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Honeywell Inc. v. Sperry Rand Corp. and Illinois Scientific Developments, Inc.

Civil Action File No. 4-67 Civ. 138.

**UNITED STATES DISTRICT COURT FOR THE DISTRICT OF MINNESOTA,
FOURTH DIVISION**

**1973 U.S. Dist. LEXIS 15600; 180 U.S.P.Q. (BNA) 673; 1974 Trade Cas. (CCH)
P74,874**

October 19, 1973.

CASE SUMMARY:

PROCEDURAL POSTURE: Plaintiff corporation moved for a declaratory judgment finding defendant developers' patent on a data processor invalid and in violation of the Sherman Antitrust Act, 15 U.S.C.S. § 2, for creating a monopoly in electronic data commerce.

OVERVIEW: Plaintiff corporation was involved in the production of electronic data processing equipment for various computer applications. Conflict arose between plaintiff and defendant developers over the enforcement of a patent on a data processor. Specifically, plaintiffs alleged that defendants' patent was invalid and also in violation of the Sherman Antitrust Act, 15 U.S.C.S. § 2, by dominating the electronic data processing industry. Litigation ensued, and plaintiff sought a declaratory judgment declaring defendants' patent unenforceable. Upon final determination, the district court dismissed the antitrust claim, holding that plaintiff failed to submit sufficient evidence that defendants' activity would substantially lessen competition or effect commerce in any section of the United States. However, the court held defendants' patent was void and unenforceable upon a finding that defendants misrepresented facts to the Patent Office upon their initial application.

OUTCOME: The court declared defendants' patent to be invalid on the grounds that they falsified the prior history of their patented processor at the time of application. However, there was no antitrust liability where plaintiff failed to show a decrease in competition.

CORE TERMS: patent, machine, public use, invention, electronic, technology, know-how, calculation, subject matter, royalty, license, demonstration, antitrust, storage, pulse, computing, technical information, technological, tab, inventor, cross-license, laboratory, census, examiner, card, printer, invalid, digital, settlement, customer

LexisNexis(R) Headnotes

Patent Law > Claims & Specifications > Description Requirement > General Overview

[HN1] It is not necessary that a patent description describe all possible embodiments of an invention.

Patent Law > U.S. Patent & Trademark Office Proceedings > Late Claiming Doctrine

[HN2] Where the applicant does not originally assert claims which are added later by amendment and the subject matter of such late claims is disclosed or in general use and applicant stands by to await developments in the industry before asserting them, there is an unreasonable delay and neglect on the applicant's part rendering such late claims invalid.

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > Amendments & Prohibition Against New Matter

[HN3] Where a late-filed amendment of the patent specification is important enough to constitute the basis for alleged patentability, the amendment constitutes new matter and cannot in fact be a basis for patentability.

Patent Law > U.S. Patent & Trademark Office Proceedings > Late Claiming Doctrine

[HN4] The long delay of a patentee in adding broadened claims to a patent application warrants an inference that such claims were added as an afterthought and not as a logical development of the original application, and where the subject matter of the later claims was in public use more than one year before such claims were first introduced, such claims are invalid.

Evidence > Inferences & Presumptions > General Overview

Patent Law > U.S. Patent & Trademark Office Proceedings > Interferences > General Overview

[HN5] The repeated entry into interferences, resulting in long delays incident to their determination, affords no just excuse for the failure of a patent applicant to assert broader claims at an earlier date. Long delay in coming to the point with new and broader or different claims strongly confirms that the final determination to do so was an exigent afterthought, rather than a logical development of the original application.

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > Amendments & Prohibition Against New Matter

Patent Law > U.S. Patent & Trademark Office Proceedings > Late Claiming Doctrine

[HN6] An applicant for patent cannot enlarge his pending application in such a manner as to embrace and include for the first time the essential elements of an article, device, or structure which has been in public use or on sale more than one year prior thereto, and a patent obtained in that manner does not represent patentable invention, but is mere appropriation of the inventive skills of others.

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > Amendments & Prohibition Against New Matter

[HN7] Courts must regard with disfavor any attempts to enlarge the scope of an application once filed, the effect of which would be to enable the patentee to appropriate other inventions made prior to such alteration, or to appropriate that which has, in the meantime, gone into public use.

Patent Law > U.S. Patent & Trademark Office Proceedings > Interferences > Patentability & Priority Determinations

[HN8] Interferences are proceedings in the Patent Office to determine who, between two or more parties, is entitled to priority of invention. Before an interference is declared the Patent Office must determine that there is sufficient common subject matter claimed by the parties to warrant declaring the interference.

Patent Law > Inequitable Conduct > Anticompetitive Conduct

[HN9] Deliberately extending the expiration of a monopoly is a serious violation of the United States Constitution and the patent laws.

Patent Law > Infringement Actions > Defenses > Estoppel & Laches > General Overview

[HN10] Intentional delay by an applicant for a patent invalidates the patent.

Patent Law > U.S. Patent & Trademark Office Proceedings > Interferences > General Overview

[HN11] The only legitimate purpose of an interference proceeding is determining the question of priority of inventorship.

Patent Law > Remedies > General Overview

[HN12] A party seeking a right under the patent statutes may avail himself of all their provisions and courts may not deny him the benefit of a single one.

Evidence > Inferences & Presumptions > General Overview***Patent Law > Infringement Actions > Defenses > Patent Invalidity > Validity Presumption******Patent Law > Infringement Actions > Infringing Acts > General Overview***

[HN13] A patent shall be presumed to be valid. This presumption is a statutory one which may be overcome so that a patent is rendered invalid or unenforceable or both. The rebuttable presumption of validity which attaches to a patent because of 35 U.S.C.S. § 282 is "a faint one" because Patent Office examination is not adversary and the public is not heard.

Patent Law > Inequitable Conduct > Effect, Materiality & Scienter > Effect of Inequitable Conduct***Patent Law > Infringement Actions > Defenses > Patent Invalidity > Validity Presumption******Patent Law > U.S. Patent & Trademark Office Proceedings > Continuation Applications > General Overview***

[HN14] Even an innocent misrepresentation of facts destroys the presumption of validity.

Patent Law > Statutory Bars > Public Use Bar > Elements

[HN15] A patent is statutorily barred and, hence invalid, if the invention was in public use in the United States more than one year prior to the date of the application. The public use bar is based on a fiat of Congress that it is part of the consideration for a patent that the public shall begin to enjoy the disclosure as soon as possible.

Patent Law > Statutory Bars > Public Use Bar > General Overview

[HN16] The use of an invention by a person other than the inventor, not essential to the completion of the making of the invention by the inventor, is a public use.

Patent Law > Statutory Bars > Experimental Use > Elements***Patent Law > Statutory Bars > Public Use Bar > General Overview***

[HN17] Under limited conditions, where the invention involves the need for public use as the only practical way to test the value of the invention and thereby permit the making of the invention to be completed, the inventor may experiment in public as a special exception to the public use bar. The experimental exception to public use is a narrow one, and it does not apply in a situation where it is possible to conduct the experiment in private, without the need for public use. The narrow experimental use exception to the public use bar only lifts the one year statutory rule where the use is by the inventor or persons under his control for the purpose of perfecting the invention.

Patent Law > Statutory Bars > Experimental Use > General Overview

[HN18] A patentee's Patent Office Rule 131 affidavit which asserts a completion of the invention in the United States before the filing date of the application fixes the last possible date for "experimental" use.

Patent Law > Statutory Bars > Experimental Use > Elements***Patent Law > Statutory Bars > Public Use Bar > General Overview***

[HN19] Where there is no question involved of the inventor's determination of whether the invention worked or how it could be improved, and, as well, where the sole purpose of a demonstration is to show new developments in equipment, which have been proved operational, to the public, such use is public, is in bar of a patent and cannot be forgiven as an experiment.

Patent Law > Statutory Bars > Experimental Use > General Overview

[HN20] Where the idea of a machine has been conceived and the conception carried into effect by its construction, which machine is then used or capable of being used for the purpose for which designed, such use is no longer an experiment.

Patent Law > Statutory Bars > Experimental Use > General Overview

[HN21] An inventor may not enjoy the best of the two possible worlds of secrecy and legal monopoly: he may not be permitted to use a period of alleged "experimentation" as a competitive tool.

Patent Law > Statutory Bars > Public Use Bar > General Overview

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[HN22] A single public use of a patented machine more than a year before application for patent is filed, even without any profit to the inventor, is sufficient to establish a public use bar.

Patent Law > Statutory Bars > Experimental Use > Elements

Patent Law > Statutory Bars > Public Use Bar > General Overview

[HN23] Where a device is publicly demonstrated to members of the public including the press, a compelling inference arises that the demonstration was a public use, was not within the experimental use exception and is a statutory bar to a patent if the demonstration occurred more than one year before an application on the device was filed.

Patent Law > Inequitable Conduct > General Overview

Patent Law > Statutory Bars > Public Use Bar > General Overview

[HN24] Complete identity of the device in public use with the device as claimed in a patent is not necessary to establish a public use bar. The difference between the device used and that patented must be a patentable one to avoid the bar and an inventor cannot relieve himself from the barring consequences of a public use merely by establishing that the device, installed and used, was imperfect.

Patent Law > Date of Invention & Priority > General Overview

Patent Law > Statutory Bars > On Sale Bar > General Overview

[HN25] A patent shall be barred if the invention was on sale in the United States more than one year prior to the date of the application for patent in the United States. "On sale" does not mean an actual accomplished sale but merely activity by the inventor in a commercial exploitation of what he later asserts the power to monopolize.

Contracts Law > Types of Contracts > Express Contracts

Patent Law > Statutory Bars > On Sale Bar > General Overview

[HN26] An express contract for the construction of equipment embodying the principles of the invention covered by a patent may constitute "on sale" despite the fact that no structure has yet been constructed.

Patent Law > Statutory Bars > On Sale Bar > General Overview

[HN27] For a specific device to be "on sale", it is not necessary that an actual delivery of that device be made but only that the device be ready for delivery.

Patent Law > Statutory Bars > On Sale Bar > General Overview

Securities Law > Blue Sky Laws > Offer & Sale

[HN28] The placing "on sale" of an invention bars all claims to that invention even though the invention may have been imperfect in a mechanical sense at the time. The "on sale" provision is not limited to a sale free from secrecy, and security classification imposed by the purchaser or offeree does not toll the operation of the bar.

Patent Law > Infringement Actions > Burdens of Proof

Patent Law > Statutory Bars > On Sale Bar > General Overview

[HN29] A prima facie showing that an invention was "on sale" can be overcome only by unequivocal and convincing evidence to the contrary.

Patent Law > U.S. Patent & Trademark Office Proceedings > Filing Requirements > Oaths

[HN30] An application for patent shall be made by the inventor, and shall include an oath in support of the claim of inventorship. A patent which is applied for by one who is not the inventor, is unauthorized by law and void, and whether taken out in the name of the applicant or of an assignee of his, confers no rights as against the public.

Patent Law > Claims & Specifications > Claim Language > Multiplicity

Patent Law > Statutory Bars > Public Use Bar > General Overview

[HN31] A patent shall be barred if the invention was described in a printed publication in this or a foreign country, either before the invention thereof by the applicant or more than one year prior to the date of the application for patent in the United States. The reproduction of a description of an invention by any copy-making technique capable of

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enabling wide dissemination of multiple copies evidences sufficient accessibility by the public so as to constitute a "printed publication" within the meaning of the statute. The statute is based upon the public policy that once an invention has been made accessible to the public through printed publication, it cannot thereafter be withdrawn into a legally sanctioned patent monopoly.

Patent Law > Statutory Bars > Public Use Bar > General Overview

[HN32] Distribution of a small number of copies of a descriptive document to a limited group of individuals skilled in the art, who are outside the distributor's organization, is publication within the meaning of the statute.

Patent Law > Claims & Specifications > Enablement Requirement > General Overview

Patent Law > Nonobviousness > Elements & Tests > Ordinary Skill Standard

Patent Law > Nonobviousness > Elements & Tests > Prior Art

[HN33] A patent may not be obtained though the invention is not identically disclosed or described in the prior art, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which the subject matter pertains.

Patent Law > Infringement Actions > Defenses > Estoppel & Laches > General Overview

[HN34] Where many persons were at work in the same field and had made advances in the art, and where the applicant learns of such work and is aware that his original claims might not cover the real advance made by his competitors, an intentional delay in the prosecution of the patent to enable later changes in the specification and claims so that the work of the other inventors might be covered, renders the patent invalid.

Patent Law > Inequitable Conduct > Effect, Materiality & Scienter > Effect of Inequitable Conduct

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > General Overview

[HN35] There is a line between willful and intentional fraud which will invalidate a patent and inequitable conduct which will render it unenforceable; inequitable conduct on the part of an applicant in obtaining a patent is sufficient to dissuade a court of equity from rendering aid in enforcing it.

Antitrust & Trade Law > Intellectual Property > Bad Faith, Fraud & Nonuse > Fraud

Patent Law > Inequitable Conduct > Anticompetitive Conduct

Patent Law > Inequitable Conduct > Burdens of Proof

[HN36] The claim for damages based on claimed violations of the federal antitrust laws because of willful and intentional fraud on the Patent Office requires proof by clear and convincing evidence.

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > General Overview

[HN37] The Patent Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor. Applications for patents shall be kept in confidence by the Patent Office and no information concerning the same shall be given without authority of the applicant or owner unless necessary to carry out the provisions of any Act of Congress or in such special circumstances as may be determined by the Commissioner.

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > General Overview

[HN38] By reason of the nature of an application for patent, the relationship of attorneys to the Patent Office requires the highest degree of candor and good faith; and in its relation to applicants, the Patent Office must rely upon their integrity and deal with them in a spirit of trust and confidence.

Patent Law > U.S. Patent & Trademark Office Proceedings > Examinations > General Overview

Patent Law > U.S. Patent & Trademark Office Proceedings > Filing Requirements > General Overview

[HN39] Those who have applications pending with the Patent Office or who are parties to Patent Office proceedings have an uncompromising duty to report to the Patent Office fully and fairly all facts which may affect the patentability of the invention; public interest demands that all such facts be submitted formally or informally to the Patent Office, for

it is only in this way that the Patent Office can act to safeguard the public in the first instance against illegal patent monopolies.

Patent Law > Inequitable Conduct > Effect, Materiality & Scienter > General Overview

[HN40] Fraud in the procurement of a patent includes not only intentional misrepresentations, but intentional concealment of material facts.

Antitrust & Trade Law > Intellectual Property > General Overview

Patent Law > Inequitable Conduct > Anticompetitive Conduct

Patent Law > Inequitable Conduct > Burdens of Proof

[HN41] To recover antitrust damages based on alleged fraud in obtaining a patent, the plaintiff must prove (1) willful and intentional fraud, (2) injury to business or property caused by the fraudulently procured patent, and (3) the other elements necessary to a violation under the Sherman Antitrust Act, 15 U.S.C.S. § 2.

Antitrust & Trade Law > Clayton Act > Defenses

Antitrust & Trade Law > Intellectual Property > Bad Faith, Fraud & Nonuse > Fraud

Patent Law > Inequitable Conduct > Anticompetitive Conduct

[HN42] Good faith or an honest mistake is a complete defense to an antitrust action based on fraud on the Patent Office.

Antitrust & Trade Law > Intellectual Property > Bad Faith, Fraud & Nonuse > Fraud

Patent Law > Inequitable Conduct > Anticompetitive Conduct

Patent Law > Inequitable Conduct > Burdens of Proof

[HN43] To prove an antitrust violation based on fraud on the Patent Office, the proof of fraud must be by clear, unequivocal and convincing evidence; a mere preponderance of the evidence is not enough.

Patent Law > Inequitable Conduct > Burdens of Proof

[HN44] A person attacking the validity of a patent for alleged fraudulent representations must prove that the representations were material, that the patent would not have issued but for the representations.

Antitrust & Trade Law > Intellectual Property > Bad Faith, Fraud & Nonuse > Fraud

Patent Law > Inequitable Conduct > Anticompetitive Conduct

Patent Law > Inequitable Conduct > Burdens of Proof

[HN45] It is not the mere obtaining of a fraudulent patent which brings antitrust liability to its owner; it is the assertion or enforcement of the issued patent acquired by fraud which creates antitrust liability.

Antitrust & Trade Law > Monopolization > Conspiracy to Monopolize > Sherman Act

Antitrust & Trade Law > Sherman Act > General Overview

Patent Law > Inequitable Conduct > Anticompetitive Conduct

[HN46] See § 1 of the Sherman Act, 15 U.S.C.S. § 1.

OPINION BY: [*1] LARSON

OPINION

FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER FOR JUDGMENT

0. Introduction

0.1 This case is a consolidation of two actions which were commenced simultaneously on May 26, 1967 before this Court and the District Court for the District of Columbia:

Honeywell Inc. v. Sperry Rand Corporation, U. S. District Court for the District of Minnesota, File No. 4-67 Civ. 138

(hereinafter the Minnesota action).

Illinois Scientific Developments, Inc. v. Honeywell, Inc., U. S. District Court for the District of Columbia, Civil Action No. 1373-67 (hereinafter the District of Columbia action).

0.1.1 Honeywell Inc. (hereinafter Honeywell or plaintiff) is a Delaware corporation with its principal office and place of business in Minneapolis, Minnesota.

0.1.2 Sperry Rand Corporation (hereinafter SR) is a Delaware corporation with its principal office and place of business in New York, New York, and is authorized to do and does business in Minnesota.

0.1.3 Illinois Scientific Developments, Inc. (hereinafter ISD) is an Illinois corporation with its principal office and place of business at that of SR. ISD is a wholly owned subsidiary of SR.

0.1.4 [*2] Honeywell's Complaint in the Minnesota action as originally filed raised two causes of action:

.1 Count One charged SR with violation of Section 2 of the Sherman Act by reason of the maintenance and enforcement of an allegedly fraudulently procured patent (the so-called "ENIAC patent"). The ENIAC patent was alleged to have the exclusionary power to effectively dominate the entire electronic data processing industry. Injunctive relief and damages were sought.

.2 Count Two sought declaratory judgment of invalidity and unenforceability of the ENIAC patent for the antitrust misconduct complained of in Count One, and for failure to comply with the legal pre-requisites of the Patent Statute.

0.1.5 ISD's Complaint in the District of Columbia action charged infringement by Honeywell of the ENIAC patent. Injunctive relief and damages were sought.

0.1.6 On March 5, 1968, the District of Columbia action was transferred to the District of Minnesota and consolidated by order of Judge Nordbye on May 1, 1968, with the Minnesota action as a counterclaim by ISD, which was realigned as a defendant.

0.1.7 On May 1, 1968, Honeywell filed its First Amended Complaint, in the consolidated [*3] action, adding expanded allegations that SR and ISD's conduct had violated Section 1 as well as Section 2 of the Sherman Act, and adding Count Three charging that the acquisition of the ENIAC patent was a violation of Section 7 of the Clayton Act.

0.1.8 On August 29, 1969, Honeywell filed its Second Amended Complaint, adding a paragraph 30A under which other patents and pending patent applications, in addition to the ENIAC patent, were alleged to be subject to the same infirmities as those with respect to the ENIAC patent, and their procurement, licensing, and attempted enforcement were alleged to constitute a further part of a pattern of conduct of defendants in restraint of trade in violation of the Sherman Act.

0.2 Based upon statements of claims as presented by the parties, the Court's pre-trial understanding of the issues to be tried was expressed to counsel for the parties at a hearing on July 1, 1970 to the following effect:

0.2.1 Honeywell claims that the basic issue as far as it is concerned is whether the activities of SR and ISD and their predecessors in obtaining, maintaining, and enforcing their EDP patent portfolio, including know-how, violate the antitrust [*4] laws particularly Sections 1 and 2 of the Sherman Act and Section 7 of the Clayton Act.

0.2.2 Honeywell claims that SR and ISD engaged in illegal activities as follows:

.1 The fraudulent procurement and enforcement of ENIAC, EDVAC, and other patents and patent applications.

.2 The illegal acquisition of the ENIAC patent application.

.3 The use of the claimed illegal patent portfolio to induce IBM and BTL to give up meritorious attacks on the validity of the ENIAC patent and other of defendants' EDP patents.

.4 Irrespective of the ENIAC patent's validity, the entering into of a total cross-license of EDP patents and EDP know-how with IBM in 1956.

.5 The attempted enforcement of the ENIAC patent known by defendants to be subject to infirmities.

.6 Demanding discriminatory royalties for the ENIAC patent license.

0.2.3 Honeywell claims that if it prevails on any of the foregoing that it is then entitled to damages and injunctive relief.

0.2.4 Honeywell states further that if its allegations of conspiracy and combination in violation of the antitrust laws are not sustained, then certain subsidiary issues must be reached:

.1 Whether or not [*5] the ENIAC patent is valid under the technical aspects of the Patent Laws.

.2 If the ENIAC patent is technically valid, has Honeywell infringed.

.3 If infringement is proved, what damages has ISD sustained.

0.2.5 SR and ISD take the position that this is basically a lawsuit by ISD charging Honeywell with infringement of the ENIAC patent, and a suit by Honeywell against SR and ISD for a declaratory judgment that the ENIAC patent is invalid.

0.2.6 SR and ISD claim that Honeywell has admitted the infringement if the ENIAC patent is valid, but will nevertheless select a limited number of claims to litigate this question.

0.2.7 In response to the ENIAC patent infringement claim, SR and ISD claim that Honeywell has raised a number of affirmative defenses:

.1 Public use prior to the critical date of June 26, 1946.

.2 That Mauchly and Eckert were not the sole inventors of the ENIAC patent.

.3 Derivation from Dr. John V. Atanasoff.

.4 Fraudulent procurement.

.5 Fraudulent conduct to delay the issuance of the ENIAC patent.

0.2.8 With respect to the antitrust issues, SR and ISD claim that the issues relate to:

.1 Fraudulent procurement [*6] which has been raised by Honeywell as a defense, but has also been raised by Honeywell as an affirmative antitrust allegation.

.2 Discriminatory licensing by SR in making IBM its favored licensee.

.3 SR's acquisition of title to the ENIAC patent application alleged in Count Three of the Complaint in 1955, which Honeywell claims substantially lessened competition.

0.2.9 In response to the Count Three claim of Honeywell's complaint, SR and ISD claim that a private party does not have standing under Section 7 of the Clayton Act, and also that the statute of limitations has run.

0.2.10 At the close of plaintiff's case, defendants moved to dismiss Counts One and Three of the Amended Complaint. The motion was denied as to Count One, but granted as to Count Three with entry of judgment stayed until final decision or otherwise ordered.

0.3 Pursuant to pretrial order on March 29, 1971, trial was set on the issues of liability under Honeywell's claims of antitrust violation and ISD's claim of patent infringement.

0.3.1 Pending determination of the issues of liability, Honeywell's testimony as to damages on its antitrust claims, and ISD's testimony as to patent infringement [*7] damages or accounting, were deferred.

0.3.2 Honeywell's evidence as to impact or injury was received in the trial on the liability issues.

0.4 Trial commenced before the Court without a jury on June 1, 1971 and continued with few interruptions until it closed on March 13, 1972, consuming over 135 days or parts of days. During this long course of trial, the Court heard and received extensive evidence. The statistics are impressive.

0.4.1 Seventy-seven witnesses presented oral testimony in the courtroom, and the testimony of an additional eighty witnesses was presented by deposition transcripts.

0.4.2 The Court's attention was directed to 25,686 exhibits marked by Honeywell as Plaintiff's Trial Exhibits (PX).

0.4.3 The Court's attention was directed to 6,968 exhibits marked by SR and ISD as Defendants' Trial Exhibits (DX).

0.4.4 Many of the exhibits were extremely voluminous, including both documents of great length and also collections of multiple documents designated as single exhibits. For example, PX-1 is a 496 page book describing the 19th century work of Charles Babbage relating to early digital computing, and DX-2 is a collection of documents relating [*8] to the ENIAC patent application, occupying a four-drawer legal filing cabinet; DX-1, the ENIAC patent itself, comprises 91 sheets of drawings and 232 columns of closely printed text.

0.4.5 About 500 additional exhibits were marked and referred to during the trial.

0.4.6 The trial transcript extends to over 20,667 pages.

0.5 The trial afforded the Court a comprehensive view of complex technical and economic evidence involving the electronic data processing industry and relevant history before and about automatic electronic digital computing and computers.

0.5.1 The Court was aided by extensive tutorial testimony and demonstrative exhibit presentations. The courtroom demonstrations included the copious use of charts, photographs, slides, physical devices, mechanical and electronic machines operated in the courtroom, and a movie film.

0.5.2 The Court had a view of both Honeywell and SR electronic data processing systems in computing operation at their respective Twin City facilities.

0.5.3 The Court had the assistance of explanatory courtroom testimony by knowledgeable fact and expert witnesses called by both parties in the course of the trial and in the [*9] presentation of demonstrative and physical exhibits.

0.5.4 The Court had the benefit of excellent and well documented briefs of both parties.

0.5.4.1 Pursuant to a pretrial conference held on July 1, 1970, the Court suggested and counsel adopted the format of Sample Pretrial Order No. 5 of the Manual for Complex and Multidistrict Litigation for the submission of final pretrial briefs.

0.5.4.2 The pretrial briefs submitted by the parties set forth, in separately numbered declarative sentences, the narration of facts relied upon in support of each claim for relief. Legal contentions and authorities in support of the claims for relief which were the subject of the narrative statement of facts were separately stated in separately numbered paragraphs. Similarly, opposing briefs set forth separate factual statements admitting or denying those of the adverse party, or presenting affirmative matters of a factual nature, and a statement of legal contentions and authorities in defense against the claim for relief to which the response was made.

0.5.4.3 Honeywell found that the separately numbered factual sentence format of the pretrial briefs lent itself to a computerized [*10] data storage and retrieval system. In this way, Honeywell's numbered narrative statement, with designated supporting evidence, and SR and ISD's admissions or denials, together with designated opposing evidence or affirmative narrative statement, were available in computer printout form (sometimes referred to by the parties as Honeywell's Computerized Brief or "CB").

0.5.4.4 During the course of the trial, Honeywell's computerized data storage and retrieval enabled the up-dating and annotating of its narrative statement in accordance with the trial evidence. In addition, cumulative lists and indices of exhibits and testimony were also subject to this computerized data storage and retrieval and were made available after the close of the trial.

0.5.4.5 After trial, extensive and comprehensive post-trial briefs of both parties were submitted, following the narrative statement format of the pretrial briefs but further supplemented by so-called "conventional" briefs containing strong advocacy by which counsel have been less than kind to each other. The Court has not lacked for thorough presentation by both parties on all issues in their pretrial and post-trial briefs.

0.5.5 [*11] The Court further had the benefit of numerous documentary aids in dealing with the special terminology and content of complex electronic and financial evidence, as well as rules and customs of patent practice, involved in the reconstruction of over three decades of past history underlying the modern day computer industry. For example:

0.5.5.1 Glossary of Principal Terms, Appendix A to Volume I of Plaintiff's Trial Brief.

0.5.5.2 General Information Concerning Patents, Appendix B to Volume I of Plaintiff's Trial Brief.

0.5.5.3 Plaintiff's Exhibit 21755.7, Abstract of the Patent Office History, U. S. Patent Application Serial Number 757,158 [the ENIAC patent application], and defendants' response thereto in their Appendix to Request for Findings.

0.6 On April 9, 1973, the Court advised counsel for the parties of ultimate Findings made upon the evidence of record. The decision reached is a mixed one, and the aid of both parties has been sought through the submission of more detailed Findings on those issues where plaintiff or defendants have prevailed.

0.6.1 The Court's ultimate Findings are grouped under twenty-five numbered topics, substantially in the order [*12] treated by counsel in their briefs. The ultimate and detailed supportive Findings are set forth below under these topics by decimal sub-numbering.

0.6.2 The nature and complexity of the issues upon which the facts have been found has resulted in an intermingling, where appropriate, of related conclusions of law under ultimate Finding topics.

0.6.3 The Findings are therefore both an amalgamation of findings of fact and conclusions of law, and an amalgamation of the supportive contributions of each party as to the respective issues upon which they have prevailed in whole or in part.

0.6.4 Findings 1 through 12 below are concerned primarily with the validity and enforceability of defendants' electronic data processing (EDP) or so-called "computer" patent rights against plaintiff. Findings 13 through 23 below deal more particularly with the antitrust issues arising out of the procurement, licensing and enforcement of those patent rights,

and other business conduct of SR in the EDP industry. Findings 24 through 26 pertain to legal matters and relief.

0.6.5 All legal citations which support the Findings and Conclusions herein are located in the Appendix hereto at the [*13] corresponding decimalized number.

0.6.6 In reaching these Findings, the Court has weighed the evidence relating to defendants' patent rights and business activities against the background evidence which was presented to show:

0.6.6.1 the history of technical evolution of automatic electronic digital computing from the earliest mechanical aids to the modern day computer;

0.6.6.2 the history of development of the EDP industry, from the early business efforts of SR's predecessors, and of International Business Machine Corporation (IBM) and others, including Honeywell, to the time of this lawsuit;

0.6.6.3 the history of design and construction of the earliest automatic electronic digital computers and, particularly, the so-called "ABC" (Atanasoff-Berry Computer) at Iowa State College, and the "ENIAC" machine (Electronic Numerical Integrator and Computer) of Army Ordnance at the Moore School of the University of Pennsylvania;

0.6.6.4 the work of Dr. John W. Mauchly (Mauchly or sometimes simply M), J. Presper Eckert, Jr., (Eckert or sometimes simply E) and many others in connection with the ENIAC machine, and in connection with their subsequent business activities [*14] for Electronic Control Company (ECC) and Eckert-Mauchly Computer Corporation (EMCC) and Remington Rand, Inc. (RR), as predecessors of SR;

0.6.6.5 the procurement of a patent describing and claiming "the invention" embodied in the ENIAC machine (the ENIAC patent), and the history of its lengthy prosecution before the Patent Office, including interference proceedings, controversies with IBM, and litigation with Bell Telephone Laboratories, Inc. (BTL);

0.6.6.6 the history of use of the ENIAC machine, including such important use as: calculations for the Los Alamos Scientific Laboratory of the University of California (Los Alamos Laboratory) and Dr. Edward Teller relating to the hydrogen bomb and calculations by Dr. Douglas R. Hartree relating to supersonic airfoils and projectiles;

0.6.6.7 the history of commercialization and further evolution of the ENIAC and computer machine work, including: the activities of the Moore School in the development of an "EDVAC" (Electronic Discrete Variable Automatic Computer) machine, and the description of a design for such a machine by Dr. John von Neumann; and the activities of Eckert and Mauchly and the ECC and EMCC, RR business enterprise [*15] predecessors of SR in the development of EDVAC, BINAC, and UNIVAC machines;

0.6.6.8 the procurement and continuing prosecution of patents and applications (referred to at Paragraph 30A of the Second Amended Complaint) on developments arising out of the commercialization and further business activities of Eckert and Mauchly based on the work on the ENIAC and EDVAC machines;

0.6.6.9 a detailed technological, financial and economic survey of the EDP industry's major or so-called "main frame" manufacturers who are the producers of full EDP systems, including such matters as gross dollar values of EDP sales, rentals and research and development expenditures by SR, IBM, Honeywell, Radio Corporation of America (RCA), National Cash Register Company (NCR), Burroughs Corporation (Burroughs), General Electric Company (GE), Control Data Corporation (CDC), and Philco-Ford Corporation (Philco-Ford); and

0.6.6.10 the convergence of all of these historical and evolving forces upon the extraordinary automatic electronic digital computer and the EDP industry today: an industry producing EDP systems which perform an almost limitless variety of electronic data processing operations at the [*16] seemingly incredible speed of a millionth of a second (microsecond) or even a billionth of a second (nanosecond) and of persisting in the work for hours on end, and thus completing tasks beyond the capacity of human bodies and minds.

0.7 The Findings, as an amalgamation as aforesaid, are nonetheless the result of as careful and detailed attention as could be given to a most fascinating, albeit burdensome lawsuit. Where conflicts existed in the testimony, facts have been found on the basis of close observation of the appearance, conduct and demeanor of the witnesses and to contemporaneous documentation or exhibits, wherever available.

0.8 Hence, the Findings, hereinafter set forth, represent the final culmination of an extraordinary part of history such as this Court has seldom confronted; the Findings are an effort at summation of a truly complex lawsuit in a relatively condensed form.

0.9 The Findings which follow, therefore, constitute the Court's decision in compliance with Rule 52 and all applicable provisions of the Rules of Civil Procedure and of law.

1. Public Use 1.1 The claimed invention disclosed in the ENIAC ('606) patent was in public use prior to [*17] the critical date.

1.1.1 The ENIAC patent, No. 3,120,606, discloses and claims the ENIAC machine constructed at the Moore School of Electrical Engineering of the University of Pennsylvania.

1.1.1.1 The ENIAC machine was an electronic computer of monstrous size, built during wartime with government funds by a team of Moore School employees. It employed some 18,000 vacuum tubes, hundreds of switches, thousands of relays, and miles of wiring. Defendants contend that the ENIAC machine is properly regarded as the pioneer electronic computer from which all others evolved.

1.1.1.2 The ENIAC machine is described in a Final Report which was prepared by the Moore School team, transmitted to and accepted by Army Ordnance by about June 6, 1946. There are no significant differences between the ENIAC machine as constructed and placed in operation, and the ENIAC machine as described in the Final Report.

1.1.1.3 The descriptive content of the ENIAC patent disclosure was extracted from and based upon corresponding portions of the Final Report description of the ENIAC machine. There are no significant differences between the subject matter described in the Final Report and the claims [*18] of the ENIAC patent.

1.1.1.4 The patentees of the ENIAC patent state therein that the ENIAC machine "embodies our invention" and are bound thereby. Conduct with respect to that ENIAC machine is, therefore, conduct with respect to "the invention."

1.1.1.5 SR and ISD have further characterized the subject matter of the ENIAC patent as "the invention of the Automatic Electronic Digital Computer," and are bound thereby. Conduct with respect to an automatic electronic digital computer is, therefore, conduct with respect to "the invention."

1.1.1.6 Each of the claims of the ENIAC patent reads on the ENIAC machine as it was constructed and placed in operation at the Moore School and described in the Final Reports.

1.1.1.7 The ENIAC machine which was represented by Eckert and Mauchly to be that which "embodies our invention" is identical with the ENIAC invention, however claimed.

1.1.1.8 Counsel for defendants did not object to the Court's statement at trial that there was no dispute about the fact that Eckert and Mauchly claimed to be the two sole joint inventors of the ENIAC, from input all the way through to output.

1.1.1.9 For the foregoing reasons, there [*19] is no necessity to make specific reference to the individual claims of the ENIAC patent where conduct barring the valid issuance of a patent is conduct involving either the same ENIAC machine (as will be set forth hereinafter with respect to the bars of public use and on sale), or involving a prior automatic electronic digital computer (as will be set forth hereinafter with respect to the bars of derivation from Atanasoff and prior publication by von Neumann).

1.1.1.10 Where an additional bar to less than the all-inclusive entirety of "the invention" has also been found herein, specific selected claims of the ENIAC patent have been applied and essentially cumulative further findings particularized by claims are also hereinafter included.

1.1.1.11 The entire subject matter of the ENIAC machine, represented by Eckert and Mauchly to be that which "embodies our invention," is barred from valid patentability since that machine was in public use in this country more than one year prior to the date of the application for patent on June 26, 1947. The one-year-prior or statutory bar date is referred to as the "critical date," and is June 26, 1946.

1.1.2 The ENIAC machine was [*20] constructed by mid-November, 1945.

1.1.2.1 The design for the ENIAC machine was frozen prior to the end of 1944 so that the construction of the machine could be completed as rapidly as possible to confirm the usefulness of electronic computation with such large machines.

1.1.2.2 By mid-1945, the construction of the various ENIAC units was complete and testing of the completed units had commenced.

1.1.2.3 The ENIAC was placed in operation as a system in mid-November, 1945.

1.1.2.4 Moore School and Army Ordnance representatives considered that the ENIAC machine was being operated rather than tested after December 1, 1945.

1.1.3 The ENIAC machine which embodied "the invention" claimed by the ENIAC patent was in public and non-experimental use for the following purposes, and at times prior to the critical date:

Los Alamos calculations December, 1945-February, 1946

International publicity

1. Press demonstration use February 1, 1946

2. Newsreel use February 8, 1946

3. Formal dedication use February 15, 1946

4. Open house use February 16, 1946 Hartree calculations April, 1946-July, 1946

Constant practical use December, 1945-June, [*21] 1946

Commercial solicitation uses February, 1946-April, 1946

1.1.3.1 The Court finds that PX 4245, a March 19, 1946 letter from Major W. J. Stephens, Jr., to Mr. A. Borbeck, Artillery Branch, which was never previously called to the attention of either the Patent Office or the late Judge Archie O. Dawson in the case of Sperry Rand Corporation et al. v. Bell Telephone Laboratories, Inc. (hereinafter SR v. BTL) before the Southern District of New York, clearly indicates that prior to March, 1946 the ENIAC machine was "completed with the performance of research and experimental work in connection with the development of an Electronic Numerical Integrator and Computer."

1.1.3.2 SR and ISD contend that the correspondence of November, 1946, between the Moore School and the Army Ordnance patent section responsible for preparation of the ENIAC patent application (referred to by the names of the writers as the "Sharpless/Libman letters") has no probative value. Despite an error in the date of the press demonstration as recited in PX 5374, the Sharpless/Libman letters otherwise have great probative value and clearly indicated to Army Ordnance attorney Max L. Libman, who was then [*22] preparing the ENIAC patent application, that the completed

ENIAC machine was first put to work for practical purposes on December 10, 1945, on a set of partial differential equations for the Manhattan Engineering District (hereinafter "the Los Alamos calculations or problem"). That initial work was not considered experimental since the letter states that "when the first problem was put on the machine it was the first time that the machine as a whole was being used, it was fully expected that the problem would be solved and it was."

1.1.4 The Los Alamos calculations which commenced December 10, 1945, were the first problem placed on the ENIAC machine. When the first problem was put on the machine it was the first time that the machine as a whole was being used. It was fully expected that the problem would be solved. It was.

1.1.4.1 The ENIAC machine, and hence any invention claimed in the ENIAC patent, was reduced to practice no later than the date of commencement of the use of the machine for the Los Alamos calculations, December 10, 1945.

1.1.4.2 The ENIAC project for the development of a high-speed electronic computer was made known to Dr. John von Neumann (Army Ordnance [*23] scientific consultant) by Dr. Herman H. Goldstine (Army Ordnance liaison officer on the ENIAC project) in the summer of 1944, after the ENIAC design had been frozen. Von Neumann visited the Moore School in July, 1944, and witnessed two ENIAC accumulator units and a cycling unit wired to function as a small ENIAC machine. By early 1945, von Neumann had begun consideration of how the ENIAC machine could be organized and operated to solve complex problems.

1.1.4.3 By the summer of 1945, Dr. Edward Teller, Dr. Stanislaw Ulam and other scientists of the Los Alamos Laboratory had already recognized the urgent need for large-scale numerical calculations designed to verify the feasibility of a hydrogen bomb design concept having several parameters including various mixtures of deuterium and tritium. Teller discussed his computational needs with von Neumann who indicated his belief that the ENIAC machine would be suitable for performing certain calculations regarding the feasibility of the hydrogen bomb, called the "Super."

1.1.4.4 The calculations to be performed were complex and required a large number of arithmetical computations. They were not intended to provide a particular [*24] numerical answer or series of answers, but rather were contemplated to provide, and did provide, the basis for a yes or no answer on the utility of continued scientific exploration of the "Super."

1.1.4.5 Useful results could be and were obtained from such calculations on the ENIAC machine even though calculational errors may have occurred in some of the primary and intermediate calculations.

1.1.4.6 Army Ordnance agreed, in 1945, to allow the use of the ENIAC by Los Alamos Laboratory personnel at the Moore School for the Los Alamos calculations.

1.1.4.7 At or about the time in December, 1945, when the Los Alamos calculations were placed on the ENIAC machine at the Moore School in Philadelphia, the machine had passed all component and system tests and was operating quite satisfactorily. The Los Alamos calculations employed 99 percent of the capacity of the ENIAC machine.

1.1.4.8 The satisfactory operation of the ENIAC machine was verified during the Los Alamos calculations by:

.1 repeating a particular production run twice and then verifying that the results obtained for each repetition were identical;

.2 stepping the ENIAC through a calculation and checking [*25] all answers after each add time;

.3 running a test problem between successive runs and checking the answer obtained to determine that it corresponded to the known answer of the test problem.

1.1.4.9 After satisfactory operation of the ENIAC machine was verified by comparing a hand calculated answer to the

ENIAC machine answer for selected calculations, various conditions of the Los Alamos problem were changed to obtain production runs for which the answer had not been previously hand calculated.

1.1.4.10 By January, 1946, many production runs for the Los Alamos calculations were completed. The calculations continued in progress for considerably over one month.

1.1.4.11 Any difficulties encountered were not with the machine but with the mathematical nature of the problem and mistakes of the mathematicians who had designed the problem for the machine.

1.1.4.12 The use of the ENIAC machine by the Los Alamos Laboratory personnel was not under the control of Eckert and Mauchly, nor under any condition of secrecy for their private benefit. The Moore School also had no control over the use of Army Ordnance's ENIAC machine by the Los Alamos personnel.

1.1.4.13 [*26] The ENIAC machine was used to perform numerous production runs for the Los Alamos calculations beginning in December, 1945, and continuing in January-February, 1946, and the consequences of these calculations were far-reaching and thoroughly practical.

1.1.4.14 The results of the Los Alamos calculations using the ENIAC machine were included in three Los Alamos reports which show or state in substance that without the ENIAC machine, important work on nuclear energy release problems could not have been done at the time. The Court concurs with Dr. Teller that one of the reports, in April, 1946, delivered a verdict on the feasibility of a thermo-nuclear bomb: difficult, but with hard work and concentrated effort, hopeful.

1.1.4.15 The contribution of the ENIAC machine in performing the Los Alamos calculations was acknowledged on March 18, 1946, by Dr. Norris Bradbury, Director of the Los Alamos Laboratory, as being of very great value in the work on the project. The Los Alamos calculations using the ENIAC machine were a substantial effort which successfully and satisfactorily solved specified problems, and the results were useful and did not lie dormant.

1.1.4.16 The use [*27] of the ENIAC machine for the Los Alamos calculations was a non-experimental public use in this country prior to the critical date of the claimed invention disclosed in the ENIAC patent, and an absolute statutory bar to the valid issuance of the ENIAC patent.

1.1.4.17 The Court credits the live testimony of distinguished scientists who were contemporaneous participants in these events including Drs. Teller, Ulam, Mark, Metropolis and Frankel of the Los Alamos Laboratory and Dr. Goldstine of Army Ordnance. The testimony of Eckert and Mauchly did not contradict such testimony or the contemporaneous circumstances.

1.1.5 Upon completion of the construction of the ENIAC machine by mid-November, 1945, and commencement of its full-scale operating use by December, 1945, Army Ordnance generated international publicity to show to all the world the developments in computing which had been proved operational.

1.1.5.1 The general principles of the ENIAC design and the machine's operational and functional characteristics were unclassified after December 17, 1945.

1.1.5.2 Only certain design details and circuits of the ENIAC remained classified Confidential after December 17, 1945, and [*28] this designation:

.1 was not made for the benefit or protection of Eckert and Mauchly;

.2 was not made at the request of Eckert and Mauchly;

.3 but was made by Army Ordnance to protect circuits of the machine being used by other military departments, including the Army Signal Corps.

1.1.5.3 The security classification of the ENIAC circuits and design details was not a matter under the control of Eckert and/or Mauchly. After the declassification in 1945, the design details and circuits of the ENIAC were left confidential until February, 1947, solely at the discretion of and for the benefit of the Government, and not for the commercial business interest and private benefit of Eckert and Mauchly.

1.1.5.4 The Army Ordnance international publicity program for the ENIAC machine was extensive and well planned, and Eckert and Mauchly as participants therein had been warned that the display of the machine would foreclose any of their private patent rights if not promptly pursued.

1.1.5.5 In January, 1946, formal press releases were prepared by Army Ordnance for release immediately following the dedication ceremony which was scheduled to be held on February 15, 1946. Mauchly's [*29] diary entries attest to his role in personally editing the Army Ordnance press releases to insure specific recognition of Eckert and him.

1.1.5.6 Eckert and Mauchly cooperated in the preparation and planning of the efforts of Army Ordnance and the Moore School to achieve saturation publicity for the completion of the ENIAC, including press releases, interviews, speeches, newsreels, press demonstrations, formal dedication and the Moore School open house, such as:

.1 Eckert and Mauchly delivered prepared remarks on the utility and speed of the ENIAC machine to reporters who attended the press demonstration;

.2 Mauchly prepared and delivered a speech to the reporters at the press demonstration explaining that the ENIAC machine demonstrated that it was possible to utilize electronic computers to solve many problems never previously solved; and

.3 Eckert delivered a speech at the press demonstration and informed reporters that the ENIAC machine had sounded the death knell to the era of electro-mechanical computing devices, and that the advent of the ENIAC machine had made electronic computers a part of the concrete present rather than a vague promise of the future.

1.1.5.7 [*30] The ENIAC machine was operated at the press demonstration on February 1, 1946, for publicity purposes, and in a manner calculated to be impressive through the press to the general public.

1.1.5.8 One of the calculations illustratively demonstrated was the use of the ENIAC machine to add the number 97,367 to itself 5,000 times, as was visible on the face of the accumulators. After the 5,000 additions were completed, the result was checked and it was determined that the ENIAC machine had properly performed the calculation.

1.1.5.9 As another demonstration calculation, the ENIAC machine multiplier was used to multiply 13,975 times 13,975 500 times, and the product was checked and found to have been properly calculated.

1.1.5.10 As another demonstration calculation, the ENIAC machine was used to produce a table of squares and cubes of the numbers from 1 to 100. The ENIAC machine functioned properly during the preparation of the table, and the results were error free.

1.1.5.11 As another demonstration calculation, the ENIAC machine was used to compute the sines and cosines for 100 different angles, and the table prepared was punched on so-called tab cards, printed on [*31] paper, and distributed to members of the press. The ENIAC machine functioned properly during the preparation of the table of sines and cosines, and correct results were obtained for each computation.

1.1.5.12 As another demonstration calculation, the ENIAC machine performed representative calculations arising out of the Los Alamos Laboratory work. A printed copy of the results or so-called printout of a number of Los Alamos-type calculations was prepared and distributed to the attendees at the press demonstration. These calculations utilized substantially the full capacity of the ENIAC machine, and contained no errors attributable to malfunction of the ENIAC machine.

1.1.5.13 Although the demonstration calculations performed on the ENIAC machine for the press were not intended by Army Ordnance or the Moore School to be for the private benefit or on behalf of Eckert and Mauchly, they were in fact later relied upon by them for that financial purpose. In no event were the calculations performed in order to enable Eckert and Mauchly to complete or perfect the making of "the invention" embodied in the ENIAC machine.

1.1.5.14 The use of the ENIAC machine in public during the [*32] press demonstration was not an experimental use, but was a publicity exercise in joint behalf of the Moore School and Army Ordnance, and was intended to impress the scientific community and the general public with the capabilities of the machine and the fact of its completion.

1.1.5.15 The use of the ENIAC machine to perform calculations during the February 1, 1946, press demonstration was a non-experimental public use of the claimed invention disclosed in the ENIAC patent, prior to the critical date and an absolute statutory bar to the valid issuance of the ENIAC patent.

1.1.5.16 The ENIAC machine was filmed in staged operation in February, 1946, for the benefit of newsreel photographers, for publicity purposes, and in a manner calculated to provide a motion picture demonstration to be shown nationally to the general public.

1.1.5.17 The use of the ENIAC machine for the newsreel photographers was not an experimental use, but was part of the large-scale international publicity program calculated to impress the public with the capabilities of the machine and the fact of its completion.

1.1.5.18 The ENIAC machine was formally dedicated on February 15, 1946, for publicity [*33] purposes, at a ceremony involving preeminent representatives of government, military, university, industrial and scientific establishments, and in a manner calculated to achieve maximum recognition of and to stimulate interest in the completed and operating ENIAC machine.

1.1.5.19 As of the date of the dedication and demonstration of the ENIAC machine at the Moore School on February 15, 1946, the ENIAC machine was represented to be, and was in fact, completed and successful.

1.1.5.20 During the dedication demonstration of the ENIAC machine, a ballistic trajectory problem was run as a simple means for impressing observers with what the machine could do. Although the trajectory data was simplified for the demonstration, the basic arithmetical operations of adding, subtracting, multiplying and dividing which would be done in a complete trajectory problem were performed. Any variance between the trajectory calculations performed during the dedication and an actual trajectory occurred as a result of programming simplifications rather than as a result of any operating defects in the ENIAC machine.

1.1.5.21 Although complete ballistic firing tables were not prepared during [*34] the dedication, the demonstration was intended to and did show that such tables could be prepared by repeating the trajectory calculations as performed with different input conditions. The data used was real and had been verified beforehand. The ENIAC machine did not err.

1.1.5.22 None of the calculations performed on the ENIAC machine at the dedication were performed for the private benefit or on behalf or under the control of Eckert and Mauchly to enable them to complete or perfect the making of "the invention" embodied in the ENIAC machine. Instead, their private interest was one of commercial exploitation (see 1.1.5.6 and .13 above).

1.1.5.23 The use of the ENIAC machine in public at the formal dedication was not an experimental use, but was part of the large-scale publicity program calculated to impress the public with the capabilities of the machine and the fact of its completion.

1.1.5.24 The use of the ENIAC machine to perform calculations during the dedication was a non-experimental public use of the claimed invention disclosed in the ENIAC patent, prior to the critical date, and an absolute statutory bar to the valid issuance of the ENIAC patent.

1.1.5.25 [*35] The ENIAC machine was publicly exhibited and demonstrated in operation on February 16, 1946, at an "open house" for the invited entirety of the Moore School staff and student body. At the open house, the same ballistic trajectory calculations that were performed at the dedication were again performed. The ENIAC machine operated satisfactorily at the open house.

1.1.5.26 The use of the ENIAC machine in public at the open house was a non-experimental public use of the claimed invention of the ENIAC patent, prior to the critical date, and an absolute statutory bar to the valid issuance of the ENIAC patent.

1.1.5.27 The Court has heard from numerous live witnesses regarding the international publicity regarding the completion and successful operation of the ENIAC machine and saw the ENIAC newsreel exhibited during the testimony of Dr. Goldstine. The Court credits this testimony.

1.1.6 Dr. Douglas R. Hartree, a highly regarded British scientist, used the completed ENIAC machine in 1946 prior to the critical date to perform complex and fundamental calculations relating to the performance of airfoils at supersonic speeds in air.

1.1.6.1 As early as 1939 Hartree had begun [*36] his study of methods for the solution of equations involved in laminar boundary layers in compressible flow. The equations are applicable to the field of supersonic aircraft design, as well as to the design of various projectiles.

1.1.6.2 Hartree's study of the laminar boundary layer in compressible flow was not a single problem for which a single answer was to be calculated, but was instead a broad investigation involving numerous computations using the ENIAC machine, each of which resulted in large groups or families of calculations or solutions which were to be compiled in the form of tables. The ENIAC patent states that the primary intended use of the ENIAC machine is to compute such large families of solutions.

1.1.6.3 Hartree visited the United States in 1945, saw the nearly completed ENIAC machine, and was furnished copies of the ENIAC progress reports. He commented on the ENIAC machine in an article published in Nature magazine in England on April 20, 1946.

1.1.6.4 Because of his knowledge of the ENIAC project gained from viewing the ENIAC machine in 1945 and the material in the progress reports, Hartree, when he arrived in the United States in April, 1946, had [*37] already reduced laminar boundary layer equations to a form suitable for solution by using the ENIAC machine. Hartree also brought working charts to the United States which described how the ENIAC machine was to be programmed by plug wiring and set up to perform the calculations required.

1.1.6.5 Prior to his visit to the United States in the spring of 1946, Hartree had already studied some special cases of the boundary layer equations which are described as null (or zero) order functions and had hand-calculated five-figure solutions to some of the families of calculations. The other cases of the study of the laminar boundary layer in compressible flow are described as the higher order functions. At the time that Hartree arrived in the United States, he brought with him the hand calculations of the null-order functions of the boundary layer equations.

1.1.6.6 Mauchly's present wife, then Kathleen McNulty, was assigned by Army Ordnance to plug in wires on the ENIAC machine according to the programming charts which Hartree had brought with him to the United States.

1.1.6.7 Hartree began his work on the ENIAC machine by evaluating the null-order equations. Calculation of [*38] the null-order equations using the ENIAC involved the basic operations of adding, multiplying and dividing. The calculation of the null-order functions on the ENIAC machine required a number of production runs, each of which produced results in the form of a stack of punched cards.

1.1.6.8 Hartree's calculations using the ENIAC machine were complex and carefully planned, and required the

operating capacity of the entire machine.

1.1.6.9 Hartree's use of the ENIAC machine began in April, 1946, and he successfully used the machine to perform useful calculations and produce large families of solutions of the null-order functions. Hartree checked the results by comparing solutions obtained from the ENIAC machine with corresponding five-figure solutions which had been hand-calculated by him prior to his arrival in the United States. Hartree completed his evaluation of the null-order functions prior to the critical date for the ENIAC patent application. Completion of these null-order functions was a substantial independent portion of Hartree's intended complete study of the laminar boundary layer in compressible flow. Also prior to the critical date for the ENIAC patent application, [*39] Hartree had successfully used the ENIAC machine to provide useful answers to practical study of the laminar boundary layer in compressible flow.

