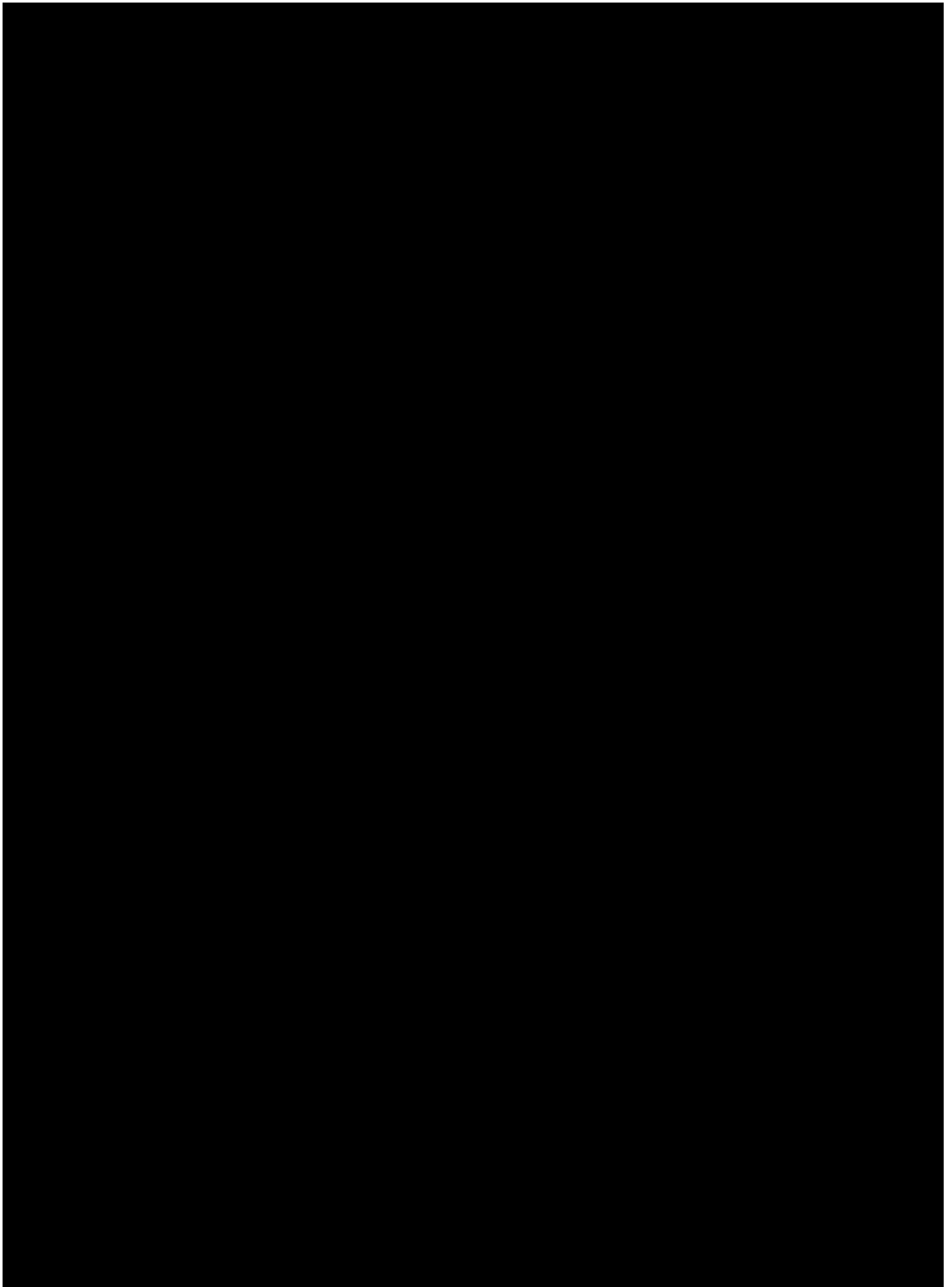
The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and expense must be properly documented to ensure the integrity of the financial statements. This includes keeping receipts, invoices, and bank statements in a secure and organized manner.

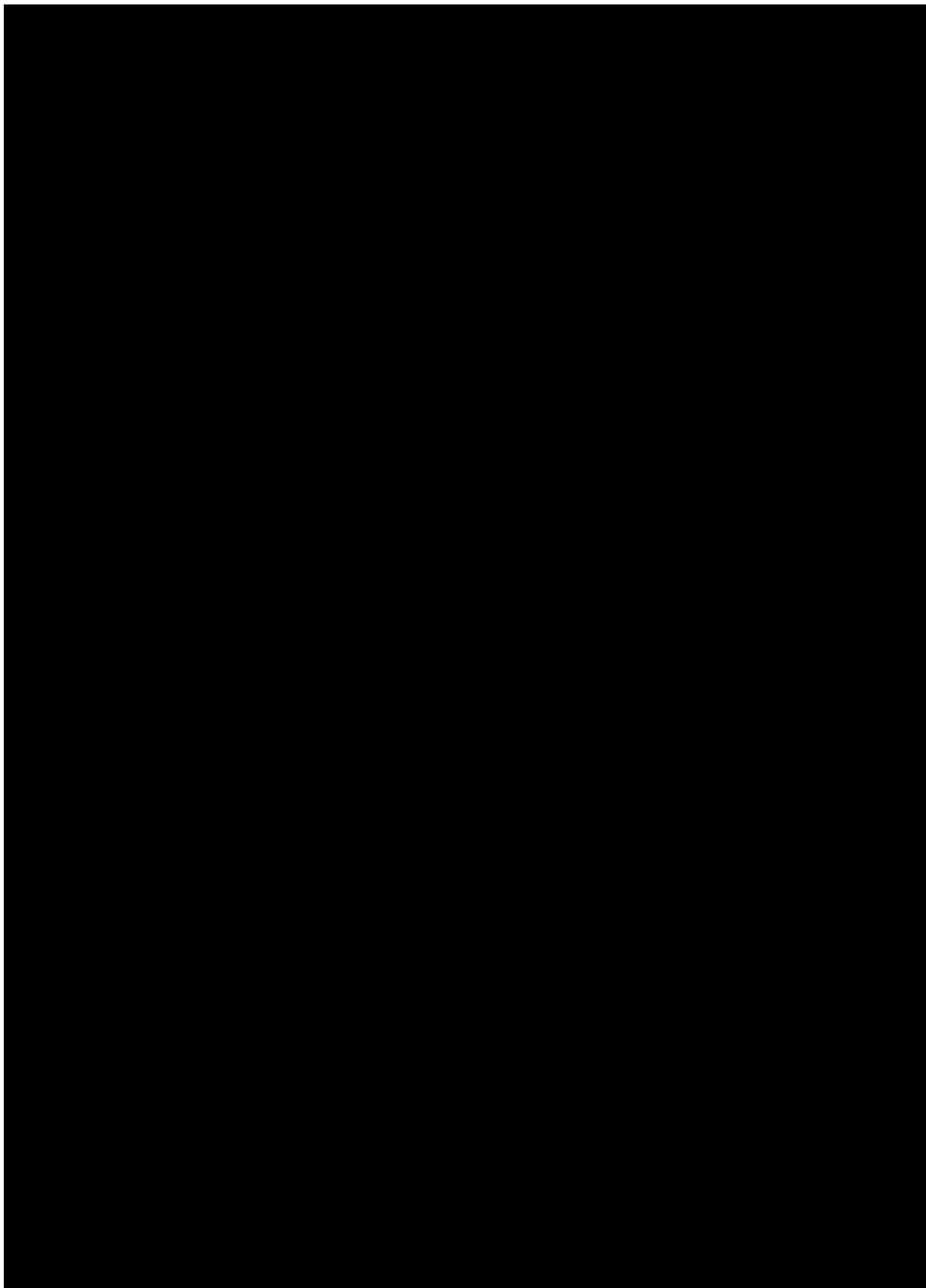
Next, the document outlines the process of reconciling the books. This involves comparing the company's internal records with the bank statements to identify any discrepancies. If there are differences, the accountant must investigate the cause, such as a missed deposit or an incorrect recording of a transaction.

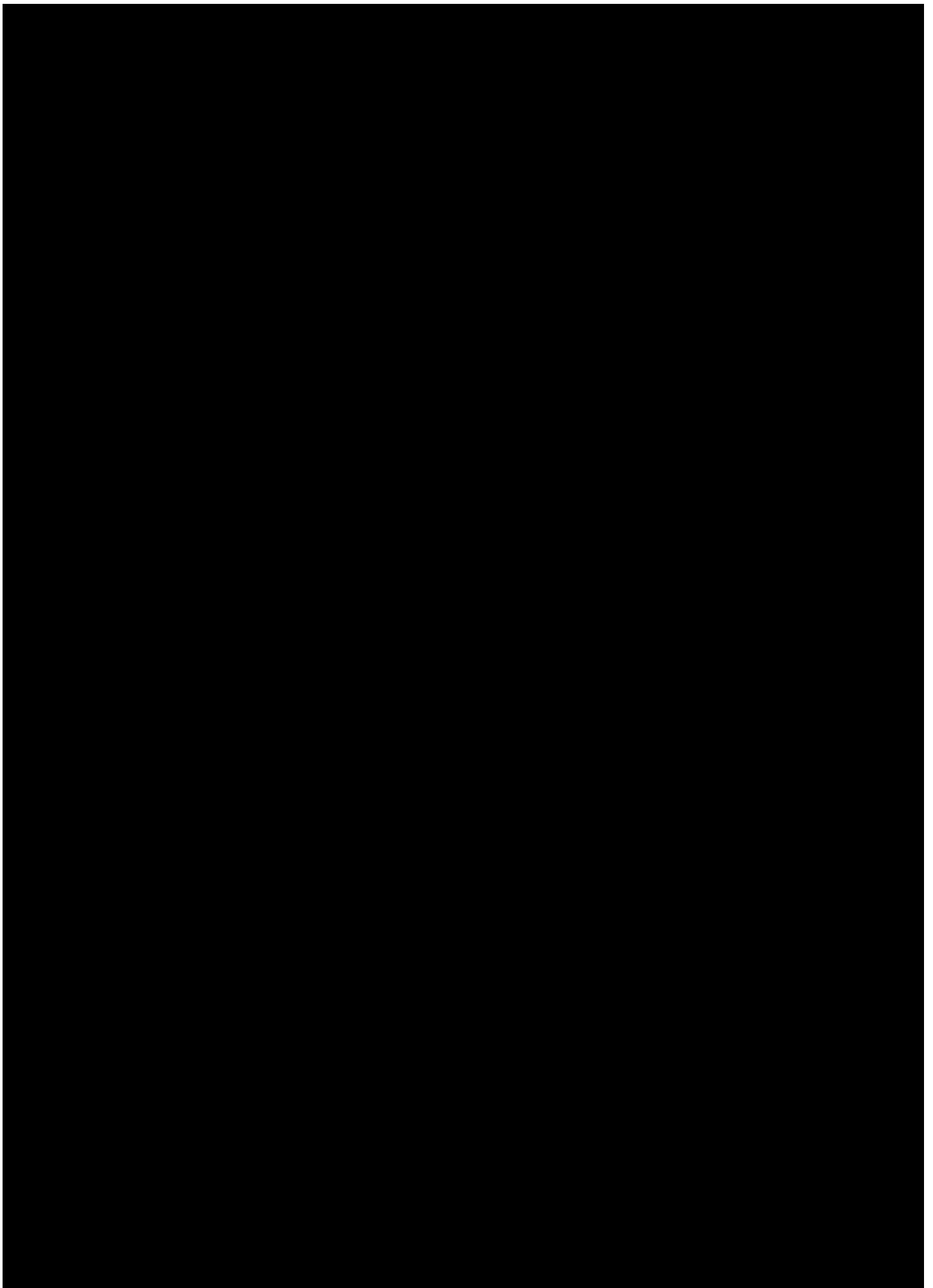
The document also covers the preparation of the financial statements. This includes the balance sheet, income statement, and cash flow statement. Each statement provides a different perspective on the company's financial health and performance over a specific period.

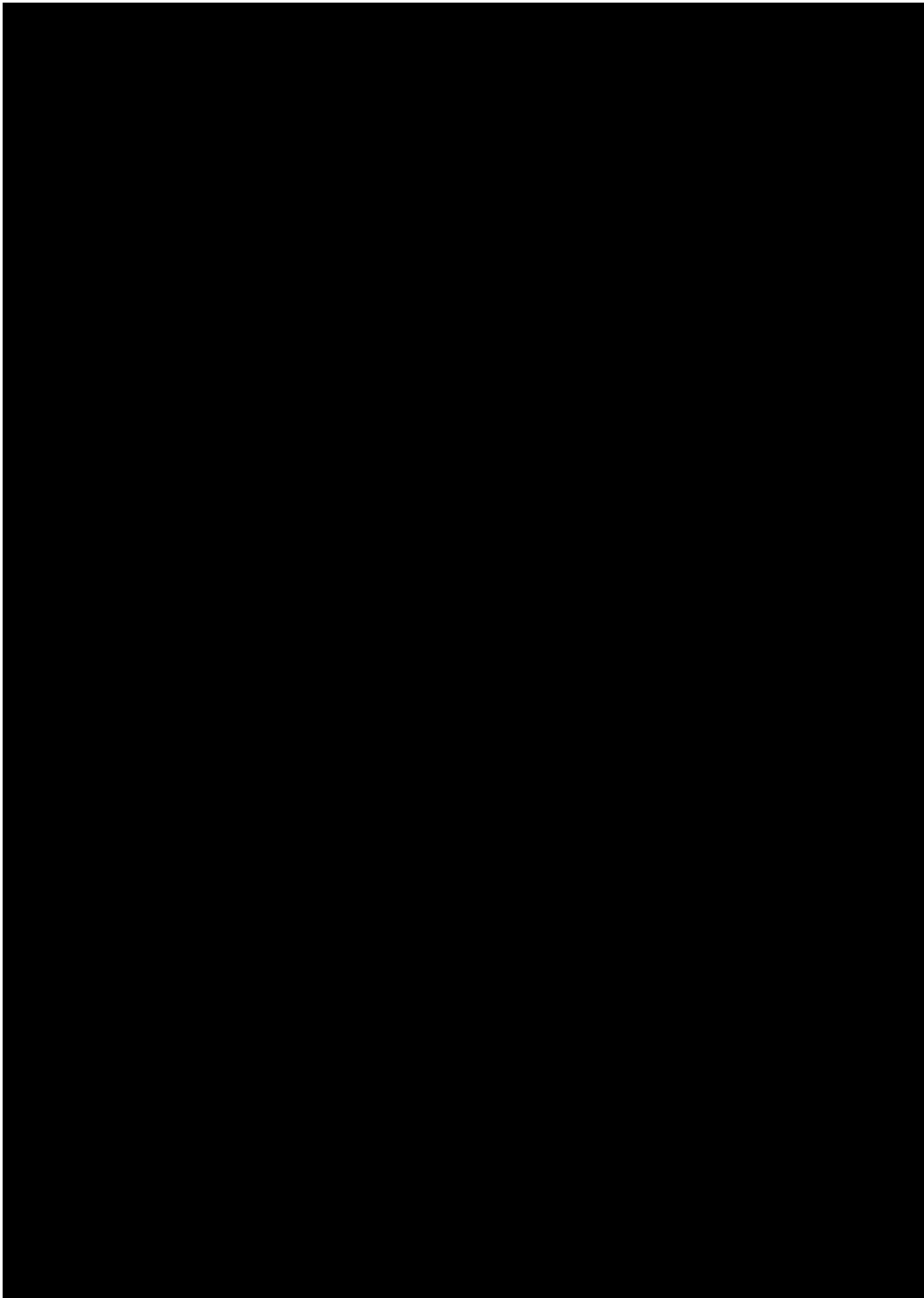
Finally, the document discusses the importance of reviewing the financial statements with management. This allows the company's leadership to understand the current financial position and make informed decisions about future operations and investments.

