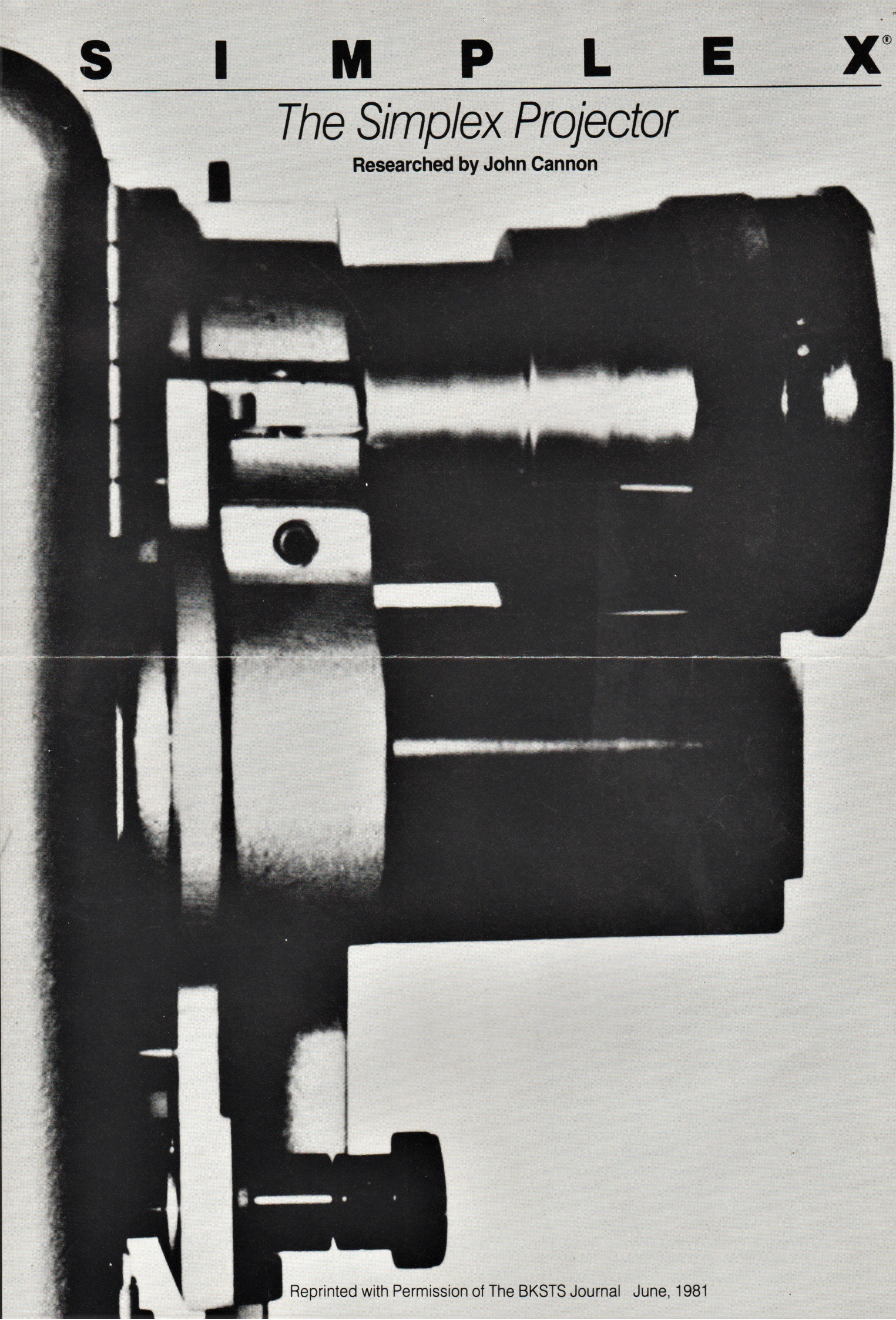


S I M P L E X[®]

The Simplex Projector

Researched by John Cannon



The Simplex Projector

It is a little ironic that this first information sheet published by the Projected Picture Trust should be on the classic American projector the Simplex. Patriots should be comforted however by the fact that the man most directly responsible for the quality of engineering in the Simplex was a Scot, Francis B Cannock, who had emigrated to America to work for the Singer Sewing Machine Company. Cannock's dictum, on which the success of the Simplex was based, was that "The requirements of machine fitting placed the thousandth of an inch as the limit of latitude; and on important parts ten-thousandths is the requirement".

