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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL MEMORANDUM OF ACTIVISION, INC. REGARDING EQUIVALENTS

MEMORANDUM OF ACTIVISION, INC. REGARDING EQUIVALENTS

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INTRODUCTION

The application of the concept of equivalents to the means plus function claims of the Rusch-2 patent is at the very core of this lawsuit. Plaintiffs have based their case for infringement of the Rusch-2 patent on proof that Activision's computer technology used with an Atari 2600 Video Computer System results in displaying bouncing spots on television screens. This contention in large part explains the disagreement between Plaintiffs' expert opinion testimony and that offered by Activision. Nonetheless, the patent law clearly requires that the issue of equivalents be addressed by a comparison of underlying functions, means and results--not by a ritualistic incantation of the "means plus function" patent language without regard to actual technical implementation. This comparison of functions, means and results should be made with close reference to the rationale of the concept of equivalents: to prevent a fraud on the patent by slight modifications to avoid literal infringement.

The evidence at trial amply has demonstrated that the underlying means and functions of Activision's computer software are profoundly dissimilar to that of the circuitry disclosed in the Rusch-2 patent, and therefore that no equivalence has been proved by Plaintiffs. Plaintiffs should not be allowed to expand the scope of the Rusch-2 patent to include the "idea" of video games, but instead must be limited to the technical implementation contained in the Rusch-2 specifications, and its equivalents.

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ARGUMENT

I.

PLAINTIFFS HAVE THE BURDEN OF PERSUASION TO PROVE CONTRIBUTORY INFRINGEMENT.

In contrast to the issue of patent invalidity, the burden of persuasion and the burden of coming forward with evidence on the issue of contributory infringement is on Plaintiffs. See, e.g., Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1534 n.4 (Fed. Cir. 1983) ("[o]n the infringement issue, the burden is borne throughout by the patent owner (or exclusive licensee)"). Plaintiffs therefore must prove substantial identity between the "invention" which is the subject of the patent in suit, and the accused device. See generally Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605, 607-09 (1950) (employing the doctrine of equivalents to support a finding of infringement where the accused electrical flux was substantially identical to the patent in suit).

The public policy of construing the patent monopoly narrowly is particularly strong in the context of contributory infringement, since a finding of contributory infringement is the "functional equivalent" of holding that the disputed article is covered by the patent monopoly. See Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417, 52 U.S.L.W. 4090, 4096 (1984) (in contributory infringement cases, courts have "always recognized the critical importance of not allowing the patentee to extend his monopoly beyond the limits of his specific grant").

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II.

"MEANS PLUS FUNCTION" PATENT CLAIMS ARE DEFINED BY THE PATENT SPECIFICATIONS AND EQUIVALENTS.

As stated by the Federal Circuit in the recent case of Palumbo v. Don-Joy Co., 762 F.2d 969, 974 (Fed. Cir. 1985): "[t]he infringement inquiry is broken down into two steps: first, the scope of the claims must be ascertained, and then the trier must decide whether the claims cover the accused device." Thus, the first inquiry is the scope of the claims at issue.

Every patent application must contain:

> ". . . a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same. . . ." (35 U.S.C. §112 (emphasis added))

The language of the seven asserted claims in this litigation do not give any hint of the "full, clear, concise, [or] exact" way to make or use the apparatus. However, the fifth paragraph of Section 112 allows patentees to avoid the linguistic difficulties of including in each patent claim an abundance of technical language:

> "[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." (35 U.S.C. §112 (emphasis added))

Since the seven claims in this case are expressed as "means for," each of the claims by operation of law incorporates the circuits,

drawings, schematics, and technology set out in the "specifications" sections of the patent.[1/]

Several courts squarely have held that Section 112's language limits a means plus function combination patent to the specification and its equivalents. See, e.g., Lockheed Aircraft Corp. v. United States, 553 F.2d 69, 80-81 (Ct. Cl. 1977) ("it is fitting and proper to look to the specification in interpreting the claims of the patent in suit and this is so even if such a review results in a narrower interpretation of the claims that the broad means plus function clauses of the claims would at first indicate")[2/] (emphasis added); Graphicana Corp. v. Baia Corp., 472 F.2d 1202, 1204 (6th Cir. 1973) ("an inventor cannot by the mere use of the word 'means' appropriate any and all kinds of devices which may perform the specified function or any other mechanism or device than that which is described in the patent or which is its mechanical equivalent"). See generally 2 D. Chisum, Patents §8.04[2] (1985); A. Deller, Patent Claims §90 (2d ed. 1971) ("[t]he objection to functional claims is that an inventor cannot obtain the exclusive right to all means of securing a desirable result. All he can validly claim is his means and means similar thereto"); 4 A. Deller, Deller's Walker on Patents §255 (2d ed. 1965)

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1/ The "specifications" of the Rusch-2 patent are attached hereto as Exhibit A for the convenience of the Court.

2/ The Lockheed case was cited with approval of its Section 112 analysis by the Federal Circuit in Palumbo v. Don-Joy Co., 762 F.2d 969, 975 (Fed. Cir. 1985)

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(functional claims are "consistently construed as limited to the disclosure and its equivalents").[3/]

Indeed, without "corresponding structure, material, or acts described in the specification," a "means plus function" patent could not possibly meet the "enablement" requirement of Section 112: "a written description of the invention, and of the manner and process of making and using it . . . to enable any person skilled in the art . . . to make and use the same." See In re Knowlton, 481 F.2d 1357, 1368 (C.C.P.A. 1973); 2 D. Chisum, Patents §8.04[1] (1985).

It is apparent that Plaintiffs' strategy is to expand the scope of the Rusch-2 patent to include all video game technologies which can generate "hitting symbols," "hit symbols," "ascertain coincidence," and impart "distinct motion." Despite Plaintiffs' obvious need to expand the Rusch-2 patent's scope to encompass Activision's radically-different computer technology, no such patenting of an "idea" is allowed by the patent law. See, e.g., Jones v. Hardy, 727 F.2d 1524, 1528 (Fed. Cir. 1984) ("'ideas' are

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3/ Plaintiffs have contended that "[i]t is a comparison of the accused device and the claim language that determines the presence of literal infringement, not a comparison of the accused device and the particular embodiment of the invention disclosed in the patent drawings and associated description." Plaintiffs' Pretrial Memorandum at 20. This contention is demonstrably incorrect as applied to "means plus function" patent claims like those asserted in this case. Thus, Plaintiffs' citation to case authority in their Pretrial Proposed Points of Law for the proposition that the "patentee is not confined to a particular illustrative mode disclosed in the specification" (No. 27) is simply inapposite, as those cases do not analyze the scope of means plus function claims.

not patentable; claimed structures and methods are").[4/] See generally A. Deller, Patent Claims §232 at 664 (2d ed. 1971) ("[a] function per se is not patentable. . . . The structure and not the function is the thing to be secured by the claim.")

It is time to put to rest once and for all Plaintiffs' efforts assiduously to ignore the statutory language "and shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. §112 (emphasis added). The key case on this point is Hale Fire Pump Co. v. Tokai, Ltd., 614 F.2d 1278 (C.C.P.A. 1980) (cited with approval in Palumbo v. Don-Joy, supra). In Hale Fire Pump the court stated as follows:

> "Because we are dealing with a 'means for' type claim, reference must be made to the last paragraph of 35 U.S.C. §112, which provides [quote omitted].
>
> "The only structure described in Appellant's specification which corresponds to the releasable means is a reversible jack screw assembly. Therefore, the 'releasable means' in claim 1 must be construed to cover a reversible jack screw and 'equivalents thereof.' [Citation omitted.] Because respondents' pumps clearly do not include a reversible jack screw, we must determine whether these pumps include a functional equivalent." (614 F.2d at 1282-83)

As if this straightforward application of the statutory language were not sufficient, the Hale Fire Pump court added the

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4/ See also Parker v. Flook, 437 U.S. 584 (1978); Gottschalk v. Benson, 409 U.S. 63, 67, 71 (1972) (finding that a patent for programming a digital computer was invalid because the practical result would be the extension of the patent monopoly to an idea). See generally 1 D. Chisum, Patents §1.03[6] (1985).

following footnote clarifying that function is not synonymous with result:

> "Appellant's position is that respondent's pumps do contain such a 'releasable means' because they are capable of performing the functions described in the claim after the words 'releasable means.' However, according to Section 112, 'means for' claims are not to be read in a vacuum and can only be construed by reference to the specification." (Id. at 1283 n.5 (emphasis in original))

The infringement analysis for a means plus function patent is therefore a three-part inquiry: (i) is the accused device identical to the patent specification [literal infringement]; (ii) if not, is the accused device equivalent to the patent specification on an element-by-element basis [Section 112 equivalents--literal infringement]; (iii) if not, is the accused device taken as a whole equivalent to the patent specification taken as a whole [doctrine of equivalents]. This memorandum will proceed to discuss (i), then (iii), as the equivalents analysis in (ii) and (iii) is very similar, but the law of equivalents has developed primarily in the context of (iii) [doctrine of equivalents]. Finally, the memorandum will address (ii) [Section 112 equivalents].

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III.

THE ACCUSED ACTIVISION SOFTWARE IS NOT IDENTICAL TO ANY OF THE CIRCUITRY IN THE SPECIFICATIONS OF THE RUSCH-2 PATENT.

The first step in the infringement analysis of any patent is to determine whether the accused device is the same as the device

described by the patent. In line with the strict construction of the scope of the patent monopoly, the patent law requires complete identity between the patent and the accused device in order to establish literal infringement. Of course, in the present case Activision does not manufacture the whole accused device, only software capable of being used on the Atari 2600 Video Computer System. The issue is therefore contributory infringement rather than direct infringement, but this distinction does not dilute the threshold requirement that a determination of identity must be established in order to find literal infringement.

The expert testimony at trial differed radically on the issue of patent infringement, but it is nonetheless undisputed that the technology of the Activision accused ROM cartridges and the Rusch-2 patent specifications is far from identical. For example, "means for generating a hitting symbol" is a sawtooth wave generator and diode slicer.[5/] The Atari 2600 using Activision software has neither of those circuits. The critical infringement issue becomes whether Plaintiffs can carry their burden of proof on the issue of demonstrating equivalents--either under the rubric of literal infringement of the elements of a means plus function claim under

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5/ Activision is referring in this analysis to each of the seven claims which Magnavox asserts in this action. Activision is not asserting--nor has it ever asserted--that limitations found in other claims of the Rusch-2 patent not at issue in this case should be literally and completely "read into" any one or more of the seven asserted claims. But cf. King Instrument Corp. v. Otari Corp., 226 U.S.P.Q. 402 (Fed. Cir. 1985) (emphasizing that other patent claims should be considered in determining Section 112 equivalents).

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Section 112, or by the doctrine of equivalents applied to the asserted claims of the Rusch-2 patent.

IV.

UNDER THE DOCTRINE OF EQUIVALENTS, ACTIVISION SOFTWARE IS NOT EQUIVALENT TO THE CIRCUITRY IN THE SPECIFICATIONS OF THE RUSCH-2 PATENT.

A. Equivalents Defined-- Means, Function and Result.

The concept of equivalents allows a finding of infringement even though the allegedly-infringing device as a whole is not identical to the patented device. However, the concept of equivalents is applied to expand the scope of the patent monopoly only if the allegedly infringing device accomplishes the same result as the patent by use of a substantially equivalent functional principle and means. See, e.g., Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605 (1950); Atlas Powder Co. v. E.I. DuPont de Nemours & Co., 750 F.2d 1569, 1579 (Fed. Cir. 1984). The tripartite test of equivalents announced in Graver Tank, supra, (result, means and function) should itself not become the prisoner of its own formula.' Id. A "substantially equivalent" means is an unimportant or slight variation designed to conceal the infringement of the patent. Thomas & Betts Corp. v. Litton Systems, Inc., 720 F.2d 1572, 1579-80 (Fed. Cir. 1983) (the purpose of the doctrine of equivalents is to prevent the patent copier "who merely makes insubstantial substitutions").

In the classic equivalents case, the alleged infringer obtains a copy of the patent, or the device it purports to cover, absorbs all of its teachings, and sets out to design around the disclosed and claimed invention. See, e.g., Graver Tank & Manufacturing Co. v. Linde Air Products Co., supra, 339 U.S. at 608 ("[t]he essence of the doctrine [of equivalents] is that one may not practice a fraud on a patent"); Atlas Powder Co. v. E.I. DuPont De Nemours & Co., 750 F.2d 1569 (Fed. Cir. 1984) (using the doctrine of equivalents where the infringer had used the gist of the invention to devise a non-literally infringing combination with only one ingredient in explosive mixture changed). See generally 4 D. Chisum, Patents §18.04 (1985) ("[w]hile contrary to the general principle that the claims measure the scope of the patent monopoly, the doctrine is retained in order to prevent persons from practicing frauds on patents"). It could hardly be clearer that Activision's software is not the result of a studied attempt to use the teachings of the Rusch-2 patent with the introduction of "slight variations" to design around the claimed invention. In fact, the uncontroverted evidence, including Plaintiffs' expert Dr. Ribbens, indicated that the teachings of the Rusch-2 patent would be absolutely valueless in any attempt to design the Activision programs or the Atari 2600 which are the accused combination in this case. (Revised Finding of Fact "FF" No. 153.)

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B. The Rusch-2 Patent Must Be Accorded A Narrow Scope Of Equivalents.

In applying the doctrine of equivalents (or Section 112 equivalents) the Court should first determine the scope that it should accord to the equivalents. This threshold determination is often the most important single step in an equivalents analysis, just as the determination to use strict scrutiny or rational basis is critical in a constitutional equal protection analysis. The Supreme Court and the Federal Circuit have enunciated three factors for the Court to consider in deciding whether or not the scope should be broad or narrow--and thereby cover only devices which are very similar in means, function and result. These three factors are:

(1) Pioneer versus improvement patent;

(2) Validity challenged or unchallenged; and

(3) Effect of claim of "file wrapper estoppel."

See generally 4 D. Chisum, Patents §18.04 (1985). As noted below, all three factors dictate use of a narrow scope of equivalents in this case.

1. The Rusch-2 Patent Is An Improvement Patent Restricted To A Narrow Scope Of Equivalents.

The most important factor in determining scope of equivalents is whether the patent is a pioneer or improvement patent. A

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pioneer patent, one which opens a new technological field,[6/] is entitled to a broad range of equivalents. See, e.g., Thomas & Betts Corp. v. Litton Systems, Inc., 720 F.2d 1572, 1580 (Fed. Cir. 1983). In contrast, a mere improvement patent like the Rusch-2 is restricted to a narrower range of equivalents in order to distinguish the patent from the prior art and the equivalents of the prior art. See, e.g., id. The reason for this distinction is that an improvement patent is necessarily narrow in scope to avoid invalidity on account of the pioneer patent and other prior art. Plaintiffs have never contended in this action that Rusch-2 is a pioneer patent. To the contrary, Plaintiffs conceded to the Patent Office that Baer-1 is the pioneer patent and Rusch himself described his work as an attempted improvement to Baer in his Patent Disclosure Sheet (FF Nos. 47-49, Exhibits JL-4 and CJ.)

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2. The Rusch-2 Patent Must Be Accorded A Narrow Scope Of Equivalents Because Its Validity Is Very Much In Issue.

Where the validity of an improvement patent is challenged on the ground of obviousness in light of the prior art (as it vigorously is in this case), the application of the doctrine of

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6/ A pioneer patent covers a function never before performed, or a function of such novelty and importance as to make a distinct step in the progress of the art. See, e.g., Westinghouse v. Boyden Power Brake Co., 170 U.S. 537, 561-62 (1898); Connell v. Sears, Roebuck & Co., 559 F. Supp. 229 (N.D. Ala.), aff'd in part and modified in part and vacated in part on other grounds, 722 F.2d. 1542 (Fed. Cir. 1983).

equivalents is particularly limited. See id. (giving an improvement patent "a range of equivalents narrow enough to distinguish over the prior art and, thus, to avoid invalidity. . . . [W]here validity in view of the prior art has not been challenged, the court is less free to limit the application of the doctrine of equivalents than where invalidity is specifically urged by the alleged infringer").

3. The Doctrine Of File Wrapper Estoppel Requires A Narrow Scope Of Equivalents For The Rusch-2 Patent.

Application of the doctrine of equivalents is also limited by the patent law doctrine of "file wrapper estoppel," which precludes a patentee from obtaining a claim construction resurrecting subject matter surrendered during prosecution of the patent application. See, e.g., Thomas & Betts Corp. v. Litton Systems, Inc., 720 F.2d 1572, 1579 (Fed. Cir. 1983); Hughes Aircraft Co. v. United States, 717 F.2d 1351, 1362 (Fed. Cir. 1983). See generally Graham v. John Deere Co., 383 U.S. 1, 33-34 (1966). Plaintiffs have urged the exclusion of computer art from consideration as prior art on the issue of obviousness, and argued before the Patent Office in the Baer reissue proceeding and in this case that computer games are non-analogous, inapplicable prior art. However, by seeking to include the computer technology of the Atari 2600 used with Activision software as the equivalent of the Rusch-2 technology, Plaintiffs are attempting to "have it both ways" with respect to computer technology (exclusion as prior art but inclusion as

equivalents). This attempt to expand the scope of equivalents should be rejected as inconsistent with the doctrine of file wrapper estoppel.

C. The Accused Activision Software Does Not Use The Teachings Of The Rusch-2 Patent.

The evidence at trial conclusively demonstrated that even if the seven claims of the Rusch-2 patent were given a relatively broad scope, Activision's copyrighted computer software used with the Atari 2600 Video Computer System is not technologically equivalent to any element of the analog circuitry disclosed in the Rusch-2 patent.[7/] It is not a copy of any part of the Rusch-2 or a fraud on Rusch-2, nor--taken element by element or as a whole--is it by any stretch of the imagination equivalent to Rusch-2.

The testimony of Plaintiffs' expert, Dr. Ribbens, revealed the fundamental discrepancy between Plaintiffs' and Activision's views on the scope of the Rusch-2 patent claims. Dr. Ribbens was asked to apply the "means for" language of the Rusch-2 patent to the Atari 2600 used with an Activision program. Dr. Ribbens never

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7/ It is indeed ironic that Plaintiffs blithely argue in this case that Rusch's analog apparatus is equivalent to a stored program digital computer. In William Rusch's signed July, 1968 "Final Report" (Exhibit HW at 5), Mr. Rusch states unequivocally that the very heart of his improvement is use of an analog method for spot generation as distinguished from what Baer and Rusch called the digital approach embodied in the Baer-1 pioneer patent.

substantively compared the circuitry disclosed in the specifications of the Rusch-2 patent with the actual technology of the Atari 2600 used with Activision software. In fact, Plaintiffs studiously avoided confronting the crucial issue of determining equivalents with reference to the actual disclosed technology, and have instead been content to find equivalents solely on the basis of result rather than technical similarity. With this as his marching orders, Dr. Ribbens not surprisingly found that the Atari 2600 used with an Activision program had "means for generating" a "hit symbol," "hitting symbol," "ascertaining coincidence" and "imparting a distinct motion," since a video game with a bouncing spot is the result of the playing of the accused Activision software on the Atari 2600. As a matter of simple "cause and effect" logic, wherever a result obtains, a means for causing that result necessarily must exist.

It is absolutely clear, however, that simple similarity of result is not enough under the doctrine of equivalents. The recent Federal Circuit decision in American Hospital Supply Corp. v. Travenol Laboratories, Inc., 745 F.2d 1 (Fed. Cir. 1984) is especially instructive on the issues of the inadequacy of similar result alone to establish equivalents, and the importance of a different fundamental functional principle. In American Hospital Supply the patent covered a nutritional formulation for patients with liver disease. The accused device also provided adequate nutrition to patents with severe liver disease who could not tolerate normal proteins. However, the two formulations were found not equivalent,

primarily because of a lack of equivalent functional principle and means arising from the fact that the accused device followed the teachings of a medical theory different from the medical theory of the patent.

The evidence adduced by Activision demonstrates the fundamental lack of equivalents between the Rusch-2 patent and the accused Activision software. It is undisputed that the Rusch-2 patent teaches a designer of the Atari 2600 or Activision software absolutely nothing about how to go about their tasks. (FF Nos. 153, 156.) The evidence reveals that the Atari 2600 is a stored program digital computer capable, with appropriate software, of playing chess or bridge against the human player or simulating the complex flight of a space shuttle. (FF No. 140.) The Rusch-2 device, on the other hand, is simply not a computer, and is accordingly incapable of the essential functional principles and technical means of the Atari 2600 used with an accused Activision software program. (Id.)

Activision's expert witness (Charles Thacker) testified that the Rusch-2 analog circuitry is dramatically different in functional principle and means from the stored program digital computer technology of Activision's software. Cf. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1446 (Fed. Cir.), cert. dismissed sub nom. Hazeltine Corp. v. RCA Corp., --U.S.--, 53 U.S.L.W. 3160 (Aug. 29, 1984) (finding certain digital circuitry not a "mere substitution" for analog circuitry). A brief review of the functional characteristics and underlying operating principles of

stored program digital computers like the Atari 2600 on the one hand, and the Rusch analog circuitry on the other hand, clearly reveals the radical dissimilarity of the two technologies.

The Atari 2600 is a stored program digital computer[8/] capable of using interchangeable software in the form of ROM cartridges like the accused Activision games. The Rusch-2 technology is a set of discrete analog hard-wired circuits. The Atari 2600 calculates the positions of the images to be displayed by use of a microprocessor. The Rusch-2 technology cannot perform any computations, but rather directly controls and displays the spots. (FF Nos. 139, 144, 150.) The Atari 2600 utilizes a read only memory (ROM) chip to instruct the microprocessor as to the nature of the game to be played. The Rusch-2 technology has no memory device. (FF No. 144.) The Atari 2600 also uses a random access memory (RAM) contained in the microprocessor/central processing unit (CPU) to store computations and positions. The Rusch-2 technology has no equivalent memory. (FF No. 149.) The Atari 2600 uses a CPU (the microprocessor). The Rusch-2 technology has no CPU or microprocessor. (FF No. 144.) The Atari 2600 utilizes external

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8/ Despite the testimony of Activision's expert and the Atari employee (Carl Nielsen) primarily responsible for the design of the Atari 2600 Video Computer System, and Magnavox' own advertisements regarding the Odyssey 2 being a computer system, Plaintiffs have persisted in asserting that the Atari 2600 is not a "computer." Nonetheless, the overwhelming evidence at trial indicated that the Atari 2600 is a stored program digital computer which can, for example, play bridge or chess against a human player or can be programmed by the game designer and by the user with a BASIC cartridge. (FF No. 143.)

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contacts to receive ROM chips (e.g., Activision cartridges), but the Rusch-2 is self-contained, with no external contacts. (FF No. 144.) The Atari 2600 can display a literally infinite variety of video games on interchangeable ROM chips with complex figures, backgrounds, action and scoring. In contrast, the Rusch-2 circuits cannot be reconfigured to play a substantial variety of games and cannot be programmed at all. Nor can the Rusch-2 patent technology keep score, or generate backgrounds or complex figures. (Id.) Indeed, the only "backgrounds" supplied in connection with the early Odyssey games were transparent plastic overlays which the player taped to the television screen. (FF No. 136.) The Rusch-2 patent circuitry contains approximately 50 transistors, whereas the Atari 2600 with a program has upwards of 50,000 transistor elements. (FF No. 151.) The process of designing Activision software has nothing in common with the hardware design process of the Rusch-2 patent, and even involves different disciplines. (FF No. 154.) All of these differences are fundamental to the very nature of the two machines, and demonstrate the lack of substantial equivalence between the two technologies.[9/]

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9/ The related doctrine of "reverse equivalents" also applies to the present case. This doctrine has been recognized by the United States Supreme Court, and provides that a device which performs the same function or accomplishes the same result by substantially different means, principle, mode of operation or in a substantially different way does not infringe. Thus, where a device is so far changed in principle from a patented article, but nevertheless falls within the literal words of the claim, the doctrine of equivalents can be used to restrict the patent claim and defeat an

(continued)

None of these fundamental differences between the Rusch-2 specifications and the Atari 2600 with an Activision program is seriously disputed in this case. Instead, Plaintiffs' expert witness essentially testified that the two technologies were equivalent because they achieved equivalent results. When asked to explain the reason for his conclusion that Activision software was equivalent to some element of the asserted claims of the Rusch-2 patent, Dr. Ribbens indicated that both the Atari 2600 and the Rusch-2 generated and moved spots on a television screen in time relationship to the horizontal and vertical synchronization pulses. This "reason" for finding equivalent means and function is no reason at all, as Dr. Ribbens admitted on cross-examination that all technologies (VCRs, cable TV, broadcast TV, etc.) for generating a coherent image on a television screen must necessarily do so in a time relationship to the horizontal and vertical synchronization pulses. The functional principle which Dr. Ribbens invoked to support his conclusion of equivalence is not the functional principle or invention of the Rusch-2 patent, it is the functional principle of television itself! (FF Nos. 157, 158.)

9/ (footnote continued)

action for infringement. See Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605, 608-09 (1950); Decca Ltd. v. United States, 420 F.2d 1010, 1014 (Ct. Cl.), cert. denied, 400 U.S. 865 (1970) ("[a] device so far changed in principle from a patented device that it performs the same or similar function in a substantially different way"); Reynolds-Southwestern Corp. v. Dresser Industries, Inc., 372 F.2d 592, 595 (5th Cir. 1967); SRI Int'l v. Matsushita Elec. Corp. of America, 591 F. Supp. 464 (N.D. Cal. 1984). See generally 4 D. Chisum, Patents §18.04[4] (1984); Pigott, Equivalents in Reverse, 48 J. Pat. Off. Soc'y 291 (1966).

The computer and the Rusch-2 circuitry are two different species of mechanisms using fundamentally different means and functional principles. Plaintiffs have not proved that Activision's software is the equivalent of anything in the Rusch-2 patent.

V.

THE LITERAL SCOPE OF THE RUSCH-2 PATENT IS DEFINED BY THE CIRCUITRY SET OUT IN THE PATENT AND EQUIVALENTS OF THAT CIRCUITRY.

Because Plaintiffs have failed to carry their burden of persuasion with respect to demonstrating the equivalence of the Rusch-2 claims at issue and the accused Activision software, the infringement inquiry is essentially at an end. However, as Plaintiffs have persisted in their effort to assert that the Activision software can infringe the Rusch-2 patent even though it is not, taken as a whole, equivalent to any of the asserted claims of the Rusch-2 patent, the analysis must turn now to the issue of the literal scope of the "means plus function" claims of the Rusch-2 patent under what the parties have referred to as "Section 112 equivalents." It should be apparent from the outset that Plaintiffs' interpretation of Section 112 produces a dramatically counterintuitive result--that an accused device can be found to be the "same" on an element by element basis for purposes of literal infringement even though taken as a whole it is not even equivalent under the doctrine of equivalents.

//

A. Section 112 Equivalents Are Limited To Mechanical Equivalents Of Specific Means.

The element by element equivalents analysis[10/] of the specific "means" at issue to ascertain the scope of the claims should be limited to "functional equivalent[s]." For example, in Hale Fire Pump Co. v. Tokai, Ltd., 614 F.2d 1278 (C.C.P.A. 1980),[11/] Section 112 functional equivalence was not found between the reversible jack screw assembly for a centrifugal pump (the structure contained in the specification of releasable means in claim 1 of the patent) and the knobs and handles used for releasable means in the accused device. The Hale Fire Pump court emphasized that there was no correspondence between the two technologies even though both technologies could perform the functions described in the claim. Id. at 1283 n.5.[12/] A review of the two "releasable means" technologies for centrifugal pumps found not equivalent in Hale Fire Pump clearly demonstrates just how closely similar two technologies must be in order to come within the equivalents

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10/ The "element by element" character of Section 112 equivalents, as opposed to the "entirety of the accused device" analysis of the doctrine of equivalents, was endorsed in D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1575 (Fed. Cir. 1985).

11/ The decisions of the Court of Customs and Patent Appeals have been specifically recognized by the Federal Circuit as binding precedent. South Corp. v. United States, 690 F.2d 1368, 1369 (Fed. Cir. 1982). Hale Fire Pump was a unanimous decision by a five-judge panel that included four of the ten present Federal Circuit judges and included Chief Judge Markey, the author of the decision in D.M.I., Inc. v. Deere & Co., 755 F.2d 1570 (Fed. Cir. 1985).

12/ See supra at 7.

//

extension of the patent monopoly. Activision's argument for nonequivalents in this case is a fortiori in light of Hale Fire Pump.

The Federal Circuit's recent decision in Palumbo v. Don-Joy Co., 762 F.2d 969 (Fed. Cir. 1985) approved the Hale Fire Pump analysis of Section 112 equivalents. Palumbo involved a patent for an orthopedic knee brace whose independent claims utilize "means plus function" language. E.g.:

> "said force developing means including first and second elastic bands wrapped in a first circumferential direction about the leg, one of said elastic bands wrapped above the knee and the other wrapped below the knee . . . ." (Palumbo claim No. 8) (Id. at 971)

The accused knee brace device in Palumbo had some similarities to both the Palumbo patent specification and to another knee brace patent which was prior art for the Palumbo knee brace. The Palumbo patent prosecution history showed specific narrowing of the patent to avoid the prior knee brace patent. The accused infringer in Palumbo moved for summary judgment on the issue of no infringement. The trial court granted summary judgment, specifically holding that the patent was limited strictly to the specification and ignoring the question of whether or not there was an equivalent to the specification. The Federal Circuit reversed, finding that a factual issue existed as to whether the accused device was equivalent to the "described embodiment" of the patent, i.e., the specific technology disclosed in the patent specification.

The Federal Circuit in Palumbo also noted that the

district court mistakenly exactly identified equivalents of specifications of claim elements under a Section 112 literal infringement analysis with the doctrine of equivalents which applies if no literal infringement is found. The Palumbo court specifically stated that the established doctrine of equivalents analysis is "relevant in any equivalents determination," citing with approval Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605, 609 (1950); Hale Fire Pump Co. v. Tokai, Ltd., 614 F.2d 1278 (C.C.P.A. 1980) and Lockheed Aircraft Corp. v. United States, 553 F.2d 69 (Ct. Cl. 1977).[13/] The Federal Circuit nonetheless indicated that the doctrine of equivalents and equivalents of specifications under Section 112 "are not completely identical notions" and "can be different" (emphasis added), since Section 112 equivalents can lead to a finding of literal infringement, while the doctrine of equivalents will be invoked if no literal infringement is found. Palumbo, supra, 762 F.2d at 975 n.4.[14/]

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13/ See also King Instrument Corp. v. Otari Corp., 226 U.S.P.Q. 402 (Fed. Cir. 1985) ("[a]s aid for ascertaining breadth of equivalents under §112, a number of factors may be considered: the patent specification, the prosecution history of the patent, other claims in the patent, and expert testimony"). The patent at issue in King Instrument related to an apparatus for loading magnetic tape into cassettes. The Federal Circuit began its analysis of the mean plus function claim language by turning immediately to the structure set out in the preferred embodiment. The King Instrument court relied heavily on expert testimony that the accused tape loading devices were Section 112 equivalents of the patent specifications.

14/ The facts in Palumbo presented a genuine triable issue as to functional interchangeability of the arms and counterarm of the patent specification and the mechanism in the accused device which

(continued)

There is an obvious lack of mechanical interchangeability of Activision's computer software used with an Atari video computer system and the elements of the Rusch-2 circuitry for generating and displaying bouncing spots on television. The Rusch-2 technology works on a fundamentally different functional principle using fundamentally different means from the Atari computer for which Activision manufactures software, and no interchangeability of electrical circuits for generating hit spots, hitting spots, ascertaining coincidence and imparting distinct motion can take place between the two technologies. Therefore, no Section 112 equivalence between Activision software and any element of the Rusch-2 patent specification has been proved by Plaintiffs.

The recent Federal Circuit decision in Stewart-Warner Corp. v. City of Pontiac, No. 84-1026 (Fed. Cir., July 18, 1985) is instructive on the narrow scope of functional equivalents of "means plus function" claim elements under Section 112. In Stewart-Warner, the Federal Circuit affirmed the lower court's finding of no equivalents under Section 112 of the patented scoreboard display system and the accused scoreboard display system at the Silverdome in Pontiac, Michigan. Obviously the two scoreboard technologies accomplished the same result. Indeed, both scoreboard display systems employed computer technology. Nonetheless, the Federal Circuit

---

14/ (footnote continued)

performed the same arm and counterarm function. In contrast, it is undisputed that there is no functional interchangeability between the elements of the Rusch-2 patent circuitry and the accused games.

cartridge. (FF No. 159-162.)

The equivalents test under Section 112 is not whether the ultimate result (display of bouncing spots on televisions) is performed by the accused device, but whether there is mechanical correspondence between the elements of the two devices. See, e.g., Hale Fire Pump Co. v. Tokai, Ltd., 614 F.2d 1278, 1283 at n.5 (C.C.P.A. 1980)(finding no functional equivalence of two mechanical means for accomplishing the same result).15/

CONCLUSION

The Atari 2600 used with an accused Activision program and the circuitry in the specifications of the Rusch-2 patent are radically dissimilar in every respect but the lowest common denominator of the result of bouncing spots on television screens. Under the established test for the doctrine of equivalents, this "similarity" of result is just not enough. In order for Plaintiffs to carry their burden of persuasion on the issue of contributory infringement, Plaintiffs must prove that the Rusch-2 patent and the Atari

---

15/ In D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1575 (Fed. Cir. 1985), the Federal Circuit reversed a trial court's granting of summary judgment in favor of defendant on the issue of no equivalents under Section 112. The Federal Circuit indicated that the equivalents analysis in the context of Section 112 should focus on equivalents of the specific elements of the claims expressed as "means plus function." Accordingly, the correct reading of D.M.I. reveals that the equivalents analysis for a specific claim element under Section 112 should be more restrictive than under the doctrine of equivalents for the entire accused device.

//

infringement, even if they are not sufficiently similar for the purposes of the doctrine of equivalents.

DATED: September 9, 1985.

Respectfully submitted,

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H. JOSEPH ESCHER III
MARLA J. MILLER
HOWARD, RICE, NEMEROVSKI, CANADY, ROBERTSON & FALK
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OF COUNSEL:
SCOTT HOVER-SMOOT

By _____
MARTIN R. GLICK

Attorneys for Defendant and Counterclaimant Activision, Inc.

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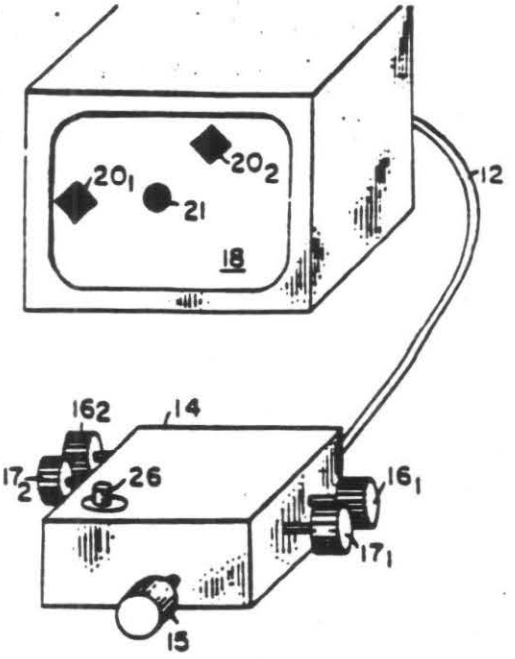
090985/16-355900Gj

FIG. 1



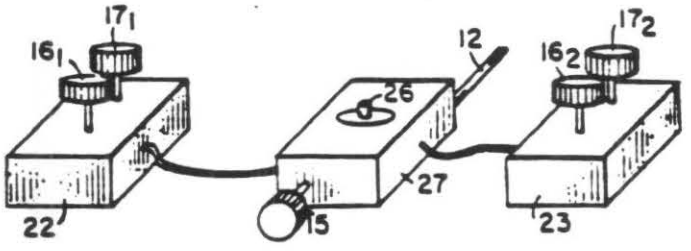


FIG. 1A

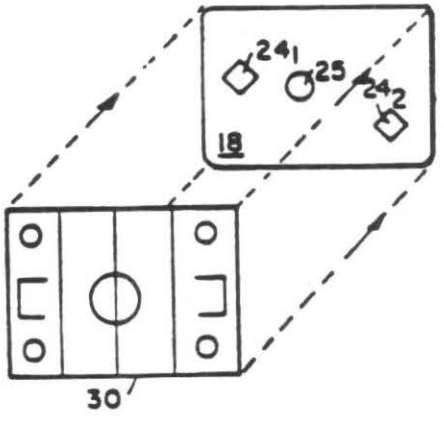


FIG. 2

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EXHIBIT "A"

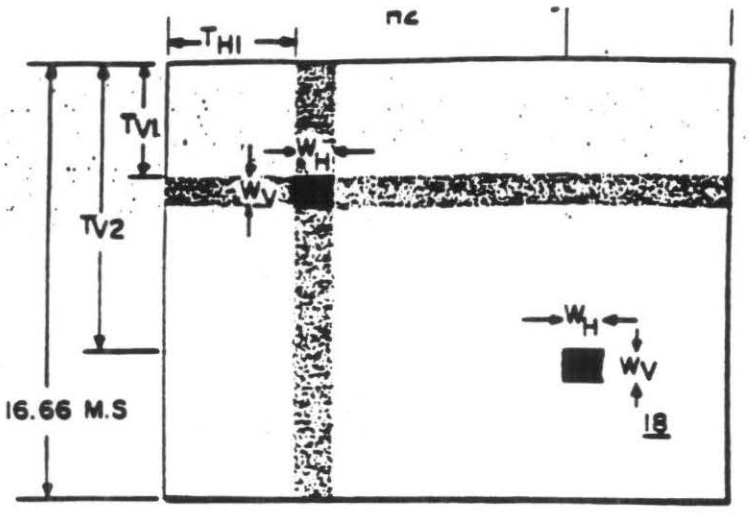

FIG. 3

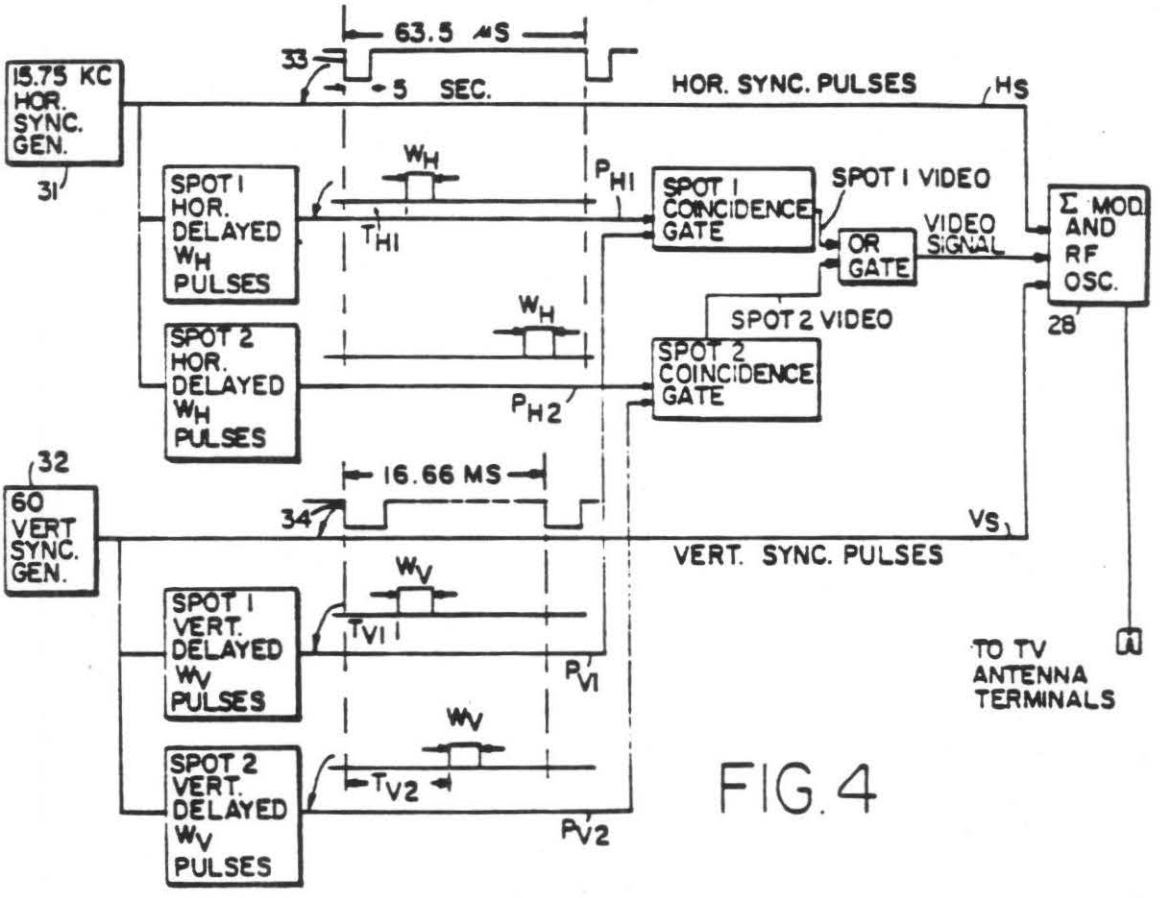

FIG. 4

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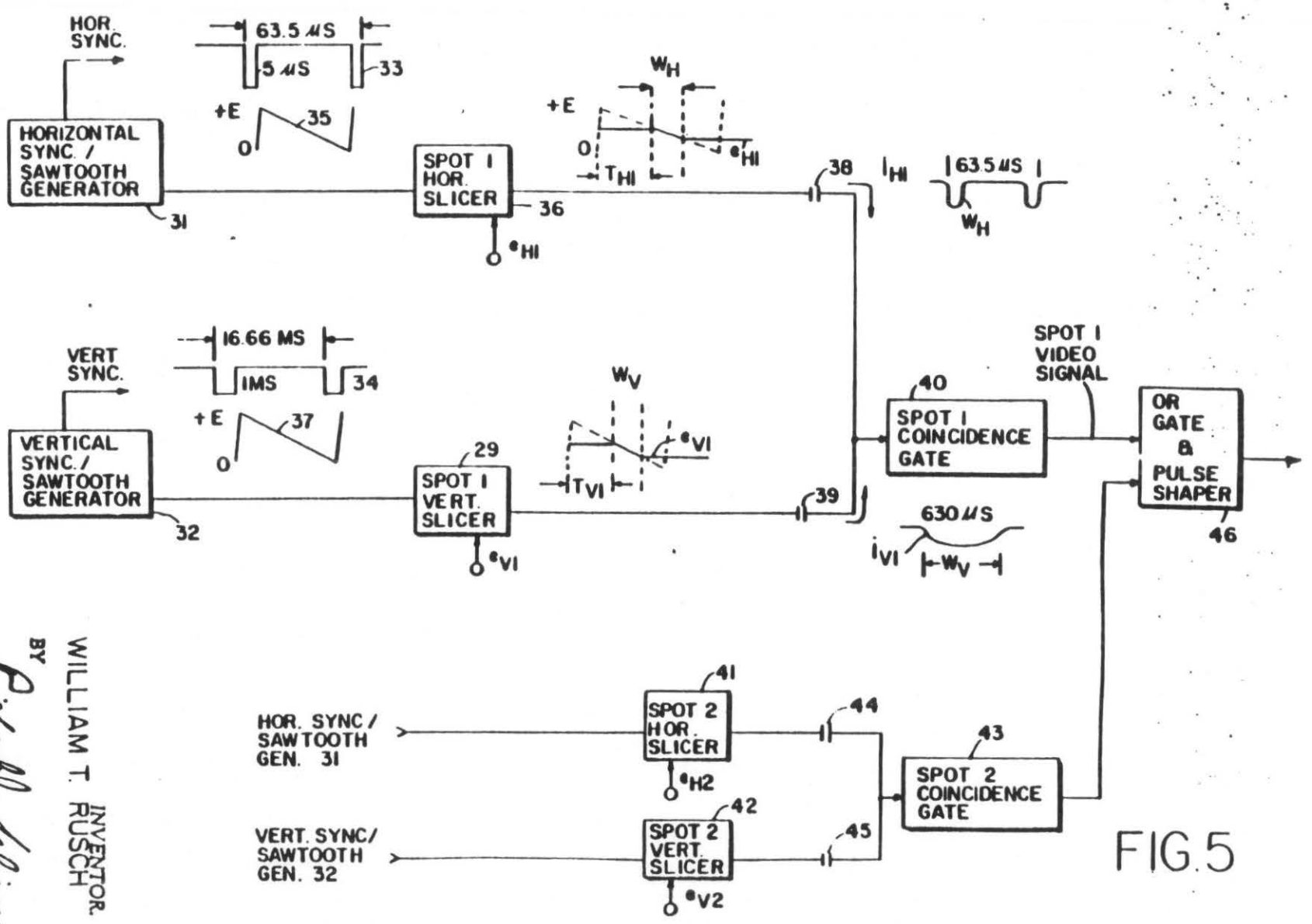