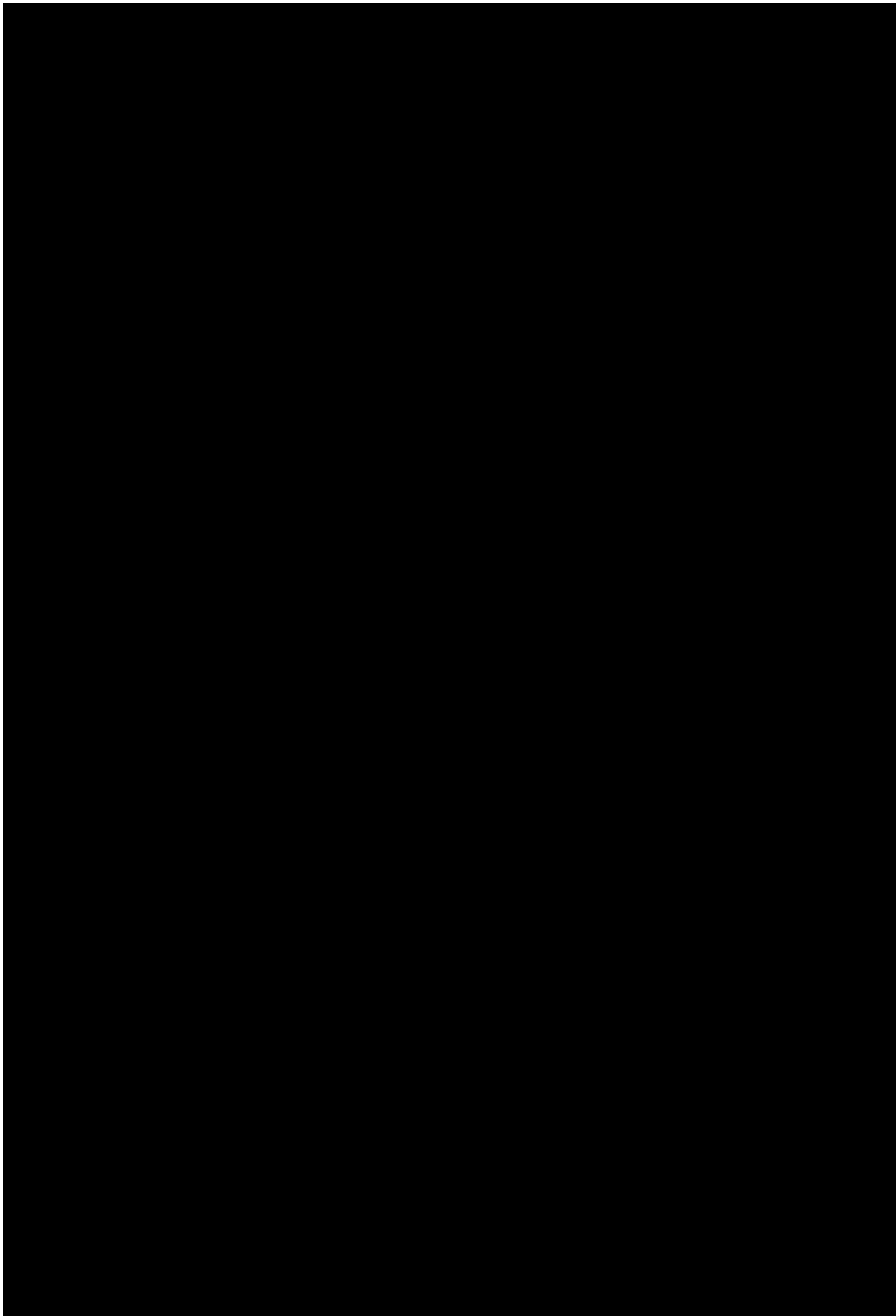


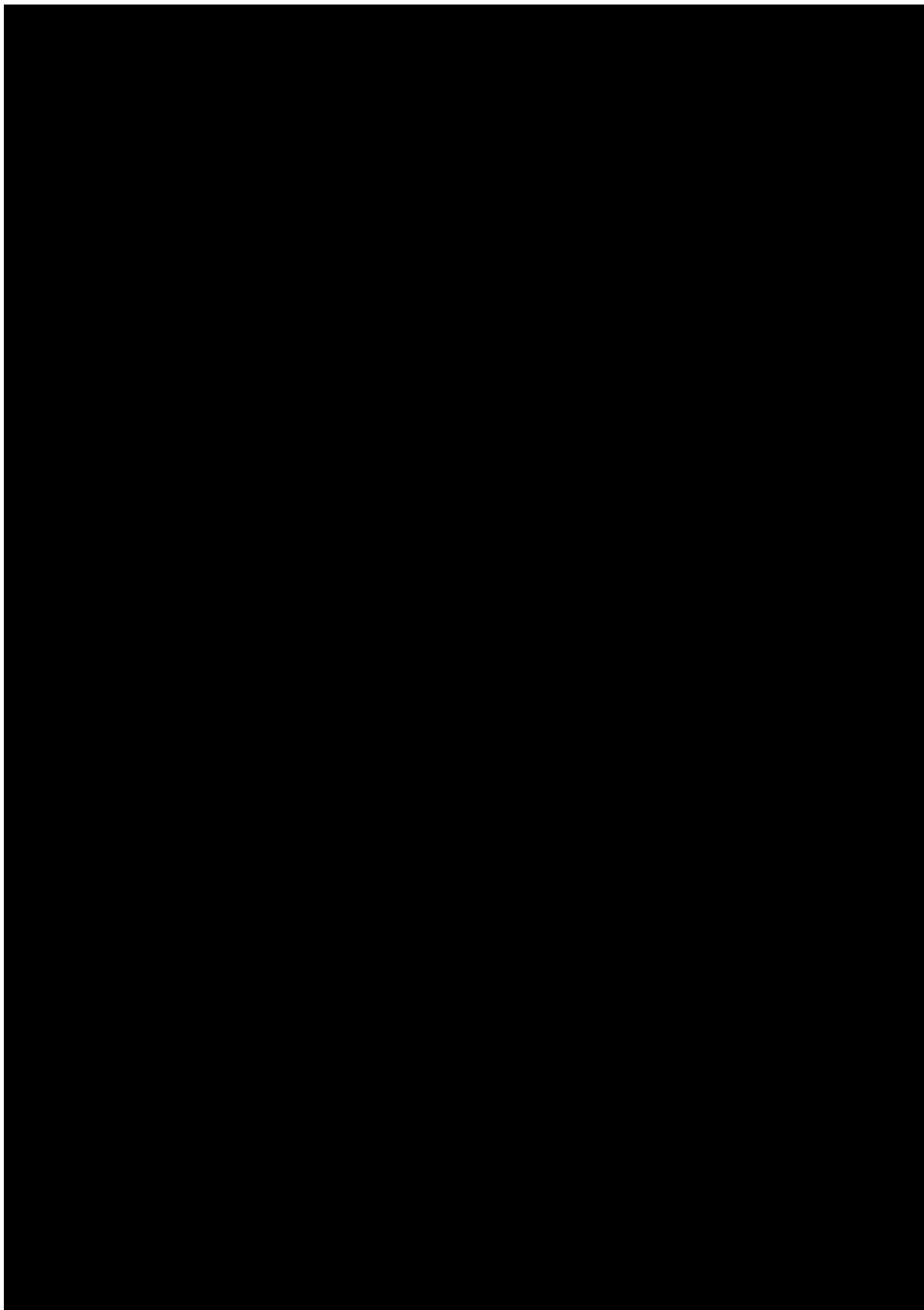


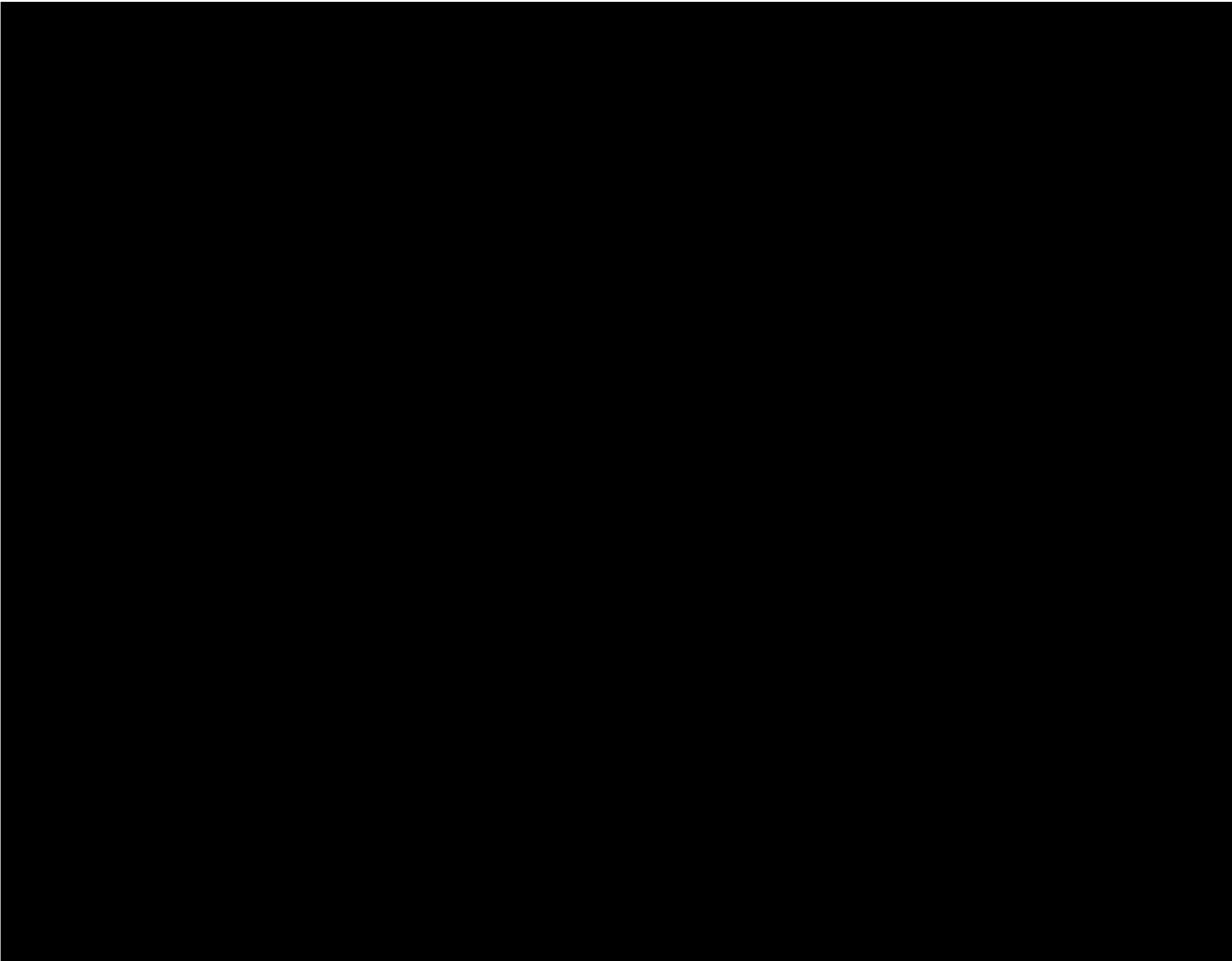


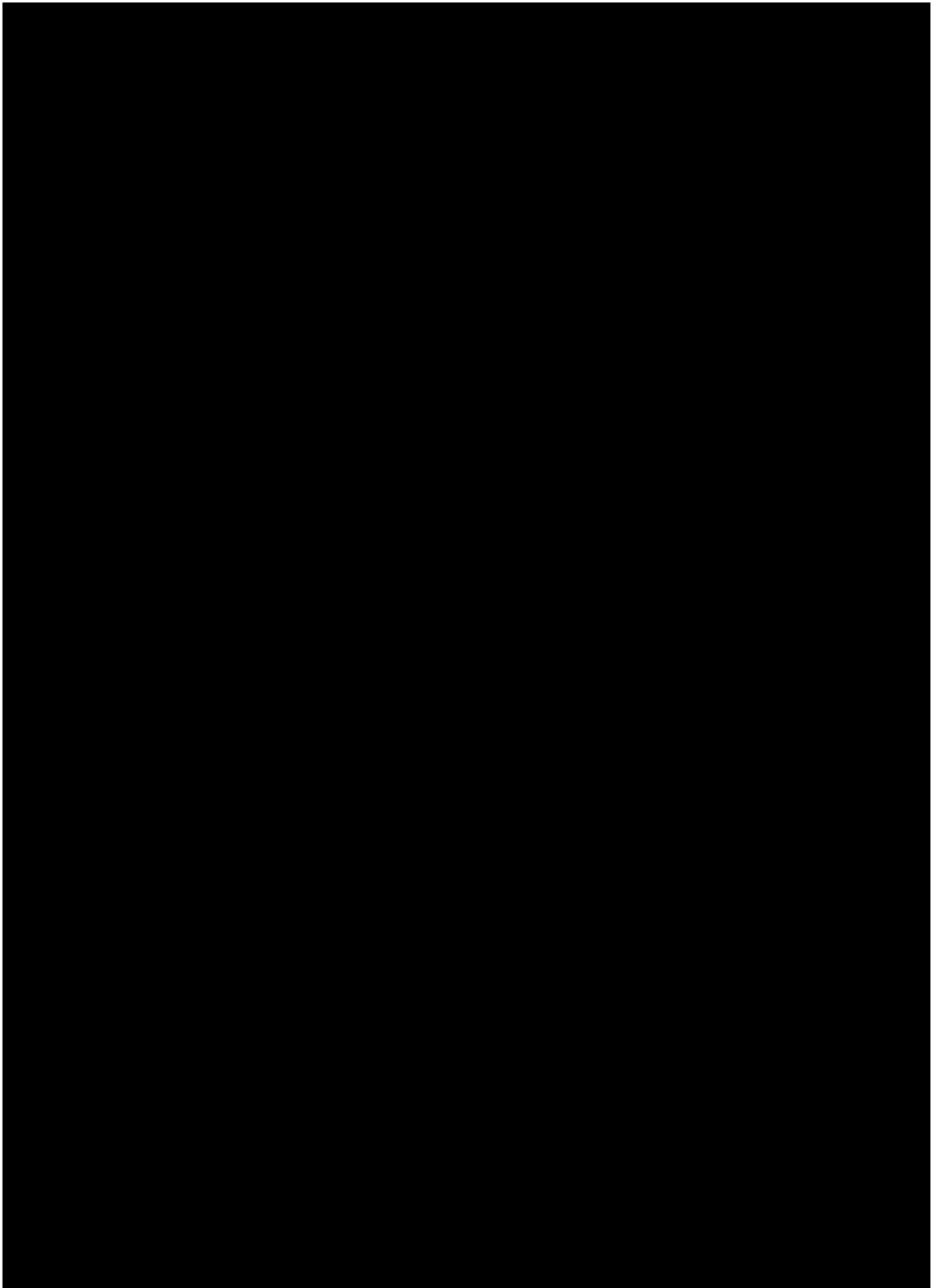


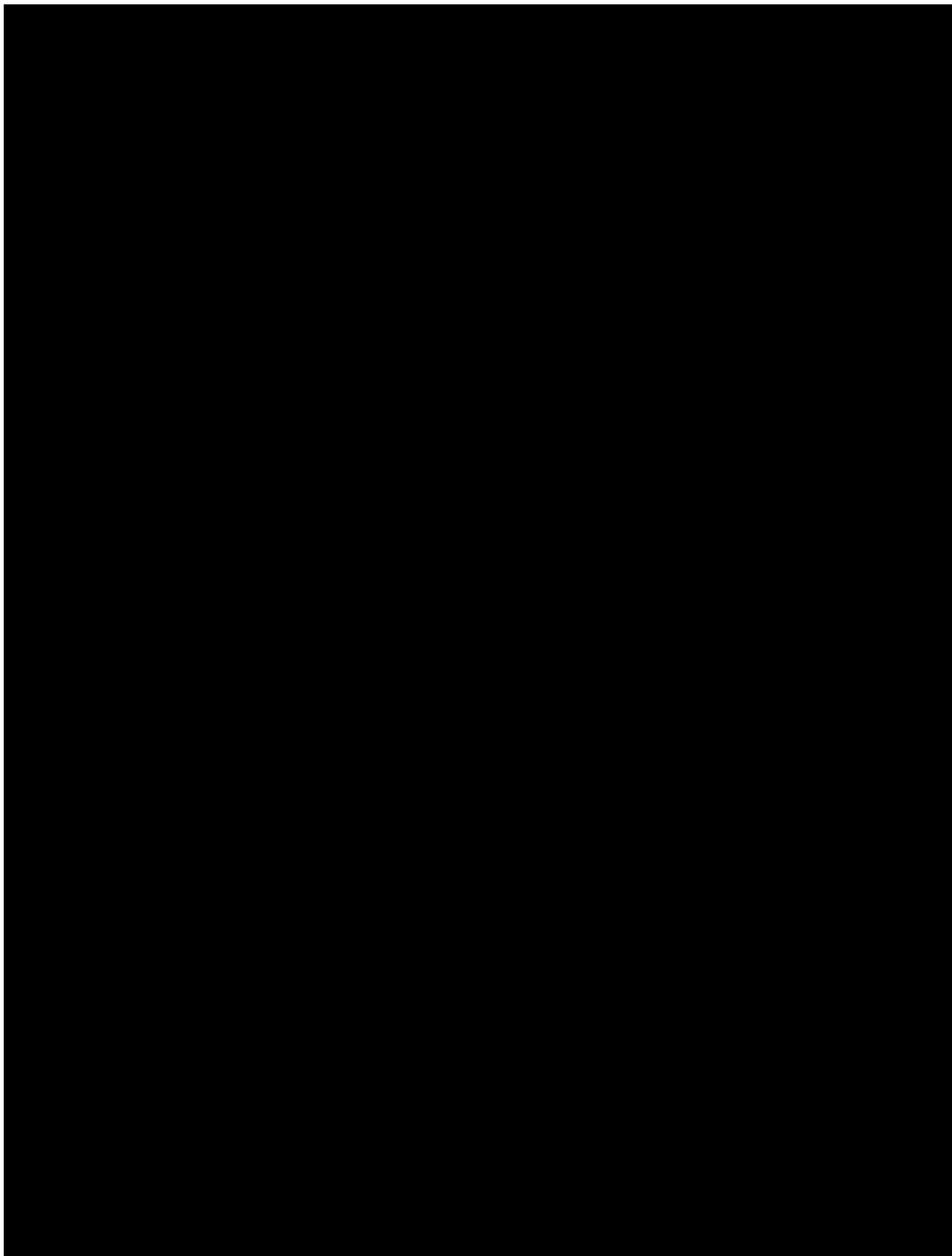


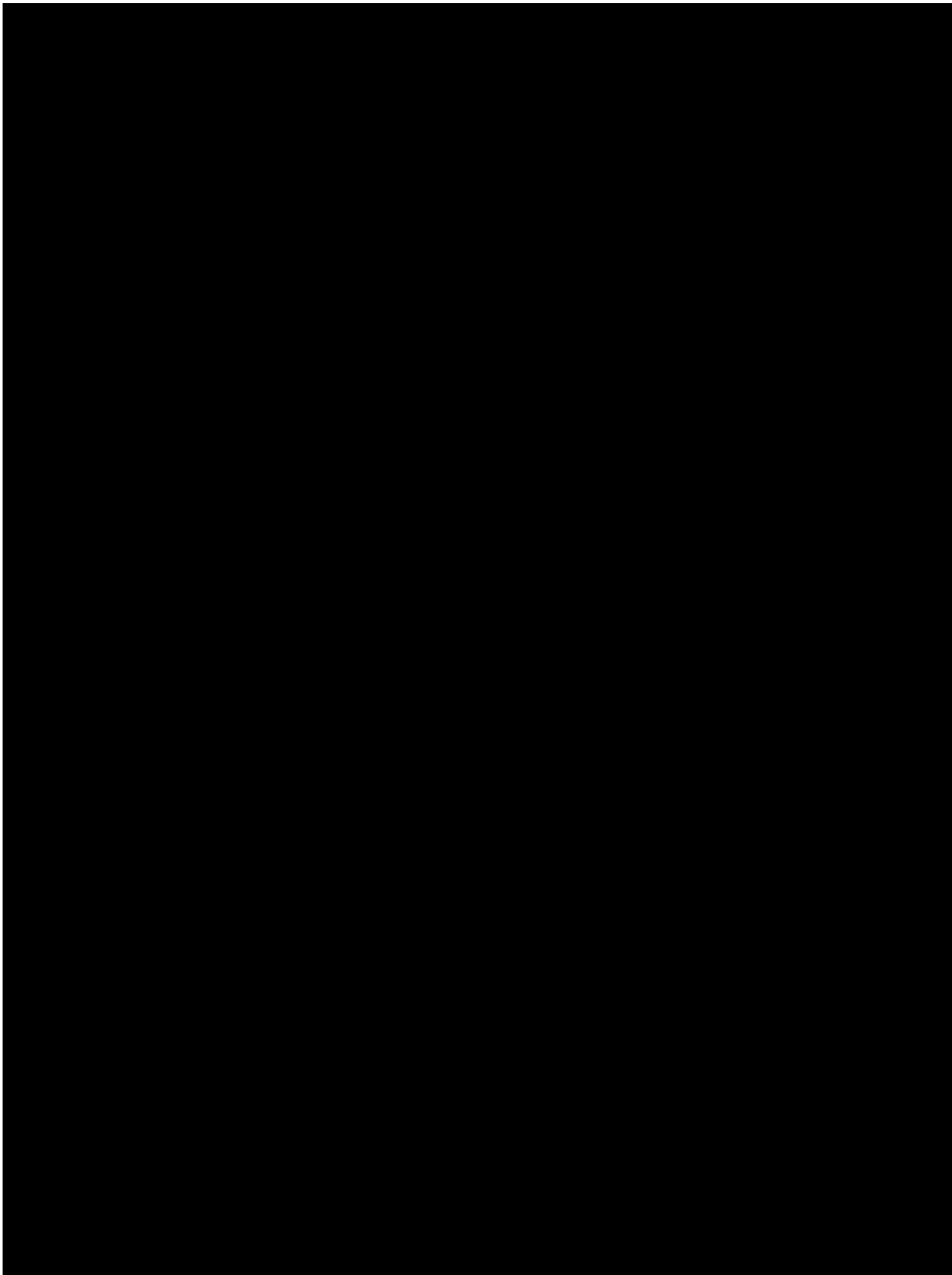


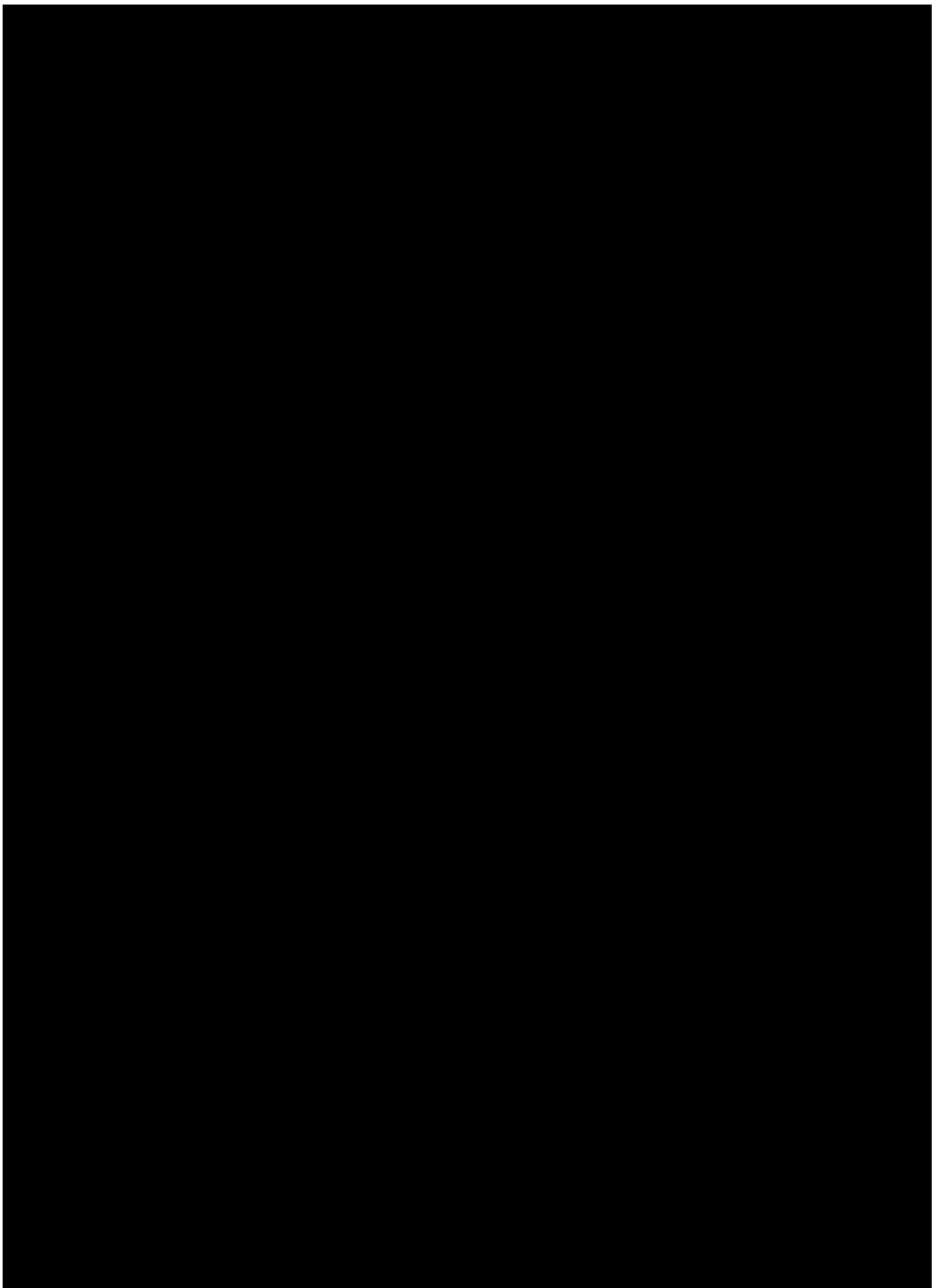


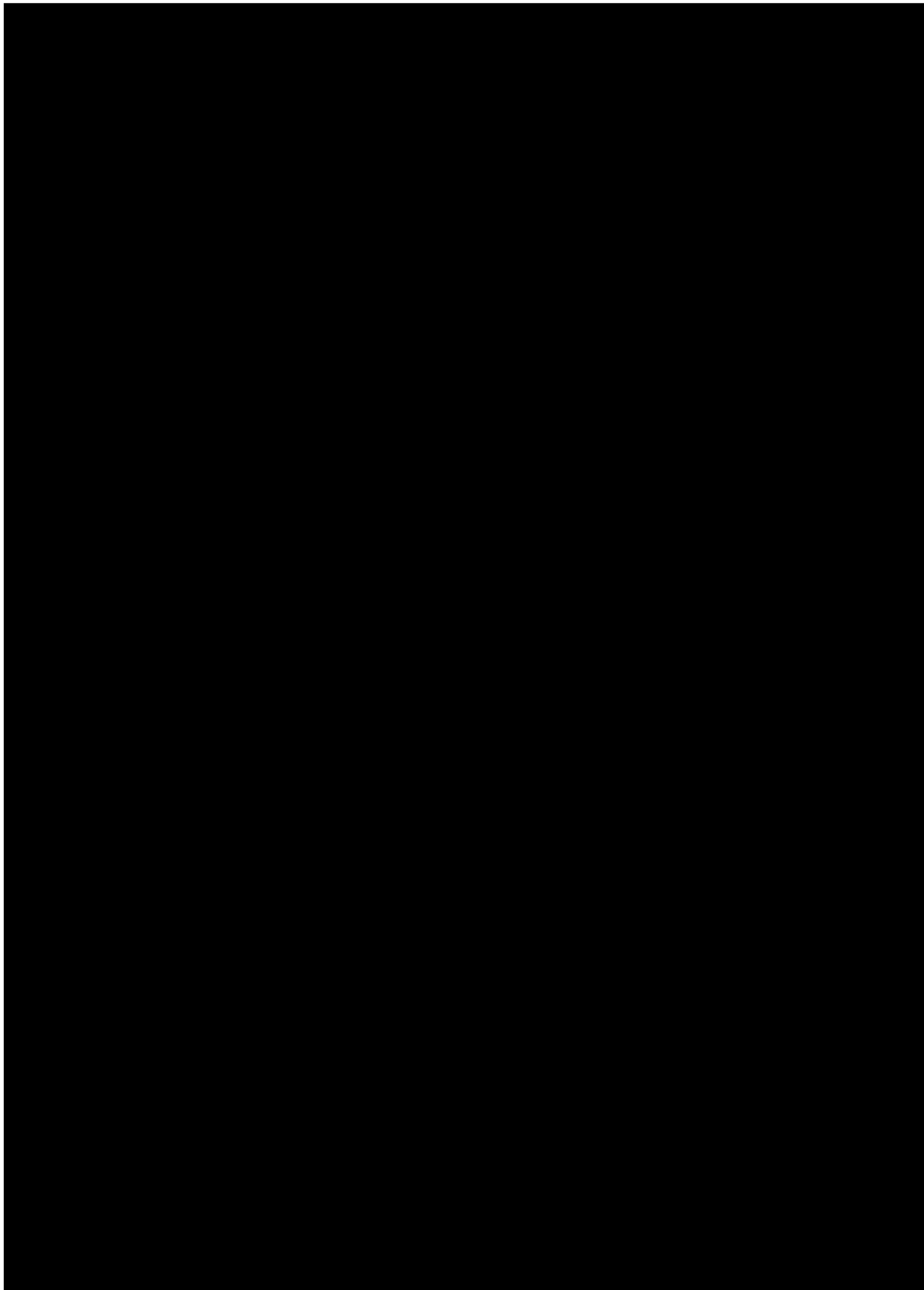


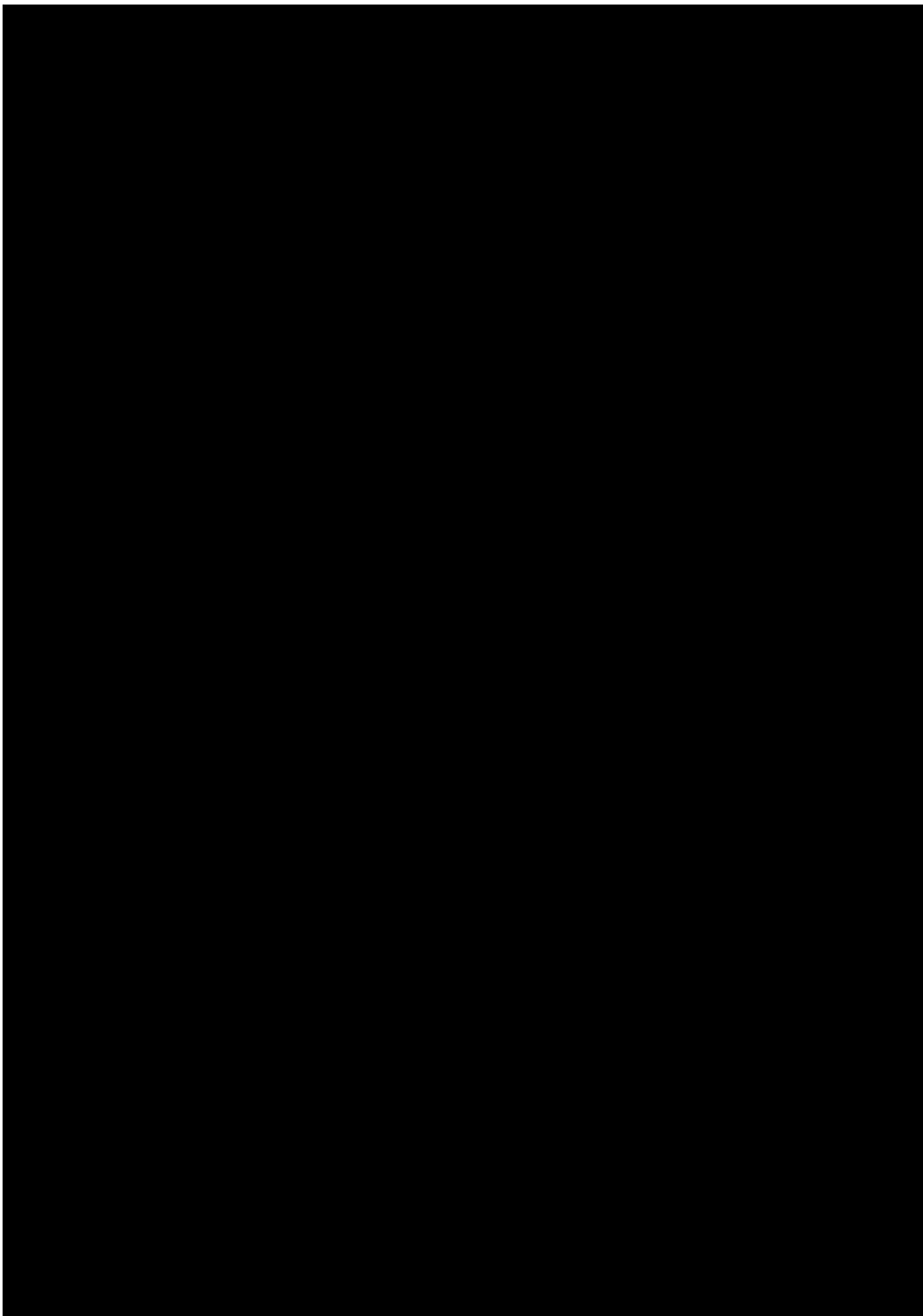


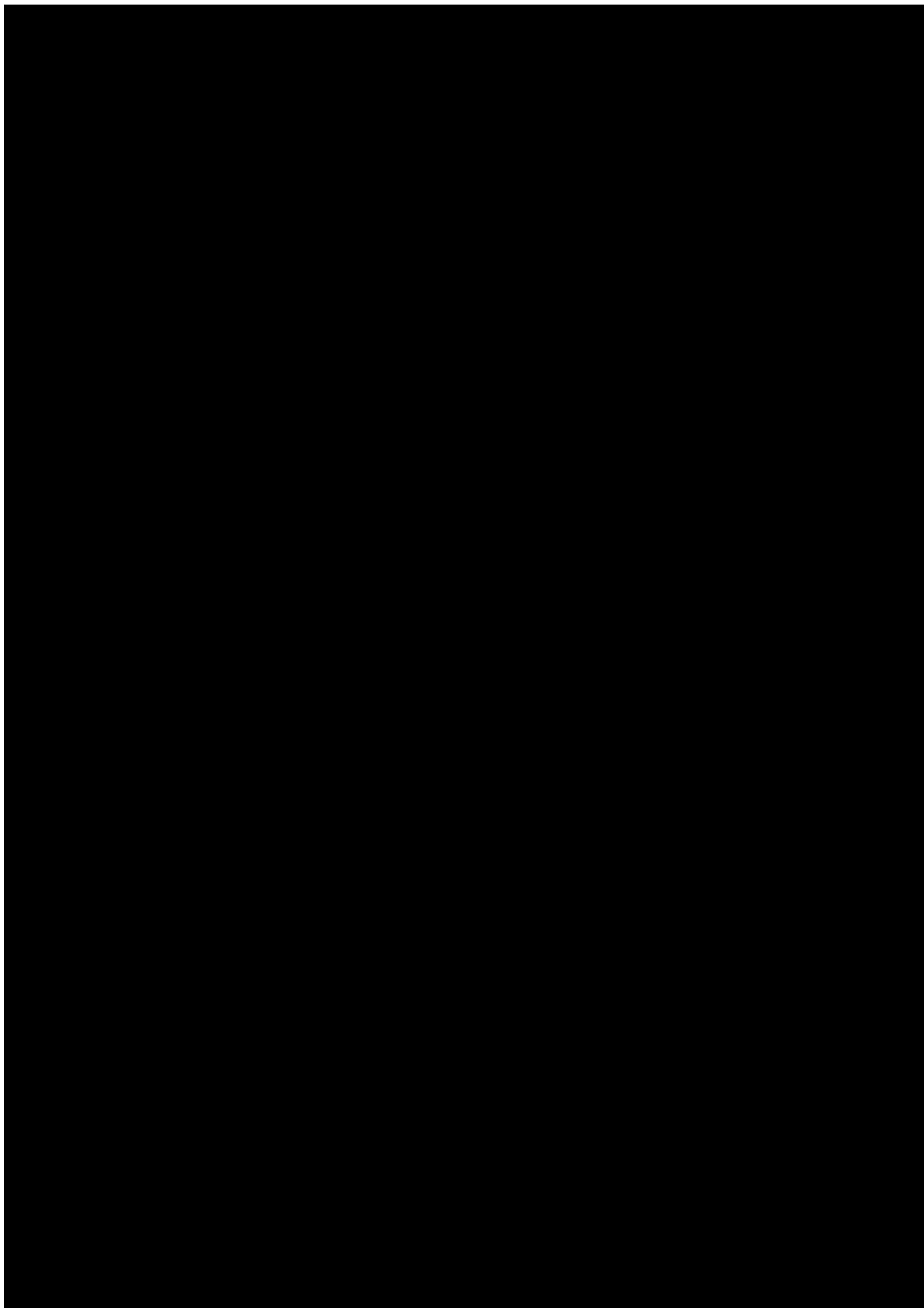


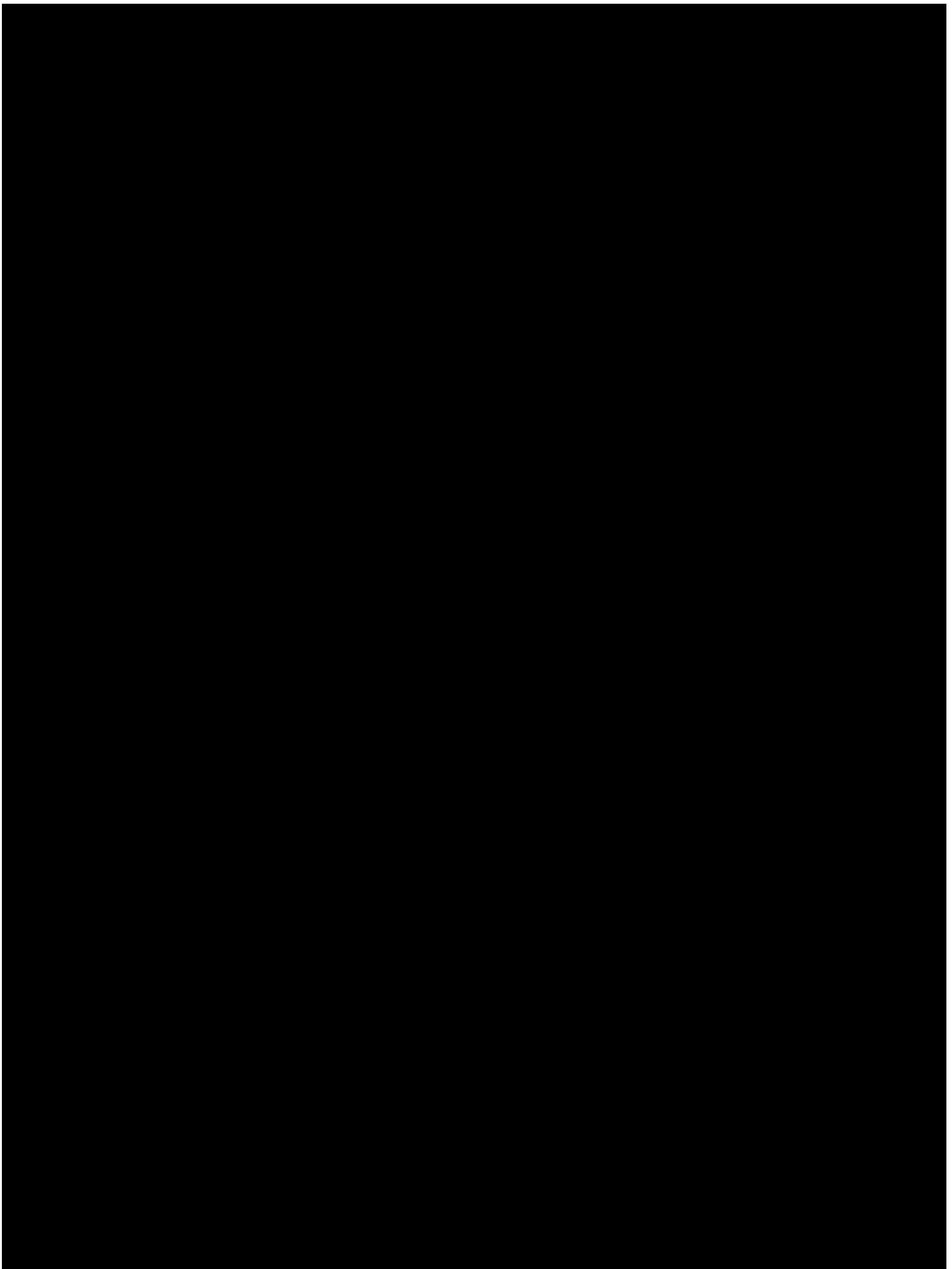


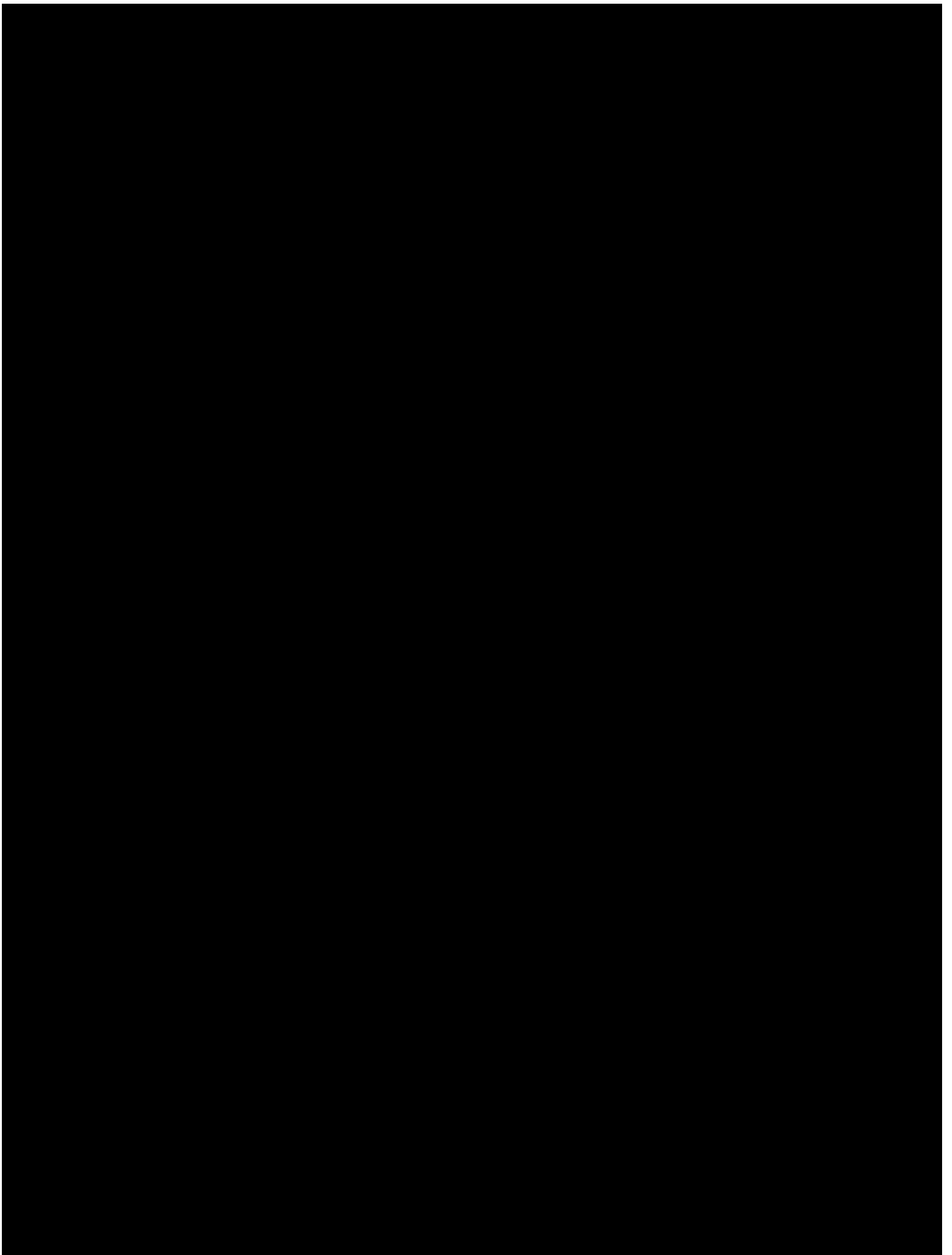


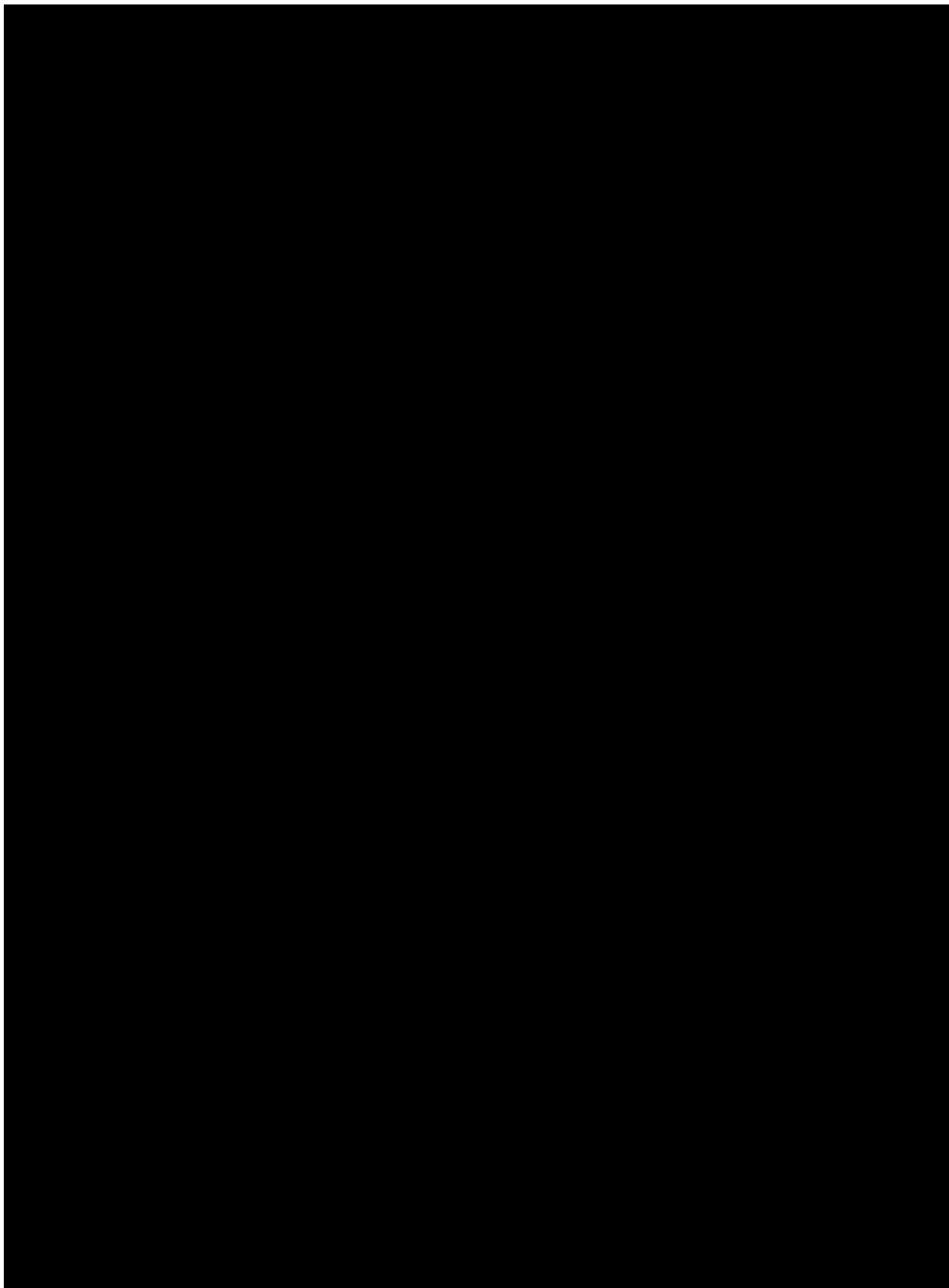


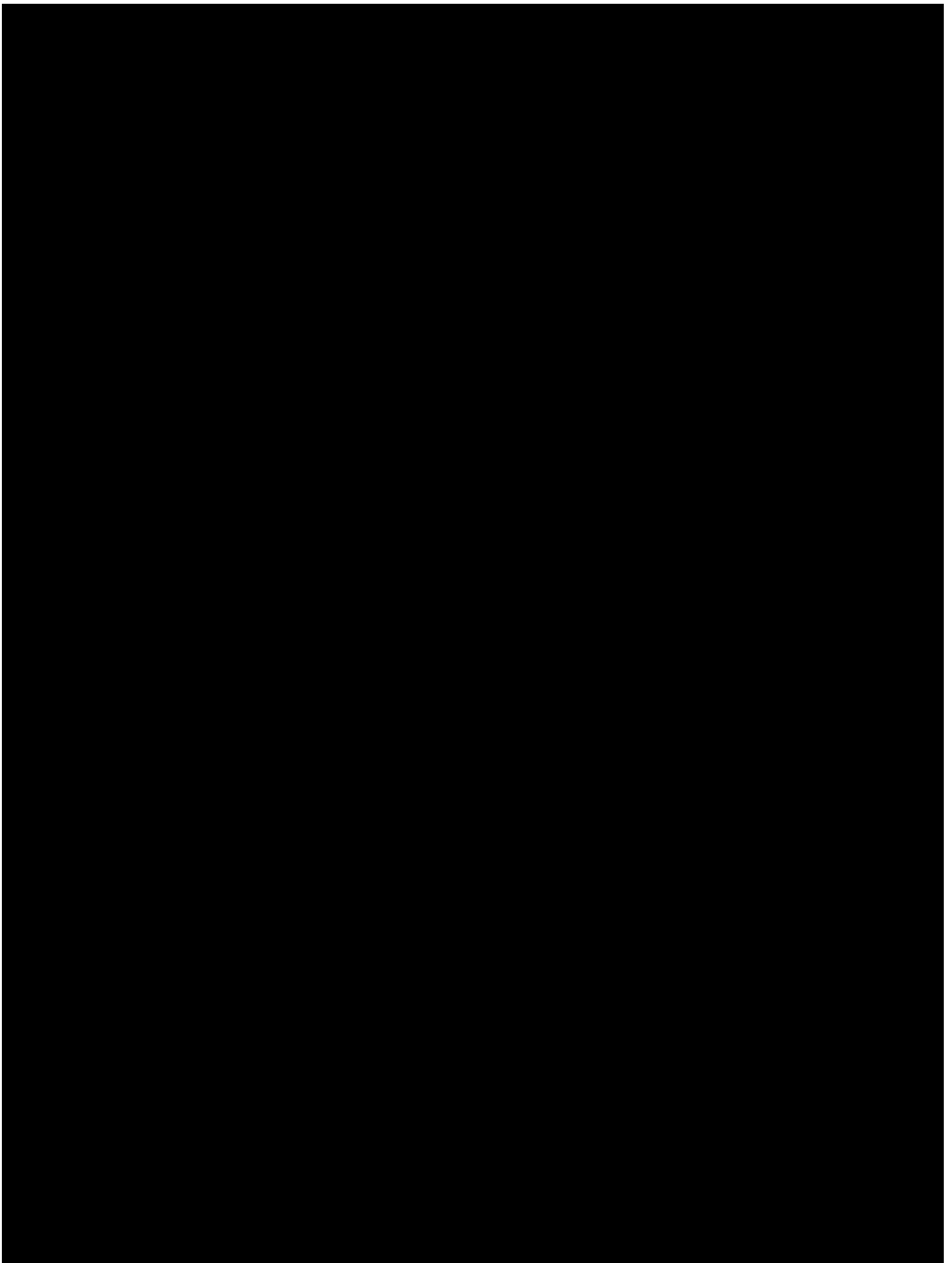


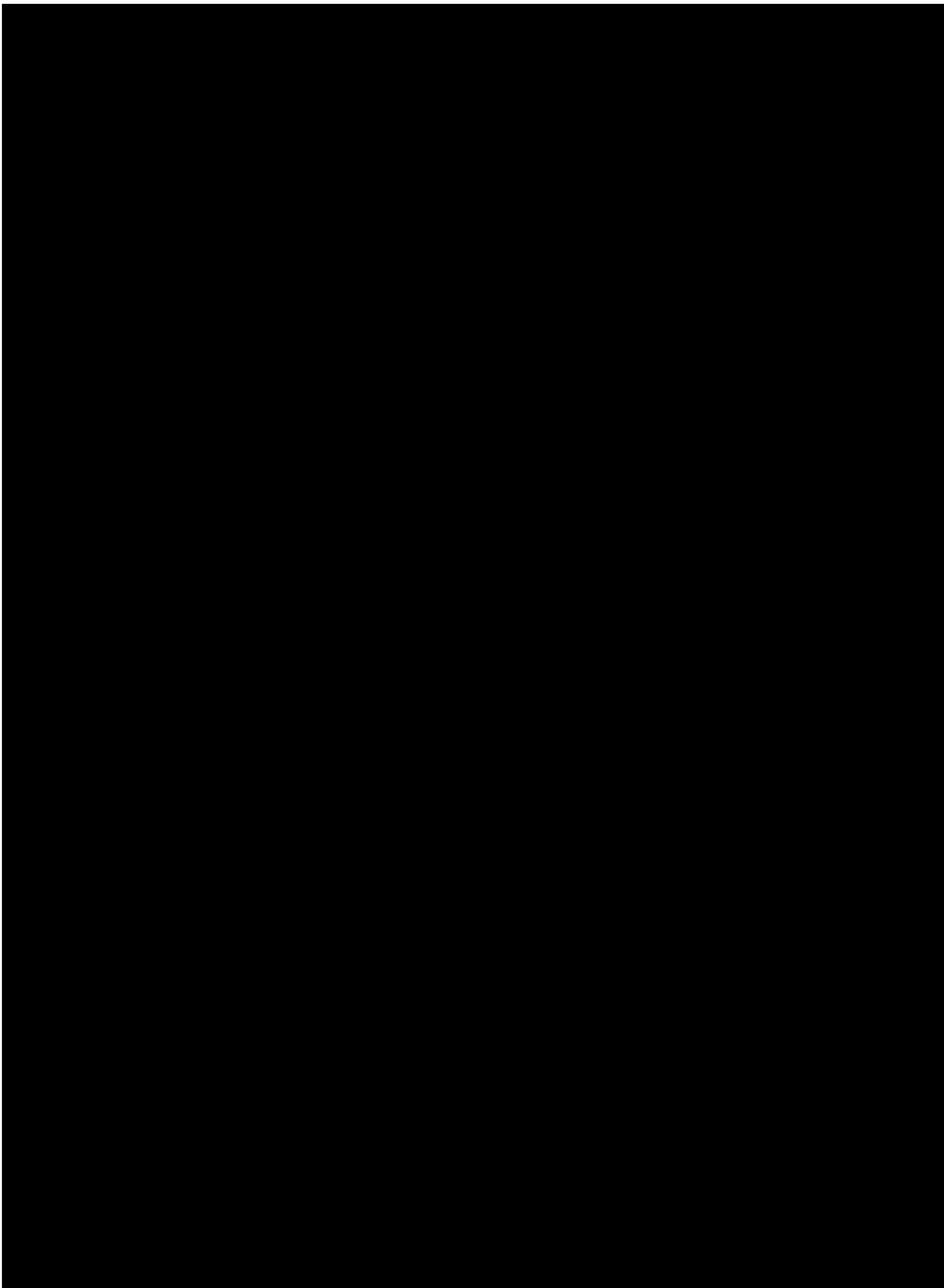


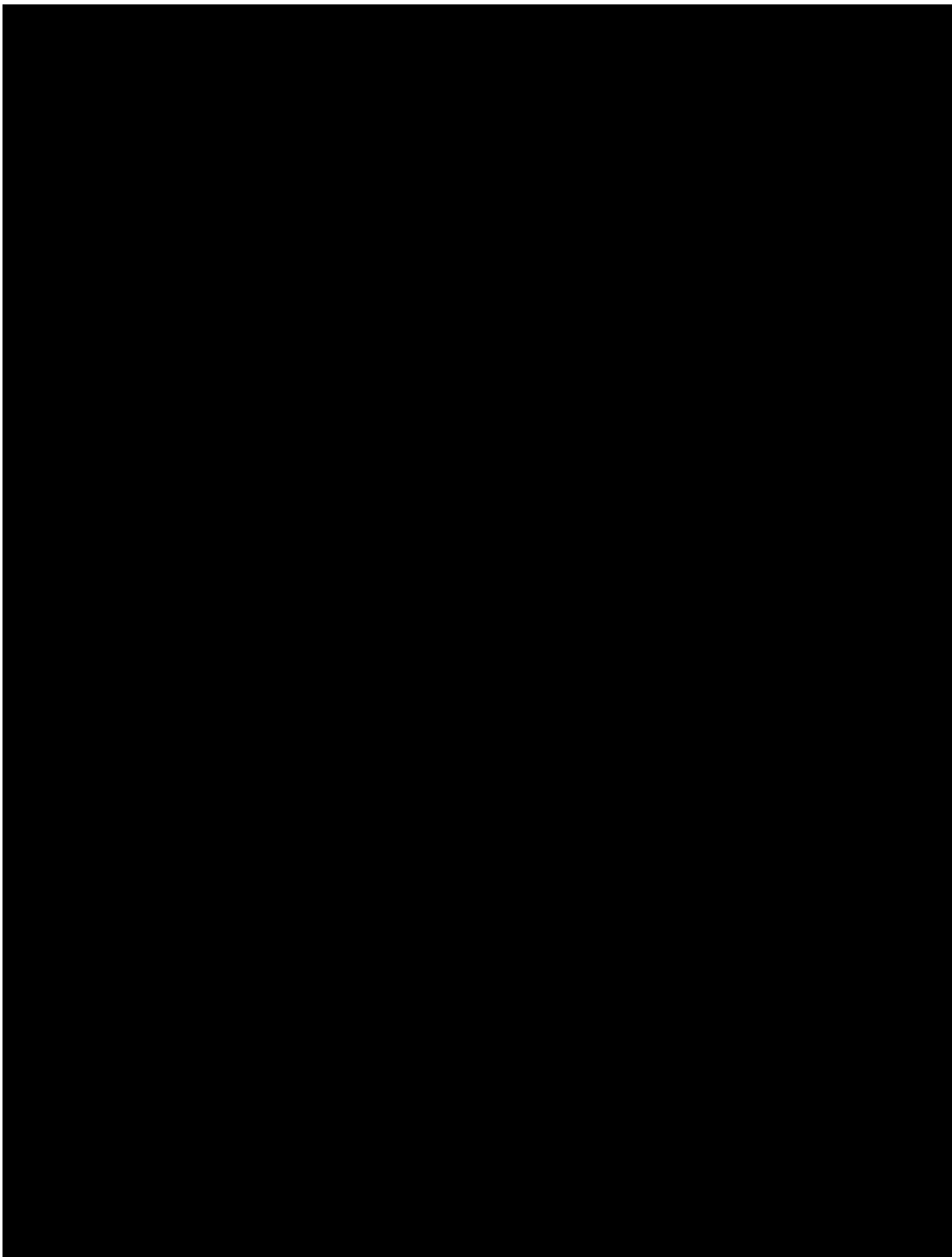


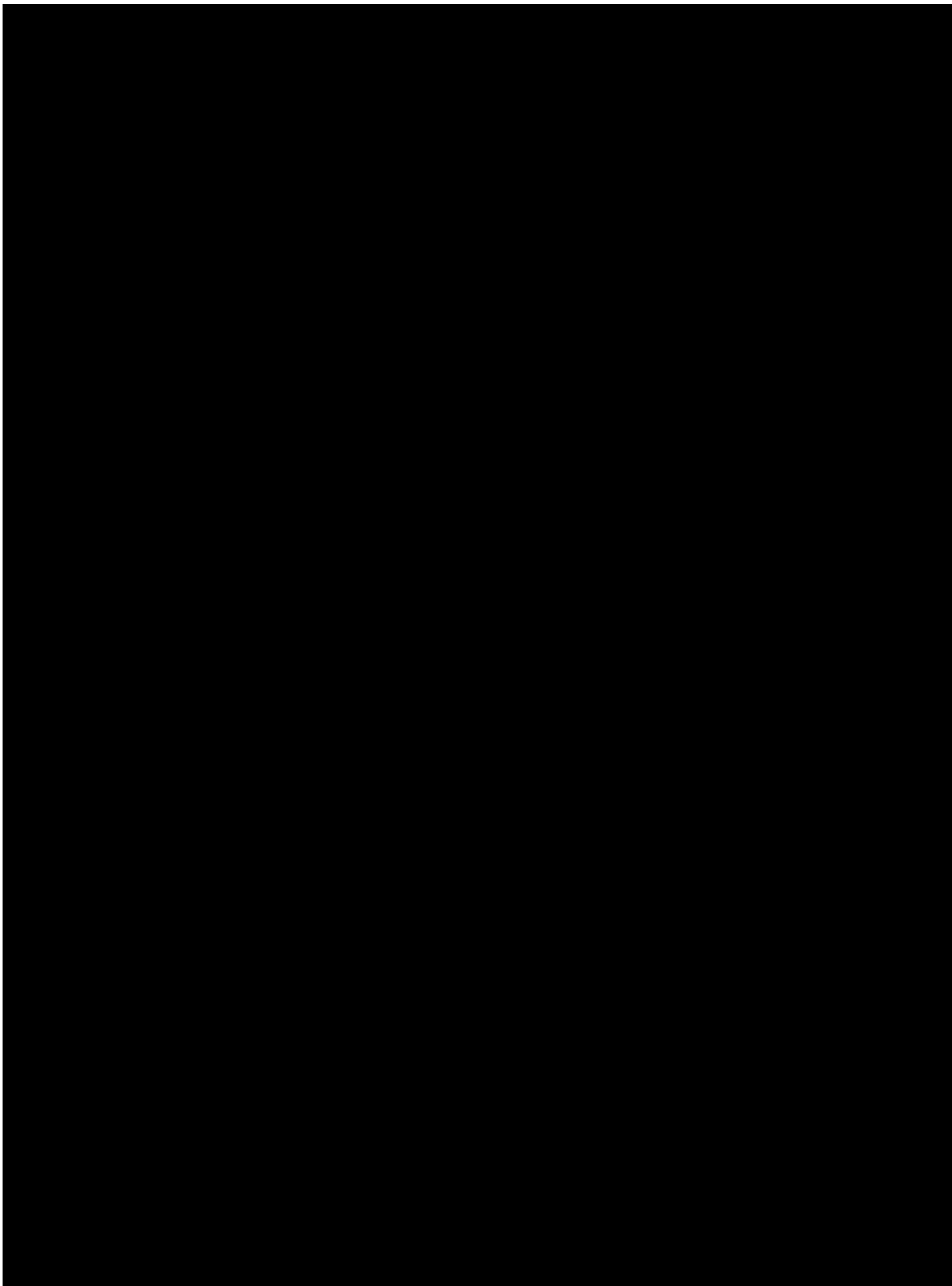


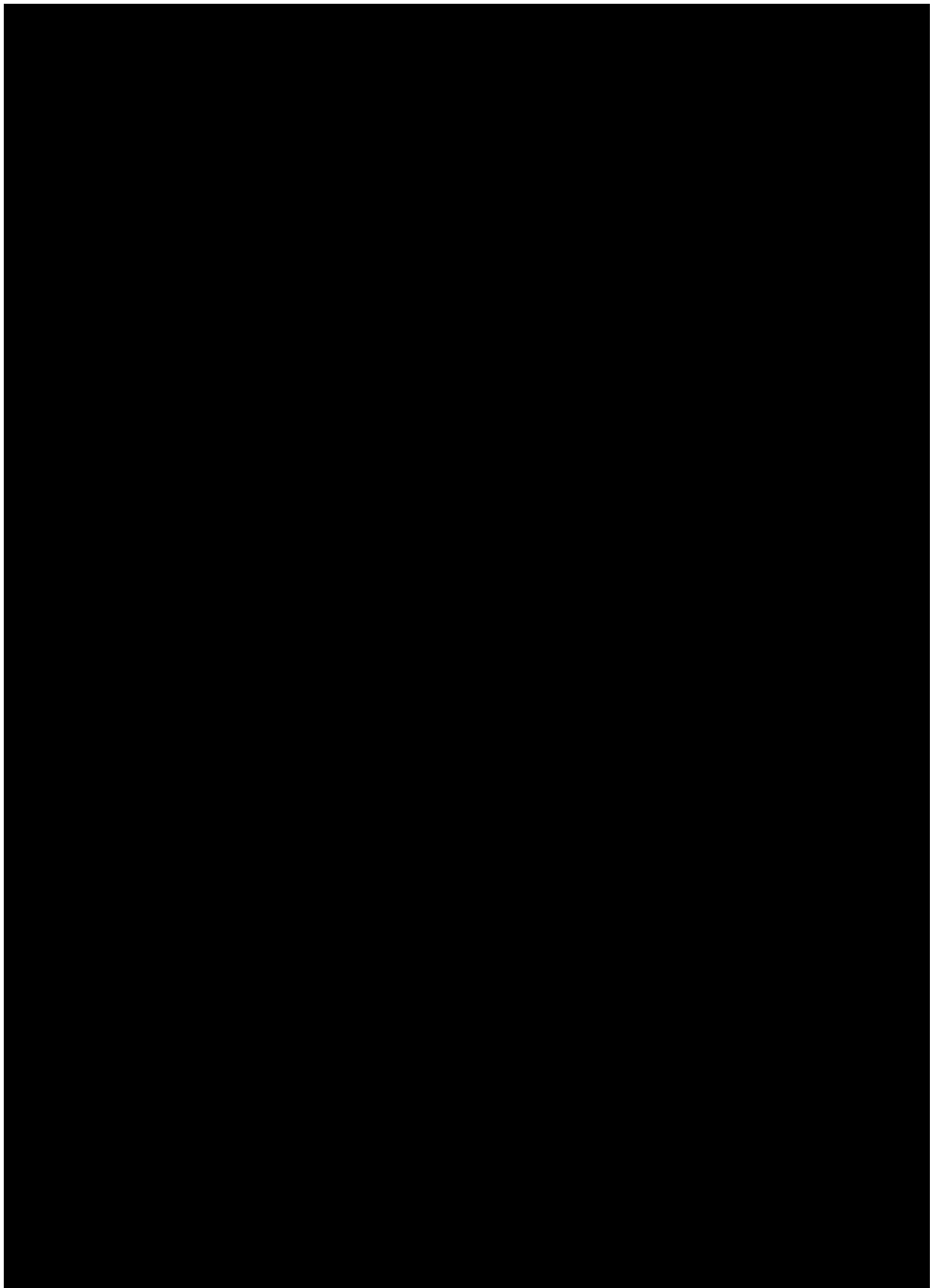


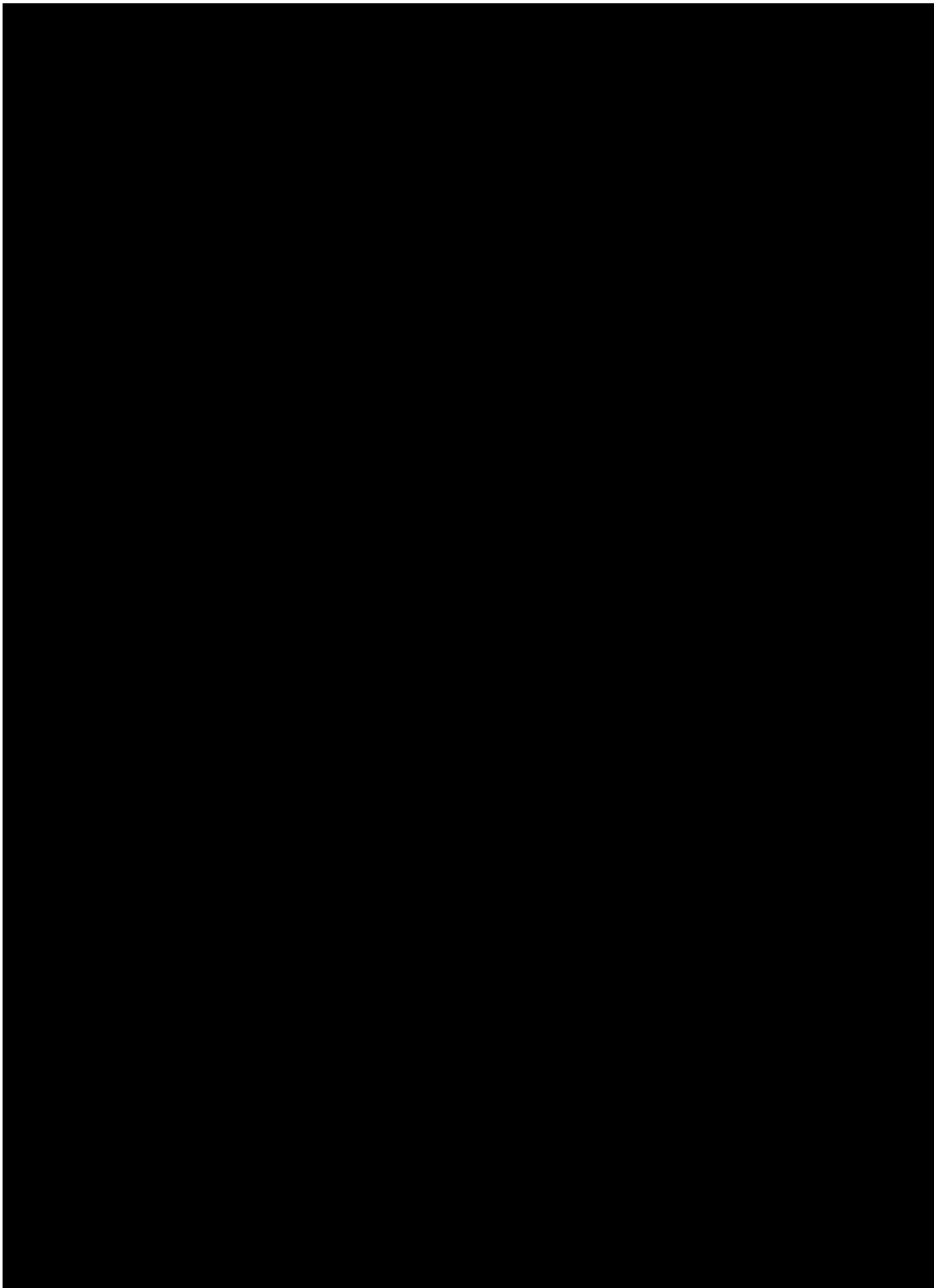


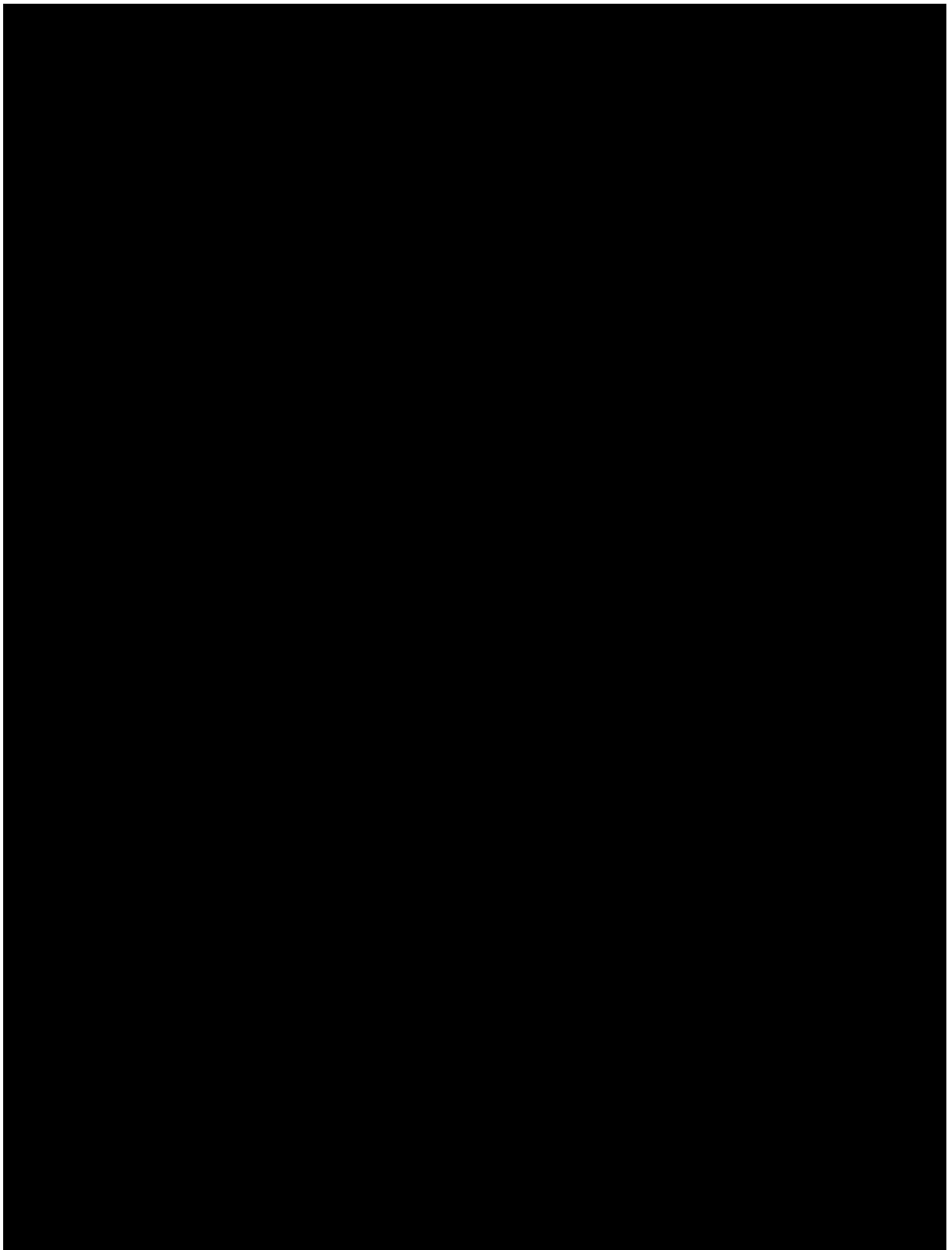


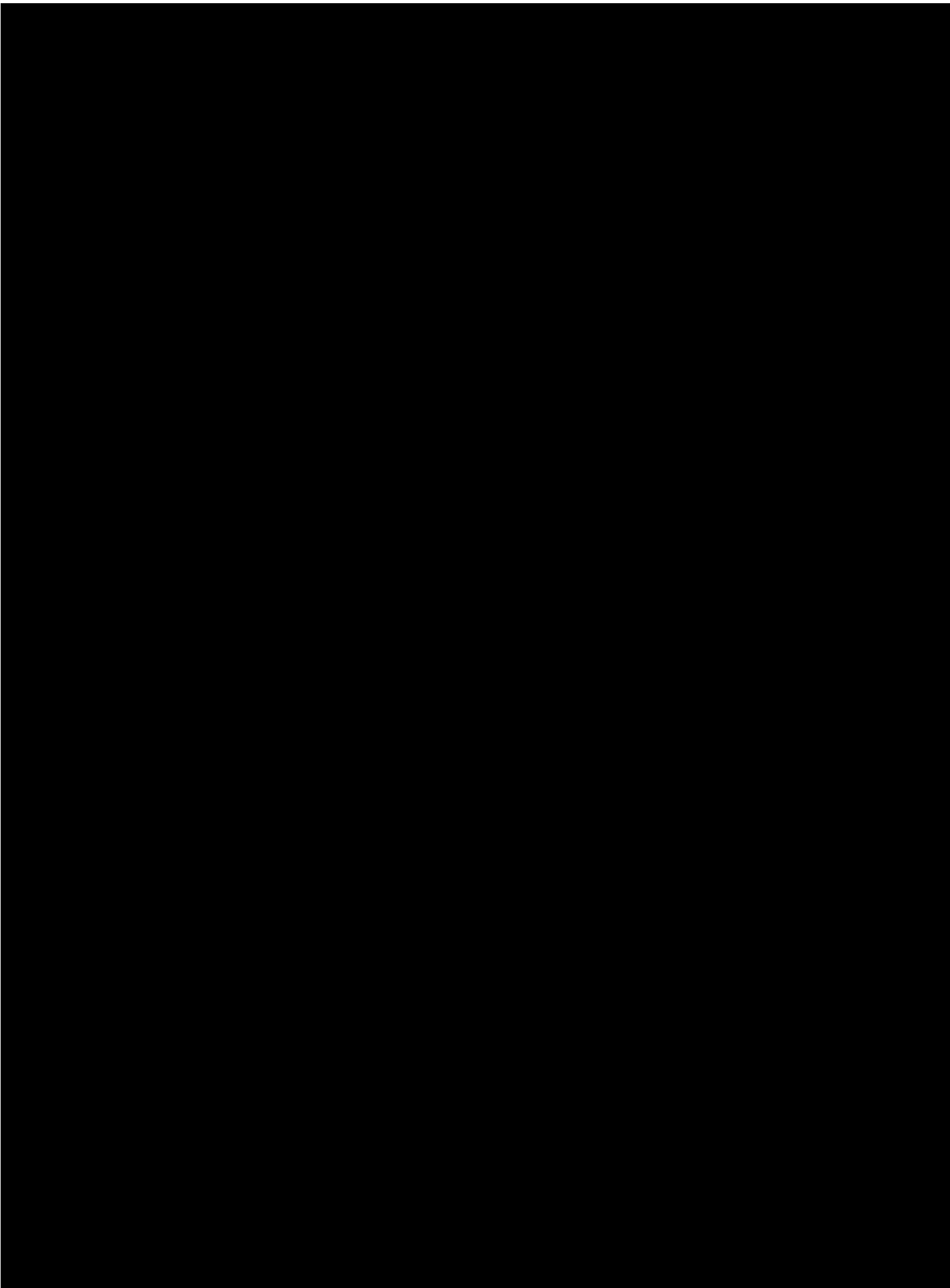


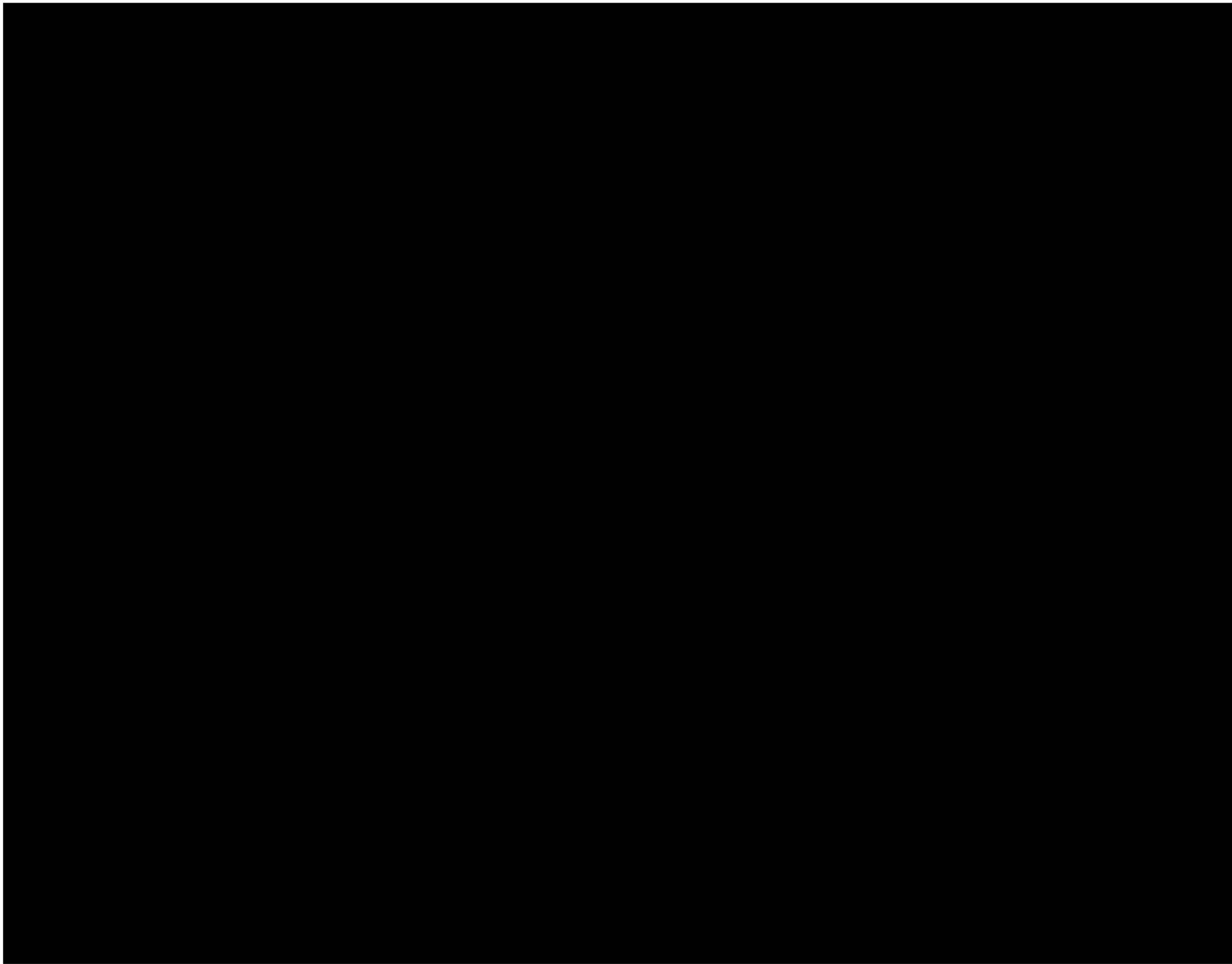