In so many ways the Simplex is an adroit first choice since one of its creators was responsible for several major developments in motion pictures. This man was Edwin Stanton Porter, best known today perhaps as the creator of modern film editing with 'The Life of an American Fireman' (1902) and for his immensely successful 'The Great Train Robbery' (1903) which gave us the screen's first cowboy star, G M 'Bronco Billy' Anderson. The Simplex can be seen as the most productive branch of the American technology tree. Its own precursors are Cannock's Cinematograph and Edengraph but the Century (Westar), the Motiograph AA and the Ballantyne can be recognised as remote descendants whilst the Kaplan and the Wenzel mechanisms were direct copies.

The Simplex projector range numbered a great many firsts in projector design among which should be included:

- Synchronous front and rear shutters
- A quickly interchangeable intermittent unit
- Removable film gate
- One shot oiling system
- Spiral bevel gears
- Automatic fire shutter trip mechanism
- Rotating sprocket framing device
- Shutter timing adjustment whilst machine running
- Shock-proof gears
- Hardened and ground intermittent sprockets
- Adjustable conical pressure pad springs
- Double-bearing intermittent
- Slip-in aperture plate

As can be easily recognised by anyone who has ever worked a Simplex the basic 1909 design of the projection head changed little over the years — the formula was right. The fire-trap gravity rollers; the four-picture upper feed sprocket; the sprung guide-rollers immediately before the film enters the gate eliminating the side-play caused by differences in width of early film; the whole gate instantly removable from the mechanism without tools; the intermittent unit, a maltese-cross in an oil-bath housing, easily detached complete within three minutes without interfering with the rest of the mechanism, placed very close to the aperture leading, it was claimed, to particularly steady projection since any shrinkage or alteration in the length of the film would have smallest possible effect; the four-picture sprocket immediately below the lens. The gate of the projector was opened or closed by means of a spring-assisted assembly operated on a sliding rod. The original hand-cranking arrangement was retained as a facility for many years to enable cold machines to be freed before turning on electric motors. All the gears of

the projector head were totally enclosed except for the later sound adaption gear at the base of the mechanism. Unlike the Gaumont Chrono, perhaps the most frequently found machine in Britain at the time, the Simplex framing adjustment did not require any re-centering of the arc following a picture 'rack'. Framing was distinctively achieved on the Simplex by turning the intermittent sprocket on itself. The really unique feature of the early Simplex was that adjustment of the front shutter to correct 'travel ghost' was possible whilst the machine was in motion. The aluminium shutter was adjusted by a racking movement which also moved the intermittent sprocket so that once set correctly it was impossible for 'ghosting' to appear on the screen. Early users enthused about the heavy pedestal stand which ensured such rock-steady projection from the quality engineering of the mechanism that by 1914 over 90% of film laboratories were using nothing but Simplex mechanisms. Simplex gears were cut from the solid and the ample shafts running in the cast main frame gave the Simplex an unequalled reputation for rugged precision.

Development on the Simplex was continuous throughout production and tooling from the original Precision Machine Company days was still very much in evidence on the last models of the Super Simplex some forty years later. The following chronology gives the significant dates and details of the development of the Simplex from 1908 to the present day.

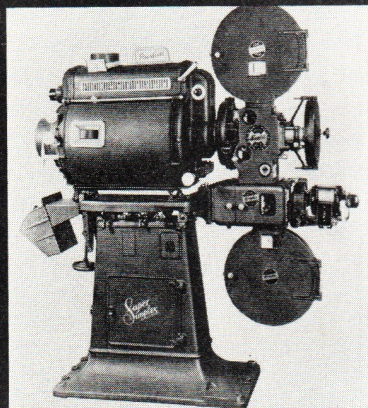
Outline chronology of the Simplex projector

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|--------------------|--|
| 1896 | Francis B Cannock is chief machinist and 'operator' at the Vitagraph works where Mike Berkowitz is engaged as a foot power lathe operator. |
| 1896
(April 23) | Edwin S Porter operated the Armat Vitascope at the first New York City screenings of projected motion pictures at Koster and Bial's music hall. |
| 1896
June | Cannock is chief operator at the Eden Musee where he is joined by Berkowitz and the Cinematograph and Edengraph projectors are designed and built in rapid succession. These projectors were not commercially feasible because of the high manufacturing costs. |
| 1898 | The Beadnell projector developed by Edwin S Porter in partnership with William J Beadnell, the publicity director of the Eden Musee. (Porter trained Nicholas Power, then an operator at the Novelty Theatre, Brooklyn to operate this machine.) Manufacture of this machine ceased in 1900 after a fire at the factory. |
| 1908 | Edwin S Porter, Francis B Cannock and Mike Berkowitz meet regularly designing the first Simplex projector in the back room of O'Keefe's saloon at 42nd Street and Vanderbilt Avenue in NYC. The first sketches being done on the back of menu cards. Edwin S Porter provided the money for a small machine shop, the Multi-Speed Shutter Company, to develop the first prototypes. |