1.1.6.10 Hartree's use of the ENIAC machine in 1946 on his own boundary layer problem was as a consultant employed and paid by Army Ordnance. Hartree was neither an agent nor employee of either Eckert, Mauchly or the Moore School, nor under any obligation of secrecy or otherwise to any thereof.

1.1.6.11 Prior to the critical date, Hartree described to Mauchly in detail the nature of the calculations that he had performed using the ENIAC machine, and Mauchly made notes of the discussion. Mauchly testified that he knew at the time of Hartree's visit that Hartree was working at the time on a problem in fluid dynamics which had to do with boundary layers and that this made sense because Mauchly had dealt with similar problems in the wind tunnel at the Bureau of Standards in the 1930's. Mauchly testified that he attended a lecture at the Moore School given by Hartree in which the boundary layer calculations were described.

1.1.6.12 Mauchly and Eckert, who had by then resigned from the Moore School, did not evaluate the results of [*40] the calculations run by Hartree to learn or to decide if any design changes to the ENIAC machine were necessary. They were not authorized to make any changes and did not make any. Although Eckert and Mauchly were aware of the fact of Hartree's use of the ENIAC machine, they neither allowed, participated in nor exercised any control over that use or over any of its consequences.

1.1.6.13 Hartree's calculations were of scientific importance and the subject of significant published papers, upon which Eckert and Mauchly later relied for their private business advantage. Hartree left the United States to return to England on July 20, 1946. In October, 1946, Nature magazine published a further article by Hartree on the ENIAC machine and his calculations on the laminar boundary layer problem. The Hartree October Nature article briefly described the method used for solving the three simultaneous, linear, ordinary, differential equations which were said by Hartree to arise from the theory of the laminar boundary layer in a compressible fluid. Eckert and Mauchly's partnership, Electronic Control Company, later reprinted the article in an advertising brochure in which it was stated that [*41] "the article represented here is based on his [Hartree's] first hand experience in using the ENIAC."

1.1.6.14 The use of the ENIAC machine by Hartree was a non-experimental public use in this country of the claimed invention disclosed in the ENIAC patent, prior to the critical date, and an absolute statutory bar to the valid issuance of the ENIAC patent.

1.1.6.15 This Court has considered Hartree's article in the 1948 Philosophical Transactions of the Royal Society and the testimony of Dr. Goldstine and Dr. Clippinger (a former Army Ordnance employee with contemporaneous knowledge of the ENIAC machine, and a present Honeywell employee), as against the conflicting testimony by defendants' counsel Hall, and holds that the Hartree article is a description of the pre-critical-date work and includes a tabulation of some of the families of solutions which he obtained prior to the critical date. Clippinger also testified that a recheck of the results on a high speed modern computer had demonstrated the correctness of Hartree's result. The Court has considered and credits the testimony of Dr. Clippinger to the effect that the Hartree article indicates that the ENIAC machine gave [*42] Hartree correct results.

1.1.7 The use of the ENIAC machine by Army Ordnance after December 1, 1945 and prior to the critical date, involved

no question of whether the machine worked or how it could be improved by Eckert and Mauchly as claimant inventors for their own private advantage, but was instead a program of production operation under the sole control of Army Ordnance entirely for governmental uses, purposes and benefits.

1.1.7.1 Beginning with the Los Alamos calculations in December, 1945, and extending to the ENIAC patent critical date, the ENIAC machine entered a period of constant practical use under the control of Army Ordnance.

1.1.7.2 In addition to the public use of the ENIAC machine for the Los Alamos calculations and the Hartree problem, there are other uses which cumulatively confirm the public use of the ENIAC machine, prior to the critical date.

1.1.7.3 None of the specific instances of ENIAC machine operation between December 10, 1945, and the critical date, comprising, in sum, a history of constant practical use of the ENIAC machine by Army Ordnance, were carried out under the control of, or in any way for the private benefit of, Eckert and [*43] Mauchly, or under any obligation of secrecy to Eckert and Mauchly.

1.1.7.4 None of these other examples of the use of the ENIAC machine were carried out for the purpose of completing or perfecting the making of "the invention" of Eckert and Mauchly embodied in the ENIAC machine.

1.1.7.5 After the Los Alamos calculations, the ENIAC was in more or less continuous use being set up for or in actual work in solving problems. All so-called testing, de-bugging and troubleshooting was normal operation and continued throughout the useful life of the ENIAC machine.

1.1.7.6 When Eckert's connection with the ENIAC project was terminated in March of 1946, the machine had been completed and running for some time and was in use by Army Ordnance, and Eckert so testified in 1954. At least by January, 1946, the ENIAC machine was a complete and operable calculating instrument, and Mauchly so testified in 1954. Neither Eckert nor Mauchly testified to the contrary before this Court.

1.1.7.7 There were no long periods of maintenance or repair shutdown, and the general practice was to operate in a continuous schedule and shut down only when a fault became apparent. The percentage of hours [*44] used for computing time was quite high, and Eckert and Mauchly so testified, so that Sperry Rand's attorney Wobensmith summarized Mauchly's testimony to that effect in 1954.

1.1.7.8 Harry Huskey, of the Moore School staff, operated the ENIAC machine, from April 15 to April 19, 1946, to generate a table of sines and cosines and this use was called to the attention of Libman, the Army Ordnance attorney who prepared and filed the ENIAC patent application for Eckert and Mauchly, prior to that filing. Eckert and Mauchly did not evaluate the results of Huskey's calculations to determine whether or not any changes in the ENIAC design were necessary in the light of the results obtained, nor were any changes ever recommended or made by them or for them.

1.1.7.9 The constant practical use of the ENIAC machine after December 1, 1945, was a non-experimental public use of the claimed invention disclosed on the ENIAC patent prior to the critical date, and an absolute statutory bar to the valid issuance of the ENIAC patent.

1.1.8 Eckert and Mauchly took commercial advantage of Army Ordnance's public uses of the ENIAC machine and also placed the ENIAC machine in public use themselves [*45] by demonstrating it to potential customers as a part of their attempts to commercialize the ENIAC machine subject matter prior to the critical date.

1.1.8.1 Eckert and Mauchly intended that the widespread publicity to be gained for them personally from the ENIAC press demonstration, dedication and open house in February, 1946, would advance their private commercial business interests.

1.1.8.2 More than one year prior to the June 26, 1947 filing date of the ENIAC patent, beginning at least as early as the fall of 1944, Eckert and Mauchly placed the claimed invention disclosed in the ENIAC patent in public use and on sale

by describing and demonstrating the ENIAC machine to their intended customers for their own commercial gain.

1.1.8.3 Eckert and Mauchly took full private business advantage of the publicity and dedication activities as a convenient forum for their solicitation of future computing machine contracts from government agencies.

1.1.8.4 During the fall of 1944, Mauchly called on various potential customers to determine the business prospects for selling high-speed computing or data processing machines. Prior to October, 1944, the ENIAC two-accumulator [*46] system had been successfully built and operated. The completion of the ENIAC two-accumulator system gave Eckert and Mauchly a tool by which they could convince potential customers that a high-speed computing or data processing machine could in fact be successfully built.

1.1.8.5 Army Ordnance's contract (W-670-ORD-4926) for the ENIAC project work required the University of Pennsylvania to grant the U. S. Government a royalty-free license under all patents arising from the work done under the contract. However, since the employment agreements of the engineers working on the ENIAC project did not clearly require any assignment of their invention rights to the University of Pennsylvania, the University was not in a position to grant the Government such a license.

1.1.8.6 Prior to March, 1945, Eckert and Mauchly sought advice from George A. Smith, a patent attorney, on methods of securing for themselves the commercial invention rights arising from the work under the Army Ordnance contract. Pursuant to his advice, Eckert and Mauchly asked the University of Pennsylvania for the right to have their own patent attorney file patent applications in their names on ideas arising out [*47] of the work on the project. During March, 1945, Eckert and Mauchly pressed for recognition of their commercial interests by the University of Pennsylvania in return for assurances that they would help the University fulfill its obligations under the contract. Facing the fact that it would require the cooperation of Eckert and Mauchly to fulfill its contractual obligations to the U. S. Government, the University yielded the commercial rights to any patents they might obtain based on the work on the contract.

1.1.8.7 Mauchly was in personal contact with personnel of the U. S. Weather Bureau as early as April, 1945, to learn their computing needs and to discuss the ENIAC and future work with them. Eckert and Mauchly also followed up their interest in business prospects at the U. S. Census Bureau throughout the summer of 1945.

1.1.8.8 On other occasions during 1945, Eckert and Mauchly called on about a dozen Census Bureau officials including Everett Kimball, Jr., Dr. Madow, Morris H. Hansen, and James L. McPherson, in order to interest them in high-speed computing or data processing machines. Hansen assigned McPherson the task of evaluating Eckert and Mauchly's proposals regarding [*48] such a high-speed computing or data processing machine. As a result of this assignment, McPherson held meetings from time to time with Eckert and Mauchly at the Census Bureau. During the meetings with McPherson and other census officials, Eckert and Mauchly described the ENIAC and sought a contract to develop a similar but more advanced machine for the Census Bureau.

1.1.8.9 In order to interest potential financial backers Earnest Cuneo and Lazar Teper in the financial backing of an Eckert-Mauchly computer company, Eckert and Mauchly displayed the ENIAC machine to them in January, 1946.

1.1.8.10 Eckert and Mauchly early sought private business advantage from the fact of the ENIAC machine's completion by the Moore School in 1945 and its constant practical use thereafter by Army Ordnance. For example, on February 15, 1946, Commander Reichelderfer of the U. S. Weather Bureau attended the ENIAC dedication and dinner on behalf of the U. S. Weather Bureau, being seated at Mauchly's table at Mauchly's request. Mauchly's purpose in having Reichelderfer present was one of private self-interest to advance his business enterprise plans, held jointly with Eckert, by using the occasion [*49] of the ENIAC dedication as a business promotion effort. During the dedication, Reichelderfer and the other guests witnessed a demonstration of the ENIAC machine. Thereafter, on February 21, 1946, Eckert and Mauchly again demonstrated the ENIAC machine for Reichelderfer's associates Dr. Harry Wexler and Jerome Namias of the U. S. Weather Bureau, and discussed with them the possible construction of a similar computer for weather purposes. The contacts with and demonstrations for Reichelderfer, Namias and Wexler were attempts to

commercialize the invention embodied in the ENIAC machine prior to the critical date, and resulted in non-experimental public uses of the claimed invention disclosed in the ENIAC patent prior to the critical date, constituting an absolute bar to the valid issuance of the ENIAC patent.

1.1.8.11 By mid-March, 1946, Eckert and Mauchly had put out a number of commercial feelers, and were actively pursuing them. For example, on March 20, 1946, in order to promote their sale of a high-speed computing or data processing machine, Eckert and Mauchly made a presentation to the Committee on Tabulation Methods and Mechanical Equipment of the U. S. Census Bureau.

1.1.8.12 [*50] On March 22, 1946, Dean Pender of the University of Pennsylvania demanded that Eckert and Mauchly either subjugate their personal commercial interests to the interests of the University or have their employment by the University terminated. On or about March 22, 1946, Eckert and Mauchly submitted their resignations from the University of Pennsylvania to take effect March 31, 1946.

1.1.8.13 On April 2, 1946, two days after their resignations from the University of Pennsylvania became effective, Eckert and Mauchly met with representatives of the Weather Bureau, Census Bureau, and Bureau of Standards. During that meeting, Eckert again described the ENIAC machine.

1.1.8.14 In order to promote their proposed sale of a computing machine, Eckert and Mauchly invited representatives of the Census Bureau and National Bureau of Standards to witness a demonstration of the ENIAC machine. The demonstration, held April 11, 1946, was attended by Eckert and Mauchly, Dr. John H. Curtiss representing the National Bureau of Standards, and Messrs. A. A. Berlinsky, J. F. Bosen, Morris H. Hansen, and James L. McPherson, representing the Census Bureau. During the April 11, 1946, demonstration, the [*51] ENIAC machine was set up and running while its operation was explained. The April 11, 1946, ENIAC demonstration was an essential part of Eckert and Mauchly's implementation of the plan to exploit electronic computing or data processing machines commercially.

1.1.8.15 Following the April 11, 1946, ENIAC machine demonstration, Eckert and Mauchly agreed to submit to the Census Bureau a set of specifications which could be included in any contract which the Bureau would award to them. The April 11, 1946, ENIAC demonstration and Eckert and Mauchly's descriptions of the ENIAC machine were Curtiss' principal sources of information about electronic computing and Eckert and Mauchly's principal credentials for competence and credibility. On or about April 30, 1946, Eckert and Mauchly submitted some tentative specifications of a proposed computing machine to the Census Bureau, as requested during the April 11 demonstration.

1.1.8.16 Based on Curtiss' recommendation, Eckert and Mauchly were awarded contract CST-7964 in the fall of 1946 to conduct a design study, including the construction of components, and prepare a report based thereon proposing a computer to be built for the Census [*52] Bureau. Contract CST-7964 directly followed from the ENIAC machine demonstration and the sequence of visits and evaluations of the technical competence of Eckert and Mauchly by the Bureau of Standards.

1.1.8.17 Eckert and Mauchly's demonstration of the ENIAC machine on April 11, 1946, was a commercialization by Eckert and Mauchly of the claimed invention disclosed in the ENIAC patent and embodied in the ENIAC machine prior to the critical date, and resulted in a non-experimental public use of "the invention" of the ENIAC patent prior to the critical date, constituting an absolute bar to the valid issuance of the ENIAC patent.

1.1.8.18 Eckert and Mauchly, in attempting to gain commercial and private business advantage from the pre-critical date early practical operation of the ENIAC machine, and the massive publicity thereof, advertised in their Eckert-Mauchly Computer Corporation literature in 1949 that the ENIAC machine had been put into operation in January, 1946.

1.1.8.19 With regard to the issue of Eckert and Mauchly's commercialization of the ENIAC machine subject matter prior to the critical date, the Court has considered the conflict between, on the one hand, [*53] the disinterested testimony of Mr. James L. McPherson and related contemporaneous documentary evidence, and, on the other hand, the

testimony of Eckert and Mauchly. The Court credits the testimony of McPherson and corroborating documentary evidence, and holds that Eckert and Mauchly knowingly sought to and did commercialize the ENIAC machine and any invention embodied therein prior to the critical date.

1.2 The usual standard in civil cases of proof by a fair preponderance of the evidence is easily and clearly satisfied.

1.3 I do not believe that the standard to be applied is that of clear and satisfactory proof or clear and convincing proof or proof beyond a reasonable doubt.

1.4 If necessary for decision, I find that the more stringent standards have been satisfied.

1.4.1 The Court has heard 22 live witnesses over many weeks of the trial relating to the history and facts surrounding the use of the ENIAC machine prior to the critical date. The Court has seen the newsreel film made in February, 1946, showing the ENIAC machine actually being used for its intended purpose in a clearly publicly intended setting.

1.4.2 Thousands of the documents received by the [*54] Court bearing on the public use issue originated contemporaneously with the relevant events and were obtained from independent and disinterested sources.

1.4.3 The Court credits this heavy weight of evidence, fully revealed for the first time upon this record, as compelling a finding that the plaintiff has shown by clear and satisfactory proof, or clear and convincing proof, or proof beyond a reasonable doubt, that the claimed invention disclosed in the ENIAC patent was in public use in this country prior to the critical date.

1.5 The use of ENIAC after December 1, 1945, was clearly not experimental in nature.

1.5.1 Defendants contend that all uses of the ENIAC machine prior to the critical date are exempted from their otherwise clear barring effect because they constitute experimental uses under Eckert and Mauchly's control, or for their benefit, and were necessary and essential to the completion or perfecting of the making of "the invention" claimed by them. The facts are clearly to the contrary.

1.5.1.1 By December, 1945, Army Ordnance was using its ENIAC machine under an operating contract W-18-001-ORD-1706 (separate from contract 4926 under which the ENIAC [*55] machine was built) which provided for the Moore School to furnish services for the initial operation of the ENIAC machine at the Moore School pending completion of the building at the Aberdeen Proving Ground where the machine was to be later housed.

1.5.1.2 After the ENIAC machine was put into constant practical use by Army Ordnance in December, 1945, the ENIAC group or team, including Eckert and Mauchly, turned their attention to the commencement of work on the next generation of computer design, the EDVAC.

1.5.1.3 Eckert and Mauchly resigned from the Moore School in March, 1946, and had no further official contact with any of the work with the ENIAC machine after April 1, 1946.

1.5.2 The pre-critical date uses of the ENIAC machine were not made under the surveillance of Eckert and Mauchly, and for the purpose of enabling them to test the machine and ascertain whether it would answer the purpose intended and to make such alterations and improvements as experience demonstrates to be necessary, and therefore are not excused as experimental uses within the meaning of *Elizabeth v. Pavement Co.*, 97 U.S. 126 (1877). The ENIAC machine demonstrated that it would [*56] answer its intended purpose in December 1945 when it was used for production runs on the Los Alamos calculations.

1.5.3 By December 1, 1945, the ENIAC machine was under the custody, dominion and control of the customer, Army Ordnance, and the relationship to the machine of Eckert, Mauchly and the other engineers at the Moore School involved in the ENIAC team effort was not one of continuing inventorship and experimentation.

1.5.4 The uses of the ENIAC machine from December, 1945, to the critical date were for its intended purpose of performing automatic electronic digital computation, and were not for the experimental purpose of the completion or perfection of the making of "the invention."

1.5.4.1 The uses of the ENIAC machine between December 1, 1945, and the critical date were not in the nature of testing, checking, or experimentation, but rather were uses of the ENIAC machine for its intended practical purpose.

1.5.4.2 The Court has considered the ENIAC Service Log and the testimony concerning the various entries which were made in it. The evidence is clear and convincing that the Service Log is a record showing routine maintenance on the ENIAC machine. The [*57] fact that such maintenance was performed does not in any way detract from the non-experimental nature of the various ENIAC public uses. The Court has considered the assertion of defendants that the ENIAC Service Log shows that changes to the machine were made. The evidence is clear and convincing that, without exception, the changes recorded in the Service Log were not design changes of any significance to "the invention," but were instead minor and routine refinements or adjustments of a non-inventive nature. This work on the ENIAC machine was done by Homer Spence, the maintenance engineer for ENIAC, after December 1, 1945, and was routine maintenance unrelated to the completion or perfection of "the invention."

1.5.4.3 The burden of proof of any exemption from the public use bar, such as by reason of experimentation essential to the completion of the making or perfecting of "the invention" by or for Eckert and Mauchly, rests with SR & ISD, and has not been carried. Instead, Honeywell has proven such use to be non-experimental and clearly practical.

2. On Sale 2.1 The claimed invention disclosed in the ENIAC was on sale prior to the critical date.

2.1.1 The entire [*58] subject matter of the ENIAC machine, represented by Eckert and Mauchly to be that which "embodies our invention," is barred from valid patentability because that machine was on sale in this country prior to the critical date.

2.1.2 The subject matter of the ENIAC patent, the invention of the automatic electronic digital computer, is barred from valid patentability because that subject matter was on sale in this country prior to the critical date.

2.1.3 All of the development activities at the Moore School, which resulted in the construction and placing in public use of the ENIAC machine, were financed by the United States Government.

2.1.3.1 In 1943, officials of Army Ordnance ordered their Philadelphia office to enter into a fixed price contract (W-670-ORD-4926, hereinafter referred to as the 4926 contract) with the Moore School for research and experimental work in connection with the development of an electronic numerical integrator and computer, generally referred to thereafter by the acronym "ENIAC." On June 21, 1943, the Moore School executed the 4926 contract which was dated June 5, 1943, as a fixed price contract. The 4926 contract provided that [*59] any completed part or unit was to be delivered to the Government F.O.B., floor of contractor's plant, as soon as possible after December 31, 1943. It was not until Supplement 5 of the 4926 contract was executed in mid-January 1945 that there was a requirement to complete and deliver any hardware.

2.1.3.2 Supplement 1 of the 4926 contract, dated December 31, 1943, extended the work on ENIAC development from January 1, 1944, until June 30, 1944. In January, 1944, Supplement 2 was added to the 4926 contract to replace the original anti-discrimination clause which was deleted from Supplement 1.

2.1.3.3 The second six months' work done under the 4926 contract, from January 1, 1944, through June 30, 1944, resulted in the freezing of an ENIAC machine design and the completion of a two-accumulator ENIAC system. The two-accumulator ENIAC system was operating by about June 30, 1944, and was used to solve second order differential equations for a sine wave at the same pulse rate later used on the completed ENIAC machine.

2.1.3.4 Supplement 3 to the 4926 contract extended the time period for the work a third six months until December 31,

1944. Supplement 4 to the 4926 contract provided [*60] for research and experimental work on an EDVAC from January 1 to September 30, 1945. The work done under the 4926 contract from July, 1944, to December 31, 1944, was primarily directed toward production and manufacture of the ENIAC machine and little work on EDVAC was done.

2.1.3.5 Supplement 5 to the 4926 contract, agreed to after the expiration of the previous supplement providing for work on ENIAC, retroactively provided funds for ENIAC work for a fourth six-month period from January 1 to June 30, 1945, and added, for the first time, a requirement for the delivery of an ENIAC "pilot model" machine. Supplements 1 to 3 of the 4926 contract had not required the delivery of a pilot model of the ENIAC machine, but rather had provided for the delivery to the Government at the contractor's plant of any equipment completed. Neither the 4926 contract nor any of its supplements included performance requirements for the ENIAC pilot model or a requirement that any hardware be tested before being accepted by the Government.

2.1.3.6 Supplement 6 of the 4926 contract extended the delivery date of the ENIAC pilot model to September 30, 1945. Although Supplement 6 of the 4926 contract required [*61] for the first time that the ENIAC pilot model be delivered and accepted before the final contract payment, the contract contained no requirement that the machine do anything, meet any specifications or pass any tests.

2.1.3.7 Supplement 7 to the 4926 contract, dated November 28, 1945, provided for the extension of the work relating to ENIAC until December 31, 1945, and the work relating to EDVAC until January 31, 1946. Supplement 7 did not add any performance requirements to be met prior to acceptance of ENIAC.

2.1.3.8 Supplements 8 and 9 to the 4926 contract affected only the EDVAC work and did not provide for any further work relating to ENIAC.

2.1.3.9 No subsequent supplement to the 4926 contract either extended the completion date for the ENIAC work beyond December 31, 1945 or added performance requirements for the ENIAC machine.

2.1.3.10 The ENIAC machine was in fact under the exclusive custody, dominion and control of Army Ordnance from December 31, 1945, onward.

2.1.3.11 Supplement or change order 10 to the 4926 contract did not provide for any change in delivery date for the ENIAC pilot model or any further ENIAC work but merely corrected the contract [*62] term pertaining to place of delivery. Supplements 11 and 12 to the 4926 contract did not in any way affect the delivery schedule or requirements for the ENIAC machine or provide for any further ENIAC work.

2.1.3.12 Contract W-1706 (hereinafter referred to as the 1706 contract), dated November 1, 1945, provided for services of the University of Pennsylvania in connection with the initial operation of the ENIAC machine pending completion of the Ballistic Research Laboratory Computing Annex Building.

2.1.3.13 Army Ordnance operation of the ENIAC machine at the Moore School was provided for by the 1706 contract, under which the University of Pennsylvania supplied electrical power, space to house the ENIAC machine and a Government computing group, and provided the services of two wiremen to maintain the ENIAC machine for Army Ordnance. It was contemplated by the Moore School that expenses incurred in the testing of the ENIAC machine by the Moore School would be charged against the 4926 contract rather than the 1706 contract. Goldstine, as Army Ordnance representative at the Moore School, agreed to approve bills for services under the 1706 contract in connection with the operation [*63] of the ENIAC machine by Army Ordnance for the period beginning December 1, 1945. Both the Moore School and Army Ordnance representatives considered that the ENIAC machine was being operated rather than tested after November, 1945.

2.1.3.14 In April of 1946, Dr. Travis, the then Director of Research at the Moore School, explained to Dean Pender that the Army was not charged under the 1706 contract in November, 1945, but was charged for December because in November the Moore School engineers had still been testing the ENIAC machine.

2.1.3.15 Formal documentary confirmation of acceptance of the ENIAC machine by Army Ordnance occurred after the University of Pennsylvania, on June 4, 1946, noted that the Government had been using the machine since December, 1945, and requested formal acceptance of the ENIAC machine so that the final payment to the University could be made.

2.1.3.16 Although formal acceptance of the ENIAC machine was not actually documented until July 25, 1946, the ENIAC machine was at all times after December 10, 1945, in the custody, dominion and control of Army Ordnance.

2.1.4 The two-accumulator ENIAC system, called a "small ENIAC," embodied "the [*64] invention" of the automatic electronic digital computer, and was both on sale and sold to Army Ordnance prior to the critical date.

2.1.4.1 The two-accumulator ENIAC system was constructed, fully tested and successfully operated by July, 1944.

2.1.4.2 The requirement contained in the 4926 contract that all equipment completed prior to the termination of each contract period was to be delivered to the Government F.O.B., floor of contractor's plant, was fully understood and complied with by the parties to the contract. All contract payments required to be made by the Government to the contractor pursuant to the 4926 contract were made by March, 1944, for work during the period ending December 31, 1943; by September, 1944, for the period ending June 30, 1944; and by August, 1945, for the period ending December 31, 1944.

2.1.4.3 Prior to July 3, 1944, the team at the University of Pennsylvania had completed the construction of the two-accumulator ENIAC system comprising two accumulator units, a cycling unit and associated power supplies. The two-accumulator ENIAC system was successfully employed in mid-1944 to solve the second order differential equations for a sine wave [*65] and for a simple exponential at the same operating speed used in the ENIAC machine and disclosed in the ENIAC patent.

2.1.4.4 The tests on the two-accumulator ENIAC system were in essence a successful test of the fundamental principles of design of the ENIAC machine.

2.1.4.5 The two-accumulator ENIAC system was an electronic numerical integrator and computer. According to the ENIAC project progress reports, the two-accumulator system constituted a small ENIAC machine.

2.1.4.6 The 4926 contract did not require the two-accumulator ENIAC system or the larger 20-accumulator ENIAC machine to perform at any particular operating speed.

2.1.4.7 During the course of the prosecution of the ENIAC patent application, the completion and successful operation of the two-accumulator ENIAC system during mid-1944 was asserted by the applicants, Eckert and Mauchly, to embody fully and constitute an actual reduction to practice of the invention claimed in the ENIAC patent application.

2.1.4.8 Any improvements to the two-accumulator system which were completed subsequent to June 30, 1944, and prior to the end of 1944, were also on sale and sold to Army Ordnance more than one year [*66] prior to the filing date of the ENIAC patent application.

2.1.5 The ENIAC machine, disclosed and claimed in the ENIAC patent, was constructed, fully tested and successfully operated in December, 1945, and was also both on sale and sold to Army Ordnance more than one year prior to the filing date of the ENIAC patent application.

2.1.5.1 By mid-1944, when the two accumulator units were completed and successfully operating in the two-accumulator ENIAC system, the final design for the 20-accumulator ENIAC machine was essentially completed and frozen.

2.1.5.2 The completion and successful operation of the two-accumulator ENIAC system was relied upon by the

Government in its decision to authorize Supplement 4 to the 4926 contract for work on the EDVAC, and this constituted a commercialization of the ENIAC invention embodied in the two-accumulator system.

2.1.5.3 Eckert and Mauchly, after mid-1944, devoted some of their time to the development of an advanced computer system known as the EDVAC.

2.1.5.4 Supplement 5 of the 4926 contract, executed in mid-January, 1945, subsequent to the construction, successful operation, delivery of and payment for the two-accumulator [*67] system as it existed on June 30, 1944, provided for the completion of the 20-accumulator ENIAC "pilot model."

2.1.5.5 By early December, 1945, the entire ENIAC machine was completed and in operation, the various units having already been individually tested, and the Government had assumed custody, dominion and control over its use and operation.

2.1.5.6 The entire ENIAC machine was placed on sale or sold at the time it was completed and surrendered to the custody, dominion and control of the Government at the Moore School in December, 1945.

2.1.5.7 Supplement 7 of the 4926 contract required delivery of the pilot model by December 31, 1945. There were no supplements to the 4926 contract which extended the delivery date of the ENIAC machine beyond December 31, 1945. The entire ENIAC machine was sold to the Government at the time of its December, 1945, completion, pursuant to the terms of Supplement 7 to the 4926 contract.

2.1.5.8 Neither the 4926 contract nor any of its supplements contained any specifications to be met other than the delivery of a Final Report and delivery of the ENIAC machine. The 4926 contract and its supplements did not require that the ENIAC [*68] machine pass any performance test.

2.1.5.9 In June, 1946, Donald S. Murray, Assistant Comptroller of the University of Pennsylvania, wrote to Army Ordnance and requested that it formally accept the ENIAC machine because it had been in use by Army Ordnance since December, 1945.

2.1.5.10 The decision to document a formal acceptance of the ENIAC machine was made at a conference held June 11, 1946. It was decided that an Ordnance employee would, for purposes of transfer of property accountability within Ordnance, furnish certification to the Philadelphia Ordnance District inspector that the ENIAC machine had been completed and received on behalf of Army Ordnance's Ballistic Research Laboratory. This was also desired to accompany change order 10 which validated, after the fact, the December, 1945, actual delivery of the ENIAC machine F.O.B. floor of the contractor's plant.

2.1.6 The subject matter disclosed and claimed by the ENIAC patent was contained in the Final Report on the ENIAC, which embodied all results of the ENIAC work under the 4926 contract, and that Final Report was delivered to and formally accepted by Army Ordnance prior to the critical date.

2.1.6.1 [*69] The 4926 contract also required the delivery to the Government of a Final Report.

2.1.6.2 The ENIAC Final Report required by the contract was completed and delivered to the Government and formally accepted as conforming to contract requirements by June 6, 1946.

2.1.6.3 The Final Report contains a written description of the invention claimed by the ENIAC patent in at least as great detail as the patent specification which was based on it.

2.1.7 The ENIAC machine was constructed and "the invention" which it embodied was completed, reduced to practice in operative form, and therefore ready for patenting, by December, 1945.

2.1.7.1 The ENIAC machine, when it was used to perform the Los Alamos calculations in 1945, was being used for its

intended purpose and gave correct answers to problems. Any experimental stage was passed prior to December, 1945.

2.1.7.2 Eckert and Mauchly, in eight affidavits prepared between 1951 and 1955 and submitted to the Patent Office in connection with the prosecution of the ENIAC patent application, swore that reduction to practice of "the invention" of the ENIAC patent had occurred on or prior to December 10, 1945.

2.1.7.3 In his [*70] testimony in 1954 in Patent Office Interference 85,809 with the Williams patent of Bell Laboratories, Eckert, in answer to a question by his own attorney as to whether the Los Alamos "problem" was satisfactorily worked out on the ENIAC machine, stated:

"Yes.

"The problem consisted of several hundred runs. Each run in itself lasted perhaps 20 minutes. Each of these runs were related to the next run so that the previous run had to be satisfactorily completed before the next run could be undertaken.

"Each run was in fact run twice, the results punched into punch cards, the punch cards put into a reproducer, what is known as a comparing board, and the two runs checked against one another for consistency. Then each few runs a test problem which ascertained that the machine was functioning correctly was also run, so that the problems were in effect tested for self-consistency, errors of a permanent nature, and errors of an intermittent nature.

"Incidentally, this problem was sufficiently classified that Dr. Goldstine and myself, plus the two men from the other agency who ran the problem, were the only people who were aware of the nature of the problem at the Moore School. [*71] The Dean of the school and other members of the staff, no one else knew the nature of this problem. And I have never been told that this problem was declassified."

2.1.7.4 In his testimony in Patent Office Interference 85,809 in 1954, Mauchly described the use of the ENIAC machine in 1945 as follows:

They actually worked with the computer and began setting it up in December, and if I recall correctly they obtained some useful results before the end of the year.

Q That is before the end of 1945?

A Yes.

Q Thereafter was the machine in more or less continuous use solving problems?

A Yes. * * *

2.1.7.5 The brief submitted on behalf of Eckert and Mauchly in Interference 85,809 adopted the testimony of Eckert and Mauchly. For example, the testimony of Eckert was summarized in 1955 as follows:

"The completed machine was first used for working problems approximately two and one-half years after they started, on ballistic problems and on another classified problem as to which the subject matter is still classified. That problem took considerably over one month, the actual running time of the problem being somewhere around two weeks. The difficulties were [*72] not with the machine but with the mathematical nature of the problem and mistakes of the mathematicians who had designed the problem for the machine (REC 641 to 643 Q122 to 126). The problem consisted of three simultaneous partial differential equations with an empirical function in the kernel of the equation (REC 643, 644 Q121, 128)."

2.1.7.6 The Court has considered the representations of Eckert, Mauchly and their attorneys, who also represented SR's predecessors, before the Patent Office during the procurement of the ENIAC patent, and has balanced them against the

trial testimony here of Eckert and Mauchly. The more nearly contemporaneous statements made before the Patent Office, many years nearer to the events and prior to the emergence of public use and on sale as substantial issues, are binding admissions entitled to be credited.

2.1.8 The Moore School's procurement of further government-financed work to design and build an EDVAC automatic electronic digital computer, utilizing the know-how and competence derived from the ENIAC invention subject matter, was a commercialization of "the invention" constituting an on sale within the meaning of 35 U.S.C. 102 [*73] (b).

2.1.8.1 Subsequent to the successful completion and reduction to practice of the two-accumulator ENIAC system in July, 1944, a Supplement 4 to the 4926 contract was negotiated to begin development and construction of a new machine, EDVAC, which would handle problems beyond the scope of ENIAC.

2.1.8.2 As stated in the Progress Report on the EDVAC, describing work done under Supplement 4 of the 4926 contract, EDVAC and ENIAC are both electronic digital computing machines.

2.1.8.3 Subsequent to the successful completion, reduction to practice and commencement of practical use of the ENIAC machine by its purchaser, Army Ordnance, in December, 1945, a new separate contract for the EDVAC was negotiated in April 1946, and given the designation W-36-034-ORD7593 (hereinafter referred to as the 7593 contract).

2.1.8.4 The completion both of the two-accumulator ENIAC system and of the ENIAC machine was used to demonstrate the capability of the Moore School and its team to build electronic digital computers such as ENIAC or EDVAC. That demonstrated capability resulted in the award of Supplement 4 of the 4926 contract and the award of the 7593 contract (both relating to [*74] the EDVAC) to the Moore School.

2.1.8.5 Supplement 4 to the 4926 contract and the 7593 contract were each an exploiting or commercialization by the Moore School of the ENIAC invention subject matter, the "electronic digital computer," after it was ready for patenting and prior to the critical date.

2.2 Implicit in this finding (2.1) is that Mauchly and Eckert obviously attempted to commercialize the ENIAC prior to the critical date.

2.2.1 Findings 1.1.8 to 1.1.8.19 above as to public use are pertinent, and reference thereto is hereby made in connection with the statutory bar of "on sale."

2.3 The standards of proof stated (in 1.2, 1.3, and 1.4) above apply here.

3. Atanasoff 3.1 The subject matter of one or more claims of the ENIAC was derived from Atanasoff, and the invention claimed in the ENIAC was derived from Atanasoff.

3.1.1 SR and ISD are bound by their representation in support of the counterclaim herein that the invention claimed in the ENIAC patent is broadly "the invention of the Automatic Electronic Digital Computer."

3.1.2 Eckert and Mauchly did not themselves first invent the automatic electronic digital computer, but instead derived [*75] that subject matter from one Dr. John Vincent Atanasoff.

3.1.3 Although not necessary to the finding of derivation of "the invention" of the ENIAC patent, Honeywell has proved that the claimed subject matter of the ENIAC patent relied on in support of the counterclaim herein is not patentable over the subject matter derived by Mauchly from Atanasoff. As a representative example, Honeywell has shown that the subject matter of detailed claims 88 and 89 of the ENIAC patent corresponds to the work of Atanasoff which was known to Mauchly before any effort pertinent to the ENIAC machine or patent began.

3.1.4 Between 1937 and 1942, Atanasoff, then a professor of physics and mathematics at Iowa State College, Ames, Iowa, developed and built an automatic electronic digital computer for solving large systems of simultaneous linear

algebraic equations.

3.1.5 In December, 1939, Atanasoff completed and reduced to practice his basic conception in the form of an operating breadboard model of a computing machine.

3.1.6 This breadboard model machine, constructed with the assistance of a graduate student, Clifford Berry, permitted the various components of the machine to be tested [*76] under actual operating conditions.

3.1.7 The breadboard model established the soundness of the basic principles of design, and Atanasoff and Berry began the construction of a prototype or pilot model, capable of solving with a high degree of accuracy a system of as many as 29 simultaneous equations having 29 unknowns.

3.1.8 By August, 1940, in connection with efforts at further funding, Atanasoff prepared a comprehensive manuscript which fully described the principles of his machine, including detail design features.

3.1.9 By the time the manuscript was prepared in August, 1940, construction of the machine, destined to be termed in this litigation the Atanasoff-Berry computer or "ABC," was already far advanced.

3.1.10 The description contained in the manuscript was adequate to enable one of ordinary skill in electronics at that time to make and use an ABC computer.

3.1.11 The manuscript was studied by experts in the art of aids to mathematical computation, who recommended its financial support, and these recommendations resulted in a grant of funds by Research Corporation for the ABC's continued construction.

3.1.12 In December, 1940, Atanasoff first met [*77] Mauchly while attending a meeting of the American Association for the Advancement of Science in Philadelphia, and generally informed Mauchly about the computing machine which was under construction at Iowa State College. Because of Mauchly's expression of interest in the machine and its principles, Atanasoff invited Mauchly to come to Ames, Iowa, to learn more about the computer.

3.1.13 After correspondence on the subject with Atanasoff, Mauchly went to Ames, Iowa, as a houseguest of Atanasoff for several days, where he discussed the ABC as well as other ideas of Atanasoff's relating to the computing art.

3.1.14 Mauchly was given an opportunity to read, and did read, but was not permitted to take with him, a copy of the comprehensive manuscript which Atanasoff had prepared in August, 1940.

3.1.15 At the time of Mauchly's visit, although the ABC was not entirely complete, its construction was sufficiently well advanced so that the principles of its operation, including detail design features, was explained and demonstrated to Mauchly.

3.1.16 The discussions Mauchly had with both Atanasoff and Berry while at Ames were free and open and no significant information concerning [*78] the machine's theory, design, construction, use or operation was withheld.

3.1.17 Prior to his visit to Ames, Iowa, Mauchly had been broadly interested in electrical analog calculating devices, but had not conceived an automatic electronic digital computer.

3.1.18 As a result of this visit, the discussions of Mauchly with Atanasoff and Berry, the demonstrations, and the review of the manuscript, Mauchly derived from the ABC "the invention of the automatic electronic digital computer" claimed in the ENIAC patent.

3.1.19 The Court has heard the testimony at trial of both Atanasoff and Mauchly, and finds the testimony of Atanasoff with respect to the knowledge and information derived by Mauchly to be credible.

4. Inventors 4.1 The application for the ENIAC patent was filed by M and E, whom I find to be the inventors.

4.1.1 On June 26, 1947, Eckert and Mauchly (sometimes abbreviated herein as "M and E") filed U. S. patent application S. N. 757,158, later designated Sperry Rand Case-EM-6, describing the ENIAC machine "which embodies our invention."

4.1.2 On June 19, 1947, Eckert and Mauchly executed an oath as the sole co-inventors in support of the ENIAC [*79] patent application.

4.1.3 Honeywell contends that because the ENIAC machine was the product of a team effort comprising the intermingled contributions of all of the personnel on the ENIAC project team, others were improperly excluded as co-inventors.

4.1.4 SR and ISD contend that Honeywell has not met its burden of proving that persons other than Eckert and Mauchly were co-inventors on a claim-by-claim basis.

4.1.5 As set forth in Sections 1 through 3 of these Findings, the claimed invention embodied in the ENIAC machine was barred from patentability by prior public use and on sale and "the invention" claimed in the ENIAC patent was derived from Atanasoff. Although Eckert and Mauchly were therefore not entitled to patent that claimed invention, they have not been shown to have incorrectly excluded as named co-inventors, other members of the ENIAC team.

4.2 I am inclined to be of the view that the work on the ENIAC was a group or team effort and that inventive contributions were made by Sharpless, Burks, Shaw, and others.

4.2.1 Arthur W. Burks made major contributions to the design of the accumulator and multiplier of ENIAC and signed at least 77 drawings.

4.2.2 [*80] T. K. Sharpless made major contributions to the design of the high-speed multiplier, the initiating and cycling units, and the accumulator of ENIAC and signed at least 83 drawings.

4.2.3 Robert F. Shaw contributed to the design of the function table, the accumulator, the master programmer, the initiating unit, the constant transmitter and the printer of ENIAC and signed at least 103 drawings.

4.2.4 John H. Davis made contributions to the design of the accumulator, the initiating unit and the cycling unit of ENIAC and signed at least 56 drawings.

4.2.5 Frank Mural made contributions to the design of the accumulators and the master programmer of ENIAC and signed at least 124 drawings.

4.2.6 Chuan Chu made contributions to the design of the divider/square rooter of ENIAC and signed at least 28 drawings.

4.2.7 In early 1944, S. B. Williams, employed by Bell Telephone Laboratories, conceived a design for the temporary storage of input information in relays which was disclosed to the ENIAC design team and later incorporated in the ENIAC machine.

4.2.8 IBM provided the input and output equipment and the interface circuits for the ENIAC machine during the first [*81] half of 1944.

4.2.9 The design of the ENIAC machine required contributions from many engineers at the Moore School who were a part of the ENIAC design team.

4.3 There is, however, a failure of proof as to specific contributions by others than M and E.

4.3.1 Notwithstanding Findings 4.2.1 to 4.2.9 above, Honeywell has not offered evidence applying claims of the ENIAC patent specifically to the respective and particular contributions made by each member of the ENIAC project team in the absence of which the court is unable to determine such specific matters.

4.3.2 In the summer of 1941, John W. Mauchly ("Mauchly") and John Presper Eckert, Jr. ("Eckert") met at the Moore School of Electrical Engineering at the University of Pennsylvania and began a series of discussions, conversations and interchanges about electronic computing.

4.3.3 In August 1942, Mauchly, by then a member of the faculty of the Moore School, prepared a memorandum, setting out some of the ideas he and Eckert, a graduate student, had discussed on the subject of electronic computing.

4.3.4 In March 1943, the memorandum, which had been circulated to Brainerd and Chambers of the Moore School [*82] came to the attention of the Office of the Chief of Ordnance of the United States Army through Captain Herman Goldstine and Colonel Paul Gillon, both of whom thought it was a very exciting proposal.

4.3.5 Thereafter, the Moore School submitted a formal proposal under the aegis of Prof. John G. Brainerd, the more technical parts of which were written by Eckert and Mauchly, and the Government and the Trustees of the University of Pennsylvania entered into a contract for "research and experimental work in connection with the development of an electronic numerical integrator and computer" [ENIAC, an acronym coined by Col. Gillon].

4.3.6 Even before the contract had been awarded, Eckert and Mauchly began to develop things to be assigned to others to work on when the latter were assigned to the ENIAC project.

4.3.7 Eckert was made the laboratory supervisor and chief engineer of the ENIAC project by Brainerd; and Mauchly, along with Eckert, was placed in charge of engineering and testing.

4.3.8 A group of engineers and other supporting personnel was assembled to work with Eckert and Mauchly on the ENIAC project. Included in this group were: Arthur W. Burks, Joseph Chedaker, [*83] J. Chuan Chu, James Cummings, John H. Davis, Harry Gail, Robert Michael, Frank Mural, Thomas Kite Sharpless and Robert Findley Shaw.

4.3.9 Eckert and Mauchly explained to the engineers what was to be done and assigned them specific jobs.

4.3.10 While others on the project were working on and building test equipment, Eckert and Mauchly were working out the details of what the ENIAC machine should be.

4.3.11 Those working on the ENIAC project, under Eckert and Mauchly, were employees of the Moore School who assisted in the engineering work, construction and testing of the ENIAC machine.

4.3.12 During the project, Eckert and Mauchly continued to refine and clarify the conception of the group as to how the computing system was going to be implemented and realized.

4.3.13 By September 27, 1944, Eckert and Mauchly's conception of the ENIAC machine was complete.

4.3.14 On September 27, 1944, Eckert wrote a letter to all the engineers on the project advising them that any patents "must be taken out in the name or names of the inventors in order to be valid" and asking the engineers to write out and submit to him or Mauchly any claims to which they believed they [*84] were entitled.

4.3.15 None of the responses to Eckert's letter identify or claim any inventive contribution to anything claimed in the ENIAC patent.

4.3.16 There is no evidence that any project engineer or anyone else, other than Eckert and Mauchly, identified or asserted any inventive contribution to the inventive subject matter claimed in the ENIAC patent until some 20 years after Eckert sent his September 27, 1944 letter.

4.3.17 Contemporary documents and publicity described only Eckert and Mauchly as the co-inventors.

4.3.18 Both Army Ordnance and Moore School officials knew that Eckert and Mauchly were naming themselves as inventors and that the patent application for the ENIAC patent was being prepared in the names of only Eckert and Mauchly but there is no evidence that other engineers knew of this or of the nature or scope of the claims finally made.

4.3.19 Eckert and Mauchly and the project engineers who testified, knew of no one, other than Eckert and Mauchly, who made any inventive contribution to the inventive subject matter claimed in the ENIAC patent.

4.3.20 Honeywell has not proved that any of the following are inventors or co-inventors [*85] of the inventive subject matter claimed in the ENIAC patent: Arthur W. Burks, Joseph Chedaker, J. Chuan Chu, James Cummings, John H. Davis, Harry Gail, Robert Michael, Frank Mural, Thomas Kite Sharpless, Robert Findley Shaw, Arthur H. Dickinson, John Wheeler, S. B. Williams, and Adele Goldstine.

4.3.21 U. S. Patent # 3,120,606 (the ENIAC patent) issued on February 4, 1964. Eckert and Mauchly are the named inventors.

4.3.22 The ENIAC patent is presumptively valid and the named inventors, Eckert and Mauchly, are presumed to be the true and actual inventors.

4.3.23 Honeywell has a heavy burden to overcome the presumption of validity.

4.3.24 Honeywell has failed to establish by a preponderance of the evidence that there were any inventors or co-inventors of the inventive subject matter claimed in the ENIAC patent, other than Eckert and Mauchly.

4.3.25 To meet its burden Honeywell would have had to establish that there were other inventors of the subject matter of the claims of the ENIAC patent. "Each claim of a patent * * * shall be presumed valid independently of the validity of other claims * * *."

4.3.26 The work, experiments, and suggestions of others--not [*86] rising to the level of invention--in assisting Eckert and Mauchly in carrying out the conception does not entitle such others to be treated as inventors or co-inventors of the subject matter claimed in the ENIAC patent.

4.3.27 The group of engineers and support personnel working on the ENIAC project, other than Eckert and Mauchly, did not make any specifically proven inventive contribution to the inventive subject matter claimed in the ENIAC patent.

4.3.28 The failure of an alleged inventor or co-inventor to make a claim of inventorship at the time Eckert and Mauchly were being publicized as the inventors is evidence permitting the inference that the alleged inventor's or co-inventor's assertions are not sustainable.

5. Claims Not Anticipated 5.1 The claims in the ENIAC patent were not anticipated by or obvious in view of the (1) RCA Reports and the Morton and Flory Patents, (2) Andrews, et al., Patent, (3) Mumma Patent, and (4) claim 142 was not anticipated by or obvious in view of the Phelps Patent.

(1)(a) RCA Reports 5.1.1 The RCA Report of February 26, 1942 was an internal RCA report.

5.1.2 The RCA Report of April 22, 1942 was a classified report [*87] to the U. S. Government.

5.1.3 Both reports concern a proposed rate device which was to determine the average rate of speed of an aircraft.

5.1.4 The proposed rate device was to be a special purpose tool which was to be very slow and whose only arithmetic function was to be subtraction.

5.1.5 Plaintiff's witness, Dr. Jan Rajchman, a prominent scientist employed by RCA during the time when the reports were prepared, and who also was familiar with the ENIAC machine, was familiar with the reports (his name appears on them) and the work they applied to.

5.1.6 The rate device was never completed or used.

5.1.7 Despite Rajchman's apparent knowledge of the reports and the work they encompassed, he nevertheless recognized that the ENIAC machine was a pioneering enterprise, a machine of enormous consequence that had an enormous influence in the field.

5.1.8 The RCA Reports do not describe any operative embodiment and do not describe a programmable computer.

5.1.9 There is no substantial equivalence, in whole or in part, between the RCA rate device and the apparatus described and claimed in the ENIAC patent.

5.1.10 In each of Claims 65, 69, 75, 78, 109, [*88] 36, and 122, there are one or more express limitations which cannot be applied to the rate device as described.

5.1.11 The rate device has utility as an all-electronic computer, capable of performing a computation for whatever purpose.

5.1.12 Claim 109 cannot be applied to the rate device since Claim 109 has several limitations and requirements not met by the rate device.

5.1.13 Each of Claims 36 and 122 are inapplicable to the rate device since each claim has several limitations and requirements not met by the rate device.

5.1.14 Claim 69 cannot be applied to the rate device since Claim 69 has several limitations and requirements not met by the rate device.

5.1.15 Claim 65 also cannot be applied to the rate device since Claim 65 has several limitations and requirements not met by the rate device.

5.1.16 Claim 78 cannot be applied to the rate device since Claim 78 has several limitations and requirements not met by the rate device.

5.1.17 Claim 75 cannot be applied to the rate device since Claim 75 has several limitations and requirements not met by the rate device.

(1)(b) Morton et al. Patent 5.1.18 The Morton et al. patent No. 2,435,841 [*89] was considered by the Patent Office during the prosecution of the application for the ENIAC patent.

5.1.19 The Morton et al. patent discloses a function generator for use in a single problem type of apparatus intended to be usable in a fire control device.

5.1.20 The device of the Morton et al. patent is inoperative.

5.1.21 Each of Claims 69, 65, 78, 75 of the ENIAC patent deals with various features of a memory arrangement, which in the ENIAC patent embodiment, includes a function table.

5.1.22 Claim 78 cannot be applied to the Morton et al. patent since Claim 78 has several limitations and requirements not met by the patent.

5.1.23 Claim 69 cannot be applied to the Morton et al. patent since Claim 69 has several limitations and requirements not met by the patent.

5.1.24 Each of Claims 65 and 75 also cannot be applied to the Morton et al. patent since each claim has at least one limitation and requirement not met by the patent.

(1)(c) Flory et al. Patent 5.1.25 The Flory et al. patent No. 2,404,047 was considered by the Patent Office during the prosecution of the application for the ENIAC patent.

5.1.26 The Flory et al. patent does not disclose [*90] the subject matter of Claims 69, 65, 78 and 75 of the ENIAC patent.

(2)Andrews et al. Patent 5.1.27 The Andrews et al. patent No. 2,977,048 concerns a relay computer.

5.1.28 The Andrews et al. patent application, assigned to Bell Telephone Laboratories (BTL), was in interference in the Patent Office with the ENIAC patent application and thus was considered by the Patent Office.

5.1.29 Andrews, one of the inventors named in the Andrews et al. patent, reviewed the ENIAC patent after it issued and concluded that Claim 36, among others, could not be applied to any BTL relay computer. The Andrews et al. patent disclosed one of the BTL relay computers.

5.1.30 Claim 36 relates to the interruption of the operation of the apparatus which controls the sequencing of a computer such that its operation may be stepped manually at a slow rate through steps which it ordinarily would proceed through synchronously at electronic speeds. In contrast, the Andrews relay machine always operates asynchronously.

5.1.31 Claim 36 cannot be applied to the Andrews et al. patent since Claim 36 has several limitations and requirements not met by the Andrews et al. patent.

5.1.32 [*91] Claim 122 relates to the ability to stop the computer during its automatic sequencing and to advance it either one add time or one pulse time per depression of a switch and to display, for example, with lamps, quantities contained in the accumulators and other units. In contrast, the Andrews et al. relay machine is asynchronous and thus cannot provide pulse signals in sequence and in definitive groups. The Andrews et al. patent does not even show an arrangement for producing discrete signals in sequence and in definitive groups as required by Claim 122.

5.1.33 Claim 122 cannot be applied to the Andrews et al. patent since Claim 122 has several limitations and requirements not met by the Andrews et al. patent.

(3)Mumma Patent 5.1.34 The Mumma patent No. 2,422,428 discloses a non-programmable console calculator apparatus which can perform a single addition, a single subtraction, or a single multiplication only.

5.1.35 The Mumma patent was considered by the Patent Office in the prosecution of the ENIAC patent application as early as March of 1950, when it was first cited by the examiner, and it appeared as a reference on the printed ENIAC patent when it issued.

5.1.36 [*92] Claims 52, 55, 56 and 57 relate to certain features for programming a data processor. In contrast, the calculator apparatus disclosed in the Mumma patent fails to meet these claims since it is not an electronic digital computer so arranged as to allow one to program it to carry out a series of mathematical operations.