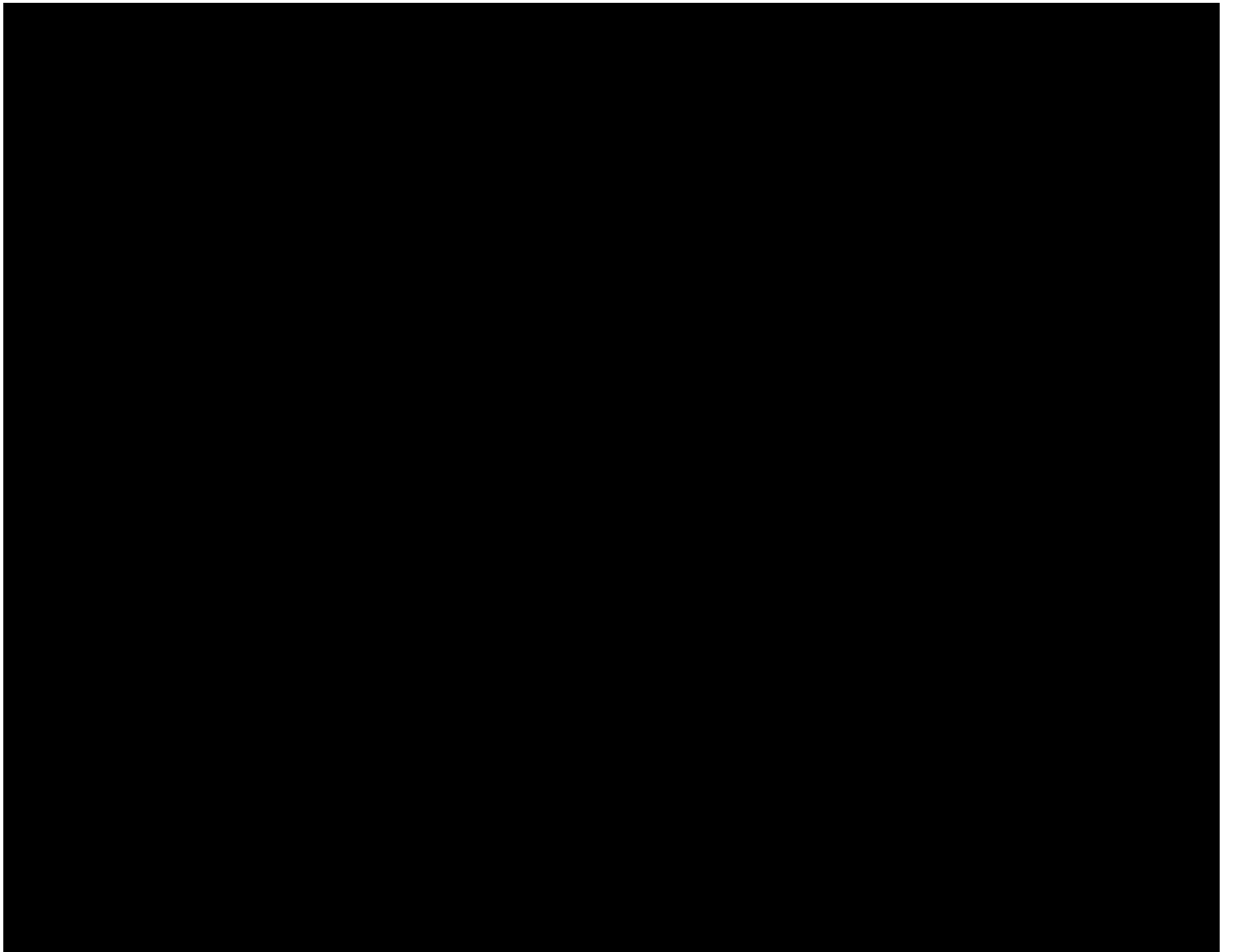


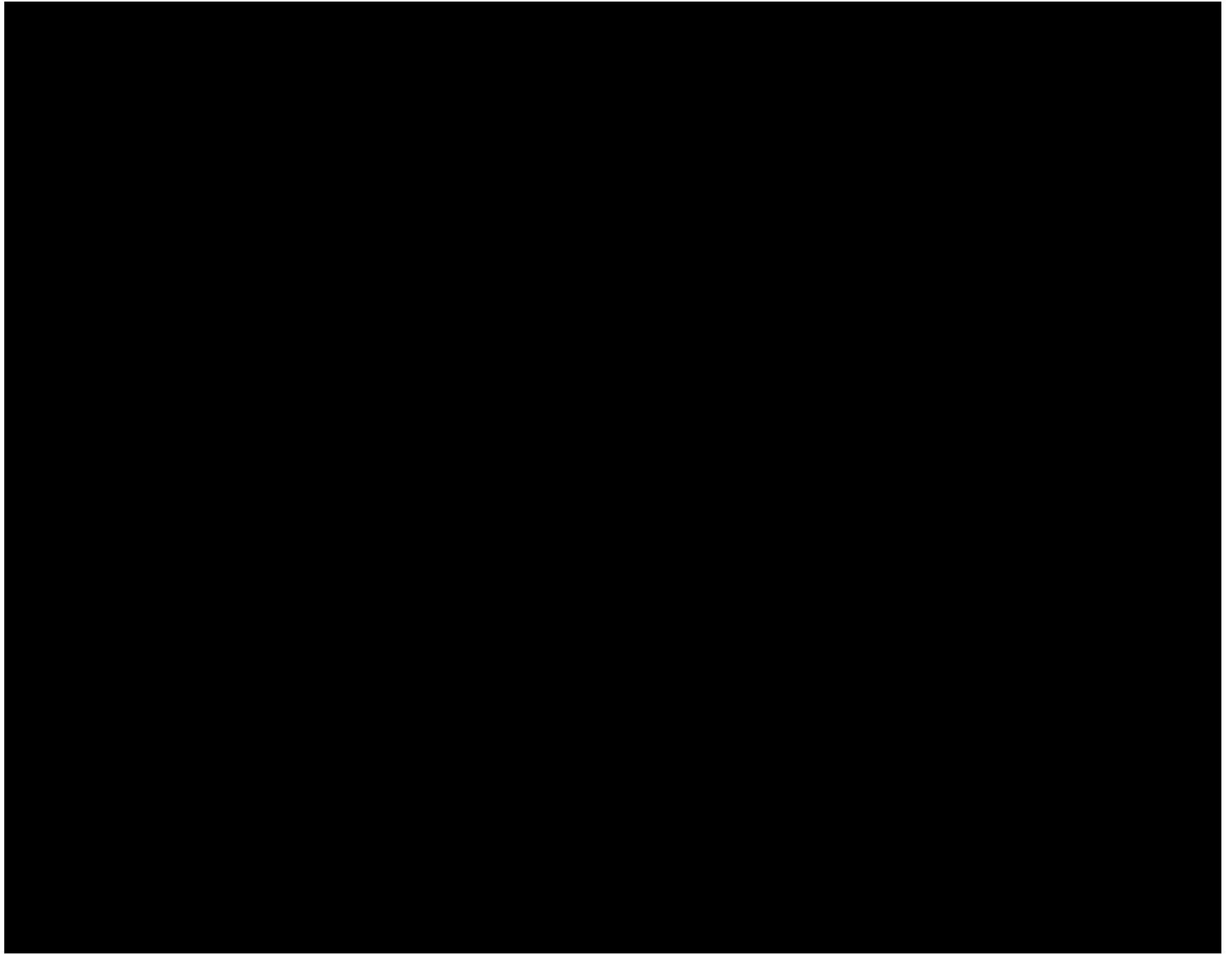


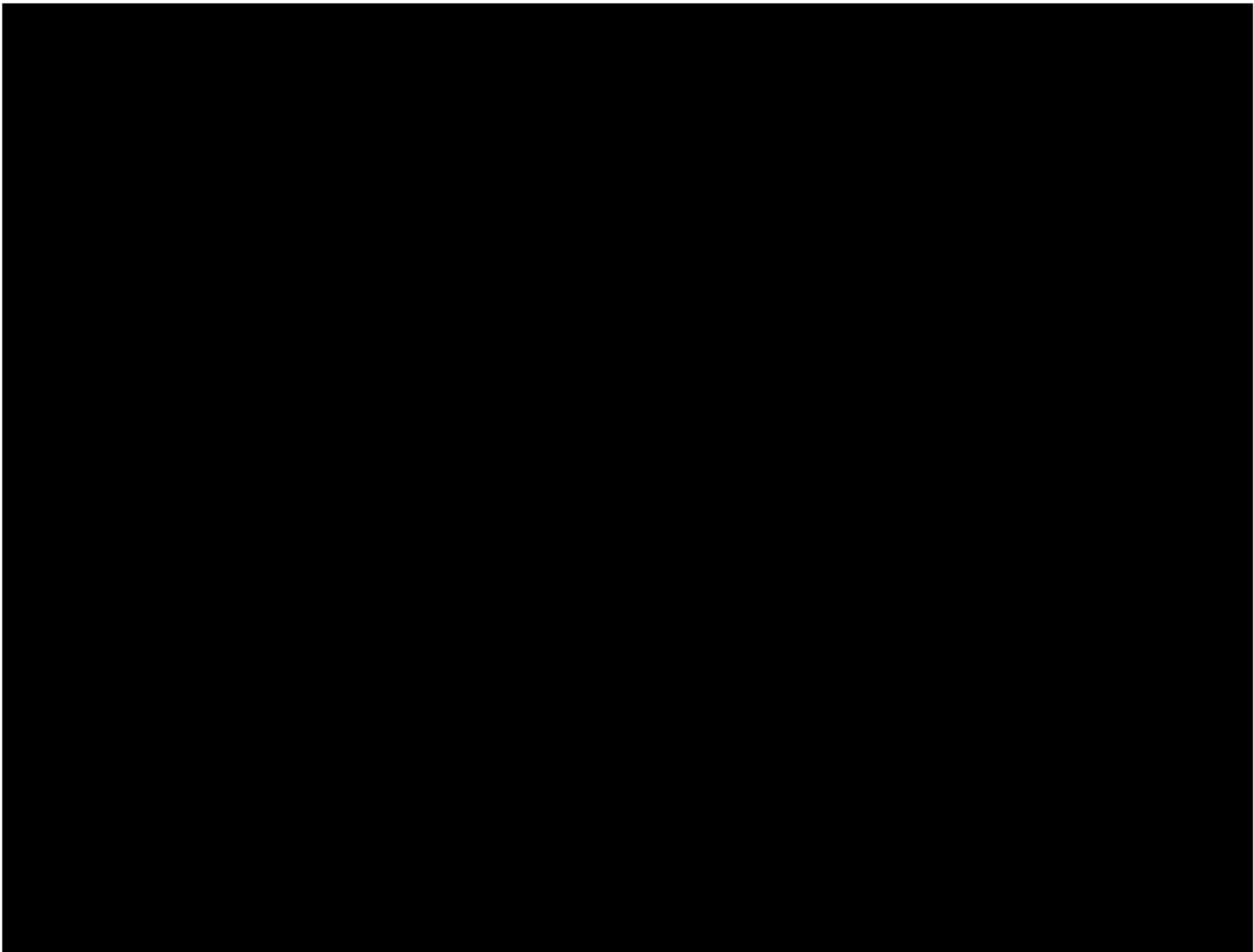


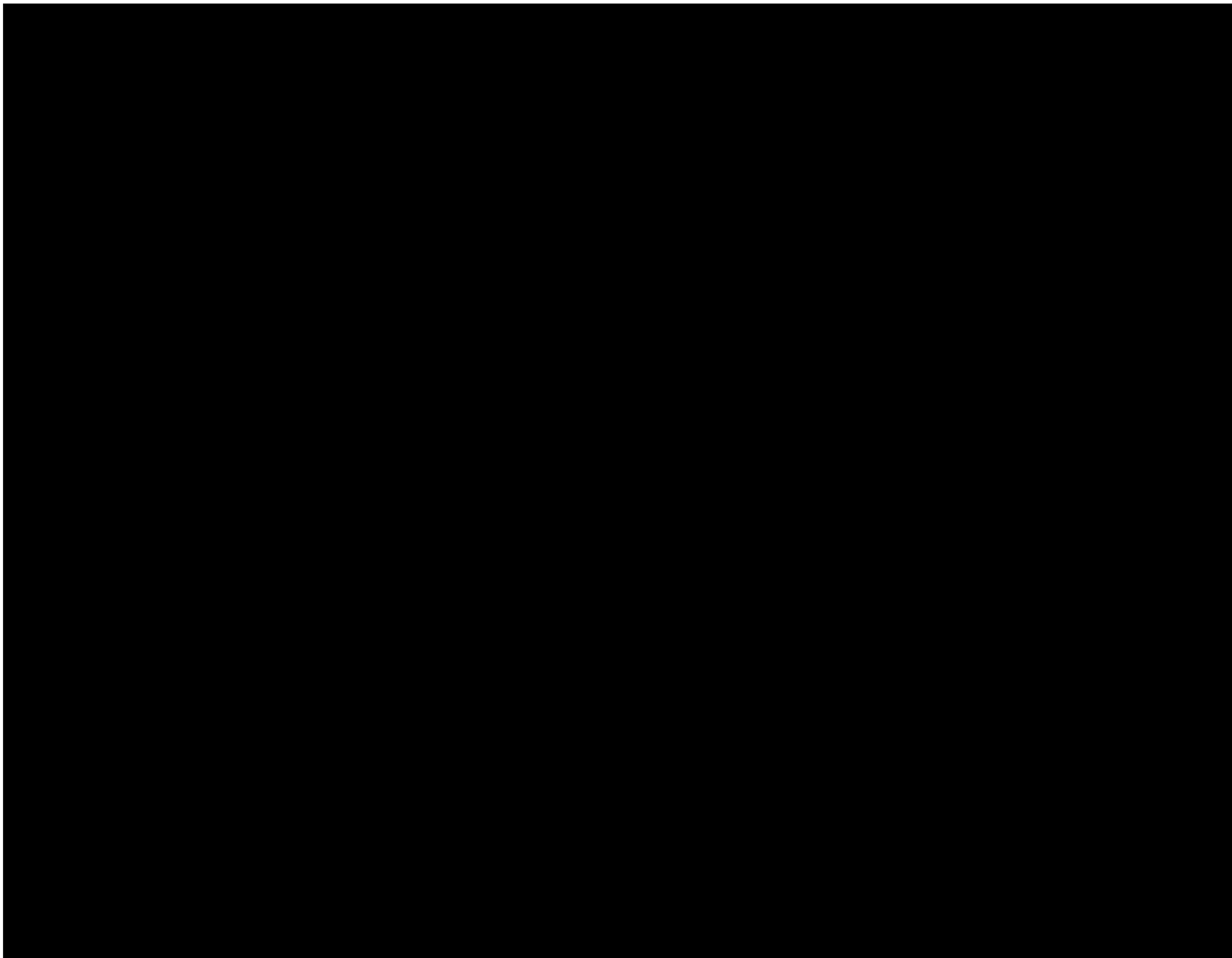


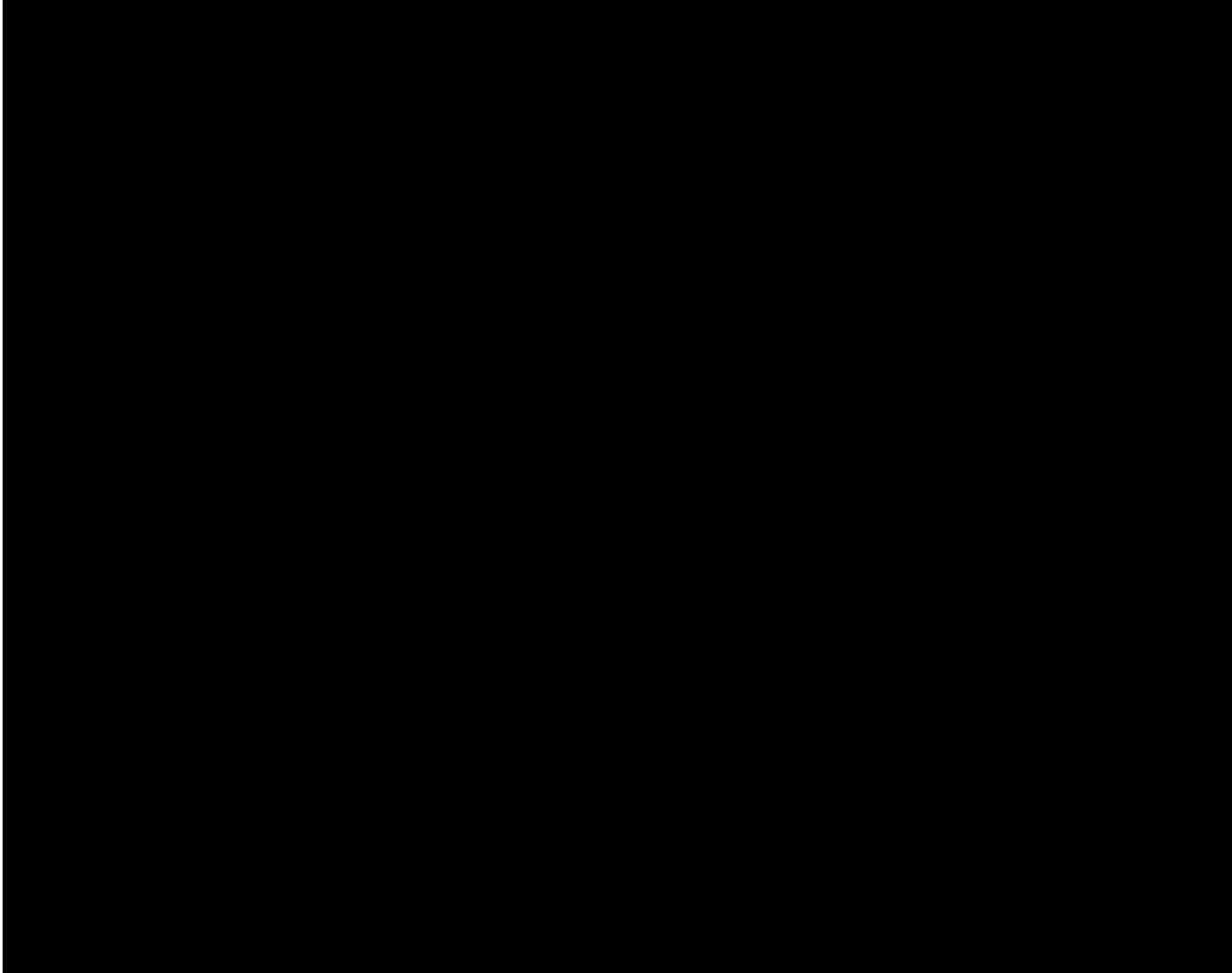


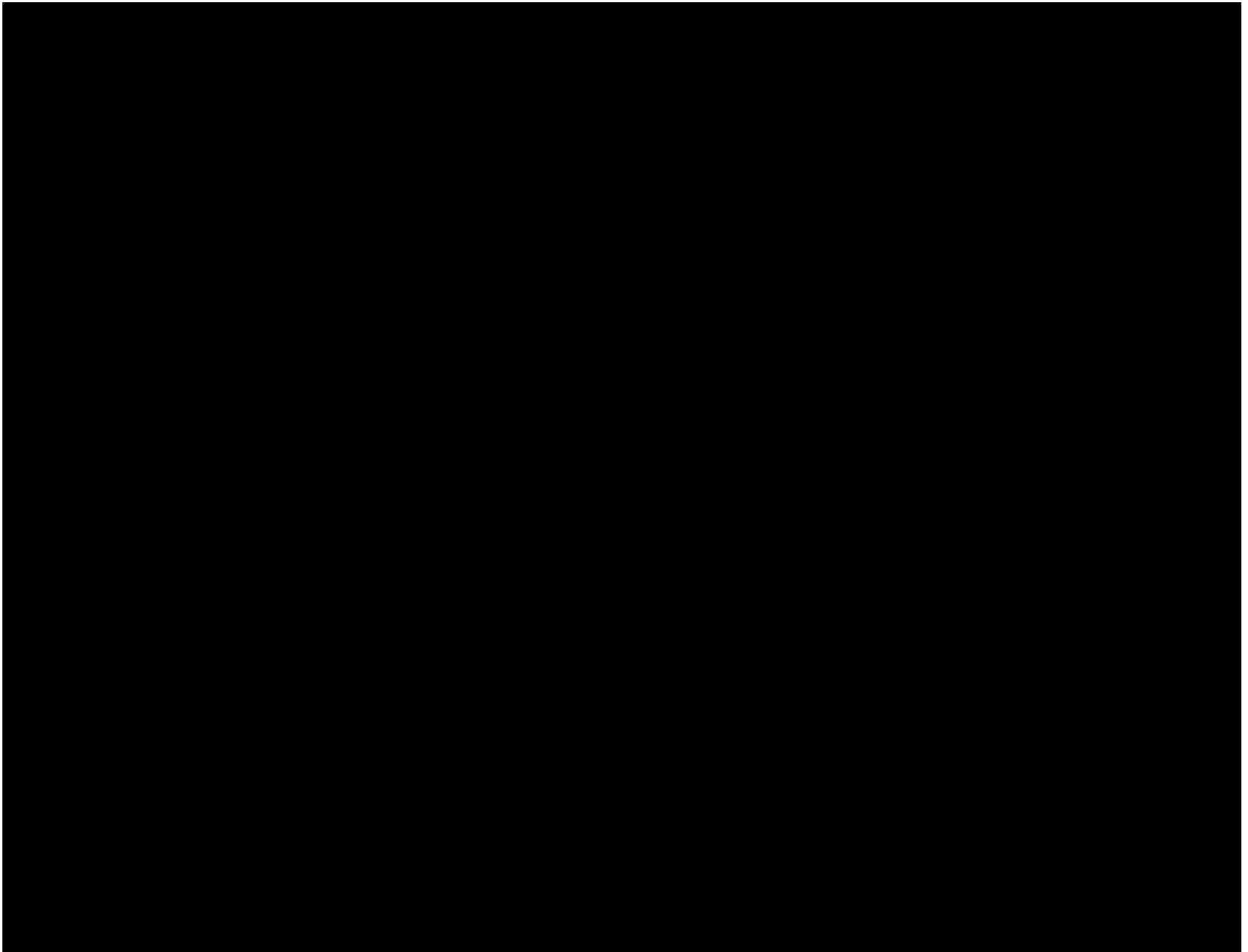


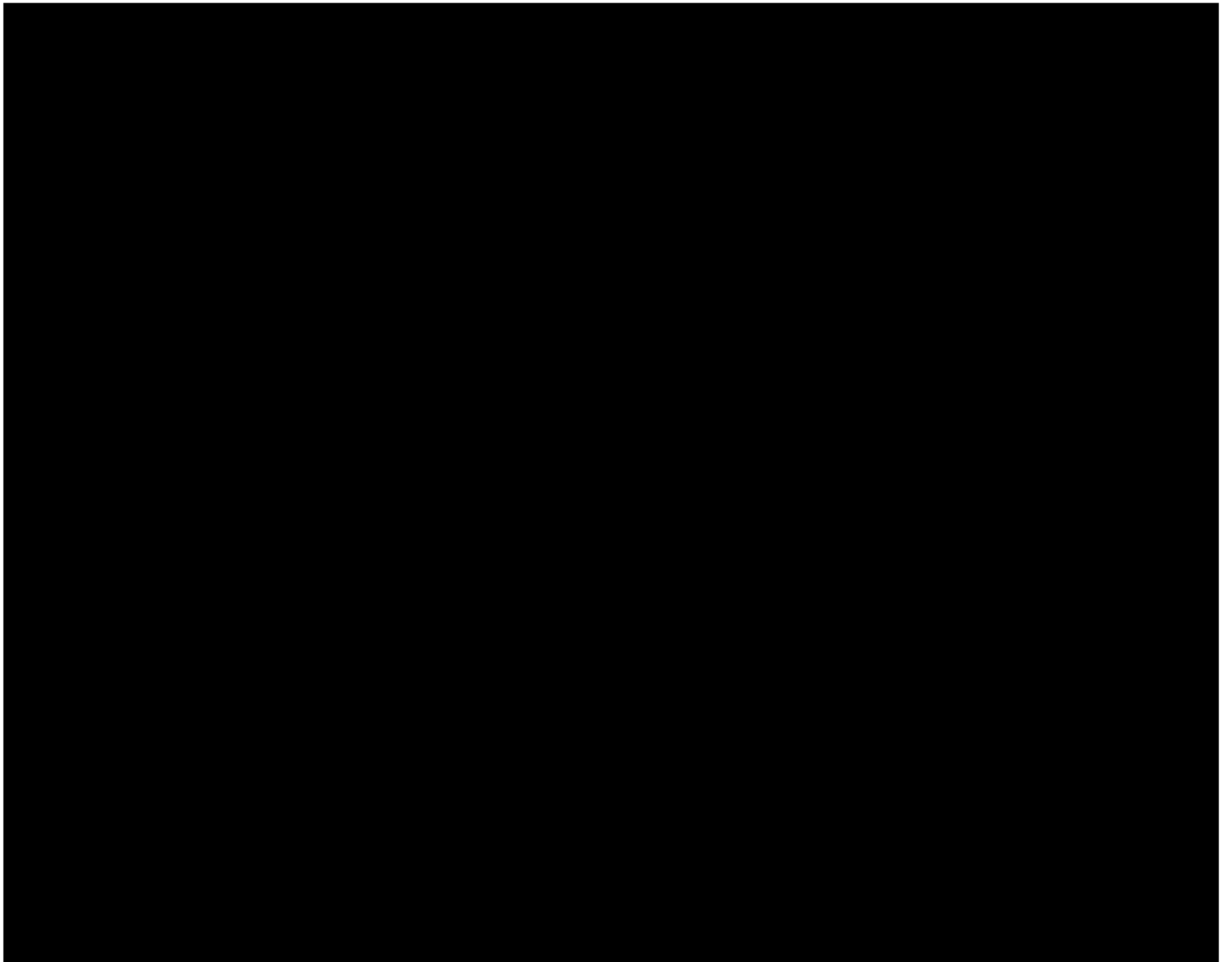


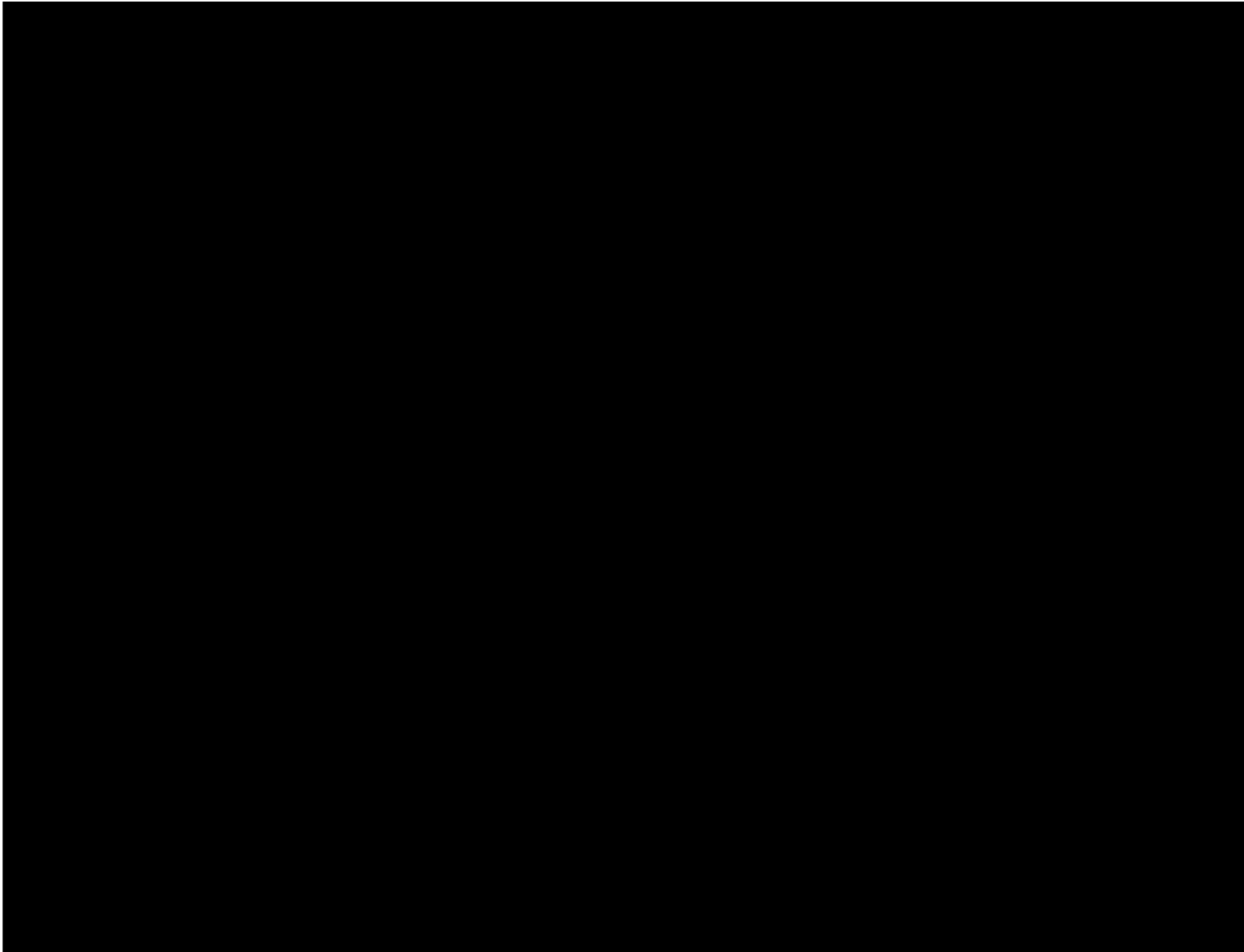


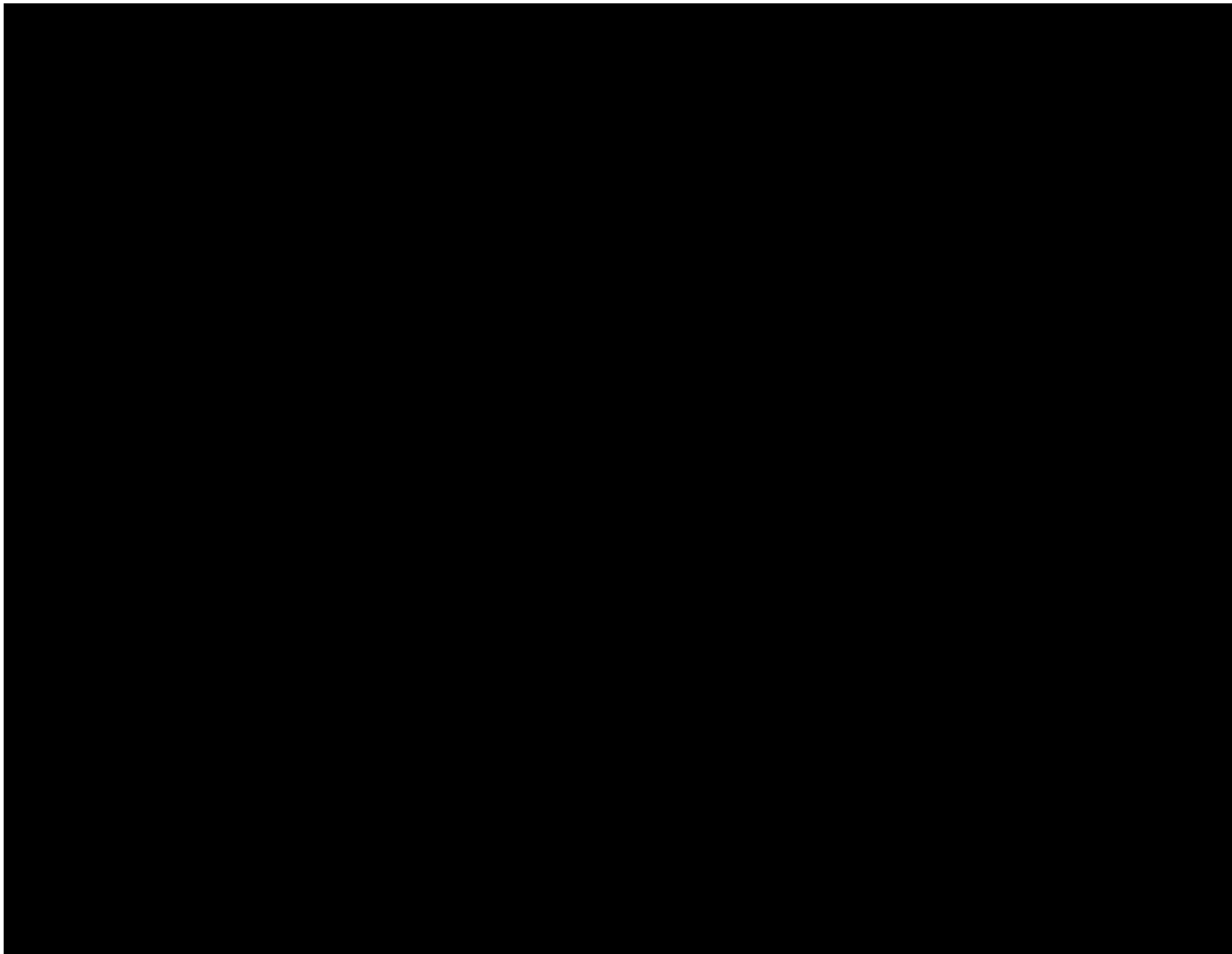


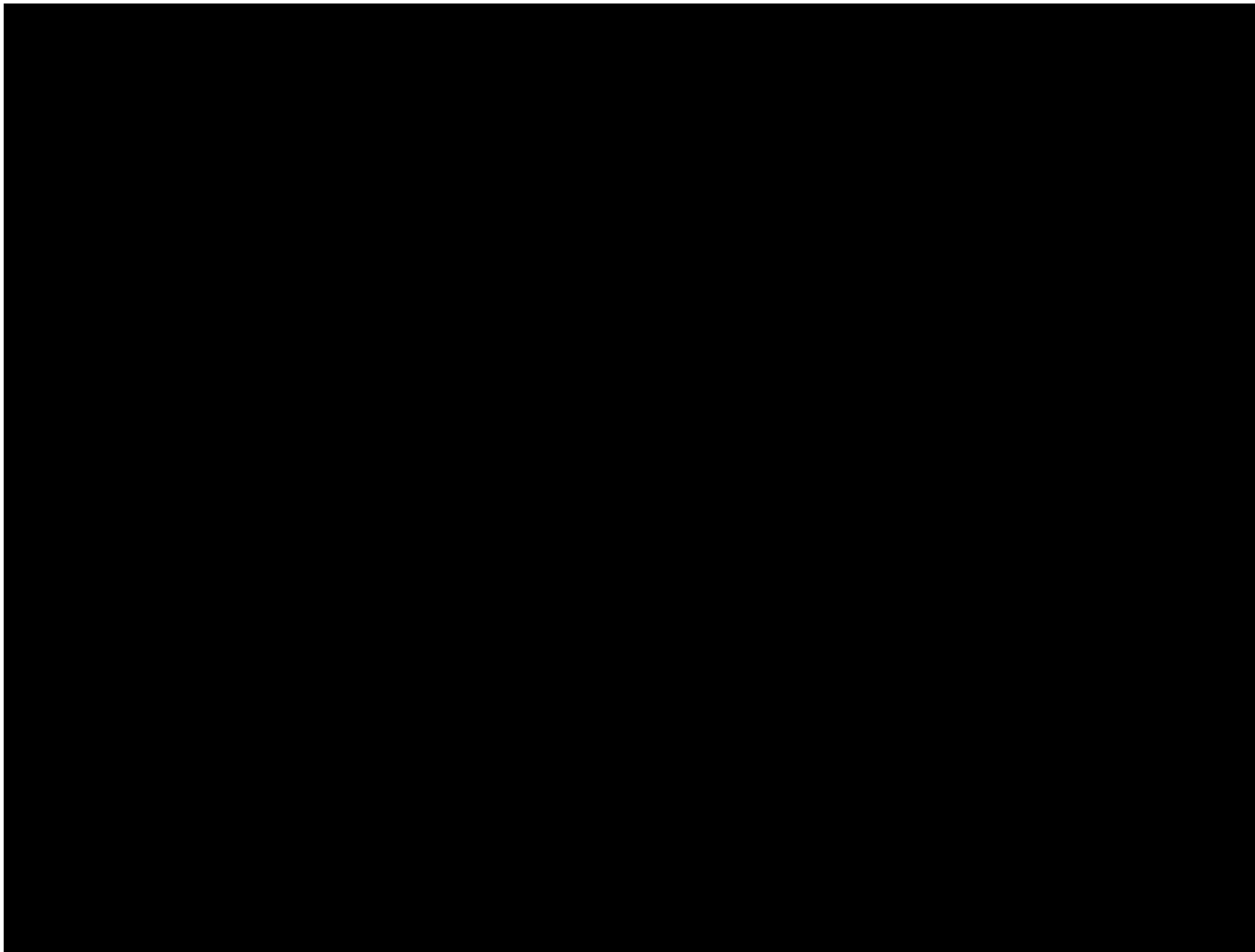


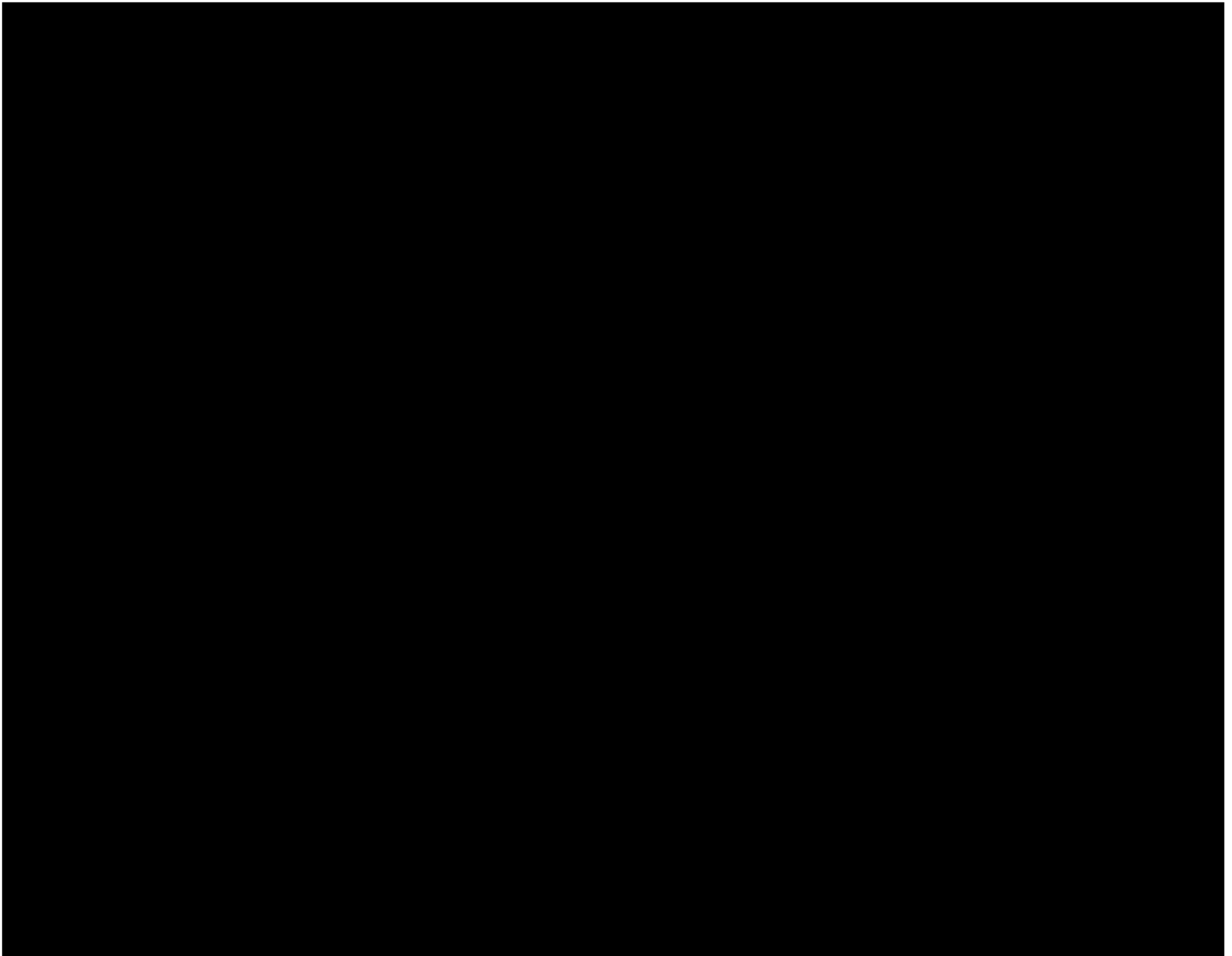


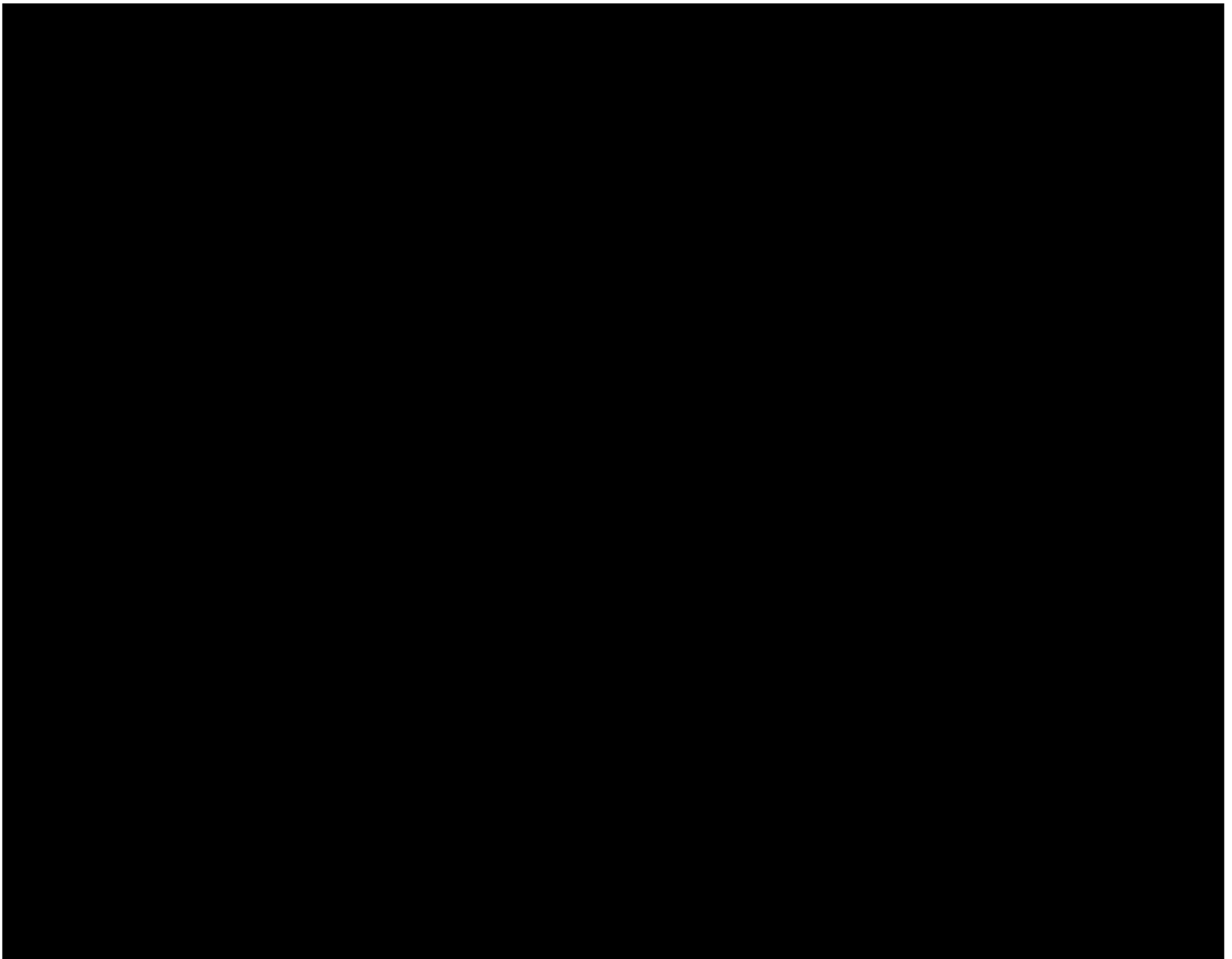


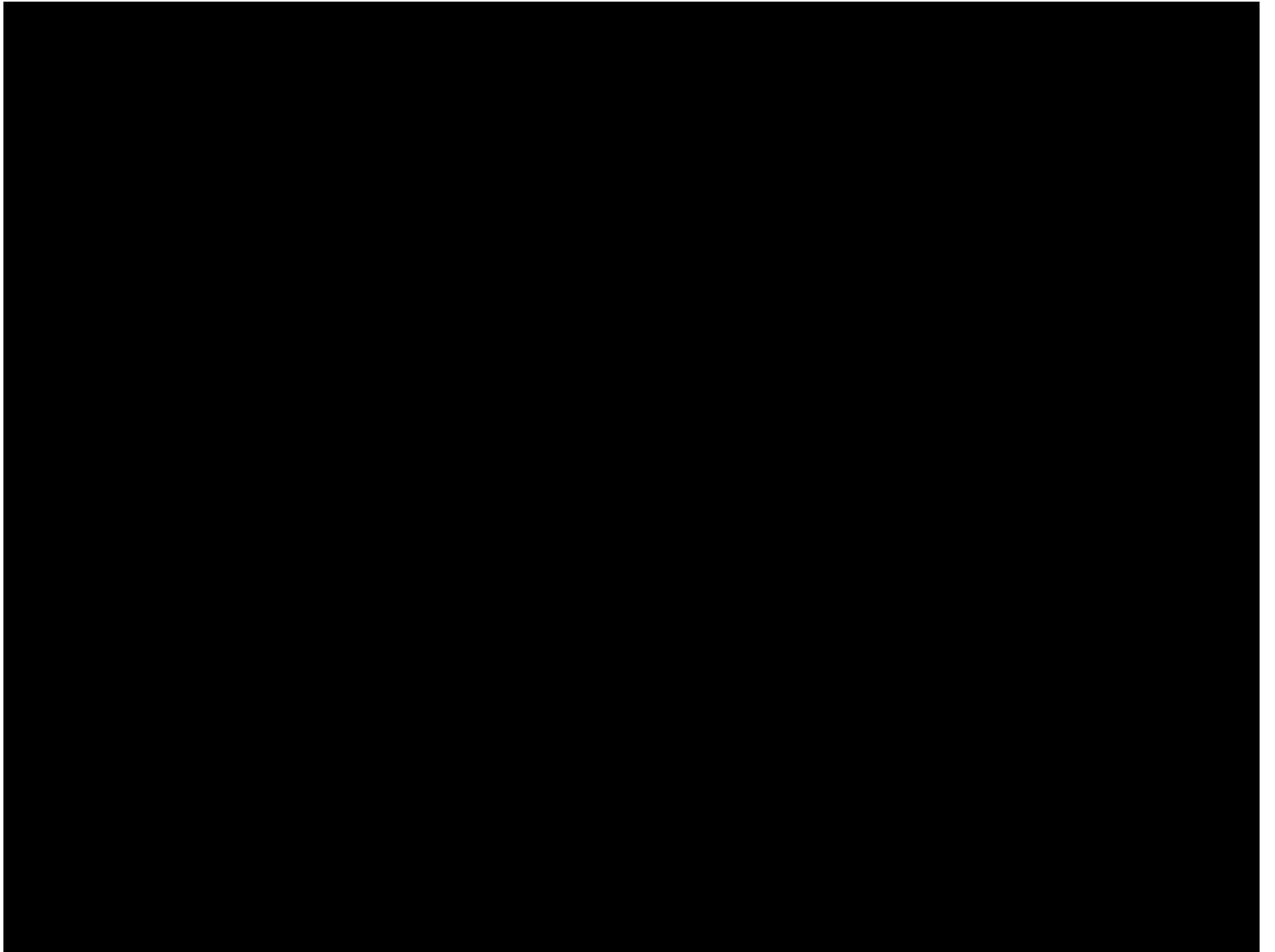


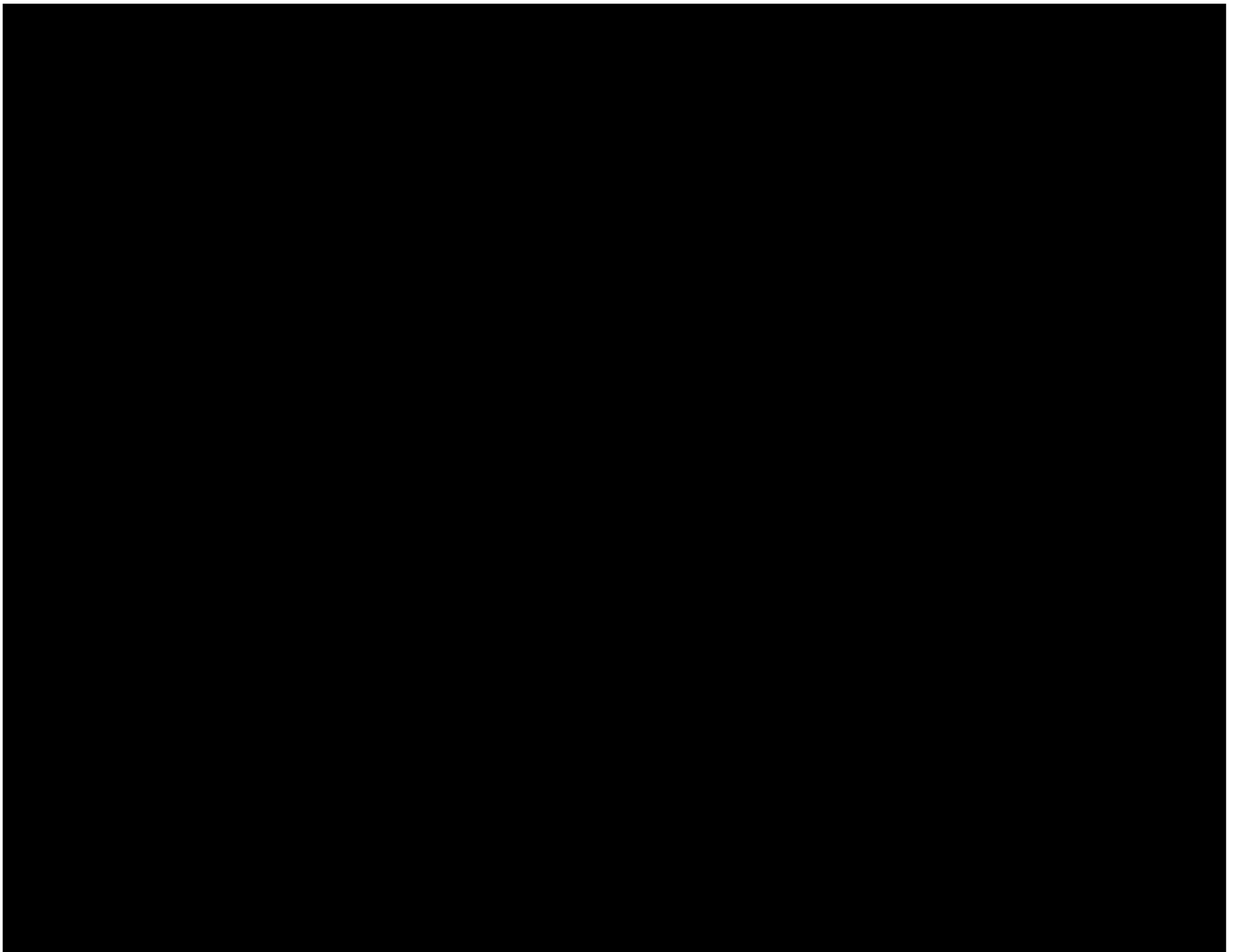


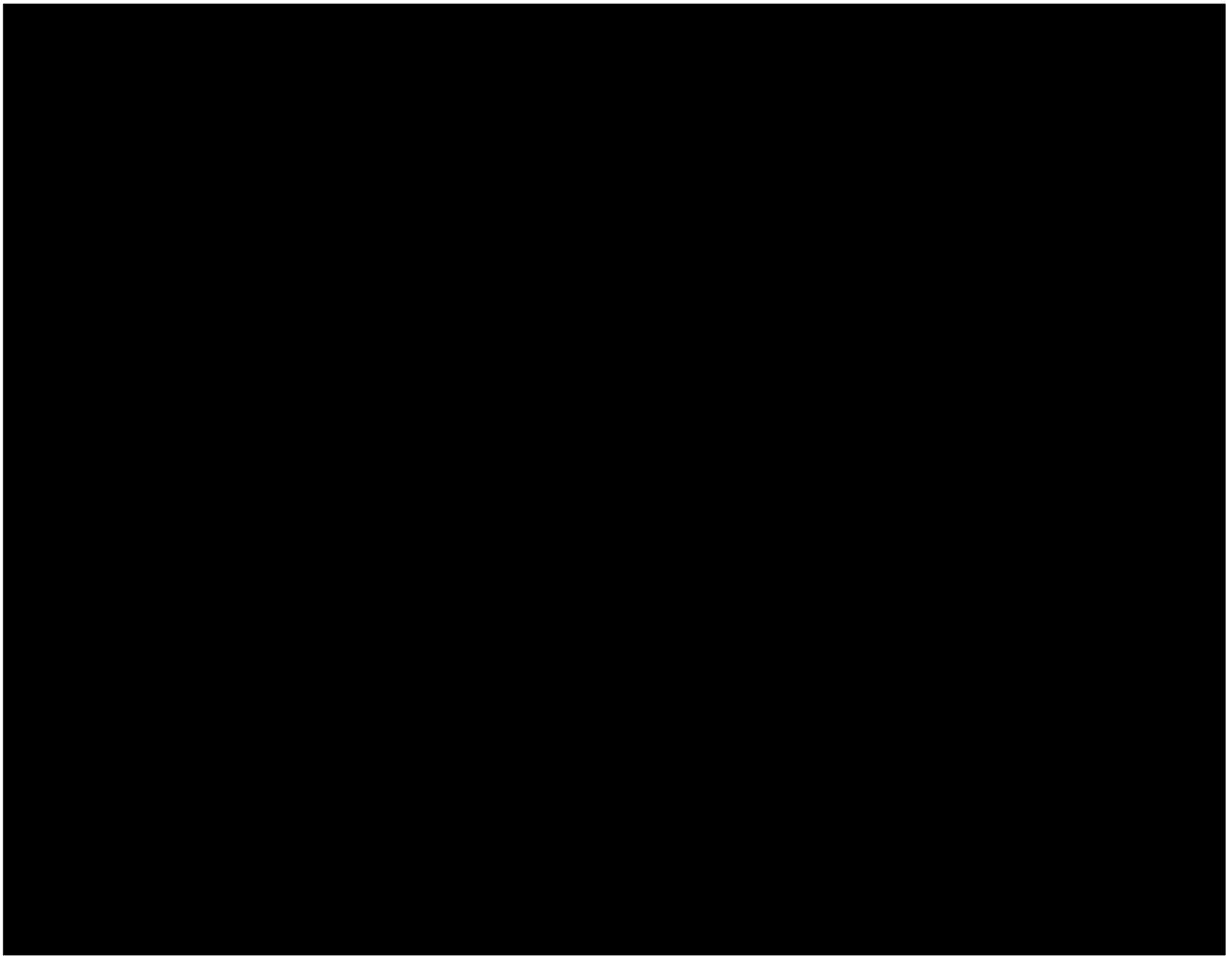


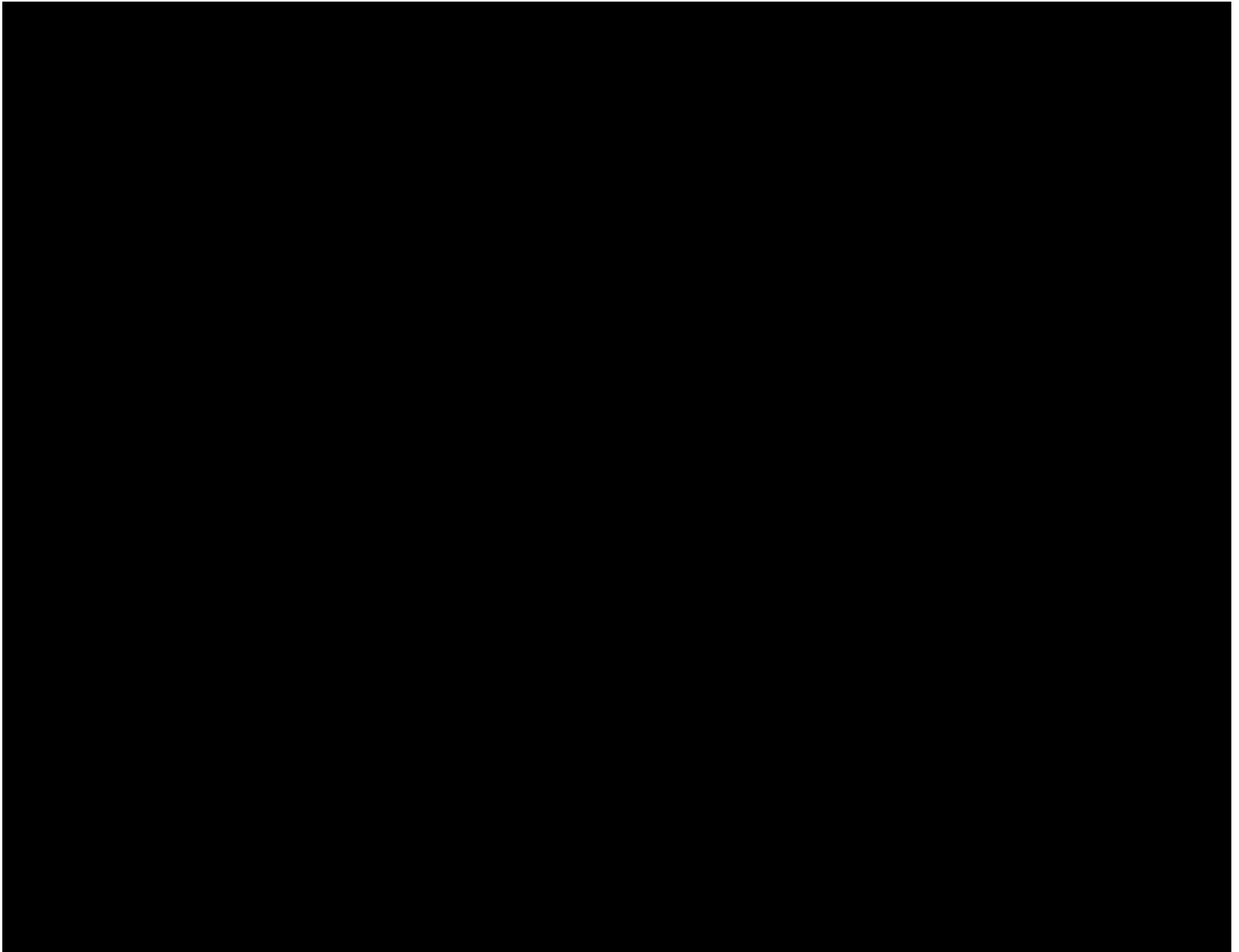


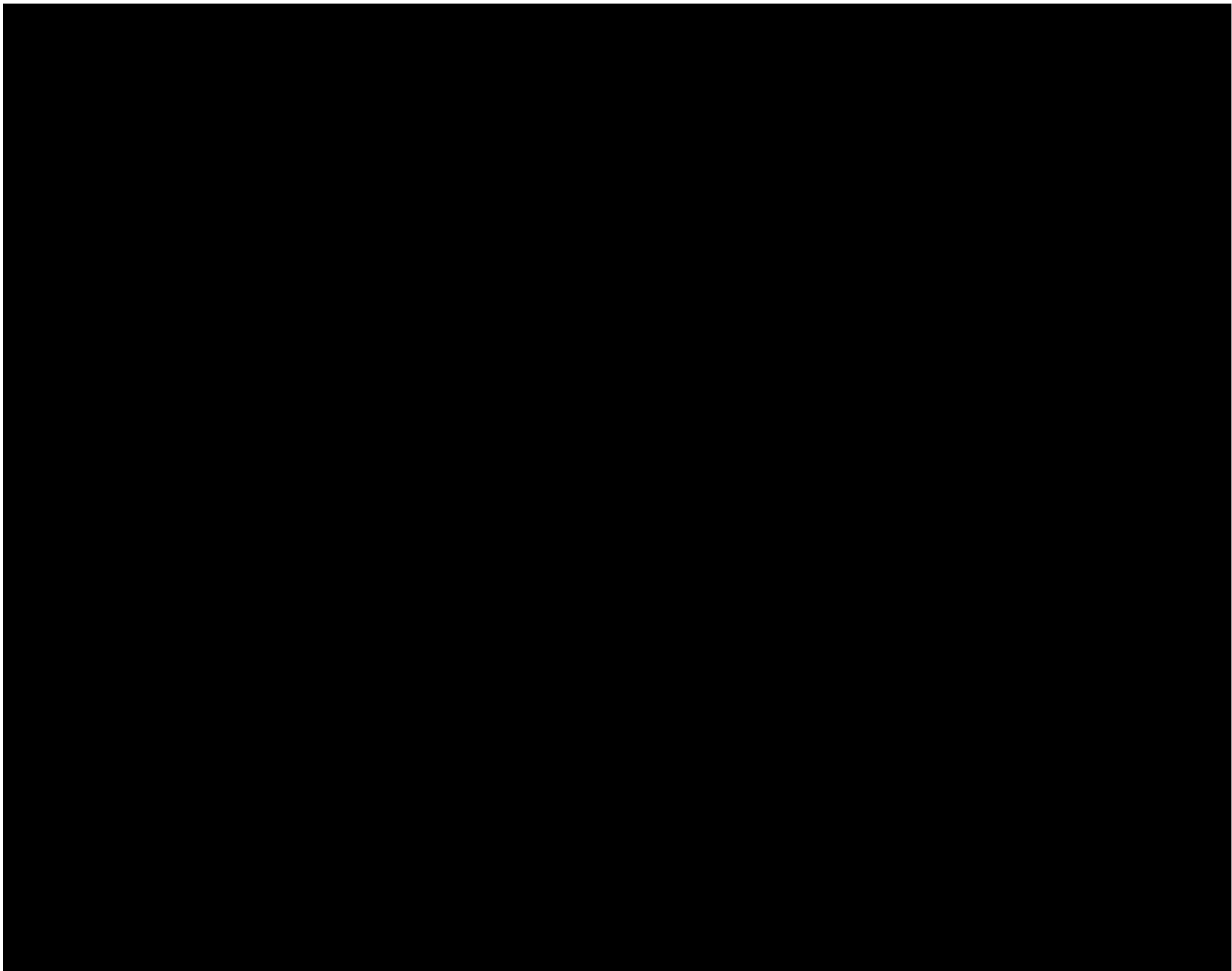


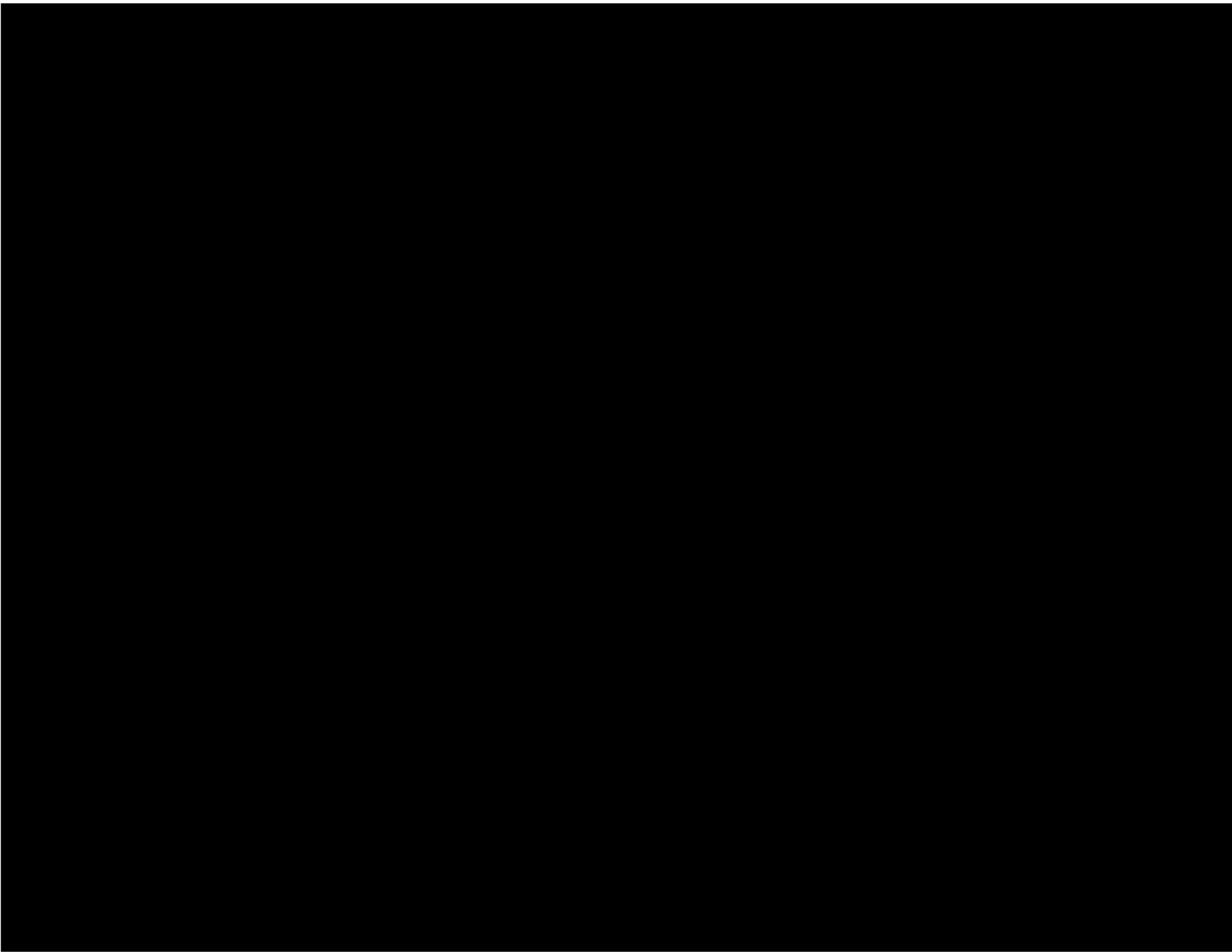


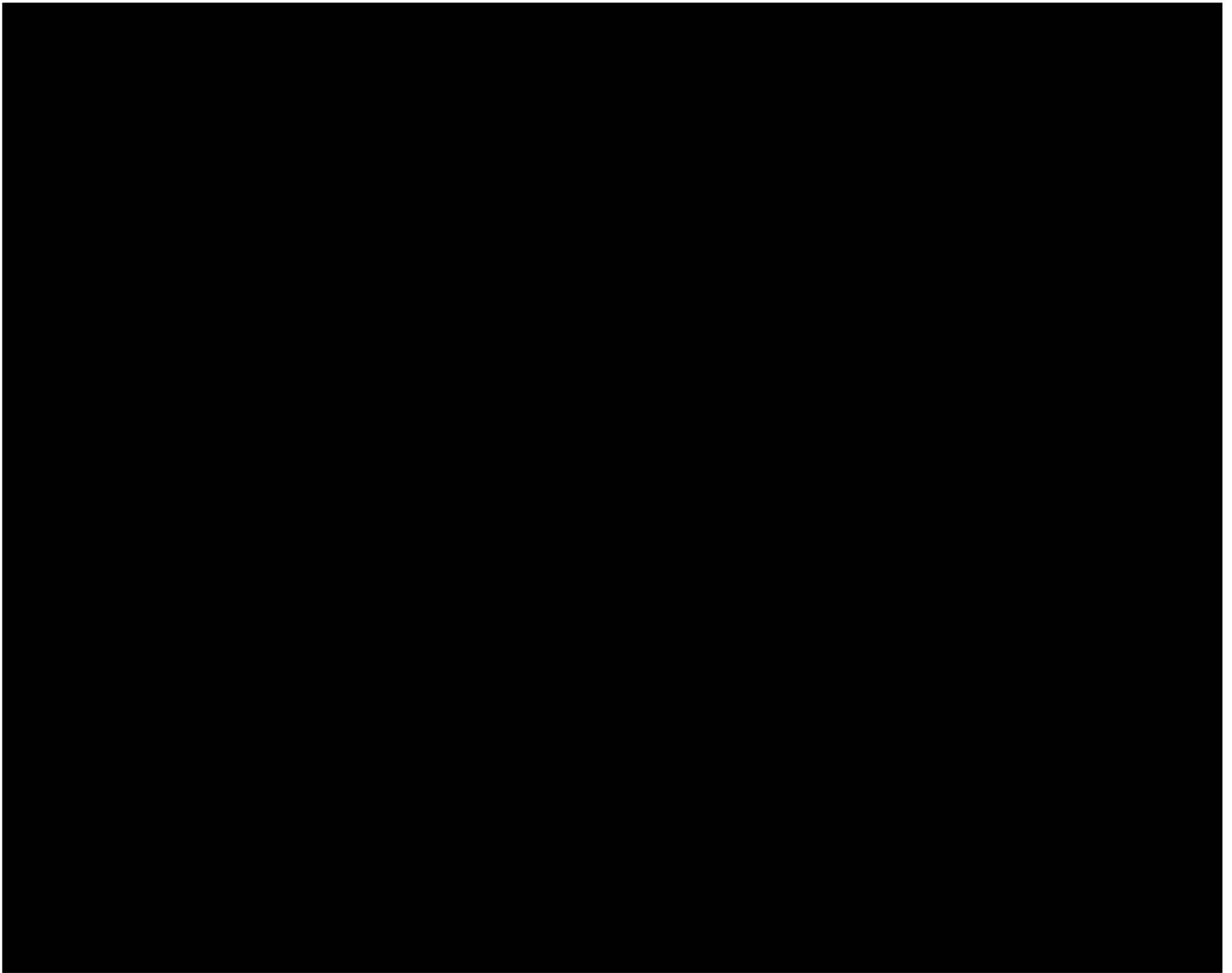


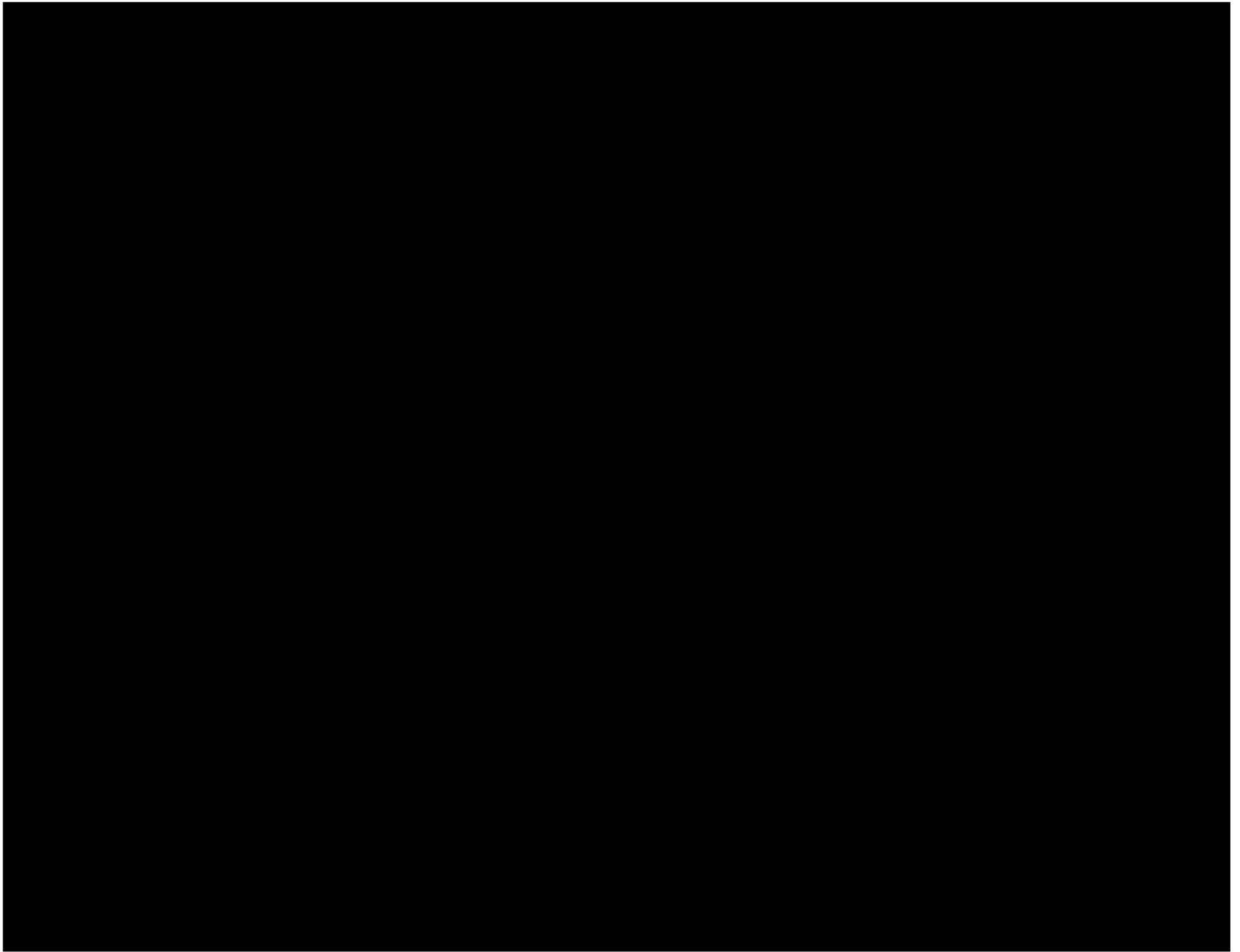


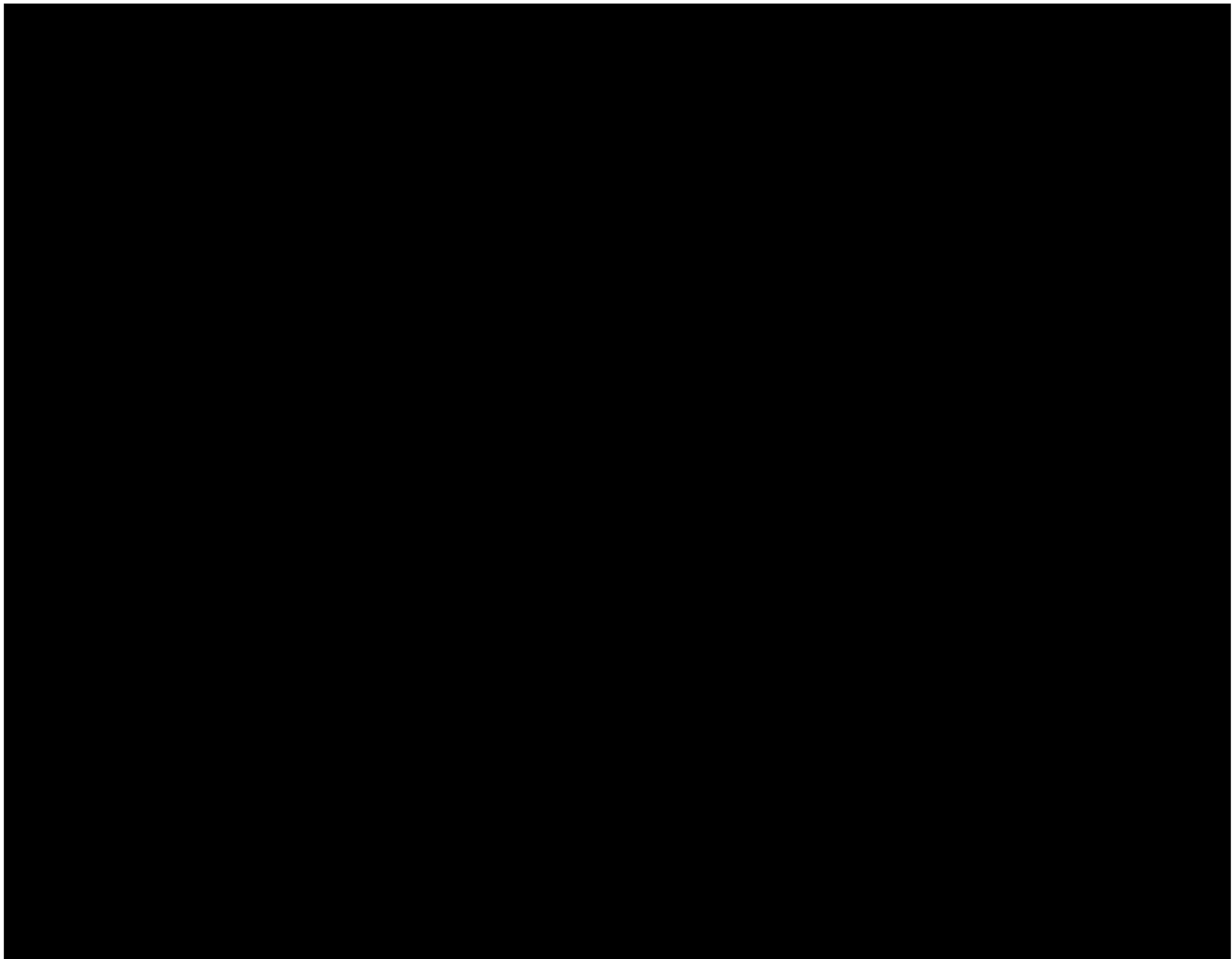


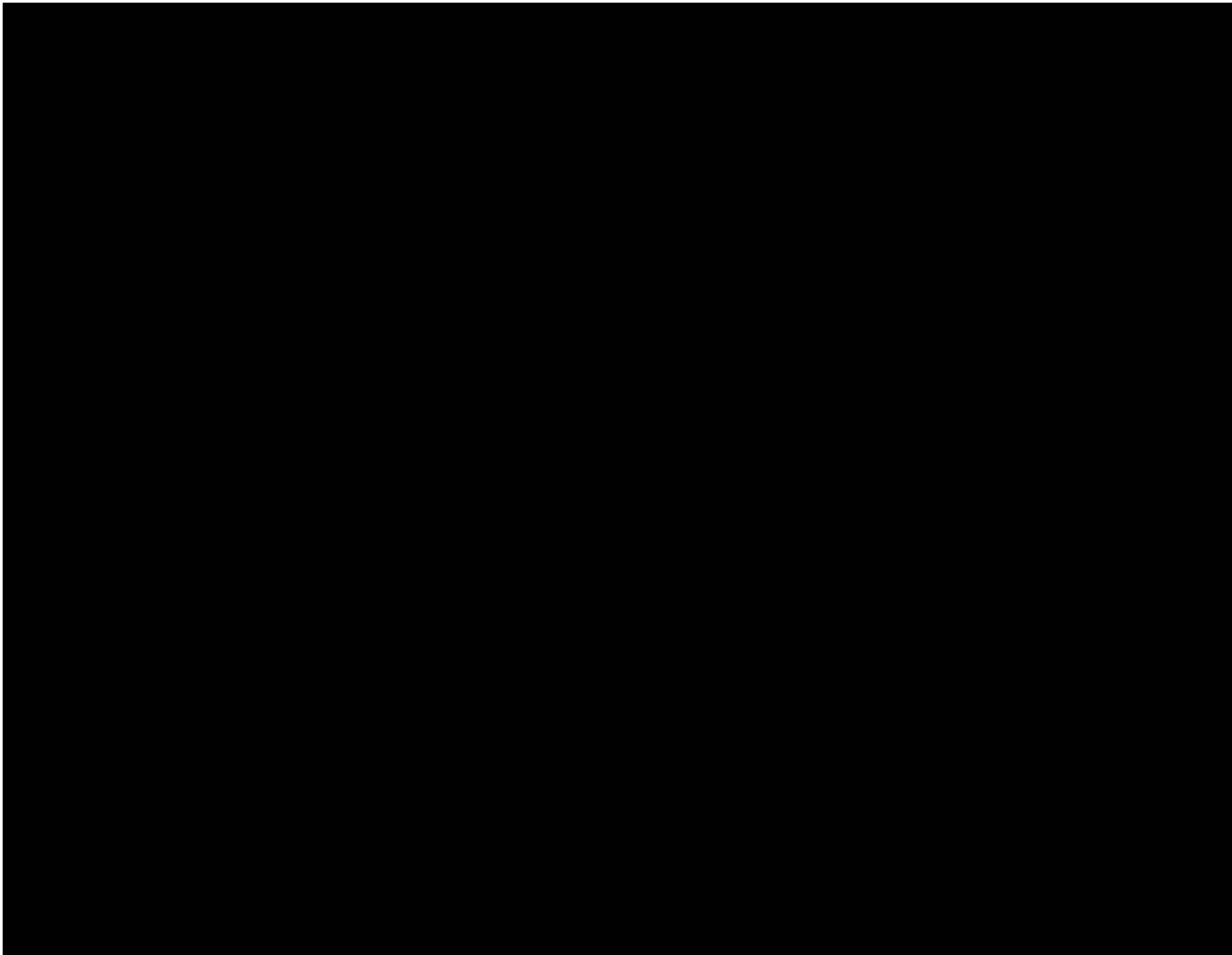


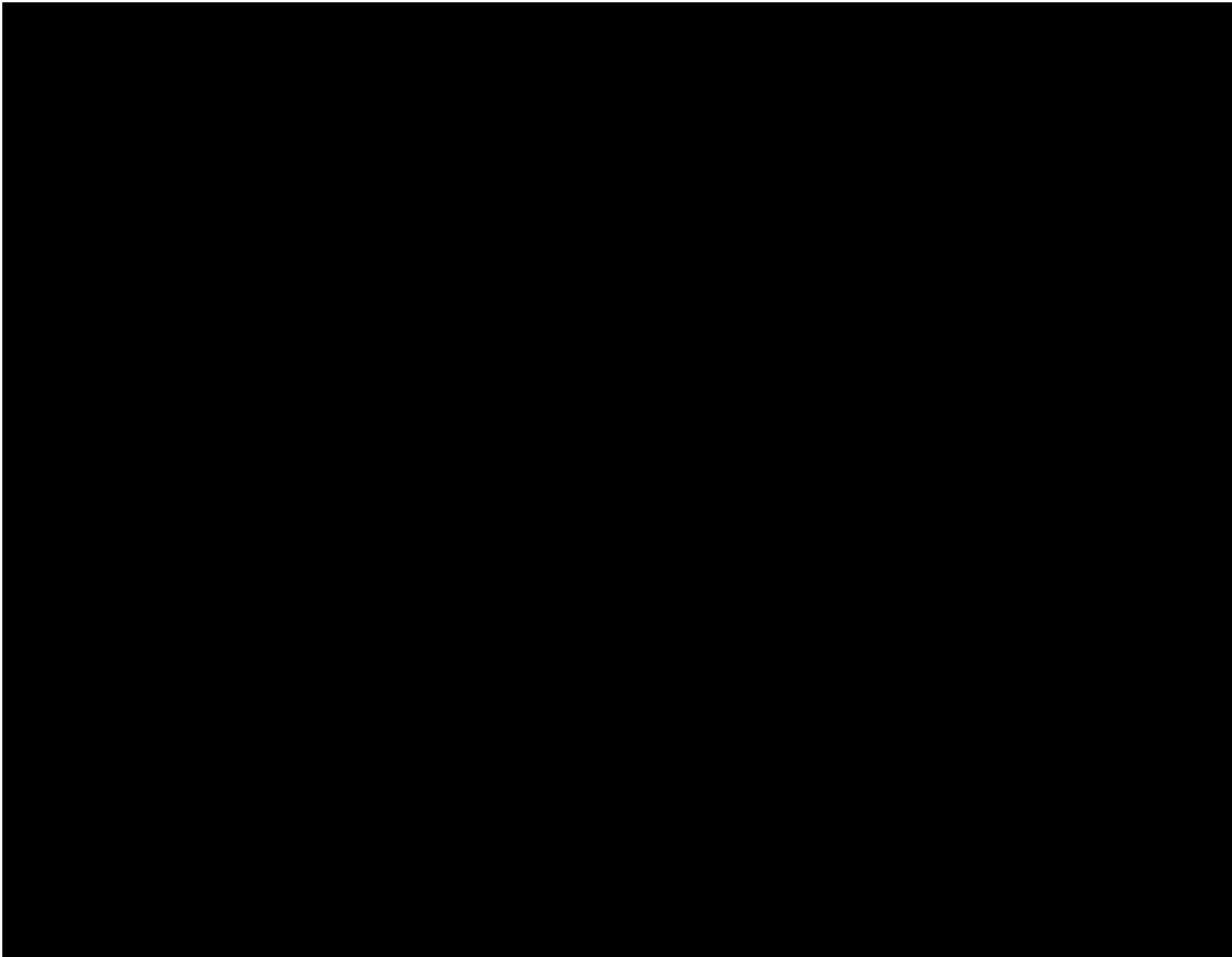