FIG.5

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16 Sheets-Sheet 5

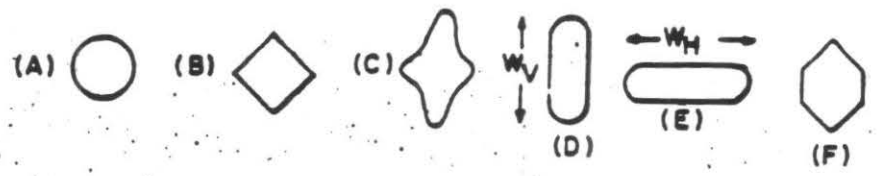

FIG. 6

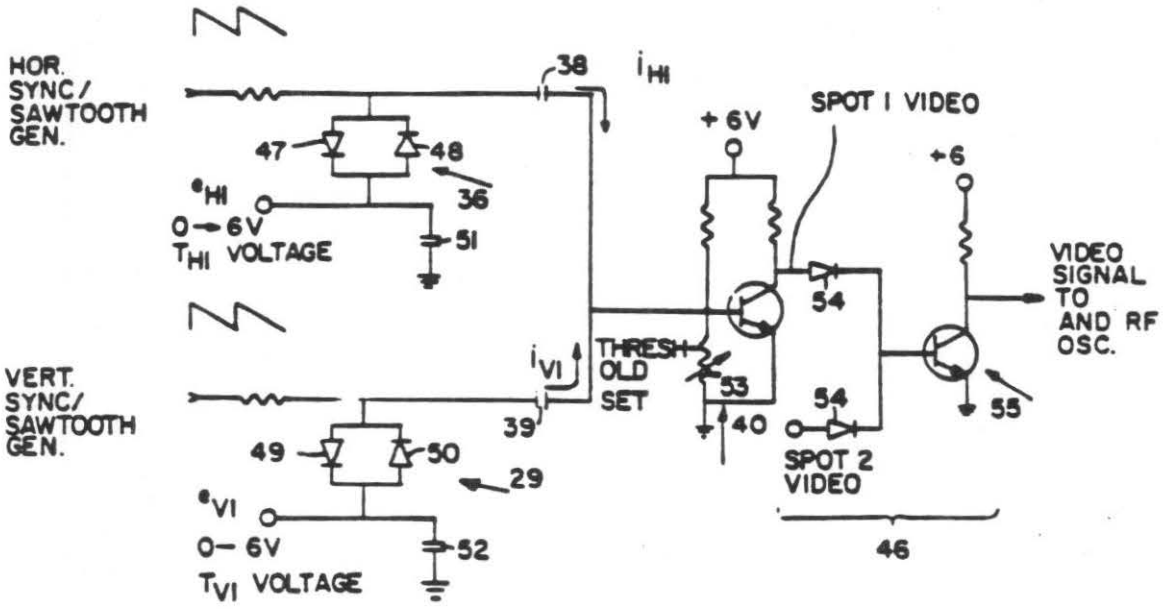

FIG. 8

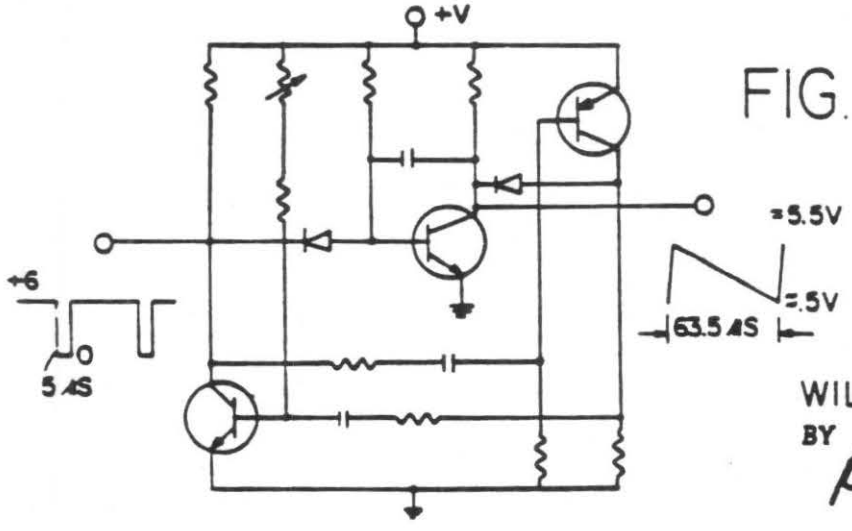

FIG. 7

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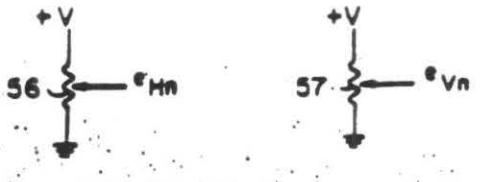

FIG. 9A

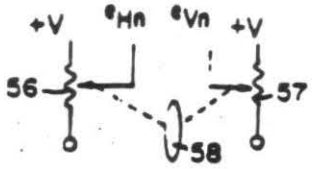

FIG. 9B

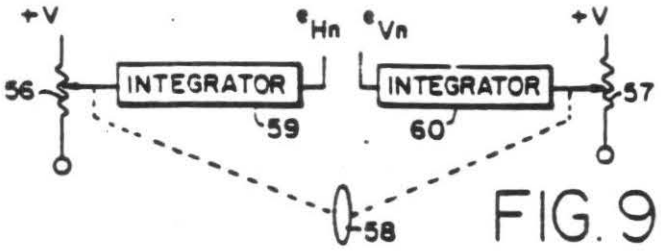

FIG. 9C

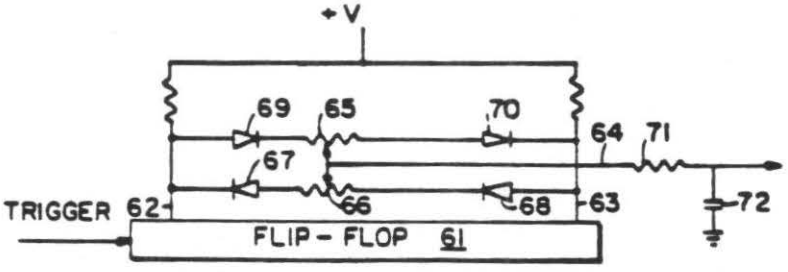

FIG. 10A

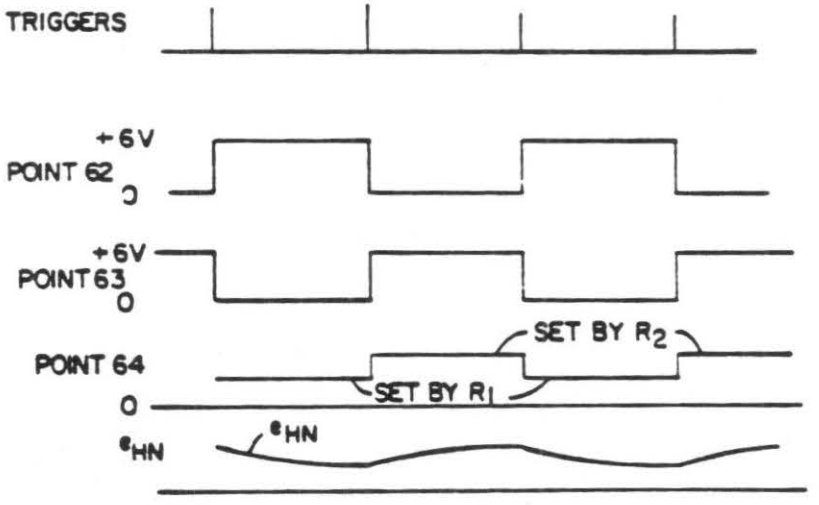

FIG. 10B

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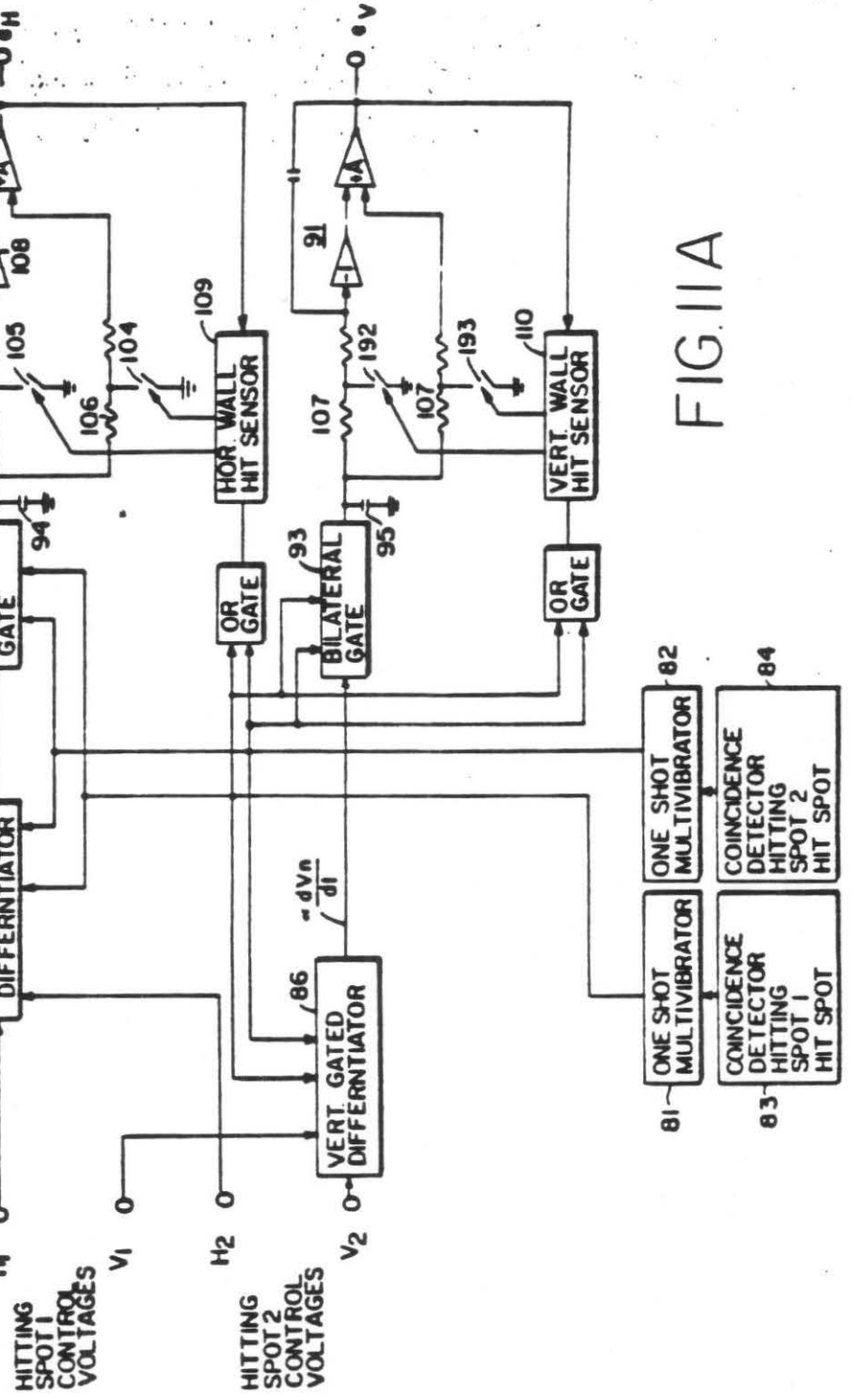

FIG. IIA

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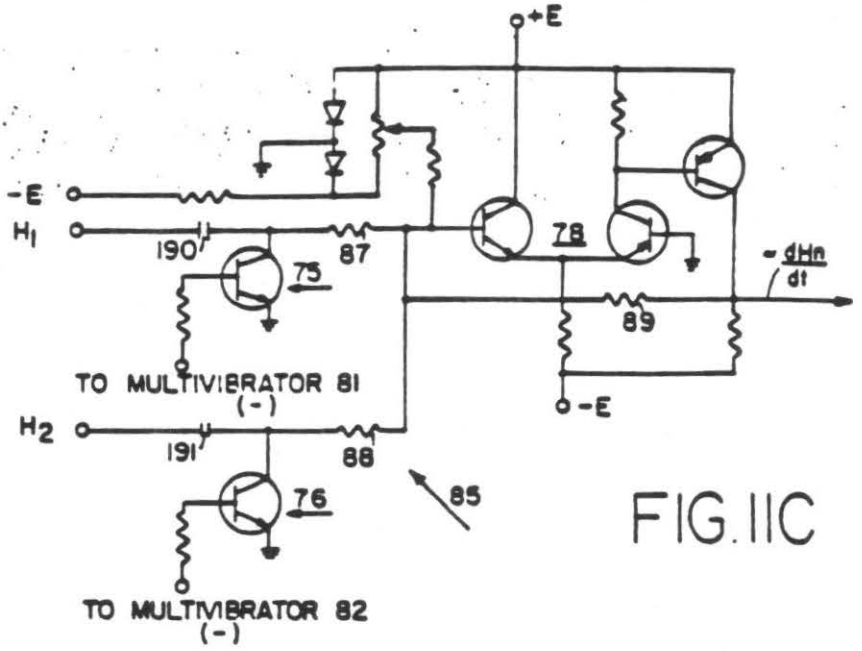

FIG. 11C

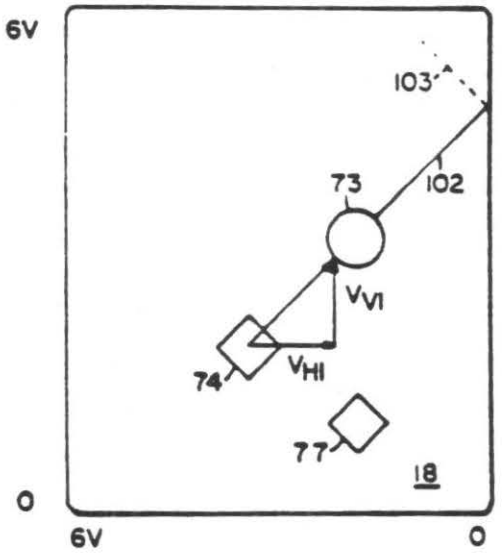

FIG. 11B

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BY Richard D. Seliger

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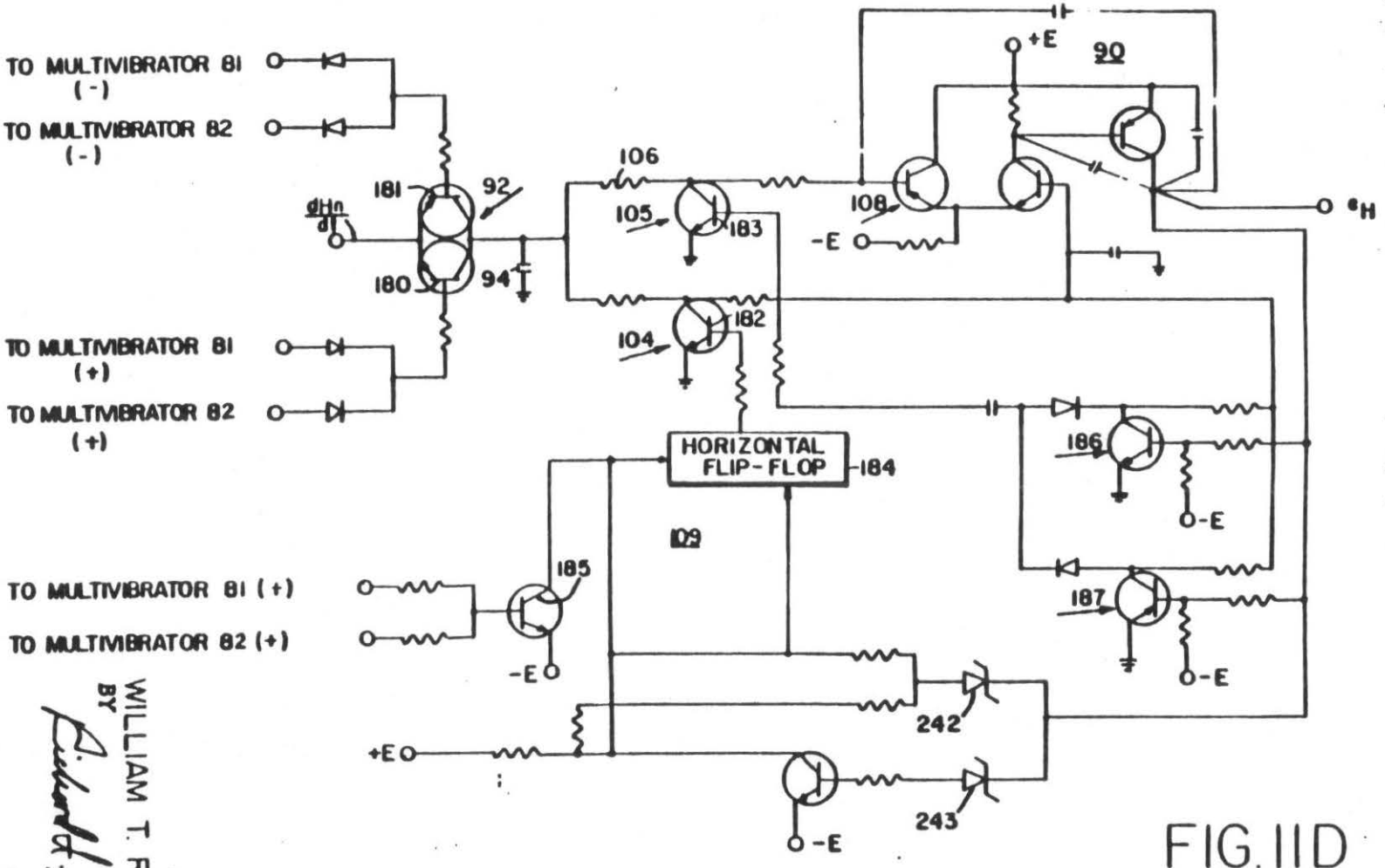

FIG. IID

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16 Sheets-Sheet 8

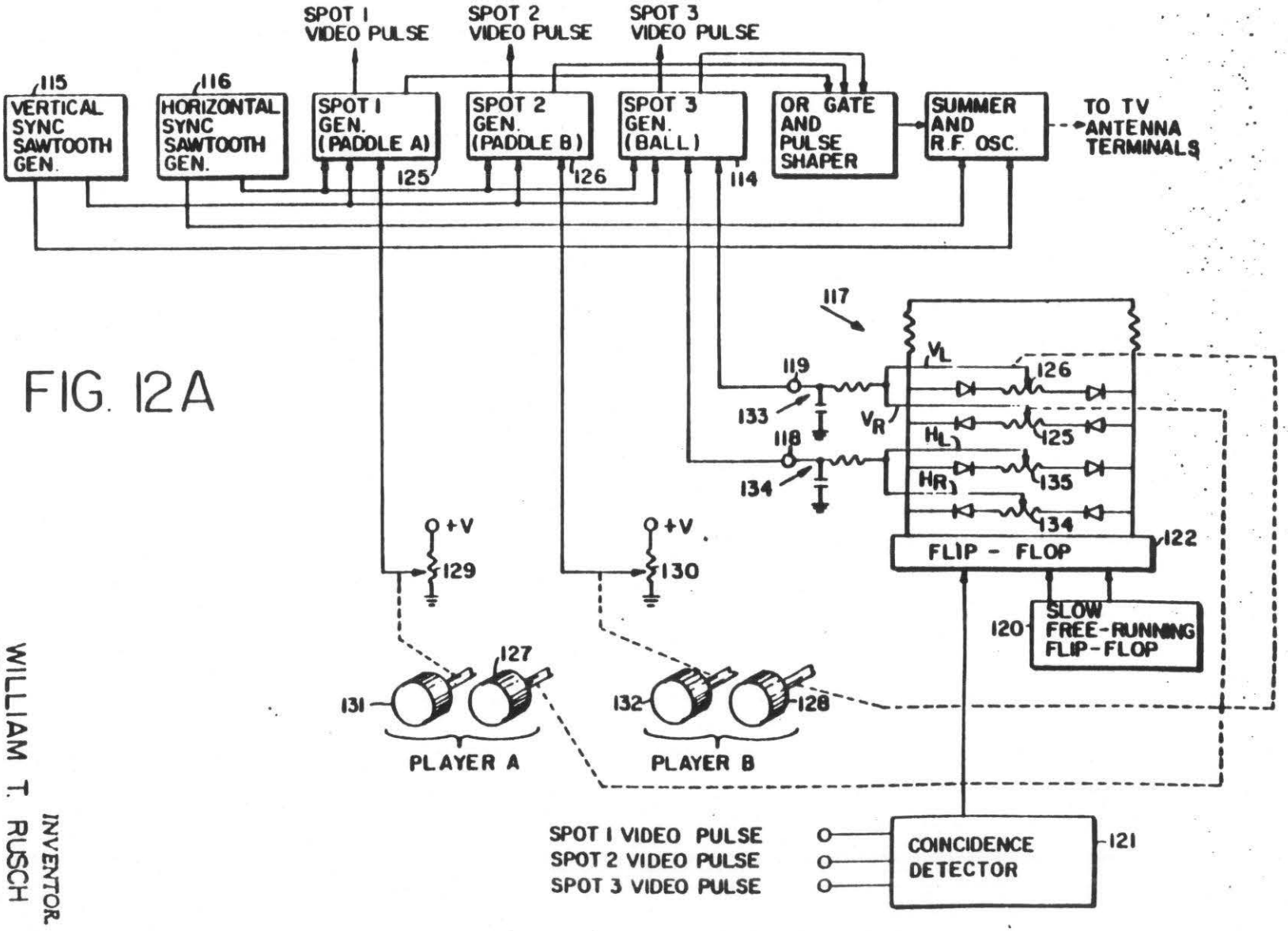

FIG. 12A

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Richard H. Kellogg
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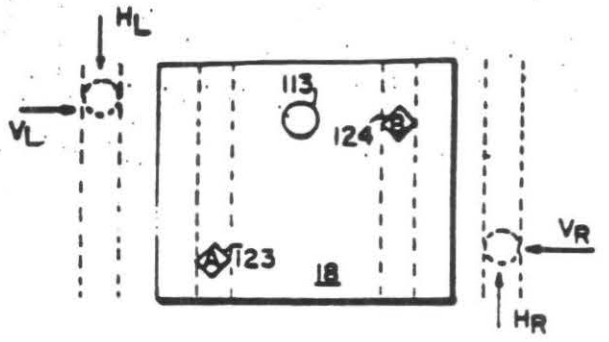

FIG. 12B

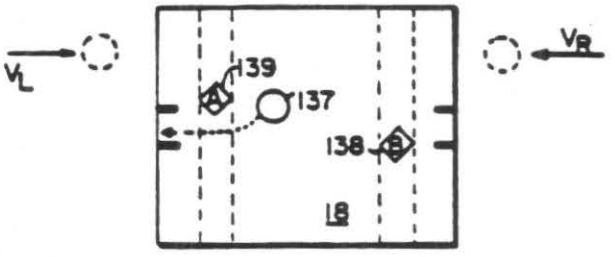

FIG. 12C

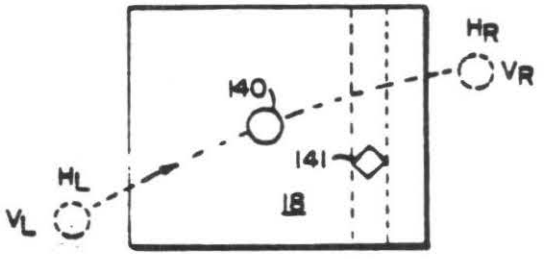

FIG. 12D

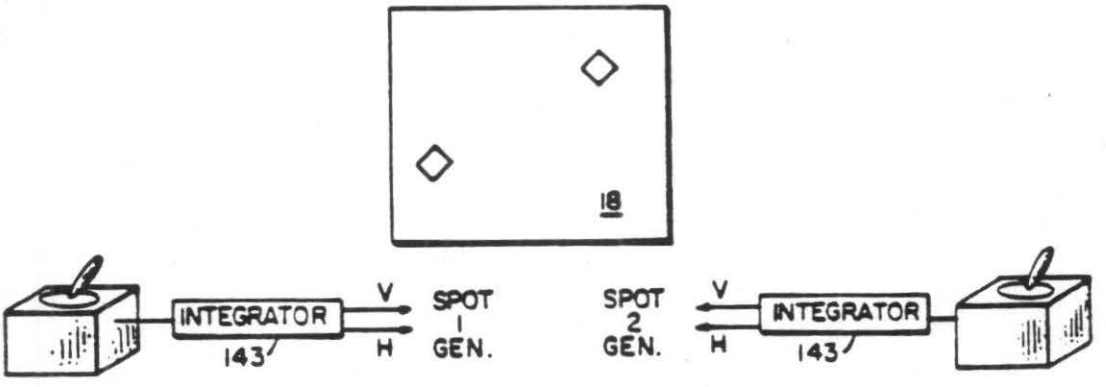

FIG. 13

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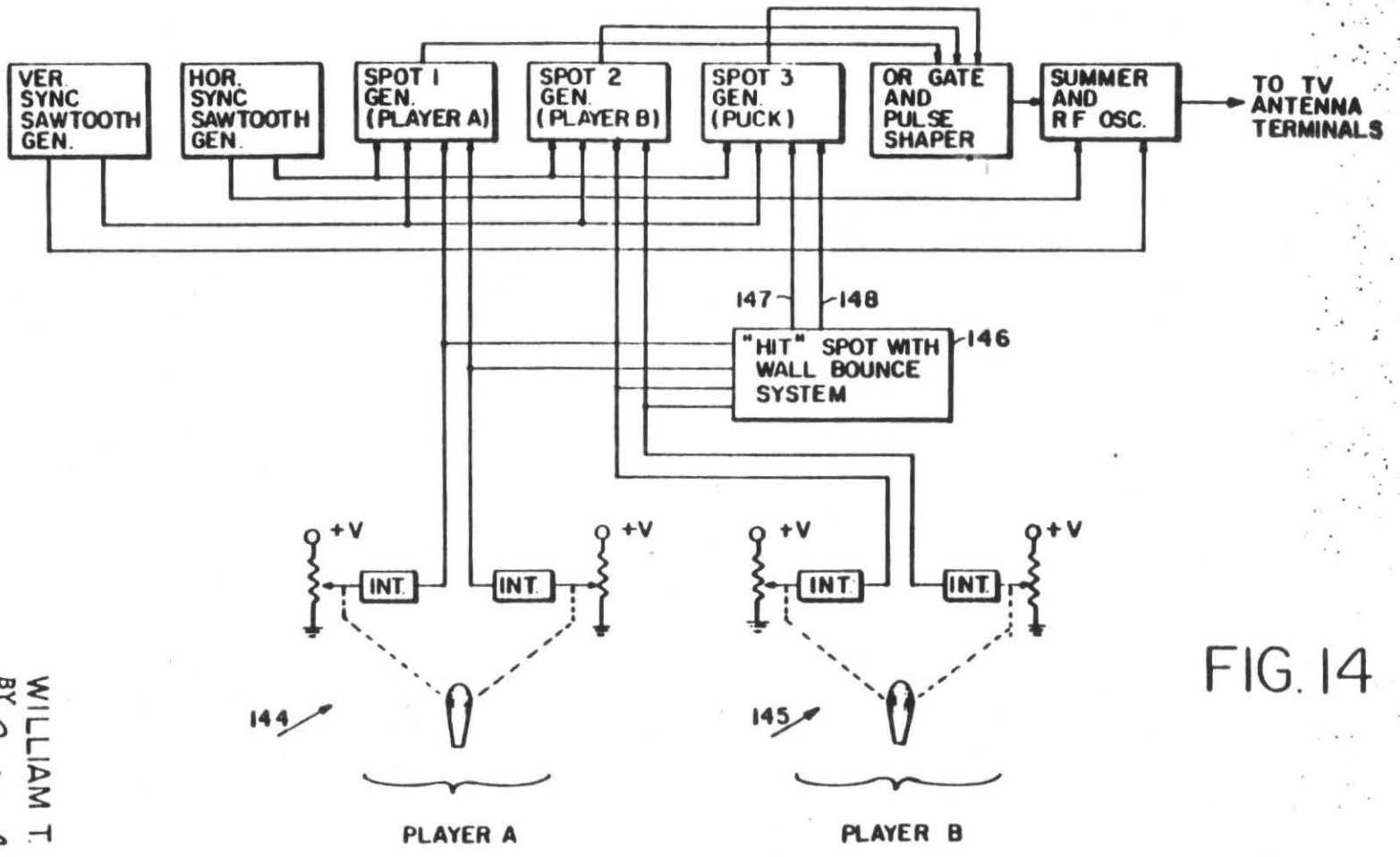

FIG. 14

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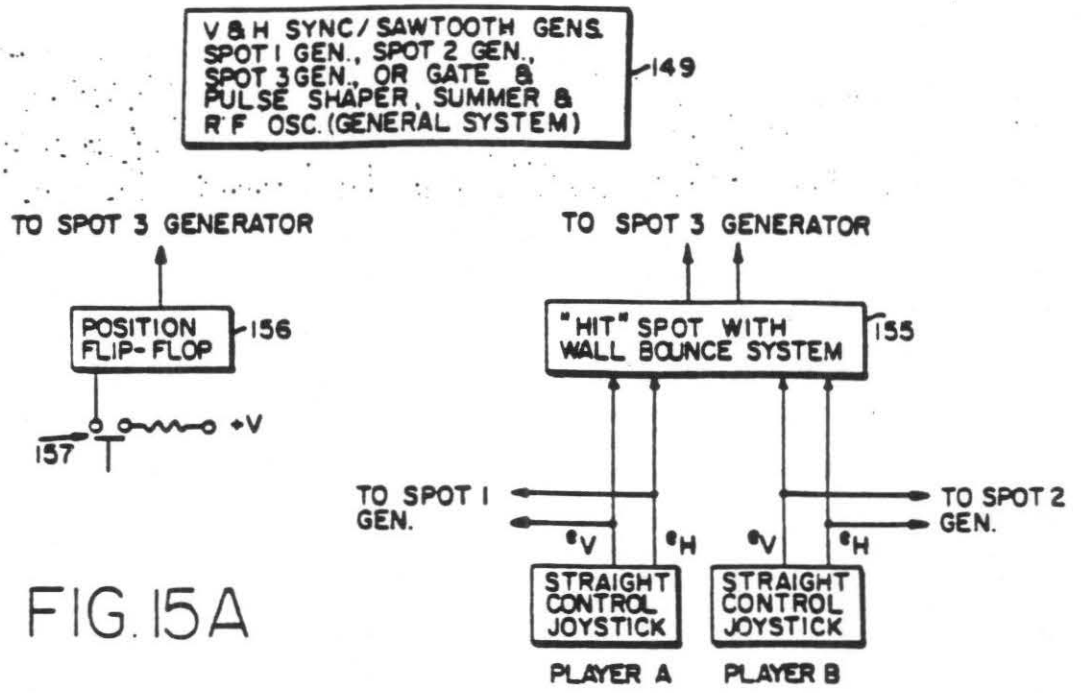

FIG. 15A

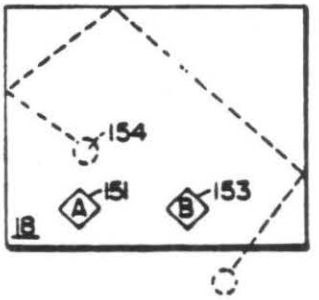

FIG. 15B

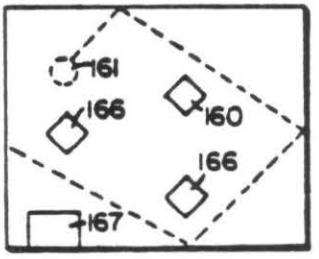

FIG. 16B

INVENTOR.
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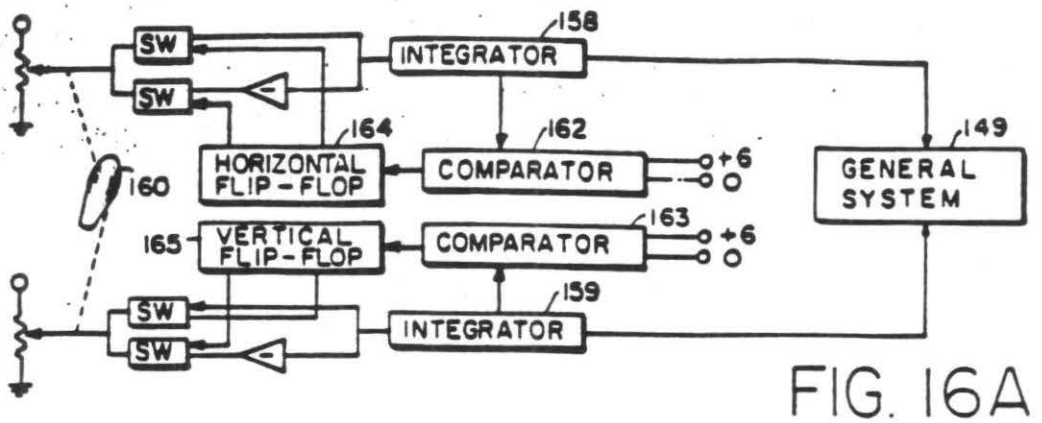

FIG. 16A

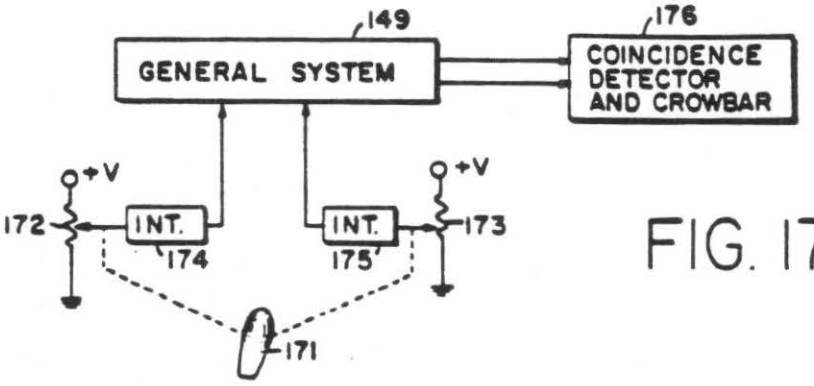

FIG. 17A

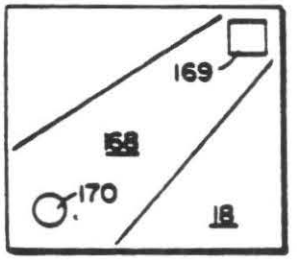

FIG. 17B

INVENTOR.
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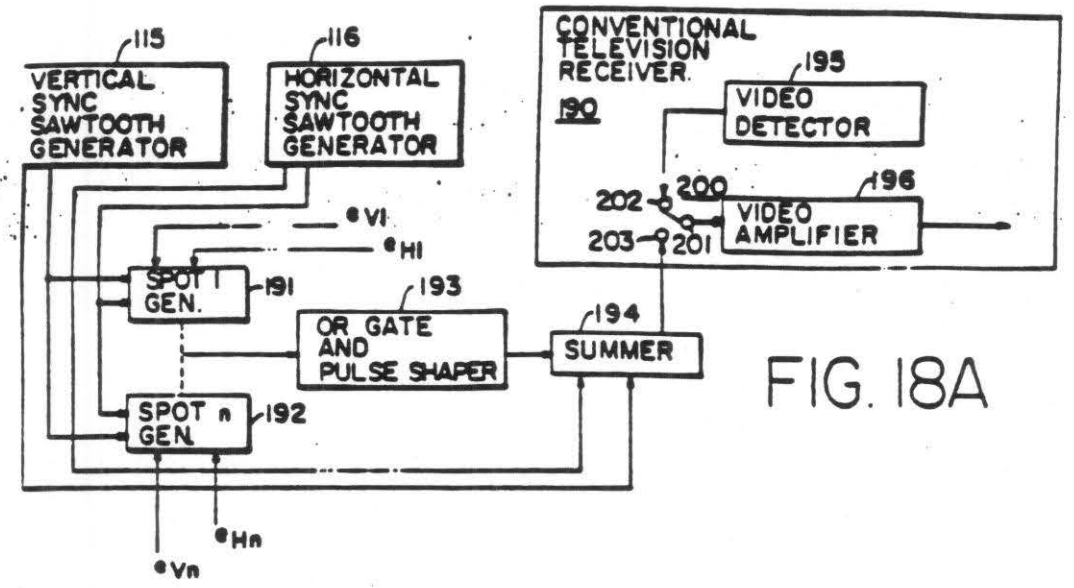

