In the Matter of

CERTAIN ERASABLE PROGRAMMABLE READ-ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES

Investigation No. 337-TA-276

USITC PUBLICATION 2196

MAY 1989

United States International Trade Commission
Washington, DC 20436

UNITED STATES INTERNATIONAL TRADE COMMISSION

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Address all communications to
Kenneth R. Mason, Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

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Washington, D.C. 20436

In the Matter of	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	Investigation No. 337-TA-276

NOTICE OF ISSUANCE OF LIMITED EXCLUSION ORDER
AND CEASE AND DESIST ORDERS

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the Commission has issued a limited exclusion order in the above-captioned investigation prohibiting the unlicensed importation of certain erasable programmable read only memories (EPROMs) manufactured abroad by Hyundai Electronics Industries Co., Ltd. as a contractor for General Instrument Corporation and/or Microchip Technology, Inc., whether in the form of single-unit packages, incorporated into a carrier of any form, mounted on a circuit board of any configuration, or contained in certain products, except for EPROMs which are the subject of a consent order issued by the Commission on August 25, 1988. In addition, the order prohibits the unlicensed importation of certain EPROMs manufactured abroad for Atmel Corporation, whether in the form of single-unit packages, incorporated into a carrier of any form, mounted on a circuit board of any configuration. In addition, the Commission has issued cease and desist orders to General Instrument Corporation, Microchip Technology, Inc., Atmel Corporation, Cypress Electronics, Inc., All-American Semiconductor, Inc., and Pacesetter Electronics, Inc., ordering them to cease and desist from the following activities: importing, selling for importation, assembling, testing, performing manufacturing steps with respect to, using, marketing, distributing, offering for sale, or selling, EPROMs which have been determined to be infringing. The orders apply to any of the affiliated companies, parents, subsidiaries, licensees, contractors, or other related business entities, or their successors or assigns, of the above-named companies.

FOR FURTHER INFORMATION CONTACT: Judith M. Czako, Esq., Office of the General Counsel, U.S. International Trade Commission, telephone 202-252-1093.

SUPPLEMENTARY INFORMATION: The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) and

in sections 210.56 and 210.58 of the Commission's Interim Rules of Practice and Procedure (53 F.R. 33071-72, Aug. 29, 1988).

The Commission instituted this investigation on September 16, 1987, in response to a complaint filed on August 5, 1987, by Intel Corporation (Intel) of Santa Clara, California. A supplement to the complaint was filed on September 2, 1987. Amendments to the complaint were filed on October 13, 1987, January 12, 1988, March 3, 1988, and September 16, 1988. Intel originally complained of unfair acts and unfair methods of competition in the importation and sale of certain EPROMs and products containing same, by reason of alleged direct and induced infringement of six U.S. product patents, and the manufacture abroad of the subject EPROMs in accordance with a process which, if practiced in the United States, would infringe claims of two U.S. process patents. The complaint further alleged that the tendency of the unfair methods of competition and unfair acts is to destroy or substantially injure an industry, efficiently and economically operated, in the United States. The complaint, and the Commission's original notice of investigation, named seven respondents allegedly engaged in the manufacture, importation, and sale of allegedly infringing EPROMs.

On September 16, 1988, following enactment of the Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418 (Aug. 23, 1988), Intel moved to amend the complaint and notice of investigation to, inter alia, delete the allegation of tendency to substantially injure the domestic industry, and the allegation of efficient and economic operation. The presiding administrative law judge (ALJ) granted Intel's motion and issued an ID (Order No. 137) amending the complaint and notice of investigation. The Commission denied two respondents' petitions for review of the ID, but determined to review the ID on its own motion and modified the ID in order to incorporate the claims of the patents remaining in controversy, which were omitted from the amended notice of investigation as set forth in the ID. 53 Fed. Reg. 45399 (Nov. 9, 1988).

On November 16, 1988, the ALJ issued her final initial determination (ID), finding that there is a violation of section 337 in the importation of certain EPROMs or the manufacture of certain EPROMs for importation. On January 3, 1989, the Commission ordered review of certain portions of the final ID, and requested written submissions regarding certain specific questions raised by the issues under review. The Commission determined not to review the remainder of the ID, which thereby became the determination of the Commission. The Commission also requested written submissions concerning the questions of remedy, the public interest, and bonding. 54 Fed. Reg. 1011 (Jan. 11, 1989). Having considered the record in this investigation, including the written submissions of the parties and comments from members of the public, the Commission made its determinations disposing of the issues on review, and the questions of remedy, the public interest, and bonding.

Notice of this investigation was published in the Federal Register of September 16, 1987 (52 F.R. 35004).

Copies of the Commission's Orders, the nonconfidential versions of opinions issued herewith, and all other nonconfidential documents filed in

connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW., Washington, D.C. 20436, telephone 202-252-1000. Hearing-impaired persons are advised that information on the matter can be obtained by contacting the Commission's TDD terminal on 202-252-1810.

By order of the Commission.

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	Investigation No. 337-TA-276

ORDER

The Commission instituted this investigation on September 16, 1987, in response to a complaint filed on August 5, 1987, by Intel Corporation (Intel) of Santa Clara, California. A supplement to the complaint was filed on September 2, 1987. Amendments to the complaint were filed on October 13, 1987, and January 12, March 3, and September 16, 1988. Intel originally complained of unfair acts and unfair methods of competition in the importation and sale of certain EPROMs and products containing EPROMs, by reason of alleged direct and induced infringement of six U.S. product patents, and the manufacture abroad of the subject EPROMs in accordance with a process which, if practiced in the United States, would infringe claims of two U.S. process patents. The complaint further alleged that the tendency of the unfair methods of competition and unfair acts is to destroy or substantially injure an industry, efficiently and economically operated, in the United States. The complaint, and the Commission's original notice of investigation, named seven respondents allegedly engaged in the manufacture, importation, and sale of allegedly infringing EPROMs.

On September 16, 1988, following enactment of the Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418 (Aug. 23, 1988), Intel moved to

amend the complaint and notice of investigation to, inter alia, delete the allegation of tendency to substantially injure the domestic industry, and the allegation of efficient and economic operation. The presiding administrative law judge (ALJ) granted Intel's motion and issued an ID (Order No. 137) amending the complaint and notice of investigation. The Commission denied two respondents' petitions for review of the ID, but determined to review the ID on its own motion and modified the ID in order to incorporate the claims of the patents remaining in controversy, which were omitted from the amended notice of investigation as set forth in the ID. 53 Fed. Reg. 45399 (Nov. 9, 1988).

On November 16, 1988, the ALJ issued her final initial determination (ID), finding that there is a violation of section 337 in the importation of certain EPROMs or the manufacture of certain EPROMs for importation. On January 3, 1989, the Commission ordered review of certain portions of the final ID. Specifically, the Commission ordered review of

1. Whether, as a matter of policy, the Commission should apply the doctrine of assignor estoppel in its consideration of the issue of violation of section 337 in this investigation;

2. Assuming the Commission does apply the doctrine of assignor estoppel in its consideration of the issue of violation of section 337 in this investigation, whether any of the respondents are in privity with George Perlegos, assignor of four of the seven patents in controversy;

3. What is the scope of the domestic industry;

4. Whether U.S. Letters Patent 3,938,108 is valid, whether any of respondents' products in issue infringe claims 14-17 of that patent, and whether the domestic industry produces articles protected by those claims of the patent;

5. Whether U.S. Letters Patent 4,048,518 is valid, whether any of respondents' products in issue infringe claims 1-3 of that patent, and whether the domestic industry produces articles protected by those claims of the patent;

6. Whether U.S. Letters Patent 4,223,394 is valid and enforceable, whether any of respondents' products in issue infringe claims 1-6 of that patent, and whether the domestic industry produces articles protected by those claims of the patent. Review on the validity issue is limited to the questions of claim construction and obviousness;

7. Whether U.S. Letters Patent 4,519,050 is valid, whether any of respondents' products in issue, other than Atmel's 1 megabit part, infringe claims 1-4 of that patent, and whether the domestic industry produces articles protected by those claims of the patent;

8. Whether U.S. Letters Patent 4,103,189 is valid. Review is limited to the question of inventorship;

9. Whether U.S. Letters Patent 4,685,084 is valid, whether any of respondents' products in issue infringe claims 1-10 of that patent, and whether the domestic industry produces articles protected by those claims of the patent; and

10. Whether U.S. Letters Patent 4,114,255 is valid, whether any of respondents' products in issue infringe claims 1-5 and 7-8 of that patent, and whether the domestic industry produces articles protected by those claims of the patent.

The Commission requested written submissions regarding certain specific questions raised by the issues under review. The Commission determined not to review the remainder of the ID, which thereby became the determination of the Commission. The Commission also requested written submissions concerning the questions of remedy, bonding, and the public interest. 54 Fed. Reg. 1011 (Jan. 11, 1989).

Having reviewed the record in this investigation, including the written submissions of the parties concerning the specific questions raised by the issues under review, the Commission has determined to reverse that portion of the ID finding that application of the doctrine of assignor estoppel in a section 337 investigation is not appropriate, and that portion of the ID

finding that respondents Hyundai Electronics Industries Co., Ltd., General Instrument Corporation, and Microchip Technology, Inc., are in privity with the inventor/assignor George Perlegos for purposes of assignor estoppel. In addition, the Commission has determined to reverse that portion of the ID finding claim 1 of U.S. Letters Patent 4,223,394 valid, that portion of the ID finding U.S. Letters Patent 4,103,189 invalid, that portion of the ID finding U.S. Letters Patent 4,114,255 invalid, and that portion of the ID finding that the domestic industry does not practice claim 1 of U.S. Letters Patent 4,223,394. Although the Commission has determined to affirm the ID in all other respects, it has made additional findings and adopted different and additional reasons for its conclusions. Thus, the Commission has determined that there is a violation of section 337 of the Tariff Act of 1930 in the unauthorized importation and sale for importation into the United States, and in the sale in the United States, of certain erasable programmable read only memories which infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084.

Having determined that there is a violation of section 337, the Commission considered the questions of the appropriate remedy, bonding during the Presidential review period, and whether public interest considerations preclude the issuance of a remedy. The Commission considered the submissions of the parties, comments received from members of the public, and the entire record in this investigation. The Commission has determined to issue a limited exclusion order prohibiting the unlicensed entry into the United States of certain EPROMs manufactured abroad by

Hyundai Electronics Industries Co., Ltd. as a contractor for General Instrument Corporation and/or Microchip Technology, Inc., whether in the form of single-unit packages, incorporated into a carrier of any form, mounted on a circuit board of any configuration, or contained in certain products, except for EPROMs which are the subject of a consent order issued by the Commission on August 25, 1988. In addition, the order prohibits the unlicensed importation of certain EPROMs manufactured abroad for Atmel Corporation, whether in the form of single-unit packages, incorporated into a carrier of any form, mounted on a circuit board of any configuration. In addition, the Commission has issued cease and desist orders to General Instrument Corporation, Microchip Technology, Inc., Atmel Corporation, Cypress Electronics, Inc., All-American Semiconductor, Inc., and Pacesetter Electronics, Inc., ordering them to cease and desist from the following activities: importing, selling for importation, assembling, testing, performing manufacturing steps with respect to, using, marketing, distributing, offering for sale, or selling, EPROMs which have been determined to be infringing. The orders apply to any of the affiliated companies, parents, subsidiaries, licensees, contractors, or other related business entities, or their successors or assigns, of the above-named companies.

The Commission has also determined that the public interest factors enumerated in sections 337(d) and 337(f) of the Tariff Act of 1930 do not preclude issuance of the limited exclusion and cease and desist orders, and that the bond during the Presidential review period should be in the amount of 100 percent of the entered value of the EPROMs in question.

Accordingly, it is hereby **ORDERED THAT** --

1. Erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by Hyundai Electronics Industries Co., Ltd. or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, pursuant to designs and process technology provided to it by General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, whether assembled or unassembled, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

2. Erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by Hyundai Electronics Industries Co., Ltd. or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, pursuant to designs and process technology provided to it by General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, incorporated into a carrier of any form, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

3. Erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by Hyundai Electronics Industries Co., Ltd. or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, pursuant to designs and process technology provided to it by General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, assembled onto circuit boards of any configuration, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

4. Computers, computer peripherals, telecommunications equipment, and automotive electronic equipment manufactured by Hyundai

Electronics Industries Co., Ltd, containing erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by Hyundai Electronics Industries Co., Ltd. or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, pursuant to designs and process technology provided to it by General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

5. Erasable programmable read only memories of 64, 256, 512, or 1024 kilobits manufactured abroad by or for Atmel Corporation or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, whether assembled or unassembled, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

6. Erasable programmable read only memories of 64, 256, 512, or 1024 kilobits manufactured abroad by or for Atmel Corporation or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, incorporated into a carrier of any form, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

7. Erasable programmable read only memories of 64, 256, 512, or 1024 kilobits manufactured abroad by or for Atmel Corporation, or any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, assembled onto circuit boards of any configuration, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

8. Erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by or for General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, whether assembled or unassembled, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

9. Erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by or for General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or clais 1 of U.S. Letters Patent 4,685,084, incorporated into a carrier of any form, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

10. Erasable programmable read only memories of 256 or 512 kilobits manufactured abroad by or for General Instrument Corporation or Microchip Technology, Inc., or any of their affiliated companies, parents, subsidiaries, licensees, contractors, or other related entities, or their successors or assigns, that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, assembled onto circuit boards of any configuration, are excluded from entry into the United States for the remaining terms of the patents, except under license of the patent owner or as provided by law.

11. Pursuant to procedures to be specified by the U.S. Customs Service, as the Customs Service deems necessary, persons seeking to import computers, computer peripherals, telecommunications equipment, or automotive electronic equipment manufactured by Hyundai Electronics Industries Co., Ltd., carriers of any form, and/or circuit boards of any configuration, containing EPROMs, shall, prior to the entry or at entry summary of such products into the United States, certify that they have made appropriate inquiry and thereupon state that to the best of their knowledge and belief any EPROMs incorporated into, assembled onto, or contained in such products are not covered by this Order.

12. The provisions of this Order do not apply to erasable programmable read only memories that are the subject of the consent order entered in this investigation by the Commission on August 16, 1988, or, in accordance with 19 U.S.C. § 1337(1), to erasable

programmable read only memories imported by or for the United States.

13. The provisions of this **Order** do not apply to assembled erasable programmable read only memories imported by or on behalf of Microchip Technology, Inc., containing chips which were wafer fabricated in the United States by Microchip Technology, Inc. Persons seeking to import assembled erasable programmable read only memories identified in this paragraph shall certify, pursuant to procedures to be specified by the U.S. Customs Service, as the Customs Service deems necessary, prior to entry or at entry summary of such articles into the United States, that the EPROM wafers from which the assembled EPROMs were manufactured were themselves fabricated in the United States by Microchip Technology, Inc.

14. The articles identified in paragraphs (1), (5), and (8) of this **Order** are entitled to entry into the United States under bond in the amount of 100 percent of their entered value from the day after this **Order** is received by the President, pursuant to subsection (j)(3) of section 337 of the Tariff Act of 1930, until such time as the President notifies the Commission that he approves or disapproves this **Order**, but, in any event, no later than 60 days after the date of receipt of this **Order** by the President.

15. The products identified in paragraphs (2), (3), (6), (7), (9), and (10) of this **Order** are entitled to entry into the United States under bond in the amount of 100 percent of the value of the erasable programmable read only memories contained therein or assembled thereon from the day after this **Order** is received by the President, pursuant to subsection (j)(3) of section 337 of the Tariff Act of 1930, until such time as the President notifies the Commission that he approves or disapproves this **Order**, but, in any event, no later than 60 days after the date of receipt of this **Order** by the President. Persons importing such products shall certify to the best of their knowledge the number of erasable programmable read only memories subject to this **Order** contained in such products, pursuant to procedures to be specified by the U.S. Customs Service, as the Customs Service deems necessary, prior to the entry or at entry summary of such products into the United States.

16. The products identified in paragraph (4) of this **Order** are entitled to entry into the United States free of bond from the day after this **Order** is received by the President, pursuant to subsection (j)(3) of section 337 of the Tariff Act of 1930, until such time as the President notifies the Commission that he approves or disapproves this **Order**, but, in any event, no later than 60 days after the date of receipt of this **Order** by the President.

17. The Commission may amend this Order in accordance with the procedure described in Interim Rule 211.57 of the Commission's Rules of Practice and Procedure, 53 Fed. Reg. 33043, 33076 (Aug. 29, 1988) (to be codified at 19 C.F.R. § 211.57).

18. A copy of this Order shall be served upon each party of record in this investigation; and

19. Notice of this Order shall be published in the Federal Register.

By order of the Commission.

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	Investigation No. 337-TA-276

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Atmel Corporation, 2095 Ringwood Avenue, San Jose, California 95131, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this **Order**:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean Atmel Corporation, 2095 Ringwood Avenue, San Jose, California 95131.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Colombia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this **Order**, specific conduct otherwise prohibited by the terms of this **Order**, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents specified in section III above to expire, and failure to report shall constitute a violation of this **Order**.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies

of all invoices, delivery orders, bills of lading, and other document concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this Order, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this Order.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this Order, a copy of the Order upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this Order upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this Order has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this Order will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this Order, or as

otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this **Order** may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this **Order**, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this **Order**.

X

(Modification)

This **Order** may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	)	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	)	Investigation No. 337-TA-276

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT General Instrument Corporation, 767 Fifth Avenue, New York, New York 10153, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean General Instrument Corporation, 767 Fifth Avenue, New York, New York 10153.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Colombia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 256 or 512 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 256 or 512 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this Order, specific conduct otherwise prohibited by the terms of this Order, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents specified in section III above to expire, and failure to report shall constitute a violation of this Order.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, or GI27C512.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, or GI27C512.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, or GI27C512.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies of all invoices, delivery orders, bills of lading, and other document concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this Order, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this Order.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this Order, a copy of the Order upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the

importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this Order upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this Order has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this Order will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this Order, or as otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this Order may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure,

53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this Order.

X

(Modification)

This Order may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	Investigation No. 337-TA-276

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Microchip Technology Incorporated, 2355 W. Chandler Blvd., Chandler, Arizona, 85224, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean Microchip Technology Incorporated, 2355 W. Chandler Blvd., Chandler, Arizona, 85224.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Colombia, and Puerto Rico.

II

(Applicability)

The provisions of this **Order** shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this **Order** by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 256 or 512 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or a permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 256 or 512 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this Order, specific conduct otherwise prohibited by the terms of this Order, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents

specified in section III above to expire, and failure to report shall constitute a violation of this Order.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, or GI27C512.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, or GI27C512.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, or GI27C512.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies of all invoices, delivery orders, bills of lading, and other document

concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this Order, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this Order.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this **Order**, a copy of the **Order** upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this **Order** upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this **Order** has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this **Order** will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this **Order**, or as

otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this Order may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this Order.

X

(Modification)

This Order may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	Investigation No. 337-TA-276

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT All-American Semiconductor, Inc., 16251 N.W. 54th Avenue, Miami, Florida, 33014, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean All-American Semiconductor, Inc., 16251 N.W. 54th Avenue, Miami, Florida, 33014.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Colombia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this Order, specific conduct otherwise prohibited by the terms of this Order, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents

specified in section III above to expire, and failure to report shall constitute a violation of this Order.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies

of all invoices, delivery orders, bills of lading, and other document concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this Order, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this Order.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this Order, a copy of the Order upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this Order upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this Order has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this Order will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this Order, or as

otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this **Order** may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this **Order**, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this **Order**.

X

(Modification)

This **Order** may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	)	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	)	Investigation No. 337-TA-276

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Cypress Electronics, Inc., 2175 Martin Avenue, Santa Clara, California 95050, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean Cypress Electronics, Inc., 2175 Martin Avenue, Santa Clara, California 95050.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Colombia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this Order, specific conduct otherwise prohibited by the terms of this Order, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents

specified in section III above to expire, and failure to report shall constitute a violation of this Order.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies

of all invoices, delivery orders, bills of lading, and other document concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this **Order**, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this **Order** and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this **Order**.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this Order, a copy of the Order upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this Order upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this Order has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this Order will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this Order, or

otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this Order may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this Order.

X

(Modification)

This Order may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	)	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	)	Investigation No. 337-TA-276

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Pacesetter Electronics, Inc., 5417 E. La Palma Avenue, Anaheim, California, 92817, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean Pacesetter Electronics, Inc., 5417 E. La Palma Avenue, Anaheim, California, 92817.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Colombia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this Order, specific conduct otherwise prohibited by the terms of this Order, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents

specified in section III above to expire, and failure to report shall constitute a violation of this Order.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations GI27256, GI27C256, GI27C512, Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies

of all invoices, delivery orders, bills of lading, and other document concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this Order, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this Order.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this Order, a copy of the Order upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this Order upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this Order has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this Order will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this Order, or as

otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this Order may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this Order.

X

(Modification)

This Order may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: March 16, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	)	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	)	Investigation No. 337-TA-276

NOTICE OF VACATUR OF COMMISSION CEASE AND DESIST ORDER AND ISSUANCE OF MODIFIED CEASE AND DESIST ORDER

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the Commission has vacated the cease and desist order issued on March 16, 1989, to Atmel Corporation in the above-captioned investigation, and has issued a modified cease and desist order to Atmel Corporation.

FOR FURTHER INFORMATION CONTACT: Judith M. Czako, Esq., Office of the General Counsel, U.S. International Trade Commission, telephone 202-252-1093.

SUPPLEMENTARY INFORMATION: The authority for the Commission's action is contained in section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337), sections 210.58(3)-(7) and 211.57 of the Commission's interim rules (53 Fed. Reg. 33076-77 (Aug. 29, 1988), 53 Fed. Reg. 49133-35 (December 6, 1988)), and the Order of the U.S. Court of Appeals for the Federal Circuit in No. 89-1382, In re Atmel Corporation, (April 27, 1989)(unpublished Order).

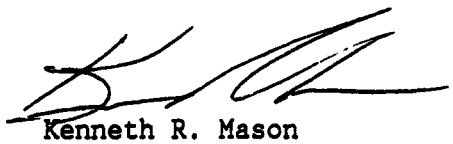
On April 27, 1989, the U.S. Court of Appeals for the Federal Circuit issued a writ of mandamus directing the Commission to vacate the cease and desist order that the Commission issued issued to Atmel Corporation on March 16, 1989, and providing that the Commission could modify or reissue a cease and desist order in accordance with section 337(j)(3) of the Tariff Act of 1930 (as amended) and the Court's order.

Notice of this investigation was published in the Federal Register of September 16, 1987 (52 F.R. 35004).

Copies of the Commission's Order, the modified cease and desist order issued to Atmel Corporation, and all other nonconfidential documents filed

in connection with this investigation are available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW., Washington, D.C. 20436, telephone 202-252-1000. Hearing-impaired persons are advised that information on the matter can be obtained by contacting the Commission's TDD terminal on 202-252-1810.

By order of the Commission.



Kenneth R. Mason
Secretary

Issued: April 28, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	)	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	)	Investigation No. 337-TA-276

ORDER

On April 27, 1989, the U.S. Court of Appeals for the Federal Circuit issued a writ of mandamus, effective April 28, 1989, directing the Commission to vacate the cease and desist order that the Commission issued to Atmel Corporation on March 16, 1989. In re Atmel Corporation, No. 89-1382 (Fed. Cir. April 27, 1989)(unpublished Order).

Accordingly, it is hereby ORDERED that --

1. The cease and desist order issued by the Commission to Atmel Corporation on March 16, 1989, is vacated;

2. A copy of this Order shall be served upon each party of record in this investigation; and

3. Notice of this Order shall be published in the Federal Register.

By order of the Commission.

Kenneth R. Mason
Secretary

Issued: April 28, 1989

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	Investigation No. 337-TA-276

MODIFIED ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Atmel Corporation, 2095 Ringwood Avenue, San Jose, California 95131, cease and desist from importing, selling for importation, assembling, testing, marketing, distributing, offering for sale, and selling in the United States certain erasable programmable read only memories in violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337).

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051.

(C) "Respondent" shall mean Atmel Corporation, 2095 Ringwood Avenue, San Jose, California 95131.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business

entity other than the above Respondent or its majority owned and/or controlled subsidiaries, their successors, or assigns.

(E) "United States" shall mean the fifty states, the District of Columbia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to Respondent and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority owned business entities, successors and assigns, all persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VII hereof.

III

(Conduct Prohibited)

Respondent shall not import into or sell for importation into the United States, erasable programmable read only memories, whether assembled or unassembled, of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

Respondent shall not assemble, test, market, distribute, offer for sale, or sell in the United States, imported erasable programmable read only memories of 64, 256, 512, or 1024 kilobits that infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084, except under license of the patent owner, or as permitted by law, unless the wafer from which such erasable programmable read only memory was manufactured was fabricated in the United States.

IV

(Conduct Permitted)

Notwithstanding any other provisions of this Order, specific conduct otherwise prohibited by the terms of this Order, shall be permitted if, in a written instrument, such specific conduct is licensed or authorized by complainant or related to the importation or sale of erasable programmable read only memories by or for the United States.

V

(Reporting)

For purposes of this reporting requirement, each reporting period shall commence on the first day of July, and shall end on the following last day of June. The first report required under this section shall cover the period March 16, 1989, to June 30, 1989. This reporting requirement shall continue in force until the date of expiration of the last of the patents specified in section III above to expire, and failure to report shall constitute a violation of this Order.

Within 30 days of the last day of each reporting period, Respondent shall report to the Commission the following:

(A) Its importations, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and/or process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(B) Its sales in the United States, measured in units, of erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell erasable programmable read only memories, if any, during the reporting period in question, manufactured according to designs and process technology provided by Respondent to any person used in the manufacture of erasable programmable read only memories bearing, as of the date of this Order, the product designations Atmel 27HC64, Atmel 27HC256, Atmel 27C256, Atmel 27C512/513/515, and/or Atmel 27C1024.

In connection with the importation and sales referred to in paragraphs (A) and (B) above, Respondent shall provide the Commission with two copies

of all invoices, delivery orders, bills of lading, and other document concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs (A) and (B) above.

VI

(Compliance and Inspection)

(A) For the purposes of securing compliance with this Order, Respondent shall retain any and all records relating to the importation to or sale in the United States of erasable programmable read only memories referred to in paragraphs (V)(A) and (V)(B) above made and received in the usual and ordinary course of its business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by Federal Courts of the United States, Respondent shall furnish or otherwise make available for inspection and copying to duly authorized representatives of the Commission, and in the presence of counsel or other representative if Respondent so chooses, upon reasonable written notice by the Commission or its staff, all books, ledgers, accounts, correspondence, memoranda, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section V of this Order.

VII

(Service of Cease and Desist Order)

Respondent is ordered and directed to:

(A) Serve, within 30 days after the date of issuance of this **Order**, a copy of the **Order** upon each of its respective officers, directors, managing agents, agents and employees who have any responsibility for the importation, marketing, distribution or sale of imported EPROMs in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph VII(A), a copy of this **Order** upon each successor.

(C) Maintain such records as will show the name, title, and address of each person described in paragraph VII(A) and (B) above upon whom this **Order** has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs VII (B) and (C) above shall remain in effect until the date of expiration of the last of the patents specified in section III above to expire.

VIII

(Confidentiality)

Information obtained by the means provided for in sections V and VI of this **Order** will be made available only to the Commission and its authorized representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than duly authorized representatives of the Commission, except as may be required in the course of securing compliance with this **Order**, or as

as otherwise required by law. Disclosure hereunder will not be made by the Commission without ten (10) days prior notice in writing to Respondent.

IX

(Enforcement)

Violation of this Order may result in any of the actions specified in section 211.56 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33075 (August 29, 1988), including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), and such other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information as required by this Order.

X

(Modification)

This Order may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33076 (August 29, 1988).

XI

(Bonding)

With respect to erasable programmable read only memories (EPROMs) imported prior to March 16, 1989, the conduct prohibited by paragraph III of this Order may be continued during the period the Commission's determination and order are before the President for his review pursuant to

section 337(j) of the Tariff Act of 1930 (as amended) subject to Respondent posting a bond in the amount of 50 percent of the sales revenues realized from the sale of the EPROMs in question. This bond provision does not apply to conduct which is otherwise permitted by paragraph IV of this Order. EPROMs imported on or after March 16, 1989, remain subject to the entry bond as set forth in the limited exclusion order issued by the Commission on March 16, 1989, and are not subject to this bond provision. The reporting requirements of paragraph V of this Order shall be effective as of March 16, 1989.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders (53 Fed. Reg. 49133-34 (Dec. 6, 1988)).

The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by paragraph III of this Order.

The bond is to be forfeit in the event that the President approves, or does not disapprove within the Presidential review period, the Commission's determination and order of March 16, 1989 and this Order, or any subsequent order issued after the President has disapproved this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses the Commission's final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the President disapproves the Commission's March 16, 1989, determination and this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the President, upon service on Respondent of an Order issued by the Commission based upon application therefor made by Respondent to the Commission.