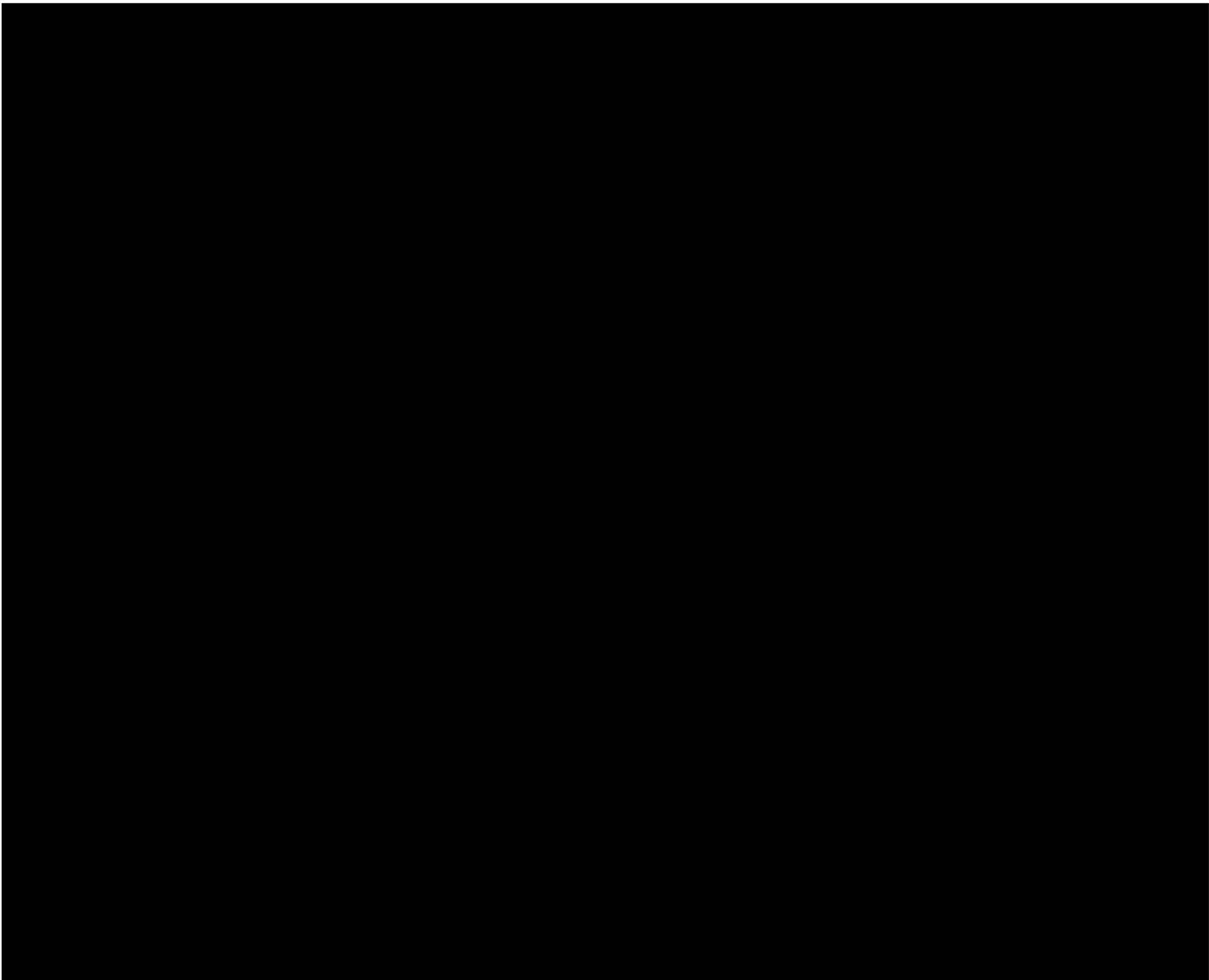


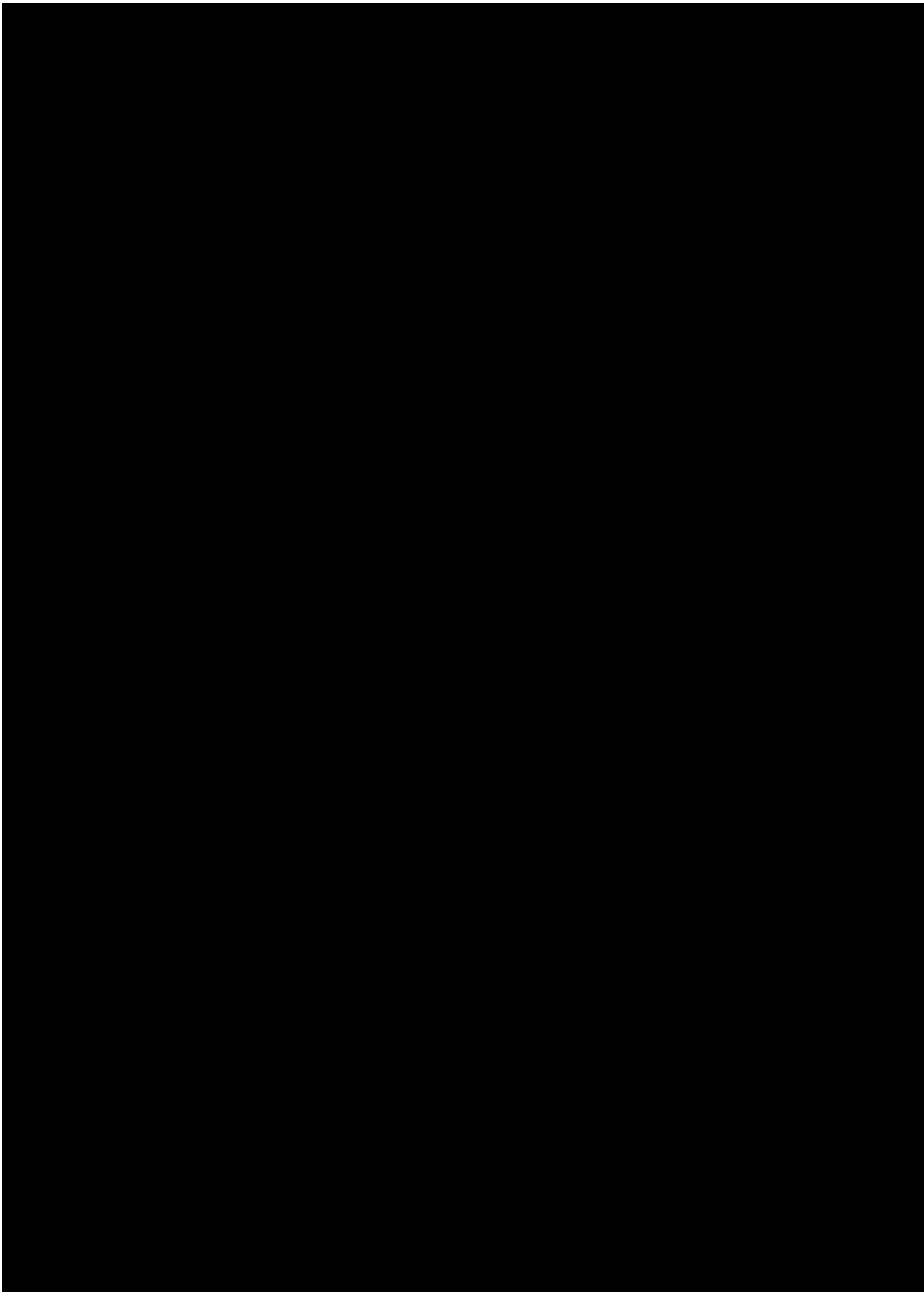




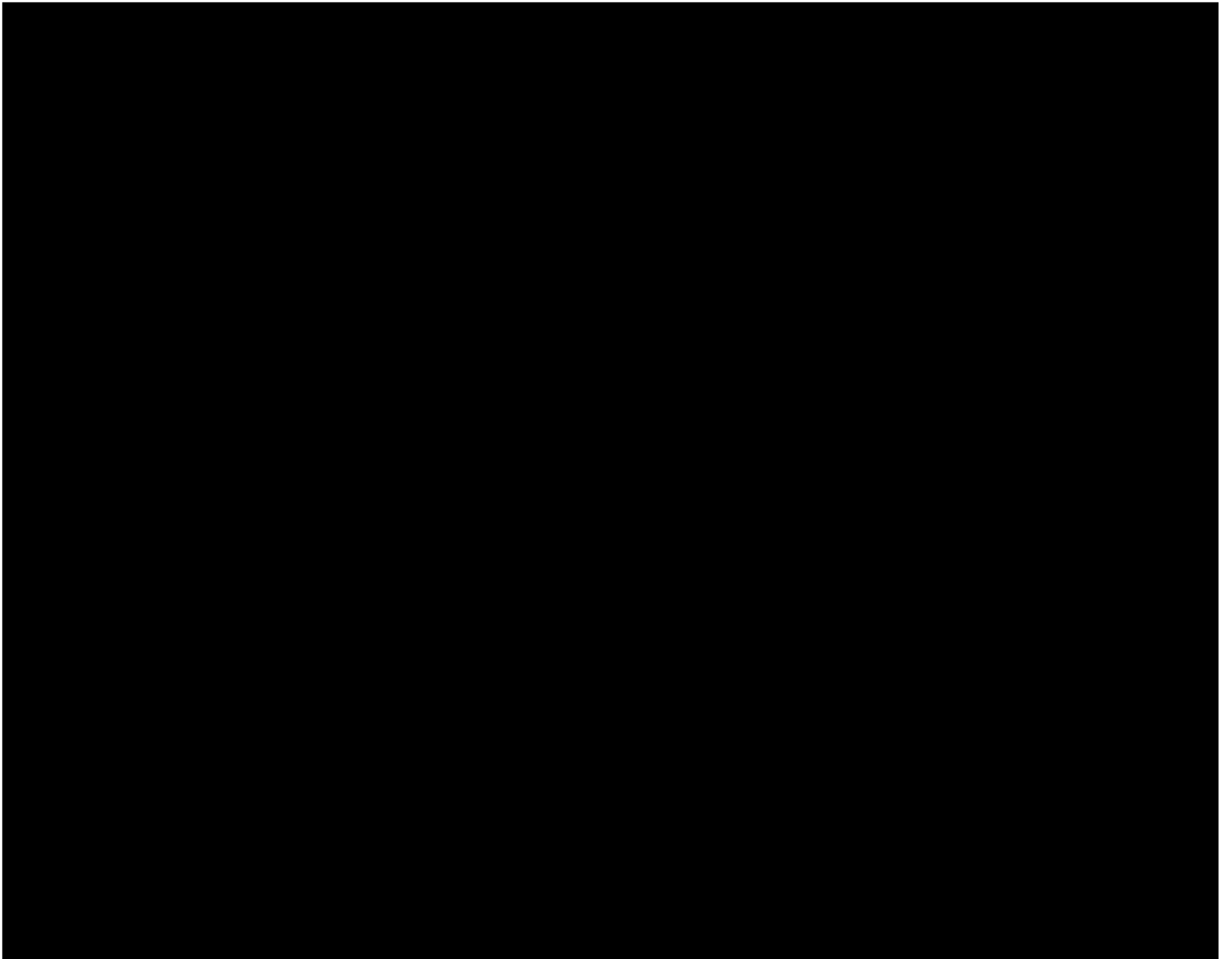


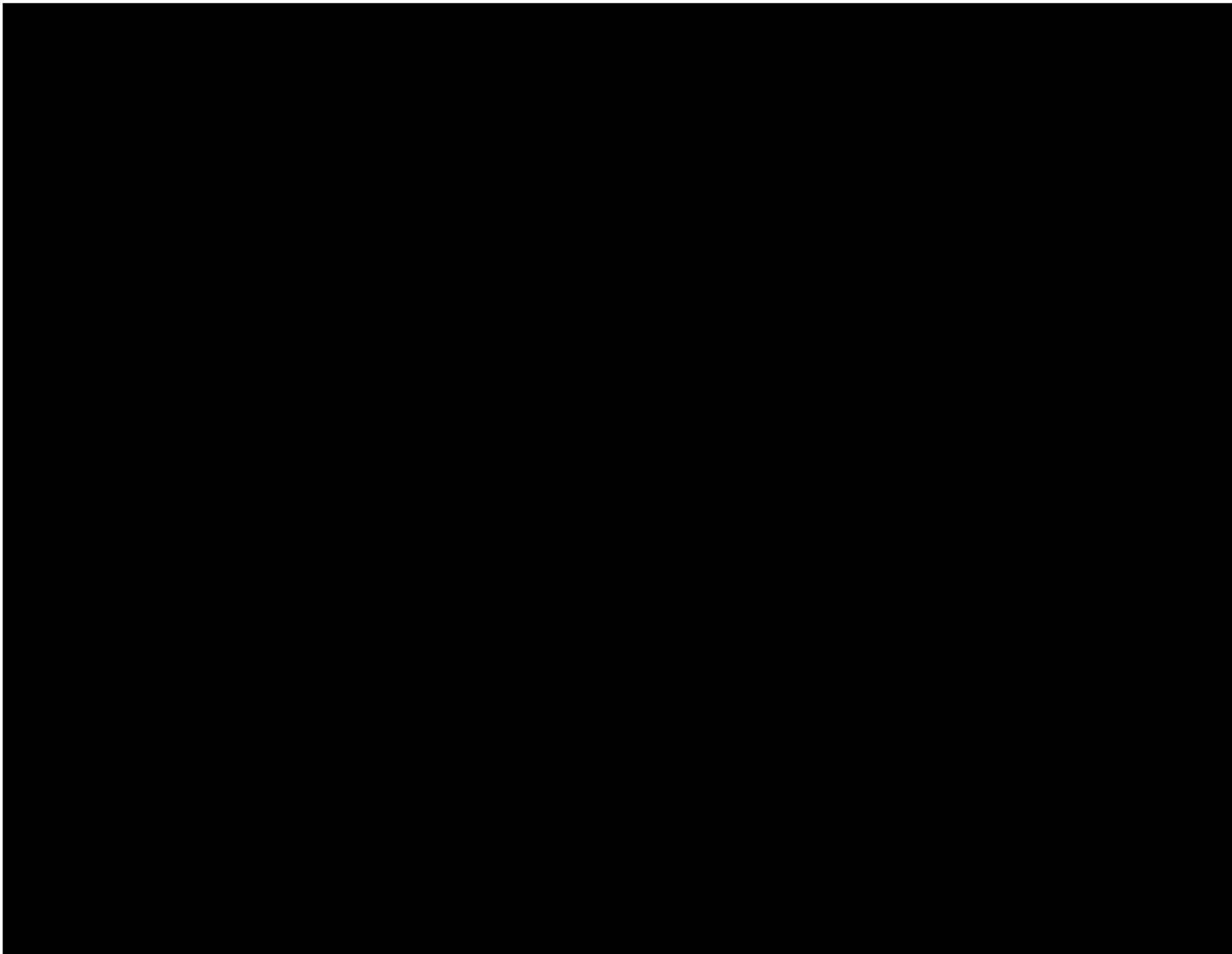


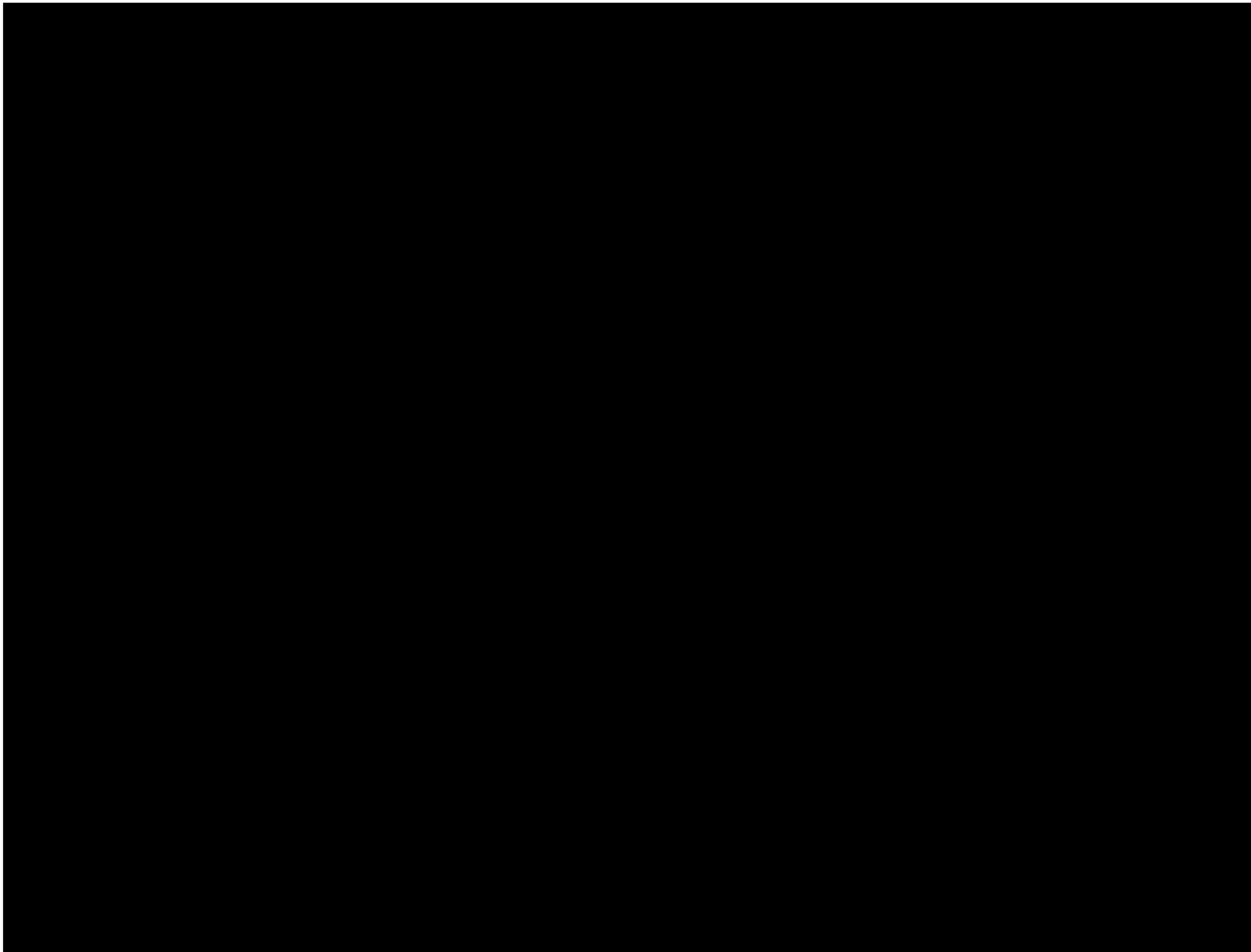


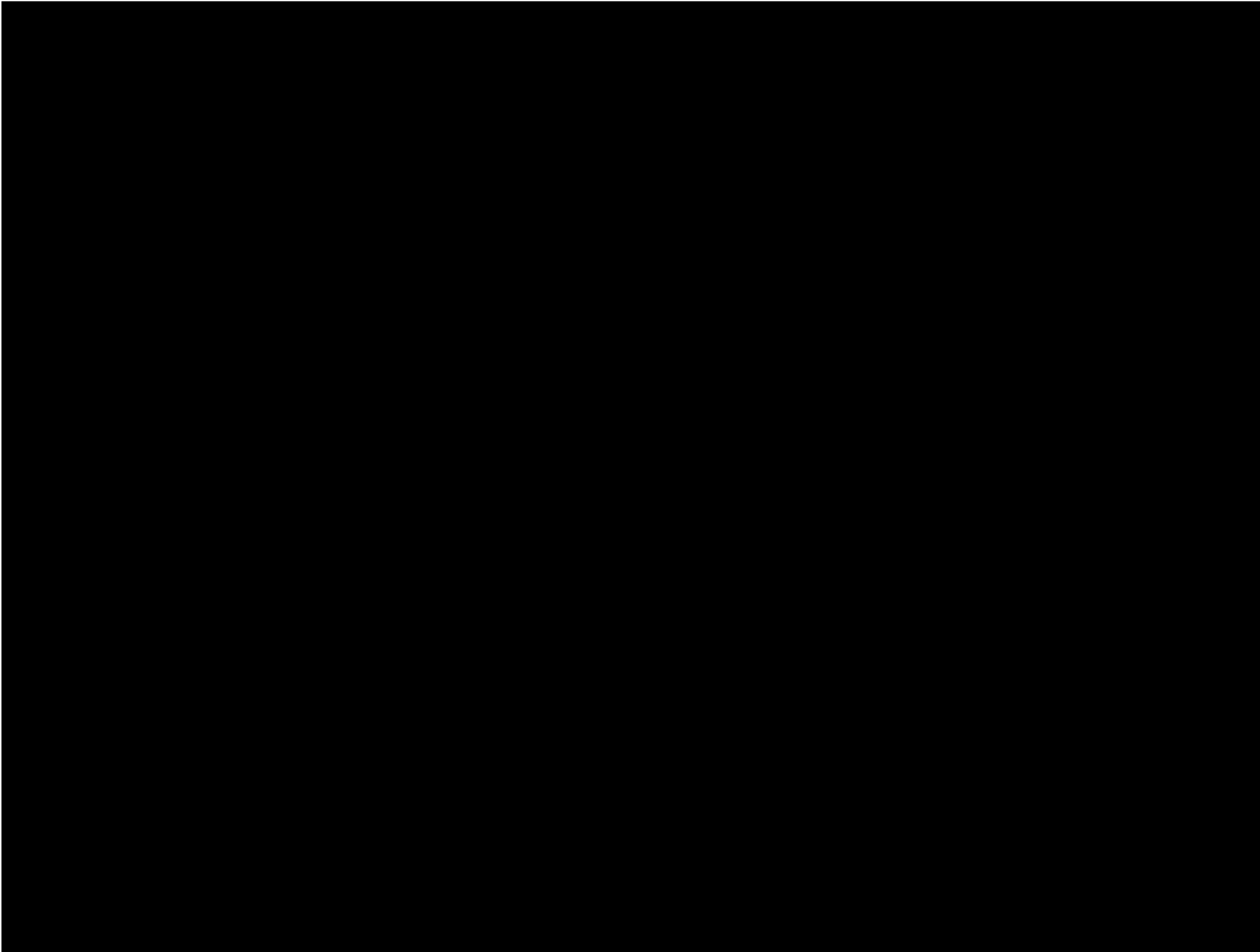


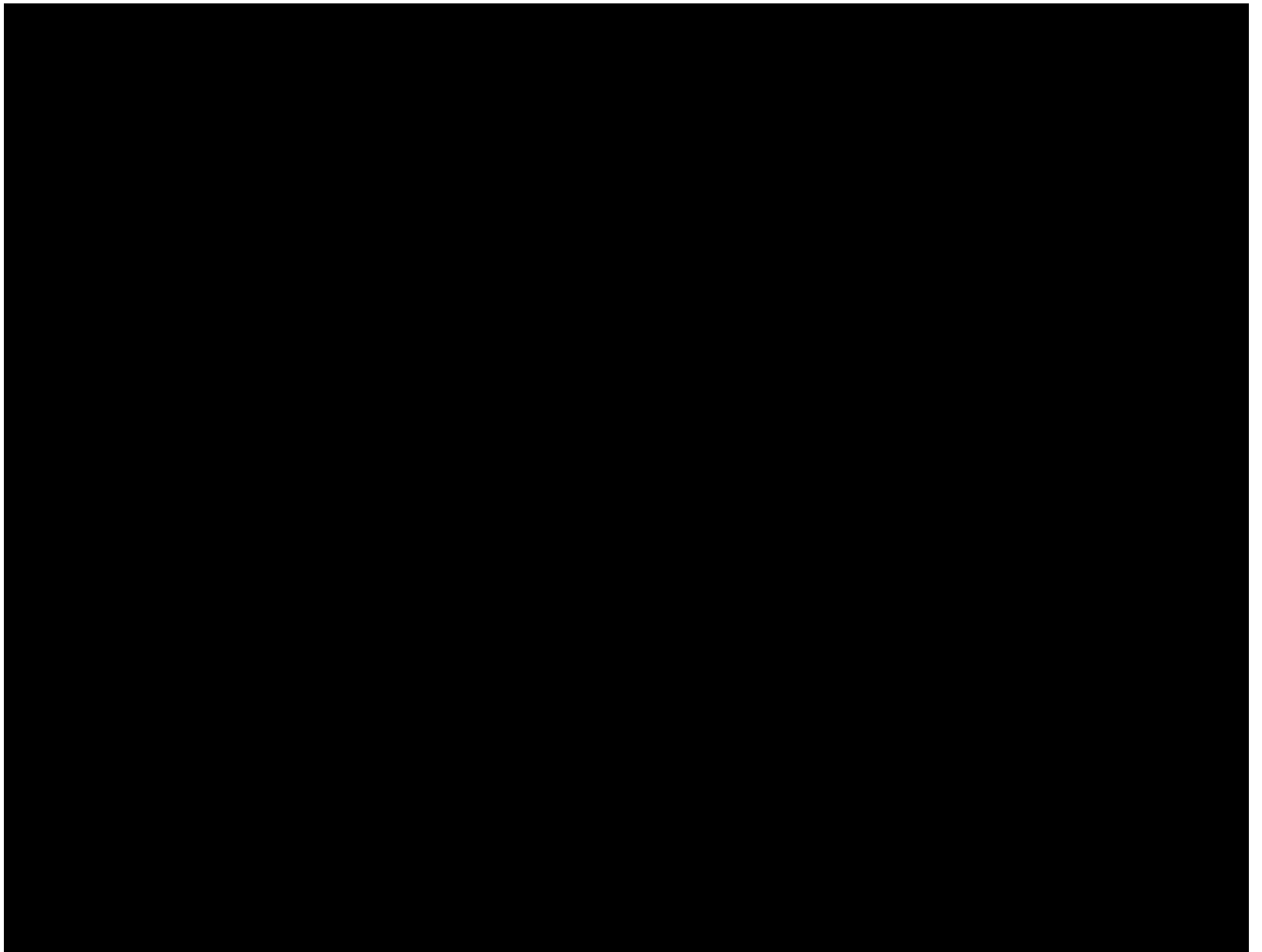


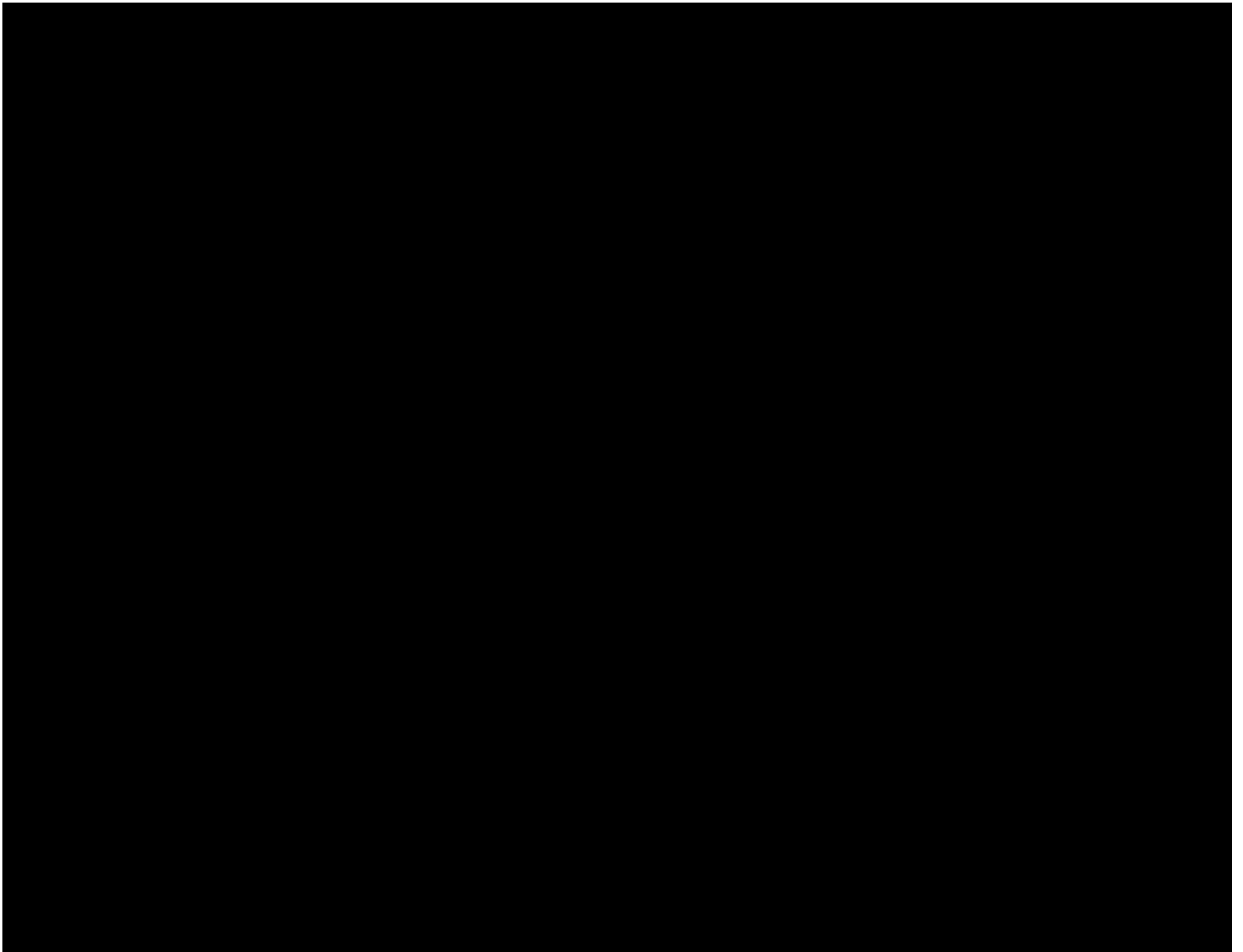


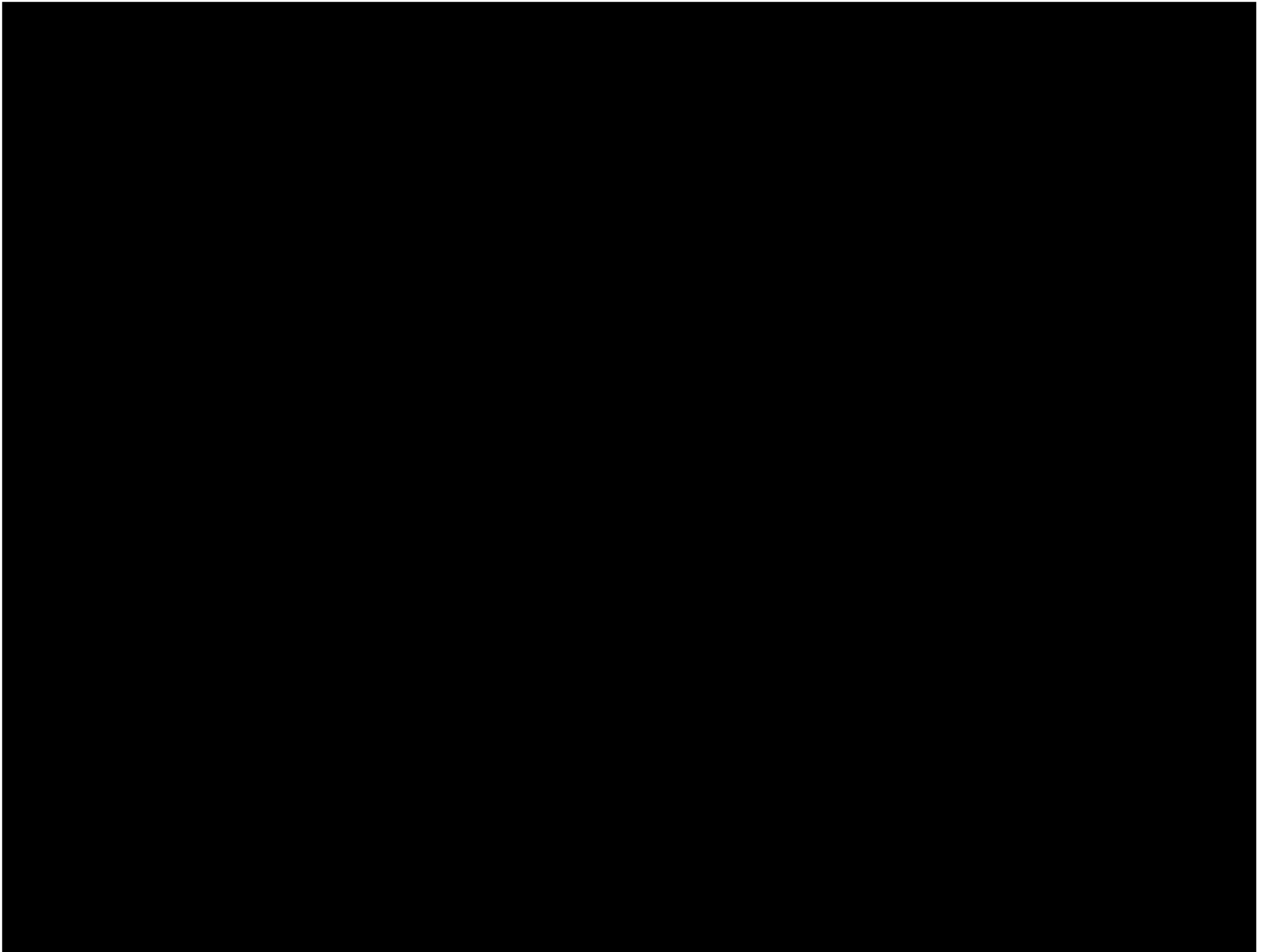


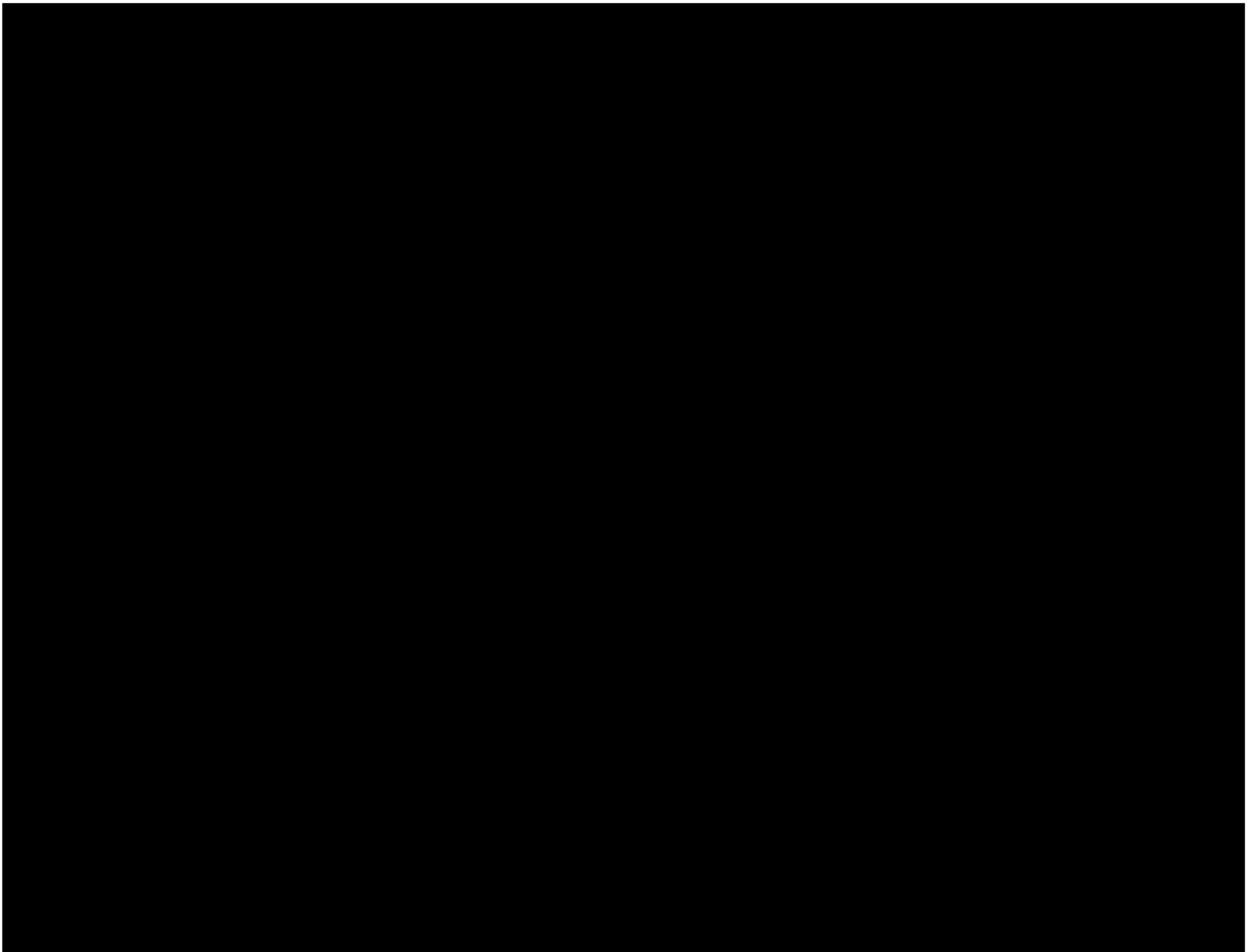


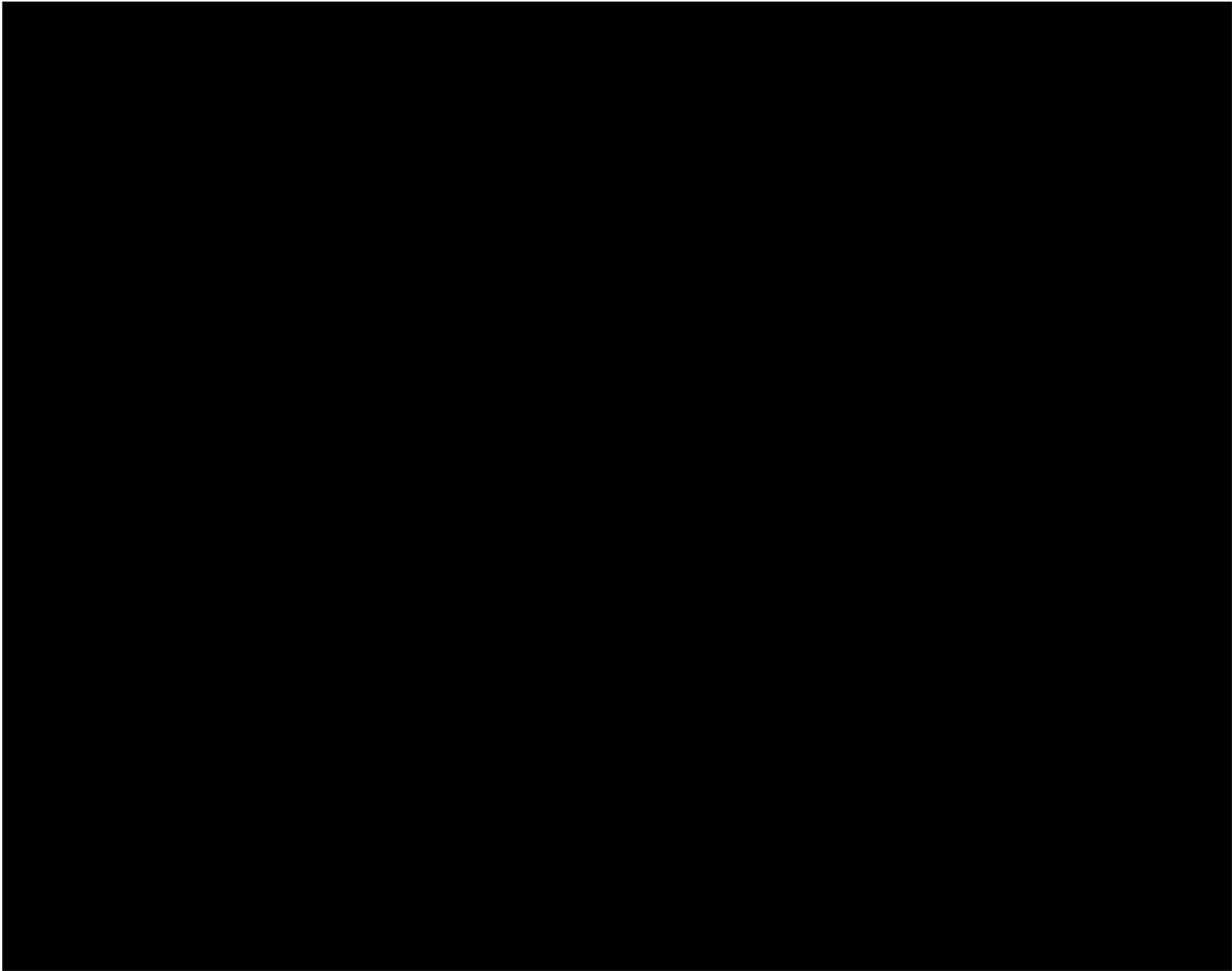


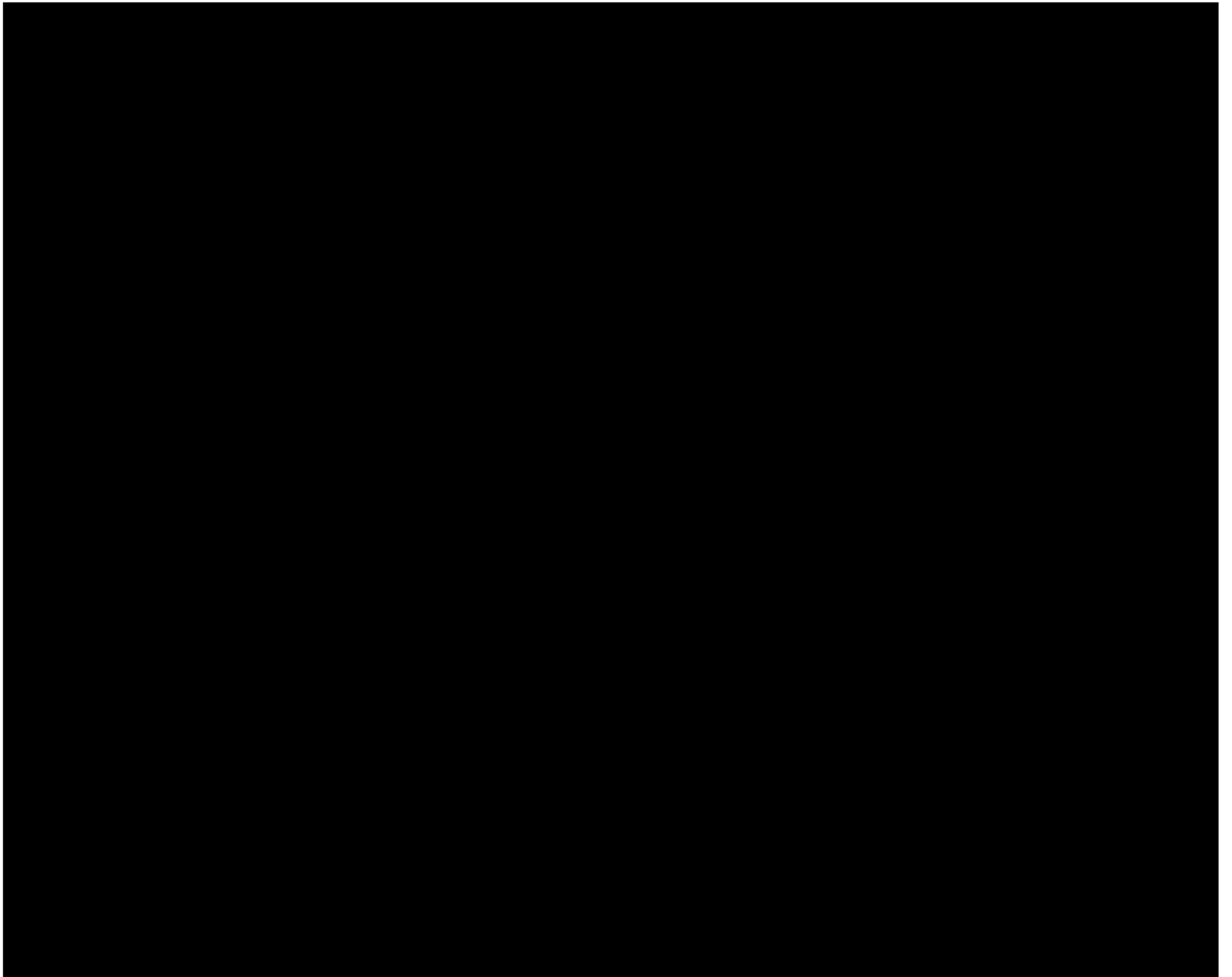


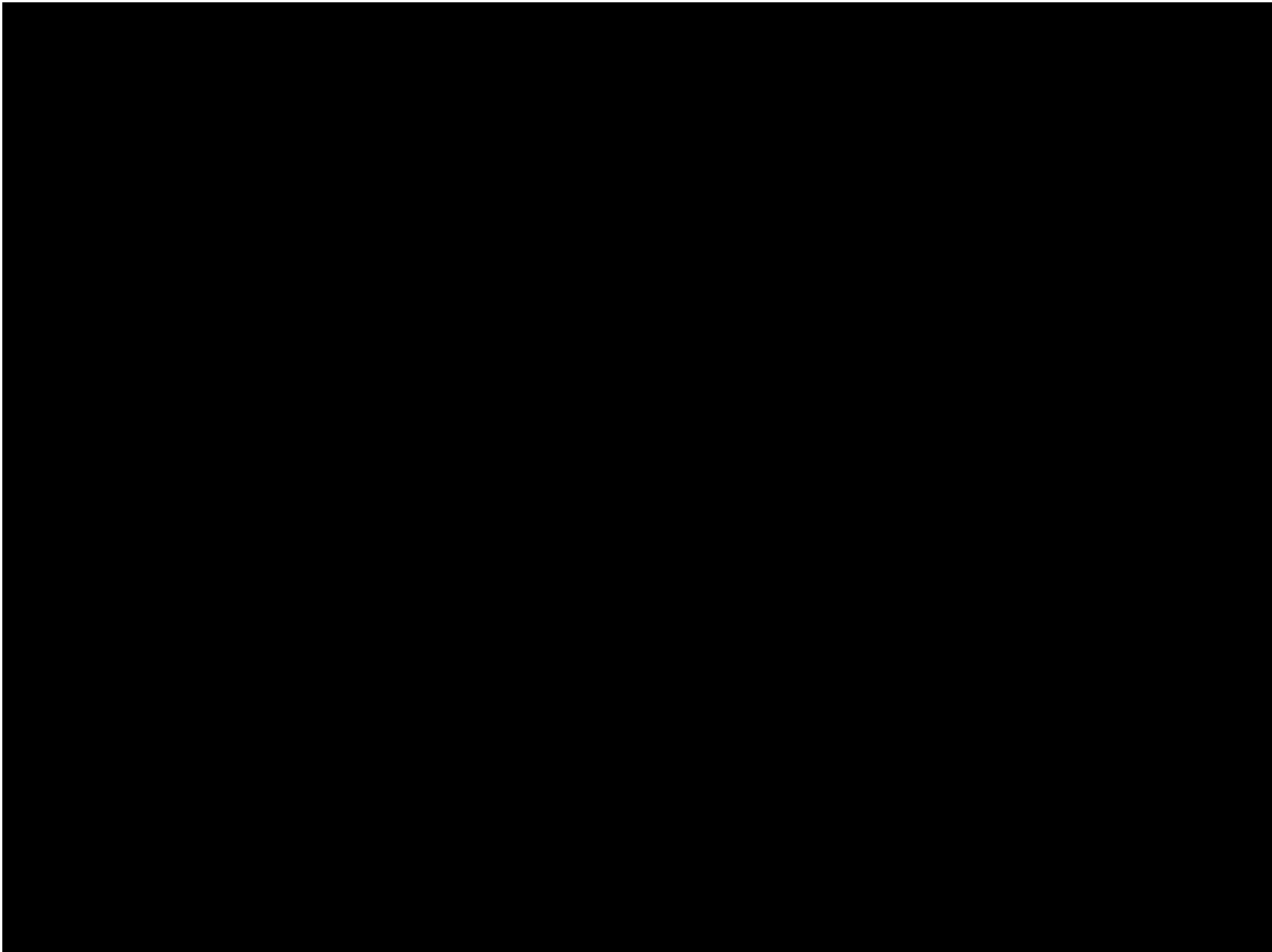


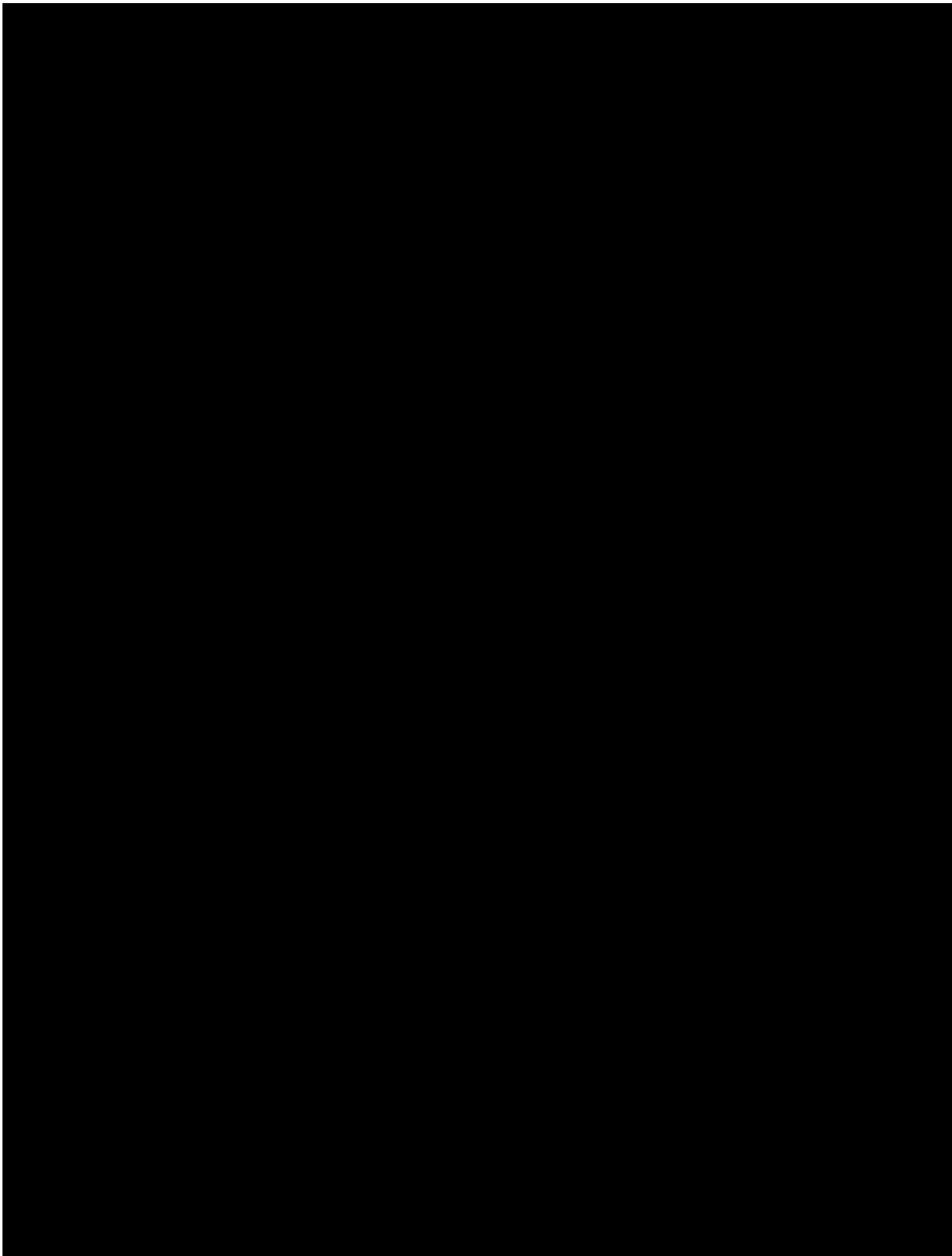


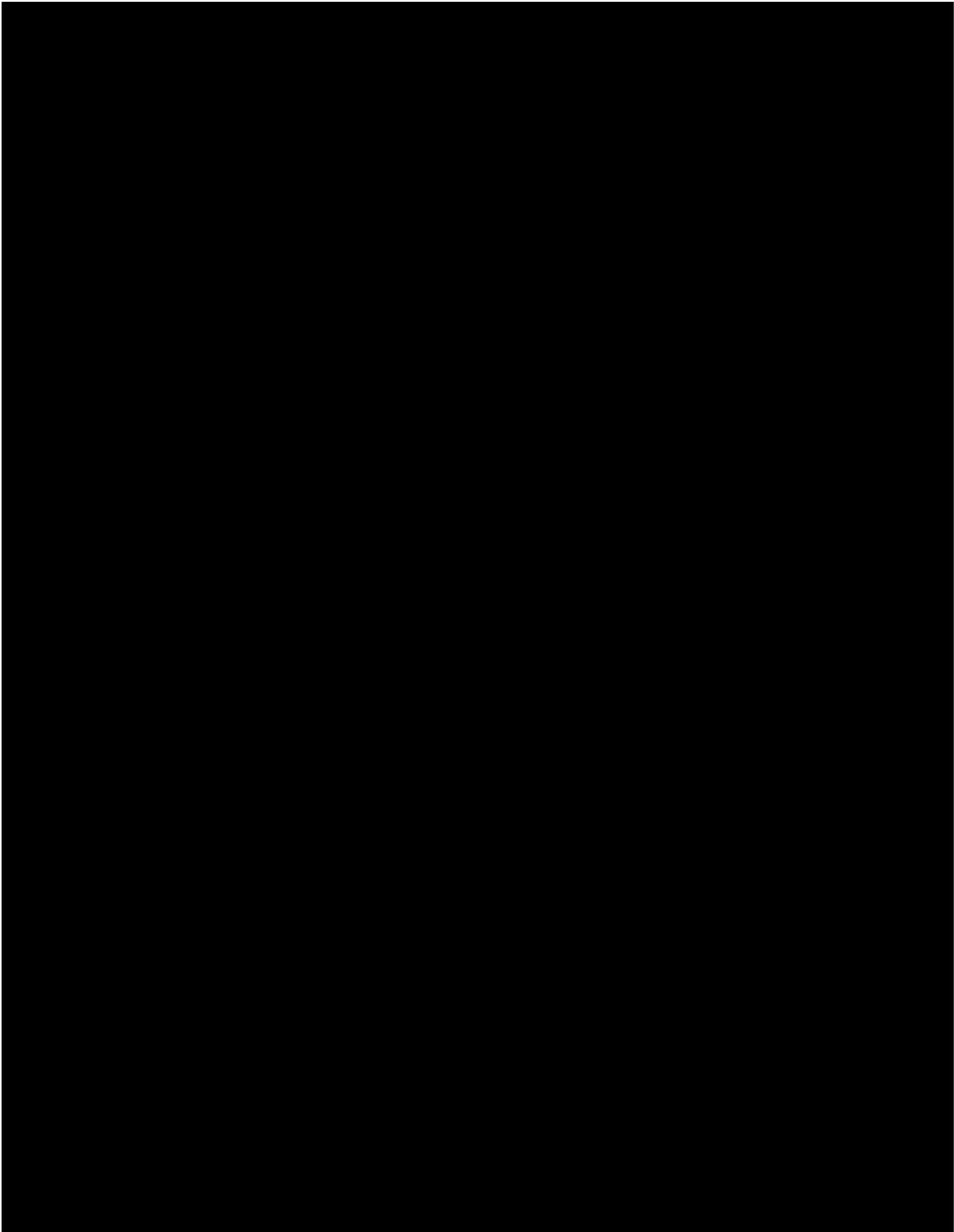


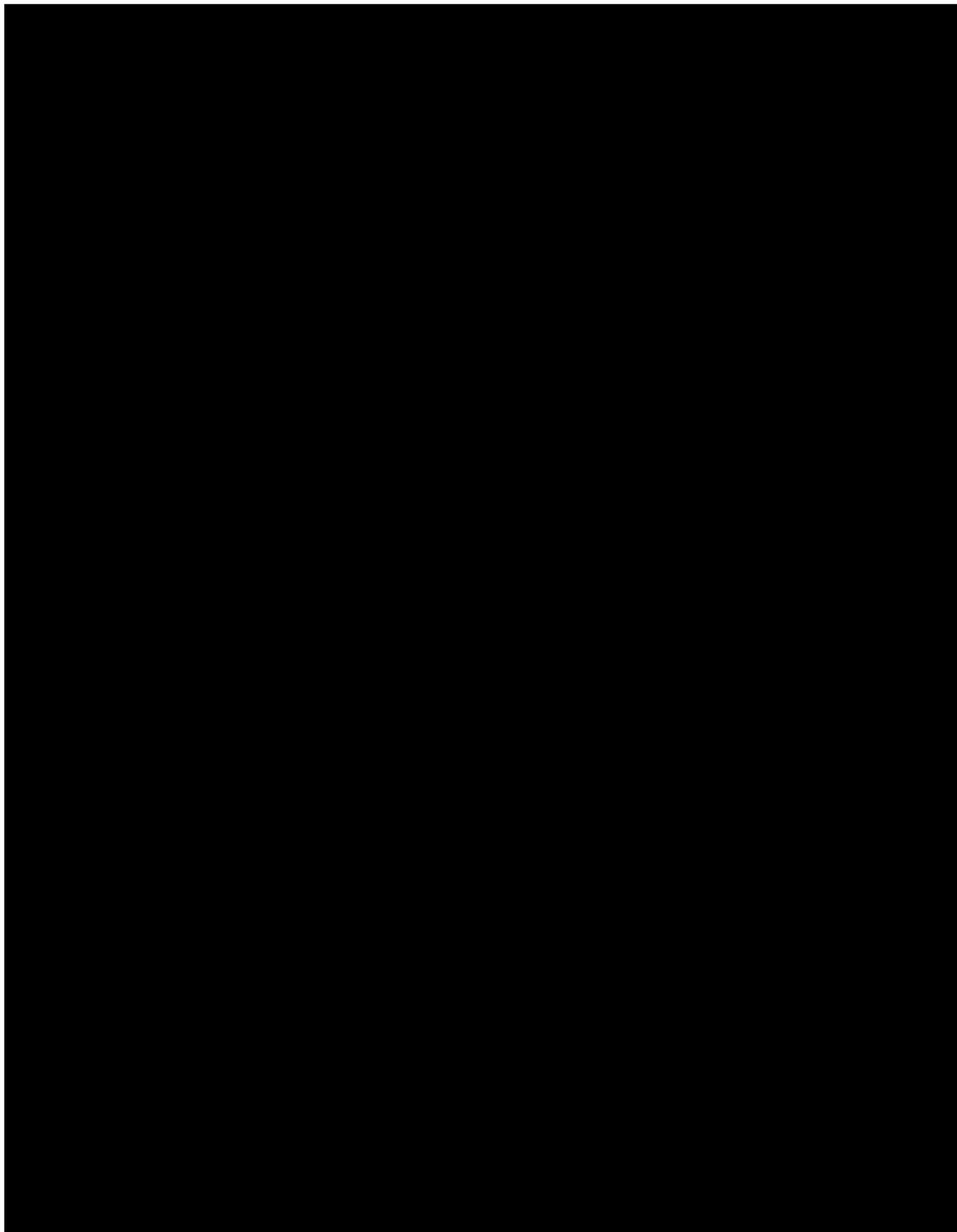


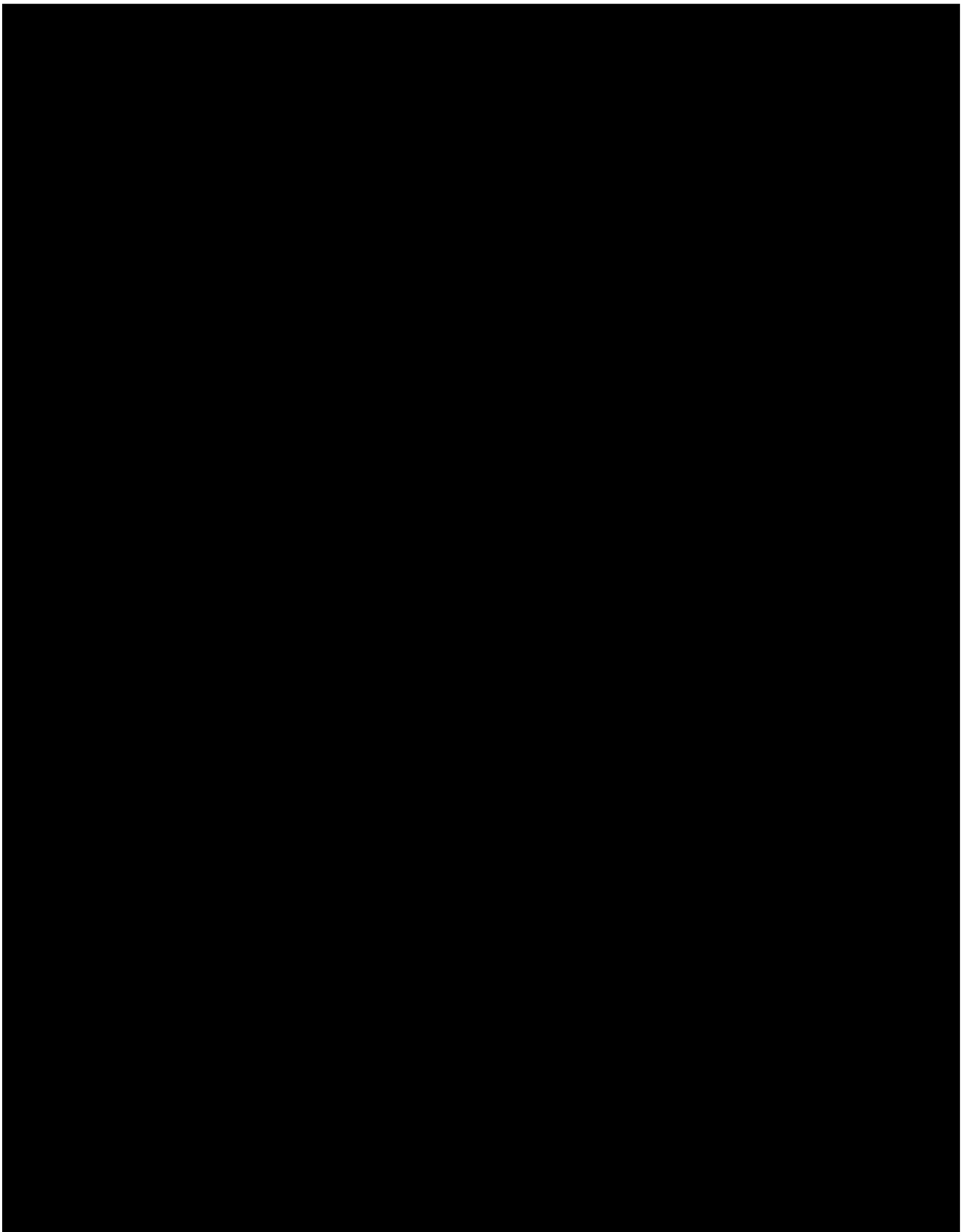


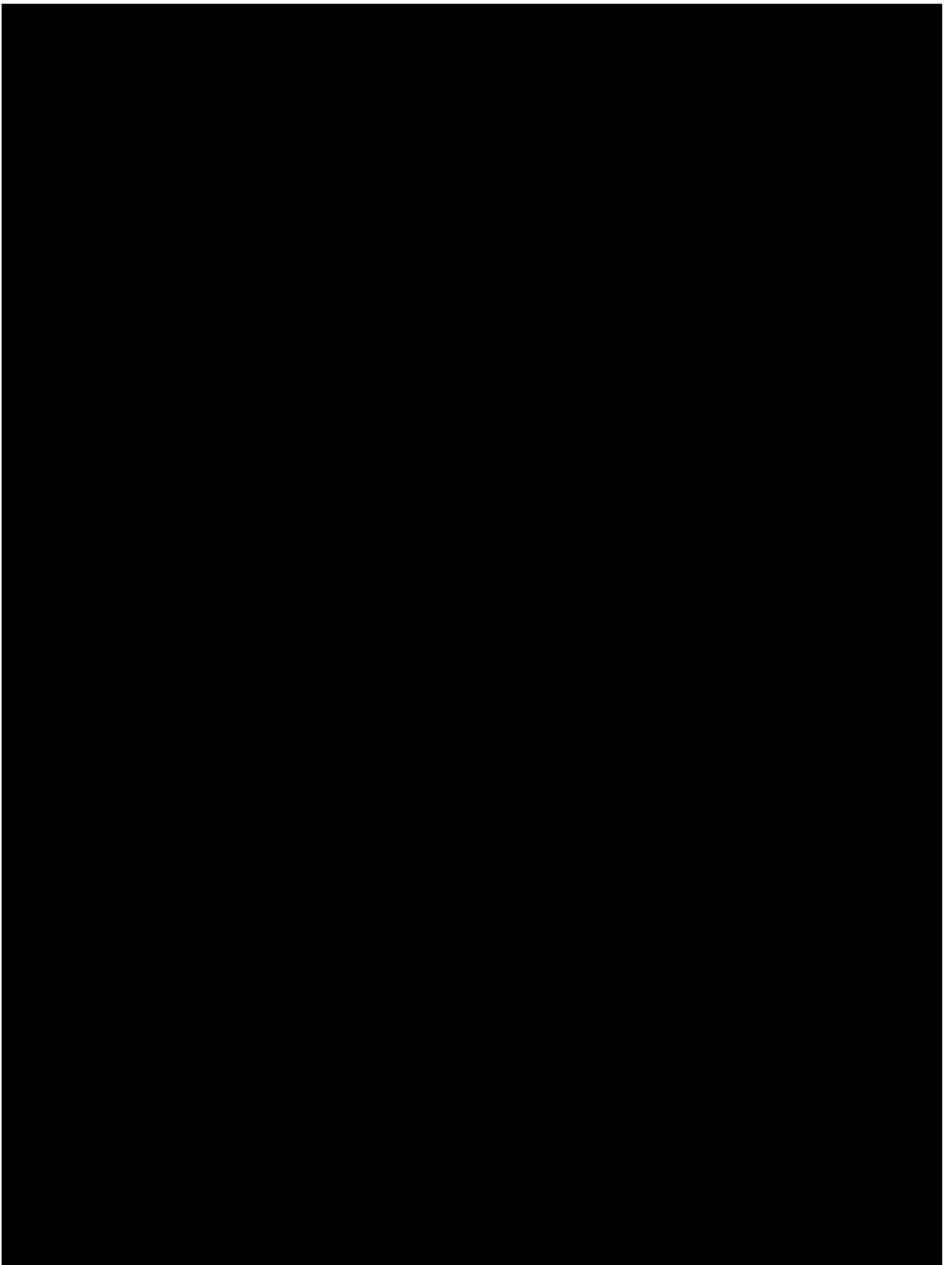


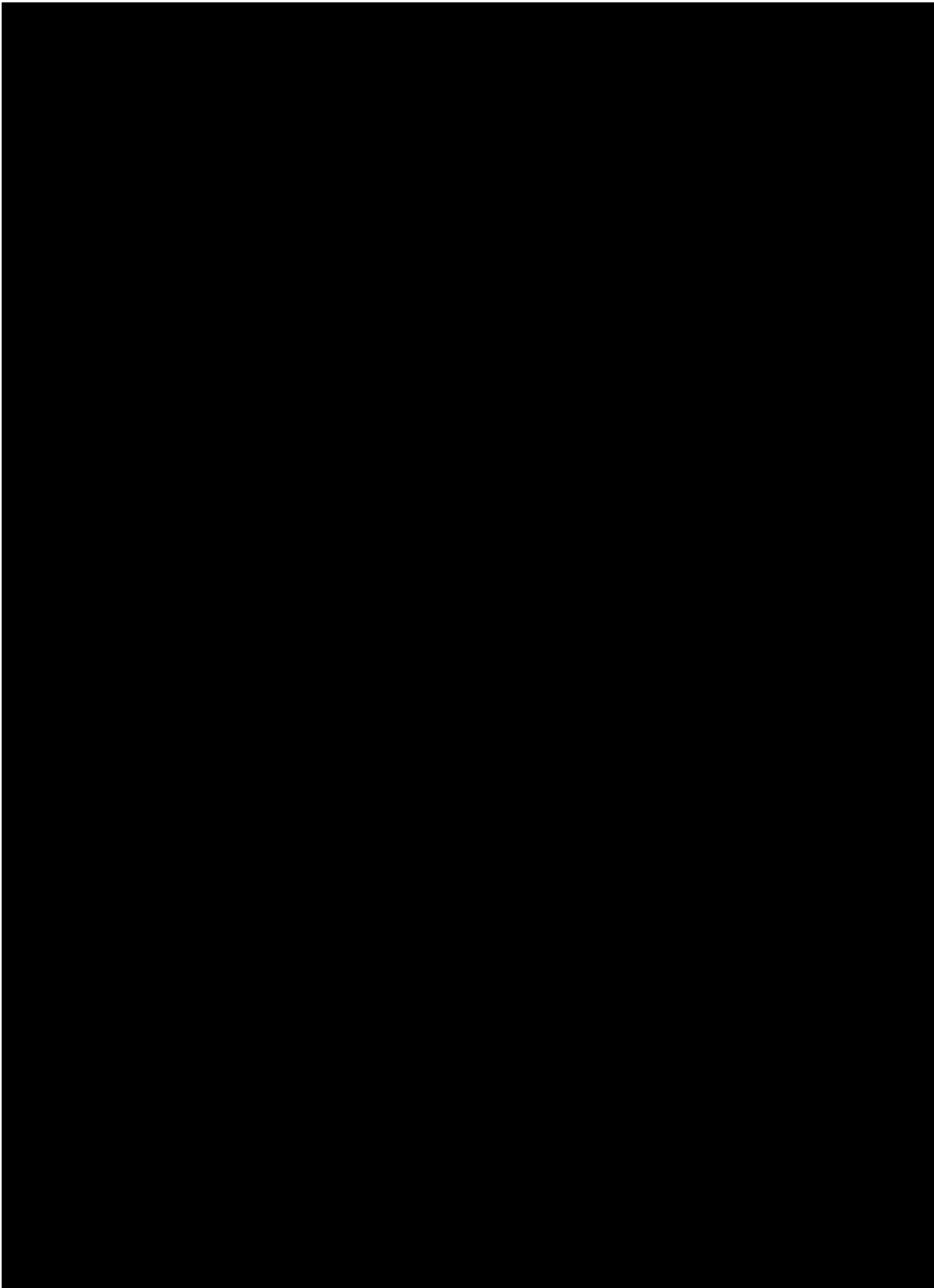


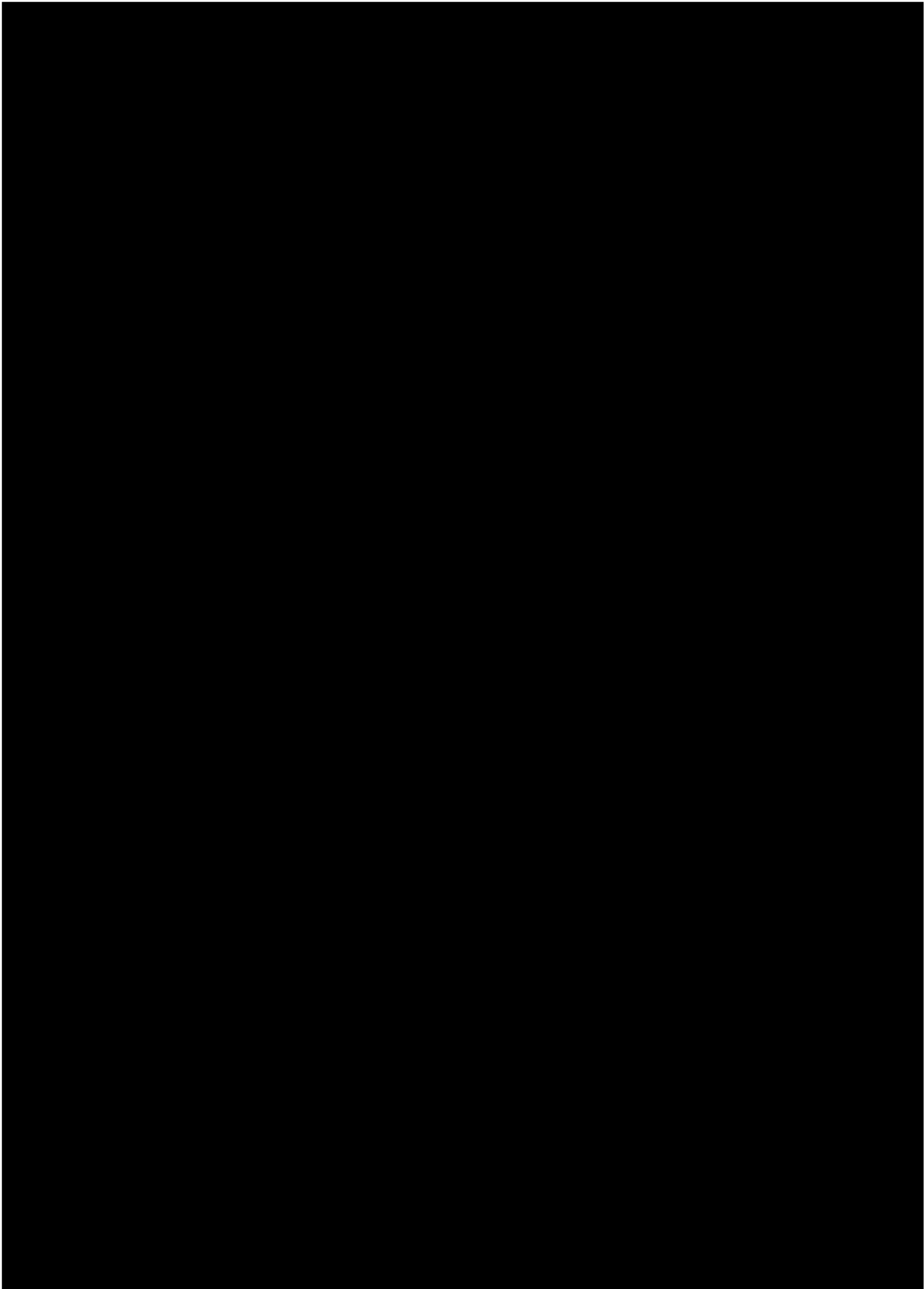


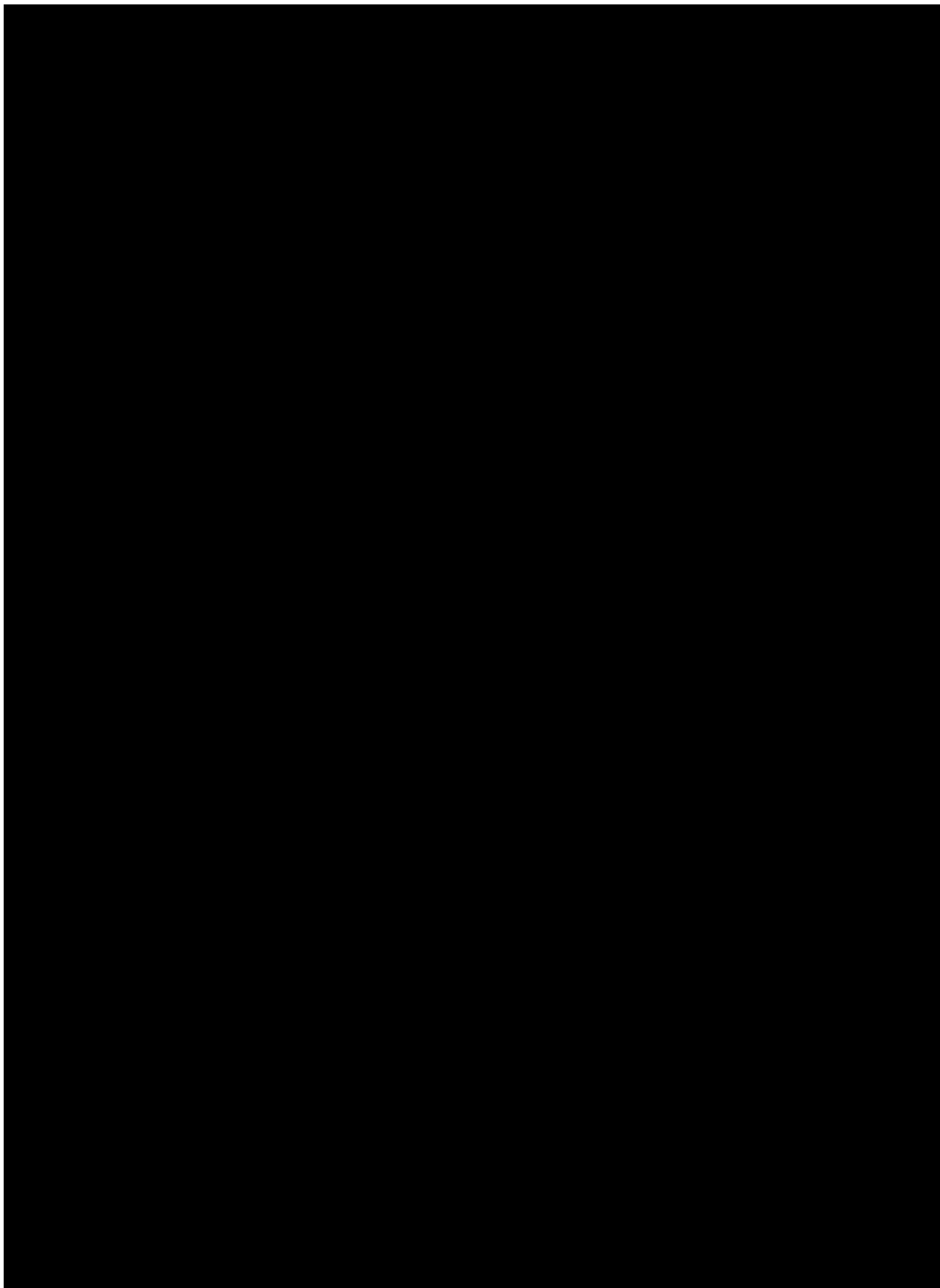


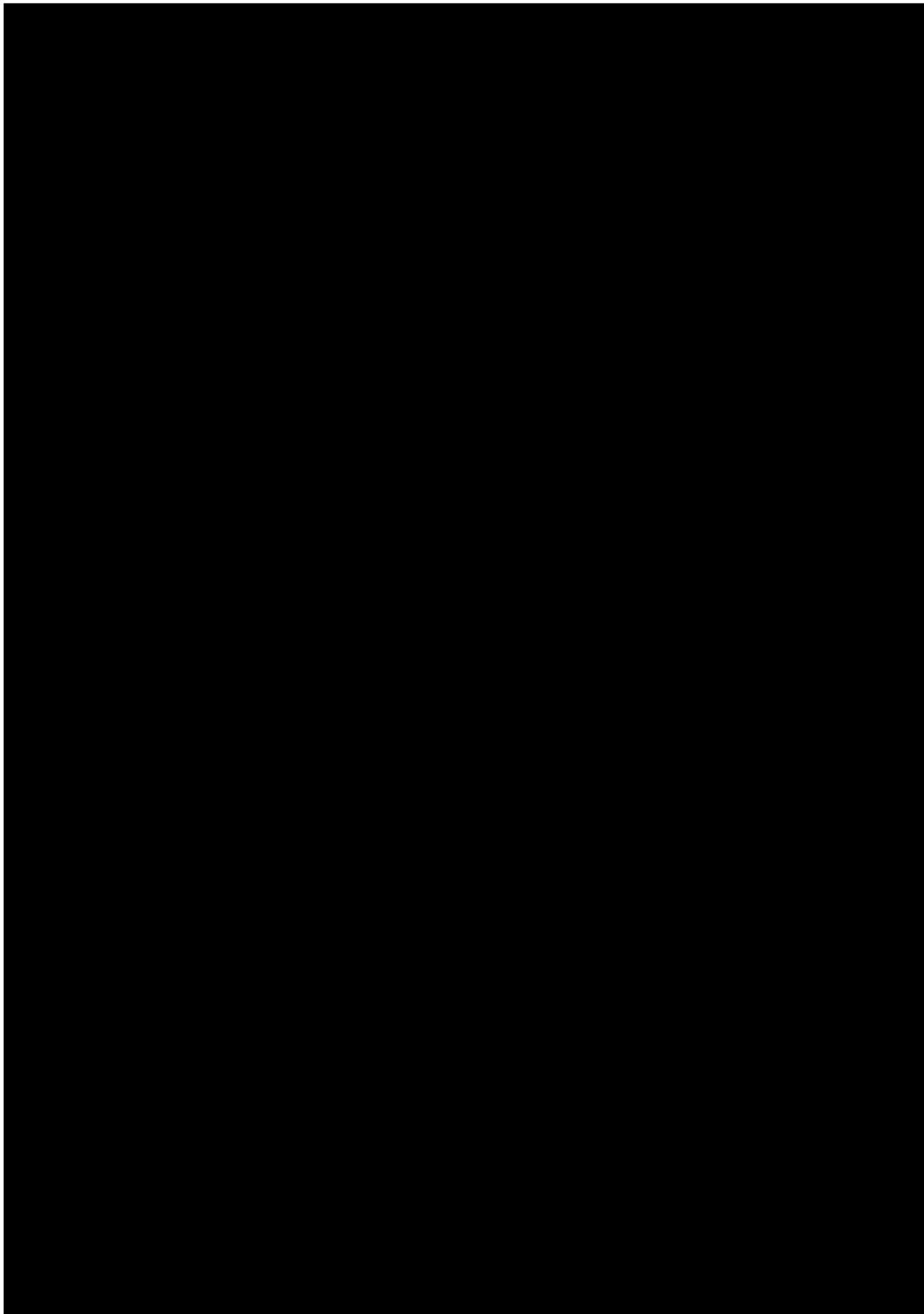