FIG. 18A

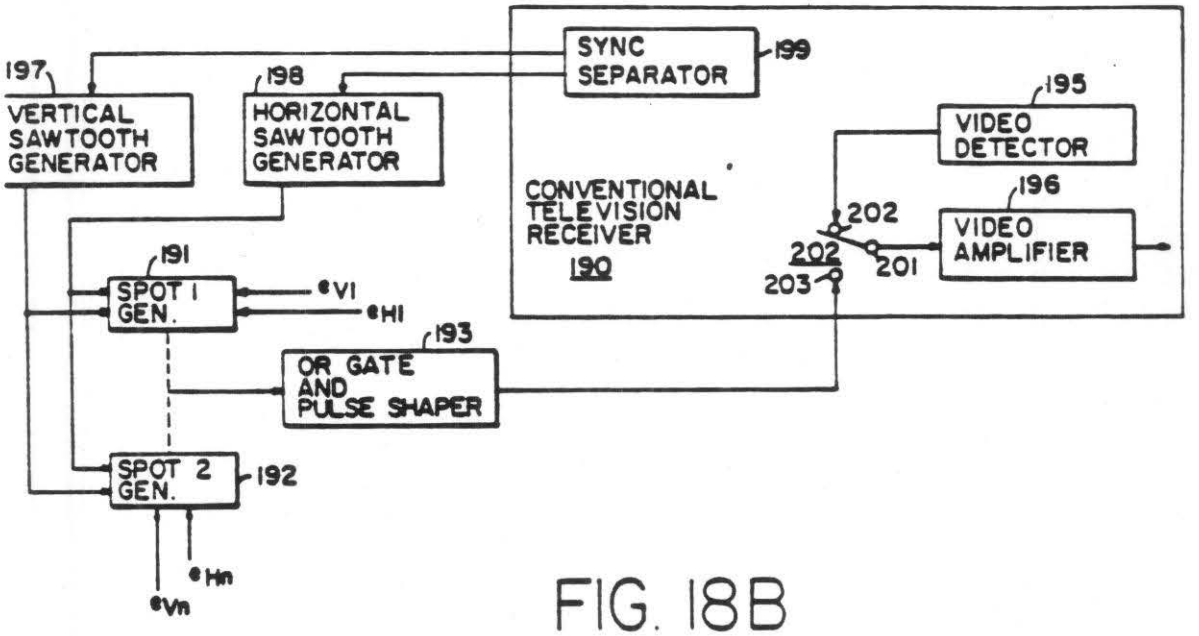

FIG. 18B

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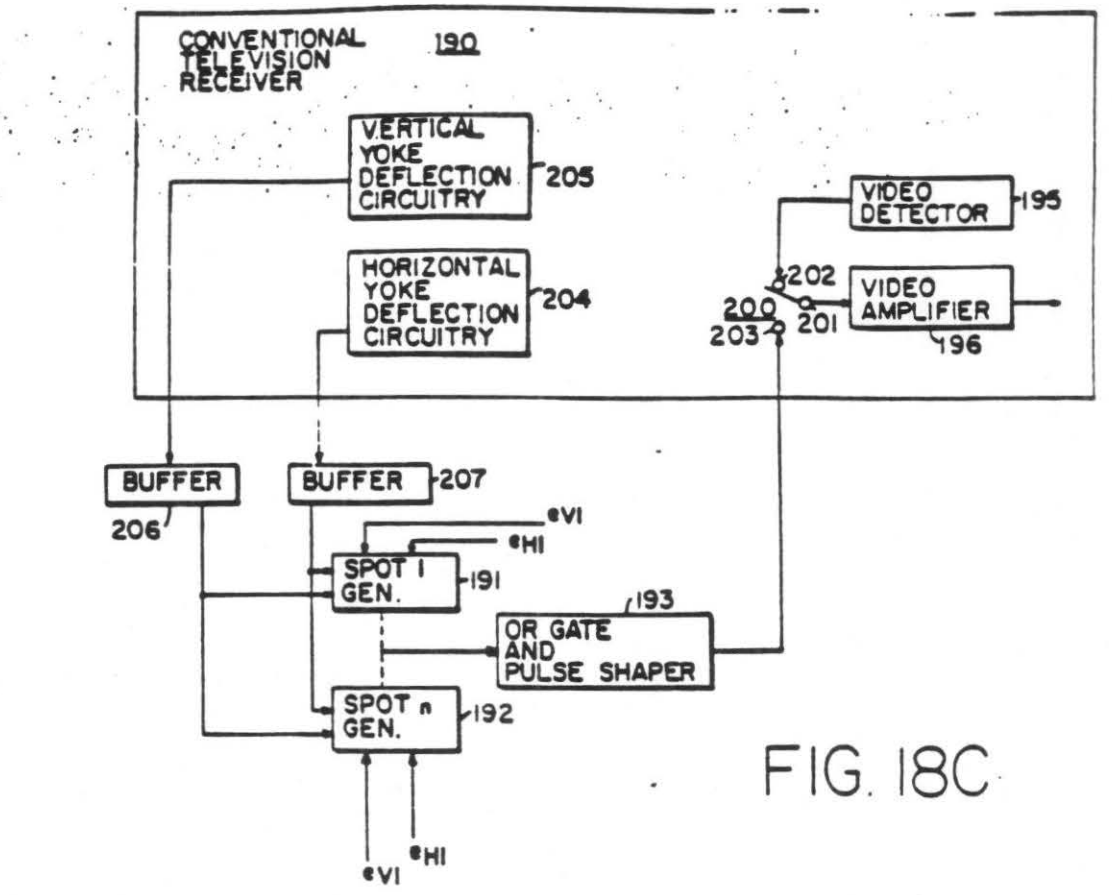

FIG. 18C

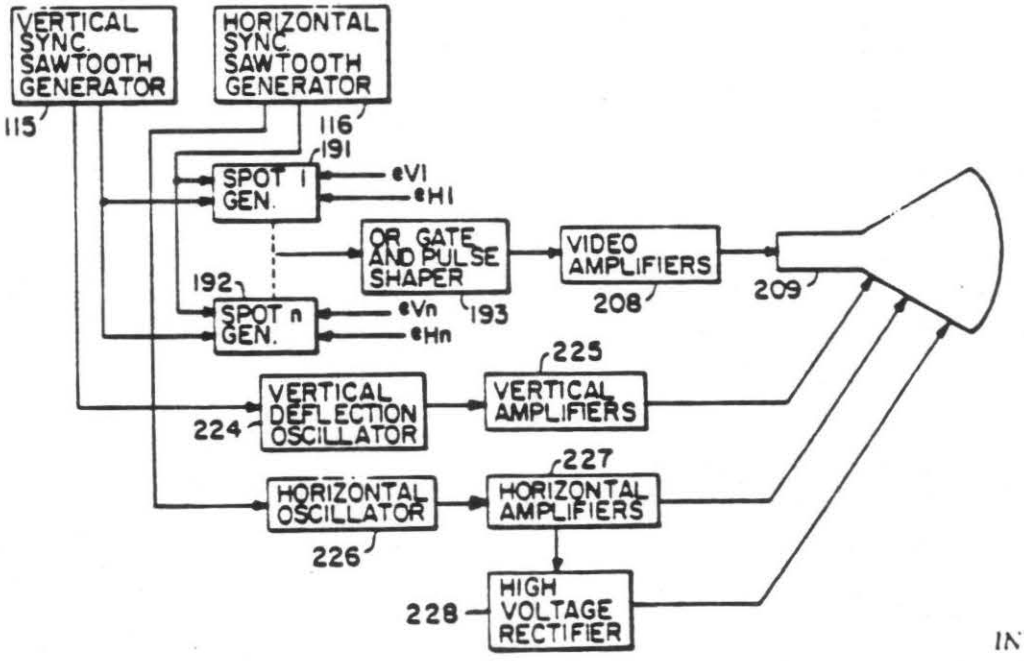

FIG. 19

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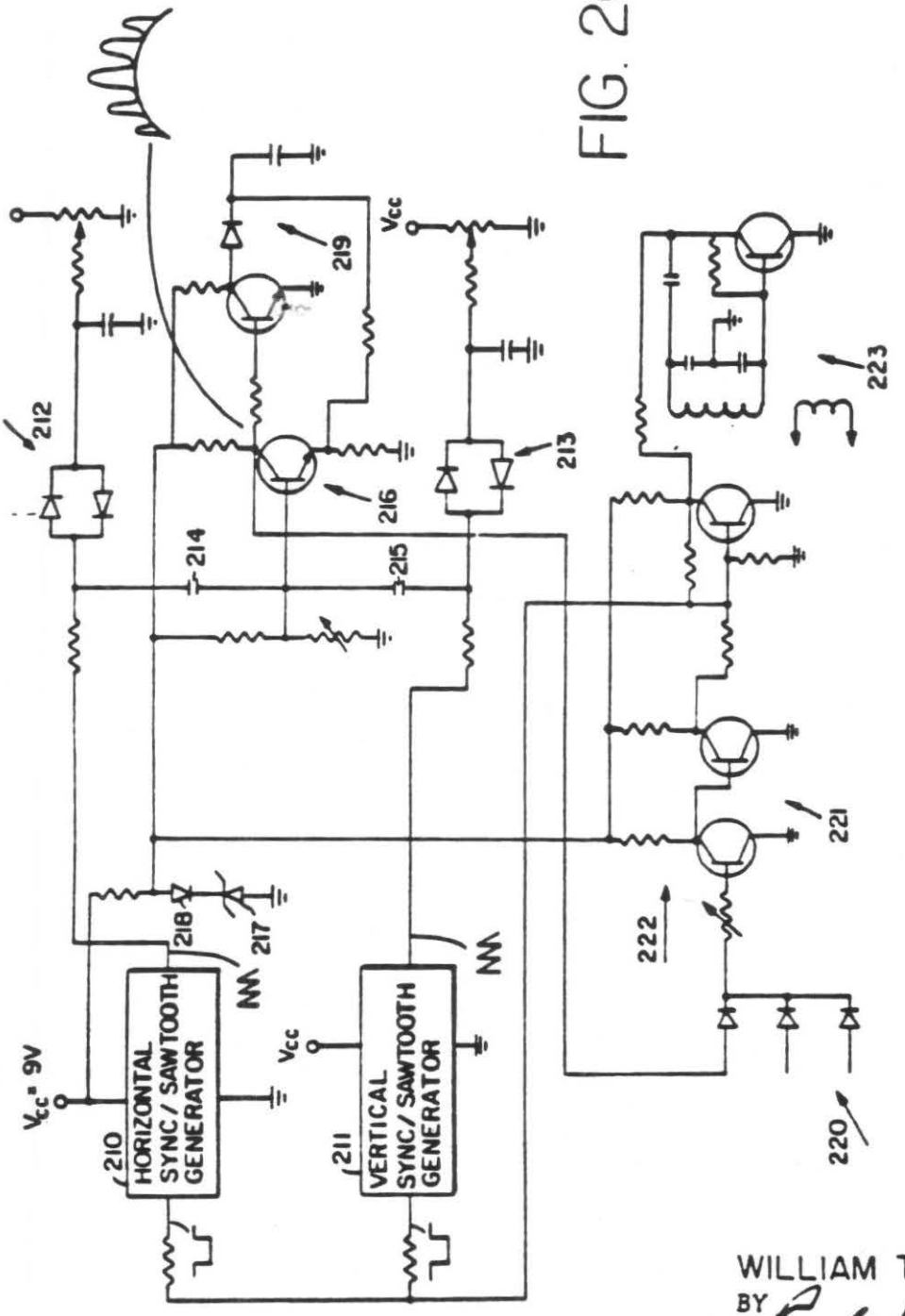
FIG. 20



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TELEVISION GAMING APPARATUS

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This invention relates to the subject matter disclosed in application Ser. No. 126,966 filed Mar. 22, 1971, a continuation of application Ser. No. 697,798 filed Jan. 15, 1968, now abandoned; and application Ser. No. 713,862, filed Mar. 18, 1968, now U.S. Pat. No. 3,497,829.

BACKGROUND OF THE INVENTION

This invention relates to an apparatus and method by means of which standard television receivers can be utilized as active rather than passive instruments. This is accomplished in certain embodiments by having participants manipulate controls of a control unit connected to the television receiver to cause a symbol, such as a rectangle, circle, ring, star, cross, spot or a plurality of spots, to be displayed upon the television screen by means of which the participants can play a variety of games, participate in simulated training programs, as well as carry out other activities. By way of example, modified versions of the well-known game of ping-pong may be played by two participants by physically or electronically placing an appropriate mask representing the net upon the screen of the television receiver. Three displayed spots represent two paddles and a ball wherein the ball is moved in a particular direction when "hit" by a paddle.

Heretofore, color and monochrome television receivers have been used generally by the home and other viewers as passive devices; i.e., the television receiver is used only as a display means for programming originating at a studio. The viewer is limited to selecting the presentations available for viewing and is not a participant to the extent that he can control or influence the nature of, or add to the presentation displayed on the receiver screen.

A standard receiver employed with auxiliary equipment to provide an active form of home entertainment is described in a patent application for "Television Gaming and Training Apparatus," Ser. No. 126,966 filed Mar. 22, 1971 a continuation of Ser. No. 697,798, filed Jan. 15, 1968, and assigned to the assignee of this application. Since most homes are equipped with television receivers, the only expense required to provide added family enjoyment is the expense of a control unit of one type or another.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide apparatus and methods for displaying video signals on the screen of a television receiver, where some or all of the video signals are both generated and controlled by apparatus external to the television receiver.

It is another object of the present invention to provide an apparatus and method wherein a standard color or monochrome television receiver is utilized as an active instrument for playing various types of games involving one or more participants.

It is a further object of the present invention to provide a device whereby an individual may pit his alertness, skill, manual dexterity and visual acuity against automatically controlled video displays.

It is yet a further object of the present invention to provide an apparatus which will generate spots such as squares, rectangles, circles, rings, stars, etc. which may be controlled by one or more participants for playing various types of games.

It is another object of the present invention to provide a cathode ray tube apparatus for displaying symbols to be manipulated by participants.

It is yet another object of the present invention to provide an apparatus which will allow one or more participants to actively use a standard television set while receiving background and other pertinent pictorial information from a cooperative commercial TV, closed-circuit TV, or CATV station, thus combining or alternating studio and home-generated information on the TV screen.

It is still another object of the present invention to allow the use of standard TV set for gaming or other activities without the need for any kind of internal electrical connection to the TV set for the introduction of video and/or chroma signals, connections being required to be made only to the externally-accessible antenna terminals.

In accordance with one embodiment of the present invention, a television gaming apparatus is provided for generating video signals in accordance with the standardized television format, which signals may be controlled by an individual operator by means of a joystick or other manually operative means. The television gaming apparatus comprises control apparatus having included therein the necessary electronic circuits to produce video signals which are compatible with standard television receivers.

The control apparatus has video signal control means mounted thereon for each access and connecting means are provided for coupling the video signals generated within the control box to the television receiver.

By way of illustration, the television gaming apparatus can be used for playing a game of ping-pong by providing on a TV screen two spots which represent paddles. Means are provided for enabling the players to control the vertical movement of the spots. Means are also provided for generating on the screen of the television receiver a third spot which represents the ping-pong ball, which spot automatically moves from an off-screen left position on an off-screen right position and vice versa unless "hit" by a paddle spot whereupon the ball spot will change direction. The players have further controls for changing the vertical position of the ball spot.

Suitable overlays or presentations from a cooperative TV station may be used in conjunction with said games to enhance the aesthetic appeal thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features and objects of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a pictorial view illustrating the principle components of an embodiment of the invention;

FIG. 1A is a pictorial view illustrating an alternate embodiment for the control unit of FIG. 1;

FIG. 2 is a sketch illustrating a typical TV screen and overlay mask as employed in an embodiment of this invention;

FIG. 3 is a sketch illustrating the manner in which spots are formed on a TV screen;

FIG. 4 is a block diagram illustrating the spot generation;

FIG. 5 is a block diagram of the preferred mode of generating spots on a TV screen;

FIG. 6 is a plurality of sketches illustrating shapes of representative spots;

FIG. 7 is a schematic of a sync/sawtooth generator employed in the embodiment of FIG. 5;

FIG. 8 are schematics of circuits employed in the embodiment of FIG. 5;

FIG. 9A is a schematic of potentiometer controls used to generate slicer control voltages;

FIG. 9B is a schematic of joystick controlled potentiometers used to generate slicer control voltages;

FIG. 9C is a schematic of joystick controlled potentiometer-integrator control used to generate slicer control voltages;

FIG. 10A is a schematic of a position flip-flop circuit used to control spots in certain applications of this invention;

FIG. 10B are sketches of representative waveforms of the circuit of FIG. 10A;

FIG. 11A is a block diagram of apparatus of controlling a "hit" spot;

FIG. 11B is a sketch illustrating the manner in which the apparatus of FIG. 11A controls a "hit" spot; [supplies]

FIG. 11C is a schematic of the horizontal gated differentiator of FIG. 11A;

FIG. 11D is a schematic of the bilateral switch, integrator and wall bounce control of FIG. 11A;

FIG. 12A is a diagram of apparatus for a simulated ping-pong game;

FIG. 12B is a sketch of a TV screen illustrating the manner of play of the ping-pong game of FIG. 12A;

FIG. 12C is a sketch of a TV screen illustrating the manner of play of a simulated hockey game using the apparatus of FIG. 12A;

FIG. 12D is a sketch of a TV screen illustrating the manner of play of a simulated baseball game;

FIG. 13 is a sketch illustrating a class of games ("chase" games) which can be played using the apparatus of this invention;

FIG. 14 is a diagram of apparatus for a simulated hockey game;

FIG. 15A is a diagram of apparatus for the simulated handball game;

FIG. 15B is a sketch of a TV screen illustrating the manner of play of a simulated handball game using the apparatus of FIG. 15A;

FIG. 16A is a diagram of apparatus for a simulated pinball game;

FIG. 16B is a sketch of a TV screen illustrating the manner of play of a pinball game using the apparatus of FIG. 16A;

FIG. 17A is a diagram of apparatus for a simulated bowling game;

FIG. 17B is a sketch of a TV screen illustrating the manner of play of a bowling game using the apparatus of FIG. 17A;

FIGS. 18A–18C are block diagrams of "built-in" embodiments of the invention;

FIG. 19 is a simplified block diagram of another embodiment of TV gaming apparatus; and

FIG. 20 is an alternate embodiment of circuits employed in the embodiment of FIG. 5.

DESCRIPTION OF PREFERRED EMBODIMENTS

The principal components of one embodiment of a television gaming system configured according to the invention are illustrated in FIG. 1 which is a pictorial view showing a television receiver 10, a control unit 14 and means 12 for connecting control unit 14 to receiver 10. The television receiver 10 employed can be any of the standard commercially available models that are generally used for home entertainment. Either a monochrome or color television set may be used with the present invention since the basic principles of the invention apply to both types. The connection means 12 is in this embodiment a shielded cable, for example, shielded twin lead, and is attached to the antenna terminals of receiver 10 in conventional fashion.

Control unit 14 generates video signals shown as spots 20_1, 20_2 and 21. The spots 20_1 and 20_2 are positioned on the receiver screen 18 by knobs 16_1, 17_1, and 16_2, 17_2, respectively. For clarity, the spot 21 is illustrated as a circle and the spots 20 are illustrated as diamonds, however, many shapes can be generated. In the devices to be described hereinafter, circles are generally employed.

Knob 16 controls the vertical position of spot 20_1 while knob 17 controls the horizontal position thereof. Thus, it can be seen that the spot 20_1 may be positioned at any point on the screen by the proper manipulation of knobs 16 and 17. Spot 20_2 is positioned in like manner by knob 16_1, 17_1. In this embodiment spot 21 is automatically positioned on screen 18 without manual control. This will be described more fully hereinafter. A reset switch 26 is shown on the control unit 14 and is used to reset the picture on the television screen. For example, a game may be played in which one spot is to be positioned over the other and when this is accomplished one spot will disappear and the background will change color. When games of this nature are played, a reset means is required before play can be resumed. Reset switch 26 performs this function.

A knob 15 controls background color for color TV receiver applications wherein a chroma generator is employed in the manner set forth in said application Ser. No. 126,966. Alternatively, control unit 14 may be broken up into a master control unit containing the electronic circuits and individual control units containing control knobs 16_1, 17_1, and 16_2, 17_2, whereby each participant may operate from a position away from the other and so not to interfere with other players. This is illustrated in FIG. 1A wherein control unit 14 is broken up into a master control unit 27 and individual control units 22 and 23. The master control unit 27 contains the electronic circuitry found in control unit 14 and controls 26 and 15. Knobs 16, 17 and 16_1, 17_1 which position the spots 20_1 and 20_2 are situated on individual control units 22 and 23 respectively.

The knobs 16, 17 may be combined into a single joystick permitting control of the horizontal and vertical spot positioning by a single control means.

Other spot position and control means (not shown) can be incorporated into the control unit(s) and these will be described hereinafter.

Rather than provide a separate control unit, the electronic circuitry of the control unit could be built into the television receiver as a constituent part thereof and the receiver sold as both an active and passive home entertainment system. Control units containing the actual manipulating controls can be provided as above.

A typical sequence of steps to play a game using the present invention would be as follows: 1. Attach connection means 12 to TV set 10 at the antenna terminals thereof, if not already attached; 2. turn the TV set on; 3. select the proper channel on the set for the control unit being used; 4. apply power to the control unit; 5. attach a mask on the face of the TV screen; if required for the game to be played; 6. begin the game.

Referring now to FIG. 2, a television screen 18 is illustrated having three spots 24_1, 24_2, and 25 displayed thereon. Spots 24 are "hitting" spots and spot 25 is a "hit" spot. Spots 24_1 and 24_2 represent, for example, hockey players while spot 25 represents a hockey puck. An overlay mask 30 of some type of transparent material such as plastic or the like, having some type of pattern, picture or other illustration pertaining to the particular game to be played is shown in a lifted position. Prior to engaging in a game, the overlay mask 30 is temporarily attached to television screen 18 and in such close proximity to it as not to create any distortion when viewed with reference to spots 24 and 25. One type of overlay mask represents a hockey field to be used for playing a modified game of hockey. Still another pattern could represent a ping-pong table, baseball diamond, etc. These are but a few of the many type games that can be adapted for use with the present invention.

Alternatively, rather than employ overlay mask 30, the pattern to be provided could be displayed directly on the screen 18. The pattern could be broadcast by TV stations or alternatively could be sent to a non-used channel over closed-circuit or CATV lines. It could also be generated electronically in the video control system.

The basic theory of TV gaming devices as described herein is now set forth.

Referring to FIG. 3, at time zero the TV electron beam is at the upper left of screen 18. It starts moving quickly to the right and slowly downwards. Sixty-three and one-half (63.5) microseconds later a 5 microsecond horizontal sync pulse is fed into the TV set, causing the beam to fly back rapidly to the left of the screen. The beam then moves to the right for 63.5 microseconds until the next horizontal sync pulse causes the next flyback to the left. After about 250 such horizontal scans (lines) the beam has progressed to the bottom of the screen. A vertical sync pulse fed into the TV set causes rapid (1 millisecond) vertical flyback to the top of the screen and another cycle begins.

Now, still referring to FIG. 3, assume that the major portion of the screen is dark (beam blanked) except for the areas shown as SPOT 1 and SPOT 2. The spots are made by passing a (positive) unblanking video signal to the TV set when, and only when, the "beam" is passing over the areas of the spots. (Quotes are used around beam because although there is no real beam when blanking is in effect, the scanning signals occur and can be thought of as still moving the "non-existent beam" in the scanning pattern).

The video (unblanking) signals required for spot generation as described with the aid of FIG. 3. To derive SPOT 1, assume that a pluse of width W_H is generated T_{H1} microseconds after the occurrence of each horizontal sync pulse. Define these new pulses as P_{H1} – horizontal video pulse for SPOT 1. If these P_{H1} pulses were used as unblanking (video) in the TV set, the beam would brighten whenever it had moved a distance equivalent to T_{H1} from the left side of the screen. If would stay bright for a length equivalent to W_H and then darken. This would happen all during the vertical scan and 250 bright little line segments of width W_H would appear to the eye as a vertical column (shown shaded in FIG. 3).

Now, SPOT 1 vertical video pulses P_{V1} are made to be of width W_v and to occur T_{V1} milliseconds after the start of the vertical sweep. W_v is on the order of 63.5 microseconds, permitting some 10 horizontal scans to take place with P_{V1} is on. If P_{V1} were used alone as the unblanking (video) signal to the TV set, ten lines the width of the set would be brightened while P_{V1} was on and a bright horizontal bar of width W_v (shown shaded in FIG. 3) would be viewed.

As the last step in spot generation, SPOT 1 horizontal video pulses (P_{H1}) and vertical video pulses (P_{V1}) are passed through a coincidence gate. The gate has an output only when both P_{H1} and P_{V1} are on. The gate output becomes SPOT 1 video (unblank) signal. From FIG. 3 it is obvious that the beam is now unblanked only where the P_{H1} vertical shaded column and the P_{V1} horizontal shaded bar overlap. Thus, a bright spot SPOT 1, comprised of about 10 small line segments, each W_H wide, is developed. SPOT 2 is developed in the like manner.

FIGS. 4 and 5 are block diagrams illustrating the manner in which the signals discussed with respect to FIG. 3 are generated.

The timing for the television gaming system is established by a horizontal sync/sawtooth generator 31 and a vertical sync/sawtooth generator 32. The horizontal sync/sawtooth generator 31 generates a series of negative horizontal sync pulses 33 having a repetition rate equivalent to the standard horizontal scanning frequency used in United States commercial television receivers and the vertical sync/sawtooth generator generates a series of negative vertical sync pulses 34.

The vertical snyc/sawtooth generator 31 also generates a 15.75 KHz sawtooth wave 35 (refer now to FIG. 5). Sawtooth wave 35 has end limits of +E and O. It is directly coupled to a SPOT 1 horizontal slicer 36. A "slice" of the sawtooth ramp of length W_H is passed through the slicer. By varying voltage e_{H1}, delay T_{H1} can be varied for spot positioning from left to right of the TV screen.

A 60Hz sawtooth 37 is generated by vertical sync-/sawtooth generator 32 and is similarly sliced in a SPOT 1 vertical slicer 29, to give ramp width W_v and voltage controlled delay T_{V1}. The two sliced waves are differentiated by capacitors 38 and 39 which connect to the low input impedance of a SPOT 1 coincidence gate 40. Since the current through a capacitor is C de/dt, current pulses appear only during the ramp portions of the sliced waveforms. Although the slope of the vertical ramp is only about one two hundred and sixtieth times that of the horizontal ramp (60 Hz/15,750 Hz), by making capacitor 39 approximately 260 times the value of capacitor 38, current pulses i_{H1} and i_{V1} are made equal in magnitude. Both i_{H1} and i_{V1} must be present to exceed in magnitude the (negative) threshold of the gate thus producing the SPOT 1 video signal.

If the invention is to be employed in conjunction with TV systems having different frequencies (number of horizontal lines and vertical flyback) then the vertical and horizontal sync/sawtooth generators would be constructed at the different frequencies. This would be particularly applicable in conjunction with foreign (other than U.S.) TV systems.

Other spots are generated in similar fashion. For example, SPOT 2 horizontal slicer 41 is also coupled to the horizotnal sync/sawtooth generator 31 and SPOT 2 vertical slicer 42 is also coupled to vertical sync/sawtooth generator 32. The horizontal and vertical slicers 41 and 42 are coupled to a SPOT 2 coincidence gate 43 by capacitors 44 and 45, respectively. All video spot signals are fed to an OR gate and pulse shaper 46. The OR gate prevents excessive brightening when spots are positioned on top of one another. The pulse shaper is required because in the present embodiment 6 volt sawtooth waveforms are used. With such low voltage the slicing action is soft (rounding at beginning and end of ramp slice). Consequently, the current pulses produced by differentiation of the ramp slicers are rounded pulses. Without shaping they produce a spot without sharply defined edges . . . the edges just "fade out" gradually into the dark background. The summer modulater and RF oscillator 28 are set forth in said patent application Ser. No. 126,966. The RF signal presented to the antenna terminals is detected and processed by the TV receiver in the standard manner and displayed on the screen thereof. The output from OR gate and pulse shaper 46 is applied to a summer which sums all the signals presented thereto (including sync pulses from the horizontal and vertical sync/sawtooth generators, outputs from chroma generator, if used, etc.). This forms the composite video signal. This signal is applied to a modulator and RF oscillator for modulating the video information with the RF oscillator carrier to generate the requisite modulated RF signal which is coupled to the TV antenna terminals.

One of the objects of the present invention is a system to produce a round spot which in some instances is more pleasant and interesting than a square or rectangular spot, (especially for "ball" games like ping-pong, baseball, etc.). This is achieved (even with the pulse shaper which just gives the round spot sharply defined edges) by the "round edges" of the current pulses going into the coincidence gate. For example, the leading and trailing edges of the current pulse i_{V1} are rounded. Thus any i_{H1} pulses which are added to i_{V1} at this time will have thinner portions protruding below the gate threshold level than those appearing during the full amplitude middle of i_{V1}. Subsequent pulse shaping of the pulses which "get past" the gate threshold steepens their sides (for sharp spot edges) but doesn't change their width. Thus the spot is narrower at top and bottom than it is in the middle.

Some of the various spot shapes which can be generated are shown in FIG. 6. Spots a, b and c are generated simply by varying the coincidence gate threshold 53. (For an individual spot. Or, all spots can be made to change shape together by changing the amplitude and slope of the common sawtooth generators.)

Spots d and e are made either by changing sawtooth slope (thus changing W_H and W_V), or by changing the slice amplitude (again changing W_H and W_V).

Various other shapes (four pointed star, cross, etc.) can be generated by simple adjustments of various component values or voltages and by switching. All spots can be made hollow as described hereinafter.

Referring now to FIG. 7, there is illustrated thereby schematically one embodiment of the sync/sawtooth generators. A generator of this type is described in detail in my co-pending patent application for "Linear Sawtooth Generator" Ser. No. 713,862, filed Mar. 18, 1968, now U.S. Pat. No. 3,497,829.

The SPOT 1 slicers 36, 29, the SPOT 1 coincidence gate 40 or the OR gate and pulse shaper 46 are illustrated schematically in FIG. 8. The horizontal 15.75 Hz sawtooth waveform 35 and the vertical 60 Hz sawtooth wave 37 waveform are sliced in the slicers 36 and 29, respectively. The slicers comprise means for generating a predetermined slice of the sawtooth waveforms and in the present embodiment include back-to-back diodes 47, 48, and 49, 50, respectively. The input sawtooth waveforms are applied to the one side of the diode pair, with the other side being capacitively coupled via capacitors 51, 52, respectively to ground and being supplied voltages e_{H1} and e_{V1}, respectively. Diodes 47 – 50 are preferably germanium diodes because their low conduction voltage drops permit the achievement of reasonably small spot size (determined by sliced ramp duration) with a 6 volt sawtooth. The capacitors 51, 52 serve to make delay control voltages e_{H1} and e_{V1} appear as true voltage sources in cases where they come from the sliders of relatively high impedance potentiometers. The differentiating capacitors 38, 39 producing i_{H1} and i_{V1} are followed by the coincidence gate 40. Variable threshold level is provided by a potentiometer 53 to produce desired spot size and shape as mentioned hereinbefore.

Spot video signals are passed through a diode OR gate 54 of the OR gate and pulse shaper 46. The "multi spot" OR'd video signal then passes through a pulse shaper 55 which steepens the sides and squares off the tops of the pulses, giving sharply defined spot edges and uniform brightness over the area of the spot.

The pulse shaped video signal is then fed, along with the negative horizontal and vertical sync signals (and chroma generator output, if applicable) to the summer and RF oscillator as indicated in FIG. 4.

If desirable, the 60 Hz sync can be extracted from a photosensor directed toward the front of the TV screen and horizontal sync can be obtained from a pickup coil as described in said patent application *Ser. No. 126,966*. Spots can be generated by using the video signal described above to short circuit or "crowbar" the antenna terminals; the RF oscillator not being used. These features are compatible with a cooperating TV or CATV station as described in said patent application Ser. No. 126,966.

Referring now to FIG. 20, there is illustrated thereby another embodiment of spot generation for TV gaming. This embodiment is very much like the embodiment of FIG. 8, however, changes have been made thereto for providing improved temperature and voltage stability such that the spots generated will maintain their size to a greater degree over wider temperature and voltage excursions.

The timing for the system is established by a horizontal sync/sawtooth generator 210 and a vertical sync/sawtooth generator 211. These generators are like the generators 31, 32 illustrated in FIG. 7, however, they use a higher Vcc voltage, in the instant example, 9 volts.

The sawtooth outputs of the generators 210, 211 are applied to a horizontal slicer 212 and vertical slicer 213, respectively. The slicers 212, 213, are like the slicers 36, 29 of FIG. 8 with the exception that silicon diodes are used in place of germanium diodes for temperature stability. However, silicon diodes have a much greater voltage drop and, therefore, the 9 volt sawtooth is used in order to get a steeper sawtooth and thereby not increase spot size which would occur if the 6 volt sawtooth of FIG. 8 was used.

The two sliced waves are differentiated, as before, by capacitors 214 and 215 and applied to a spot coincidence gate 216. The DC voltage for the spot coincidence gate 216 is stabilized by a zener diode 217. A diode 218 is also used for temperature compensation. The principal change in spot coincidence gate 216 as contrasted to spot coincidence gate 40 of FIG. 8 is the addition of a peak detector 219 which detects the peak of the horizontal spot pulses which ride on the vertical spot pulses and feeds this signal back to appropriately bias the coincidence gate to maintain spot size.

The OR gate 220, pulse shaper 221, summer 222 and RF oscillation and modulator 223 serve the same functions as described with respect to FIG. 8.

Prior to describing various games that can be played using the present invention, several of the electronic functions which the system is capable of providing are described herein. Many of these depend strongly upon the voltage control positioning features of the system.

The voltages e_{Hn}, e_{Vn} (illustrated in FIGS. 5 and 8) control a spot's horizontal and vertical position. Changing e_{Hn} from 0 volts to, for example, +6 volts moves a spot across the screen from off-screen right to off-screen left. A similar change in e_{Vn} moves a spot from off-screen bottom to off-screen top.

In one embodiment, the e_H and e_V voltages are derived from the slides of the potentiometer 56 and 57 which are connected between ground, and for example, +6 volts (see FIGS. 9A). Knobs 16, 17 and 16, 17 of FIGS. 1 and 1A are attached to the potentiometers controlling the positions of SPOT 1 and SPOT 2. If more than two positioned spots are required, additional potentiometers and knobs 16_n, 17_n would be required in addition to spot horizontal and vertical slicers and spot coincidence gates. Alternatively, two potentiometers (one vertical, one horizontal) may be connected to a single joystick 58 in order to provide the user single handed control of position (see FIG. 9B).

If the control potentiometers 57, 58 are followed by integrators 59, 60, respectively, (see FIG. 9C) with e_{Hn} and e_{Vn} obtained from the outputs of the integrators, a different type of spot positioning is obtained. For example, with the two potentiometers mechanically connected to a single joystick 58, the spot will move as long as joystick 58 is away from its center position. The speed of spot movement is proportional to the distance the joystick is offset from its center position and the direction of spot motion is determined by the angular position of the joystick.

Whereas the simple H and V joystick of FIG. 9B gives direct control in which the spot returns to center screen when the joystick is returned to center, this "integrator joystick" of FIG. 9C merely stops the spot wherever it happens to be when the joystick is returned to center position.

The resulting "spongier" positioning action is much more interesting for certain types of games such as chase, hockey ("spongy" motion simulates gliding skaters very well) soccer, car racing, etc.

Referring now to FIG. 10A there is illustrated thereby yet another arrangement for providing spot positioning voltages e_{Hn} and e_{Vn}.

When the flip-flop 61 is set so that output 62 is high and output 63 is low, the voltage at point 64 can be varied from approximately 0 to +V volts (for example, 6 volts) by adjusting potentiometer 65 (Potentiometer 66 has no effect since it is disconnected from the circuit by a pair of back biased diodes 67, 68). With flip-flop 61 in its other stable state, potentiometer 66 controls the voltage at point 64 and potentiometer 65 is disconnected by a pair of diodes 69, 70.

If the delay control voltage lead for a spot (the e_{V_n} or e_{Hn} input) is connected to point 64 the spot can be made to move (rapidly) between two stable positions. The stable positions being controlled by potentiometers 65 and 66.

For certain applications, rapid motion is not desirable. In these cases an RC time constant provided by a resistor 71 and a capacitor 72 is added. The spot still moves between two stable positions but gives the effect of moving fast when "kicked" or "hit" and then gradually slowing down and finally stopping.

If the RC time constant is replaced by an integrator the spot will move at constant velocity. Naturally, if two flip-flops are used (one for horizontal and one for vertical) a spot can be made to move to any one of four pot-controllable stable positions.

Typical waveforms taken at points 62, 63, and 64 are illustrated in FIG. 10B. The trigger to flip-flop 61 can be the output from a coincidence circuit or a "serve" flip-flop as will be described hereinafter.

By changing the triggering sequence of two flip-flops different paths are obtained. A slow free-running flip-flop is useful to "serve" a ball which has gone off-screen when used in a ping pong game, etc. This is described in greater detail hereinafter.

For playing games, two functionally different types of spots are often generated, a hit spot and a hitting spot. The hit spot simulates a ball, a hockey puck, etc. A hitting spot simulates a paddle, a hockey stick, a golf club, a hand, etc. The uses for hit and hitting spots will become readily apparent when various games are described hereinafter.

Referring now to FIGS. 11A–11D, there is illustrated yet another electronic function which is included in the present invention.

This electrical function provides the e_H and e_V spot positioning voltages to a hit spot such as spot 73 in FIG. 11B. These voltages, the outputs of the circuit of FIG. 11A are applied to the horizontal and vertical slicers of the hit spot generator. The inputs to the circuit of FIG. 11A are the control voltages of a hitting spot, for example, spot 74 or spot 77 of FIG. 11B. The embodiment shown is for applications having two hitting spots which could represent, for example, two ping-pong paddles in a simulated ping-pong game.

The hitting spots horizontal control voltages are applied to a horizontal gated differentiator 85 and the hitting spots' vertical control voltages are applied to a vertical gated differentiator 86. Each of the gated differentiators has as further inputs thereto outputs from a pair of one shot multivibrators 81, 82. The multivibrators 81, 82 are triggered by outputs from a pair of coincidence detectors 83, 84, respectively. Coincidence detector 83 signifies coincidence between a first hitting spot, for example, spot 74, and the hit spot for exam-

ple, spot 73. Coincidence detector 84 signifies coincidence between a second hitting spot, for example, spot 77, and the hit spot.

The gated differentiators 85, 86 provide pulses whose amplitudes are proportional to the horizontal and vertical components of the velocity of the hitting spot at the instant of contact between the hitting and hit spots. The pulse width is that of the pulses from the one shot multivibrators 81, 82. Accordingly, this causes the hit spot to travel in the direction from which it was hit and at a speed proportional to how "hard" it was hit.

A preferred embodiment of horizontal gated differentiator 85 is shown in FIG. 11C. Vertical gated differentiator 86 is constructed in like fashion. The differentiator is comprised of capacitors 190 and 191 and feedback amplifier 78. The input signals H_1 and H_2 are coupled to the differentiator. A pair of switches, 75 and 76, follow the differentiating capacitors, 190 and 191. The switches 75, 76 are normally closed. One or the other is opened by a signal from either multivibrator 81 or 82 allowing the differentiator to differentiate the input signal of the spot which makes coincidence with the hit spot. The resistors 87, 88 prevent shorting to ground of the desired signal when the other signal switch 76 or 75 is closed. Resistor 89 is the differentiating feedback resistor. The output pulse of this circuit can be positive or negative depending upon the direction of the hitting spot when it coincides with the hit spot. Using the preferred gated differentiator of FIG. 11C, undesirable overshoots and preshoots are avoided since the switching is accomplished following the differentiating capacitors rather than before them.

Referring again to FIG. 11A, to provide the control voltages for the hit spot, the signal dHn/dt must be integrated for a period of time. If the signal is integrated for a period of time equivalent to the relatively short pulse width of the one shot multivibrators, the hit spot would move only during this time and this is too fast a spot movement. Accordingly, it is desirable to "stretch" the time of spot movement, by for example, providing an RC delay to the dHn/dt signal. This would be a simple matter if dHn/dt and dVn/dt were always one polarity. However, since dHn/dt and dVn/dt can be either polarity a more complex arrangement is necessary.

When either hitting spot makes coincidence with the hit spot a coincidence pulse from multivibrators 81 or 82 allows the bilateral gates 92 and 93 to pass positive or negative dHn/dt and dVn/dt pulses to stretching capacitors 94 and 95, respectively. After the coincidence pulse ends, the bilateral gates return to their open or high impedance state and the voltage on capacitors 94 and 95 delay at a rate determined by the capacitors and resistors 106 and 107.

The stretched pulses at capacitors 94 and 95 are coupled to integrators 90 and 91. The outputs of the integrators are voltages e_H and e_V. These voltages become the control voltages for the hit spot.

The resultant effect is that the hit spot moves in the same direction in which the hitting spot is moving when coincidence is made. If hit hard, the hit spot moves rapidly and far. If the hitting spot is moving slowly at coincidence, the hit spot is merely "nudged" a short distance and moves slowly.

In the embodiment illustrated, a wall-bounce feature is included. When the hit spot is to travel, for example, along the line 102 (see FIG. 11B), switch 104 is open and switch 105 is closed and the signal bypasses on inverter 108. When the hit spot reaches the edge of the TV screen, it is desired that it "bounce" back as shown by line 103 of FIG. 11B, simulating, for example, a puck bouncing off the wall of a rink in a simulated hockey game or a billiard ball bounding from a cushion. The hit spot bounces from the sides of the screen with a reflection angle equal to the incidence angle. When the spot reaches the edge of the screen, switch 104 closes and 105 opens. The signal from the bilateral gate is thus now applied to the integrator via inverter 108. A horizontal or vertical wall sensor 109, 110, as the case may be provides the requisite signal to cause the switching of switches 104, 105 and 192, 193.