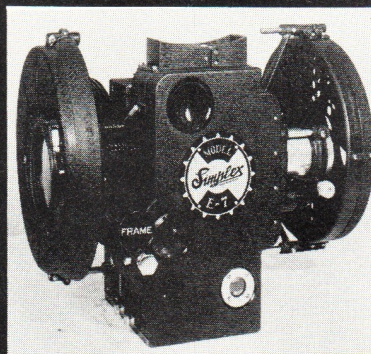
- The patents were in Porter's name with a half interest assigned to Cannock. Porter enlisted the financial support of James A Stillman of the National City Bank who poured in \$80,000 before the first Simplex came off the production line in 1909.
- 1909 Precision Machine Co. founded to manufacture the Simplex and taking over the inventions of Francis B Cannock. Porter was made president of this company. The first models of the production Simplex appeared in this year.
- 1910 The first year of full production of the Regular Simplex.
- 1912 (Sept) Kineto at 80-82 Wardour Street cordially invite British exhibitors to call in and inspect 'this Splendid Machine'.
- 1913 (Feb) Simplex mechanisms installed in London Hippodrome, Standard Electric Theatres, Blue Hall Hammersmith, Rink Kinema, North Finchley, Pyke's Circuit, B B Pictures, Glasgow, North British Film Bureau, Newcastle, Royal Bioscope, Liverpool, Gem Electric Theatre, Bristol, Victoria Hall, York and Lizars, Edinburgh.
- 1913 (March 22-29) The Simplex was the most prominent newcomer to the British market at the 1st International Kinematograph Exhibition held at Olympia.
- 1916 (July 11) The Simplex patented in New York.
- 1919 Spring arrangement introduced to lens mount enabling it to be pushed forward for speedier threading of film in the gate.
- 1920 The speed control introduced allowing 40-140 feet per minute by means of a variable disc clutch arrangement driven by a constant speed driving motor.
- 1925 International Projector Corporation founded merging Precision Machine Co., Nicholas Power Co., and the Acme Motion Picture Projector Co. all activity being based at 90 Gold Street, New York City.
- 1925/26 New double-bearing intermittent assembly with rotary oil-bath for the maltese cross introduced.
- 1928 The Super Simplex first introduced in America with shutter removed to the rear of the projector, new design of pad roller arms, a threading lamp and further enclosure for the entire mechanism.
- 1929 The coming of sound virtually eliminates the Powers projector since both RCA and Western Electric were in the beginning made for adaptation to the Simplex projector only. RCA Photophone refused to install sound equipment unless new Simplex projectors were also installed.
- 1930 Rear shutters available in Britain for fitting to existing mechanisms. The leading cinemas of the world's capitals are equipped with Simplex.
- 1930 — Grandeur equipment developed by IPC mid for 'wide-film projection' in America. 1931 This was originally intended for 70mm presentation but was subsequently modified to the SMPE-approved standard of 50mm. The mechanisms were really modified Super Simplex with a film gate slightly curved longitudinally, the convexity facing the lens. There were new design aspects to the Grandeur equipment: the mechanisms ran entirely in an oil bath, both 50 and 35 mm film could be shown, positive fire-prevention devices and a triple lens turret rotatable with each lens having lateral, horizontal and vertical adjustment.
- 1932/33 The Acme-Simplex portable 35mm equipment was introduced to Britain.
- 1933 The Super Simplex introduced to Britain.
- 1936 A new intermittent unit was introduced and an extra heavy film trap.
- 1937 The heavy duty Super Simplex pedestal introduced to Britain.
- 1937 (April) Simplex E-7 mechanisms installed for trials in Loew's Capitol Theatre, New York City.
- 1938 Full production and introduction of the new E-7 projector in America with its unique shutter arrangement. Front and rear shutters were synchronised on the same shaft. Each shutter acting on a half beam giving a dissolving effect which it was claimed produced 12½% more light, a sharper picture and less eye-strain for audiences. The E-7 brought in hunting-tooth gearing and one-shot lubrication via an oil-reservoir lever. In the E-7 gears revolve on shafts which are stationary and do not revolve on bushings in the main frame — the first major departure in design from the original Simplex model.
- 1940 Front Shutters available for modifying British Simplex and Super Simplex mechanisms.
- 1945 (Sept) Simplex High arc-lamp in American production.
- 1946 (Jan) Simplex plant moves to Broomfield, New Jersey.
- 1948 American introduction of Simplex type SP sound projector.
- 1949 (Jan) The new X-L Simplex mechanisms installed for trials in the Loew's State Theatre, Broadway.
- 1950 (June) Simplex X-L and Four Star sound system in American production. Super Simplex production began to be run down.
- 1952 Production of E-7 mechanisms began to be run down.
- (To date) The X-L has undergone continuous adaptation and called a Simplex 35 had a brief spell as a dual 70/35mm machine. In its latest form the Simplex is still being produced in Paramus, New Jersey by the Simplex Projector Company, NYC, Div. National Screen Service Corp.