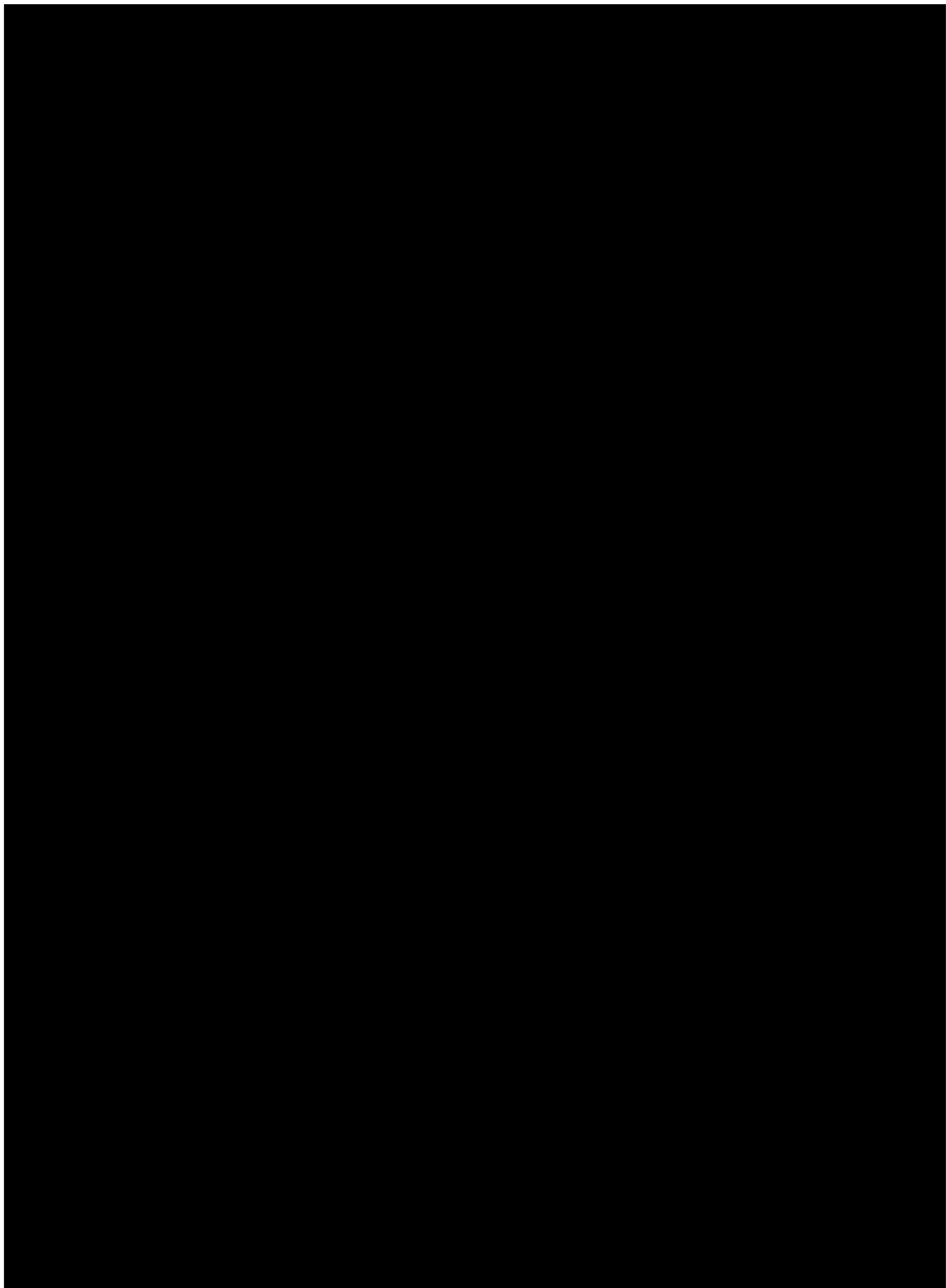


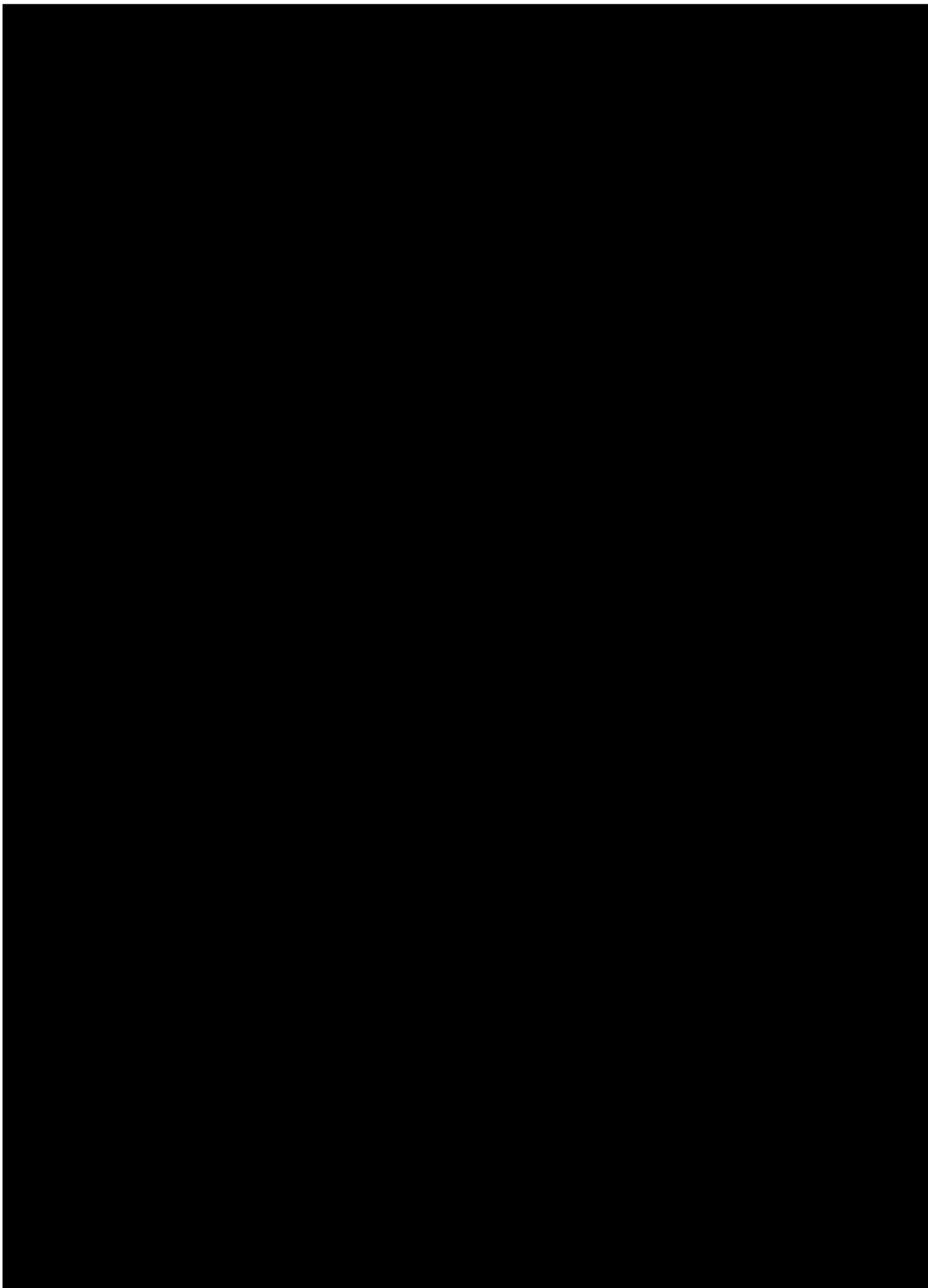


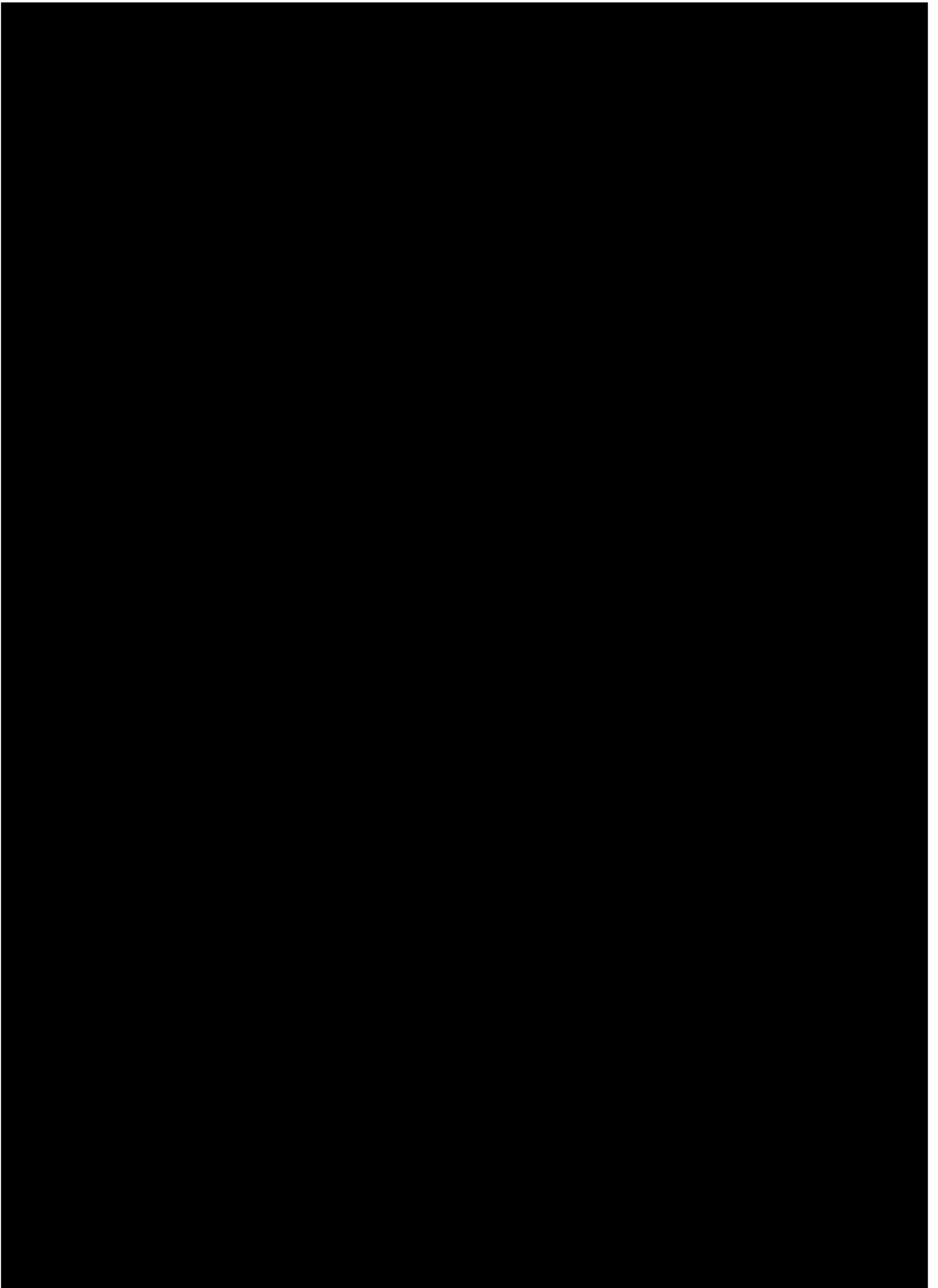


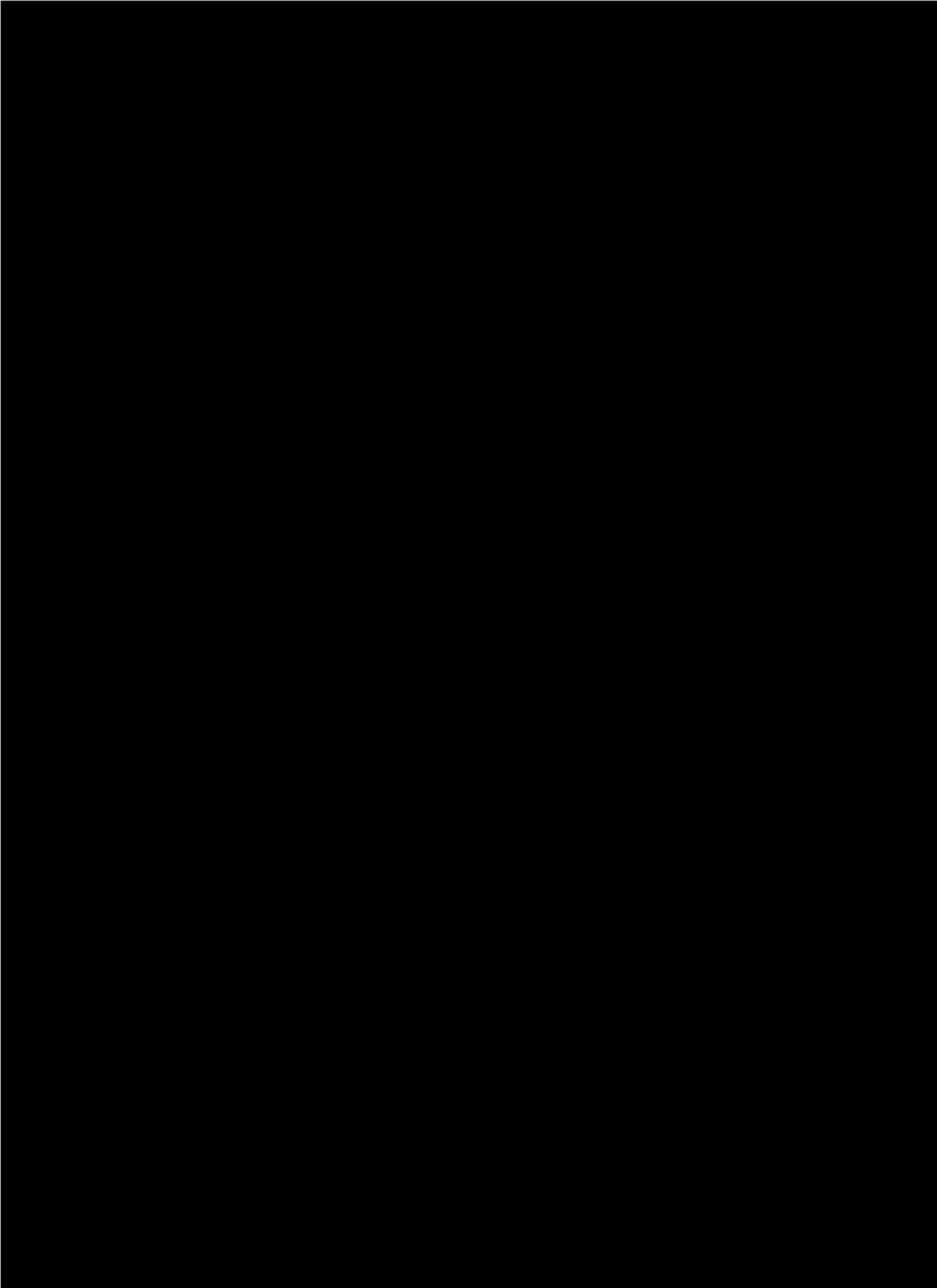


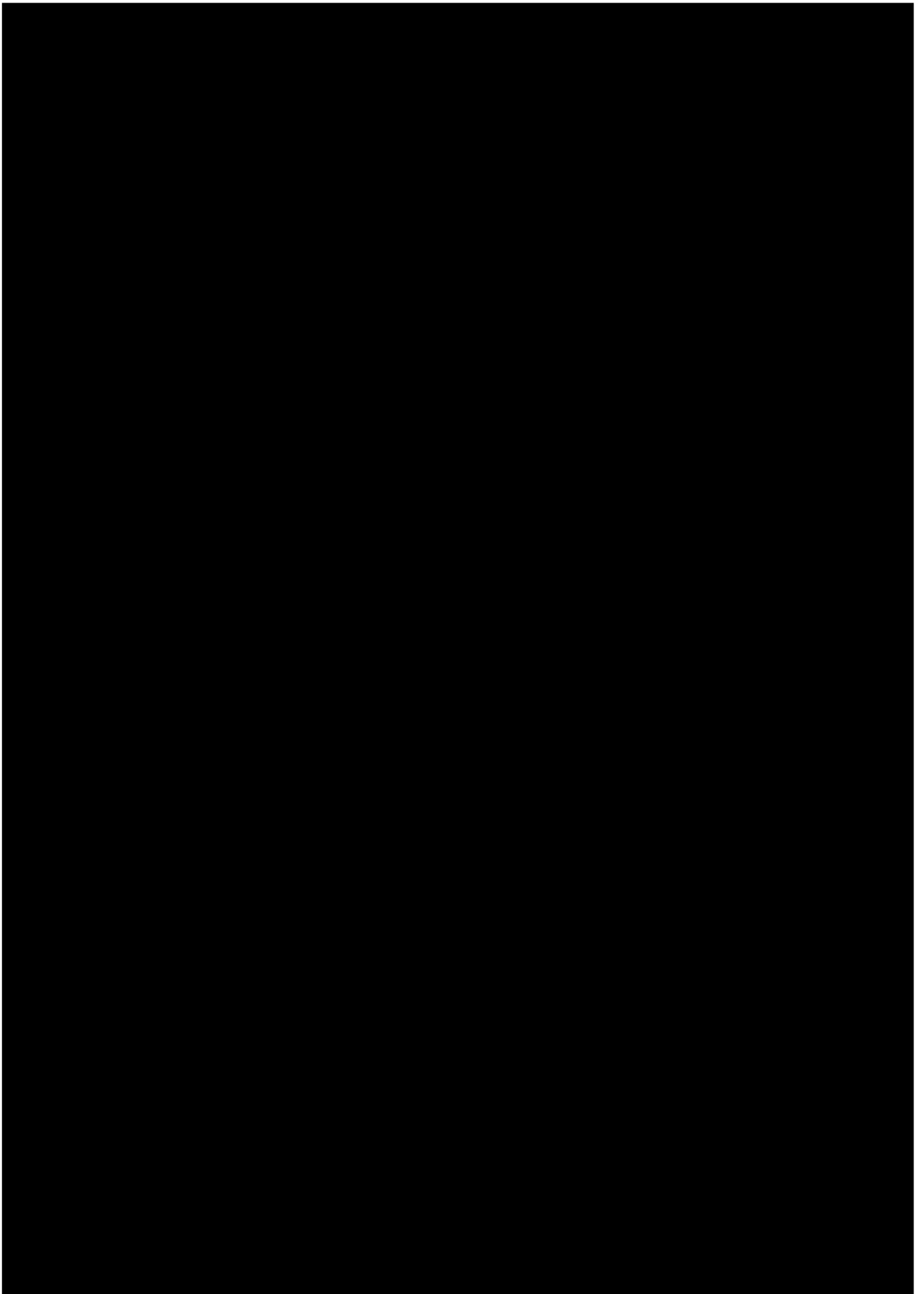


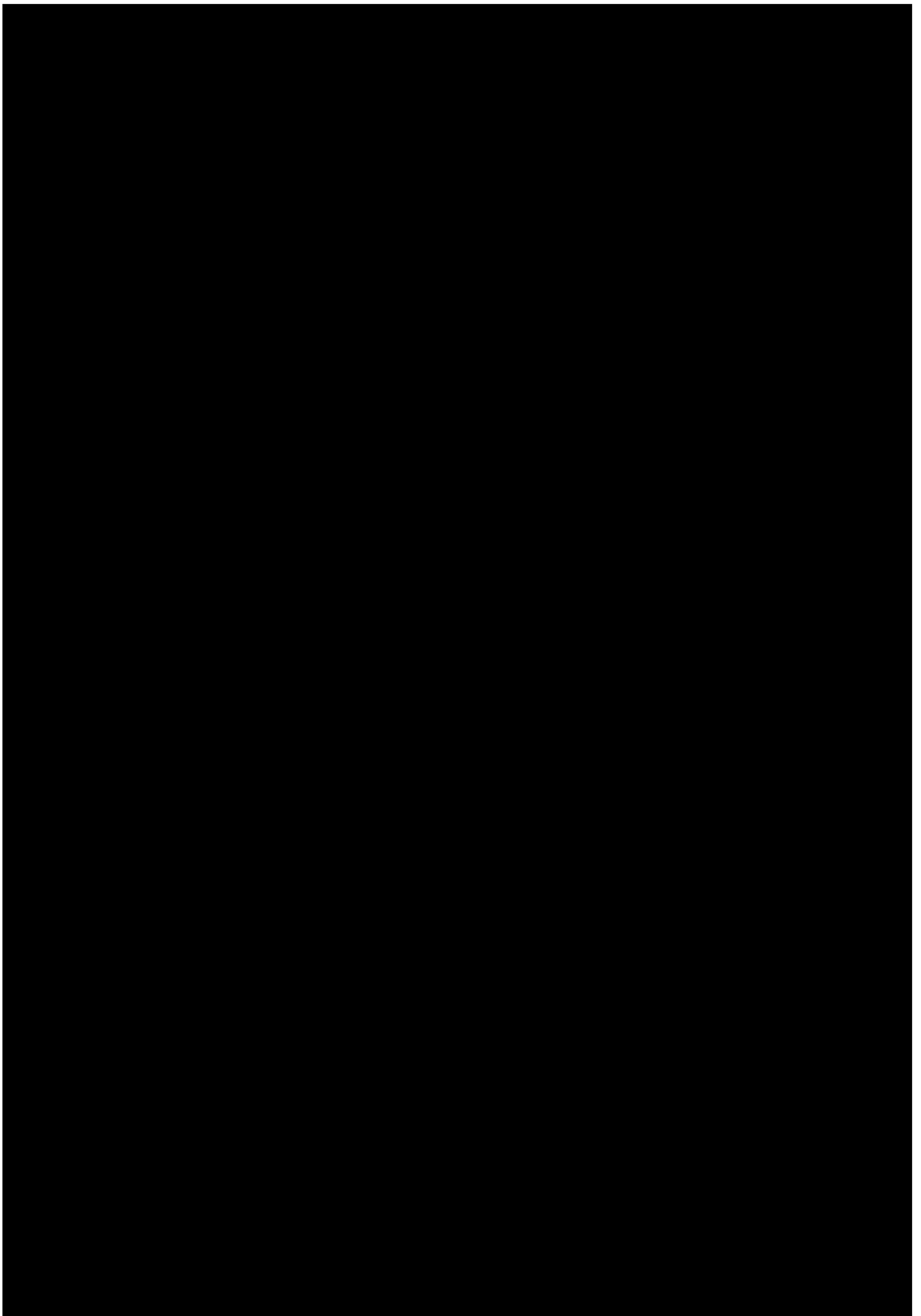


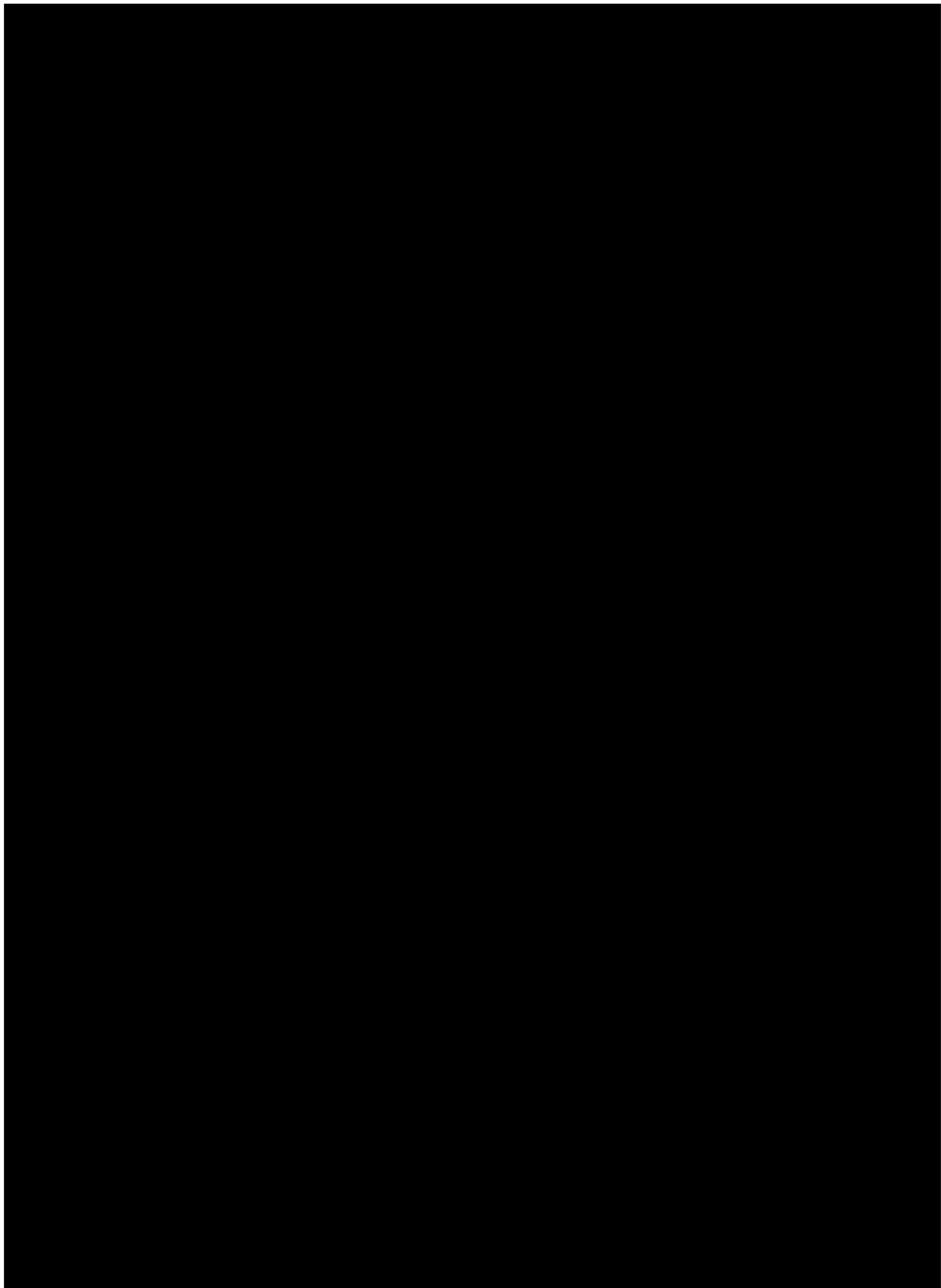


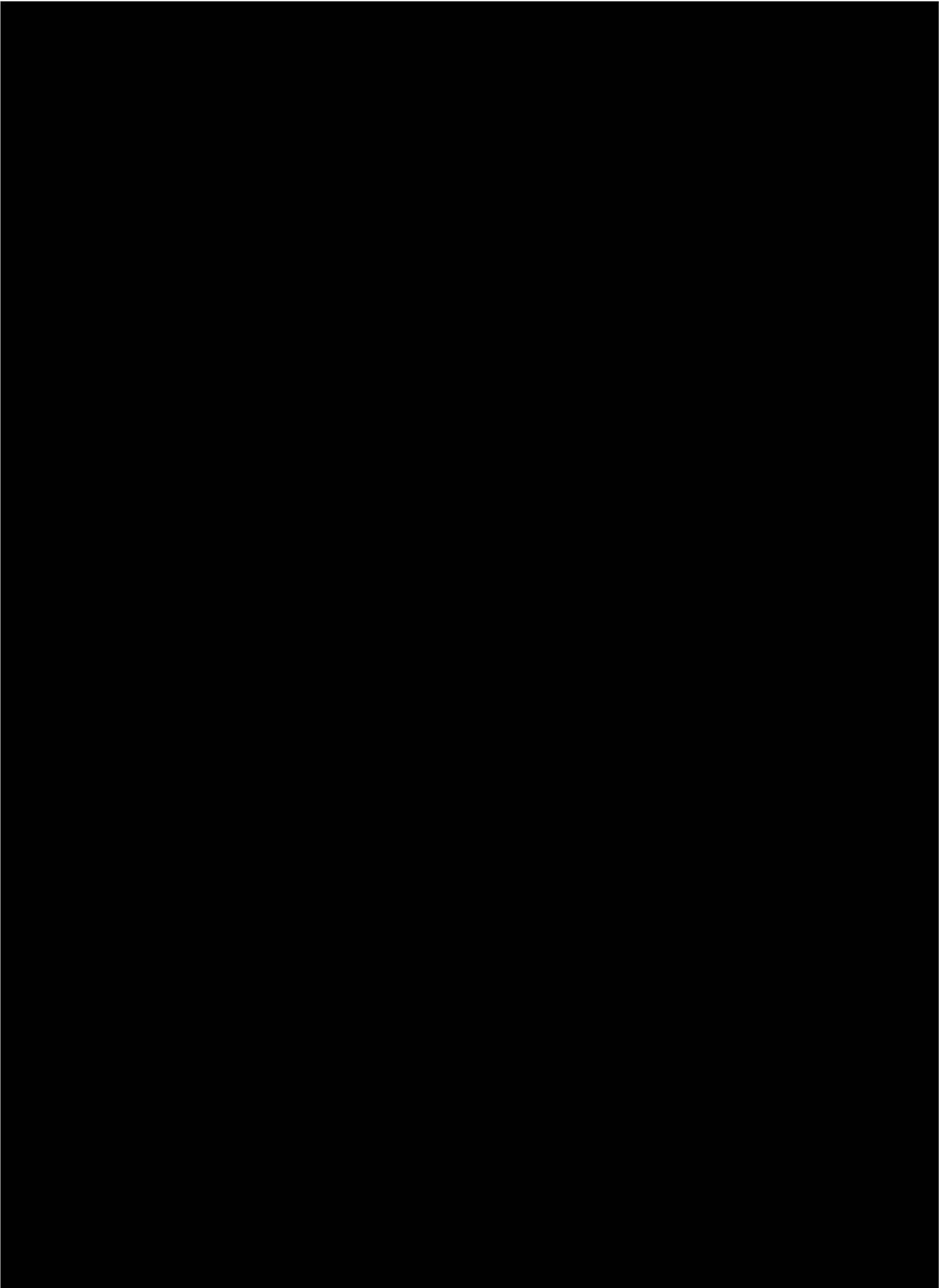


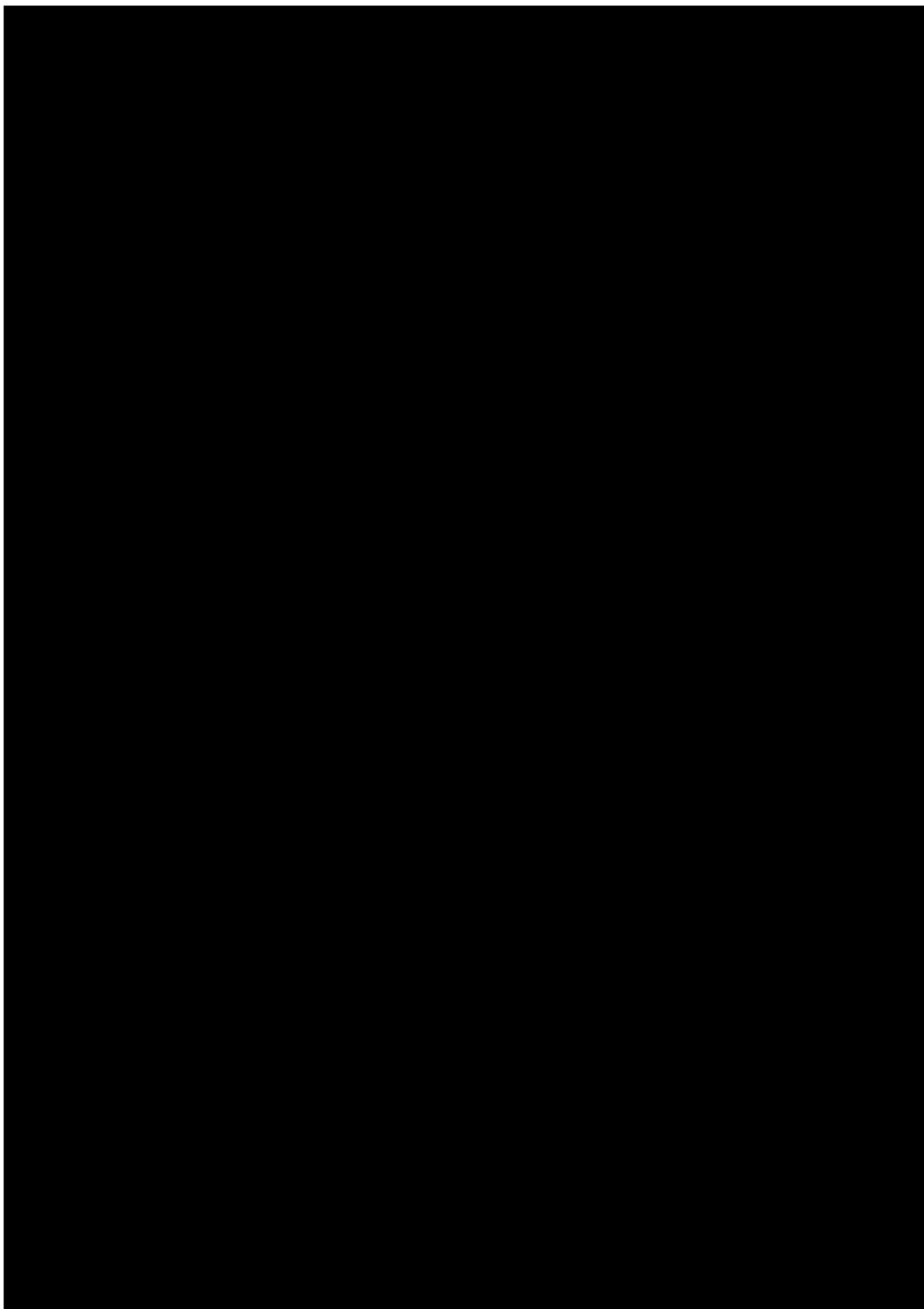


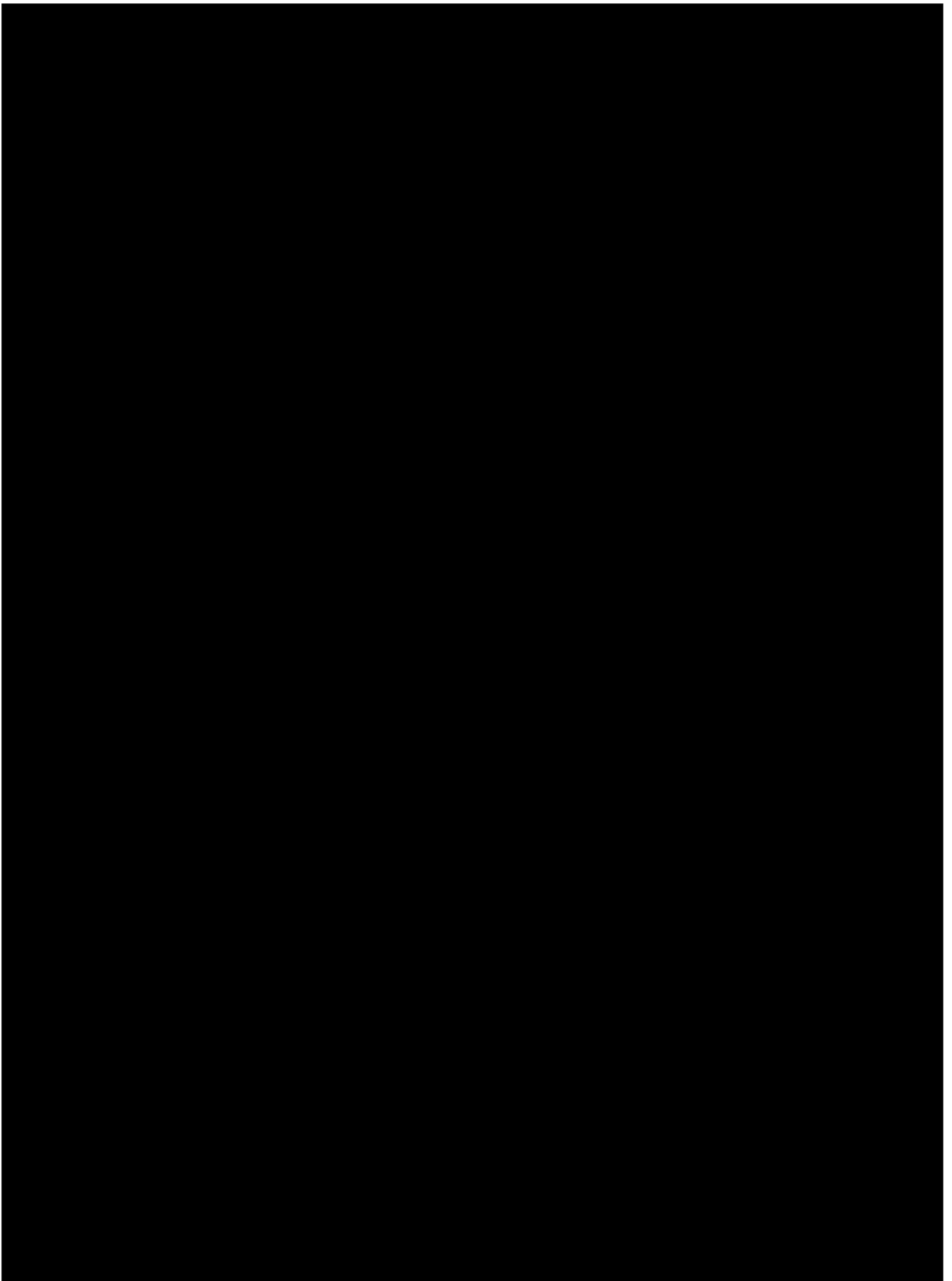


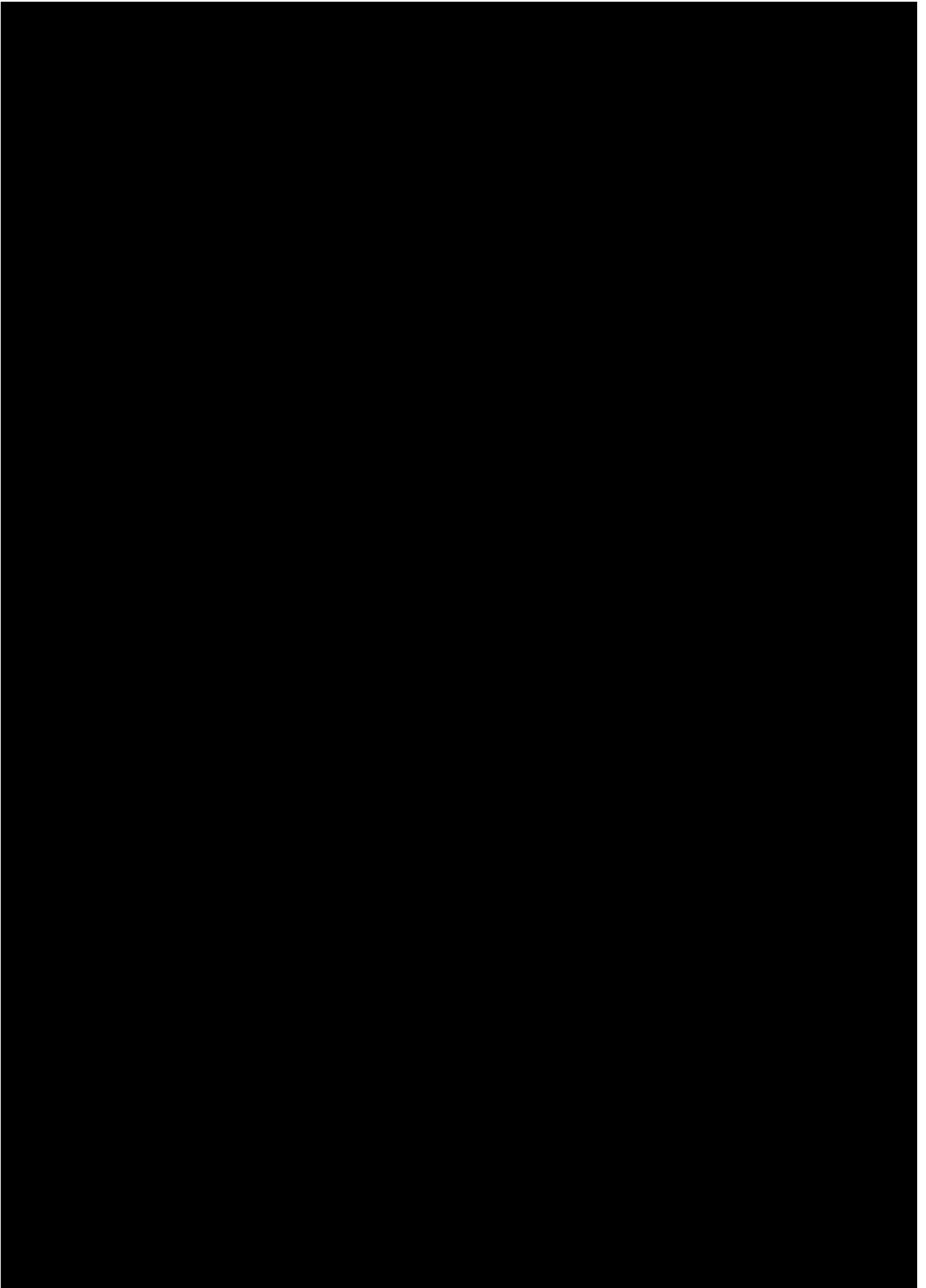


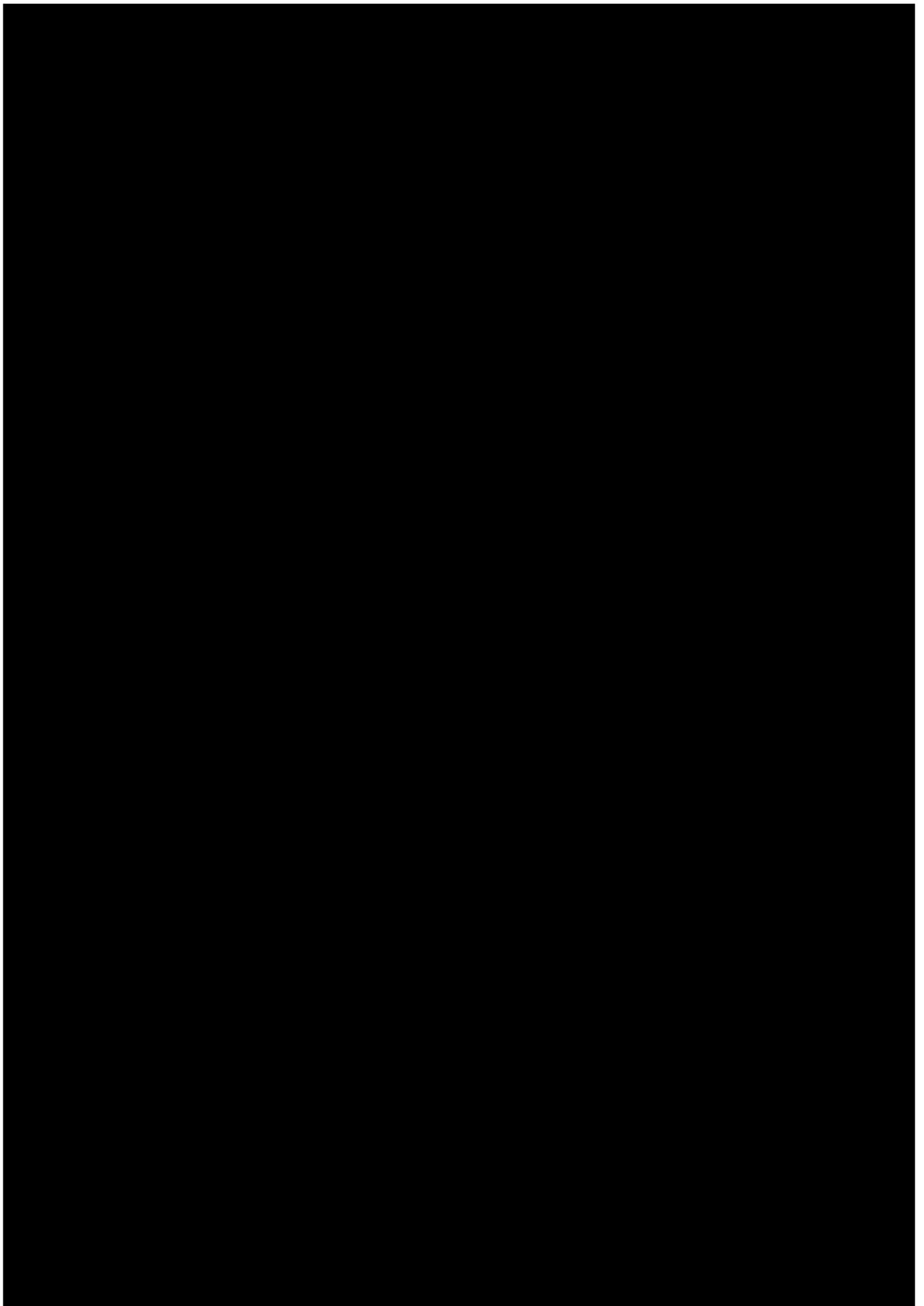


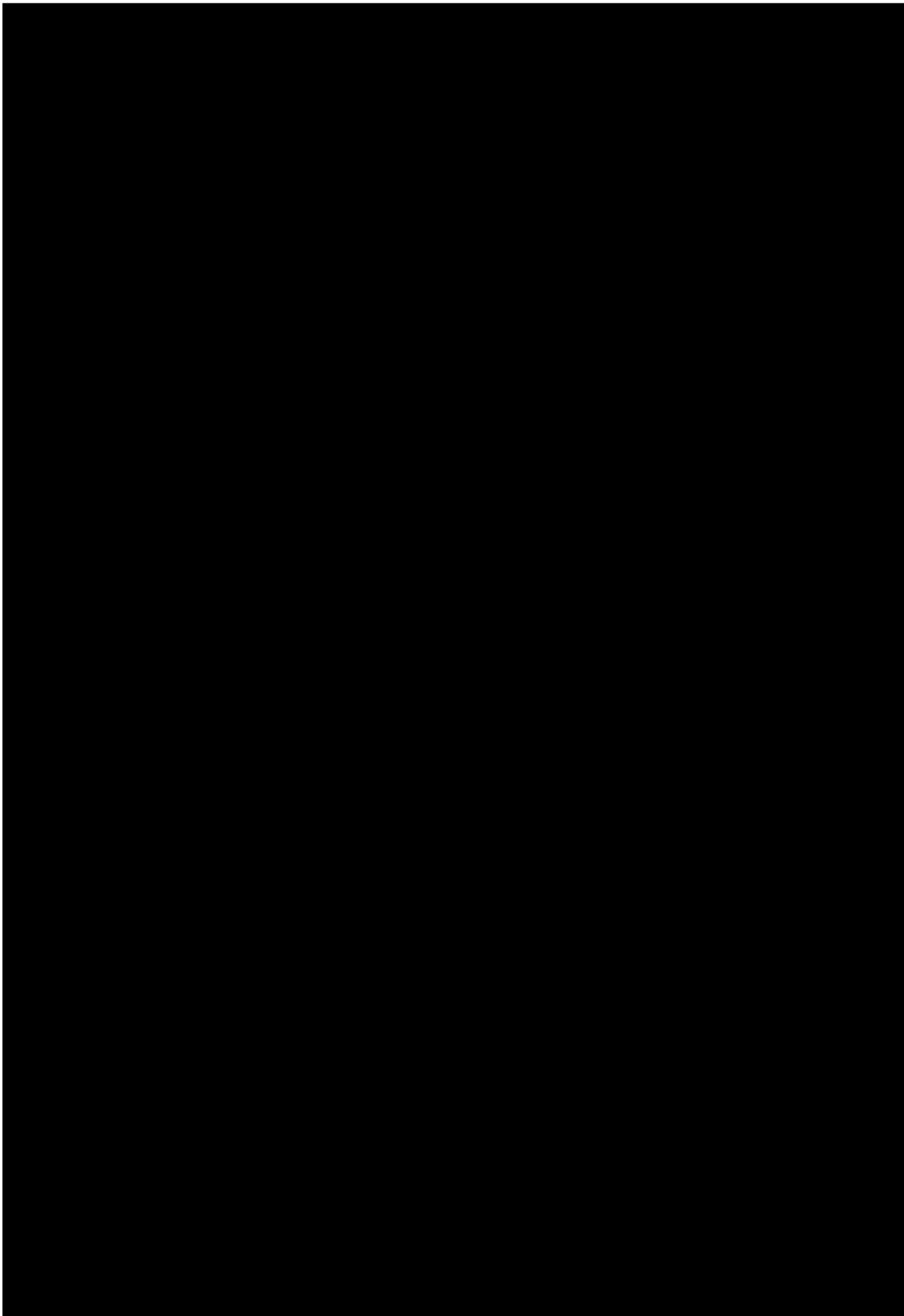


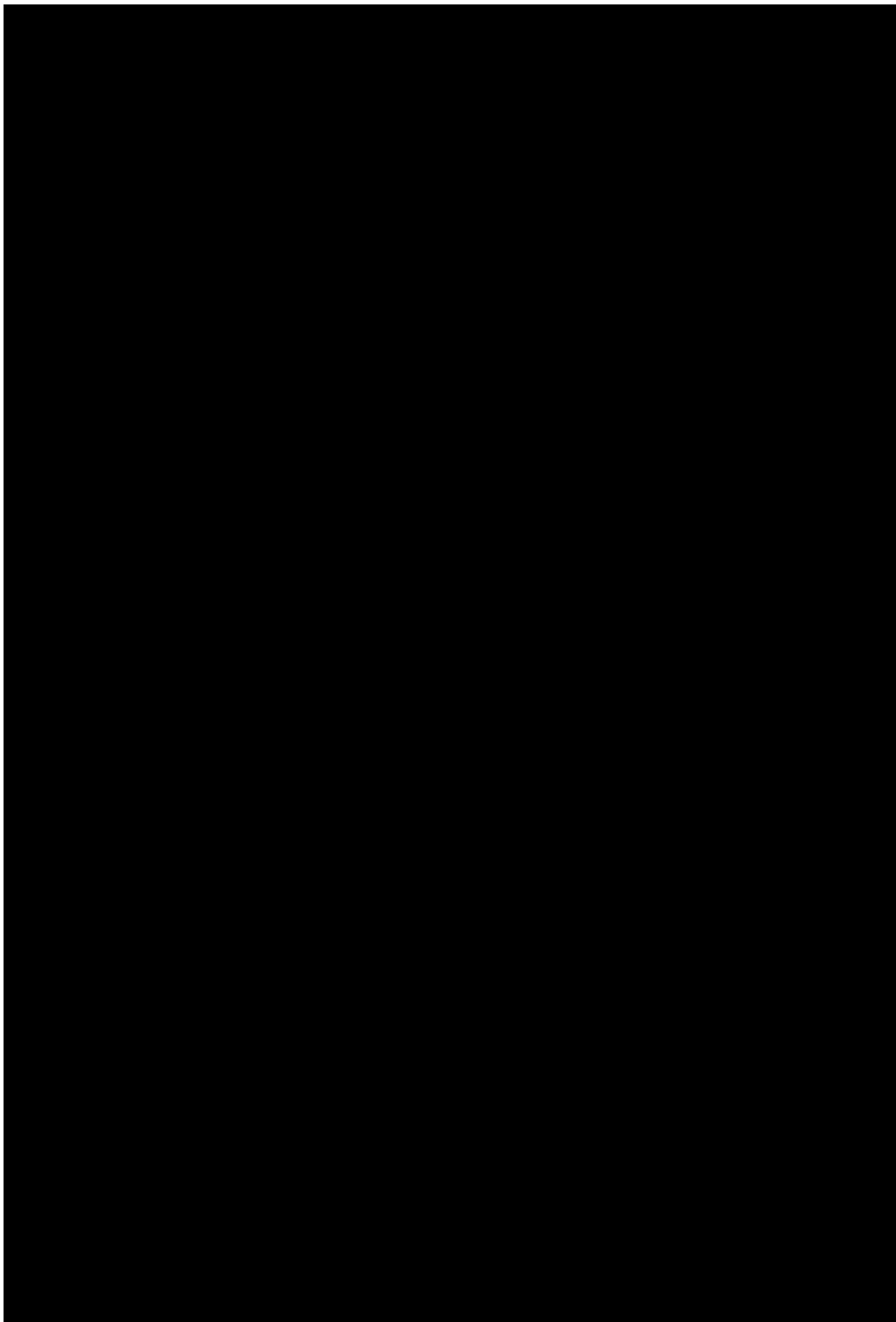


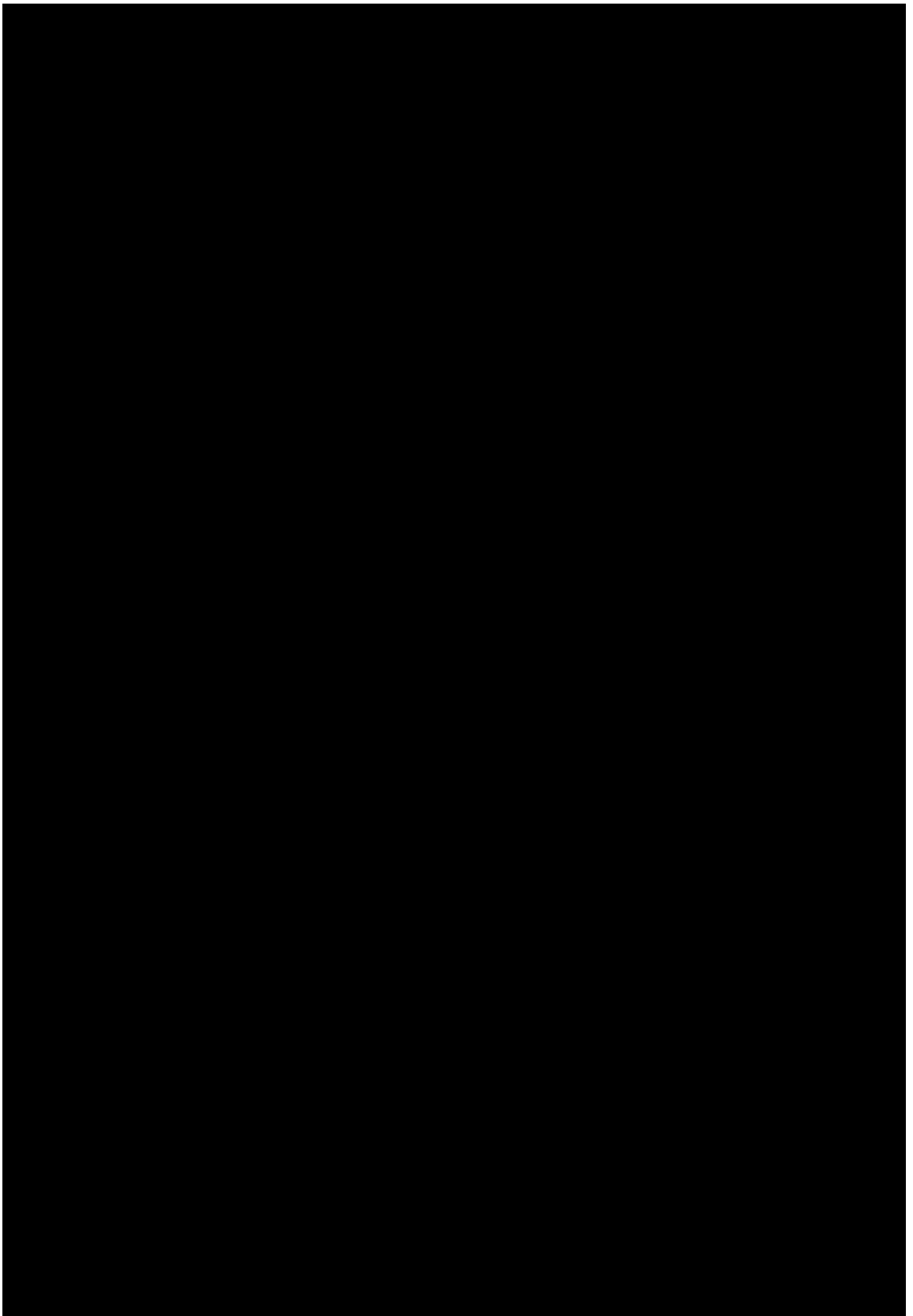


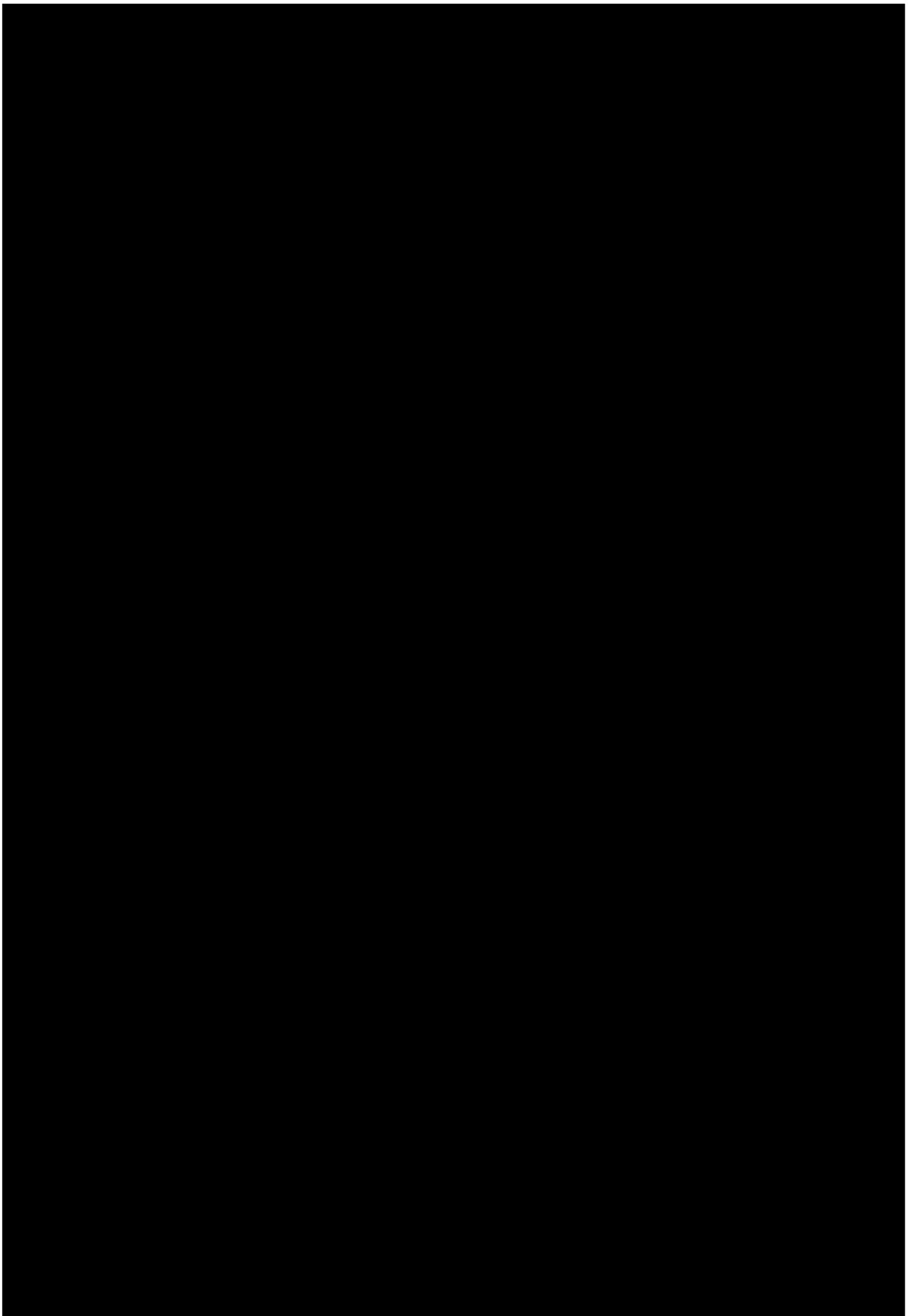


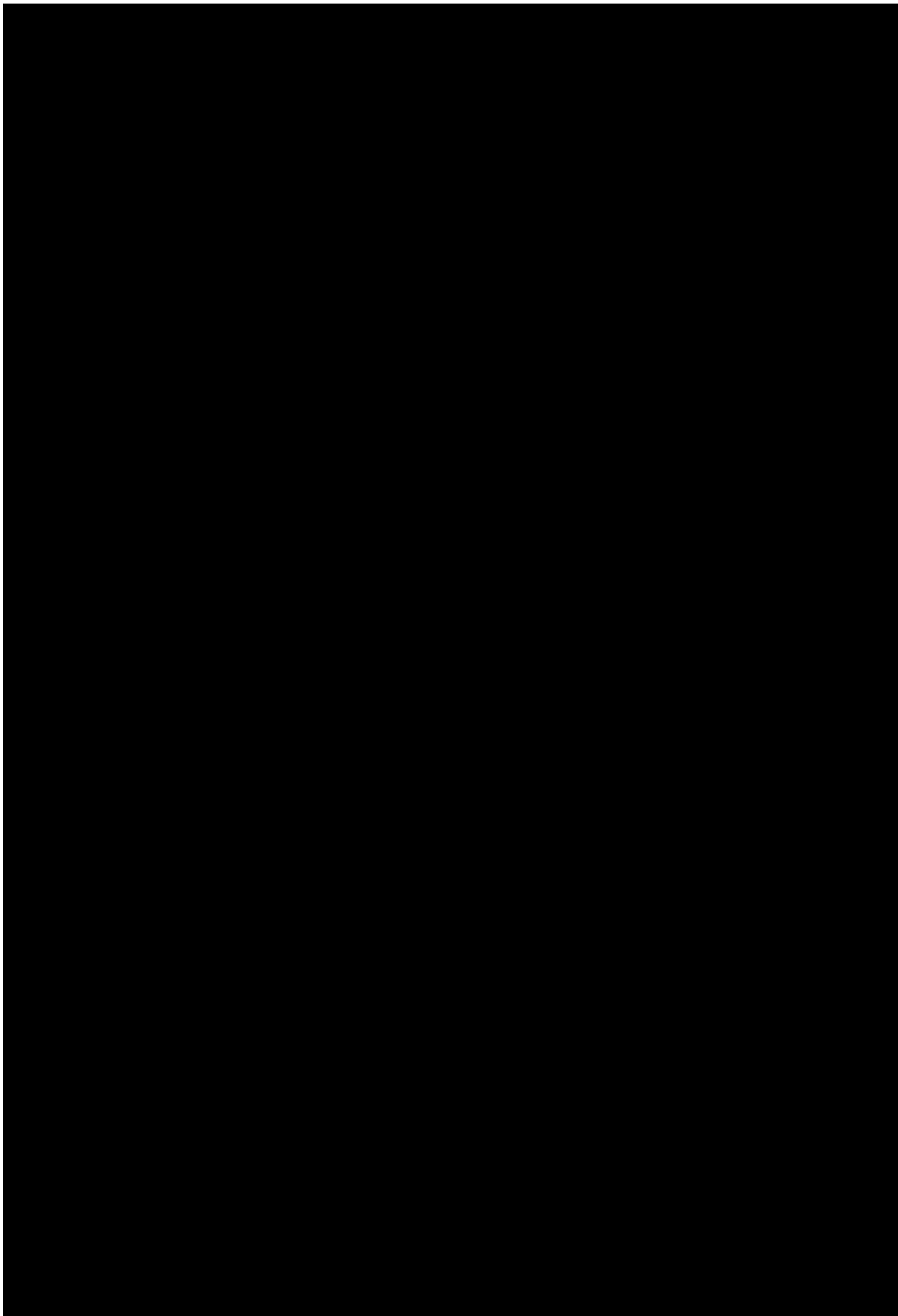


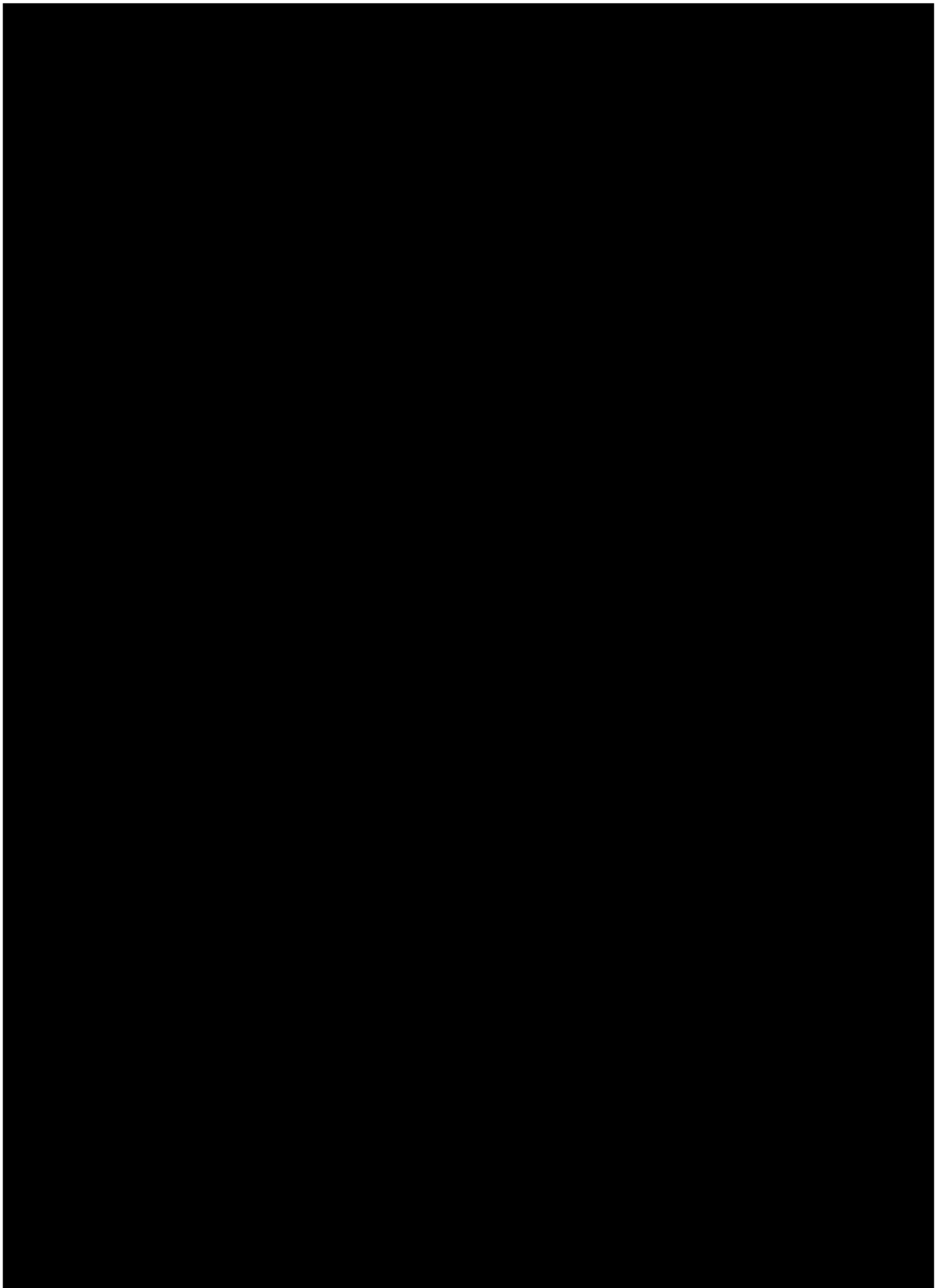


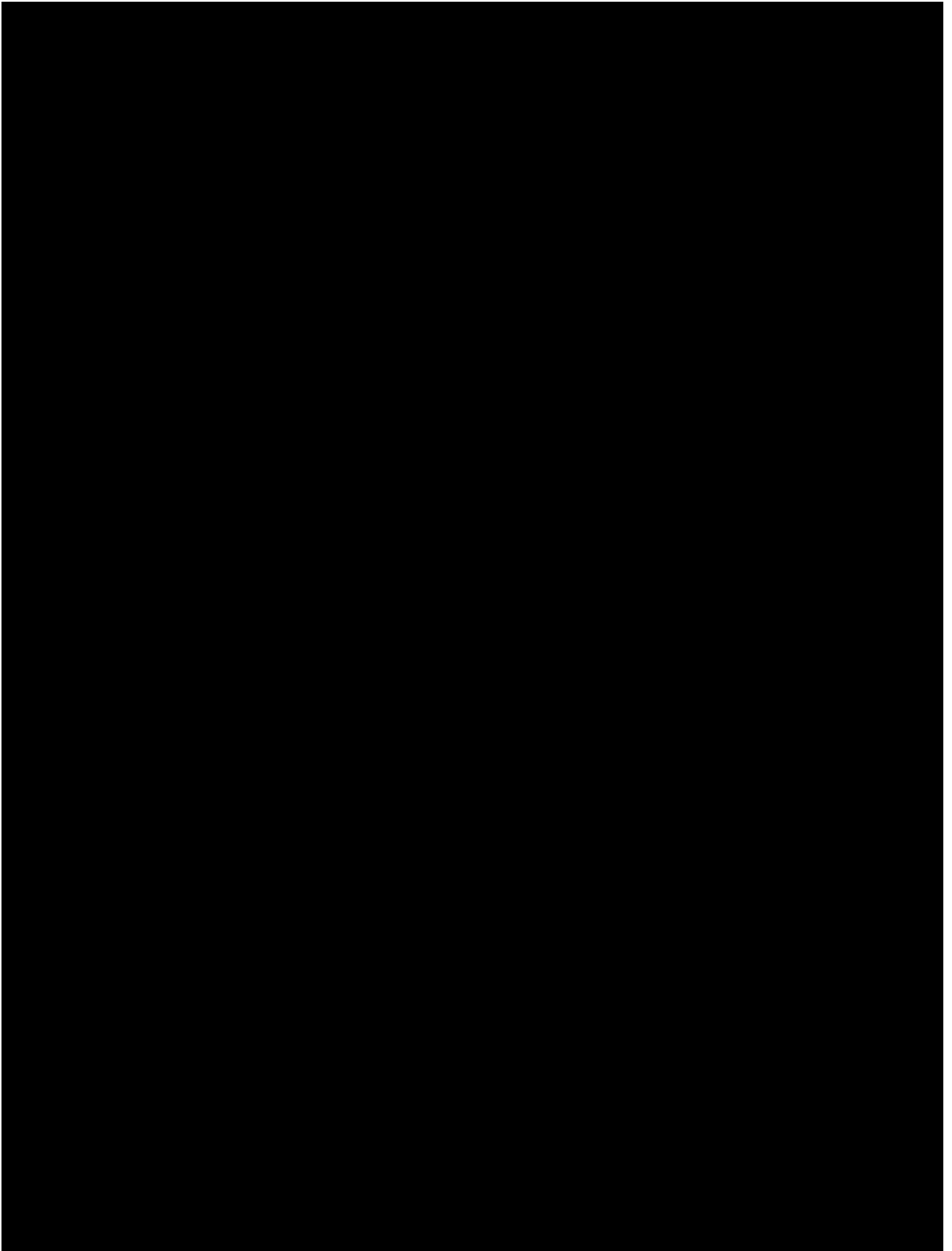


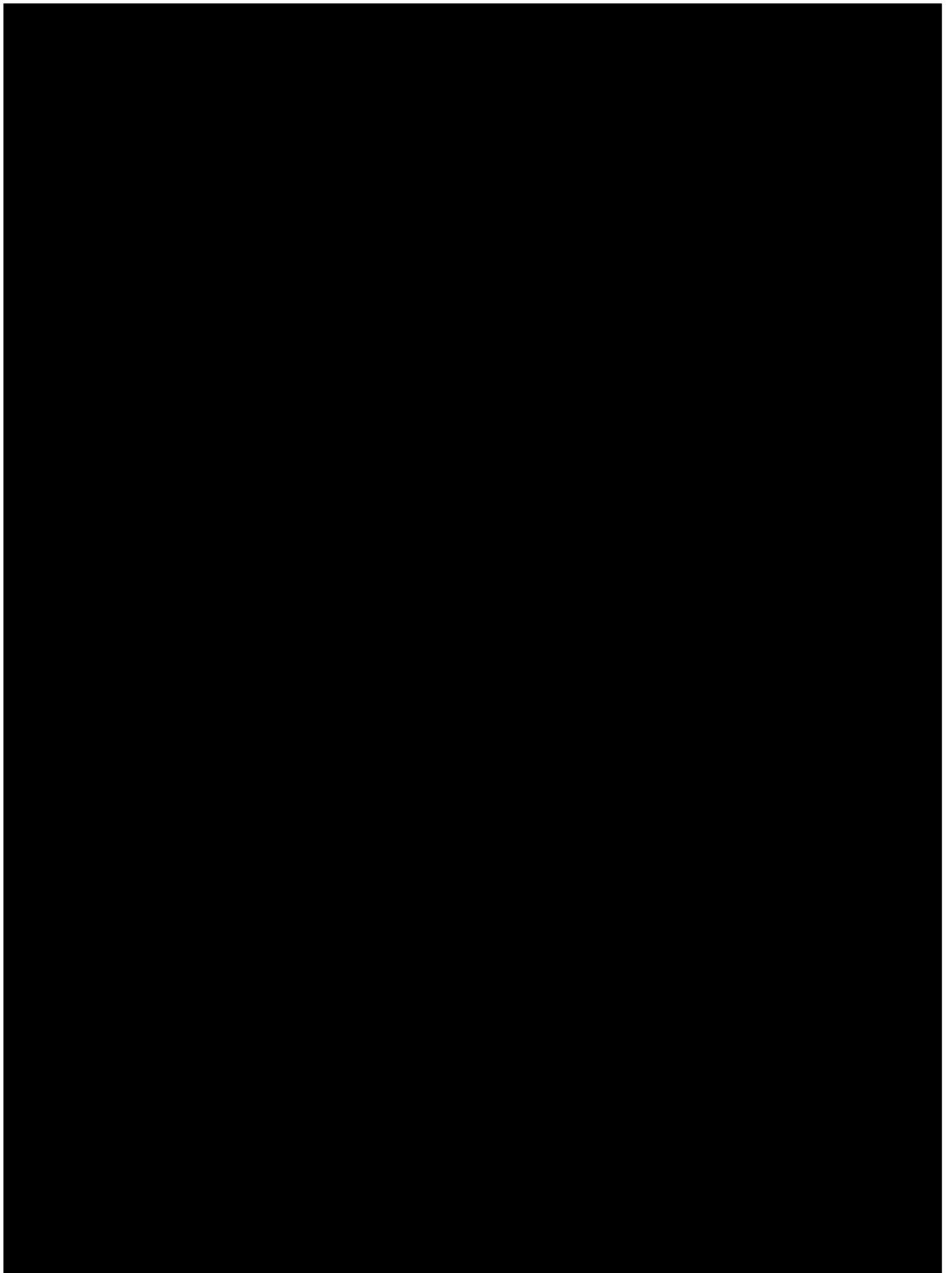


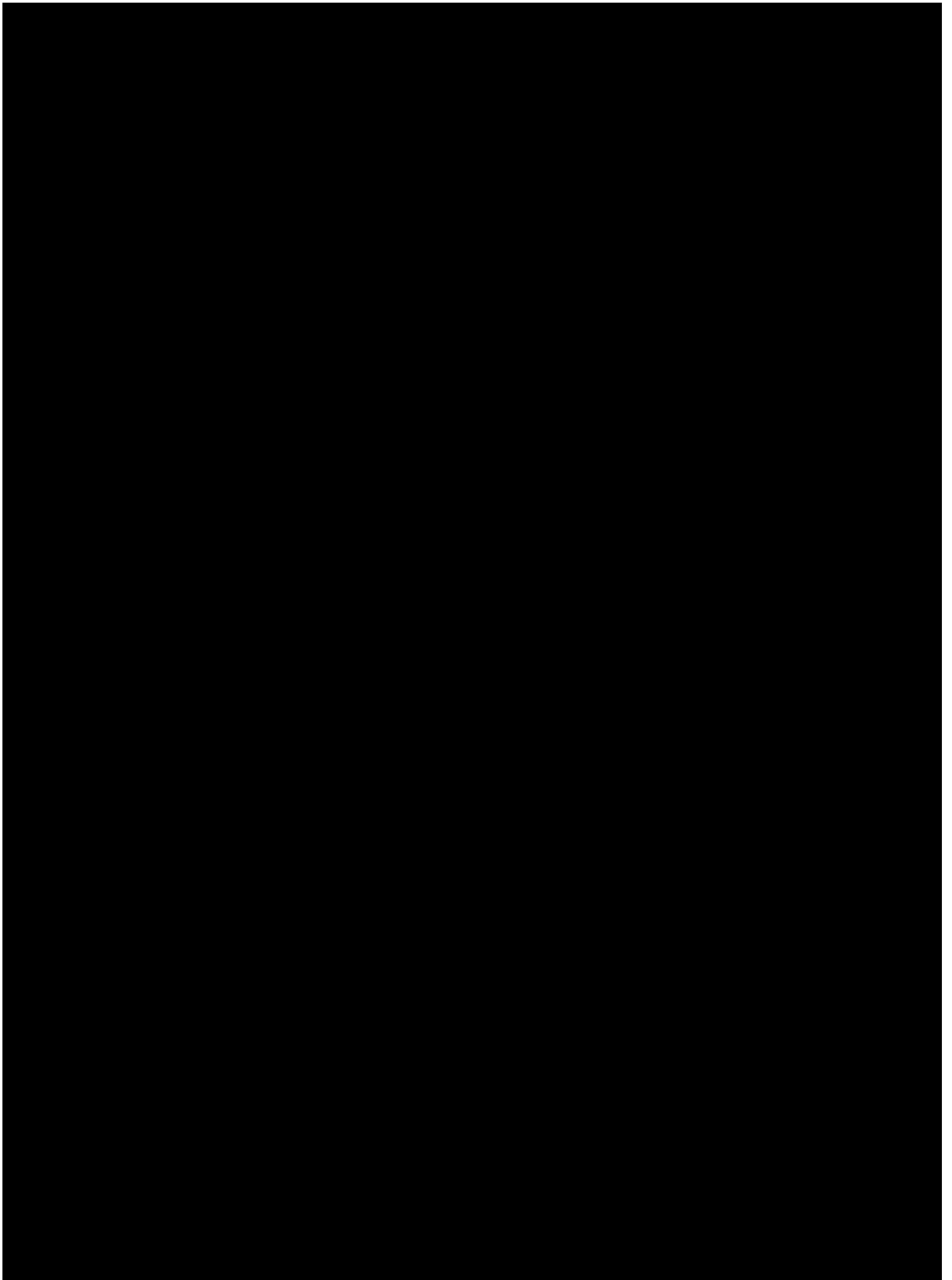


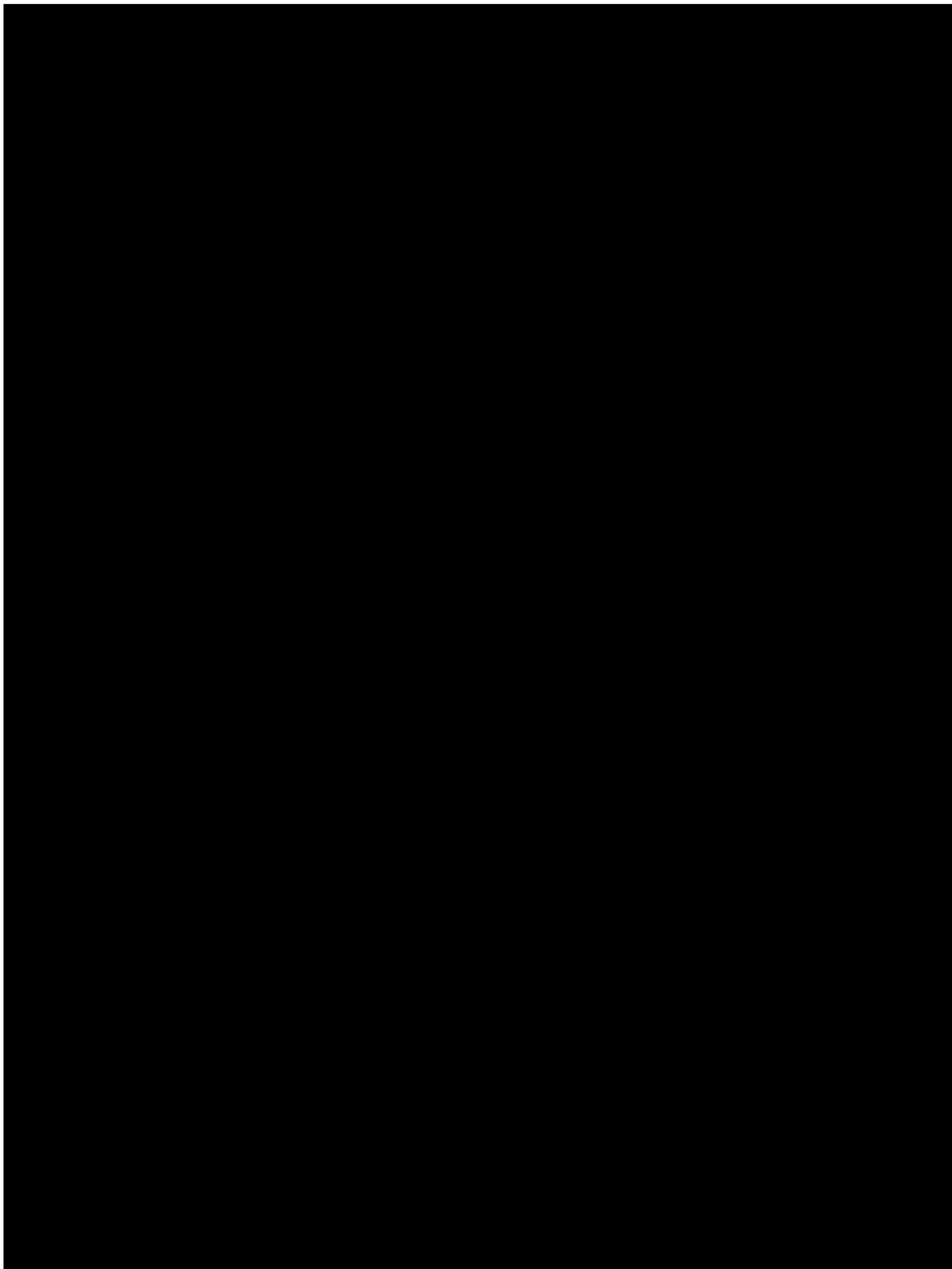