Note, in the event the wall bounce feature is not required, the horizontal system of FIG. 11A may be modified by deleting switches 104, 105, inverter 108 and the horizontal wall hit sensor 109, like components also being deleted from the vertical system.

The bilateral gate 92, integrator 90 and horizontal wall bounce circuitry is shown in greater detail in FIG. 11D. Like circuitry is also provided for the vertical portion of the system.

The differentiated signal pulse dHn/dt is applied to bilateral gate 92 which is comprised of a pair of transistors 180, 181. Signals indicative of coincidence between a hitting and hit spot are obtained from the two sides of the coincidence multivibrators and are applied to the bases of the transistors as shown, negative pulses turning 181 on and positive pulses turning 180 on. The switches 104, 105 of FIG. 11A are comprised of transistors 182, 183, respectively. The output hitting spot control signal e_H is obtained at the output of integrator 90.

The output from integrator 90 is also applied to horizontal wall hit sensor 109 which comprises a pair of zener diodes 242, 243 which cause the switching of a flip-flop 184 when voltage is reached equivalent to off-screen voltage (for example, 0 volts or +6 volts). Initially, flip-flop 184 is set to a given state upon coincidence between either hitting spot and the hit spot by an output from transistor 185 to insure correct direction of the hit spot. If the flip-flop were in the wrong state, the hit spot would move 180° from the desired direction.

The circuits 186 and 187 are provided to prevent oscillation of the flip-flop 184 and failure to flip correctly which can occur if the hit spot approaches an off-screen position very slowly such that only a poor rise time signal is available to trigger the flip-flop.

With voltage control of a spot's horizontal and vertical position it is obvious that its motion is similar to that of a spot on an oscilloscope. Thus, the TV spot can be made to follow any path that can be made on an oscilloscope.

One example of this is Lissajous patterns. Phase displaced sinusoids used for horizontal and vertical positioning (applied as the e_H and e_V inputs to the spot slicers) result in spot paths of circles, ellipses, "figure eights," etc.

As previously mentioned, spot size and configuration may be altered. For example, the shape of a spot can be changed to simulate 3D effects (e.g., a bowling ball which gets smaller as it rolls down the alley). This is accomplished by varying the threshold potentiometer 53 of the coincidence gate of FIG. 8. This can be readily accomplished electronically by a varying voltage input.

In certain embodiments a hollow spot or ring may be desired and this can be readily achieved by inverting the "non-square" pulses at the base of shaper 55 of FIG. 8 and subtracting from the original pulses to "hollow" them out.

Other electronic functions which may be generated are negative video, pumping action, kaledioscope effects, even-odd spot displacements and slave spots. These will now each be described in detail.

In certain gaming applications such as simulated hockey it is desirable to use a black spot (e.g. for a hockey puck). This is accomplished by inverting the video signal.

Colored spots can be generated by applying the video signal to the phase shifter portion of the chroma generator via, for example, a variable resistor.

If a pulse generator running at an integral multiple of 15.750 kc is synchronized with the horizontal sync signals and the pulses fed to the video summation stage, a background of black and white vertical columns is obtained. If the horizontal video signal from a "spot" is used to synchronize the pulse generator, the columns can be moved from side to side. Horizontal bars can be similarly obtained with a 60 cps pulse generator.

Coincidence gating the vertical columns with the horizontal bars so that the screen is brightened only where they cross one another yields a "checkerboard" pattern of bright squares or rectangles on a dark background; inversion of the signal of course give black squares on a white background.

When the horizontal and vertical positioning voltages of a spot are obtained from nominal quadrature sinusoids, various different patterns are obtained as the sinusoid frequency and phase shift are changed. Some patterns are stationary; others have motion; some are a combination. The effect is somewhat similar to that of a stroboscope or a kaleidoscope.

If the output of the photosensor is fed to a flip-flop the sensor and directed toward a bright spot on the TV set; even-odd "spot discernment" is obtained. This flip-flop is reset each time so that side A is high. When the spot comes on, the flip-flop flips at the 60 cps vertical scan rate. If the spot remains on for an even number of scans, side A of the flip-flop is high when the spot is removed. If the spot is on for an odd number of scans, side A stays low when the spot is removed. Thus, a coded spot, visually identical to others, can be discerned electronically. The flip-flop can, of course, ring a bell, light a light, etc.

Normally, the vertical and horizontal current pulses of a spot are coincidence gates as shown in FIGS. 5 and 8 in the coincidence gates 40 and 43.

If the vertical pulse of one spot is coincidence gated with its own horizontal pulse and with the horizontal pulse of a second spot, then a third spot appears. It is called a "slave" spot because its horizontal position is controlled by one of the "real" spots and its vertical position by the other. Obviously, with two real spots two slave spots are easily generated.

The material which follows contains a description of typical games which can be played using the electronic functions set forth above. These games are only exemplary of the many games which can be played and are set forth to merely illustrate some of the ways in which the various electronic functions are combined.

One typical game is a simulated ping-pong game and this is illustrated in FIGS. 12A and 12B.

The simulated ping-pong ball 13 is generated by spot 3 generator 114 which has inputs thereto from vertical sync/sawtooth generator 115 and horizontal sync/sawtooth generator 116 (of the type set forth in FIG. 7). The spot generators are similar to those set forth in FIG. 8. The control voltages for the horizontal slicers of spot 3 generator 114 are derived from a flip-flop positioner 117 of the type described in FIG. 10A. Flip-flop positioner 117 provides control voltages at outputs 118, 119 which move the ball between off-screen positions H_L, V_L, and H_R, V_R. Flip-flop positioner 117 is controlled by a slow free-running or "serve" flip-flop 120 and by the output from a coincidence detector 121. In one state flip-flop 122 will serve the ball from off-screen left to off-screen right and in the other state from off-screen right to off-screen left. The output from coincidence detector 121 is used to switch flip-flop states when the ball is hit by one of the two simulated paddles. The serve flip-flop 120 is coupled to both sides of flip-flop 122. With this arrangement, if a paddle hits the ball first, the serve flip-flop cannot retrigger flip-flop 122 until the ball goes off screen on the other side of the screen.

The inputs to coincidence detector 121 are the spot 1 (paddle 123) video pulse, the spot 2 (paddle 124) video pulse and the spot 3 (ball [13] *113*) video pulse which are derived from the respective spot generators 125, 126 and 114. The video pulses are obtained from the outputs of the coincidence gates of the spot generators, for example, the output of coincidence gate 40 of the spot generator shown in FIG. 8.

The V_R and V_L off-screen positions of ball 113 are controlled by players A and B, respectively, by adjustments of potentiometers 125, and 126 via knobs 127 and 128, respectively.

The vertical position of paddles A and B are determined by the setting of potentiometers 129 and 130 which provide the vertical control voltages to the vertical slicers of the spot 1 and spot 2 generators 125, 126, respectively. Knobs 131 and 132 control the potentiometers 129, 130.

This simulated ping-pong game is played as follows:

The ball 113 is connected, with RC time constants 133, 134 to the flip-flop 122 which moves the ball between off-screen positions H_L, V_L, and H_R, V_R. The RC time constant prevents instantaneous spot motion. Additionally, since the resulting velocity is exponential in nature the spot starts fast and slows down; by moving the potentiometers 134, 135 which control H_R and H_L, in toward the screen the ball's motion is fairly slow. Moving H_R and H_L out gives a faster game.

Assume the ball is at H_L, V_L, it is served automatically when the free-running flip-flop 120 flips. The ball proceeds towards H_R, V_R. Player B moves paddle B vertically (by turning knob 132 connected to potentiometer 130) to try to hit the ball. If he misses it he loses a point as it goes off-screen right (where it will be served automatically again by the free-running flip-flop).

However, if he hits the ball it bounces off his paddle and starts left toward H_L, V_L. Now he has control of its flight, and by adjusting V_L with his other hand (by turning knob 128 connected to potentiometer 126) he can send the ball up or down and even try to "wiggle" it around player A's paddle.

Player A controls the vertical motion of paddle A (by turning knob 131 connected to potentiometer 129) and, if he hits the ball, gains control of its path by ad-

justing V_R (by turning knob 127 connected to potentiometer 125).

Play can be made fast or slow by setting H_I and H_R (potentiometer 135, 134) or by setting the paddles in different horizontal positions (by adjusting potentiometers within the generators 125, 126).

When color is used, the ball and paddles are white, the "table" green. Overlays or TV or CATV backgrounds showing a lined table and net enhance the effect. The game can be played by two man teams. One man controls the paddle, the other man the path of the ball.

By modification of the embodiment of FIG. 12, a game of gun ping-pong can be played. In this embodiment the players use light sensor guns instead of paddle spots to hit the ball back and forth. An output from the light sensor is used to trigger flip-flop 122 instead of coincidence detector 121. The control knobs 131 and 132 are not required. Whereas, it is difficult for one man to aim a gun and control a potentiometer, the game is best with two man teams. One man shoots; his partner controls the ball's path. Or, if a pistol is used a player can shoot with one hand and use a potentiometer with the other. Or, a ramdom or pseudo-random electronic change of V_R and V_I can be used.

Illustrative electronics for performing this "gun" function is illustrated in said patent application 126,966. A light sensitive cell is contained, for example, within the barrel of a gun and used to trigger an SCR. A switch is provided for resetting same.

A simple hockey game can be played which uses the same mechanics (FIG. 12A) as the above ping-pong games including the "automatic serve" flip-flop (see FIG. 12C). The paddles (now "goalies") are moved closer in toward center where the puck is moving faster.

If player B (with spot 138) hits the puck 137 it moves to the left and the controls its path by moving V_I. He trys to "wiggle" the puck around goalie A (spot 139) and into the goal.

Player A controls V_R after he hits the puck.

In color TV application, it is preferred to use white goalies, a black puck (using negative video) and blue ice.

Again, this game is adaptable to two man teams, and even more if more spots are used.

Another game which can be played using most of the system shown in FIG.. 12A is a simulated baseball game. This is illustrated in FIG. 12D.

The pitcher controls the path of a ball 140 by adjusting knobs 127 and 128 connected to potentiometers 125 and 126 which, therefore, controls V_I and V_R. The ball, therefore, goes from position H_I, V_I to H_R, V_R.

Another knob (not shown) is connected to potentiometer 134 and thereby permits speed control by the pitcher.

The batter tries to hit ball 140 by moving bat 141 (spot 2) vertically by turning knob 132. Spot 1 is not required for this game. If the batter connects, the ball will be hit left, back to position H_I, V_I. If the batter misses, the ball will be automatically returned as in the above games.

In an alternate embodiment, the free-running serve flip-flop 120 can be eliminated and a pushbutton set and reset of flip-flop 122 can be used for manual "pitch" and reset.

One class of games makes use of the electronic function illustrated in FIG. 9C and is shown in FIG. 13. This class of games requires one or more joystick controls 142 coupled to integrators 143. The outputs from the integrators are applied to the horizontal and vertical slicers of their respective spot generators. With this setup race games, etc., may be played. The somewhat sluggish "spongy" effect of the integrator and the non-return to center requires more skill of the players than a "straight control" joystick.

Of course, appropriate backgrounds or overlays can be employed. A third (or more) "obstacle" spot can be used. If a player hits it, the coincidence pulse can be used to make all spots disappear or to change screen color, etc., as described in said patent application Ser. No. 126,966. For chase games, coincidence of the pursuer and pursued can do the same thing.

A more sophisticated hockey game than that described with respect to FIG. 12C may be played employing the circuits previously set forth. This game is set forth in FIG. 14. The vertical and horizontal sync. sawtooth generators, the spot generators, the OR gate and pulse shaper and the summer and RF oscillators serve the same function as previously described. The control voltages to the horizontal and vertical slicers of the spot 1 generator are obtained from the outputs of a joystick integrator 144 of the type illustrated in FIG 9C and the control voltages for the slicers of the spot 2 generator are obtained from the outputs of a second joystick integrator 145.

The control signals for the horizontal and vertical slicers of the spot 3 generator are obtained at the outputs 147, 148 of his spot and wall bounce system 146. Hit spot and wall bounce system is shown in detail in FIG. 11. The inputs to the system 146 are the respective outputs of the joystick integrators 144 and 145.

With two players on joystick integrators 144, 145 and a puck which moves "in direction hit," a realistic hockey game results. The semi-sluggish response of the integrators gives an effect similar to real hockey players gliding on ice. They can't stop or reverse direction instantaneously. The puck can be nudged along if hit easily of sent fast if hit rapidly. It may be noted here that the "ball moves in direction hit" function derives the hitting from differentiation of the hitting spot's positioning voltages. It comes as a surprise to a player "standing still guarding his goal" when the puck glides right through his stationary defending spot.

If the puck is hit very hard, it may bounce off several sides of the screen before stopping. With the sluggish joystick integrator spots and the bounce from screen sides, a player must anticipate the "bounce." He cannot usually go right after the puck, but must move to a spot which he anticipates the puck will pass after bouncing. This game may be simplified somewhat by deleting the wall bounce feature in the manner hereinbefore described.

A simulated handball game is achieved when the player's spots are on straight control joysticks without integrators (as shown in FIG. 9B). The hit spot with wall bounce system of FIG. 11 is employed to supply the hit spot or ball generator's slicer control voltages with one minor variation. One of the comparator reference voltages is deleted so that the hit spot or ball will not bounce off the bottom of the screen.

Wall bounce is used on screen top, right and left. Player A hits ball. It must hit front (top) wall sometime

during its flight. Player B tries to hit ball. If he misses all, it disappears off-screen bottom, he loses a point and ball is then automatically served from off-screen after a certain length of time by using a flip-flop arrangement like that shown in FIG. 10 in conjunction with a slow free-running flip-flop for automatically triggering same or a push button trigger for manual reset.

This handball game is illustrated in FIGS. 15A and 15B. The general system electronics 149 is the same as shown in FIG. 12A. The control voltages for the slicers of spot 1 generator are obtained from a straight control joystick 150 (see FIG. 9B). Spot 1 generator generates the spot 151 representing Player A. A second straight control joystick 152 provides control voltages for Player B, spot 153. The ball or hit spot 154 is generated by spot generator 3 and receives its slicer control voltages from a hit spot and wall bounce system 155, which is similar to that of FIG. 11A; however, comparator 111 does not have a 0 reference level so that the ball will bounce off all the walls but the bottom one. A position flip-flop 156 similar to that of FIG. 10A is used to return the ball to the "playing area" but being triggered from a switch 157. Alternatively, a slow free-running or serve flip-flop could be employed as described hereinbefore.

FIGS. 16A and 16B illustrate a simulated pinball game. The spot 3 or ball generator receives its vertical and horizontal slicer control voltages from a pair of integrators 158 and 159. Note in this application the spot 1 and 2 generator of general system 149 are not required. The player operates a joystick to cause ball 161 to move. The ball keeps moving as long as the joystick is off the center position. The ball will bounce off the walls or edges of the screen since a pair of comparators 162 and 163 will cause a pair of flip-flops 164 and 165 to change the direction of the ball by reversing the polarity of the signals applied to integrators 158, 159 in the manner previously described when discussing the circuit of FIG. 11.

Various "scoring" spots are placed on the screen by overlays, electronically, etc., as is a game end zone 167. Play is commenced by a player "throwing" joystick 160 in some off center position and removing his hand. Ball 161 then keeps moving. When it hits a side wall it bounces, when it hits scoring spots points are scored. Play continues until ball happens to go into "game end" zone 167.

Score is observed visually. However, the scoring spots can be generated electronically by additional spot generators and score made on occurrence of coincidence using a coincidence detector of the type described hereinbefore.

A simulated bowling game illustrated in FIGS. 17A and 17B is played by providing an "alley" 168 overlay or TV-CATV background. It should go from one corner bottom screen to opposite corner top screen, narrowing to give a 3-D effect. One or more spots simulating bowling pins are at upper end of alley. One spot 169 is illustrated. Player "bowls" a ball 170 by "throwing" a joystick 171. If pin (pins) are hit, they disppear. If missed, ball just keeps going past them off the screen. Ball can be returned to start point either with joystick or an instantaneous pushbutton reset (not shown).

The joystick 171 is connected to potentiometers 172, 173 whose outputs are connected via integrators 174, 175 to the control voltage outputs to the horizontal and vertical slicers of the spot 3 generator of the generator system 149. If the ball 170 hits pin 169, coincidence detector and crow-bar circuit 176 causes the pin to disappear. One embodiment of said coincidence detector and crow-bar circuit is disclosed in said patent application Ser. No. [697,798] 126,966. The ball would be made smaller as it approaches the pins by using a varying voltage as the voltage applied to the threshold set resistor. In this game the vertical control voltage would be used.

The various games illustrated above are only a few of the multitude of games which can be played using the concepts taught by this invention. The electrical functions to generate various configurations can be combined in any number of possible ways. For example, a gold putting game can be played over a green background using a black negative video hole. A small white spot can be used as the golf ball and larger white spot used as the putter. The putter spot can be controlled by a straight joystick of the type illustrated in FIG. 9B. The ball can be controlled from circuitry like that shown in FIG. 11A, preferably without the wall bounce feature. The game can be further enhanced, if desired, by coincidence pulse timing such that if ball is moving very slowly when it hits the hole it will disappear. If the ball is moving very fast, it will go right across the hole.

A simpler version would not require coincidence circuitry. If the ball comes to rest over the hole, the ball's negative video signal overrides the ball's video and blanks out the ball.

In another example, cushion billiards can be played The player's balls are on straight control joysticks (see FIG. 9B). Third ball is hit using control of FIG. 11A. Wall bounce is used on all four sides. Player hits a third ball. The latter must hit at least one cushion first and then hit opponent's ball to score a point.

For skilled players, the third ball must hit two cushions first; and the game can be elaborated to three cushion billiards.

Maze games can also be played using the various features. TV screens are not large enough to permit a normal "line type" maze. The "correct" path through the maze is too obvious. Therefore, a "number maze" was devised. An overlay or background divided into rectangles is used. A number is in each rectangle.

One of two players is designated as EVEN, the other as ODD. EVEN moves his spot (or ring) so that the sum of his and opponent's numbers is even. ODD moves so as to make the sum ODD.

The resulting coded pattern of moves enables the maze designer to keep the two players on separate paths or on shared paths. The maze paths are drawn first and the numbers and then inserted. Mazes can be simple or complex, containing many false paths and dead ends. Normally, moves are one space at a time horizontally or vertically.

As a variation, if one player can land on the same number his opponent occupies elsewhere, he takes an extra move. (ODD is permitted to do this also even though in so doing he makes a temporarily even sum).

Unless a large number of rectangles are used, the maze designer is limited when trying to keep players on separate isolated paths.

Considerably more pattern flexibility results if one path can jump across another. This is accomplished by jumps between identical numbers with one space in between them. For example, if a player is on a 2 and needs to move to an odd number such as 7, after he

moves to the 7 he can jump a space in horizontal or vertical directions to another 7. Multiple jumps are permitted and can be incorporated in the maze.

More intricate and interesting patterns can be laid out if a three term sum is used, i.e., players make the sum of the two numbers they occupy and the one they intend to move to be even or odd accordingly.

An easier version of this is done with colors. The "code" available to the designer is the same. If red and white rectangles are used, for example, the "rule" for both players is simply "move to red, unless both on red."

A simple "ghost" game can be played wherein a lettered background or overlay is used. Players move spots to jointly spell a word. Player ending a word loses a point.

A spell check game is played by putting letters in columns. Players advance a column if they can add a letter to a jointly spelled word. They drop back one or more columns if they can find an appropriate letter only there.

As mentioned before, the control units or any parts thereof can be built into a television receiver as a constituent part thereof rather than be a separate unit and coupled to antenna terminals as described above. In other embodiments some of the elements contained in the gaming apparatus can be eliminated and replaced by some of the functions which are already provided in conventional television receivers.

FIGS. 18A through 18C are examples of television gaming apparatus which can be built into a conventional television receiver.

Referring now to FIG. 18A, there is illustrated one embodiment of a built-in television apparatus. The entire apparatus of FIG. 18A or any parts thereof can be built into a television receiver 190. In the manner described hereinbefore, the spots are provided by spot generators 191 through 192. The spot generators receive inputs from the vertical sync/sawtooth generator 115 and the horizontal sync/sawtooth generator 116. The voltage control inputs to the spot generators can be derived from a potentiometer or a potentiometer in connection with an integrator or outputs of other spot generators etc. In other words, the voltage control inputs can be any and all voltage control inputs described hereinbefore.

The outputs from the spot generators are applied via an OR gate and pulse shaper 193 to a summer 194. Summer 194 also receives the sync outputs from the vertical sync/sawtooth generator 115 and the horizontal sync/sawtooth generator 116. Summer 194 is different from the summers previously described in that no RF oscillator or separate modulator is required since the output therefrom is coupled internally directly to the video circuitry of the TV receiver 190.

The output from summer 194 is connected to, for example, a contact 203 of a switch 200. The center arm 201 of switch 200 is coupled to the video amplifier 196 of the conventional TV receiver 190. Another contact 202 of switch 200 is coupled to the video detector of the conventional TV receiver 190. In this manner receiver 190 can be switched from the video detector or passive viewing mode of operation (to receive broadcast programs) to the summer or active mode of operation.

In certain embodiments, it is necessary to connect both contacts 202 and 203 to the video amplifier,

where, for example, the active mode TV receiver will be used in conjunction with broadcast programs which broadcast background or other information. Broadcast is used herein in the broadest sense to include programs generated by a CATV station, programs generated by a closed-circuit TV arrangement information generated by a video tape recorder and by a slide projector. Many of the symbol generations herein described can be superimposed upon backgrounds generated by a broadcast station and games played in conjunction therewith.

Of course, the other systems previously described can also be built into the TV receivers with the outputs therefrom applied to the antenna input of the TV receiver.

Referring now to FIG. 18B, there is illustrated another built-in TV gaming apparatus. In this embodiment the vertical sync/sawtooth generator 115 and the horizontal sync/sawtooth generator 116 are replaced by vertical sawtooth generator 197 and horizontal sawtooth generator 198 which generate merely sawtooth waves rather than sync pulses and sawtooth waves. The sawtooth generators 197 and 198 are synchronized to the sync of the conventional TV receiver 190 by a pair of outputs from a sync separator 199. In this embodiment a separate summer 194 is not required since the sync pulses are derived from the conventional receiver as broadcast by a broadcasting station and thereby external sync pulses are not required. Therefore, the input of contact 203 in this embodiment is merely the output from pulse shaper 193.

In another embodiment of a built-in TV gaming apparatus (see FIG. 18C) the sawtooths required for spot generation are derived from the vertical and horizontal yoke deflection circuits 204, 205 within the conventional TV receiver 190. Buffer circuits 206 and 207 change the current sawtooth of the deflection circuitry to voltage waveforms and provide the proper polarity and amplitude correction. Since the vertical and horizontal yoke deflection circuitry are already synchronized, no external sync is required nor is any additional internal connection required. Additionally, any waveform generated within the conventional television receiver can be utilized, where appropriate, for TV gaming symbol generation.

In a further embodiment of this invention a unit is set forth which is used solely for TV gaming and does not have capability to receive broadcast programs. This is illustrated in the simplified block diagram of FIG. 19.

The spots are provided, in the same manner as hereinbefore described, by spot generators 191, 192 which receive sawtooth inputs from the sync/sawtooth generators 115, 116 and also receive voltage control inputs e_V and e_H. The outputs from the spot generators 191, 192 are coupled to OR gate and pulse shaper 193.

The output from OR gate and pulse shaper 193 is applied to the intensity input of a cathode ray tube 209 via a video amplifier 208. By appropriately selecting the parameters of the spot generators, appropriate video pulse size can be developed and, therefore, the video amplifiers eliminated.

The vertical sync pulses from vertical sync/sawtooth generator 115 are applied to the vertical yoke of CRT 209 via a vertical deflection oscillator 224 and vertical amplifiers 225 in known fashion.

The horizontal sync pulses from horizontal sync/sawtooth generator 116 are applied to the horizontal yoke

PROOF OF SERVICE

I, Judy Scott, declare as follows:

1. I am a resident of the City and County of San Francisco, over the age of eighteen years and not a party to the within action. My business address is Three Embarcadero Center, Suite 700, San Francisco, California.

2. On September 9, 1985, I served the following documents: 1) Memorandum Regarding Permissible Adaption and Noninfringement; 2) Memorandum Regarding New Cases on Patent Invalidity; 3) Memorandum regarding Implied License to Consumers; 4) Memorandum Regarding New Case on File Wrapper Estoppel; 5) Memorandum Regarding Exclusion of Undisclosed Expert Witness; 6) Memorandum Regarding Equivalents; 7) Revised Findings of Fact

in the following manner, addressed as follows:

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I declare under penalty of perjury that the foregoing is true and correct, and that this declaration was executed on September 9, 1985 at San Francisco, California.

Judy Scott

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL MEMORANDUM OF ACTIVISION, INC. REGARDING PERMISSIBLE ADAPTATION AND NONINFRINGEMENT

MEMORANDUM OF ACTIVISION, INC. REGARDING PERMISSIBLE ADAPTATION AND NONINFRINGEMENT

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INTRODUCTION

Plaintiffs are seeking to extend their patent monopoly to encompass sales of interchangeable copyrighted software for use on Atari 2600 Video Computer Systems[1/] already licensed by Plaintiffs. The long-established rule is that the contributory infringement doctrine will not be applied so as to allow the patentee to recover more than one complete royalty from each sale of the complete patented device. In this case, the licensing of the Atari 2600 brings Activision's software squarely within the reasoning of the United States Supreme Court's decisions in the "convertible top" and "fish canning" cases discussed in this memorandum. Plaintiffs' attempt to expand the contributory infringement doctrine would, if successful, expose manufacturers of interchangeable software to patent infringement litigation by patentees of any element in home or office computers despite the fact that the patentee has licensed the manufacturer of the computer and software sold with the

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1/ The overwhelming majority of the Activision software accused in this action is compatible with the Atari 2600. The Coleco master console involved in this action was also licensed by Plaintiffs before the accused Activision game for Coleco was marketed. The only accused Activision program compatible with Mattel Intellivision is Stampede. There may have been some sales of Stampede software for the Intellivision between October 1982, the date it was first offered for sale, and January 24, 1983, the date Magnavox gave a paid-up license to Mattel. (Since Plaintiffs did not present any evidence whatsoever concerning the Mattel system, they have failed in any event to show infringement by playing Activision software on the Mattel unit). For convenience, throughout this memorandum the "Atari 2600 Video Computer System" and "Atari 2600" are defined to include the Coleco master console and all Mattel master consoles, except when combined with the Stampede units sold before January 24, 1983 (see discussion of "Aro II," infra).

computers and already received his royalty for doing so.[2/] Pursuant to the Supreme Court decisions regarding permissible adaptation, and the underlying rationale of the contributory infringement doctrine, Activision's interchangeable software for the licensed Atari 2600 cannot as a matter of law constitute contributory infringement of the Rusch-2 patent.

ARGUMENT

I.

ACTIVISION'S SOFTWARE DOES NOT CONTRIBUTORILY INFRINGE THE RUSCH-2 PATENT.

A. Plaintiffs Must Prove That There Is An Underlying Direct Infringement By The Purchaser Of Activision Software.

It is unquestionable that Plaintiffs have the burden of

2/ This action, because of its potential influence, continues to receive the close attention of the software manufacturers and associations in the United States. No software-only manufacturer has taken a license from Magnavox (FF No. 162). As early as June 1981 in one of the first letters Aldo Test (patent counsel for Activision) sent to Magnavox counsel, Mr. Test stated: "[a]ssuming arguendo that the completed combination is within a claim of the noted patent there still is no infringement. The user has a license to practice the combination because of the license he obtains through Atari because of his purchase of the licensed Atari machine. It is well established that there can be no contributory infringement if there is no direct infringement. Aro Mfg. Co., Inc. v. Convertible Top Replacement Co., 365 U.S. 336 (1961). We are therefore of the opinion that our client does not require a license for the manufacture and sale of its game cartridges." (Plaintiffs' Exhibit 140, introduced by Defendant).

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persuasion and the burden of coming forward with evidence on the issue of contributory infringement, and that there can be no contributory infringement or inducement to infringe under 35 U.S.C. Section 271(b) and (c) without an underlying direct infringement. See Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 216 (1980) (no contributory infringement without underlying direct infringement); Stukenborg v. Teledyne, Inc., 441 F.2d 1069, 1072 (9th Cir.), cert. denied, 404 U.S. 852 (1971) (no inducement to infringe without underlying direct infringement); Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1534 n.4 (Fed. Cir. 1983) (burden of persuasion on patentee). See generally 4 D. Chisum, Patents ¶17.04 (1985). Thus, Plaintiffs have the burden of persuasion on the issue of demonstrating that an owner of a licensed Atari 2600 Video Computer System directly infringes the Rusch-2 patent when he chooses to play one of the accused Activision programs on his Atari 2600.

B. Contributory Infringement Defined.

Contributory infringement originally developed as a common-law concept. The purpose of the contributory infringement doctrine was to avoid the potential injustice of the strict literal infringement rule of complete identity, in which the accused device had to contain "every single element of the patentee's claimed

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combination" in order to come within the patent monopoly.[3] See generally Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 188 (1980). The statutory embodiment of the contributory infringement doctrine is 35 U.S.C. Section 271(c). Under Section 271(c) and case law interpreting the statute, contributory infringement is established only when: (i) an unpatented component of a patented device is a material part of the invention which is essential to the inventive character of the patented combination; and (ii) the manufacturer knows that the component is especially made or adapted for use in infringement of the patent; and (iii) the component is not a staple article or commodity of commerce suitable for substantial noninfringing use. 35 U.S.C. §271(c).[4] See generally Dawson

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3/ Activision's software cartridges by themselves quite obviously do not contain the requisite characteristics directly to infringe the Rusch-2 patent, as no hit spot, hitting spot or distinct motion can be displayed unless the ROM cartridge is played on the Atari 2600 Video Computer System. Where not all of the characteristics of the claims at issue are present, the issue becomes one of contributory infringement rather than direct infringement. See generally Dawson Chem. Co. v. Rohm & Haas Co., 448 U.S. 176 (1980). Therefore, the sale of a component of a patented combination does not in itself constitute direct infringement. See, e.g., id.; Aro Mfg. Co. v. Convertible Top Replacement Co., 365 U.S. 336, 339-40 (1961) ("Aro I").

4/ 35 U.S.C. §271(c) provides:

> "(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial

(continued)

Chemical Co. v. Rohm & Haas Co., 448 U.S. 176 (1980); Wilbur-Ellis Co. v. Kuther, 377 U.S. 422 (1964).

The underlying rationale of the contributory infringement doctrine is to preserve the patentee's monopoly of one complete sale of the patented device or combination. See, e.g., Motion Picture Patents Co. v. Universal Film Manufacturing Co., 243 U.S. 502 (1917) (discussed in Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 190-91 (1980)). After the one complete sale of the patented combination, the patent monopoly expires as to the sold device. See, e.g., United States v. Univis Lens Co., 316 U.S. 241, 250-52 (1942) ("[t]he first vending of any article manufactured under a patent puts the article beyond the reach of the monopoly which the patent confers")[5]; United States v. Masonite Corp., 316 U.S. 265, 277-78 (1942).

4/ (footnote continued)

> noninfringing use, shall be liable as a contributory infringer."

In Dawson Chem. Co. v. Rohm & Haas Co., 448 U.S. 176, 187 (1980) the Supreme Court emphasized that "the language of §271 is generic and freighted with a meaning derived from the decisional history that preceded it."

5/ The Supreme Court in Univis Lens Co. went on to note "that where one has sold an uncompleted article which, because it embodies essential features of his patented invention, is within the protection of the patent, and has destined the article to be finished by the purchaser in conformity to the patent, he has sold his invention so far as it is or may be embodied in that particular article. . . . He has thus parted with his right to assert the patent monopoly with respect to it . . . ." Id. at 250-51.

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C. Activision's Software Is Not A "Reconstruction" Of The Rusch-2 Patent, And Therefore The Sale Of Activision Software Does Not Constitute Contributory Infringement.

The case law on contributory infringement distinguishes the sale of components used to "reconstruct" the patented (and licensed) device from permissible "adaptation," "replacement," or "repair"[6/] of components of a licensed device. There is accordingly no contributory infringement of a valid patented combination by reason of the sale of a component of the combination unless the component constitutes "reconstruction" of the device embodying the patent so as to deprive the patentee of an additional complete sale, or the device used with the component itself is unlicensed. See generally Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 217-18 (1980); Brown, The Manufacture and Sale of Unpatented Parts, 18 J. Pat. Off. Soc'y 573 (1936); Comment, Combination Patents: The Right to Prohibit Sales of Replacement Parts, 70 Yale L.J. 649 (1961).

The critical cases relating to permissible adaptation are the so-called "convertible top" (Aro I and Aro II) and "fish

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6/ Plaintiffs have constructed a straw man in connection with their argument that Activision programs are not a "repair" of the Atari 2600. Activision has never claimed that its software is a literal "repair" of physically worn-out cartridges. The issue is whether there has been a "reconstruction" vel non--not whether a "repair" has taken place. See General Elec. Co. v. United States, 572 F.2d 745, 785 n.21-23 (Ct. Cl. 1978). See also Wilbur-Ellis Co. v. Kuther, 377 U.S. 422 (1964).

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canning" (Wilbur-Ellis) decisions. The United States Supreme Court addressed the issue of reconstruction of a patented device in the context of contributory infringement in the Aro I and Aro II decisions. In Aro I (365 U.S. 336), the patent was for a combination of fabric, supporting structures and a mechanism for automobile convertible tops. The accused contributory infringer in Aro I was a manufacturer of replacement fabric specially designed for use solely on patented and licensed convertible tops for General Motors cars. The Supreme Court held that sale of replacement fabric did not constitute contributory infringement. The specially-designed replacement fabric was not patented, and the Supreme Court emphasized that because of the nature of convertible tops, and the demand for new fabric, a substantial industry of replacement fabrics had developed. Justice Black's concurring opinion explicitly stressed that "[o]ne royalty to one patentee for one sale is enough . . . ." Id. at 360. In Aro Manufacturing Co. v. Convertible Top Replacement Co., 377 U.S. 476 (1964) ("Aro II"), the Supreme Court confronted the identical replacement fabric for convertible tops, but this time for use on unlicensed convertible top systems for Ford automobiles. Without the underlying license, the replacement fabric was found to be a classic example of contributory infringement.[7/]

7/ The Aro II Court found that as to replacement material for Ford convertibles made after Ford had bought its license, there was no contributory infringement.

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The parallels between Aro I and Aro II and the home video game industry are apparent, as licensed Atari 2600s are sold with software which the manufacturer fully expects will be used interchangeably with other software. (FF No. 161.) A very substantial industry of interchangeable "replacement" software has developed. (FF Nos. 122, 162.) The consumer obviously will become bored with the single game cartridge sold with the Atari 2600 and will from time to time "replace" that cartridge with other software which unquestionably greatly enhances the original commercial appeal of the Atari 2600.

Wilbur-Ellis Co. v. Kuther, 377 U.S. 422 (1964), was decided the same day as Aro II. In Wilbur-Ellis the United States Supreme Court considered whether a licensed fish canning machine could be adapted to fill cans of different dimensions without constituting contributory infringement. The adaptation involved resizing six of the 35 elements of the patent combination. The Supreme Court found that the adaptation of the fish canning machine did not amount to a "reconstruction" of the patented device which would run afoul of the one complete sale rule. Thus, adaptation which did not go to the heart of the invention was found to be a permissible replacement within the meaning of the Aro I and Aro II decisions. See also General Electric Co. v. United States, 572 F.2d 745, 785 (Ct. Cl. 1978) (approving the reasoning of Wilbur-Ellis, noting that "the decisions are plain that replacement of one or two elements of a many-elemented combination does not constitute reconstruction by a licensed user" [at n.21]). See generally Dawson Chemical Co. v.

Rohm & Haas Co., 448 U.S. 176 (1980).

Once again, the parallels to the home video game industry are apparent. It flies in the face of common sense to contend that Activision's interchangeable software for use on licensed Atari 2600 Video Computer Systems constitute "second creations" of the Rusch-2 patent, thereby depriving the patentee of the one complete sale ensured (and delimited) by the patent monopoly. The licensed Atari 2600 which was sold with software for approximately $200 does not disappear when a $25 Activision cartridge is used interchangeably with the original Atari cartridge and other software, nor is it rebuilt from the ground up. The game cartridge sold with the licensed Atari 2600, as well as a myriad of other software programs, can be in use at times when the Activision cartridge is not being played. Only at times when the Activision software is being played will the other cartridges temporarily not be in use while the interchangeable Activision cartridge "adapts" the functioning of the Atari 2600 Video Computer System to display a different video game. Plaintiffs' argument that the insertion of each software program constitutes a "new combination" is the purest question-begging, as any replacement component of a combination patent (including the fabric for convertible tops) could be said to create a "new combination" once it is incorporated with the other components of the combination. The issue is whether the "new combination" is by its character a full reconstruction of the patented combination which deprives the patentee of his right to a royalty on each complete sale. It would be absurd to claim that interchangeable software is

the heart of the Rusch-2 patent, as it is not even mentioned in Rusch-2. (FF Nos. 134, 167.)

Plaintiffs have relied on the ancient decision in Leeds & Catlin Co. v. Victor Talking Machine Co., 213 U.S. 325, 335-37 (1909), as authority for the proposition that, like interchangeable phonograph records (cylinders) on the early phonograph machines, interchangeable software contained in Activision cartridges can constitute impermissible "reconstruction" of patented combinations. Plaintiffs' reliance on the Leeds & Catlin opinion is misguided. The Supreme Court in Leeds & Catlin strongly emphasized that the phonograph/stylus interaction was the essence of the combination patent held by the Victor Talking Machine Co., and was specifically described in the patent claims: "it is the distinction of the invention, constituting . . . the advance upon the prior art." Id. at 335. In contrast, Plaintiffs' combination patent in no way describes (or even anticipates) the Atari 2600 Video Computer System used with Activision software, but is rather a combination of an altogether different character. Thus, the Activision software contained in the cartridge certainly does not go to the heart of the patented combination, but is rather a technological development in another field (computer science) not described in or anticipated by the patent at all. See, e.g., Wilbur-Ellis Co. v. Kuther, 377 U.S. 422, 424 (1964) ("[w]hen six of the 35 elements of the combination patent were resized or relocated, no invasion of the patent resulted, for as we have said the size of cans serviced by the machine was no part of the invention . . . .")

A second major factor indicating that the Leeds & Catlin decision does not control the present case is the development of the Supreme Court's contributory infringement doctrine since 1909. In Motion Picture Patents Co. v. Universal Film Manufacturing Co., 243 U.S. 502 (1917), the Supreme Court significantly limited the apparent scope of the Leeds & Catlin ruling. The Motion Picture Patents case involved a patented motion picture projector which used unpatented motion picture film. The patentee of the projector attempted to limit use of unpatented film on the projectors, but the Supreme Court found this impermissible, emphasizing that the "film is obviously not any part of the invention of the patent in suit." Id. at 518. See generally Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 191-92 (1980). As the Seventh Circuit recently emphasized in Beckman Instruments, Inc. v. Technical Development Corp., 730 F.2d 1076, 1086 (7th Cir.), cert. denied, --U.S.--, 53 U.S.L.W. 3239 (Oct. 1, 1984) (incorporating the district court opinion):

> "[T]he days when the purchase of a record for a talking machine was a major event are far removed from a market in which complicated equipment is promoted for multiple uses through interchangeable accessories. . . . [A] purchaser of major equipment, a transaction knowingly authorized . . . without any restrictions, most certainly reasonably expects that he can acquire whatever accessories are necessary for all the uses contemplated and encouraged upon sale . . . ."

The days of the Victor Talking Machine Company's monopoly over all phonograph records by virtue of its phonograph patent for the stylus/record combination are indeed "far removed" from the stored program digital computers and interchangeable software accused in

the present case.

CONCLUSION

The Rusch-2 patent does not describe anything like the use of interchangeable computer software. To extend the Rusch-2 patent to cover such copyrighted interchangeable computer programs is profoundly inappropriate from the perspective of public policy and is inconsistent with the patent laws. Plaintiffs already have received their royalty on all the licensed Atari 2600 Video Computer Systems on which the accused software is played. The Supreme Court has recognized that no contributory infringement can occur in the context of adaptations of licensed machines like the use of the accused interchangeable software on licensed Atari 2600s, and no such extension of patent monopolies into the area of copyrighted

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interchangeable computer software should be allowed.

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL MEMORANDUM OF ACTIVISION, INC. REGARDING NEW CASES ON PATENT INVALIDITY

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INTRODUCTION

Subsequent to the filing of Activision's Trial Brief in April of this year, several important and relevant decisions have been handed down by the Court of Appeals for the Federal Circuit. These cases addressed issues relating to (i) equivalence, both under 35 U.S.C. Section 112 and the doctrine of equivalents; (ii) obviousness under 35 U.S.C. Section 103; and (iii) file wrapper estoppel as applicable to determining noninfringement of specific accused games. The recent cases which address equivalence are discussed in Activision's Memorandum on Equivalents, and the file wrapper estoppel case is discussed in a short separate memorandum. This brief will concern itself with the recent decisions on the issue of obviousness.