5.1.37 In the Mumma calculator apparatus, data is entered manually on a set of keyboards by key depression and another button must be pressed for a multiplication, for example, to occur; and thus Mumma's calculator only performs one operation per key depression and pushing of a start button.

5.1.38 Mumma himself acknowledged that the tally impulse generator of the device disclosed in the Mumma patent

merely keeps track of a single value and thus involves no selectivity such as is called for by Claims 56 and 57 of the ENIAC patent.

5.1.39 Claim 56, and also Claim 57 which is dependent on Claim 56, cannot be applied to the Mumma patent because each claim has several limitations and requirements not met by the Mumma patent.

5.1.40 Claims 52 and 55, which also relate to programming, cannot be applied to the Mumma patent since each claim has several limitations [*93] and requirements not met by the Mumma patent.

5.1.41 Claim 109 cannot be applied to the Mumma patent since it has several limitations and requirements not met by the Mumma patent.

5.1.42 The Mumma patent cannot meet the language of either Claim 8 or Claim 9, each of which calls for more than one arithmetic operation. Mumma himself recognized that his apparatus fails in this respect; additionally, each of these claims has several other limitations and requirements not met by the Mumma patent.

(4) Claim 142 of the Phelps Patent 5.1.43 The Phelps patent No. 2,624,507 concerns a multiplying device and not a programmable electronic digital computer.

5.1.44 The Phelps patent discloses two embodiments and Honeywell relied on the first embodiment which discloses a relay multiplier.

5.1.45 An IBM patent attorney, while preparing the application for the Phelps patent, suggested the second embodiment which is the electronic version.

5.1.46 In contrast to that which is described and claimed in the ENIAC patent, the device disclosed in the Phelps patent cannot chain together a series of multiplications to be carried out in a desired order or otherwise, much less [*94] can it perform multiplications and other operations in accordance with a program.

5.1.47 Claim 142 of the ENIAC patent relates to a timing mechanism having a stepping circuit.

5.1.48 Claim 142 requires, among other things, an output signal which must be a single pulse repeated regularly but with a lower frequency or a frequency related to the source frequency. In contrast the Phelps patent does not disclose a signal, but rather a burst of ten pulses occurring and spaced from another burst of ten pulses, and does not disclose a stepping circuit.

5.1.49 Claim 142 cannot be applied to the Phelps patent since Claim 142 has several limitations and requirements not met by the Phelps patent.

5.1.50 The application for the Phelps patent was filed in the Patent Office on September 27, 1945.

5.1.51 Honeywell has not met its burden of proving that any of Claims 69, 65, 78, 75, 109, 36, or 122 of the ENIAC patent is identically disclosed in either or both RCA reports.

5.1.52 Honeywell has not met its burden of proving that any of Claims 69, 65, 78, 75, 109, 36, or 122 of the ENIAC patent is anticipated by either or both RCA reports.

5.1.53 Honeywell has not met [*95] its burden of proving that any of Claims 69, 65, 78, 75, 109, 36, or 122 of the ENIAC patent was obvious in view of anything described in the RCA reports.

5.1.54 Honeywell has not met its burden of proving that any of Claims 69, 65, 78, or 75 of the ENIAC patent is anticipated by the Morton et al. patent or the Flory et al. patent.

5.1.55 Honeywell has not met its burden of proving that any of Claims 69, 65, 78, or 75 of the ENIAC patent was obvious in view of the Morton et al. patent or the Flory et al. patent.

5.1.56 Honeywell has not met its burden of proving that either Claim 36 or Claim 122 of the ENIAC patent is identically anticipated by the Andrews et al. patent.

5.1.57 Honeywell has not met its burden of proving that either Claim 36 or Claim 122 of the ENIAC patent is obvious in view of the Andrews et al. patent.

5.1.58 Honeywell has not met its burden of proving that any of Claims 8, 9, 52, 55, 56, 57, or 109 of the ENIAC patent is identically anticipated by the Mumma patent.

5.1.59 Honeywell has not met its burden of proving that any of Claims 8, 9, 52, 55, 56, 57, or 109 of the ENIAC patent is obvious in view of the Mumma patent.

5.1.60 [*96] Honeywell has not met its burden of proving that Claim 142 of the ENIAC patent is anticipated by the Phelps patent.

5.1.61 Honeywell has not met its burden of proving that Claim 142 is obvious in view of the Phelps patent.

6. Claims Anticipated 6.1 Claims 83, 86, and 88 were anticipated by or obvious in view of the Phelps patent.

6.1.1 During the 1930's IBM experimented with the use of electronic counting devices as high-speed substitutes for the mechanical adding wheels used in their commercial products. IBM engineers developed and built an electronic multiplier and tests were successfully carried out at its rated punching speed in November 1942.

6.1.2 The electronic multiplying apparatus developed and constructed at IBM was later described in detail in a patent application filed by an IBM engineer, Phelps, on September 27, 1945, now U. S. Patent No. 2,624,507. Although the Phelps patent did not issue until January 6, 1953, the same disclosure by Phelps issued earlier in the form of the equivalent British Patent No. 616,962 on January 28, 1949.

6.1.3 The IBM multiplier consisted of a mechanical card feeding, reading and punching unit electrically coupled [*97] to a separate electronic multiplying unit. The only mechanical part of the IBM electronic multiplier was that necessary to read and punch the cards, the arithmetic operations of the multiplication being performed at electronic speeds.

6.1.4 Factors punched on an IBM card were read in the reading unit, the multiplication was performed in the electronic computing unit, and the result was then punched on the same card as it passed through the punching station. The electronic multiplier was pulse-responsive and operated under the control of a first timer at a rate of 8,000 pulses per second while the peripheral card handling equipment was operated by a second timer at the rate of 23 pulses per second.

6.1.5 The Patent Office rejected claims of the ENIAC patent application as "obviously fully met" by the British Phelps disclosure. Examiner Pokotilow advised Eckert and Mauchly's attorney, William D. Hall, that the Phelps disclosure was "very pertinent to the claims in the ENIAC application." The Phelps patent was overcome as prior art only after the filing by Eckert and Mauchly of an affidavit representing that the invention was made by them before the filing date of the IBM application [*98] for the Phelps patent.

6.1.6 Notwithstanding the affidavit which "overcame" the application filing date of the Phelps patent as prior art in the Patent Office, Phelps had in fact made the invention of the rejected ENIAC claims before the ENIAC project work had even begun, and such invention was not thereafter abandoned, suppressed or concealed.

6.1.7 Claims 83, 86 and 88, shown to be readable in all material respects on the prior Phelps work, are therefore barred from patentability by the provisions of 35 U.S.C. 102(g) and 103.

7. The First Draft Report 7.1 The First Draft Report was a printed publication prior to the critical date, and was an anticipatory publication, and contains an enabling disclosure of the ENIAC.

7.1. 1 In 1944, Dr. John von Neumann, a mathematician of international distinction, was serving as a consultant with the Ballistics Research Laboratory of Army Ordnance. During this same period, he also was serving as scientific advisor and counselor to the Los Alamos Laboratories in nuclear weapons research matters.

7.1.1.1 Dr. Herman H. Goldstine, of the Ballistics Research Laboratory ("BRL"), sparked von [*99] Neumann's interest in the ENIAC during a train ride which the two took to Philadelphia in late summer 1944. Almost immediately thereafter, von Neumann viewed the ENIAC two-accumulator system in operation and became deeply involved in the ENIAC project, meeting frequently with Eckert, Mauchly, Burks and Goldstine.

7.1.1.2 Von Neumann's dual roles BRL and Los Alamos led him to recommend the use of high-speed computing machines as an aid to the computations of the Los Alamos Laboratories and to Dr. Edward Teller in particular.

7.1.1.3 Goldstine and von Neumann agreed that a report should be prepared to summarize the general ideas regarding the art of high-speed automatic electronic digital computers discussed at the Moore School and, as a result, von Neumann prepared a document entitled "First Draft of a Report on the EDVAC". This First Draft Report was authored by von Neumann between February and June of 1945 and was a substantial and major part of the total report he intended to write.

7.1.1.4 Von Neumann's First Draft Report, a comprehensive document of one hundred one pages, contains fifteen chapters, each having subsections, and deals in detail with the logical organization [*100] and makeup of a highspeed automatic electronic digital computer. Included in the report are definitions of report terminology and a chapter devoted to the procedure used by the author for discussion. Specific hardware was not detailed, in order to avoid governmental security classification and, in Eckert's and Mauchly's words, to avoid raising engineering problems which might detract from the logical considerations under discussion.

7.1.2 Goldstine, with the approval of von Neumann, circulated a large number of mimeographed copies of the First Draft Report for the express purpose of making the knowledge therein publicly available to advance the state of the computer art.

7.1.2.1 The purpose of early publication of the First Draft Report was to further the development of the art of building high-speed automatic electronic digital computers, and to advance scientific engineering thinking on this subject as widely and as early as feasible.

7.1.2.2 After its completion in mimeographed form, the Draft Report, which was unclassified with the knowledge and approval of Army Ordnance, was immediately distributed to members of the technical staff in the Moore School, and thereafter, [*101] to other persons in the United States and England variously representing: the Ballistics Research Laboratory; the Princeton Institute for Advanced Study; the Applied Mathematics Panel of the National Defense Research Committee; the Radiation Laboratory at the Massachusetts Institute of Technology; Scientific Computing Ltd. in London, England; United States Army Ordnance; United States Naval Ordnance; the Computing Laboratory at Cambridge University in England; the Mathematics Institute at New York University; and the University of Chicago.

7.1.2.3 The First Draft Report was a printed publication, within the meaning of 35 U.S.C. 102, by June 30, 1945, prior to the ENIAC patent critical date.

7.1.2.4 The distribution of the First Draft Report had an important influence on the continuing development of electronic computers.

7.1.2.5 The computing system described by von Neumann in the First Draft Report featured the use of the computer's high-speed memory to store not only numbers but operating instructions as well. Called "stored programming," this

concept introduced new dimensions in the speed, flexibility and usefulness of automatic electronic digital [*102] computers.

7.1.3 While the First Draft Report does not include a detailed disclosure of the specific hardware to mechanize the machine disclosed within the report, it does include a disclosure sufficient to teach one skilled in the art how to accomplish the logical control of a high-speed automatic digital computing system.

7.1.3.1 Each of the logic elements (referred to as "organs") disclosed in the First Draft Report had existing physical counterparts and/or could have been constructed by the exercise of ordinary skill in the art at the time the report was published, before the critical date for the ENIAC patent. Experts in the field testified at trial that the report is, and was at the time of its publication, sufficient to enable persons skilled in the art to make and use the computer set forth in the report.

7.1.3.2 Plaintiff's tutorial expert witness, Kenneth Rose, read and understood the First Draft Report and presented an in-court demonstration model of the stored program technique taught in the First Draft Report.

7.1.3.3 The Court also heard the testimony of plaintiff's expert witness Paul Winsor, who studied the First Draft Report extensively with a view [*103] toward determining whether or not a computer could have been constructed at the time (1945) from the report's teachings. He examined the wartime technology available, when the report was published, to construct the elements referred to in the report. As a result of his study, Winsor concluded, and this Court concurs, that the report was sufficient to enable persons skilled in the art in 1945 to construct the computer set forth therein with the available technology. Moreover, documents written by persons concerned with the report, contemporaneous with its publication, corroborate this testimony. For example, ENIAC patent attorney Church commented on the First Draft Report:

"I think the broad conception is there and to one skilled in the art it is sufficient to put them on the road of accomplishing a development."

Von Neumann's attorney Townsend agreed, despite the fact that his conclusion prejudiced any possible patent rights his client might have sought. The Court credits this testimony.

7.1.4 The claims of the ENIAC patent asserted in this suit are anticipated by or obvious in view of the First Draft Report. The Court reaches this finding through an independent study [*104] of the record, including the testimony of plaintiff's expert, Winsor.

7.1.4.1 Claims 8, 9, 52, 55, 56, 57, 65, 75 and 78 are each anticipated by the First Draft Report.

7.1.4.2 The inventive subject matter of "the Automatic Electronic Digital Computer" is either anticipated by or obvious in view of the First Draft Report.

7.1.5 The finding that the First Draft Report disclosed the basic concepts of the ENIAC invention is supported by statements of those who considered the same issue prior to the time the ENIAC application was filed.

7.1.5.1 The applicants for the ENIAC patent were informed before the ENIAC patent application was filed, by Army Ordnance patent lawyers who prepared and prosecuted the ENIAC application, that the First Draft Report was a barring publication. [See also Findings 13.31 et seq. herein]

7.1.5.2 Defendants have admitted that by April 8, 1947, Eckert and Mauchly had been advised that the Army Ordnance patent lawyers considered the First Draft Report to be a printed publication within the meaning of the patent statute.

7.1.5.3 On April 8, 1947, a meeting including the patentees, Eckert and Mauchly, and Libman (the principal active [*105] lawyer who prepared and filed the ENIAC application on behalf of Eckert and Mauchly) and Church (later an

attorney of record for Eckert and Mauchly in the ENIAC application), was held to consider the impact of the First Draft Report on the patentability of inventions theretofore made by them. During this meeting, Church stated:

"It is our firm belief from the facts that we have now that this report of yours dated 30 June 1945 is a publication and will prohibit you or anyone else from obtaining a patent on anything it discloses because it has been published more than a year and statute provides that if you don't file disclosures within a year it constitutes a bar to patenting that device."

7.1.5.4 During the April 8, 1947 meeting, Eckert admitted that the report was a barring publication, and it was clearly and unequivocally established, in the presence of the patentees Eckert and Mauchly and their patent lawyers Church and Libman, that the report was an enabling publication dated more than one year before the ENIAC patent application was filed.

7.1.6 It is apparent from the distribution list of the June 30, 1945 First Draft Report that Mauchly was charged with the duty [*106] of delivering the report to the Army Ordnance Patent Department. The list also makes clear the report's relevance to Eckert's and Mauchly's patent matters. On the list, it is stated:

"Dr. J. W. Mauchly (2) (to be given to patent lawyer and patent Dept. of Ordnance)"

There is no evidence that Mauchly ever carried out this duty, and the First Draft Report did not come to the attention of the Army Ordnance Patent Department until it was later submitted by von Neumann.

8. The AMP Report and Burks Article 8.1 The AMP Report and Burks Article were printed publications prior to the critical date.

8.1.1 The AMP Report No. 171.2R, portions of which were copied into the ENIAC application, is a general description of the ENIAC machine. Its title indicates its purpose: "Description of the ENIAC and Comments on Electronic Digital Computing Machines."

8.1.1.1 The AMP report was prepared for the Applied Mathematics Panel of the National Defense Research Committee at the request of Dr. Brainerd of the Moore School.

8.1.1.2 The report is sixty-eight pages in length, and includes a description of the ENIAC machine with drawings and appendices discussing the arithmetic [*107] operation, programming, and constructional data of the ENIAC machine.

8.1.1.3 The report was jointly authored by Brainerd, Goldstine, Eckert and Mauchly.

8.1.2 In excess of one hundred copies of the AMP Report were printed, separately numbered, and distributed during or prior to March, 1946, to numerous persons skilled in the art at that time. This distribution was made with the approval of Army Ordnance.

8.1.3 The persons receiving the AMP report represented or were affiliated with such institutions as Ballistics Research Laboratory, University of Chicago, Princeton Institute for Advanced Study, Los Alamos Scientific Laboratory, the National Academy of Sciences, University of Michigan, University of Vermont, RCA, New York University and University of Pennsylvania.

8.1.4 The AMP Report, as distributed, was marked "Restricted." However, this classification permitted dissemination of material to anyone for official purposes and was, at the time of the publication of the AMP Report, the lowest level of Government security classification. In any event, the general principles of design and operational and functional characteristics of the ENIAC were declassified from [*108] military security by Army Ordnance on December 7, 1945, and the "Restricted" stamp failed to prevent actual publication.

8.1.5 The ENIAC patent was, in substantial part, based upon and copied from the AMP Report. The report's stated

purpose was "to give the reader a rather complete account of the general features of the ENIAC * * *", and had the intended effect. For example, one of its readers, Major Sterne, received "a much clearer idea of the working employment of the ENIAC." Sterne also stated that the report dealt "clearly with the theory of the design of digital computing devices," and the Court concurs in this contemporaneous comment.

8.1.6 The Burks article, entitled "Super Electronic Computing Machine," is a seven-page description of the ENIAC machine having as its stated purpose "to explain how the ENIAC solves mathematical problems electronically." Included in the article are photographs of a layout of the ENIAC machine and of the initiating and cycling units. Also shown are the master programmer and accumulator, and a diagram of the actual connections between units of the ENIAC machine to solve a representative differential equation. Separate schematic diagrams [*109] of various logic gates (e.g., a flip-flop, "and" gate and "or" gate employing vacuum tubes) and of a typical ENIAC circuit showing the interconnection of two program control circuits with an accumulator, also are set forth and discussed in the article. The text of the article sets forth and discusses the basic ENIAC units including arithmetic units, the control units, and the input/output equipment.

8.1.7 Although the Burks Article appeared in the July, 1946 issue of Electronics Industry (a date after the critical date), the credible evidence shows that the article was first published on June 25, 1946, before the critical date.

8.1.8 The fact of publication of the Burks article on this date is evidenced, pursuant to 17 U.S.C. 209, by the certificate of copyright registration for the article which states: "This issue was published on the 25 day of June 1946" by the Guide Printing Company, New York, N. Y.

8.2 Plaintiff has not, however, proved the readability of the claims of the ENIAC on either the AMP Report or the Burks Article.

8.2.1 Honeywell did not prove that the AMP report describes to those skilled in the art how to make and use the [*110] invention disclosed in Claim 142 or any other claim of the ENIAC patent.

8.2.2 The Burks Article was considered by the Patent Office and the patent examiner found that it did not anticipate the claims of the ENIAC patent application in interference.

8.2.3 Honeywell did not prove that the Burks Article describes to those skilled in the art how to make and use the invention disclosed in Claim 8 or any other claim of the ENIAC patent.

8.2.4 Honeywell offered no testimony to show readability of any of the claims of the ENIAC patent on the AMP report or the Burks Article.

8.2.5 Honeywell did not meet its burden of proving that the inventive subject matter claimed in the ENIAC patent was anticipated by or obvious in view of the AMP report or that any claims of the ENIAC patent read on the AMP report.

8.2.6 Honeywell did not meet its burden of proving that the inventive subject matter of Claim 8 or any other claim of the ENIAC patent was anticipated by or obvious in view of the Burks Article or that any of the claims of the ENIAC patent read on the Burks Article.

9. Description 9.1 The description and disclosure in the ENIAC are sufficient.

9.1.1 The [*111] description and disclosure in the ENIAC patent are sufficient to enable one skilled in the art to practice the invention defined by the claims.

9.1.2 There is a presumption that the Patent Office reviewed the ENIAC patent application for sufficiency of its description and that the patent's disclosure is sufficient to teach one skilled in the art how to practice the invention.

9.1.3 Honeywell did not meet its burden of proving that the disclosure and description of the ENIAC patent are

insufficient.

9.1.4 [HN1] It is not necessary that the patent description describe all possible embodiments of the invention.

10. Pulse 10.1 The claims of the ENIAC which use the word pulse and which were covered by the May 20, 1963 amendment redefining the term pulse are invalid.

10.1.1 Both the ENIAC Patent as issued in 1964 and the application for the patent as originally filed in 1947 contain claims which employ the term "pulse." That term was a defining element of the claims and was of material importance to the determination of their patentability.

10.1.1.1 The original application specification described a synchronized computer using coordinated "pulses" as a characterizing [*112] part of the description of the invention. The term was expressly defined for purposes of the description of, and the claims to, the invention as follows:

"A pulse is a positive or negative change in potential which has a duration of about two to five microseconds (μ sec.)." [A "microsecond" is one millionth of a second.]

The lengthy specification is replete with detailed operational descriptions designating the pulses employed as being of 2 microseconds or longer duration.

10.1.1.2 There is no indication of any recognition by the applicants, either in the original application for patent as filed or in the ENIAC patent as issued, that pulses having less than two microseconds duration could be used in a computer, or that higher speed operation would result from the use of such pulses.

10.1.1.3 The patentability of the ENIAC claims employing the term "pulse," over such prior art as the Harvard Mark I computer system, depended upon material representations of electronic high speed made to the Patent Office. The term used in the claims as originally presented upon the basis of the 1947 disclosure was a material one.

10.1.1.4 SR's attorneys repeatedly manifested [*113] their awareness that the term "pulse" in the ENIAC claims was limited by the definition of the term in the application as filed.

10.1.1.5 During the case of Sperry Rand et al. v. Bell Telephone Laboratories, Inc., SR, Eckert and Mauchly represented to the Court that the word "pulse," as used in the ENIAC application, was limited to a duration of 2 to 5 microseconds.

10.1.1.6 As late as December 1962, SR's attorney, Hall, recognized that in the ENIAC application, " * * * the claims use the word 'pulses,' and the specification at page 66 defines this word as referring to changes of potential of duration on the order of two to five microseconds."

10.1.1.7 In December 1962, Hall recognized that this definition was "something of very critical character" and that "many modern computers operate with pulses shorter than two microseconds."

10.1.2 During the period from 1947 to 1963, the state of the art of electronic computers advanced dramatically. The contributions of numerous others in the electronic industry, including Honeywell, had produced speeds of operation many orders of magnitude faster than that of the ENIAC machine.

10.1.2.1 For example, a modern day CDC [*114] computer is about two thousand times faster than the ENIAC machine.

10.1.2.2 During 1960 and 1961, Honeywell marketed the H-800 computer which used pulses having a duration of less than 0.25 microseconds.

10.1.2.3 At the time of the filing of the ENIAC patent application in 1947, the ENIAC machine had already been

obsoleted by more advanced planning, such as that described for example in the von Neumann First Draft Report. Eckert and Mauchly knew this.

10.1.3 In an amendment to the ENIAC patent application, filed on May 20, 1963, by SR's patent lawyer, Hall, the original definition of the term "pulse" was changed by a broadening addition, as follows:

"Within the meaning of the appended claims 'pulse' will be construed to mean a change or excursion in potential or current which has a duration not exceeding about five microseconds."

10.1.3.1 By this change, the lower limit of the original speed range (two microseconds) was effectively eliminated, thereby rendering the original claims for a circa-1947 computer readable on the circa-1963 computer technology of others, no matter how much faster.

10.1.3.2 Hall knew that the use of shorter pulses, now covered [*115] by the new definition, had been made possible by the intervening advances of others in the computing art.

10.1.3.3 There is evidence that Eckert and Mauchly did not read the 1963 Amendment before it was filed, and were not consulted about this change in definition.

10.1.4 The 1963 amendment to broaden the scope of all "pulse" claims was unreasonably delayed, and was not merely a logical development of the original application but rather an exigent afterthought to capture the subsequent contributions of others already in the public domain.

10.1.5 The "pulse" claims are invalid because (1) they are directed to an invention which had not theretofore been claimed in the application, and (2) the claimed invention had been in public use more than one year before the claims were presented.

10.1.6 The prior rights intervening between 1947 and 1963, by reason of the widespread manufacture, use and sale of computers of vastly greater speed than the two to five microsecond pulse characteristic of the ENIAC machine disclosed and claimed by the ENIAC patent application as filed, render the broadening amendment of May 20, 1963 an improper "late claiming" of the invention thereby [*116] defined.

10.1.7 ENIAC patent claims 8, 9, 52, 65, 83, 86, 88, 109 and 122 which use the term "pulse", and claim 36 which uses the equivalent term "impulse" are invalid; also, since the word "signal" is defined by defendants as a "pulse", claims containing such word are equivalently invalid, e.g., 69, 75, 78, 142.

.1 [HN2] Where the applicant does not originally assert claims which are added later by amendment and the subject matter of such late claims is disclosed or in general use and applicant stands by to await developments in the industry before asserting them, there is an unreasonable delay and neglect on the applicant's part rendering such late claims invalid.

.2 [HN3] Where a late-filed amendment of the patent specification is important enough to constitute the basis for alleged patentability, the amendment constitutes new matter and cannot in fact be a basis for patentability.

.3 [HN4] The long delay of a patentee in adding broadened claims to a patent application warrants an inference that such claims were added as an afterthought and not as a logical development of the original application, and where the subject matter of the later claims was in public use more than one [*117] year before such claims were first introduced, such claims are invalid.

.4 [HN5] The repeated entry into interferences, resulting in long delays incident to their determination, affords no just excuse for the failure of a patent applicant to assert broader claims at an earlier date. Long delay in coming to the point with new and broader or different claims strongly confirms that the final determination to do so was an exigent

afterthought, rather than a logical development of the original application.

.5 [HN6] An applicant for patent cannot enlarge his pending application in such a manner as to embrace and include for the first time the essential elements of an article, device, or structure which has been in public use or on sale more than one year prior thereto, and a patent obtained in that manner does not represent patentable invention, but is mere appropriation of the inventive skills of others.

.6 [HN7] Courts must regard with disfavor any attempts to enlarge the scope of an application once filed, the effect of which would be to enable the patentee to appropriate other inventions made prior to such alteration, or to appropriate that which has, in the meantime, gone into public use.

[*118] 11. Delay 11.1 The ENIAC application was filed in 1947 and issued in 1964.

11.1.1 The application for the ENIAC patent was filed in the Patent Office on June 26, 1947.

11.1.2 The ENIAC patent contains 91 sheets of drawings and 232 columns of specifications and claims. There are 148 claims.

11.1.3 The ENIAC patent application and patent describe the ENIAC machine which was a pioneering achievement.

11.1.4 Patent applications on pioneering achievements are said to be involved more frequently in interferences than other inventions, particularly if the patent application is pending over a substantial period, because other people may learn generally about it and move into the field.

11.1.5 During 1949, counsel for E and M agreed to keep patent cases such as EM-1 pending in the interest of taking into account during their prosecution the interim developments of others following their filing; the same view was expressed in 1959 by Hall.

11.1.6 The amendment of May 20, 1963, with respect to the term "pulse" was an abuse of the long pendency of the ENIAC patent application.

11.2 The complaint in SR v. BTL was filed in November, 1955, a one day trial **[*119]** was held in March, 1962, and the District Court decision followed in September, 1962.

11.2.1 The trial was based upon a stipulated submission of documentary evidence and briefs, and no testimony was presented in open court.

11.2.2 The court was afforded no opportunity to judge witness credibility on the basis of manner and demeanor.

11.3 Plaintiff claims that defendant SR and its counsel intentionally and unreasonably delayed proceedings before the Patent Office and the courts by deliberate action taken through deliberate lack of action.

11.3.1 This Court found a prima facie showing of deliberate delay upon the testimony of Honeywell's expert witness, Professor James B. Gambrell.

11.4 The first interference was filed more than 3- 1/2 years after the filing of the application.

11.4.1 In March 1951, while the application for the ENIAC patent was being prosecuted, the first (No. 85,131) of eleven interferences was declared in the Patent Office.

11.4.2 Interference No. 85,131 was declared following the copying of claims by Eckert and Mauchly from NCR's Mumma patent No. 2,495,075.

11.4.3 The interference was dissolved after Eckert and Mauchly filed [*120] an abandonment of the contest.

11.5 Many of the interferences filed were unwarranted.

11.5.1 [HN8] Interferences are proceedings in the Patent Office to determine who, between two or more parties, is entitled to priority of invention. Before an interference is declared the Patent Office must determine that there is sufficient common subject matter claimed by the parties to warrant declaring the interference.

11.5.2 Defendants instigated numerous interferences by copying claims of patents on devices developed by competitors.

11.5.3 The first interference was concluded by June 14, 1951.

11.5.4 The second interference was declared in May 1951 and was concluded in the fall of 1951.

11.5.5 From 1951 through 1957, defendants copied 156 claims from competitors' patents in order to initiate interference proceedings. 152 of these claims were copied from patents based on applications filed subsequent to the ENIAC application, and resulted in the setting up of numerous interference proceedings involving NCR, BTL, Stromberg-Carlson, IBM, and Clary Corp.

11.5.6 When the interferences were ultimately terminated, the Patent Office held that 147 of the 152 claims were [*121] for improvements to which defendants had no legitimate claims. With respect to many of the 147 claims, the Patent Office held that there was no support for them in the ENIAC patent application.

11.5.7 The issuance of the ENIAC patent was delayed by these interferences.

11.5.7.1 There was no intentional delay during the first two interferences.

11.5.8 The third interference, No. 85,809, began in May 1952 as a result of Bell Telephone Laboratories' (BTL's) copying of two claims from the ENIAC patent application.

11.5.8.1 The third interference involved the question whether or not, as to Claims 39 and 42 of the ENIAC patent application (Claims 8 and 11 of ENIAC patent), Eckert and Mauchly were entitled to priority over Samuel B. Williams, whose patent application No. 22,784 was assigned to BTL.

11.5.8.2 The Board of Patent Interferences awarded priority to Williams (BTL) on September 29, 1955, over 9 months after the final hearing.

11.5.8.3 There was no intentional or undue delay during Interference No. 85809 in the Patent Office, especially in view of the complexity of the case, and it probably moved more expeditiously than might have been expected.

11.5.9 [*122] The remaining interferences were declared subsequent to Interference No. 85809 and terminated prior to September 6, 1962 when the United States District Court of the Southern District of New York handed down its decision in a litigation growing out of the third interference.

11.6 Defendants failed to obtain the services of counsel with the time or interest in pursuing a matter which defendants considered important.

11.6.1 The subject matter of SR v. BTL case, the ENIAC application and the Williams patent, was complex and required large amounts of time.

11.6.2 SR recognized that a team effort was required in order to prepare the SR v. BTL case for trial within a reasonable period of time.

11.6.3 The aggregate time devoted to the SR v. BTL case by all of the SR attorneys during the first six years of the litigation averaged substantially less than the reasonable billing time of a single attorney.

11.7 [HN9] Deliberately extending the expiration of a monopoly is a serious violation of the Constitution and the patent laws.

11.7.1 [HN10] Intentional delay by an applicant for patent invalidates the patent.

11.7.2 [HN11] The only legitimate purpose of an interference proceeding [*123] is determining the question of priority of inventorship.

11.8 In the SR v. BTL suit plaintiff's counsel for much of six years failed to adequately prepare for trial.

11.8.1 On November 25, 1955, within the allotted 60 day period, SR filed a civil action under 35 U.S.C. Section 146 in the United States District Court of the Southern District of New York to overturn the decision of the Board of Patent Interferences.

11.8.2 From January, 1957 until October, 1961, Sperry Rand's chief trial counsel for the SR v. BTL case conducted interparty discovery only when:

.1 he was faced with the necessity " * * * because the case might be on the dismissal calendar";

.2 he faced a court-imposed deadline; or

.3 in the case of depositions, the health of a witness of advanced aged (80) was of concern (Williams), and a distant witness happened to be passing through town (Huskey).

11.8.3 Between the commencement of the action and the trial in March 1962, inside counsel and other personnel at SR as well as outside counsel from New York, Philadelphia, and Washington were less than diligent in obtaining formal and informal discovery, preparing and answering [*124] interrogatories, taking depositions, securing affidavits, working with fact and expert witnesses, researching the law, learning about the extremely complex electronic subject matter, conducting negotiations for simplification of procedure in the case, and generally preparing the case for trial.

11.8.4 The outside attorneys who worked on this case for SR included: C. Blake Townsend, William D. Hall, Carroll G. Harper, Nelson Moore, Robert Kosinski, Elliott Pollock, Zachary T. Wobensmith II, Reynolds Brown, Max L. Libman, and Mr. Hussey.

11.8.5 The inside attorneys and personnel who worked on the case for SR included: John P. Dority, C. A. Norton, Joseph Forman, L. Etlinger, Louis Altman, Francis McNamara, C. E. McTiernan, Marshall Truex, C. C. English, Jerry Light, and Dr. Throckmorton.

11.8.6 SR also had at least two outside experts, Dr. Stibitz and Mrs. Loveday, working part-time on the electronic aspects of the case with Stibitz hired to work approximately 50% of his time. Stibitz wrote a number of reports for and consulted on many occasions with counsel for SR in order to aid them with various technical issues in the case, including the question of the operativeness [*125] of the Williams (BTL) patent.

11.8.7 SR's New York counsel had billed SR approximately \$ 120,000 for its work from the fall of 1955 through the fall of 1961, the latter date being some six months prior to the trial before Judge Dawson.

11.8.8 Carroll Harper, a young lawyer working under C. Blake Townsend, SR's lead counsel, spent approximately 3,000 hours on the case.

11.8.9 William D. Hall, SR's Washington counsel, testified that he began spending 50% of his time on ENIAC matters

including SR in August 1955, and by mid 1960, when all the interferences and IBM public use proceedings had concluded, Hall said he was spending 50% of his time on SR.

11.8.10 Judge Cashin, Judge Palmieri, Chief Judge Clancy, and Judge Dawson of the United States District Court for the Southern, District of New York encouraged the parties' efforts toward settlement and/or a simplified procedure in this complex case.

11.8.11 On December 10, 1958, SR made an application to Chief Judge Clancy for the appointment of a single judge and in that application SR stated in its concluding paragraph:

"In view of the nature and complexity of the subject-matter, the necessity for detail and [*126] prolonged preparation and pretrial proceedings, and the probable length of time which will be required for trial, it is believed that the designation of a single Judge to hear all further proceedings in this case will expedite considerably the resolution of the controversy and will materially reduce the burden upon this Court."

11.8.12 On December 17, 1958, Chief Judge Clancy assigned the case to the Honorable Archie O. Dawson "for all purposes including trial."

11.8.13 The issuance of the ENIAC patent was delayed by Sperry Rand's failure diligently to prepare the SR v. BTL case for trial.

11.9 Plaintiff's (SR) management was in part at fault because of unnecessary and unreasonable delays in carrying on settlement negotiations.

11.9.1 SR allowed negotiations for an overall cross-licensing arrangement with BTL and Western Electric to extend over a period of more than seven years.

11.9.1.1 The priority dispute of the SR v. BTL case had begun in 1952, at the instigation of BTL, by the declaration of Patent Office interference proceeding No. 85,809.

11.9.1.2 By April 30, 1954, SR recognized that it would eventually endeavor to perfect a cross-licensing arrangement [*127] with BTL.

11.9.1.3 The cross-licensing arrangement was completed on July 1, 1961.

11.9.2 SR's unnecessary and unreasonable delay of the SR v. BTL case was suited to the convenience of its overall cross-licensing negotiations.

11.9.2.1 As late as 1957, BTL urged that no action or consideration be taken in the case until the parties first consummated an overall cross-license including other patent rights.

11.9.2.2 SR's counsel, Townsend, contacted BTL's counsel, Pugh, to make sure that he "was not coasting along in a 'fool's paradise' by taking no further action in this case pending the outcome of the present negotiations."

11.9.2.3 BTL assured SR that inactivity by SR pending such negotiations would not be urged by BTL to constitute unjustified delay or laches.

11.9.2.4 For example, on November 12, 1959, Townsend asked McNamara, Vice President and General Counsel of defendants, how negotiations were progressing, because he and Pugh agreed that Judge Dawson " * * * may take some drastic action" in setting the case for trial. On November 19, 1959, McNamara requested Townsend to "hold this in abeyance pending our present negotiations with Western Electric on [*128] an overall license in designated fields including the data processing field." In a follow-up letter dated November 20, 1959, Townsend expressed his understanding of McNamara's instructions as follows:

"I note that you wish to hold this matter in abeyance pending your present negotiations with Western Electric.

"This will put me in a position to deal with Mr. Pugh if he calls again."

11.9.2.5 By March, 1960, SR's counsel Townsend, advised the court that:

- .1 pre-trial preparations have not yet been completed;
- .2 BTL has not yet commenced its discovery;
- .3 discussion of a possible settlement still continues between the parties;
- .4 it is impossible to say when the case will actually be ready for trial; and
- .5 pre-trial hearings would be premature at this time in view thereof.

11.10 Despite six years of inadequate preparation, a District Court must force a trial.

11.10.1 Judge Dawson wrote to counsel about the status of the case on March 14, 1960 and held pretrial conferences on July 1, 1960, December 2, 1960, June 12, 1961 and June 30, 1961.

11.10.2 On July 1, 1960, Judge Dawson held a pretrial conference:

"The Court: * * * I [*129] called this conference because this case was filed in this court almost five years ago. It is one of the oldest cases untried in this court, and I want to know where we are going, how soon we are going to be ready for trial and what we have to do to get ready for trial in this case.

"* * * I want to find out where we go from here because this is the sort of thing that creates the criticism in Washington of this court. When a case is dragging around for five years and does not go to trial, they say the court is not doing its work.

"* * * I think by November 1, if you put the pressure on, you can have everything done. By then this case will have been in this court about five years. So I think in five years' time any depositions can have been taken. As a matter of fact, if this was anything other than one of these involved patent cases, I would dismiss it right now for lack of prosecution, because no case should be instituted and then require a five-year wait before it is ready for trial."

11.10.3 Judge Dawson was "a very competent judge" who was "prone to getting his cases tried."

11.11 The kind of trial resorted to in desperation by counsel and the court produced [*130] a clearly incorrect result.

11.11.1 About September 27, 1961, the parties entered into a cross-license agreement dated as of July 1, 1961. Thereafter, on November 1, 1961, the parties filed with the court a stipulation and order narrowing issues for submission of evidence through documents.

11.11.1.1 On November 1, 1961, Judge Dawson approved a stipulation and order for a simplified procedure "(i)n the interest of simplifying and expediting the trial of the above civil action, to lessen the amount of work and the expense required in the presentation of proof and to materially shorten the court time required * * *."

11.11.1.2 The November 1, 1961 stipulation and order provided for testimony to be submitted in the form of affidavits, depositions, or oral testimony as the parties might elect. Each party was given the right to cross-examine by deposition any affiants of the other party.

11.11.2 On March 6, 1962, a one-day trial was held. The trial constituted an oral submission by counsel of stipulated documentary evidence.

11.11.3 Judge Dawson handed down his decision in favor of SR on September 6, 1962. *Sperry Rand Corp. v. Bell Telephone Labs., Inc.*, 208 F.Supp. 598, 135 USPQ 254 (S.D. N.Y. 1962).

[*131] 11.11.4 The Court of Appeals dismissed BTL's appeal as moot in May 1963. *Sperry Rand Corp. v. Bell Telephone Labs., Inc.*, 317 F.2d 491, 137 USPQ 497 (2d Cir. 1963).

11.12 A one or two month trial in the spring of 1962 would have possibly eliminated a nine month trial in 1971 and 1972.

11.12.1 Judge Dawson stated that through this stipulation and order of November 1, 1962, " * * what was originally predicted to be a trial of several months' duration was reduced to a single day * * *. Through the commendable efforts of both parties the issues in this action have been greatly simplified."

11.13 In contrast is the speed with which a substantial number of lawyers acted in 1963 in filing the amendments and the apparent repeated pressure on the Patent Office in 1963 to issue the patent.

11.13.1 During a six-month period in 1962 and 1963, fifteen of Sperry Rand's in-house attorneys spent over 2,000 hours preparing the May 20, 1963 amendment to the ENIAC application.

11.13.1.1 After the Court of Appeals' dismissal in May 1963, SR promptly proceeded with amendments and examiner interviews in the Patent Office in connection with the ENIAC patent application.

[*132] 11.13.1.2 SR received the Patent Office's Notice of Allowance of the ENIAC patent on December 20, 1963.

11.13.1.3 SR's counsel paid the necessary final fee on that same day although six months was automatically allowed for such payment in 1963-64.

11.13.1.4 The ENIAC patent issued on February 4, 1964.

11.13.2 The effort applied to that single amendment is about as much as Sperry Rand's chief trial counsel for the SR v. BTL case, Townsend, had devoted to the case over the six years of its pendency.

11.14 On the record as a whole (but with reluctance) I find that there was no undue delay in the proceedings before the Patent Office or the District Court.

11.14.1 SR did not exceed any time limits provided either by court order, rule, or statute.

11.14.2 There was no intentional delay in the prosecution of the case of *Sperry Rand Corp. v. Bell Telephone Labs.*

11.14.3 There was no intentional delay in the issuance of the ENIAC patent.

11.14.4 [HN12] A party seeking a right under the patent statutes may avail himself of all their provisions and courts may not deny him the benefit of a single one.

11.14.5 Honeywell has not met its burden of establishing [*133] that there was undue delay in the issuance of the ENIAC patent or that there was any improper conduct on the part of SR or its counsel which caused undue delay.

12. Validity 12.1 [HN13] A patent shall be presumed to be valid.

12.1.1 This presumption is a statutory one which may be overcome so that a patent is rendered invalid or unenforceable or both.

.1 The rebuttable presumption of validity which attaches to a patent because of 35 U.S.C. 282 is "a faint one" because Patent Office examination is not adversary and the public is not heard.

.2 The presumption of validity is not accorded great weight in the more recent decisions of the Supreme Court, notwithstanding its positive assertion in the case of *Radio Corporation of America v. Radio Engineering Laboratories, Inc.*

.3 The presumption may not be used to transmute the products of mechanical skill into patentable inventions, since it is as much the duty of the court to protect the public against having to pay tribute to a patentee who is not in any true sense an inventor or discoverer, as to protect the patent rights of one who is a real inventor.

.4 The presumption is greatly weakened, [*134] if not destroyed, where bars to patentability raised in litigation are based on prior art or use which were not before the Patent Office Examiner.

.5 One practical reason for the requirement of absolute honesty and good faith disclosure by an applicant in ex parte Patent Office examination is that [HN14] even an innocent misrepresentation of facts destroys the presumption of validity.

.6 How strong this presumption may be is debatable in view of the multiplicity of patents issued (over three million by 1964), and the high proportion held invalid when litigated (only one held valid in the 8th Circuit since the Supreme Court's decision in *Graham v. John Deere*, 1966).

.7 While the patent grant still gives rise to a presumption of validity, the effective force of that presumption has been substantially weakened by the plethora of decisions recognizing "the notorious difference" between the loose standards applied by patent examiners in approving patented unpatentables, and the standards applied by the courts in dispatching patents issued thereunder.

12.2 Plaintiff has overcome the presumption of validity by substantial evidence which is clear and convincing. 12.2.1 SR and [*135] ISD assert a broad scope for the ENIAC patent:

.1 "No data processing machine of any consequence * * * in the United States today is being made that does not make use of inventions covered by this patent."

.2 The subject matter of the ENIAC patent is "the invention of the Automatic Electronic Digital Computer."

12.2.2 The substantial, clear and convincing evidence in this case establishes that the entirety of this broad subject matter of the ENIAC patent is not validly patentable. Patentability has not been created, and the absolute bars to patentability have not been overcome by the ingenuity of expression and the variety of technical language found among the 148 different claims of the ENIAC patent.

12.2.3 The machine disclosed and claimed in the ENIAC patent, and embodying the invention of the patent, was in public use in this country more than one year prior to the filing of the ENIAC patent application, and the ENIAC patent is thereby invalid.

.1 [HN15] A patent is statutorily barred and, hence invalid, if the invention was in public use in the United States more than one year prior to the date of the application.

.2 The public use bar is based on a fiat [*136] of Congress that it is part of the consideration for a patent that the public shall begin to enjoy the disclosure as soon as possible.

.3 [HN16] The use of an invention by a person other than the inventor, not essential to the completion of the making of the invention by the inventor, is a public use, and the fact that the invention is buried within a machine is irrelevant.

.4 [HN17] Under limited conditions, where the invention involves the need for public use as the only practical way to test the value of the invention and thereby permit the making of the invention to be completed, the inventor may experiment in public as a special exception to the public use bar.

.5 The experimental exception to public use is a narrow one, and it does not apply in a situation where it is possible to conduct the experiment in private, without the need for public use.

.6 The narrow experimental use exception to the public use bar only lifts the one year statutory rule where the use is by the inventor or persons under his control for the purpose of perfecting the invention.

.7 [HN18] A patentee's Patent Office Rule 131 affidavit which asserts a completion of the invention in the United States before [*137] the filing date of the application fixes the last possible date for "experimental" use.

.8 [HN19] Where there is no question involved of the inventor's determination of whether the invention worked or how it could be improved, and, as well, where the sole purpose of a demonstration is to show new developments in equipment, which have been proved operational, to the public, such use is public, is in bar of a patent and cannot be forgiven as an experiment.

.9 [HN20] Where the idea of a machine has been conceived and the conception carried into effect by its construction, which machine is then used or capable of being used for the purpose for which designed, such use is no longer an experiment.

.10 [HN21] An inventor may not enjoy the best of the two possible worlds of secrecy and legal monopoly: he may not be permitted to use a period of alleged "experimentation" as a competitive tool.

.11 That a device, in public use, is capable of improvement can be said in every case; there are few, if any, machines which are not susceptible of further development and improvement; the fact that a machine has not been ultimately perfected at the time it was first in use does not avoid a public use bar.

[*138] .12 The policy consideration behind the "public use" doctrine is to stimulate seasonable disclosure of inventions. [HN22] A

single public use of a patented machine more than a year before application for patent is filed, even without any profit to the inventor, is sufficient to establish a public use bar.

.13 [HN23] Where a device is publicly demonstrated to members of the public including the press, a compelling inference arises that the demonstration was a public use, was not within the experimental use exception and is a statutory bar to a patent if the demonstration occurred more than one year before an application on the device was filed.

.14 [HN24] Complete identity of the device in public use with the device as claimed in a patent is not necessary to establish a public use bar. The difference between the device used and that patented must be a patentable one to avoid the bar and an inventor cannot relieve himself from the barring consequences of a public use merely by establishing that the device, installed and used, was imperfect.

12.2.4 The machine disclosed and claimed in the ENIAC patent, and embodying the invention of the patent, was on sale in this country more than one [*139] year prior to the filing of the ENIAC patent application, and the ENIAC patent is thereby invalid.

.1 [HN25] A patent shall be barred if the invention was on sale in the United States more than one year prior to the date of the application for patent in the United States.

.2 "On sale" does not mean an actual accomplished sale but merely activity by the inventor in a commercial exploitation of what he later asserts the power to monopolize.

.3 [HN26] An express contract for the construction of equipment embodying the principles of the invention covered by a patent may constitute "on sale" despite the fact that no structure has yet been constructed.

.4 [HN27] For a specific device to be "on sale", it is not necessary that an actual delivery of that device be made but only that the device be ready for delivery.

.5 [HN28] The placing "on sale" of an invention bars all claims to that invention even though the invention may have been imperfect in a mechanical sense at the time.

.6 The "on sale" provision is not limited to a sale free from secrecy, and security classification imposed by the purchaser or offeree does not toll the operation of the bar.

.7 [HN29] A prima facie showing that an [*140] invention was "on sale" can be overcome only by unequivocal and convincing evidence to the contrary.

12.2.5 Eckert and Mauchly did not themselves first invent "the automatic electronic digital computer," which SR and ISD contend to be the subject matter of the ENIAC patent, but instead derived that broad subject matter from Dr. John V. Atanasoff, and the ENIAC patent is thereby invalid.

.1 [HN30] An application for patent shall be made by the inventor, and shall include an oath in support of the claim of inventorship.

.2 A patent which is applied for by one who is not the inventor, is unauthorized by law and void, and whether taken out in the name of the applicant or of an assignee of his, confers no rights as against the public.

.3 The public grants the patent to the first inventor only; and a patent which credits anyone else with the invention confers no rights against the public and does not authorize the purported patentee to tax the industry for that which was actually contributed to the advancement of the arts by the conception of another.

.4 The utilization of ideas in a device prior to the time of the alleged invention, whether or not the device was subsequently [*141] abandoned, is evidence that when those ideas are incorporated in a later development along the same line, they do not amount to invention.

12.2.6 The inventive subject matter of "the automatic electronic digital computer," which SR and ISD contend to be the subject matter of the ENIAC patent, is either anticipated by or obvious in view of the printed publication in this country more than one year prior to the filing of the ENIAC patent application of the von Neumann First Draft of a Report on the EDVAC, and the ENIAC patent is thereby invalid.

.1 [HN31] A patent shall be barred if the invention was described in a printed publication in this or a foreign country, either before the invention thereof by the applicant or more than one year prior to the date of the application for patent in the United States.

.2 The reproduction of a description of an invention by any copy-making technique capable of enabling wide dissemination of multiple copies evidences sufficient accessibility by the public so as to constitute a "printed publication" within the meaning of the statute.

.3 The statute is based upon the public policy that once an invention has been made accessible to the public [*142] through printed publication, it cannot thereafter be withdrawn into a legally sanctioned patent monopoly.

.4 A descriptive document qualifies as a printed publication even where only a single typewritten copy is put on file in the library of a college, because it is the expression of an intent that the fruits of research be available to those of the public who have an interest in the subject matter that is determinative of the fact of publication.

.5 [HN32] Distribution of a small number of copies of a descriptive document to a limited group of individuals skilled in the art, who are outside the distributor's organization, is publication within the meaning of the statute.

.6 [HN33] A patent may not be obtained though the invention is not identically disclosed or described in the prior art, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which the subject matter pertains.

12.2.7 Each of the 17 ENIAC patent claims representatively asserted in this suit by the counterclaim of ISD is further and specifically invalid on a claim-by-claim [*143] basis:

.1 The subject matter set forth in each of the 17 representative claims (8, 9, 36, 52, 55, 56, 57, 65, 69, 75, 78, 83, 86, 88, 109, 122 and 142) was in the public use in this country more than one year before the filing of the ENIAC application.

.2 The subject matter set forth in each of the 17 representative claims was on sale in this country more than a year before the filing of the ENIAC application.

.3 Eckert and Mauchly did not themselves invent the subject matter set forth in at least claims 88 and 90 but instead derived knowledge of that subject matter from John V. Atanasoff.

.4 Claims 83, 86 and 88 are anticipated by U. S. patent No. 2,624,507 issued to Byron Phelps.

.5 Claims 8, 9, 52, 65, 83, 86, 88, 109 and 122 containing the word "pulse," and Claim 36 containing the fully equivalent word "im pulse," were improperly broadened in September 1963 to cover a new and previously unexpressed invention for the purpose and with the effect of encompassing subject matter already in the public domain, and are invalid for late claiming.

.6 Claims 8, 9, 52, 55, 56, 57, 65, 69, 75 and 78 are each anticipated by the printed publication in this country [*144] more than one year prior to the filing of the ENIAC patent application of the von Neumann First Draft of a Report of the EDVAC.

12.3 I find and conclude that the ENIAC is invalid and unenforceable.

12.3.1 See Findings 1, 2, 3, 7 and 10 above as establishing invalidity.

12.3.2 Although not made a basis for a finding of undue delay such as to render the ENIAC patent invalid for deliberately extending the expiration of a monopoly, the inherent consequences of delay in issuance due to six years of inadequate preparation by SR and its counsel in the SR v. BTL case, and thereby the proceedings before the Patent Office as set out at Finding 11 above, render the ENIAC patent unenforceable.

.1 [HN34] Where many persons were at work in the same field and had made advances in the art, and where the applicant learns of such work and is aware that his original claims might not cover the real advance made by his competitors, an intentional delay in the prosecution of the patent to enable later changes in the specification and claims so that the work of the other inventors might be covered, renders the patent invalid.

.2 The patent laws are founded on public policy to promote the [*145] progress of science and the useful arts. The public, therefore, is a most material party to, and should be duly considered in, every application for a patent, securing to the individual a monopoly for a limited time, in consideration for the teaching of the results of the exercise of his genius and skill. But the arts and sciences will certainly not be promoted by giving encouragement to inventors to withhold and conceal their inventions to a time when they may use and apply them to their own exclusive advantage, irrespective of the public benefit, and certainly not if the inventor is allowed to conceal his invention to be brought forward in some later time to thwart and defeat other inventors who have placed the benefit of their inventions within the reach and knowledge of the public.

12.3.3 Although not made a basis for a finding of willful and intentional fraud, the various derelictions of Eckert and Mauchly and their counsel before the Patent Office, as set out at Finding 13 below, render the ENIAC patent

unenforceable.

.1 Whether the applicant's misconduct was material in the procurement of the patent is of no consequence. If the conduct of the applicant is reprehensible, [*146] it matters not that it was really unnecessary, and the patent is unenforceable.

.2 [HN35] There is a line between willful and intentional fraud which will invalidate a patent and inequitable conduct which will render it unenforceable; inequitable conduct on the part of an applicant in obtaining a patent is sufficient to dissuade a court of equity from rendering aid in enforcing it.

13. Fraud on Patent Office

13.1 [HN36] The claim for damages based on claimed violations of the antitrust laws because of willful and intentional fraud on the Patent Office requires proof by clear and convincing evidence.

13.2 Patent proceedings are largely ex parte in nature.

13.2.1 The Patent Act provides:

[HN37] The Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner [*147] shall issue a patent therefor.

Applications for patents shall be kept in confidence by the Patent Office and no information concerning the same shall be given without authority of the applicant or owner unless necessary to carry out the provisions of any Act of Congress or in such special circumstances as may be determined by the Commissioner.

13.3 This has long been an unfortunate situation and should be remedied.

13.3.1 The Patent Reform Act of 1973, introduced on March 22, 1973, by Senator Phillip A. Hart (D-Mich.) of the Patents, Trademarks and Copyrights Subcommittee of the Senate Judiciary Committee, would eliminate ex parte prosecution. In his floor remarks introducing this legislation, Senator Hart said:

The bill recognizes that the patent monopoly grant is a carefully delineated privilege designed to serve the public interest in promoting the progress of science and useful arts and not an unlimited license to the recipient. Let me highlight some of the significant features of the bill.