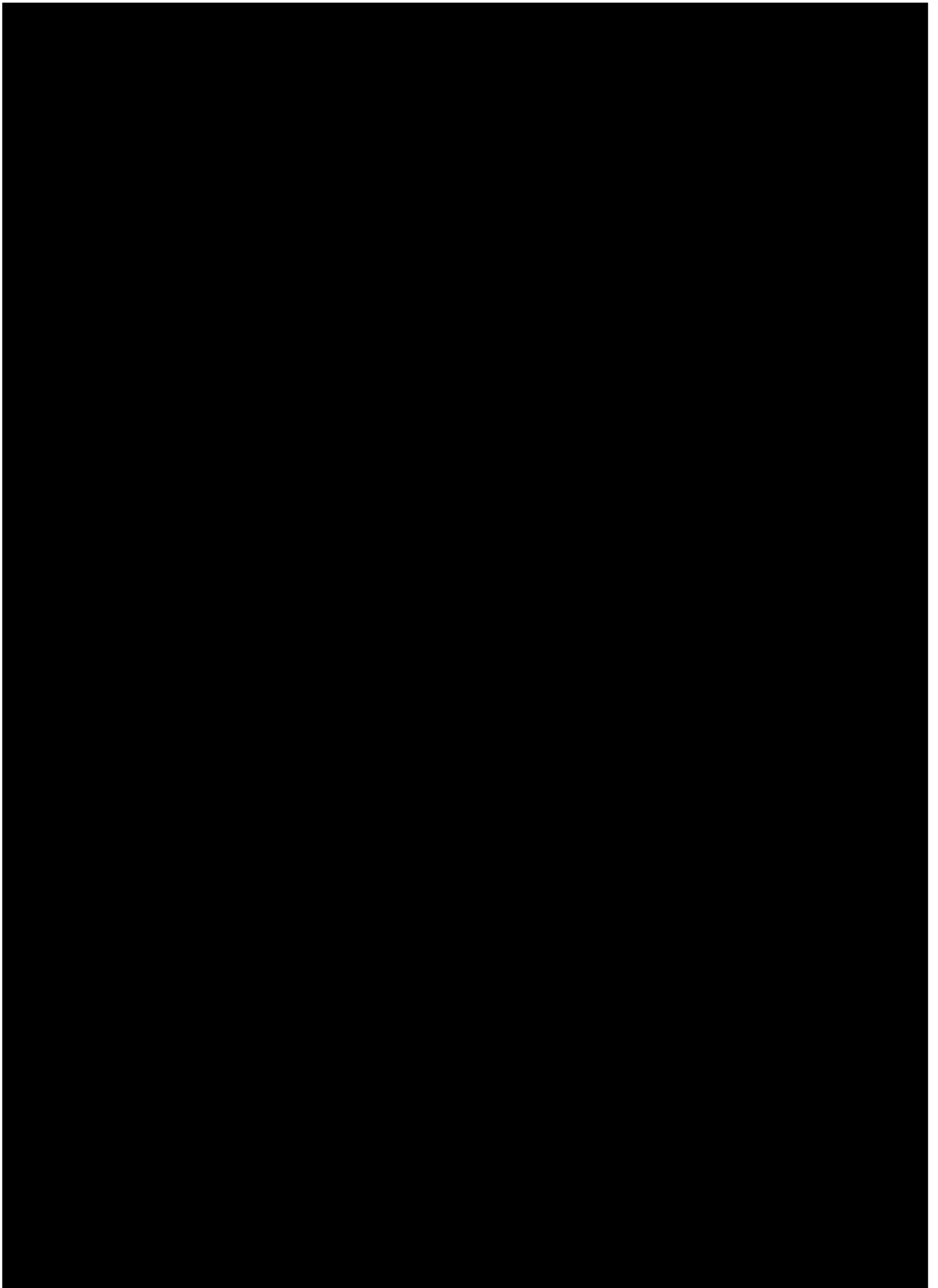


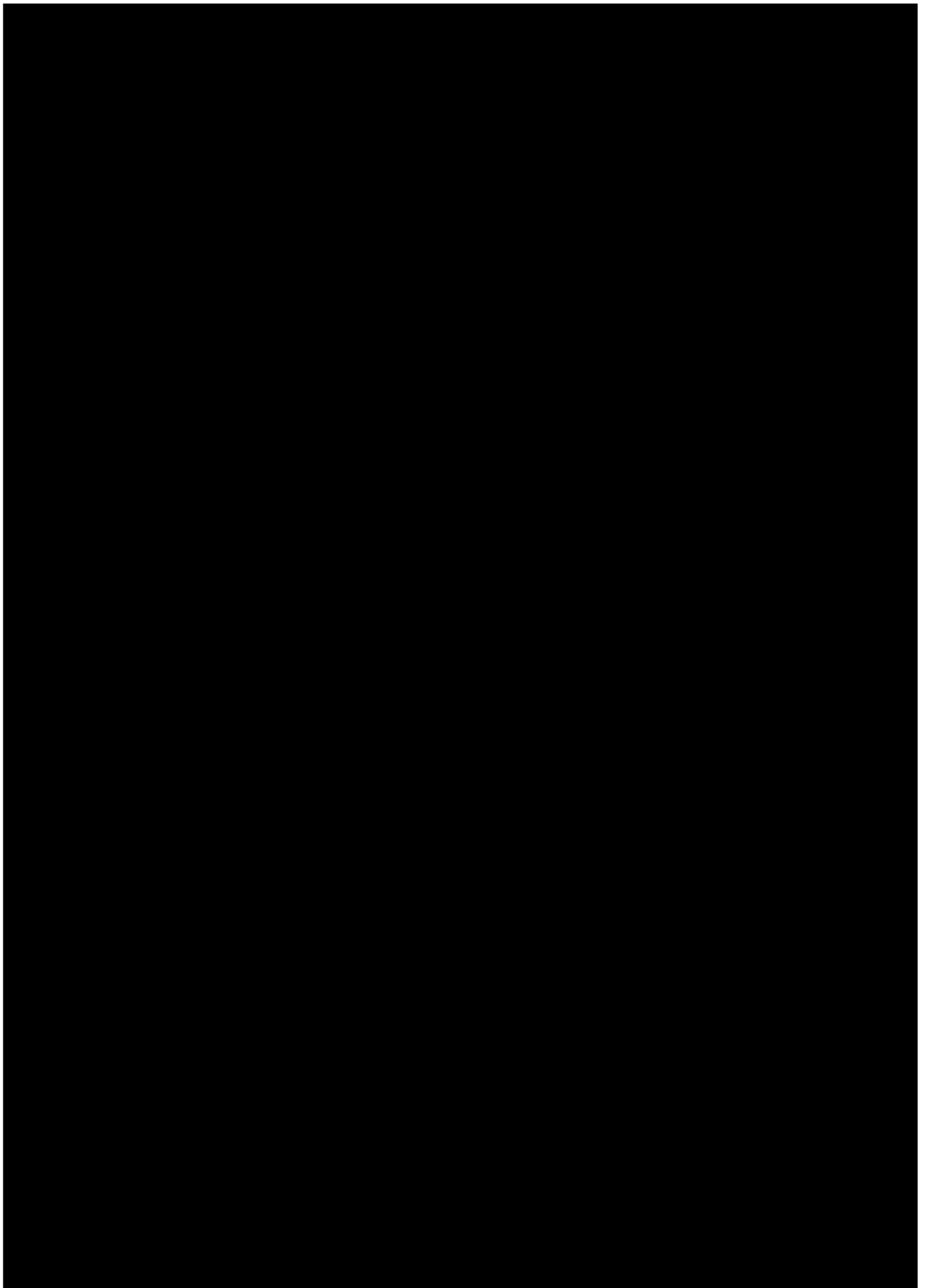


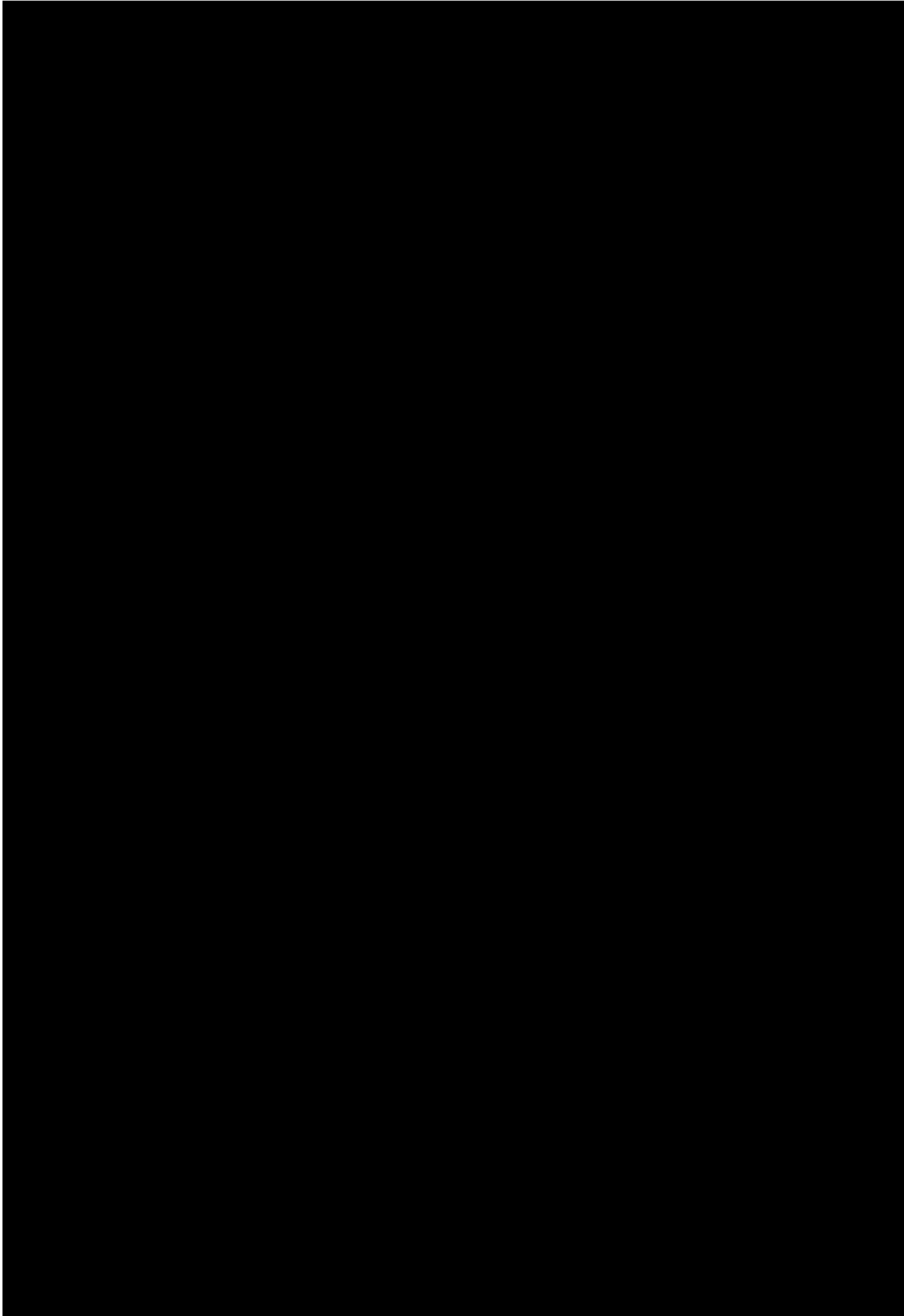


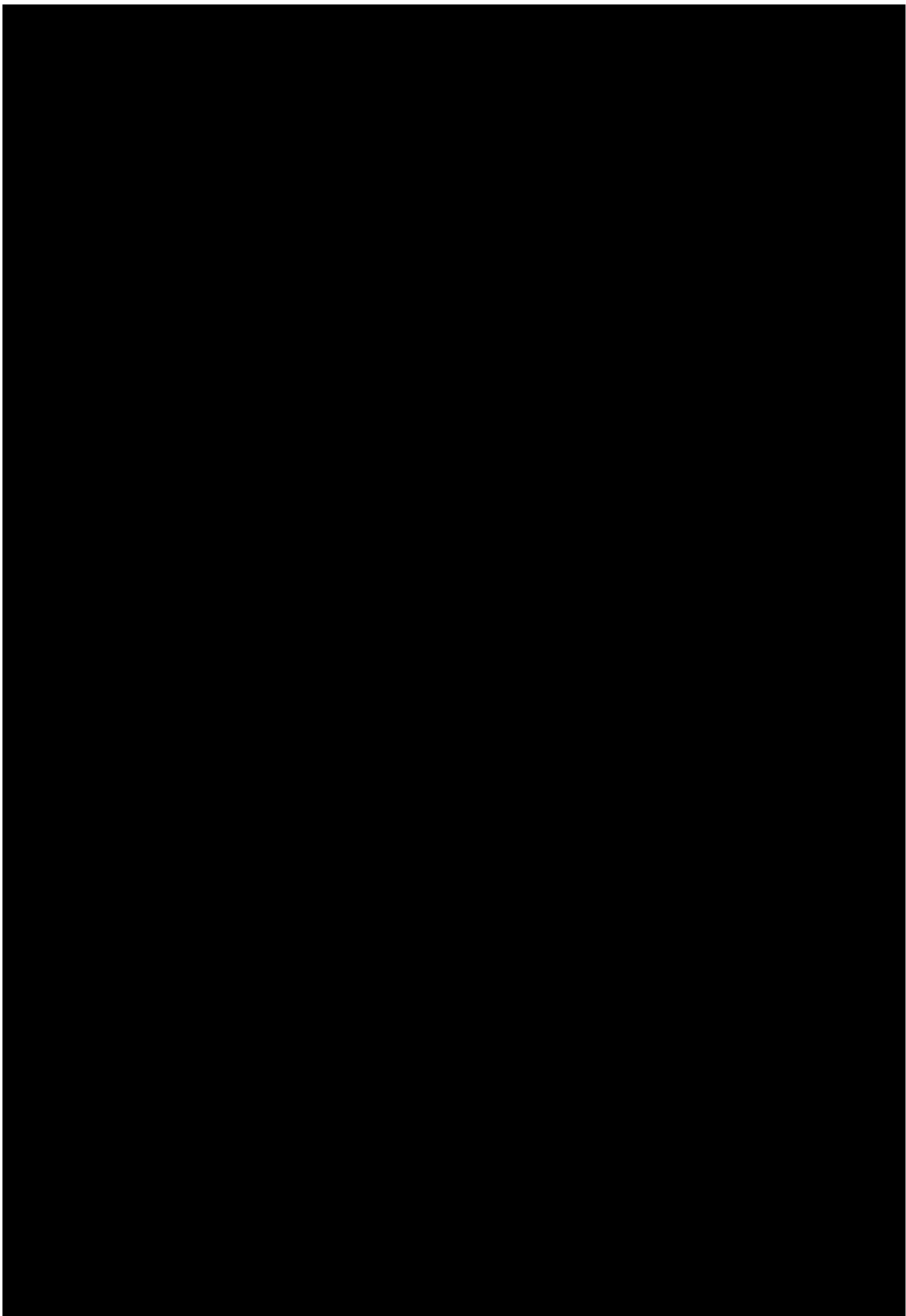


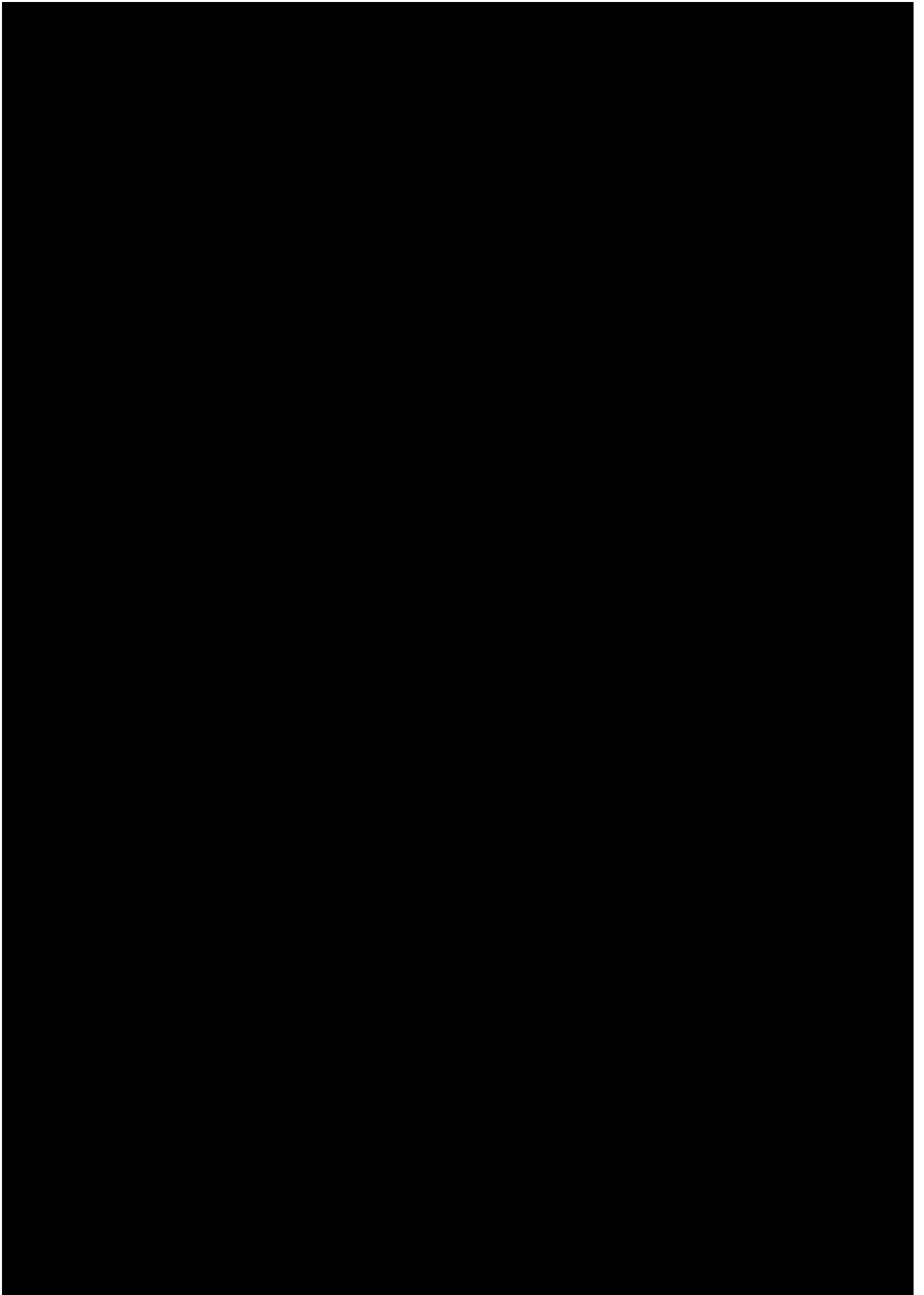


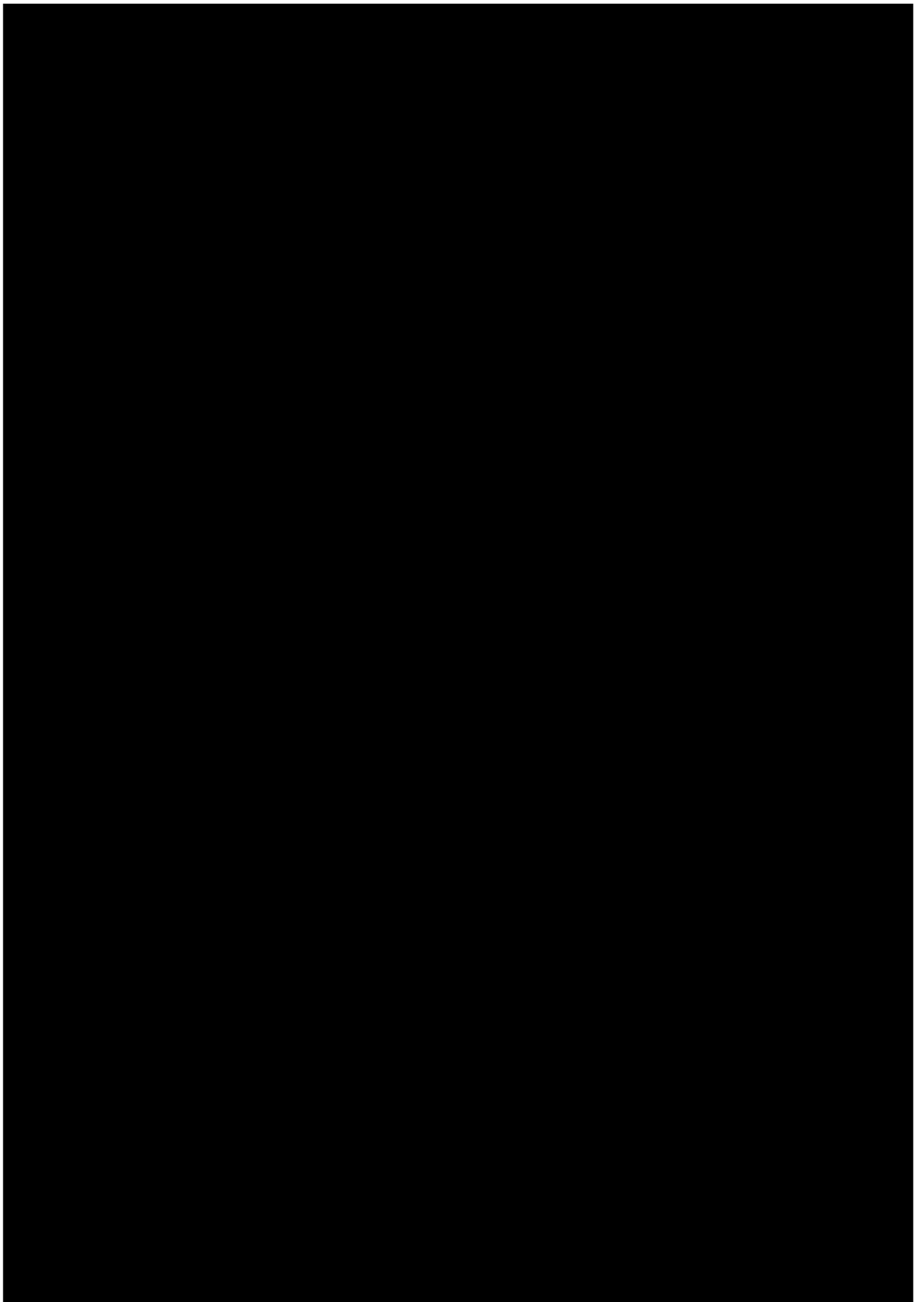


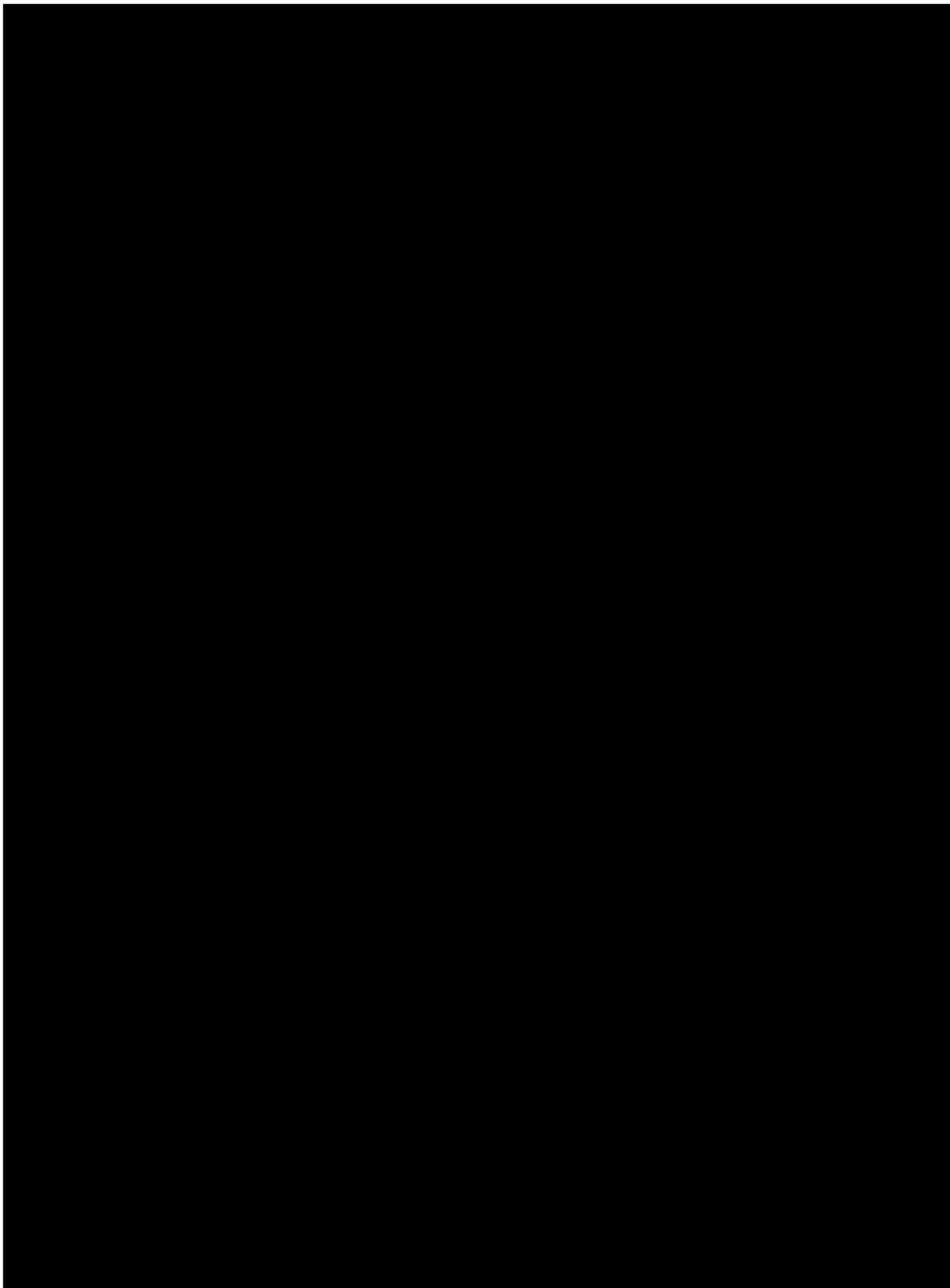


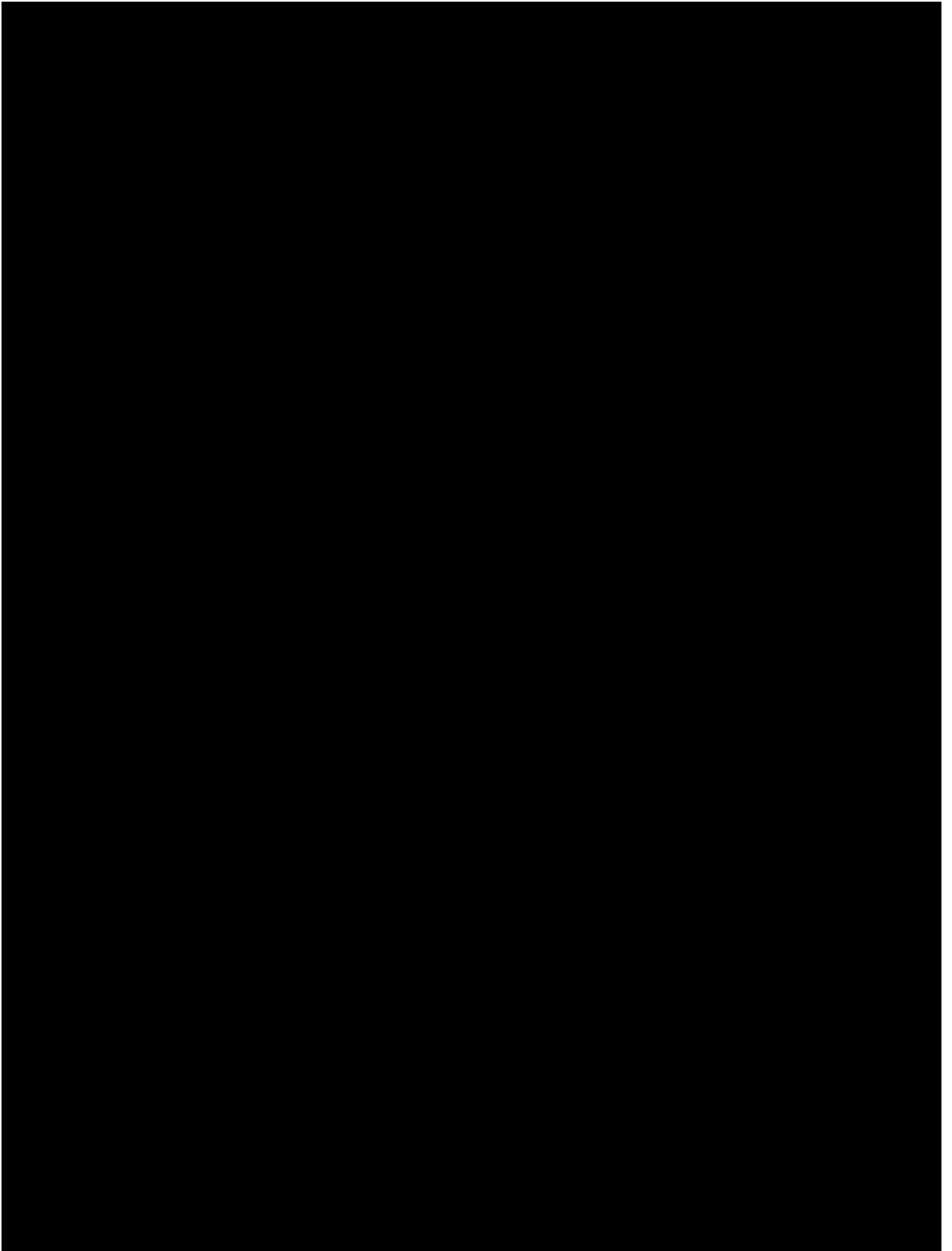


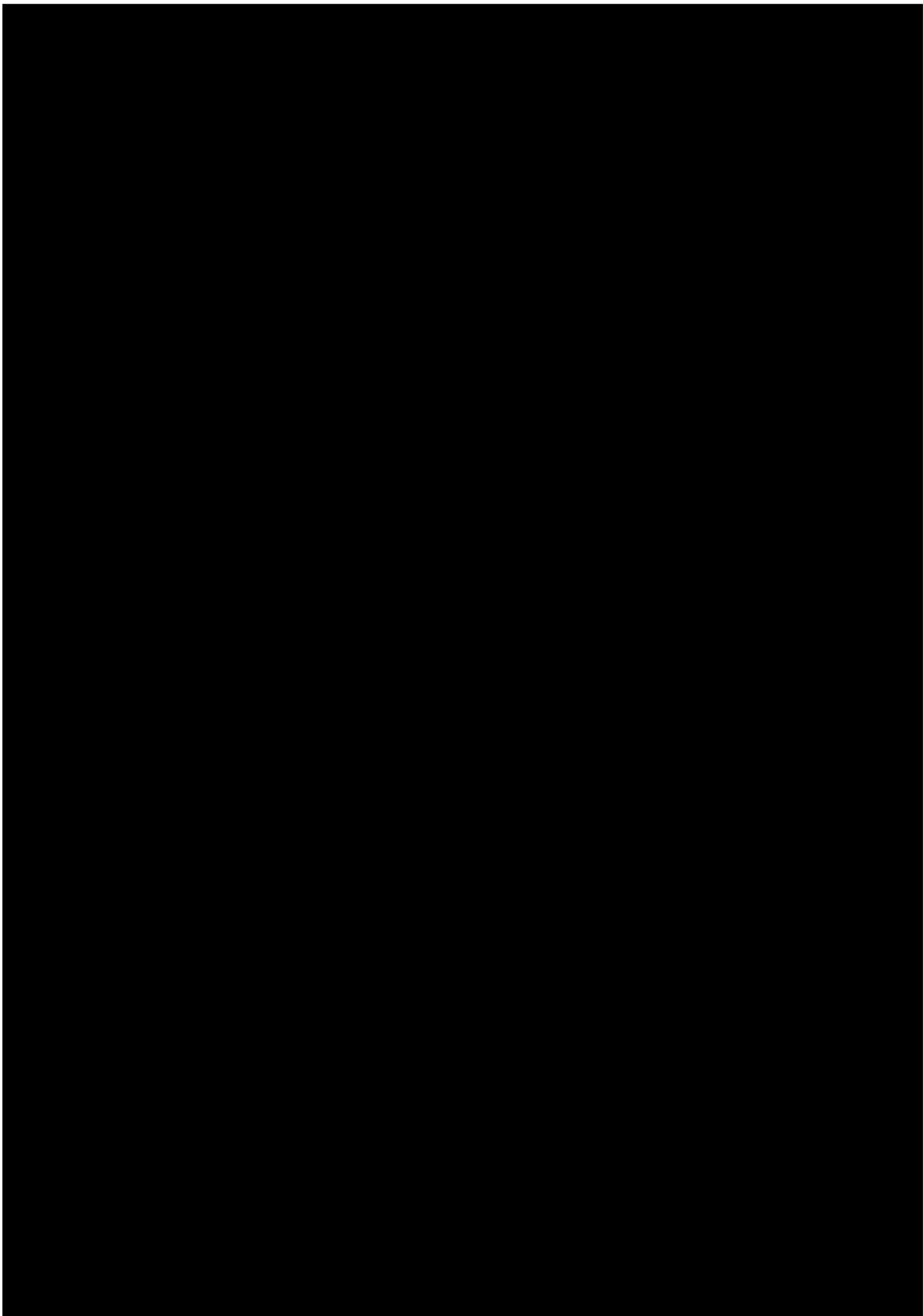


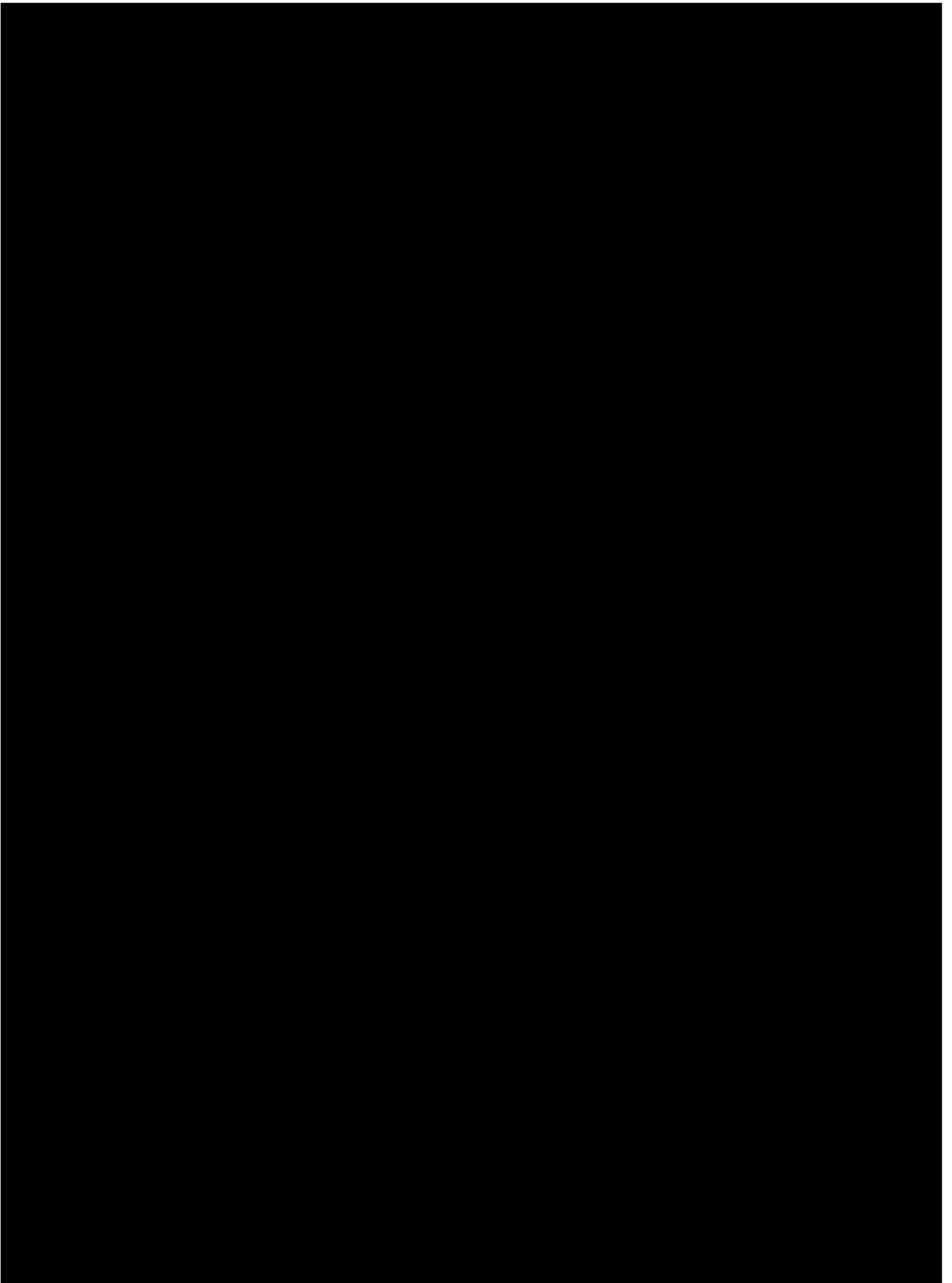


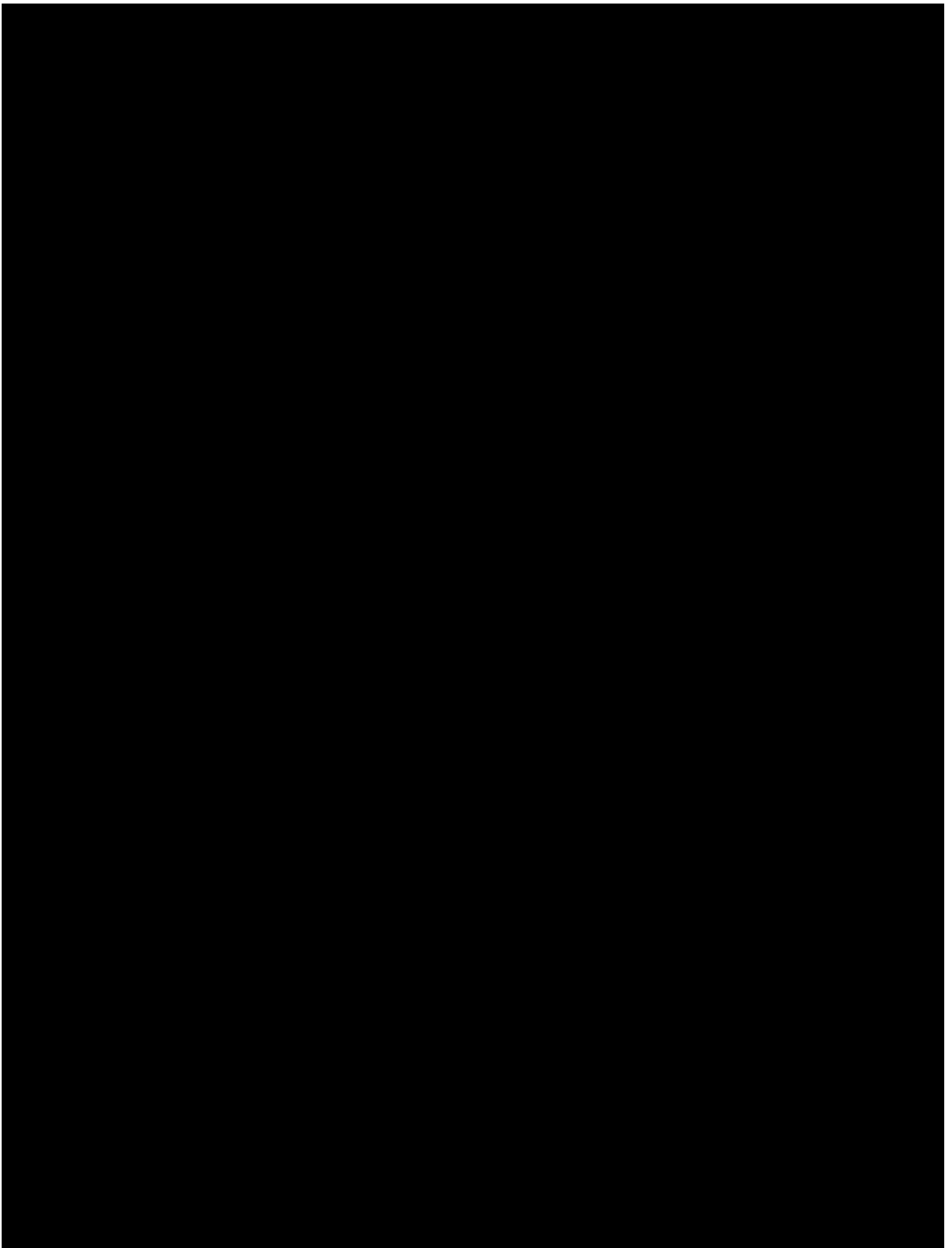


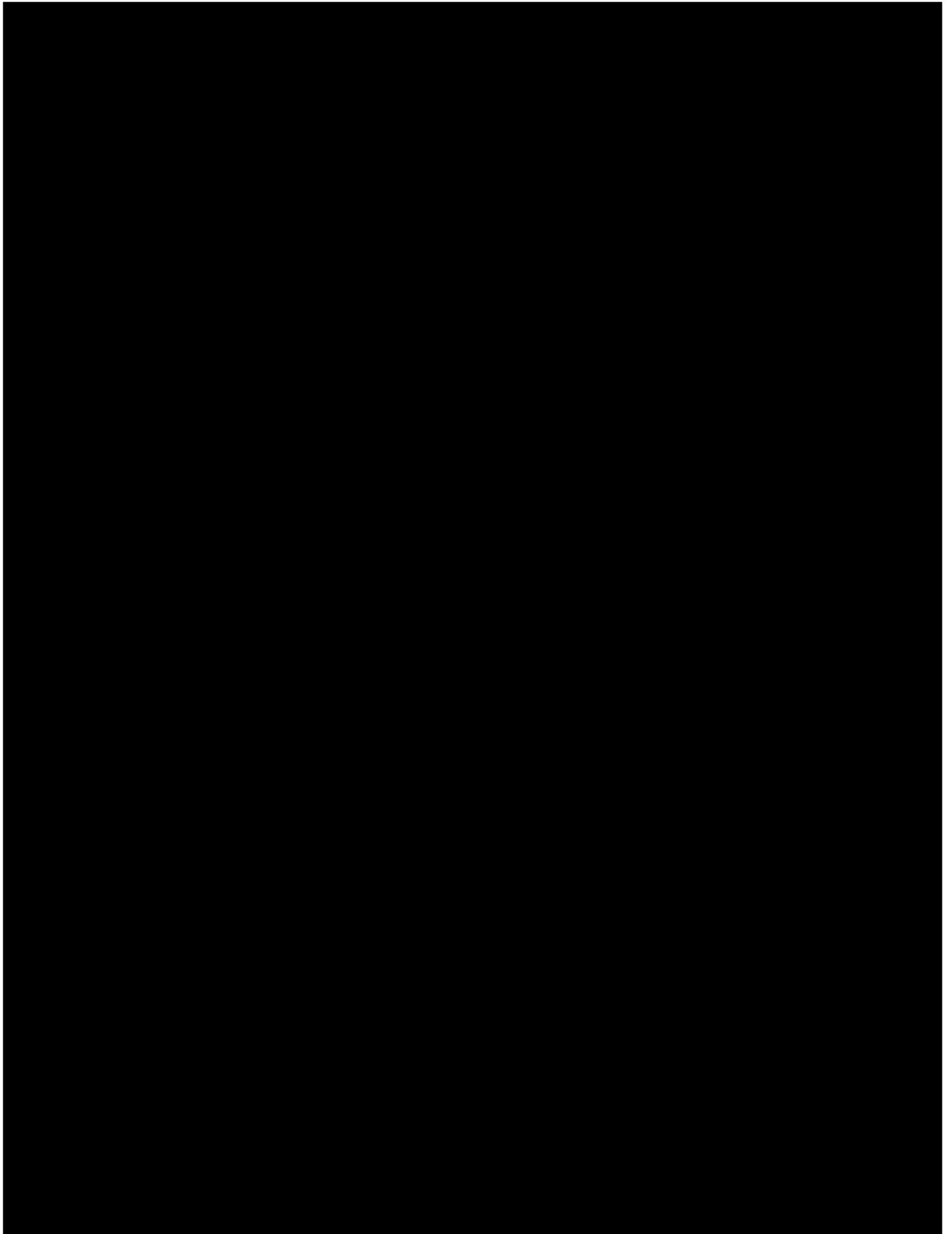


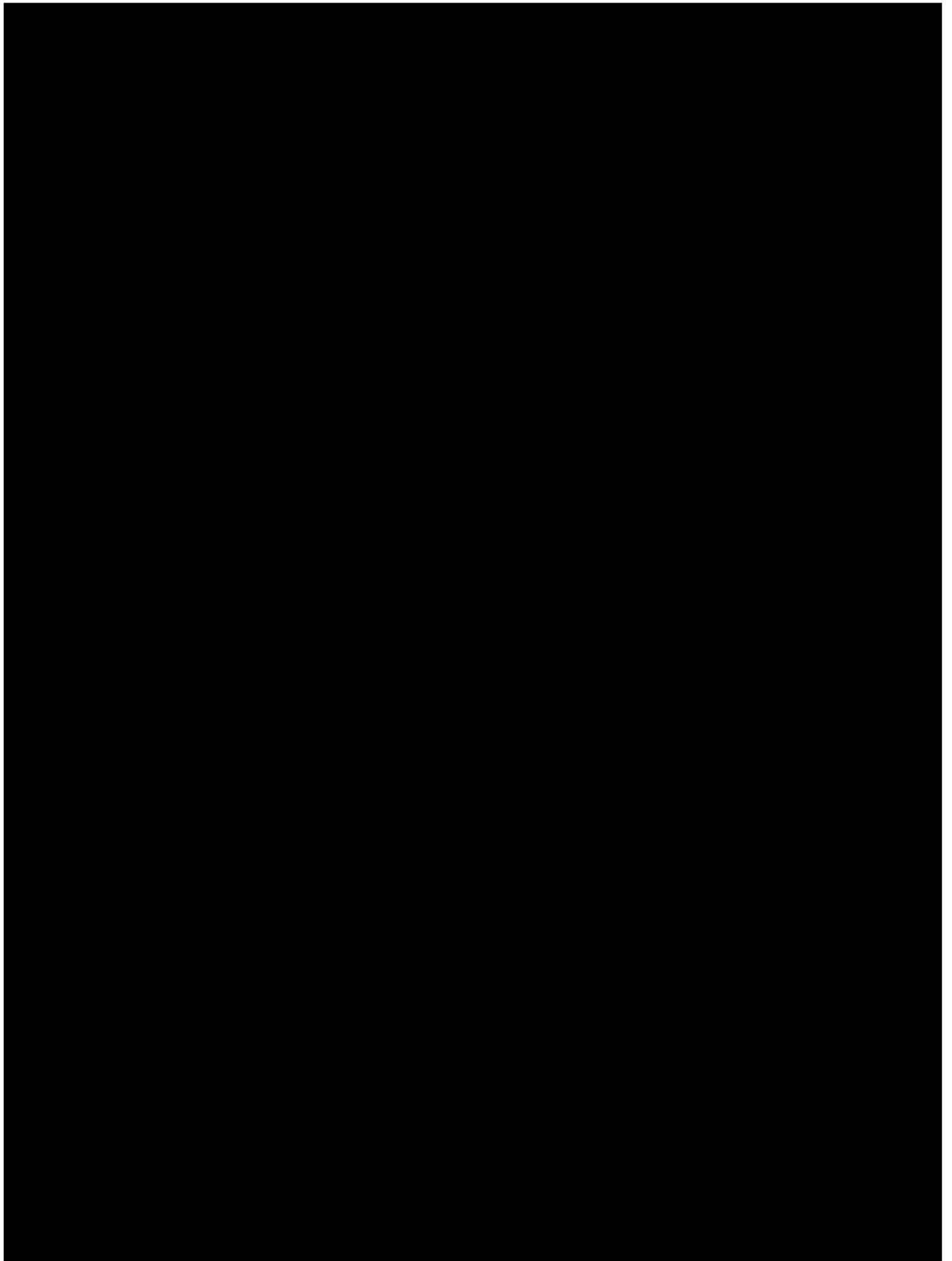


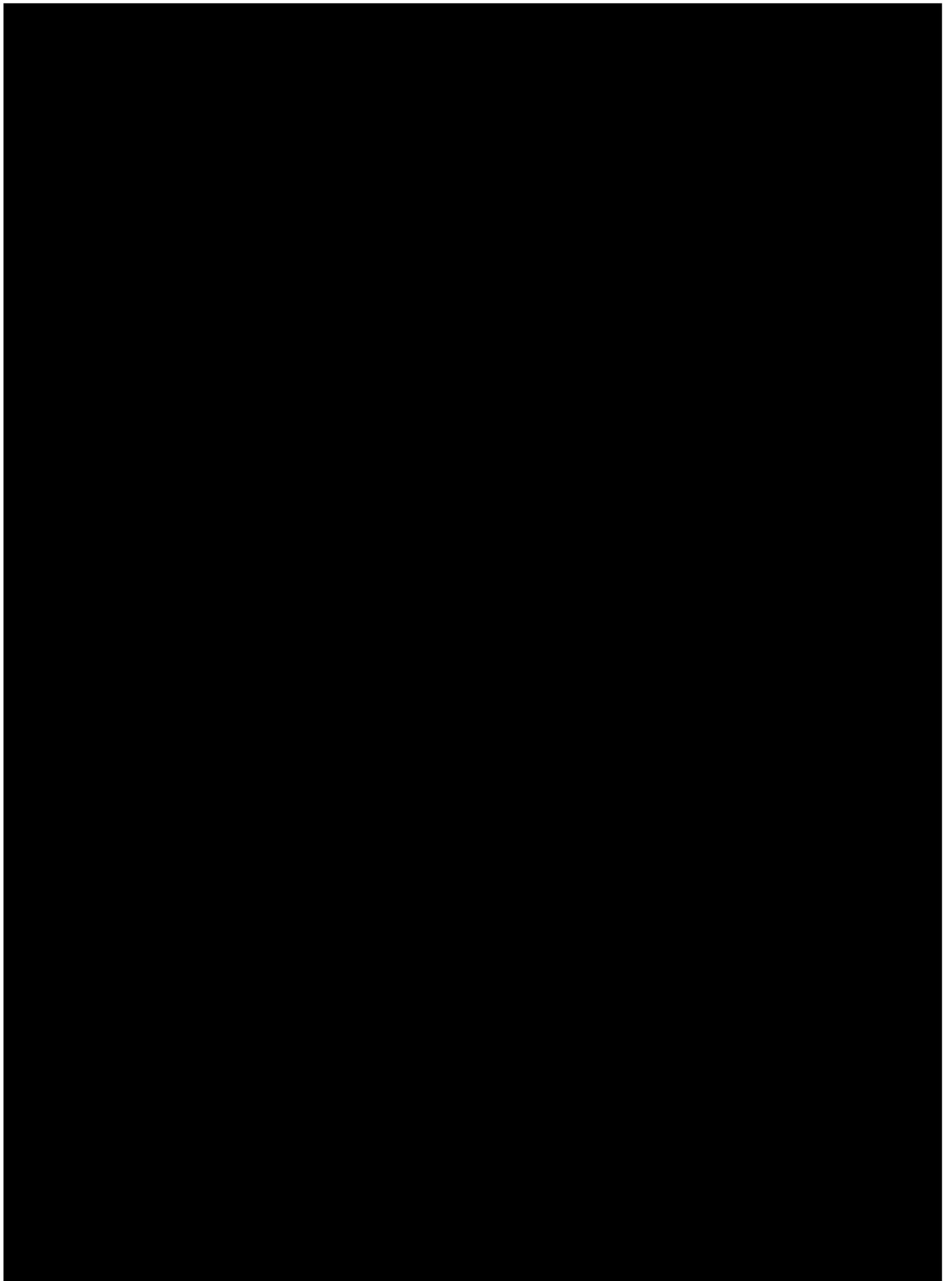


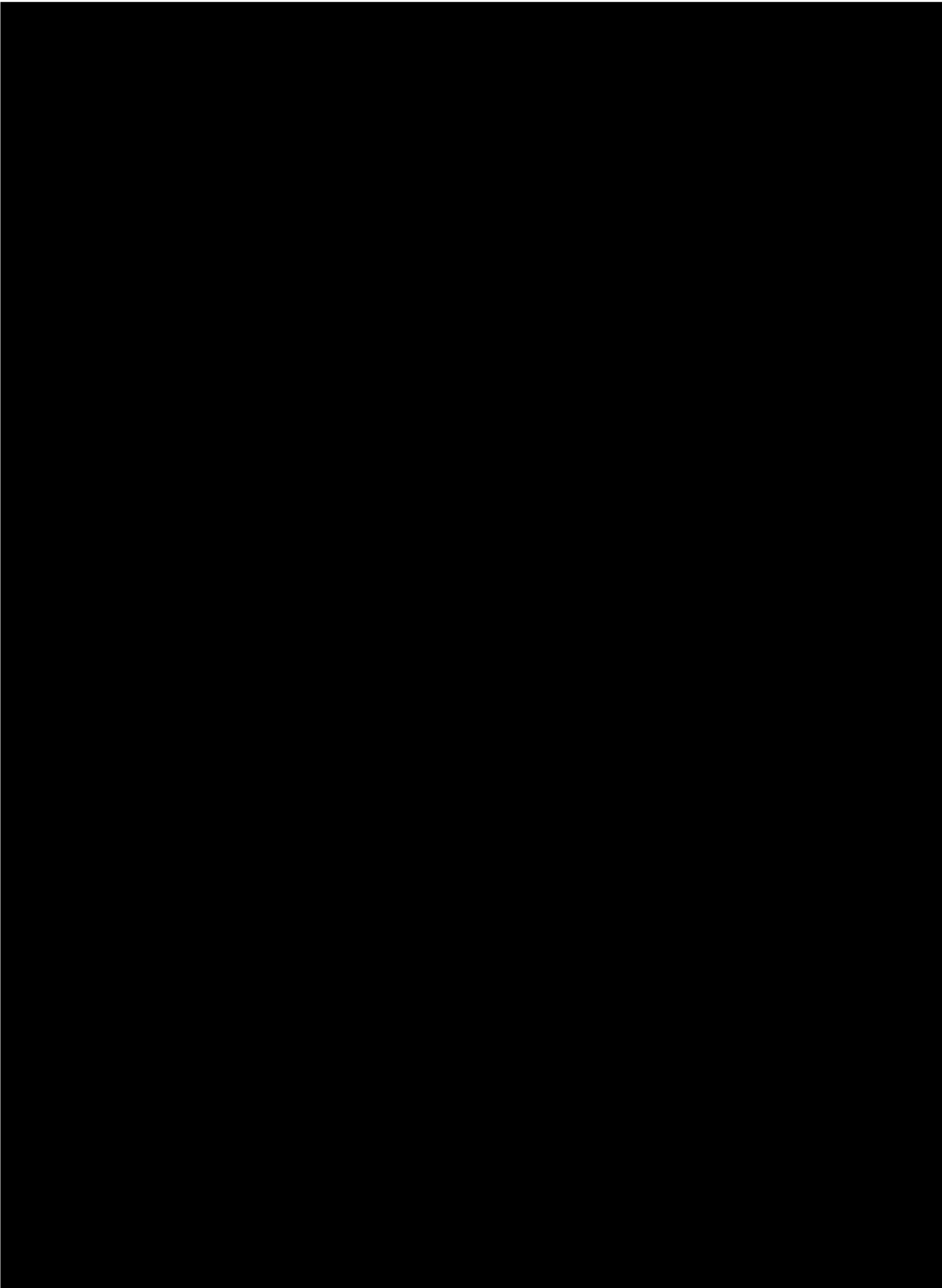


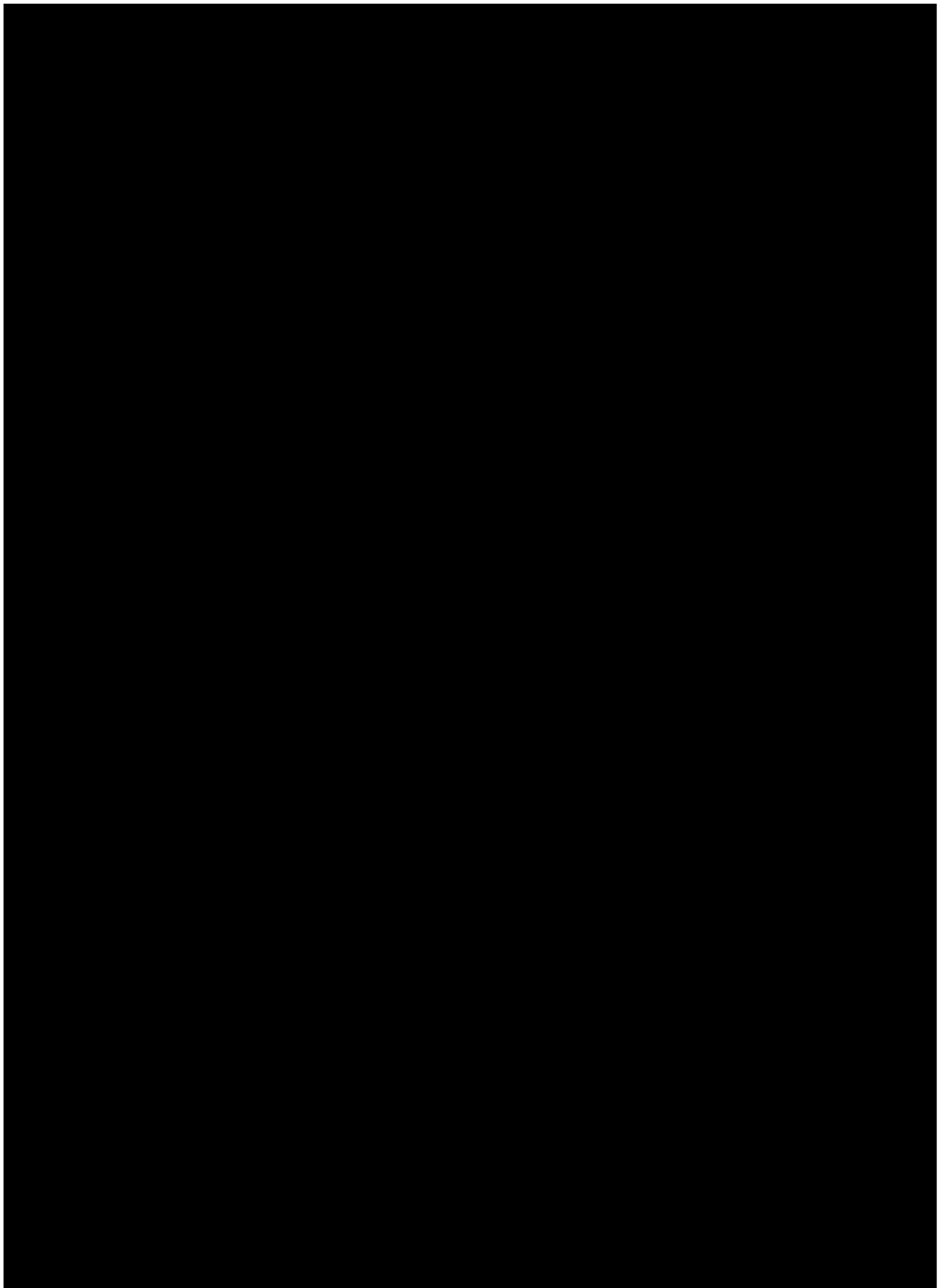


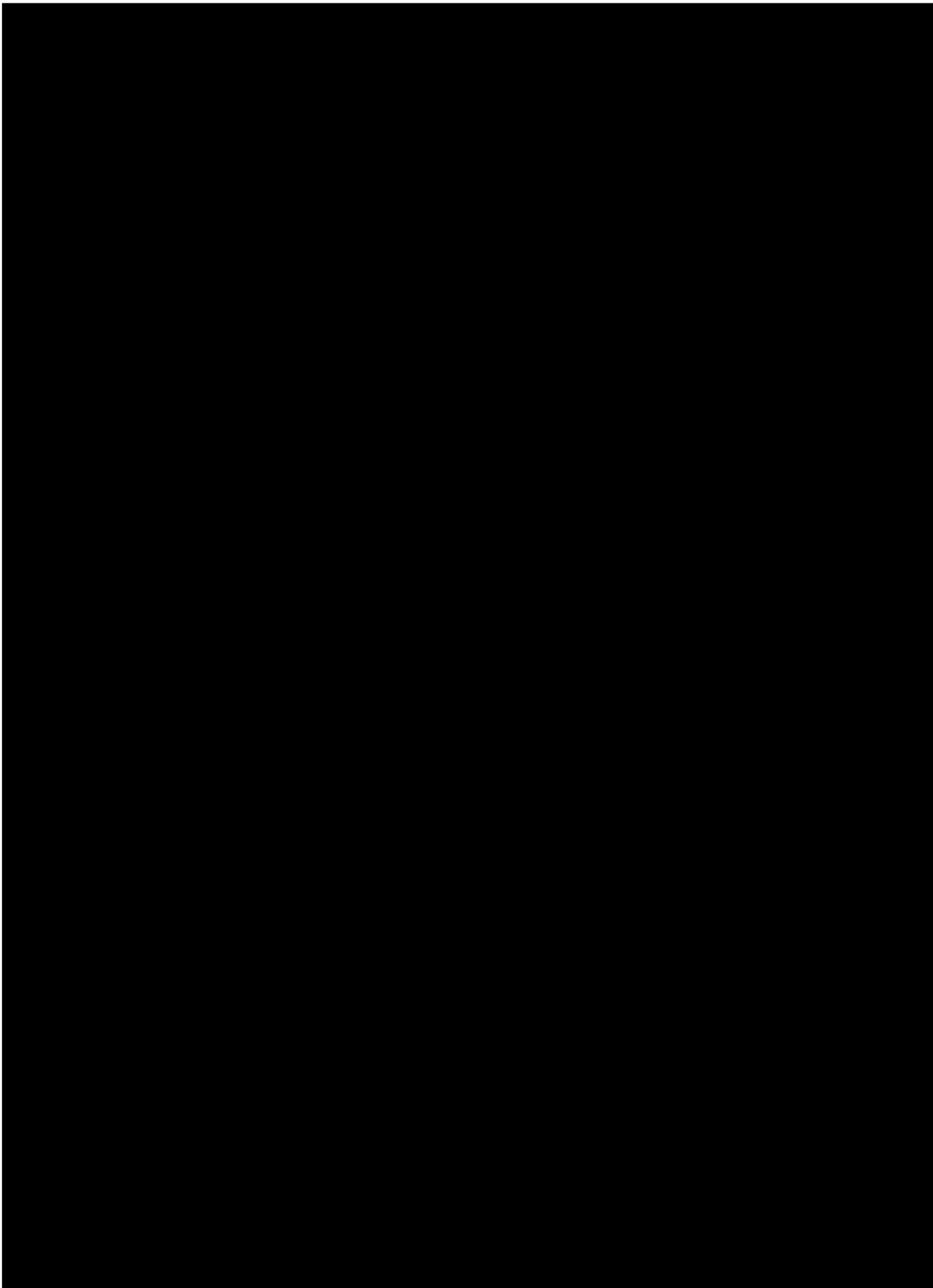


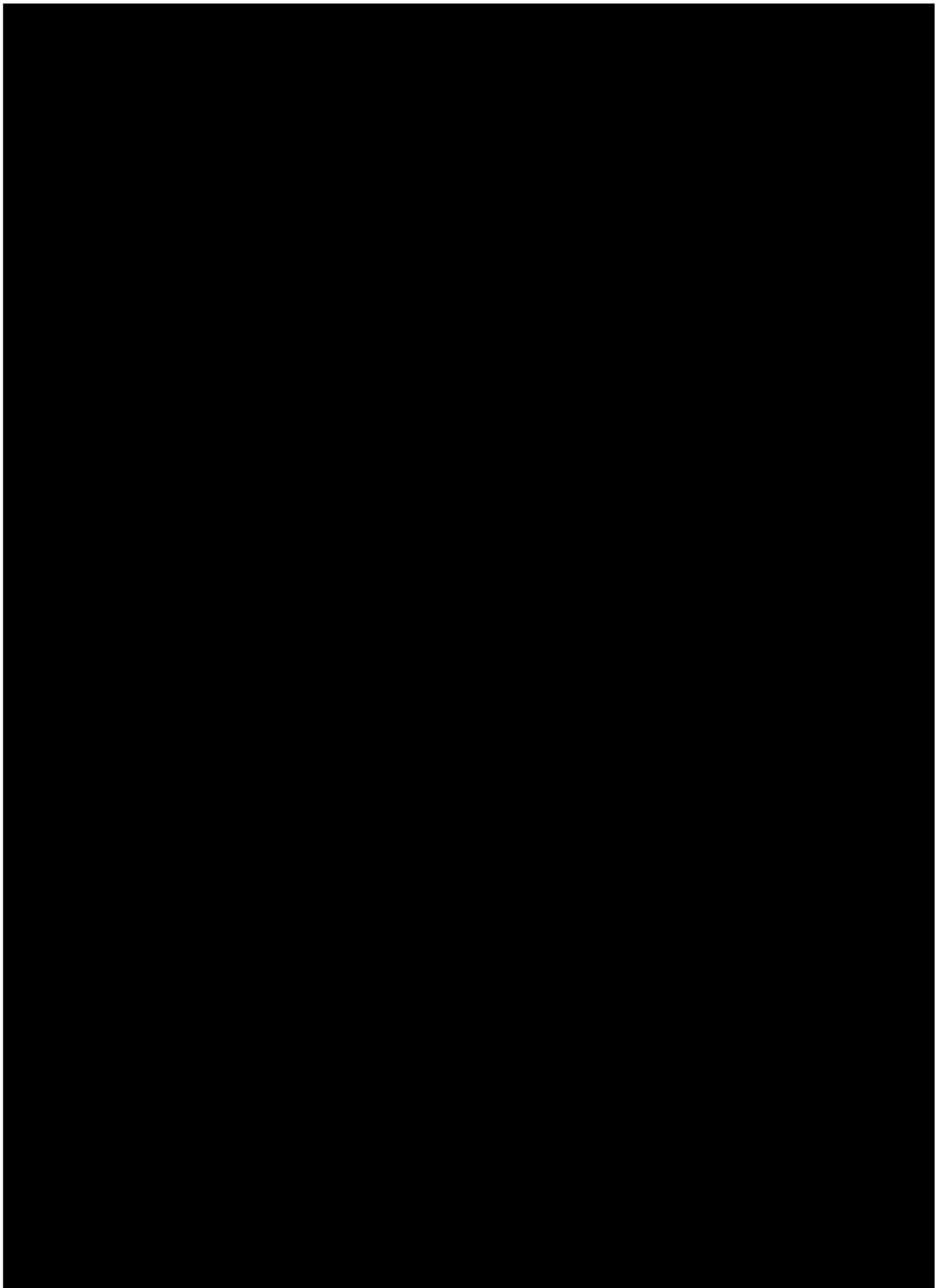


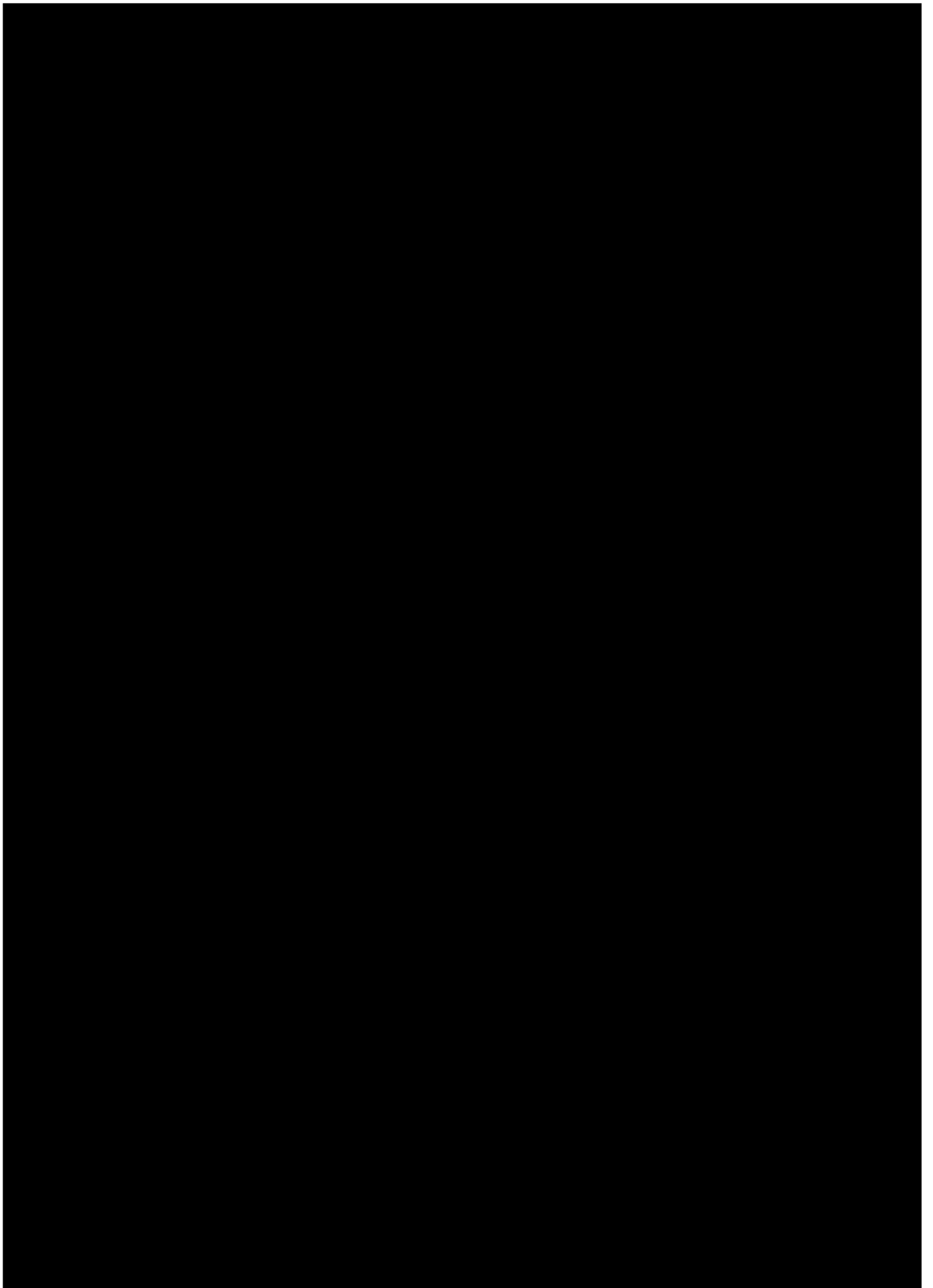


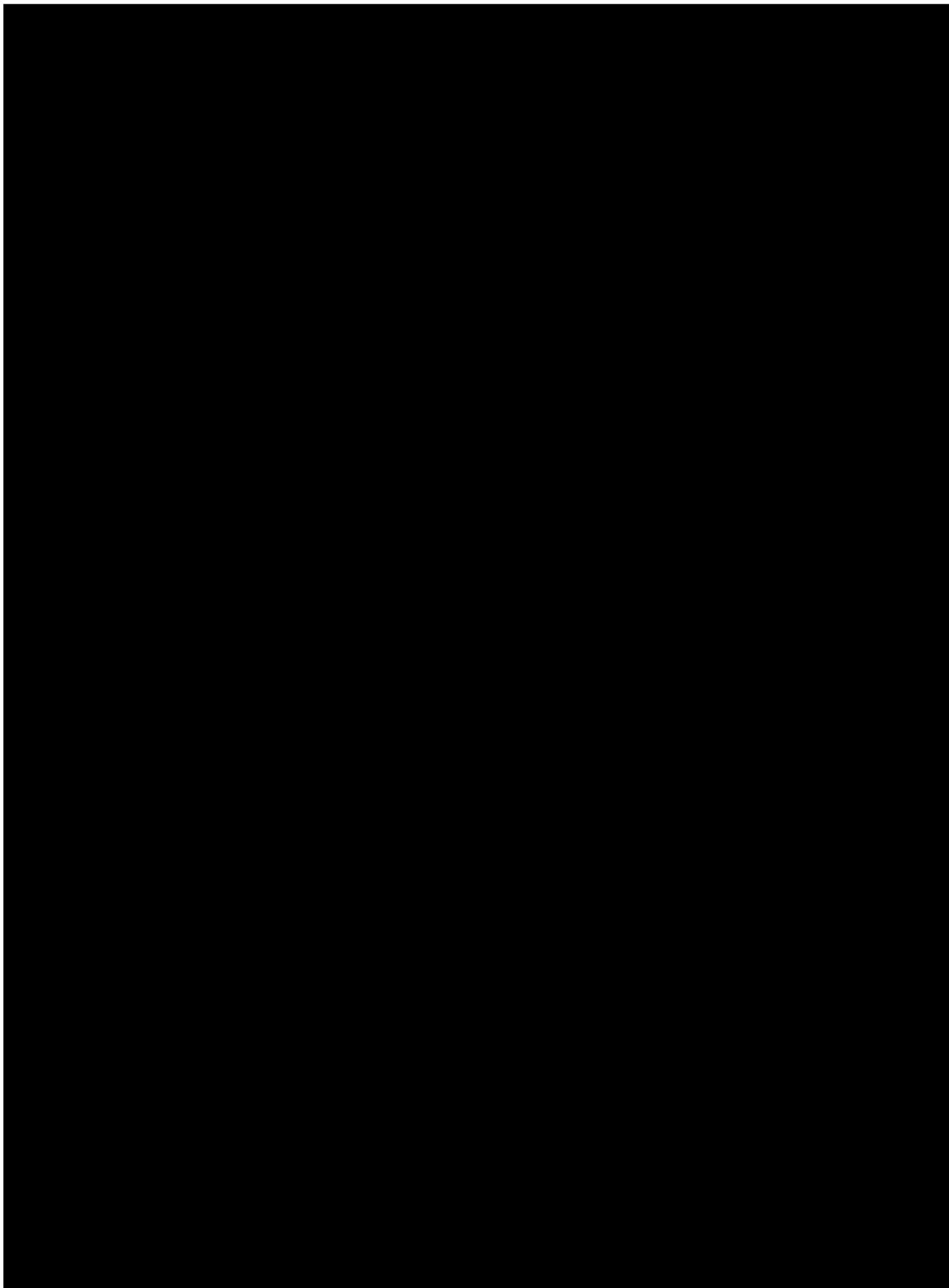


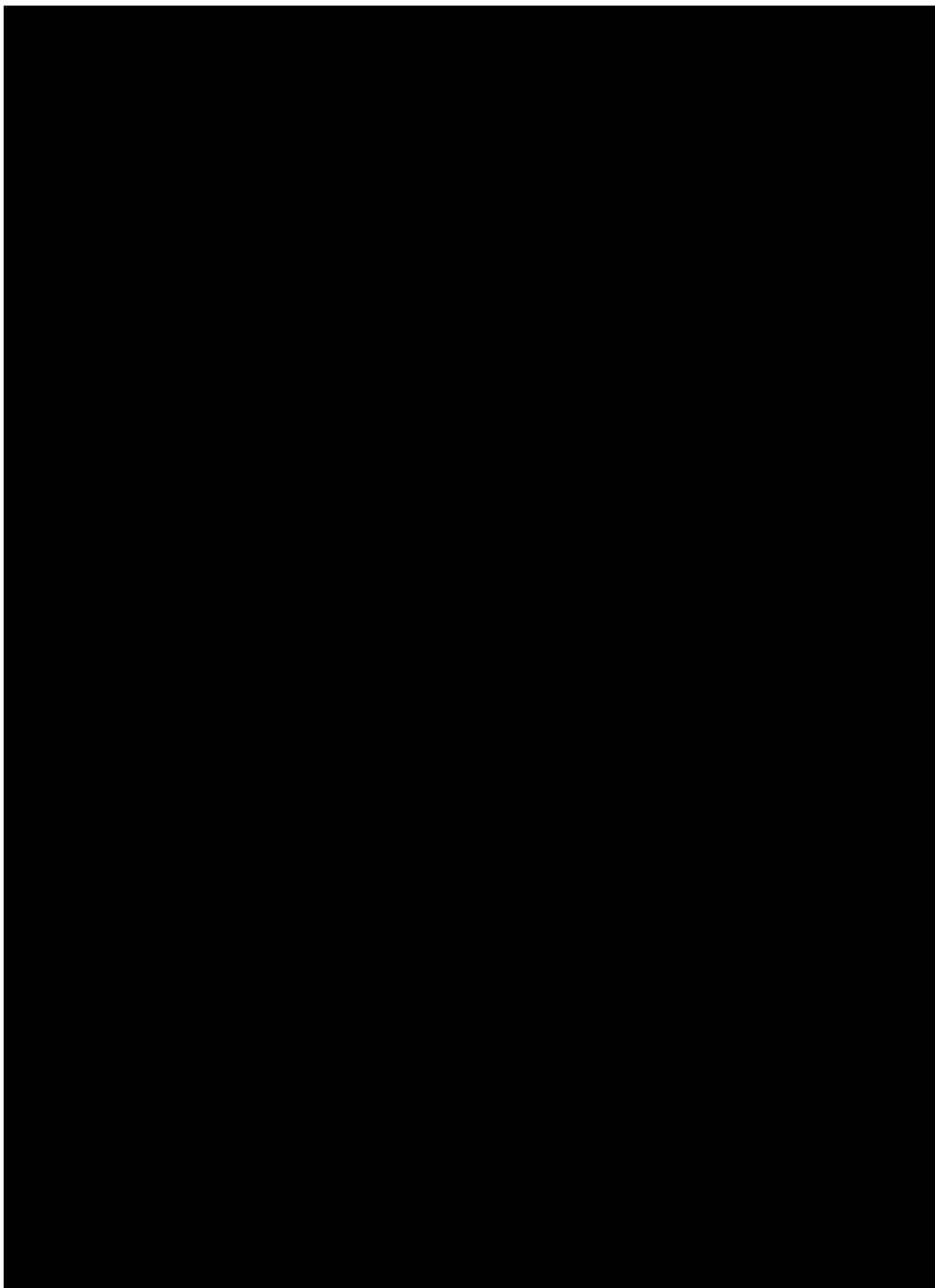


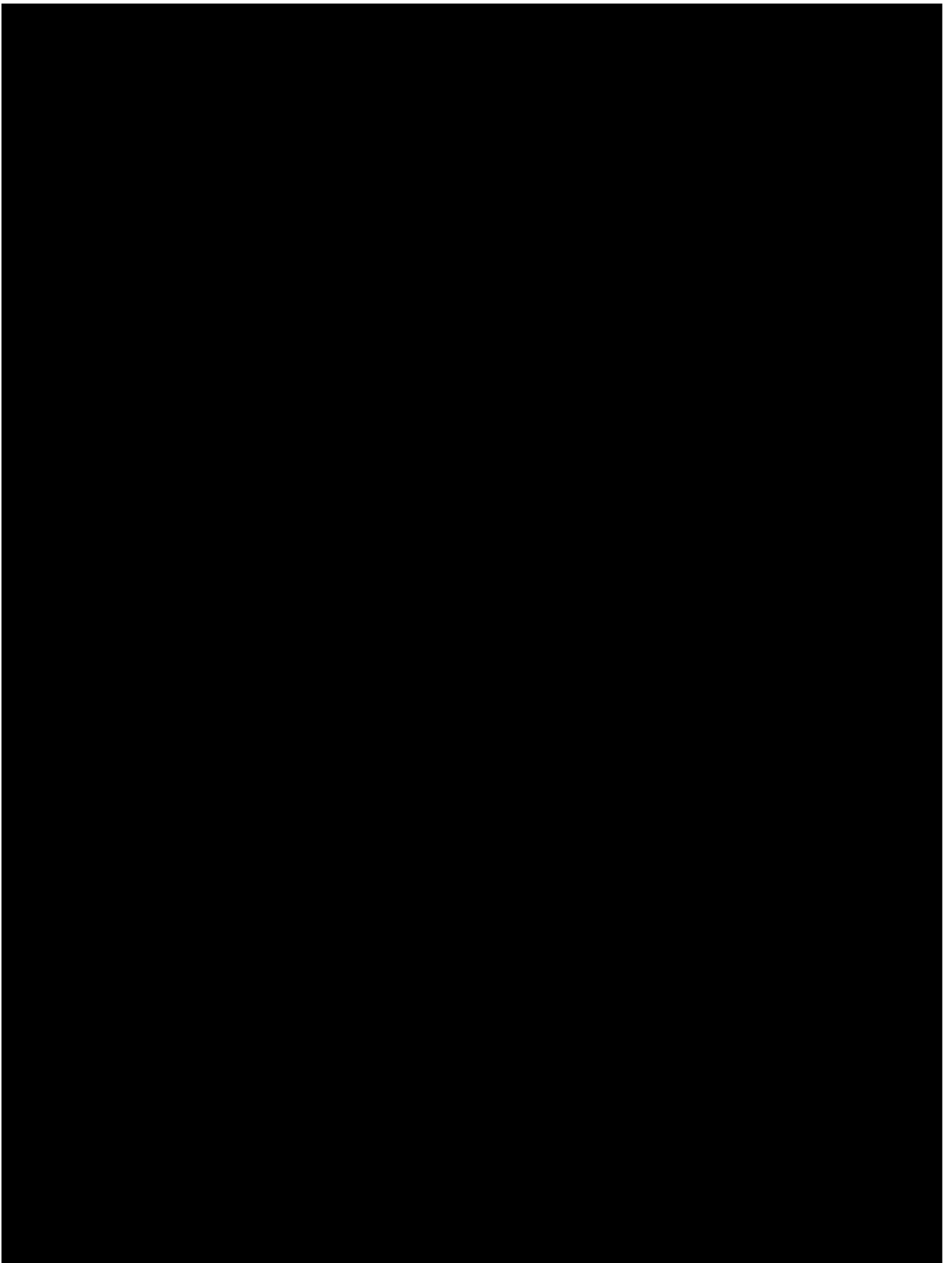