Two recent cases decided by the Federal Circuit unequivocally support Activision's analysis of the burden of persuasion on the issue of obviousness of the Rusch-2 patent, the proper weight to be afforded "secondary considerations," the scope of the relevant prior art, and the applications of the prior art to find the Rusch-2 patent obvious. These recent opinions are Cable Electric Products, Inc. v. Genmark, Inc., No. 84-1412, slip op. (Fed. Cir. Aug. 9, 1985); and In re Sovish, No. 85-781, slip op. (Fed. Cir. July 26,

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1985).[1/]

A. Cable Electric.

Cable Electric is an appeal from an order granting summary judgment in which Judge Schwarzer of this district found the patent in suit obvious in light of the prior art. A Federal Circuit three-judge panel unanimously affirmed this finding. The case involved a patent relating to a photosensitive electric lamp made to turn itself on by degree as ambient light diminishes.

The plaintiff argued that Judge Schwarzer failed to observe the statutory presumption of validity (35 U.S.C. §282). The Federal Circuit responded that:

> "While 'the burden of persuasion on the issue of invalidity also rests throughout the litigation with the party asserting invalidity,' id., if evidence is presented establishing a prima facie case of invalidity, the opponent of invalidity must come forward with evidence to counter the prima facie challenge to the presumption of section 282. This requirement is in no way contrary to the procedural role of the presumption of validity." (Cable Electric, supra at 11.)

1/ Activision recognizes that the Court asked only for new cases on the patent invalidly issue and therefore we do not recapitulate in this Memorandum Activision's extensive obviousness argument set forth in its Trial Brief. It is worthy of note, however, that the two new cases strongly reinforce and rely on EWP Corp. v. Reliance Universal Inc., 755 F.2d 898 (Fed. Cir. 1985) and In re Vamco Machine & Tool, Inc., 752 F.2d 1564 (Fed. Cir. 1985), the two cases decided by the Federal Circuit earlier this year. Accordingly, it is instructive to review EWP and In re Vamco together with the new cases discussed herein.

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Plaintiff also contended that the District Court improperly combined prior art relating to florescent as opposed to incandescent lighting technology and that it had failed to indicate how the teachings could be combined. The Federal Circuit rejected these arguments, reasoning as follows:

> "In evaluating obviousness, the hypothetical person of ordinary skill in the pertinent art is presumed to have the 'ability to select and utilize knowledge from other arts reasonably pertinent to [the] particular problem' to which the claimed invention is directed. [Cites omitted.] Assuming arguendo that these four references are not strictly within the field of art represented by Schwartz [the patent in suit], they are easily within a field analogous thereto, and their teachings are properly combinable with the earlier references discussed above. [Cites omitted.] Cable faults the district court for failing to make determinations as to how teachings of the references could be combined to produce the patented invention. Nevertheless, the straight-forward quality of the invention and art involved make the required combination quite apparent. The district court pointed out features in each reference; presumably it was these that were to be joined. . . . Further, the suggestion to modify the art to produce the claimed invention need not be expressly stated in one or all of the references used to show obviousness. 'Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.' [Cites omitted.]" (Id. at 17-18)

The plaintiff in Cable Electric also argued that the District Court failed to give proper weight to proffered declaration concerning commercial success. In pertinent part that declaration stated:

> "Plaintiff [Cable] began manufacturing its night light in 1978. Since the introduction of that night light, over 5 million units have been sold. Profits of not less than fifty ($.50) cents per unit have been realized by plaintiff. Plaintiff's night light

has been distributed nationwide in major department store chains and local hardware outlets." (Id. at 21)

The Cable Electric court first cautioned that ". . . the weight to be accorded evidence on secondary considerations is to be carefully appraised in relation to the facts of the actual case in which it is offered. [citing EWP Corp. and In re Vamco.]" Cable Electric, supra at 11. The Federal Circuit then held that the District Court properly disregarded this conclusory statement as having no weight on the issue of commercial success as an indication of non-obviousness:

> "Nevertheless, what it shows in relation to commercial success is fairly minimal. Without further economic evidence, for example, it would be improper to infer that the reported sales represent a substantial share of any definable market or whether the profitability per unit is anything out of the ordinary in the industry involved . . . . this court in Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983), has unequivocally stated that for commercial success of a product embodying a claimed invention to have true relevance to the issue of nonobviousness, that success must be shown to have in some way been due to the nature of the claimed invention, as opposed to other economic and commercial factors unrelated to the technical quality of the patented subject matter. Thus, a 'nexus is required between the merits of the claimed invention and the evidence offered, if that evidence is to be given substantial weight enroute to [a] conclusion on the obviousness issue.' [Citing EWP Corp. and In re Vamco as well as other cases.]" (Cable Electric, supra, at 21, 22)

B. In re Sovish.

In re Sovish was an appeal from the decision of the Patent and Trademark Office Board of Appeals which had affirmed the

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examiner's rejection of certain claims under 35 U.S.C. Section 103. Judge Rich wrote the opinion which unanimously affirmed the ruling of invalidity because of obviousness. The invention which is the subject of the rejection relates to plugging of heat-shrinkable electrical conduit apertures by use of a novel plug which permits both long term sealing and reopening to insert new cable. The plug and the way it cooperates with the aperture is set forth at length in the opinion.

Sovish's invention was found to be obvious in light of patents to Esher and Weagant. Esher discloses the use of an aperture plug for use in non-heat shrinkable conduits. "No heat-recoverable or heat-shrinkable parts are disclosed [in Esher]." Id. at 4-5. Esher's plug was used to keep debris out of the conduit box during construction. Weagant discloses a hermetically-sealed junction box resembling an automobile distributor cap and sleeves made of heat-shrinkable tubing. Weagant uses "simple solid plugs like corks in wine bottles . . . ." Id. at 5.

Sovish argued that Esher and Weagant were from "non-analogous art." The Court disagreed, noting that Sovish's claimed invention relates to plugging an opening in a conduit for electrical cables and that both Esher and Weagant clearly pertain to the same general subject matter.

Sovish also argued that the Patent Office incorrectly combined Esher and Weagant to find the invention obvious. The Federal Circuit flatly disagreed:

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"Appellants have argued at length about the 'propriety' of 'combining the two references' as though the question is simply whether the Esher patent suggests within its four corners using the disclosed tubular, closed-end plug in a heat-recoverable aperture member or conduit or whether Weagant similarly suggests using an Esher type plug in place of his cork-like plug 26. That is not the proper approach to the issue, which is whether the hypothetical person of ordinary skill in the relevant art, familiar with all that Esher and Weagant disclose, would have found it obvious to make a structure corresponding to what is claimed . . . ."

"They [Sovish] are assuming that one of ordinary skill would not appreciate that Esher's hollow member 14 could be removed if it is not wanted, as insulation or otherwise, and that it would not be removed by a skilled worker who wished to allow heat recovery of the conduit in which it was placed. This argument presumes stupidity rather than skill. (Id. at 8-11 (emphasis added))

APPLICATION OF RECENT CASES TO THE ISSUE OF THE OBVIOUSNESS OF THE RUSCH-2 PATENT.

A. Burden of Proof.

Activision bears the burden of proving the allegedly infringed claims of the Rusch-2 patent invalid as obvious by clear and convincing evidence. Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1534 (Fed. Cir. 1983). Activision has met this burden with Dr. Higinbotham's testimony that any engineer in 1967 who had a bachelor degree in electrical engineering and was familiar with the Baer-1 patent and Higinbotham's tennis game could very easily have put together a television ping-pong game. As Dr. Higinbotham said: "It's very obvious what to do." (TT at 122.) Mr. Thacker also testified that the ordinary person skilled in the art, having knowledge of the Baer-1 patent and Higinbotham's tennis game, would have

found that Rusch did to be the obvious solution to the problem Rusch faced. (TT at 143.)

The schedule of the trial was changed at Plaintiff's request to accommodate the travel plans of their expert, Dr. Ribbens. Dr. Ribbens was present during Dr. Higinbotham's testimony, throughout Mr. Thacker's testimony and during Plaintiff's rebuttal. Notwithstanding Dr. Ribbens' presence, Plaintiffs have come forward with no evidence to counter Activision's prima facie case. Thus, as the Court of Appeals for the Federal Circuit held in Cable Electric, this Court should find the Rusch-2 patent obvious in light of the prior art.

B. The Proper Approach To Obviousness.

As did Sovish (wine bottle plug combined with non-heat recoverable conduit) and Cable Electric (combining fluorescent and incandescent lighting references), Plaintiffs here argue that the Baer-1 patent fails to suggest within its four corners generating a bouncing ball, and that the Higinbotham tennis game fails to suggest generating player controlled symbols on a television. Sovish and Cable Electric both held that is the wrong approach to the issue of obviousness.

The proper approach is to ask whether the hypothetical person skilled in the art, familiar with all that the Baer-1 patent and the Higinbotham tennis game disclose, would have found it

obvious to make an apparatus corresponding to what is claimed. Cable Electric at 18. When asked this question, both Dr. Higinbotham and Mr. Thacker responded in the affirmative. No contrary testimony was adduced from Dr. Ribbens.[2/] (FF No. 73.)

C. Claimed Subject Matter And The Scope Of The Art.

As in Sovish and Cable Electric, Plaintiffs seek to narrow the scope of the relevant prior art, in this case to "[a] combination of toy and game art and television art." (TT at 3-19.) Nonetheless, both Baer and Rusch always intended that their devices would have educational and military applications as well as game value, and the patents recited these potential uses. (FF No. 69.) Their attempt years later to exclude relevant simulation art was rejected by the Primary Examiner when he combined Speigel and Space War to invalidate claims in the Baer-1 patent (Exhibit DQ). This is no different from the rejected efforts of Cable Electric to exclude fluorescent lighting and the effort of Sovish to exclude non-heat recoverable conduits.

2/ The conclusion is almost inescapable that the total absence of testimony or other evidence from Plaintiffs relating to combining of Baer-1 (or Speigel) with Higinbotham is because the Higinbotham and Thacker testimony on this point is not susceptible to rational disagreement. Rather, Plaintiffs have pressed the "commercial success" secondary consideration argument as their major defense to the invalidity issue.

D. Secondary Considerations.

Plaintiffs have argued that the Magnavox Odyssey games and Magnavox' royalties from sublicensees constitute a sufficient showing of commercial success to rescue the Rusch-2 patent from Activision's proof of obviousness. Plaintiffs' argument is flawed in precisely the same way and for the same reasons as those of the plaintiff in Cable Electric. See also EWP Corp. v. Reliance Universal Inc., 755 F.2d 898 (Fed. Cir. 1985); In re Vamco Machine & Tool, Inc., 752 F.2d 1564 (Fed. Cir. 1985).

The sole evidence offered by Plaintiffs on commercial success is two questions asked of Mr. Briody:

> "Q: (By Mr. Anderson) I will start over. With respect to the total licensing income that Magnavox has realized on behalf of Magnavox and Sanders under your licensing program of the television game patents, including the Rusch 507 patent, what is that total number, if you know?
>
> "A: The gross royalty income as of May the 25th was in excess of 40 million dollars, somewhere between 40 and 43 million dollars. (TT at 6-86, line 9-15 (emphasis added))
>
> * * *
>
> "Q: (By Mr. Anderson) Mr. Briody what is the gross sales of Odyssey games and cartridges that Magnavox and North American Phillips have sold?
>
> "A: 297. Two 97 million dollars. That is a rounded number." (TT at 6-92)

Turning first to royalty income, the sworn statements of Ralph Baer made in connection with reissue proceedings for the Baer-1 Canadian patent [Exhibit LJ] are especially apt:

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"30. Other manufacturers entered into the home TV game business in subsequent years. It is therefor clear to me that my invention and the success in licensing to Magnavox created a new industry where there was none before. Since producing first model Odyssey, Magnavox has continued, developed, and produced Video Games base on my original and further inventions. In addition to manufacturing, Magnavox has continued to license other manufacturers and has collected well over ten million dollars in royalties to-date.

"31. Magnavox has been the exclusive licensee of all Sanders' early patents relating to video games since January 27, 1972. Magnavox has also granted sublicenses to in excess of thirty companies, including Atari, Inc., Coleco Industries Inc., and Tandy Corporation, for the manufacture of television game components.

"32. All of these companies are using my invention as described and claimed in patent application no. 286,872. My contribution has been recognized by many professional groups over the past ten years. More recently, in 1980, the New York Patent Law Association chose me as Inventor of the Year."

The Primary Examiner who rejected the Baer-1 Reissue was confronted with affidavits from Baer and Mayer similar to the above Canadian affidavit. The Primary Examiner dismissed those affidavits stating, "[W]ho's to say that the alleged commercial success was not a result of licenses on other related patents or heavy advertising." (Exhibit DQ.)

It is also instructive to look at the license agreements themselves to determine precisely which patents Magnavox licenses. For example, the Coleco license agreement refers to eight principal patents, three pending patent applications, and their corresponding foreign patents in 20 foreign countries. Plaintiffs have offered no competent evidence as to the relative values of a license under the

Rusch-2 patent as opposed to the multitude of other patents they habitually license.[3]

To the extent there were sales of the Odyssey product, Plaintiffs' witness, Mr. Briody, failed to state the extent to which foreign sales not subject to the Rusch-2 patent were reflected in the figure he gave. Furthermore, Mr. Briody did not know what Magnavox' cost of manufacturing Odyssey was, what the cost of distributing Odyssey was or what percentage of returns or repairs was. Mr. Briody admitted that his job does not involve monitoring the profitability of the Odyssey line. (TT at 6-115, 116.) Briody's "sales information" was the purest hearsay based solely on a phone call he purportedly made to Knoxville and it did not include any "information" as to profit or any information as to which sales could be attributed to master consoles or hit and hitting cartridges. (TT at 6-89.) His testimony is clearly not competent to support any contention of commercial success attributable to the Rusch-2 patent based on sales of Odyssey products.[4]

It is clear that no competent or relevant evidence was

3/ No software-only manufacturer was ever licensed by Sanders or Magnavox. (FF Nos. 112, 121.)

4/ In fact, the testimony adduced regarding Odyssey was just the opposite. Bushnell, Crane, Levy, Baer, and Fritsche all testified that the original Odyssey with overlays was unsuccessful and it was not until Bushnell successfully marketed his video arcade games that sales begin to materialize in any numbers (FF Nos. 108-11). The Magnavox microprocessor based game was a weak third in the marketplace behind Atari and Mattel both in terms of capability and performance. (TT at 7-11, 1-4.)

//

offered concerning the extent to which sales of the Magnavox Odyssey products in any way involve the commercial success of the Rusch-2 patent. The schematics Sanders Associates provided Magnavox pursuant to their license agreement were not those of the Rusch-2 patent but instead were the schematics of the BRH-3 patent (Compare Exhibit CP with the drawings of the BRH-3 patent, Exhibit DK.) The first Odyssey model, the ITL 200, used the BRH-3 circuitry. (TT at 4-15, line 7--4-16, line 25 (Baer)). Plaintiffs offered no evidence that any of Rusch's device, schematics, or drawings were ever sent to Magnavox let alone used. They have not shown the required "nexus" any more than the Cable Electric affidavit of sales of 5 million units (at a profit of $2.5 million) demonstrated a nexus with the patent itself.[5/]

CONCLUSION

Activision's Trial Brief set out the proper methodology for this Court's analysis of the obviousness of the Rusch-2 patent.

5/ In re Vamco Machine & Tool, Inc., 752 F.2d 1564 (Fed. Cir. 1985) involved a commercial success claim by Vamco that it was market leader with an increase in sales of 5000% after marketing its product. Id. at 1574. This claim was rejected by the Federal Circuit when the Court found success was due to a more advanced feeder than the one described in the patent. The court stated:

> "[T]he commercial success of a machine 'claimed' may be due entirely to improvements or modifications made by others to the invention disclosed in a patent. Such success, we are holding, is not pertinent to the non-obviousness of the invention disclosed." (Id. at 1577 n.5 (emphasis in original))

The recent decisions in Cable Electric and In re Sovish support Activision's analysis that the Rusch-2 patent is invalid as obvious in light of the Baer-1 patent and the Higinbotham tennis game. Plaintiffs' attempt to revive the Rusch-2 patent with the breath of commercial success failed because there is no link between Magnavox' licensing or the Odyssey product and the Rusch-2 patent. Nor is there any proof that Magnavox's Odyssey product was successful.

DATED: September 9, 1985.

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL MEMORANDUM OF ACTIVISION, INC. REGARDING IMPLIED LICENSE TO CONSUMERS

MEMORANDUM OF ACTIVISION REGARDING IMPLIED LICENSE

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INTRODUCTION

The users of Atari 2600 Video Computer Systems[1/] reasonably expect that they may purchase or use any compatible game software regardless of the identity of the software manufacturer. Plaintiffs have been well-aware of consumer expectations and have done nothing, either directly or through its licensees, to attempt to change those expectations. The consumers' reasonable expectations, and Plaintiffs' willing acquiescence have given rise to an implied license to play any compatible software. These facts negate any finding of direct infringement by consumers who purchase Activision software, and thereby preclude any contributory infringement by Activision.

STATEMENT OF FACTS

The facts regarding implied license to consumers are essentially uncontroverted, and are set out in the Revised Findings of Fact. In summary, all of the master consoles for which the accused Activision software is compatible are licensed by Plaintiffs

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1/ Since the great majority of the accused cartridges are compatible with the Atari 2600, and there is no difference between Plaintiffs' conduct toward consumers who purchase Mattel or Coleco systems, all three master consoles will typically be referred to collectively as the Atari 2600.

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under the Baer-1 and Rusch-2 patents.[2/] The Atari license was fully paid up, so that Plaintiffs did not profit from further sales of Atari software or master consoles. Each of these licensed master consoles is sold with a compatible video game cartridge manufactured by the same company which manufactured the master console itself.

Video game software contained in ROM cartridges are sold in toy stores, department stores, audio-visual specialty stores, and through catalog sales. Video game software is displayed and sold in the same department as the master consoles and peripheral equipment such as joystick controllers. The software is organized and displayed according to the hardware system with which it is compatible. Nonetheless, there were no warnings from any source in video game departments at any retail store to alert the customer that only Atari-manufactured software could be purchased or used with Atari-manufactured consoles, or that only Coleco cartridges could be used

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2/ Only one Activision game compatible for use with the Mattel Intellivision master console--"Stampede"--is alleged by Magnavox to infringe the Rusch-2 patent. Magnavox put on absolutely no evidence at trial about the Mattel Intellivision unit, and Magnavox has not met its burden of proving infringement as it relates to the Mattel Intellivision. On January 24, 1983 Mattel purchased an undifferentiated paid-up license from Magnavox under the Rusch-2 covering future and past use and releasing it from "past infringement." Thus, all purchasers of Mattel Intellivision master consoles own Magnavox-licensed master consoles, either because they purchased a licensed unit on or after January 24, 1983, or because consoles purchased prior to that date were licensed retroactively. In any event, the Activision Stampede cartridge was not even shipped to the stores until October, 1982, and thus even if Magnavox could prove (which it has failed to do) that Stampede infringed the Rusch-2 patent, and even if a license could not be said to attach which would have permitted purchase and use of Stampede in October 1982 - January 1983, such period of unlicensed use is certainly de minimus.

with Coleco consoles, or that only Mattel cartridges could be used with Mattel consoles. Nothing on the master console package or instructions notified the consumers that they were restricted in any way in the use of interchangeable software.

Despite the relative ease with which Plaintiffs could have warned video game consumers, and despite Plaintiffs' full awareness of the characteristics of the video game market, Plaintiffs did absolutely nothing. Because the Atari license was fully paid up, Plaintiffs had every economic incentive to knowingly acquiesce in the consumers' reasonable expectations regarding the use of interchangeable software, as no further royalties from Atari software sales could be obtained.

ARGUMENT

I.

CONSUMERS WHO PURCHASE LICENSED VIDEO GAME SYSTEMS HAVE AN IMPLIED LICENSE TO USE ACTIVISION SOFTWARE ON THOSE LICENSED GAME SYSTEMS.

A. The Law Of Implied License.

In Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417, 52 U.S.L.W. 4090, 4095 n.19 (1984), the United States Supreme Court noted the basic similarity of copyright and patent law, and held that the use of a video cassette recorder to copy television programs covered by copyright was a fair use. In reaching its holding, the Supreme Court emphasized the video cassette recorder owner's reasonable expectations with respect to the

use of the VCR to record or "time-shift" television programs.

The recent case of Beckman Instruments, Inc. v. Technical Development Corp., 730 F.2d 1076, 1085-86 (7th Cir.), cert. denied, --U.S.--, 53 U.S.L.W. 3239 (Oct. 1, 1984), explicitly applied this evolving concept of the consumer's implied license in a patent context. Relying on Aro Manufacturing Co. v. Convertible Top Replacement Co., 377 U.S. 476, 484 (1964) ("Aro II"), the Beckman Instruments court invoked the "axiom that 'the sale of a patented article by the patentee or under his authority carries with it an "implied license to use."'" 730 F.2d at 1085.

The defendant in Beckman Instruments was a university which had purchased a multi-purpose direct-writing oscillograph adaptable to many applications when used with appropriate input couplers (a plug-in module for use with the equipment). In holding that the purchaser of the complex multi-purpose equipment received an implied license to use it with whatever accessories were necessary or appropriate for full use, the Beckman Instruments court closely examined the reasonable expectations of the purchaser:

> "Unless he is told otherwise at the time of sale, the purchaser quite reasonably expects that he can acquire those accessories necessary for full use of the equipment without running afoul of the patent laws." (Id. at 1086)

Distinguishing Leeds & Catlin v. Victor Talking Machine Co., 213 U.S. 325 (1909), the Seventh Circuit emphasized the extremely anachronistic character of that decision, and stated that "the days when the purchase of a record for a talking machine was a major event [the facts in Leeds & Catlin] are far removed from a market in

which complicated equipment is promoted for multiple uses through interchangeable accessories." 730 F.2d at 1086.

In conclusion, the Beckman Instruments court held as follows:

> "A person cannot induce reliance by another and then change the rules of the game. And a purchaser of major equipment, a transaction knowingly authorized by the patentee without any restrictions, most certainly reasonably expects that he can acquire whatever accessories are necessary for all the uses contemplated and encouraged upon sale, whether or not some use or another may be within the coverage of a patent and regardless of any change in the relationship between supplier and patentee." (Id. (emphasis added))

This articulation of the evolving implied license doctrine is compelling precedent for the present case, and is indistinguishable in all material respects. Like the university in Beckman Instruments which purchased complex equipment adaptable to many applications when used with appropriate input couplers, the evidence is uncontroverted here that the consumer who buys a licensed master console certainly has the reasonable expectation of purchasing and using Activision and other compatible cartridges on his master console. Just as in Beckman Instruments, there was no warning or any indication of restriction against such reasonable use; here Plaintiffs have knowingly acquiesced in the consumer's reasonable expectations. Having knowingly induced these reasonable expectations, Plaintiffs cannot claim that the purchasers of Activision software directly infringe the Rusch-2 patent. In the absence of proof of a direct infringement, a judgment in favor of Activision on the issue of contributory infringement is required. See Dawson

Chemical Co. v. Rohm & Haas Co., 448 U.S. 176, 216 (1980) (no contributory infringement without underlying direct infringement).

Plaintiffs' reliance on Bandag, Inc. v. Al Bolser's Tire Stores, 750 F.2d 903 (Fed. Cir. 1984) is misplaced. The patent at issue in that case was a "method" patent, as opposed to the "apparatus" patent in this case. The issue in Bandag was whether defendant Bolser had acquired an implied license to use the Bandag method of retreading tires when Bolser bought some non-patented equipment from a former franchisee of Bandag. The court held that under the specific circumstances of that case, there was no such implied license on a method patent.

The Bandag case is different in several material respects from this case, and from Beckman Instruments. First, as the court made clear in Bandag, a method patent is significantly different from an apparatus patent. The Bandag court stressed that the doctrine that "the first sale by a patentee of an article embodying his invention exhausts his patent rights in that article, [citations omitted], is inapplicable here, because the claims of the Carver patent [at issue] are directed to a 'method of retreading' and cannot read on the equipment Bolser used in its cold process recapping." Id. at 924. Thus, because contributory infringement of an apparatus patent was not at issue, the Bandag court did not take into account what is key to this case: the underlying rationale of limiting the scope of contributory infringement to one complete sale and the relationship between that rationale and the related issues of permissible adaptation and implied license. See Memorandum of

Activision, Inc. Regarding Permissible Adaptation and Noninfringement.

Moreover, as is clear from the Bandag opinion, the Bandag decision relied heavily on the particular circumstances of the actual negotiations between Bandag (the patent holder), the defendant, and the terminated Bandag franchisee and licensee from whom Bolser purchased the Bandag manufactured (but non-patented) equipment with which the patented method could be practiced. Id. at 924. In Bandag, unlike this case and Beckman Instruments, there was nothing to suggest that defendant's asserted implied license to use the patented method was based on anything other than his "unilateral expectations," which were in fact not well-founded. The Bandag defendant attempted to rely on his knowledge, gained subsequent to the time he purchased the equipment, of the particular terms of the franchise agreement between Bandag and its terminated franchisee, and negotiations between Bandag and the terminated franchisee for the re-purchase of that equipment. Defendant Bolser tried to draw significance from these factors--which in no way resemble the basis for the reasonable expectations of the consumers in Beckman Instruments or this case--but as they clearly had no effect on forming his expectations, they simply did not suffice to give rise to an implied license.

Finally, the Bandag court's reliance on the proposition that no implied license to practice a method patent could have arisen in that case because the non-patented machinery on which the method patent could be practiced had other non-infringing uses is

simply not applicable here, where the issue is contributory infringement of an apparatus patent. In Bandag, the equipment could be used to practice the patented cold process method, but could also be used to do things not covered by the method patent, or even be resold as spare parts. Given the particular facts of Bandag, there was no implied license to practice a method patent arising simply from the sale of machinery with other uses.

B. Plaintiffs' Knowing Failure To Take Any Steps To Warn Consumers Gave Rise To Consumers' Reasonable Expectations.

As the evidence at trial established, Plaintiffs did absolutely nothing to notify consumers that they were restricted in the use of their licensed master consoles to software sold by a particular manufacturer. Plaintiffs now attempt to escape the obvious consequences of their failure to act by theorizing via their eleventh-hour "expert" Dr. Star[3/] that no warning would have been feasible or successful. Having done nothing except knowingly acquiesce to consumer expectations, Plaintiffs are not in a strong position to argue infeasibility.

There were several reasonable methods Plaintiffs could have employed, had they chosen to do so. Plaintiffs never caused

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3/ Activision has objected to the admission of Alvin Star's expert testimony, and is filing a memorandum in support of a motion to exclude that testimony herewith.

Primary Patent Examiner. Plaintiffs could easily have conveyed the message that Claim 1 of the Baer-1 patent--which they would no doubt contend covers every Activision cartridge ever manufactured--prohibits the use of any unlicensed software with licensed Atari, Coleco and Mattel master consoles, regardless of whether the cartridge has the "imparting a distinct motion upon coincidence" feature ascribed to the Rusch-2 patent.

Finally, Plaintiffs feebly contend that putting a patent number on the bottom of the master console was sufficient to alert customers and prevent them from forming the reasonable expectation that compatible software could interchangeably be used. Indeed, the evidence in this case establishes that such marking did not even alert the patent attorneys who represented Activision in late 1979 and early 1980 of the relevance of the Rusch-2 or other Magnavox patents to the cartridges themselves. The number on the console, if anything, simply informs the consumer that purchase of that console gives him a license under the marked patent numbers.

The evidence can lead only to the conclusion that Plaintiffs chose to allow consumers to continue to hold the reasonable expectations they had developed. As the Beckman Instruments court wrote, "[a] person cannot induce reliance by another and then change the rules of the game." 730 F.2d at 1086. Plaintiffs cannot now change the rules of the game and claim that purchasers of Activision software directly infringe the patent when those cartridges are used on licensed master console systems.

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CONCLUSION

The purchasers of licensed master consoles have the reasonable expectation that they may use those consoles without restriction, and may use them with any compatible software. Plaintiffs have knowingly acquiesced in this expectation, with a good economic motive for doing so. Such purchasers of Atari 2600s therefore have an implied license to use their licensed Atari 2600s with compatible software, and do not directly infringe the Rusch-2 patent. Thus, Activision cannot contributorily infringe the Rusch-2 patent.

DATED: September 9, 1985.

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NORTHERN DISTRICT OF CALIFORNIA

THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL MEMORANDUM OF ACTIVISION, INC. REGARDING NEW CASE ON FILE WRAPPER ESTOPPEL [NONINFRINGING GAMES]

Magnavox has never claimed that the Activision scrolling games Sky Jinks, The Activision Decathlon, Enduro, Grand Prix, or Barnstorming, infringe independent Claims 25 or 51 of the Rusch-2 patent. Claims 60-64 were added to the Rusch-2 patent in reissue

proceedings for the sole purpose of covering monitors. (FF No. 58). In Claim 60 the term "imparting a distinct motion" is unchanged from Claims 25 and 51; the terms "hit symbol" and "hitting symbol" are changed to "first symbol" and "second symbol." Magnavox apparently contends that this minor unexplained change relieves it from the file wrapper limitations which apply to Claims 25 and 51. The recent Federal Circuit decision in Builders Concrete, Inc. v. Bremerton Concrete Products Co., 757 F.2d 255 (Fed. Cir. 1985)-[1/] holds otherwise.

Builders Concrete, Inc. v. Bremerton, supra, involved a marine float utility lines "passage" for carrying utilities to outlets at the side of the deck of the float. Summary judgment in favor of defendant was granted because the doctrine of file wrapper estoppel precluded a finding of infringement. Id. The patent claim at issue was independent claim 10 whereas the relevant prosecution history defining the word "passage" related to claim 1.

The Federal Circuit stated as follows:

> "Although Claim 10 is the only claim in suit, the prosecution history of all claims is not insulated from review in connection with determining the fair scope of Claim 10. To hold otherwise would be to exalt form over substance and distort the logic of this jurisprudence, [file wrapper estoppel] which serves as an effective and useful guide to the understanding of patent claims. The fact that the 'passage' clause of patent claim 10 was not itself amended during prosecution does not mean that it can be extended by the doctrine of equivalents to cover the

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1/ Builders Concrete is dated five weeks prior to the filing of Activision's Trial Brief but the opinion was not available in the Howard, Rice offices prior to filing.

precise subject matter that was relinquished in order to obtain allowance of claim 1." Id. at 260.

The Rusch-2 claims which later became Claims 25 and 51 were specifically rejected for failure to define "hit" and "hitting" and were amended by use of the claim limiting language "imparting a distinct motion" in order to achieve allowance of those claims (Exhibits CV and CW). It would indeed exalt form over substance to allow an amendment covering monitors to broaden the definition of "imparting a distinct motion" agreed to by Rusch and Sanders in order to get their original claims approved.[2/]

DATED: September 9, 1985.

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2/ This memorandum addresses only the effect of Builders Concrete on Plaintiffs' attempt to redefine the term "imparting a distinct motion" in Claims 60-64 of the Rusch-2 patent. Other issues relating to noninfringement by specific accused games are addressed in Activision's Trial Brief and Revised Findings of Fact (see Section VII).

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THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL MEMORANDUM OF ACTIVISION, INC. REGARDING EXCLUSION OF UNDISCLOSED EXPERT WITNESS (Fed. R. Civ. P. 26(e)(1); 37(b)(2)(B))

INTRODUCTION

Activision has objected to the testimony of Alvin Star, an expert witness offered in "rebuttal" whose identity was not disclosed to Activision until less than one full day before his

testimony. The subject matter of the expert's testimony was never properly identified. Plaintiffs' failure to identify Dr. Star and the subject matter of his testimony is especially egregious in light of the fact that Plaintiffs had retained Dr. Star more than one month prior to his testimony. Plaintiffs had a clear obligation under Rule 26(e)(1) of the Federal Rules of Civil Procedure to identify this expert and the subject matter of his testimony in early July 1985. However, Plaintiffs did not do so, and instead purposefully kept Dr. Star's identity a secret until the afternoon before his testimony, after Activision had completed its testimony on the subject matter of Mr. Star's "expert" testimony. Plaintiffs did not reveal the substance of their surprise expert's testimony until he was actually on the stand. The established rule of law is that such "trial by ambush" tactics are not allowed, and that an undisclosed expert normally will not be permitted to testify.

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STATEMENT OF FACTS

On October 4, 1984, Magistrate F. Steele Langford ordered that both Activision and Plaintiffs disclose their expert witnesses pursuant to discovery requests within three weeks, and if necessary supplement responses prior to December 13, 1984. Both Activision and Plaintiffs complied with that October 4, 1984 Order.

On or about July 6 or 7, 1985, Plaintiffs' counsel met with, and by July 8 retained Dr. Alvin Star as an expert witness on the issue of implied license in this case. Dr. Star received

Activision's Proposed Findings of Fact and Trial Brief to review in preparation for his expert testimony. Dr. Star admitted that the testimony of Activision's implied license witnesses was in line with Activision's Proposed Findings of Fact. Despite several meetings between Dr. Star and counsel for Plaintiffs, and Dr. Star's research on behalf of Plaintiffs, Dr. Star's identity was not disclosed to Activision from July 8 to August 13, the day before his testimony. The subject matter of Dr. Star's testimony was not disclosed until he actually testified.

ARGUMENT

I.

PLAINTIFFS INEXCUSABLY FAILED TO IDENTIFY DR. STAR AS AN EXPERT WITNESS PURSUANT TO RULE 26(e)(1).

There can be no doubt that (i) Dr. Star was offered as an expert witness; (ii) Dr. Star was not timely identified as an expert witness; (iii) Dr. Star was retained on July 8, 1985 for his testimony in mid-August. The issue is therefore whether Plaintiffs should be allowed to call Dr. Star despite the obvious prejudice to Activision in being unable properly to prepare for Dr. Star's cross-examination, and despite Plaintiffs' blatant disregard for the explicit provisions of Rule 26(e)(1).

Rule 26(e) of the Federal Rules of Civil Procedure sets out the limited circumstances under which a party has an obligation to update responses to interrogatories. The identity of expert

witnesses who are expected to be called as witnesses at trial is one of those specific obligations. Rule 26(e)(1) provides in relevant part as follows:

> "(1) A party is under a duty seasonably to supplement his response with respect to any question directly addressed to . . . (B) the identity of each person expected to be called as an expert witness at trial, the subject matter on which he is expected to testify, and the substance of his testimony." (Fed. R. Civ. P. 26(e)(1))

Can there be any doubt that Dr. Star was a "person expected to be called as an expert witness" between July 8, when he was retained at $300 per hour, and August 14, 1985? It is established that the phrase "expects to call" will be interpreted broadly, to achieve the purpose of Rule 26(e)(1). See Knighton v. Villian & Fassio e Compagnia, etc., 39 F.R.D. 11, 13 (D. Md. 1965); 8 C. Wright & A. Miller, Federal Practice and Procedure §2030 (1970). The obvious purpose of Rule 26(e)(1) is to give the opponent adequate time to hear the facts and opinions the experts intend to put in evidence in order that the opponent might prepare cross examination and rebuttal of the expert. Id. Plaintiffs had known of the substance of Activision's presentation on the issue of implied license to consumers since April 1985 when Activision filed its Trial Brief, if not earlier, when Activision filed its Pretrial Proposed Findings of Fact. Dr. Star sat through the direct examinations of Tom Lopez and Dick Lehrberg, a full day prior to his testimony, but still no proper designation of subject matter and substance of testimony was ever made that evening or the following morning. Cf. Tabatchnick v. G.D. Searle & Co., 67 F.R.D. 49

(D.N.J. 1975) (emphasizing the requirement of ample notice of expert witnesses).[1/]

Plaintiffs have urged that the fact that Dr. Star was offered as a "rebuttal" expert witness somehow relieves Plaintiffs from their obligations to identify Dr. Star as an expert witness pursuant to Rule 26(e)(1) once he is "expected" to testify. There is absolutely no suggestion of such a distinction in Rule 26(e)(1), and no authority or rationale for such a distinction between rebuttal expert witnesses and non-rebuttal expert witnesses. See Collin v. Connecticut Valley Arms, Inc., 137 Cal. App. 3d 815, 821-22 (1982) (holding that under California law an undisclosed expert will be excluded regardless of whether he is a rebuttal or prima facie case witness); Cal. Civ. Proc. Code §2037.5. For example, Plaintiffs cannot seriously contend that they could have retained a second expert witness on computer science issues two years ago, with the intention of using him as a "rebuttal" witness, but not identify him and the subject matter of his testimony until he is called to the stand. As soon as Plaintiffs expected to call Dr. Star as an expert witness to rebut the position of Activision on implied license which was set out in Activision's Proposed Findings of Fact in late 1984, and again in Activision's Trial Brief in April 1985, Plaintiffs then had a duty under Rule 26(e)(1) to identify Dr. Star and the subject of his testimony. Plaintiffs' asserted lack of

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1/ It is settled that the duty to supplement responses under Rule 26(e) continues into trial. See Weiss v. Chrysler Motors Corp., 515 F.2d 449 (2d Cir. 1975).

certainty as to whether they would or would not call Dr. Star after he was retained on July 8 is both flatly unbelievable and irrelevant. Indeed, Plaintiffs specifically identified Dr. Ribbens as a rebuttal expert witness in October 1984, but did not call him as a rebuttal witness. Thus, Plaintiffs have admitted by their own conduct that they had a duty under Magistrate Langford's Order to disclose the identity of expert rebuttal witnesses. Activision deserved to be seasonably informed of Dr. Star, and the Federal Rules expressly require that such disclosure of expert witnesses and the subject matter of their testimony be made.

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II.

DR. STAR'S TESTIMONY SHOULD BE EXCLUDED PURSUANT TO RULE 37(b)(2)(B).

The only appropriate sanction for Plaintiffs' trial by ambush tactics is not to allow the ambush to take place. The general rule is that courts exclude the testimony of unidentified expert witnesses pursuant to Rule 37(b)(2)(B):

> "If a party answers such an interrogatory, and subsequently decides to call an additional expert that he had not listed, he is under a duty seasonably to supplement his earlier response by providing similar information about the new expert . . . . Presumably a court will not permit an expert witness to testify if an interrogatory of this kind has been answered and that expert has not been named, but the matter is within the discretion of the court." (8 C. Wright & A. Miller, Federal Practice and Procedure §2030 (1970))

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Indeed, the Advisory Committee Notes to Rule 26(e) expressly indicated that "[t]he duty [to identify and supplement] will normally be enforced . . . through sanctions imposed by the trial court, including exclusion of evidence, continuance, or other action, as the court may deem appropriate." See also Rosemount, Inc. v. Beckman Instruments, Inc., 727 F.2d 1540, 1549-50 (Fed. Cir. 1984) (excluding an undisclosed expert witness in patent case). The prejudice to Activision from being forced to cross-examine Dr. Star "cold" is both apparent and presumed--the fact of "ambush" presumptively has some effect on the course (if not necessarily the outcome) of the encounter. Plaintiffs can point to no reason why their own secretive tactics should not be thwarted in the only way possible in this case--by exclusion of Dr. Star's "expert" testimony.

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CONCLUSION

Plaintiffs are guilty of surprise tactics that run squarely contrary to the letter of Rule 26(e)(1) and the spirit of the Federal Rules. Exclusion of Dr. Star's testimony is the only possible recourse for Plaintiffs' disregard of their obligation seasonably to disclose the identity and subject matter of an additional expert witness--whether or not offered procedurally as

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rebuttal or in the prima facie case.

DATED: September 9, 1985.

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

THE MAGNAVOX COMPANY, a corporation, and SANDERS ASSOCIATES, INC., a corporation, Plaintiffs, vs. ACTIVISION, INC., a corporation, Defendant. AND RELATED CROSS-ACTION.	No. C 82 5270 CAL ACTIVISION, INC.'S REVISED FINDINGS OF FACT

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For the convenience of the Court, we set forth below a description of abbreviations contained in citations throughout the Findings of Fact.

TT __-__	Trial transcript, volume __- page __ (June, 1985 session)
TT 8/__ a.m.	Trial transcript, August __, 1985, morning session
TT 8/__ p.m.	Trial transcript, August __, 1985, afternoon session
Dep.	Deposition
Complaint	Complaint for Patent Infringement, Preliminary and Permanent Injunction and Damages, dated September 28, 1982
Answer; Counterclaim	Answer and Counterclaims, dated October 25, 1982
Reply	Reply to First and Third Counterclaim, dated November 18, 1982
Plf's Resp. to Def's First Set	Plaintiff's Response to Defendant's First Set of Interrogatories (Nos. 1-125), dated February, 1983
Plf's Supp. Resp. to 38 and 39	Plaintiffs' Supplemental Response to Defendant's Interrogatories 38 and 39, dated March 26, 1984
Plf's Supp. Resp.	Plaintiffs' Supplemental Response to Defendant's Interrogatories, dated May 11, 1984
Plf's Third Supp. Resp.	Plaintiffs' Third Supplemental Response to Defendant's Interrogatories, dated September 7, 1984
Stip.	Stipulation of the Parties Regarding Undisputed Facts, dated May 1, 1985
Judicial Notice	Activision, Inc.'s Request for Judicial Notice, dated June 3, 1985

As a further convenience to the Court, set forth below is the chronology of the relevant Sanders Associates patents in this lawsuit, which are referred to throughout the Findings of Fact as the '480 or Baer-1 patent, the '507 or Rusch-2 patent, and the '598 patent or BRH-3 patent.