By Order of the Commission

Kenneth R. Mason
Secretary

Issued: April 28, 1989

TABLE OF CONTENTS

TABLE OF ABBREVIATIONS

ALJ	the presiding Commission administrative law judge (Judge Saxon)
Atmel	respondent Atmel Corporation
CAFC	the U.S. Court of Appeals for the Federal Circuit (also Fed. Cir.)
CCPA	the U.S. Court of Customs and Patent Appeals.
CMOS	complementary channel metal oxide semiconductor
EPROM	erasable programmable read only memory
GI	respondent General Instrument Corporation
GI/Microchip	respondent GI and its wholly owned subsidiary, respondent Microchip Technology, Inc.
Hyundai	respondent Hyundai Electronics Industries Co., Ltd. (Korea)
HEA	respondent Hyundai Electronics America, Inc. (Hyundai's U.S. subsidiary)
IA	Commission investigative attorney (Mr. Rinkerman and/or Ms. Sorkin)
ID	The presiding ALJ's 357-page final initial determination, issued November 16, 1988.
Intel	complainant Intel Corporation
K	kilobit (1,024 bits of memory capacity)
M	megabit (1 million bits of memory capacity)
MOS	metal oxide semiconductor
NMOS	N-channel metal oxide semiconductor
OTCA	Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418, 102 Stat. 1107, (Aug. 23, 1988)
PTO	U.S. Patent and Trademark Office
Tr	Transcript of the evidentiary hearing

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	)	
CERTAIN ERASABLE PROGRAMMABLE READ ONLY MEMORIES, COMPONENTS THEREOF, PRODUCTS CONTAINING SUCH MEMORIES, AND PROCESSES FOR MAKING SUCH MEMORIES	)	Investigation No. 337-TA-276

COMMISSION OPINION ON VIOLATION, AND REMEDY, BONDING, AND THE PUBLIC INTEREST

INTRODUCTION

The Commission instituted this investigation on September 16, 1987, in response to a complaint filed on August 4, 1987, by Intel Corporation (Intel), of Santa Clara, California. 1/ A supplement to the complaint was filed on September 2, 1987. Amendments to the complaint were filed on October 13, 1987, and January 12, March 3, and September 16, 1988. Intel originally complained of unfair acts and unfair methods of competition in the importation and sale of certain EPROMs and products containing EPROMs, by reason of alleged direct and induced infringement of six U.S. product patents, and the manufacture abroad of the subject EPROMs in accordance with a process which, if practiced in the United States, would infringe claims of two U.S. process patents. The complaint further alleged that the tendency of the unfair methods of competition and unfair acts is to destroy or substantially injure an industry, efficiently and economically operated, in the United States. The complaint, and the Commission's original notice

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1/ Notice of Investigation, 52 Fed. Reg. 35004 (Sept. 16, 1987).

of investigation, named seven respondents allegedly engaged in the manufacture, importation, and sale of allegedly infringing EPROMs. 2/

On September 16, 1988, following enactment of the Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418 (Aug. 23, 1988), Intel moved to amend the complaint and notice of investigation to, inter alia, delete the allegation of tendency to substantially injure the domestic industry, and the allegation of efficient and economic operation. The presiding administrative law judge (ALJ) granted Intel's motion and issued an initial determination (ID) (Order No. 137) amending the complaint and notice of investigation. The Commission denied two respondents' petitions for review of the ID, but determined to review the ID on its own motion and modified the ID in order to incorporate the claims of the patents remaining in controversy, which were omitted from the amended notice of investigation as set forth in the ID. 53 Fed. Reg. 45399 (Nov. 9, 1988). Thus, the investigation is to determine whether there is a violation of section 337 of the Tariff Act of 1930 in the sale for importation, importation into the United States, or sale in the United States, of certain erasable programmable read only memories (EPROMs) which allegedly infringe certain U.S. patents owned by Intel. 3/

On November 16, 1988, the ALJ issued her final initial determination (ID), finding that there is a violation of section 337 in the importation of EPROMs or the manufacture of EPROMs for importation. Petitions for review and responses thereto were received from complainant Intel, and all respondents remaining in the investigation. On January 3, 1989, the

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2/ Notice of Investigation, 52 Fed. Reg. 35004 (Sept. 16, 1987).

3/ Amended Notice of Investigation, 53 Fed. Reg. 45399 (Nov. 9, 1988).

Commission determined to review certain issues, and determined not to review the remainder of the ID, which thereby became the determination of the Commission. 4/ The Commission also requested written submissions responding to specific questions raised by the issues on review, as well as submissions concerning remedy, the public interest, and bonding.

The Commission received submissions on the issues specified for review from all parties, received submissions on remedy, the public interest, and bonding from all parties as well, and received a submission on the public interest filed by the Department of Defense.

Having reviewed the record in this investigation, including the written submissions of the parties concerning the specific questions raised by the issues under review, the Commission has determined to reverse that portion of the ID finding that application of the doctrine of assignor estoppel in a section 337 investigation is not appropriate, and that portion of the ID finding that respondents Hyundai Electronics Industries Co., Ltd., General Instrument Corporation, and Microchip Technology, Inc., are in privity with the inventor/assignor George Perlegos for purposes of assignor estoppel. In addition, the Commission has determined to reverse that portion of the ID finding claim 1 of U.S. Letters Patent 4,223,394 valid and not infringed, that portion of the ID finding claim 2 of U.S. Letters Patent 4,223,394 not infringed, that portion of the ID finding claim 2 of U.S. Letters Patent 4,223,394 is not practiced by the domestic industry, that portion of the ID finding U.S. Letters Patent 4,103,189 invalid, and that portion of the ID finding U.S. Letters Patent 4,114,255

4/ Notice of Commission decision on whether to review initial determination, specification of issues for review, and schedule for filing of written submission on review, and on remedy, the public interest, and bonding, 54 Fed. Reg. (Jan. , 1989).

invalid. Although the Commission has determined to affirm the ID in all other respects, it has made additional findings and adopted different and additional reasons for its conclusions. Thus, the Commission has determined that there is a violation of section 337 of the Tariff Act of 1930 in the unauthorized importation and sale for importation into the United States, and in the sale in the United States, of certain erasable programmable read only memories which infringe claim 2 of U.S. Letters Patent 4,223,394, claims 1-4 of U.S. Letters Patent 4,519,050, claims 1-3 of U.S. Letters Patent 4,103,189, and/or claim 1 of U.S. Letters Patent 4,685,084.

Having determined that there is a violation of section 337, the Commission considered the questions of the appropriate remedy, whether public interest considerations preclude the issuance of a remedy, and bonding during the Presidential review period. The Commission considered the submissions of the parties, comments received from members of the public and government agencies, and the entire record in this investigation. The Commission has determined to issue a limited exclusion order prohibiting the unlicensed entry into the United States of certain EPROMs manufactured abroad by Hyundai Electronics Industries Co., Ltd. as a contractor for General Instrument Corporation and/or Microchip Technology, Inc., whether in the form of single-unit packages, incorporated into a carrier of any form, mounted on a circuit board of any configuration, or contained in certain products, except for EPROMs which are the subject of a consent order issued by the Commission on August 25, 1988. In addition, the order prohibits the unlicensed importation of certain EPROMs manufactured abroad by or for Atmel Corporation, General Instrument Corporation, and/or Microchip Technology, Inc., whether in the form of

single-unit packages, incorporated into a carrier of any form, or mounted on a circuit board of any configuration. In addition, the Commission has issued cease and desist orders to General Instrument Corporation, Microchip Technology, Inc., Atmel Corporation, Cypress Electronics, Inc., All-American Semiconductor, Inc., and Pacesetter Electronics, Inc., ordering them to cease and desist from the following activities: importing, selling for importation, assembling, testing, performing manufacturing steps with respect to, using, marketing, distributing, offering for sale, or selling, EPROMs which have been determined to be infringing. The orders apply to any of the affiliated companies, parents, subsidiaries, licensees, contractors, or other related business entities, or their successors or assigns, of the above-named companies.

The Commission has also determined that the public interest factors enumerated in sections 337(d) and 337(f) of the Tariff Act of 1930 do not preclude issuance of aforementioned the limited exclusion and cease and desist orders, and that the bond during the Presidential review period should be in the amount of 100 percent of the entered value of the EPROMs in question.

PROCEDURAL HISTORY 5/

As noted, this investigation was instituted on September 16, 1987, in response to a complaint filed by Intel on August 5, 1987. Intel originally complained of unfair acts and unfair methods of competition in the importation and sale of certain EPROMs and products containing same, by

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5/ Because of the length and complexity of the proceedings in this investigation, only those aspects of the procedural history which involved Commission determinations or were relevant on review are discussed herein.

reason of alleged direct and induced infringement of six U.S. product patents, and the manufacture abroad of the subject EPROMs in accordance with a process which, if practiced in the United States, would infringe claims of two U.S. process patents. 6/ The complaint further alleged that the tendency of the unfair methods of competition and unfair acts is to destroy or substantially injure an industry, efficiently and economically operated, in the United States.

The complaint, and the Commission's original notice of investigation, named seven respondents. 7/ The Korean respondent, Hyundai Electronics Industries Co., Ltd. (Hyundai), allegedly engaged in the manufacture of allegedly infringing EPROMs. Hyundai's U.S. subsidiary, Hyundai Electronics America, Inc. (HEA), allegedly engaged in the importation into and sale in the United States of allegedly infringing EPROMs. Respondents Atmel Corporation (Atmel) and International CMOS Technology, Inc. (ICT)

6/ The eight patents, and the specific claims at issue, were (1) claims 14-17 of U.S. Letters Patent 3,938,108, entitled Erasable Programmable Read-Only Memory (the '108 patent); (2) claims 1-3 of U.S. Letters Patent 4,048,518, entitled MOS Buffer Circuit (the '518 patent); (3) claims 1-3 of U.S. Letters Patent 4,103,189, entitled MOS Buffer Circuit (the '189 patent); (4) claims 1 and 2 of U.S. Letters Patent 4,223,394, entitled Sensing Amplifier for Floating Gate Memory Devices (the '394 patent); (5) claims 1-4 of U.S. Letters Patent 4,519,050, entitled Radiation Shield for an Integrated Circuit Memory with Redundant Elements (the '050 patent); (6) claims 1-10 of U.S. Letters Patent 4,685,084, entitled Apparatus for Selecting Alternate Addressing Mode and Read-Only Memory (the '084 patent); (7) claims 1-5, 7, and 8 of U.S. Letters Patent 4,114,255, entitled Floating Gate Storage Device and Method of Fabrication (the '255 patent); and (8) claims 1-3 of U.S. Letters Patent 4,519,849, entitled Method of Making EPROM Cell with Reduced Programming Voltage (the '849 patent).

7/ The seven original respondents were (1) Hyundai Electronics Industries Co., Ltd., a Korean corporation; (2) Hyundai Electronics America, Inc., a U.S. subsidiary of Hyundai Electronics Industries Co., Ltd.; (3) Atmel Corporation, a U.S. corporation; (4) International CMOS Technology, Inc., a U.S. corporation; (5) Cypress Electronics, Inc., a U.S. corporation; (6) All-American Semiconductor, Inc., a U.S. corporation; and (7) Pacesetter Electronics, Inc., a U.S. corporation.

allegedly engaged in the importation into and sale in the United States of allegedly infringing EPROMs. The remaining three respondents allegedly engaged in the sale in the United States of allegedly infringing imported EPROMs.

Following institution, Chief Administrative Law Judge Saxon designated herself the presiding ALJ. In response to a motion filed by Hyundai, and supported by the Commission investigative attorney (Mr. Rinkerman), the ALJ issued an ID (Order No. 1), designating the investigation "more complicated." The Commission determined not to review the ID, which thereby became the determination of the Commission. 51 Fed. Reg. 44231 (Nov. 18, 1987). The deadline for completion of the investigation was extended to the full eighteen months available under the statute, and the statutory deadline for completion of the investigation is therefore March 16, 1989.

In response to a motion filed by complainant Intel, the ALJ issued an ID (Order No. 2) amending the notice of investigation to add General Instrument Corporation as a respondent. The Commission determined not to review the ID, which thereby became the determination of the Commission. 52 Fed. Reg. 46688 (Dec. 9, 1987).

In response to a motion filed by Seeq Technology, Inc., the ALJ issued an ID (Order No. 13) permitting Seeq to intervene in the investigation for the limited purpose of protecting its trade secrets. The Commission determined not to review the ID, which thereby became the determination of the Commission. 53 Fed. Reg. 291 (Jan. 6, 1988).

In response to a motion filed by complainant Intel seeking to add claims 3-6 of the '394 patent to the notice of investigation, the ALJ issued an ID (Order No. 37) amending the complaint to include allegations

of infringement of any claims of the '394 patent. The Commission determined to review the ID on its own motion, and affirmed that part of the ID amending the notice of investigation to include claims 3-6 of the '394 patent, and reversing that part of the ID which amended the notice of investigation to include claims 7-15 of that patent. 53 Fed. Reg. 6708 (March 2, 1988).

In response to a motion filed by complainant Intel, the ALJ issued an ID (Order No. 58) adding Microchip Technology, Inc., as a respondent to the investigation. The Commission determined not to review the ID, which thereby became the determination of the Commission. 53 Fed. Reg. 15147 (Apr. 27, 1988).

In response to a motion filed by complainant Intel, the ALJ issued an ID (Order No. 95) terminating respondent ICT from the investigation on the basis of a consent order. The Commission determined not to review the ID, which thereby became the determination of the Commission. 53 Fed. Reg. 20191 (June 2, 1988).

On May 6, 1988, respondent Hyundai filed a motion for partial summary determination on the issues of importation and sale, contending that it was not a proper respondent in the investigation because it acted only as a foundry in Korea for respondents General Instrument and Microchip Technology. On May 31, 1988, the ALJ issued Order No. 118, denying the motion.

In response to a motion filed by respondent Atmel, the ALJ issued an ID (Order No. 113) granting partial summary determination with respect to one EPROM at issue in the investigation. The Commission determined not to review the ID, which thereby became the determination of the Commission. 53 Fed. Reg. 23703 (June 23, 1988).

In response to a joint motion filed by complainant Intel and respondent HEA, the ALJ issued an ID (Order No. 128) terminating respondent HEA from the investigation on the basis of a consent order. The Commission determined not to review the ID, which thereby became the determination of the Commission. 53 Fed. Reg. 32477 (Aug. 25, 1988).

On August 23, 1988, the Omnibus Trade and Competitiveness Act of 1988 (the OTCA) was signed into law. Pub. L. 100-418 (Aug. 23, 1988). On August 1, 1988, respondent Hyundai filed a brief with the ALJ concerning whether the then-pending bill, if enacted, would apply to the EPROMs investigation. The ALJ ordered that only evidence pertaining to section 337 as amended by the OTCA would be presented at the trial on the economic issues, which was scheduled to commence on August 8, 1988. On August 4, 1988, the day after the bill that became the OTCA was passed by the Senate, complainant Intel filed a request with the ALJ seeking a ruling that the amendments to section 337 made by the OTCA would apply to this investigation. On August 23, 1988, the Commission issued its Interim Rules implementing the statutory changes to, inter alia, section 337. In the preamble to the Interim Rules, the Commission stated that it had --

> determined to apply the amendments to section 337 contained in the new legislation to all pending section 337 investigations. To the extent that such amendments affect the scope of a pending investigation, the Commission expects that a motion will be made to amend the scope and notice of that investigation pursuant to interim rule 210.22.

On August 26, 1988, the ALJ issued an order granting Intel's motion, and stating that "a public statement of the Commission construing the new law is binding on the administrative law judges in deciding a motion raising the same issue." Order No. 130 at 2. Respondents Hyundai and Atmel

requested leave to file an application for interlocutory review of Order No. 130, which the ALJ denied. Order No. 131.

On September 16, 1988, Intel moved to amend the complaint and notice of investigation to, inter alia, delete the allegation of tendency to injure the domestic industry, and the allegation of efficient and economic operation. 8/ The ALJ granted Intel's motion and issued an ID (Order No. 137) amending the complaint and notice of investigation. Respondents Hyundai and Atmel filed petitions for review of the ID, arguing that the OTCA does not apply to section 337 investigations instituted prior to the August 23, 1988 effective date of the OTCA. The Commission denied Hyundai and Atmel's petitions for review, but determined to review the ID on its own motion and modified the ID in order to incorporate the claims of the patents remaining in controversy, which were omitted from the amended notice of investigation as set forth in the ID. 53 Fed. Reg. 45399 (Nov. 9, 1988).

Following the receipt of petitions for review and responses thereto from all parties remaining in the investigation, the Commission, on January 3, 1989, determined to review certain portions of the ID. 9/ Specifically, the Commission determined to review:

1. Whether, as a matter of policy, the Commission should apply the doctrine of assignor estoppel in its consideration of the issue of violation of section 337 in this investigation;

8/ Intel also sought to conform the complaint and notice of investigation to the termination and addition of respondents and patent claims described above, and to conform the complaint to the evidence presented at trial.

9/ Notice of Commission decision on whether to review initial determination, specification of issues for review, and schedule for filing of written submission on review, and on remedy, the public interest, and bonding, 54 Fed. Reg. (Jan. , 1989).

2. Assuming the Commission does apply the doctrine of assignor estoppel in its consideration of the issue of violation of section 337 in this investigation, whether any of the respondents are in privity with George Perlegos, assignor of four of the seven patents in controversy;

3. What is the scope of the domestic industry;

4. Whether U.S. Letters Patent 3,938,108 is valid, whether any of respondents' products in issue infringe claims 14-17 of that patent, and whether the domestic industry produces articles protected by those claims of the patent;

5. Whether U.S. Letters Patent 4,048,518 is valid, whether any of respondents' products in issue infringe claims 1-3 of that patent, and whether the domestic industry produces articles protected by those claims of the patent;

6. Whether U.S. Letters Patent 4,223,394 is valid and enforceable, whether any of respondents' products in issue infringe claims 1-6 of that patent, and whether the domestic industry produces articles protected by those claims of the patent. Review on the validity issue was limited to the questions of claim construction and obviousness;

7. Whether U.S. Letters Patent 4,519,050 is valid, whether any of respondents' products in issue, other than Atmel's 1 megabit part, infringe claims 1-4 of that patent, and whether the domestic industry produces articles protected by those claims of the patent;

8. Whether U.S. Letters Patent 4,103,189 is valid. Review was limited to the question of inventorship;

9. Whether U.S. Letters Patent 4,685,084 is valid, whether any of respondents' products in issue infringe claims 1-10 of that patent, and whether the domestic industry produces articles protected by those claims of the patent; and

10. Whether U.S. Letters Patent 4,114,255 is valid, whether any of respondents' products in issue infringe claims 1-5 and 7-8 of that patent, and whether the domestic industry produces articles protected by those claims of the patent.

The Commission requested written submissions concerning specific questions raised by the issues under review. The Commission determined not to review the remainder of the ID, which thereby became the determination of the Commission. The Commission also determined to deny Atmel's appeal of the ALJ's ruling excluding certain evidence concerning the

interpretation of the license agreement between Intel and [

], to deny Intel's request to reopen the record to allow introduction of additional evidence concerning Atmel's 1 megabit EPROM, and to deny Atmel's appeal of the ALJ's ruling allowing Intel to withdraw an exhibit relating to U.S. Letters Patent 4,048,518, upon which Atmel sought to rely as prior art. In addition, the Commission took under advisement the question of whether certain portions of the ID should be published, or whether they contain business confidential information which should not be published, and will make its decision on this question at a later date. The Commission also requested written submissions concerning the questions of remedy, the public interest, and bonding.

GENERAL BACKGROUND

An erasable programmable read only memory (EPROM) is a monolithic integrated circuit containing thousands of metal oxide semiconductor (MOS) transistor cells on which encoded binary information can be stored. 10/ The transistor cells in an EPROM are arranged in arrays of rows and columns, permitting individual access to each cell. 11/ In addition to the transistor (memory) cells, an EPROM has various other electronic elements, which operate as sensing devices, operating circuits, buffers, etc. EPROMs are used to store programs for various computer operations. EPROMs can be

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10/ EPROMs were first introduced in the early 1970s with a memory capacity (density) of 2,048 (2K, with K representing "kilobit" or 1,024 bits of memory). Since then, the densities of EPROMs have progressively increased. Currently, 256K and 512K EPROMs represent the bulk of production. One megabit (1,024,000 bits) EPROMs are also in production, and still higher densities are in development.

11/ The speed at which the individual cells can be addressed is called access time, and is expressed in nanoseconds (ns). A nanosecond is one billionth of a second.

programmed, then erased by the application of ultraviolet radiation and reprogrammed, as the needs of the user dictate.

An EPROM cell is generally comprised of four electrodes: a source, a drain, a control gate, and a "floating" gate. An EPROM is programmed by the selective charging of the floating gates of the cells. Once the gates are charged, they remain charged indefinitely, even when the power is turned off. This ability to retain the stored charges distinguishes EPROMs from other types of memory cells, such as dynamic random access memories (DRAMs), which require constant refresh charges to retain stored information.

An EPROM is programmed by applying a relatively high voltage, on the order of 25 volts, to the control gates of selected cells. This places an electric charge on the cell's floating gate. The floating gate is insulated in order to hold the charge. 12/ EPROMs store information in each cell in the form of a binary digit (a "bit"), i.e., a "one" or a "zero." A charged gate represents a binary one, and an uncharged gate represents a binary zero.

In order to read an EPROM cell, it must be accessed by addressing both its row and its column. This is done by applying a selected voltage, on the order of 5 volts, to the row (word) line, and the column (bit) line. If the floating gate of the selected cell is uncharged, the presence of these voltages will cause the cell to conduct electric current from its drain to its source. Since the source is connected to ground (i.e., zero voltage), once it begins to conduct electric current from the drain, the

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12/ The application of ultraviolet radiation causes the insulation around the floating gate to conduct electricity, thereby causing the gate to lose the charge previously applied to it.

voltage at the drain is pulled down to zero. This "low" voltage is detected or "read" by a sense amplifier.

If the floating gate of the cell selected to be read is charged, the 5 volt signal applied by the word line will not cause the cell to conduct electric current. Thus, the voltage at the drain is not pulled down. This "high" voltage is detected by the sense amplifier. Once the sense amplifier has detected the voltage at the drain of a selected cell, it "amplifies" that voltage, and passes it on to the output circuitry of the EPROM, which allows the information, i.e., whether that particular cell stored a binary one or zero, to be used.

An EPROM memory cell is a particular type of metal oxide semiconductor field effect transistor (MOSFET or FET), characterized by the presence of a floating gate. Other MOSFETs, without floating gates, comprise the basic operating elements (other than memory cells) of an EPROM. Some of these elements are involved in the patents in controversy. These other FETs are of various types, including n-channel FETs, p-channel FETs, zero threshold FETs, and enhancement or depletion mode FETs. N- or p- channel refers to the type of semiconductor material (negative or positive) which comprises the passage (channel) through which electric current flows. Zero threshold FETs conduct current when a very low voltage, on the order of tenths of volts, is applied to their gates. These types of devices are described in more detail in connection with the discussion of the patents in controversy with which they are involved.

EPROM chips or dice are produced in large numbers on a single silicon wafer. The number of chips on a single wafer depends on the size of the wafer, and on the EPROM "geometry," i.e., the scale of the circuitry of the

EPROM. 13/ Wafer fabrication involves repeated photolithographic steps, thin films dispersion, etching, and the controlled introduction of impurities (dopants) in order to define the individual circuits on the wafer. Wafer fabrication must be done under "clean room" conditions, with tightly controlled temperature and humidity, and extraordinarily small volumes of minute particulates in the air, or else the resulting chips will have unacceptably high failure rates. After wafer fabrication, individual chips are tested, then cut apart, assembled into plastic or ceramic casings, and tested again before sale. Wafer fabrication need not be done in the same location as the remaining test and assembly steps, which are far less technology intensive.

THE ISSUES ON REVIEW

Assignor Estoppel

Assignor estoppel is an equitable doctrine that prevents an inventor who has assigned his or her rights in a patent to another party from later arguing that the patent is invalid. The estoppel extends to those in "privity" with the assignor. In this case, George Perlegos is a named inventor on four of the patent in issue -- the '394, '189, '108, and '255 patents. Perlegos assigned his rights in each of those patents to his then-employer, complainant Intel. Subsequently, Perlegos left Intel and

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13/ "Geometry" refers to the minimum line definition of the circuitry resulting primarily from the photolithographic steps involved in wafer fabrication. This minimum geometry dictates the size of each cell, and consequently also the total number of die of a particular density (number of cells) which can be produced on a single wafer. One of the technological challenges of EPROM development is reducing the geometry, so that a larger number of cells can be located on the same size die, or on an even smaller die. Currently, EPROMs are being produced with geometries of 1 micron (a micron is one millionth of a meter, or one thousandth of a millimeter).

became one of the founders of respondent Atmel. Atmel has had dealings of various sorts involving development and production of EPROMs with respondents Hyundai and GI/Microchip. 14/

The ALJ held that, if the doctrine of assignor estoppel applies in this case, Perlegos would be estopped from contesting the validity of the four patents in issue, and that respondents Atmel, Hyundai, and GI/Microchip are in privity with Perlegos and therefore also estopped. The ALJ, however, determined that the doctrine should not be applied in a section 337 investigation. 15/ She noted that assignor estoppel is an equitable doctrine, applied in the courts by balancing the private rights of the parties involved against the public interest in avoiding an unlawful patent monopoly.

14/ There appears to be no dispute among the parties as to the facts of those dealings, only as to their legal significance. Briefly, shortly after Atmel was founded, Atmel entered into a joint development agreement with GI, to develop EPROM designs and processes, some of which eventually became the subject of this investigation. GI personnel served on Atmel's Board of Directors, GI owned Atmel stock, and George Perlegos, one of Atmel's founders, [ ]. That agreement has since been terminated, and is apparently the subject of litigation between the parties. At the time of the joint development agreement, Microchip was an unincorporated division of GI, with responsibilities for EPROM design and development. Microchip subsequently became a separately incorporated, wholly-owned subsidiary of GI. GI entered into a contract with Hyundai to manufacture EPROMs for it in Korea, according to GI-supplied EPROM designs and processes. GI assigned its rights under that contract to Microchip when it separately incorporated the subsidiary.

15/ The ALJ conducted the trial and made her validity findings without applying the doctrine of assignor estoppel. Intel made repeated objections at trial to the introduction of evidence supporting respondents' invalidity arguments, presumably in order to preserve the issue for review and possible appeal. The ALJ's procedure allowed the creation of a complete record for purposes of Commission review. As discussed further below, the Commission wishes its ALJs to continue to make a complete record, including evidence and determinations on validity, before deciding whether to find an estoppel. This will enable the Commission and the courts to continue to have a full record in order to carry out review responsibility in future cases.

The Commission determined to review the issue of whether assignor estoppel should, as a matter of policy, apply in the violation phase of section 337 investigations, and, if so, whether any of the respondents are in privity with George Perlegos such that they should be estopped from challenging the validity of the four patents where assignor estoppel is an issue.

We determine that application of the doctrine of assignor estoppel in section 337 investigations in appropriate circumstances is required by law and is appropriate as a matter of Commission policy. Our reviewing court, the Federal Circuit, recently affirmed the applicability of the doctrine in patent litigation in the federal district courts. Diamond Scientific Co. v. Ambico, Inc., 848 F.2d 1220, cert. dismissed, 109 S. Ct. 28 (1988). The question of applicability of the doctrine in section 337 investigations is, we believe, a question of patent law, as to which we are bound to follow Federal Circuit precedent. 16/

Nonetheless, we agree with the ALJ that the application of the doctrine of assignor estoppel in section 337 investigations raises

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16/ Atmel argues that since the Ninth Circuit, where the assignment contract was made, had abolished assignor estoppel at the time the contract was made, Coastal Dynamics Corp. v. Symbolic Displays, Inc., 469 F.2d 79 (9th Cir. 1972) (per curiam), the Commission must apply Ninth Circuit law, and not apply assignor estoppel in this case.

We do not follow the law of the Ninth Circuit on the issue of whether assignor estoppel should apply in section 337 investigations. Since Coastal Dynamics was decided, exclusive jurisdiction over patent law matters has been transferred by Congress to the Federal Circuit. The Federal Circuit itself has stated that since assignor estoppel is a question of patent law, it is not bound by decisions of other circuits. Diamond Scientific at 1225, n.1. Similarly, the Commission is not bound by decisions of circuits other than the Federal Circuit with respect to matters directly related to the patent law.

important questions of Commission policy. The Commission has not previously had occasion to address these questions. 17/

As pointed out above, assignor estoppel is an equitable doctrine, designed to do justice to the private rights of parties in patent litigation. However, section 337 is not merely a statute extending the private rights of patentees into the arena of international trade. Important public interests are implicated as well. Consequently, in administering section 337, the Commission acts in the public interest, particularly in considering remedy issues. 18/ The effect of application of assignor estoppel is to allow a possibly invalid patent to be enforced, and could result in the issuance of an exclusion or cease and desist order based on a possibly invalid patent.