First, the Patent Office would be made independent divorcing it from the interests of the Commerce Department.

Second, secret ex parte sessions wherein interested [*148] parties and a patent examiner decide the patentability of an idea would be replaced with public adversary hearings.

Third, a Public Counsel would be installed in the Patent Office--to argue for the public interest and to make the Office itself simply judge instead of both judge and advocate.

Fourth, the Patent Office is given subpoena, investigative, and research powers so it may independently, and with great assurance, determine the question of patentability before--rather than after--issuance of the patent.

Currently, the Office relies on information supplied by the applicant. Under the present system, the average patent receives a total of about 15 hours of review.

The new procedures would allow a full airing of the facts and hopefully enable the Patent Office to deny patents that today are being found invalid in the courts in such great numbers.

13.4 To obtain a monopoly which can exact tremendous tribute from the public requires complete candor on the part of applicants and their attorneys.

13.4.1 The Patent Office does not have full research facilities of its own, and it has never been intended by Congress that it should; in fact, the Patent Office [*149] relies heavily upon research by applicants.

13.4.2 [HN38] By reason of the nature of an application for patent, the relationship of attorneys to the Patent Office requires the highest degree of candor and good faith; and in its relation to applicants, the Patent Office must rely upon their integrity and deal with them in a spirit of trust and confidence.

13.4.3 [HN39] Those who have applications pending with the Patent Office or who are parties to Patent Office proceedings have an uncompromising duty to report to the Patent Office fully and fairly all facts which may affect the patentability of the invention; public interest demands that all such facts be submitted formally or informally to the Patent Office, for it is only in this way that the Patent Office can act to safeguard the public in the first instance against illegal patent monopolies.

13.4.4 [HN40] Fraud in the procurement of a patent includes not only [*150] intentional misrepresentations, but intentional concealment of material facts.

13.5 M and E took oaths stating that they were the sole inventors, that there had been no public use of the ENIAC before the critical date, and that the ENIAC was not on sale before the critical date.

13.5.1 One such oath was the oath of June 19, 1947, which was filed with the ENIAC patent application on June 26, 1947.

13.5.2 Another such oath was the oath with the Rule 131 affidavit filed on September 16, 1963, after Eckert and Mauchly had been made aware, in the IBM attempts to institute Patent Office public use proceedings and in the BTL litigation, that the ENIAC machine had been in public use and on sale prior to the critical date.

13.6 M and E knew of the Los Alamos use of the ENIAC, though permission for its use was not asked of them.

13.6.1 Eckert and Mauchly have been aware since 1945 that the Los Alamos calculations were an important and successful use of the ENIAC machine.

13.6.2 Commencing in 1946, lawyers acting in the interest of Eckert and Mauchly have been aware that, when the Los Alamos calculations were put on the ENIAC machine in 1945, it was the first time [*151] that the machine as a whole was being used; that it was fully expected that the problem would be solved; and that it was solved.

13.6.3 Eckert and Mauchly have sworn on behalf of SR and themselves that various ENIAC patent claims were actually reduced to practice at the time of or prior to the use of the ENIAC machine to perform the Los Alamos calculations.

13.6.4 In the brief in BTL interference No. 85,809, submitted in 1954, lawyers for Eckert and Mauchly characterized the Los Alamos calculations as an extensive problem which was successfully worked out on the ENIAC machine.

13.6.5 It was only after the issue of public use of the ENIAC machine had been raised in 1956 and 1959 by the IBM Public Use Petitions that SR reversed the earlier position of claiming reduction to practice at or before the Los Alamos calculations and contended instead that the ENIAC machine and hence the invention it embodied was not reduced to practice until August, 1946.

13.6.6 At the time that SR lawyers drafted affidavits for the signatures of Los Alamos personnel Metropolis and Frankel, which contended that they were not interested in answers to practical problems and had not obtained [*152] any useful results, they had already been otherwise informed by the Los Alamos Laboratory that the calculations were in fact a substantial effort which successfully and satisfactorily solved specified problems and that the results did not lie

dormant.

13.6.7 The use of the ENIAC machine by the Los Alamos Laboratory personnel was not under the control of Eckert and Mauchly.

13.6.8 Eckert, in sworn testimony in interference No. 85,809, was asked if the Los Alamos problem was satisfactorily worked out on the machine. He said:

"Yes.

"The problem consisted of several hundred runs. Each run in itself lasted perhaps 20 minutes. Each of these runs were related to the next run so that the previous run had to be satisfactorily completed before the next run could be undertaken.

"Each run was in fact run twice, the results punched into punch cards, the punch cards put into a reproducer, what is known as a comparing board, and the two runs checked against one another for consistency. Then every few runs a test problem which ascertained that the machine was functioning correctly was also run, so that the problems were in effect tests for self-consistency, errors of a permanent [*153] nature, and errors of an intermittent nature. * * *

"Incidentally, this problem was sufficiently classified that Dr. Goldstine and myself, plus the two men from the other agency who ran the problem, were the only people who were aware of the nature of the problem at the Moore School."

13.6.9 Eckert, in sworn testimony in interference No. 85,809 summarized in SR's interference brief, testified that "the difficulties were not with the machine but with the mathematical nature of the problem and the mistakes of the mathematicians who designed the problem for the machine."

13.7 They appear not to have known of the results obtained.

13.8 In view of their lack of knowledge of the problem solved and the results obtained, they may have acted in good faith.

13.9 M and E knew of the public demonstrations in February 1946, and that problems were put on the ENIAC and solved, but may have acted in good faith in this regard in that the circuit designs were classified.

13.9.1 Army Ordnance sufficiently declassified the ENIAC machine prior to the press demonstration, dedication and open house in February, 1946, in order to give wide-spread publicity to the machine so that [*154] persons interested in such devices would be allowed to know all details in connection with it.

13.9.2 The original 4926 contract, all supplements and change orders thereto, and the ENIAC project were from the inception Government classified "confidential".

13.9.3 The ENIAC and EDVAC projects were still classified "confidential" on October 15, 1945, when a meeting on computing methods and devices was held at the Ballistic Research Laboratory. At the October 15, 1945, BRL meeting, it was stated:

.1 that a number of academic institutions as well as other government agencies were beginning to display the greatest possible interest in new, high-speed computing machines along the lines pioneered by the Ordnance Department;

.2 that in order to be of service to universities and the Navy, as soon as practicable, the ENIAC and EDVAC were to be declassified and all pertinent information on the machines made available to the country at large;

.3 that anything less than a free exchange of information on high-speed computing machines would be detrimental to the best interest of the United States; and

.4 that as soon as the ENIAC was successfully working, its logical [*155] and operational characteristics would be completely declassified, and sufficient publicity would be given to the machine in order that those who were interested in such devices would be allowed to know all details in connection with it.

13.9.4 In a December 7, 1945, meeting on ENIAC and EDVAC at the Ballistic Research Laboratory, it was agreed that the ENIAC would be declassified as soon as possible, and detailed plans were made for the dedication ceremony of the ENIAC machine.

13.9.5 Ordnance Committee Memorandum 29904, which was read for record before the Ordnance Committee on December 20, 1945, reclassified the ENIAC project; on January 4, 1946, a copy of Ordnance Committee Memorandum 29904 was sent to Goldstine by Gillon with the explanation that the item would facilitate existing work on publicity for the ENIAC.

13.9.6 In February, 1946, when Army Ordnance held a press demonstration, dedication and open house of the ENIAC machine, persons attending the ceremonies were allowed, by reason of the reclassification of the ENIAC machine, to view it and its operative parts and units in actual problem solving operation and their questions concerning its performance capabilities [*156] and design principles were answered.

13.10 M and E knew of the running of the Hartree problem, but again were possibly unaware of the results obtained and may thus have acted in good faith.

13.11 M and E were, of course, bound by the actions of their lawyers.

13.12 There appears to have been suppression of the Hartree notes or letters or results by counsel for applicants who appeared before the Patent Office and the District Court.

13.12. 1 In 1961, documents describing details of the Hartree problem were withheld by SR from Bell Telephone Laboratories, and were not offered in evidence before the District Court for the Southern District of New York in SR v. BTL.

13.12.2 On June 24, 1955, SR patent agent Charles English wrote to T. H. Thiemann, in England, seeking his aid in collecting diaries, programming notes, and other such records pertaining to Hartree's 1946 use of the ENIAC machine.

13.12.3 English indicated that this course of action to obtain Hartree's original records was suggested by Hartree "when he discussed the matter with Dr. Mauchly, of this company."

13.12.4 On August 8, 1956, a year after the original inquiry by English, [*157] Hartree wrote to SR's London office enclosing: (a) Hartree's original programming sheets, (b) a page of notes attached to the program sheets which Hartree had written in order to point out how the specific information requested could be found on these sheets and (c) a published paper entitled The Laminar Boundary Layer in Compressible Flow, by W. F. Cope and D. R. Hartree, F.R.S., Royal Society of London Philosophical Transactions, Series A (published June 22, 1948, manuscript received May 13, 1947).

13.12.5 On August 27, 1956, the material which had been sent by Hartree was forwarded to patent agent English by John C. Sims, Jr., or SR, with the suggestion that it be in turn forwarded to one of SR's patent attorneys, William D. Hall, at an early date so that Hall could evaluate it in connection with his work on a Patent Office interference involving the ENIAC patent application.

13.12.6 On April 3, 1958, English forwarded the Hartree letter, original notes, and published paper to Hall, stating that Mauchly believed that the problem which Hartree ran on the ENIAC, and which was described in the Hartree/Cope published paper, had been Problem No. 4 on the ENIAC machine.

13.12.7 [*158] The programming sheets received by SR and Hall from Hartree described how the ENIAC machine was connected in the spring of 1946 to calculate the null-order functions of Hartree's work; the relevant pages of Hartree's published paper to this effect, as sent by him, had been hand marked by Hartree personally.

13.12.8 Since August 8, 1956, to date, SR has been in possession of these materials supplied by Hartree relative to his use of the ENIAC machine before the critical date.

13.12.9 From 1956 to 1963, SR was in litigation with BTL, and Hall was an attorney of record for SR.

13.12.10 In the 1956-63 SR-BTL litigation, the question of whether or not the ENIAC machine had been in public use, so as to bar the issuance of any valid patent, was in direct controversy.

13.12.11 In the SR-BTL litigation, on November 29, 1960, BTL served upon SR and its individual co-defendants, Mauchly and Eckert, a set of interrogatories, including Interrogatories 15 to 20, specifically seeking information with respect to certain problems, including the Hartree problem "No. 4" run on the ENIAC machine.

13.12.12 The answer to Interrogatories 15 to 20 was given and signed on February 17, 1961, by [*159] each of the individuals, Mauchly and Eckert, and an officer of Sperry Rand.

13.12.13 In this answer, SR did not identify either Hartree's published paper as marked by him or his programming sheets and explanatory letter and note, or the correspondence relating to it.

13.12.14 The scope of BTL's Interrogatories 15 to 20 necessarily required the identification of all of these Hartree materials.

13.12.15 On January 14, 1960, Hall filed an opposition brief in the IBM attempted public use proceeding before the Patent Office, attacking the description Goldstine had given of the Hartree problem in an affidavit, although the description was corroborated by the documentation from Hartree then in Hall's possession; Hall charged that Goldstine's description of the Hartree problem was based on hearsay, and that "unfortunately, Hartree is dead, so rebuttal is not easy."

13.12.16 Only certain of the evidence held by SR concerning Hartree's use of the ENIAC machine was placed before Judge Dawson through the affidavits and/or deposition testimony of the following: Herman Goldstine, John Holberton, Frances Holberton, Kathleen Mauchly, Jean Bartik, Homer Spence.

13.12.17 SR's [*160] advocacy against the Hartree work as a public use of the ENIAC machine was made despite knowledge of facts and possession of unproduced relevant documents to the contrary.

13.13 The record may support the running of other problems of use of the ENIAC before the running of problem No. 9 upon which defendants rely as the first problem run and solved.

13.13.1 For example, in addition to Los Alamos and Hartree, Harry Huskey operated the ENIAC machine in April, 1946, as set out under 1.1.7.8 above.

13.14 It appears that attorney Libman, who was primarily responsible for the preparation of the application, knew in November 1946 that the ENIAC had been in public use since December 10, 1945.

13.14.1 Army Ordnance patent attorneys began consideration of filing ENIAC patent applications in early 1944, and worked on application material pertinent to EDVAC and ENIAC intermittently from 1944 through the June 26, 1947, filing date of the ENIAC application.

13.14.2 On February 25, 1944, Eckert and Brainerd met with Gillon and Majors Windham and Ruestow of the Army Ordnance legal branch to discuss the transmittal of detailed disclosure information for the patenting of ENIAC [*161]

project inventions; as a result, the Army Ordnance patent branch undertook the preparation of a patent application to cover inventions made under the 4926 contract.

13.14.3 In August, 1944, further ENIAC/EDVAC meetings between Eckert, Mauchly and the Ordnance patent attorneys were held in Washington, and Army Ordnance patent attorney Horace Woodward began preparation of at least one patent application on the ENIAC machine in September, 1944; by late 1944, Ordnance patent attorneys had prepared at least two patent application drafts on ENIAC/EDVAC subject matter and delivered them to Mauchly.

13.14.4 On June 28, 1945, Max Libman was assigned by Army Ordnance as the attorney to complete the patent applications which had been started by Woodward more than one year before.

13.14.5 Libman was directed to devote his full time to the preparation of the ENIAC application, and to begin "from scratch" without using the parts of the ENIAC application Woodward had previously prepared.

13.14.6 In addition to the Army Ordnance patent attorneys, Libman and Woodward, Eckert and Mauchly's personal patent counsel, George E. Smith, was also given copies of the ENIAC Final Report so [*162] that he could help in preparing the patent application.

13.14.7 In the late fall of 1946, Libman through Kessenich asked the Moore School to supply information indicating when public use of the ENIAC machine began.

13.14.8 The Moore School, in response to the Libman-Kessenich request, informed Army Ordnance and Kessenich, by letter dated November 18, 1946, that successful operation of the ENIAC machine began with the Los Alamos calculations on December 10, 1945.

13.14.9 It would not have been possible for the Army Ordnance Patent Section to have filed the ENIAC patent application prior to December 10, 1946, after receiving the November 18, 1946, answer to the request for public use dates.

13.14.10 Libman nevertheless proceeded on the clearly erroneous assumption that there had been no public use of the ENIAC; he did not interview anyone at the Moore School, or do any further investigating of fact or law but decided there had been no public use on the sole ground that he personally deemed it doubtful that a pilot model of a machine could be in public use.

13.15 Public use was at issue before the Patent Office in two petitions filed by IBM.

13.15.1 One such [*163] petition was filed on July 1, 1946.

13.15.2 The second petition was filed on February 20, 1959.

13.16 The first was ruled to be premature and in the second, after an adverse ruling by the assistant commissioner, no further proceedings were had.

13.16.1 See 13.34.5 and 13.34.25, *infra*.

13.17 The question of public use was also an issue in *SR v. BTL*, but litigated without any kind of a trial.

13.17.1 Although Patent Office proceedings are in general *ex parte*, the ENIAC patent application was involved in numerous adversary proceedings: eleven interferences, IBM's public use petitions, and the litigation with Bell Telephone Laboratories in the U. S. District Court for the Southern District of New York.

13.17.2 The controversy which led to that trial began in the Patent Office in 1952 over the issue of priority of invention between ENIAC and a 1942 BTL automatic electronic digital computer, and ended in the Southern District of New

York with the BTL and SR litigation on the question of public use.

13.17.3 On July 1, 1961, prior to the SR v. BTL trial, Western Electric Company (acting for the Bell System, including BTL) and SR executed a complete cross-license [*164] of all their patents and applications (including EDP patents and patent applications).

13.17.4 The Agreement had the effect of mooting BTL's attack on the validity of Sperry Rand's ENIAC patent application and put BTL in a position in which it had nothing to gain and patent protection to lose by establishing the invalidity of the ENIAC patent.

13.17.5 BTL did not pursue the public use issue vigorously in the SR v. BTL case after the execution of the July, 1961, Agreement; at the time when the question of the public use was submitted in the fall of 1961, BTL had no real or legal interest in establishing public use.

13.17.6 BTL's internal memoranda indicate that it desired to complete the SR v. BTL litigation at the least expense and with the least possible amount of effort; BTL submitted its evidence in affidavits and deposition transcripts with no live testimony in open court.

13.17.7 Most of the volume of the stipulated lated evidence in the SR v. BTL trial did not bear on the public use issue at all, but instead bore on the priority issue which had previously been eliminated from the case by agreement.

13.17.8 After Judge Dawson incorrectly found no public [*165] use on the scanty evidence before him, BTL pursued an appeal to the Court of Appeals for the Second Circuit which dismissed it because the case had been rendered moot by the execution of the patent cross-license between Western Electric and Sperry Rand on July 1, 1961.

13.18 Though I have found that the ENIAC was on sale before the critical date and that M and E attempted its commercialization, it may be that M and E acted in good faith in that they did not know what on sale meant.

13.19 The work of Atanasoff was current and was of great importance to M.

13.19.1 Detailed findings and conclusions concerning the work of Atanasoff and John Mauchly's knowledge of that work have previously been set forth under Finding 3, above.

13.19.2 Prior to his visit to Ames, Iowa, Mauchly had been broadly interested in electrical analog calculating devices, but had neither conceived nor built any electronic digital calculating device.

13.19.3 In a letter dated June 29, 1941, to H. Helm Clayton, John Mauchly described Atanasoff's work, and its relationship to Mauchly's prior thinking, as follows:

"Immediately after commencement here, I went out to Iowa State University [*166] to see the computing device which a friend of mine is constructing there. His machine, now nearing completion, is electronic in operation, and will solve within a very few minutes any system of linear equations involving no more than thirty variables. It can be adapted to do the job of the Bush differential analyzer more rapidly than the Bush machine does, and it costs a lot less. My own computing devices use a different principle, more likely to fit small computing jobs."

13.19.4 After his visit with Atanasoff, Mauchly left his employment at Ursinus College and joined the staff of the Moore School of Electrical Engineering at the University of Pennsylvania.

13.19.5 Mauchly took a short course in electronics at the Moore School and then joined the faculty, during which time he began to consider applying his understanding of the new impulse or digital principles he had been taught by Atanasoff.

13.19.6 On September 30, 1941, Mauchly wrote to Atanasoff from the Moore School:

"A number of different ideas have come to me recently anent computing circuits--some of which are more or less hybrids, combining your methods with other things, and some of which are nothing [*167] like your machine. The question in my mind is this: Is there any objection, from your point of view, to my building some sort of computer which incorporates some of the features of your machine? For the time being, of course, I shall be lucky to find time and material to do more than merely make exploratory tests of some of my different ideas, with the hope of getting something very speedy, not too costly, etc.

"Ultimately a second question might come up, of course, and that is, in the event that your present design were to hold the field against all challengers, and I got the Moore School interested in having something of the sort, would the way be open for us to build an 'Atanasoff Calculator' (a la Bush analyzer) here?"

13.19.7 Dr. Atanasoff responded that, while he had no qualms about having disclosed his ideas to Mauchly, he did not wish to have his concepts made public until adequate steps had been taken to obtain patent protection for his ideas.

13.20 The latter had further contact with Atanasoff in 1944 and invited him to the public demonstrations in February 1946.

13.20.1 The April, 1943, proposal for the ENIAC contract referred to the Atanasoff work, but [*168] did not identify it.

13.20.2 In August, 1944, Eckert and Mauchly visited with Atanasoff on the same day they began the process of filing patent applications involving subject matters which stemmed from Atanasoff's prior work.

13.20.3 The apparent purpose of this visit to Atanasoff in 1944 was to seek his assistance in the perfection of the recirculating delay line memory for EDVAC.

13.20.4 The purpose of Eckert and Mauchly's visit with Ordnance patent lawyers on the same day was to lay plans for making patent claims to ENIAC and EDVAC inventions, including the recirculating memory.

13.20.5 Neither Eckert nor Mauchly disclosed Atanasoff's work to their attorneys prior to filing the ENIAC patent application.

13.21 If Atanasoff had proceeded in 1942 or 1943 to file a patent application, the information in the application would have been available to the Patent Office.

13.21.1 The ABC was described in a definitive manuscript and in a draft patent application specification which was prepared by Clifford Berry but, because it was never filed, the Patent Office had no means by which it could have become aware of the ABC or of Mauchly's prior knowledge of the [*169] ABC.

13.22 Complete candor with and disclosure to the Patent Office is required.

13.23 At the same time, knowledge of the applicant may come from a variety of sources and from many years of education and experience.

13.24 What should be disclosed to the Patent Office as possible sources of invention, prior art or derivation must in some degree be left to the judgment and conscience of the applicant.

13.25 M may in good faith have believed that the monstrous machine he helped create had no relationship to the ABC or Atanasoff.

13.25.1 Mauchly may in good faith have believed that he did not derive the subject matter claimed in the ENIAC patent from Atanasoff. In September, 1944, he wrote a summary of the situation as he then saw it: "I thought(t) his (Atanasoff's) machine was very ingenious, but since it was in part mechanical (involving rotating commutators for switching) it was not by any means what I had in mind".

13.25.2 Atanasoff saw the ENIAC machine as it existed on October 26, 1945, and in early 1946 extensive publicity was given to the ENIAC project, acknowledging Eckert and Mauchly as the inventors, but Atanasoff did not assert that the ENIAC machine [*170] included anything of his until two decades later.

13.25.3 Of the 17 claims of the ENIAC patent at issue in this suit, Honeywell has failed to prove the readability of claims 8, 9, 36, 52, 55, 56, 57, 65, 69, 75, 78, 83, 86, 109, 122 and 142, or any of them, on Atanasoff's machine or any other work of Atanasoff.

13.26 M and E have maintained that they were the sole co-inventors of the ENIAC.

13.26.1 Eckert and Mauchly each signed sworn oaths to that effect on July 19, 1947, and again on September 11, 1963.

13.27 The fact that E directed inquiries to other members of the group or team would indicate that he felt that others had made contributions.

13.27.1 By August, 1945, Eckert and Mauchly informed Army Ordnance patent attorneys that they were the inventors of all inventions arising out of the 4926 contract.

13.27.2 Eckert and Mauchly first designated themselves as co-inventors without the prior consent or knowledge of the University of Pennsylvania.

13.27.3 Ordnance lawyers never questioned this, and never interviewed any other members of the ENIAC team to confirm or alter this representation.

13.27.4 In September, 1944, Eckert, without authority [*171] from the Moore School, wrote letters to each Moore School engineer who participated in the ENIAC design asking each man to identify any features of the ENIAC machine to which he claimed inventorship.

13.27.5 Eckert was not authorized by the Moore School or the University of Pennsylvania to write the letters.

13.27.6 Dr. Brainerd reprimanded Eckert for sending the letter and told Eckert that the letter would be interpreted as a request for a waiver of patent rights as a natural act of loyalty to the Moore School in a cooperative spirit.

13.27.7 At least one of the members of the Moore School team, T. Kite Sharpless, notified Eckert that he believed he had made inventive contributions to the design of the ENIAC machine and to the design of the acoustic delay line memory later used in the EDVAC.

13.27.8 Robert F. Shaw also informed Eckert that he claimed inventorship to some features of the ENIAC machine.

13.27.9 In March, 1946, Sharpless wrote Eckert for a second time indicating that Sharpless still believed himself to be a co-inventor to both EDVAC and ENIAC subject matter.

13.27.10 Army Ordnance patent attorneys were not informed about Sharpless and Shaw's [*172] claims as co-inventors of the ENIAC; Mauchly told Army Ordnance that there were no such claims, and Libman testified that he relied on this representation in prosecuting the application.

13.27.11 None of the Moore School engineers who were members of the team, other than Eckert and Mauchly, were interviewed by Army Ordnance patent attorneys to determine the actual inventorship of inventions embodied in the ENIAC machine.

13.28 It is unfortunate that Sharpless and Shaw and Burks could not testify.

13.28.1 T. Kite Sharpless and Robert F. Shaw were deceased at the time of trial.

13.28.2 Arthur W. Burks was asked to testify by Honeywell, which offered to pay his reasonable expenses, but Burks would agree to testify only to predetermined issues (as outlined in a written "proffert" filed on his behalf by his attorney); no motion to intervene was filed by Burks and the Court accordingly declined to invite him to testify under the conditions expressed.

13.29 M and E did not falsely claim to be the only inventors.

13.29.1 Honeywell has not proven that there were any inventors or co-inventors, other than Eckert and Mauchly, of the subject matter claimed in the ENIAC [*173] patent.

13.29.2 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with any alleged co-inventors of the subject matter claimed in the ENIAC patent.

13.30 The claims anticipated and not anticipated were cited to the Patent Office.

13.30.1 All of the patents relied on by Honeywell as showing anticipation of claims of the ENIAC patent were considered by the Patent Office during the prosecution of the ENIAC patent application.

13.30.2 See 5 and 12 above.

13.31 The First Draft Report, which bars the patent, was referred at one time to the Patent Office and seems to have gotten lost or been misfiled in the Patent Office.

13.31.1 As set out in the Findings under 7 above, it was concluded at the April 8, 1947, meeting, including Eckert, Mauchly and Army Ordnance patent attorneys in attendance, that the von Neumann First Draft Report had been published more than one year prior to the meeting and would bar patents for all material disclosed by the report.

13.31.2 Of the 17 claims of the ENIAC patent at issue in [*174] this suit, Honeywell has failed to prove the readability of claims 36, 83, 86, 88, 109, 122 and 142, or any of them, on the First Draft Report.

13.31.3 On May 20, 1947, before the ENIAC patent application was filed, Army Ordnance patent attorney Kessenich sent the Patent Office a copy of the June 30, 1945, von Neumann report; the transmittal did not indicate that the Army Ordnance Patent Section believed it to be a publication, and did not correlate the publication to any specific patent application or to the contemplated ENIAC application; Kessenich noted in his cover letter to the Patent Office only that the report "may be of interest to those examining divisions which are concerned with this subject matter, particularly Div. 23;" however, the transmittal alone was not sufficient to bring the report before any ENIAC examiner; Church anticipated this result when he told Eckert and Mauchly at the April 8, 1947, meeting that a patent examiner might not find the report for years if it was not brought to his attention.

13.31.4. The von Neumann report was never specifically found and cited by any examiners who dealt with the ENIAC application; nor was it ever brought to the attention [*175] of those examiners by Eckert and Mauchly or their attorneys at any time during the prosecution of the ENIAC application; the report was not included in the lengthy list of prior art cited by Eckert and Mauchly during the only prosecution on the merits, which commenced with the amendment of May 23, 1963; Manny Pokotilow, the patent examiner who conducted the examination of the ENIAC application under pressure during its 1963 amendment and thereafter to its issuance, testified that he never saw the First Draft Report until it was shown to him in the courtroom; the Court credits the Pokotilow testimony.

13.32 Church and Libman knew, or should have known, that the report was a printed publication which barred the patent.

13.32.1 During 1946, von Neumann submitted a copy of his First Draft Report to the Army Ordnance patent attorneys;

Mauchly had been instructed to deliver the report to these attorneys much earlier, but had not done so.

13.32.2 On April 1, 1947, Jules Warshaw of the Moore School staff met with Mauchly and with Kessenich, Church, Libman and Woodward (patent attorneys for Army Ordnance) and told those present about the publication of the First Draft Report: [*176] "I pointed out that this report was unclassified and as such had probably had a general distribution such as to make it a publication in the legal sense."

13.32.3 During the subsequent April 8, 1947, meeting, Church and Libman both agreed that the First Draft Report was a printed publication under the patent statute and would be a statutory bar reference against any application filed thereafter; Church stated at the meeting: "It is our firm belief from the facts that we now have that this report of yours dated June 30, 1945, is a publication * * *." and Libman concurred: "That [the report was unclassified] taken together with widespread distribution there seems to be very little doubt about it"; Eckert agreed: "The publication makes what is in the report public property."

13.33 The fact that the Patent Office had the report may excuse the applicants and their counsel.

13.33.1 Although the First Draft Report was forwarded to the Patent Office, there is no evidence that any examiner responsible for the ENIAC application ever knew of the report, and Examiner Pokotilow had no knowledge of it when the patent was granted.

13.33.2 Contrary to Church's advice at the April 8, 1947, meeting, [*177] Mauchly stated that inasmuch as he and Eckert did not publish or distribute the First Draft Report, they should try to claim whatever they could.

13.34 There is evidence of lack of good faith and candor on the part of counsel for defendants in attempting to frustrate the efforts of IBM and others to obtain documents relating to ENIAC from the Government.

13.34.1 Information which would have otherwise been available from the Government concerning the ENIAC project was withheld at the urging of counsel for defendants from IBM when that company was attempting to institute public use proceedings against the ENIAC patent application. Attorneys for Remington Rand (later SR) served as co-counsel with attorneys for the Ordnance Department, together representing Eckert and Mauchly in Patent Office proceedings, from at least June 20, 1950, onward.

13.34.2 On October 14, 1955, IBM attorney Charles P. Boberg wrote a letter asking that Army Ordnance verify that OCM 29904 declassified the general design principles and the operational and functional characteristics of the ENIAC.

13.34.3 On November 1, 1955, Army Ordnance attorney Thibodeau wrote to Boberg and stated that "your [*178] information regarding the OCM item referred to in your letter is incorrect"; Thibodeau said that it was OCM 31419, dated February 13, 1947, that declassified the ENIAC general principles of design and operational and functional characteristics.

13.34.4 On June 1, 1956, IBM filed a petition for the institution of public use proceedings against the ENIAC application in the U. S. Patent Office; until such public proceedings use should be allowed (which never occurred), IBM had no right to employ any discovery procedures such as are provided in the Federal Rules of Civil Procedure.

13.34.5 On July 18, 1956, the Patent Office dismissed IBM's petition for the institution of public use proceedings filed on June 1, 1956, as premature but without prejudice to a subsequent timely renewal following termination of the pending interference No. 46,576.

13.34.6 On December 19, 1955, IBM asked the Government for copies of contract W-670-ORD-4926, including all supplementary and amendatory papers and any papers evidencing a formal acceptance of the ENIAC by the Government or a transfer of title to the Government.

13.34.7 The 4926 contract (with supplements) established that title [*179] to the ENIAC passed to the Government at the time the machine was completed, that the time for delivery of the ENIAC was never extended beyond December 31, 1945, and that no work on ENIAC was required to be done under the 4926 contract after December 31, 1945.

13.34.8 On January 18, 1956, Boberg stated in a memorandum that IBM needed a copy of the ENIAC contract in order to determine whether or not there was a sale of the ENIAC in the statutory sense more than one year prior to the ENIAC application filing date.

13.34.9 On February 17, 1956, Thibodeau of Ordnance notified IBM that its request for the contract had been considered, but that, in accordance with Army regulations, it was not available for the purpose of assisting IBM in Patent Office proceedings.

13.34.10 On February 2, 1956, IBM requested that Ordnance supply a certified copy of OCM item 29904, dated December 20, 1945.

13.34.11 On February 7, 1956, IBM sent a telegraphic message to Army Ordnance, asking that its February 2, 1956, letter be answered, whereupon Thibodeau informed IBM by telephone that its request for OCM item 29904 was denied.

13.34.12 On February 20, 1956, IBM again wrote Ordnance, [*180] stating that in lieu of item 29904, IBM was willing to accept from Ordnance a statement that, effective 20 December 1945, the general principles of design and the operational and functional characteristics of the ENIAC equipment were unclassified under the authority of OCM item 29904.

13.34.13 On February 28, 1956, a conference was held between Thibodeau and McGee (of Ordnance), and Boberg and Hogan (attorneys for IBM), in which it was pointed out by IBM that, if a dedication to the public of the inventions claimed in the ENIAC application because of public use could be shown, the claims being contested in the IBM-Sperry Rand interferences would fall into the public domain.

13.34.14 On February 20, 1959, IBM, still without the benefit of formal discovery procedures or access to documents filed in other interferences, filed a renewal of its petition for the institution of public use proceedings in the Patent Office.

13.34.15 On June 4, 1959, First Assistant Commissioner Crocker of the Patent Office directed the primary examiner of Division 23 to make a report, following investigation, of whether the documents submitted with the renewal petition made a prima facie showing [*181] of public use of the ENIAC prior to the critical date.

13.34.16 On October 27, 1959, SR attorney Hall notified Army Ordnance that he had retained Thibodeau (the ex-government attorney who had been responsible for denying IBM access to Government documents), and Hall told Army Ordnance that Thibodeau would help SR secure information from Army Ordnance to help SR win any or all ENIAC interferences and public use proceedings connected therewith.

13.34.17 Remington Rand (later SR) had previously retained Libman (at least as early as September 22, 1952) he having been the Army Ordnance attorney who prepared and filed the ENIAC application as attorney for Eckert and Mauchly.

13.34.18 On October 30, 1959, attorney Rotondi of Army Ordnance recommended that Thibodeau, as well as Hall, be permitted free access to all the unclassified Army Ordnance files pertinent to the ENIAC interference and public use proceedings.

13.34.19 On November 2, 1959, Hall prepared an affidavit for signing by George E. Stetson of Army Ordnance for use in the public use proceedings, in which Stetson swore that the absence of documentation on use of the ENIAC machine was of negative significance [*182] to any contention of public use because the use of ENIAC by non-Ordnance

Department personnel would have been accompanied by communications between such parties and Army Ordnance and by other documentation, all of which would be matters of record in the Ordnance Department if such had ever occurred.

13.34.20 The November 2, 1959, SR memorandum in opposition to the IBM renewed public use petition also stated that SR had filed certified copies of actual orders issued by the Army setting forth the military classification of the ENIAC project throughout the entire period in question, even though SR had never filed OCM 29904, and a copy of it had been denied to IBM by Army Ordnance.

13.34.21 On November 5, 1959, A. C. Lazure, an Army Ordnance attorney, stated that SR should be given whatever assistance is available in the files of Ordnance, but that IBM's request for information should continue to be denied.

13.34.22 On November 6, 1959, McGee of Ordnance informed Ostmann, IBM's Washington counsel, by telephone that its request for certified document copies was denied.

13.34.23 On November 12, 1959, Hall recorded in writing his previous advice to Army Ordnance as to [*183] why it should not assist IBM in the Patent Office public use proceeding involving the ENIAC, but rather should assist and make available Government documents only to SR to assure that the ENIAC patent application remained pending and ultimately issued into a patent.

13.34.24 On December 14, 1959, Hall filed a reply memorandum in opposition to the IBM renewed public use petition, pointing out that IBM had been unable to refer to (1) a single leak in the Government's security order, (2) the name of a single person, not under injunction to secrecy, who either received, or had available to him, any information about any novel circuit of the ENIAC, (3) a single practical problem that was put to the machine because someone wanted to know the answer to it, (4) a single answer that was checked and found correct, (5) a single instance in which anybody connected with the project attempted to make a single penny profit from any alleged use of the machine, (6) a single mention of any particular part of the ENIAC allegedly involved in the demonstration, (7) a single allegation, other than hearsay, implying that the machine was beyond the test stage, (8) a single document, indeed not even anything [*184] as big as a postage stamp, showing the structure alleged to be in public use.

13.34.25 On May 26, 1960, First Commissioner Crocker of the Patent Office denied IBM's renewal petition to institute public use proceedings.

13.35 Apparently, eventually some or all of the documents were obtained.

13.36 No effort was made, however, by counsel for defendants to obtain information from the AEC when that agency offered to provide additional information.

13.36.1 The existence of documents and potential testimony concerning the Los Alamos calculations was not revealed to BTL or the District Court for the Southern District of New York.

13.36.2 The ENIAC machine was used between December 10, 1945 to mid-March, 1946, to calculate the solutions to numerical equations relating to studies of the feasibility of hydrogen bomb designs being considered by the Los Alamos Laboratory.

13.36.3 On November 5, 1954, in BTL interference 85,809, SR, in an effort to establish an early reduction-to-practice, represented to the Patent Office:

.1 that the first real problem to be put on the ENIAC was one originating in the Los Alamos scientific laboratories under the atomic energy [*185] project;

.2 that the problem took approximately one month, of which two weeks were actual running time;

.3 that, at the time, the ENIAC machine was a complete and operable calculating instrument;

.4 that there were no difficulties with the machine, but rather any difficulties were with the mathematical nature of the Los Alamos problem, and mistakes of the mathematicians;

.5 that there were no long periods of maintenance or repair shutdown; and

.6 that the general practice was to operate on a continuous basis.

13.36.4 On December 1, 1961, Carroll G. Harper, an associate in the patent law firm of Byerly, Townsend, Watson & Churchill of New York City, which had been retained by SR as counsel for the litigation with BTL, wrote the Atomic Energy Commission, asking for information concerning the Los Alamos problem.

13.36.5 Harper's inquiry of December 1, 1961, was directed to Roland Anderson, Assistant General Counsel for Patents, United States Atomic Energy Commission, Germantown, Maryland.

13.36.6 In his December 1, 1961, letter to Anderson, Harper pointed out that BTL and SR had agreed that evidence would be submitted to the U. S. District Court [*186] for the Southern District of New York largely upon affidavits, depositions and exhibits, all of which were to be submitted and marked in evidence in court on January 19, 1962.

13.36.7 In his December 1, 1961, letter to Anderson, Harper asked the A.E.C. to confirm SR's position that the Los Alamos problem was simply an initial, extremely simplified problem, the results of which could not have been put to any practical use nor could have formed the basis for any design or construction of an actual device, and the results, in any event, lay dormant in the Government files for a number of years.

13.36.8 On December 1, 1961, SR knew of the existence of an official Los Alamos classified report, designated report number LA-525, issued March 2, 1950, and entitled "Ignition of Deuterium-Tritium Mixtures, Numerical Calculations Using the ENIAC," the number, date and title of which were not classified and asked the A.E.C. if it could be declassified.

13.36.9 In addition to writing Anderson on December 1, 1961, Harper also discussed the substance of his request with Anderson by telephone on the same day.

13.36.10 On December 5, 1961, Harper again wrote Anderson, pointing out [*187] that, if report number LA-525 could not be declassified, SR desired to obtain an affidavit from at least one person in an official position at Los Alamos concerning the nature of the relevant ENIAC calculations and what was done with the results, to the extent that secrecy restrictions would permit.

13.36.11 At the request of Anderson, Strausser of the A.E.C. office of classification reviewed report number LA-525 and confirmed that it was not declassifiable in its entirety; at trial it was established that its substance could have been procured on relevant points.

13.36.12 At the request of Anderson, William B. Holton, of the A.E.C. headquarters technical staff in Maryland, with Strausser, studied classified reports describing the Los Alamos problem, and each of them concluded:

.1 that the problem worked on the ENIAC machine by Los Alamos personnel beginning about December, 1945, was not trivial or a mere test problem;

.2 that it was a substantial problem which was successfully and satisfactorily solved;

.3 that the results were useful; and

.4 that the results did not lie dormant.

13.36.13 On December 8, 1961, Holton delivered a handwritten memorandum [*188] to Anderson describing the

nature of the Los Alamos problem, and observing that the facts regarding that problem were directly contrary to the view SR hoped to establish.

13.36.14 On December 13, 1961, Anderson wrote to Harper informing him of the A.E.C.'s position that the Los Alamos work on the ENIAC machine was a substantial effort which successfully and satisfactorily solved specific problems and that the results were useful and did not lie dormant, and offered to establish this position by affidavit.

13.36.15 On the same day, December 13, 1961, Anderson also wrote to Mr. Henry Heyman, Los Alamos Scientific Laboratory, Los Alamos, New Mexico, asking Heyman to ascertain whether or not there was someone at Los Alamos who could make an affidavit as to the work and extent of use of the ENIAC machine on the Los Alamos problem.

13.36.16 On December 18, 1961, Anderson discussed with Harper by telephone the possibility of submitting affidavit evidence concerning the Los Alamos problem; Harper informed Anderson that, based on the information contained in Anderson's letter of December 13, 1961, SR considered that an affidavit "might not be too helpful".

13.36.17 On December 18, 1961, in [*189] his telephone conversation with Anderson, Harper stated that SR and BTL were going to exchange proofs on the following day, although in his December 1, 1961, letter to Anderson, Harper had stated that affidavits were to be submitted in evidence to the court on January 19, 1962.

13.36.18 Meanwhile, at the Los Alamos Scientific Laboratory in New Mexico, in response to Anderson's request of December 13, 1961, Heyman discussed the Los Alamos problem with Dr. Carson Mark in order to obtain the requested information.

13.36.19 On or about January 4, 1962, Mark informed Heyman that the problem run on the ENIAC machine related to the Super (the hydrogen bomb) and was run in the latter part of 1945 and early part of 1946.

13.36.20 On or about January 4, 1962, Mark also informed Heyman that the Los Alamos problem was of a scientific investigative nature and was by no means a simple one, and that the ENIAC machine correctly handled the mathematical processes based upon the information coded into the machine.

13.36.21 Harper's letters of December 1, 1961, and December 5, 1961, as well as Anderson's response of December 13, 1961, have been in the possession of defendant's counsel, [*190] John P. Dority, since 1963.

13.36.22 On June 13, 1968, Honeywell served interrogatories on SR in this action, seeking the identification and ultimate production of all materials in defendant's possession which involved the operation of the ENIAC machine during the time period July 1, 1944 through August 25, 1946, and which were not introduced into evidence in any interference or public use proceeding or in the litigation between SR and BTL.

13.36.23 The Harper-Anderson correspondence was not identified in SR's answers to Honeywell's interrogatories and was not produced for Honeywell until after SR had been given notice, in April, 1970, that Honeywell intended to take the deposition of the custodian of documents at Los Alamos.

13.36.24 On October 16, 1970, Honeywell brought a motion in this action to abrogate SR's claim of privilege as to all materials relating to the Los Alamos problem, this motion having been based in part upon Honeywell's external discovery of the existence of the correspondence between Harper and Anderson which had never previously been produced or identified for either BTL or Honeywell.

13.36.25 Honeywell's motion to abrogate the claim of privilege [*191] with to the Los Alamos problem documents was set for hearing on November 23, 1970.

13.36.26 On November 13, 1970, SR attorney Hall in Washington, D. C. telephoned Anderson to inquire concerning Anderson's December 13, 1961, letter to Harper; Hall was informed by Anderson that the A.E.C. had in its possession

the letter by Heyman dated January 4, 1962, and that the letter was available to him upon written request.

13.36.27 SR did not produce or report its knowledge of the Heyman letter of January 4, 1962, at the November 23, 1970, hearing held before this Court on Honeywell's motion to abrogate the claim of privilege with respect to Los Alamos documents.

13.36.28 The Heyman letter of January 4, 1962, was first made known to Honeywell by SR when it was ultimately produced for the court on December 18, 1970, with the explanation that SR did not have the letter until subsequent to the argument on November 23, 1970.

13.37 Counsel for defendants chose instead to confine the investigation to Metropolis and Frankel.

13.37.1 The Los Alamos Laboratory personnel who performed the calculations with the ENIAC machine at the Moore School, and reported their results to Teller [*192] and others, were Dr. Nicholas Metropolis and Dr. Stanley Frankel.

13.37.2 On or about October 29, 1959, Libman, then in private practice, prepared an affidavit for the signature of Metropolis for use in opposition to the IBM public use petition, wherein Metropolis was to swear that, although he (Metropolis) had a complex problem, he knew it could not be solved on the ENIAC machine and that he visited the Moore School only in the hope of obtaining information about the potentialities of an electronic digital computer.

13.37.3 Metropolis refused to sign the October, 1949, affidavit prepared by Libman, but on November 2, 1959, Metropolis did sign a revised affidavit which had been prepared by SR and which was thereafter filed in the Patent Office.

13.37.4 The revised, November 2, 1959, Metropolis affidavit differed materially from the earlier draft, omitting any reference to the complex problem, except what could be deduced from the newly formulated statement that Metropolis learned about some of the preliminary qualitative features of the physical problems the calculational form of which represented a considerable simplification.

13.37.5 An affidavit purporting to [*193] describe the Los Alamos problem was obtained from Metropolis on January 31, 1962, and filed with the court in the SR v. BTL case.

13.37.6 An affidavit of Frankel was obtained on February 6, 1962, which also purported to describe the Los Alamos problem.

13.37.7 Such affidavits did not state sufficient facts to prevent their conclusory content from being misleading as now appears from the record in this case.

13.38 They may have thus withheld information from the Patent Office and the District Court.

13.38.1 The District Court for the Southern District of New York, based on the limited evidence presented, found that the work done by the ENIAC machine on the Los Alamos problem was highly classified, and (erroneously) that the only two persons who knew the nature of the problem were Metropolis and Frankel, who submitted affidavits that the results were not checked for accuracy, that there were almost certainly some undetected errors.

13.38.2 Because no effort was made to obtain information from the A.E.C., and information may thus have been withheld, all of the essential facts presented at this trial concerning the Los Alamos problem, had not been placed before [*194] Judge Dawson through the limited affidavits and/or deposition testimony of witnesses.

13.38.3 The New York District Court's finding was thus directly contrary to the clear and convincing evidence presented in this action which establishes that the Los Alamos work on ENIAC was in fact a substantial effort which successfully and satisfactorily solved specific problems and that the results were useful and did not lie dormant.

13.39 The Court finds and concludes that despite the various derelictions of M and E, defendants and their counsel that the claim of willful and intentional fraud on the Patent Office has not been proved by clear and convincing evidence.

13.39.1 Honeywell has not proven by clear and convincing evidence any willful and intentional fraud on the Patent Office concerning the ENIAC patent.

13.39.2 Honeywell has not proven that defendants or their predecessors violated the Sherman Act in the filing and prosecution of the ENIAC patent application and/or in the enforcement of the ENIAC patent.

13.39.3 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional [*195] fraud on the Patent Office in connection with the public use of the claimed subject matter of the ENIAC patent.

13.39.4 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with the Los Alamos problem.

13.39.5 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with the February, 1946, demonstration and dedication.

13.39.6 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with Hartree's use of the ENIAC machine.

13.39.7 All of the essential facts presented at this trial concerning the investigation of alleged public use by the attorneys responsible for filing the ENIAC patent application were not placed before Judge Dawson through the deposition testimony of Max L. Libman.

13.39.8 Honeywell has not proven by clear and convincing [*196] evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with the alleged "on sale" condition of the inventive subject matter claimed in the ENIAC patent.

13.39.9 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with the work of Atanasoff.

13.39.10 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with alleged anticipation by prior art patents.

13.39.11 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on the Patent Office in connection with the RCA Reports, the AMP Report and/or the Burks Article.

13.39.12 Honeywell has not proven by clear and convincing evidence that Eckert and Mauchly, their attorneys, successors or assigns, committed willful and intentional fraud on [*197] the Patent Office in connection with the First Draft Report.

13.39.13 Apart from attorney's fees, Honeywell has not proven that it suffered any injury to its business or property by reason of the existence of the ENIAC patent.

13.39.14 Honeywell has not proven that defendants or their predecessors violated the Sherman Act in the filing and

prosecution of the ENIAC patent application and/or in the enforcement of the ENIAC patent against Honeywell.

13.39.15 [HN41] To recover antitrust damages based on alleged fraud in obtaining a patent, the plaintiff must prove (1) willful and intentional fraud, (2) injury to business or property caused by the fraudulently procured patent, and (3) the other elements necessary to a Section 2 Sherman Act violation.

13.39.16 [HN42] Good faith or an honest mistake is a complete defense to an antitrust action based on fraud on the Patent Office.

13.39.17 [HN43] To prove an antitrust violation based on fraud on the Patent Office, the proof of fraud must be by clear, unequivocal [*198] and convincing evidence; a mere preponderance of the evidence is not enough.

13.39.18 "The road to the Patent Office is so tortuous and patent litigation is usually so complex, that 'knowing and willful fraud' as the term is used in Walker, can mean no less than clear, convincing proof of intentional fraud involving affirmative dishonesty, 'a deliberately planned and carefully executed scheme to defraud * * *.'"

13.39.19 " [HN44] A person attacking the validity of a patent for alleged fraudulent representations must prove that the representations were material-that the patent would not have issued but for the representations."

13.39.20 An applicant for a patent need not set up "straw men which he reasonably and in good faith believes he can knock down."

13.39.21 The requirement of "full, frank disclosure * * * does not mean an applicant must list out the full spectrum of his knowledge to establish bona fides."

14. 25 Other Patents and Patent Applications 14.1 These are the so-called 30A patents and patent applications.

14.1.1 Honeywell amended its Amended Complaint (by [*199] Order of Court entered September 19, 1969) to add paragraph 30A, alleging that SR claimed to own or control a "Patent Portfolio" containing issued patents and pending patent applications that are subject to the same types of infirmities as the ENIAC patent, and that the procurement, licensing and attempted enforcement by SR of these additional patents and applications constituted a further part of the originally alleged fraudulent and conspiratorial pattern of conduct by SR in restraint of trade.

14.1.2 Honeywell contends that these applications and patents (hereinafter "the 30A patents and applications") evidence a pattern of conduct calculated to procure and maintain a patent portfolio of dominance over the computer industry, and that the 30A patents and applications have been and are being procured in disregard of the uncompromising duty of fairness and full disclosure to the Patent Office and the courts in patent matters.

14.1.3 During the discovery stage of this lawsuit, SR produced for Honeywell's in spection and copying hundreds of SR patent application files.

14.2 Several have been abandoned, several have expired, and two--BINAC and UNIVAC--are still pending.

[*200] 14.2.1 Honeywell has offered evidence with respect to twenty-five 30A patents and applications to establish SR's pattern of prosecuting applications and procuring patents known to be barred by printed publications, public uses, sales, or other invalidating infirmities.

14.2.1.1 In addition to its charges concerning the ENIAC patent, Honeywell has charged fraud on the Patent Office in connection with two pending patent applications, two abandoned patent applications, and 19 patents (ten of which have expired).

14.2.2 These other patents and patent applications within SR's EDP portfolio are as follows:

EM	Patent No.	Filing	Name	Issue Date
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1973 U.S. Dist. LEXIS 15600, *200; 180 U.S.P.Q. (BNA) 673;
1974 Trade Cas. (CCH) P74,874

No.	or Application No. If No Patent Has Issued	Date		Or Condition If No Patent as Issued
1	2,629,827	10/31/47	Regenerative Memory	2/24/53
8	2,969,478	6/10/49	Electrostatic Storage Memory	1/24/61
14	2,687,473	4/13/50	Cycling Unit	8/24/54
19	2,708,554	7/29/50	Uniservo Tape Unit	5/17/55
19a	3,189,290	7/29/50	Uniservo Tape Unit	6/15/65
19b	2,901,734	7/29/50	Uniservo Tape Unit	8/25/59
20	2,686,299	6/24/50	BINAC Function Table	8/19/54
21	2,600,744	10/21/50	Serial Binary Adder	6/17/52
22	S.N. 179,782	8/16/50	BINAC System	Still pending
23	2,646,501	10/21/50	Unit Adder	7/21/53
25	2,673,293	10/21/50	Serial Binary Full Adder	3/23/54
26	2,655,598	10/21/50	Parallel Binary Adder	10/13/53
27	S.N. 194,112	11/ 4/50	Excess-3 Binary Coded Decimal Adder	Abandoned
28	S.N. 213,072	2/28/51	Parallel Excess-3 Binary Coded Decimal Added	Abandoned
29	2,590,950	11/16/50	Function Table Full Adder	4/1/52
39	S.N. 279,710	3/31/52	UNIVAC System	Still pending
40	2,860,756	3/31/52	Uniprinter	11/18/58
41	2,860,325	3/31/52	Unityper	11/11/58
42	3,133,190	3/31/52	UNIVAC Arithmetic Unit	5/12/64
43	2,781,446	3/28/52	UNIVAC Cycling Unit	2/12/57
44	3,056,947	3/31/52	Card to Tape Unit	10/2/62
48	2,748,270	3/31/52	UNIVAC Clock Gate and Pulse Former	5/29/56
..	2,842,663	6/10/55	Binary Signal Comparator	7/8/58
..	2,915,966	6/13/55	High Speed Printer	12/8/59
..	2,938,193	6/10/55	Binary Signal Encoder	5/4/60

[*201] 14.3 Plaintiff has not been directly charged with infringement of any of the issued patents.

14.3.1 SR has raised no counterclaim in this case charging Honeywell with infringement of any patents, but ISD has raised a counterclaim for infringement of the ENIAC patent.

14.3.2 SR and ISD have represented to this Court that no charge of infringement has been directed against Honeywell

under any patents other than the ENIAC patent.

14.4 Plaintiff claims, however, that these patents and patent applications were referred to as part of defendants' portfolio in the negotiations which preceded this lawsuit.

14.4.1 When Honeywell and other competitors within the EDP industry raised their own patents against SR as trading material to offset ISD's charges of infringement of the ENIAC patent, SR responded by correspondingly raising other patents and pending applications, including its 30A patents and applications, for bargaining purposes in the negotiation of any possible overall cross-license settlement of the ENIAC patent controversy.

14.4.2 For example, ISD had sought a one and one-half percent royalty from National Cash Register Co. (NCR) for license rights under the [*202] ENIAC patent; and in the negotiation for a possible overall cross-license between NCR and SR, including the ENIAC patent being asserted by ISD, SR contended that an equal exchange was inappropriate because additional royalties should be accorded to the weight of its EDP patent portfolio including its 30A patents and applications, over NCR's portfolio.