January 15, 1968.	Baer applies for patent. ("Baer-1") Serial No. 697,798.
May 27, 1969.	Rusch applies for patent. ("Rusch-2") Serial No. 828,154.
August 21, 1969.	Baer-Rusch-Harrison apply for patent ("BRH-3"). Serial No. 851,865.
April 25, 1972.	Rusch-2 patent issued as U.S. Patent No. 3,659,284.
April 25, 1972.	BRH-3 patent issued as U.S. Patent No. 3,659,285.
April 17, 1973.	Baer-1 patent issued as U.S. Patent No. 3,728,480.
April 25, 1974.	Rusch files application for reissue of the Rusch-2 patent.
April 25, 1974.	Baer-Rusch-Harrison file application for reissue of BRH-3 patent.
August 5, 1975.	Patent Office reissues Rusch-2 patent as U.S. Patent Re. 28,507 ("the '507 patent").
October 28, 1975.	Patent Office reissues BRH-3 patent as U.S. Patent Re. 28,598 ("the '598 patent").
June 27, 1977.	Baer files application for reissue of Baer-1 patent.
January 10, 1977.	Claims of the BRH-3 patent alleged to be infringed in Magnavox v. Chicago Dynamics Industries, 201 U.S.P.Q. 25 (N.D. Ill. 1977) found invalid and obvious in light of Rusch-2 patent.

April 23, 1982. Patent Office Primary Examiner finally rejects 78 of the 96 claims of the Baer-1 patent.

Matter pending before Board of Patent Appeals.

I.

THE PARTIES, CLAIMS AND GAMES INVOLVED IN THIS LAWSUIT.

1. Activision is a California corporation based in Mountain View, California, that designs and manufactures a wide variety of video game cartridges and disks.

Complaint; Answer; Counterclaim; Reply; Stip. 17.

2. Activision was founded in 1979 for the specific purpose of designing copyrighted video games which are ultimately sold to owners of master video game consoles, primarily the Atari Video Computer System 2600 ("2600"). Activision currently employs approximately 100 individuals. The master console is a computer; an Activision video game cartridge is one of many programs which may make use of that computer. Activision does not and has never manufactured master consoles or joysticks.

TT 6-140, line 22--6-142, line 16 (Levy).

3. Activision has designed and manufactured 42 video game cartridges to be played on the user's television set in connection with a master console and a hand-held control known as a "joystick". A video game cartridge is a small plastic box, the size of a tape cassette, which contains a computer program encoded in a

"read only memory" (ROM) semiconductor, and placed on a very small printed circuit board. The player inserts into the master console the video game cartridge which contains the program for the Activision game of his or her choice, turns on the television set, and the television set then displays the computer-generated images. The player uses a hand-held control or "joystick" to move the player-controlled object on the display.

TT 6-140, line 22--6-142, line 16 (Levy); Ex. GT (Atari 2600 circuit board).

4. In addition to designing computer game programs for the Atari 2600, Activision has designed and manufactured cartridges and disks to be played on other computers, including the Commodore 64, IBM and Apple computer.

Ex. FN (current list of Activision games).

5. The creative process of designing, manufacturing, and marketing an Activision computer program usually takes between eight and nine months. The resulting computer program is, therefore, an

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original product which is copyrighted by Activision.

TT 6-154, lines 4-18 (Levy); TT 8/14 p.m. at 351, line 24-353, line 8 (Crane).

6. Sanders Associates, Inc. is and has been a corporation of the State of Delaware and is the owner of U.S. Patent Re. 28, 507 (the "Rusch-2 patent") and the corresponding patents in foreign countries. The Magnavox Company is and has been a corporation of the State of Delaware and is the exclusive licensee of Sanders under the Rusch-2 patent and the corresponding patents in foreign countries.

Complaint Answer; Stip. 18.

7. Magnavox is also the exclusive licensee of other patents owned by Sanders Associates, Inc., including: U.S. Patent 3,728,480, for which the original application was filed on January 15, 1968 (the "Baer-1 patent").

Plaintiffs' Ex. 261.

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8. The Rusch-2 patent has 64 claims. Magnavox asserts that Activision has contributed to or induced the infringement of claims 25, 26, 51, 52, 60, 61 and 62 of the Rusch-2 (hereafter sometimes collectively referred to as the "relevant claims.") Magnavox has never alleged or proved that Activision directly infringed the Rusch-2 patent.

Stip. 19; Ex. DF (Rusch-2 patent); Plf's Resp. to Def's First Set at 30-31; Plf's Supp. Resp. to 38 and 39 at 2; Plf's Supp. Resp. at 9-11; Plf's Third Supp. Resp. at 2.

9. Magnavox asserts that use by a consumer of 11 of Activision's video game software cartridges infringed at least one of the relevant claims of the Rusch-2 patent. These 11 Activision video game cartridges are manufactured and sold to be played on Atari, Coleco, and Mattel master computer consoles as follows:

	Atari	Coleco	Mattel
Boxing	x		
Fishing Derby	x		
Tennis	x		
Stampede	x		x
Ice Hockey	x		

	Atari	Coleco	Mattel
Barnstorming	x		
Grand Prix	x		
Sky Jinks	x		
Enduro	x		
Decathlon	x	x	
Pressure Cooker	x		

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The Atari, Coleco and Mattel master computer consoles which play the Activision game software are sublicensed by Magnavox under the Rusch-2 patent.

Stip. 20.

10. Magnavox asserts that each of the 11 Activision video games infringed the relevant claims of the Rusch-2 patent as follows:

Game	Claim
Tennis	25, 26, 51, 52, 60, 61, 62
Ice Hockey	25, 26, 51, 52, 60, 61, 62
Boxing	25, 26, 51, 52, 60
Pressure Cooker	25, 26, 51, 52, 60
Fishing Derby	25, 26, 51, 52, 60, 61
Stampede	25, 51, 60
Grand Prix	60
Barnstorming	60
Sky Jinks	60
Enduro	60
Decathlon	60

Stip. 19; Plf's Resp. to Def's First Set at 30, 31; Plf's Supp. Resp. to 38 and 39 at 2; Plf's Supp. Resp. at 9-11; Plf's Third Supp. Resp. at 2.

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II.

THE RUSCH-2 PATENT IS INVALID.

A. The Non-Computer Prior Art Before Sanders Associates' Video Game Effort.

a. Simulated Games

11. "Ball" games including tennis, ping-pong, handball, billiards (pool), and hockey pre-date the 20th century and, more specifically, were not devised or invented by any plaintiff in this action.

Stip. 1.

b. Higinbotham Tennis Game

12. In 1958, Dr. William A. Higinbotham designed electronic circuitry which allowed two people to play a game of tennis on a cathode ray tube display ("Higinbotham tennis"). Each player controlled an invisible tennis racket by means of a hand controller. The view on the screen of the display was that of a tennis court seen from the perspective of one standing on the sidelines. The net was a vertical line in the middle of the screen, and a horizontal line represented the length of the court. When a player hit the ball, the ball would appear to move in a realistic fashion, depending upon how it was hit. Thus, the ball would bounce off the court, bounce backwards off the net (if the net were hit) or move beyond the end of the court. When the player pushed a button on the hand

control to hit the ball, the ball would reverse direction and move with a velocity determined by the player's manipulation of a second knob on the hand controller.

TT 8/12 p.m. at 102, line 20 - 103, line 1; 105, line 6 - 111, line 10 (Higinbotham); Exs. JN, JP, JQ.

13. Dr. Higinbotham used 10 operational amplifiers, originally part of a Donner analog computer, and several relays to make his tennis game. He took the amplifiers from the Donner analog computer; he did not use the computing power of the Donner device. The operational amplifiers compared, integrated, and differentiated voltages with respect to time. The relays acted as bi-stable devices which were triggered by the operational amplifiers, thereby changing the motion of the tennis ball. For example, one operational amplifier sensed when the ball hit the court. A relay was adjusted so that it would operate whenever the operational amplifier determined that the vertical position of the ball had reached a particular voltage level. The court line on the display was separately adjusted to this same voltage level. Thus when the ball's vertical voltage equalled the voltage which controlled the court line, the relay was triggered. The bounce of the ball was achieved by changing the state of the relay so that the connections of a charged capacitor were reversed, thus changing the voltage applied to the operational amplifier which generated the ball. When either player pushed their control to return the tennis ball over the net,

a ratched relay was activated. The ratched relay is a mechanical bi-stable device which is the same as a flip-flop except that the flip-flop is an electronic bi-stable device. Dr. Higinbotham used an electronic switch, a bi-stable multivibrator, to separately generate the signals which resulted in the display of the ball, net, and court.

TT 8/12 p.m. at 112, line 13 - 120, line 6 (Higinbotham); TT 8/12 p.m. at 140, line 5-141, line 23 (Thacker); Exs. JN, JO, JP, E, F.

14. In the 1950's, Brookhaven National Laboratory held open houses, typically on a weekend in early fall. Each department and division prepared exhibits which were displayed in the gymnasium. The Higinbotham tennis game was displayed at two such open houses in 1958 and again in 1959. Thousands of people, including technicians from neighboring universities and school children, visited Brookhaven and saw the game being played. A number actually played the game. There was no secrecy attached to the Higinbotham tennis game and questions about it were answered. The Higinbotham tennis game is prior art with respect to the Baer-1 and Rusch-2 patents under 35 U.S.C. §102(b) because it was publicly known and used in 1958, ten years before patent applications were filed for the Baer-1 and Rusch-2 devices.

TT 8/12 p.m. at 103, line 2 - 104, line 27 (Higinbotham); Ex. JQ.
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or Rusch began the work which resulted in their respective patents.

Ex. BD (Spiegel patent); Ex. DQ (Examiner's Answer, '480 reissue proceedings); Stip. 4.

17. In 1977 Magnavox brought suit against APF Electronics and several other entities for infringement of the Rusch-2 patent. The suit against APF was dismissed for lack of venue. In November 1980 APF acquired the Spiegel patent; in January 1981 APF intervened in litigation between Magnavox and APF customers Sears, Roebuck and Montgomery Ward and counterclaimed against Magnavox for infringement of the Spiegel patent. That case was ultimately settled; as part of the settlement, APF conveyed the Spiegel patent (which by then had expired) to Magnavox. Magnavox valued the expired patent at $200,000. Since its acquisition of the Spiegel patent, Magnavox has failed to bring suit or even contemplate filing an action against any video game manufacturer for infringement of the Spiegel patent. Magnavox has never licensed a video game manufacturer under the Spiegel patent. Magnavox acquired the Spiegel patent because they recognized that Spiegel is and was highly relevant prior art. Magnavox, by acquiring Spiegel, effectively precluded alleged infringers whose sales occurred before 1980, from asserting Spiegel

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as that would be escaping the frying pan for the fire.

Lipper Dep. (5/13/82, APF) at 97, 136-138; Mayer Dep. (5/9/84, Activision) at 34-39, 43-44; Ex. EA (APF/Messerschmidt license agreement); Ex. ED (Assignment of Spiegel patent to APF); Ex. EC (APF counterclaim); Ex. EG (APF Settlement Agreement).

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B. The Baer Prior Art--Work At Sanders Associates.

a. Ralph Baer and the Baer-1 Patent.

18. From 1961 through the early 1970's, Ralph Baer was the Division Manager for the Equipment Design Division of Sanders Associates. As part of his job, Ralph Baer oversaw the development of electronic display systems that Sanders designed for the military. The period from September, 1966 through February, 1968 is referred to hereafter as "the development period."

TT 2-4, line 4 - 2-5, line 8 (Baer).

19. In September of 1966, Baer wrote a memorandum recording his conceptions regarding the development of video games. The memorandum describes no circuitry or other means for implementing Baer's video game. Among the many game ideas Baer disclosed is that of auto racing, using the screen as a scrolling roadway or obstacle course. A basic electronics technician would have been able to develop the circuitry to implement Baer's memorandum.

TT 3-97, lines 3 - 3-101, line 16; 3-113, line 20 - 3-115, line 9 (Baer); Ex. CA (Baer, September 1966 memo); Ex. CC (Baer, TV Game Data in Chronological Order).

20. In early 1967, Baer gave his memorandum to his technician William Harrison, and told Harrison to make some electronic

circuitry to implement the memorandum. Harrison constructed this circuitry in part by using a "Heathkit" Baer had purchased. Baer's Heathkit was a commercially available piece of equipment which was used to check the horizontal and vertical signals on a standard television set.

TT 2-16, line 25 - 2-17, line 25; 2-24, line 4 - 2-25, line 2 (Baer); Ex. HF (Harrison's notebook).

21. By January 10, 1967 an apparatus was constructed and tested by Baer and William Harrison. That apparatus generated a pair of spots on a television screen.

TT 3-115, lines 17-25 (Baer); Ex. HD (Baer Disclosure Sheet) at 2.

22. The Sanders TV game project maintained security so "the whole concept, which would be very evident on brief viewing, would not be broadcast throughout the company in short order."

TT 2-14, lines 8-10 (Baer).

23. By May 1967, Baer had completed work on a video game prototype. That apparatus embodied circuitry for generating

player-controlled spots on a television screen and detecting coincidence between the spots. By May 19, 1967 an apparatus had been constructed, tested, and reduced to practice which embodied Baer's car race game disclosed in his September, 1966 memorandum. The apparatus generated a roadway which appeared to move, scrolling toward the player.

TT 3-116, lines 8-25; 3-101, line 25 - 3-107, line 18 (Baer); Harrison Dep. (3/17/76, Bally) at 60.

24. William Rusch had nothing to do with the idea, conception or reduction to practice of Baer's scrolling car game. The Rusch-2 patent does not disclose any scrolling game, nor was any evidence offered to show that Rusch had ever conceived of or reduced to practice such a game.

TT 3-105, lines 14-19 (Baer).

25. Ralph Baer's May, 1967 apparatus played chase games, pumping games, target shooting games, and, with an overlay, some board games.

TT 3-117, lines 1-8 (Baer).

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26. By June of 1967 Baer had constructed, tested, and reduced to practice a device for playing video games. A control box was attached to the antenna terminals of a television set. This control box included means for generating vertical and horizontal synchronization signals, means for generating dots on the screen of a television receiver to be manipulated by at least one participant, means for generating dots whose motion is non-player controlled (automatic), means for detecting coincidence, and means for altering a dot in response to coincidence. By this time, Baer's game concept had matured into seven distinct games which were demonstrated by Baer to his superiors at Sanders on June 15 and 16, 1967. The games included a game called "Fox Hunt" where a white spot (hunter) controlled by a player chased a red spot (controlled by another player); when the spots touched the red spot would disappear by a change in background color. In another game, "Fox & Hounds Chase," the player controlled a "red fox" trying to maneuver past three spots representing hounds whose movement was controlled by the machine. Baer also developed a target shooting game where one player attempted to shoot at either a stationary spot, a player-controlled spot, or a randomly moving spot on the screen. Two other games developed by Baer were "pumping games" where each player would pump a switch as fast as possible to see who could raise the level of "water" displayed on the screen.

TT 3-118, line 18 - 3-123, line 2 (Baer); Ex. CD (Summary of Major Games); Ex. HD (Baer Disclosure Sheet) at 2, last line.
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27. Baer's device demonstrated in June, 1967 and his patent disclose the use of a delay multivibrator which is used in conjunction with horizontal and vertical synchronization signals for generating the time delay necessary to create and move spots on a television screen.

Ex. DA (Baer-1 patent); Ex. IU; TT 8/12 p.m. at 128, line 24-132, line 11 (Thacker).

28. All elements of the June, 1967 demonstrations were incorporated into the Baer-1 patent.

TT 3-122, lines 15-22; 3-123, lines 3-5; 4-40, lines 8-25; Ex. HD; Ex. DA (Baer-1 patent) [note particularly claims 1, 9, 11 and 25].

29. On June 16, 1967 (one of the days Baer demonstrated his apparatus to Sanders' top management) Baer, having reduced his concept to practice, wrote, signed and dated his Patent Disclosure Sheet.

Ex. HD (Patent Disclosure Sheet).

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30. Ralph Baer reduced to practice in June, 1967 a device which generated more than two spots. Generating more spots than two was incidental, i.e., just a matter of adding more generic spot generators and coincidence detectors.

TT 3-124, line 23 - 3-125 (Baer); Admissions: Ex. JL-7 (Baer).

31. By September 12, 1967 Baer completed work on further refinements to the June apparatus, culminating the work which encompassed everything shown in the Baer-1 patent.

TT 3-123, line 19 - 3-124, line 21.

32. The Baer-1 patent teaches playing of interactive, i.e., two player games.

TT 6-29, lines 5-15 (Baer); Ex. DA (Baer-1 patent).

33. Circuits built by Baer and Harrison in February, April, and May of 1967 to produce spots on the screen and detect coincidence were used over and over again in succeeding versions of

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television games, including the Rusch ping-pong game.

TT 3-117, line 22 - 3-118, line 17; TT 3-132, line 22 - 3-133, line 2; Admissions: Ex. JL-8 (Baer).

34. Ralph Baer's apparatus described in the Baer-1 patent detected coincidence and then altered the signal representing one of the dots. This was accomplished by color change or by having a spot disappear. There was, however, no limit to the number of things that could happen after coincidence using Baer's concept and apparatus because the spot surrogates for anything one wishes to visualize and therefore can have any attributes the designer chooses.

TT 3-125, line 8 - 3-126, line 1 (Baer); Admissions: Ex. JL-7 (Baer).

35. The Baer-1 patent embodies the concept of automatic motion, i.e. having both a player controlled spot and at least one machine controlled spot.

TT 3-119, line 13 - 3-122, line 12; 3-123, lines 3-5; 4-40, lines 8-25 (Baer); Admissions: Ex. JL-6 (Baer); Ex. DA (Baer-1 patent, claim 25); Ex. DU (Seligman argument for Baer-1 reissue) at 14; Ex. DX (Seligman argument for Baer-1 reissue) at 5.

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36. The Baer-1 patent embodies use of voltage control for spot generation.

Ex. DA (Baer 1 patent, column 1, lines 7-17); TT 3-137, line 24 - 3-138, line 23; 3-139, lines 18-25 - 3-140, line 1 (Baer); TT 5-150, line 22 - 5-151, line 2 (Ribbens).

37. On January 15, 1968, Baer applied for a patent entitled "Television Gaming and Training Apparatus." The Patent and Trademark Office assigned Baer's application Serial No. 697,798. The application was eventually issued as U.S. Patent No. 3,728,480. When Baer applied for the patent, neither Baer nor Sanders disclosed to the Patent Office the existence of the Spiegel patent, Space War, Spiegel patent, G.E./NASA scene generator, Higinbotham tennis game, Michigan pool game, Drumheller pool game, and the RCA pool game. Moreover, none of this prior art was considered by the patent office prior to the issuance of the Baer-1 patent.

Ex. DB ('798 file wrapper); Ex. DE ('480 file wrapper); Ex. DA (Baer-1 patent).

38. On April 17, 1973, the Baer-1 patent was issued to Sanders Associates as assignee of Baer.

Ex. DA (Baer-1 patent).

39. On June 27, 1977, Baer filed an application for reissue of the Baer-1 patent with the U.S. Patent and Trademark Office, stating that as the Baer-1 read, it was "partly inoperative or invalid" because Baer had claimed more than he had a right to claim in the patent. Baer's "error" was to include claims in the Baer-1 patent that "appear to be too broad" in light of the invention described by Fritz Spiegel in U.S. Patent 3,135,815.

Ex. DZ (Baer Supplemental Declaration).

40. During the more than 8 years that the Baer-1 reissue application has been sought, the Patent Office, on five separate occasions, has rejected various of Sanders Associates' claims, and Sanders has filed at least five amendments to its application. Baer has submitted 96 claims which purport to set out the meets and bounds of his "invention." On April 23, 1982, the Patent Office Primary Examiner finally rejected substantially all of the submitted claims. Specifically, 78 of the claims were rejected, primarily because the teachings of the Spiegel patent and Space War, made the Baer-1 patent obvious to one skilled in the art. The 18 remaining claims relate primarily to very specific circuitry and to a light detecting target shooting game unrelated to Activision's video games here in suit.

Ex. DP ('538 file wrapper).

41. In 1982, Baer appealed the Final Rejection of the Baer-1 reissue application to the U.S. Patent Office Board of Appeals. The Primary Patent Examiner filed its Answer to Baer's appeal in October, 1983. The matter is still pending before the Patent Board of Appeals.

Ex. DP ('538 file wrapper).

42. On October 25, 1984, Magnavox covenanted that it would never sue Activision for infringement of the Baer-1 patent or identical subject matter in any reissue application for Baer-1, to the extent the claimed subject matter of such reissue application is identical to the claimed subject matter of Baer-1. In exchange for this covenant Activision dismissed its counter-claim for declaratory judgment that Baer-1 is invalid and not infringed. Magnavox' covenant not to sue on the Baer-1 patent is essentially an admission by Magnavox that it could not prevail in a court of law on the issues of the validity and/or infringement of the Baer-1 patent.

Ex. FO.

b. <u>William Rusch Assigned To Work For Baer</u>.

43. William Rusch, an engineer at Sanders Associates,

began work on the Sanders' video game effort between September 25 and September 29, 1967.

TT 3-126, lines 2-15; 3-128, line 9 (Baer); Ex. CF (Rusch Notebook) at 95.

44. Rusch first clearly conceived the ideas embodied in the Rusch-2 patent beginning on or about October 12, 1967, and work on these ideas began in the latter part of October, 1967.

Ex. CJ (Rusch Disclosure Sheet) at 1 (#5); Ex. HT (Rusch First Progress Report); Harrison Dep. (3/24/76, Bally) at 42-43.

45. Although William Rusch was officed with the Sanders TV Game Unit prior to September 25, 1967 he was not, prior to that date working on television games. Rather he was, with occasional help from Harrison, working on a music (guitar string) project and was still assigned to another corporate director.

TT 3-127, lines 1-23 (Baer).

46. Before Rusch began any work on Sanders Associates' video game project, Rusch became thoroughly familiar with all of

Baer's and Harrison's ideas, designs, circuits and working models, including the entirety of what became the Baer-1 patent.

TT 3-131, lines 6-16 (Baer).

47. Rusch's work was only an attempted "improvement" to that completed earlier by Baer.

TT 3-131, lines 17-25 (Baer); Admissions: Ex. JL-5 (Seligman Supp. Amendment to Response to Opposer's 2nd Paper).

48. Rusch undertook the task of improving Baer's video game as reflected in the Baer-1 patent and the schematics and drawing which relate to it. Specifically, Rusch sought to make improvements, as follows:

(1) Replacement of Baer's "digital" approach with an analogue method of spot generation;

(2) Generation of spots of different shape, e.g., round;

(3) Introduction of bounce for ball and paddle games.

Of the three above, the only one advanced by Plaintiffs as relevant in this action is the introduction of the bounce feature.

Ex. HD (Baer Disclosure Sheet); Ex. HT (Rusch First Report); Ex. HU (Status Report); Ex. HV (Sanders Stop Order); Ex. HW (Rusch Final

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Report).

49. In his Final Report signed in July, 1968 William Rusch in his "conclusion" distinguishes his analog approach from Baer's "digital" approach and concludes that his analog approach is superior. Rusch was attempting an improvement which, by his own definition, excluded using digital technology.

Ex. HW (Rusch Final Report at 5).

50. Rusch completed and tested his first video game apparatus on October 26, 1967, 14 days after his first conception.

Ex. CJ (Rusch Disclosure Sheet) at 1 (#6); Ex. HU (Status Report).

51. Rusch finished all work on the Rusch-2 patent, i.e., he reduced the conception embodied in the Rusch-2 to practice by January, 1968. He submitted his patent disclosure sheet to Sanders on February 2, 1968.

Ex. CJ (Rusch Disclosure Sheet) at 1; Ex. HV (Sanders Stop Order).

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52. Rusch used a flip-flop to cause reversal of motion. A flip-flop circuit, such as the one used by Rusch in the Rusch-2 patent, is a simple circuit which could automatically change voltage. No specific flip-flop was even set out in the schematics of the Rusch-2 patent. Flip-flop circuits substantially identical to the one used by Rusch were well known at least as early as 1960, and in fact appear in an electrical engineering textbook as early as 1960 and in a standard dictionary in 1968.

Judicial Notice: Ex. M; Ex. GY (textbook).

53. Sawtooth wave forms, such as the one drawn in the Rusch-2 patent, were well known in connection with generating symbols on a television screen. Every television set uses a sawtooth wave to generate the picture on the screen and thus the use of a sawtooth wave to control spots on a screen is inherent from the nature of television itself.

TT 5-7, lines 11-13..

54. The Rusch-2 patent describes a set of simple electronic analog circuits which are soldered together ("hard-wired"). The Rusch-2 patent discloses a box which could be used only to play a discrete number of games whose circuits were either built into the

box or could be reconfigured in a limited fashion by use of a plug-in board.

Ex. DF (Rusch-2 patent); TT 7-121, line 9 - 7-122, line 2 (Thacker).

55. On May 27, 1969, Rusch applied for a patent entitled "Television Gaming Apparatus." The Rusch patent application tracked almost word per word much of the specification and claim language found in the then pending Baer-1 application. The Patent and Trademark Office assigned Rusch's application Serial No. 828,154. The application was eventually issued as U.S. Patent No. 3,659,284 and later reissued as U.S. Patent Re. No. 28,507. The Higinbotham tennis game, Spiegel patent, Space War, G.E./NASA scene generator, Michigan pool game, Drumheller pool game, and the RCA pool game were not disclosed to nor considered by the Patent Office prior to the issuance of U.S. Patent No. 3,659,284. Baer's pending application for what was to become the Baer-1 patent was not cited to the Patent Office as prior art, but only cross-referenced as a related application. The Patent Office examiner did not consider the impact of the Baer-1 patent on the validity of U.S. Patent No. 3,659,284. The art not considered by the Patent Office was more pertinent than that

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which it did consider.

Ex. CS ('284 file wrapper); Ex. CR ('284 patent); Exs. CT, CU, CV, CW (excerpts from '284 file wrapper); Ex. DB ('798 file wrapper).

56. On April 25, 1972, the Rusch-2 patent was issued to Sanders Associates as assignee of Rusch.

Ex. CR ('284 patent).

57. On April 25, 1974, Rusch filed an application for reissue of the Rusch-2 patent with the U.S. Patent and Trademark Office. Pursuant to the terms of 35 U.S.C. §251, a patent holder may file an application for reissue when the patent is "deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent. . . ." The Higinbotham tennis game, Spiegel patent, Space War, G.E./NASA scene generator, Michigan pool game, Drumheller pool game, and the RCA pool game were not disclosed to nor considered by the Patent Office prior to the re-issuance of the '284 patent as U.S. Patent Re. 28,507. The Baer-1 patent was not cited to nor considered by the patent office as prior art, but only cross-referenced as a related

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patent. The art not considered by the Patent Office was more pertinent that that which it did consider.

Ex. DG ('507 file wrapper); Exs. DH, DI (excerpts from '507 file wrapper).

58. Rusch's application for reissue of the '284 patent stated that as the patent then read, it was "partly inoperative by reason of a defective specification." Sanders Associates sought to have the patent reissued to cover displays on all cathode ray tubes, so that it would cover coin-operated video games in arcades. This was the sole reason reissue was sought. To this end, claims 60 through 64 were added to the patent that was reissued as the Rusch-2 patent. Nothing in the reissue application changes or addresses the definition of "imparting a distinct motion."

Ex. DI (excerpt from '507 file wrapper).

59. The Rusch-2 reissue application was allowed by the Commissioner. Rusch surrendered the '284 patent. The reissue was issued on August 5, 1975, and was given the number U.S. Patent Re. 28,507.

Ex. DF (Rusch-2 patent).

c. The Baer-Rusch-Harrison Patent.

60. On August 21, 1969, Baer, Rusch and Harrison together applied for a patent entitled "Television Gaming Apparatus and Method." The Patent and Trademark Office assigned this application Serial No. 851,865. The application was eventually issued as U.S. Patent Number 3,659,285 (the "BRH-3" patent). This patent purports to describe circuitry for playing games on a television display by generating dots, getting the hitting dot(s) to move and "hit" the hit dot(s), detecting coincidence of the dots, and "imparting a distinct motion" or "altering the motion upon coincidence" of the hit dot(s). The BRH-3 patent disclosed and claimed digital circuits for generating spots on the screen, i.e., spot generators. The BRH-3 patent disclosed circuitry which could generate screen-width walls off of which spots could bounce. The Higinbotham tennis game, Spiegel patent, Space War, NASA scene generator, Michigan pool game, Drumheller pool game, and the RCA pool game were not disclosed to nor considered by the Patent Office prior to the issuance of the BRH-3 patent. Baer's pending application for what was to become the '480 or Baer-1 patent was not cited to the Patent Office as prior art, but only cross-referenced as a related application. The Patent Office examiner did not consider the impact of the Baer-1 patent on the validity of the BRH-3.

Ex. CX (BRH-3 patent); Ex. CY ('285 file wrapper).

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61. On April 25, 1972, the BRH-3 patent was issued to Sanders Associates as assignee of Baer, Harrison and Rusch.

Ex. CX ('285 patent).

62. On April 25, 1974, Baer, Harrison and Rusch filed an application for reissue of the BRH-3 patent with the U.S. Patent and Trademark Office. Baer, Rusch and Harrison gave the same reasons for seeking reissue of the BRH-3 patent that Rusch gave in seeking reissue of the '284 patent. The BRH-3 reissue application was allowed by the Commissioner. The reissue patent was issued on October 28, 1975, and was given the number U.S. Patent Re. 28,598 (the "BRH-3" patent). The Patent Office examiner did not consider the impact of the Baer-1 patent on the validity of the '598 patent. The Higinbotham tennis game, Spiegel patent, Space War, G.E./NASA scene generator, Michigan pool game, Drumheller pool game, and the RCA pool game were not disclosed to nor considered by the Patent Office prior to the issuance of the BRH-3 patent as U.S. Patent Re. 28,598.

Ex. DK ('598 patent); Ex. DL ('598 file wrapper).

63. The relevant claims of the BRH-3 patent alleged to be infringed in Magnavox v. Chicago Dynamics Industries, 201 U.S.P.Q. 25 (N.D. Ill. 1977) were found by the court to be invalid by reason

of anticipation or obviousness in light of the Rusch-2 patent.

Judicial Notice: Ex. C.

d. The Baer-1 Patent Is Prior Art With Respect To The Rusch-2 Patent.

64. The Rusch-2 patent in the "Background of Invention" section, at col. 1, lines 46-51, specifically refers to the Baer-1 patent. This reference is, in accordance with patent office procedures, an admission that both the claims and the entire disclosure of the Baer-1 are prior art with respect to Rusch-2.

Admissions: Ex. JL-3 at 1288-89 (Professor Kayton).

65. Ralph Baer conceived and reduced to practice his apparatus described in the Baer-1 patent before William Rusch conceived of or reduced to practice his apparatus described in the Rusch-2 patent. This was specifically conceded by Sanders' attorney during the Baer-1 reissue proceedings. The Baer-1 patent is prior art with respect to the Rusch-2 patent.

Admissions: Ex. JL-5 (Seligman); see also Findings of Fact 18-53.

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C. Rusch-2 Is Obvious In Light Of The Non-Computer Prior Art.

a. Scope Of The Prior Art.

66. From the late 1960's through the present Sanders Associates has been a major defense contractor very involved in providing a variety of systems for the military. As part of this work, Sanders provided displays for military use. Ralph Baer was aware of that throughout the development period.

TT 4-27, lines 11-20 (Baer).

67. Sanders Associates did work during the 1960's on the Saturn Five launch control system for NASA. Ralph Baer was aware of that throughout the development period.

TT 4-27, lines 20-24 (Baer).

68. Ralph Baer was aware throughout the development period that video simulation techniques were employed by the military and NASA to train personnel, including training for radar, sonar, weapons systems, and space systems.

TT 4-27, line 25 - 4-28, lines 1-9 (Baer).

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69. Both the Baer-1 and Rusch-2 patents were specifically developed for military, scientific, and educational use as well as for amusement.

TT 3-123, lines 13-18 (Baer); Etlinger Dep. (4/6/76, Bally) at 38, 39; Ex. DF (Rusch-2 patent), column 1, lines 27-28; Ex. DA (Baer-1 patent), column 1, lines 22-25, 45-48, 55-58; Ex. HD (Baer Disclosure Sheet) at 1, ¶7; Ex. HW (August 1968 Rusch Final Report) at 1, 5.

70. The United States Patent Office sorts the patent applications it receives into subject matter groupings called "art units". Since it is impossible to compartmentalize the breadth of subjects which are potentially patentable, the Patent Office art units cross-reference related classes. The classes which are concerned with amusement games such as video games cross-reference educational and training devices which include flight trainers and simulators.

Judicial Notice: Ex. J.

71. The scope of the art relevant to the validity of Rusch-2 is the use of cathode ray tube displays to play games, the use of cathode ray tube displays to simulate and train, and the television sciences, i.e., the electronics of generating pictures

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composed of myriad dots for the enjoyment of viewers.

See Findings of Fact 66-70; TT 8/12 p.m. at 142, lines 3-13 (Thacker).

b. Skill In The Art.

72. A hypothetical person of ordinary skill in the art in the Fall of 1968 would be a person with a college degree in electrical engineering, or the practical equivalent, and at least two years experience in electrical engineering and television electronics (hereafter referred to as "a skilled person").

TT 3-30, line 22 - 3-21, line 18 (Baer); TT 8/12 p.m. at 122, line 12-123, line 8 (Higinbotham); Harrison Dep. (3/16/76, Bally) at 7, line 39 - 11, Q. 74; 40-41, Q. 261; see Findings of Fact 18, 20, 71.

c. The Relevant Claims Of The Rusch-2 Patent Are Obvious.

73. A skilled person having knowledge of the Higinbotham tennis game and the Baer-1 or the Spiegel patent, would have found it obvious to make a structure corresponding to that disclosed in the relevant claims of the Rusch-2 patent.

See Findings of Fact 11-72; TT 8/12 p.m. at 122, line 5-123, line 8 (Higinbotham); TT 8/12 p.m. at 142, line 14-143, line 20; 144, line 25-145, line 6 (Thacker).

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74. The relevant claims of the Rusch-2 patent are invalid under 35 U.S.C. 103 as obvious over Spiegel in view of Higinbotham.

See Findings of Fact 11-73. TT 8/12 p.m. at 122, line 5-123, line 8 (Higinbotham); TT 8/12 p.m. at 142, line 14-143, line 20 (Thacker).

75. The relevant claims of the Rusch-2 patent are invalid under 35 U.S.C. 103 as obvious over Baer-1 in view of Higinbotham.

See Findings of Fact 11-73; TT 8/12 p.m. at 144, line 25-145, line 6 (Thacker).

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D. The Computer Prior Art.

a. Space War.

76. In 1961-1962, a computer program for the game called "Space War" was written by Stephen Russell and Allen Kotok at the Massachusetts Institute of Technology. Russell was employed by and Kotok was a student at MIT at the time. A Space War program was typically embodied in a paper tape which was read by the computer and stored in its memory. The Space War program, similar to software created by Activision designers, contained the instructions for play of the game.

TT 4-49, line 21 - 4-50, line 15 (Russell); Ex. Q.

77. Space War was played by two persons, each of whom controlled his or her own spaceship which was shown on a cathode ray tube display. The view on the screen was that of outer space; there was a sun in the center and a moving star field surrounding it in the background. The object of the game was for each player to destroy the other's spaceship by firing torpedos, before his or her own spaceship was destroyed. The visible torpedo would be launched in the direction the spaceship was pointing. When a player piloted a spaceship, the spaceship would move in a realistic fashion. If a torpedo or spaceship hit the other player's spaceship, the hit

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spaceship would explode.

TT 4-52, line 8 - 4-57, line 9 (Russell); Exs. H, I.

78. Stephen Russell prepared a modified version of the computer program for Space War in which, at least as early as 1964, if a spaceship or torpedo hit the edge of the screen, it would bounce off the edge, and rebound in a realistic fashion. People who played Space War could change selected variables in the computer program to change the play of the game. For example, players could choose one version where if a spaceship hit the sun, the spaceship would stop and explode.

TT 4-59, line 9 - 4-61, line 4 (Russell); TT 8/13 a.m. at 166, line 10 - 170, line 6 (Thacker); Stip. 2.

79. Space War received substantial publicity and achieved substantial popularity during the 1960's. It was promoted in demonstrations and open houses around the United States by the Digital Equipment Corporation (DEC), the manufacturer of the computer for which the program was written. Space War was played on college campuses from Cambridge to Palo Alto. Space War was played at Sanders Associates by its employees at least as early as February 1968. Space War is prior art with respect to the Baer-1 and Rusch-2 patents under 35 U.S.C. §102(b) because of this extensive public

use. Space War is prior art with respect to the Baer-1 and Rusch-2 patents under 35 U.S.C. §102(b) because it was described in a printed publication more than one year prior to the applications for those patents.

TT 4-62, line 15 - 4-63, line 24; 4-68, line 24 - 4-70, line 22 (Russell); Exs. H, I, HA; Green Dep. (4/26/76, CDI) at 3, 7, 13-15, 24-26.

b. The G.E./NASA Scene Generator.

80. In 1964, the National Aeronautics and Space Administration (NASA) purchased a system from the General Electric Co. (G.E.) which used a stored program digital computer to generate moveable images on raster scan television screens ("the G.E./NASA scene generator") (Ex. CF at I-1) The 1964 G.E./NASA scene generator displayed an infinite ground plane surface textured with four patterns and a rendezvous surface. Motion was imparted by varying the inputs to the computer through a hand controller like a joystick.

Lawrence Dep. (5/23/80, Activision) at 19-21; Ex. BE (Manual for 1964 System) at II-3,15; Ex. BL (photo of ground plane); Ex. BK (Smith personal log).

81. The 1964 G.E./NASA scene generator was used to simulate lunar landings and orbital docking or rendezvous maneuvers.

The scene generator received commands from the pilot and caused the pilot's instruments to indicate that he was indeed falling towards the moon. The pilot used his hand controls so that he could see the landing surface. The pilot would fly the space-craft down to the lunar surface until he touched down at which point the computer detected the coincidence.

Lawrence Dep. (5/23/84, Activision) at 68-71.

82. In the 1964 orbital docking or rendezvous simulation, the pilot would see the rendezvous surface, floating in space like a piece of paper. The object of the exercise was for the pilot to maneuver his space-craft so that it contacted the rendezvous surface within certain speed and angle criteria at which point the computer detected coincidence.

Lawrence Dep. (5/23/84, Activision) at 71-75.

83. The 1964 G.E./NASA scene generator is prior art with respect to the Baer-1 and Rusch-2 patent under 35 U.S.C. §102(b) because it was sold by G.E. to NASA more than one year before either patent was applied for. The 1964 G.E./NASA scene generator is prior art with respect to the Baer-1 and Rusch-2 under 35 U.S.C. §102(b) because it was publicly demonstrated and used by one other than the

designer thereof (e.g., G.E.) more than one year before either patent was applied for.

See Findings of Fact 80-82; Ex. BK (Smith personal log); see also designated Smith Dep. excerpts.

84. In 1967, NASA purchased from General Electric further equipment and computer programs for the G.E./NASA scene generator, which allowed the generation of moveable three-dimensional objects on a television screen. The 1967 G.E./NASA scene generator was used to simulate the lunar excursion module landing on the moon, a rendezvous in outer space in which the lunar excursion module docks with the command module, a tank game, an aircraft carrier and airport landings. The programs for the G.E./NASA scene generator, similar to those written by Activision game designers, contained the instructions for play of the simulations and the tank game.

Lawrence Dep. (5/28/84, Activision) at 77-78, 81-83; 5/24/84 at 14-17; Exs. BF, BG (Manuals for 1967 System); Ex. BI (History of NASA-ESG [pp.1 & 2 of block diagram]); Ex. BJ (article by Rougelot); Exs. BS, BU, BV, BW, BX, BY (NASA footage); TT 8/13 a.m. at 170, line 17 - 172, line 8 (Thacker).

85. In the docking simulation, the view on the user's television set was of the command spaceship the user was to dock with in outerspace. The engineer or astronaut controlling the lunar

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excursion module used a device similar to a joystick to maneuver the lunar module until it docked successfully with command ship. The simulation was programmed to provide, upon docking, a transfer of momentum from the lunar module to the command ship, although the resulting motion was slight inasmuch as significant motion could only result from velocities which would cause the ships to crash. Once the ships were docked they moved together. NASA personnel monitored the simulation in a control room. The view on their screen was the command spaceship, the lunar module controlled by the user, and outerspace in the background. NASA personnel could see on their television set when the docking maneuver was successfully completed and the two spaceships coincided.

Ex. BO (photo); Lawrence Dep. (5/24/84, Activision) at 36-37, 46-54.

86. In the lunar landing simulation, the goal of the exercise was to realistically simulate the landing of the lunar excursion module (LEM) on a lunar surface dotted with craters and mountains. In the actual moon landing the sun was behind the pilot who used the shadow of his LEM to determine the distance to the lunar surface. As the LEM descended, its shadow would grow larger and move closer, until finally the landing pad of the LEM touched the shadow. This movement of the shadow was realistically simulated

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by the 1967 G.E./NASA scene generator.