However, the legislative history stating that public interest considerations are overriding in the administration of section 337 appears in connection with the Senate Finance Committee's discussion of the remedy provisions of the statute. It is less clear that the public interest should be an overriding consideration in administration of the violation portion of the statute, and particularly with regard to questions of patent validity, enforceability, and infringement. Congress has specifically provided that "[a]ll legal and equitable defenses may be presented in all

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17/ This may be because, until the Federal Circuit's decision in Diamond Scientific, the doctrine of assignor estoppel was generally considered to be, if not entirely dead, moribund. See Cooper, Estoppel to Challenge Patent Validity: The Case of Private Good Faith vs. Public Policy 18 W. Res. L. Rev. 1122 (1967).

18/ The legislative history of the Trade Act of 1974 states that public interest considerations are overriding in the administration of section 337. S. Rep. No 1298, 93d Cong., 2d Sess. 197 (1974).

[section 337] cases." 19 U.S.C. § 1337(c). In its consideration of this provision of the statute, the Senate Finance Committed noted that:

> The Commission would also consider the evolution of patent law doctrines, including defenses based upon antitrust and equitable principles. . . . [T]he ultimate issue of the fairness of competition raised by section 337 [] necessitates that the Commission review the validity and enforceability of patents, for the purposes of section 337, in accordance with contemporary legal standards when such issues are raised and adequately supported.

S. Rep. No. 1298, 93d Cong., 2d Sess. 196 (1974) (emphasis added).

While assignor estoppel is not, strictly speaking, a defense in a section 337 investigation, we believe the passage quoted above indicates Congress' intent that the Commission apply the patent law as it is developed and applied in the courts in its consideration of alleged patent-based violations of section 337. In this respect, we note particularly the holding of the Federal Circuit in the Lannom case. 19/ In the investigation underlying Lannom 20/, the Commission determined that the public interest required it to consider whether a patent at issue in a section 337 investigation is valid, even though no party had challenged validity, respondents having been held in default, and the IA having not taken a position on validity. The Federal Circuit disagreed with the Commission's determination, and held that unless a party to a section 337 investigation challenges a patent's validity, the Commission must find the patent valid, based on the statutory presumption of validity, as a federal district court would. Thus, the court found that the Commission's public interest responsibilities did not imbue it with an independent duty to

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19/ Lannom Manufacturing Co. v. United States International Trade Commission, 799 F.2d 1572, 1579 (Fed. Cir.1986).

20/ Certain Softballs and Polyurethane Cores Therefor, Inv. No. 337-TA-190, USITC Pub. 1751 (Sept. 1985).

determine the validity of a patent where no challenge to validity was raised by the parties.

This investigation is clearly different from that underlying the Lannom case, since the validity of the patents in question was challenged by the parties. Nonetheless, in our view, the analogy of Lannom to the question of the proper role of the doctrine of assignor estoppel in section 337 investigations is clear. We believe that the Commission must apply the doctrine of assignor estoppel in considering patent validity to the same extent as a federal district court would. In applying the doctrine of assignor estoppel, the Commission would be in the same position as a federal district court insofar as whether it is "unfair" or "inequitable" to enforce a possibly invalid patent. We do not believe that the fact that the Commission is a government agency has any bearing on the question. A federal district court is as much an instrumentality of the United States as is the Commission. Similarly, we do not believe that the nature of the remedies available in section 337 investigations has any bearing on the question. A federal district court can issue cease and desist orders, just as the Commission can, and a Commission order excluding infringing goods from the United States is similar to a district court injunction barring a company from manufacturing infringing goods in the United States.

Consequently, we determine that application of the doctrine of assignor estoppel in the violation phase of section 337 investigations is required as a matter of law and proper as a matter of Commission policy, when appropriate based on a balancing of the equities between the parties.

In this investigation, the ALJ determined, and the Commission did not review her determination, that based on a balancing of the equities, George Perlegos is estopped from challenging the validity of four of the patents

at issue. However, we did determine to review the question of whether respondents Atmel, Hyundai, and GI/Microchip, or any of them, are in privity with George Perlegos, such that they should be estopped from challenging the validity of the four patents in question.

We determine that Atmel Corporation is in privity with George Perlegos and is estopped from challenging the validity of the four patents in question, but that respondents Hyundai and GI/Microchip are not. The case law of assignor estoppel sheds little light on the question of which persons are to be considered "in privity" with an assignor estopped from challenging the validity of the patent in question. In the context of assignor estoppel, privity has most commonly been found in the close relationship between the assignor of a patent and a corporation, which allegedly infringes the patent, formed by that assignor. E.g., Diamond Scientific at 1224; Stubnitz-Greene Spring Corp. v. Fort Pitt Bedding Co., 110 F.2d 192 (6th Cir. 1940). It is not clear, however, that a strict alter ego relationship must be found in order to find privity for purposes of assignor estoppel, as respondents have argued.

In Stubnitz-Greene Spring Corp., the Sixth Circuit found privity where the inventor/assignor founded the defendant corporation, was its principal stockholder, president, general manager, and designer, although it did not make any specific findings as to whether the defendant corporation was the alter ego of the inventor/assignor. In American Machinery Co., Inc. v. Everedy Mach. Co., 35 F.2d 526 (E.D. Penn. 1929), the court stated that "[t]he word 'privity' implies co-operation, but it also includes the thought of sharing and of participation in profits." Id. at 528. However, the court went on to analyze the question of whether Everedy was estopped from challenging the validity of the patent, which had been assigned to

American Machinery Co. by one of Everedy's two owners and directors during prior employment, as a question of whether Everedy and the assignor were joint tort-feasors. The court concluded that they were not, based on a finding of fact that Everedy was making use of the assignor, and not vice versa. In National Cash Register Co. v. Remington Arms Co., 283 F. 196 (D. Del. 1922), the court, having determined that the defendant corporation was neither a party to the assignment, nor the alter ego or under the control of the inventor/assignor Fuller, nonetheless went on to consider the question of whether the corporation was in privity with Fuller.

Most recently, in Diamond Scientific, the Federal Circuit found the defendant corporation to be in privity with the inventor/assignor. The court's decision does not give much indication of the specifics of the relationship between the assignor/inventor and the corporate defendant. The assignor/inventor, while an employee of Diamond Scientific Co., invented a vaccine against gastroenteritis in swine, filed a patent application, and assigned all of his rights to his employer. The patent later issued. Subsequently, the assignor/inventor left Diamond Scientific, and founded Ambico, which began manufacturing and selling a gastroenteritis vaccine for swine. The district court opinion notes merely that the assignor/inventor was "founder, majority stockholder and president" of the defendant company, Ambico. Diamond Scientific Co. v. Ambico, Inc., 666 F. Supp. 163, 164 (S.D. Iowa 1987).

We believe that the proper test for privity in the context of assignor estoppel is not as strict as the "alter ego" test proposed by respondents. In general, the alter ego test derives from corporation law, and operates to "pierce the corporate veil" to bring the consequences of corporate wrongdoing upon the heads of the owner(s) of a corporation. The alter ego

test in corporation law is a strict one, and generally requires that the corporation be the creature or instrumentality of the owner, created and used in order to insulate the owner from the consequences of wrongdoing. The district court found, and the Federal Circuit affirmed, privity in Diamond Scientific without making any specific findings as to control, domination, or the like by the assignor/inventor.

We believe the appropriate standard for determining whether privity exists for purposes of assignor estoppel is whether there is an identity of interests between the persons potentially subject to estoppel with respect to the subject matter (i.e., infringement of the assigned patent in question) sufficient to warrant, in light of the equities of the situation, placing the corporation or other person in the shoes of the assignor/inventor. If the circumstances and limited factual findings of the District Court in Diamond Scientific are sufficient for the Federal Circuit to determine that privity exists for purposes of assignor estoppel, we believe the facts of this investigation are sufficient to determine that privity exists between George Perlegos and Atmel. Perlegos was one of three founders of Atmel, originally owned [] percent of the stock, which was later reduced to [] percent as stock was transferred to employees. Nonetheless, he remains the largest single shareholder. Perlegos was president of Atmel, is chief executive officer and is responsible for Atmel's business and finances. [

]. On the basis of these facts, we find Atmel in privity with Perlegos, even though he is not the designer of the accused Atmel EPROMs.

We believe the situation is different with respect to the other respondents, GI/Microchip and Hyundai, as to whom assignor estoppel was

asserted. The ALJ's finding of privity with respect to those respondents was based on their relationships with each other and with Atmel, not on a direct relationship between each of them individually and Perlegos. Since we do not find that Atmel is Perlegos' alter ego, we do not believe there is any basis for extending the privity chain in this manner. Moreover, the nature of the relationships between GI/Microchip and Atmel, and between Hyundai and Atmel, does not support a conclusion that there is an identity of interests between them and Perlegos, or between them and Atmel, with respect to infringement of the patents in question. 21/ Atmel and GI undertook a joint development program to develop EPROM designs and processes. Some of the EPROMs resulting from this program became the subject of this investigation. GI personnel have served on Atmel's Board of Directors, and GI owns some Atmel stock. At the time of the joint development program, Microchip was an unincorporated division of GI. Microchip and GI have a contract with Hyundai, whereby Hyundai manufactures EPROMs for GI/Microchip, some of which incorporate designs and processes developed pursuant to the joint development program between Atmel and GI.

While some of the products resulting from the relationship between Atmel and GI/Microchip have become the subjects of this investigation, there is no evidence in the record to suggest that GI/Microchip took part in that agreement in order to avail itself of infringing technology. The evidence indicates that Perlegos is not directly in charge of Atmel's EPROM design operations. The joint development program was directed at the design and development of new EPROM products and processes. Therefore, the

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21/ We note as an aside that Atmel is apparently engaged in a series of lawsuits with, among others, GI/Microchip, concerning the very relationships at issue.

fact that Atmel may have transferred to GI, in the context of that relationship, some of the patent information which is at issue in this investigation does not, we believe, warrant extending the estoppel to GI/Microchip.

Similarly, GI/Microchip undertook to have Hyundai manufacture products for it as a foundry. Again, there is little evidence to suggest that Hyundai was aware that some of the designs and process technologies may have originated in the patents at issue. 22/ We believe that these relationships are not sufficient to warrant the conclusion that GI/Microchip and Hyundai have an identity of interests with Atmel in connection with the patents at issue such that the chain of privity should be extended to them, particularly since assignor estoppel is a doctrine based in equity. Therefore, we determine that GI/Microchip and Hyundai are not in privity with George Perlegos, and are not estopped from challenging the validity of the four patents in question.

Having determined that assignor estoppel is applicable in section 337 investigations, we recognize that there are practical problems which arise with the application of assignor estoppel in a section 337 investigation. Assignor estoppel operates to preclude a challenge to the validity of the patent in question, and bars the introduction of evidence or argument concerning invalidity of that patent. However, it is a personal estoppel, i.e., it applies only to the assignor and his or her privies. Any person not in privity with the assignor (the rest of the world) remains free to challenge the validity of the patent. Diamond Scientific, 848 F.2d at 1222.

22/ There is some evidence to indicate that Hyundai was aware of the joint development agreement, as well as some evidence to indicate that Perlegos assisted GI/Microchip in choosing a foundry and establishing the operations.

Moreover, even persons estopped from challenging validity are permitted to introduce evidence of prior art to narrow the scope of the claims of the patent at issue and to demonstrate that the alleged infringer is actually practicing the prior art. Westinghouse Co. v. Formica Co., 266 U.S. 342 (1924); Scott Paper Co. v. Marcalus Co., 326 U.S. 249 (1945). Section 337 investigations often include multiple respondents, one or more of whom may be estopped from challenging validity, while the remainder are not. In such circumstances, the Commission could find itself in the anomalous situation of concluding that the same patent is presumed valid as to some respondents (those estopped from challenging its validity), and is proven invalid as to other respondents (those not estopped from challenging its validity).

This problem arises in this investigation with respect to the '394 patent. We have determined that respondent Atmel is estopped from introducing evidence and arguments challenging the validity of this patent. However, as discussed further below, we have also determined that the ALJ erred in determining that claim 1 of the '394 patent is valid, and have reversed her determination, finding claim 1 of the '394 patent invalid. Thus, we have found that claim 1 of the '394 patent is invalid, even though Atmel is estopped from challenging its validity. 23/ The issue therefore arises as to whether the Commission can or should enter a remedy as to

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23/ The question has been raised whether the estoppel applies to testimony presented by Perlegos on behalf of the non-estopped respondents in their challenge to the validity of the patents at issue. We have found no precedent on this question. However, we note that our finding of invalidity of claim 1 of the '394 patent was based on evidence and arguments presented by the non-estopped respondents, not including Perlegos' testimony. The evidence and arguments presented by the non-estopped respondents are sufficient to support the finding of invalidity of claim 1 of the patent.

Atmel with respect to claim 1 of this patent, which we have determined is invalid with respect to the other respondents, in the same proceeding.

This situation is analogous to that arising from a previous investigation, Certain Plastic Fasteners and Processes for the Manufacture Thereof, Inv. No. 337-TA-248, appeal pending, Dennison Mfg. Co. v. United States International Trade Commission, Appeal No. 88-1250 (Fed. Cir.). In the investigation underlying the Dennison case, several respondents were found to be in default. The remaining respondents, however, presented an invalidity defense, and the Commission found the patent at issue to be invalid. The Commission therefore did not enter any remedial orders. We believe that it would be anomalous for the Commission in this investigation to enter a remedial order against Atmel with respect to claim 1 of the '394 patent, while at the same time determining that claim 1 of the patent is invalid. Therefore, we determine that, while Commission determinations on matters of patent law, including determinations of patent invalidity have no res judicata effect in subsequent court proceedings, 24/ and may not have such an effect in subsequent Commission investigations, a Commission determination of patent invalidity is binding as to all parties in a particular investigation. This approach prevents the anomalous result of the Commission ordering a remedy based on a patent claim it has determined is invalid.

Even though we determine that application of the doctrine of assignor estoppel in the violation phase of section 337 investigations in appropriate circumstances is required, we also note that we wish ALJs

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24/ S. Rep. 1298, 93d Cong., 2d Sess. 196 (1974); Tandon Corp. v. United States International Trade Commission, 831 F.2d 1017, 1019 (Fed. Cir. 1987); Union Mfg. Inc. v. Han Baek Trading Co., Ltd. 763 F.2d 42,45 (2d Cir. 1985).

conducting the evidentiary hearing in future section 337 investigations in which the question of assignor estoppel arises to make a record and determination on patent validity even in cases where, based on a balancing of the equities between the parties, the ALJ determines that assignor estoppel is proper. The ALJs should take evidence and make determinations on the question of the balancing of the equities between the parties, and the privity issues in assignor estoppel as well. The Commission is the final decision maker in section 337 investigations, and has both the power and responsibility to review ALJ determinations of both fact and law in appropriate circumstances. If an ALJ were to apply the doctrine of assignor estoppel to preclude the introduction of evidence and arguments as to patent validity, there would in some cases (those where all respondents are estopped) be no record on patent validity. Should the Commission subsequently determine that the ALJ erred in balancing the equities, and incorrectly applied the doctrine, the Commission would have no record on which to decide patent validity. Section 337 is intended to be a speedy procedure for obtaining relief from infringing imports, and the strict statutory deadlines would preclude a remand to the ALJ to create a record on patent validity. The Commission is not likely to have time, during the review phase of the investigation, to create such a record for itself, and would be forced to accept the validity of the patent, based on the statutory presumption of validity. Similarly, should both the ALJ and the Commission err in determining that assignor estoppel applies in a particular case, the likely result would be a remand from the Federal

Circuit to create a record on validity. 25/ These results would undercut the Congressionally intended speed of section 337 relief.

25/ As an appellate court, the Federal Circuit would not be in a position to create such a record on its own.

The '108 Patent: Sense Amplifier

I. Background

U.S. Letters Patent 3,938,108 (the '108 patent) issued on February 10, 1976, and is assigned to Intel. Claims 14-17, the claims at issue, are directed to a sense amplifier used in EPROMs. The ALJ found that those claims are not invalid, not infringed, and practiced by the domestic industry. The Commission determined to review the ALJ's findings of validity, noninfringement, and practice by the domestic industry based on the ALJ's construction of the terms "sense amplifier" and "coupled in parallel," as those terms appear in the claims. On review, the Commission determines that the '108 patent is not invalid, not infringed, and practiced by the domestic industry. The Commission adopts the ALJ's discussion of the '108 patent at pages 43-57 of the ID, to the extent that it is not inconsistent with the following discussion.

II. Claim Construction

The ALJ construed the term "sense amplifier" as requiring a differential sense amplifier. In so doing, she found that the claimed circuit must perform a differential function, of which a comparator function is a part. ID at 81.

On review, Intel argued that the claims do not require that a comparator or differential function take place in the claimed sense amplifier branches.

Thus Intel contended that a combination or part of a device may be claimed separately, even though it cannot do useful work separately from the remainder of the device. Respondents all argued that the claim term "sense amplifier" should be construed as meaning "differential sense amplifier" because the only sense amplifier described in the patent is a differential sense amplifier and, therefore, there is no disclosure in the patent to support any other kind of sense amplifier.

The Commission does not adopt the ALJ's conclusion that the claimed branches must at least compare two inputs, because a comparator function is not required by either the claims or the specification. The ALJ reasoned that the comparator function may be implied by the claim requirement that the reference cell establish a level for the part of the sense amplifier comprising two branches coupled in parallel. ID at 78. It is reasonable to infer from the claims that the reason that two branches are claimed and that one of them contains a memory cell that establishes a reference is that a comparator function is to take place in the claimed sense amplifier. However, the law does not require that all of the claims recite each and every element necessary to the operation of the invention. In re Myers, 410 F.2d 420, 161 USPQ 668 (CCPA 1969). The comparator function could be performed by some comparator means not recited, but also not excluded by the scope of the claims at issue.

The ALJ also stated that the part of the sense amplifier comprising two branches coupled in parallel "at least must begin a comparator function." ID at 78 (emphasis in original). That conclusion is correct because the purpose

of the claimed second branch and the memory cell for establishing a reference potential is to permit eventual comparison of the reference cell signal on one side and the array cell signal on the other side. Therefore, the Commission determines that the first and second branches must be coupled in such a manner that a comparator function can be performed by the claimed sense amplifier.

The Commission also does not adopt the ALJ's conclusion that the claimed sense amplifier branches must perform a differential function, because that function is not required by the claims or the specification. The ALJ's reasons for inferring a differential function are similar to those she relied upon to infer a comparator function. Thus, the ALJ reasoned that "[t]he only reason to require [the branches] to be coupled is to allow them to interact, or to have a differential function." ID at 80. That premise is correct and the claimed branches are part of a differential sense amplifier. Tr. 3475. However, the Commission concludes that the use of the term "comprising" in the preamble of claim 14 means that the claimed sense amplifier includes the elements recited after that term but is not limited to those elements. Ex Parte Schaefer, 171 USPQ 110 (Bd. App. 1970). Therefore, the differential function can be completed in a part of the sense amplifier not recited in the claims in controversy. 26/

26/ The ALJ noted that "[i]n the circuit of Figure 6 the final outputs of the sense amplifier are not compared and no signal is developed that will determine whether the selected for reading stored a 1 or a 0." Thus, that circuit does not complete the comparator, and consequently, the differential functions. However, the specification provides that a later stage can complete those functions. '108 patent, Col. 7, lines 54-56.

Intel also argued that the ALJ was incorrect in construing the claims as requiring that the branches of the claimed sense amplifier be coupled in parallel through a common node. Respondents countered that in construing the claim language "coupled in parallel," the ALJ properly required that the branches be coupled between two common nodes, so that the current in the branches is shared and divided between them, because that is the definition of a parallel connection.

The ALJ construed the phrase "branches coupled in parallel" as meaning coupled through the common node number 84 in Figure 6 of the '108 patent. ID at 82. The Commission does not adopt that conclusion because the claims in controversy are not limited to circuits that are connected in the precise manner shown in Figure 6.

The meaning of the term "coupled in parallel" was contested by the parties during the subject investigation. Intel first argued that "[i]n a parallel connection, the current flow is divided up so that there are parallel current paths." Intel Pretrial Memorandum at 89. Intel later modified its definition so that branches are considered to be coupled in parallel if they extend between two common nodes. Intel Post Trial Memo on the '108 patent at 30. Respondents contended that Intel's original definition is correct and that the branches must therefore be coupled together between the common current-sharing nodes in order to be coupled in parallel.

The Commission adopts the definition of "coupled in parallel" originally proposed by Intel and quoted by the ALJ at page 80 of the ID. The parallel

current paths described in the quoted passage are important because the voltages at the drains of the first and second transistors are established by the current flowing through each. '108 patent, col. 8, lines 23-38.

The Commission determines that the remainder of the ALJ's claim construction is correct. Therefore, the Commission adopts the ALJ's claim construction to the extent it is not inconsistent with this opinion.

III. Validity

The Commission determined to review the ALJ's conclusion that the respondents did not sustain their burden of proving by clear and convincing evidence that the claims in controversy are invalid as obvious in light of the prior art, because that conclusion was based on the claim construction subject to Commission review. The ALJ correctly concluded that the claim requirement that the sense amplifier branches be "coupled in parallel" was not found in the prior art. All of the prior art DRAM (dynamic random access memory) sense amplifiers included cross-coupled branches instead of parallel-coupled branches. The Commission's construction of the claim phrase "coupled in parallel" does not change the ALJ's conclusion that the prior art DRAM sense amplifiers do not have branches that are coupled in parallel. The Commission, therefore, adopts the ALJ's findings of fact and conclusions of law relating to validity to the extent that they are not inconsistent with the Commission's determination.

IV. Infringement

Intel alleged that respondents' EPROMs [27] infringe claims 14-17 of the '108 patent. The ALJ determined that respondents' EPROMs do not infringe those claims, either literally or under the doctrine of equivalents. The Commission determined to review the infringement issues in view of its review of the claim construction.

For the reasons set forth below, the Commission affirms the ALJ's conclusion regarding infringement and adopts her findings of fact and conclusions of law to the extent not inconsistent with the Commission's determination.

The ALJ found that the accused EPROMs do not infringe the claims in controversy because: (1) the branches of the accused sense amplifiers do not amplify their inputs; and (2) the accused branches are not coupled in parallel. The ALJ also found that the claims in controversy do not cover cross-coupled circuits because, if they did, those claims would also cover the prior art DRAM sense amplifiers.

A. The Accused EPROMs

The parties agree that the Atmel 27C512 EPROM is representative of all of respondents' accused EPROMs, other than the Atmel 27C256 and the GI 27C256 EPROMs (the 27C256 EPROMs). ID at 86.

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[27] The accused EPROMs are set forth in the ID at 86.

1. The Atmel 27C512 EPROMs

The Commission affirms the ALJ's finding that the 27C512 EPROMs do not infringe the claims in controversy because none of respondents' EPROMs uses a sense amplifier that includes branches coupled in parallel, as required by claim 14 and its dependent claims. The accused branches are coupled at one common node, viz., the supply voltage. However, they are not coupled to a second node so that two parallel current paths are established. Intel argues that the second common node is found in the supply ground connection of the inverter used in the feedback circuit. However, that ground terminal does not establish parallel current paths. Current cannot pass from the source of the accused first transistor (i.e., the 100/4 transistor) into the NOR gate that is used in the feedback circuit. Simko Tr. 3461. Moreover, current cannot pass from the output of the NOR gate to the gate of the 100/4 transistor. Id. The accused branches are connected between the supply voltage and the inputs to the respective column biasing circuits. Those inputs are not connected to each other, as would be required for a second common node to exist. The ALJ was therefore correct in finding that the accused branches are not coupled in parallel.

The Commission also adopts the ALJ's conclusion that no amplification takes place in the accused branches. Intel contended that the accused first transistor (i.e., the 100/4 transistor) amplifies the voltage swing at the source of that transistor. However, the ALJ found that no real amplification takes place in the column biasing circuits. ID at 92. The reason that the voltage swing at the source of the accused first transistor is smaller than

that at its drain is that the column biasing circuit limits the voltage swing at the source of the accused first transistor, not because of any amplification. Boll Tr. 3807-08. As noted, the Commission does not adopt the ALJ's conclusion that the claims in controversy require that the claimed branches complete a differential amplification function. Therefore, any findings that such a "requirement" is not met are not adopted by the Commission.

The Commission also adopts the ALJ's finding that the accused Atmel 27C512 EPROMs do not infringe the claims in controversy under the doctrine of equivalents. However, the Commission has determined to supplement the ALJ's analysis under the doctrine of equivalents.

The doctrine of equivalents is a judicially-created doctrine which insures that a party is prevented from "stealing the benefit of the patent" by making a device that differs only in minor ways from the patents. The Supreme Court has stated that an accused device or process that does not literally infringe a claim may be found to infringe that claim if the accused device or process performs substantially the same function in substantially the same way to obtain the same result as the claimed produce or process. Graver Tank & Mfg. Co. v. Linde Air Products, 339 U.S. 605, 608 (1950).

In examining the range of equivalents to which an invention is entitled, the fact-finder must look at the prosecution history of the patent, the pioneer/non-pioneer status of the invention and the prior art. D.M.I. Inc. v. Deere & Co., 755 F.2d 1570, 1575, 225 USPQ 236, 239 (Fed. Cir. 1985). If the fact-finder finds that the accused process fails to meet one prong of the

"function, way, and result" test, then the fact-finder cannot find infringement under the doctrine of equivalents. Sealed Air Corp. v. USITC, 645 F.2d 976, 984, 209 USPQ 469, 476 (CCPA 1981). In Pennwalt Corp. v. Durand-Wayland, Inc., [28/] the Federal Circuit held that a doctrine of equivalents analysis can be performed on an element-by-element basis. The ALJ found that there is no element in respondents' EPROMs that is the equivalent of the branches coupled in parallel required by the claims in controversy. ID at 93. The Commission adopts that conclusion. The function of the claimed branches is to amplify the potentials at the memory cell column and at the reference cell column. Foss Tr. 2313. The function of the column biasing ciruits alleged by Intel to correspond to the claimed branches, is to limit the voltage swing on the memory cell and reference cell column lines. Boll Tr. 3793, 3907-08. Those functions are not substantially the same and consequently infringement cannot be found under the doctrine of equivalents.

Similarly, there is no equivalent of the amplification of the signal level in the branches identified by Intel as the branches coupled in parallel. As noted, the function of the claimed branches is to amplify the potentials at the memory cell column and at the reference cell column. That function is substantially different from that of the column biasing circuits in the accused branches because those circuits do not perform an amplification function.

[28/] 833 F.2d 931, 4 USPQ 2d 1737 (Fed. Cir. 1987) cert. denied, 108 S.Ct. 1226 (1988).

2. The Atmel 27C256 EPROM

The Commission also adopts the ALJ's conclusion that the Atmel 27C256 EPROMs do not infringe the claims in controversy. As previously discussed, the Commission does not adopt the ALJ's conclusion that a comparator function must be completed in the claimed branches. However, her conclusion that a comparator function begins in the claimed branches is correct.

As the ALJ found, the 27C256 EPROMs do not compare voltages or potentials. Instead, through a current mirror, a signal that is one-half the amplitude of the reference column line is used as the reference. ID at 94. The whereby clause at the end of claim 14 states that a reference potential is provided by the reference memory cell. Therefore, a comparison of potentials must at least begin in the claimed branches. Since the 27C256 EPROMs do not establish a reference potential and do not compare potentials, they cannot begin such a comparison and, consequently, do not infringe the claims in controversy.

Moreover, the Commission adopts the ALJ'S conclusion that the 27C256 EPROMs do not infringe the claims in controversy for the same reasons that the 27C512 EPROMs do not (i.e., they do not contain branches coupled in parallel and those branches do not perform the required amplification).

As in the case of the 27C512 EPROMs, the 27C526 EPROMs do not infringe the claims in controversy under the doctrine of equivalents. The function of the claimed branches is to amplify the voltages at the memory column and at the reference column. Foss Tr. 2313. The function of the accused branches (i.e., the column biasing circuits) is to limit the column voltage swing so

that the column capacitance does not have to be charged and discharged continuously. Simko Tr. 3473. That function is substantially different from the amplification function of the claimed branches. Moreover, the claimed and accused branches perform in substantially different ways because the claimed branches are not used in conjunction with a current mirror as the accused branches are.

V. Domestic Industry

The Commission affirms the ALJ's conclusion that the '108 patent is practiced by the domestic industry. The Commission's claim construction does not affect the ALJ's conclusion that Intel's licensee, Texas Instruments, practices claims 14-16 of the '108 patent. Therefore, the Commission adopts the ALJ's findings of fact and conclusions of law relating to the domestic industry issue, to the extent that they are not inconsistent with the Commission's determination.