14.4.3 SR had called over 1000 of its patents to the attention of GE, including the ENIAC patent and its 30A patents and applications, and sought royalties of 8.5 million dollars; SR internally registered doubt as to the enforceability of the ENIAC patent, and estimated that the "Chance of winning in court is less than 50%."

14.4.4 When a one and one-half percent royalty was sought from RCA under the ENIAC patent, SR contended that the rest of its EDP portfolio, including its 30A patents and applications, had "a greater value than the ENIAC patent."

14.4.5 SR and ISD had contended in their negotiations with RCA that SR's portfolio of other patents, including the 30A patents and such 30A applications as BINAC and UNIVAC I, gave SR the "basic position in the systems area."

14.4.6 During negotiations with Honeywell, [*203] SR discussed ten patents from its EDP portfolio, including the EM-1 regenerative memory or '827 patent and the high-speed printer or '966 patent among the 30A group; the fact of the pendency of SR's UNIVAC application, within the 30A group, was also considered, SR contended that its patent portfolio, exclusive of ENIAC but including the 30A patents and applications, was at least as valuable as the entirety of Honeywell's EDP patent rights.

14.5 Plaintiff claims also that they were used as leverage in obtaining the IBM and BTL license agreements.

14.5.1 On August 21, 1956, IBM and Sperry Rand entered into an agreement including:

1. a cross-license under all of their respective EDP and tabulating (TAB) equipment patents and patent applications, including the ENIAC application and the 30A patents and applications;
2. a settlement of all EDP and TAB Patent Office interferences; and
3. an exchange of secret and proprietary EDP and TAB equipment know-how.

14.5.2 BTL and Western Electric entered into a cross-license with SR dated July 1, 1961.

14.6 Plaintiff claims that the fraudulent procurement of the portfolio was part of an overall scheme to monopolize [*204] and restrain trade.

14.7 The emphasis in plaintiff's claim of infirmities is on public use and on sale.

14.8 Other claims rest on derivation from Atanasoff, incomplete application at time of execution, and omission of co-inventors.

14.9 As to publication, plaintiff relies on the First Draft Report (already found to be a printed publication before the critical date) [Findings 7.1-7.1.6 above], the EDVAC report of September 30, 1945, the EDVAC report of June 30, 1946, three lectures of the Moore School lecture series, and the report on the UNIVAC.

14.10 I find that as part of an action in antitrust that plaintiff has standing to assert these claims, that no claims of infringement have been made by defendants on the issued patents, and that defendants have made no demands for royalties on the applications.

14.11 I find that the publications referred to above (In Finding 14.9) were printed publications before the critical dates, that the claims as to public use and on sale before the critical dates have been proved, that the claims as to derivation from Atanasoff as to EM-1 have been proved, that the claims as to incomplete execution have been proved, and that [*205] the claim as to the omission of a certain inventor has been proved.

14.11.1 Publications

The June 30, 1946 EDVAC Report 14.11.1.1 The Progress Report on the EDVAC, dated June 30, 1946, (hereafter called the EDVAC Report) became a printed publication more than one year prior to June 10, 1949, the filing date of the EM-8 application.

14.11.1.2 The Court notes that in prior litigation, SR swore in answer to an interrogatory that the publication date of the EDVAC Report was June 30, 1946.

14.11.1.3 The EDVAC Report was completely declassified on or before February 13, 1947.

14.11.1.4 During the spring of 1947, persons skilled in the computer art were notified about the declassification of the EDVAC Report.

14.11.1.5 The declassification of EDVAC information, such as the EDVAC Report, was widely publicized during March of 1947, including press reports in the New York Times, Philadelphia Bulletin, and Philadelphia Inquirer.

14.11.1.6 By the spring of 1947, Eckert and Mauchly were aware of the declassification of the EDVAC Report.

14.11.1.7 By March 1948, the EDVAC Report had been widely distributed and was available to all persons having an interest [*206] in the computing arts, as a result of its unrestricted classification, its availability to persons attending the 1946 Moore School Lecture Series and its availability in the Library of Congress.

14.11.1.8 By the end of June, 1948, copies of the EDVAC Report were available in the Moore School Library and were being loaned by that library to other institutions, including Johns Hopkins University; a review of the EDVAC Report was published in the January 1949 edition of Mathematical Tables and Other Aids to Computation, and Eckert cited the EDVAC Report in an article (which he co-authored) published in the August 1949 edition of the Proceedings of the I.R.E.

14.11.1.9 In 1957, SR's patent agent, English, who was assigned to an EM-8 interference, withheld the existence of the EDVAC Report from the Patent Office "since it might be used as an anticipating publication against our application EM-8."

14.11.1.10 The stated purpose of the EDVAC Report was to serve as a disclosure to the Patent Office of possibly patentable ideas, and Eckert, Mauchly and defendants' predecessors and lawyers used the EDVAC Report to this end; in October 1946, Eckert and Mauchly asked [*207] for and received permission to inspect the EDVAC Report for the purpose of preparing patent applications; the following applications or patents were derived from portions of the EDVAC Report by Mr. Eltgroth, a patent attorney for Eckert-Mauchly Computer Corporation team (EMCC) and Remington-Rand (RR), both predecessors of SR: EM-21, 23, 25, 26, 27, 28 and 29; two attorneys, Messrs. Eltgroth and

Light, handled the prosecution of each of these patent applications; examples of the correspondence of the EDVAC Report with the applications or patents are hereinafter found and set forth.

14.11.1.11 Figure 1 of the EM-21 patent has a one-for-one relationship in all significant respects to EDVAC Report drawing PY-0-105, described at pages 1-1-2 through 1-1-5 of the EDVAC Report; Figure 1 of the EM-23 patent shows the same circuit, except for immaterial variations, as that shown and described in EDVAC Report drawing PY-0-105 and pp. 1-1-2 through 1-1-5; Figures 5, 6 and 7 of the EM-25 patent show the same circuits as are shown and described in EDVAC Report drawings PY-0-177, PY-0-178 and PY-0-174 and at pp. 1-1-11 through 1-1-13; Figure 2 of the EM-26 patent shows the same circuit as that [*208] shown and described in EDVAC Report drawing PY-0-177 and page 1-111 of the EDVAC Report.

14.11.1.12 During August, 1952, the patent examiner assigned to the EM-27 application located the EDVAC Report unaided by defendants or their attorneys and found that: "This reference [the EDVAC Report] discloses a circuit which is manifestly identical in all respects to the instant alleged invention"; the Court concurs with the examiner's finding; Figure 1 of the EM-27 application shows the same circuit as that shown and described in Report drawing PY-0-108 and pages 1-1-27 through 1-1-29 of the EDVAC Report; RR's attorney prosecuting EM-27, E. J. Light, also concurred, stating that the EDVAC Report was "a publication identical to the disclosure" of EM-27.

14.11.1.13 Figure 1 of the EM-28 application illustrates the same circuit shown and described in EDVAC Report drawing PY-0-181 and pages 1-1-29 through 1-1-30 of the EDVAC Report.

14.11.1.14 Figures 1 and 2 of the EM-29 case were based upon drawings PY-0-101 and PY-0-102 of the EDVAC Report; when the EM-29 application was drawn into an interference (No. 85,958), RR's patent attorney, Light, reported to Eckert and Mauchly that [*209] the adder described in the EM-29 patent was described in the EDVAC Report.

14.11.1.15 Yet RR's attorneys failed to state to the Patent Office at any time during the EM-29 prosecution and interference that the EM-27 examiner had found the EDVAC Report to be a printed publication more than one year prior to the EM-29 filing date.

The Moore School Lecture Series 14.11.1.16 During July and August of 1946, a lecture series was held at the Moore School entitled "Theory and Techniques for Design of Electronic Digital Computers."

14.11.1.17 The lectures were recorded and edited by the respective lecturers for publication, and were published in four volumes between September 10, 1947 and June 30, 1948.

14.11.1.18 These published lectures (hereafter called the "Lecture Series") were made available in the Moore School Library, and Lectures 1 through 48 in fact were checked out by borrowers prior to October 17, 1949; this same Lecture Series was also made available at the Library of Congress on or before November 12, 1948.

14.11.1.19 The following applications or patents were based substantially on portions of the Lecture Series, published before the earliest critical [*210] date of the applications or patents: EM-21, 25 and 26, all filed on October 21, 1950; and EM-28, filed February 28, 1951.

.1 Figure 1 of EM-21 shows the same circuit as that shown and described by Eckert in Lecture 23.

.2 Figure 5 of the EM-25 case is also shown and described by Eckert in Lecture No. 23.

.3 Figure 1 of the EM-26 case is derived from Figure 6 of Lecture No. 46, and Figure 2 of EM-26 shows the same circuit shown and described in Lecture 23.

.4 The alleged invention of EM-28 is shown and described in Lecture No. 46; this is the case in which the examiner found the published Lecture and rejected the application, stating: "Claims 1-7 are rejected as fully met by the Moore

School Publication"; RR did not contest the rejection, but instead abandoned the case.

14.11.1.20 By summer of 1949, more than one year before Eckert and Mauchly filed EM-21, 25, 26 or 28, they both were aware that the published Lecture Series was publicly available; Mauchly observed as much to his attorney Eltgroth, writing, on May 2, 1949, that as a result of the published review of the Lecture Series "a larger segment of the public will now be aware of their existence. I believe [*211] that these lectures should be on file in the patent department"; Mauchly also noted in the same communication that the publication announced the "availability of the lecture course" and "that these lectures are now available at \$ 5.00 per volume as long as the supply holds out."

14.11.1.21 Of the EM-21, 25, 26 and 28 applications, only EM-28 failed to issue because the EM-28 examiner found the published Lecture Series on his own initiative and rejected the application "as fully met by the Moore School Publication [Lecture No. 46] cited above"; however, the examiners of the EM-21, 25 and 26 applications (all of which ultimately issued as patents) failed to find the published Lecture Series, and defendants' predecessors' attorneys, Eltgroth and Light, did not inform those examiners about the Lecture Series or the rejection of the EM-28 application thereon.

The First Draft Report 14.11.1.22 In addition to the barring of the valid issuance of the ENIAC patent, the publication of the von Neumann First Draft Report also anticipates the claims of the EM-1 patent No. 2,629,827 entitled "Regenerative Memory."

The Report on the UNIVAC 14.11.1.23 During the fall of 1947, [*212] Eckert and Mauchly submitted under contract to the Bureau of Standards a Report on the UNIVAC. This report discussed all phases of a proposed UNIVAC computer and included many detailed schematic diagrams of circuits to be employed in the UNIVAC computer.

14.11.1. 24 In 1947 and 1948, copies of the Report on the UNIVAC were widely distributed and effectively "published" with the knowledge and consent of high-ranking officers of SR's predecessor, the Eckert-Mauchly Computer Corporation (EMCC); the distribution included: making the report available to the Prudential Insurance Company; circulating the Report, according to Mauchly, "rather widely through governmental agencies"; and making the Report available at the library at Harvard University.

14.11.1.25 An employee of EMCC, Isaac Auerbach, assessed the widespread distribution of the Report in an April 8, 1948 memo, stating with respect to a suggestion to limit its further reproduction: "What a laugh at this late date! * * * Our report has already received widespread circulation."

14.11.1.26 During April 1948, EMCC requested an opinion from its patent attorneys, Busser and Harding, about the steps which it [*213] might take to call in copies of the Report on the UNIVAC which the Bureau of Standards had already published.

14.11.1.27 With regard to the testimony of McPherson (a disinterested non-party witness) and Mauchly relating to Mauchly's statement to McPherson that the Report on the UNIVAC was studied at the Harvard University Library, the Court finds McPherson credible.

14.11.1.28 SR and ISD admit that the Report on the UNIVAC was made available to Prudential; on October 12, 1948, EMCC was informed by Cannon of the Bureau of Standards that the Report on the UNIVAC shall be "available to all governmental agencies requesting it, unless you [EMCC] can furnish us with a sound reason for refusing the request"; EMCC replied that it had no such objection; on July 8, 1949, attorney Eltgroth informed Mauchly that the Report "will be available on a reciprocal basis to parties having a legitimate interest therein."

14.11.1.29 Many patent applications describing the UNIVAC computer were filed by RR. These applications are anticipated by the Report on the UNIVAC which provided a detailed description of the same UNIVAC computer. These applications include EM-14 (filed April 13, 1950), [*214] and EM-39 through 44 and 48 (all filed March 31, 1952, except EM-43, filed March 28, 1952).

14.11.1.30 RR's patent attorney, Eltgroth, admitted that the computer described in the EM-22 application is disclosed in the Report on the UNIVAC, stating that "the computer described in that application [EM-22] is operable and embodies all the essential material of the study report"; Eltgroth earlier indicated that "applications have been filed or are now being filed for a considerable portion of the inventive material disclosed in these reports * * *"; while Eltgroth went on to conclude that the reports had not been published, the Court finds that this was not correct.

14.11.1.31 SR admits that the EM-20 application purported to cover the encoding and decoding function tables used with the BINAC system shipped to Northrop during 1949; in order to prove prior inventorship, Eckert filed an affidavit claiming such an invention prior to May 6, 1948, and supported the affidavit with drawing D69-1077 entitled "Tank Selector Circuit of Memory Switch"; this drawing was a part of the Report on the UNIVAC; the subject matter of EM-20 is disclosed in, and therefore anticipated by, the Report [*215] on the UNIVAC but such Report was not brought to the attention of the EM-20 examiner by defendants or their predecessors.

14.11.1.32 SR has admitted that the subject matter claimed in the EM-39 through 44 and 48 applications was embodied in the Census UNIVAC system turned over to the U. S. Census Bureau during March, 1951; the Report on the UNIVAC described the Census UNIVAC system in comprehensive detail; there were some changes made to the Census UNIVAC system after the Report was made; however, these changes do not materially affect the Report's disclosure of the subject matter of EM-39-44 and 48; in view of the foregoing, the Court finds that the Report on the UNIVAC anticipates the EM-39 application and the EM-40-44 and 48 patents.

14.11.2 Public Use and On Sale

14.11.2.1 Eckert, Mauchly, and EMCC placed an electrostatic information storage system claimed in the EM-8 application and patent in public use and on sale in the United States more than one year prior to the application filing date.

14.11.2.1.1 During January, 1948, EMCC demonstrated to personnel of the U. S. Bureau of Standards and the U. S. Bureau of Census a model of an electrostatic information [*216] storage system which Eckert and Herman Lukoff had built.

14.11.2.1.2 During January, 1948, the electrostatic information storage system was demonstrated to Standards and Census personnel, including Messrs. Cannon and Alexander, to induce them to enter into a contract with EMCC for the purchase of a UNIVAC computer.

14.11.2.1.3 During the demonstration, the storage system was operated, and Cannon and Alexander observed the memory effects achieved by the storage system.

14.11.2.1.4 During the period of time in which EMCC was demonstrating the electrostatic information storage system, it was negotiating with the Bureau of Standards for additional contracts to develop a computer having an information storage system.

14.11.2.1.5 The demonstration of the electrostatic information storage system for the commercial purpose of inducing Standards and Census officials to enter into a contract to develop a computer put the system on sale and in public use.

14.11.2.1.6 On June 10, 1949, Eckert filed an application describing the electrostatic information storage system demonstrated during January, 1948, designated Case EM-8, that resulted in U. S. Patent No. 2,969,478 (the [*217] '478 Patent).

14.11.2.1.7 On June 10, 1949, Eckert knew that subject matter claimed in the EM-8 application was embodied in the electrostatic information storage system demonstrated to Bureau of Standards personnel during January, 1948.

14.11.2.2 EMCC placed a binary adder claimed in the EM-14 application and patent in public use and on sale in the

United States more than one year prior to the application filing date.

14.11.2.2.1 By December 23, 1947, EMCC had built a demonstration model of a binary adder of the type described in a Report on the UNIVAC.

14.11.2.2.2 The binary adder demonstration model also comprised a cycling unit in the form of a test word generator that generated pulses representing numbers for the binary adder to count.

14.11.2.2.3 On or about December 23, 1947, Mauchly informed the Bureau of Standards that it was possible to demonstrate the binary adder model.

14.11.2.2.4 During January, 1948, a large number of people from the U. S. Bureau of Census and the U. S. Bureau of Standards visited EMCC and observed demonstrations of the binary adder model.

14.11.2.2.5 During March, 1948, the binary adder model was publicly demonstrated [*218] by EMCC to numerous persons at a convention of the Institute of Radio Engineers held in New York, New York.

14.11.2.2.6 The purpose of the demonstrations of the binary adder model was to interest the viewers in the purchase of the BINAC or UNIVAC computers then being developed by EMCC.

14.11.2.2.7 The demonstrations of the binary adder model put the subject matter of the model in public use and on sale in the United States.

14.11.2.2.8 On April 13, 1950, Eckert filed an application designated Case EM-14 that resulted in U. S. Patent No. 2,687,473 (the '473 Patent).

14.11.2.2.9 The binary adder demonstration model included apparatus essentially the same as the apparatus described and claimed in the EM-14 application and patent.

14.11.2.2.10 On April 13, 1950, Eckert knew that the binary adder model had been publicly demonstrated during March 1948, and that the test word generator of the adder was essentially the same as the apparatus described and claimed in the EM-14 application.

14.11.2.3 EMCC placed the BINAC computer claimed in the EM-22 application in public use and on sale in the United States more than one year prior to the application filing date.

[*219] 14.11.2.3.1 During October 1947, Electronic Control Company, a partnership of Eckert and Mauchly and a predecessor of EMCC and SR, entered into a contract to manufacture and sell a BINAC computer system to Northrop Aircraft, Inc.

14.11.2.3.2 The BINAC computer system consisted of two identical BINAC computers capable of simultaneous and independent operation upon the same problem in such a way that their reliability could be tested by direct comparison of their outputs.

14.11.2.3.3 Beginning in late August, 1948, EMCC periodically offered BINAC computers for sale and demonstrated the Northrop BINAC computers to prospective customers, thereby putting subject matter embodied in each Northrop BINAC computer on sale and in public use in the United States.

14.11.2.3.4 On or about August 12, 1948, the production of the first Northrop BINAC computer was complete.

14.11.2.3.5 On or about September 9, 1948, the production of the second Northrop BINAC computer was complete.

14.11.2.3.6 On September 10, 1948, Mauchly, president of EMCC, offered to sell to the University of Illinois a BINAC

computer identical to the Northrop BINAC computers.

14.11.2.3.7 Eckert [*220] was informed at the time about this offer to sell a BINAC computer to the University of Illinois.

14.11.2.3.8 During November, 1948, a Northrop BINAC computer was demonstrated to representatives of the U.S. Air Controllers Office and the Council of Economic Advisors to the President of the United States.

14.11.2.3.9 During the spring of 1948, EMCC asked for and received permission from Northrop to demonstrate the Northrop BINAC computers to additional prospective customers.

14.11.2.3.10 During the spring and summer of 1949, prior to August 16, 1949, the Northrop BINAC computers were demonstrated to many potential customers by EMCC for the purpose of selling computers.

14.11.2.3.11 Prior to August 16, 1949, visitors at the EMCC plant viewed the same type of BINAC demonstrations later given to the press and invited guests at public demonstrations held during the third week of August, 1949.

14.11.2.3.12 One of the demonstrations involved the solution of a Poisson equation which was a real and practical problem.

14.11.2.3.13 Prior to August 14, 1949, the purpose of the BINAC demonstrations to visitors was to sell computers.

14.11.2.3.14 During the BINAC [*221] demonstrations to visitors, the entire EMCC plant was used as "a gigantic salesroom."

14.11.2.3.15 During the demonstrations, the engineers employed by EMCC cooperated with the attempts of management to sell computers.

14.11.2.3.16 The engineers gave the potential customers any information they wanted about the Northrop BINAC computers.

14.11.2.3.17 During May, 1949, a Northrop BINAC computer was demonstrated to representatives of Hughes Aircraft Company in an attempt to sell Hughes a computer.

14.11.2.3.18 During the week of June 12, 1949, the Northrop BINAC computer system was visited by R.A. Meagher of the University of Illinois.

14.11.2.3.19 During July, 1949, a Northrop BINAC computer was demonstrated to representatives of Fairchild Engine and Aircraft Corporation in an attempt to sell Fairchild a computer.

14.11.2.3.20 On or about July 27, 1949, a Northrop BINAC computer was demonstrated to representatives of A.C. Neilsen Company for commercial purposes.

14.11.2.3.21 Prior to August 16, 1949, EMCC received \$ 20,000 for demonstrating a Northrop BINAC computer to the Prudential Insurance Company of America (Prudential) and for making drawings [*222] and specifications of the BINAC computer available to Prudential.

14.11.2.3.22 During December, 1948, EMCC agreed to sell a computer to Prudential on the condition that it be paid \$ 20,000 for disclosing and demonstrating a binary computer to Prudential.

14.11.2.3.23 In order to receive the \$ 20,000 payment, EMCC made available to Prudential complete drawings of a Northrop BINAC computer.

14.11.2.3.24 In order to receive the \$ 20,000 payment, a Northrop BINAC computer was demonstrated to representatives of Prudential on July 29 and August 2, 1949.

14.11.2.3.25 On or about August 3, 1949, EMCC received the \$ 20,000 payment for disclosing and demonstrating a Northrop BINAC computer to Prudential in accordance with the December, 1948 Agreement.

14.11.2.3.26 On August 16, 1950, Eckert and Mauchly filed U.S. Application Serial No. 179,782, still pending, designated Case EM-22, that purported to describe and claim one of the two identical Northrop BINAC computers.

14.11.2.3.27 On August 16, 1950, Eckert and Mauchly knew that a BINAC computer had been offered for sale to the University of Illinois in September, 1948, and that the Northrop BINAC computers had [*223] been demonstrated to potential customers in the Eckert-Mauchly Computer Corporation plant-sales-room on numerous occasions prior to August 16, 1949.

14.11.2.4 EMCC placed a selecting network incorporated in the Northrop BINAC Computer System and described and claimed in the EM-20 application and patent on sale in the United States more than one year prior to the application filing date.

14.11.2.4.1 On June 24, 1950, Eckert filed an application, designated Case EM-20, that resulted in U.S. Patent No. 2,686,299.

14.11.2.4.2 The EM-20 application described and claimed the encoding and decoding function tables used in the Northrop BINAC computers.

14.11.2.4.3 On June 24, 1950, Eckert knew that subject matter claimed in the EM-20 application covered equipment used in the Northrop BINAC computers and that a BINAC computer identical to the Northrop BINAC computers was offered for sale to the University of Illinois during September, 1948.

14.11.2.5 EMCC placed a UNISERVO tape drive and recording device described and claimed in the EM-19 application and patent in public use and on sale in this country more than one year prior to the application filing date.

14.11.2.5.1 [*224] EMCC entered into a Purchase Agreement with Prudential, dated December 8, 1948, for the sale of a UNIVAC system including 12 UNISERVO tape drive and recording devices.

14.11.2.5.2 On May 5, 1949, representatives of Prudential witnessed a demonstration of the UNISERVO device at the EMCC plant and expressed satisfaction with the device.

14.11.2.5.3 On or about May 5, 1949, Eckert was notified that the UNISERVO device had been successfully demonstrated to Prudential, and that EMCC would receive \$ 20,000 for having completed the apparatus.

14.11.2.5.4 On or about May 6, 1949, Prudential accepted a UNISERVO device as complying with Exhibit C of the December 8, 1948 Agreement and paid EMCC \$ 20,000 for having completed the UNISERVO device, thereby placing the UNISERVO device on sale and in public use.

14.11.2.5.5 On July 29, 1950, Eckert filed an application, designated Case EM-19, describing and claiming the UNISERVO device accepted by Prudential in May 1949.

14.11.2.5.6 Preparations for the May, 1949, UNISERVO demonstration received priority from EMCC, because completion of the demonstration would generate income for the corporation.

14.11.2.6 SR's predecessor [*225] placed a Census UNIVAC System described and claimed in the EM-39--EM-44 and EM-48 applications and patents on sale and in public use in the United States more than one year prior to the application filing dates.

14.11.2.6.1 During 1948, EMCC entered into an agreement to sell a UNIVAC System (hereinafter the Census UNIVAC System) to the U.S. Government for use by the U.S. Census Bureau; the Census UNIVAC System included a UNIVAC Computer, a UNIPRINTER, a UNITYPER, a CARD-TO-TAPE CONVERTER and other UNIVAC equipment.

14.11.2.6.2 By February 2, 1951, the Census UNIVAC System was completely assembled and under test.

14.11.2.6.3 Prior to March 28, 1951, the Census UNIVAC System was demonstrated to a continual flow of potential customers in the EMCC plant for the purpose of selling UNIVAC Systems.

14.11.2.6.4 During the demonstrations, there was every intent to make the customers aware of the capabilities of the UNIVAC system and there were no orders for secrecy.

14.11.2.6.5 Prior to March 28, 1951, Dr. Albert Auerback programmed the Census UNIVAC System to solve a genetics problem which was run on the Census UNIVAC System as a demonstration for visitors; the program [*226] for solving the genetics problem was of the type actually used in genetics field work.

14.11.2.6.6 Prior to March 15, 1951, SR's predecessor turned over the Census UNIVAC System to the U.S. Government for acceptance testing, thereby placing the system on sale.

14.11.2.6.7 While the acceptance tests were being planned, the Census Bureau dealt with employees of RR.

14.11.2.6.8 There was general agreement between the U.S. Government and RR that passage of any acceptance test meant that the corresponding equipment became the property of the U.S. Government.

14.11.2.6.9 UNIVAC System Test A was passed March 15, 1951; the UNIPRINTER acceptance test was passed during the period of time from March 19 through March 25, 1951; the CARD-TO-TAPE Unit acceptance test was passed and the CARD-TO-TAPE unit was accepted for payment by at least March 27, 1951; UNIVAC System Test B was passed March 30, 1951, thereby completing the last of the acceptance tests.

14.11.2.6.10 Beginning at least by March 20 or March 21, 1951, Census Bureau employees commenced work on actual Census tabulations using the Census UNIVAC System.

14.11.2.6.11 On March 31, 1951, after all the acceptance [*227] tests had been passed, the Census Bureau employees just continued to do the same type of tabulations they had been doing before with the help, permission and assistance of employees of SR's predecessor.

14.11.2.6.12 By turning the Census UNIVAC System over to the U. S. Government for acceptance testing, SR's predecessor put the system on sale.

14.11.2.6.13 On March 28, 1952, Eckert filed an application describing the Census UNIVAC System Pulse Cycling Circuit, designated Case EM-43 that resulted in U. S. Patent No. 2,781,446.

14.11.2.6.14 On March 31, 1952, Eckert filed application Serial No. 279,710 (EM-39), still pending, and other applications describing various portions of the Census UNIVAC System designated cases EM-40, EM-41, EM-42, EM-44, and EM-48, that resulted in U. S. Patent Nos. 2,860,756; 2,860,325; 3,133,190; 3,056,947; and 2,748,720.

14.11.2.6.15 Subject matter claimed in each of these applications and patents was embodied in the Census UNIVAC System.

14.11.2.6.16 On March 28 and March 31, 1952, Eckert was aware that the Census UNIVAC System had been sold to the U. S. Government under a contract executed in 1948, that the System had been turned [*228] over to the U. S. Government for acceptance testing by March 15, 1951, that the System had been used by Census Bureau employees to run census tabulations prior to March 28, 1951, and that the UNIPRINTER and CARD-TO-TAPE Units had been

accepted for payment by the U. S. Government prior to March 28, 1951.

14.11.2.6.17 The Census UNIVAC System was on sale and in public use in the United States prior to March 28, 1951.

14.11.2.7 SR's predecessor placed a high-speed printer described and claimed in U. S. Patent Nos. 2,842,663; 2,915,966 and 2,938,193 on sale and in public use in the United States more than one year prior to June 10, 1955, the earliest filing date of the applications resulting in these patents.

14.11.2.7.1 Prior to March 31, 1954, units of the high-speed printer were delivered for installation in customers' offices, thereby putting the high-speed printer on sale and in public use.

14.11.2.7.2 The high-speed printer claimed in U. S. Patent Nos. 2,842,663; 2,915,966 and 2,938,193 was placed on sale and in public use prior to March 31, 1954.

14.11.3 Subject matter claimed in the EM-1 patent was derived from Atanasoff.

14.11.3.1 On October 31, 1947, Eckert [*229] and Mauchly filed an application describing various memory systems, designated case EM-1, that resulted in U. S. Patent No. 2,629,827 (the '827 patent).

14.11.3.2 Subject matter claimed in the EM-1 application as the joint invention of Eckert and Mauchly was disclosed to Mauchly by Atanasoff in June of 1941.

14.11.3.3 In one embodiment of the EM-1 application, information is stored in a coded sequence of pulses, the pulses being temporarily recorded on a rotating carrier as electrostatic charges, carried by rotation to another station where they give rise to electrical potential pulses which are handled through an external feedback circuit for replacement or reinforcement of the pulses on the carrier.

14.11.3.4 This subject matter as claimed in the '827 patent was anticipated by the disclosure contained in the Atanasoff manuscript disclosed to Mauchly.

14.11.3.5 Atanasoff's concept of the recirculating or regenerative memory was used in the EDVAC program, with Atanasoff's rotating electrostatic charge carrier being replaced by the recirculation of pulses through an electrical delay line; this delay line version of a recirculating memory was disclosed in the EM-1 [*230] application as an embodiment of Eckert and Mauchly's invention.

14.11.3.6 The Atanasoff electrostatic charge version of a recirculating memory was also disclosed in the EM-1 application as yet another embodiment of Eckert and Mauchly's alleged invention.

14.11.3.7 In October 1953, after the '827 patent was granted on the EM-1 application, Eckert stated that prior to 1942, Atanasoff had developed what was probably the first example of what could generally be termed regenerative memory; Eckert's knowledge of Atanasoff's prior work was based on what Mauchly had earlier told him.

14.11.3.8 On April 1, 1964, SR charged Control Data Corporation with infringement of the '827 patent (EM-1).

14.11.3.9 On February 2, 1965, SR charged Potter Instrument Company with infringement of the '827 patent (EM-1).

14.11.3.10 SR also called the '827 patent (EM-1) to other computer manufacturers' attention, including Honeywell, as a part of its basic EDP patent portfolio.

14.11.4 Incomplete Execution of the EM-14 and EM-22 Applications.

14.11.4.1 Albert Auerbach, an engineer formerly employed by EMCC, was misled by the legal department of SR's predecessor into signing the [*231] EM-14 oath of inventorship without being given an opportunity to determine what

was claimed in the EM-14 application; Auerbach was not provided with the claims of the EM-14 application before he was asked to sign and did sign the EM-14 application oath; as of September 10, 1971, Auerbach had never seen the claims filed with the EM-14 application.

14.11.4.2 Albert Auerbach and Wilson, another engineer formerly employed by EMCC, were misled by the legal department of SR's predecessor into signing the EM-22 oath of inventorship without being given an opportunity to determine what was claimed in the EM-22 application; neither Auerbach nor Wilson was provided with the claims of the EM-22 application before each was asked to and did sign the EM-22 application oath.

14.11.5 Co-inventor omitted from the EM-43 patent.

14.11.5.1 Part of the subject matter claimed in the EM-43 patent was invented by Paul Winsor who was not named therein and whom the Court finds to be a credible witness.

14.11.5.2 Paul Winsor invented some of the apparatus described and claimed in the EM-43 patent.

14.11.5.3 Paul Winsor invented the 27 Pulse Delay Line arrangement shown in Figures 5 and [*232] 13 of the EM-43 patent.

14.12 In view of the statement by plaintiff that the Court need not decide that any individual patent is invalid, I make no such finding of invalidity.

14.12.1 Honeywell has stated that the Court need not decide that any of these 30A patents and applications is invalid.

14.12.2 Accordingly, the Court expresses no opinion on the technical validity or invalidity of these 30A patents and applications and confines itself to the questions of unenforceability of the 30A patents issued and pending as against Honeywell, and whether Honeywell has proven a Sherman Act violation based on alleged willful and intentional fraud on the Patent Office concerning these patents and applications.

14.13 I find disturbing the fact that with the rejection and abandonment of EM-27 based on the June 30, 1946 EDVAC Report the applicants or their counsel did not call this report to the attention of other examiners in Division 23.

14.13.1 The EM-21, 23 and 25-29 patent applications all were prepared from the EDVAC Report by attorney Eltgroth who represented SR's predecessors.

14.13.2 The earliest of the EM-21, 23 and 25-29 applications to be filed was not [*233] received by the Patent Office until October 21, 1950.

14.13.3 The EM-27 and EM-28 applications were both assigned to Division 23 of the Patent Office for examination; the EM-21, 23, 25, 26 and 29 applications were assigned to Division 51 of the Patent Office for examination.

14.13.4 Attorneys for SR's predecessors, Eltgroth and Light, handled all the prosecution of these applications.

14.13.5 Through his own efforts, the EM-27 patent examiner in Division 23 uncovered the EDVAC Report and found that the EDVAC Report was a printed publication within the meaning of the patent statute prior to October 21, 1949, thereby barring patent protection for the EM-27 application.

14.13.6 This finding of the EM-27 examiner was agreed to by Light and was confirmed by information from RR's ERA subsidiary and from Libman; nonetheless, an amendment attempting to eliminate the report as a reference was filed.

14.13.7 A second examiner repeated the rejection, affirmed the finding that the EDVAC Report anticipated EM-27, and stated that the materials submitted with the amendment were "incomplete and consequently misleading"; no further action was taken and EM-27 was abandoned.

[*234] 14.13.8 After the critical nature of the EDVAC Report had been pointed out to them by the EM-27 examiner, Light and Eltgroth continued prosecution of the EM-23, 25, 26 and 29 applications which Eltgroth had based directly on the anticipatory EDVAC Report.

14.13.9 The EM-21, 23, 25, 26 and 29 applications were handled by examiners outside Division 23 who did not locate and cite the EDVAC Report against these applications; there is no evidence that these examiners were aware of the EDVAC Report; neither Eltgroth nor Light informed such examiners about the EDVAC Report or of the EM-27 examiner's adverse ruling based on the EDVAC Report.

14.13.10 When the EM-29 patent was drawn into an interference, Light and Eltgroth relied on the EDVAC Report to establish prior inventorship but withheld information which they had of the fact of the Report's publication.

14.13.11 Light and Eltgroth relied on the EDVAC Report as proof of invention of EM-28, but withheld information about the fact of its publication and the EM-27 examiner's prior adverse ruling based on it; despite the reliance upon the EDVAC Report as a publication by the EM-27 examiner, Light and Eltgroth submitted [*235] an affidavit to the EM-28 examiner to antedate and avoid a prior art reference cited in the EM-28 case; in the affidavit in this respect, Eckert and Mauchly attempted to establish prior invention by relying on a drawing copied from the EDVAC Report; the EM-28 examiner was never told, however, that the EDVAC Report had already been found to be a printed publication by the EM-27 examiner in Division 23.

14.13.12 Based on the affidavit, the EM-28 examiner withdrew his rejection and relied instead on another prior art reference (Moore School Lecture Series No. 46) as anticipating all claims of the EM-28 case; this was on June 16, 1953, and Eckert and Mauchly and RR then abandoned the EM-28 application.

14.13.13 The published Moore School Lecture Series also anticipated cases EM-21, 25 and 26; yet, even after the fact of publication was established by the EM-28 examiner, Eckert and Mauchly's attorneys continued to withhold knowledge of the Lecture Series from one Division 51 examiner handling EM-25 and from another Division 51 examiner handling EM-26.

14.13.14 EM-21 had already issued when the EM-28 examiner uncovered the published Lecture Series; however, neither Eckert [*236] nor Mauchly nor their successors have ever made any attempt to call the published Lecture Series to the attention of the Patent Office in connection with the EM-21 patent or to dedicate or disclaim the patent or any portion thereof.

14.14 I find and conclude that as yet defendants have threatened no harm to plaintiff, that plaintiff has not proved injury, that plaintiff has failed to prove willful and intentional fraud on the Patent Office by clear and convincing evidence, and that plaintiff has failed to prove an illegal monopoly in restraint of trade.

14.14.1 Honeywell has proven no actual or threatened injury to its business or property caused by any of the 30A patents and applications it has challenged.

14.14.2 Defendants have not directly charged Honeywell with infringement of, or specifically demanded royalties on, any of the 30A patents and applications.

14.14.3 Honeywell offered no evidence that it tried to design around any SR patent or altered its conduct because of an SR patent or application. Honeywell has not admitted that it designed any of its EDP machines to avoid any of the claims of the 30A patents and applications.

14.14.4 Honeywell has failed [*237] to prove willful and intentional fraud [the Patent Office in connection with any of the 30A patents and applications.

14.14.5 Findings 14.11-14.11.5.2 and 14.13-14.13.14 as to the infirmities in the 30A patents and applications and

evidence tendered by Honeywell with respect to the SR-IBM August 21, 1956 cross-licensing and exchanging technical information which included the 30A patents and applications and which was an unreasonable restraint of trade in violation of Section 1 of the Sherman Act as found in 15.25 and 15.37 provide grounds for declaring the issued and pending 30A patents unenforceable.

14.14.6 " [HN45] It is not the mere obtaining of a fraudulent patent which brings antitrust liability to its owner; it is the assertion or enforcement of the issued patent acquired by fraud which creates antitrust liability."

14.14.7 One who has not yet been charged with infringing a patent may have standing as private attorney general to seek a declaration that it is invalid or unenforceable as may be necessary to fit the exigencies.

14.14.8 Honeywell has proven that SR violated [*238] Section 1 of the Sherman Act in connection with the August 21, 1956 Agreement with IBM which licensed the 30A patents and patent applications, but has not proven that any of these 30A patents or patent applications has injured Honeywell in its business or property.

15. SR-IBM August 21, 1956 Agreement 15.1 Plaintiff has stated its claim that defendants violated the antitrust laws in a variety of ways and I am not certain beyond the broad claims of violation what the exact claims may be.

15.2 I believe the claims to be somewhat as follows:

15.3 Plaintiff claims that this agreement effected a technological merger between the two companies then in control of about 95% of the EDP business.

15.3.1 Honeywell claims that on August 21, 1956, SR and IBM entered into a massive settlement and patent cross-license Agreement in the TAB and EDP fields [hereinafter the "1956 Agreement"] and shared proprietary and non-patented design and manufacturing technology thereunder which effected a practical merger thereof between SR and IBM; Honeywell claims also that at that time SR and IBM controlled about 95% of the EDP business and became conspirators.

15.3.2 See 15.24.

15.4 [*239] Plaintiff claims that the two companies shared their technological portfolios by cross-licenses and exchanged know-how.

15.4.1 See 15.25.

15.5 Plaintiff claims that they further settled interferences with respect to ENIAC and SSEC and other patents and applications which they then knew to be invalid.

15.5.1 See 15.24.

15.6 Plaintiff claims that in substance that the agreement was anti-competitive and that defendants violated Section 1 in that they unreasonably restrained competition and this restraint violated the per se standard or the rule of reason.

15.6.1 Honeywell claims that SR, together with IBM, unreasonably restrained competition by entering into and performing the 1956 Agreement and technological merger and that such action was a per se violation of Sherman 1.

15.7 With respect to Section 2, plaintiff claims that defendants effected or attempted to effect monopoly power in the relevant market with an intent or purpose to exercise that power.

15.7.1 Honeywell also contends that SR, its constituent corporations and ISD, effected, attempted to effect, and, together with IBM under the 1956 Agreement and technological merger, combined and conspired [*240] to effect monopoly power in the relevant market in violation of Sherman 2.

15.8 Plaintiff claims that monopoly power is the power to control prices or exclude competition.

15.8.1 Honeywell claims that power to control prices or exclude competition may exist by virtue of a jungle of patents and technology which creates substantial barriers to competitive entry or burdens the competition after entry by affecting costs.

15.9 Plaintiff claims that it was thus forced to compete in an artificially and illegally infected and structured market or in an artificially impacted market.

15.10 Plaintiff claims that by the alleged misconduct that defendants intended to dominate the EDP market and that defendants performed such acts intentionally and with an ultimate anti-competitive goal.

15.10.1 Honeywell's claim of misconduct by defendants included that of conspiring with IBM in 1956 and 1965 and with BTL in 1961 under the leverage of ENIAC application or patent which created a jungle of patents and technology.

15.11 Plaintiff suggests that there was a less restrictive alternative which defendants did not choose.

15.12 Plaintiff claims that though the agreement [*241] was labelled non-exclusive, that it was nonetheless exclusive and secret.

15. 13 In 1956 the EDP industry was in its beginning stages.

15.13.1 Remington Rand (Remington Rand and Sperry Corporation were consolidated in 1955 to form SR) entered the computer business in 1950 by acquiring the Eckert-Mauchly Computer Corporation, which had been formed by Eckert and Mauchly.

15.13. 2 In 1953, Remington Rand acquired another EDP company, Engineering Research Associates, Inc.

15.13.3 IBM had been the dominant force in the tabulating machine business, and in the early 1950's was preparing to enter the computer business.

15.13.4 The commercial computer industry originated in the EDP systems offerings of Remington Rand and IBM shortly after 1950; in the early 1950's, IBM was offering the 650, 701, 702, 704 and 705 EDP systems and Remington Rand was offering the UNIVAC I and 1103 EDP systems.

15.13.5 While the Government's 1952 suit against IBM was pending, the EDP industry began to emerge.

15.13.6 Because of its acquisition of the Eckert-Mauchly Computer Corporation in 1950, and Engineering Research Associates in 1953, Remington Rand [*242] and its UNIVAC division had an early lead in EDP; however, it soon lost this lead to IBM.

15.13.7 In the period 1955-1956, other companies besides SR and IBM, including Honeywell, began to move seriously into the electronic data processing field but basically IBM and SR still dominated it.

15.13.8 By 1956, several other companies were beginning to develop and offer EDP systems. Honeywell was working on a large computer, the D-1000, which was first shipped at the end of 1957, and NCR, having acquired an EDP company, was also working on a computer, first shipped in 1959.

15.13.9 In April 1955, Honeywell formed its joint venture with Raytheon to develop, produce and market EDP systems.

15.13.10 NCR acquired Computer Research Corporation in 1953-54 and began design on the NCR 303 (later 304) EDP system to be offered for business applications.

15.13.11 Burroughs acquired ElectroData Corporation in 1956, inherited and marketed ElectroData's 205 EDP system, and had begun designing its 220 EDP system for business applications.

15.13.12 RCA had already marketed its BIZMAC system by 1956 and was planning its 501 system which was intended for commercial applications.

[*243] 15.14 For many years IBM had dominated the tabulating machine industry and had a substantial sales force.

15.14. 1 In 1956, IBM was recognized as the principal U. S. supplier of 80 column TAB card equipment and SR as the principal U. S. supplier of 90 column TAB card equipment; both of these companies had years of experience and know-how, both in design and production areas.

15.14.2 The tremendous customer base which IBM had because of its domination of the tabulating industry had a good deal to do with its position in the early days of the EDP industry and this, combined with the information exchange, gave them the predominant role which has tended to perpetuate itself.

15.14.3 IBM used its dominant position in the tabulating business--particularly its large sales and service force--to quickly seize the lead in the EDP business.

15.15 IBM and SR in 1956 had about 95% of the EDP business.

15.15.1 In terms of total revenue (stated in dollars) and market shares (stated as percentages of the total revenue of the industry), SR and IBM had the following shares of the EDP market in 1956:

	<i>WorldMarket</i>	<i>DomesticMarket</i>
IBM	\$42,174,000	\$39,276,000
	42.9%	47.5%
SR	\$50,329,000	\$37,590,000
	51.2%	45.5%
IBM & SR	\$92,503,000	\$76,866,000
	94.1%	93.0%

[*244] 15.15.2 In terms of the retail sale value of new EDP systems shipped (stated in dollars) and market shares (stated as percentages of the total value of shipments in the industry), SR and IBM had the following shares of the EDP market in 1956:

	<i>WorldMarket</i>	<i>DomesticMarket</i>
IBM	\$160,036,800	\$157,138,800
	85.2%	84.9%
SR	\$ 18,270,000	\$ 18,270,000
	9.7%	9.9%
IBM & SR Combined	\$178,306,800	\$175,408,80 0
	94.9%	94.8%

15.15.3 In terms of the retail sale value of units of systems outstanding in the market-place at year end (stated in dollars) and market shares (stated as percentages of the total value of units of systems outstanding in the industry), SR and IBM had the following shares of the EDP market in 1956:

	<i>WorldMarket</i>	<i>Domestic Market</i>
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IBM	\$206,568,600	\$202,851,600
	75.7%	75.3%
SR	\$ 50,190,000	\$ 50,190,000
	18.4%	18.6%
IBM & SR Combined	\$256,758,600	\$253,041,600
	94.1%	93.9%

15.16 Several other companies had 1% or 2% of the business.

15.16.1 In terms of total revenue (stated in dollars) and market shares (stated as percentages of the total revenue of the industry), the other EDP companies [*245] had the following shares of the EDP market in 1956:

	<i>WorldMarket</i>	<i>DomesticMarket</i>
RCA	\$ 1,583,000	\$ 1,583,000
	1.6%	1.9%
Burroughs	\$ 4,184,000	\$ 4,184,000
	4.3%	5.1%
Others	- 0 -	- 0 -
	- 0 -	- 0 -

15.16.2 In terms of the retail sale value of new EDP systems shipped (stated in dollars) and market shares (stated as percentages of the total value of shipments in the industry), the other EDP companies had the following shares of the EDP market in 1956:

	<i>WorldMarket</i>	<i>DomesticMarket</i>
RCA	\$ 4,200,000	\$ 4,200,000
	2.2%	2.3%
Burroughs	\$ 5,406,450	\$ 5,406,450
	2.9%	2.9%
Others	- 0 -	- 0 -
	- 0 -	- 0 -

15.16.3 In terms of the retail sale value of units of systems outstanding in the market-place at year end (stated in dollars) and market shares (stated as percentages of the total value of units of systems outstanding in the industry), the other EDP companies had the following shares of the EDP market in 1956:

	<i>WorldMarket</i>	<i>DomesticMarket</i>
RCA	\$ 4,200,000	\$ 4,200,000
	1.5%	1.6%
Burroughs	\$11,782,050	\$11,782,050
	4.3%	4.4%
NCR	\$ 280,056	\$ 280,056
	.1%	.1%
Others	- 0 -	- 0 -

- 0 -

- 0 -

[*246] 15. 17 In 1956 IBM shipped about 85% of all the new business and SR about 10%.

15.17.1 See 15.15.2

15.18 At the end of 1956 IBM had 75% of all the EDP systems outstanding and SR 18%.

15.18.1 See 15.15.3

15.19 From 1955 through 1966 SR did not have less than 10% of the EDP business.

15.19.1 In terms of the retail sale value of units of EDP systems outstanding in the market place at respective year end (stated in thousands of dollars) and market shares (stated as percentages of the total value of systems outstanding in the industry), the major members of the EDP industry had the following shares of the world (W) and domestic (D) EDP market from 1955 through 1967:

			Honey-well	RCA
1955(W)	31,920	47,372		4,20
	38.10%	56.55%		5.01%
(D)	31,920	46,553		4,200
	38.48%	56.12%		5.06%
1956(W)	50,190	206,569		4,200
	18.38%	75.66%		1.54%
(D)	50,190	202,85 2		4,200
	18.64%	75.32%		1.56%
1957(W)	81,270	402,872	1,680	4,200
	15.94%	79.01%	.33%	.82%
(D)	81,270	391,238	1,680	4,200
	16.31%	78.54%	.34%	.84%
1958(W)	115,710	566,001	6,720	12,600
	15.93%	77.92%	.93%	1.73%
(D)	115,710	548,035	6,720	12,600
	16.34%	77.40%	.95%	1.78%
1959(W)	178,836	778,253	11,760	13,860
	17.28%	75.18%	1.14%	1.34%
(D)	178,83 6	750,997	11,760	13,860
	17.75%	74.54%	1.17%	1.38%
1960(W)	220,332	1,023,224	11,760	32,970
	15.65%	72.66%	.84%	2.34%
(D)	220,332	971,804	11,760	32,970
	16.24%	71.62%	.87%	2.43%
1961(W)	303,156	1,490,818	39,732	60,690

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	14.44%	71.00%	1.89%	2.89%
(D)	303,156	1,355,232	39,732	58,170
	15.49%	69.25%	2.03%	2.97%
1962(W)	319,662	2,004,576	62,706	107,520
	11.34%	71.09%	2.22%	3.81%
(D)	319,662	1,810,110	58,380	89,376
	12.35%	69.91%	2.25%	3.45%
1963(W)	397,509	2,764,129	71,077	167,084
	10.13%	70.46%	1.81%	4.26%
(D)	397,509	2,489,221	64,701	123,981
	11.15%	69.84%	1.84%	3.48%
1964(W)	570,759	3,660,610	129,810	204,937
	10.68%	68.46%	2.43%	3.83%
(D)	570,759	3,306,253	118,915	147,267
	11.79%	68.30%	2.46%	3.04%
1965(W)	728,923	4,398,308	255,444	236,204
	10.79%	65.10%	3.78%	3.50%
(D)	728,923	3,938,446	231,874	173,122
	12.08%	65.28%	3.84%	2.87%
1966(W)	1,006,114	6,504,163	517,084	338,217
	10.10%	65.30%	5.19%	3.40%
(D)	1,006,114	5,910,929	464,134	244,984
	11.27%	66.20%	5.20%	2.74%
1967(W)	1,246,925	8,891,566	619,538	541,338
	9.40%	66.98%	4.67%	4.08%
(D)	1,246,925	8,014,659	555,936	381,653
	10.59%	68.06%	4.72%	3.24%

[*247]

	NCR	Burr	GE	CDC	Philco
1955(W)	280				
	.33%				
(D)	280				
	.34%				
1956(W)	280	11,782			
	.10%	4.32%			
(D)	280	11,782			

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	.10%	4.38%			
1957(W)	280	19,580			
	.05%	3.84%			
(D)	280	19,470			
	.06%	3.91%			
1958(W)	280	23,582	1,484		
	.04%	3.25%	.20%		
(D)	280	23,205	1,484		
	.04%	3.28%	.21%		
1959(W)	1,176	42,437	8,904		
	.11%	4.10%	.86%		
(D)	1,176	42,033	8,904		
	.12%	4.17%	.88%		
1960(W)	4,704	47,258	38,328	12,852	16,800
	.91%	1.19%			
(D)	12,852	16,800			
	.95%	1.24%			
1961(W)	16,716	53,835	67,209	42,756	25,200
	.80%	2.56%	3.20%	2.04%	1.20%
(D)	14,530	51,353	66,915	42,756	25,200
	.74%	2.62%	3.42%	2.18%	1.29%
1962(W)	55,226	59,781	97,701	80,808	31,920
	1.96%	2.12%	3.46%	2.87%	1.13%
(D)	47,863	57,354	95,349	80,808	30,240
	1.85%	2.22%	3.68%	3.12%	1.17%
1963(W)	108,648	97,451	129,507	151,851	35,616
	2.77%	2.48%	3.30%	3.87%	.91%
(D)	94,817	90,794	125,979	142,275	33,936
	2.66%	2.55%	3.53%	3.99%	.95%
1964(W)	159,638	166,039	169,538	243,740	41,664
	2.99%	3.11%	3.17%	4.56%	.78%
(D)	133,919	147,737	160,823	214,970	39,984
	2.77%	3.05%	3.32%	4.44%	.83%
1965(W)	219,122	253,541	228,588	392,171	44,352
	3.24%	3.75%	3.38%	5.80%	.66%
(D)	173,083	217,018	201,587	328,318	40,488
	2.87%	3.60%	3.34%	5.44%	.67%

1966(W)	294,745	321,807	372,592	565,291	39,816
	2.96%	3.23%	3.74%	5.68%	.40%
(D)	214,716	271,117	311,518	468,781	35,952
	2.40%	3.04%	3.49%	5.25%	.40%
1967(W)	432,466	387,943	431,557	697,116	25,704
	3.26%	2.92%	3.25%	5.25%	.19%
(D)	298,094	346,223	355,925	554,053	21,840
	2.53%	2.94%	3.02%		

[*248] 15. 20 In 1967 the percentage was slightly less than 10%.

15.20.1 See 15.19.1

15.21 In many of these years SR operated at substantial losses.

15.22 Plaintiff claims that the exchange of technological know-how between the two dominant companies in the industry permitted their progress at a much faster rate than the extremely small companies not parties to the agreement.

15.23 Plaintiff claims that the failure to make this information available to competitors caused plaintiff and the other small computer manufacturers to become involved in a re-invention cycle which caused tremendous expenses to the excluded companies, particularly for R & D.

15.24 The agreement was the product of a number of factors, including the 1956 IBM Consent Decree, the 1955 antitrust suit by SR v. IBM, the claim of IBM that SR had infringed a number of its patents, a number of interferences involving ENIAC, the evaluation of ENIAC, the evaluation of the respective patent portfolios, the claim by IBM that the ENIAC was invalid because of public use, and undoubtedly other factors.

15.24.1 On January 21, 1952, the Government filed an antitrust suit against IBM.

15.24.1.1 [*249] The Government suit charged IBM with monopolizing the tabulating machine industry and with engaging in various restrictive practices in the conduct of its tabulating machines business.