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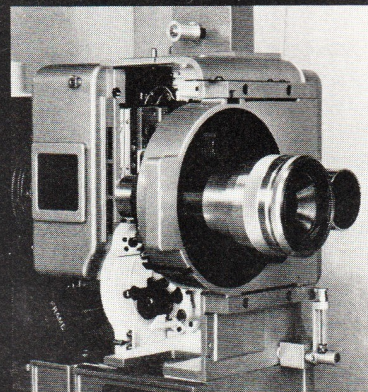
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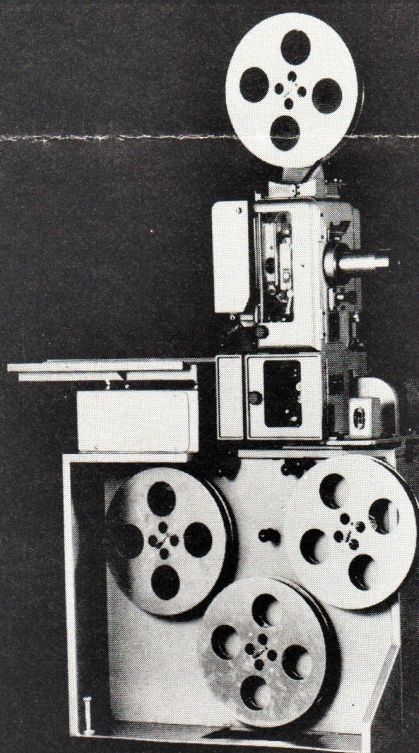
Super Simplex



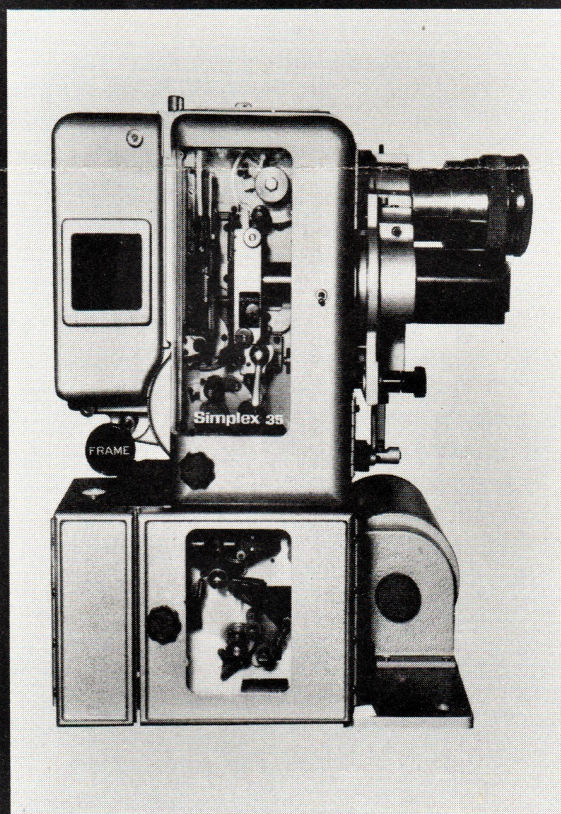
Simplex E-7



XL Model PR1050
with Manual Turret

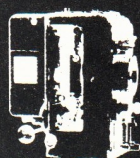


Studio Projector & Base



XL Model PR1014 with Auto Turret
and Aperture changer

For further information write or call: Richard J. Green
Vice Pres., General Manager



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