The 518 Patent: MOS Buffer Circuit

I. Background

U.S. Letters Patent 4,048,518 (the '518 patent) issued on September 13, 1977, and is assigned to Intel. It expires on September 13, 1994. Claims 1-3, the claims in controversy, are directed to a metal oxide semiconductor (MOS) buffer with improved speed of operation. 29/ The ALJ found the claims in controversy to be valid but not infringed. She also found that the domestic industry does not practice the '518 patent. The Commission determined to review the ALJ's claim construction and infringement analysis. The validity and domestic industry issues were reviewed as well because they may have been affected by the claim construction. On review, the Commission determines that the '518 patent is not invalid and not infringed.

II. Claim Construction

The ALJ defined the claim term "inverter" appearing in the preamble of claim 1 as "a circuit that takes a low input and turns it into a high output, or takes a high input and turns it into a low output." ID at 121. However, she found that claim 1 does not require that the inverter always perform an inversion function.

The Commission defines the term "inverter" as meaning a circuit that produces a high output in response to a low input and a low output in

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29/ A detail description of the claimed invention is contained in the ID at 45-58.

response to a high input. That is the way that all of the circuits disclosed in the '518 patent function and that is the definition given by Intel's expert Dr. Foss (Tr. 3163). 30/ An inverter is not a circuit in which , if the input is low, the output may be high (Boll Tr. 3758). Therefore, the Commission does not adopt the ALJ's determination that an inverter is not required to always perform an inversion.

Intel argued that the term "inverter" in claim 1 is not a limitation because that term only appears in the preamble. However, claim 1 is written in so-called Jepson form, and elements recited in the preambles of such claims operate as limitations thereon. Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 315, 227 USPQ 766, 770 (Fed. Cir. 1985).

Intel argued that the claim term "decoupling" may include something less than turning off the decoupling transistor. Respondents argued that "decoupling" requires that the decoupling transistor must turn off or cease to conduct current.

The ALJ determined that the word decoupling as it was used in the '518 patent referred to ceasing to conduct current. ID at 122. However, the ALJ also construed the term "decoupling" as including "something less than completely turning off the transistor so that the transistor ceases to conduct (or in a MOS transistor ceases to conduct significant current)." ID at 123 (emphasis in original). Thus, the ALJ concluded that "[d]ecoupling of

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30/ The ALJ cited the definition given by Dr. Foss but found that "[a]n inverter is a circuit that takes a low input and turns it into a high output, or takes a high input and turns it into a low output." ID at 121 (emphasis added). Dr. Foss actually testified than an inverter performs both of those functions, not either, as the ALJ implies.

capacitance can be accomplished by a transistor in saturation, one that ceases to conduct additional current, but continues to conduct a finite amount of current." Id. (emphasis in original).

The '518 patent does not teach that a transistor in saturation decouples the output from the capacitance associated with the input transistor or that it simply decouples capacitance. Intel alleged that a transistor operating in the saturation mode in the accused EPROMs corresponds to the claimed decoupling transistor.

The Federal Circuit has stated: "A claim is construed in light of the claim language, the other claims, the prior art, the prosecution history and the specification, not in light of the accused device." SRI Intern v. Matsushita Elec. Corp. of America, 775 F.2d 1107, 1118, 227 USPQ 577, 583 (Fed. Cir. 1985) (emphasis in original). The Federal Circuit further noted in SRI that "claims are not construed 'to cover' or 'not to cover' the accused device" because that procedure would make infringement a matter of judicial whim. Id. The claims must be construed without reference to the accused device. Id. Therefore, the ALJ's reference to a transistor in saturation (the accused device) was not proper when construing the term "decoupling transistor" and the Commission does not adopt that part of her claim construction.

The Commission construes the term "decoupling" (or "decouple") as referring to the reduction of the voltage at the gate of the decoupling transistor so that is ceases to conduct current (to the extent possible in a metal oxide semiconductor field effect transistor). The '518 patent

specification consistently refers to the decoupling transistors as "decoupling" when they cease to conduct current. See: col. 3, lines 5-11; col. 3, line 66; col. 4, line 3; and col. 4, lines 29-31. Thus the '518 patent makes it clear that it is the turning off of the decoupling transistor, in order to electrically disconnect the input transitor and its capacitance from the output, that permits the output signal to rise quickly. This is so because the delay associated with charging up the input transistor's capacitance is thus avoided.

During prosecution of the divisional application of the claims drawn to the embodiment of Fig. 2 of the '518 patent, the patent applicant also referred to the decoupling transistor as one that ceases to conduct current:

> "As explained on page 7, beginning at line 24, of the specification the decoupling transistor ceases to conduct more quickly since its gate is discharged through transistor 38 of Figure 2."

Atmel Ex. 9 at 26 (page 5 of Preliminary Amendment).

Thus, the prosecution history also supports the construction of "decoupling" as ceasing to conduct current.

The '518 patent specification does not refer to EPROM cells. The part of the accused EPROM allegedly covered by the term "input transistor" is the memory cell. Therefore, the ALJ should not have referred to an EPROM in construing "input transistor," SRI Intern., supra, and the Commission does not adopt her construction of that term. However, the Commission adopts the remainder of the ALJ's claim construction, to the extent not inconsistent with the foregoing discussion.

III. Validity

The ALJ held that the claims of the '518 patent in controversy were not anticipated and would not have been rendered obvious under 35 U.S.C. § 103 by the Kruggel reference read in light of Heeren. ID at 115, 117. The Commission determines to affirm the ALJ's conclusions that the claims in controversy are neither anticipated nor would they have been obvious. The Commission's claim analysis merely narrows the scope of the claims in controversy as construed by the ALJ. The prior art is distinguishable from the claims in controversy without relying on the claim limitations construed herein by the Commission. Therefore, the Commission adopts the ALJ's findings of fact and conclusions of law relating to validity, to the extent they are not inconsistent with the Commission determination.

IV. Infringement

Intel alleged that respondents' EPROMs [31/] infringe claims 1-3 of the '518 patent. The ALJ determined that respondents' EPROMs do not infringe those claims either literally or under the doctrine of equivalents. The Commission determines to affirm the ALJ's noninfringement conclusion and finds that there are additional grounds for noninfringement. In view of the Commission's definition of the term "inverter", the accused EPROMs are not inverters because they do not invert the word line signal as Intel alleged. The ALJ specifically found that the accused EPROMs do not invert the word

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31/ The parties agreed that for purposes of infringement analysis, the respondents' 27C512 EPROMs were representative of the other accused EPROMs. ID at 131. However, the respondents' 27C256 EPROMs have somewhat different sense amplifier circuitry, and are discussed separately in the ID.

line signal. ID at 135. However, the ALJ found that an inversion takes place in the accused EPROMs "[w]hen the circuit moves from reading an unprogrammed cell to a programmed cell, or vice versa." ID at 135. The ALJ's finding that the word line is not inverted is inconsistent with her finding that an inversion takes place. What the ALJ perceived as an inversion is not an inversion at all. When a programmed cell is selected after an unprogrammed cell was selected, the output from the column line does change. But this change is not because the word line voltage at the gate of the previously-selected cell has been removed, it is because a word line voltage has been applied to another EPROM cell. That is not an inversion of the word line signal.

If one were to apply the word line signal to a programmed cell (i.e., a high input), the output would also be high because the EPROM cell would not conduct and thus no path to ground would be provided that would result in a low output. There is no inversion under those conditions. If the same (programmed) cell is not selected (i.e., a low input according to Intel), the output could either be high or low depending on whether the cell selected at that time was programmed or unprogrammed. Thus, the function and operation of an EPROM cell is quite different from the function and operation of an inverter as defined by both Dr. Foss (Intel's expert witness) and by respondents. The Commission therefore determines that the "inverter" limitation of claim 1 is not met by the accused EPROMS.

The Commission also determines that the ALJ's determination that the accused EPROMs include a "decoupling transistor," as required by the claims

in controversy, is also incorrect. As previously discussed, the ALJ determined that there are two ways to "decouple" the capacitance of the column lines: (1) by turning the decoupling transistor off so that it ceases to conduct current (to the extent possible in a MOS device); and (2) by using a transistor in saturation. In view of the Commission's determination not to adopt the ALJ's construction of "decouple" as including the second method of decoupling set forth above, it must be determined whether a transistor in saturation decouples the undesired capacitance.

The Commission defines "decoupling" as turning off the decoupling transistor so that it ceases to conduct current (to the extent possible). Respondents' accused decoupling transistor does not turn off after the output of the accused circuit changes state. Instead, it keeps conducting current to charge up the capacitance associated with the column line. The accused decoupling transistor is biased to operate in saturation (i.e., it conducts the maximum current possible given its physical characteristics). That is an important function because the accused circuits achieve rapid operation by keeping the column lines charged so that delay in recharging them is avoided. Boll Tr. 3808. Therefore, the Commission determines that the alleged decoupling transistor does not "decouple" as that term is used in the '518 patent and hence it is not a decoupling transistor.

The Commission adopts the ALJ's determination that the accused EPROMs do not include the "controlled variable potential means" of claim 1 to the extent it is not inconsistent with the following discussion. The "controlled variable potential means" is for controlling the gate potential of the

decoupling transistor in response to a change of voltage on the gate of the input transistor. The ALJ correctly found that the voltage on the gate of the accused decoupling transistor does not respond to the input (the word line signal) because the word line signal merely selects the subject EPROM cell, and it is the state of the floating gate that determines the state of the output. 32/ Therefore, her conclusion that this limitation is not met in respondents' EPROMS is correct.

The ALJ's determination that the accused EPROMs do not include the requirement of claim 2 that the output signal respond to the input signal is also correct. Intel alleged that the input signal is the word line signal (which selects the EPROM cell to be read). The output signal of the accused EPROMs is a function of the state of the floating gate. The only purpose of applying the word line signal to the control gate is to interrogate or read the EPROM cell. When an EPROM cell is not selected, the alleged output is not a function of the alleged input to that cell. Thus, the Commission determines that the accused EPROMs do not literally infringe claim 2 because they have neither (1) an "output signal in response to an input signal" nor (2) a decoupling transistor.

The Commission also determines that the accused EPROMs do not infringe the claims in controversy of the '518 patent under the doctrine of equivalents.

32/ If the selected floating gate is programmed, the voltage at output is high, and if it is unprogrammed, the output is low.

Claim 1: The Commission determines that claim 1 is not literally infringed because the following claim elements are not found in the accused EPROMs: (1) an inverter; (2) a decoupling transistor; and (3) a controlled variable potential means. To find infringement under the doctrine of equivalents, the equivalent of each element must be found in the accused EPROMs. Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 4 USPQ 2d 1737 (Fed. Cir. 1987) cert. denied, 108 S.Ct. 1226 (1988).

First, the Commission does not find the equivalent of an "inverter" in the accused EPROMs. The function of an inverter is to provide an output which is the inverse of the input (i.e., if the input is low the output is high and vice versa). The function of a selected EPROM cell is to provide an output that is a function of the programming state (i.e., charged or uncharged floating gate) of that EPROM cell. Those functions are entirely different. In the case of the inverter, the output is easily determined if one is given the state of the input (i.e., high or low). In the case of the EPROM cell, if a word line voltage is applied at the gate (the alleged high signal), the function is not to obtain a low output but rather to determine whether the selected cell is programmed. That function is so different from an inversion function that it cannot be considered to be the substantial equivalent of the inversion function.

Second, the Commission does not find the equivalent of the claimed "decoupling transistor" in the accused EPROMs. The function of the claimed "decoupling transistor" is to cease conducting current, thereby decoupling the input transistor from the load means to allow the output signal to change

more quickly. The function of respondents' accused decoupling transistor is to maintain the voltage swing on the column line limited so that the capacitance of the column line is never fully discharged. Boll Tr. 3808. The two functions are not substantially the same.

The results of the claimed decoupling transistor and of the accused decoupling transistor are the same, viz., an increase in the speed of operation by elimination of the delay resulting from charging up the capacitance associated with an input transistor. However, the claimed and accused decoupling transistors perform in different ways. The claimed decoupling transistor eliminates the charging-up delay by decoupling or disconnecting the input transistor from the output so that the voltage at the output may increase without having to charge up the input transistor's capacitance. The accused EPROMs accomplish the same increase in speed of operation by keeping the voltage on the column line from dropping so low that a delay would result in recharging the capacitance.

Finally, the Commission does not find the equivalent of the claimed "controlled variable potential means" in the accused EPROMs. Intel contended that the function of the "controlled variable potential means" (working in conjunction with the decoupling transistor) is to decouple capacitance. However, claim 1 states that what is being decoupled is the input transistor from the load means. The function of the "controlled variable potential means" is to control the voltage on the gate of the decoupling transistor in response to changes in the voltage on the gate of the input transistor. This can be seen from the express language of claim 1. The circuit of respondents

accused of meeting this claim requirement is the feedback amplifier circuit in the column biasing circuit. The function of the feedback amplifier is to control the voltage on the gate of the accused decoupling transistor. The ALJ found that this was not the same function as that of the "controlled variable means" because the feedback amplifier does not control the voltage on the gate of the accused decoupling transistor in response to changes in the voltage on the gate of the selected EPROM cell. ID at 138. The issue under the doctrine of equivalents is whether these two functions are substantially the same. The Commission finds that the voltage at the gate of the EPROM cell acts only to select the cell to be read. When there is no voltage at the control gate of an EPROM cell, it is not selected and it does not have any function. Therefore it is only meaningful to speak of functions with respect to a selected EPROM cell. The feedback amplifier in a selected EPROM cell controls the voltage on the gate of the accused decoupling transistor only in response to the programming state of the selected cell. That function is different from that of the "controlled variable potential means" of claim 1.

Moreover, the claimed "controlled variable potential means" performs its function in a substantially different way from that of the feedback amplifier. The structure in the '518 patent corresponding to the claimed means responds to a low voltage (a logic zero) on the gate of the input transistor by causing the decoupling transistor to cease to conduct, thereby decoupling the capacitance associated with the input transistor. The feedback amplifier in the accused EPROMs does the opposite. When a

discharged column is selected, [33] and the selected EPROM cell is programmed, the voltage on that column will rise. The feedback amplifier will turn the accused decoupling transistor on, allowing it to charge the column capacitance, and the feedback amplifier keeps the accused decoupling transistor on so that the column capacitance is not allowed to discharge. That is also the opposite of the way the "controlled variable potential means" works. However, both the claimed means and the feedback amplifier obtain the same ultimate result, viz., faster operation of the circuit.

Claim 2: The accused EPROMs were found not to literally infringe claim 2 because the following claim limitations were not met: (1) an output signal that responds to the alleged input signal; and (2) a decoupling transistor. The Commission also does not find equivalents of these claim elements in the accused EPROMS.

First, an equivalent of the output signal that responds to the alleged input signal (the word line signal) is lacking. As previously discussed, the word line signal merely selects the EPROM cell to be read and its output depends on the presence or absence of charge on the floating gate of the cell. Intel identified the output signal of the accused EPROMs as being the voltage at the drain of the accused decoupling transistor.

Intel contended that the function of the circuit recited in claim 2 is the decoupling of capacitance. By "decoupling," Intel means eliminating the effect of the capacitance at the input of the claimed circuit. The

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[33] A column is selected by a y-select signal which has nothing to do with the word line signal except that together, the signals select a cell.

Commission has determined to construe "decoupling" to mean the disconnection of the capacitance so that the decoupling transistor ceases to conduct current. 34/ As previously discussed, the accused circuit (essentially an EPROM cell connected to a column biasing circuit) does not perform the same function as the claimed circuit because it does not "decouple" capacitance. The issue relating to function under the doctrine of equivalents is whether the function of the claimed circuit is substantially the same as that of the accused circuit. The function of the accused circuit is the elimination of the delay associated with the time required to discharge and recharge a column line capacitance by keeping the voltage swing on the column line limited and, consequently, the capacitance charged. The function of the claimed circuit is the disconnection of the capacitance of the input transistor from the load so that the capacitance is not charged up as the output across the load rises. The two functions are not substantially the same because the approach of the accused circuits is not to decouple, but rather to couple, the supply voltage (through the column load and the accused decoupling transistor) to the column line.

The accused EPROM circuit also operates in a substantially different way from the way the circuit of claim 2 functions. Preventing the capacitance from charging up by decoupling it from the rest of the circuit is the opposite of maintaining the connection so that the capacitance may not

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34/ While it is true that the "whereby" clause of claim 2 refers to decoupling of capacitance, it is the current passing through the decoupling transistor that must be decoupled to prevent the capacitance from being charged.

completely discharge. However, the result is again the same, viz., faster circuit operation.

The accused decoupling transistor is not the equivalent of the claimed decoupling transistor for the reasons discussed with respect to claim 1.

Claim 3: Claim 3 is dependent upon claim 2. Therefore, it is not infringed literally or under the doctrine of equivalents for the same reasons as discussed with respect to claim 2.

The Commission adopts the remainder of the ALJ's findings of fact and conclusions of law, to the extent that they are not inconsistent with the foregoing discussion.

V. Domestic Industry

The ALJ determined that the domestic industry does not practice the '518 patent. [

]. The ALJ found that "for the same reasons that respondents' products do not infringe, Intel's products do not practice the claims." ID at 143.

Intel contends that the ALJ's determination that the domestic industry does not practice the '518 patent is based upon the same clearly erroneous factual findings as her noninfringement findings. All of respondents' contentions and arguments relating to the ALJ's noninfringement determination apply equally to her finding on domestic industry.

The claims in controversy do not read on Intel's EPROMs for the same reasons that they do not read on the accused EPROMS and consequently there is no domestic industry practicing the '518 patent. The Commission therefore adopts the ALJ's determination regarding the domestic industry, to the extent it is not inconsistent with the foregoing analysis.

The '394 Patent: EPROM Sense Amplifier

I. Background

U.S. Letters Patent 4,223,394 (the '394 patent) is directed to an EPROM sense amplifier using column biasing circuits to limit the voltage swing on the EPROM cell column lines. Intel alleged that respondents infringe claims 1 and 2 of the '394 patent. The ALJ found those claims valid and enforceable, provided that they are construed more narrowly than Intel proposed. Using the narrower construction, she found that the accused EPROMs do not infringe the claims in controversy and that the domestic industry does not practice those claims. The Commission determined to review the ALJ's claim construction and, consequently, the validity, enforceability, infringement, and domestic industry issues. The Commission determines to construe the claims in controversy more broadly than the ALJ and, as a consequence of that claim construction, determines that claim 1 is invalid as obvious in view of the prior art, but that claim 2 is valid, enforceable, infringed, and practiced by the domestic industry.

II. General Description of the Invention [35/]

The invention set forth in the claims in controversy is an EPROM sense amplifier circuit that uses a reference (or "dummy") cell to establish a reference voltage to be compared with the voltage produced in a column line

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35/ The ALJ's discussion of the subject matter of the '394 patent is in the ID at 148-157.

containing EPROM cells. The claimed sense amplifier uses a column biasing circuit to limit the voltage swing (i.e., the range of voltage variation) across the column line to achieve greater speed of operation.

III. Claim Construction

The claim elements subject to Commission review are the "first biasing means" and the "second biasing means". The ALJ construed the term first biasing means "to cover the specific biasing means disclosed in the only figure in the patent, and equivalent means, but [not] a circuit that is closer to the one found in the '012 [U.S. Letters Patent 4,094,012] prior art patent than to the one disclosed in the '394 patent using two transistors with a specific threshold difference between them to set specific upper and lower voltage swing limits." ID at 168-69.

From her claim analysis it is clear that the ALJ did not allow any range of equivalents with respect to the second biasing means, as required by 35 U.S.C. § 112(6). Moreover, it is clear from the ALJ's infringement analysis that she also did not allow any range of equivalents for the first biasing means. Thus, in support of her noninfringement conclusion, the ALJ stated:

> Respondents' EPROMS do not limit the column line voltage between the first and second upper and lower voltages, and do not employ different threshold voltage MOS devices for this purpose.

ID at 181. The use of transistors having differing threshold voltages to establish the upper and lower limits of the column voltage swing is found only in the specification and in claim 3, not in claims 1 and 2.

The Commission determines to modify the ALJ's claim construction in the manner discussed below. The ALJ's construction of the term "first biasing

means" recited in claim 1 is not adopted by the Commission. The first biasing means is construed to cover the corresponding structure in the specification and equivalents thereof. 35 U.S.C. § 112(6). However, the first biasing is not limited to circuits that use transistors having a difference in threshold voltages equal to the difference between upper and lower voltage limits on the column line, because that limitation appears only in claim 3 (which is not being asserted by Intel) and in the specification.

The ALJ's construction of the term "second biasing means" is also not adopted by the Commission. The second biasing means is also construed to cover the corresponding structure in the specification and equivalents thereof.

The Commission determines that the ALJ's claim construction is incorrect because she did not follow 35 U.S.C. § 112(6), and because she read into independent claim 1 a limitation appearing in dependent claim 3. Section 112(6) was enacted to prevent courts from holding that means-plus-function limitations cover only the means disclosed in the specification. DMI Inc. v. Deere & Co., 755 F.2d 1570, 1574, 225 USPQ 236, 238 (Fed. Cir. 1985). Moreover, it is well established that narrow claim limitations cannot be read into broader claims to avoid invalidity or to escape infringement. Id.

IV. Validity and Enforceability

The ALJ determined that if the claims in controversy were construed as broadly as Intel proposed, they would be invalid as obvious over the prior art under 35 U.S.C. § 103. Specifically, she found that if the claims were

broad enough to cover the column biasing circuits used in the accused EPROMs, then those claims would also read on the column biasing circuits disclosed in the prior art '012 patent. Although the '012 patent relates to a single-ended sense amplifier and not to a balanced sense amplifier, as required by the '394 patent, the ALJ determined that it would have been obvious to one of ordinary skill in the art to combine the teachings of the '012 patent with the balanced sense amplifier of the prior art '108 patent (U.S. Letters Patent 3,938,108). The ALJ determined that she had to construe the claims in controversy narrowly to preserve their validity. She therefore construed them to cover only the column biasing circuit disclosed in the '394 patent specification, which is distinguishable from the column biasing circuit of the '012 patent.

The ALJ also determined that if she construed the claims in controversy as broadly as Intel proposed, they would be unenforceable, because Intel did not disclose the '108 patent to the PTO examiner. Since Intel obviously knew about its own patent, such nondisclosure would constitute inequitable conduct. She therefore construed the claims narrowly to preserve their enforceability.

The Commission determines that: (1) claim 1 is invalid as obvious over the prior art '012 and '108 patents, (2) claim 2 is not invalid; and (3) respondents have failed to prove that the claims in controversy would be unenforceable if broadly construed.

As previously discussed, claim 1 cannot be limited to cover only column biasing circuits that use two transistors having different threshold

voltages, like the transistors of the preferred embodiment and those that are claimed in dependent claim 3. Claim 1 must be construed broadly enough to cover column biasing circuits that limit the voltage swing on the column line by means other than transistors of differing threshold voltages.

The '394 patent is presumed to be valid. 35 U.S.C. § 282. With respect to obviousness, that means that it is presumed that the claimed invention would not have been ovious to one ordinary skill in the art. The party asserting invalidity must prove the facts underlying a conclusion of invalidity by clear and convincing evidence. N.V. Akzo v. E.I. DuPont de Nemours, 810 F. 2d 1148, 1151, 1 USPQ 2d 1704, 1707 (Fed. Cir. 1987).

The Commission determines that respondents sustained their burden of proving by clear and convincing evidence that it would have been obvious to one of ordinary skill in the art to combine the column biasing circuitry of the '012 patent with the balanced EPROM sense amplifier of the '108 patent and, that when viewed as a whole, claim 1 reads on that combination, whereas claim 2 does not. The Commission adopts the ALJ's findings of fact on the scope and content of the prior art, the differences between the prior art and the claims, the level of ordinary skill in the art, and the secondary considerations (objective indicia of nonobviousness), to the extent those findings are not inconsistent with the following discussion.

After considering the evidence proferred by Intel as objective indicia of nonobviousness, the Commission agrees with the ALJ's findings in that regard. The Commission further notes that the evidence proferred by Intel does not relate to any long felt need, commercial success, or unexpected

results and that it is not otherwise probative of nonobviousness of the claimed invention. The Commission specifically finds that (1) the failure of George Perlegos to combine the teachings of prior art patents in which he was an inventor and (2) his praise of co-inventor Pathak, are too subjective to be considered probative of nonobviousness.

The teachings of the '012 and '108 patents may be properly combined for the following reasons:

(1) The prior art references are related in that both claim EPROM sense amplifiers.

(2) They are both related to a common art (i.e., the EPROM art).

(3) The hypothetical person of ordinary skill in the art would be presumed to be familiar with both references. 36/

(4) A combination of the teachings of the '108 and '012 patents would have suggested the possibility of achieving an improvement of the column biasing circuit of the '012 patent by using it in the balanced sense amplifier taught by the '108 patent. This is so because the '012 patent refers to the '108 patent and one of ordinary skill in the art would find that the use of the '012 patent column biasing circuit in the balanced sense amplifier of the '108 patent would result in faster operation. Simko Tr. 3576.

(5) The invention recited in claim 1 could not achieve more than was achieved by the combination of the prior art. Simko Tr. 3577-84. 37/

Therefore, it would have been obvious to combine the teachings of the '012 and '108 patents. The elements of claim 1 are all found in the combination of the '012 and '108 patents. Simko Tr. 3576-84. Intel argued that the

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36/ In re Sernaker, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983).

37/ The foregoing five-step analysis follows that set forth by the Federal Circuit in determining whether prior art references may be properly combined in In re Sernaker, supra.

combination of the '012 and '108 patents lacks the claimed second biasing means. However, the ALJ found that the '108 patent does have a second biasing means on the reference cell column. ID at 160-161. The record establishes that transistors 96 and 97 in Figure 6 of the '108 patent act as a biasing means that corresponds to the second biasing means of claim 1. Simko Tr. 3581-82.

Claim 2 narrows claim 1 by adding the limitation that "the first and second biasing means are substantially identical circuits." The '012 patent does not teach a second biasing circuit. Moreover, the circuit in the '108 patent corresponding to the "second biasing means" is quite different from the circuit on the memory cell column disclosed in the '108 patent. 38/ Therefore, the combination of the '012 and '108 patents does not teach or suggest a second biasing means that is substantially identical to the first biasing means. Consequently, respondents have failed to prove by clear and convincing evidence that the circuit of claim 2 would have been obvious to one of ordinary skill in the art.

The ALJ's determination that the '394 patent is enforceable only if its claims are limited to the specific circuit described in the specification (which includes limitations from the unasserted claim 3) is incorrect, because she did not make the finding regarding intent now required for a holding of inequitable conduct before the PTO.

38/ The '108 patent only discloses a load on the memory cell column. See Figure 6 of the '108 patent.

The ALJ determined that if the claims in controversy are broadly construed, the '108 patent would be highly material and "the gross negligence of the inventor and Intel's patent attorney in failing to disclose it to the patent examiner would make the patent unenforceable." ID at 173. However, the ALJ acknowledged that "[t]here is no evidence of actual intent to mislead the PTO." Id.

Persons asserting unenforceability of a patent due to inequitable conduct must prove by clear and convincing evidence that (1) the prior art or information not cited by the patent applicant to the PTO was material and (2) the patentee intended to deceive the PTO. J.P. Stevens & Co. v. Lex Tex. Ltd., 747 F.2d 1553, 1559, 223 USPQ 1089, 1092 (Fed. Cir. 1985). The ALJ made no finding of an intent to deceive the PTO. Instead, she found that the degree of materiality of the '108 patent and the gross negligence of the patent applicant would justify a finding of unenforceability. The Federal Circuit has recently (December 1988) clarified the law on the requisite intent to deceive:

> We adopt the view that a finding that particular conduct amounts to "gross negligence" does not of itself justify an inference of intent to deceive; the involved conduct, viewed in light of all the evidence, including evidence indicative of good faith, must indicate sufficient culpability to require a finding of intent to deceive.

Kingsdown Medical Consultants, Ltd. v. Hollister, Inc, 863 F.2d 867, 876 (Fed. Cir. 1988). Thus the ALJ's finding of gross negligence is not itself enough to justify an inference of an intent to deceive. In fact, if the ALJ

had found that Intel intended to deceive the PTO, it would not matter how broadly the claims were construed; she would have certainly held the patent unenforceable.

Respondents contended on review that if the claims in controversy are construed as broadly as Intel proposes, they would be unenforceable. Respondents specifically point out that Intel offered no explanation or excuse for the conduct of its patent attorney. However, the Commission determines that respondents did not prove, by clear and convincing evidence, that Intel intended to deceive the PTO.