15.24.1.2 At the time the Government action was filed and for some years thereafter IBM had about a 90 per cent share of the tabulating business and Remington Rand had the remaining 10 per cent.

15.24.1.3 The Government suit charged that one of the methods IBM used to maintain its monopoly was to exclude potential and existing manufacturers of tabulating machines from entering the tabulating industry by monopolizing patents, inventions and technical information relating to tabulating systems.

15.24.1.4 The Government suit also charged that IBM had refused to grant licenses under its patents relating to certain key tabulating machines and that Remington Rand had endeavored unsuccessfully to obtain a license under these patents from IBM.

15.24.1.5 In April of 1955, Herbert A. Bergson, former head of the Antitrust Division who had been retained by Remington Rand, submitted a draft consent decree to the Department of Justice.

15.24.1.6 According to Bergson's testimony of what he [*250] was told by McNamara, the Department of Justice had solicited Remington Rand's views about the relief to be sought from IBM in March of 1955.

15.24.1.7 Since Bergson was keenly aware that IBM had been using its tabulating monopoly to monopolize the computer industry, the proposed decree he submitted to the Department of Justice applied to EDP as well as to TAB.

15.24.1.8 Eventually, Bergson testified, he came to believe that the Government would not get, via negotiations with IBM, what he considered to be adequate relief from IBM.

15.24.1.9 On December 27, 1955, SR had sued IBM for Clayton and Sherman Act antitrust violations involving, inter alia, EDP and TAB monopoly practices, restrictive practices and the illegal tie-in of purchase of tab cards with the lease of tab systems.

15.24.2 As of January 3, 1956, SR and IBM were involved in seven Patent Office interferences over priority and validity of claims contained in the ENIAC patent application and a few other interferences with others of IBM and SR EDP patents and applications.

15.24.2.1 IBM and SR met in late 1955 and early 1956 to discuss a procedure for facilitating the resolution of these interferences.

[*251] 15.24.2.2 Eventually, these late 1955 and early 1956 IBM-SR discussions expanded to include discussion of other outstanding differences between the two companies, particularly patent licensing and the SR antitrust suit against IBM. In the discussions SR and IBM considered the possibility of a TAB and EDP patent cross-license and an exchange of know-how.

15.24.3 On January 25, 1956, the United States District Court for the Southern District of New York approved a consent decree entered in the case of United States v. IBM.

15.24.3.1 The 1956 consent decree contained numerous remedial provisions directed at the IBM tab and EDP monopoly.

15.24.3.2 In section IV of the decree, for example, IBM was required to offer for sale as well as lease all of its tab and EDP machines.

15.24.3.3 In section IX of the decree, IBM was required to afford certain applicants (other than agents or employees of a manufacturer of tab or EDP machines) the opportunity to obtain training to repair and maintain IBM tab and EDP machines and to furnish to such applicants repair and maintenance manuals and instruction books on all IBM tab and EDP machines. IBM was also required pursuant to [*252] section IX to furnish such repair and maintenance books and manuals to owners and lessees of IBM machines.

15.24.3.4 Regarding patents, section XI of the consent decree required IBM to license any applicant under any, some or all IBM's tab and EDP patents and applications filed prior to 1961. IBM was permitted to charge a reasonable royalty for most patent licenses, but section XI of the decree also stated that if the applicant and IBM were unable to agree on what constitutes a reasonable royalty, either could apply to the Court for such a determination (with the burden on IBM to prove reasonableness).

15.24.3.5 Section XI of the decree opened the injunction so as to permit IBM to grant patent licenses under future tab and existing or future EDP patents on the applicant's granting fair value to IBM, as a reasonable royalty, including licenses under any, some or all of the applicant's patents.

15.24.3.6 In addition to the information contained in the IBM repair and maintenance manuals required to be furnished applicants under section IX, section XIV of the decree required IBM to furnish any applicant for a patent license with technical information with respect to, and [*253] for use in the manufacture of, a list of some 98 IBM "tabulating machines". Basically, this list (set forth in Appendix A to the decree) of "tabulating machines" included all of IBM's tab line as of January 1, 1956 of which three were electronic, viz., the IBM 604 Electronic Calculating Punch, the 083 Sorter and the 101 Electronic Statistical Machine. The card readers, card punches and other devices covered by the decree were not electronic nor used primarily in or with an electronic data processing system. These were not "EDP systems or machines", therefore, and the consent decree did not provide that the EDP know-how later obtained by SR

was to be available to anyone.

15.24.3.7 The technical information to be provided by IBM pursuant to section XIV of the consent decree was to be such as to enable the applicant satisfactorily to manufacture or assemble the tabulating machinery covered thereby. IBM was permitted to charge applicants only for the cost of reproducing the technical information.

15.24.3.8 Section XIII of the consent decree also prohibited IBM from entering into any agreement or understanding relating to tab or EDP machines or systems which, "provides for disclosure [*254] to IBM on an exclusive basis of any invention, formula, process or technical information".

15.24.4 The 1956 consent decree required IBM to grant specifically defined tabulating systems know-how technology, but not EDP systems know-how technology, to certain applicants.

15.24.5 Honeywell executives were aware of the IBM consent decree, and Henry Hanson, Honeywell's EDP patent counsel, prepared a summary of the decree for distribution to selected Honeywell personnel.

15.24.6 Herbert Bergson, one-time Assistant Attorney General in charge of the Antitrust Division, had attempted (for SR) to persuade the Justice Department to include a consent decree provision for a public dedication of IBM's EDP know-how technology in order to correct what he and SR saw as the already noticeable advantage of IBM in the EDP industry.

15.24.7 SR and Bergson considered it necessary, in order to have viable competition in the EDP industry, for all competitors to have royalty-free access to IBM's EDP know-how technology, as well as its TAB know-how technology.

15.24.8 However, SR was unsuccessful in having the EDP know-how requirement included in the consent decree for the public; subsequently [*255] it began direct negotiations with IBM to and did obtain the IBM EDP know-how solely for itself.

15.24.9 On March 5, 1956, a conference was held between SR and IBM to discuss the possibility of settlement of the then pending patent and antitrust disputes between the two companies.

15.24.10 Because SR believed that the consent decree January 1, 1956 cutoff date was insufficient, SR suggested that the cutoff date be extended approximately a year and that the definition of technical information be broadened to include EDP, as well as tab.

15.24.11 On May 28, 1956, SR and IBM representatives met to discuss the antitrust problems which might arise out of a then proposed settlement between IBM and SR which included a complete sharing of know-how technology in both the tabulating systems and EDP systems area and a settlement of all Patent Office interferences between the two companies.

15.24.12 At this meeting, IBM submitted a proposal to SR that each company would grant the other a royalty-free, non-exclusive license under all tab and EDP patents and patent applications as of July 1, 1956; each would release the other from liability for past infringement; each would furnish [*256] the other, at cost, tab and EDP know-how as of July 1, 1956; IBM would pay \$ 2,000,000 in royalties to SR; and SR would dismiss its antitrust suit.

15.24.13 As part of the negotiations at that meeting, representatives of IBM told SR that neither company would get a patent in the "big interference case" between the IBM "SSEC" computing system and the SR "ENIAC" because of the fact that the ENIAC machine and any alleged invention therein were in public use prior to the critical date.

15.24.14 It was stated by both SR and IBM that it was in the interest of both companies to settle their Patent Office interferences.

15.24.15 Shortly after making its May 28, 1956 proposal to SR, IBM counterclaimed against SR for infringement of 35 patents, mostly in the tabulating area, and it petitioned the Patent Office for the institution of public use proceedings

against the ENIAC patent application.

15.24.16 SR management evaluated the IBM May 28, 1956 offer and concluded that EDP should be left out of the settlement. But it remained interested in tab, particularly because it suspected that IBM was holding under wraps an IBM tabulating machine called the World Wide Accounting Machine [*257] (or WWAM).

15.24.17 SR officials estimated that patent licenses and technical information on the WWAM machine would be worth \$ 20,000,000 to SR.

15.24.18 SR sent a counter-offer to IBM on June 27, 1956, proposing a tab patent cross-license and an exchange of tab technical information as of December 31, 1956. SR also asked for a \$ 20,000,000 payment by IBM.

15.24.19 SR hoped that the December 31, 1956 cutoff date contained in its June 27, 1956 counter-offer to IBM would be late enough to "catch" IBM's WWAM tabulating machine.

15.24.20 At meetings subsequent to June 27, 1956, SR reduced its offer to \$ 10,000,000 and IBM eventually accepted, but on the basis that the agreement include licenses under IBM and SR's EDP patents and applications (including the ENIAC patent application) and that the cut-off date for know-how be shortened to October 1, 1956. After much discussion, the parties agreed to these arrangements.

15.24.21 Again in the July 1956 negotiations, IBM representatives told SR representatives that IBM's patent counsel, Sanborn, Brumbaugh & Cooper, New York City, had forecast that IBM would prevail ultimately on the public use question and that the ENIAC [*258] patent would be invalidated.

15.24.22 At a meeting with SR on July 16, 1956, IBM representatives took the firm position that the ENIAC application had to be a part of any settlement agreement.

15.24.23 At a July 23, 1956 meeting, SR was successful in obtaining IBM's agreement to pay an additional royalty if certain conditions were fulfilled.

15.24.24 A July 25, 1956 draft of the agreement contained a provision for exchange of EDP technical information on machines announced or released to production as of October 1, 1956.

15.24.25 In July of 1956, IBM's top management indicated a concern that the largest patent license deal in history would not be well received by the public.

15.24.26 There were final drafting sessions on August 1 and August 2, 1956. Bergson testified that he had probably reviewed the final drafts of the agreement and orally advised SR that the agreement was lawful.

15.24.27 At the August 2, 1956 drafting session, Bergson suggested that the parties submit a copy of the agreement to the Department of Justice. After the agreement was signed, Bergson personally delivered a confidential copy of the agreement to Marcus Hollabaugh, a Justice [*259] Department attorney who had been in charge of the IBM litigation.

15.24.28 In August, 1956, a meeting was held between representatives of SR and IBM to work out the procedure for settling major interferences and lesser Patent Office interferences.

15.24.29 Interferences were divided into major and lesser to try to avoid raising antitrust problems over a settlement of major interferences between the conspirators without presentation of some evidence by IBM; all such showings were essentially a formality.

15.24.30 At this August, 1956 meeting, representatives of IBM again repeated to representatives of SR that the "public use" defense was a good one against the ENIAC patent.

15.24.31 On August 15, 1956 the Assistant Attorney General wrote IBM's counsel and asked for a copy of the agreement. Accordingly, after the agreement was executed on August 21, 1956, IBM's counsel sent a copy to the Assistant Attorney General.

15.24.32 Defendants used their EDP patent and application portfolio in influencing IBM to enter into the 1956 Agreement at a time when the conspirators had about 95% of the EDP market.

15.24.33 On August 21, 1956, IBM and SR entered into a complete [*260] cross-license under all their EDP and TAB equipment patents and patent applications, a complete sharing of all EDP and TAB equipment know-how and a complete settlement of all EDP and TAB Patent Office interferences.

15.24.34 The completeness of the August 1956 technology sharing is evidenced by the following excerpt from that Agreement:

"Exchange of Technical Information. Sperry Rand and IBM will each, to the extent that it has the right to disclose such information, furnish to the other, as soon as practicable but in no event later than January 1, 1957, all technical information, both domestic and foreign, in its possession as of October 1, 1956, relating to, and for use in the manufacture of tabulating systems and machines and electronic data processing systems and machines which shall have been released to production or announced to the public for sale or lease by it up to and including October 1, 1956.

For the purpose of this Section 5, "technical information" shall mean the following information:

- (1) a complete set of drawings used in the manufacture of all the detail parts, assemblies, subassemblies, circuits, components, etc., for the product;
- (2) a [*261] complete set of operation sheets, duplicates of those which the manufacturer used in the manufacture of the product;
- (3) a duplicate set of all inspection specifications for parts, assemblies, sub- assemblies, circuits, components and machines;
- (4) a duplicate set of drawings of the tools, jigs, dies, and fixtures necessary for the manufacture of the product;
- (5) a bill of all materials necessary for the manufacture of the product and specifications to cover the purchase of such materials; and
- (6) illustrated service manuals listing all the detail parts of the product and setting forth mechanical and electrical instructions to enable servicemen to maintain and service machines.

In the event that either party shall give the other party notice in writing that the technical information furnished to it is inadequate to enable it satisfactorily to manufacture the commercial end product involved, the other party will supply such further written explanation of the information furnished as may be reasonably necessary for such purpose."

15.24.35 The 1956 IBM-SR Agreement as finally consummated contained, among other things, the following terms:

- (a) an exchange [*262] of patent licenses on tab and EDP patents and applications as of October 1, 1956;
- (b) an exchange of technical information on tab and EDP machines announced to the public or released to production as of October 1, 1956;
- (c) a payment of a fixed annual royalty by IBM of \$ 1,250,000 a year for eight years;
- (d) a payment by IBM of an additional royalty, if a patent issued on the ENIAC application prior to January 1, 1956, of

1 per cent of the manufacturing cost of each IBM EDP machine embodying any invention covered by the claims of the ENIAC patent manufactured within the United States between October 1, 1956 and October 1, 1964--after deducting the \$ 1,250,000 payments as a credit;

(e) dismissal of SR's antitrust suit against IBM and dismissal of IBM's patent infringement counterclaim against SR.

15.24.36 IBM and SR also on August 21, 1956 entered into a series of procedural agreements to dispose of the various outstanding patent interferences between patent and patent applications of the two companies. These agreements were characterized as "very conventional", and Honeywell (Datamatic) later joined in several of them.

15.25 I find that the cross-license [*263] and exchange of technical information agreement was an unreasonable restraint of trade and was an attempt by IBM and SR to strengthen or solidify their monopoly in the EDP industry.

[HN46] 15.25.1 Section 1 of the Sherman Act prohibits "Every contract, combination * * * or conspiracy, in restraint of trade * * *."

15.25.1.1 Nonexclusive patent cross-licensing in itself may be proper.

15.25.1.2 During the negotiation of their 1956 Agreement, both IBM and SR had expressed the view that they were not particularly interested in exchanging EDP know-how (or technical information); each asserted its belief that its own position in EDP was superior to the other's. Nevertheless, a provision for an exchange of EDP technical information--on machines announced to the public or released to production as of October 1, 1956--became part of the agreement.

15.25.1.3 Shortly before the 1956 SR-IBM Agreement was executed, J. Presper Eckert, then a UNIVAC executive, expressed opposition to the agreement. Among other things, Eckert was concerned about the treatment of "some dubious information known as 'know-how' (whatever that is)". Eckert also wrote:

"A considerable emphasis has been [*264] placed on the value of something known as 'know-how' (presumably this means manufacturing drawings, etc.) to us. I cannot find anyone in Engineering who actually knows how we can use this so-called valuable know-how. The only work I know of at IBM which would be of great interest to us would be that of high speed circuitry and the study of new electronic storage techniques. Since, however, none of this is at the present time being used or offered for sale we would not get anything on the things that they are doing which would be of real value to us * * *."

15.24.1.4 Notwithstanding Eckert's demurral, the 1956 Agreement was concluded and IBM and SR went about working out details for the exchange of technical information. IBM and SR representatives met again several times in the fall of 1956 for this purpose.

15.25.1.5 Since neither IBM nor SR really knew what it wanted or might expect in the other's technical information, it was ultimately agreed to have a broad exchange. However, a large number of obsolete machines were removed from the lists of machines on which information was to be exchanged.

15.25.1.6 Pursuant to the August 21, 1956 Agreement, IBM and SR did, in [*265] late 1956, exchange thousands of documents containing proprietary, technological and production know-how of the kinds described in the Agreement with respect to the EDP and TAB systems and machines listed in the Exhibits A to that Agreement; at least as late as 1962, SR requested and received technical information from IBM pursuant to the 1956 Agreement.

15.25.1.7 In the fall of 1956, SR received IBM manuals called for by the agreement and also received the manufacturing information on the IBM 604 Electronic Calculating Punch (a tab machine listed on appendix A to the IBM consent decree). The remainder of the manufacturing information which IBM supplied was received by SR in late December of 1956. After this information was received, it was placed in the custody of Robert Kalb at a UNIVAC facility in St. Paul.

15.25.1.8 The technical information SR obtained from IBM did not disclose design alternatives that had been considered by IBM and rejected, cost data, price data, software, third-party proprietary information or information on IBM's field experience.

15.25.1.9 In October of 1959, McNamara (General Counsel of SR's Remington Rand division) approached IBM's Birkenstock, [*266] stating that perhaps the time had come to discuss extension of the 1956 cross-license with an exchange of know-how. Birkenstock replied that he did not feel that an exchange of know-how was practical and that:

"We were able to include a know-how exchange in our present cross-license agreement because we had already been required by our Consent Judgment to make January 1, 1956 level know-how available. It was relatively simple for us to merely update it to a level consistent with the date of our cross-license agreement. It would, however, be a tremendously expensive and time-consuming job to update it again to a current level. Furthermore, if we were to make current know-how available to RemRand, we would feel obligated to make it available to others who request it as well. The cost of maintaining the records would be too burdensome."

15.25.1.10 No further exchange of unpatented know-how (or technical information) between IBM and SR was entered into after 1956 except under the patent exchange of 1965.

15.25.2 None of the other EDP competitors ever received either SR's or IBM's EDP know-how.

15.25.3 After receiving the technological and production know-how from each [*267] other, both SR and IBM studied and used the information; SR refused to sell or allow use of any of its equipment made in consequence of the technological merger by any EDP industry member at any price; IBM sold or leased such items at retail prices; by reviewing and studying the technical information shared under the 1956 Agreement, SR and IBM were better able to know and to evaluate the options available to each of them and to decide what equipment to build and how; having such opportunities involves time and cost saving shortcuts in the evaluation and selection of alternative routes.

15.25.3.1 One instance where manufacturing information on an IBM EDP machine was examined by SR was on the IBM RAMAC device.

15.25.3.2 The drawings on the RAMAC were incomplete and, in any case, SR had prior to 1957 already developed considerable competence in random access storage, both disc and drum. Indeed, SR's Appleton patent, filed on February 2, 1955, and licensed to IBM but not to others, discloses an invention bearing a striking similarity to the IBM RAMAC.

15.25.3.3 SR made no specific use of the IBM RAMAC drawings as it could have; instead it continued to follow the drum approach [*268] to random access, which it had used prior to 1957.

15.25.3.4 The SR technical information was shipped in late 1956 to IBM's plants at Endicott and Poughkeepsie, New York. The SR EDP material went to Poughkeepsie.

15.25.3.5 An assignment was made in February of 1957 to H. A. Mussell of IBM to review the SR drawings that had been sent to Poughkeepsie. After months of prodding by Mussell's superior, Phelps, a one-page report was ultimately issued on July 8, 1957. The report stated:

"Detailed studies of the subject information were not made since it was felt, in all cases, that the information to be gained would not greatly benefit IBM.

"In all cases, it was felt that the material might have proven more valuable, if:

- (1) Information available was better organized.
- (2) A key to readily interpreting the Sperry Rand circuit coding were available.

(3) Missing prints and information were available."

15.25.3.6 In September of 1957, Phelps was asked by H. T. Marcy, the head of engineering at IBM's Poughkeepsie facility: "Are we using any of the data we obtained from Sperry Rand as a result of our settlement with them?" Phelps responded:

"For a few [*269] weeks * * * there was reasonable activity in that various individuals came to the library and studied parts of the data. For some time there has been almost no activity with these files at Poughkeepsie."

15.25.3.7 In the spring of 1957, IBM was in a "bind" on its high speed printers--they were wire printers giving IBM "fits from a mechanical performance point of view". IBM examined the 1956 SR technical information on the UNIVAC high speed printer, but concluded that IBM should solve its problem by going ahead with its own development, the chain printer. IBM thus eventually elected to introduce its very successful chain printer, which was "as different as day and night, from a functional and mechanical point of view" from the UNIVAC printer. No other mainframe manufacturer had this choice.

15.25.3.8 IBM also examined 1956 SR technical information on magnetic drum plating and magnetic drum bearings. However, IBM found no information that would advance IBM's state of the art and so put the drawings "back in the file and forgot it". No other mainframe manufacturer had this opportunity.

15.25.3.9 IBM put the 1956 SR information into dead storage in 1958.

15.25.3. 10 In 1960 [*270] J. Svigals, an IBM employee, wrote to Birkenstock:

"Several years ago, I believe the year was 1956, IBM received detailed descriptive material from Sperry Rand. The material described all of their announced products at that time.

"There has been little or no use of this material. As part of this department's File Retention Program, it is desirable that this material be discarded. May I please have your advice on the disposition of this material. Attached is a list describing the contents of these files."

The EDP information which IBM had received from SR was subsequently destroyed and the tab information remained in dead storage at Endicott.

15.25.3.11 IBM could have but never built a copy of any of the SR machines on which it had received EDP technical information and it could have but never used or incorporated into any of its equipment, designs, details, features or processes specifically derived from the SR technical information. No other main frame manufacturer had such opportunity.

15.25.4 There was a competitive advantage to be gained by both IBM and SR by receiving the respective packages of EDP know-how.

15.25.5 That same competitive advantage [*271] was also possible for any other EDP competitor had it received that EDP know-how.

15.25.6 SR and IBM attempted to, and did, gain a competitive advantage by the receipt and subsequent ability to consider and decide upon utilization of that EDP know-how.

15.25.7 The other EDP competitors, by reason of their non-access to the EDP information, did not gain or have a competitive advantage.

15.25.8 Since SR and IBM gained a competitive advantage and since the other EDP competitors did not, the others were at a competitive disadvantage compared to either SR or IBM or both.

15.25.9 Thus, the effect of the technological sharing, embodied in the 1956 Agreement, and the subsequent use of and ability to use each other's know-how by SR and IBM, was to confer a competitive advantage on the parties and to put the other EDP competitors at a competitive disadvantage with respect to SR and IBM and each of them as they both are held to have realized at the time and thereafter.

15.25.10 Conversely stated, the cause of the other EDP competitors being put at a competitive disadvantage was the technological merger accomplished by the 1956 Agreement, and the subsequent use of and [*272] the opportunity and ability to use each other's know-how by SR and IBM which the competitors lacked.

15.25.11 The impact of the total EDP and TAB system technological merger between IBM and SR in 1956 was stifling on the growth of EDP competitors and the EDP industry generally; since 1956, all EDP industry members except IBM and SR (and CDC to a limited degree) have been operating under artificial EDP market constraints imposed by having had to compete against the combined technological portfolios of IBM and SR during the critical starting and developmental period of the EDP industry.

15.25.12 The technological merger between IBM and SR restrained and hampered the EDP industry from growing in time and size, restrained and hampered the ability of other members of the EDP industry to thrive and grow and depressed the incentive to invent within the industry.

15.25.13 Prior to and after the 1956 technological merger between SR and IBM, technological competition was the single most important component of competition among entrants to the EDP industry; in perhaps no other industry has technological development been so important to the success of the participants.

15.25.14 [*273] The competitive structure of the EDP industry, particularly prior to 1956, created a substantial incentive toward technological innovation.

15.25.15 The importance of technological competition in the computer industry is illustrated by the large outlays for research and development (hereinafter R & D) made by the various members of the EDP industry.

15.25.16 The R & D expenditures for the EDP divisions of several electronics firms frequently exceed 10% of total revenues and, in early stages of development, R & D expenditures actually exceed total EDP system revenues.

15.25.17 For example, Honeywell made annual R & D expenditures considerably in excess of its annual world EDP system revenues in the entire period 1955-1960, and in excess of 20% of EDP system revenues in the following five year period 1961-1965.

15.25.18 Even SR, although a party to the technological merger with IBM in 1956, made annual R & D expenditures in excess of 10% of its annual world EDP revenues in all except one of the four years from 1957 to 1960.

15.25.19 Because of the benefits obtained from the technology shared under the SR-IBM Agreement of 1956, both SR and IBM realized a dulling [*274] of their individual incentive to innovate which would have continued but for the Agreement.

15.25.20 At the time of the SR-IBM Agreement of 1956, IBM and SR had already developed substantial technological expertise in the EDP field and were the two dominant firms in the tabulating machine market whose customers were the most likely prospects for EDP systems.

15.25.21 Thus, the SR-IBM Agreement of 1956 solidified an already dominant consortium.

15.25.22 The terms of the SR-IBM Agreement of 1956 assured that the dominance of the consortium would persist since the parties agreed to exchange existing know-how and information on developments then in progress as well as future patents.

15.25.23 The SR-IBM technological merger gave SR and IBM a decisive advantage over the actual and potential EDP manufacturers who were not parties to the Agreement and, as a consequence, significantly reduced the competitive potential of outsiders.

15.25.23.1 After the 1956 IBM-SR agreement, SR's share of EDP business declined.

15.25.23.2 Although SR's UNIVAC Division had been claimed to be profitable before the 1956 IBM-SR agreement, it lost \$ 250,000,000 in the 1957-1965 period.

[*275] 15.25.23.3 In the 1957 to 1967 period, Honeywell, RCA, Control Data and NCR grew from having practically no EDP business to having annual EDP shipments each about as large as SR's.

15.25.23.4 In the 1957-67 period, SR spent \$ 223,000,000 (18% of its EDP revenues) on EDP research and development; in the same period Honeywell spent \$ 95,000,000 (21% of its EDP revenues) on EDP research and development.

15.25.23.5 The 1956 IBM-SR patent cross-license was de facto exclusive, and SR conspired and agreed with IBM to prevent Honeywell from obtaining access to any IBM or SR patent licenses and know-how.

15.25.23.6 Honeywell has proven that it was injured in its business or property by reason of the 1956 EDP patent cross-license between IBM and SR.

15.25.23.7 As to licenses under IBM EDP patents, any applicant under the IBM consent decree had a right to obtain such licenses, and Honeywell and the other major EDP companies did obtain such licenses.

15.25.23.8 Honeywell offered no evidence that it ever tried to design around an SR patent or even altered its conduct because of an SR patent. In fact, in answers to defendants' Interrogatories 248 and 251, Honeywell [*276] admitted that it never studied any of the SR patents and applications involved in the 1956 IBM-SR cross-license and that it never designed any of its EDP machines to avoid any of their claims.

15.25.24 The SR-IBM technological merger in 1956 injured competition in the EDP industry by conspiratorially allowing the perpetuation of the high combined market share of the two parties to the merger and tending to protect the proportion of each conspirator.

15. 26 In 1956 IBM and SR had about 95% of the EDP market and each had a duty to the remaining members of the industry to make full disclosure of the agreement.

15.26.1 SR had the duty to seek out Honeywell and offer it access to technical information equal to that offered IBM.

15.26.2 On May 10, 1956, a meeting was held between IBM and SR at which representatives of both companies discussed a then proposed settlement between SR and IBM.

15.26.2.1 At this meeting, F. J. McNamara of SR stated that as a part of the settlement, he contemplated an exchange of know-how between IBM and SR which would cover the EDP field as well as the TAB systems area.

15.26.3 On May 15, 1956, Birkenstock of IBM sent [*277] a letter to outside counsel with an attached copy of suggested points to be negotiated between IBM and SR, including an exchange of EDP know-how.

15.26.4 On May 22, 1956, IBM concluded that the proposed know-how exchange between IBM and SR would raise serious problems under the antitrust laws unless both companies were willing to provide the same know-how to all licensees.

15.26.5 On May 28, 1956, a meeting was held between representatives of IBM and SR to discuss further a proposed

settlement between the two companies.

15.26.6 One of the principal points at this meeting was the antitrust problems which might arise out of the proposed settlement.

15.26.6.1 Judge Bromley, outside counsel of IBM, stated that the proposed settlement between the two principal occupants of the field was fraught with antitrust difficulties.

15.26.6.2 McNamara of SR stated that an exchange of EDP know-how would give rise to antitrust problems and that SR was not then disposed towards a know-how exchange.

15.26.7 On June 6, 1956, Birkenstock of IBM and McNamara of SR discussed the fact that should an exchange of know-how be concluded between the two companies, IBM would be obligated [*278] to provide EDP know-how, at least coextensive to the patent grant, to all licensees.

15.26.7.1 IBM had made it clear to SR throughout their negotiations that because of its consent decree, IBM would make available to all competitors who requested it the same patent licenses and technical information it provided to SR. IBM did nothing effectual to implement this requirement.

15.26.8 At a June 20, 1956 meeting with IBM, McNamara stated that, based upon a previous conference with Birkenstock, there was an understanding that the objective of a settlement between IBM and SR was to place SR in such a position with respect to patents, applications and know-how that it would be on the same level as IBM; this was what occurred.

15.26.9 At a June 29, 1956 meeting with SR, Birkenstock of IBM stated that, contrary to the advice of IBM's antitrust counsel, IBM would agree to a cutoff date of June 1, 1956, for an IBM-SR know-how exchange; the ultimate date became October 1, 1956.

15.26.10 Birkenstock further stated that IBM's counsel had advised IBM that it would be obligated to provide to all licensees, with respect to any particular machine, the same know-how exchanged with [*279] SR.

15.26.11 The 1956 consent decree required IBM to grant technology access to specifically defined tabulating systems [not EDP systems technology] to certain applicants; Section XIII of the decree also prohibited IBM from exchanging disclosures of technical information on an exclusive basis.

15.26.12 During the course of the 1956 negotiations IBM had become concerned that any settlement with SR, if publicized, might be construed as an admission of guilt to SR's monopoly charges or that SR's salesmen might make unfair use of it in the way they might describe or talk about the agreement. This concern first appears in the "minutes" of a June 29, 1956 SR-IBM negotiating session; these memoranda indicate that IBM and SR then discussed having a joint press release as a possible solution.

15.26.13 An IBM draft agreement dated July 6, 1956 contained an express provision that there should be a joint press release and that the terms and conditions of the agreement would be kept confidential; this draft contained no provision for an exchange of EDP technical information.

15.26.14 In July of 1956, IBM was specifically advised by outside counsel, and so told SR, that a know-how [*280] and patent exchange with SR would violate the antitrust laws unless IBM made arrangements for other companies in the industry to get the same benefits royalty-free; no provision implementing this necessity was included in the technological merger.

15.26.15 At an August 1, 1956 meeting of IBM and SR representatives, Birkenstock of IBM reported that IBM had been unable to avoid mentioning the settlement negotiations to the editors of Fortune magazine; however, SR

representatives were assured that Fortune would not publish any details.

15.26.16 Both companies desired to gain technological peaceful coexistence and expressed their mutual concern over antitrust problems which would arise from the two dominant companies exchanging EDP know-how and patent licenses when these same benefits would not be available royalty-free to the industry; nonetheless, they made their Agreement de facto exclusive.

15.26.17 Both conspirators desired to keep factual information from their competitors and the public concerning the true scope of their proposed technological merger and concealed, to the maximum degree, details of the 1956 Agreement, both before and after it was executed.

15.26.18 [*281] SR and IBM were naturally sensitive about candid disclosure of the full details of their know-how exchange when they did not heed the warnings of counsel by making the technology available to all; they agreed upon a closely worded and innocuous-sounding press release and agreed that no other comment would be allowed by any representative of either company.

15.26.19 By issuing the jointly drafted press release, SR and IBM appeared to disclose the nature of their settlement, but the press release did not contain enough information to make it self-explanatory nor to prevent it from being misleading as to the true content of the technological merger; the press release was calculated to allay suspicions which the conspirators knew would follow the inevitable leak of information about the deal.

15.26.19.1 The joint press release was issued a few hours after the 1956 Agreement was signed. The release stated:

"Culminating more than a year's negotiations, International Business Machines Corporation and Sperry Rand Corporation today entered into a nonexclusive licensing agreement to exchange licenses to manufacture punched card accounting machines and electronic data processing [*282] machines under their respective patents and patent applications in existence as of October 1, 1956.

"Based on IBM's greater production of these machines, IBM will pay to Sperry Rand a fixed annual royalty of \$ 1,250,000 for eight years as a credit against production royalties, after which time no further royalty payments will be due.

"The two companies also agreed upon a procedure for settling patent interferences now pending in the United States Patent Office and arranged to exchange technical information with respect to punched card accounting and electronic data processing machines announced or released to production prior to October 1, 1956.

"Simultaneously with the execution of the above agreements, Sperry Rand withdrew its Anti-trust complaint, filed December 27, 1955, and IBM withdrew its counterclaim, charging patent infringement, filed June 6, 1956."

15.26.19.2 The fact of the 1956 IBM-SR Agreement, but not the details, received publicity:

(a) Versions of the press release appeared in the Wall Street Journal, The New York Times and in trade journals such as Computers and Automation.

(b) The press release was mailed to thousands of IBM stockholders [*283] and an expanded version of it appeared in the 1957 SR Annual Report.

(c) The Wall Street Journal account stated that technical information was to be exchanged on "all data processing and punched card equipment announced or released for production before October 1," 1956.

(d) SR had several hundred copies of the agreement printed; these copies were circulated to SR personnel and some copies went to outsiders.

15.26.20 On August 21, 1956, T. J. Watson, Jr., chief executive of IBM sent a worldwide memorandum to all executives and department managers, district managers, IBM branch managers and plant and laboratory executives in which he specified what could and should be said regarding the technological merger and attached a script with prescribed answers to questions; the script was designed to disclose none of the details of the Agreement.

15.26.21 Although IBM and SR made reference to an exchange of EDP and TAB systems technical information in their jointly drafted press release of August 21, 1956, and a letter to IBM shareholders dated the same date containing the same reference, both companies were careful to disclose no factual details concerning the extent to [*284] which IBM and SR had accomplished a practical technological merger by the 1956 Agreement.

15.26.22 At a September 5, 1956 meeting of SR executives, McNamara stated that the privileges of the deal with IBM, including the know-how exchange, were not available to other industry members.

15.26.23 IBM and SR, singly and together, had the duty to explain the 1956 Agreement openly to the other members of the EDP industry and the public and to offer the opportunity to gain access to the joint power base on nondiscriminatory terms; the 1956 Agreement created an affirmative obligation to inform others of the availability of the pooled EDP know-how.

15.26.24 However, neither IBM nor SR ever told any EDP competitor about the extent of the EDP information exchange in 1956, nor did either ever offer any EDP competitor any of the EDP know-how of either company; neither pursued a program of bringing their know-how, patent or application technology into the public domain; neither engaged in any program or plan to make their de facto exclusively shared technology available on any terms to any EDP industry members or the public.

15.26.24.1 SR's executives testified that they had remained [*285] entirely willing after the 1956 agreement to discuss patent licensing and technical information with competitors but did nothing overt to make this willingness effective.

15.26.25 In fact, every effort was made by SR and IBM to keep such information from their competitors and the public, and only a limited number of men in each company were given access to the information.

15.26.26 The 1956 Agreement between IBM and SR had significant anti-competitive impact on the development of the EDP industry and there was a less restrictive alternative available, namely, to grant the EDP industry access to the technological merger with accompanying freedom to innovate and compete.

15.26.27 IBM and SR were both specifically familiar with how to achieve publication of the availability of know-how as a result of the 1956 IBM governmental consent decree experience; however, neither took any steps reasonably calculated to publicize the availability of the EDP technology and know-how shared between themselves.

15.26.28 While IBM and SR filed copies of the 1956 Agreement with the Justice Department, they knew and intended that the Justice Department would treat the matter as confidential [*286] under the express provisions of the 1956 Consent Decree; it was so treated.

15.26.29 SR knew, before it entered into the 1956 Agreement with IBM, that there was a probability that the technological merger provided for in the agreement between the two then dominant companies in the EDP and TAB industries would violate the antitrust laws.

15.26.30 Therefore, in July of 1956 and thereafter, SR and IBM agreed to and did keep the details of the Agreement secret from the EDP industry and the public; the 1956 technology sharing was regarded by SR to be "company confidential and not to be disclosed"; further, SR and IBM agreed that there would be no publicity regarding any of their technology sharing activities.

15.26.31 Consequently, no industry member actually realized or knew the scope and breadth of the Agreement and

information exchange between IBM and SR in 1956 nor until much later.

15.26.32 Honeywell had no actual knowledge or realization of the full significance of the technological merger between SR and IBM or the conspiratorially intended effects thereof until the discovery processes provided by this lawsuit.

15.26.33 The 1956 EDP know-how exchange between [*287] IBM and SR, although labeled "non-exclusive" was effectively "exclusive", i.e., de facto exclusive as it was intended by the parties to be.

15.26.34 The true scope of the 1956 Agreement and the breadth of information exchanged was kept secret by the conspirators until unearthed by Honeywell during discovery in this lawsuit in 1969.

15.26.35 When IBM and SR finally, under legal demand, produced copies of the 1956 Agreement in this lawsuit, both demanded that the copies be treated as "confidential" by Protective Orders of the Court.

15.27 Plaintiff knew of the 1956 Agreement, the 1956 IBM Consent Decree, and the 1955 antitrust suit of SR against IBM.

15.28 Though plaintiff knew of the 1956 Agreement, it made no demand then or within a reasonable time thereafter for the agreement or the information contained therein.

15.28.1 Honeywell officials read the press accounts of the 1956 IBM-SR agreement. In fact, Hanson (the head of Honeywell's EDP patent department) in a September 10, 1956 memorandum to Finke (the head of Honeywell's EDP operations) described the 1956 IBM-SR Agreement and wrote:

"There is also alleged to be a mutual exchange of technical information [*288] between the two companies in the tabulating machine and electronic data processing machine field."

Hanson also wrote in the same memorandum that the Honeywell system "is capable of outperforming the Univac I and Univac II and they might be interested in obtaining know-how from us".

15.28.2 In late 1956, Honeywell explicitly considered whether it should approach SR or IBM or whether it should stall and wait for IBM or SR to approach Honeywell. It adopted the latter course in the hope that it could in the meantime develop trading stock so that it would not have to pay cash for any IBM or SR patent licenses.

15.28.3 Until this lawsuit, neither Binger (Honeywell's chief executive), Finke nor Hanson ever sought any additional details concerning the 1956 Agreement from IBM or SR, nor did they ever ask to see a copy of the agreement.

15.28.4 Honeywell has never sought any technical information from SR or from IBM.

15.29 If the demand had been refused, legal action in antitrust or other theory would have forced disclosure of the agreement.

15.29.1 See 18.8.

15. 30 In 1956 plaintiff knew that SR had a high speed printer and that IBM had RAMAC and [*289] knew that it suffered competitively for lack of such devices or information.

15.30.1 See 15.40.49 through 15.40.70 and 15.40.83 through 15.40.94.

15.31 Plaintiff, however, took no legal action in 1956 or within a reasonable time thereafter to eliminate the restraint of trade or continued monopoly power.

15.32 As in Section 7 cases, the Court believes that whatever happened after 1956 has relevance.

15.33 The history of the industry indicates that defendants in no way assumed or obtained a dominant or monopolistic position.

15.34 SR from 1956 to 1967 remained at about 10% of the EDP industry, and in most of those years operated at substantial losses.

15.34.1 See 15.19.1.

15.35 SR and ISD are the defendants in this lawsuit, not IBM.

15.36 The relevant market is the EDP industry and the geographic market is the United States and foreign markets for sales or rentals of EDP products manufactured in the United States.

15.36.1 The relevant product market for purposes of this lawsuit is defined to include those EDP systems and machines falling within the following definition:

EDP System --shall mean any machine or group of automatically inter-communicating [*290] machine units capable of entering, receiving, storing, classifying, computing and/or recording alphabetic and/or numeric accounting and/or statistical data without intermediate use of tabulating cards, which system includes one or more central data processing facilities and one or more storage facilities, and has either

(a) the ability to receive and retain in the storage facilities at least some of the instructions for the data processing operations required, or

(b) means, in association with storage, inherently capable of receiving and utilizing the alphabetic and/or numeric representation of either the location or the identifying name or number of data in storage to control access to such data, or

(c) storage capacity for 1,000 or more alphabetic and/or decimal numeric characters or equivalent thereof.

EDP Machine --shall mean a machine or device and attachments thereof used primarily in or with an electronic data processing system.

All systems and machines falling within the above definition are included in the relevant product market, with the exception of those so-called "special purpose" systems designed to accomplish a specialized task and sold or [*291] leased to the United States or any agency or department thereof, as long as no such system was ever offered generally to the public, and with the proviso that business or scientific electronic data processing machines or systems ordinarily sold or leased in the commercial market, which happen also to be sold or leased to the military, the United States Department of Defense or any other United States Government department are included.

15.36.2 The relevant geographic markets for purposes of this lawsuit are the United States and the world market (a combination of the foreign and United States markets).

15.36.3 At least since the early 1950's, there has been a definable relevant market in the development, manufacture, sale, lease, and use of electronic data processing machines and systems (as defined above) in each of the geographic markets (as defined above).

15.37 I find a violation of Section 1 in the agreement.

15.37.1 See 15.24, 15.25 and 15.26.

15.38 Though the agreement was a further attempt to extend the monopoly, I find that in view of later events that defendants did not create any monopoly in violation of Section 2.

15.38.1 Honeywell has failed [*292] to prove that SR's participation in the 1956 IBM SR Agreement violated Section 2 of Sherman Act.

15.39 I find that in view of plaintiff's knowledge of the fact of the agreement and of the dominant position of SR and IBM in 1956, that plaintiff failed to act with any kind of diligence in the protection of its interests.

15.40 I find that if the agreement violates the antitrust laws that plaintiff has proved injury.

15.40.1 The creation of the mutually shared pool of technological know-how on the part of SR and IBM, who at the time of the Agreement had about 95% of the world EDP market, placed the other industry members not party to the Agreement, including Honeywell, at a severe competitive disadvantage.

15.40.2 In agreeing to exchange know-how and information on developments, SR assured itself that other EDP manufacturers would confront a decisive technological disadvantage or excessively high R & D costs, either of which would reduce technological competition in the EDP market.

15.40.3 An analysis of the ratio of "imputed rental value" of annual EDP system shipments to R & D expenses for the period 1957-1967 shows that Honeywell's R & D outlays relative to [*293] value of shipments were consistently much higher than those of SR.

15.40.4 "Imputed rental value" as herein used means the value arrived at by converting all EDP sale transactions in each year to lease transactions by a formula which spreads the revenue derived from these sale transactions over a 3 1/2 year period commencing with the first year the revenue was earned; this "imputed" value is then added to the actual lease revenue to obtain the "imputed rental value" (hereinafter "IRV"); this is a valid base for comparison purposes.

15.40.5 From 1957 to 1960, the four years immediately following the SR-IBM Agreement, Honeywell's R & D outlays exceeded total EDP revenues.

15.40.6 During the same period, SR's R & D outlays ranged from 10% to 22% of its EDP revenues.

15.40.7 Although the productivity of particular R & D investment may not be immediately measurable, it is well accepted statistically that given the fact that a company is investing R & D dollars every year, the ratio of annual revenue or value of equipment shipped to annual R & D expenditures is a valid basis for considering how productive R & D efforts are over a period of time.

15.40.8 It was not [*294] until 1965 that Honeywell attained a ratio (4.787) of IRV of EDP systems shipped to R & D costs as favorable as the 4.619 ratio which SR had enjoyed in 1957, the year immediately following the technological merger.

15.40.9 Utilization of the ratio analysis technique makes possible the ascertainment of the competitive disadvantage suffered by Honeywell as a result of the 1956 Agreement in either of two ways: (1) the lower revenues of Honeywell compared to its R & D outlays as compared to SR, or (2) the excess R & D outlays Honeywell was forced to make in order to achieve any given level of revenues as compared to SR.

15.40.10 The competitive disadvantage suffered by Honeywell as a result of the 1956 Agreement (compared with SR's experience) measured in terms of lost IRV in the years 1958 to 1967, ranges from \$ 516,877,000 (calculated with no time lag between R & D spent and IRV earned) to \$ 360,541,000 (one year time lag); generally speaking, this means that had Honeywell's R & D expenditures been statistically as productive as SR's for those years, Honeywell would have generated between \$ 360,000,000 and \$ 517,000,000 more revenue than it actually did.

15.40.11 The competitive [*295] disadvantage suffered by Honeywell as a result of the 1956 Agreement (compared to SR's experience) measured in terms of excess R & D costs incurred in the years 1958 to 1967, ranges from \$ 55,314,000

(calculated with no time lag between R & D spent and IRV earned) to \$ 36,871,000 (one year time lag); generally speaking, this means that Honeywell had to spend between \$ 36,000,000 and \$ 55,000,000 more for R & D than SR did in order to generate the same dollar revenue.

15.40.12 The SR-IBM technological merger had the effect of causing a technological lag of several years on Honeywell, and it required unusually high R & D expenditures in an attempt to overcome that lag.

15.40.13 To determine the extent of the injury to Honeywell caused by the 1956 Agreement and the technological sharing thereunder, the nature of that agreement must be evaluated in light of what Honeywell stood to gain from having access to it, or alternatively, what it stood to lose from not having access to it, in terms of its competitive position.

15.40.14 What Honeywell's activities and subsequent competitive position would have been must be compared to what its activities and subsequent competitive [*296] position actually were in order to measure the total impact of the technological merger on it; essentially, the extent of the competitive advantage Honeywell would have received must be added to the extent of the competitive disadvantage it actually sustained.

15.40. 15 In 1956-57 and thereafter, Honeywell and others of the EDP industry had workable central processing units ["main frames"] but were experiencing substantial difficulties in developing and producing peripheral and input-output devices and were therefore forced to turn to costlier and disadvantageous sources.

15.40.16 Because it recognized its deficiencies in the peripheral areas, Honeywell representatives talked with representatives of SR in 1956 and requested that SR sell Honeywell its high-speed printers and card readers; SR declined to do so on any basis; this equipment was included in technology shared between SR and IBM.

15.40.17 Therefore, Honeywell was obligated to and did ask IBM to supply card readers and punches and went elsewhere to obtain printers.

15.40.18 IBM did agree to lease card punches and readers to Honeywell but only on a full retail price basis, thereby eliminating [*297] that part of the EDP system as a potential for profit for Honeywell.

15.40.19 From 1957 to 1964, Honeywell leased for re-lease card readers and punches from IBM.

15.40.19.1 Beginning with the Datamatic D-1000, Honeywell's first computer (first shipped at the end of 1957), Honeywell obtained input/output devices from IBM for use with Honeywell central processors. Among the IBM items purchased or leased at retail prices by Honeywell were the IBM 407 printer and the IBM 519 card punch.

15.40.19.2 The IBM 407 printer and the IBM 519 card punch were explicitly listed on Appendix A to the IBM consent decree as items on which IBM was obligated to furnish technical information to all tab patent licensees. Honeywell never sought this 407 and 519 technical information, or any other technical information, from IBM.

15.40.19.3 Binger, Honeywell's chief executive officer, did not know why Honeywell did not invoke the IBM consent decree to get IBM 80 column punched card equipment.

15.40.19.4 At various times over the years since 1956, Honeywell's Capp Smith and Walter Finke complained to IBM about IBM's policy concerning prices on peripherals it was selling or leasing to [*298] Honeywell. On such occasions, Birkenstock testified that he countered that Honeywell was free to apply for IBM know-how and build the peripherals itself if it did not like IBM's policy. Birkenstock claimed to have explained to Smith and Finke that IBM would make available to Honeywell all of the technical information, both tab and EDP, that it had made available to SR.

15.40.19.5 In August of 1959, Birkenstock met with Paul Wishart, then Honeywell's President, to discuss the possibility of Honeywell's taking a license under IBM EDP patents.

15.40.19.6 Following his August 1959 discussions with Birkenstock, Wishart advised Finke that IBM's royalty rates were "a great deal more liberal than I had thought they would be". Wishart also stated to Finke:

"I think what he (Birkenstock) was trying to say in a nice way was that he knew we were infringing, and that perhaps the time had come to talk about it * * *. I do not think there is any occasion to immediately contact him, but when we start delivering (our first computers), we may well be forced to do this."

15.40.19.7 Henry Hanson wrote to Will Freeman, outside patent counsel for Honeywell, about the August 1959 Birkenstock [*299] visit. Hanson stated:

"As we have discussed previously, we are not desirous of opening any patent discussions at the present time. However, we may not be able to stall indefinitely on this matter. I have been hoping that it would be possible to build up a better picture in the anti-trust area than I have been able to do at the present time * * *. I am not planning to put any concentrated effort on this at the moment but to continue on as we have been trying to locate what our potential problems may be and building up our own patent portfolio."

15.40.19.8 By March of 1963, IBM and Honeywell had agreed in principle on a patent cross-license that was royalty-free but with IBM to receive licenses also under Honeywell's valuable industrial instrumentation patents as a "quid pro quo" for IBM's greater EDP patent position.

15.40.19.9 The final IBM-Honeywell agreement was worked out in an April 1963 session between Will Freeman (late Honeywell patent counsel) and Birkenstock. During this session, Birkenstock claimed, he had a detailed discussion with Freeman concerning IBM's tab and EDP technical information exchange with SR in 1956 and the fact that similar IBM information--as [*300] of October 1, 1956--was available to Honeywell.

15.40.19.10 At their April 1963 meeting, Birkenstock said, Freeman advised that since the IBM know-how (technical information) was limited to October 1, 1956 he believed it had little value to Honeywell at that time. Freeman also expressed a reluctance, according to Birkenstock, to request IBM know-how because he did not want to expose Honeywell to the possibility of IBM's asking for Honeywell know-how in the instrumentation field.

15.40.19.11 At his April 1963 meeting with IBM's Birkenstock, Freeman suggested, according to Birkenstock, that the IBM-Honeywell agreement specifically state that no know-how was to be provided by either party; such a provision was incorporated into the agreement.

15.40.19.12 Final drafting of the IBM-Honeywell agreement was concluded, and it was executed in April of 1964.

15.40.19.13 The IBM-Honeywell agreement called for nonexclusive patent cross-licenses on existing "information handling" patents and on patents issuing on applications filed prior to May 1, 1968.

15.40.20 In December of 1964, IBM notified Honeywell that it would no longer lease for re-lease card readers and punches [*301] to Honeywell.

15.40.21 That meant that Honeywell was forced to purchase card readers and punches at full list price from IBM in the current year and then wait several years for a return through rental payments of money which was currently paid to IBM for its readers and punches.

15.40.22 Although this placed Honeywell at a significant competitive disadvantage in the EDP market, Honeywell nevertheless continued to buy readers and punches from IBM since SR would not deal on any terms and there was no other alternative pending final completion of design and development of Honeywell readers and punches.

15.40.23 In May of 1966, representatives of Honeywell visited representatives of IBM to ask that IBM reconsider its policy that it would not lease for re-lease readers and punches to Honeywell.

15.40.24 IBM refused to reconsider both policies, SR knowing of IBM policy and vice-versa.

15.40.25 From at least as early as 1956-57, it has been very important for an EDP manufacturer to develop its own complete system because customers disliked "split-system responsibility" with one manufacturer maintaining the central processor and one or more others maintaining the peripheral [*302] devices.

15.40.26 The purchase or lease of peripheral devices by an EDP system producer from another manufacturer removed that area of the system as a potential profit-maker.

15.40.27 Peripherals have contributed an increasingly greater share of total system price during the period 1955 to 1970.

15.40.28 Peripheral and input-output devices have been and are now critically important to EDP system customers and hence to sales since they determine the "through-put" of the system, the speed and flexibility with which the system can meet the user's needs, and often, the quality of the system user's performance for its customer.

15.40.29 A range of types of peripheral devices (as well as a range of speed and capacity within each type) offered with a central processor permits the selection of the best combination of capability and price for the customer.

15.40.30 The EDP manufacturer with a limited set of peripherals was and is therefore severely limited in its ability to compete.

15.40.31 Since the late 1950's, emphasis has been moving increasingly away from the central processor and toward peripheral capabilities in the EDP customer's comparison of performance [*303] of data processing business applications by competing EDP systems.

15.40.32 It is common today, and has been increasingly so since the late 1950's, to refer to a system with apparent limitations in efficiency as "printer-bound" or "input-bound" or "tape-bound" meaning that the speed of a particular peripheral unit is the measure of EDP system performance.

15.40.33 Honeywell experienced substantial deprivation and competitive disadvantage because of nonaccess to the exclusively held technology which IBM and SR shared under the 1956 Agreement.

15.40.34 Although the Honeywell EDP organization had a strong management position and a growing sales capability in 1956/1957, it had little if any specialized know-how with respect to peripheral or terminal equipment design and evaluation or the production of electronic or mechanical units except on a model-shop basis.

15.40.35 Had Honeywell participated in the information sharing between IBM and SR, it would have obtained valuable, needed know-how to supplement that which it already possessed.

15.40.36 With access to the SR-IBM shared technology, the overall course of Honeywell would have changed noticeably; access to [*304] the exchanged information would have significantly changed the climate in which business decisions were being made at Honeywell EDP in the areas of management, finance, engineering and marketing during the entire period from 1956 until 1970.

15.40.37 Honeywell would have achieved a strong number two EDP industry market share position as early as the 1960-1964 period if the company's two prime weaknesses had been eradicated in the late 1950's by access to the shared technology:

.1 The lack of production and commercial product experience; and

.2 The lack of knowledge and customer and corporate confidence in the peripheral areas from both a design and production viewpoint.