Lawrence Dep. (5/24/84, Activision) at 55-57; Ex. BP (photo of ground plane); Exs. BR, BZ (NASA footage).

87. The lunar excursion module pilot's view during a lunar landing simulation included the lunar landscape with craters and mountains, a shadow which followed the LEM's movement, and the LEM's footpad whose contact with the shadow signalled a successful landing. The computer in charge of the simulation detected when a successful landing had been made and stopped the movement on the screen.

Lawrence Dep. (5/24/84, Activision) at 57-64.

88. In the tank game, the view on the television set was a battlefield seen from the perspective of an airplane. The player-controlled airplane fired bullets at a moving tank. The NASA computer controlled movement of the tank. The object of the game was for the bullets to hit the moving tanks on the screen. In the tank game, coincidence was ascertained between the bullets and the tank. Upon coincidence, depending upon the number of bullets that hit the tank, the tank would change shape and the "explosion" would

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grow in size in proportion to the size of the hits.

Lawrence Dep. (5/24/84, Activision) at 23-76; Exs. BM, BN (photos); Exs. BR, BT (NASA footage).

89. In the aircraft carrier landing simulation, the view on the screen was an aircraft carrier from the perspective of a pilot in an airplane. The pilot controlling the airplane, using a device similar to a joystick, landed the airplane on the deck of the carrier. The simulator detected coincidence between the airplane and the aircraft carrier and stopped the airplane's movement. In the airport landing simulation, the view on the screen was an airport from the perspective of a pilot in an airplane. The pilot controlling the airplane, using a device similar to a joystick, landed the airplane on the runway. The simulator detected coincidence between the airplane and the ground and stopped the airplane.

Lawrence Dep. (5/24/84, Activision) at 19-23; Smith Dep. (5/29/84, Activision) at 48-51; Ex. BR (NASA footage).

90. The 1967 G.E./NASA scene generator is prior art with respect to the Rusch-2 patent under 35 U.S.C. 102(b) because it was described in a printed publication more than one year before Rusch's patent application was filed. The 1967 G.E./NASA scene generator is

prior art with respect to the Rusch-2 patent under 35 U.S.C. 102(b) because it was publicly demonstrated, and thus publicly known, more than one year before Rusch filed his patent application. The 1967 G.E./NASA scene generator is prior art with respect to the Rusch-2 patent under 35 U.S.C. §102(b) because it was sold by G.E. to NASA and used by NASA more than one year before the Rusch-2 patent was applied for.

Ex. BH (1967 article from Electronic Engineer); Ex. BQ (photo and advertising material); Ex. BK (Smith personal log); see Findings of Fact 84-89.

c. Michigan Pool Game.

91. In 1954 a computer program was written at the University of Michigan which allowed a game of pool to be played on a cathode ray tube display ("Michigan pool game"). The program, similar to computer software created by Activision designers, contained instructions for the play of the game. The program was stored in a digital computer, called the MIDSAC computer. The Michigan pool game was an interactive game played by two persons. The view on the display screen was that of a pool table, seen from the top down: there was a circular figure representing a cue ball at one end of the display, and 15 "balls" in a triangular "rack" at the other. When any ball hit a "pocket," the ball disappeared. When the cue ball hit an object ball, a transfer of momentum would occur

and the balls would move in a direction and with a speed dictated by the laws of physics. When any ball hit the side of the pool table, the ball would bounce off in a realistic fashion. In Michigan pool, distinct motion was imparted by a hitting spot or player-controlled spot (cue ball) to the hit spot or computer-controlled spot (other balls).

Brown Dep. (6/25/76, CDI) at 12-13, 42, 46-55, 79-83; Ex. C; TT 8/13 a.m. at 157, line 15 - 160, line 18 (Thacker).

92. The Michigan pool game is prior art with respect to the Baer-1 and Rusch-2 patents under 35 U.S.C. §102(b) because it was described in a publication printed in October, 1954 in this country and because the Michigan pool game was publicly demonstrated more than one year before either the Baer-1 or Rusch-2 patents were applied for.

Exs. A, B; Brown Dep. (6/25/76, CDI) at 36-39, 93-102.

d. Drumheller Pool Game.

93. In early 1966 John Drumheller wrote a computer program for a pool game to be played on a cathode ray tube display ("Drumheller pool game"). The Drumheller pool game was similar in appearance to the Michigan pool game. In Drumheller's version, the

player controlled the cue stick, and the motion imparted to the cue ball, when hit by the cue stick, was proportional to the velocity with which the cue stick was moved. When the cue ball hit an object ball, a computer determined velocity, dictated by the law of physics, would be imparted to the computer-controlled object ball. Balls bounced off the side of the pool table in a realistic fashion. In 1967 Patrick Mullarky and Drumheller collaborated to produce a similar pool game for demonstration at the Spring 1967 Joint Computer Conference.

Drumheller Dep. (5/31/84, Activision) at 15-21, 23-25; Mullarky Dep. (5/27/76, CDI) at 6-11; Ex. CB (pool source listing); TT 8/13 a.m. at 160, line 19 - 161, line 24 (Thacker).

94. In San Francisco, California at the Fall 1966 Joint Computer Conference sponsored by the American Federation of Information Processing Societies and the Association of Computing Machineries, the Drumheller pool game was publicly demonstrated and played. ("Drumheller pool game"). Because of this public use the Drumheller pool game is prior art with respect to the '507 patent.

Drumheller Dep. (5/31/84, Activision) at 33-37.

e. RCA Pool Game.

95. In the mid-1960's employees at RCA's David Sarnoff

Research Center wrote a computer program for a game of pool ("RCA pool"). The program, similar to computer software written by Activision designers, contained instructions which implemented the game to be played. The cue ball was made from a myriad of small dots which formed a circle. When the player touched a light pen to any one of the dots, the cue ball would move as if struck by a cue stick at that point. When the cue ball hit any of the numbered object balls, the cue ball's velocity would be transferred to the hit ball in accordance with the laws of physics. Balls bounced off the sides of the table in a realistic fashion and when a ball entered a pocket it disappeared.

TT 8/13 a.m. at 162, line 16-163 line 20 (Thacker); Lechner Dep. (10/28/76, CDI) at 66, 67; Cooke Dep. (10/27/76, CDI) at 39-41.

96. From September 28 through October 1, 1967, RCA held an open house for the 25th anniversary of the David Sarnoff Research Center in Princeton, New Jersey. The RCA pool game was demonstrated to and played by visitors at the open house. Because of this public use, the RCA pool game is prior art with respect to the '507 patent.

Teger Dep. (10/27/76, CDI) at 145-185, 190-194; Exs. CG, CH, CI, CK, CL; TT 8/13 a.m. at 162, line 16 - 164, line 24 (Thacker).

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E. Rusch-2 Is Obvious In Light Of The Computer Prior Art.

a. Scope Of The Prior Art: Computer Related.

97. To the extent plaintiffs seek by this suit to expand the scope of the Rusch-2 patent to include computer generated graphics, such as those generated by the combination of the Atari Video Computer System and Activision software, the art relevant to the validity of the Rusch-2 patent further includes, in addition to that set out in previous findings, the use of computers and computer programs to generate dots or other symbols or graphics on the screen of cathode ray tube displays.

TT 8/12 p.m. at 142, lines 3-13 (Thacker).

b. Skill In The Art: Computer Related.

98. A hypothetical person of ordinary skill in the art in the Fall of 1968 would be a person possessed of the skills of a "skilled person," as previously defined, and--to the extent plaintiffs seek by this suit to expand the scope of the Rusch-2 patent to include computer generated graphics--experienced at computer programming and computer graphics (hereinafter "a skilled computer person").

TT 4-44, line 23 - 4-47, line 1 (Russell); TT 8/12 p.m. at 84, line 7-86, line 26 (Nielsen); see also deposition excerpts of Smith, Lawrence, Teger, Lechner, Cooke, Brown and Drumheller.

c. The Relevant Claims Of The Rusch-2 Patent Are Obvious.

99. A skilled computer person having knowledge of the Baer-1 or the Spiegel patent and Space War, the G.E./NASA scene generator, and/or Michigan pool, Drumheller pool, or RCA pool would have found it obvious to make a computer-based structure corresponding to that disclosed in the relevant claims of the Rusch-2 patent.

TT 8/13 a.m. at 173, lines 14-26 (Thacker); see also Findings of Fact 76-98.

100. To the extent that the relevant claims of Rusch-2 were to be read to reach the Atari/Activision combination, those claims are invalid under 35 U.S.C. 103 as obvious over Baer-1 in view of G.E./NASA, Michigan pool, RCA pool, Space War, and/or Drumheller pool.

TT 8/13 a.m. at 173, lines 14-26 (Thacker); see also Findings of Fact 76-99.

101. To the extent that the relevant claims of Rusch-2 were to be read to reach the Atari/Activision combination, those claims are invalid under 35 U.S.C. 103 as obvious over Spiegel in view of G.E./NASA, Michigan pool, RCA pool, Space War, and/or

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Drumheller pool.

TT 8/13 a.m. at 173, lines 14-26 (Thacker); see also Findings of Fact 76-99.

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F. The Secondary Considerations Do Not Render The Rusch-2 Nonobvious.

a. No Commercial Success--Odyssey; No Nexus Of Rusch-2 To Odyssey.

102. For the four years between January, 1968 and January, 1972 Sanders tried without success to sell or license the circuits described in the Baer-1, Rusch-2 and BRH-3 patents.

Ex. CQ (list of companies solicited).

103. In 1972, Magnavox manufactured and sold a game marketed in the United States under the trademark "Odyssey." This game, the Model ITL200 "Odyssey," was a battery-operated unit which generated signals, producing images on a television screen. Because the Odyssey game unit had very limited capacity to play different games, the game unit came with transparent plastic overlays with different backgrounds printed on each, which the user would tape to the face of the television screen depending upon which game was to be played.

Exs. HX, HY.

104. The circuitry Rusch developed for playing video games has never been used in any commercial product. Rusch's sawtooth wave/diode slicer circuitry was not used in the ITL200. Ralph Baer

didn't like Rusch's circuitry and abandoned it in favor of his digital approach, embodied in the Baer-1 and BRH-3 patents. The Rusch-2 circuitry was unstable with respect to time, temperature and voltage, and was deemed by Baer to be too expensive to be used in a commercial product.

TT 4-19 lines 8-10 (Baer); Ex. JL-1 (Anderson's Opening Statement, CDI); Plaintiffs' Pre-Trial Memorandum at 5 (Rusch's circuits "had little commercial impact in the industry").

105. Rusch did not participate in any demonstration of Sanders' video game work; he was present but "wasn't very helpful" at the earliest such demonstration. By March 1, 1968, Rusch was no longer working on Sanders' video game development effort, and has been entirely out of the picture since then. Rusch is still employed by Sanders as an engineer, although he was not called to testify at trial by Magnavox.

TT 3-141, lines 19-25; 3-142, lines 9-20; 3-144, lines 9-22.

106. The first Magnavox Odyssey produced, the ITL200, was licensed by Sanders under the BRH-3 patent, as well as others. The schematics Sanders supplied Magnavox in support of their patent license agreement included player and ball symbol generators, primary and secondary flip-flops, wall generators and other associated

circuitry. These schematics were identical to those of the BRH-3 patent.

Ex. CP (Magnavox license support schematics); Ex. DK (BRH-3 patent); Plaintiffs' Ex. 30 (service manual, ITL200); TT 4-15, 4-16 (Baer).

107. The various circuits and functions of the Odyssey ITL200 are disclosed in the BRH-3 patent, not the Rusch-2 patent.

TT 4-15, line 7 - 4-16, line 25 (Baer).

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b. No Commercial Success--Odyssey Sales.

108. The sales of the Odyssey game (ITL200) started very slowly, and were slower than Magnavox anticipated. There was a great deal of difficulty in selling the games. Consumers did not understand them, or how they worked. The game was somewhat clumsy and was destined to commercial failure; the motion was erratic and difficult to control. The game used archaic techniques.

TT 6-111, line 15 - 6-112, line 19 (Briody); TT 7-65, line 22-25; 7-68, line 2-7 (Bushnell); TT 8/14 a.m. at 339, lines 5-10 (Crane).

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109. Many consumers did not like the overlays that came with the Odyssey and, since television screen size varied, they were impractical.

TT 6-114, line 6 - 6-115, line 3 (Briody); TT 7-68, line 2-7 (Bushnell); Fritsche counterdesignation at 537, 538.

110. In 1980, the Odyssey 2 microprocessor based game was a weak third in the marketplace behind the Atari 2600 and Mattel Intellivision, both in terms of capability and performance.

TT 7-11, lines 1-4 (Levy).

111. In a self-described effort in late 1978 to "have the best total game system and make a lot of money," Magnavox instructed its employee R.W. Staup to "have our list of games to be developed include those games which we can 'steal' from other manufacturers." Staup and G.A. Michaelson (the author of the memorandum to Staup) would then jointly review all Atari games and all other games and cartridges, and then "select those we think are the best and get someone to design a Magnavox version."

Ex. IC.

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112. In 1982, the Seventh Circuit reversed Judge Leighton's denial of a preliminary injunction against Magnavox and directed the district court to enter a preliminary injunction against Magnavox' continued copyright infringement of Atari's rights in the video game "PAC-MAN." At issue was Magnavox' video game for the Odyssey 2 called "K.C. Munchkin."

See Atari Inc. v. North American Phillips Consumer Electronics Corp., 672 F.2d 607 (7th Cir. 1982).

113. No competent testimony was offered by Magnavox to establish that Magnavox ever made any money from the sales of its Odyssey ITL200 video game. Magnavox' sole witness on the subject of sales did not know how much Magnavox invested in tooling up for the production of Odyssey or Magnavox' total costs of manufacturing during the relevant years of 1972-1975, or Magnavox' costs of distribution, or Magnavox' cost for repair or maintenance of refurbished items, or Magnavox' profitability or lack thereof.

TT 6-115, line 4 - 6-116, line 7 (Briody).

c. No Commercial Success--Licensing (Atari Pong).

114. **While at the University of Utah Bushnell saw the game**

"Space War" being played at the computer lab. Space War had a "profound" influence on Bushnell's career. He believed that if he could make Space War cost effective it would obsolete the other coin operated games he managed at the amusement part.

TT 7-58 - 7-59, line 7 (Bushnell).

115. In 1969 and 1970 Bushnell worked on and developed an arcade game called "Computer Space." At this time Bushnell and his associates developed long lists of games that could be made with the basic technology used for "Computer Space"; he planned a "fundamental revolution" playing amusement games on the video screen. Included on the games list were sports games such as tennis, soccer, hockey, and baseball. He planned to make games for both the arcade and consumer home markets.

TT 7-60, line 1 - 7-63, line 13 (Bushnell).

116. Bushnell saw the Magnavox Odyssey game at a demonstration in a hotel in May, 1972. By that time, Bushnell's Computer Space game was already on the market, and various other games were in the planning stages. Bushnell believed the Odyssey game was an inferior product and would never be a commercial success. The only effect on Bushnell of seeing the Odyssey game was to reorder his

priorities. Instead of choosing a baseball game or a driving game as his second game, as he would probably have done, Bushnell chose instead to use a tennis game as his second commercial product.

TT 7-65, line 6 - 7-68, line 16 (Bushnell).

117. The Atari "Pong" tennis game was developed by Bushnell with his assistant Alan Alcorn. In developing "Pong" for the Arcade, Bushnell had no use for and did not refer to the Baer-1 or Rusch-2 patents; he used a different technology appropriate for the arcade. The commercial success of arcade Pong is due entirely to the development, implementation, and marketing efforts of Bushnell and Atari and cannot be cited as the requisite nexus between the analogue circuitry of Rusch-2 and commercial success.

TT 7-69, line 12 - 7-71, line 8; 7-78, line 18 - 7-79, line 3 (Bushnell).

118. Nolan Bushnell, for Atari, settled litigation against Magnavox and took a license under the Baer-1, Rusch-2, and BRH-3 because the price of litigation would be at least as much as the cost of the license (about half a million dollars). Further, Bushnell believed that as an early, cheap licensee he would gain a substantial advantage over competitors from whom Magnavox, utilizing

an Atari license, could exact a premium. At no time in the past or to this day did Bushnell or Atari believe that they infringed the Baer-1 or Rusch-2 or that they were valid. Bushnell's and Atari's decision to settle litigation for a license is no evidence of commercial success.

TT 7-75, line 8 - 7-79, line 3 (Bushnell).

119. As part of the Atari settlement with Magnavox, Atari was to turn over information about certain technology to Magnavox; this technology did not include the microprocessor based technology of the Atari Video Computer System 2600. After the settlement, Magnavox sought without success to obtain from Atari the microprocessor based technology of the Atari 2600 Video Computer System. The technology portion of the Atari settlement was of little, if any, significance.

TT 7-78, line 2-17; 7-90, line 2-18 (Bushnell).

d. No Commercial Success--Licensing: Other Licensees.

120. Coleco and Bally settled litigation for licensees at about the same time as Atari settled and the amounts paid for licensees by Coleco and Bally were similar to that paid by Atari.

Revenues obtained from these and other Magnavox settlements and licensees were from both foreign and U.S. sales which were not disaggregated in the presentation of evidence. These settlements, as well as subsequent settlements and licenses, were subject to the same commercial considerations as detailed in regard to Atari, and cannot be accepted as proof of commercial success in the absence of more specific proof by plaintiffs that the settlements represent willing acceptance and recognition of the Rusch-2 patent or any other Sanders patent.

DM (Coleco license); DN (Atari license); TT 7-75, line 8 - 7-79, line 3 (Bushnell); Stip. 27.

121. Magnavox has never before asserted either the Baer-1 or the Rusch-2 patents against software-only manufacturers.

TT 6-124, lines 1-5, 21-25; 6-125, line 21; 6-126, line 22 (Briody).

122. There are 25-30 companies who at one time produced software for the Atari 2600 VCS; today there are approximately 150 producers of computer and game software.

TT 7-24, lines 10-19 (Levy).

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123. No software-only manufacturer of video game programs has purchased a license from Magnavox under the Rusch-2 patent, nor has Magnavox requested or demanded that any such manufacturer obtain a license. Unlicensed program manufacturers include Imagic, Parker Brothers, Broderbund, Synapse, Epyx, Sierra, Electronic Arts, Spinnaker, and CBS. Demonstrated in Court was a Parker Brothers "Reactor" game for the Atari 2600; the game object was to use a plaza-controlled "hitting spot" to hit machine-controlled "hit spots" and thereby reverse the hit spot motion in exactly the fashion seen in Odyssey Tennis. Also unlicensed are most manufacturers of home computers which play video games, including IBM, Apple, and Commodore.

TT 6-126, lines 5-22 (Briody); Ex. JV (Parker Brothers' Reactor game cartridge); Mayer Dep. (5/9/84, Activision) at 59, 66, 175.

124. Milton Bradley took a license from Magnavox effective January 1, 1983 which obligated Milton Bradley to make an initial non-refundable payment of $100,000.00, and a running royalty on products sold after the license date. Milton Bradley never made any subsequent royalty payment. Milton Bradley made both hardware and software itself and through a system acquired from GCE. They are

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not a software-only manufacturer.

Plaintiffs' Ex. 260 (MB license); Exs. EV, FL (Lehrberg); TT 8/13 p.m. at 260, line 28 - 262, line 22; 292, line 16-25 (Lopez); Stip. 27.

e. No Evidence That Any Licensing Commercial Success Is Due To Rusch-2.

125. Early in the prosecution of the forerunner to the Baer-1 patent, Magnavox informed the Patent Office that Baer "has 'discovered' a new and novel use for a standard television receiver, whereby the general public may employ the television receivers in their homes for other than viewing telecast material. This novel discovery is that the standard television receiver used in the home can be further employed for the playing of games and other similar activities."

Ex. DC (Seligman).

126. Ralph Baer, in his signed affidavit filed in connection with the Canadian patent office proceedings on the validity of the Canadian counterpart to the Baer-1 patent, took credit for creating the videogame industry, attributing nothing to Rusch or the Rusch-2 patent. Baer stated, in part, "It is therefore clear to me that my invention and the success in licensing to Magnavox created a

new industry where there was none before. Since producing the first model Odyssey, Magnavox has continued [to] develop and product Video Games based on my original and further inventions. In addition to manufacturing, Magnavox has continued to license other manufacturers and has collected well over ten million dollars in royalties to date." Baer continued in support of his Baer-1 patent: "Magnavox has also granted sublicenses to in excess of thirty companies, including Atari, Inc., Coleco Industries, Inc., and Tandy Corporation for the manufacture of television game components." Baer concluded: "All of these companies are using my invention as described and claimed in patent application [Canadian counterpart to Baer-1]. My contribution has been recognized by many professional groups over the past ten years."

Admission: Ex. JL-4 (Baer Canadian affidavit - May 5, 1982).

127. In communications to the U.S. Patent Office, again in an effort to defend the validity of the Baer-1 patent, Magnavox again urged the commercial success of Baer-1 and affirmed that the Mayer affidavit "states the facts intended to be shown thereby namely that [the Baer-1] patent has been sublicensed by Magnavox to more than thirty companies. This fact is evidence of commercial success." Sales in the "period subsequent to Baer" were "further evidence of commercial success." The U.S. Patent Office Primary Examiner declined to give weight to the Mayer affidavit and other

Magnavox submissions precisely because no distinction was made between the various Sanders patents in ascribing "success."

Ex. DS at 40; Ex. ID (Mayer affidavit); Ex. DY (Examiner's Statement from File Wrapper).

f. The Rusch-2 Patent Met No Long-Felt Need.

128. The Rusch-2 patent met no long-felt need. There was no need to develop an analog spot generator to replace Baer's digital embodiment, as evidenced by Baer's abandonment of Rusch's analog approach. Groups of people had not been laboring in an attempt to develop improvements to Baer's device; only Rusch undertook this task. Even with a fully operational prototype, albeit of the BRH-3 patent, it took Sanders four years to develop an interest in their video game.

TT 4-19, lines 8-10 (Baer); Ex. JL-1 (Anderson's Opening Statement, CDI); Plf's Resp. to Def's First Set (#71).

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III.

NO INFRINGEMENT.

A. The Claims Defined.

129. The Rusch-2 patent is an improvement patent expressed in the elements of the relevant claims in means plus function language, e.g. "means for generating a hit symbol." The Rusch-2 patent relevant claims are therefore defined by the claim language together with the circuitry disclosed in the specification and its equivalents. The scope of equivalents is narrower than that accorded to a pioneer patent.

Exs. JL-4 and CJ.

130. In the case of generating a hitting symbol, the only means the Rusch-2 patent discloses is the combination of a sawtooth wave generator pulses and a diode slicer which varies a voltage level. Likewise, the only means disclosed by Rusch for generating a hit, or ball symbol, is the combination of externally generated ball horizontal and vertical control voltages and a capacitor delay network. Rusch's means for detecting coincidence is the same as that developed by Ralph Baer and otherwise well known in the art, namely, an AND gate. The sole means Rusch discloses for imparting a distinct motion is the use of a flip-flop (a generic circuit which Rusch did not even include in the patent drawings) which provided

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the horizontal and vertical control voltages to the ball generator.

TT 5-24, line 7 - 5-39, line 3 (Ribbens).

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B. The Differences Between Rusch-2 and Atari 2600/Activision.

131. There is no sawtooth wave generator or diode slicer in the Atari 2600 used with an accused Activision cartridge.

TT 6-63, line 25 - 6-65, line 9 (Ribbens).

132. The Atari 2600 does not generate or use a digital or analogue sawtooth wave form.

TT 6-64, line 21 - 6-65, line 9 (Ribbens).

133. A hard-wired electronic device is a device whose function is determined at the time it is built, so that the function cannot be changed except by reconfiguring the wiring of the device. The devices described by the Baer-1, Rusch-2 and BRH-3 patents were hard wired. A read only memory is not a "hard-wired" device.

TT 7-121, lines 9-19; TT 8/13 p.m. at 235 line 27-236, line 9 (Thacker).

134. The Rusch-2 patent does not describe or disclose the use of video game cartridges such as those made, designed and sold

by Activision and there is nothing in any of the language of the patent or the patent specifications to indicate that use of interchangeable software was contemplated to be a part of the Rusch-2 patent.

TT 6-24, lines 10-22 (Ribbens).

135. Activision designs and manufactures video game cartridges to be played on the user's television set in connection with a master console and a hand-held control known as a "joystick." A video game cartridge is a small plastic box, the size of a tape cassette, which contains a computer program encoded in a "read only memory" (ROM) semiconductor, and placed on a very small printed circuit board. Activision does not manufacture master consoles or joysticks.

Exs. GT, IE.

136. The only "background" supplied in connection with the early Odyssey games were transparent plastic overlags which the player would tape to the television screen.

Plaintiffs' Exhibits 28, 31 and 32 (Manuals for early Odyssey).

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137. Activision game cartridges are computer software. The cartridge itself does not generate dots, detect coincidence, or provide a means for imparting a distinct motion. Each Activision cartridge, depending upon the theme of the particular video game, contains a computer program which instructs the microprocessor in the master console to perform certain functions. Each Activision game cartridge is programmed to instruct the microprocessor in the master console to generate colorful and realistic backgrounds and sound effects.

TT 6-9, line 17 - 6-10, line 3 (Ribbens).

138. The three main components of stored program digital computers are a memory, a central processing unit and an input-output system.

TT 7-118, line 21 - 7-120, line 2 (Thacker).

139. The Atari 2600 Video Computer System is a stored program digital computer which is capable, among other things, of generating and displaying games on a TV set. A program cartridge (ROM chip) supplies instructions to the microprocessor, which performs calculations on a line-by-line basis using its memory to hold the results of its calculations. The player inputs information to

the Atari 2600 by using the joysticks, which are read by the input/output chip, which sends a coded message to the central processing unit. The (microprocessor) central processing unit then sends coded messages to the "TIA chip" to display display certain images on the TV. Motion is reversed by instructing the microprocessor to increment a register; no flip-flop or voltage reversal occurs. Momentum is imparted by a series of program instructions; no resistor/capacitor differentiator/integrator is used, as in the Rusch-2 circuitry.

TT 8/12 a.m. at 8, line 24 - 23, line 10; 41, line 11 - 22, line 1 (Thacker); TT 8/12 p.m. at 86, line 10 - 87, line 9 (Nielsen).

140. The Atari 2600 stored program digital computer is capable, with the appropriate program, of playing chess or bridge against a human player, or of simulating the flight of a space shuttle. The Rusch-2 patent technology is not capable of playing a game against a human player or of performing the complex tasks necessary to play chess or bridge.

Exs. JT, HZ.

141. The ROM chips containing the accused Activision software were manufactured in an extremely complex industrial

process of chemical, electrical and photographic means. A ROM chip is composed almost entirely of transistor elements. A ROM chip is largely a generic part, with the changes in transistor location (presence or absence) made to produce the distinctive aspects of each game. The presence or absence of transistors is determined by one of the photographic steps in the manufacture of the ROM chip.

TT 7-125, line 21 - 7-128, line 12; 7-131, line 13 - 7-133, line 16 (Thacker); Ex. GW (ROM Chip photograph).

142. During the operation of the Atari 2600 Video Computer System playing an accused Activision program, the central processing unit (microprocessor) recomputes what the entire frame should look like 60 times per second. The microprocessor issues as "write" operation to the TIA chip to display each line. The write operation is a series of Os and is known as a single binary byte.

TT 7-148, line 1 - 7-149, line 21 (Thacker).

143. An Atari 2600 Video Computer System can be programmed by the end user by employing a BASIC (computer language) cartridge and a simple hand-held push-button keyboard which is inserted in place of the joysticks. The Rusch-2 patent technology is not

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programmable.

TT 8/14 a.m. at 342, line 9 - 343, line 21 (Crane); Ex. JS (Keyboard Controller).

144. The technology disclosed in the Rusch-2 patent specifications is a set of discrete analogue hard-wired circuits. The Atari 2600 stored program digital computer calculates positions by use of a microprocessor. The Rusch-2 technology cannot perform any computations. The Atari 2600 utilizes a read only memory (ROM) chip to instruct the microprocessor as to the nature of the game to be played. The Rusch-2 technology has no memory device. The Atari 2600 also uses a random access memory contained in the central processing unit (CPU) to store computations and positions. The Rusch-2 technology has no equivalent memory. The Atari 2600 uses a central processing unit (the microprocessor). The Rusch-2 technology uses no CPU or microprocessor. The Atari 2600 utilizes external contacts to receive ROM chips (e.g., Activision cartridges), but the Rusch-2 has no external contacts, but is self-contained. The Atari 2600 can display an infinite variety of video games on interchangeable ROM chips with complex figures, backgrounds, action and scoring. The Rusch-2 technology cannot display backgrounds or complex figures, or keep score. The Rusch-2 is not a programmable device and cannot display a great variety of video

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games.

TT 7-153, line 3 - 7-155, line 11 (Thacker); TT 8/12 a.m. at 8, line 24 - 23, line 10; 28, line 20 - 42, line 1 (Thacker).

145. The function of the microprocessor in the Atari 2600 Video Computer System is to perform mathematical and logical operations pursuant to the algorithms supplied by the computer program.

TT 8/12 a.m. at 8, line 24 - 11, line 2 (Thacker).

146. The algorithms which are stored in the read-only memories contained in the accused Activision cartridges define the motions in each Activision game which make each game distinctive.

TT 6-36, lines 5-8 (Ribbens).

147. In order to generate an image, whether moving or static, with the Atari 2600 using an accused Activision cartridge, the program issues a sequence of instructions to the microprocessor.

TT 8/12 a.m. at 22, line 25 - 23, line 10 (Thacker).

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148. The microprocessor in the Atari 2600 Video Computer System can execute between 100,000 and 500,000 instructions from the program per second.

TT 8/12 a.m. at 11, lines 3-17 (Thacker).

149. The Atari 2600 Video Computer System uses a RAM (or read-write) memory to store the results of calculations. No RAM or its equivalent is used in the circuitry in the specification of the Rusch-2 patent, and no calculations take place in that technology.

TT 6-36, line 21 - 6-37, line 16 [Ribbens]; TT 7-139, line 10 - 7-140, line 16 (Thacker).

150. The technology of the Rusch-2 patent specification cannot calculate the position of spots by performing computations, but rather directly displays the positions of the spots, and directly displays motion.

TT 6-23, line 25 - 6-24, line 12; 6-37, line 21 - 6-38, line 8 (Ribbens).

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151. The Rusch-2 patent circuitry contains approximately 50 transistors, whereas the Atari 2600 with an accused Activision program has more than 50,000 transistor elements on the various integrated circuits.

TT 6-39, line 7 - 6-40, line 1 (Ribbens).

152. There are two means for detecting coincidence used by computer programmers for the Atari 2600. The programmer may use the 16 collision laches which sample the numbers representative of the position on the screen of all generated images, and compares these numbers; or the programmer may use a computer algorithm to arithmetically analyze the relative positions of the symbols on the screen. The Atari 2600 Video Computer System increments or decrements (adds to or subtracts from) the position registers which store the numerical data representative of the position on the screen of various symbols. No such function is performed by the Rusch-2 patent which uses an elementary electronic flip-flop to reverse direction or impart momentum.

TT 5-79, lines 1-15 (Ribbens); TT 8/13 a.m. at 211, lines 2-8 (Thacker).

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C. The Rusch-2 Is Of No Value Or Relevance to Atari VCS 2600/Activision Concept, Design, or Manufacture.

153. Both Plaintiffs' and Defendant's experts fully agreed that the circuitry disclosed in the specification of the Rusch-2 patent teaches nothing about how to design the Atari 2600 used with Activision software, the Rusch-2 patent was not used as a technical source for the design of the Atari 2600 Video Computer System.

TT 6-42, lines 9-15 (Ribbens); TT 8/12 a.m. at 38, line 28 - 39, line 3 (Thacker).

154. The process of designing Activision software for the Atari 2600 Video Computer System is totally unrelated to the design process of the discrete electronic circuits in the specification of the Rusch-2 patent, and typically involves designers from different disciplines, with different educational backgrounds and skills.

TT 8/12 a.m. at 37, line 25 - 38, line 22 (Thacker); TT 8/14 a.m. at 338, line 26 - 340, line 2 (Crane).

155. The process of software design begins with assembly language. Assembly language is converted into numbers by an assembler program. The machine language which results from the conversion of assembly language into numbers is then sent to the ROM

manufacturer, which uses the machine language to make the individual mask level in the fabrication process for the ROM chip.

TT 8/12 a.m. at 14, line 12 - 15, line 2 (Thacker).

156. Activision video game designers did not use and had no use for the Rusch-2 patent in designing Activision video games, since there was no connection between the microprocessor-based computer programs written by Activision software designers and the circuits in the Rusch-2 patent specification.

TT 8/14 a.m. at 357, line 21 - 359, line 7 (Crane).

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D. All Television Applications Use Time Delay.

157. Plaintiffs' expert Dr. Ribbens testified that in his opinion the accused Activision cartridges used with an Atari 2600 Video Computer System were equivalent to the Rusch-2 patent circuitry on an element-by-element basis under Section 112 as well as taken as a whole under the doctrine of equivalents because both systems function to generate video signals on the screen of a television at a point which is determined by the time relationship of the horizontal and vertical synchronizing pulses. Given this reason for an opinion of equivalents, all conceivable technologies for displaying moving spots on televisions (or other raster scan displays), including cable TV, VCRs, all modern personal computers and/or broadcast television would be equivalent to the Rusch-2 patent.

TT 5-96, line 13 - 5-97, line 3; 6-24, line 23 - 6-27, line 20 (Ribbens); TT 8/12 a.m. at 48, line 19 - 52, line 1 (Thacker).

158. Measurement of time delay from the vertical synchronization signal is necessary to display any coherent image on raster scan displays, including television, and this characteristic is inherent in the nature of television itself.

TT 8/13 p.m. at 235 lines 4-18 (Thacker).
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E. There is No Infringement.

159. Activision video game software used with the Atari 2600 Video Computer System is not identical to any of the relevant claims (means plus function claims as defined by the circuitry in the specifications of the Rusch-2 patent.) Plaintiffs have not proved literal infringement by proof of identical devices.

TT 8/12 a.m. at 39, line 4-42, line 1 (Thacker); see Findings of Fact 129 - 158.

160. Activision software used with the Atari 2600 is not, on an element by element basis, equivalent under Section 112 to any of the relevant claims of the Rusch-2 patent. Plaintiffs have not proved lateral infringement by proof of element by element Section 112 equivalance.

See Findings of Fact 129 - 158; TT 8/12 a.m. at 45, line 3 - 49, line 28 (Thacker).

161. Activision software used with the Atari 2600 is not, taken as a whole, equivalent (under the doctrine of equivalents) to any of the relevant claims of the Rusch-2 patent. Plaintiffs have

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not proved infringement under the doctrine of equivalents.

See Findings of Fact 129 - 158; TT 8/12 a.m. at 43, line 9 - 45, line 2 (Thacker).

162. No testimony concerning the Mattel Intellivision system was adduced from Plaintiffs' expert, Dr. Ribbens. Since Plaintiffs bear the burden of proving infringement, in the absence of such proof the Activision game cartridges accused of infringing the Rusch-2 patent when combined with the Mattel Intellivision master console do not infringe said patent.

(No transcript or exhibit cite since no evidence offered or introduced.)

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IV.

PERMISSIBLE ADAPTATION

163. Atari 2600 Video Computer Systems were manufactured and sold pursuant to a license from Magnavox. The Atari 2600 is sold with one or more software cartridges which Atari fully expects will be used interchangeably with other software which is compatible with the Atari 2600.

Ex. DN-1; TT 8/13 p.m. at 277, line 23 - 278, line 12 (Lehrberg).

164. There was and is a substantial industry of interchangeable software for the Atari 2600, including Atari itself, Activision, Parker Brothers, Imagic and many others; none of the software-only manufacturers took a license from Magnavox.

TT 6-125, line 21 - 6-126; line 22 (Briody).

165. Activision does not directly infringe any claim of the Rusch-2 patent.

Plf's Third Supp. Resp. at 2. see Findings of Fact 8.

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166. Atari, Coleco, and Mattel have licenses from Magnavox, including the right to sell master consoles and video game cartridges to consumers. The purchaser of any one of these master consoles receives the rights that the licensed manufacturer of its master console possesses.

Exs. DN, DM, EI.

167. The software contained in the Activision game cartridge constitutes only a small portion of the total circuitry of the Atari 2600 Video Computer System when that cartridge is being played on the Atari 2600.

Ex. GT (disassembled Atari 2600).

168. The ROM chip which stores the program in an Activision cartridge is physically almost a generic product, in which the arrangement of transistor elements is changed from game to game to define the individual game characteristics.

TT 7-131, line 13 - 7-133, line 16 (Thacker).

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169. Interchangeable software or ROM cartridges are nowhere mentioned in the Rusch-2 patent.

Ex. DF (Rusch patent).

170. When a consumer uses interchangeable Activision video game software on the consumer's licensed master console, the software simply "adapts" the functioning of the master console to display a different video game. By so doing the consumer does not directly infringe any claim of the Rusch-2 patent, and thus Activision does not induce or contribute to any infringement of any claim of the Rusch-2 patent.

See Findings of Fact 159 - 169.

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V.

CONSUMERS OF ATARI CONSOLES
AND ACTIVISION SOFTWARE
HAVE AN EXPRESS LICENSE.

171. In June 1976, Magnavox and Atari entered into a sweeping settlement agreement and license agreement under the Baer-1, Rusch-2, and BRH-3 patents in which Magnavox specifically released Atari and all of Atari's customers from liability for infringement, and convenanted that it would not sue them, in exchange for a paid-up license (i.e., fixed sum) from Atari to Magnavox.

Ex. DN (Atari license); Stip. 27.

172. The relevant language from the License Agreement provides:

> "4.01 Magnavox covenants not to sue Atari or its customers for infringement of any patents presently issued or issued on presently pending applications owned or controlled by Maganvox or Sanders, in the field of video games, during the term of this license [until 1990]." (Emphasis supplied)

Ex. DN-1 (Atari license).

173. The relevant language from the Settlement Agreement provides:

> "V. As to games made or sold by Atari, Magnavox and Sanders hereby release and forever

discharge Atari and its customers and each of them, from any and all claims, demands, actions or causes of action of any nature whatsoever which Magnavox or Sanders have, shall or may have against Atari and its customers by reason of any act, cause, matter or thing claimed or alleged in any of the pleadings [includes infringement of Rusch-2], records or other papers on file in the Sears case and in the Atari case, or based upon or connected with claims made or filed in the aforesaid actions or in any way related thereto." (Emphasis supplied)

EX. DN-2 (Atari Settlement).

174. This covenant not to sue and release of Atari's United States customers gave Atari's United States customers an express license to purchase Activision video game cartridges for use with their licensed Atari master consoles.

Ex. DN-2 (Atari Settlement); TT 7-76, lines 12-19; 7-86, lines 17-24 (Bushnell) [Note that the cross-examination question beginning on 17-25 refers to purchase of a separate Allied Leisure Arcade Game Machine which is itself a complete game system which obviously cannot be plugged into or otherwise used with an Atari Master Console.]

175. In accordance with the terms of the Atari-Magnavox settlement agreement, Atari received a fully paid-up license instead of a running royalty arrangement.

TT 7-75, lines 8-15 (Bushnell); Stip. 27.

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176. At the time of the Atari-Magnavox agreements, the Atari 2600 and Atari 5200 video game master consoles were not yet on the market. Every United Sates customer who subsequently bought an Atari master console received the benefit of Magnavox' release and covenant not to sue, and each was thereby completely free (licensed) to use his or her unit to play video games. Nothing in the settlement or license agreements limits either document to situations in which the consumer uses only Atari video game cartridges and joysticks.

TT 7-76, lines 12-16 (Bushnell).

177. Atari's United States customers do not infringe any claim of the '507 patent through their purchase or use of any Activision video game cartridge for use with their Atari 2600 master console.

See Findings of Fact 171 - 176.

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VI.

CONSUMERS PURCHASING ACTIVISION SOFTWARE HAVE AN IMPLIED LICENSE IN LICENSED CONSOLES.

178. Video game cartridges were sold in toy stores; chain stores; department stores such as Sears, Penney's, and Macy's; audio visual stores; video stores; such places as the Wherehouse, King Norman's, and Pacific Stereo; and through the Sears catalogue.

TT 8/13 p.m. at 249, lines 24-26 (Lehrberg); 289, lines 9-12 (Lopez).

179. In June, 1976, Magnavox and Atari entered into a settlement and license agreement, under which Atari received a paid-up license (i.e., fixed sum) from Magnavox. Each and every Atari 2600 Video Computer System master console is manufactured, offered for sale and sold under a Magnavox patent license which includes the Rusch-2 and Baer-1 patents.

Ex. DN-1 (Atari license); TT 6-120, line 10 - 6-121, line 1 (Briody); Stip. 27.

180. In June, 1976 Magnavox and Coleco entered into a license agreement under which Coleco received a fixed payment license agreement from Magnavox. Each and every Coleco master

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console is manufactured, offered for sale and sold under a Magnavox patent license which includes the Rusch-2 and Baer-1 patents.

Ex. DM (Coleco license); Stip. 27.