GI/Microchip were the only respondents to argue the unenforceability of the '394 in their post-trial briefs. They argued that "[i]nequitable conduct is satisfied by gross negligence." Post Hearing Brief of GI/Microchip on the '108, '394, and '518 patents at 39. However, on review GI/Microchip and the other respondents argued that the ALJ was correct in her finding of enforceability, but only because she limited the claims. The only reasons that respondents advanced for a finding of gross negligence are that the materiality of the '108 patent is high 39/ and the facts that the '108 patent is Intel's and was prosecuted by the same patent attorney who prosecuted the '108 patent. Respondents offered evidence from which only gross negligence may be inferred. In view of the recent Federal Circuit's Kingsdown decision, the requisite intent may not be inferred from gross negligence alone.

39/ The Commission notes that the materiality of the '108 patent to the '394 patent claims depends upon the scope of those claims.

Therefore, the Commission determines that respondents did not sustain their burden of proving that the '394 patent is unenforceable by clear and convincing evidence.

V. Infringement

The ALJ determined that none of respondents' accused EPROMs infringe the claims in controversy. The parties agree that Atmel's 27C512 EPROM is representative of all the accused EPROMs, except the 27C256 EPROMs.

1. The 27C512 EPROMs -- The ALJ determined that the 27C512 EPROMs do not literally infringe the claims in controversy because those EPROMs do not include the first biasing means or the second biasing means required by claim 1. As previously discussed, in order to preserve their validity, the ALJ construed the claims in controversy to cover only the circuit described in the '394 patent specification. Thus, the basis for the ALJ's noninfringement determination was that the accused EPROMs do not maintain a limited voltage swing between a first potential (when the first device--the EPROM cell--is in one binary stage) and a second potential (when the first device is in its other binary state (ID at 179)), and that they do not employ different threshold voltage MOS devices for this purpose. The ALJ found that the 27C512 EPROMs do not have a "second biasing means" for the same reasons that they do not have a "first biasing means."

2. The 27C256 EPROMs -- The ALJ found that the only difference between the 27C512 EPROMs and the 27C256 EPROMs lies in the comparator means. She then found that "the 27C256 EPROMs do not infringe the '394 patent for the same

reasons that the 512 (i.e., the 27C512) EPROMs do not." ID at 186. The ALJ also determined that (1) the comparator means element of claim 1 is not literally found in the 27C256 EPROMs because those EPROMs compare currents instead of potentials (i.e., voltages), as required by claim 1, and (2) comparing potentials and comparing functions are equivalent but not identical functions, as required for infringement under 35 U.S.C. § 112(6).

3. Infringement under the doctrine of equivalents -- The ALJ determined that none of the accused EPROMs infringe the claims of the '394 patent in controversy because "[t]he equivalent of the first and second biasing means cannot be found in the respondents' EPROMs." ID at 187.

Intel contended that the ALJ's noninfringement finding should be reversed because it is based on an improper narrowing of the claims in controversy. Intel asserted that if the claims are construed properly, the record establishes literal infringement. Intel also contended that the ALJ erred by not performing the required analysis under the doctrine of equivalents, and that if the claims are not literally infringed they are certainly infringed under the doctrine of equivalents.

Atmel argued that the ALJ's noninfringement determination is correct because it is supported by the record. Atmel asserted that the ALJ properly construed the "means" elements of the claims to cover the corresponding structure in the specification and equivalents thereof, as required by 35 U.S.C. § 112(6).

GI/Microchip and Hyundai argued that the ALJ's noninfringement determination is correct because their column biasing circuits do not limit

or change the voltage on the memory column between "first" and "second" potentials. Those respondents contended that they instead use prior art voltage regulator circuits. GI/Microchip and Hyundai also argued that their 27C256 EPROMs do not practice either the claimed "first biasing means" or the "comparator means," as Intel's expert (Foss) conceded.

The Commission determines (1) to reverse the ALJ's determination that the group of accused EPROMs represented by Atmel's 27C512 device do not infringe claim 2 of the '394 patent and (2) to affirm her findings that the accused EPROMs represented by Atmel's 27C256 do not infringe the claims in controversy, either literally or under the doctrine of equivalents.

1. The 27C512 EPROMs

As the ALJ found, the first and second biasing means are the key elements that respondents argued are missing from their EPROMs. ID at 175. The first step in deciding whether a claim element drafted in means-plus-function form is infringed is to determine whether the claimed function is identical to the function of the accused device. Pennwalt Corp. v. Durand-Wayland Inc., 833 F.2d at 934, 4 USPQ 2d at 1739.

The function of the first biasing means is to charge the memory cell column line to a first potential (when the memory cell is in one binary state) and to prevent that column line from dropping below a second potential (when the memory cell is in its other binary state). The function of the accused EPROM circuit is the same as that of the "first biasing means."

In Intel Exhibits EH and EI, the alleged first biasing means is labelled "C4", and the memory cell column line is connected to node Oi. If the

selected cell is programmed (one binary state), it does not conduct. Therefore, if the previously selected cell was unprogrammed, the voltage at node Oi will begin to increase ([

] See ID at 176. Thus, the column line is charged to a first potential (i.e., the voltage level desired).

On the other hand, if the selected cell is unprogrammed (the other binary state), it will conduct current, thus pulling the voltage at node Oi down toward ground. The inverting circuit ([

] ID at 177-78. Therefore, the column line is prevented from dropping below a certain potential.

In summary, the functions of both the accused and the claimed first biasing means are identical, viz., maintaining the voltage swing across the column line within a small limited range. Foss Tr. 2050.

The next step in the infringement analysis is to determine whether the structure of the '394 patent corresponding to the claimed "first biasing means" is the equivalent of accused "first biasing means." 35 U.S.C. § 112(6). The circuit described in the '394 patent specification uses transistors having different threshold voltages to establish a limited

voltage swing. The accused circuit uses the 100/4 transistor in conjunction with a negative feedback circuit that controls the voltage at its gate in response to changes of voltage at its source. Respondents conceded that the accused circuit limits the voltage swing across the column line. 40/ Both the claimed and the accused circuits use MOS transistors with zero (or near zero) thresholds to pull up the column line voltage as it begins to drop and to keep the column line voltage at a minimum level so that the capacitance associated with it does not discharge. Consequently, both circuits obtain the same result, viz., avoiding the delay associated with charging up the capacitance of the column line when the output of the circuit goes from a low voltage to a high voltage. Therefore, the first biasing means in the '394 patent specification is the equivalent of the accused biasing means.

Intel alleged that the reference cell column biasing circuit in the accused EPROMs meets the "second biasing means" limitation of claim 2 of the '394 patent because that accused circuit is substantially identical to the accused "first biasing means." The accused reference cell column biasing circuit differs from the claimed reference cell column biasing circuit only in the sizes and number of the load transistors. Otherwise, the two circuits are identical. The ALJ found that "the reference column, biasing circuit in the respondents' EPROMs is substantially the same as the column biasing circuit." ID at 186. The Commission agrees with the ALJ in this regard, to the extent that she did not require that the first biasing means be limited

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40/ See Atmel Post Hearing Memorandum (on the '518 patent) at 83; see also Boll Tr. 3793, 3807-08.

to the preferred embodiment. The difference in the numbers or sizes of load transistors in respondents' column biasing circuits is not sufficiently great to render them not substantially identical. Foss Tr. 2093. Therefore, the Commission determines that the accused EPROMs include a second biasing means that is substantially identical to their first biasing means.

In view of the foregoing analysis, the Commission determines that the accused EPROMs infringe claim 2. The Commission adopts the ALJ's infringement analysis regarding the 27C512 EPROMs with respect to the claim elements other than the first and second biasing means, to the extent that such analysis is not inconsistent with the discussion herein.

2. The 27C256 EPROMs

The ALJ was correct in finding that the 27C256 EPROMs do not literally infringe the claims in controversy, because they do not literally include the claimed comparator means. ID at 186. To find literal infringement under 35 U.S.C. § 112(6), the accused device must perform the identical function claimed in the patent and its structure must be equivalent to the corresponding structure in the patent specification. Pennwalt Corp. v. Durand-Wayland Inc., 833 F.2d at 934, 4 USPQ 2d at 1739. Claim 1 requires "a comparator means for comparing potentials" (emphasis added). The accused 27C256 EPROMs compare currents, not potentials. Therefore, there is no identity of function and no literal infringement can be found. The Commission adopts the ALJ's analysis and conclusion of no literal infringement of the claims in controversy by the 27C256 EPROMs, to the extent not inconsistent with the foregoing discussion.

To find infringement under the doctrine of equivalents, the accused device must perform substantially the same overall function in substantially the same way to obtain the substantially the same result. Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 607 (1950). The ALJ correctly found that comparing currents and comparing voltages are equivalent functions. ID at 186. However, Intel's expert Foss testified that the accused and claimed circuits operate in different ways. Tr. 2074. The Commission finds that the accused comparator circuit in the 27C256 does not operate in substantially the same way as the claimed comparator means. The structure corresponding to the claimed comparator means is the differential sense amplifier number 11 in the '394 specification's figure. That differential sense amplifier compares the potentials on nodes 26a and 26b and provides the resulting signals to the output circuit 12. '394 patent, Col. 5, lines 21-23. There is no circuitry in the accused 27C256 EPROMs that functions substantially the same way as the differential sense amplifier. Simko Tr. 3541. The accused 27C256 EPROMs function by using the reference column and memory column currents to determine the input level to a NOR gate. Simko Tr. 3541-42. 41/ That "way" of operating is substantially different from the way the differential sense amplifier in the '394 patent operates. Therefore, the Commission concludes that the 27C256 EPROMs do not infringe the claims in controversy under the doctrine of equivalents. The

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41/ This sensing system is referred to as a current mirror. Simko Tr. 3474.

Commission adopts the remainder of the ALJ's findings of fact and conclusions of law, to the extent that they are not inconsistent with the foregoing discussion.

VII. Domestic Industry

The ALJ determined that the domestic industry does not practice the '394 patent because [ ] (Tr. 2624) that she found was not covered by the claims of the '394 patent. ID at 188. Intel and respondents took substantially the same positions on domestic industry as they took with respect to infringement of the '394 patent claims.

The Commission determines to reverse the ALJ's determination that the domestic industry does not practice the '394 patent. The ALJ determined that [

]. The Commission has construed the first and second biasing means more broadly. So construed, those claim limitations read on Intel's EPROM circuits just as they do on respondents' 27C512 EPROMs. Therefore, the Commission determines that claim 2 reads on Intel's EPROM circuits. The Commission also adopts the ALJ's findings regarding practice of the '394 patent by the domestic industry, except to the extent inconsistent with the foregoing discussion.

The '050 Patent: Radiation Shield for an Integrated Circuit Memory with Redundant Elements

I. Background

U.S. Letters Patent 4,519,050 (the '050 patent) issued on May 21, 1985, and expires on May 21, 2002. The patent claims a radiation shield for an EPROM cell comprising an upper cover and upstanding elements. The claimed invention converts normally erasable EPROMs into unerasable EPROMs (commonly referred to as UPROMs) by shielding the floating gate of the EPROM cell from ultraviolet radiation. 42/ Intel alleged that Atmel's 27HC64, 27C256, 27HC256, 27C512, 27C513, 27C515, and 1 megabit devices and GI/Microchip's 27C256 and 27C512 devices infringe claims 1-4 of the '050 patent. The ALJ found that all of the respondents use the same UPROM shield design in their redundancy circuit, and respondents stipulated that, with the exception of Atmel's 1 megabit EPROM, there is no material difference between Atmel's and GI/Microchip's accused devices. 43/

Respondents argued before the ALJ that the claims of '050 patent in issue are invalid under 35 U.S.C. § 103 as obvious over the prior art and unenforceable due to the inequitable conduct of the inventor, who allegedly failed to disclose material prior art references to the PTO examiner during

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42/ A more thorough discussion of the '050 patent is contained in the ID at 191-195.

43/ ID at 217.

the prosecution of the '050 patent. Certain respondents [44/] also argued that the '050 patent is invalid because the claims recite an inoperative structure. Lastly, respondents argued that, even if the patent claims in controversy are valid, respondents' accused devices are noninfringing.

The ALJ found the claims of the '050 patent to be valid, enforceable, and infringed by all of the accused devices except Atmel's one megabit device. Respondents petitioned for review of the ALJ's validity and infringement findings and Intel petitioned for review of the ALJ's noninfringement finding with respect to Atmel's one megabit device.

The Commission determined to review the ID on the issues of whether the claims in issue are valid and infringed by respondents' accused devices (other than Atmel's one megabit part), and on the issue of whether the domestic industry produces articles covered by those claims.

The Commission determined not to review the ALJ's determinations that the '050 patent is enforceable and noninfringed by Atmel's one megabit part and those determinations thereby became the determinations of the Commission.

Having considered the record and the arguments of the parties, the Commission affirms the ALJ's determination that: (1) respondents failed to prove by clear and convincing evidence that claims 1-4 of the '050 patent are invalid [45/] (2) respondents' accused EPROMs (except for Atmel's one megabit

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44/ Both Atmel and GI/Microchip argued that the '050 patent is invalid due to inoperativeness.

45/ The Commission notes that the ALJ in performing her obviousness analysis
(Footnote continued on next page)

device) literally infringe claims 1-4 of the '050 patent, and (3) the domestic industry practices the claims of the '050 patent. Having affirmed the ALJ determination that respondents' accused EPROMs (except Atmel's one megabit device) literally infringe the claims in issue, the Commission vacates the ALJ's determination concerning infringement under the doctrine of equivalents. The Commission also vacates that portion of the ALJ's claim construction wherein she imposes an hourly limitation in construing the claim phrase "permanently programmed." The Commission finds that the ALJ's ultimate determinations concerning this patent are not undermined by this modification to her claim construction. The record fully supports those determinations when the claims are construed as modified. The Commission otherwise adopts the ALJ's findings of fact and conclusions of law to the extent that they are not inconsistent with the determinations of the Commission as expressed herein.

II. Claim Construction

The Commission adopts the ALJ's claim construction of claims 1-4 of the '050 patent except for her construction of the claim phrase "permanently programmed" of the whereby clause of claim 1. 46/ The Commission construes the claim phrase "permanently programmed" to mean "for the useful lifetime of the EPROM part under normal operating conditions." 47/

(Footnote continued from previous page)
subsumed her discussion of the scope and content of the prior art in her discussion of the differences between the prior art and the claims at pages 199-205 of the ID. The Commission is satisfied that her obviousness analysis adequately addresses the scope and content of the prior art.

46/ Claims 1-4 of the '050 patent are in controversy in this investigation; claim 1 is written in independent form, and claims 2-4 in dependent form.

47/ Support for this construction is found in the ID at 214.

The ALJ construed the whereby clause of claim 1 as requiring that the shielded EPROM cell be permanently programmed such that redundant elements may always be used in place of defective elements. 48/ She found that, in the context of the claims of the '050 patent, permanently programmed does not mean programmed forever, but rather programmed over the normal useful life of the EPROM. 49/ In reaching this conclusion, the ALJ noted that the only length of time referred to in the '050 patent is a statement in the specification that it is the goal of the claimed invention for the UPROM cell disclosed in the preferred embodiment to resist erasure for 300 hours. 50/ She also noted that respondents' expert testified that "permanently programmed" referred to some hourly level and did not mean forever. 51/ She then attempted to ascertain what the normal lifetime of an EPROM cell is and found that, while the record did not establish an hourly level, it offered clues. 52/ Those clues related to evidence of the normal useful lifetime of respondents' accused EPROMs, and by reference to those devices she concluded that 20 hours is a reasonable estimate of the number of hours of erasure that an EPROM would be exposed to in a normal lifetime of usage. 53/

48/ The ALJ found that permanent programming refers to the redirection of an inquiry from a defective cell to a working cell.

49/ ID at 213.

50/ ID at 213.

51/ ID at 214.

52/ ID at 214.

53/ ID at 215.

Respondents argued that the ALJ improperly construed the claim phrase "permanently programmed" by reference to the accused devices. Intel argued that the ALJ correctly construed the phrase "permanently programmed" as meaning "for the useful lifetime of the EPROM part under normal operating conditions." Intel contended that, while it was unfortunate that the ALJ referred to the accused devices in the claim construction section of the ID, she did not construe that phrase by reference to the accused devices.

The Commission has determined not to adopt the ALJ's construction of the claim phrase "permanently programmed" because she did so by reference to the accused devices. The Commission is mindful of the fact that claims must not be construed by reference to the accused devices. 54/ The ALJ first found that "permanently programmed" meant "for the useful lifetime of the EPROM part under normal operating conditions." 55/ In attempting to ascertain what the useful lifetime of that EPROM part was, the ALJ repeatedly referred to the accused devices and found that 20 hours is a reasonable estimate of the number of hours of erasure that an EPROM would be exposed to in a normal lifetime of use. 56/ The Commission believes that it was unnecessary for the ALJ to ascertain what the useful lifetime of that EPROM is, and erroneous as a matter of law to have done so by reference to the accused devices. Rather, the Commission believes that the useful life of respondents' EPROMs is a factual

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54/ SRI International v. Matsushita Electric Corp., 775 F.2d 1107, 1119, 227 USPQ 577, 583 (Fed. Cir. 1985).

55/ ID at 214.

56/ ID at 215.

question to be determined in the context of infringement.

III. Infringement

The ALJ determined that Atmel's 27HC64, 27C256, 27HC256, 27C512, 27C513, and 27C515 UPROMs and GI/Microchip's 27C256 and 27C512 UPROMs literally infringe claims 1-4 of the '050 patent. She also found that, had respondents' parts not literally infringed the claims in issue, they would have infringed under the doctrine of equivalents. The Commission affirms the ALJ's determination that the accused EPROMs (except Atmel's one megabit device) literally infringe claims 1-4 of the '050 patent because each element of those claims is found in the accused devices. Respondents' accused EPROMs are permanently programmed, as that claim phrase is now construed, because they are not erased during the lifetime of the EPROM under normal operating conditions. 57/ The Commission adopts, to the extent not inconsistent with the Commission's determination, the ALJ's factual findings and conclusions of law made in connection with her determination that respondents' devices (except for Atmel's one megabit device) literally infringe claims 1-4 of the '050 patent. Having determined that respondents' accused EPROMs (except Atmel's one megabit part) literally infringe the claims in issue, the Commission vacates the ALJ's finding as to infringement of those devices under the doctrine of equivalents.

57/ See the ALJ's discussion of the accused EPROMs at 215-216, and 223-224.

The '084 Patent: Apparatus for Selecting Alternate Addressing Mode

I. Background [58]

U.S. Letters Patent 4,685,084 (the '084 patent) issued on August 4, 1987, and expires on August 4, 2004. It relates to circuitry for enabling an EPROM to be programmed selectively for addressing either the full memory array (i.e., in a "non-page mode") or for addressing the array by "pages" (i.e., in a "page mode"). [59]

Intel alleged that respondents' "old" 512K EPROMs infringe claims 1-10 and that their "new" 512K EPROMs infringe claims 1-4 of the '084 patent. [60] Respondents argued before the ALJ that the claims of the '084 patent in controversy are invalid under 35 U.S.C. § 102(b) because of Intel's on-sale/public use activities more than one year prior to the filing date of the '084 patent application. Respondents also argued that the '084 patent is unenforceable due to the inequitable conduct of Intel's patent counsel during

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58/ The ALJ's discussion of the subject matter of the '084 patent is contained in the ID at 231-235.

59/ The basic concept of the page mode was known prior to the invention of the '084 patent. ID at 231. This mode of operation allows microprocessors to address the same memory array using fewer address pins.

60/ There are two groups of 512K EPROMs produced by respondents: (1) the old EPROMs (viz., Atmel's original 27C512, 27C513, and 27C515 EPROMs and GI/Microchip's 27512C EPROMs) containing the original design used by respondents, which includes the circuitry that Intel alleged infringes the claims in controversy; and (2) the new EPROMs (viz., Atmel's redesigned 27C512, 27C153, and 27C515 EPROMs and GI/Microchip's redesigned 27C512 EPROM) having the same circuits as the old ones, but altered to disable the programmable selection circuitry.

the prosecution of the '084 patent before the PTO. 61/ Lastly, respondents contended that, even if the claims of the '084 patent are valid, their 512K EPROMs are noninfringing.

The ALJ determined that respondents failed to prove that the claims of the '084 patent in controversy are invalid, or that the patent is otherwise unenforceable due to the inequitable conduct of Intel's patent counsel. The ALJ found that respondents' "old" 512K EPROMs infringe claim 1 of the '084 patent under the doctrine of equivalents, but that respondents' "new" 512K EPROMs do not. Intel petitioned for review of the ALJ's noninfringement finding concerning respondents' "new" 512K devices. Respondents petitioned for review of the ALJ's validity determination and noninfringement determination concerning their "old" 512K EPROMs.

The Commission determined to review the ID concerning: (1) whether the the claims of the '084 patent in controversy are valid, (2) whether respondents' accused EPROMs are infringing, and (3) whether the domestic industry produces articles covered by the claims in issue of the '084 patent. The Commission specifically requested the parties to address in their briefs the issue of whether the ALJ construed the claim phrase "programmable selection means" to include process steps. The Commission determined not to review the ALJ's enforceability determination and it thereby became the determination of the Commission.

61/ The basis of the inequitable conduct allegation was the purported failure of Intel's patent counsel to bring to the attention of the PTO examiner sales activities that could have constituted a 102(b) bar to the issuance of the '084 patent.

Having considered the record and the arguments of the parties, the Commission determines to affirm the ALJ's determination that: (1) respondents failed to prove by clear and convincing evidence that claims of the '084 patent in issue are invalid, (2) respondents' accused "old" EPROMs do not literally infringe the claims in controversy but do infringe claim 1 under the doctrine of equivalents, (3) respondents' accused "new" EPROMS do not infringe the claims in issue, and (4) the domestic industry practices the claims of the '084 patent.

II. Claim Construction

The ALJ construed the claim phrase "programmable selection means" (i.e., the means for selecting the alternate addressing mode (the page mode) or the normal mode (the non-page mode)) as covering "the means described in the specification" [62/] wherein the addressing mode is selected by the program state of an EPROM cell. Based on the specification, the ALJ found that the selection as to the mode of operation (i.e., page mode or non-page mode) can be made either at the time of manufacturing or after the product is manufactured. [63/] She also found that the programmable selection means would include mask programming, a process that takes place near the end of the manufacturing process. The ALJ recognized, however, that her construction of the phrase "programmable selection means" (which includes the information

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62/ ID at 244.

63/ Id. She found that, because the patent specification taught the advantage of one part serving two purposes, any programmable selection means that occured during manufacture would have to occur at, or close to the end of, the manufacturing process. ID at 245.

stored in the metal mask itself) is "an impediment to finding that respondents' products infringe at the time that they are imported, because the mask itself . . . no longer accompanies the product when it is imported." 64/

The ALJ stated that the meaning of the term "special address buffer" was "the most important issue of claim construction." 65/ She defined a buffer as "circuitry that performs some kind of conversion on a signal to get it ready for the next logical operation in a circuit." ID at 247 (citing Huber testimony at Tr. 4953-54).

Claims 2-6 are dependent on claim 1 and each adds a limitation to the preceding claim or claims. The ALJ discussed these further limitations at pages 250-51 of the ID. Claim 7 calls for an electrically programmable read-only memory to select the alternate address mode. ID at 251. Claims 8-10 are dependent on claim 7, each adding a limitation thereto.

Intel argued on review that the ALJ erred when she construed the claim phrase "programmable selection means" as including the process step of using a mask to form a structural element on the chip during the manufacturing process. Intel maintained that the programmable selection means covers "the pattern of metal interconnections placed on the chip by the mask" during the manufacturing process and not the mask itself. Thus, Intel argued, when this claim phrase is properly construed, it becomes evident that respondents' new accused devices infringe claims 1-4 of the '084 patent.

64/ ID at 246.

65/ ID at 243 (the ALJ was apparently referring to the "address buffer" because the term "special address buffer" only appears in the specification).

Atmel argued that the ALJ did not construe the claim phrase "programmable selection means" as a process step but rather as an element of the claimed apparatus. Atmel further argued that the '084 patent "teaches a scheme that enables a manufacturer to have 'a single manufactured part . . . able to fill two different requirements.'" 66/ Those two requirements are the page mode and non-page mode manners of operation. Thus, Atmel argued that its new 27C512 and 27C513 EPROMs are noninfringing because they are permanently programmed during manufacture to operate in only one mode of operation.

GI/Microchip/Hyundai jointly argued that Microchip's new 27C512 design is never capable of page-mode operation at any stage of fabrication and therefore could not infringe the claims in controversy.

The Commission determines to vacate those portions of the ID wherein the ALJ construed the claim phrase "programmable selection means" as including process steps performed during the manufacture of the claimed invention, such as mask programming. The programmable selection means are part of a product claim, not a process claim. Thus, the Commission determines that the ALJ erred when she construed that claim phrase as including process steps performed during the manufacture of the accused devices. 67/ Her

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66/ Respondent Atmel's Reply to Intel's Submission on Issues Specified in Notice of Commission determination at 43; '084 patent specification, col. 6, lines 1-2.

67/ The Commisssion notes that the ALJ's construction of this phrase is itself somewhat inconsistent. At one point she found that "mask programming

(Footnote continued on next page)

construction of that claim phrase is otherwise correct and the Commission adopts it.

III. Validity

The Commission affirms the ALJ's determination that respondents' failed to prove by clear and convincing evidence that the claims in issue of the '084 patent are invalid. The Commission agrees with the ALJ that respondents failed to prove the existence of an invalidating on-sale bar under 35 U.S.C. § 102(b). One would have to engage in extensive inference drawing to conclude that Intel's 27C512/513 part was actually sold or offered for sale more than a year prior to the filing of the application that matured into the '084 patent. Such inference drawing does not in the Commission's view rise to the level of clear and convincing evidence. The Commission adopts the ALJ's factual findings and conclusions of law to the extent they are not inconsistent with the Commission's determination.

IV. Infringement

The ALJ found that respondents' original designs for their 512K EPROMs, while not literally infringing, nevertheless infringe claim 1 of the '084 patent under the doctrine of equivalents. 68/ She also found that

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(Footnote continued from previous page)
before the manufacturing process is completed is covered by the term 'programmable selection means' in the patent. . . ." ID at 260. Later in the ID she states that one of the purposes of the patent is that of "having a manufactured part fill two objectives." ID at 263, (emphasis added). Clearly, a part that has been programmed during the manufacturing process to operate in only one mode cannot serve the dual objective she alludes to after manufacture.

68/ Respondents' old designs are discussed in the ID at 253-259.

respondents' new (i.e., redesigned) 512K EPROMs are noninfringing because they do not include a "programmable selection means" or its equivalent as required by the claims in issue. 69/

Intel argued that respondents' new 512K EPROMs infringe claims 1-4 of the '084 patent. 70/

Atmel argued that the ALJ correctly concluded that Atmel's new 512K/513K designs do not infringe the claims of the '084 patent in issue. Atmel maintained, inter alia, that its new designs do not contain "programmable selection means," nor is the output of Atmel's multiplexer controlled by the "latch signal" as required by the claims in issue. Respondents GI/Microchip and Hyundai argued that the ALJ correctly determined that their new 27C512 EPROMs do not infringe the claims of the '084 in controversy because their new design does not contain a "programmable selection means" as required by the claims of the '084 patent in issue. All respondents argued that the ALJ erred when she found their old 512K devices are infringing under the doctrine of equivalents because these devices do not contain the functional equivalent of the address buffer claimed in the '084 patent.

Having considered the record and the arguments of the parties, the Commission determines to: (1) affirm the ALJ's determination that respondents'

69/ Respondents new EPROMs are discussed in the ID at 259-264.

70/ Intel argued that the ALJ incorrectly construed "programmable selection means" to include a programmable selection "option" at the time of importation. Intel also argued that the ALJ erroneously incorporated a process step into an apparatus claim. Finally, Intel argued that the ALJ's noninfringement determination is legally erroneous because it fails adequately to consider infringement under the doctrine of equivalents.

"old" 27C512/513/515 EPROMs, while not literally infringing, infringe claim 1 under the doctrine of equivalents, (2) affirm the ALJ's noninfringement determinations concerning respondents' "new" 512K EPROMs, and (3) supplement the ALJ's noninfringement determination as to respondents' new EPROMs under the doctrine of equivalents.

Respondents' old 512K EPROMs

The Commission's modification of the ALJ's claim construction does not alter the ALJ's ultimate determination that respondents' "old" 512K EPROM's do not literally infringe the claims in controversy, because that determination was not based on her construction of the claim phrase "programmable selection means." Rather she found that respondents' devices did not meet another limitation of the claims in controversy, viz., the "address buffer" limitation. Thus, the Commission adopts the ALJ's findings in support of that determination to the extent they are not inconsistent with the discussion herein.

The ALJ's determination that the "old" 512K EPROMs infringe claim 1 under the doctrine of equivalents is correct in view of the revised claim construction and is affirmed. The Commission determines to supplement the ALJ's analysis.