15.40.38 The following benefits would have accrued to Honeywell from the time Honeywell obtained access to the 1956 know-how technology:

.1 Electronic products would have been produced at lower costs with better reliability, and EDP systems could have been brought into the market sooner;

.2 Electromechanical products would have been selected with greater discrimination, implemented for better performance, and produced in-house at a much earlier date with greater customer acceptance;

.3 A broader and more reliable product line would have enhanced the image of the company as a full-line vendor of EDP equipment;

.4 A full-line vendor image would have resulted in more customers earlier; and

.5 A broader product line would have attracted more creative design talent to Honeywell employment in both hardware and software areas.

15.40.39 The primary technical strength of the Honeywell organization rested in its central processor design competence rather than in the areas of implementation of designs in reliable, economical or producible hardware.

15.40.40 Honeywell would have profited by access to the merged technology in the areas of memories, central processors, and control units by knowing certainly what had already been discarded as unreliable, uneconomical or otherwise unsuitable.

15.40.41 Brute-force implementation techniques were utilized in the Honeywell D-1000 and H-800 in an attempt to resolve problems which surely had more reasonable solutions; however, the pressures of time and lack of design knowledge and experience forced Honeywell engineers to find their own solutions which were often clumsy, expensive, or difficult to reproduce, all [*306] of this would have been alleviated from the time of and by access to the merged technology.

15.40.42 Some of the major potential contributions from Honeywell access to the shared technology are in the areas of improved implementation of the conceptual design (better documentation, better packaging, better powering) and in the application of the detailed information to efforts to replace or co-exist with equipment of IBM or SR which a potential customer already had; none of these could be supplied by examination of the competing equipment or by "reverse-engineering."

15.40.43 The Honeywell D-1000 systems were built one-by-one by highly trained engineers and technicians, as were the first H-800 systems; access to the merged technology would have ameliorated this condition for Honeywell and the public would have benefited.

15.40.44 Honeywell EDP engineers had little production experience in 1957; particularly, a lack of knowledge of what could be produced in a factory as opposed to a model shop or test laboratory, and a lack of knowledge of what the factory had to know to produce such equipment; the technology shared between SR and IBM covered such matters.

15.40.45 [*307] The lack of production experience among Honeywell EDP engineers resulted in the use of older technology when current technology of Honeywell (not equal to that shared between SR and IBM) did not produce reliable products, or resulted in expensive model shop crash redesign programs and other activities tending to increase costs, delay shipment, reduce reliability and damage Honeywell's performance and image.

15.40.46 SR's UNIVAC II and File computer, made accessible to IBM, both were constructed using printed circuit packages; had information on these been available to Honeywell as it was to IBM, Honeywell would have been able to improve both design and documentation by engineers and improvement of procedures and techniques by production

personnel; IBM had access to all of this in the technological merger.

15.40.47 The SR-IBM information concerning design and production would have been valuable to Honeywell with respect to connectors, connector techniques, power supply and distribution, cabling and cooling.

15.40.48 Honeywell, having personnel with little knowledge of production techniques, used older technology or over-designed for performance reliability, with the result [*308] that the electronic portions of the H-800/1800, 400/1400 and 200, were more expensive to build and operate than competitive equipment, which affected Honeywell's competitive ability in terms of price and customer costs in floor space and environmental condition.

15.40.49 These deficiencies in Honeywell's design implementation, documentation and production know-how would have been substantially eliminated by access to the technology shared between SR and IBM.

15.40.50 These deficiencies resulted in a loss of sales and loss of EDP image because of the deficiencies in technology displayed by Honeywell.

15.40.51 Honeywell's financial losses were reflected not only in lost sales dollars and increased costs for production and repair of hardware, but also a loss in market place status as reflected in the difficulty in hiring quality personnel and gaining access to sophisticated buyers.

15.40.52 As early as 1959, in developing the H-800 system, Honeywell was forced to attempt to achieve compatibility with certain SR and IBM equipment in order to make sales.

15.40.53 In late 1957, Honeywell was weak in the entire area of high capacity, medium-access-time storage [*309] when contrasted with the IBM 305 RAMAC and the SR Magnetic Drum File Computer, both covered by the shared technology.

15.40.54 In 1958 and thereafter, the weakness of Honeywell in random access units was increasingly apparent and the competition, including SR, capitalized on that weakness.

15.40.55 Honeywell had few personnel experienced in this branch of EDP technology and any realistic prospect of developing random access equipment from scratch was hopeless.

15.40.56 Honeywell, in 1957 and for several years thereafter, could not have become competitive in this rapidly evolving technological area without a body of technological information on which to build; the shared technology would have provided this know-how.

15.40.57 The Bryant disc memory unit was selected to be the device offered by Honeywell with its systems, although not without reluctance.

15.40.58 Four systems containing the Bryant disc unit were shipped to Honeywell customers, but they did not become acceptable in the general marketplace primarily because of inability to keep them operative in service.

15.40.59 For the immediate future, Honeywell was thus committed to the use [*310] of the Bryant disc unit but the difficulties with this unit coupled with the increasing pressure of the market required that investigation of other units be continued.

15.40.60 Honeywell considered as late as 1964, developing a unit using magnetic tape loops to provide a random access capability because of growing indications that the IBM 1311 (random access) unit would destroy any possible market success for the Honeywell 400 and also the Honeywell 200; SR and IBM had shared this technology in 1956-57.

15.40.61 Honeywell personnel concluded that wide tape would not be competitive either with the IBM 1301 disc unit or with the IBM 1311 disc pack unit and that Honeywell would need another program for random access mass storage.

15.40.62 Large numbers of important EDP prospects, some of whom already were customers, made it plain in 1964 that they would not continue to consider Honeywell as a supplier because Honeywell was not competitive in random access.

15.40.63 In September 1964, Honeywell was forced to offer to provide IBM 2311 disc pack units with Honeywell systems or be faced with the alternative of continuing to lose orders.

15.40.64 In December 1964, [*311] The Bryant disc unit was removed from the product line because of difficulty in operation and the conviction by Honeywell personnel that it was no longer competitive.

15.40.65 Honeywell's attempted internal development of a magnetic card random access storage proved to be a disaster both financially and reputation-wise.

15.40.66 The Honeywell card mass storage project was terminated as a product development in the first quarter of 1966 because Honeywell could not perfect the card storage unit to a point at which it would function reliably; access to the 1956 technology shared by SR and IBM would have provided a substitute whenever access was achieved.

15.40.67 Honeywell immediately instituted a series of orders to CDC for disc pack drive units and began a crash program for control units, both resulting in heavy expenses.

15.40.68 In 1966, Honeywell began its own disc pack development and in 1969 put into production random access equipment of its own comparable to current offerings of disc pack drive units of other vendors; the shared technology anticipated this by over ten years.

15.40.69 Had the IBM 305/355 information been made available to [*312] Honeywell in 1957 as it was to SR, the following would have resulted [each year of deferment beyond 1957 would have postponed the results correspondingly]:

.1 Honeywell would have undertaken in 1957 to build random access storage systems starting with the H-800, increasing the customer base and storing up a reservoir of know-how on hardware, software, and systems;

.2 The net result to Honeywell of this development project would have, at least, yielded a workable, acceptable random access storage unit, and the leverage on sales would have been markedly positive;

.3 Honeywell would have avoided involvement with the Bryant units on the 800 and 400 systems.

.4 Honeywell would have avoided the card mass storage debacle which cost it not only money but also time and adverse publicity;

.5 Honeywell would have saved some of the very large disc drive development costs incurred from 1966 to 1970;

.6 Honeywell would have avoided investing a very large amount of money in the purchase of CDC's disc pack drives; and

.7 Honeywell would have avoided involvement with the Bryant units on the 800 and 400 systems.

15.40.70 The loss to Honeywell of not having suitable [*313] random access equipment, available by the shared technology, during the first half of the 1960's was substantial and was further complicated by the fact that this was one area where Honeywell was at the mercy of its competitors, IBM and SR.

15.40.71 IBM and SR capitalized on Honeywell's weaknesses by repeatedly taking prospective sales away from Honeywell during a period of potentially substantial Honeywell growth.

15.40.72 With a strong random access unit from the shared technology in its equipment offering, Honeywell's total

would have accelerated during the period from 1959 to 1965.

15.40.73 The effect of such equipment offering would have been cumulative since, as Honeywell enjoyed a wave of customer acceptance, it would have received further orders from those who had shown previous hesitancy.

15.40.74 With the addition of suitable random access equipment from the shared technology, it can be seen retrospectively that Honeywell's sales for the H-800 series alone would have tripled or quadrupled, and these sales would have had substantial impact on sales of the H-400 series and later of the H-200 series.

15.40.75 Honeywell had never had a drum storage unit [*314] of its own design and manufacture and instead of building on a shared technology base, had been forced to go to other EDP manufacturers for drum storage units whenever a customer demanded such a unit with a Honeywell system.

15.40.76 Often Honeywell was not able to provide a drum storage unit at all when a potential customer demanded one and hence it lost the sale or lease.

15.40.77 Honeywell could have offered a drum storage system on, or earlier than the H-800 and would have with access to the technology shared between SR and IBM in 1957.

15.40.78 Honeywell had no design or production know-how in the area of tab-card handling equipment in the late 1950's and could not afford the gamble of undertaking to design and produce its own tab-card equipment with no base to start from and no guarantee of success.

15.40.79 If Honeywell had had access to the technology shared between IBM and SR in 1957, it could have begun to manufacture tab-card equipment by the end of 1959 with confidence in success and provided its H-800 customers with card equipment of its own manufacture; each year of deferred access cost money and delayed the date of fruition for Honeywell.

15.40.80 [*315] Beginning such activity in 1957 would have produced more competitive tab-card products earlier with Honeywell features designed to complement its own system designs.

15.40.81 Without access to the shared technology, Honeywell was not able to deliver a card-reader of its own design and manufacture until May of 1965 after substantial expenditures and difficulties.

15.40.82 Similarly to the card-reader, Honeywell was not able, without access to the shared technology, to deliver a card-punch of its own design and manufacture until mid-1966; access to the shared technology could have accelerated this delivery.

15.40.83 If Honeywell had developed its own readers and punches for delivery with its first H-800 in 1960, based on shared technology, it would have been able to market an "all-Honeywell system" then with single (not split) system responsibility, and thus would have improved sales, market status and customer base earlier.

15.40.84 With adequate and competitive reader-punch equipment based on shared technology, Honeywell could have retained the profits paid to SR's co-conspirator IBM from which units were obtained at list prices (either leased or purchased); and [*316] the money spent in modifying its own equipment to suit the IBM design, such expenditures being non-recoverable since the leases and purchases from IBM were on a full retail price basis, and interface costs could not be passed on to the EDP customer; earlier access to the shared technology would have shortened the period of dependence on IBM.

15.40.85 Assuming access to the shared technology, Honeywell would have acquired over the years after 1957, or after obtaining such access, a competency in engineering, manufacturing and field maintenance which would have become increasingly valuable because of the growing numbers of Honeywell systems and card handling units installed.

15.40.86 With access to the shared technology, Honeywell's revenues would have been increased in the following ways: by selling or leasing an increased number of systems, by making an increased profit on each system sold or leased, and by improving long-range opportunity, starting with the date of access.

15.40.87 From 1955 to 1965, the printer was a weak link in the Honeywell EDP system offering and had a negative impact on the company's image as an EDP equipment supplier for the whole decade.

15.40.88 [*317] Print quality was considered carefully when vendor-selections were being made by several potentially large Government and commercial accounts for which business Honeywell bid in 1955-1965.

15.40.89 Honeywell approached SR in 1956 to attempt to buy or lease for re-lease the UNIVAC High Speed (600 lines a minute) printer and SR refused to deal on any terms; this was included in the technology shared between IBM and SR; and, incidentally, the patents on such printers were barred by public use.

15.40.90 Honeywell then decided to offer Anelex printers at an advertised speed of 900 lines per minute.

15.40.91 The Anelex arrangement was a costly and unsatisfactory interlude in Honeywell's search for a solution to its printer problems.

15.40.92 The Anelex printer occupied an inordinate amount of time on the part of Honeywell's systems engineers and designers, and control over the design proved to be of only limited advantage.

15.40.93 By March, 1959, the decision was made to manufacture printers for the 800 system at Honeywell which began a tedious learning process lasting several years for the Honeywell developmental group.

15.40.94 Print quality remained only [*318] marginally acceptable through the Honeywell 822, 422, and 206 printers delivered by Honeywell during the period of 1960-1965 and improvements did not come until the Honeywell 222 printer was first delivered in 1965.

15.40.95 Honeywell poured large amounts of money into printer engineering and field maintenance, but its loss was far greater in terms of systems sales or leases lost to competition.

15.40.96 Had the UNIVAC high-speed printer design information and manufacturing drawings shared with IBM been made available to Honeywell in 1957 or later, steps would have been taken to produce the UNIVAC type printer in-house immediately.

15.40.97 The first Honeywell printer would have been designed and produced inhouse by the end of 1959 [or later if access to the shared technology had been later] for delivery with the H-800 system which would have been a better product, both in cost and performance, than the printer Honeywell actually delivered with the system.

15.40.98 Assuming access to the shared technology, the print quality of the H-800 or the 400 and the early 200 series printers would have been at least equal to that of SR's UNIVAC printer device and the impact [*319] upon sales of the H-800, H-400 and H-200 would have been substantial during the years 1958-1965 when such systems were offered.

15.40.99 In 1957, Honeywell had little know-how on which to build an EDP system manufacturing facility.

15.40.100 The only electromechanical EDP units manufactured by Honeywell prior to 1964 were magnetic tape units and printers with tape units receiving by far the greatest amount of attention.

15.40.101 Had the IBM/SR shared technology been available to Honeywell in 1957 or later, Honeywell engineers would have been able to learn in such areas as optimal assembly techniques, preferred componentry, preferred materials, current manufacturing methodologies and use of special tools and jigs; knowledge in these areas was the product of extensive prior cycles of trial, error, and revision by IBM and SR product engineering and manufacturing

personnel by the time of the 1956 Agreement and was shared thereunder; early access by Honeywell would have meant earlier accomplishment by Honeywell.

15.40.102 Had Honeywell had access to the technology exchanged between IBM and SR in 1957 or later, there would have been improvements in Honeywell's [*320] production engineering activities, in documentation and implementation of design changes and in manufacturing performance and cost reduction before they were accomplished without access.

15.40.103 Access to core storage stack technology shared between SR and IBM would have increased the ability of Honeywell to choose, work with and evaluate core storage suppliers earlier, which would have resulted in reduced system costs and increased system performance earlier.

15.40.104 Information from service manuals exchanged between IBM and SR in 1957 or later would have benefited Honeywell in the following ways as soon as obtained and thereafter:

.1 In those cases in which IBM equipment would still have been used with Honeywell systems, selection of specific units and cost estimates would have been on a more knowledgeable and effective basis;

.2 Honeywell service manuals, after exposure to IBM and SR manuals, would have been improved;

.3 Adjustment and calibration information necessary to achieve compatibility with IBM and SR terminal and peripheral units respectively would have been more readily available; and

.4 Maintenance tools and test equipment respectively [*321] used by IBM and SR would have been available to Honeywell design engineers and would have minimized one of Honeywell's greatest technical problems, namely, disparity between Honeywell maintenance aids and those of IBM and SR.

15.40.105 Honeywell could not have "reverse-engineered" the IBM and SR electronic and electromechanical devices as to which IBM and SR shared information in the technological merger of 1956 and which would have been helpful to it in the period 1957 to date for the following reasons:

.1 It is impossible on small parts to determine what type of metallic material was used, whether steel, brass, bronze, or some alloy;

.2 It is impossible to tell from examination of parts which parts were made by the peripheral device manufacturer and which parts were purchased from vendors and, if some were purchased, it is impossible to tell the sources, purchase specifications and inspection criteria;

.3 It is impossible to tell by examination of the device what kinds of tooling, or machine tools, fixtures, jigs and dies were used by the manufacturer of the device to produce the desired shapes and tolerances;

.4 It is impossible to decipher tolerances and [*322] adjustments of intricate electromechanical and electronic parts since the particular machine which is torn down may be in the middle, low or high position within the permissible tolerance range with respect to each part; and competitive tolerance ranges are not known and are impossible to decipher by inspection;

.5 It is impossible to determine by inspection the order of manufacture and assembly and the procedures and finishes used in the manufacture and assembly processes; and

.6 Most important, it is impossible to reproduce any device without making some unintended or intended modifications or adjustments and as soon as any such modification or adjustment is made a part may be moved outside the permissible tolerance range since there is no way of knowing which adjustments are incidental and which are fundamental.

15.40.106 Had Honeywell been given access to the shared technology, a substantial forward momentum would have been delivered to Honeywell at an earlier time when the leverage was much greater; hence, potential beneficial effects from such an exchange to IBM and SR were greater in 1956-57 than they would be today and made it that much more difficult for those [*323] who had no access to the shared technology to compete profitably in the years after the exchange.

15.40.107 The following is the actual schedule for production and delivery of the Honeywell H-800, H-400 and H-200 systems:

.1 The first H-800 was delivered on December 31, 1960, but production problems were not resolved until July of 1961;

.2 The H-800 used IBM card readers and punches, had no drum storage unit, had no acceptable disc random access storage unit, and had a significantly inferior Honeywell-built printer;

.3 The first H-400 system was delivered in late December, 1961, but production problems were not resolved until about July, 1962;

.4 The H-400 had acceptance problems in the marketplace and suffered from the same peripheral equipment disadvantages as H-800;

.5 The first H-200 system was delivered in June of 1964 but did not go into volume production until December of 1964 or January of 1965;

.6 The H-200 suffered from split system responsibility in its early years and lacked quality peripheral devices until Honeywell was able to deliver its own reader, its own punch, its improved printer, and its own disc random access storage unit; and

. [*324] 7 Honeywell has never had its own drum storage equipment, did not come out with a printer which was satisfactory to its customers until February of 1965, did not produce its own card reader until May of 1965, did not produce its own card punch until mid-1966, and did not produce its own disc random access storage unit until 1969.

15.40.108 Had Honeywell had access in 1957 to the technology shared between IBM and SR, Honeywell could have designed and manufactured a set of its own peripherals for inclusion with the first H-800 system delivery in 1960; later access would have saved money but not alleviated the problem of the 1960s.

15.40.109 That set of Honeywell peripherals would have included a card reader, a card punch, a drum storage device, a disc random access storage device, and a high speed printer with print quality and speed equal to that of SR's high speed printer.

15.40.110 Had Honeywell had access in 1956-1957 to the information exchanged, the first H-800 system could have been in volume production by July 1, 1960.

15.40.111 Delivery of the H-800 with its own set of Honeywell-built peripherals at an earlier date would have enhanced the image of the system [*325] in the marketplace and improved the reliability and performance of the complete package.

15.40.112 Had Honeywell had access to the shared technology in 1956-57, first delivery and volume production of the H-400 would have been stepped up to July 1, 1961, resulting in a time saving of six months in first delivery and a full year in volume production over the actual schedule, again with additional competitive advantage of greater dimension.

15.40.113 Assuming Honeywell had had access to the shared technology in 1956-57, the H-400 which had acceptance problems in the marketplace, would have had its image enhanced and its reliability and performance improved because of the availability of a complete set of high quality Honeywell-built peripherals.

15.40.114 Had Honeywell had access to the shared technology, in 1956-57, the H-200 would have been first delivered and in volume production by late 1963, instead of 1964, resulting in a time saving of six months in first delivery and a full year in volume production; this six month to one year advantage would have greatly increased sales of the H-200 system since SR's co-conspirator IBM had problems in meeting promised delivery [*326] schedules of its own 360 system as late as 1965 and 1966 which promises were forcedly announced to meet the H-200 system.

15.40.115 The experience of having designed and built a complete set of Honeywell peripherals on the shared technology base for the H-800 and the H-400 systems would have meant that Honeywell's H-200 system would have contained an attractive set of Honeywell-built peripheral devices which would have enhanced the H-200's market image for reliability and performance for customers.

15.40.116 As a result, Honeywell would have become a much more efficient organization earlier with a totally competitive EDP system product to offer in the marketplace and thus would have had substantially increased efficiencies, sales, revenues, and profits throughout the period after access to the shared technology.

15.40.117 Had Honeywell had access to the shared technology, it would also have been able to penetrate user markets earlier from which it was excluded by its lack of peripheral equipment capabilities.

15.40.118 These effects are cumulative.

15.40.119 The most important loss to Honeywell was the loss of the opportunity it could have had to advance its [*327] image and customer base position in the field and its consequent reduction in revenue and profit during the years following the technological merger of SR and IBM.

15.40.120 The anticompetitive effect of the sharing of technology between SR and IBM was to place Honeywell (and others) in a "re-invention" cycle in competition with both SR and IBM; SR and IBM conspiratorially obtained an advanced and combined base of know-how in 1957 against which Honeywell and the EDP industry had to compete; it enabled SR and IBM to stay two or three years ahead of Honeywell and the Industry which were "re-inventing" the merged technology whereas SR and IBM were able to concentrate on more advanced products or fresh approaches and to keep them in reserve until competition was about to or did announce or introduce similar items to the market.

15.40.121 This never-ending disadvantage continued with Honeywell and the industry still having to "re-invent" what the co-conspirators shared in technology and which provided a base on which they could build.

15.40.122 Finally, the technological merger dampened the need and diminished the reason for SR and IBM to expend as large sums, relatively [*328] speaking, for current R & D, thus reducing the total penetration of EDP equipment and systems and keeping total market size smaller and more risky to enter than otherwise would have been the case.

15.40.123 Honeywell, throughout the period 1957 to 1969, made R & D expenditures for design of EDP equipment, some of which would have been unnecessary at some point in time had Honeywell had access to the technology shared between SR and IBM in 1956 or thereafter.

15.40.124 Honeywell EDP Division's financial history for the period 1955 to 1969 demonstrates the heavy expenses and losses which Honeywell incurred in trying to turn the profit corner in the EDP industry dominated by co-conspirators SR and IBM.

15.40.125 Comparing the relationship between R & D productivity statistics for Honeywell against those with access to the merged technology produced injury and probable damage to Honeywell.

15.40.126 Honeywell's wasted or marginally required EDP R & D expenses produced injury and probable damage to Honeywell.

15.40.127 Honeywell's lost EDP business due to defendants' pattern of conduct, including their control of and shared technology, produced injury and probable [*329] damage to Honeywell.

15.40.128 Defendant's pattern of conduct, including the technological merger of IBM and SR, imposed and perpetuated the effects of an entry barrier on the EDP industry and artificially depressed the size and rate of growth of the industry and its market, and depressed Honeywell's share therein and produced injury and probable damage to Honeywell.

15.40.129 Hindsight demonstrates that certain of the injury and indicated damage aforesaid were probably provable with reasonable certainty prior to May 26, 1963; certain thereof were not susceptible of proof at all or to such a certainty until a later time.

16. SR-IBM Settlement of Interferences 16.1 Plaintiff claims that the settlement of the interferences violated Sections 1 and 2 in that SR and IBM each knew of the invalidity of the ENIAC and SSEC applications and other patents and applications.

16.2 IBM repeatedly took the position that the ENIAC application was invalid and did file another petition with the Patent Office in 1959.

16.2.1 See 15.24.2, 15.24.13, 15.24.21 and 15.24.30.

16.2.2 The following lists the Patent Office interferences which were settled by IBM and SR pursuant [*330] to the 1956 Agreement, the subject, the application number, the filing date, the applicants, and the SR "EM" file number for each SR application involved in the interferences settled: 15. 20 In 1967 the percentage was slightly less than 10%.

Interference No.	Subject of Applicants	Application No.	Date Filed	SR Application	EM No.
86,576	ENIAC	757,158	06/26/46	EckertMauchly	EM-6
86,997	Information				
	Storage System	98,178	06/10/49	Eckert	EM-8Lukoff
86,998	Information				
	Storage System	98,178	06/10/49	Eckert	EM-8Lukoff
87,203	Information				
	Storage System	98,178	06/10/49	Eckert	EM-8Lukoff
87,230	ENIAC	757,158	06/26/46	EckertMauchly	EM-6
87,231	B INAC	179,782	08/16/59	Eckert et al	EM-22
87,388	ENIAC	757,158	06/26/46	EckertMauchly	EM-6
87,779	ENIAC	757,158	06/26/46	EckertMauchly	EM-6
87,872	ENIAC	757,158	06/26/46	EckertMauchly	EM-6
87,957	Magnetic				
	Reading Device	253,189	10/25/51	Rubens	ERA-30
88,118	ENIAC	757,158	06/26/46	EckertMauchly	EM-6

16.2.3 In the August 21, 1956 Agreement, IBM reserved the right to proceed with a challenge to the ENIAC patent application [*331] on the public use ground.

16.2.4 In 1958, IBM became concerned because it feared that, for antitrust purposes, it might be argued that IBM's 1956 attempt to institute a public use proceeding against the ENIAC patent application was insufficient since the

petition had been denied on a procedural matter and not on the merits.

16.2. 5 In 1958, IBM was aware that there could be antitrust ramifications if it did not proceed further and that it could charge in a renewed petition that Eckert and Mauchly committed a fraud on the Patent Office by not disclosing public use information to the Office at the time they executed their oaths in 1947.

16.2.6 IBM, with SR's knowledge, never raised the question of the commission of a fraud on the Patent Office by Eckert and Mauchly in its petitions for institution of public use proceedings.

16.2.7 On February 20, 1959, IBM renewed its previously filed petition for the institution of a public use proceeding against the ENIAC application and did not bring out all of the public use information it had nor the information concerning inventive derivations by Mauchly from Atanasoff which was then in IBM's possession.

[*332] 16.2.8 Furthermore, both parties knew that the Patent Office had a long established policy of refusing to process public use petitions.

16.2.9 IBM had more to lose than to gain by establishing invalidity of the ENIAC patent application once the 1956 cross-license had been executed because IBM knew that once it had agreed to pay \$ 10,000,000, its competitors would be financially burdened by the ENIAC patent application only if it issued; furthermore, IBM knew that any of the claims of its SSEC application common to ENIAC claims would also be invalid and other SSEC claims reading on ENIAC would be similarly invalid.

16.2.10 When IBM renewed its public use petition in 1959, a patent attorney representing SR wrote a letter to Army Ordnance asking that Ordnance not give IBM access to evidence which might establish the fact that ENIAC had been in public use before the critical date; however, no effort was made by IBM to subpoena the records.

16.2.11 The foregoing acts and non-acts are consistent with conspiracy.

16. 3 In 1960, the Assistant Commissioner declined to order a hearing on the claim of public use and IBM took no further legal action.

16.3.1 [*333] On May 26, 1960, the Commissioner of Patents by Assistant Commissioner Crocker advised IBM and the ENIAC applicants that the IBM petition to institute public use proceedings had been denied on the ground the affidavits and exhibits submitted on behalf of IBM failed to make a prima facie showing that the subject matter of the ENIAC application was in public use or on sale more than one year prior to its filing; thus, the question of public use of the ENIAC was never considered on the merits by the Patent Office.

16.3.2 After the Patent Office denied IBM's petition for institution of a public use proceeding in 1959, IBM made an internal report to state that it had pursued the public use proceeding in good faith even though any direct benefit to IBM to be obtained from the public use proceeding was eliminated and even though IBM and SR knew the Patent Office proceeding was essentially a sham.

16.3.3 IBM and SR were both aware that further appeals were available on the public use issue and that the Patent Office decision not to hold a public use hearing was not binding on the courts; however IBM concluded it could claim to have leaned over backwards to appear to act in an ethical [*334] manner and that nothing further could be expected of it.

16.3.4 IBM made no further formal attack on the validity of the ENIAC patent application or patent despite its possession of evidence of and belief in the invalidity.

16.4 Settlements are, of course, to be encouraged unless in the process the antitrust laws are violated and the public interest harmed.

16.5 I find no violation of the antitrust laws and find lack of proof as to injury.

16.5.1 On August 21, 1956, IBM and SR entered into an agreement providing, inter alia, for a non-exclusive patent cross-license in the EDP field.

16.5.2 Also on August 21, 1956, IBM and SR entered into procedural agreements to dispose of eleven outstanding Patent Office interferences between patents and patent applications of the two companies. Six of these interferences and agreements involved the ENIAC patent application and five involved other SR patent applications.

16.5.3 A Honeywell witness characterized these 1956 IBM-SR interference procedure agreements as "very conventional," and Honeywell itself (through Datamatic, which it controlled) later joined in certain of them.

16.5.4 Honeywell has not proven any [*335] fraud in connection with the patents and patent applications involved in the eleven IBM-SR procedural interference agreements.

16.5.5 Honeywell has not shown that the 1956 IBM-SR agreements on interference procedures alone constituted an unreasonable restraint on trade or were otherwise improper.

16.5.6 Honeywell has proven no injury to its business or property caused by the 1956 IBM-SR agreements on interference procedure.

16.5.7 Honeywell has not shown that the 1956 IBM-SR agreements on interference procedures provide any grounds for declaring the ENIAC patent, or any other SR patent, invalid or unenforceable.

16.5.8 There was suppression of the facts concerning the 1956 IBM-SR interference agreements.

17. 1961 Agreement and SR and BTL 17.1 The 1961 Agreement apparently resolved the issue of priority between Williams and Mauchly and Eckert.

17.1.1 One of the principal interferences (No. 85,809) in which the ENIAC patent application was involved was with BTL's Williams patent.

17.1.2 That interference began in 1952 over the issue of priority of invention and ended with BTL and SR litigation on the actually academic [to the parties] question [*336] of public use of the ENIAC before the late Judge Archie Dawson of the Southern District of New York.

17.1.3 On July 1, 1961, prior to the trial of that litigation, Western Electric Company (acting for the Bell System, including BTL) and SR executed a complete cross-license of all their patents and patent applications which included all EDP patents and applications, of which ENIAC was one.

17.1.4 This Agreement had the effect of disarming BTL's attack on the validity of SR's ENIAC patent application and put BTL in a position in which it had nothing to gain by establishing the invalidity of the ENIAC patent application.

17.1.5 Pursuant to the terms of 1961 SR-Western Electric Agreement, Western Electric received, among many other things, a license under any patent to issue on the ENIAC patent application.

17.1.6 Because SR owned the Eckert and/or Mauchly patent and application rights (including ENIAC), it was able to and did gain access to the Bell System's very substantial patent and application portfolio; and this was done after BTL had first been held to have priority in the Patent Office over what SR later claimed to be the basic computer patent.

17.2 The [*337] issue of public use of the ENIAC was submitted to the District Court and incorrectly decided.

17.2.1 See 18.1.1 through 18.1.5.

17.2.2 BTL never pursued the public use issue vigorously in the Southern District of New York case and certainly not after the execution of the July, 1961 cross-license Agreement with SR.

17.2.3 At the time when the question of the public use was submitted to Judge Dawson in the Fall of 1961, BTL had no true interest in establishing public use as a defense to the validity or issuance of the ENIAC patent.

17.2.4 On December 18, 1961 in the course of the BTL case, SR was advised that the Los Alamos Laboratory of the A.E.C. was prepared to furnish an official affidavit that the 1945-46 ENIAC work before the critical date was useful, important, solved real problems and was relied upon; SR declined the affidavit as not helpful, did not reveal the A.E.C. offer to BTL or the court and contended to a contrary effect on the record to the court.

17.2.5 BTL's internal memoranda in connection with the lawsuit prove that it desired to complete the public use litigation in the Southern District of New York at the least expense and with the least [*338] possible amount of effort; SR was of a like mind as it never mounted a truly effective effort.

17.2.6 BTL and SR submitted their evidence in perfunctory and conclusory affidavits and deposition transcripts.

17.2.7 Most of the volume of the evidence before Judge Dawson did not bear on the public use issue at all but on the priority issue which had previously been eliminated from the case.

17.2.8 On September 6, 1962, Judge Dawson found that the ENIAC machine had not been in public use more than one year prior to filing the ENIAC application and directed the Commissioner of Patents to issue a patent on the ENIAC application.

17.2.9 After this decision, BTL took a "for-the-record" appeal to the Court of Appeals for the Second Circuit which dismissed the appeal because the case had been moot all along by the 1961 execution of the cross-license between Western Electric and SR.

17.2.10 Thus, had the case been correctly decided by the District Court, the ENIAC patent would not have issued and the EDP industry would not have been threatened with its burden or sanction.

17.3 I find no violation of the antitrust laws and find lack of proof as to injury.

17.3.1 [*339] Honeywell has not shown that it was injured in its business or property by reason of the 1961 SR-Western Electric Agreement.

17.3.2 Honeywell has not proven that the 1961 SR-Western Electric Agreement was an unreasonable restraint on trade.

17.3.3 Honeywell has not proven that the 1961 SR-Western Electric Agreement, of itself, violated the Sherman Act or injured Honeywell in its business or property.

17.3.4 Nonexclusive patent cross-licensing in itself may be proper.

18. 1965 Agreement of SR and IBM 18.1 Following the issuance of the ENIAC patent, the question of whether further payments were required under the 1956 Agreement required resolution.

18.1.1 The 1956 Agreement required that IBM pay minimum royalties to SR of \$ 10,000,000 in eight \$ 1,250,000 annual installments; an additional royalty of 1 percent of IBM's EDP manufacturing costs (for infringing equipment) from October 1, 1956 to September 30, 1964, after crediting the \$ 10,000,000 prepaid, was due if the ENIAC patent should issue prior to December 31, 1964.

18.1.2 After the ENIAC patent issued on February 4, 1964, SR served notice on IBM claiming additional royalties due under the 1956 Agreement, [*340] and asked IBM to prepare a statement (certified by independent auditors) of

additional royalties due as provided by the 1956 Agreement.

18.1.2.1 Subsequent to the issuance of the ENIAC patent in 1964, IBM and SR engaged in a dispute concerning whether IBM owed SR additional royalties under a provision of the 1956 IBM-SR agreement.

18.1.3 On April 24, 1964, J. Birkenstock of IBM furnished SR with a certified "Statement of Additional Royalty Due" which concluded that since IBM's total manufacturing costs from the period October 1, 1956 for all EDP equipment, infringing or not, did not exceed \$ 1,000,000,000 (making 1% of that less than the \$ 10,000,000 fixed royalty), IBM owed no further royalties other than the remaining fixed royalty payment.

18.1.4 On May 1, 1964, C. McTiernan of SR informed IBM that in SR's opinion IBM had not fulfilled its obligation under the 1956 Agreement as regards furnishing a royalty statement; accordingly, SR requested a formal, exact, detailed presentation which would enable it to certify IBM's accounting.

18.1.5 During 1964 and 1965, IBM and SR continued to negotiate in an attempt to arrive at a satisfactory resolution to their controversy; [*341] the main points at apparent issue, aside from the validity of the ENIAC patent, were the interpretation of IBM's obligations under the 1956 Agreement, the scope of the ENIAC patent claims as they related to IBM equipment (which SR claimed covered some TAB machines) and the accounting measures used by IBM to arrive at its manufacturing costs for infringing equipment.

18. 2 In 1964 or 1965 IBM was still contending that the ENIAC was invalid for a number of reasons.

18.2.1 At a December 15, 1964 meeting between IBM and SR patent representatives, Charles Walker, outside patent counsel of IBM, contended that if IBM should prevail on any one of four stated positions in a court contest, the ENIAC patent would be declared invalid; the four contentions were:

.1 The ENIAC patent fails with respect to public use;

.2 Even if SR should persuade the Court that use up to a certain time was experimental, the public use was nevertheless more than a year before claims to the system were first introduced;

.3 Although IBM is a licensee, it has the right to construe a patent and the background against which it should be read; and

.4 Certain claims from the ENIAC [*342] patent read on the Phelps patent. [See 6.1 through 6.1.7]

18.2.2 At a February 5, 1965 meeting of representatives of SR and IBM, IBM outside counsel again contended that the ENIAC machine had been in public use and that IBM retained the right under the 1956 Agreement to raise the public use defense against the ENIAC patent; IBM also correctly contended that the public interest would be to have an invalid patent declared invalid, and that Judge Dawson in the SR v. BTL case made a clear error in finding experimental instead of public use.

18.2.3 At an August 11, 1965 meeting of SR and IBM representatives, IBM again contended that the ENIAC patent was invalid by reason of public use and the Phelps patent and reiterated the late claiming defense [See 10.1] and IBM's position that the scope of the ENIAC patent should not include input and output units; at this meeting IBM gave SR a report, prepared as a result of earlier meetings with SR, detailing these contentions.

18.3 It had, however, in 1959 or 1960 given up its strongest argument on invalidity because of public use.

18.3.1 See 16.2.1 through 16.2.10 and 16.3.1 through 16.3.4.

18.4 The dispute resolved [*343] into an accounting issue and IBM agreed to further payment of \$ 1,100,000.

18.4.1 See 18 through 18.1.5 and 18.5 through 18.5.4.

18.5 This payment was conditioned by the 1956 agreement on the issuance of the ENIAC application, and it appears that much of the total \$ 11,100,000 paid by IBM to SR represented ENIAC royalties.

18.5.1 The 1956 Agreement contains a specific definition of the ENIAC application and also provides specifically and separately for an additional royalty to be paid in the event ENIAC finally ripened into a patent; the ENIAC application was a significant issue, was negotiated separately from the other issues, was eventually settled separately from the other issues and was the subject of a specific provision in the 1956 Agreement and again in the 1965 renewal or extension agreement.

18.5.2 The 1956 Agreement called for IBM to pay minimum royalties to SR of \$ 10,000,000 plus an additional royalty of 1% of IBM's EDP manufacturing costs (for infringing equipment) from October 1, 1956 to September 30, 1964, after crediting the \$ 10,000,000, if the ENIAC patent should issue prior to December 31, 1964.

18.5.3 Under the 1956 Agreement no additional [*344] royalties were payable by IBM if the ENIAC patent did not issue or was invalidated or held unenforceable.

18.5.4 On November 15, 1965, SR and IBM entered into a complete cross-license on all information handling systems patents and patent applications filed between that date and November 15, 1970 and agreed that IBM should pay SR \$ 1,100,000 to settle the dispute over additional royalty due because of the issuance of the ENIAC patent; this accomplished "peaceful co-existence" between the co-conspirators for five more years, each being free to infringe each others' patents without risk.

18.5.4.1 After more than a year's negotiation, IBM and SR on November 15, 1965 reached an agreement resolving, among other things, the dispute concerning the 1956 IBM-SR Agreement.

18.5.4.2 Under the provisions of their 1965 Agreement IBM and SR exchanged paid-up nonexclusive cross-licenses in the field of "information handling" under patents and future patent applications filed prior to November 15, 1970. Moreover, IBM and SR released each other from all claims under the 1956 agreement, and IBM paid SR \$ 1,100,000 upon the execution of the agreement.

18.6 What is difficult to measure [*345] is what part in the 1956 agreement the fact of dismissal of the SR antitrust suit against IBM and other factors played.

18.7 IBM was then, and should be now, apprehensive about antitrust lawsuits.

18.7.1 See 15.26.4 through 15.26.30.

18.8 The fact is that plaintiff and the newcomers in the EDP market in 1956, including Burroughs, NCR, RCA and others, should have in 1956 or later sued SR and IBM which then controlled about 95% of the EDP market.

18.8.1 Had such a suit or suits been commenced by filing prior to May 26, 1963, judicial notice may be taken that they could not have resulted in a trial in less than two (2) to four (4) years nor in a decision in less than four (4) to six (6) years after commencement.

18.8.2 Had such a suit or suits been commenced, judicial notice may be taken that evidence of damage in any one year which flowed from non-access to the shared technology would not have been available until after the end of at least that year or one prior thereto and projections as to the future from deprivation in the past would have been subject to vigorous objection as speculative and conjectural even though broad-based injunctive relief could have [*346] been awarded as protection for years in the future.

18.8.3 To illustrate, had the lawsuit been filed in 1957 or 1958 and come to trial and decision in 1960 (a most unlikely

event), evidence of the technology-shared damage could have been offered for the years 1957, 1958 and 1959 but estimates of any "pour-over" until 1961 or later would have been met with the objection of guesswork even though the plaintiff (Honeywell for instance) was assumed not only to have been granted free access by discovery to see but also the right to use the shared technology by 1960 as a result of a final decree and no appeal.

18.9 I find that regardless of whatever further accommodation of the interests of SR and IBM resulted from the 1965 Agreement, that the agreement did not violate the antitrust laws.

18.9.1 Honeywell has not proven that the 1965 IBM-SR Agreement was an unreasonable restraint on trade.

18.9.2 Nonexclusive patent cross licensing in itself may be proper.

18.9.3 Honeywell has not proven that the 1965 IBM-SR Agreement violated the Sherman Act or injured Honeywell in its business or property.

18.10 Plaintiff has failed to prove injury.

18.10.1 Honeywell has [*347] not proven that the 1965 IBM-SR Agreement, in itself, had any effect on Honeywell.

18.10.2 Honeywell has not shown that it was injured in its business or property by reason of the 1965 IBM-SR Agreement.

19. Discriminatory Licensing 19.1 Plaintiff claims a violation of Section 2 because two competitors of SR have been treated differently.

19.2 The SR and IBM agreements of 1956 and 1965 resulted in payments by IBM to SR of \$ 11,100,000.

19.2.1 See 18.5.1 through 18.5.4.

19.2.2 One percent of IBM's EDP equipment manufacturing cost for the period 1957-64 was agreed by SR and IBM to be \$ 11,100,000.

19.3 The ENIAC application was an important factor in the considerations exchanged.

19.3.1 See 15.24, 15.24.2, 15.24.13, 15.24.21, 15.24.25, 15.24.30, 16.2.2, 18.1.2, 18.2.1 through 18.2.3 and 18.5.1 through 18.5.4.

19.3.2 During the course of the 1956 negotiations between IBM and SR, IBM insisted that any overall settlement include a license to IBM under SR's ENIAC patent application.

19.3.3 The 1956 SR-IBM Agreement as consummated included a cross-license on EDP patents and applications filed prior to October 1, 1956. The ENIAC patent application [*348] was included in this group.

19.3.4 Under the 1956 IBM-SR Agreement, SR received, among other things, licenses under IBM's tab patents and applications, and also received technical information on all IBM tabulating machines announced or released to production as of October 1, 1956.

19.3.5 SR officials hoped that the 1956 IBM patent licenses and technical information would include patent licenses and technical information on a proposed IBM World Wide Accounting Machine (WWAM), and it had been estimated that the rights to this WWAM tabulating machine would be worth \$ 20,000,000 to SR.

19.3.6 SR also received pursuant to the 1956 IBM-SR Agreement patent licenses under IBM's EDP patents and applications, as well as EDP technical information, as of October 1, 1956.

19.3.7 Among the patent licenses each party received pursuant to the 1956 IBM-SR Agreement were licenses under the patents or applications that were involved in eleven interferences with SR patents and applications.

19.3.8 Each party also received from the other, pursuant to the 1956 IBM-SR Agreement, a release for past patent infringement, and IBM agreed to dismiss its counterclaim against SR for infringement [*349] of 35 patents.

19.3.9 SR also received, pursuant to the 1956 IBM-SR Agreement \$ 10,000,000 from IBM, plus a covenant by IBM to pay an additional royalty under the ENIAC patent, if a patent issued on the ENIAC patent application prior to January 1, 1965. This additional royalty was to be 1% of the manufacturing cost of each EDP machine embodying any invention covered by the claims of the ENIAC patent manufactured by IBM within the United States between October 1, 1956 and October 1, 1964--after deducting the prepaid \$ 10 million as a credit.

19.3.10 Frost, SR's general counsel and its chief negotiator, had asked his patent people in 1956 to give him an estimate of the values of the respective patent positions of IBM and SR but they were unable to do so. Frost concluded that the only premise he could adopt was that the patents were equally balanced in value.

19.3.11 As to the entire noncash package SR received from IBM in 1956, Frost had been advised by UNIVAC personnel that it was worth from \$ 30,000,000 to \$ 40,000,000.

19.3.12 Shortly after the ENIAC patent issued on February 4, 1964, Birkenstock, IBM's chief negotiator, wrote to T. J. Watson, Jr., IBM's chief [*350] executive:

"The issuance of the 'ENIAC' patent to Sperry Rand after ten years of litigation makes our \$ 10 million settlement look many times better than we figured it to be in 1956."

19.3.13 After issuance of the ENIAC patent, IBM and SR became involved in a dispute concerning whether IBM owed additional royalties under the 1% provisions of the 1956 IBM-SR Agreement.

19.3.14 After more than a year's negotiation, IBM and SR on November 15, 1965 reached agreement.

19.3.15 Under the provisions of the 1965 IBM-SR Agreement, IBM and SR exchanged paid-up nonexclusive cross-licenses in the field of "information handling" under patents and patent applications filed prior to November 15, 1970. Under the broad definition of "information handling" in the 1965 Agreement, SR received licenses under IBM's electric typewriter patents as well as under EDP and tab patents. IBM and SR also released each other from all claims under the 1956 IBM-SR Agreement, and IBM paid SR \$ 1,100,000 upon the execution of the agreement.

19.3.16 The ENIAC patent issued on February 4, 1964.

19.3.17 On April 8, 1964, SR assigned its rights in the ENIAC patent to ISD, a wholly-owned subsidiary [*351] of SR.

19.3.18 In June of 1964, ISD sent out notices of infringement of the ENIAC patent, with an offer to license "on reasonable terms" to various companies, including Honeywell. ISD offered to license these alleged infringers at 1- 1/2 % of the selling price of equipment covered by the ENIAC patent. Although ISD continued correspondence and discussions with various alleged infringers, no license agreements were concluded.

19.3.19 Some alleged infringers of the ENIAC patents, including Honeywell, insisted on including SR and its patents in the discussions.

19.4 After the issuance of the ENIAC patent, the defendants initially demanded \$ 250,000,000 from plaintiff for royalties.

19.4.1 In a meeting on July 21, 1965, SR informed Honeywell that the ENIAC license royalty rate was 1- 1/2 % of the net selling price of each Honeywell EDP system sold or leased with no paid up limit; SR later estimated that

Honeywell's liability to it under this proposal for the 1964-1981 life of the ENIAC patent would be in excess of \$ 200,000,000.

19.4.1.1 SR and ISD communicated with Honeywell in 1965 and 1966, but negotiations dragged on into 1967.

19.4.2 At a January 26, 1967 meeting, [*352] John Dority of SR stated that he had computed a potential liability of Honeywell approximating \$ 250,000,000 using the 1- 1/2 percent figure as applied to past and expected future shipments; Honeywell indicated to SR representatives that this was quite disproportionate to the \$ 10,000,000 asked of IBM under the 1956 cross-license Agreement with IBM.

19.4.2.1 At the urging of John Dority, UNIVAC patent counsel, a meeting was held on January 26, 1967. At that meeting, SR indicated to Honeywell that SR considered its EDP patent portfolio (excluding ISD's ENIAC patent) as more valuable than Honeywell's and that disparity alone should warrant the payment of a 1- 1/2 % royalty by Honeywell.

19.4.2.2 Nevertheless, SR and ISD, in the cynically expressed hope of promptly getting the matter resolved, told Honeywell at their January 26, 1967 meeting that, in the context of a cross-license including the ENIAC patent, they would accept a lump-sum settlement of \$ 1,250,000 annually for 15 years, plus a negotiated settlement for past infringement.

19.4.2.3 Honeywell neither accepted the 1967 SR-ISD offer nor made a counter-offer. No license agreement was ever concluded and Honeywell [*353] has never paid any royalties to SR or ISD.

19.5 This was later reduced to about \$ 20,000,000.

19.5.1 During the January 1967 meeting, SR indicated to Honeywell that it would accept, in the context of an EDP patent cross-license between Honeywell and SR and ISD, a lump sum settlement with Honeywell paying SR \$ 1,250,000 annually for fifteen years, a total of \$ 18,750,000, plus settlement for past liability.

19.6 Defendants demanded royalties from the other members of the EDP industry.

19.6.1 After issuance of the ENIAC patent on February 4, 1964, defendants systematically demanded royalties for a license under the ENIAC patent at a rate of 1- 1/2 percent of the selling price of the affected equipment from all EDP industry members, including, among others, GE, Burroughs, RCA, NCR, CDC, Philco-Ford and numerous manufacturers of peripheral equipment; a royalty of 1- 1/2 percent of the selling price (in dollars) of equipment sold or leased in the years 1964-1967 by the main-frame manufacturers appears in Column A below and that four year total royalty multiplied by 4.25 produces a 17 year conservatively estimated royalty which appears in Column B as follows:

	A 4 yr.royalty	B 17 yr. est.royalty
General Electric	\$ 5,848,406	\$ 24,855,726
RCA	6,619,317	28,132,097
CDC	9,857,210	41,893,142
NCR	6,364,531	27,049,257
Philco-Ford	420,840	1,788,570
Burroughs	6,044,316	25,688,343
Totals	\$35,154,620	

[*354] 19.6.1.1 Lump-sum settlements in the context of cross-licenses with SR and ISD were offered to those alleged infringers with whom negotiations continued, including RCA and Honeywell, but no license agreements were

concluded.

19.6.2 During a July, 1965 meeting with Burroughs, SR indicated that it would consider granting it a paid-up license for \$ 20,000,000.

19.6.3 In December, 1965, SR contacted representatives of GE and indicated that SR was willing to grant GE a paid-up license for \$ 8,500,000.

19.6.4 In January, 1966, GE informed SR that the \$ 8,500,000 paid-up license offered to them was unreasonable and discriminatory since it was similar in total amount to the settlement given to IBM although GE's computer business was much smaller.

19.6.5 At the October, 1966 meeting of SR and RCA, SR was prepared to offer RCA a cross-license at the rate of \$ 1,250,000 per year for 15 years or an aggregate of \$ 18,750,000.

19.6.6 RCA rejected the SR demand as exorbitant.

19.7 A substantial difference is that in 1956 the ENIAC patent was still in the application stage and in 1964 the patent had issued.

19.8 It, of course, strains logic to settle with IBM (one [*355] of the two dominant members of the industry in 1956 and the monopolist in 1965 and now) for \$ 11,100,000 and to demand in 1964-1967 from plaintiff (a minor factor in the industry) \$ 250,000,000 or \$ 20,000,000.

19.8.1 The competitive situation and comparative patent portfolio values of IBM and SR during the license negotiations in 1956 are comparable to the competitive situation and comparative patent portfolio values of SR and Honeywell during their license negotiations in 1966-67.

19.8.2 In the 1956 negotiations for an EDP cross-license between IBM and SR, SR representatives indicated to IBM representatives that the SR EDP patent and application portfolio, excluding the value of the then pending ENIAC patent application, was equal to the IBM EDP patent and application portfolio.

19.8.3 In negotiations with IBM in 1965, SR contended that the \$ 10,000,000 paid by IBM to SR under the 1956 Agreement was not adequate to cover 1% of IBM's EDP equipment manufacturing cost for the years 1957-64; as a result IBM paid an additional \$ 1,100,000 royalty to SR under the 1965 Agreement.

19.8.4 In answer to Honeywell's Interrogatory 58 in this case, SR stated that none of the [*356] \$ 10,000,000 paid by IBM under the 1956 Agreement was attributable to a license under the ENIAC patent rights.

19.8.5 Contemporaneous documents, how ever, indicate that IBM's license under the ENIAC patent rights was claimed by SR at a value equal to 1% of IBM's EDP equipment manufacturing cost for the years 1957-64; although SR represented in negotiations with Eckert and Mauchly that only 2% of the IBM 1956 Agreement royalty of \$ 10,000,000 [or \$ 200,000] was attributable to the license under the ENIAC patent rights; if this is accepted, the 30A patents and applications account for a larger part of the \$ 10,000,000 than either conspirator admits.

19.8.6 In negotiations between Honeywell and defendants in January 1967, defendants indicated that they regarded Honeywell's EDP patent and application portfolio as equal to defendants' EDP patent and application portfolio excluding the ENIAC patent.

19.8.7 The IBM royalty rate under the ENIAC patent was 1% of EDP system and machine manufacturing cost over the 8 year period 1956-64 compared with the royalty rate demanded from Honeywell and the rest of the EDP industry of 1-1/2 % of EDP system and machine selling price or [*357] rental value over the 17 year period 1964-81.

19.8.8 Had Honeywell been given the same arrangement as IBM for the same period 1957 through 1964, royalties for access to the ENIAC patent and the rest of the SR portfolio would have totaled merely \$ 953,680 compared with the minimum \$ 20,000,000 demand made by defendants before ISD sued.

19.8.9 Honeywell's royalty based on 1-1/2% of the selling price or rental value of shipments for the four year period immediately following the issuance of the ENIAC patent would have been in excess of \$ 8,000,000 and would greatly increase every year.

19.9 I believe competitors should in fairness be treated somewhat equally but find no violation of the antitrust laws.

19.9.1 Honeywell has not shown that acceptance of defendants' 1967 license offer would have caused a substantial impairment of competition in the relevant market; it would have increased cost or reduced profit on the basis of 1-1/2% of price.

19.9.2 In order to sustain a finding of patent misuse or a Sherman Act violation based on discriminatory licensing, at least the following must be present: (a) the plaintiff took a license; (b) the royalty rate charged plaintiff [*358] and that charged a competitor were unequal; (c) in all particulars relevant to equality of rates plaintiff and its licensed competitor were similarly situated; and (d) the royalties were an important expense factor in the production costs and the discriminatory rate caused substantial impairment of competition in the relevant market.

19.9.3 Honeywell failed to prove that defendants' offers to license the ENIAC patent and SR's EDP patents violated the Sherman Act, injured Honeywell in its business or property, or provide any basis for declaring the ENIAC patent invalid or unenforceable.