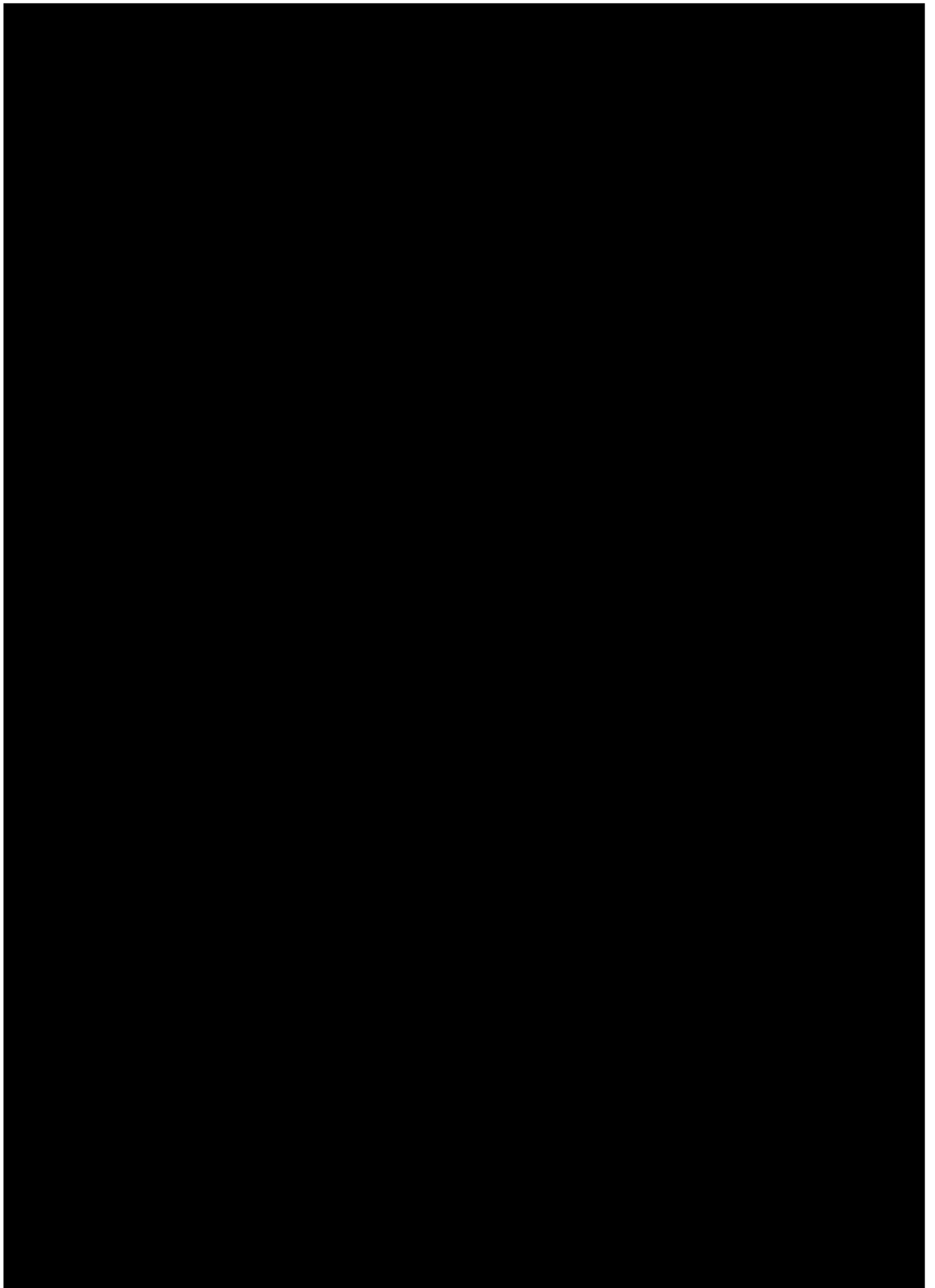


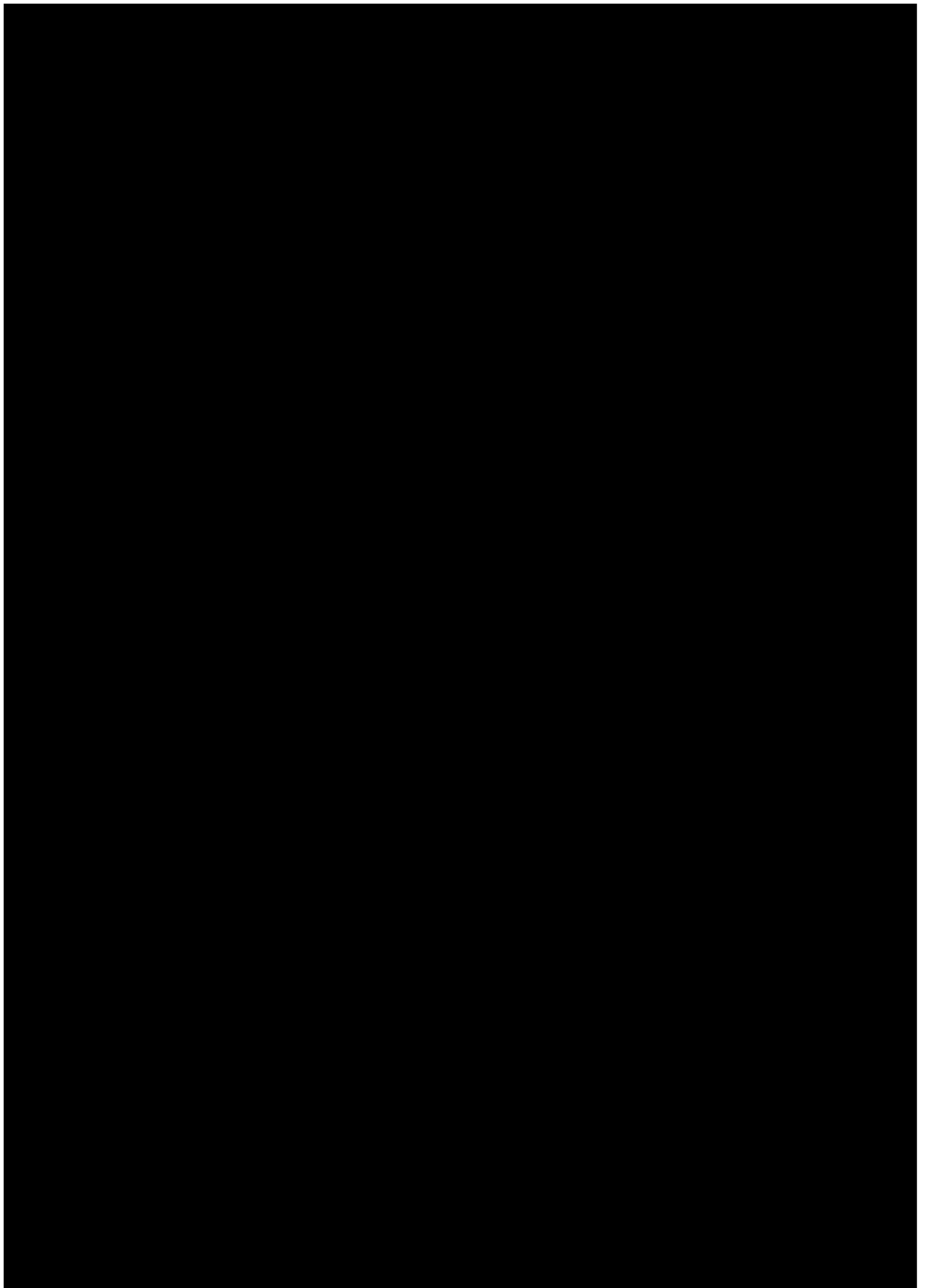


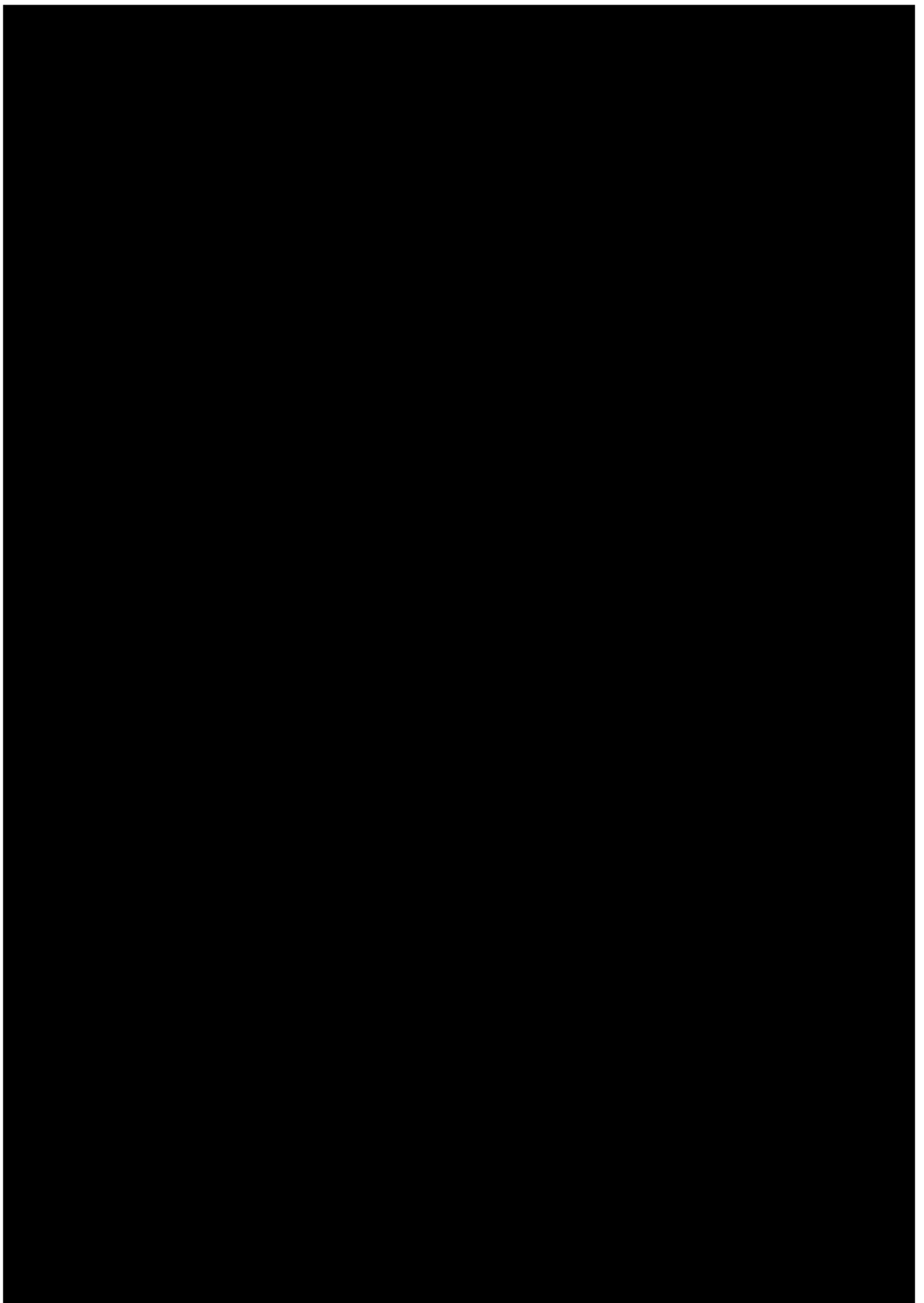


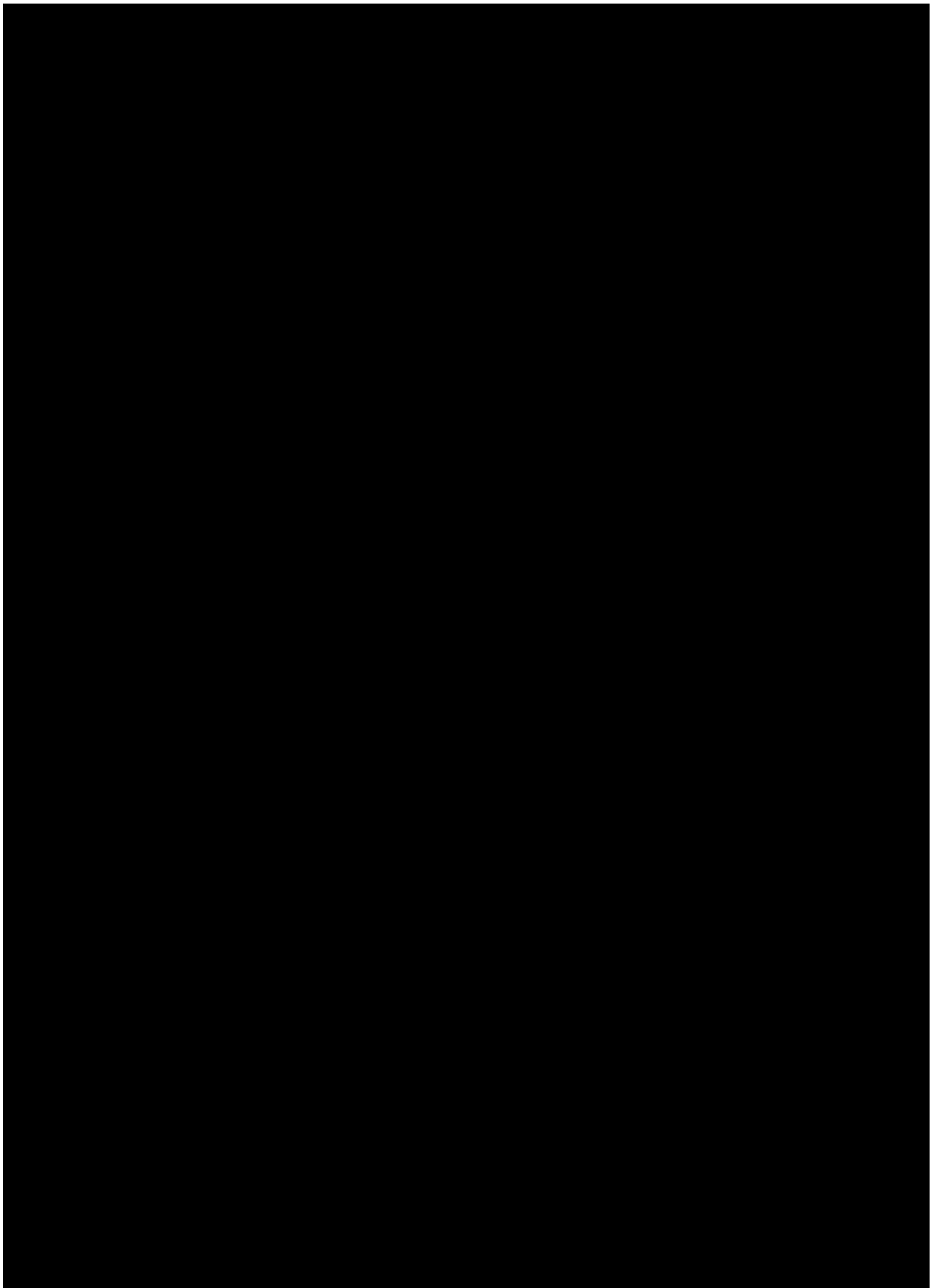


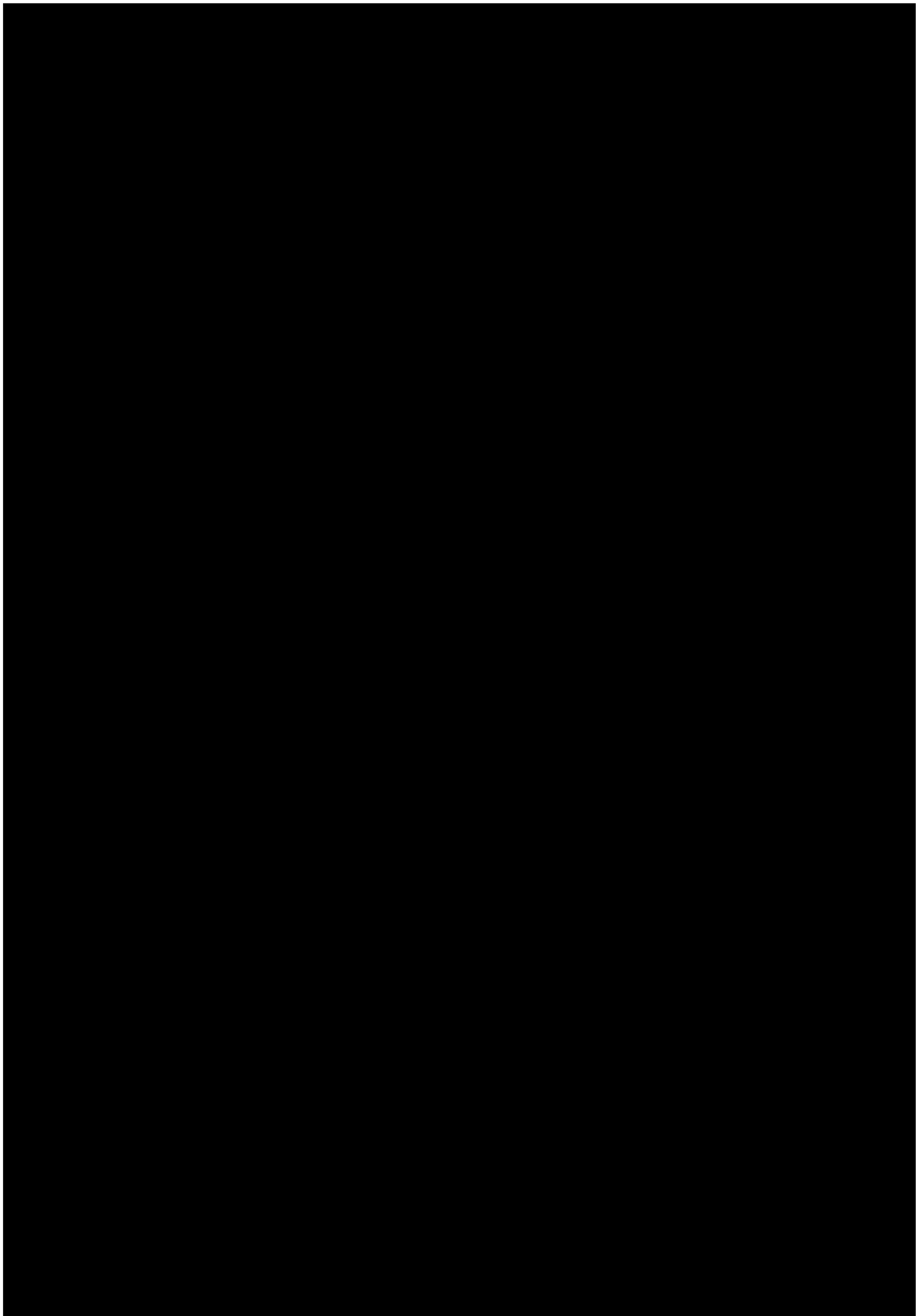


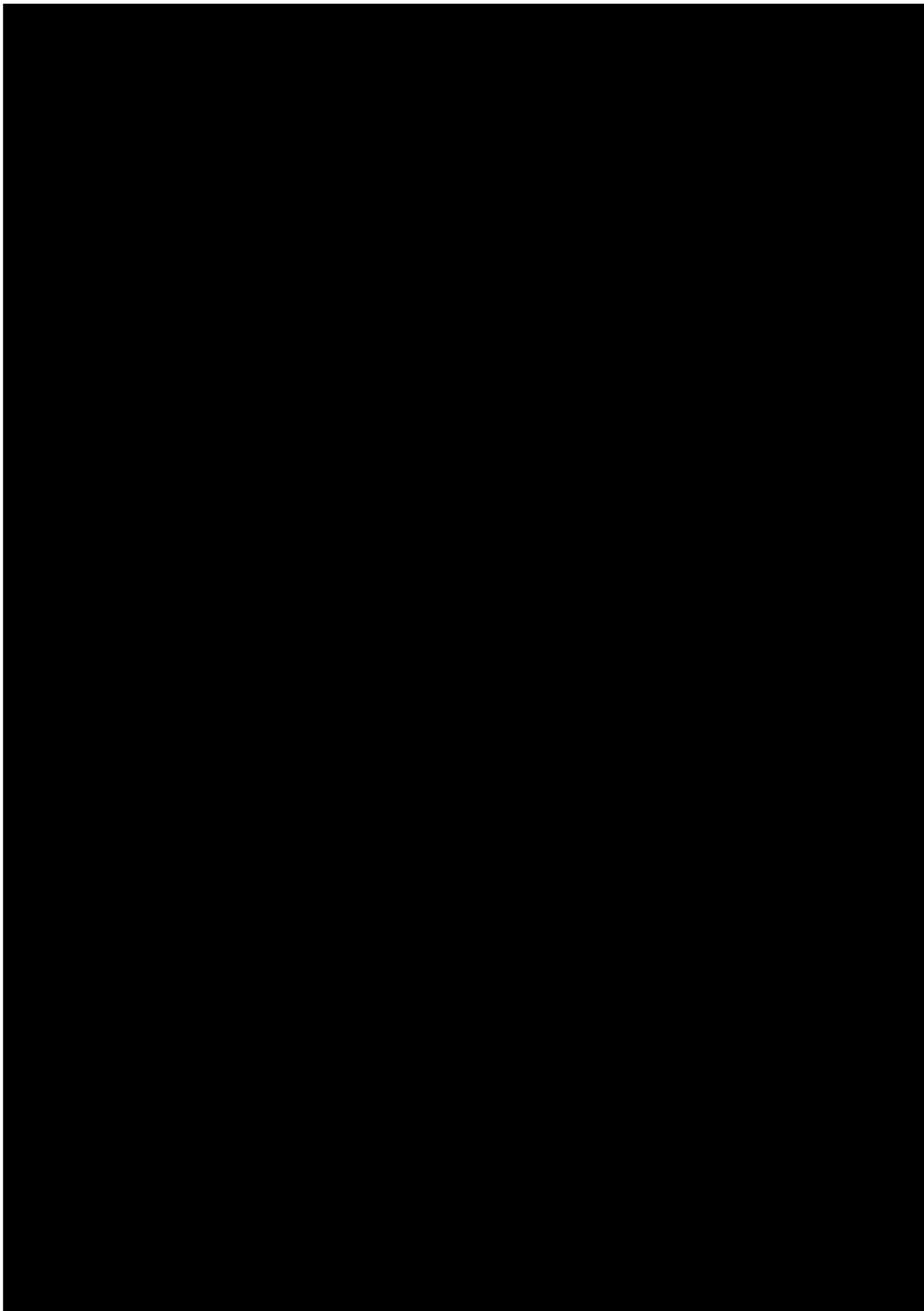


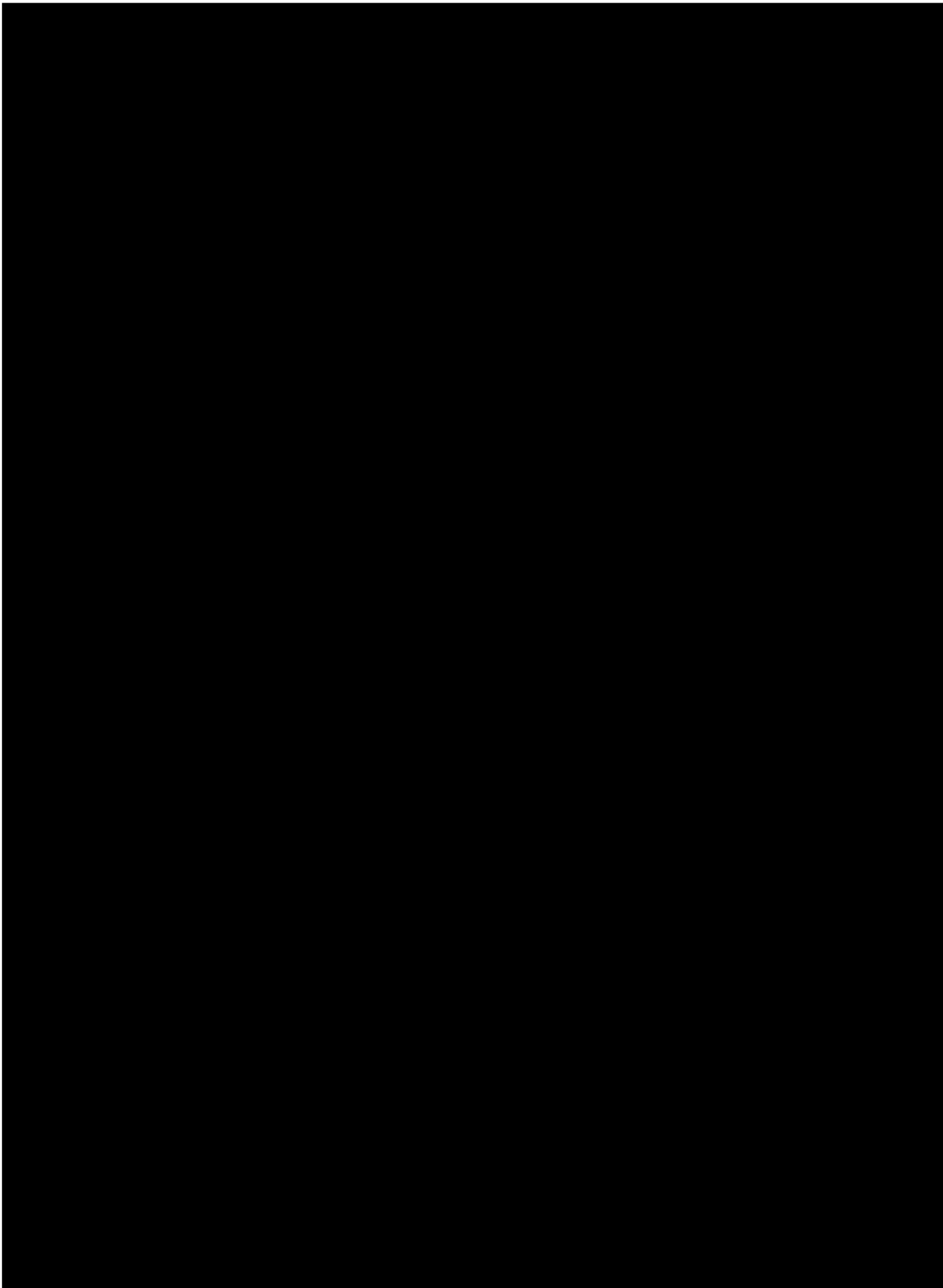


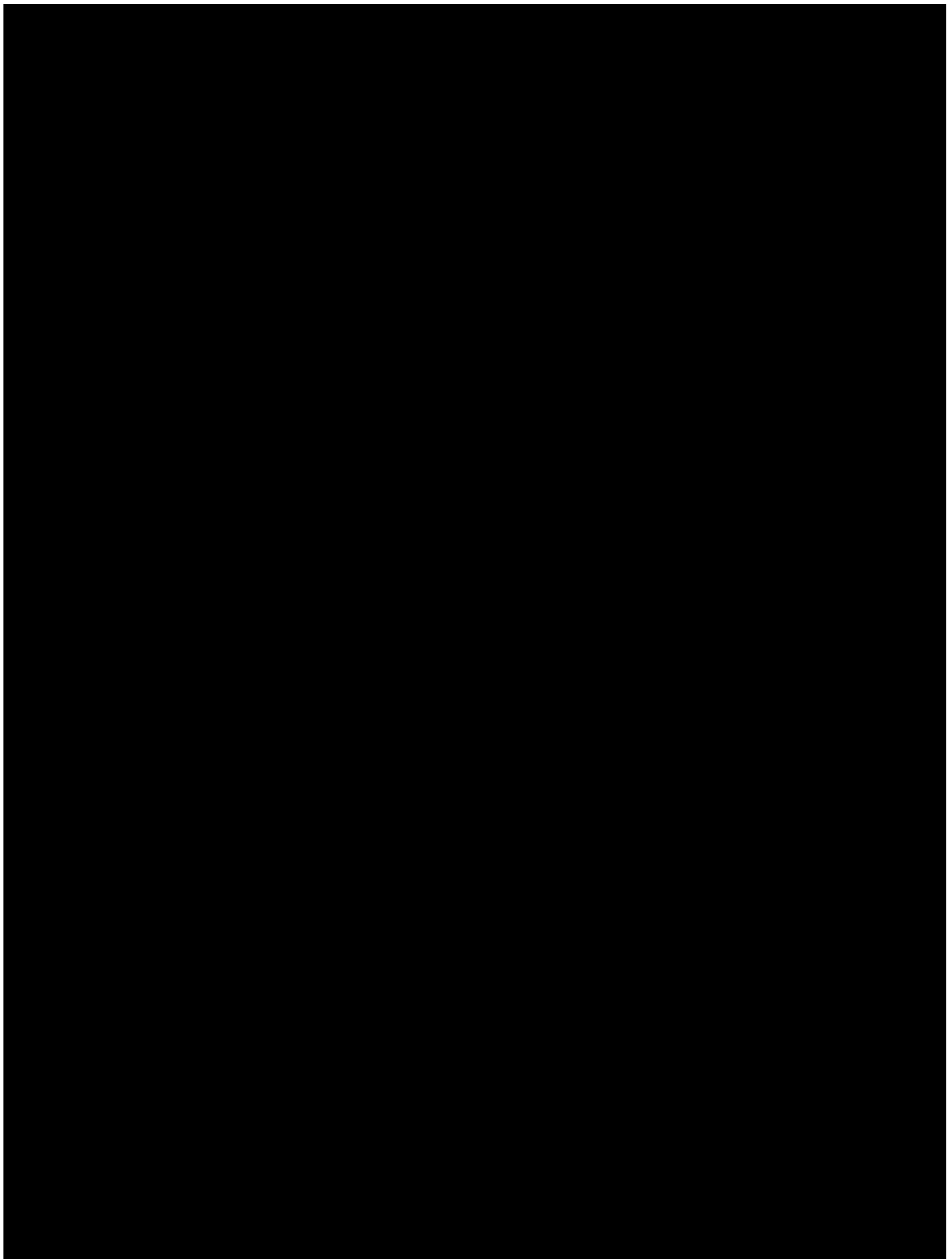


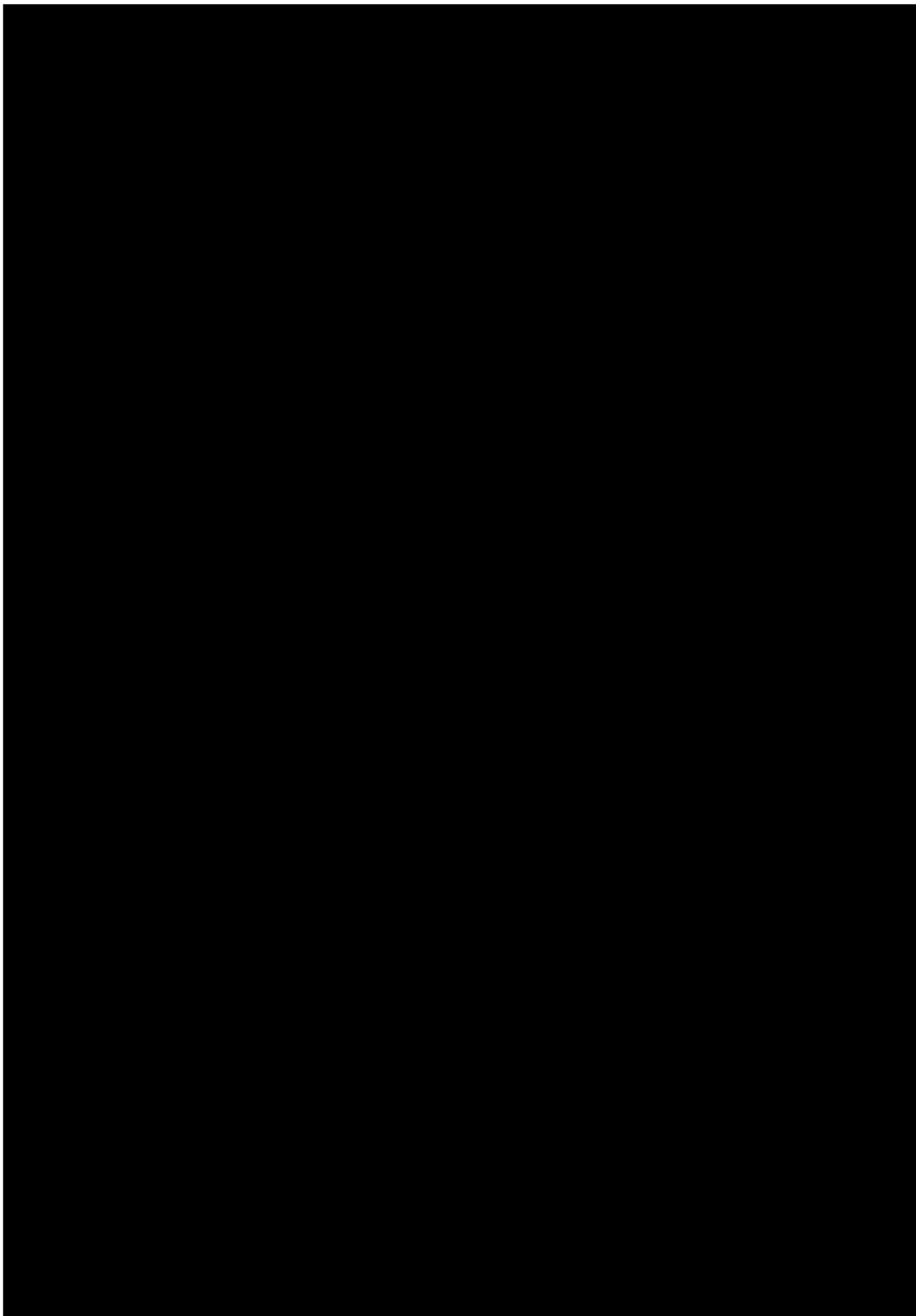


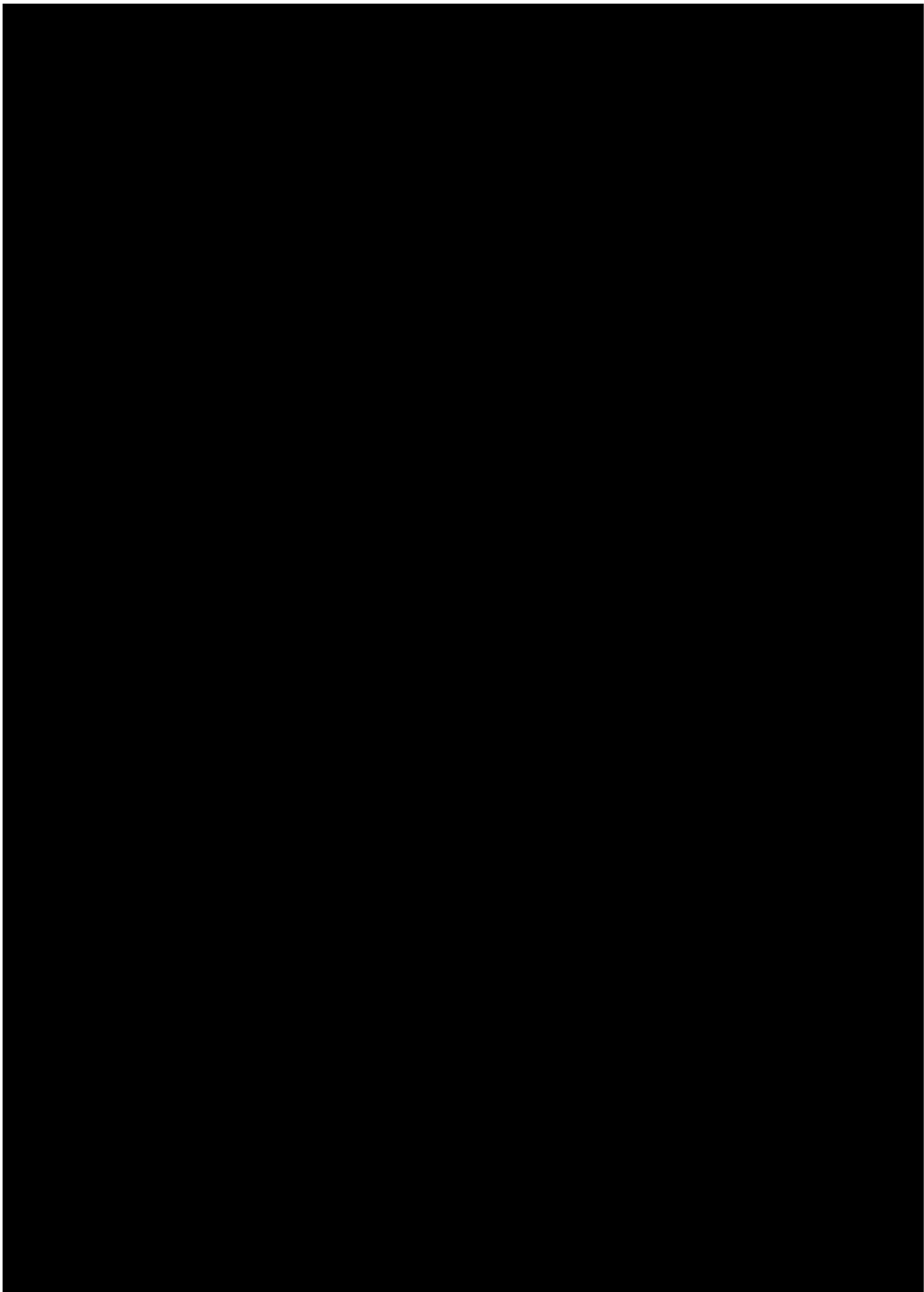


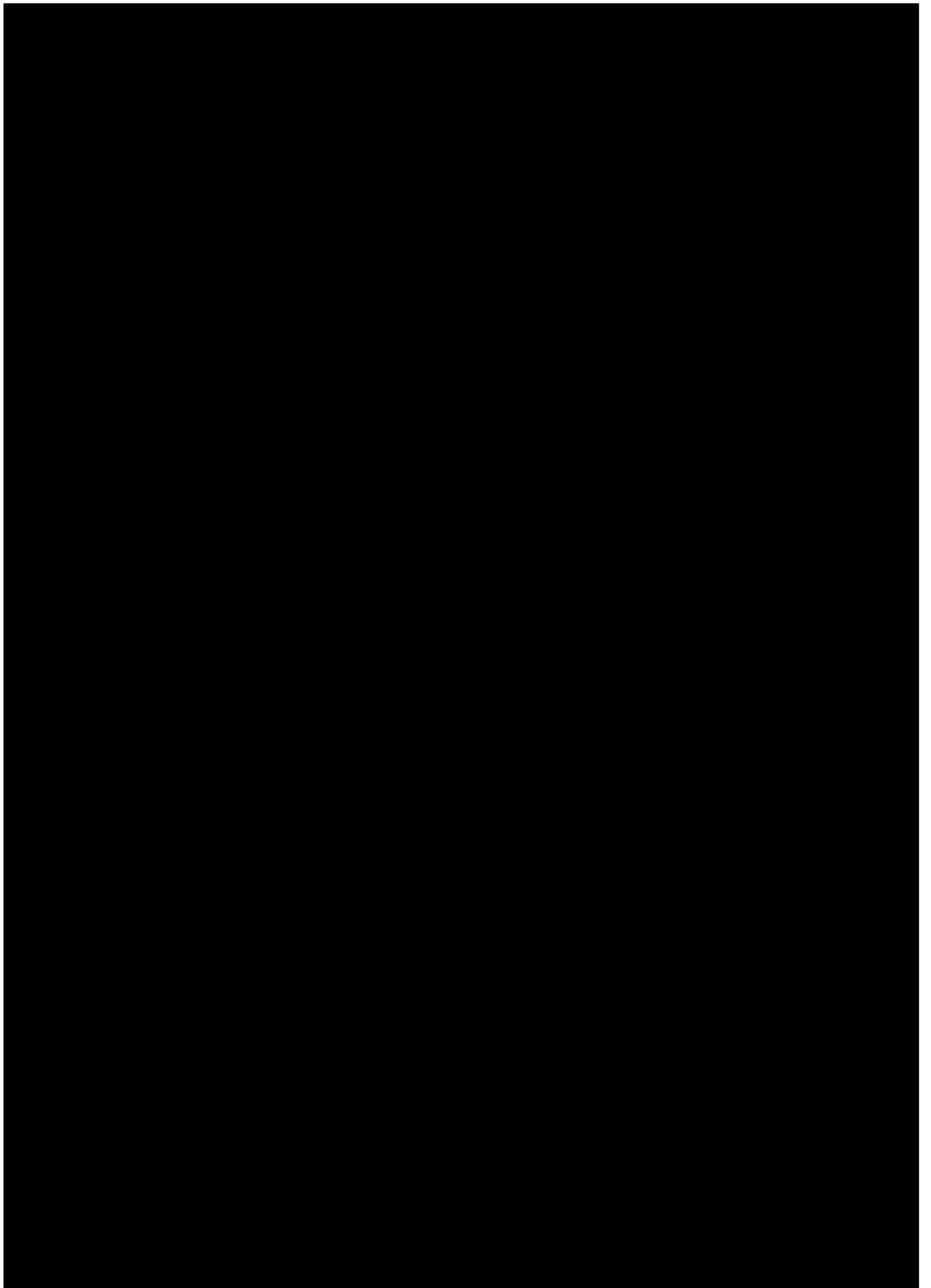


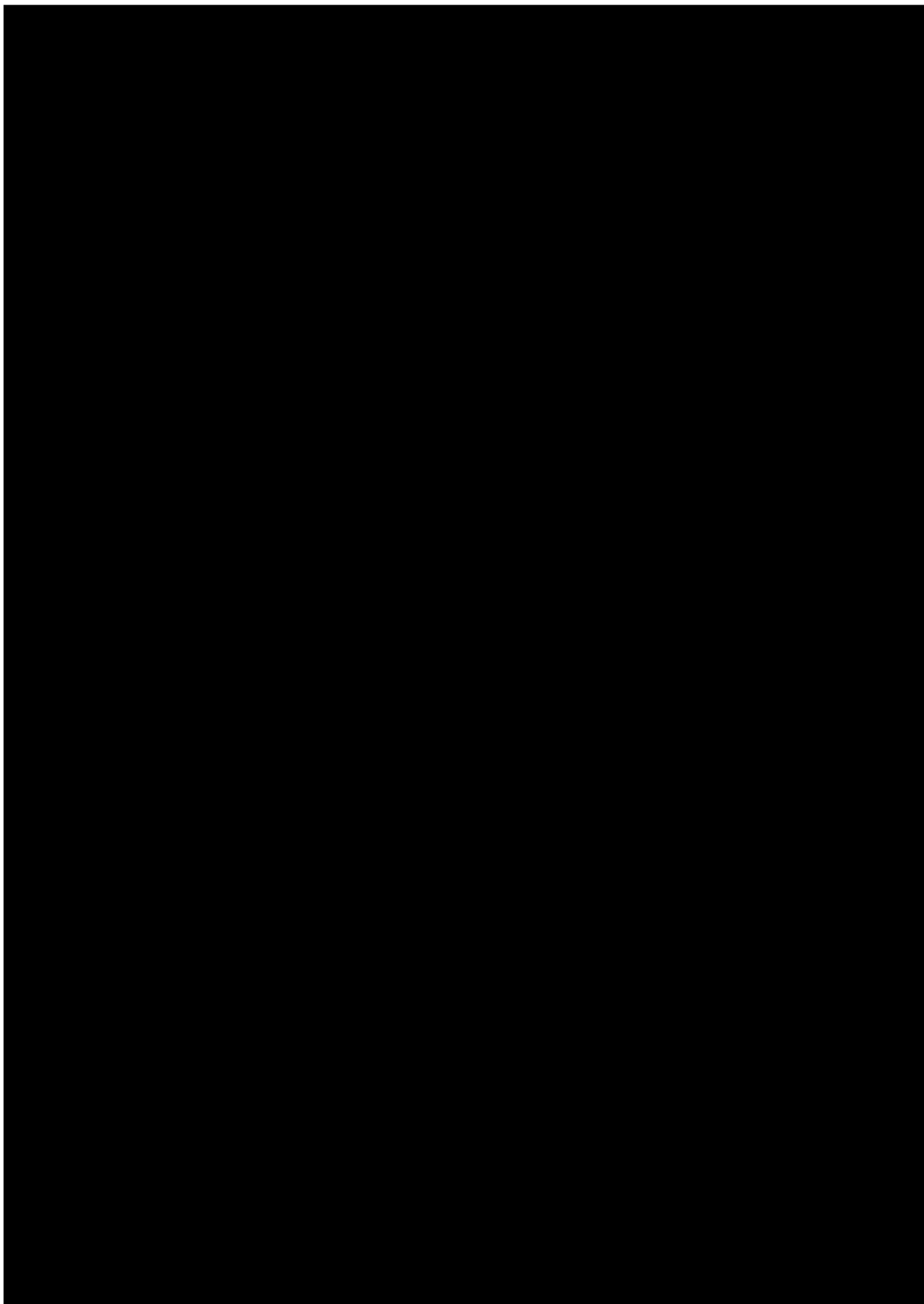


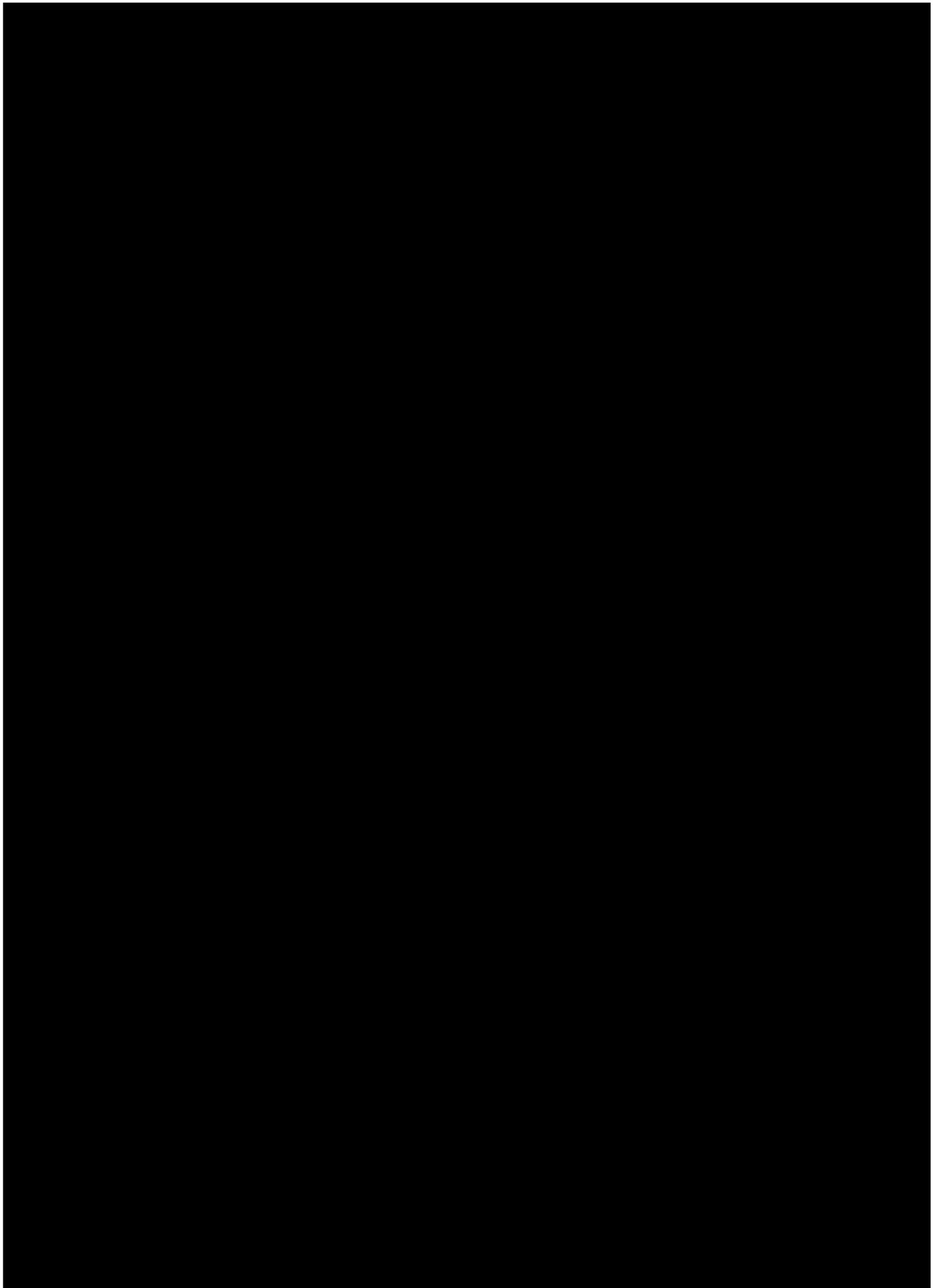


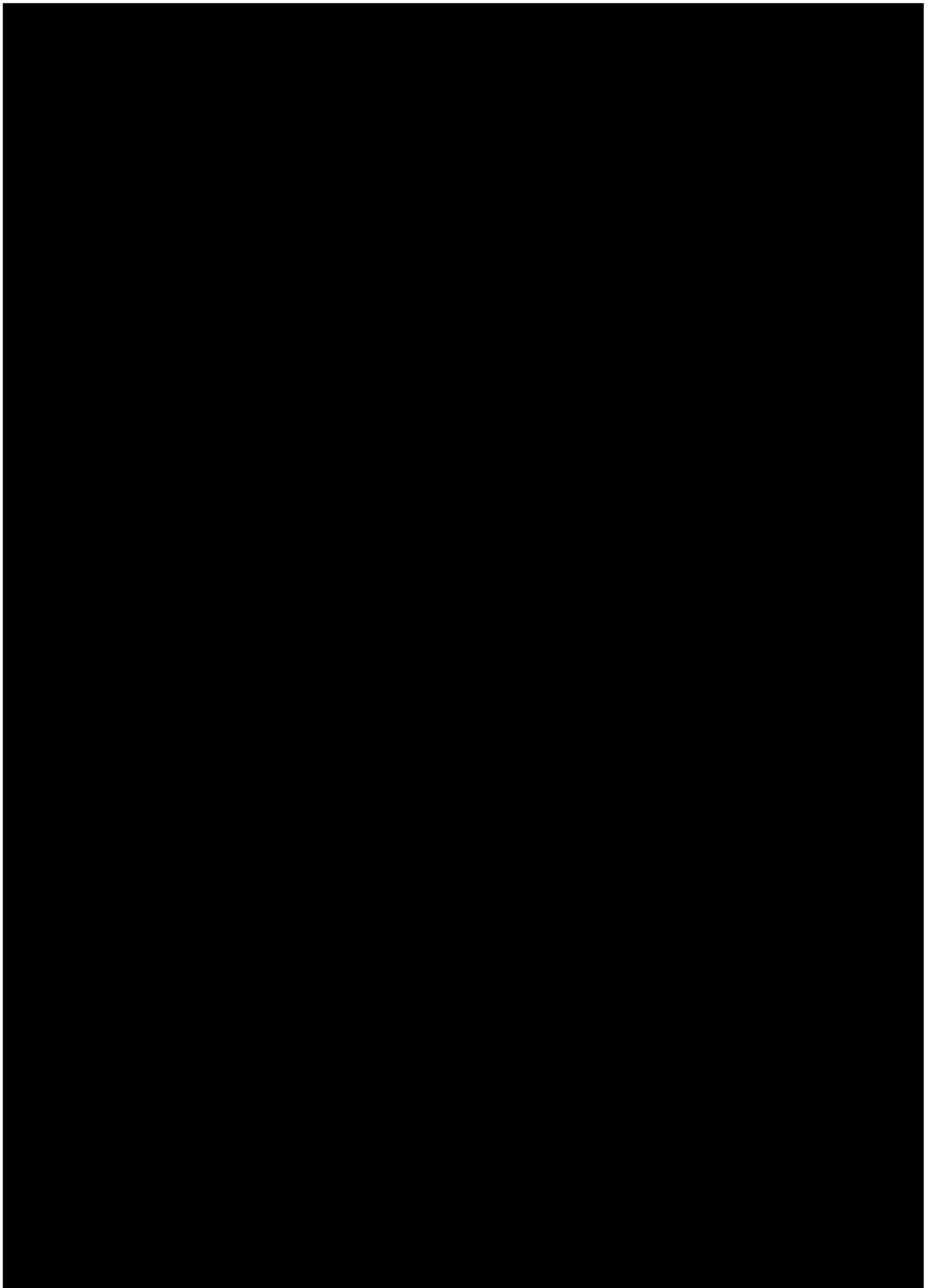






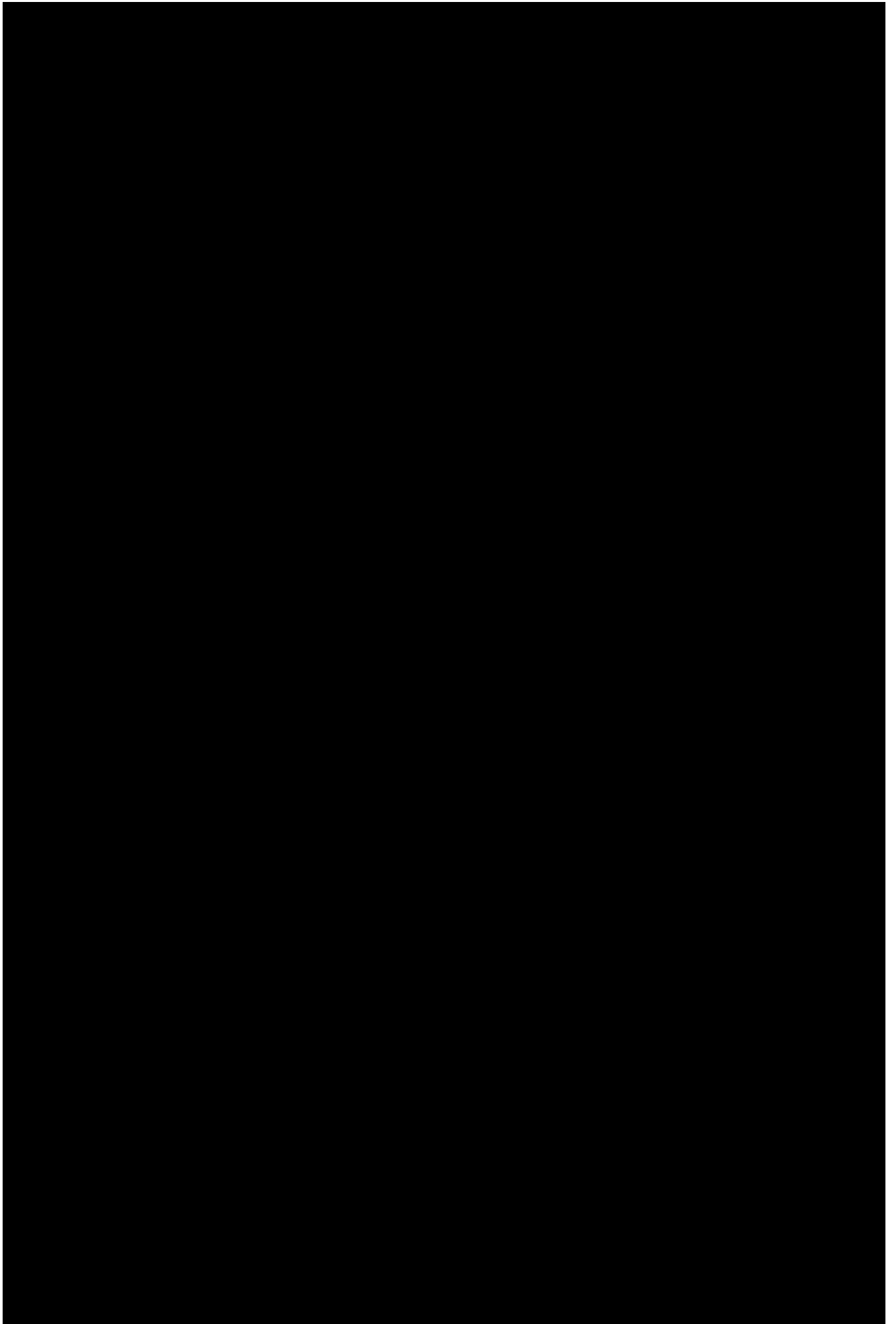


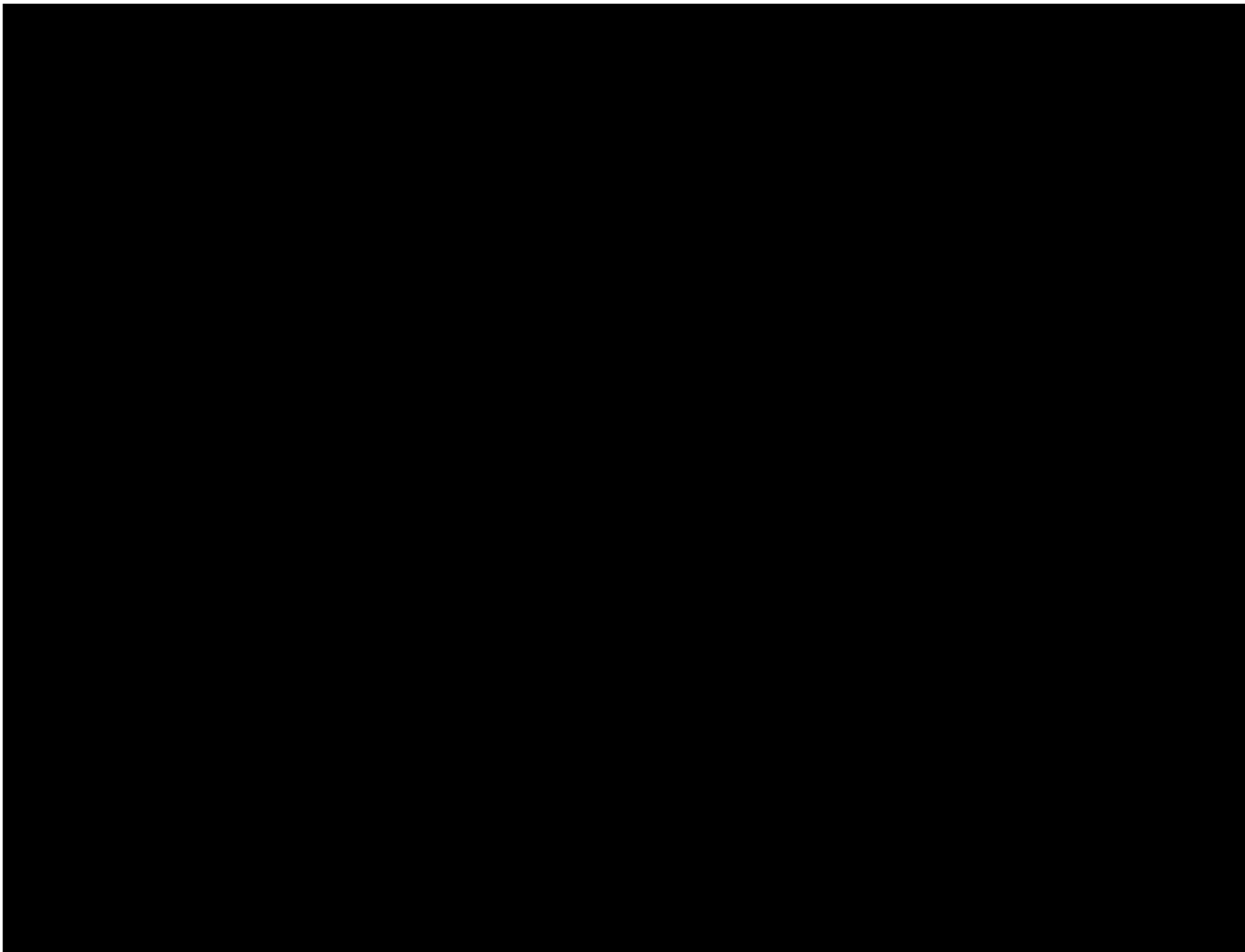


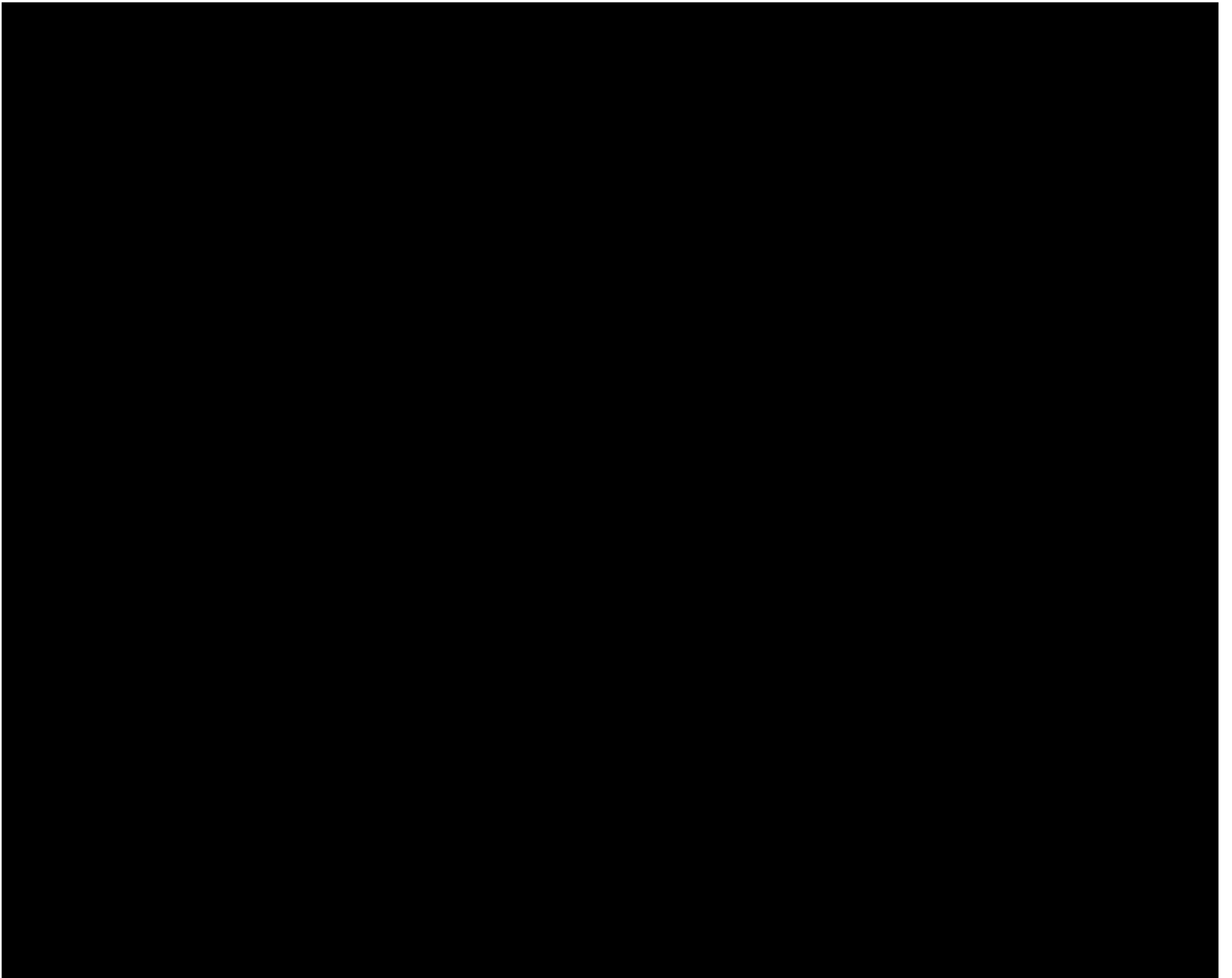


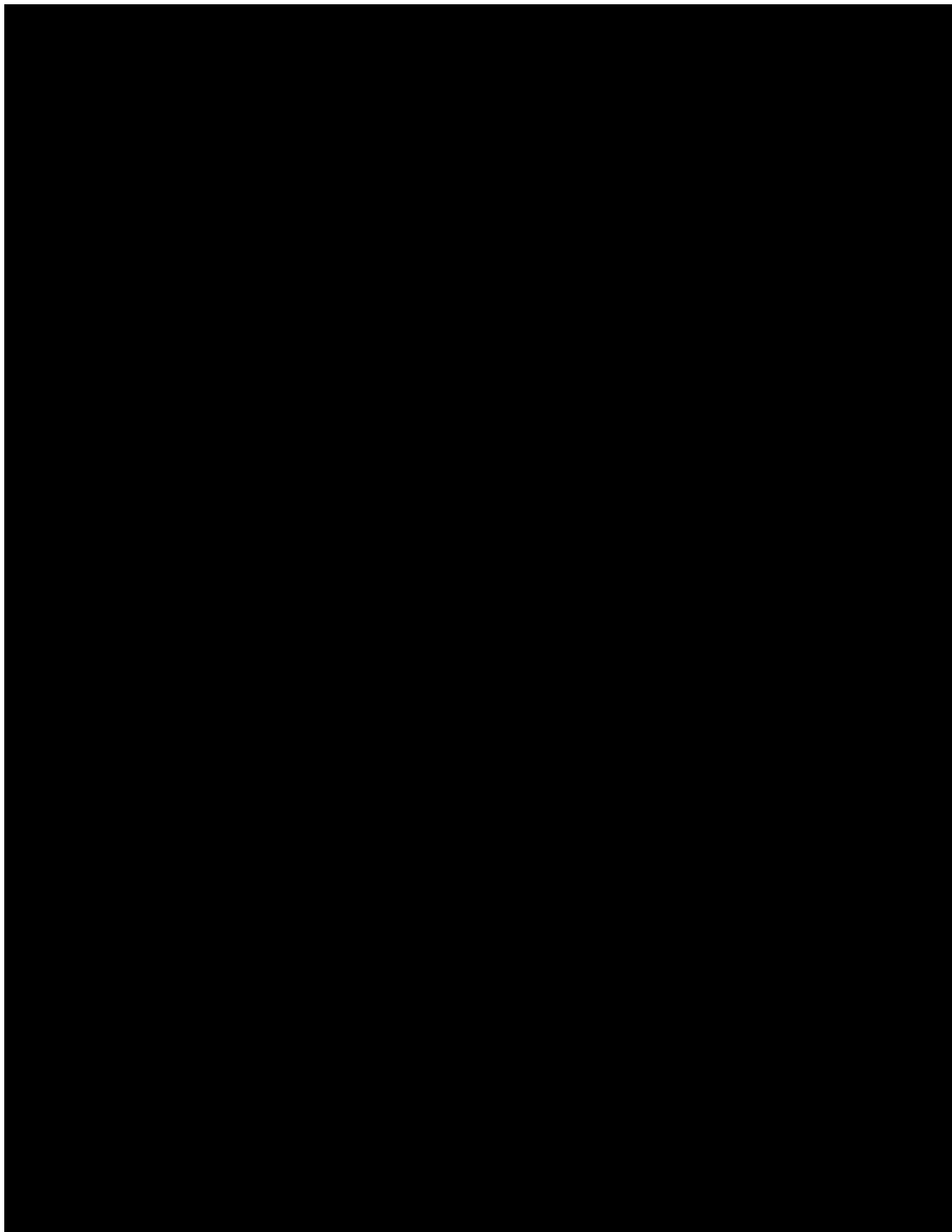
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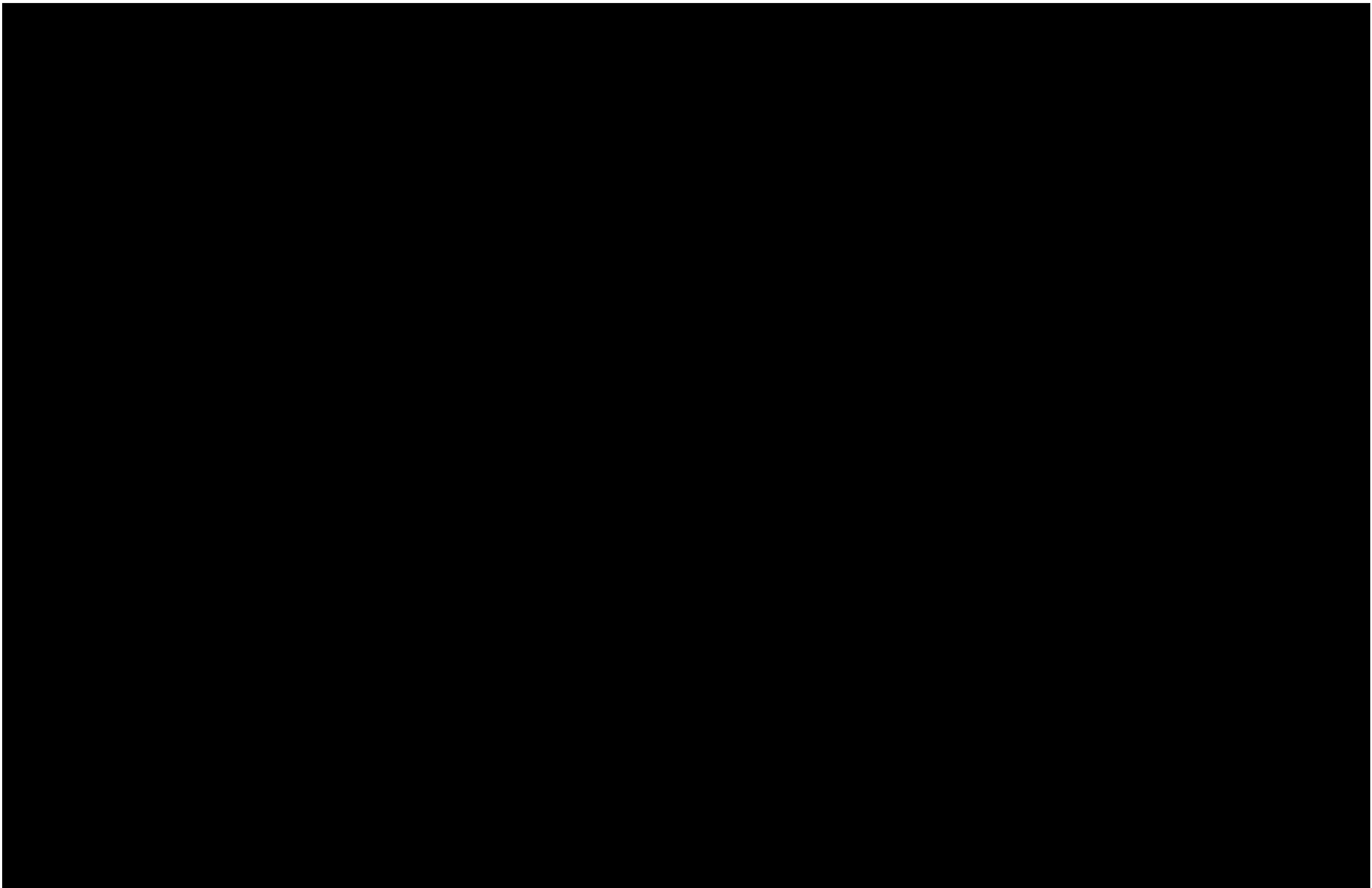
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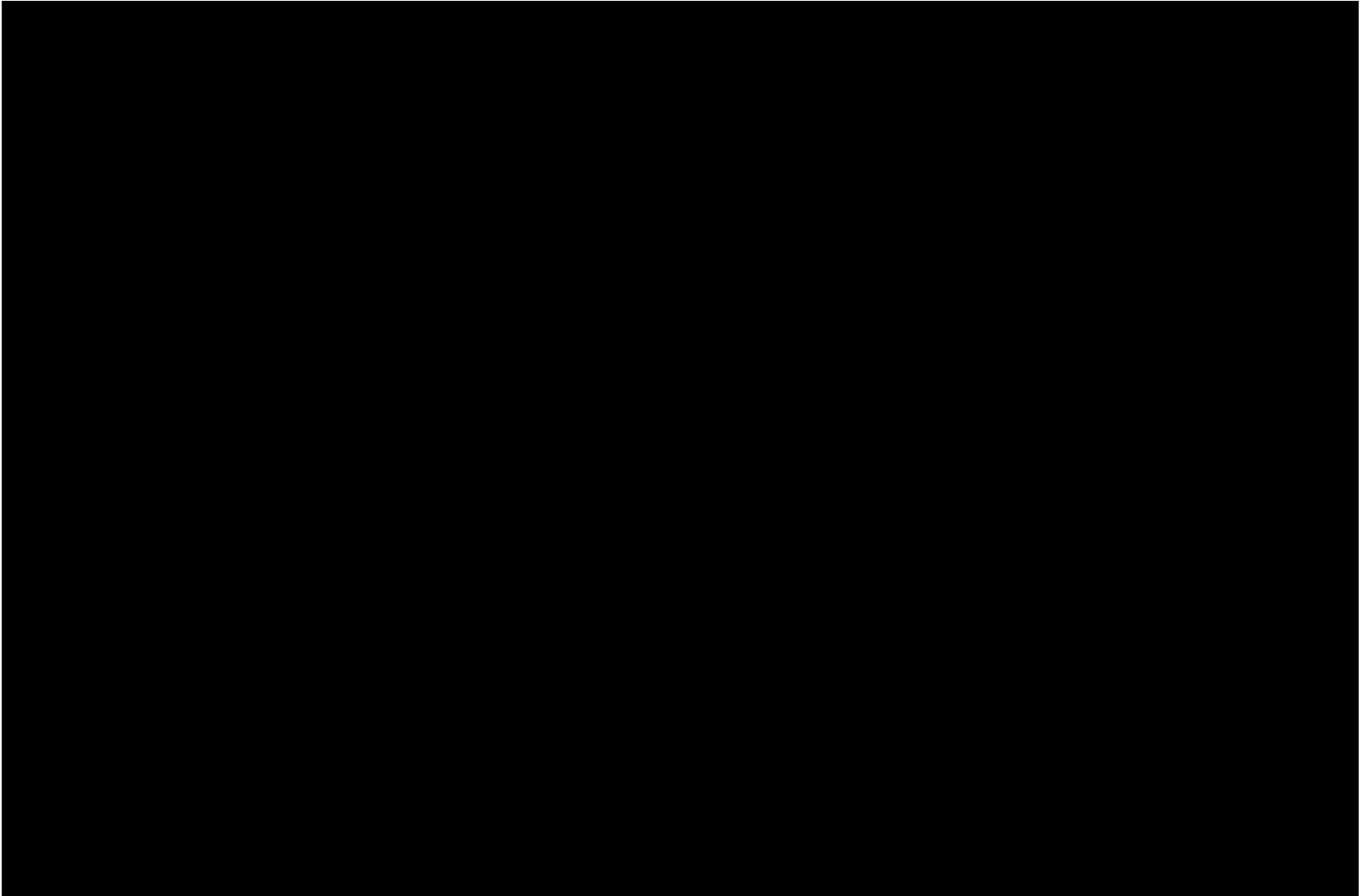