To find infringement under the doctrine of equivalents, Intel must prove by a preponderance of the evidence that the accused devices perform substantially the same overall function or work, in substantially the same way, to obtain substantially the same result. Graver Tank & Mfg. Co. v. Linde Air Prod., Co., 339 U.S. 605, 607 (1950). The Federal Circuit has held that to find infringement under the doctrine of equivalents at least the equivalent

of each claimed element must be found in the accused device. Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 935, 4 USPQ2d 1737, 1740 (Fed. Cir. 1987), cert. denied, 108 S.Ct. 1226 (1988). Moreover, the equivalent need not be found in a corresponding component. Corning Glass Works v. Sumitomo Electric U.S.A., Inc., App. Nos. 88-1192,-1193 (Fed. Cir. Feb. 22, 1989).

In finding that respondents' devices infringe claim 1 under the doctrine of equivalents, the ALJ determined that the "multiplexer" used in the accused circuits was the equivalent of the claimed "address buffer." The function of the address buffer is to provide a means for addressing a read only memory in alternative modes. 71/ She found that the multiplexer performs substantially the same function in the accused devices. 72/ She also found the multiplexer in the accused devices and the claimed buffer circuit achieved the same result, viz., selection between two alternative modes. Moreover, she found that the multiplexer in the accused device performs in substantially the same way as the claimed buffer circuit. Both the multiplexer and the address buffer use an addressing signal to select a particular memory cell from an incoming address pin or latch. Thus, the accused circuits infringe claim 1 under the doctrine of equivalents because they perform substantially the same function in substantially the same way to obtain the same result as the invention claimed in the '084 patent.

71/ '084 patent, col. 4, lines 50-63.

72/ ID at 259; Tr. at 4851, and 4965-57.

Respondents' new 512K EPROMs

The Commission's modification of the ALJ's claim construction does not alter the ALJ's ultimate determination that the respondents' new 512K EPROMs do not infringe the claims in issue of the '084 patent, either literally or under the doctrine of equivalents. The Commission therefore affirms that determination. The Commission also determines to supplement the ALJ's doctrine of equivalents analysis.

The ALJ determined that respondents' new 512K EPROMs do not infringe claims 1-4 because they do not contain a programmable selection means, or its equivalent, as claimed in the '084 patent. She found that the accused devices have been permanently programmed during their manufacture so that they can operate only in one mode of operation. The claims in issue require the presence of a programmable selection means whose function is selecting an alternate addressing mode. The accused devices cannot perform that function, or its equivalent, and are therefore noninfringing. They fail to meet the "function" prong of the "function, way, result" test mandated by the Supreme Court in Graver Tank. Therefore, the accused devices do not infringe the claims in issue under the doctrine of equivalents.

The '189 Patent: MOS Buffer Circuit Stage

I. Background

The '189 patent is directed to an improved MOS buffer circuit stage for implementing a power-down or power-saving function. Intel alleged that the GI/Microchip NMOS 27256 EPROM infringes claims 1-3 of the '189 patent (the claims in controversy). The ALJ found that the '189 patent is invalid due to incorrect inventorship under 35 U.S.C. § 102(f), but that the GI27256 EPROM would infringe the claims in controversy if the '189 patent were valid. Moreover, the ALJ found that Atmel had, by its design of the GI27256 EPROMs, induced infringement of the claims in controversy. ID at 293. The Commission determined to review the ALJ's determination of invalidity for incorrect inventorship. On review, the Commission determines to reverse the ALJ's holding that the '189 patent is invalid because of incorrect inventorship.

II. General Description of the Invention [73/]

The object of the invention of the '189 patent was to solve two problems: (1) consumption of power when the circuit is not in use, Tr. 904 (Salsbury); and (2) maintaining a "high" output level (i.e., a logic "one") in the circuit without a voltage drop, Tr. 908 (Salsbury). The improvement of the '189 patent is found in the use of a zero-threshold MOS transistor in series with another transistor (the input) and a load (at which the output voltage is taken).

III. Validity Under 35 U.S.C. § 102(f)

The '189 patent resulted from a patent application that was a division of the application that resulted in U.S. Letters Patent 4,094,012 (the '012 patent). The inventors named in both the '012 patent and the '189 patent were

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73/ The ALJ's discussion of the subject matter of the '189 patent is contained in the ID at 269-275.

George Perlegos and Phillip J. Salsbury. However, the ALJ found that each testified that he did not invent the power down circuit and that their testimony was corroborated by that of another former Intel employee, Kim Kokkonen. ID at 279. She therefore determined that respondents had met their burden of proving by clear and convincing evidence that the named inventors did not invent the subject matter of the '189 patent.

On review, Intel argued that the ALJ erred in finding that respondents proved by clear and convincing evidence misjoinder or nonjoinder of inventors on the '189 patent. Intel also argued that that ALJ erred by not considering the invention as a whole in reaching her invalidity finding. Respondents argued that the evidence relied upon by the ALJ to hold the '189 patent invalid is clear and convincing because it includes the testimony of the named inventors and is corroborated by the testimony of another former Intel employee.

The Commission determines to reverse the ALJ's finding of invalidity based on incorrect inventorship. The ALJ's finding is erroneous because it is based on improper consideration of evidence regarding inventorship of discrete circuit devices, rather than inventorship of the claimed circuit as a whole. Moreover, much of the testimony relied upon by the ALJ was of questionable weight, either because it was that of a person having an interest in the outcome of the investigation or because it was admittedly uncertain. See In re Scheiber, 587 F.2d 59 (CCPA 1978).

There is a statutory presumption that inventorship is correct and that presumption can only be overcome by clear and convincing evidence. Jamesbury Corp. v. United States, 518 F.2d 1384, 1395 (Ct. Cl. 1975). A review of the record reveals that no clear and convincing evidence of improper inventorship exists.

A. Phillip Salsbury's Testimony

Phillip Salsbury testified that he was involved in the design of the power down circuit innovation (Salsbury Tr. 907). He never testified, however, that he did not invent the claimed circuit. Salsbury testified:

> Q. Dr. Salsbury, I've replaced on your podium the copy of Figure 3 of the ['189] patent and we'd been talking about that series claim of transistors.
>
> A. Yes.
>
> Q. 106, 107 and 108.
>
> Do you recall who specifically designed that set of transistors?
>
> A. No, I don't recall specifically. I'm not able to attach specific names to devices on this diagram. 74/

It is not clear whether counsel's question regarding who designed the set of transistors 106, 107, and 108 seeks to ascertain the inventorship of the transistors or of the circuit. Salsbury's response clearly indicates that he did not know who invented each of the devices (i.e., the transistors) and that he was not discussing inventorship of the circuit. Since the claims in controversy are directed at a circuit, Salsbury's answer cannot be said to be an admission that he did not know who invented the subject matter of the claims, i.e., the circuit. Therefore, his testimony is not clear and convincing evidence in support of the proposition that he was not an appropriate inventor and the ALJ's reliance thereon was misplaced.

74/ Tr. at 1206 (questions by Mr. Judlowe, counsel for respondents) (emphasis added).

B. George Perlegos' Testimony

The ALJ also cited the testimony of George Perlegos for the proposition that "he did not invent it [the power-down circuit], but that he had learned of it [ ]" ID at 279. It is not clear whether the doctrine of assignor estoppel precludes consideration of the testimony of George Perlegos regarding the invalidity of the '189 patent based on incorrect inventorship, when his testimony is proferred by parties not in privity with him. However, the Commission does not consider that testimony, in any event, to be probative of incorrect inventorship of the claimed circuit. The cited testimony reads as follows:

Q. [

]?

A. [

]. 75/

Perlegos' testimony is directed at inventorship of transistors 106 and 109, which are the zero threshold transistors used in the claimed circuit. Perlegos was not discussing who invented the power-down circuit claimed in the '189 patent. In fact, the power-down circuit is part of the output buffer shown in Figure 3 of the patent, and Perlegos admitted that he invented that circuit. Tr. 6977, 6979.

Even though the use of the zero threshold transistor in the claimed circuit is what appears to be novel in the invention, it is improper to focus

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75/ Tr. 7010 (questions by Mr. Judlowe, counsel for respondents GI/Microchip).

on the point of novelty as if it were the invention. 76/ Thus, an interpretation of this testimony as an admission by Perlegos that he did not invent the claimed circuit would be the result of an improper view of the claimed invention.

C. Kokkonen's Testimony

The ALJ also relied on the testimony of Kim Kokkonen, another former Intel employee who was listed as an inventor in Intel's U.S. Letters Patent 4,096,584 (the '584 patent). Kokkonen's deposition was admitted into evidence and the testimony relied upon by the ALJ is set forth in pertinent part below:

> Q. Who came up with the circuits [i.e., power-down circuits] shown in Figure 2-B [of the '584 patent]?
>
> A. That's a good question. My memory isn't a hundred percent accurate on that. I can say for certain that it was not me. Based on circumstantial reasoning, I can conclude that it was Bill Owen, but I'm not certain of that. 77/

Kokkonen further testified:

> Q. So it's your belief that George Perlegos did not originate this circuit [i.e., the power-down circuit]?
>
> A. That's my belief. 78/

76/ Although the requirement that claims be read as a whole is found in 35 U.S.C. § 103 (relating to obviousness) the requirement has more general applicability. See Parker v. Flook, 437 U.S. 584 (1978) (extending the § 103 requirement of reading claims as a whole to § 101) and Diamond v. Diehr, 450 U.S. 175 (1981) (also applying the requirement in a § 101 setting).

77/ Hyundai Ex. 81 at 7 (questions by Mr. Schwab, counsel for respondents).

78/ Id. at 8.

So Kokkonen was not certain as to who originally designed the claimed circuit and his belief that it was not George Perlegos was admittedly based on "circumstantial reasoning." The accuracy of Kokkonen's testimony is further brought into question by a statement in the '584 patent, which disclosed the power-down circuit, and attributed that circuit to the earlier '189 patent. Moreover, Kokkonen signed a declaration attesting to the accuracy of the contents of the application for the '584 patent which contained the subject statement. 79/ Finally, neither Kokkonen nor "Bill Owen" were named as inventors in the '189 patent.

Section 116 of title 35 provides that "[i]nventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent." George Perlegos testified that he designed the output buffer circuit which contains the power-down circuit. Tr. 6977. Phillip Salsbury testified that he was involved in the design of the power down circuit "innovation." Tr. 907. Therefore, it does not appear that either Perlegos or Salsbury was improperly named as an inventor of the '189 patent. The only other possible problem with inventorship is whether "Bill Owen" or someone else should have been joined as an inventor in the '189 patent. As previously discussed, Kokkonen's belief that Owen was the inventor of the claimed circuit is too uncertain to be considered clear and convincing evidence. The Commission therefore determines that respondents failed to sustain their burden of proving by clear and convincing evidence that the '189 patent is invalid because of incorrect inventorship.

79/ Id. at 8-9.

The '255 Patent: Floating Gate Storage Device and Method of Fabrication

I. Background and General Description [80/]

U.S. Letters Patent 4,114,255 (the '255 patent) issued on September 19, 1978, and expires on September 19, 1995. The patent claims a process for fabricating a floating gate memory device on a silicon substrate. Intel alleged that respondents' processes infringe claims 1-5 and 7-8 of the '255 patent. Respondents argued that their accused processes are noninfringing and that Intel's construction of the claims in controversy renders the '255 patent invalid as anticipated under 35 U.S.C. § 102 or invalid as obvious in light of the prior art under 35 U.S.C. § 103. Respondents also argued that the '255 patent should be declared unenforceable due to inequitable conduct by Intel's patent counsel in the prosecution of the '255 patent application before the PTO patent examiner.

The ALJ found the '255 patent to be enforceable but invalid as obvious over the prior art under 35 U.S.C. § 103. She further found that, if the '255 patent were valid, the accused processes would be noninfringing.

The Commission determined to review the ALJ's findings of invalidity, noninfringement, and whether the domestic industry produces articles covered by the claims in controversy. Having considered the record and the arguments

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80/ A detailed description of the claimed invention is contained in the ID at 299-310.

of the parties, the Commission determines that: (1) respondents have failed to prove by clear and convincing evidence that the claims in controversy are invalid, (2) Intel has failed to prove by a preponderance of the evidence that the respondents' accused processes infringe the claims in issue, and (3) there is a domestic industry practicing the process claimed by the '255 patent. The Commission adopts the ALJ's findings of facts and conclusions of law to the extent that they are not inconsistent with the determination of the Commission as expressed herein.

II. Claim Construction

Claims 1-5 and 7-8 of the '255 patent are in controversy in this investigation. 81/ The Commission agrees with, and therefore adopts, the ALJ's construction of the claims in issue except for her construction of the whereby clauses of claims 1 and 7. 82/

The whereby clause of claim 1 reads "whereby regions along said first sides of said gate are doped, thereby permitting charge to be more easily

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81/ Claims 1 and 7 are written in independent form; claims 2-5 are dependent on claim 1, and claim 8 is dependent on claim 7.

82/ In adopting the ALJ's construction of the claim phrase "first doped regions" the Commission does so insofar as the ALJ construed that phrase as referring to regions adjacent to the first opposite sides of the channel area, which are the sides extending between the regions where the source and drain of the EPROM cell will later be formed. Intel argued that the ALJ construed that claim phrase as also requiring that the doped regions have a "significantly higher" concentration of dopant than the center of the channel. It is clear from the ID that the ALJ implied certain dopant limitations into the whereby clauses of claims 1 and 7; it is less clear that she read the "significantly higher" limitation into that claim phrase. To the extent that she may have, the Commission does not adopt that portion of her claim construction.

injected into said floating gate." The whereby clause of claim 7 reads: "whereby regions which enable easier programming of said floating gate are formed in alignment with said floating gate." The Commission construes the whereby clause of claim 1 as requiring only that regions formed along the first sides of said gate (viz., first doped regions formed from laterally diffusing field dopant from the substrate) permit charge to be more easily injected into the floating gate (claim 1), and the whereby clause of claim 7 as requiring that regions (viz., p-type regions along first opposite sides of the channel area) formed in alignment with the floating gate enable easier programming of the floating gate.

The ALJ construed the whereby clauses of claims 1 and 7 as imposing positive claim limitations; viz., making the programming of the floating gate easier. 83/ The ALJ also construed the whereby clauses of claims 1 and 7 as requiring that a certain amount of dopant (i.e., the amount necessary to produce the 5 to 1 ratio taught in the '255 patent specification) be used, followed by adequate annealing to disseminate the heavier doping to, but not beyond, the edges of the channel. 84/ This, she concluded, would facilitate the programming of the floating gate.

83/ ID at 338. She found that the whereby clauses impose postive claim limitations because they describe a function that is not the necessary result of the process claimed in the language preceding them. The ALJ correctly noted that the law gives no weight to whereby clauses when they express a necessary or inherent result of the preceding structure recited in the body of the claim.

84/ ID at 340.

Intel argued, as the Commission believes it must, [85/] that the functions recited in the whereby clauses are not inherent from the claim language preceding them and are thus positive limitations on the claims. Intel, however, argued that ALJ was incorrect as a matter of law in implying limitations from the specification into those whereby clauses. This, Intel argued, limits the claims in issue to the preferred embodiment disclosed in the specification.

The Commission is mindful of the fact that it is the claims that measure the invention. [86/] Though claims are to be construed in light of the claim language, the other claims, the prior art, the prosecution history, and the specification, [87/] this does not mean that everything expressed in the specification must be read into the claims. [88/] The Commission has examined the relevant prior art, the prosecution history of the '255 patent, the '255 patent specification, and the language of the claims, and finds no basis for reading the dopant ratio limitation into the respective whereby clauses. The Commission finds that it was improper as a matter of law for the ALJ to have

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85/ The Commission, in reversing the ALJ's invalidity determinations, relied exclusively upon the limitations recited in the respective whereby clauses. Were the functions of the whereby clauses inherent from the claim language preceding them, the Commission believes that the claims in issue would be invalid as obvious over the prior art under 35 U.S.C. § 103.

86/ Jones v. Hardy, 727 F.2d 1524, 1528, 220 USPQ 1021, 1024 (Fed. Cir. 1984).

87/ SRI International v. Matsushita Electric Corp., 775 F.2d 1107, 1119, 227 USPQ 577, 583 (Fed. Cir. 1985)(in banc).

88/ Id. at 1021.

done so and that this unduly limits the scope of protection to which the claims in issue are entitled. Therefore, the Commission does not adopt that portion of the ALJ's claim construction.

Similarly, the Commission does not adopt that portion of the ID wherein the ALJ seemingly implied other limitations into the whereby clauses of claims 1 and 7. She construed the whereby clauses as implying a limitation that the center of the channel be lightly doped relative to the edges of the channel. 89/ It is apparent that if the "read" function is to be performed in the EPROM device using the '255 process, then the center of the channel must in fact be more lightly doped than the edges of the channel. The specification, insofar as it pertains to the preferred embodiment, clearly mandates such a result. 90/ The claims, however, do not recite a read function, and it is improper as a matter of law to imply such a limitation. It is well established that an inventor can claim less than the entire invention. 91/ Moreover, the law does not require that all of the claims recite each and every element necessary to the operation of the invention. 92/ Therefore, the Commission does not adopt the ALJ's finding that whereby clauses of claims 1 and 7 impliedly require that the center of the channel be more lightly doped than the edges of the channel.

89/ ID at 311.

90/ '255 patent specification, col. 3, lines 51-54.

91/ Andrew Corp. v. Gabriel Electronics, Inc. 847 F.2d 819, 823, 6 USPQ2d 2010, 2014 (Fed. Cir. 1988).

92/ In re Myers, 410 F.2d 420, 161 USPQ 668, 672 (CCPA 1969).

The Commission also does not adopt the ALJ's finding that the respective whereby clauses require that the field dopant "stay at the edges of the channel and not go across the entire channel." 93/ Nowhere is such a limitation recited in any of the claims in issue, and neither the prior art nor the prosecution history mandate that result. Therefore, the Commission does not adopt that finding.

III. Validity

The ALJ determined that the claims at issue of the '255 patent are not anticipated under 35 U.S.C. § 102, but are invalid as obvious in light of the prior art under 35 U.S.C. § 103. In invalidating the claims as obvious, the ALJ applied the four-factor obviousness analysis mandated by the Supreme Court in Graham v. John Deere 94/ and found the claims of the '255 patent invalid as obvious over the Masuoka and Richman patents, the Masuoka and Kooi references, or the Masuoka and Dennard patents, or, alternatively, over the Kooi, Richman, and Dennard references. 95/ She specifically found that the Kooi, Richman, and Dennard references each taught that dopant implanted into the field for isolating the devices in the field from spurious transistors could be used to create regions of heavy doping along the edges of the channel. 96/ She also found that the Dennard patent taught that there would

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93/ ID at 309.

94/ 383 U.S. 1, 17-18, (1966).

95/ ID at 320.

96/ ID at 320.

be advantages in deliberately having a high threshold at the edges of the channel and that the Masuoka patent taught that high threshold regions along the edge of the channel could be used to program the floating gate of the EPROM. 97/ In view of those teachings, the ALJ found that the invention claimed in the '255 patent would have been obvious to one of ordinary skill in the art in 1977, 98/ even if the whereby clauses are construed as imposing substantive limitations taught in the patent but not otherwise required in the claims. 99/

Intel argued that the ALJ, in invalidating the claims, committed errors of law and made clearly erroneous findings of fact. 100/ Respondents maintained that the ALJ correctly determined that the claims of the '255

97/ ID at 321.

98/ The ALJ found the date of invention of the '255 patent to be May 2, 1977, which was the filing date of the continuation-in-part application that matured into the '255 patent. The Commission adopts that finding.

99/ ID at 329.

100/ Intel argued that the ALJ made clearly erroneous findings of fact when she held: (1) that the PTO examiner misunderstood the prior art Kooi patent, (2) that Intel's patent counsel misrepresented the teachings of the Kooi patent to the examiner during the prosecution of the '255 patent, and (3) that the invention claimed by the '255 patent was reduced to practice at the time of the filing of the continuation-in-part application that ultimately matured into the '255 patent rather than when it was actually reduced to practice. Intel also contended that the ALJ committed legal error when she held: (1) that the doctrine of assignor estoppel did not preclude respondents from challenging the validity of the '255 patent, (2) that the Siemens reference was evidence of contemporaneous development without requiring authentication of the article, and (3) that the Masuoka patent was not considered by the examiner of the '255 patent. Finally, Intel argued that the ALJ ignored probative, secondary indicia of nonobviousness including failure by others in the field and the practice of the industry.

patent at issue are invalid as obvious over the prior art. They contended that the ALJ's conclusions are supported by the record and that her holding is correct both in law and in fact.

For reasons set forth below, the Commission reverses the ALJ's determination that the claims of the '255 patent are invalid under 35 U.S.C. 103 as obvious over the prior art and instead finds that respondents have failed to prove by clear and convincing evidence that the claims in issue are invalid. The ALJ appears to have engaged in hindsight reconstruction of the prior art by combining prior art references without the requisite teaching or suggestion to do so. Moreover, the secondary indicia of nonobviousness strongly suggest that at the time of the '255 invention it would not have been obvious to one of ordinary skill in the art to combine such references to arrive at the claimed invention.

Under 35 U.S.C. § 282, each claim of a patent is presumed valid. The burden of establishing invalidity of a patent or any claim thereof rests on the party asserting invaldity. 101/ In determining the obviousness of an invention, prior art references should not be selectively combined in order to find an invention obvious; rather, there must be some teaching or suggestion in the references that would support their use in combination. 102/ It is improper to dissect claims and reconstruct them in piecemeal fashion by

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101/ 35 U.S.C. 282.

102/ Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied sub nom., Delta Resin & Refractories, Inc. v. Ashland Oil, Inc., 475 U.S. 1017 (1986).

picking and choosing from among the prior art references using the patent as a blueprint. 103/ Thus, in determining obviousness, the inquiry is not whether each element existed in the prior art, but whether the prior art made obvious the invention as a whole. 104/

The Commission has examined each of the references relied on by the ALJ in invalidating the claims and finds that none of those references, considered alone or in combination, teaches or suggests the process claimed in the '255 patent. The ALJ found that the prior art teachings of Masuoka and Kooi; Masuoka and Richman; or Masuoka and Dennard; or, alternatively, Kooi, Richman, and Dennard each rendered the process claimed in the '255 patent obvious over the prior art. 105/ The Masuoka patent, which she found suggested the use in an EPROM cell of more highly doped regions in the channel to enhance programming, was critical to her holding that the '255 patent is invalid as obvious because it was the only reference she relied on that specifically disclosed the use of an EPROM cell. She found that, in allowing the '255 patent to issue, the patent examiner did not consider the Masuoka patent. 106/ The ALJ cites no record support to justify that finding. The burden of proof is on the party asserting invalidity to prove that the uncited

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103/ Application of Kamm, 452 F.2d 1052, 1056-57, 172 USPQ 298, 301-302 (CCPA 1972)).

104/ Hartness Int'l, Inc. v. Simplimatic Eng'g. Co., 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1832 (Fed. Cir. 1987).

105/ ID at 320.

106/ ID at 322.

prior art was not considered by the PTO examiner; the burden is not on the patentee to prove that it was considered. 107/ In finding that the Masuoka patent was not considered by the examiner, the ALJ committed legal error by improperly shifting the burden of proof to the patentee. Moreover, the ALJ's finding is implausible under the circumstances of this case, because, as the ALJ herself ackowledges, the PTO examiner issued a rejection of the claims of the '255 parent application over the Masuoka patent. 108/ Additionally, the Masuoka patent is specifically listed as a prior art reference in the continuation-in-part application that matured into the '255 patent. 109/

In finding the invention claimed in the '255 patent obvious, the ALJ found that the Dennard patent suggested the combination of all the elements disclosed in claims of the '255 patent. 110/ She does not specify where in the Dennard patent such a suggestion may be found, nor does she indicate where in the record there is support for such a finding. She does state, however, that neither the Kooi, Richman, or Dennard patent specifically discloses the use of a floating gate memory device as used in an EPROM cell. 111/ The Dennard patent claims a method for fabricating silicon semiconductor devices having reduced subthreshold sidewall conduction between the source and drain

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107/ Lindemann Maschinenfabrik v. American Hoist & Derrick, 730 F.2d 1452, 1460, 221 USPQ 481, 486 (Fed. Cir. 1984).

108/ ID at 322.

109/ Column 1, lines 44-57 of the '255 patent.

110/ ID at 326.

111/ Id.

regions of a field effect transistor surrounded by recessed oxides. 112/ As the ALJ acknowledges in the ID, Dennard taught there would be advantages in deliberately having a high threshold at the edges of the channel. 113/ Nowhere, however, does Dennard teach the progamming of a floating gate of an EPROM cell which is a critical feature of the invention claimed in the '255 patent. Thus, the ALJ's finding that the Dennard patent taught all of the elements of the invention claimed in the '255 patent is clearly erroneous and the Commission does not adopt that finding.

The Richman and Kooi references are merely cumulative of what the Dennard patent teaches and thus they too lack the requisite teaching or suggestion to combine. 114/

The Commission has considered the other prior art references considered during the prosecution of the '255 patent and the references cited by respondents during this investigation and finds that none of those references, either alone or in combination, teaches or suggests the process claimed in the '255 patent. As to the content of those references, the Commission adopts the Commission Investigative Staff's Proposed Findings of Fact and Conclusions of Law on U.S. Patent No. 4, 114,255 (August 30, 1988) Nos. HH1-HH48.

112/ Dennard patent, col. 9, lines 14-18.

113/ ID at 321.

114/ The Kooi patent is directed to a process for forming high threshold parasitic regions that bound the active channel of a MOSFET. Intel's Amended Proposed Findings of Fact No. 1556; Hearing Transcript at 6553-6554. It does not teach that the doped regions bounding the channel could be used to program the floating gate of an EPROM cell. The Richamn patent teaches essentially the same process as that taught by Kooi. Id. at No. 1583; Hearing Transcript at 6574, and 7596-98.

The Commission adopts all other findings of fact and conclusions of law made by the ALJ in the context of her obviousness analysis to the extent that they are not inconsistent with the determination of the Commission.

The Commission also finds that the application of the doctrine of assignor estoppel is not outcome determinative as to the validity of the claims in issue. The Commission finds that respondents failed to prove by clear and convincing evidence, considering the record in its entirety, that the claims in issue are invalid.

IV. Infringement

A. Background

The ALJ found that, if the claims of the '255 patent were valid, respondents' processes would be noninfringing. Intel argued that the ALJ made erroneous conclusions of law and clearly erroneous findings of fact when she found that respondents' accused processes do not infringe the claims of the '255 patent in controversy. Specifically, Intel argued that the ALJ committed legal error when she read limitations from the patent specification into the claims thereby limiting the scope of the claims to the preferred embodiment disclosed in the specification. Intel asserted that once the claims are properly construed, it becomes evident that respondents' processes infringe because they meet all the limitations of the claims in issues, including those of the whereby clauses of claims 1 and 7. Respondents argued that the ALJ's noninfringement finding is legally correct and fully supported by the record.

Having reviewed the record and the arguments of the parties, the Commission determines to affirm, as herein modified, the ALJ's noninfringement determination because Intel failed to prove by a preponderance of the evidence

that the accused processes infringe the claims of the '255 patent in issue. The Commission adopts the ALJ's findings of fact and conclusions of law to the extent they are not inconsistent with the determination of the Commission.

B. The Accused Processes [115/]

The ALJ found that respondents' use the field doping step of the LOCOS front-end process to set the threshold in the field and not to program the floating gate of the EPROM cell, as required by the whereby clauses of claims 1 and 7. [116/] She found that the programming of the EPROM cell in respondents' processes was accomplished by using a thinner layer of gate oxide above the channel region and by placing a second, heavier boron implant in the center of the channel at a concentration that allows both for the programming of the floating gate and for the reading of the EPROM cell. [117/] She further found that in respondents' representative process the concentration of boron in the center of the channel is actually higher than the field boron and that the channel boron diffuses outwardly from the center of the channel to the edges of the channel such that any inwardly diffusing field dopant is overtaken by the outwardly diffusing channel dopant. [118/] Thus, she

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115/ The ALJ noted in the ID that the parties litigated the various respondents' processes as if they were the same insofar as the claims of '255 patent were concerned. ID at 343. Thus, she directed her infringement analysis at respondents' processes in a representative sense rather than on a process-by-process basis.

116/ ID at 347.

117/ ID at 345.

118/ Id.

concluded that the field dopant diffuses vertically into the field and not laterally into the channel edges and therefore could not affect the programming of the EPROM cell. Accordingly, she found that respondents' processes do not practice the '255 patent because little or no field boron moves into the channel edges and because Intel had failed to prove that the field boron has any impact upon the programming of the EPROM cell.

In reaching this determination, the ALJ found that the programming of the EPROM cell is controlled by factors other than the laterally diffusing field dopant including channel width, the coupling between the floating gate and the control gate, the thickness of the oxide layer, and the channel implant. 119/

C. Literal Infringement

Literal infringement may be found if the accused device falls within the scope of the claims as properly construed. 120/ The asserted claims must be compared with the device accused of infringement. 121/ The patentee bears the burden of proving infringement by a preponderance of the evidence. 122/ That burden is initially carried when literal infringement has been proved. 123/

119/ ID at 350-51.