19.9.4 Even if Honeywell had proven any impropriety on defendants' part in making the 1964-67 license offers, any such impropriety would have been cured and purged by the placing of ISD's patent infringement case (and the question of appropriate royalties or infringement damages) before the Court.

19.10 Plaintiff has not proved injury.

19.10.1 Honeywell has not shown that the SR-ISD 1964-67 offers to license their patents injured Honeywell in its business or property.

20. Pending Application Royalties 20.1 After issuance of the ENIAC patent in 1964 and a demand by ISD for [*359] royalties, H and SR discussed a possible cross license of their respective patent portfolios.

20.1.1 After the issuance of the ENIAC patent in 1964, Honeywell and SR, at Honeywell's request, discussed a possible cross-license of their EDP patents.

20.1.1.1 In October, 1964, ISD requested a meeting with representatives of Honeywell to discuss a license under the ENIAC patent; there has never been an EDP patent cross-license or know-how exchange between Honeywell and SR.

20.1.1.2 No such patent cross-license ever ensued.

20.1.2 Also in October, 1964, SR sent Honeywell a notice of infringement of two additional SR EDP Patents Nos. 2,625,607 and 2,686,100 (EM Nos. 2 and 2A).

20.1.3 In December, 1964, Honeywell requested a specification of the ENIAC claims believed to apply to Honeywell EDP equipment and indicated that any meetings to discuss licenses under the ENIAC patent would have to be arranged so that both SR and ISD representatives were present.

20.1.4 In May, 1965, SR inquired of Honeywell as to when a meeting with SR and ISD could be arranged but protested that the matters to be considered by Honeywell and SR were entirely separate from the matters [*360] to be considered

by Honeywell and ISD.

20.1.5 In June, 1965, SR sent Honeywell a notice of infringement of two additional SR EDP Patents Nos. 3,189,290 (EM No. 19A) and 3,189,291.

20.1.6 On July 21, 1965, representatives of SR and ISD asserted that the ENIAC patent claims covered entire data processing systems and submitted to Honeywell a draft of an ENIAC license agreement which provided for a royalty of 1- 1/2 % of the net amount of the selling price or rental value of the equipment covered by the ENIAC patent.

20.1.7 The draft license agreement also included a clause under which Honeywell was to agree to admit validity of the ENIAC patent and agree not to question or attack it.

20.1.8 Also during the July, 1965 meeting, SR demanded that Honeywell make an initial royalty payment as a prerequisite to any agreement to account for alleged past infringement of the ENIAC patent and estimated that Honeywell's liability during the life of the patent would be in excess of \$ 200,000,000.

20.1.9 SR also stated at the July meeting that it had studied the issue of excluded coinventors to the ENIAC patent four or five times and that it felt safe on the public use question [*361] since it had been litigated successfully.

20.1.10 During the July, 1965 meeting, SR gave Honeywell notices of infringement of two additional SR EDP 30A Patent Nos. 2,629,827 and 2,915,966 (EM Nos. 1 and 55C).

20.1.11 In December, 1965, Honeywell informed ISD that it would only deal with SR on a unified basis regarding all patents of both corporations rather than dealing with ISD alone for rights under the ENIAC patent.

20.1.12 At a later meeting in January, 1967, SR representatives informed Honeywell that SR had evaluated its patent portfolio including the ENIAC patent and concluded SR's portfolio was more valuable than Honeywell's; in view of this, SR demanded a royalty of 1-1/2% of all EDP sales to enter into a total cross-license including the 30A patents and applications.

20.1.13 During the January, 1967 meeting, SR indicated to Honeywell that it would accept a lump sum settlement with Honeywell paying SR \$ 1,250,000 annually for fifteen years [\$ 18,750,000] plus settlement for past liability.

20.1.14 During the January, 1967 meeting, Honeywell stated its belief that the royalty arrangement between IBM and SR was detrimental to Honeywell which was subject [*362] to a license on terms which carried a larger dollar amount than was reported to have been paid by IBM which had a much larger sales base.

20.1.15 Honeywell informed SR that it believed the paid-up license offered by SR put Honeywell at an unfair and arguably unlawful disadvantage vis-a-vis both SR and IBM.

20.1.16 During the January, 1967 meeting, SR informed Honeywell that its royalty position was nonnegotiable and that any further meetings, including meetings between top management, would not be particularly helpful.

20.1.17 On May 26, 1967, ISD sued Honeywell and Honeywell sued SR.

20.1.18 Throughout the license negotiations with Honeywell, SR never indicated that it was willing to grant Honeywell access to any EDP know-how nor did it reveal that IBM and SR had already shared their entire EDP technology.

20.2 Honeywell claims that the demands of SR included pre-issuance royalties for the BINAC and UNIVAC, and claims that such demands constitute further violations of the antitrust laws.

20.3 I find that SR did not make such demands and if made do not violate the antitrust laws.

20.3.1 Honeywell has not proven that SR either specifically demanded [*363] or actually received from Honeywell or anyone else any royalties on its pending BINAC and UNIVAC I patent applications, or on any other 30A patent applications.

20.4 Plaintiff has not proved injury.

21. Section 7 of the Clayton Act 21.1 Count III of the Amended Complaint of May 1, 1968, charged defendants with a violation of Section 7 because of the 1950 acquisition of the ENIAC application.

21.2 The Court on November 29, 1971, dismissed Count III.

21.3 In asking for injunctive relief under Section 16, plaintiff emphasizes the ENIAC asset acquisition and states that this was the root cause of defendants' ability to dominate the EDP market.

21.3.1 On February 6, 1950, Remington Rand acquired control of Eckert-Mauchly Computer Corporation ("EMCC").

21.3.2 At the time of Remington Rand's 1950 acquisition of EMCC, EMCC was an under-financed company.

21.3.3 At the time of Remington Rand's 1950 EMCC acquisition, the ENIAC patent application was owned of record by Eckert and Mauchly, not EMCC. Remington Rand finally acquired full legal control of the ENIAC patent application on February 13, 1950 when Eckert and Mauchly assigned it to EMCC, then under [*364] Remington Rand control.

21.3.4 Prior to February 1950, Remington Rand had been engaged in the tabulating business but not EDP.

21.3.5 Honeywell has proved that there was an EDP line of commerce in 1950.

21.4 Plaintiff makes inconsequential reference to the asset acquisitions from IBM and BTL.

21.5 Plaintiff's specific request is that the ENIAC and 30A patents acquisition be declared unenforceable.

21.6 I find that the acquisition by defendants of the ENIAC and 30A patents did not violate Section 7.

21.6.1 Honeywell has not proven that Remington Rand's 1950 acquisition of the ENIAC patent application might have had the effect of, or had the effect of, substantially lessening competition or tending to create a monopoly in any line of commerce in any section of the country.

21.6.2 Honeywell has not proven that Remington Rand's 1950 acquisition of EMCC might have had the effect of, or had the effect of, substantially lessening competition or tending to create a monopoly in any line of commerce in any section of the country.

21.6.3 Honeywell has not proven that the record transfers of the ENIAC patent or patent application from EMCC to Remington Rand [*365] in 1952, from Remington Rand to SR in 1955, and from SR to ISD in 1964, might have had the effect of, or had the effect of, substantially lessening competition or tending to create a monopoly in any line of commerce in any section of the country.

21.6.4 Honeywell has not proven that the 1965 IBM-SR Agreement and the 1961 SR-Western Electric Agreement might have had the effect of, or had the effect of, substantially lessening competition or tending to create a monopoly in any line of commerce in any section of the country.

21.6.5 Section 7 of the Clayton Act prohibits the acquisition of the whole or any part of the stock or assets of another corporation "where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to create a monopoly".

21.6.6 Section 7 of the Clayton Act in effect in February 1950 applied to the acquisition of stock not to the acquisition of assets. Accordingly, Remington Rand's February 13, 1950 acquisition of the ENIAC patent application could not have violated Section 7 of the Clayton Act.

21.6.7 Even after its amendment in December 1950 to apply to the acquisition [*366] of assets, Section 7 of the Clayton Act has applied only to the acquisition of assets from corporations, not individuals. Since Remington Rand acquired, for record, the ENIAC patent application on February 13, 1950 from Eckert and Mauchly, individuals, that record acquisition could not have violated Section 7 of the Clayton Act.

21.6.8 Honeywell, a private party, has no standing to sue for any alleged violations of Section 7 of the Clayton Act.

21.7 Honeywell has not proven that it has suffered any actual or threatened injury to its business or property as a result of any of the acquisitions or transactions it has challenged under Section 7 of the Clayton Act with the exception of the 1956 SR-IBM Agreement.

22. Statute of Limitations 22.1 Fraud on Patent Office. If this Court's findings are reversed on appeal, damages to plaintiff will have accrued after May 26, 1963, and plaintiff will be entitled to recover its attorneys' fees and costs trebled.

22.2 1956 Cross-License and Technical Exchange Agreement. The cause of action accrued before May 26, 1963, and is barred, and prior to that date non-speculative damages could have been proved.

22.2.1 Certain of [*367] Honeywell damages caused by the 1956 IBM-SR Agreement were nonspeculative before May 26, 1963.

22.2.2 Honeywell's May 26, 1967 Complaint did not raise any claims for damages caused by the 1956 IBM-SR Agreement.

22.2.3 Honeywell first raised a claim for damages caused by the 1956 IBM-SR Agreement in early 1970.

22.2.4 Certain Honeywell damages caused by the 1956 IBM-SR Agreement were non-speculative before late 1965.

22.2.5 Honeywell's claim based on the 1956 IBM-SR Agreement is barred by the four-year statute of limitations.

22.3 1956 Interference Agreement. The cause of action accrued before May 26, 1963, and is barred by the four-year statute of limitations.

22.4 1961 Agreement. The cause of action accrued before May 26, 1963, and is barred by the four-year statute of limitations.

22.5 1965 Agreement. The cause of action accrued after May 26, 1963, and is not barred, but plaintiff has not proved any injury.

22.6 Discriminatory Licensing. The cause of action accrued after May 26, 1963, and is not barred.

22.7 In view of the invalidity of the ENIAC patent, plaintiff will have suffered no injury or damages.

22.8 Pre-Issuance Royalties. [*368] The cause of action accrued after May 26, 1963, and is not barred.

22.9 Plaintiff has paid nothing and has suffered no injury or damages.

22.10 Section 7. The cause of action accrued before May 26, 1963, and is barred.

22.10.1 Honeywell's claims concerning Remington Rand's 1950 acquisitions of EMCC and the ENIAC patent

application are barred by the four-year statute of limitations.

22.10.2 Honeywell's Clayton Act claims concerning the 1956 IBM-SR Agreement and the 1961 SR-Western Electric Agreement are barred by the four-year statute of limitations.

22.11 I find no fraudulent concealment sufficient to toll the statute of limitations.

22.11.1 There was no fraudulent suppression of the facts concerning the 1956 IBM-SR Agreement which is sufficient to toll the statute of limitations as to that violation of the Sherman Act.

23. Infringement of ENIAC 23.1 Assuming that ENIAC is determined to be valid and enforceable, I find that certain Honeywell products infringe various claims of the ENIAC.

23.1.1 Prior to the trial, pursuant to Rule 30(b)(6), F.R.C.P., defendant ISD took the deposition of Honeywell consisting of the testimony of officers and [*369] other persons it designated to testify on its behalf with respect to Honeywell products H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400 and D-1000 and the printed documents describing these products, and said deposition of Honeywell and its printed descriptive materials were received in the evidence at the trial.

23.1.2 Dr. Walter R. Beam, a witness called by defendant ISD, is an electronics expert who has specialized in electronic digital computers, with extensive experience as an engineer, a University faculty member, and an author. Dr. Beam made an investigation of the Honeywell products H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000, and considered the printed descriptive documents relating thereto (including the Schrimpf patent No. 3,201,762 containing descriptive matter relating to the D-1000 computer) and the deposition of Honeywell taken pursuant to Rule 30(b)(6). He also made an initial study of the ENIAC patent [but not the "file wrapper" or prior art] in order to determine the relationship between Honeywell's products and the subject matter claimed in the ENIAC patent. He devoted [*370] more than 1,000 hours to this study.

23.1.3 Dr. Beam explained the manners in which the apparatus disclosed in the ENIAC patent may be arranged to perform different operations and to solve different types of problems to achieve accurate answers.

23.1.4 One particular arrangement which is disclosed in the ENIAC patent calls for an ENIAC function table to be connected in a way such that a program of sequences takes place. Claims 56 and 57 are directed to the apparatus and combination of elements which make possible the carrying out of such a programming arrangement.

23.1.5 If Claim 56 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 56 and the claim applies in the same manner as in the ENIAC patent.

23.1.6 If Claim 57 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 57 and [*371] the claim applies in the same manner as in the ENIAC patent.

23.1.7 Claim 52 covers an arrangement to permit program sequences to be selected alternatively, i.e., an arrangement for branching. In such an arrangement the apparatus disclosed in the ENIAC patent is so connected and programmed as to cause the next program sequence step to be taken from some location in the storage means (function table) which is not sequentially arranged with respect to the previous step.

23.1.8 If claim 52 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements called for by Claim 52 and the claim applies in the same manner as in the ENIAC patent. Each

of these Honeywell products use this program feature in a substantially similar way and for the same general purpose as the apparatus described in the ENIAC patent.

23.1.9 Claim 55 describes another arrangement for sequencing a computer, and for using a storage means (its function table) for program memory. The operation of such an arrangement in the ENIAC patent is a [*372] parallel to that of such Honeywell computers as the H-201-0 computer and H-4201 computer.

23.1.10 If Claim 55 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 55 and the claim applies in the same manner as in the ENIAC patent.

23.1.11 Any or all of the three function tables of the ENIAC patent can serve as memory means storing data in selectively accessible locations.

23.1.12 Claim 69 relates to a memory used for storing data items with particular means for accessing those data items from the memory.

23.1.13 The accessing of both ENIAC function table and the Honeywell magnetic core memories is done at electronic speeds, and the selection of a particular location is done at electronic speeds.

23.1.14 If Claim 69 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 69 and [*373] the claim applies in the same manner as in the ENIAC patent.

23.1.15 Claim 65 deals with a memory which has specific means for assessing information in it and for locating that information within it.

23.1.16 If Claim 65 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 65 and the claim applies in the same manner as in the ENIAC patent.

23.1.17 Claim 75 also relates to a memory device and with respect to both the ENIAC function table memory operation and the Honeywell memory operation the relationship between the action provided and the result accomplished is the same, that is, related data items in closely adjacent storage locations in memory (closely adjacent addresses) are arranged to be accessed with circuitry provided for modifying the address.

23.1.18 If Claim 75 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the [*374] combination of elements required by Claim 75 and the claim applies in the same manner as in the ENIAC patent.

23.1.19 Claim 78 also relates to a data storing means and the configuration for accessing data from it in particular ways.

23.1.20 If Claim 78 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 78 and the claim applies in the same manner as in the ENIAC patent.

23.1.21 Claim 109 relates to the selection of alternative program sequences upon the comparison of two quantities such that, based on some characteristics of the quantities, a choice of a subsequent operation can be made. This claim applies to a compare operation in the ENIAC patent and in the Honeywell equipment and also applies to a sign comparison operation in the ENIAC patent and in the Honeywell equipment.

23.1.22 If Claim 109 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each [*375] of these products contains the combination of elements required by Claim 109 and the claim applies in the same manner as in the ENIAC patent.

23.1.23 Claim 142 relates to a particular type of timing mechanism for a data processing machine. Both the Honeywell products H-201-0, H-201-1, H-201-2, H-121, H-2201, and D-1000 and the apparatus in the ENIAC patent have similar circuits used for the timing of the computer and each of them has as its purpose the production of pulses of accurately determined duration at an accurately known frequency, which is related as a submultiple of the source frequency.

23.1.24 If Claim 142 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-2201, and D-1000. Each of these products contains the combination of elements required by Claim 142 and the claim applies in the same manner as in the ENIAC patent.

23.1.25 Claim 36 relates to a combination of elements for the interruption of the apparatus which controls the sequencing of a computer whereby its operations may be stepped manually at a slow rate through steps it would ordinarily step through at electronic speeds.

23.1.26 The apparatus [*376] described in the ENIAC patent to which Claim 36 is applicable includes the cycling unit which can be halted and caused to advance manually.

23.1.27 If Claim 36 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, and D-1000. Each of these products contains the combination of elements required by Claim 36 and the claim applies in the same manner as in the ENIAC patent.

23.1.28 Claim 122 also relates to the facility for manually advancing the operations of the computer and additionally requires certain display means.

23.1.29 If Claim 122 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, and H-111/121/126. Each of these products contains the combination of elements called for by Claim 122 and the claim applies in the same manner as in the ENIAC patent.

23.1.30 Claim 8 relates to an electronic computing system in which a control system of pulses is used to manipulate numbers in a series of units constructed for that purpose and some of which are constructed to do arithmetic operations.

23.1.31 [*377] Claim 8 was ENIAC patent application Claim 39 and was in Interference 85,809 in the U. S. Patent Office [in which the Patent Office held Williams had priority on his 1942 invention] and in litigation [but not on any issue of priority] in Sperry Rand Corp. v. Bell Telephone Labs, Inc., 208 F.Supp. 598, 135 USPQ 254 (S.D. N.Y. 1962), appeal dismissed [as mooted by settlement] 317 F.2d 491, 137 USPQ 497 (2d Cir. 1963).

23.1.32 If Claim 8 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201 and H-111/121/126. Each of these products contains the combination of elements required by Claim 8 and the claim applies in the same manner as in the ENIAC patent.

23.1.33 Claim 9 is similar to Claim 8, except that among other distinctions Claim 9 calls for a multiplicity of arithmetic units and the requirement to emit pulse signals significant of the numerical result of respective arithmetic operations.

23.1.34 If Claim 9 is valid, it is infringed by each of the following Honeywell products: H-201-2 and H-4201. Each of these products contains the combination of elements required [*378] by Claim 9 and the claim applies in the same manner as in the ENIAC patent.

23.1.35 Claim 83 of the ENIAC patent pertains to the provision of a reservoir for input data and output data so arranged and connected as to permit a very much slower inputting device to operate effectively with a very much faster processor

by collecting the input data in a temporary storage means before processing it and placing the data to the output in a second temporary storage means prior to transferring it at a slow rate of speed (as compared to electronic speeds) to an output device. Both the apparatus described in the ENIAC patent and Honeywell products H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000 provide the same function in this respect.

23.1.36 If Claim 83 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 83 and the claim applies in the same manner as in the ENIAC patent.

23.1.37 Claim 86 relates to another aspect of input operation described [*379] in the ENIAC patent and to a similar or parallel operation in the Honeywell systems. Specifically it relates to the ability to perform data processing operations simultaneously with the transmission of data from an input device and the ability to condition continuation of additional data processing operations on the completion of the input operation and the completion of the concurrent data processing operation. Both the apparatus described in the ENIAC patent and Honeywell equipment H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000 perform the same function.

23.1.38 If Claim 86 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/122/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 86 and the claim applies in the same manner as in the ENIAC patent.

23.1.39 Claim 88 pertains to a data processing machine having a capacity for synchronization of data transfer operations between a device with a timer operating at one rate and a second device with a timer operating at a second rate.

23.1.40 [*380] If Claim 88 is valid, it is infringed by each of the following Honeywell products: H-201-0, H-201-1, H-201-2, H-121, H-1201, H-2201, H-4201, H-111/121/126, H-800, H-400, and D-1000. Each of these products contains the combination of elements required by Claim 88 and the claim applies in the same manner as in the ENIAC patent.

23.1.41 With respect to each of Claims 8, 9, 36, 52, 55, 56, 57, 65, 69, 75, 78, 83, 86, 88, 109, 122 and 142, the specified combination of elements finds response in a combination of elements in each Honeywell product which infringes such claims; providing that the definition of the term "pulse" is that stated in the 1963 Amendment; thereby, the combination of elements in each infringing Honeywell product cooperates in the same general way and for the same general purpose as that described in the ENIAC patent.

23.1.42 The meaning of the words of the 17 claims of the ENIAC patent in suit is the same as applied both to the apparatus of the ENIAC patent and the accused Honeywell equipment.

23.1.43 During the trial, Honeywell adduced no evidence controverting the clear evidence of infringement.

23.1.44 In determining whether an accused device [*381] infringes a valid patent, resort must be had in the first instance to the words of the claim. If the accused matter falls clearly within the claim, infringement is made out and that is the end of it.

23.1.45 If any of the seventeen claims of the ENIAC patent in suit is valid, ISD is entitled to an injunction against continued infringement by Honeywell of any such claim.

24. Damages 24.1 Neither plaintiff nor defendants are entitled to any damages except as follows:

24.2 If it is later determined that plaintiff has proved fraud on the Patent Office, plaintiff will be permitted to establish that part of its attorneys' fees and costs attributable to its antitrust claim.

24.3 If it is later determined that defendants have violated the antitrust laws, plaintiff will be permitted to establish the

damage to its business or property where damages can be proved within the limitation period.

24.4 If it is later determined that the ENIAC patent is valid and enforceable and infringed, defendants will be permitted to establish their infringement damages.

24.5 I do not believe this to be an exceptional case and do not believe that reasonable attorneys' fees should [*382] be awarded to the prevailing party in the patent part of this litigation.

24.6 If it is decided on appeal or on remand that this is an exceptional case, reasonable attorneys' fees will be awarded to the prevailing party.

25. Declaratory and Injunctive Relief 25.1 I find that the ENIAC is invalid and unenforceable and that plaintiff is entitled to a declaration to that effect.

25.2 I find that plaintiff is entitled to an injunction restraining defendants from enforcing or attempting to enforce the monopoly created by the invalid ENIAC patent.

25.3 I find that if the ENIAC is later declared valid, that defendants are entitled to an injunction against continued infringement by plaintiff.

26. Order for Judgment 26.1 The clerk shall enter judgment forthwith on these findings and conclusions as follows:

26.1.1 The ENIAC patent, U. S. Patent Serial No. 3,120,606 of Illinois Scientific Developments, Inc. ("ISD") is hereby declared to be invalid and unenforceable. The counterclaim of ISD against Honeywell is dismissed.

26.1.2 Defendants and each of them and their respective officers, agents, servants, employees and all persons in active concert or participation [*383] with them or either of them who receive actual notice of this judgment by personal service or otherwise be and they hereby are permanently restrained and enjoined, pending further order, from enforcing or attempting to enforce the invalid ENIAC patent aforesaid against Honeywell, its subsidiaries, successors, privies or assigns and all customers or users of products acquired mediately or immediately from Honeywell.

26.1.3 For the defendant Sperry Rand Corporation and against plaintiff Honeywell Inc., on Counts I and III of plaintiff's Second Amended Complaint.

26.1.4 Neither plaintiff nor defendants are entitled to an award of costs.

1. Public Use 1.1.1.11, 35 U.S.C. 102(b).

2. On Sale 2.1.1, 35 U.S.C. 102(b).

2.1.2, 35 U.S.C. 102(b).

2.1.8, 35 U.S.C. 102(b).

3. Atanasoff 3.1.2, 35 U.S.C. 102(f).

4. Inventors 4.3.22, 35 U.S.C. Section 282; RCA v. Radio Engineering Labs., Inc., 293 U.S. 1, 8, 21 USPQ 353, 355-356 (1934).

4.3.23, RCA v. Radio Engineering Labs., Inc., 293 U.S. 1, 8, 21 USPQ 353, 355-356 (1934); [*384] Acme Highway Products Corp. v. D. S. Brown Co., 431 F.2d 1074, 1083, 167 USPQ 129, 135-136 (6th Cir. 1970).

4.3.25, 35 U.S.C. Section 282; see Leeds & Catlin v. Victor Talking Machine Co., 213 U.S. 301, 319 (1909).

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4.3.26, *Agawam Co. v. Jordan*, 74 U.S. (7 Wall.) 583 (1868); *Hobbs v. United States Atomic Energy Comm.*, 451 F.2d 849, 864-65, 171 USPQ 713, 723-725 (5th Cir. 1971).

4.3.28, *The Telephone Cases*, 126 U.S. 1, 561-63 (1888); *Larson v. Crowther*, 26 F.2d 780, 788-89 (8th Cir. 1928).

7. First Draft Report 7.1.2.3, 35 U.S.C. 102(b).

8. AMP Report and Burks Article 8.2.5, *Griswold v. Oil Capital Valve Co.*, 375 F.2d 532, 537, 152 USPQ 95, 97-98 (10th Cir. 1966); *McCullough Tool Co. v. Well Surveys, Inc.*, 343 F.2d 381, 398, 145 USPQ 6, 19-20 (10th Cir. 1965), cert. denied, 383 U.S. 933, 148 USPQ 772 (1966); *Greening Nursery Co. v. J and R Tool and Mfg. Co.*, 376 F.2d 738, 740, 153 USPQ 660, 661-662 (8th Cir. 1967); 35 U.S.C. Section 103.

8.2.6, *Griswold v. Oil Capital Valve Co.*, 375 F.2d 532, 537, 152 USPQ 95, 97-98 (10th Cir. 1966); [*385] *McCullough Tool Co. v. Well Surveys, Inc.*, 343 F.2d 381, 398, 145 USPQ 6, 19-20 (10th Cir. 1965), cert. denied, 383 U.S. 933, 148 USPQ 772 (1966); *Greening Nursery Co. v. J and R Tool and Mfg. Co.*, 376 F.2d 738, 740, 153 USPQ 660, 661-662 (8th Cir. 1967); 35 U.S.C. Section 103.

9. Description 9.1.2, 35 U.S.C. Section 112 (see Manual of Patent Examining Procedure Section 702); *Eversharp, Inc. v. Fisher Pen Co., Inc.*, 204 F.Supp. 649, 671-72, 132 USPQ 423, 440-441 (N.D. Ill. 1961); 35 U.S.C. Section 282.

9.1.4, *Kesling v. General Motors Corp.*, 66 F.Supp. 1, 6, 70 USPQ 485, 489 (E.D. Mo. 1946), aff'd, 164 F.2d 824, 76 USPQ 30 (1947); *Suczek v. General Motors Corp.*, 35 F.Supp 806, 809, 47 USPQ 376, 379-380 (E.D. Mich. 1940), aff'd, 132 F.2d 371, 56 USPQ 45 (6th Cir. 1942); *Bowser, Inc. v. United States*, 388 F.2d 346, 349, 156 USPQ 406, 408-409 (Ct. Cl. 1967).

10. Pulse 10.1.7.1, *Webster Electric Co. v. Splitdorf Electrical Co.*, 264 U.S. 463, 465 (1924); *Muncie Gear Works, Inc. v. Outboard Marine & Mfg. Co.*, 315 U.S. 759, 768, 53 USPQ 1, 5 (1942).

[*386] 10.1.7.2, *Standard Oil Development Co. v. James B. Berry Sons Co.*, 92 F.2d 386, 388, 35 USPQ 102, 104-105 (3rd Cir. 1937); *General Foods Corp. v. Perk Foods Co.*, 419 F.2d 944, 948-949, 164 USPQ 1, 3-4 (7th Cir. 1969), cert. denied, 397 U.S. 1038, 165 USPQ 290 (1970).

10.1.7.3, *Webster Electric Co. v. Splitdorf Electrical Co.*, 264 U.S. 463 (1924); *General Foods Corp. v. Perk Foods Co.*, 419 F.2d 944, 164 USPQ 1 (7th Cir. 1969), cert. denied, 397 U.S. 1038, 165 USPQ 290 (1970).

10.1.7.4, *Schriber-Schroth Co. v. Cleveland Trust Co.*, 305 U.S. 47, 39 USPQ 242 (1938); *Webster Electric Co. v. Splitdorf Electrical Co.*, 264 U.S. 463, 465 (1924); *General Foods Corp. v. Perk Foods Co.*, 419 F.2d 944, 164 USPQ 1 (7th Cir. 1969), cert. denied, 397 U.S. 1038, 165 USPQ 290 (1970).

10.1.7.5, *Schriber-Schroth Co. v. Cleveland Trust Co.*, 305 U.S. 47, 39 USPQ 242 (1938); *Chicago Pneumatic Tool Co. v. Hughes Tool Co.*, 192 F.2d 620, 91 USPQ 227 (10th Cir. 1951).

10.1.7.6, *Railway Co. v. Sayles*, 97 U.S. 554, 563 (1878); [*387] *Tropic-Aire, Inc. v. Sears, Roebuck & Co.*, 44 F.2d 580, 6 USPQ 301 (8th Cir. 1930), cert. denied, 282 U.S. 904 (1931); *Pratt and Whitney Co. v. United States*, 345 F.2d 838, 843, 145 USPQ 429, (Ct. Cl. 1965).

11. Delay 11.5.9, *Sperry Rand Corp. v. Bell Telephone Labs*, 208 F.Supp. 598, 135 USPQ 254 (S.D. N.Y. 1962).

11.7, *Woodbridge v. United States*, 263 U.S. 50 (1923).

11.7.1, *Woodbridge v. United States*, 263 U.S. 50 (1923).

11.7.2, *Lowry v. Allen*, 203 U.S. 476 (1906).

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11.12.1, *Sperry Rand Corp. v. Bell Telephone Labs., Inc.*, 208 F.Supp. 598, 600, 601, 135 USPQ 254, 256 (S.D. N.Y. 1962).

11.13.1.3, 35 U.S.C. Section 151.

11.14.4, *Overland Motor Co. v. Packard Motor Co.*, 274 U.S. 417, 425 (1927).

11.14.5, *Overland Motor Co. v. Packard Motor Co.*, 274 U.S. 417 (1927); *Columbia Motor Car Co. v. C. A. Duerr & Co.*, 184 F. 893 (2d Cir. 1911); *Hartford-Empire Co. v. Obear-Nester Glass Co.*, 39 F.2d 769, 775, 4 USPQ 483, 488-489 (8th Cir. 1930); *Ericson et al. v. Jorgensen et al.*, 180 F.2d 180, 181, 183, 84 USPQ 176, 178-179 (D.C. Cir. 1950); [*388] *Cline Electric Mfg. Co. v. Kohler*, 27 F.2d 638, 641-42 (7th Cir. 1928).

12. Validity 12.1.1, 35 U.S.C. 282.

12.1.1.1, *Aero Spark Plug Co. v. B. G. Corporation*, 130 F.2d 290, 294, 54 USPQ 348, 351-352 (2d Cir. 1942).

12.1.1.2, *Radio Corporation of America v. Radio Engineering Laboratories, Inc.*, 293 U.S. 1, 21 USPQ 353 (1934); *Cleveland Punch & Shear Works Co. v. E. W. Bliss Co.*, 145 F.2d 991, 64 USPQ 77 (6th Cir. 1944), noting: *Cuno Engineering Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 51 USPQ 272 (1941).

12.1.1.3, *Frank Adam Electric Co. v. Colt's Patent Fire Arms Mfg. Co.*, 148 F.2d 497, 65 USPQ 85 (8th Cir. 1945), citing: *Muncie Gear Works, Inc. v. Outboard Marine & Mfg. Co.*, 315 U.S. 759, 768, 53 USPQ 1, 5 (1942).

12.1.1.4, *American Infra-Red Radiant Co. v. Lambert Industries*, 360 F.2d 977, 149 USPQ 722 (8th Cir. 1966); *Butler Manufacturing Company v. Enterprise Cleaning Company*, 81 F.2d 711, 28 USPQ 196 (8th Cir. 1936); *Buchanan et al. v. The Wyeth Hardware & Manufacturing Company*, 47 F.2d 704, 8 USPQ 389 (8th Cir. 1931); [*389] *John Deere Co. of Kansas City v. Graham*, 333 F.2d 529, 142 USPQ 459 (8th Cir. 1964); rev. on other grounds at 383 U.S. 1, 148 USPQ 459; *Piel Mfg. Co., Inc. v. George A. Rolfes Co.*, 363 F.2d 57, 150 USPQ 330 (8th Cir. 1966).

12.1.1.5, *Corning Glass Works v. Anchor Hocking Glass Corp.*, 253 F.Supp. 461, 149 USPQ 99 (D. Del. 1966); *Huston v. Buckeye Bait Corp.*, 237 F.2d 920, 112 USPQ 4 (6th Cir. 1956).

12.1.1.6, *Graham Paper Company v. International Paper Company*, 46 F.2d 881, 8 USPQ 463 (8th Cir. 1931); Hearing Before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, United States Senate, Eighty-Seventh Congress, Pursuant to S. Res. 52 on S. 1552, October-November, 1961; Hearings Before the Antitrust Subcommittee of the Committee on the Judiciary, House of Representatives, Eighty-Seventh Congress, on H.R. 6245, May 1962; "1961-1962 Management Survey of the U. S. Patent Office," Study Prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, United States Senate, Eighty-Seventh Congress, Pursuant to S. Res. 267; "To Promote the [*390] Progress of * * * Useful Arts in an Age of Exploding Technology", Report of the President's Commission on the Patent System, 1966; Special Committee to Study the Patent System, Final Report, July 14, 1966, American Patent Law Association.

12.1.1.7, *Atlas Copco Aktiebolag v. Ingersoll-Rand Co.*, 155 USPQ 651 (D. N.J., 1967); *Graham v. John Deere Co.*, 383 U.S. 1, 18, 148 USPQ 459, 467 (1966); *A. & P. Tea Co. v. Supermarket Co.*, 340 U.S. 147, 156, 87 USPQ 303, 307-308 (1950); *Packwood v. Briggs & Stratton Corp.*, 195 F.2d 971, 974, 93 USPQ 274, 276 (3rd Cir. 1952).

12.2.3.1, 35 U.S.C. 102(b) (1952); *Pennock v. Dialogue*, 27 U.S. (2 Pet.) 1 (1829); *Muncie Gear Works, Inc. v. Outboard, Marine & Mfg. Co.*, 315 U.S. 759, 53 USPQ 1 (1942); *Electric Storage Battery Co. v. Shimadzu*, 307 U.S. 5, 41 USPQ 155 (1939).

12.2.3.2, *Metallizing Eng'r Co. v. Kenyon Bearing Auto Parts Co.*, 153 F.2d 516, 520, 68 USPQ 54, 58 (2d Cir. 1946); *Andrews v. Hovey*, 123 U.S. 267 (1887); *Cataphote Corp. v. De Soto Chemical Coatings, Inc.*, 356 F.2d 24, 148 USPQ

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527 (9th Cir. 1966).

[*391] 12.2.3.3, Hall v. Macneale, 107 U.S. 90, 97 (1882); Root v. Third Ave. R.R., 146 U.S. 210 (1892); Egbert v. Lippmann, 104 U.S. (14 Otto.) 333, 336 (1881); Watson v. Allen, 254 F.2d 342, 345, 117 USPQ 68, 69-70 (D.C. Cir. 1958).

12.2.3.4, Elizabeth v. Pavement Co., 97 U.S. 126 (1877).

12.2.3.5, Smith & Griggs Mfg. Co. v. Sprague, 123 U.S. 249 (1887); Monolith Portland Midwest Co. v. Kaiser Aluminum & Chemical Corp., 267 F.Supp. 726, 152 USPQ 380 (S.D. Cal. 1966), modified, 407 F.2d 288, 160 USPQ 577 (9th Cir. 1969); Bourne v. Jones, 114 F.Supp. 413, 98 USPQ 206 (S.D. Fla. 1951), aff'd, 207 F.2d 173, 98 USPQ 205 (5th Cir.), cert. denied, 346 U.S. 897, 99 USPQ 490 (1953).

12.2.3.6, Magnetics, Inc. v. Arnold Eng'r Co., 438 F.2d 72, 168 USPQ 392, 394 (7th Cir. 1971); Monolith Portland Midwest Co. v. Kaiser Aluminum & Chem. Corp., 267 F.Supp. 726, 785, 152 USPQ 380, 427-428 (S.D. Cal. 1966), aff'd, 407 F.2d 288, 160 USPQ 577 (9th Cir. 1969).

12.2.3.7, Nicholson v. Carl W. Mullis Eng'r and Mfg. Co., 315 F.2d 532, 137 USPQ 13 (4th Cir. 1963).

[*392] 12.2.3.8, Atlas v. Eastern Air Lines, Inc., 311 F.2d 156, 136 USPQ 4 (1st Cir. 1962), cert. denied, 373 U.S. 904, 137 USPQ 912 (1963).

12.2.3.9, Smith & Griggs Mfg. Co. v. Sprague, 123 U.S. 249, 267 (1887); Buser v. Novelty Tufting Machine Co., 151 F. 478 (6th Cir. 1907); Thomson-Houston Electric Co. v. Lorain Steel Co., 117 F.2d 49 (2d Cir. 1902); W-R Co. v. Sova, 106 F.2d 478, 481, 43 USPQ 35, 37-38 (6th Cir. 1939).

12.2.3.10, Koehring Co. v. National Automatic Tool Co., 362 F.2d 100, 149 USPQ 887 (7th Cir. 1966).

12.2.3.11, Smith & Griggs Mfg. Co. v. Sprague, 123 U.S. 249 (1887); Coffin v. Ogden, 85 U.S. (18 Wall) 120 (1873); National Biscuit Co. v. Crown Baking Co., 105 F.2d 422, 427, 42 USPQ 214, 218-219 (1st Cir. 1939).

12.2.3.12, Egbert v. Lippmann, 104 U.S. (14 Otto.) 333 (1881); Atlas v. Eastern Air Lines, Inc., 311 F.2d 156, 159, 136 USPQ 4, 6 (1st Cir. 1962), cert. denied, 373 U.S. 904, 137 USPQ 912 (1963).

12.2.3.13, Atlas v. Eastern Air Lines, Inc., 311 F.2d 156, 136 USPQ 4 (1st Cir. 1962), [*393] cert. denied, 373 U.S. 904, 137 USPQ 912 (1963); Koehring Co. v. National Automatic Tool Co., 362 F.2d 100, 149 USPQ 887 (7th Cir. 1966).

12.2.3.14, Midland Flour Co. v. Bobbitt, 70 F.2d 416, 21 USPQ 60, (8th Cir. 1934); Franz Manufacturing Co. v. Phenix Mfg. Co., 307 F.Supp. 822, 824, 164 USPQ 381, 382-383 (E.D. Wis. 1970); Tri-Wall Containers, Inc. v. United States, 408 F.2d 748, 750, 161 USPQ 116, 118 (Ct. Cl.), cert. denied, 396 U.S. 828, 163 USPQ 704 (1969).

12.2.4.1, 35 U.S.C. 102(b).

12.2.4.2, Amphenol Corp. v. General Time Corp., 397 F.2d 431, 433, 158 USPQ 113, 114 (7th Cir. 1968); Magee v. Coca-Cola Co., 232 F.2d 596, 109 USPQ 124 (7th Cir. 1956).

12.2.4.3, Stearns-Roger Mfg. Co. v. Ruth, 179 F.Supp. 906, 124 USPQ 3 (D. Colo. 1959); Philco Corp. v. Admiral Corp., 199 F.Supp. 797, 131 USPQ 413 (D. Del. 1961).

12.2.4.4, Chicopee Mfg. Corp. v. Columbus Fiber Mills Co., 165 F.Supp. 307, 118 USPQ 53 (M.D. Ga. 1958).

12.2.4.5, Mayer v. A. & H. G. Mutschler, 248 F. 911, 915 [*394] (2nd Cir.), cert. denied, 248 U.S. 563 (1918); Monroe

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v. Bresee, 239 F. 727 (7th Cir. 1917).

12.2.4.6, *Piet v. United States*, 176 F.Supp. 576, 123 USPQ 21 (S.D. Cal. 1959), modified, 283 F.2d 693, 127 USPQ 410 (9th Cir. 1960); *In re Hobbs*, 165 USPQ 99, 132 (A.E.C. Pat. Comp. Bd., 1970); 42 U.S.C. 2185 (1965).

12.2.4.7, *A. H. Emery Co. v. Marcan Products Corp.*, 268 F.Supp. 289, 153 USPQ 337 (S.D. N.Y. 1967); *Cloud v. Standard Packaging Corp.*, 376 F.2d 384, 153 USPQ 317 (7th Cir. 1967).

12.2.5.1, 35 U.S.C. 111 and 115.

12.2.5.2, *Kennedy v. Hazelton*, 128 U.S. 667 (1888).

12.2.5.3, *Interstate Bakeries v. General Baking Co.*, 84 F.Supp. 92, 113, 80 USPQ 566, 583-584 (D. Kan. 1948).

12.2.5.4, *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358 (1928); *Pennington v. National Supply Co.*, 95 F.2d 291, 37 USPQ 18 (5th Cir. 1938); *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 141 USPQ 549 (6th Cir.), cert. denied, 379 U.S. 888, 143 USPQ 465 (1964).

[*395] 12.2.6.1, 35 U.S.C. 102(a),(b).

12.2.6.2, *I.C.E. Corp. v. Armco Steel Corp.*, 250 F.Supp. 738, 148 USPQ 537 (S.D. N.Y. 1966).

12.2.6.3, *Dix-Seal Corp. v. New Haven Trap Rock Co.*, 236 F.Supp. 914, 144 USPQ 57 (D. Conn. 1964); *Cottier v. Stimson*, 20 F. 906 (C.C. D. Ore. 1884).

12.2.6.4, *Hamilton Laboratories, Inc. v. Massengill*, 111 F.2d 584, 45 USPQ 594 (6th Cir. 1940); *Indiana General Corp. v. Lockheed Aircraft Corp.*, 249 F.Supp. 809, 148 USPQ 312 (S.D. Cal. 1966), rev'd on other grounds, 408 F.2d 294, 160 USPQ 6 (9th Cir. 1968); *Brian Jackson Associates, Inc. v. San Manuel Copper Corp.*, 259 F.Supp. 793, 151 USPQ 5 (D. Ariz. 1966), aff'd per curiam, 384 F.2d 487, 155 USPQ 417 (9th Cir. 1967).

12.2.6.5, *Hazeltine Research, Inc. v. Zenith Radio Corp.*, 239 F.Supp. 51, 144 USPQ 381 (N.D. Ill. 1965), rehearing denied, 401 U.S. 1015 (1971); *Dix-Seal Corp. v. New Haven Trap Rock Co.*, 236 F.Supp. 914, 144 USPQ 594 (D. Conn. 1964); *Klein v. United States*, 375 F.2d 825 (Ct. Cl. 1967).

12.2.6.6, [*396] 35 U.S.C. 103.

12.3.2.1, *Woodbridge v. United States*, 263 U.S. 50, 57 (1923); *Levinson v. Nordskog Co., Inc.*, 301 F.Supp. 589, 163 USPQ 52 (C.D. Cal. 1969).

12.3.2.2, *In re Appeal of Mower*, 15 App. D.C. 144, 152 (1899) (Chief Justice Alvey).

12.3.3.1, *Hazel-Atlas Glass Co. v. Hartford-Empire Co.*, 322 U.S. 238, 246, 61 USPQ 241, 245 (1944); *General Excavator Co. v. Keystone Driller Co.*, 62 F.2d 48, 50, 16 USPQ 269, 270-271 (6th Cir. 1932); *Corning Glass Works v. Anchor-Hocking Glass Corp.*, 253 F.Supp. 461, 470, 149 USPQ 99, 106-107 (D. Del. 1966), modified on other grounds, 374 F.2d 473, 153 USPQ 1 (3rd Cir.), cert. denied, 389 U.S. 826, 155 USPQ 767 (1967).

12.3.3.2, *SCM Corporation v. Radio Corporation of America*, 318 F.Supp. 433, 449, 167 USPQ 196, 207-208 (S.D. N.Y. 1970), citing U.S. Supreme Court authorities; cf. *Earle R. Hanson & Associates v. Farmers Coop. Creamery Co.*, 403 F.2d 65, 70 (8th Cir. 1968); *Precision Instrument Mfg. Co. v. Automative Maintenance Mach. Co.*, 324 U.S. 806, 814-816, 65 USPQ 133, 137-138 (1945).

[*397] 13. Fraud on Patent Office 13.2.1, 35 U.S.C. 131; 35 U.S.C. 122.

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13.4.1, *Kingsland v. Dorsey*, 338 U.S. 318, 83 USPQ 330 (1949); *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 428 F.2d 555, 165 USPQ 355 (5th Cir. 1970); *Charles Pfizer & Co. v. F. T. C.*, 401 F.2d 574, 579 (6th Cir. 1968), cert. denied, 394 U.S. 920 (1969).

13.4.2, *Kingsland v. Dorsey*, 338 U.S. 318, 319, 83 USPQ 330, 331 (1949).

13.4.3, *Precision Instrument Mfg. Co. v. Automotive Maintenance Mach. Co.*, 324 U.S. 806, 818, 65 USPQ 133, 139 (1945); *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 428 F.2d 555, 165 USPQ 355 (5th Cir. 1970); *Monolith Portland Midwest Co. v. Kaiser Aluminum & Chemical Corp.*, 407 F.2d 288, 160 USPQ 577 (9th Cir. 1969); *Monsanto Co. v. Rohm and Haas Co.*, 312 F.Supp 778, 793, 164 USPQ 556, 568 (E.D. Pa. 1970).

13.4.4, *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 428 F.2d 555, 165 USPQ 355 (5th Cir. 1970).

13.12.1, 208 F.Supp. 598, 135 USPQ 254 .

13.17.4, *SR v. BTL*, appeal [*398] dismissed as being moot, 317 F.2d 491, 137 USPQ 497 (2nd Cir. 1963).

13.17.8, See *SR v. BTL*, appeal dismissed as moot, 317 F.2d 491, 137 USPQ 497 (2nd Cir. 1963).

13.38.1, *SR v. BTL*, 208 F.Supp. 598, 605, 135 USPQ 254, 259 .

13.39.15, *Walker Process Equipment, Inc. v. Food Machinery and Chemical Corp.*, 382 U.S. 172, 148 USPQ 308 (1965).

13.39.16, *Walker Process Equipment, Inc. v. Food Machinery and Chemical Corp.*, 382 U.S. 172, 147 USPQ 404 (1965).

13.39.17, *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 328 F.Supp. 1132, 1138, 170 USPQ 466, 470-471 (W.D. Tex. 1971).

13.39.18, *Cataphote Corp. v. De Soto Chemical Coatings, Inc.*, 450 F.2d 769, 772, 171 USPQ 736, 738-739 (9th Cir. 1971), cert. denied, 408 U.S. 929, 174 USPQ 193 (1972).

13.39.19, *Waterman-Bic Pen Corp. v. W. A. Sheaffer Pen Co.*, 267 F.Supp. 849, 856, 153 USPQ 499, 504 (D. Del. 1967). See also *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 328 F.Supp. 1132, 1138, 170 USPQ 466, 470-471 (W.D. Tex. 1971).

13.39.20, *United States v. Standard Electric Time Co.*, 155 F.Supp. 949, 952, 116 USPQ 14, 16 (D. Mass. 1957).

[*399] 13.39.21, *Eli Lilly and Co. v. Generix Drug Sales, Inc.*, 460 F.2d 1096, 174 USPQ 65 (5th Cir. 1972).

14. Other Patents and Patent Applications 14.14.6, *Struthers Scientific and International Corp. v. General Foods Corp.*, 334 F.Supp. 1329, 1331-32, 172 USPQ 426, 427-429 (D. Del 1971).

14.14.7, *United States v. Glaxo Group Ltd.*, 410 U.S. 52, 176 USPQ 289 (1973); *Hawaii v. Standard Oil Co.*, 405 U.S. 251 (1972).

15. SR--IBM August 21, 1956 Agreement 15.6.1, 15 U.S.C. 1.

15.7.1, 15 U.S.C. 2.

15.25, 15 U.S.C. 1; *Standard Oil v. United States*, 221 U.S. 1 (1911); *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150 (1940); *Times-Picayune Publishing Co. v. United States*; 345 U.S. 594 (1953); *United States v. E. I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956); *United States v. National Lead Co.*, 63 F.Supp 513, 66 USPQ 141 (S.D. N.Y.

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1945), *aff'd*, 332 U.S. 319, 73 USPQ 498 (1947).

15.25.1, 15 U.S.C. 1.

15.25.1.1, *United States v. Line Material Co.*, 333 U.S. 287, 76 USPQ 399 (1948); [*400] *Standard Oil Co. (Indiana) v. United States*, 283 U.S. 163, 9 USPQ 6 (1931); Report of the Attorney General's National Committee to Study the Antitrust Laws (1955), at 242.

15.26, *United States v. National Lead Co.*, 63 F.Supp. 513, 66 USPQ 141 (S.D. N.Y. 1945); *aff'd*, 332 U.S. 319, 73 USPQ 498 (1947); *United States v. Timken Roller Bearing Co.*, 83 F.Supp. 284, 81 USPQ 28 (N.D. Ohio 1949).

15.36, *United States v. E. I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956); 16 Business Organizations, Von Kalinowski, *Antitrust Laws and Trade Regulation*, 8.02.

15.40, 15 U.S.C. 15; *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 161 USPQ 577 (1969).

17. 1961 Agreement of SR and BTL 17.2.8, *SR v. BTL*, 208 F.Supp. 598, 135 USPQ 254 (S.D. N.Y. 1962).

17.3.4, *United States v. Line Material Co.*, 333 U.S. 287, 76 USPQ 399 (1948); *Standard Oil Co. (Indiana) v. United States*, 383 U.S. 163, 9 USPQ 6 (1931); Report of the Attorney General's National Committee to Study the Antitrust Laws (1955), at 242.

18. 1965 Agreement [*401] of SR and IBM 18.9.2, *United States v. Line Material Co.*, 333 U.S. 287, 76 USPQ 399 (1948); *Standard Oil Co. (Indiana) v. United States*, 383 U.S. 163, 9 USPQ 6 (1931); Report of the Attorney General's National Committee to Study the Antitrust Laws (1955), at 242.

19. Discriminatory Licensing 19.9.2, *Peelers Co. v. Wendt*, 260 F.Supp. 193, 151 USPQ 378 (W.D. Wash. 1966); *Bela Seating Co. v. Poloron Products, Inc.*, 438 F.2d 733, 168 USPQ 548 (7th Cir.) cert. denied, 403 U.S. 922, 170 USPQ 65 (1971); *LaSalle Street Press, Inc. v. McCormick & Henderson, Inc.*, 445 F.2d 84, 170 USPQ 305 (7th Cir. 1971).

19.9.4, *Laitram Corp. v. King Crab, Inc.*, 244 F.Supp. 9, 17-19, 146 USPQ 640, 645-647, modified, 245 F.Supp. 1019, 1021, 147 USPQ 136, 137-138 (D. Alaska 1965); *Peelers Co. v. Wendt*, 260 F.Supp. 193, 204, 151 USPQ 378, 386 (W.D. Wash. 1966).

21. Section 7 of the Clayton Act 21.6.5, 15 U.S.C. 18.

21.6.6, Act of October 15, 1914, ch. 323, 7, 38 Stat. 731-32, amended 64 Stat. 1125-26, December 29, 1950; *United States v. Philadelphia National Bank*, 374 U.S. 321, 337-38, 340-41 fn. 18 (1963).

[*402] 21.6.7, 15 U.S.C. 18.

21.6.8, *Highland Supply Corp. v. Reynolds Metals Co.*, 327 F.2d 725, 728 (8th Cir. 1964).

22. Statute of Limitations 22.2.5, 15 U.S.C. 15(b).

22.3.1, 15 U.S.C. 15(b).

22.4.1, 15 U.S.C. 15(b).

22.10.1, 15 U.S.C. 15(b).

22.10.2, 15 U.S.C. 15(b).

23. Infringement of ENIAC 23.1.44, *Graver Tank and Manufacturing Co., Inc. et al. v. Linde Air Products Co.*, 339

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U.S. 605, 607, 85 USPQ 328, 330 (1950).

23.1.45, 35 U.S.C. 283.

25. Declaratory and Injunctive Relief 25.2, 15 U.S.C. 26; United States v. United States Gypsum Co., 340 U.S. 76, 87 USPQ 276 (1950); United States v. National Lead Co., 63 F.Supp. 513, 66 USPQ 141 (S.D. N.Y. 1945), aff'd, 332 U.S. 319, 73 USPQ 498 (1947).

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15 U.S.C. § 18	21.6.5
15 U.S.C. § 26	25.2
35 U.S.C. § 122	13.2.1
35 U.S.C. § 131	13.2.1
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38 Stat. 731-32, 64 Stat. 1125-26, <i>amended</i>	
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<i>Cases:</i>	
<i>, Beckman Instruments, Inc. v. Chemtronics, Inc.</i>	
328 F. Supp. 1132 (W.D. Tex. 1971)	13.4.1, 13.4.3,
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<i>, Bela Seating Co. v. Poloron Products, Inc.</i>	
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<i>, Corning Glass Works v. Anchor Hocking Glass Corp.</i>	
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<i>, General Excavator Co. v. Keystone Driller Co.</i>	
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<i>,Hawaii v. Standard Oil Co.</i>	
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<i>, Hazel-Atlas Glass Co. v. Hartford-EmpireCo.</i>	
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<i>, Highland Supply Corp. v. Reynolds MetalsCo.</i>	
327F.2d 725 (8th Cir. 1964)	21.6.8
<i>, Kingsland v. Dorsey</i>	
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<i>Laitram Corp. v. King Crab, Inc.</i> , 244 F. Supp. 9,	
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<i>,Henderson, Inc.</i>	
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<i>, Levinson v. Nordskog Co.</i>	
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<i>, Eli Lilly and Co. v. Generix Drug Sales,Inc.</i>	
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