181. On January 24, 1983 Magnavox and Mattel entered into a license agreement under which Mattel received a paid-up license from Magnavox covering present and past use of the Rusch-2 and Baer-1 patents. Each and every Mattel Intellivision master console is thus manufactured, offered for sale and sold under a Magnavox patent license which includes the Rusch-2 and Baer-1 patents.

Ex. EI (Mattel license); Stip. 27.

182. At the retail stores that sold video games, master consoles, video game cartridges and peripheral equipment such as joysticks and storage devices were all displayed together and sold in the same department.

TT 8/13 p.m. at 250, line 26 - 251, line 23 (Lehrberg); 290, lines 3-11 (Lopez).

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183. Game cartridges were organized and displayed according to the master console hardware with which they were compatible. Thus, all Atari 2600 VCS-compatible software is grouped together, all Coleco-compatible software is grouped together, and all Mattel-compatible software is grouped together, regardless of manufacturer.

TT 8/13 p.m. at 252, lines 2-28 (Lehrberg); 291, line 11 - 294, line 13 (Lopez); Exs. ET, EU, EV, EM, ES, EP.

184. Video games cartridges were internally organized and displayed in retail stores within system compatibility in several different ways: e.g., in alphabetical order by title, or by type of game, such as sports games or puzzle games. Video games cartridges were always organized by system compatibility, without regard to the manufacturer of the software. Thus, software manufactured by Atari for the Atari 2600 VCS was displayed side by side with software from Activision, Imagic, U.S. Games, and Twentieth Century Fox, to name but a few manufacturers of Atari 2600 VCS software. Store displays made clear immediately to the consumer which video game cartridges played on which hardware system.

TT 8/13 p.m. at 291, line 11 - 294, line 13 (Lopez); Exs. ET, EU, EV, EM, ES, EP.

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185. A common marketing practice in retail stores was to have a working display of a master console connected to a television set, with an assortment of compatible cartridges of various manufacturers that the consumer could plug in and play.

TT 8/13 p.m. at 250, line 26 - 251, line 7 (Lehrberg); 294, line 14 - 295, line 2 (Lopez).

186. Video game cartridges are entertainment products. Within system compatibility, consumers bought video games by title, rather than on the basis of who was the manufacturer, just as movie-goers choose by title and content, not producer. Moreover, customers were confused about manufacturer.

TT 8/13 p.m. at 296, line 21 - 297, line 5 (Lopez); 267, lines 19-23 (Lehrberg); 268, lines 10-17 (Lehrberg).

187. Sears, Roebuck & Co. was a pioneering retailer of video games. In 1982, Sears' sales from the video game line were over $220 million, up from approximately $120 million the year before. Sears was Atari's largest customer, at least until Spring, 1982. Sears sold the Atari 2600 VCS under Sears' private label "Sears Video Arcade," which sales accounted for approximately one-half of the VCS units sold in its first year of sale. In 1980,

Sears had approximately 850 retail stores, in addition to catalog sales outlets.

TT 8/13 p.m. at 247, lines 12-15; 249, lines 7-21; 268, lines 1-21; 269, line 24 - 270, line 7 (Lehrberg).

188. Video games were displayed and promoted in Sears catalogs and in Sears advertisements according to the same principles by which video games were displayed and promoted in retail stores. The various video game master consoles were displayed with the software with which each master console was compatible. About 16-18 million Sears' 1982 and 1983 Christmas catalogs were distributed.

TT 8/13 p.m. at 254, line 17 - 260, line 27; 262, line 23 - 267, line 23 (Lehrberg); Exs. FK, FL, FH, FI, FM.

189. As part of its video game display, Sears published a "flip book"--a merchandising device used in many products throughout the Sears store. In the case of the video game department, a flip book sits on a cardboard easel on top of the glass case which contains the video games. Each page of the flip book is devoted to a single video game cartridge sold by Sears, including a description

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of the game, and artwork showing what the package looked like and how the game looked on the TV screen.

TT 8/13 p.m. at 251, line 13 - 252, line 1 (Lehrberg).

190. The guiding marketing principle for print and television consumer advertising of video game cartridges was to identify the hardware system with which the cartridge was compatible.

TT 8/13 p.m. at 263, line 26 - 264, line 5 (Lehrberg); Exs. FH, FI; TT 8/13 p.m. at 299, line 10 - 303, line 19 (Lopez); Exs. EX, EY, EZ, FB, FE.

191. Advertising, store displays, and what a consumer is told at point of sale all have a substantial impact on that customer's expectations about the product he is purchasing. Thus, since by advertising, by display, and by information at point of sale, the customer was told that he may plug an Activision cartridge into an Atari 2600, the customer went away with the expectation that if he purchased the cartridge, he could do so.

TT 8/14 p.m. at 454, line 20 - 455, line 4; 455, line 16 - 456, line 4 (Star).

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192. Video game cartridges, regardless of manufacturer, were used to promote the sale of the master consoles with which they were compatible. Existence of desirable software enhanced the sale of master consoles.

TT 8/13 p.m. at 268, line 22 - 269, line 21 (Lehrberg).

193. By 1982, one-half of the 10 million American homes with Atari 2600 VCS systems had at least one Activision game cartridge.

TT 8/13 p.m. at 298, line 18 - 299, line 2 (Lehrberg); Ex. EE (Bernstein survey).

194. The Consumer Electronics Show ("CES") is the semi-annual exhibition of manufacturers of consumer electronics and related goods. Since January, 1980, Activision has attended every CES show; Activision first exhibited its software at the June, 1980 show. Magnavox was also at the June, 1980 CES show, and at every show thereafter.

TT 7-1, line 18 - 7-4, line 25; 7-6, line 15 - 7-7, line 3 (Levy); Exs. EJ 1-9, FC.

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195. Activision ran widely distributed trade advertisements in connection with CES to intrigue retailers and everyone else at the show to visit the Activision booth and see its products.

TT 8/13 p.m. at 302, lines 1-20 (Lopez).

196. All successful sellers in the wholesale or retail trade pay attention to customer attitudes, beliefs, concerns, and preferences. Any company, such as Magnavox, who marketed a video game system would have done so and they did so.

TT 8/14 p.m. at 456, line 23 - 457, line 1 (Star); TT 8/13 p.m. at 289, lines 21-27 (Lopez); see also Finding of Fact 197.

197. Magnavox followed the video game market very closely. At the time Magnavox and Atari entered into a settlement in June, 1976, Magnavox knew that Atari was developing a microprocessor-based video game (eventually marketed as the Atari 2600 Video Computer System). Moreover, Magnavox has employees responsible for keeping up with the video game market. One or more in-house attorneys at Magnavox are assigned to keep abreast of the business of video game licensing. They read trade magazines to keep informed of the products that are coming on the market. Marketing and salespersons at Magnavox are in and out of retail stores from time to time and have

been informed to stay aware of video games that are brought out on the market and how they are sold. From 1972 to the present, Ralph Baer himself had responsibilities for monitoring the appearance of home video games on the market, and in this connection reads publications, attends consumer electronic shows, visits displays there, and on occasion goes to retail stores.

TT 4-19, line 17 - 4-20, line 22 (Baer); 6-99, lines 6-11; 6-122, lines 1-19 (Briody).

198. There were no warnings in video game departments at any retail store to alert the customer that only Atari-manufactured cartridges could be purchased or used with Atari-manufactured consoles, or that only Coleco-manufactured cartridges could be used with Coleco-manufactured consoles, or that only Mattel-manufactured cartridges could be used with Mattel-manufactured consoles.

TT 8/13 p.m. at 270, lines 8-24 (Lehrberg); 295, lines 3-16 (Lopez).

199. There were no warnings to video game consumers in advertisements, magazines, catalogues, or printed material of any type which notified consumers or warned them in any way that they

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were restricted in any fashion in the use of video game cartridges.

TT 8/13 p.m. at 270, lines 13-24; 272, lines 2-9, (Lehrberg); 295, lines 17-19 (Lopez).

200. There are no warnings on the packages for the Atari 2600 VCS or the Mattel or Coleco master consoles, or on any written instructions or materials contained therein to alert the customer of a master console that certain video game cartridges should not be purchased or used with that master console.

TT 8/13 p.m. at 270, line 8 - 271, line 20 (Lehrberg).

201. Atari is required by its agreement with Magnavox to "mark all products sold by it" which are covered by the Rusch-2 patent "with the word 'Patents' or 'Patent' and the numbers or number of the patents or patent applicable thereto." There are no patent markings on any Atari-manufactured or Sears private label cartridges.

Ex. DN-1 (Atari license); TT 8/13 pm. at 274, lines 12-14 (Lehrberg); Ex. IT (Atari Basketball cartridge).

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202. Magnavox was aware that Sears planned to and in fact did carry non-Atari manufactured software made by companies such as Activision. Magnavox never informed anyone at Sears that it should not sell Activision cartridges, or certain types of Activision cartridges, or cartridges with "hit and hitting" features, or any other non-Atari-manufactured cartridge. Magnavox never suggested to Sears that there should be any warnings to consumers about the use of Activision cartridges nor did it or its licensee Atari provide such a caution in their products.

TT 8/13 p.m. at 275, line 21 - 276, line 28 (Lehrberg).

203. Sears had the capability to and did in fact warn consumers when necessary about the merchandise it sells. Earlier, Sears had warned customers of dedicated (i.e., non-cartridge) video games that leaving the game on overnight might damage the television set. The consumer was warned about this possibility by signs in the retail store and information placed in the "flip book."

TT 8/13 p.m. at 270, line 25 - 272, line 1 (Lehrberg).

204. Sears had an entire department devoted to sending out information to the 850 Sears retail stores. Sears deals with many types of products that have warranties or are affected by government

regulations, and which require Sears to convey information regarding the purchase or use of those products. It was relatively easy for Sears to put out warnings to consumers regarding the burning phosphor problem, and it would have been relatively easy to inform Sears customers that certain video games could or could not be played with certain master consoles.

TT 8/13 p.m. at 271, line 23 - 272, line 1; 277, lines 1-22 (Lehrberg).

205. Atari, a Magnavox licensee, never requested Sears to put up warnings of any type to its customers about video games, nor did Atari ever inform Sears that it was not permissible for a Sears customer to purchase or use an Activision game cartridge with an Atari 2600. Atari did try to keep Sears, its largest customer, from selling other software manufacturers' cartridges for the Atari 2600, by doing such things as giving Sears exclusive deals. Atari was at all times extremely desirous of keeping competitors such as Activision out of the market for sales of software. Atari took out a trade advertisement directed to retailers (not consumers) which made ambiguous suggestions that non-Atari manufactured cartridges might cause a warranty problem with the Atari 2600. Consumers were never

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informed about the substance of the trade ad.

TT 8/13 p.m. at 268, lines 5-9; 272, lines 10-14, 19-21, 24 - 273, line 1; 273, lines 6-9 (Lehrberg); 295, line 25 - 296, line 7 (Lopez); TT 7-75, line 16 - 776, line 11 (Bushnell).

206. Consumer publications such as "Electronic Games" and "Joystick" are devoted to the play and enjoyment of video games. These consumer magazines contain, among other things, game reviews of software manufacturered by different companies, and playing tips. The consumer publications are typically organized by sections according to type of master console--e.g., Atari 2600, Colecovision, Intellivision. No warnings through advertising, announcement, or otherwise, were published in these magazines warning customers that certain video game cartridges could not be used or purchased without potentially infringing the Baer-1 or Rusch-2 patents.

TT 8/13 p.m. at 273, line 10 - 274, line 11 (Lehrberg).

207. The consumer of a master console reasonably expected that he could purchase or use any video game cartridge that was advertised or communicated as being compatible with the master console hardware he owned, regardless of the manufacturer of the

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video game cartridge.

TT 8/13 p.m. at 278, lines 7-12 (Lehrberg); 303, line 27 - 304, line 5 (Lopez); TT 8/14 a.m. at 455, line 15 - 456, line 4 (Star).

208. The consumer of an Atari, Mattel or Coleco master console has an implied license for reasonable use of his or her master console, including the purchase and use of compatible game cartridges, regardless of manufacturer. The consumer does not infringe any claim of the '507 patent by purchasing or using any Activision video game cartridge.

See Findings of Fact 198 - 207.

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VII.

SEVEN ACCUSED ACTIVISION GAMES
DO NOT INFRINGE THE RUSCH-2 PATENT.

A. The Phrase "Imparting A Distinct Motion" Describes Only Two Types Of Motion: Reversal And A Transfer Of Velocity.

209. Rusch's patent application, for what eventually issued as the Rusch-2 patent, did not use the words "imparting a distinct motion" to describe Rusch's invention.

Ex. CS ('284 file wrapper); Ex. DF (Rusch-2 patent).

210. The phase "imparting a distinct motion" is found only in the claims of the Rusch-2 patent; it is not used anywhere within the specification. The phrase was created by Sanders' patent attorneys in response to a Patent Office rejection which stated that certain claims, including claims 25 and 52 (then 44 and 88), were indefinite under 35 U.S.C. 112 "for the uncertain meaning of 'hit' and 'hitting.'" In their remarks which explain the new phrase, Sanders' patent attorneys stated:

> "Applicant, through his attorney, wishes to thank the Examiner for the courtesy extended at an interview on July 13, 1971. Pursuant to the agreement arrived at during the interview, Applicant has amended claim 44 [claim 25 in the Rusch-2] to include the cooperating nature of the 'hit' and 'hitting' symbols particularly reciting that the motion of the 'hit' symbol is dependent upon the position (coincidence) of the 'hitting' symbol with

the 'hit' symbol to impart motion thereto."

Ex. CF ('284 file wrapper) at 127, 146; Ex. CV.

211. In their definition of "hit" spot, Sanders defined the two types of motion which could be imparted:

> "The second functional spot is referred to as a 'hit' spot, and this spot is not directly controlled by the viewer but its position, movement, etc., is determined in part by other electronic signal generating means in the unit, including signal generating means responsive to the position, direction, etc. of the so-called 'hitting' spot. This type of spot represents, for example, a ball, a hockey puck, etc. In the games described in the body of the application, various different control signals are set forth to cause this 'hit' spot to move in different patterns, as, for example, one control causes it to automatically go from an off-screen left position to an off-screen right position and vice versa continually unless coincidence is made with a 'hitting' spot, whereby it would reverse direction, or, alternatively, the 'hit' spot will remain in a steady position until 'hit' by a 'hitting' spot whereupon it will travel in a direction and with a velocity proportional to the direction and velocity of the 'hitting' spot, causing it to move toward an off-screen position, whereupon it will bounce away from the screen in the same fashion as a ball would."

Ex. CF ('284 file wrapper) at 147, 148.

212. Rusch application claim 88, which later issued as claim 51, was amended in precisely the same fashion as application

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claim 44.

Ex. CF ('284 file wrapper) at 163.

213. In other documents filed with the patent office by applicant's attorneys both before reissue was sought and in connection with reissue, imparting a distinct motion is again defined as "cooperating" motion in which the motion of the "hit" or "second" spot is dependent upon or responsive to the motion of the first spot at coincidence.

Ex. CU (Seligman); Ex. DJ (Seligman).

214. The only two types of motion of the "hit" spot within the ambit of claims 25 and 51 of the Rusch-2 patent are reversal of motion (bounce) or where the hit spot travels in a direction and with a velocity proportional to the direction and velocity of the "hitting" spot. The doctrine of file wrapper estoppel limits the claims to this definition since this definition was specifically advanced to avoid a §112 rejection and no subsequent definition or modification was ever submitted to the patent office.

See Findings of Fact 209 - 212.

215. The sole reason that claims 60 through 64 of the Rusch-2 patent were added was to insure that the claims covered video monitors as well as television receivers. The manufacturers of coin operated video games were refusing to take a license under Rusch-2 because they used monitors instead of standard television sets. Sanders was particularly concerned about this omission with respect to claims 25 and 51:

> "The inclusion of terms within claims of said Letters Patent 3,059,284, such as claims 25 and 51, which might form a basis for any party to take the position that those claims do not include television games using as a video display device either a television monitor or a television receiver intended to receive broadcast television signals but with the radio frequency and intermediate frequency portions thereof by-passed or disabled was through error and without any deceptive intention."

Ex. DG ('507 file wrapper) at 32 (Rusch Declaration).

216. Claims 60 and 61 employ the phrase "imparting a distinct motion." Because the only definition of this phrase is found in reference to independent claims 25 and 51, the motion recited in these claims is limited in the same fashion as claims 25 and 51.

Ex. DF (Rusch-2 patent).

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217. Unless the issue involved is use of monitors instead of standard television, any game which does not infringe either claims 25 or 51 cannot infringe claim 60 because all material elements called for in 60 are found in claims 25 and 51.

See Findings of Fact 58, 215 - 217.

218. The elements of the games listed below which are alleged to constitute "imparting a distinct motion to the hit symbol upon coincidence with the hitting symbol" are as follows:

A.	Fishing Derby	The motion of the fish following coincidence with the end of the fishing line.
B.	Stampede	The motion of the cattle after coincidence with the horse and rider.
C.	Grand Prix	The motion of the game-controlled car or the bridge after coincidence with the player-controlled car.
D.	Barnstorming	The motion of the windmill, barn or goose following coincidence with the airplaine.

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E. Sky Jinks	The motion of the pylon, tree or balloons after coincidence with the airplane.
F. Enduro	The motion of the game-controlled car following coincidence with the player-controlled car.
G. Decathlon	The motion of the hurdle following coincidence with the hurdler.

Stip. 21.

219. Until the eve of trial Magnavox contended the "imparting a distinct motion" in Dolphin and Keystone Kapers was as follows:

A. Dolphin	The motion of the squid after coincidence with the dolphin after the dolphin has touched the seagull.
B. Keystone Kapers	The motion of the beach ball following coincidence with Officer Kelly.

Stip. 21.

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B. No Motion Is "Imparted" In Six Activision Scrolling Games.

220. Six of the accused Activision game cartridges are "scrolling games." These games include Sky Jinks, Decathlon, Enduro, Grand Prix, Barnstorming, and Stampede. The Activision game Dolphin, previously alleged by Plaintiffs to infringe the Rusch-2 patent, is a scrolling game, as is Activision's Skiing which has never been alleged to infringe. In a scrolling game the game designer writes a computer program which keeps the player controlled symbol on the screen at all times and moves the background past the player. Ralph Baer conceived the idea of a scrolling video game in September 1966, and in May, 1967 he reduced it to practice in a car race game. Rusch neither conceived nor described in claim or specification such games. Therefore, they do not infringe the Rusch-2 patent.

TT 8/14 a.m. at 362, line 27 - 363, line 12 (Crane); 3-97, line 3 - 3-101, line 16; 3-113, line 20 - 3-115, line 9; 3-116, lines 8-25; 3-101, line 25 - 3-107, line 18 (Baer).

221. Bob Whitehead designed the game Sky Jinks, modeling the game after the pylon races at the Reno Air Show. The object of the game is to fly an airplane around pylons which scroll from the top of the screen toward the bottom, while avoiding hitting either the pylons or other obstacles which randomly appear. The player controls the left and right movement of the airplane, and its speed

with a button on the joystick. When a tree or other obstacle is hit, the speed of the player's airplane is automatically decreased to a fixed rate close to zero. Because it is the player controlled aircraft which slows, everything on the scroll at the time of impact is effected; so if a tree is hit, all the other trees on the scroll, as well as the pylons and balloons will appear to slow. No motion is imparted to any of the obstacles after touching the player's airplane, rather the computer program reduces the speed of the airplane in response to coincidence.

TT 8/14 a.m. at 363, line 21 - 364, line 28 (Crane); Ex. FT.

222. Sky Jinks is not a ball and paddle game. Sky Jinks is not an interactive game where two players simultaneously compete with each other. Obstacles do not bounce off of the player controlled airplane, nor is the velocity of the airplane in some way imparted to any particular obstacle on the scroll. There is no distinct reversal of motion of a hit symbol upon coincidence with a hitting symbol. Accordingly, Sky Jinks does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 365, lines 1-22 (Crane).

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223. The Activision game Skiing is identical in all material respects to Sky Jinks. Skiing was released before Sky Jinks, and has never been alleged to infringe the Rusch-2 patent. (In response to interrogatories, Magnavox specifically stated that it only omitted games from a charge of infringement when it found from examination that an element of Rusch-2 was not present.) Skiing was also designed by Bob Whitehead. The player skis down either a slalom or downhill course while trying to avoid obstacles. The player controls the skier's horizontal position as well as speed. If the player controlled skier hits an obstacle, his speed is automatically set to zero, thereby stopping the entire scroll. There is no difference in the motion of the obstacle upon impact in Skiing as opposed to Sky Jinks.

TT 8/14 a.m. at 365, line 25 - 367, line 11 (Crane); Ex. FY; Pl's Supp. Resp. at 12-13 (#41).

224. David Crane's Activision Decathlon is a scrolling game in which the player rapidly "pumps" his joystick to cause the player controlled symbol to run across the screen. The Activision Decathlon simulates all ten events of the Olympic decathlon. Magnavox alleges that the collision of the player's runner with a hurdle in the 110 meter high hurdles infringes the Rusch-2 patent. The other nine events are conceded to be non-infringing. In the Decathlon 110 meter hurdles the object is to run as fast as you can

and jump over the hurdles to reach the finish line in a minimum of time.

TT 8/14 a.m. at 367, lines 15-27 (Crane); Exs. FX, HE; Stip. 21(k); Pl's Supp. Resp. at 12-13 (#41).

225. Since the object of the Activision Decathlon is to avoid hitting the hurdle, this is not a hit and hitting event. None of the events played with the Activision Decathlon cartridge are ball and paddle games. When the player controlled symbol touches a hurdle, the player's speed is decreased to a fixed value and the graphic representing the hurdle is changed to show the hurdle in a horizontal position. The hurdle does not reverse direction when hit by the runner, and there is no transfer of velocity from the player controlled symbol to the hurdle. There is no distinct reversal of motion of a hit symbol upon coincidence with a hitting symbol. Accordingly, the Activision Decathlon does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 371, line 1 - 372, line 11 (Crane); TT 3-113, line 7-19 (Baer).

226. Enduro is an endurance race, the objective is to pass a predetermined number of obstacle cars within a set time period.

The player controls the horizontal position and the speed of his car on the roadway. Obstacle cars are randomly generated by the computer and the player has to avoid them to complete the course in timely fashion. The obstacle cars move in the same direction as the player's car, but at a slower fixed speed. When the player's car hits an obstacle car, the player's speed is automatically decreased to a fixed speed slower than that of the obstacle car. The velocity of the struck obstacle car is unaffected by the collision, as is the velocity of the other cars in the scroll at the time of collision. Thus, after a collision, the other cars on the screen are moving faster than the player controlled car and they disappear off into the distance as if the player had slowed by using his brake.

The player's car does not impart motion to the obstacle car. The player's car does not reverse the direction of an obstacle car it collides with, nor is the player's car's velocity imparted to the obstacle car. Enduro is not a ball and paddle game, nor is it an interactive game which allows two players to participate simultaneously. Accordingly, Enduro does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 373, line 9 - 376, line 28 (Crane); Ex. FW.

227. The game Grand Prix is very similar to Enduro. The player controls the vertical position of his car on a race track which moves from right to left. The player accelerates or decelerates his car in an effort to reach the end of the track in minimum

elapsed time. Unlike Enduro, the obstacle cars of Grand Prix have four fixed speeds. When the player's car collides with an obstacle car, the player's car is set to a speed less than that of the obstacle car. The speed of all the obstacle cars on the screen is unaffected by collision. There is another obstacle in Grand Prix besides other cars; in some versions of Grand Prix a bridge appears, narrowing the track. If the player's car hits the bridge, the car slows its motion; it would be unrealistic to have a stationary object, the bridge, "bounce" off the car.

The player's car does not impart motion to the obstacle cars or the bridge. The player's car does not reverse the direction of an obstacle car it collides with nor does it impart velocity to the obstacle car or bridge. Grand Prix is not a ball and paddle game. It is not an interactive game which allows two players to race simultaneously. Accordingly, Grand Prix does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 377, line 9 - 381, line 19 (Crane); Ex. FS.

228. In Barnstorming the player controls the speed and vertical position of a biplane with the objective of flying through a predetermined number of barns while avoiding obstacles in minimum time. The obstacles are of two types: barns and windmills which are fixed with respect to the scrolling background, and flights of geese which are flying in front of and in the same direction as the

biplane. When the player makes a mistake and hits a windmill or the wrong part of a barn, the biplane's speed is set to a fixed value less than that of the object struck. Since Barnstorming is intended to simulate real life occurrences, it would make no sense to "bounce" the barn or windmill. When the biplane hits the geese, the speed of the geese is increased to some fixed value unrelated to the speed of the biplane. Even if just one goose is hit, all of the geese in that line fly faster.

Barnstorming is not a ball and paddle game, nor is it an interactive game two players play at the same time. Motion is not imparted to the obstacles when the player's biplane collides with them. The obstacles' motion is not reversed when they collide with the player's biplane. The biplane's velocity is not imparted to the obstacles upon collision. Barnstorming does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 382, line 15 - 385, line 25 (Crane); Ex. FR.

229. Dolphin is a scrolling game which, until the eve of trial, Magnavox contended infringed the Rusch-2 patent. Magnavox has offered no explanation why this game suddenly ceased to infringe the Rusch-2 patent. As in all of the previously described scrolling games, in Dolphin the player controls the position on the screen and the speed with respect to the scroll of a symbol, namely a dolphin. The object of the game is to guide the dolphin through walls of

seahorses while avoiding being eaten by a chasing squid. At certain times a seagull flies overhead, and if the dolphin can leap out of the water and touch it, the dolphin can turn the tables and chase the squid. When the dolphin catches the squid, the squid sulks off towards the left edge of the screen. As in the other scrolling games, the velocity of the squid after collision is unrelated to the motion of the dolphin prior to contact. Although the squid appears to reverse direction after coincidence with the player-controlled dolphin, this reversal is simply in the nature of the scrolling technique.

TT 8/14 a.m. at 386, line 5 - 388, line 4 (Crane); Ex. FV; Plf's Supp. Resp. at 12-13 (#41).

230. The player of Stampede controls the vertical position of a cowboy on a horse and uses a lasso to capture cattle. The object of the game is to lasso as many cattle as possible while letting no more than three cows escape. To this end the cowboy can herd cattle so that they speed up, giving the cowboy another chance to catch them. The cattle are running in the same direction as the cowboy, but at different speeds. When the cowboy herds the cattle, their speed is increased a fixed amount unrelated to the cowboy's speed.

Stampede is not a ball and paddle game, nor is it an interactive game two can play at once. Motion is not imparted to

the cattle; when the cowboy herds the cattle, they increase their speed and do not reverse direction with respect to the scrolling background. The velocity of the cowboy is not imparted to the cattle. Because the motion of the cattle after herding is totally unrelated to the velocity of the cowboy, Stampede does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 388, line 9 - 391, line 18 (Crane); Ex. FQ.

231. On September 28, 1982, Magnavox filed this lawsuit, but did not allege which Activision game cartridges, when used with a master console, allegedly infringed the Rusch-2 patent. In February 1983, in response to Interrogatories from Activision, Magnavox alleged that "as presently advised" the following games were at issue: Tennis, Ice Hockey, Boxing, and Fishing Derby. On February 9,1984, Activision provided Magnavox with sales data for these four games. Shortly thereafter, on March 2, 1984, Magnavox indicated that it would name nine additional games, and did so formally by filing Supplemental Responses to Interrogatories 38 and 39 (regarding alleged infringing games and claims) on March 26, 1984. Notably, three of the nine newly alleged games were on the market at the time this lawsuit was filed; of the remaining six newly alleged games, one was on the market when Magnavox answered interrogatories in February, 1983, and four were on the market at the time Magnavox filed a 32-page Supplemental Response to

Interrogatories (Nos. 1-125) on September 1, 1983 which did not include any further supplementation to Interrogatories 38 or 39. The most recently released of the nine newly alleged games had already been on the market for over five months before Magnavox formally named the nine additional allegedly infringing games; every alleged infringing scrolling game was identified only after Magnavox realized from the sales data provided that only a limited amount of money was involved in the first four accused games.

See Plfs' Answers to Interrogatory No. 39 as supplemented in February 1983, March 1984 and September 1984.

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C. Fishing Derby, Like Keystone Kapers And Frostbite, Does Not Infringe The Rusch-2 Patent.

232. Keystone Kapers, like Dolphin, was alleged to infringe the Rusch-2 patent. On the eve of trial, Magnavox conceded that Keystone did not infringe and has offered no explanation why. In Keystone, Officer Kelly runs as fast as he can to catch a thief who throws obstacles at him. The motion of a beach ball, one of the obstacles, after hitting Officer Kelly was alleged to infringe the Rusch-2 patent. The beach ball moves either right to left or left to right, bouncing slowly as it goes. When the ball hits Kelly, its horizontal motion stops and it bounces once in place and then disappears. Keystone Kapers is not an interactive game; although there is a ball in the game it is not a ball and paddle game. The motion of the ball, which changed after collision, is neither a reversal of motion nor a change in motion related to the velocity of the hitting spot on impact.

TT 8/14 a.m. at 391, line 27 - 393, line 21 (Crane); Ex. FV; Plf's Supp. Resp. at 12-13 (#41).

233. Magnavox has conceded that the game Frostbite does not infringe the Rusch-2 patent. In Frostbite the player controls the position of an eskimo whose goal is to jump from ice floe to ice floe, building his igloo with each successful jump. Every time the player controlled eskimo touches an ice floe, the horizontal

movement of the ice floe is imparted to him in exactly the same fashion the fish imparts motion to the player controlled fishing line in Fishing Derby. While on an ice floe, the eskimo is faced with certain obstacles, such as flying geese, whose purpose is to push him off the floe. If a goose touches the eskimo, his horizontal movement becomes that of the goose and he is pushed off the end of the floe. As in Fishing Derby, once the machine controlled symbol touches the player controlled symbol, the movement of the machine symbol is imparted to the player symbol.

TT 8/14 a.m. at 397, line 5 - 398, line 21 (Crane); Ex. GD; Pl's Supp. Resp. at 12-13 (#41).

234. In Fishing Derby, the player's objective is to catch fish which are swimming randomly back and forth in defined horizontal bands. The player controls the horizontal position of his fishing rod, and can lower a baited hook down to the fish. If a fish takes the hook, it continues to move randomly back and forth. As the fish swims back and forth, it carries the player's fishing line, causing the line to move. The player can reel the fish in either by doing nothing, in which case the computer controls the player's fishing line, or the player can speed up the process by pushing a button which tells the computer to shorten the fishing line more quickly. In either case, the horizontal motion of the fish is unaffected. The fish does not reverse direction when

caught, nor is velocity imparted from the fishing line to the fish. Since it is the machine controlled symbol which imparts motion to the player controlled symbol and since there is no reversal or velocity exchange, Fishing Derby does not infringe the Rusch-2 patent.

TT 8/14 a.m. at 394, line 4 - 397, line 4 (Crane); Ex. FP.

235. Sky Jinks, The Activision Decathlon, Enduro, Grand Prix, Barnstorming, Stampede, and Fishing Derby are not interactive games nor are they ball and paddle games. In Plaintiffs' Pretrial Memorandum in this action they again define and delimit Rusch's invention to "development of interactive games and game concepts" and circuitry to implement them. Baer identified Rusch's device as the "ball and paddle" game. Therefore, none of these games infringe the Rusch-2 patent.

Plf's Pre-Trial Mem. at 5; Ex. DF (Rusch-2 patent); TT 2-29, lines 2-23 (Baer); Ex. CU (Seligman); Ex. DJ (Seligman); Ex. CF ('284 file wrapper).

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D. Nonaccused Activision Software Sold Prior To The Start Of Trial Does Not Infringe The Rusch-2 Patent.

236. Before trial Activision asked Magnavox to state the reason why nonaccused games do not infringe the Rusch-2 patent. In response, Magnavox stated in pertinent part: "At to each Activision television game cartridge not alleged to form the basis for a charge of infringement [of Rusch-2] . . . plaintiffs have not found elements in the game, the game cartridge, and the game cartridge in combination with a television game console, which respond to every element of any claim or the equivalent thereof."

Pl's Supp. Resp. at 12-13 (#41).

237. The manufacture, use, sale, or offer for sale of the Activision video game software cartridges and disks listed below were not alleged to and therefore by admission and by the principle of res judicata do not directly or contributorily infringe or induce infringement of any claim of the Rusch-2 patent:

	Title	Shipment Date	System
1.	Dragster	July, 1980	Atari
2.	Checkers	July, 1980	Atari
3.	Skiing	July, 1980	Atari
4.	Bridge	December, 1980	Atari
5.	Laser Blast	March, 1981	Atari

6.	Freeway	July, 1981	Atari
7.	Kaboom!	July, 1981 September, 1983	Atari Atari Home Computer ("HC")
8.	Chopper Command	May, 1982	Atari
9.	Starmaster	May, 1982	Atari
10.	Pitfall!	August, 1982 November, 1982 May, 1984 August, 1984	Atari Mattel Commodore disk Commodore cartridge, Atari HC, Coleco
11.	MegaMania	September, 1982 December, 1983	Atari Atari HC
12.	River Raid	December, 1982 September, 1983 October, 1983 November, 1983 September, 1984 October, 1984	Atari Atari HC IBM Mattel Commodore disk Commodore cartridge
13.	Spider Fighter	January, 1983	Atari
14.	Seaquest	February, 1983	Atari
15.	Oink!	March, 1983	Atari
16.	Keystone Kapers	April, 1983 May, 1984	Atari Coleco, Atari HC
17.	Happy Trails	April, 1983	Mattel
18.	Dolphin	April, 1983	Atari
19.	Plaque Attack	May, 1983	Atari
20.	Crackpots	July, 1983	Atari
21.	Dreadnaught Factor	July, 1983 May, 1984	Mattel Atari; Atari HC

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22. Pitfall II	August, 1983 May, 1984 August, 1984	Atari Commodore disk Commodore cartridge, Coleco, Commodore disk Atari HC October, 1984 IBM December, 1984 Apple
23. Beamrider	August, 1983 April, 1984 May, 1984 May, 1984 July, 1984	Mattel Coleco Atari Commodore disk Atari HC, Commodore cartridge
24. Worm Whomper	September, 1983	Mattel
25. Frostbite	September, 1983	Atari
26. Space Shuttle	November, 1983 October, 1984	Atari Commodore disk, Atari HC, Commodore cartridge
27. Private Eye	February, 1984	Atari
28. H.E.R.O.	March, 1984 June 1984 June, 1984 June, 1984 August, 1984 December, 1984	Atari Atari HC Commodore disk Coleco Commodore cartridge Apple
29. Decathlon	May, 1984 June, 1984 June, 1984 June, 1984	IBM Atari HC Commodore disk Commodore cartridge Coleco
30. Robot Tank	June, 1984	Atari
31. Toy Bizarre	June, 1984	Commodore disk Commodore cartridge

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32.	Zenji	July, 1984 August, 1984 September, 1984	Commodore disk Atari HC, Atari, Coleco Commodore cartridge
33.	Zone Ranger	September, 1984	Atari HC, Commodore cartridge, Atari Commodore disk
34.	Park Patrol	September, 1984	Commodore disk
35.	Designer's Pencil	September, 1984 December, 1984 January, 1985	Commodore disk, Commodore cartridge Atari HC, Apple IBM
36.	Ghostbusters	October, 1984 December, 1984	Commodore disk Apple, Atari HC
37.	Past Finder	November, 1984	Atari HC, Commodore disk, Commodore cartridge
38.	Space Shuttle	November, 1983 October, 1984	Atari Commodore disk, Atari HC, Commodore cartridge

Ex. FN (current list of Activision games); Stip. 19; Stip. 20; Plf's Supp. Resp. at 12-13 (#41); Plf's Third Supp. Resp. to Def's Interrogs. at 2 (#38); Stips. 22, 23.

VIII.

NO WILLFUL INFRINGEMENT

238. Before forming Activision, Jim Levy and David Crane and other founders sought and obtained legal advice from patent attorneys Thomas Schaetzel and Aldo Test concerning potential liability under patents held by others. Neither Schaetzel nor Test brought the Rusch-2 patent to their attention. The first time Activision became aware of the Rusch-2 patent was when Jim Levy, president of Activision, received a letter from Magnavox. Activision reasonably relied on the advice of their patent counsel.

TT 6-144, line 11 - 6-146, line 6 (Levy); Exs. IF, IG, IH, II, IJ, IK, IQ, IR, IS, ED.

239. Activision has reasonably relied upon opinion of counsel that it does not infringe the Rusch-2 patent. No game designer at Activision has ever relied on the teachings of the Rusch-2 patent in creating a video game. To this day David Crane, the leading game designer at Activision, does not understand what relationship, if any, the Rusch-2 patent bears to the work he does.

TT 8/14 a.m. at 357, line 21 - 359, line 7 (Crane); Ex. IE (Business Plan); Ex. JH (Board Minutes).

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240. In November, 1980, Jim Levy of Activision wrote a letter to Magnavox opening discussion about a possible competitive arrangement for manufacture by Activision of software for Odyssey-2. At the January, 1981 meeting he discussed the matter with the Magnavox Marketing Manager responsible for Odyssey, Mike Staup. Mike Staup made no mention of any patent claim. Levy would not have approached Magnavox in this way if he had any knowledge of the Rusch-2 patent and/or Magnavox's claims regarding it.

TT 7-8, line 5 - 7-12, line 5; Exs. 10, IP, IQ.

241. Activision, in the conduct of its business, takes great care to avoid infringing valid patents which might affect any of its products. Activision has proceeded at all relevant times in the good faith belief that its products do not infringe any applicable patent.

TT 7-26, lines 3-19 (Levy).

242. On September 7, 1984, in response to Activision's Motion to Compel, Magnavox supplemented for the third time their answer to Defendant's Interrogatory No. 38. Less then one month before the then-scheduled trial date of October 8, 1984, Magnavox contended that 13 Activision games infringed the Rusch-2 patent.

Less than one week before this action commenced, counsel for Magnavox changed their allegation to include only 11 games, dropping Keystone Kapers and Dolphin. No explanation has been offered why these games ceased to infringe after having been alleged for almost two and one-half years.

Plf's Third Supp. Resp. (#38).

243. Neither Magnavox nor Activision has been certain as to which, if any, of Activision's games infringe the Rusch-2 patent. Magnavox' expert, Dr. Ribbens did not remember what steps he took to determine whether a game infringed. When Dr. Ribbens viewed the play of Dolphin he could not tell if it infringed but initially thought it did and later retracted indicating that "distinct motion" should apparently be readily visible on first viewing. Dr. Ribbens was uncertain about the infringement of Keystone Kapers. Tom Briody testified that Magnavox did not pursue Parker Brothers because they made no infringing games; however, the Parker Brothers game "React-or," the object of which is to bounce machine-controlled spots in reverse direction by manipulation of a player-controlled hitting symbol, is far closer to fitting the definition of "imparting distinct motion" than any of the disputed Activision software. Activision could not and did not willfully infringe the Rusch-2

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patent because its scope is completely uncertain.

TT 6-49, lines 21-25; 6-59, lines 1-10 (Ribbens); TT 7-19, lines 5-16 (Levy); TT 6-126, lines 5-8 (Briody).

IX.

THE PRIOR LAWSUITS ARE ENTITLED TO LITTLE OR NO WEIGHT.

244. The Rusch-2 patent has been the subject of two prior lawsuits filed by Magnavox, neither of which has bearing on the present action as set forth below. Neither action involved a software-only manufacturer. Activision was not a party nor in privity to a party in Magnavox v. CDI. The major defendants settled on the eve of trial leaving only two manufacturers remaining when trial began. Of these two, one, Chicago Dynamic Industries, declared bankruptcy just a few days into trial. The remaining defendant was the Seeburg Corporation and its distributors; Seeburg's major business is and was manufacture of juke boxes although it did manufacture some coin-operated video game units. The prior art Seeburg presented to the court did not include the Higinbotham tennis game, the G.E./NASA scene generator or the Spiegel patent, art which Activision has presented to this Court. The prior art considered in Magnavox v. CDI was therefore significantly different than that presented in this case. The decision in CDI stands only for the proposition that Seeburg failed to meet its burden of proving invalidity on the record in that case. Seeburg settled after losing the trial for two payments of a total of $85,000. After completion of the CDI trial, the Primary Examiner in the Patent Office found the Baer-1, termed by the CDI Judge the

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"pioneer patent," to be invalid.

Judicial Notice No. 3, Ex. C, Ex. D; Stip. 26, 28; Ex. DO.

245. Magnavox v. CDI began with an extensive and expensive venue fight between the courts in Illinois (7th Circuit) and California (9th Circuit). Venue was critical during this period because patent holders received significantly disparative results depending upon the circuit where the litigation occurred, particularly on the issue of validity where the Seventh Circuit was regarded to be more favorable to patent holders than the Ninth. As a result of lack of uniformity the Federal Circuit was later created.

Stip. 26, 28; Judicial Notice Ex. E, H, No. 10.

246. In Magnavox v. Mattel, also commenced in Illinois, the validity of the Rusch-2 patent was not in issue. The technical portions of the Mattel transcript were placed under seal by Mattel and were not available to Activision. Activision was not a party to nor in privity to a party to the action; a prior finding of infringement has no effect against a non-party not in privity. Because Mattel did not challenge validity, the "scope of equivalents" accorded there was not limited as it is when validity is

challenged.

Judicial Notice Ex. E, F, H, No. 10.

Hon. Charles A. Legge
United States District Judge

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