120/ Envirotech Corp. v. Al George, Inc. 730 F.2d 753, 758, 221 USPQ 473, 477 (Fed. Cir. 1984).

121/ Amstar Corp. v. Envirotech Corp. 730 F.2d 1476, 1481, 221 USPQ 649, 653 (Fed. Cir. 1984), cert. denied. 105 S.Ct. 306 (1984).

122/ SRI International v. Matsushita Electric Corp. at 1123; SSIH Equipment v. United States International Trade Commission, 718 F.2d 365, 376, 218 USPQ 678, 688 (Fed. Cir. 1983).

123/ SRI International v. Matsushita Electric Corp. at 1123.

Intel argued, and the ALJ found, that the whereby clauses of claims 1 and 7 impose limitations on the claims in controversy. Those clauses, as herein construed, require that field dopant (i.e., dopant from the substrate) form along the first opposite sides of the channel so as to permit charge to be more easily injected into the floating gate (claim 1) or to enable easier programming of the floating gate (claim 7). To prove infringement of the asserted claims, Intel must prove by a preponderance of the evidence that the effect on programming recited in those whereby clauses, or their equivalent, is practiced by respondents' accused processes. Intel failed to sustain its burden of proving literal infringement because it failed to prove by a preponderance of the evidence that in respondents' accused processes: (1) any field dopant diffuses into the edges of the channel region (viz., the first doped regions) [124/], and (2) that the field dopant formed along the edges of the channel permits charge to be more easily injected into the floating gate (claim 1) or enables easier programming of the floating gate (claim 7).

The ALJ found that respondents' processes do not practice the claims of the '255 patent because "little" or "no" boron moves into the channel edges. [125/] She further found that "[e]ven if a 'little' bit of the field boron moves into the channel, Intel has not shown that this little bit of

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124/ The ALJ did not allow certain computer simulations (SUPREM 4) offered by Intel into evidence because the results were of highly questionable reliability.

125/ ID at 346.

boron would have any impact on programming the EPROM cell." 126/ Intel noted a statement by the ALJ in the ID to the effect that the field implant in respondents' process has no "significant" effect on programming the EPROM cell. ID at 346. From this, Intel argued that the ALJ construed the whereby clauses as requiring that the field dopant along the edges of the channel have a "significant" effect on the programming of the EPROM cell. 127/ Intel asserted that this error in claim construction led the ALJ to an erroneous conclusion of no infringement because the record otherwise establishes that the field dopant has some effect, albeit not necessarily a significant one, on the programming of the EPROM cell and that is all that the whereby clauses require.

Intel's interpretation of the ID is at odds with other statements made by the ALJ in the ID, such as her statement that Intel failed to prove that the field dopant had "any" impact on programming in respondents' processes. 128/ Moreover, the ALJ found, based on the testimony of a number of expert witnesses, 129/ that the field dopant "plays no role" in programming

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126/ ID at 346.

127/ In the claim construction section of this opinion, the Commission makes plain its view that the whereby clauses do not require a "signficant" effect on programming the EPROM cell.

128/ ID at 346.

129/ Wu testimony at Tr. 7416; Korsh testimony at Tr. 6331, 6333, 6356-57; and Spinella testimony at Tr. 6449.

respondents' EPROMs. 130/ Instead, she found that respondents program the floating gate by "keeping the gate oxide thin and controlling the amount of the cell implant [i.e., not the field implant]." 131/

In considering the issue of infringement, the Commission reemphasizes that it is not respondents' initial burden to disprove the allegation of infringement, rather it is Intel's burden to establish that respondents practice the claimed invention and thereby infringe. In attempting to sustain that burden, Intel argued that it has established, and that respondents have conceded, that field dopant diffuses into the edges of the channel forming more highly doped regions along the sides of the channel in respondents' processes. 132/ Intel then argued that any amount of dopant along the edges of the channel facilitates the programming of the EPROM cell, thereby meeting the limitations of the whereby clauses. Thus, Intel asserts that respondents' processes are infringing. The Commission disagrees.

First, respondents never made the concession alluded to above. In fact, they vigorously argued the opposite. Moreover, Intel, in distinguishing the claims of the '255 patent over the prior art, argued that the respective whereby clauses are positive limitations on the claims in issue because their recited functions are not inherent from the claim steps preceding them. In so arguing, Intel correctly recognized that to be a positive claim limitation,

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130/ ID at 348.

131/ ID at 348.

132/ Intel's Post-hearing Reply Memorandum at 17.

the functions recited in the whereby clauses cannot be inherent from the claim language preceding them. However, the claim language preceding the whereby clauses of claims 1 and 7 results in at least some dopant from the substrate reaching the edges of the channel where the programming of the EPROM cell occurs. 133/ If any level of dopant facilitates the programming of the EPROM cell, then the programming function of the whereby clauses is rendered inherent as well. Thus, Intel's proffered construction of the whereby clauses for infringement purposes is inconsistent with its position concerning patent validity, wherein Intel argued that these clauses are positive limitations on the claims.

A better view, the Commission believes, is that if the whereby clauses are to be considered limitations in their own right, then Intel must prove not only that field dopant encroaches on the edges of the channel but that this field dopant actually facilitates the programming of the EPROM cell. Simply

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133/ The controversy surrounding whether field dopant reaches the edges of the channel in respondents' accused processes arises from the fact that the respondents use a heavy channel doping step to program the floating gate of their EPROM cells. Respondents argued, and the ALJ found that, in respondents' processes, channel dopant actually diffuses outwardly from the center of the channel to such a degree that it prevents the inwardly diffusing field dopant from reaching the channel region below the floating gate of the EPROM cell wherein the programming occurs. ID at 345-346. Respondents argued, and the ALJ found, that this phenomenon was supported by Fick's law (a basic law of physics pertaining to diffusion dynamics). Intel argued that Fick's law proved the opposite. The Commission recognizes that the parties disagree over the application of Fick's law and that there is expert testimony in the record to support each of the party's conflicting positions as to the application of that law. The Commission defers to the ALJ's finding regarding the application of Fick's law. This phenomenon does not occur in the in the claimed process because, as the '255 patent specification teaches, programming occurs along the edges of the channel and not in the interior of the channel where the read function is performed.

establishing that some dopant reaches the edges of the channel is not sufficient to satisfy the programming requirement of the whereby clauses because, as noted above, that much is inherent from the claim language preceding those clauses. 134/ Intel simply assumes that any increased concentration of dopant along the edges of the channel will enable easier programming of the floating gate because dopant increases the threshold voltage of that region and a fortiori the programming of the EPROM cell. 135/ The ALJ found, however, that there was evidence suggesting that in scaled EPROMs, 136/ such as those used by respondents, additional dopant not only does not facilitate the programming of the EPROM cell but could actually cause undesirable second-level programming to occur. 137/ The ALJ also found that in Intel's own P422 process, Intel engineers found that once the cell implant is made, later driving steps caused the cell surface

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134/ The ALJ found that if one practiced the Richman and Kooi patents (which use the LOCOS process) then highly doped regions would form along the edges of the channel. ID at 327. What those patents do not teach is the programming of the floating gate of an EPROM cell. See also, Intel's Trial Memorandum, Volume II (May 6, 1988) at 181-186 for a discussion of an exemplary claim of the '255 patent wherein it is evident that field dopant encroaches the channel region as result of the claim steps preceding the whereby clause.

135/ Intel introduced certain computer charts (Intel Exhibit 230) which it claimed substantiated that, in respondents' processes, field implant improved the programming of the floating gate of the EPROM cell. The ALJ found the data contained in those computer charts were skewed by several defective wafers. She also found that a plot of that data showed the field dopant had no effect on programming and found that this was reflected in an Atmel memorandum (Atmel Exhibit 230) discussing that data. ID at 349-350.

136/ Scaled EPROMs are EPROMs that have been reduced in dimension.

137/ ID at 351.

concentration to decrease and programming to deteriorate. 138/ Because respondents program their EPROM cells through a channel implant, it is not at all clear that additional field dopant formed along the edges of the channel would facilitate programming of their EPROM cell. The evidence of record referred to above suggests the opposite conclusion.

In sum, the ALJ found that respondents program their EPROMs cells by controlling the channel width, the coupling between the floating gate and the control gate, the thickness of the gate oxide, and the channel implant. 139/ She found that Intel failed to prove that the field dopant would have any impact on programming the floating gate in respondents' accused processes. The whereby clauses of claims 1 and 7, as herein construed, require that the laterally diffused field dopant formed along the first opposite sides of the channel facilitate or enable the programming of the floating gate. Inasmuch as Intel has failed to prove by a preponderance of the evidence that respondents' processes practice the whereby clause limitations of claims 1 and 7, the Commission affirms the ALJ's determination that respondents' processes are not literally infringing.

D. Infringement Under the Doctrine of Equivalents

Under the doctrine of equivalents, a device or process, though not literally infringing, may still infringe if the accused device or process "performs substantially the same function in substantially the same way to

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138/ ID at 349.

139/ ID at 351.

obtain the same result" as the claimed product or process. Graver Tank & Mfg. v. Linde Air Products Co., 339 U.S. 605, 608 (1950). If the fact-finder finds that the accused process fails to meet one prong of the so-called "function, way, result" test, then the fact-finder cannot find infringement under the doctrine of equivalents. Sealed Air Corp. v. U.S.I.T.C., 645 F.2d 976, 984, 209 USPQ 469, 476 (C.C.P.A. 1981). The range of equivalents to which an invention is entitled is determined by reference to the prosecution history of the patent, the pioneer/non-pioneer status of the invention, and the prior art. D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1575, 225 USPQ 236, 239 (Fed. Cir. 1985).

In determining whether respondents' processes as a whole are equivalent to the claimed process, the Commission may limit its discussion to only a few claim limitations if those claim limitations demonstrate that the accused processes do not satisfy the "function, way, result" test. See, e.g., Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1535, 3 USPQ2d 1321, 1326-1327 (Fed. Cir. 1987). Accordingly, the Commission will confine its discussion of infringement under the doctrine of equivalents to whether respondents' method of programming their EPROM cells is equivalent to the programming limitations recited in the whereby clauses of claims 1 and 7.

In examining respondents' accused processes, the ALJ found that the programming of the floating gate of the EPROM cell is accomplished by "keeping the gate oxide thin and controlling the amount of the cell implant." 140/

140/ ID at 348.

She found that the field implant, which plays an important role in programming the floating gate in the claimed process, "plays no role in [the] programming of respondents' EPROMs. 141/ She also found that the concentration of the field dopant was set at the lowest possible level consistent with the need to set a threshold in the field in order to prevent parasitic conductances between devices in the integrated circuit. 142/ Respondents use a single channel implant step to set the desired threshold voltage for both the progamming and reading of the EPROM cell. She also found that respondents' EPROMs are scaled EPROMs, 143/ which lessens the effect that channel dopant has on programming characteristics of those devices. In conclusion, she found that respondents' process is "completely foreign" to the process disclosed and claimed in the '255 patent. Respondents program their EPROM cells in a substantially different way than that claimed in the '255 patent and thus the "way" prong of the "function, way, result" test is not met by respondents' processes. The Commission does not predicate its determination on the fact that respondents are practicing the prior art in using the brute method,

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141/ ID at 348.

142/ ID at 343.

143/ As noted earlier, scaled EPROMs are EPROMs that have been reduced in dimension. Such reductions were not possible at the time of the '255 invention due to manufacturing and technological constraints. The ALJ found that the substantial downsizing of EPROMs that is now possible has made the '255 patent obsolete because, in scaled EPROMs, a single channel dopant step can provide for both the programming and reading of the EPROM cell whereas at the time of the '255 patent it could not. ID at 353. Thus, at the time of the '255 invention the field dopant step was critical to the programming of the EPROM cell in 16K devices with a 5-volt power supply because programming could not be adequately set by use of a channel dopant step; such is not the case today.

but rather on the fact that respondents program their floating gate in an entirely different way than that contemplated by the claims in issue. Therefore, the Commission affirms the ALJ's determination that respondents' accused processes do not infringe under the doctrine of equivalents.

The Commission adopts the ALJ's infringement findings of fact and conclusions of law to the extent that they are not inconsistent with its determination.

V. The Domestic Industry

The Commission affirms the ALJ's determination that Intel is practicing the claims of the '255 patent.

REMEDY

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding, and judicial review of its choice of remedy necessarily is limited. 144/ The Federal Circuit has consistently upheld the Commission's discretion in determining the appropriate remedy. 145/ In addition, the Commission has the power to make factual determinations in the remedy phase of a section 337 investigation, to the extent necessary, in order to reach its determination. These factual determinations may be made on the basis of the evidence of record in the violation phase of the investigation, or on the basis of information submitted by the parties in the remedy phase of the investigation.

Complainant Intel requested that the Commission enter limited exclusion orders of broad scope against respondents Atmel, GI/Microchip, and Hyundai, and also enter cease and desist orders of broad scope against those respondents, and the respondent distributors. In addition to excluding the EPROMs manufactured by or for, or imported by, respondents found to be infringing, Intel asked the Commission to exclude a variety of downstream products. 146/

144/ Viscofan, S.A. v. United States International Trade Commission, 787 F.2d 544, 548 (Fed. Cir. 1986) (affirming Commission remedy determination in Certain Processes for the Manufacture of Skinless Sausage Casings and Resulting Product, Inv. No. 337-TA-148/169, USITC Pub. 1624 (December 1984)).

145/ The Federal Circuit has upheld a Commission remedy which effectively shifted the burden of proof on infringement issues to require a company seeking to import goods to prove that its product does not infringe. The Federal Circuit so held despite the fact that, in general, the burden of proof is on the patentee to prove, by a preponderance of the evidence, that a given article does infringe the patent in question. Canadian Tarpoly Co. v. United States International Trade Commission, 649 F.2d 855 (C.C.P.A. 1981).

146/ Specifically, Intel's proposed order (1) named each EPROM by the model designation assigned to it by Atmel and GI/Microchip, (2) named the

(continued...)

The cease and desist orders proposed by Intel would require the named respondents to cease and desist from assembling, testing, performing manufacturing steps with respect to, marketing, distributing, selling, importing, or offering for sale, imported infringing EPROMs. 147/ They also would require Atmel and GI/Microchip to cease and desist from transferring to any other entity, design schematics, process flows, and other technical information to be used in the production of infringing EPROMs, unless such transfer expressly restricted the transferee from using such information in any EPROMs, or products containing EPROMs, imported into the United States.

The IA also proposed that the Commission enter limited exclusion orders against Atmel, GI/Microchip, and Hyundai, and cease and desist orders against all respondents. The IA's proposed limited exclusion orders were based on the order issued by the Commission in DRAMs 148/, and

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146/(...continued)
EPROM wafers manufactured for Atmel by [ ] by their Atmel model designations, (3) described the EPROMs in terms other than their model designations, (4) identified for exclusion infringing EPROMs assembled onto circuit boards of any configuration, and (5) named downstream products manufactured by Hyundai which, as a general rule, contain EPROMs, and may therefore in the future contain infringing EPROMs. Exhibit 1 to Intel's Submission on Public Interest, Remedy, and Bonding. The specific downstream products Intel sought to have excluded are computers (such as personal and business computers), computer peripherals (such as monitors, terminals, printers, and disk drives), telecommunication equipment (such as cellular mobile telephones, key phones, programmable phones, digital private branch exchanges (PBX), facsimile machines, and multiplexers), automotive electronic equipment (such as electronic fuel systems, electronic suspension systems, antiskid braking systems, and vehicle control systems) and automobiles manufactured by Hyundai or any of its affiliated companies, parents, subsidiaries, licensees, or other related business entities, or its successors or assigns. Intel's proposed exclusion order is intended to cover both assembled and unassembled EPROMs.

147/ Exhibit 2 to Intel's Submission on Public Interest, Remedy, and Bonding.

148/ Certain Dynamic Random Access Memories, Components Thereof, and Products Containing Same, Inv. No. 337-TA-242, USITC Pub. 2034 (Nov. 1987).

included EPROM wafers, chips, chips assembled onto any carrier, and certain downstream products manufactured by Hyundai. 149/ The IA's proposed cease and desist orders would have prohibited each of the respondents from importing, assembling, testing, performing manufacturing steps with respect to, using, marketing, distributing, offering for sale or selling, EPROMs determined to be infringing.

Respondents did not propose any specific remedies. Atmel primarily argued that the public interest precludes the issuance of any remedy against it. Atmel argued that exclusion of EPROM wafers is precluded by the statutory exemption from exclusion which applies to imports by or on behalf of the United States. 150/ Atmel also suggested that any relief should be limited to CMOS EPROMs with an access speed of 150 nanoseconds or greater, arguing that this is the scope of the products currently produced by the domestic industry.

Respondent Hyundai argued that any remedy issued in this proceeding should apply only to EPROMs manufactured by Hyundai for or on behalf of GI/Microchip, since it is only in connection with those EPROMs that Hyundai has been found to have committed an unfair act. Hyundai also objected to the proposed exclusion of downstream products it manufactures which incorporate EPROMs.

GI/Microchip objected to the scope of Intel's proposed exclusion order, which it believed would apply to Microchip's domestically-fabricated

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149/ Specifically, the IA's proposed order would have excluded computers (such as mainframe, personal, and small business computers), facsimile machines, telecommunications switching equipment, and printers manufactured by Hyundai.

150/ Section 337(1), as redesignated by section 1342 (a)(5)(A) of the Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418, 102 Stat. 1107, 1213, to be codified at 19 U.S.C. 1337(1).

EPROMs. GI/Microchip noted that domestic production is beyond the reach of section 337, and that any exclusion order should therefore specifically exempt Microchip EPROMs, the wafers of which are fabricated in the United States.

We determine that a limited exclusion order is an appropriate element of the remedy in this investigation. Complainant has not requested a general exclusion order, and no information or evidence has been provided to the Commission which would suggest that a general exclusion order is appropriate. A general exclusion order is a significant burden on international trade, which we have in the past determined is appropriate only if certain specific criteria are met. 151/ Those criteria are not met in this investigation.

Exclusion of the specific articles found to infringe the patents at issue in the investigation is obviously appropriate. Therefore, the limited exclusion order applies to EPROMs of the specific densities (64K, 256K, 512K, and 1M) which have been determined to infringe the patents at issue. The more difficult questions in this investigation concern the appropriate scope of any limited exclusion order with respect to EPROM wafers and downstream products.

With respect to the wafers, we note that, as in the DRAMs investigation, the infringement which we have determined to exist is in the silicon chip itself. There can be importation of either silicon wafers, each containing a number of chips, i.e., unassembled EPROMs, or of individual chips incorporated into usable form, i.e., assembled EPROMs.

151/ Certain Airless Paint Spray Pumps and Components Thereof, Inv. No. 337-TA-90, USITC Pub. 1199 (November 1981) at 17-20 (hereinafter Spray Pumps).

Importation of the fabricated wafer with the infringing EPROM circuitry embodied therein is properly within the scope of the exclusion order, since the chips themselves, that make up the wafer, infringe the patents at issue. Exclusion of assembled EPROMs, but not fabricated wafers composed of infringing EPROM chips, would result in an easily circumvented order.

The major difficulty in excluding wafers is the problem identified by Atmel with respect to production for military uses. Importations by or on behalf of the United States are, by statute, exempt from exclusion. 152/ However, Atmel's production processes make it impossible to determine prior to final testing (which occurs in the United States) whether a particular EPROM meets military specifications. 153/ Thus, exclusion of the wafers would exclude chips which could eventually become importations by or on behalf of the United States. While the Commission recognizes that this may produce results that appear to be at odds with the purpose of the statutory exemption, we can see no alternative which will provide the relief to which Intel is entitled except to exclude wafers containing infringing chips manufactured abroad for Atmel. 154/ Moreover, at the time a given wafer, or assembled EPROM, is imported by Atmel, it is only potentially an importation by or for the government. Atmel will not be able to state with

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152/ Section 337(1), as redesignated by section 1342 (a)(5)(A) of the Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418, 102 Stat. 1107, 1213, to be codified at 19 U.S.C. § 1337(1).

153/ Whether an EPROM meets military specifications can only be determined after final assembly and testing. Testing must occur in the United States. Atmel's operations include the importation of wafers manufactured for it abroad, testing, reexport for assembly, reimportation and testing.

154/ If the Department of Defense and Customs Service can agree upon a means of certifying that such importations are for the United States, they would obviously not be subject to exclusion under our order.

certainty that a given imported wafer or assembled EPROM qualifies for the statutory exemption. Thus, the statutory exemption does not on its face apply to importations of such wafers, since it is not clear that they are by or for the United States.

The situation with respect to downstream products is complicated. 155/ In order to warrant the exclusion of downstream products, the Commission has in the past required that there be a determination of injury to the domestic industry by reason of the importation or sale of such products containing the article(s) determined to be the subject of the unfair act. 156/ However, the Omnibus Trade and Competitiveness Act (OTCA) specifically eliminated the injury test from section 337 investigations based on alleged patent infringement. The legislative history of the OTCA makes it clear that Congress does not wish the Commission to reintroduce an injury test via its consideration of the public interest factors relevant to the remedy phase of an investigation. 157/ Therefore, it would be inappropriate for the Commission to base its determination of whether to exclude downstream products on whether the importation of such products has been shown to cause injury to the domestic industry. 158/

155/ Commissioners Eckes and Rohr do not join in this discussion of the basis for determining the scope of exclusion of downstream products. See their separate views at page 145, infra. Commissioner Lodwick also does not join in this discussion of the basis for determining the scope of exclusion of downstream products. See his separate views at page 149, infra.

156/ Certain Aramid Fiber, Inv. No. 337-TA-194, USITC Pub. 1824 (March 1986) at 10-14.

157/ S. Rep. No. 71, 100th Cong., 1st Sess. 129 (1987).

158/ We also note the impossibility of doing so, given that no evidence of injury at all has been introduced in the record of this investigation, much less any evidence of injury by reason of downstream products, in view of

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However, the statutory public interest factors do not really come into play in initially determining the appropriate scope of a remedy in a section 337 investigation. The Commission first determines what remedy is appropriate, including the scope of that remedy, and then, based on consideration of the statutory public interest factors, determines whether any remedy at all should issue. Consequently, the Commission may make determinations as to the proper scope of the remedy without violating the spirit of Congress' intent in eliminating the injury test from section 337.

In the absence of an injury-based standard on which to delimit the downstream scope of an exclusion order, the question arises as to what factors the Commission should consider. 159/ In general, in determining

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158/(...continued)
the elimination of the injury test under the OTCA.

159/ The legislative history of the OTCA demonstrates Congress' general intent that section 337 be strictly enforced, and its desire to provide domestic industries with the most complete protection possible from infringing imports. S. Rep. No 71, 100th Cong., 1st Sess. 127-133 (1987). However, the limited exclusion order is itself a limitation on the relief afforded a prevailing complainant, created by the Commission without specific authority in the statute. Congress has never specifically authorized the Commission to issue limited exclusion orders as the final remedy in a section 337 investigation, although it has specifically authorized them when directed at defaulting respondents. Nevertheless, the Commission has been issuing limited exclusion orders since 1981. In light of the extensive attention devoted to section 337 in the past two years, resulting in the amendments effected by the OTCA, we believe it is reasonable to infer Congressional acquiescence in the Commission's practice of issuing limited exclusion orders from Congress' silence on the matter. This is particularly so, since with respect to remedy matters, Congress noted the Commission's belief that it was precluded from issuing both exclusion and cease and desist orders with respect to the same unfair act, and provided specific authority for the Commission to do so, presumably in order to expand the extent of relief available to a prevailing complainant. Had Congress objected to the issuance of limited rather than general exclusion orders as insufficient relief, it would presumably have acted to limit the Commission's authority to issue such orders. Consequently, we believe the Commission may similarly circumscribe the scope of an exclusion order with respect to downstream products.

whether to issue a general exclusion order, the Commission balances the complainant's interest in obtaining complete protection from all potential foreign infringers against the inherent potential of a general exclusion order to disrupt legitimate trade. 160/ Similarly, the Commission may, in issuing exclusion orders, whether general or limited, balance the complainant's interest in obtaining complete protection from all infringing imports by means of exclusion of downstream products against the inherent potential of even a limited exclusion order, when extended to downstream products, to disrupt legitimate trade in products which were not themselves the subject of a finding of violation of section 337.

In performing this balancing, the Commission may consider such matters as the value of the infringing articles compared to the value of the downstream products in which they are incorporated, the identity of the manufacturer of the downstream products (i.e., are the downstream products manufactured by the party found to have committed the unfair act, or by third parties), the incremental value to complainant of the exclusion of downstream products, the incremental detriment to respondents of such exclusion, the burdens imposed on third parties resulting from exclusion of downstream products, the availability of alternative downstream products which do not contain the infringing articles, the likelihood that imported downstream products actually contain the infringing articles and are thereby subject to exclusion, the opportunity for evasion of an exclusion order which does not include downstream products, the enforceability of an order by Customs, etc. This list is not exclusive; the Commission may identify and take into account any other factors which it believes bear on

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160/ Spray Pumps, supra note 151 at 17-20.

the question of whether to extend remedial exclusion to downstream products, and if so to what specific products.

On the facts of this investigation, and in light of the extent of relief ordered in the DRAMs investigation, which involved a very similar product, exclusion of some downstream products is justified. We believe that exclusion of EPROMs in packages or mounted on circuit boards is warranted in order to ensure that the exclusion order is reasonably effective. Circumvention of an order covering only assembled chips as individual units would be easy and inexpensive for a large, integrated manufacturer such as Hyundai, which presumably already has circuit board manufacturing and stuffing facilities. 161/ Similarly, because of the low cost of such an operation, and the existence of facilities to perform such operations throughout the world, we believe that exclusion of infringing EPROMs in carriers of any type or mounted on circuit boards of any configuration is warranted.

Although there is no evidence of the number or type of EPROMs contained in the Hyundai products Intel sought to have excluded 162/, the products described are generally of a type which requires EPROMs to function. The GI/Microchip foundry agreement with Hyundai provides [

161/ A "stuffed" circuit board is one with semiconductor chips mounted on it. Such a board can be readily "unstuffed" by simply disengaging the chips, which can then be sold individually.

162/ Intel submitted an affidavit describing the purchase of a Hyundai personal computer, which did contain EPROMs. Those EPROMs were identified as having been manufactured by Fujitsu, a company which is not involved in this investigation. See Exhibit 12 to Intel's submission on remedy, bonding, and the public interest.

]. Requiring Hyundai to certify that its downstream products do not contain infringing EPROMs is a reasonable means of ensuring the effectiveness of the remedy to which Intel has proven itself entitled.

With respect to the value of the EPROMs contained in the downstream products Intel proposed for exclusion, there is again no evidence. However, as a general rule, computer equipment requires EPROMs in order to function. Thus, while the actual value of the EPROMs compared to the value of the equipment may be small, they are vital to its operation. This may well be true with respect to the other products Intel sought to have excluded. However, unlike computers, automobiles can be built without EPROMs -- it is only the newest technology in automotive engineering which relies heavily on advanced electronics, including EPROMs.

We determine that the exclusion order is properly limited to only downstream products manufactured by Hyundai containing infringing EPROMs. None of the other respondents to the investigation appears to manufacture downstream products. Complainant has not requested exclusion of downstream products containing infringing EPROMs manufactured by anyone other than Hyundai. In addition, the incremental benefit to the complainant of exclusion of non-respondent manufacturers' products appears relatively small compared to the burden which would be imposed on those manufacturers by the certification requirements of an exclusion order applicable to them.

We further determine that the exclusion of Hyundai downstream products is properly limited to computers, computer peripherals, telecommunications equipment, and automotive electronic equipment manufactured by Hyundai

containing infringing EPROMs. These are the products most likely to contain EPROMs, and which require EPROMs for their operation. We believe the exclusion of Hyundai automobiles per se is excessive, and would not significantly increase the relief afforded complainant.

We determine that it is not appropriate to name [ ] which manufactures the infringing Atmel EPROMs pursuant to a foundry agreement, in the exclusion order. The only [ ] products determined to infringe were those it manufactured for Atmel pursuant to the foundry agreement. [ ] is licensed by Intel to produce EPROMs pursuant to the patents at issue for its own use. We believe there is no reason to include [ ], since the Atmel EPROMs it manufactures can be identified without naming [ ], as infringing EPROMs manufactured on behalf of Atmel by a contractor. 163/

We further determine that it is not appropriate to limit the exclusion order to EPROMs which correspond to those manufactured by the domestic industry, as identified by Atmel, i.e., CMOS EPROMs of an access speed of 150 nanoseconds or greater. There is no reason to limit the extent of relief afforded in this investigation to products corresponding to those currently manufactured by the domestic industry. Section 337 provides a remedy for imports which infringe a domestic patent, provided there is a domestic industry. Those conditions are met in this case, and therefore the remedy should extend to all EPROMs which infringe the patents at issue.