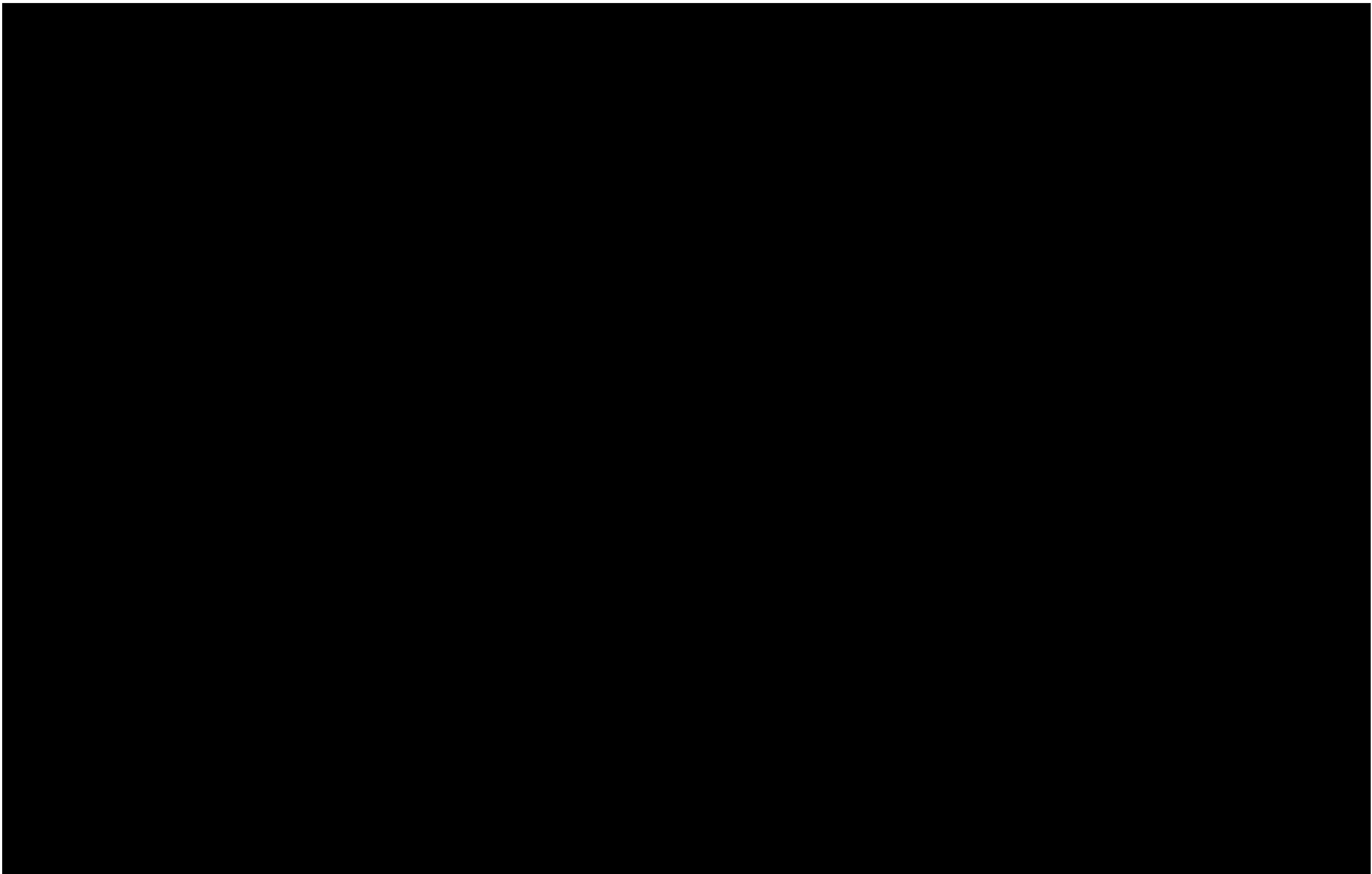


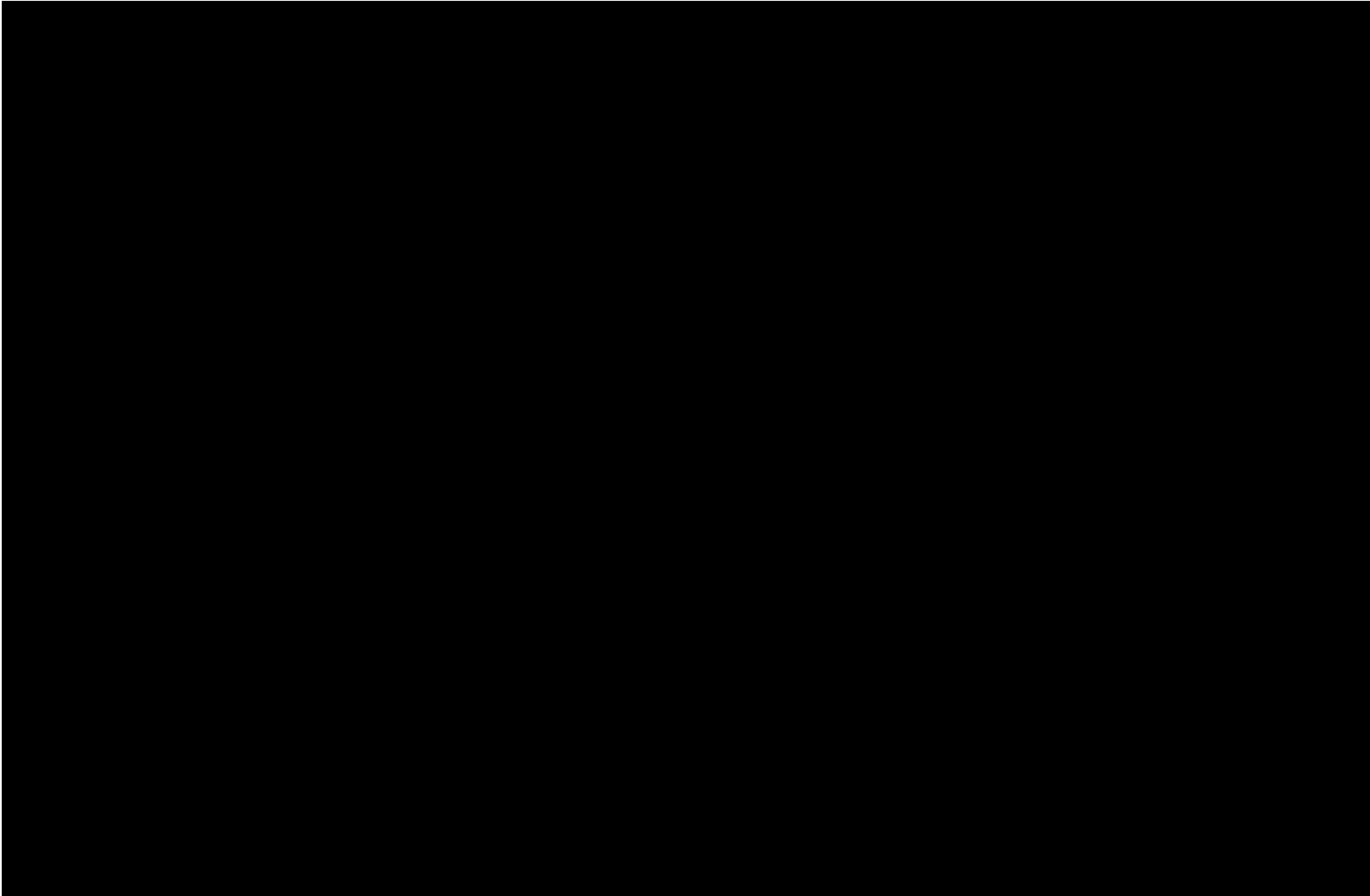


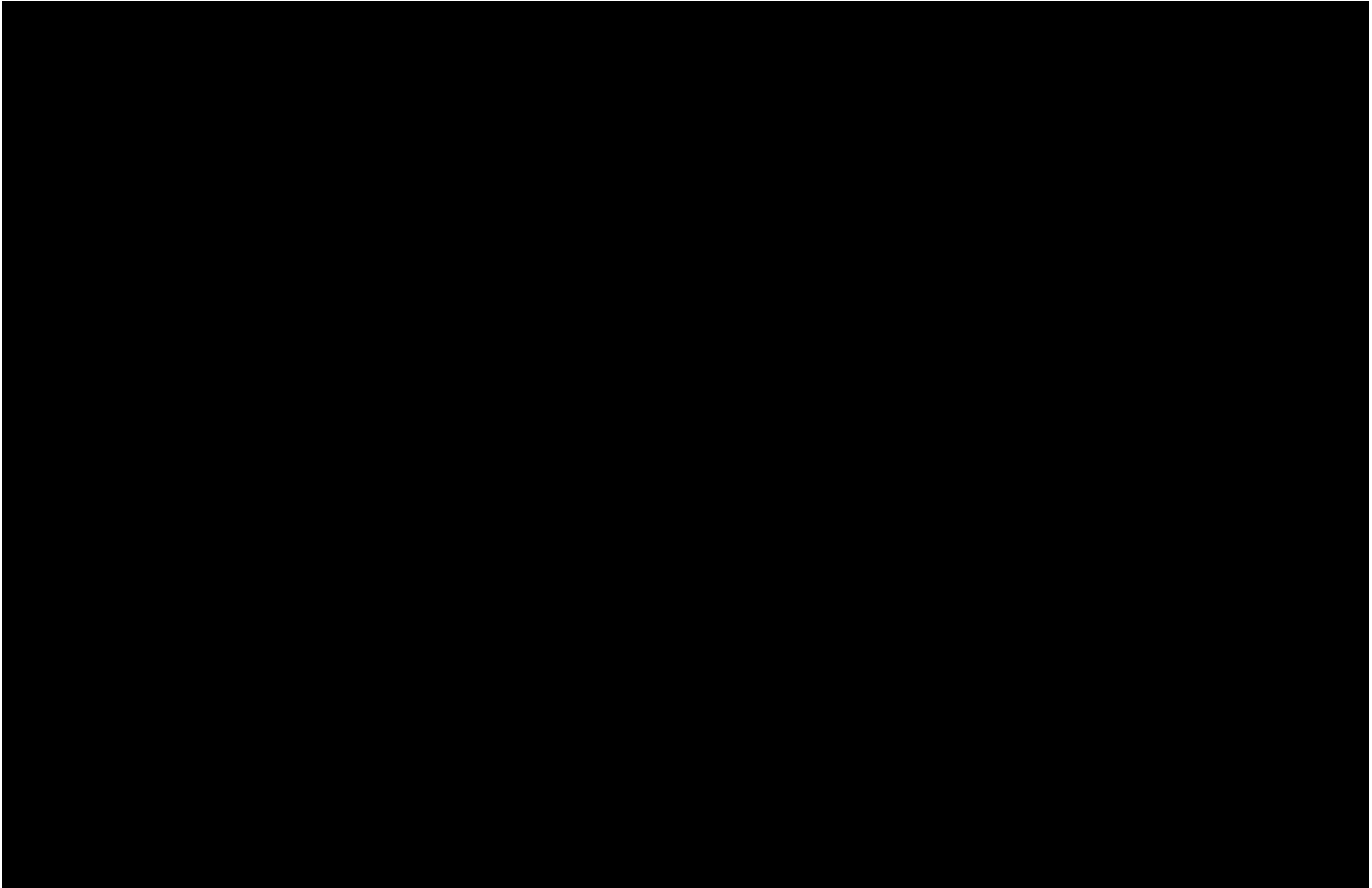


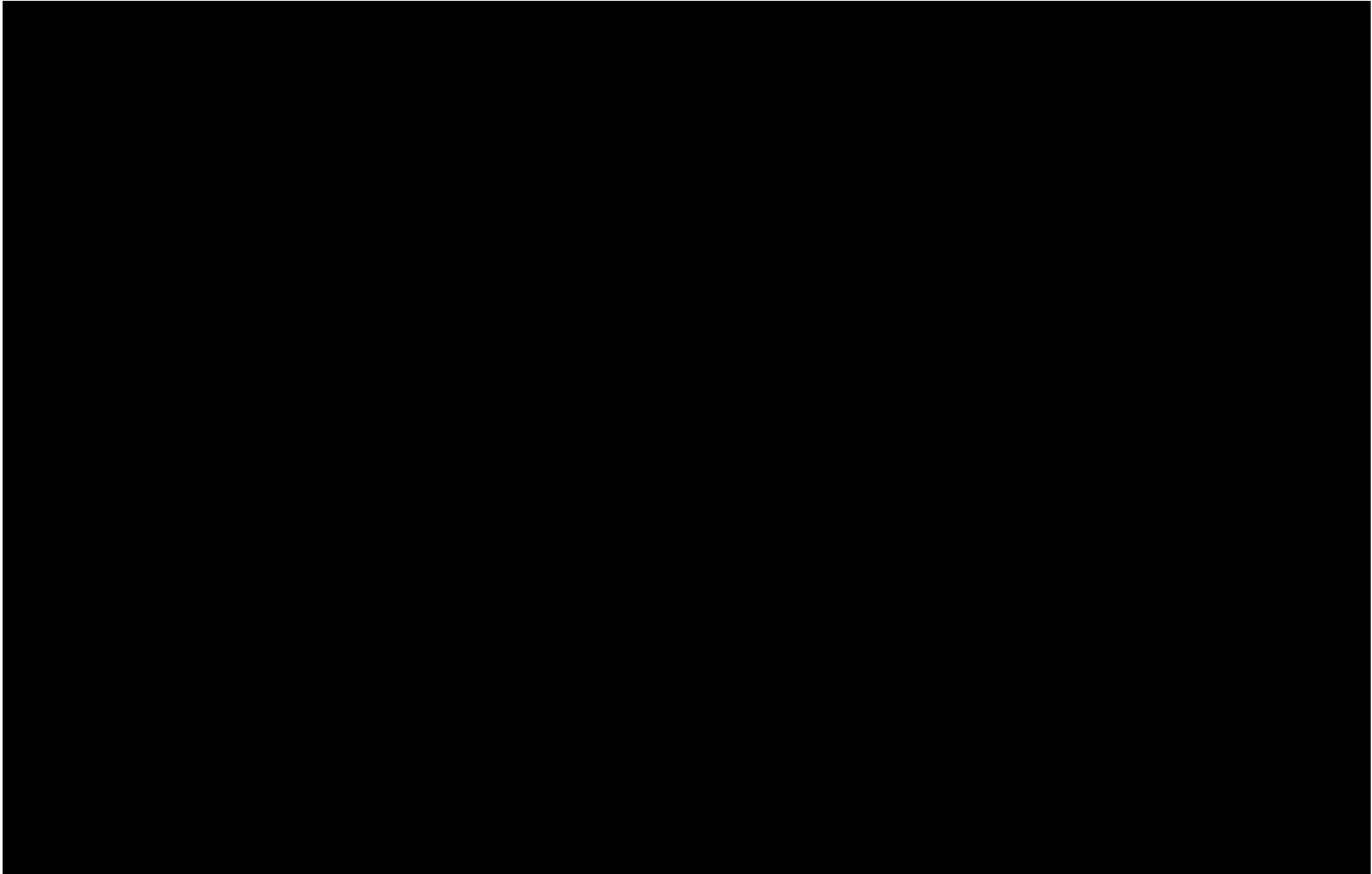


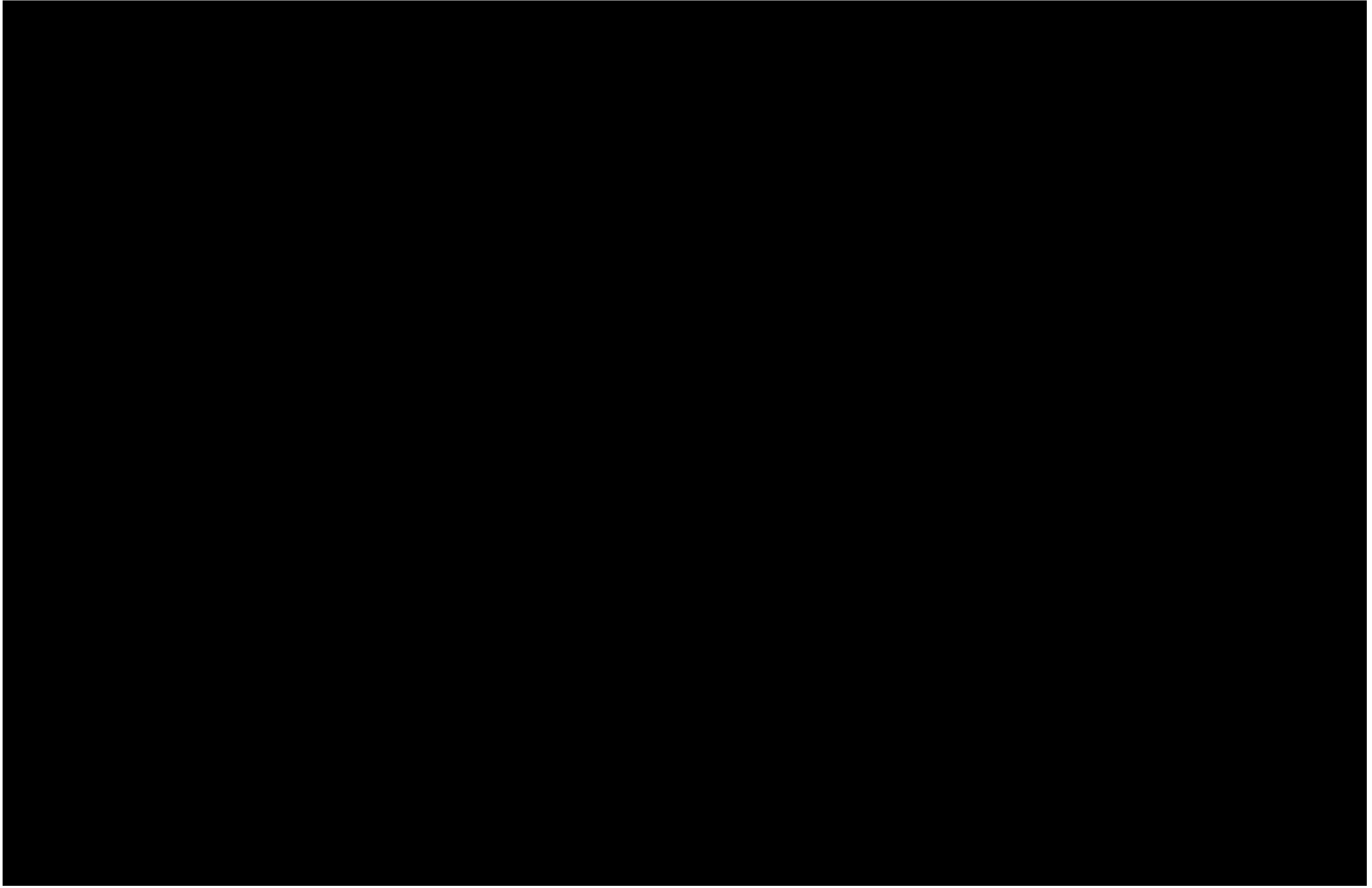




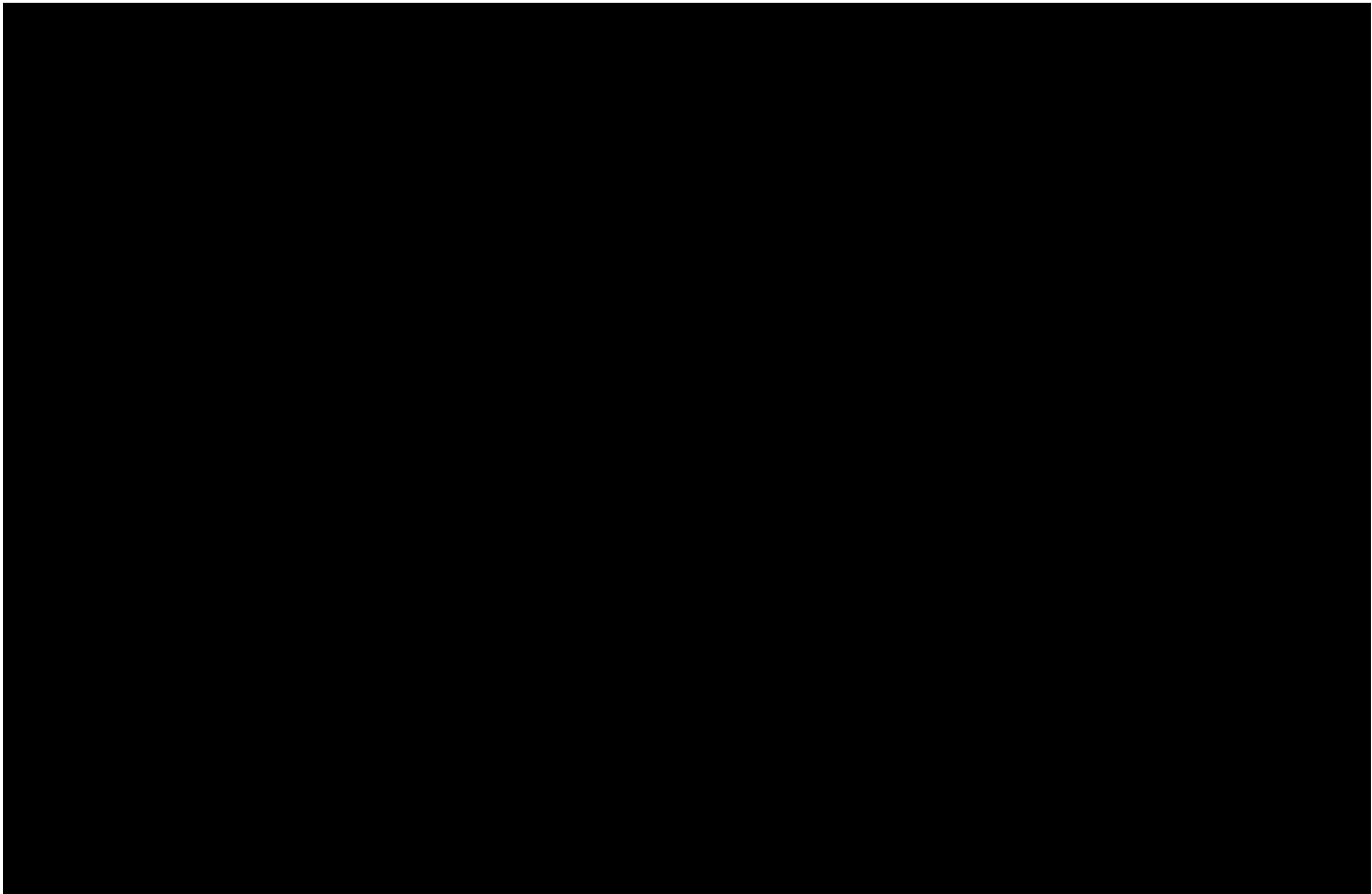


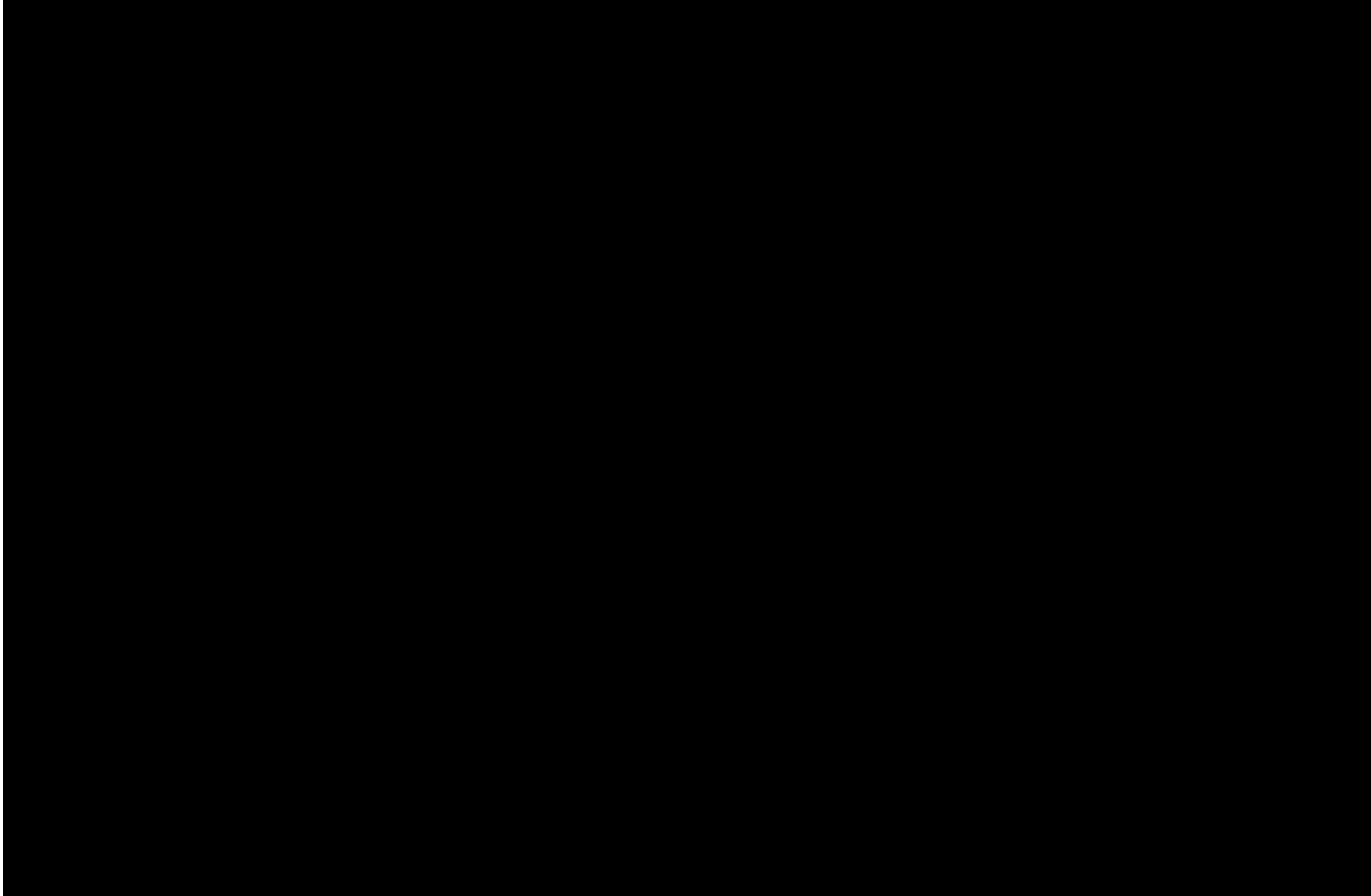




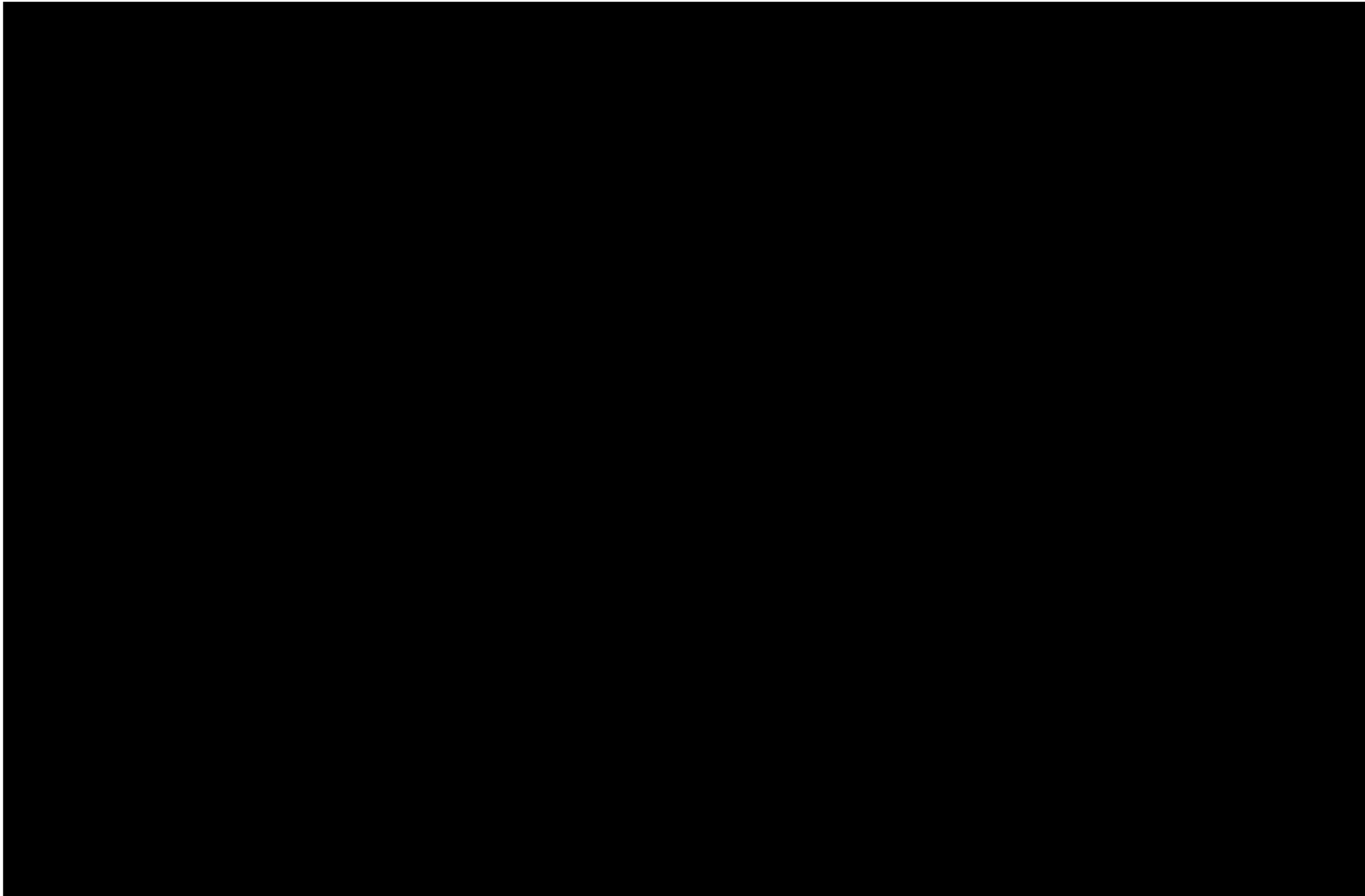


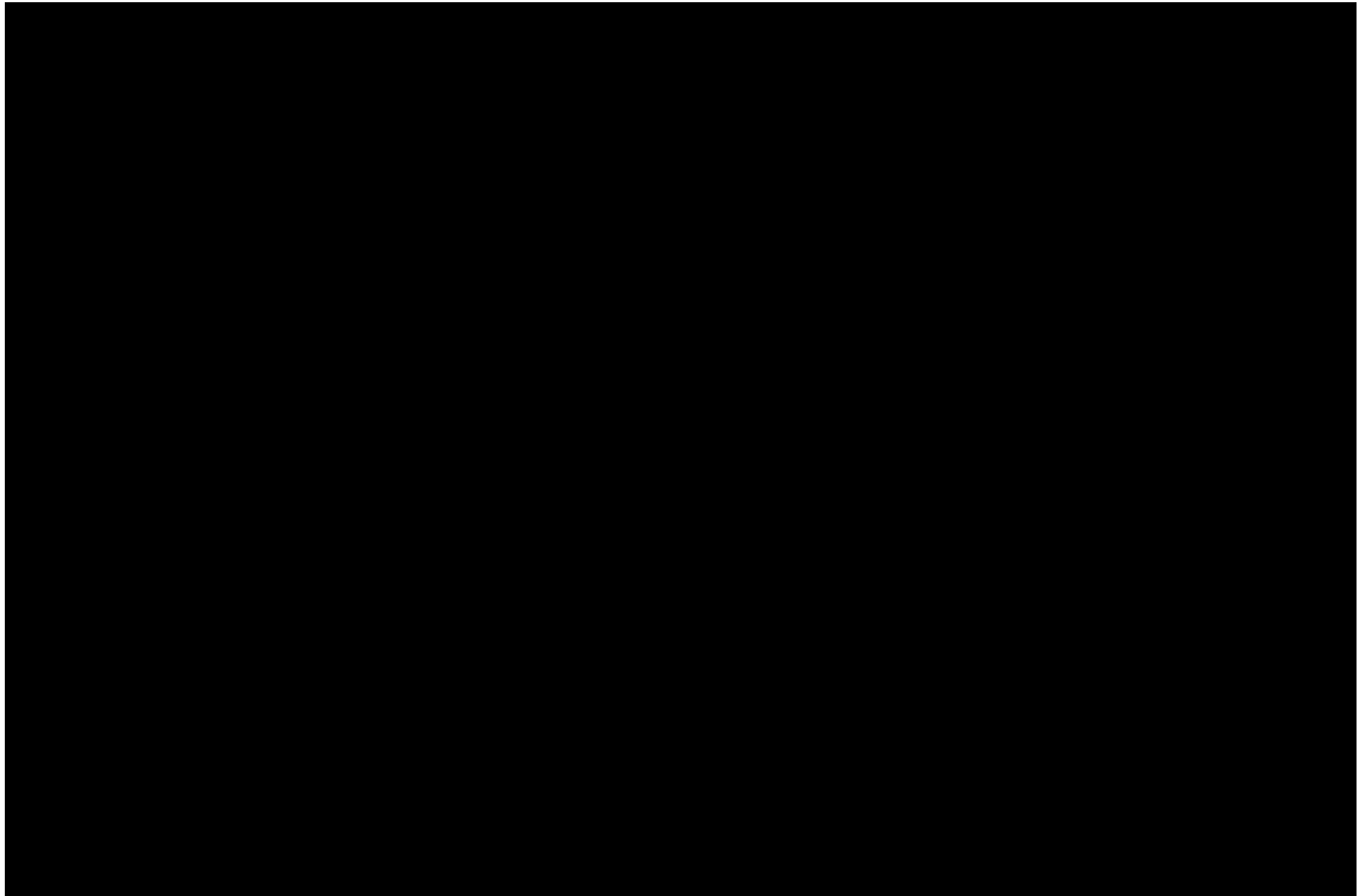


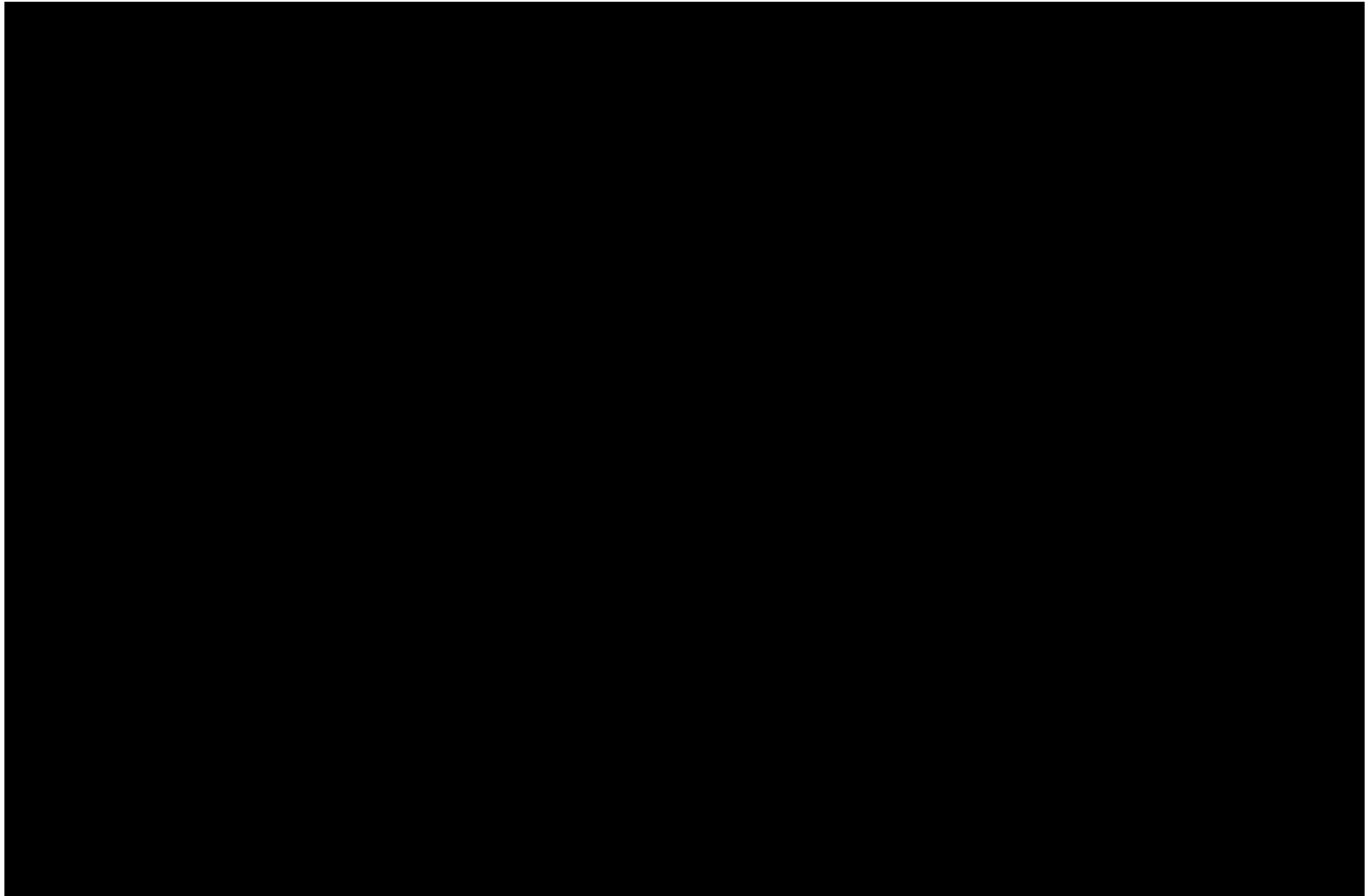


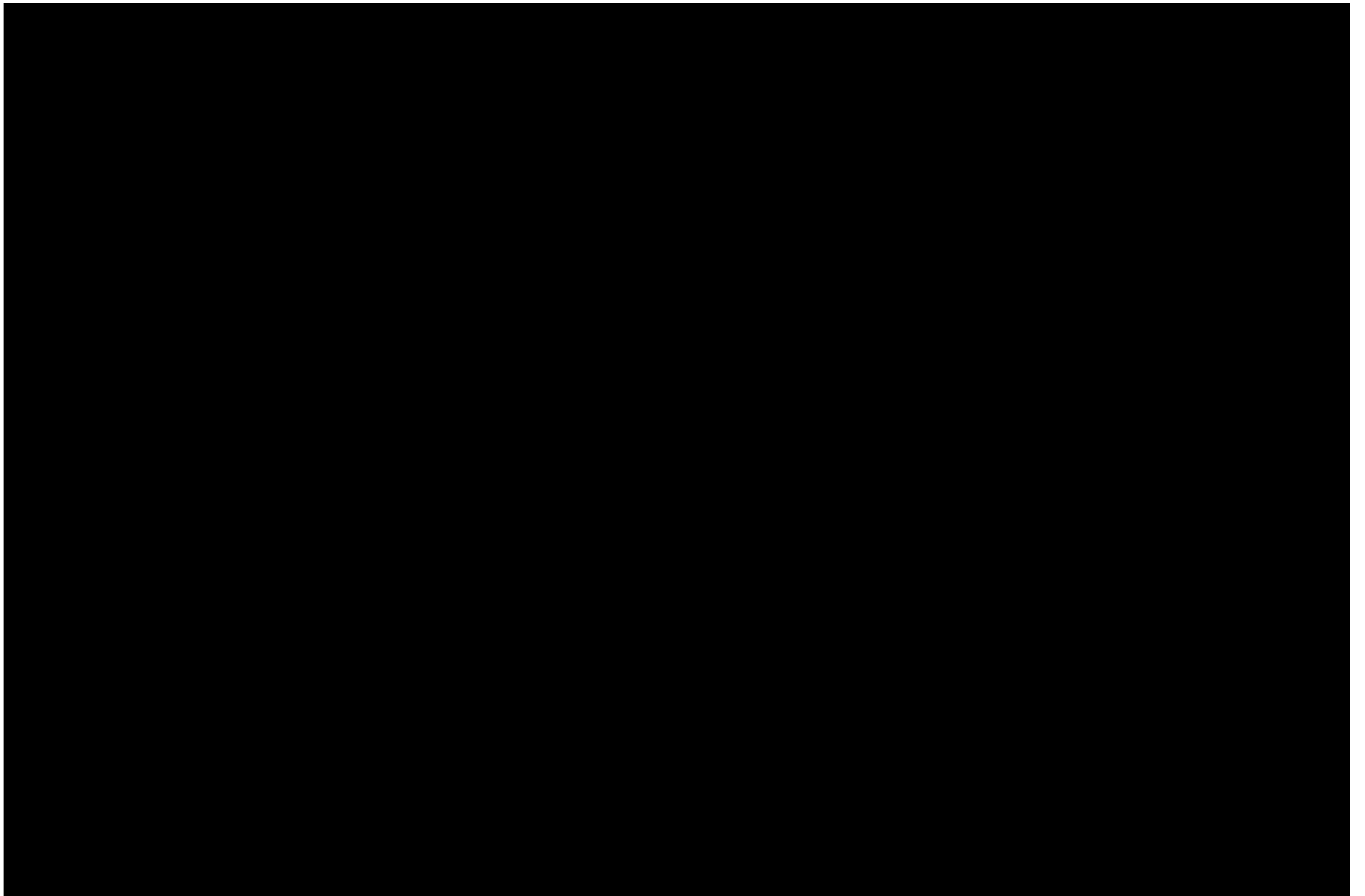


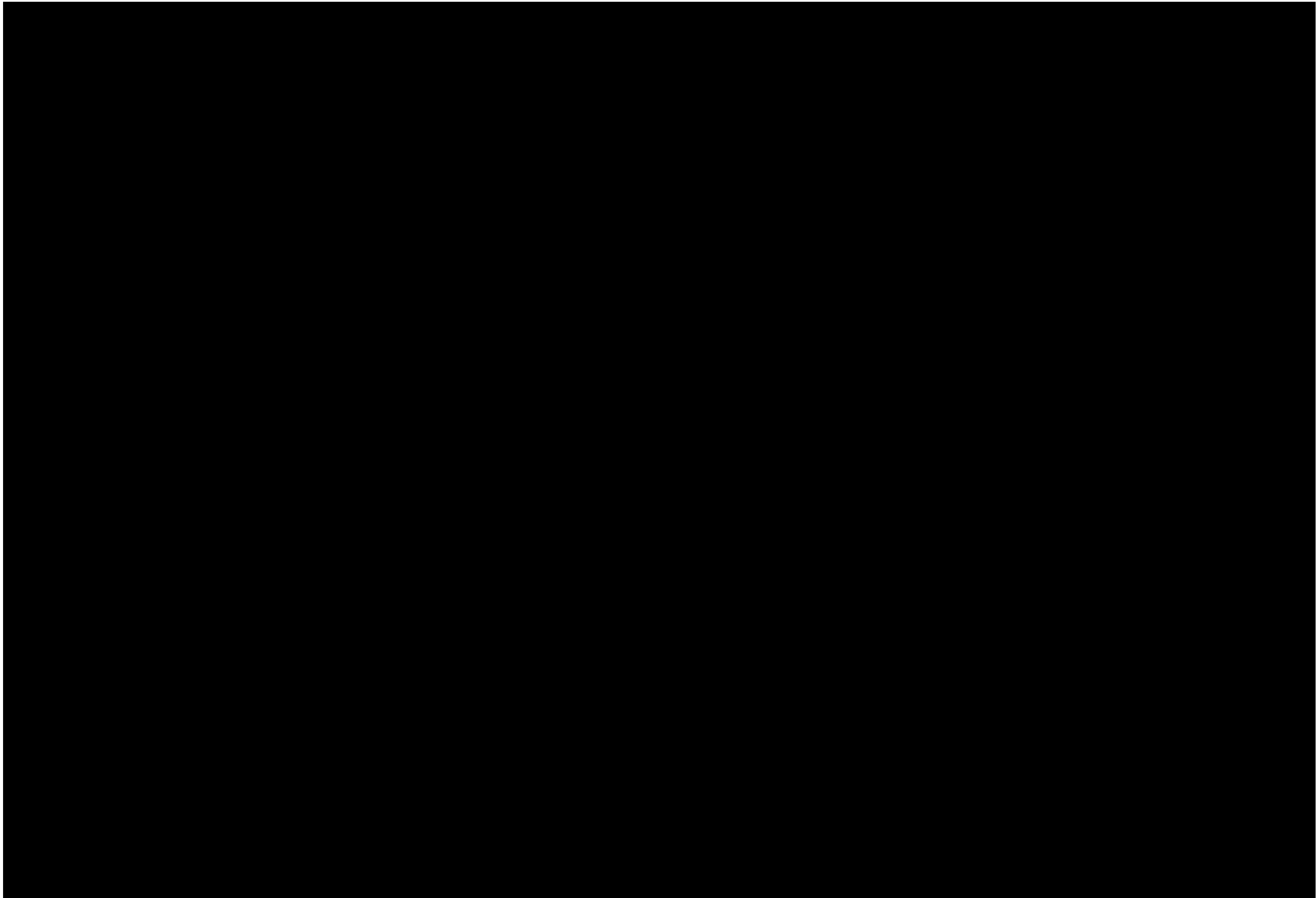


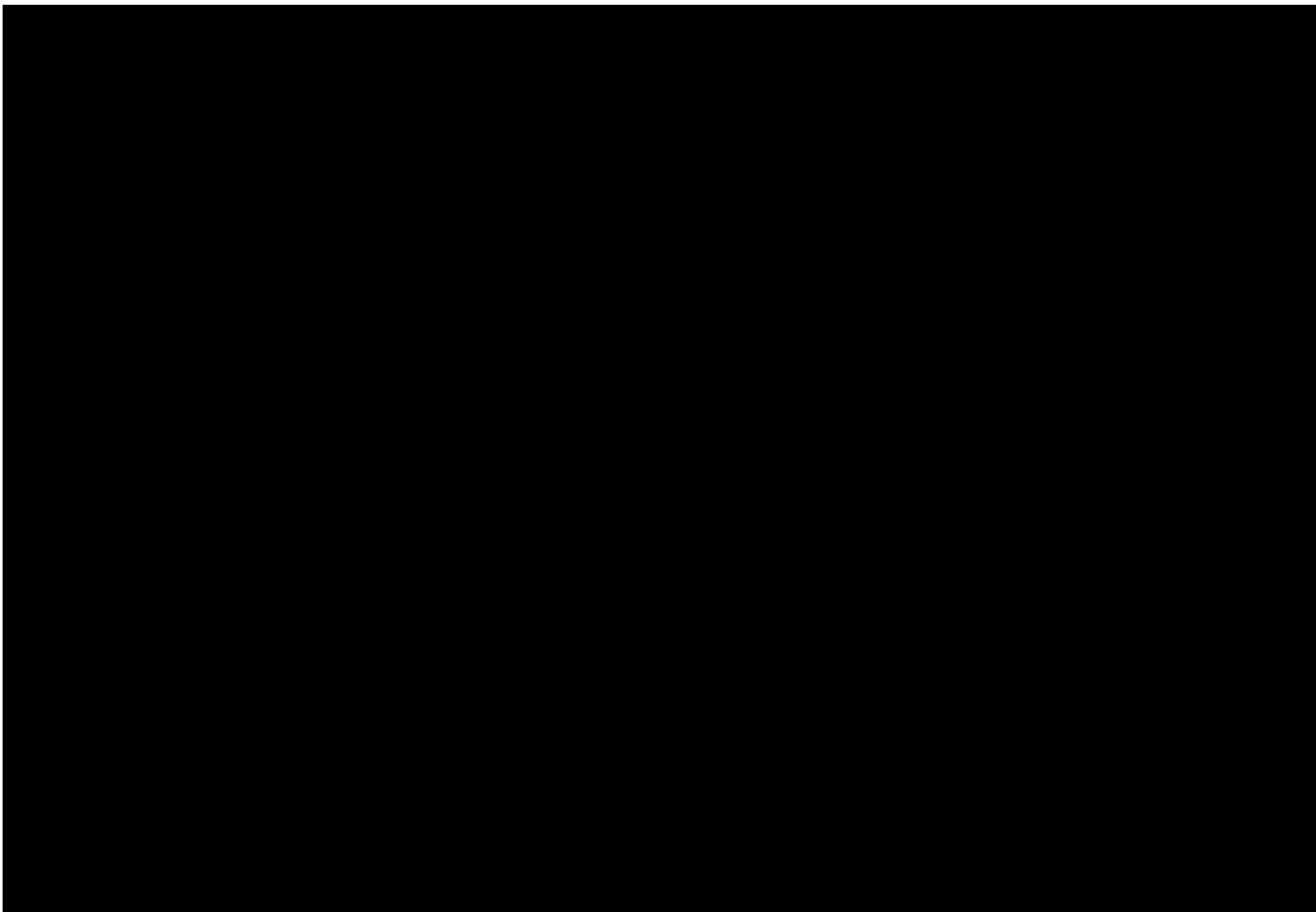


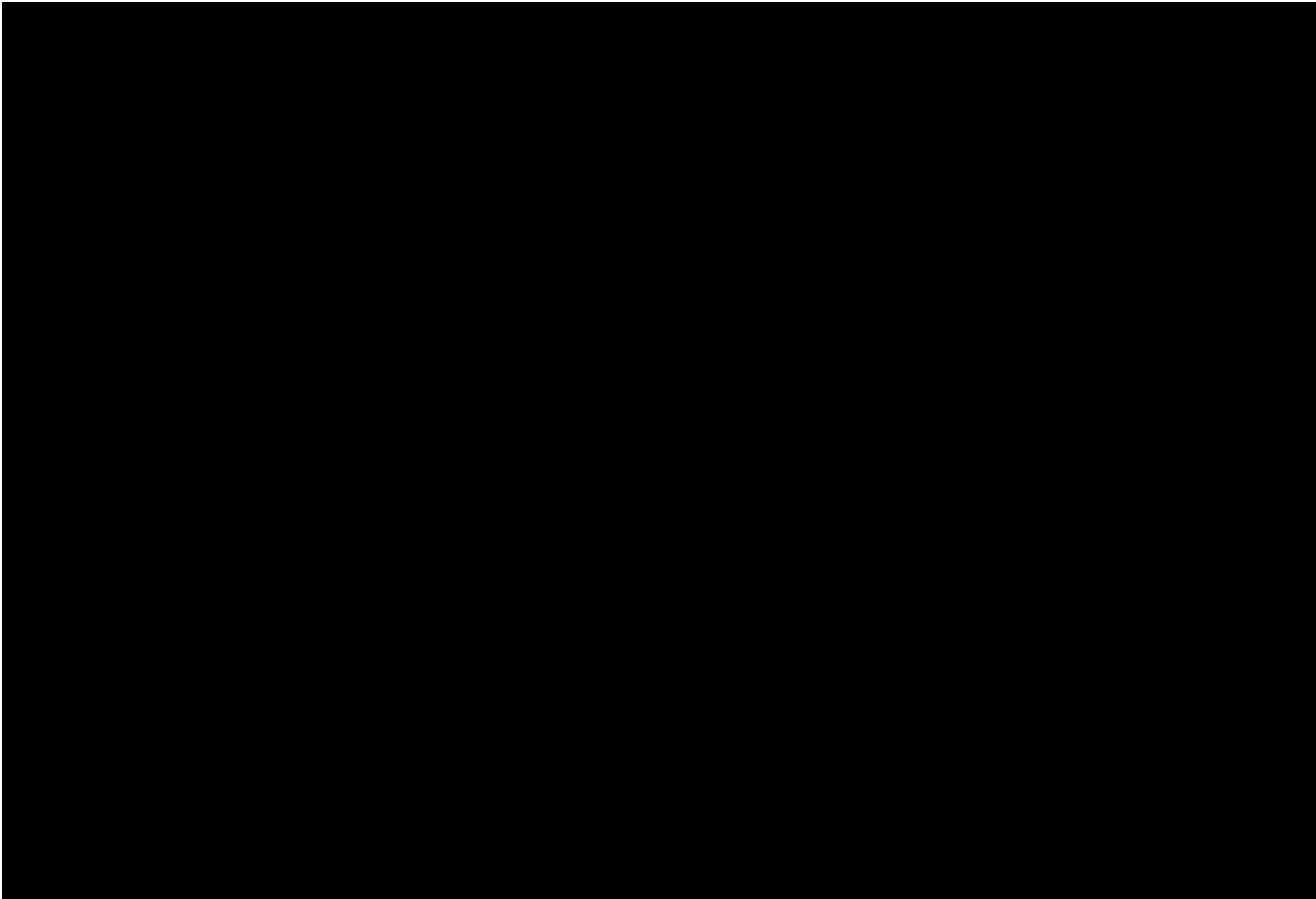


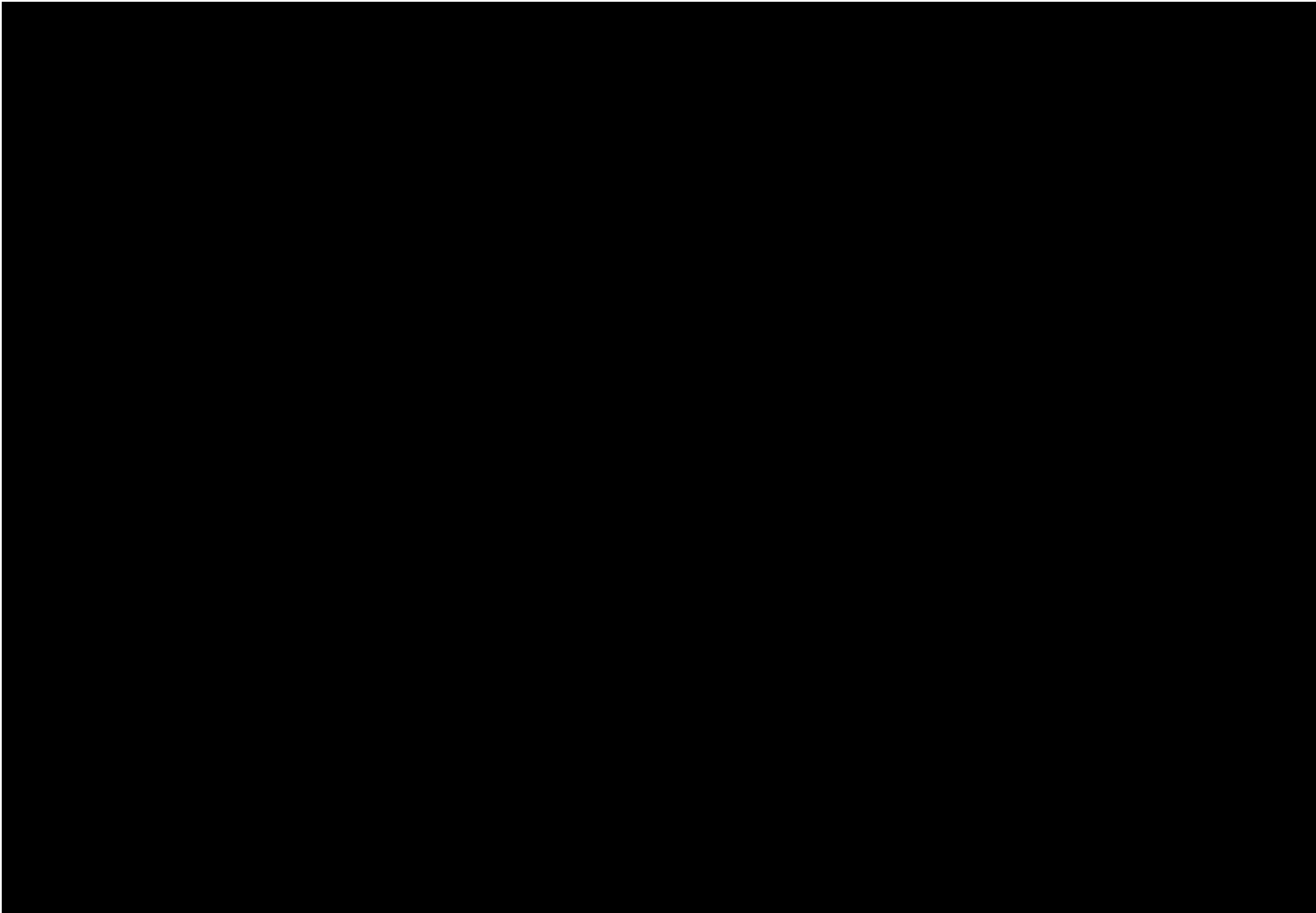


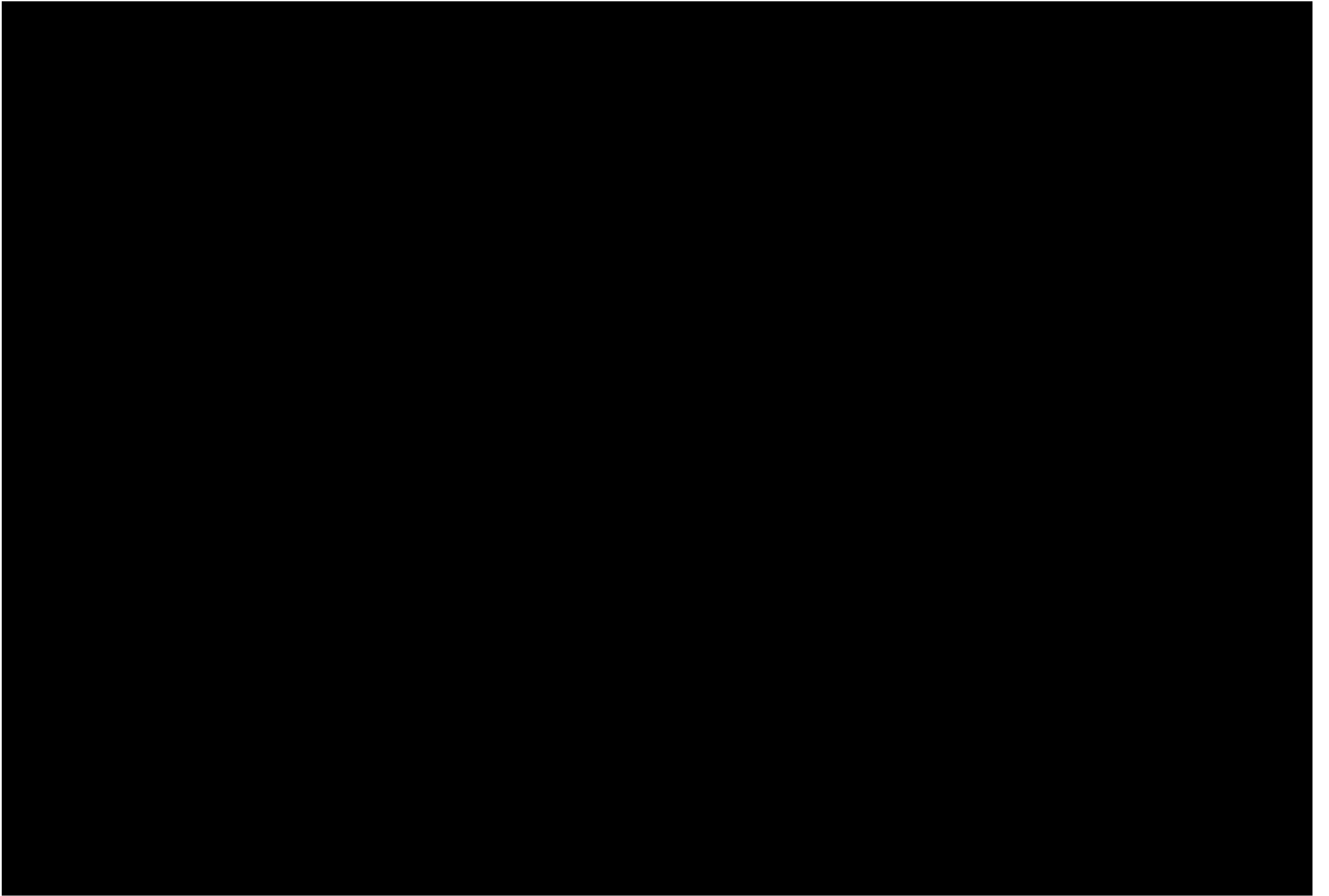


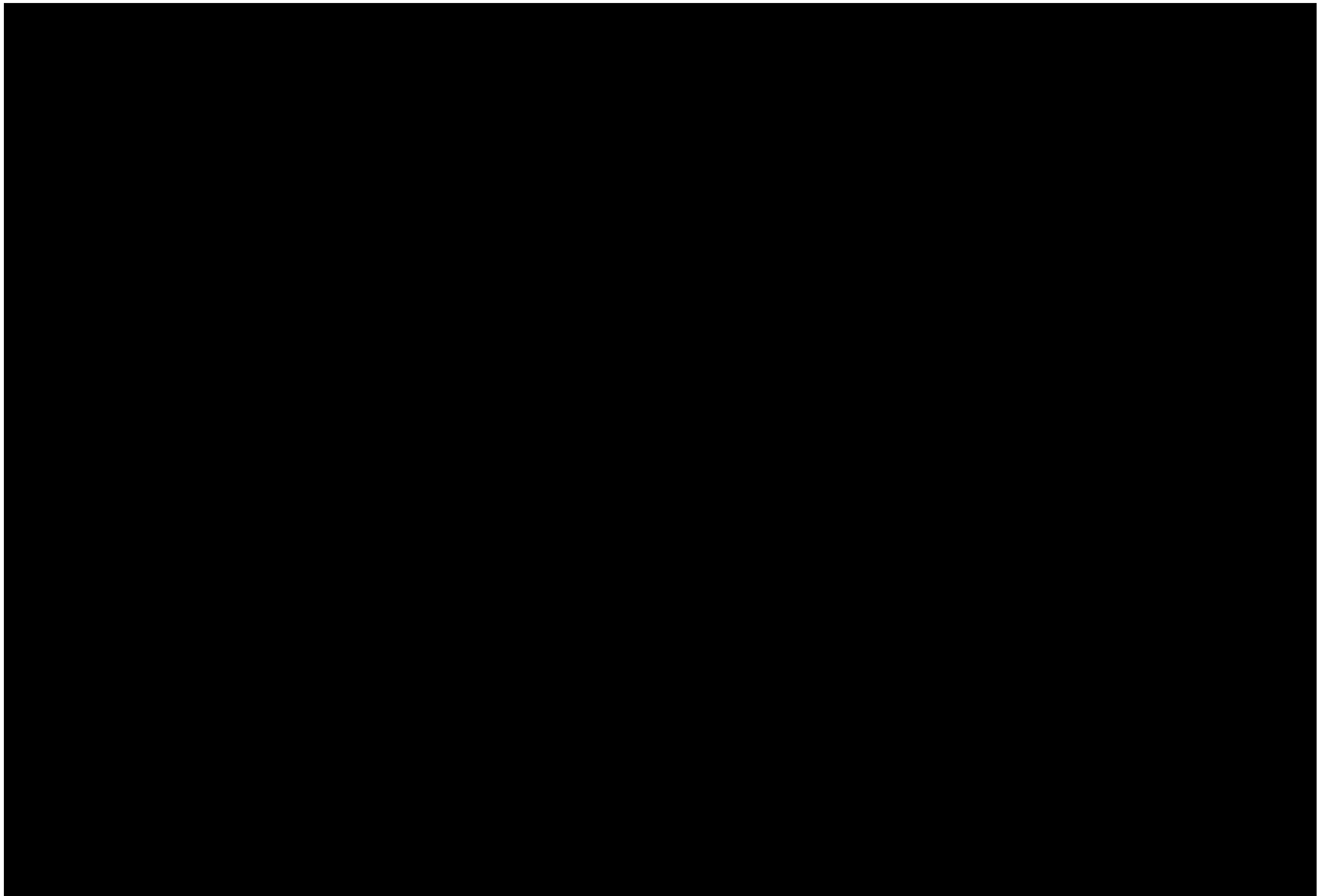












Ruland Road	Document number, revision 1JNL759421,		Page 1 of 9	Language en
	Status Approved	Resp.dept PG,PGGI,2215	Class.no -	
Prepared Piotr Login, 2020-02-28	Approved Brannvall Anders, 2020-03-03			
Title Noise impact from the Ruland Road Station 2020				

Summary

This report provides the anticipated audible noise levels that will be generated by the operation of the proposed Ruland Rd (NY) converter station.

The Ruland Road converter station is located near the intersection of Ruland Road and Baylis Road in Melville, NY.

The converter station includes numerous equipment that generates audible noise. However, most of the electrical equipment is located inside the station buildings and, therefore, has little impact on the surroundings of the station.

There are four groups of outdoor equipment that generate audible noise in the proposed converter station:

1. Converter transformers with associated cooling fans;
2. Converter reactors;
3. Fans in the outdoor coolers used for cooling of indoor converter valves;
4. Climate control/HVAC equipment as well as the openings in the station buildings.

The sound calculations were based on typical sound power levels for all significant audible noise sources in the converter station.

The report also presents the sound requirements which the sound emitted by Ruland Rd HVDC station shall comply with.

Preliminary audible noise predictions of sound levels around the Ruland Rd converter station show that the facility will comply with the sound requirements.

This conclusion is illustrated by the results of computations presented in this report.

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1 General

The proposed Ruland Rd converter station on Long Island will be the onshore termination of a planned HVDC link for interconnection of offshore wind facilities. The Ruland Road converter station is located near the intersection of Ruland Road and Baylis Road in Melville, NY.

The converter station includes numerous equipment that generates audible noise. However, most of the electrical equipment will be located inside the station buildings and, therefore, has little impact on the surroundings of the station. The main contributors to audible noise generated by the operation of the converter station will be equipment located outdoors.

1.1 Environmental Noise from the Industrial Plant

1.2 Environmental Noise Descriptors

Acoustical descriptors;

L_{Aeq} or L_{pA} sound pressure levels in the report are relative to 20 µPA and A-weighted

L_{WA} sound power levels are relative to 1 pW and A-weighted.

Noise Maps with isophone-lines is an output from the preliminary Audible Noise Analysis, illustrating the combined sound pressure distribution in the topography from the contributing sound sources in the HVDC converter station.

1.3 Converter Station

The Ruland Rd converter station will include numerous equipment that generates audible noise.

In general, the main sound sources in the HVDC converter station are:

- Converter transformers;
- Cooling fans for converter transformer cooling plants;
- Converter valves located inside the valve halls (part of the converter building);
- Converter reactors located outdoors in the AC yard;
- DC filter equipment located in the converter building;
- Fans for valve cooling system;
- Climat control and HVAC equipment.

The most significant sources of noise impacting the surroundings of the station will be from equipment located outdoors.

There are four groups of outdoor equipment in the proposed HVDC converter station that will generate audible noise that may impact the surroundings of the installation.

That is:

- 1) Converter transformers (transformer enclosure) with associated cooling plant;
- 2) Fans in the outdoor coolers used for the cooling of the indoor converter valves;
- 3) AC filter components (reactors and capacitors);

- 4) Auxiliary HVAC equipment and ventilation openings in the converter station buildings.

Most of the generated sound is within the frequency range of 100 to 2000 Hz.

2 Calculation Method Description

2.1 Prediction Methods

To verify compliance with the maximum specified sound levels at the immission points, a method of prediction of sound levels is required. In order to obtain the highest possible accuracy, it is necessary to use a 3D model of the converter station and its surrounding.

This has been done in the sound calculation program, SoundPLAN 7.4 of SoundPLAN GmbH. This calculation program is designed for sound calculations around industrial plants. Electrical substations and HVDC converter stations are examples of such systems.

The computation of audible sound around the Ruland Rd converter station has been done according to the calculation standard ISO9613-2:1996.

2.2 Environmental Parameters

Environmental parameters, such as temperature, relative humidity and air pressure are input parameters to calculate sound velocity and attenuation due to atmospheric absorption. The weather assumptions used for this study are part of the standard algorithm used.

2.3 Presentation of the Calculation Results

A way of presenting the calculation results is noise maps showing isophones-lines with constant noise level and with colored areas between them, which have been used in this report. The figures also show buildings and the different sound sources.

3 Noise Limiting Methods

The preliminary measures used for the Ruland Rd converter station are presented in Section 3.1.

3.1 Used Noise Limiting Measures

A list of preliminary external noise attenuation measures considered for the Ruland Rd converter station is given below:

- Converter transformer tanks will be enclosed in acoustical housings;
- Converter reactors will be acoustically optimized
- Cooling fans for valve cooling system will be of low noise type;
- Walls and roof of the station building will be acoustically optimized;
- Ventilation openings of the station building will be acoustically designed;
- A screening wall/station perimeter wall will be installed around the perimeter line of the station.

Use of noise mitigation measures will be evaluated during detailed design of the HVDC converter station. At that time, in order to meet the sound requirements, it

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may either be necessary to add noise mitigation measures or there may be a possibility to reduce one or more measures stated above.

4 Sound Propagation Calculations

In order to predict sound levels outside the Ruland Rd converter station, a preliminary sound propagation map for the station has been calculated.

The calculation has been carried out in a 3D (three-dimensional) model of the converter station and its closest surrounding.

The results of the calculations are described in Section 4.4.

4.1 Computation model

In order to predict sound pressure levels around the converter station, all significant sound sources in the station have been modeled.

The model assumes flat terrain around the converter station site. Therefore, elevation differences in the terrain and its influence on sound propagation have not been taken into account.

In the computations for the converter station, the typical sound power data for equivalent equipment for all significant sound sources, was used.

The sound sources are represented either as a point source or vertical line source or an area source in the model. This was determined based on the size and shape of the equipment.

4.1.1 Power load level

Maximum power level for the converter station has been used for noise calculations.

4.2 Audible Sound Level Limits

This section provides sound level requirements for the Ruland Rd converter station:

- As previously communicated for the site, the noise at any point on the converter station site property line, continuous airborne sound level shall not exceed 50 dBA.
- According to available data, maximum permissible sound-pressure levels at specified points of measurement (sensitive receptors) for noise radiated continuously from an establishment, between the hours of 10:00 p.m. and 7:00 a.m. shall be as shown in Table 1 below.

It is understood that these values are required by the Town of Huntington if they will be present in normally/presently used octave band system.

Octave band	63Hz	125Hz	250Hz	500Hz	1 kHz	2 kHz	4 kHz	8 kHz
Requirement	65 dB	53 dB	45 dB	40 dB	36 dB	33 dB	30 dB	27 dB

Table 1- Sound pressure level requirements of the town of Huntington

- The continuous airborne sound level with the Ruland Road converter stations operating at maximum power load, measured at each of the residential receptors shall not exceed 45 dBA.

This requirement may be problematic to verify due to fact that a normal night level of background noise in the area is possibly always higher than 45 dBA.

4.3 Input Data

4.3.1 Layout

The preliminary station layout was used in developing the model for the Ruland Rd converter station.

The top view of the converter station is presented in the figure below.

4.3.1.1 Ruland Rd station

The acoustic model of the Ruland Rd station includes significant sound sources in the converter station, which are listed below:

- Three converter transformers with acoustical enclosures
- Cooling fans of converter transformers
- Cooling fans of valve cooling system
- AC filter equipment including reactors and capacitors
- Ventilation equipment in the station buildings

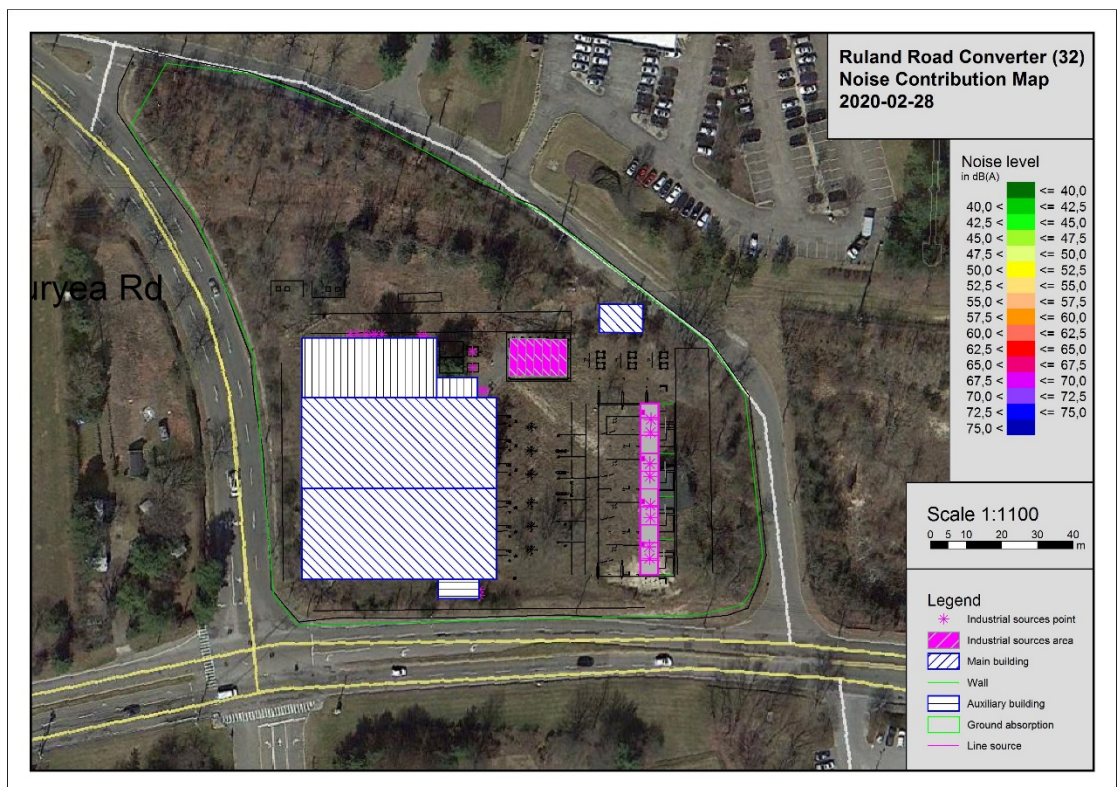


Figure 1– Ruland Rd converter station, location of the buildings and main equipment.

4.4 Results

The result shows preliminary predicted noise contribution from the typical sources within the converter station only. The result is valid for full capacity operation at nighttime.

4.4.1 Property line

The preliminary predicted noise contribution map (sound pressure levels caused by the equipment in the converter station) for the Ruland Rd station and the vicinity of

this converter station is in the map below, shown in the aerial picture of the station area.

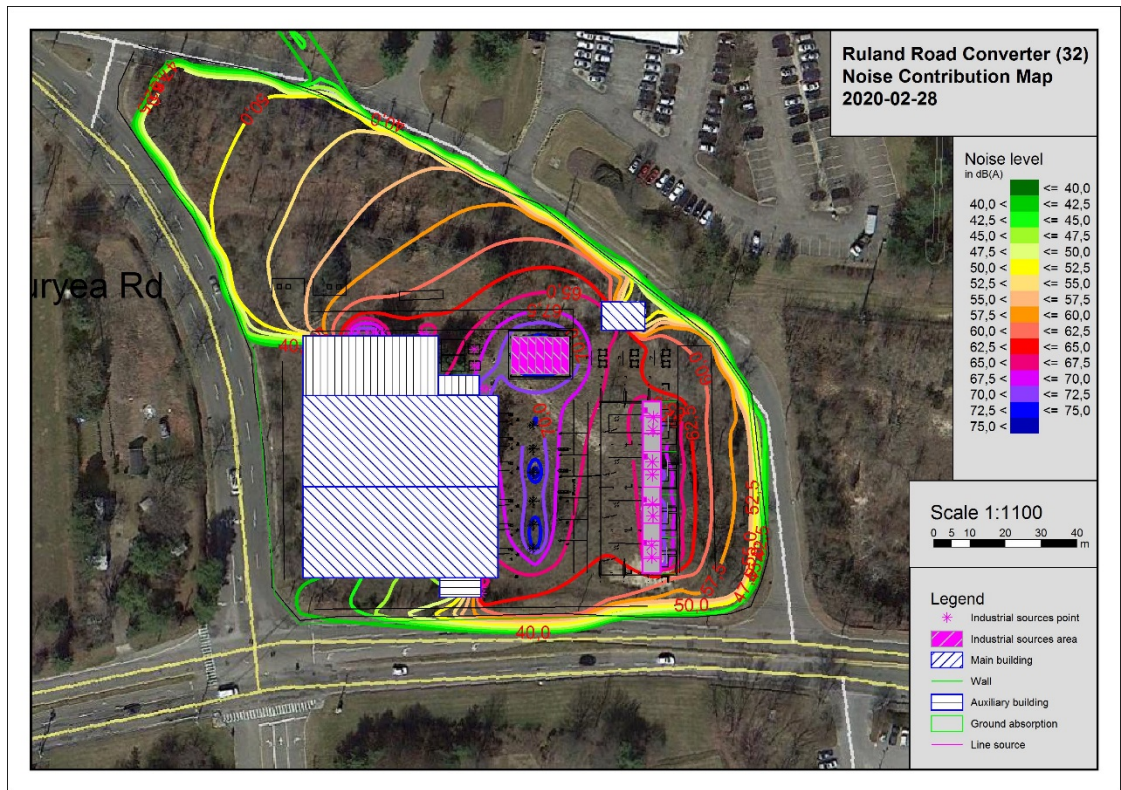


Figure 2 -Noise contribution map for the Ruland Rd station just outside the station, with station wall 10 feet high around.

The outdoor equipment in the converter station are the major contributors to noise from the station. Most of the electrical equipment sources for noise are totally enclosed in the station buildings and, therefore, well screened. That is, indoor equipment does not contribute significantly to noise level outdoors.

Due to short distances from the equipment to the property line, preliminary calculations show that a station wall will be required to limit the noise level at the station boundary.

The results of computations of sound propagation show that the Ruland Rd converter station will comply with the sound limits mentioned in Section 4.2 above. The noise level from the station will be below 50 dBA around the perimeter fence.

4.4.2 Noise contribution in the area

The preliminary predicted noise contribution map for the area around the Ruland Rd station, showing noise contribution at longer distances from the station, is presented below.

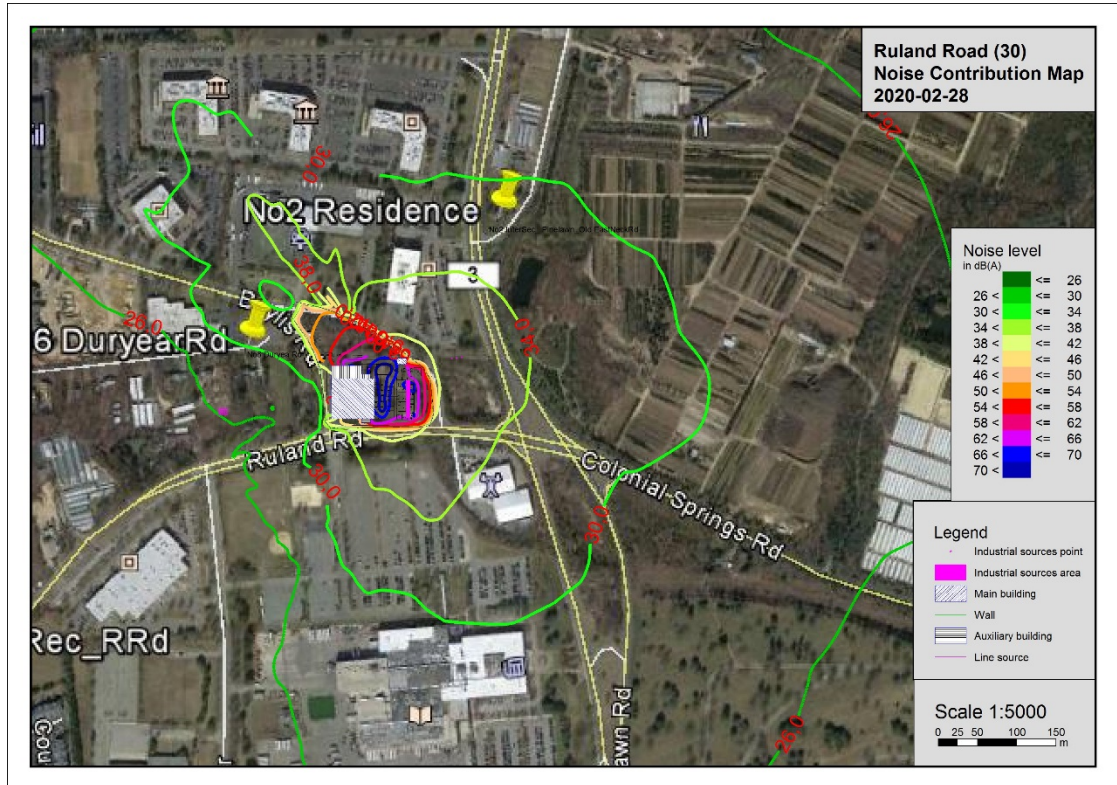


Figure 3– Noise contribution map for the Ruland Rd station on the aerial photo of the station area, at 2m above the ground.

The highest noise impact is caused in eastern direction from the converter. It is mainly caused by the cooling fans of the valve cooling system and the cooling fans associated with the converter transformers. These sources generate a broad-banded sound, which is typically not disturbing.

In western direction, the noise impact from the converter station will be the lowest.

4.5 Conclusion

Preliminary audible noise predictions of sound levels around the Ruland Rd converter station show that the facility will comply with the noise requirements as stated in Section 4.2.

The results are valid for the proposed layout and noise attenuation measures used for the equipment included in the converter station. The detailed noise study for the Ruland Rd converter station will be done during the detailed design phase of the project.

5 References

- [1] “Attenuation of sound during propagation outdoors”. Part 2:
A general method of calculation, ISO/DIS 9613-2, dated April 1996.
- [2] CIGRÉ - Technical Brochure No 202, “HVDC Stations Audible Noise”,
working group 14.26, dated April 2002.

6 Revision history

Rev.	Prepared	Approved
Revision text		



September 17, 2019

Howard Kosel
Anbaric Development Partners
401 Edgewater Place, Suite 680
Wakefield, Massachusetts 01880

**Re: Anbaric Development Partners – Baseline Sound Survey
South Brunswick, New Jersey
ESS Project No. A592-003.16**

Dear Mr. Kosel,

The following report summarizes the results of the Baseline Sound Survey (Sound Survey) completed by ESS Group, Inc. (ESS) on August 30, 2019 and provides a comparison of the combined sound levels from the measured baseline readings and ABB's predicted Project sound level contributions¹ at each location to the applicable permissible sound levels adopted by South Brunswick. The purpose of this Sound Survey was to establish the existing sound levels along the property line of the proposed Davidson Mill Road Converter Station (the "Project"); therefore, providing a baseline to determine whether the predicted sound levels from the proposed Project could potentially cause an exceedance of the permissible sound levels in the area surrounding the Project.

The results of the Sound Survey demonstrate that the predicted sound levels from the Project, when combined with the existing baseline sound levels, will comply with the maximum permissible sound levels specified in the New Jersey Noise Control Regulations (N.J.A.C 7-29) and the South Brunswick Code of Ordinances (Chapter 42 –Environment, Article IV – Noise Control). The sound levels during operation will be below 50 dB(A) (*Permissible A-Weighted Sound Level for Residential Properties*) along the property line associated with the residential property along Magee Lane. At all other locations, the sound levels during operation will be below 65 dB(A) (*Permissible A-Weighted Sound Level for Non-residential Properties*).

FACILITY SETTING

The proposed Davidson Mill Road Converter Station will be located in the Township of South Brunswick, New Jersey (see Attached Figure 1). The site is bordered by an overhead electric transmission line to the west, Davidson's Mill Road to the north, Deans Substation to the east, and an overhead electric transmission line to the south.

CONCEPTS OF ENVIRONMENTAL SOUND

Sound is generated by a variety of sources (e.g., a musical instrument, a voice speaking, or an airplane that passes overhead). Energy is required to produce sound, and this sound energy is transmitted through the air in the form of sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear. The range of sound pressures that can be detected by a person with normal hearing is very wide,

¹ ABB, *Predicted Audible Sound for Davidsons Mill Road Station*, (Raleigh, North Carolina, 2019)



ranging from about 20 micro-pascals (μPa) for very faint sounds, at the threshold of hearing, to nearly 10 million μPa for extremely loud sounds, such as a jet during take-off at a distance of 300 feet.

Sound levels are reported using “sound pressure levels,” which are expressed in terms of decibels, because the range of human hearing is so wide. The sound pressure level in decibels is the logarithm of the ratio of the sound pressure of the source to the reference sound pressure of 20 μPa , multiplied by 20.

The table below provides some examples of common sources of sound and their sound pressure levels. All of the sound levels presented in this report are provided in A-weighted decibels, abbreviated “dB(A)” or “dBA.” The A-weighted sound level reflects how the human ear responds to sound, by deemphasizing sounds that occur in frequencies that the human ear is least sensitive to sound (at frequencies below about 100 hertz and above 10,000 hertz) and emphasizing sounds that occur in frequencies at which the human ear is most sensitive to sound (in the mid-frequency range from about 200 to 8,000 hertz). In the context of environmental sound, noise is defined as “unwanted sound.”

Examples of Common Indoor and Outdoor A-weighted Sound Pressure Levels

Sound Level dB(A)	Common Indoor Sounds	Common Outdoor Sounds
110	Rock Band	Jet Takeoff at 1000 feet
100	Inside NYC Subway Train	Chain Saw at 3 feet
90	Food Blender at 3 feet	Impact Hammer (Hoe Ram) at 50 feet
80	Garbage Disposal at 3 feet	Diesel Truck at 50 feet
70	Vacuum Cleaner at 10 feet	Lawn Mower at 100 feet
60	Normal Speech at 3 feet	Auto (40 mph) at 100 feet
50	Dishwasher in Next Room	Busy Suburban Area at night
40	Empty Conference Room	Quiet Suburban Area at night
25	Empty Concert Hall	Rural Area at night

It is often necessary to combine the sound pressure levels from one or more sources. Because decibels are logarithmic quantities, it is not possible to simply add the values of the sound pressure levels together. For example, if two sound sources each produce 70 dB and they are operated together, they produce only 73 dB – not 140 dB as might be expected. Four equal sources operating simultaneously result in a total sound pressure level of 76 dB. In fact, for every doubling of the number of equal sources, the sound pressure level goes up another three decibels.

Sound frequencies are grouped in octaves. An octave band is defined as the range of frequencies from one frequency to double that frequency. Typically, environmental noise studies focus on the nine most commonly heard octave bands between 31.5 Hz (low bass, like a pipe organ) up to 8,000 Hz (high treble, like a flute).

Noise guidelines typically reference the L_{eq} . The L_{eq} is defined as the equivalent continuous sound pressure level. It represents the average sound level at a location that incorporates the sound pressure levels at the individual octave bands, and the variations in sound pressure levels over time. The L_{eq} is considered the

most representative indicator of the average sound pressure level at any given location over any time period.

APPLICABLE NOISE STANDARDS

Applicable noise standards for the proposed Project are contained within the New Jersey Noise Control Regulations (N.J.A.C 7-29) and the South Brunswick Code of Ordinances (Chapter 42 –Environment, Article IV – Noise Control) and are as follows:

Section 42-142 (a) of South Brunswick’s noise ordinance states that “No person shall cause, suffer, allow, or permit the operation of any source of sound on any source property listed in section 42-138(a) in such a manner as to create a sound level that equals or exceeds the sound level limits set forth in Tables I, II or III (of the ordinance) when measured at or within the real property line of any of the receiving properties listed in Tables I, II or III (of the ordinance) except as specified in section 42-141(b).”

Please see attachment to view Tables I, II, and III.

BASELINE SOUND SURVEY METHODOLOGY

ESS collected sound level measurements at ten locations along the property line of the proposed Project based on the preliminary predictions of audible sound levels around the proposed Davidson Mill Road Converter Station (ABB, 2019), using precision integrating sound level meters that meet the requirements of American National Standards Institute (ANSI) Standards for Type I instruments. The sound level meter microphones were each fitted with a windscreen and then set up on a tripod at a height of five feet above ground. The sound level meters were calibrated at the beginning of each measurement period using acoustic calibrators following procedures pursuant to the National Institute of Standards and Technology (NIST). The sound level meters were programmed to sample and store A-weighted sound level data; including equivalent sound levels (Leq) and sound pressure levels (dBA) in each of the nine octave bands (Table 1).

Short-term measurements of 30 minutes were made at each of the locations between the hours of 12:00 PM and 6:00 AM on August 29, 2019. The measurement locations are described below (Figure 1):

- Site 1; along the southeastern property line of Lot 7 (non-residential)
- Site 2: along the northwestern property line of Lot 7 (non-residential)
- Site 3: along the southwestern property line of Lot 7 (non-residential)
- Site 4: at the southernmost corner of lot 12, the location closest to the existing Deans Substation (non-residential)
- Site 5: along the southwestern property line of lot 12 (non-residential)
- Site 6: along the northeastern property line of Lot 12 (non-residential)
- Site 7: along the northwestern property line of Lot 12, abutting Magee Lane and Lot 11 (adjacent to a residential property)
- Site 8: along the northern property line of Lot 12, abutting Davidsons Mill Road (non-residential)

- Site 9: along the northwestern property line of Lot 9, abutting the Right-of-Way (non-residential)
- Site 10: along the northernmost corner of Lot 9, abutting Davidsons Mill Road (non-residential)

SOUND SURVEY RESULTS

The results of the sound survey are summarized below (Table 1). This table presents the weighted average of the sound pressure level measurements taken at each of the ten locations, the predicted audible sound levels generated by the proposed Davidson Mill Road converter station, and the combined sound levels from the measured baseline readings and the predicted audible sound levels at each location according to ABB (2019). The table also compares the combined sound levels to the applicable permissible sound levels from Table I and III of Section 42-142 of the Town of South Brunswick’s Noise Ordinance.

Table 1. Sound Pressure Level Measurements

Site	1	2	3	4	5	6	7	8	9	10		
Receiving Property Category*	NR	NR	NR	NR	NR	NR	R	NR	NR	NR		
Octave Band Center Frequency, Hz	Octave Band Sound Pressure Levels, dB											
	Residential Limit ¹	Non-Residential Limit ¹	Baseline Measurements, dB									
31.5	86	96	11.7	12.0	12.3	12.4	13.0	13.5	14.1	15.3	16.0	15.7
63	71	82	26.1	24.2	24.0	26.8	28.0	26.6	27.4	29.1	27.6	29.5
125	61	74	35.0	28.1	27.1	45.7	39.7	33.2	31.1	32.8	31.9	34.6
250	53	67	32.8	32.8	29.8	37.0	31.3	35.7	30.4	36.7	31.3	41.6
500	48	63	35.7	35.7	33.4	37.4	36.0	35.6	36.6	45.9	34.9	46.8
1000	45	60	34.7	35.6	29.1	29.7	28.9	30.4	37.4	51.8	35.3	54.0
2000	42	57	42.8	39.6	39.2	45.9	42.2	42.3	37.3	48.0	37.4	51.6
4000	40	55	51.6	50.2	44.4	41.3	38.2	37.5	39.1	41.7	51.2	51.0
8000	38	53	34.9	33.0	24.4	23.1	19.3	24.0	20.0	28.0	34.6	36.0
	Residential Limit ²	Non-Residential Limit ²	Baseline Measurement									
Leq (dB(A))	50	65	52.5	51.0	46.1	50.1	46.0	45.3	44.3	54.4	51.8	57.7
Predicted Project Operational Sound Contribution ³			57.5	55.0	52.5	55.0	57.5	52.5	35.0	35.0	40.0	35.0
Combined Sound Level ⁴			58.7	56.5	53.4	56.2	57.8	53.3	44.8	54.5	52.1	57.7

*Receiving Property Categories

NR = Commercial facility, public service facility, non-residential portion of a multi-use property, or community service facility.

R = Residential Property, or residential portion of a multi-use property.

¹⁾ South Brunswick Code of Ordinances (Chapter 42 –Environment, Article IV – Noise Control): Table III. Maximum Permissible Octave Band Sound Pressure Levels in Decibels when measured outdoors



- 2) *South Brunswick Code of Ordinances (Chapter 42 –Environment, Article IV – Noise Control): Table II Maximum Permissible A-Weighted Sound Levels when measured outdoors*
- 3) *Predicted audible sound for Davidsons Mill Road Station (ABB, 2019) - Figure 3*
- 4) *Sum of the Predicted Project Operational Sound Contribution and the August 30, 2019 Baseline Measurements*

$$L_{\Sigma} = 10 \cdot \log_{10} \left(10^{\frac{L_1}{10}} + 10^{\frac{L_2}{10}} + \dots + 10^{\frac{L_n}{10}} \right) \text{ dB}$$

The results of the sound measurements taken at Sites 1 through 6 and Sites 8 through 10, combined with the applicable predicted sound level contribution from the proposed Project, demonstrate that the sound pressure levels will fall below South Brunswick’s Maximum Permissible A-Weighted Sound Levels limits for non-residential properties during operation.

The results of the sound measurements taken at Site 7, combined with the applicable predicted sound level contribution from the proposed Project, demonstrate that the sound pressure levels will fall below South Brunswick’s Maximum Permissible A-Weighted Sound Levels limits for residential properties during operation.

CONCLUSION

The results of the Sound Survey conducted at the proposed Davidsons Mill Road converter station site demonstrate that the Project will comply with the South Brunswick Code of Ordinances (Chapter 42 – Environment, Article IV – Noise Control). Should you have any questions or require any additional technical information, please do not hesitate to contact me at telephone number (781) 419-7749 or via email at mfeinblatt@essgroup.com.

Sincerely,

ESS GROUP, INC.

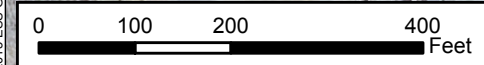
Michael E. Feinblatt
Vice President
Environmental Compliance & Monitoring Services

Attachments

Figure 1 – Baseline Sound Survey
Chapter 42, Article IV, Section 42-142 – Maximum permissible sound levels (South Brunswick, New Jersey)



Drawing Date: 20190830\MapData\LOB\SA592-XXX-Anbaric - NY, NJ Ocean Grid\07 TECHNICAL\A592-003 TO8 Davidson Mill Road Sound Survey\04 GRAPHIC\SMXD\BaselineSoundMeasurementLocations_20190830\BaselineSoundSurvey_Figure 1
 © 2015 ESS Group, Inc.



Anbaric Development Partners
 South Brunswick, New Jersey

1 inch = 200 feet
 Source: 1) NJOIT, Orthophotography, 2012 - 2013
 2) Middlesex County Department of Planning
 3) ESS Group, 2019

Legend

- Project Property Boundary
- Middlesex County Parcel Data
- X Sound Measurement Site

Baseline Sound Survey

Figure 1

Sec. 42-142. - Maximum permissible sound levels.

- (a) No person shall cause, suffer, allow, or permit the operation of any source of sound on any source property listed in section 42-138(a) in such a manner as to create a sound level that equals or exceeds the sound level limits set forth in Tables I, II or III when measured at or within the real property line of any of the receiving properties listed in Tables I, II or III except as specified in section 42-141(b).
- (b) *Impulsive sound* . Between 7:00 a.m. and 10:00 p.m., impulsive sound shall not equal or exceed 80 decibels. Between 10:00 p.m. and 7:00 a.m., impulsive sound which occurs less than four times in any one hour shall not equal or exceed 80 decibels. Impulsive sound which repeats four or more times in any one hour shall be measured as continuous sound and shall meet the requirements as shown in Tables I and II.

**TABLE I. MAXIMUM PERMISSIBLE A-WEIGHTED SOUND LEVELS
 WHEN MEASURED OUTDOORS**

RECEIVING PROPERTY CATEGORY	Residential property, or residential portion of a multi-use property	10 p.m.—7 a.m.	Commercial facility, public service facility, non-residential portion of a multi-use property, or community service facility
TIME	7 a.m.—10 p.m.	10 p.m.—7 a.m.	24 hours
Maximum A-Weighted sound level standard, dB	65	50	65

**TABLE II. MAXIMUM PERMISSIBLE A-WEIGHTED SOUND LEVELS
 WHEN MEASURED INDOORS**

RECEIVING PROPERTY CATEGORY	Residential property, or residential portion of a multi-use property	10 p.m.—7 a.m.	Commercial facility or non-residential portion of a multi-use property
TIME	7 a.m.—10 p.m.	10 p.m.—7 a.m.	24 hours
Maximum A-Weighted sound level standard, dB	55	40	55

Note— Table II shall only apply when the source and the receptor are separated by a real property line and they also share a common or abutting wall, floor or ceiling, or are on the same parcel of property.

**TABLE III. MAXIMUM PERMISSIBLE OCTAVE BAND SOUND PRESSURE LEVELS
 IN DECIBELS**

Receiving Property Category	Residential property, or residential portion of a multi-use property OUTDOORS		Residential property, or residential portion of a multi-use property INDOORS		Commercial facility, public service facility, nonresidential portion of a multi-use property, or community service facility OUTDOORS	Commercial facility or non-residential portion of a multi-use property INDOORS
	Octave Band Sound Pressure Level, dB		Octave Band Sound Pressure Level, dB		Octave Band Sound Pressure Level, dB	Octave Band Sound Pressure Level, dB
Octave Band Center Frequency, Hz	7 a.m.-10 p.m.	10 p.m.-7 a.m.	7 a.m.-10p.m.	10p.m.-7a.m.	24 hours	24 hours
31.5	96	86	86	76	96	86
63	82	71	72	61	82	72
125	74	61	64	51	74	64
250	67	53	57	43	67	57
500	63	48	53	38	63	53
1,000	60	45	50	35	60	50
2,000	57	42	47	32	57	47
4,000	55	40	45	30	55	45
8,000	53	38	43	28	53	43