163/ Intel is concerned that the Customs Service would not recognize that [ ] is a contractor for Atmel, and would therefore not know to exclude such EPROMs. However, we note that prevailing complainants frequently provide Customs with model designations, importer names, and other information in order to assist with enforcement of an exclusion order, and that Customs generally welcomes such assistance.

We determine that the exclusion order should provide that it applies only to those EPROMs which Hyundai manufactures as a foundry for GI/Microchip. Hyundai's EPROMs which do not fall into that category were either not subject to this investigation, or else are subject to a consent order entered by the Commission. Therefore, it is reasonable to be explicit as to the extent of the exclusion.

We also determine that the exclusion order should not apply to GI/Microchip EPROMs, the wafers of which were fabricated in the United States, shipped overseas for assembly, and then reimported into the United States. 164/ The infringement, as discussed above, is in the electronic circuitry, which is embodied in the chip during wafer fabrication. Thus, the infringement, if any, with respect to these EPROM wafers and the resulting assembled EPROMs, takes place in the United States. Intel has a remedy in federal district court against infringement occurring in the United States. Such infringement is beyond the scope of the Commission's jurisdiction in section 337. We have therefore included in the order a provision exempting imported assembled EPROMs, the wafers of which were fabricated in the United States by Microchip, along with an appropriate certification requirement.

We have also determined that it is appropriate to issue cease and desist orders against each of the respondents except Hyundai, i.e., Atmel, GI, Microchip, and the respondent distributors -- Cypress Electronics, Inc, All-American Semiconductor, Inc., and Pacesetter Electronics, Inc. -- ordering them to cease and desist from the following activities: importing, selling for importation, assembling, testing, performing manufacturing

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164/ We note that the cease and desist order, discussed below, does not apply to Microchip's U.S. wafer fabrication operations.

steps with respect to, using, marketing, distributing, offering for sale, or selling, imported EPROMs which have been determined to be infringing. 165/

The OTCA made clear that the Commission has the authority to enter both an exclusion order and cease and desist orders to remedy the same unfair act in violation of section 337. 166/ Issuance of cease and desist orders in addition to the limited exclusion order affords Intel more effective relief, as the record suggests that there are inventories of imported infringing EPROM wafers already in the United States on which additional work, including testing, is continuing to be performed. The limited exclusion order does not reach the continuing assembly, testing, and manufacturing activities in the United States. Moreover, the limited exclusion order does not reach the marketing and sales activities of the respondent domestic distributors.

The Commission has in the past required evidence of significant inventories in the United States as a basis for issuance of an order to cease and desist selling in the United States. 167/ The precise extent of any inventories in the United States is unknown, and is disputed by the parties. However, the evidence concerning GI/Microchip and Atmel's production processes, which involve testing in the United States prior to sale, suggests that there are inventories of work in progress. On the

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165/ Acting Chairman Brunsdale and Commissioner Cass would issue a cease and desist order to respondent Hyundai as well. They do not believe that there is a persuasive argument for treating Hyundai differently than the other respondents in this respect.

166/ Omnibus Trade and Competitiveness Act of 1988, Pub. L. 100-418, 102 Stat. 1107, § 1342(a)(4)(A), to be codified at 19 U.S.C. § 1337(f)(1).

167/ Certain Compound Action Metal Cutting Snips and Components Thereof, Inv. No. 337-TA-197, USITC Pub. 1831 (March 1986) at 9.

record of this investigation, we determine this is sufficient to justify cease and desist orders directed at sales activities.

We further determine that an order requiring respondents Atmel and GI/Microchip to cease and desist from transferring technology is not warranted. The technology at issue is patented, and therefore is in the public domain. Making use of that technology in the United States without a license is infringement, and making use of that technology without a license in products imported into the United States is a violation of section 337. However, transferring patented technology is not per se either an infringement or a violation of section 337. Moreover, transfers of technology abroad fall under federal statutes controlling exports, and the appropriate authorities can act with respect to proposed transfers to technology.

BONDING

Section 337(g)(3) provides for the entry of infringing articles upon the payment of a bond during the 60-day Presidential review period. The bond is to be set at a level sufficient to "offset any competitive advantage resulting from the unfair method of competition or unfair act enjoyed by persons benefitting from the importation." 168/

Complainant Intel proposed that the Commission impose a bond of 100 percent of the entered value of each EPROM chip during the Presidential review period. The IA also proposed a bond of 100 percent of the entered value of the EPROMs in question. Respondent GI/Microchip proposed that the

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168/ Section 210.58(a)(3) of the Commission's Interim Rules of Practice and Procedure, 53 Fed. Reg. 33034, 33072 (Aug. 29, 1989), to be codified at 19 C.F.R. § 210.58(a)(3).

bond should be set at 10 percent of the articles' entered value with respect to EPROMs which infringe the '050 patent, and 25 percent of entered value with respect to infringement of any other patent. Respondent Hyundai did not make any suggestions as to the appropriate bond. Respondent Atmel argued that Intel's proposed 100 percent bond is grossly excessive. Atmel asserted that a bond based on a reasonable royalty is most appropriate in this investigation. Atmel suggested that a one (1) percent bond would represent a reasonable royalty.

Unfortunately, competitive advantage in this investigation is incapable of precise calculation. The lack of precise, recent price information, and the broad range of EPROM prices cited by the parties precludes using direct price comparisons as a basis of the bond amount. 169/ In addition, the lack of any information as to reasonable royalties makes the calculation of a royalty-based bond, as was imposed in the DRAMs investigation, difficult. Atmel suggested that the Commission calculate a reasonable royalty by considering the factors a federal district court would consider in establishing a reasonable royalty for purposes of calculating damages in an infringement suit. The record does not contain the information necessary to undertake such an exercise.

Moreover, the reasons for a district court calculation of a reasonable royalty are significantly different from the Commission's need to establish a bond during the Presidential review period. A federal district court

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169/ We note that this problem may also occur in future section 337 investigations involving patent infringement, since injury is no longer an issue in such cases and pricing information is no longer likely to be introduced during the evidentiary hearing. The Commission can, however, make factual determinations, including determinations concerning pricing, based on the information presented by the parties in the context of the remedy phase of an investigation.

calculates reasonable royalties as an alternative basis for an award of monetary damages for infringement, where proof of lost profits is not available. 170/ Such a calculation, based on a number of factors, is essentially an exercise to determine what royalty rate a willing licensor and a willing licensee would have agreed upon in a hypothetical negotiation for a license under the patent in question at the time the infringement commenced. 171/ While such a figure would be a reasonable basis for establishing a bond, the calculation of the reasonable royalty is itself complex, and requires evidence of the conditions of the market at the time of the infringement, the anticipated profits of the patentee, the patentee's policy toward licensing in general, and of the patent at issue in particular, etc. 172/ The record in this case simply does not contain evidence, beyond the assertions of Atmel, as to these matters. Moreover, we do not believe the Commission's purpose in setting a temporary bond necessitates the complex calculations undertaken by a federal district court in assessing damages for infringement. Therefore, we do not calculate a reasonable royalty for purposes of setting the bond in this investigation.

In the absence of real pricing information and real royalty information as a basis for establishing the bond, the amount of any bond

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170/ 35 U.S.C. § 284 provides for money damages "adequate to compensate [the patentee] for the infringement."

171/ See Georgia-Pacific Corp. v. United States Plywood Corp., 318 F. Supp. 1116, 1121-22. (S.D.N.Y. 1970), modified, 446 F.2d 295 (2d Cir. 1971), cert. denied, 404 U.S. 870 (1971).

172/ See id.

set by the Commission must depend upon more general considerations. 173/ We agree with the general proposition that the bond should not be set so high as to effectively prevent importation during the Presidential review period. However, the period of the Presidential review is relatively short, and the consequences of a bond set at 100 percent will be short-lived. Therefore, in the absence of better information, we determine to accept the IA's (and Intel's) suggested bond of 100 percent of the entered value of the EPROMs in question. In the case of EPROMs assembled into a carrier or mounted on a circuit board, we determine that the bond should be assessed on the number of EPROMs contained therein, and that the importer should be required to certify to the best of its knowledge the number of EPROMs contained therein. With respect to the remainder of the downstream products, we determine that they should be allowed entry free of bond during the Presidential review period, since the value of the EPROMs in these products is likely to be a very small portion of the value of the product and difficult to calculate for the importer.

THE PUBLIC INTEREST

Section 337(d) provides that the Commission shall issue an order excluding the goods in question unless, after considering the effect of such remedy upon (1) the public health and welfare, (2) competitive conditions in the U.S. economy, (3) the U.S. production of articles that are like or directly competitive with those which are the subject of the investigation, and (4) U.S. consumers, it finds that a remedy should not be

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173/ We do not believe it appropriate or necessary to establish different bonds based on the patents infringed. Such bonds would be impossible for the Customs Service to enforce, since more than one patent is infringed in the manufacture of several of the products subject to exclusion.

issued. 174/ This provision was added by the Trade Reform Act of 1974. The legislative history makes clear that these statutory public interest factors are to be the overriding consideration in the administration of the statute. 175/

Intel asserted that issuance of a limited exclusion and cease and desist orders in this investigation will have no adverse effect on the statutory public interest factors the Commission is required to consider. Atmel argued that the public interest precludes the imposition of any remedy as to it in this investigation at this time. The IA argued that the statutory public interest factors do not preclude the issuance of a remedy in this investigation.

Atmel asserted that it will be unable to continue in business if it is precluded from selling EPROMs on a commercial basis due to an exclusion order, and that as a consequence, certain defense contractors will be deprived of their sole source of supply of certain semiconductor parts, including some EPROMs subject to exclusion, with harmful consequences for United States national security interests. Respondents Hyundai and GI/Microchip did not make any public interest arguments. Intervenor Seeq Technology, Inc. opposed Atmel's request to be exempted from any remedy in this investigation.

The Department of Defense (DoD) submitted a letter concerning the national security interest issue raised by Atmel's request to be exempted

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174/ Section 337(f)(1) contains an identical provision regarding the Commission's issuance of cease and desist orders after considering the effects of the order on the same public interest factors. 19 U.S.C. § 1337(f).

175/ S. Rep. No. 1298, 93d Cong., 2d Sess. 193 (1974).

from any remedy in this investigation. 176/ DoD's letter and analysis are explicitly premised on the assumption that an exclusion order in this investigation will result in respondent Atmel going out of business in the immediate future. 177/ The DoD letter refers to certain semiconductors manufactured by Atmel (only one of which is subject to our exclusion order) which are of critical importance to certain defense contracts, and states that --

> the loss of Atmel as a viable entity will have serious production and technology base implications to the DoD. Atmel is a critical supplier of unique products to the DoD and their loss will present programmatic problems that would be difficult to overcome. . . . Atmel also is an important technology resource for the United States. . . . DoD firmly believes in supporting the enforcement of the intellectual property rights of US companies. However, in this situation, national security implications must also be considered based on Atmel's contention that under an exclusion order [it] would be unable to survive on its military sales alone.

DoD Letter at 1-2.

We do not believe that the statutory public interest considerations preclude the issuance of the limited exclusion and cease and desist orders in this investigation. As a rule, the Commission considers the public welfare as a whole in its public interest determination, and not the effects of the remedy on the interests of a small group. 178/ There has been no showing that EPROMs are products which have general implications

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176/ We note that DoD's letter was received on March 6, 1989, less than two weeks before the statutory deadline in this investigation.

177/ DoD did not express any knowledge or information as to whether Atmel would go out of business in the face of a remedy in this investigation, stating merely that "DoD understands that there is a possibility that Atmel could be forced out of business should an exclusion order be envoked [sic] as a result of a violation determination by the ITC." DoD letter at 1.

178/ See Certain Large Video Matrix Display Systems and Components Thereof, Inv. No. 337-TA-75, USITC Pub. 1158 (June 1981) at 32.

for the public health and welfare. 179/ It is clear that the domestic industry, together with Intel's other licensees, both domestic and foreign, have adequate capacity to supply the U.S. market. As a general matter, numerous alternatives to the excluded EPROMs are available. Certain consumers' preference for an infringing alternative is irrelevant to our consideration of the public interest, and does not warrant denying Intel the relief to which it is entitled. 180/

However, Atmel's public interest argument raises several difficult questions. At the outset, the mere fact that an exclusion order might result in Atmel going out of business is not a sufficient basis for determining that the public interest precludes issuance of a remedy. The Federal Circuit has held that a company which bases its business on infringement of an intellectual property right has no right to complain if the remedy issued results in the loss of the business, loss of jobs, or serious inconvenience to the public. In Windsurfing International, Inc. v.

179/ Atmel asserts that it is the sole supplier of an electrically erasable programmable read only memory used in an LDC heart monitor/defibrillator, used by ambulance and emergency room personnel. This public health issue raised by Atmel does not concern an excluded infringing EPROM, but one of Atmel's other semiconductor products. Thus, even assuming the loss of this product would have adverse public health consequences, these would result only if Atmel closed its doors, an issue which is discussed further below.

180/ Similarly, the loss of a choice of EPROMs, among which are the infringing models, is not sufficient to warrant denying relief. In Certain Aramid Fiber, supra note 156, the Commission excluded the product of the single alternative producer in the world from the U.S. market, noting that customers' preference for a second source of a patented product does not provide a basis for denying relief under section 337. In this investigation, there are numerous sources of EPROMs, both domestic and foreign. To the extent that Atmel's EPROMs may be unique in some respects, an assertion which is disputed by Intel and Seeq, the evidence does not support the conclusion that the potential substitutes are insufficient in general, particularly in light of the constantly evolving nature of EPROM design and technology.

AMF, Inc., et al., 782 F.2d 995 (Fed. Cir. 1986), cert. denied, 477 U.S. 905 (1986), the Federal Circuit stated, with respect to injunctive relief for patent infringement which would assertedly put the infringing company out of business:

> That sailboards are Downwind's primary product, and that an injunction might therefore put Downwind out of business, cannot justify denial of that injunction. One who elects to build a business on a product found to infringe cannot be heard to complain if an injunction against continuing infringement destroys the business so elected.

Id. at 1003 n.12. Accord, Polaroid Corp. v. Eastman Kodak Co., 641 F. Supp. 828, 228 U.S.P.Q. 305 (D. Mass. 1985), aff'd 789 F.2d 1556 (Fed. Cir. 1986), cert. denied, 479 U.S. 850 (1986).

Moreover, as the Commission has stated previously, there is, in general, "no competitive right to infringe valid United States patents." Certain Headboxes and Papermaking Machine Forming Sections for the Continuous Production of Paper, and Components Thereof, Inv. No. 337 TA-82A, USITC Pub. 1197, (Nov. 1981) at 13. In addition, the loss to the domestic market of some non-infringing products manufactured by infringing company is not alone sufficient to warrant denying relief, particularly in the case of a product such as EPROMs, where research and development of new, more advanced products is ongoing, and new products are regularly introduced.

Thus, the only reason Atmel's assertion that an exclusion order will force it to go out of business is at all relevant to our analysis is the assertion that certain defense contractors rely on Atmel semiconductor parts in fulfilling certain important military contracts. This argument raises serious concerns for the Commission, which it has never before had to address.

To the extent that certain of Atmel's semiconductor products, including infringing EPROMs, are unique and necessary for defense contractors, it appears to be true that the currently available substitutes are insufficient. However, DoD's concern, as expressed in its letter and supporting attachments, appears to be more with the loss of Atmel semiconductors other than the EPROMs we have determined are infringing and subject to our exclusion and cease and desist orders. In addition, the concerns expressed by the DoD are premised on the assumption that Atmel will be forced to go out of business in the immediate future, depriving the DoD contractors who rely on Atmel as a supply source of, inter alia, infringing EPROMs, with resultant "programmatic problems" for DoD. The Commission does not have experience in evaluating threats to national security due to interruptions in supply of critical parts. However, the Commission does possess a substantial degree of expertise in considering evidence concerning the economic health and well-being of domestic companies, and threats to their continued existence. In the final analysis, we are simply unpersuaded by Atmel's argument that an exclusion order on its infringing EPROMs will have the drastic consequences for Atmel's continued existence Atmel has posited. 181/

Atmel provided the Commission with information indicating that a significant portion of its sales revenues ([

]) is attributable to EPROMs. Atmel argued that, even though its military sales are statutorily exempted

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181/ We note that a company may, for many reasons, decide to go out of business. We cannot say what Atmel may choose to do. We can say that, based upon our evaluation of the data available at this time and our experience with the assessment of the operations of companies in the EPROM, semiconductor, electronics, and other industries, the orders in question would not "force" the company into liquidation.

from exclusion, an exclusion order would result in a [ ] sales revenue loss, based on 1988 figures. 182/ Atmel also presented two hypotheticals, from which it concluded that an exclusion order would result in (1) operating losses of $[ ] (as opposed to projected income of $[ ]) in one year (presumably the first year of exclusion), assuming no cost savings, or (2) operating losses of $[ ], assuming layoffs of employees and other cost savings. 183/ However, Atmel provided the Commission with no information concerning its profits attributable to its various product lines, including the EPROMs potentially subject to exclusion, its earnings history, its capital reserves, its costs, etc. 184/ Consequently, the Commission lacks information from which it could determine the validity of these hypotheticals, or the likelihood that Atmel will be unable to remain in business in the face of the likely revenue loss resulting from the Commission's remedial orders.

Moreover, Atmel's calculations (and argument) are based on the assumption that an exclusion order would result in the complete loss of its EPROMs business. However, Atmel's catalog lists two EPROM products which we have not determined infringe the Intel patents at issue in this investigation, as well as at least four additional EPROM products which

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182/ Atmel's Response Brief in support of its request to be exempted from any remedy that might be issued in this case for compelling public interest reasons (hereinafter Atmel Response Brief), at Exhibit 3.

183/ Atmel Brief in support of its request to be exempted from any remedy that might be issued in this case for compelling public interest reasons (hereinafter Atmel Brief), at Exhibit 9.

184/ Atmel did indicate that its gross margins were [] percent of sales in 1988. Atmel Brief at Exhibit 11.

Atmel expected or expects to introduce in the near future. 185/ Since we do not know the revenues, or profits, attributable to these non-infringing products, we cannot assess their importance to the company's performance.

Atmel asserted that if it were forced out of business by an exclusion order in this investigation, it might be forced to sell its technology, and that the most likely purchaser is [ ], Atmel's current foundry, since [ ] is licensed under the Intel patents at issue. Atmel argued that it would be inimical to national security interests to allow this technology out of domestic hands. However, other companies, including domestic companies, are also licensed under the Intel patents at issue, and might be interested in purchasing Atmel's technology. In addition, the semiconductor parts of concern to DoD are for the most part not the EPROMs that we have found to be infringing. Thus, there is no apparent need for the purchaser of such technology to be licensed by Intel under the patents in question. An exclusion order might result in a lower price for the sale of Atmel's technology, but that is not inappropriate in view of the finding that the excluded Atmel EPROMs infringe valid U.S. patents. Moreover, we note that exports of technology are subject to controls, and if in fact Atmel's technology is vital to the national interest, we expect that the appropriate authorities could, if necessary, act to prevent the transfer of that technology overseas.

We also determine that an exemption from the remedy in this investigation is not warranted by Atmel's argument that it could

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185/ Atmel Brief at Exhibit 1. We note that the revenue projections in Atmel's Brief indicate that while EPROMs, including the infringing EPROMs, are the company's single most important revenue source, Atmel is concentrating its efforts on other semiconductor products, in addition to EPROMs, and the percentage of revenue attributable to EPROMs is projected to decline over the next two years. Atmel Brief at Exhibit 11.

successfully issue a public offering, and build a domestic wafer fabrication plant within the twelve to eighteen months. Evidence in the record suggests that Atmel has been considering a public offering since at least 1986. Atmel suggested that it is ready to go, but for the anticipated effects of the proposed remedy, which it argued would doom the public offering. But construction of a domestic wafer fabrication facility, and bringing that facility fully up to operation is a difficult and expensive project, which could fail for any number of reasons wholly unrelated to the existence of an exclusion order. We do not believe the Commission should suspend relief as to Atmel based on the mere possibility that doing so will allow Atmel to establish a domestic wafer fabrication facility. This is particularly the case since what Atmel asks is that the Commission suspend relief with respect to Atmel, so that Atmel may continue to profit by its infringement of Intel's patents, until Atmel is able to construct a domestic wafer fabrication facility, in which that infringement may continue, forcing Intel to seek further relief for infringement. 186/

186/ Atmel has requested that the Commission make a determination that its newly designed EPROM does not infringe the '050 patent, based on a recent redesign which eliminates the redundancy cell. While we do not make such a determination at this time, if in fact Atmel can so easily redesign its EPROM to avoid infringement, and if the newly-designed EPROM is as clearly non-infringing as Atmel argues, an advisory opinion proceeding, which could be commenced at any time after the exclusion order becomes final, should not be a lengthy proceeding. Thus, at least some of the effects of the exclusion order could be eliminated in a relatively short time. Moreover, if Atmel can so easily redesign its EPROMs to be non-infringing, this undercuts Atmel's argument that it would be forced out of business by our remedial orders in this investigation.

Finally, we note that the President may disapprove the Commission's recommended remedy for policy reasons, including the national security interests argued by Atmel and addressed in the DoD submission. 187/

In sum, Atmel has not established that exclusion of its infringing EPROMs will necessarily result in its going out of business, and certainly not that this result will occur within three to six months. Since DoD's concern is premised on the assumption that Atmel will go out of business and be lost as a supplier, we do not find the national security interests argued by Atmel warrant exempting it from the remedy in this investigation.

187/ We note that the national security interest may be a factor more appropriate for the President's consideration during the review period. National security interests are not specifically identified in the statute as a public interest factor for the Commission's consideration. Section 337(d) requires the Commission to issue an order excluding the goods in question unless, after considering the effect of such remedy upon (1) the public health and welfare, (2) competitive conditions in the U.S. economy, (3) the U.S. production of articles that are like or directly competitive with those which are the subject of the investigation, and (4) U.S. consumers, it finds that a remedy should not be issued.

The President, in reviewing our determination, is likely to have far greater access to the information necessary to form an informed opinion as to the national security implications of the possible loss of Atmel as a supplier of semiconductor parts to defense contractors. The President may disapprove a Commission remedy determination "for policy reasons," without limitation or judicial review of his decision. Duracell, Inc. v. United States International Trade Commission, 778 F.2d 1578, 1581-82 (Fed. Cir. 1985).

Dissenting Views of Commissioners Alfred E. Eckes and David B. Rohr Concerning Exclusion of Downstream Products

Investigation No. 337-TA-276

We concur with our colleagues that the appropriate remedies for the violation of section 337 found to exist in this investigation are cease and desist orders directed against all domestic respondents and a limited exclusion order directed at, *inter alia*, infringing articles manufactured by Hyundai. We disagree strongly, however, with our colleagues as to the scope of the proposed order and specifically its extension to downstream products of Hyundai, as to which there is no evidence of infringement.

It is true that the Commission has considerable discretion is fashioning a remedy for the violations of section 337 that we find to exist. This discretion is not unlimited however. We are sensitive to the need to provide domestic industries the fullest protection possible against infringing imports. We are also mindful that in providing such protection we must avoid disrupting legitimate trade in products which have not been found to be violating section 337.

In past investigations, we determined that the proper balance between these conflicting goals was to be found in a determination whether particular imported products could be found to injure or threaten injury to the domestic industry.[1] However, since the enactment of the Omnibus Trade and Competitiveness Act of 1988, the injury requirement of section 337 does not apply to cases involving infringement of patents.

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[1] See, e.g. Dissenting Views of Commissioners Eckes and Rohr Concerning Remedy and Public Interest, In the Matter of Certain Dynamic Random Access Memories, Components Thereof and Products Containing Same, Inv. No. 337-TA-242, USITC Pub. 2034 (1987).

We believe it inappropriate, therefore, to use any injury based balancing test in this investigation in fashioning a remedy. Similarly, we reject any balancing test which is based on the weighing of relative benefit and harm in fashioning a remedy because such a balancing is merely a reintroduction of injury principles in direct violation of congressional admonition.

We conclude that the only appropriate limitations to be used in fashioning remedies are those contained in the statute itself. Under the statute, a violation of section 337 can only occur in connection with imports or sales of imports. The authority of the Commission to impose any remedy must also be limited to imports and sales of imports. In this investigation, there is no evidence that any articles manufactured by Hyundai, except the particular EPROM's it manufactures for GI/Microchip, contain the infringing circuits or EPROM's containing the infringing circuits. There is not even any information suggesting that it would be likely that Hyundai would use the infringing circuits, or EPROM's containing the infringing circuits.

In the absence of any evidence whatsoever that any of the articles, which our colleagues propose to exclude, have ever been imported or sold with an infringing EPROM contained in them, we feel it is an improper and unwarranted extension of Commission authority to exclude them.[2] Any remedy we might issue against such products would unjustifiably disrupt legitimate trade in articles which have not been found to violate section 337.

We also believe that the extension of the exclusion order to the four specific types of downstream products mentioned in our colleagues' order is arbitrary and

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[2] Certainly, if, subsequent to the issuance of a properly delimited order, it was shown that certain articles, such as those mentioned in our colleague's improper order, were being imported containing infringing circuits or infringing EPROM's, as in an effort to circumvent a proper order, we could easily modify the order to include such articles within its scope.

without basis in any information of record in this investigation. These four products are apparently singled out because they require large numbers of EPROM's and Hyundai could put infringing EPROM's into them. However, this could also and equally be said of any of the many other products that Hyundai manufactures which contain EPROMS. Thus, we do not believe there is any rational basis for the selection of the four particular types of downstream products the Commission proposes to exclude.

We therefore respectfully dissent from paragraph 4 of the order proposed by our colleagues.

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ADDITIONAL VIEWS OF COMMISSIONER SEELEY G. LODWICK

I concur with those of my fellow Commissioners who believe that the orders issued by the Commission in this investigation are appropriate. I take exception, however, to the construction of Section 337 expressed in the main opinion, and to the analysis based thereon, regarding the matter of remedy and so-called "downstream products." Downstream products is not a statutory term; Section 337 does not mention downstream products. Section 337 provides, in pertinent part (with emphasis added):

> 337 (a) Unfair ...acts in the importation of articles...are... unlawful, and...shall be dealt with...as provided in this section.
>
> 337 (d) If the Commission determines...that there is violation of this section, it shall direct that the articles concerned... be excluded from entry into the United States...
>
> 337 (d) ...unless, after considering the effect of such exclusion upon [1] the public health and welfare, [2] competitive conditions in the United States economy, [3] the production of like or directly competitive articles in the United States, and [4] United States consumers, it finds that such articles should not be excluded from entry.

The three terms underlined refer, in this investigation, to certain erasable programmable read only memories (EPROMS). With regard to subsection (a), the "certain EPROMS" are specific EPROMS (identified by manufacturer and capacity) which complainant alleged infringe specific patents. With regard to subsection (d), the "certain EPROMS" are those of the allegedly infringing EPROMS which have been found to infringe those of the specified patent claims which have been found to be valid and enforceable.

The statutory scheme of Section 337, as it functions in this investigation, may be stated as follows: Patent infringement related to the importation of certain EPROMS is unlawful. The Commission, having determined that certain EPROMS infringe specific valid and enforceable patent claims, shall direct that those certain EPROMS be excluded from entry into the United States. However, the Commission: (1) is directed to consider the effect of such exclusion on four specified factors; and, (2) is allowed, upon that consideration, to find that those certain EPROMS should not be excluded.

Simply, in this investigation, the findings produced by the operation of the statutory scheme are: EPROMS were imported; EPROMS infringe the patents; EPROMS shall be excluded; unless, for reasons regarding "public interest", the Commission finds that EPROMS should not be excluded.

Having found a violation, the first part of 337 (d) directs that "the articles concerned", i.e., the certain EPROMS, be excluded. The first part of 337 (d), i.e., the part preceding the word "unless", is unqualified. Therefore, the Commission, under the first part of 337 (d), is required to exclude all of "the articles concerned", i.e., all of the certain EPROMS. This unlimited exclusion (which may be referred to as Total Exclusion) means exclusion of all certain EPROMS whether they are "naked" or whether they are contained in any one or more downstream products.

The second part of 337 (d) directs the Commission to consider the effect of Total Exclusion on four specified items. These four "public interest" items are not further defined in Section 337, but they have such breadth as to admit of a large number of subsidiary considerations. All of the matters mentioned in the main opinion as appropriate for the Commission to consider in performing a "balancing" with regard to downstream products are in fact subsidiary considerations under the four specified public interest items. As noted in the main opinion, that list is not exhaustive.

The significance of one construction of these provisions of Section 337 as compared with another construction, and the resulting analyses, can only be demonstrated by future cases having various fact situations. The strength of this construction, over that expressed in the main opinion, is that this construction rests squarely on Section 337, whereas the other construction incorporates an extraneous procedure in the midst of the statutory scheme on the authority of an argument by analogy with limited exclusion orders.

It should be noted by parties to future investigations that, whatever construction of these provisions of Section 337 is applied, the crafting of an exclusion order with regard to downstream products cannot be effectively performed in a factual vacuum.