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THE AELITA PROJECT

"To screen AELITA is to discover something rather different from the bete noire of Soviet montage cinema's pioneers . . . we find an ambitious, multi-layered work which draws upon pre- as well as post-Revolutionary sources and contemporary European influences to reflect the new Soviet life more fully than any other film of the time." Ian Christie, director of the British Film Institute

The *AELITA* project serves the dual purposes of returning the obscure Soviet silent science-fiction film to international view by providing a new musical score in an appropriate idiomatic style, and to showcase the celebrated theremin, the avant-garde Soviet musical instrument invented in 1920.

Project director Dennis James has founded *The Theremin Trio* to perform his musical score on tour utilizing piano and theremin along with traditional and electrified instruments. His musical score is based on the surviving original film score fragments and generic Soviet silent film music compositions from the period of the film's premier. James engaged the noted American new-music duo **(trom-bown)** to compose, arrange and perform the electronic portions of the new film score. Source materials for the project have been provided by museums and archives from around the world. A beautifully clear 35mm print of the feature length film has been struck from the original negative and made available for a series of selected performances. Echoing traditional Soviet silent film music instrumentation, the score incorporates acoustic piano, violin, trombone for the Earthbound scenes. Theremin plus electrified violin, electronic synthesis and processed acoustic instruments are featured for the scenes set on the planet Mars. Beginning in November, 1992, the film and a newly revised version of the score will be available for full symphony orchestra presentations.

AELITA, the landmark 1924 Soviet film production with sets and costumes designed in Constructivist and Futurist styles, received more publicity during its initial release than any other Soviet film until *POTEMKIN*. While not an innovator of the calibre of Eisenstein or Vertov, the film's director Protazanov was the best of the Russian pioneer filmakers known to have been an eclectic master of all the resources of the silent cinema. He was the creator of a large body of work that enriched the Russian cinema almost from its beginning- civilized, intelligent, and courageous in its quiet assertion of human rather than commercial or doctrinaire values. Protazanov is now credited with preserving a kind of healthy simple folk-humor in Soviet films. The stylized theatrical settings and costumes by Alexandra Exter and Isaac Ratinovich were used to telling effect in the Martian sequences.

The theremin, a musical invention by Professor Lev Sergevitch Termen (anglicized to Leon Theremin) of the Institute Physico-Technique in Leningrad, was the first truly practical and publicly available electronic musical synthesizer. The instrument, which he called the aetherphone or thereminvox and later became known as the theremin, was played by the motion of the musician's hands in the space surrounding the instrument. As Theremin stated in a contemporary interview:

> "This is not at all a plaything for me. It is much more a concrete proof, an incontestable demonstration, of my conception of the arts and the sciences. The two are but one to me. To prove that science can render the greatest services in the development of the arts and to demonstrate the fertility of intimate collaboration of the arts and sciences is my aim."

Following its celebrated 1928 American debut the instrument was mass-produced by the unique consortia of RCA, Westinghouse and General Electric for a limited 1929 production run. The theremin was designed for and initially used in concert symphonic performances by such individuals and organizations as Leopold Stokowski and The Philadelphia Orchestra, the Cleveland Orchestra and the New York Philharmonic. The theremin is best recalled today, however, by its predominant

use in popular Hollywood film scores throughout the 1940s and 50s for such titles as Hitchcock's *SPELLBOUND* and the pioneer science-fiction classic *THE DAY THE EARTH STOOD STILL.*

Leon Theremin speaks about his new instrument:

"Physicists for many years have been able to create sounds by means of alternating currents of diverse frequencies, but I have had the idea of regulating these sounds, to give them a musical soul, to vary their intensity, their timbre and their loudness.. With this instrument I have made it possible to produce tones of constancy of pitch not even remotely approached by the best piano or organ. My apparatus contains an ordinary wood box through which I send an alternating current of electricity of which I can vary the frequence. The current creates an elctro-magnetic field around the small pole surmounting the box. When I move my hand in this field I create disturbances. I simply stand in front of it as a conductor stands in front of his orchestra. The waves emitted by the pole and diffused throughout the room consequently are transmitted to the loud speaker in a special order which renders them musical sounds. The metal coil or ring, placed at the left of the box, is a round antenna above which I wave one hand in order to vary the intensity of the sound. With my other hand I regulate the loudness or softness of the sound.

Since time immemorial 'pointing of the finger' has been a symbol of powerful, unrestricted command. If I want to make a trill, as on a violin, I simply trill with my fingers in space, and my instrument answers. I move my hands through the air and the pianissimo or fortissimo tones come. I can produce the sounds of a violin, viola or a trumpet. The quality of the sound of my apparatus is even better than that produced by the real instruments. This instrument is much better, because it is more responsive and it is less difficult to play. All you need is an ear for music and a sense of music within you, and the rest is easy.

Tone is controlled by an electro-magnetic field, generated by means of an electrical current of low voltage around a vertical body of metal. To this rod batteries of low amperage are connected and on the left of the rod is a metal ring. As the hand approaches the rod the tone becomes higher and vice versa. Thus the intensity of tone from pianissimo to thundering fortissimo is regulated by approaching and withdrawing the hands from the metal ring on the left side of the apparatus. This ring is less than two feet in diameter. The method of playing is simple and can be learned by any one, who has some degree of musical feeling.

We all know that electric waves exist in the air at all times and some of these waves are utilized as radio carriers. My machine transforms electro-magnetic waves into acoustic energy, but it is the person who will produce music by properly waving his hands to produce various tones and musical passages. My apparatus frees the composer from the despotism of the twelve-note tempered piano scale, to which even violinists must adapt themselves. The composer can now construct a scale of the intervals desired. He can have intervals of thirteenths, if he wants them. In fact any gradation detectable by the human ear can be produced.

To this must be added an entirely new range of tonal colors. Hitherto the composer has had only about twenty tone colors, represented by as many different types of orchestral instruments. I give him literally thousands of tone colors. In order to demonstrate the possibilities of ether wave music I am now building twelve instruments. Good musicians will learn how to play them in a fortnight. With an orchestra thus constituted, with nothing but gestures these men will give us concerts that will reveal new beauties in tones and their combinations. Apart from these possibilities, ether wave music is created with simplicity and a directness matched only by singing. There is no keyboard to obtrude itself, no catgut, no bow, no pedal, nothing but simple expressive gestures of the hands."

-derived from various 1927 and 1928 published interviews and public remarks at demonstrations of the new instrument from *NEW YORK TIMES, EVENING POST, EVENING WORLD and the LOUISVILLE HERALD POST*

THE AELITA PROJECT

CONTEMPORARY VIEWS OF THE THEREMIN

"RUSS INVENTOR TURNS AIRWAVES INTO MUSIC" by Don Ryan

"The Theremin Vox demonstrates the theory, long held by philosophers, that sound waves dominate the ether waves too fine to be heard by human ear until they are stepped down by electrical device. This was the music of the spheres of which many poets have sung.

What a vista! What a world the children of America may live in- when telephone and radio have become as obsolete as the stem-winding music box of the eighteenth century.

WHAT THE FUTURE HOLDS?

On the terrace of one of the sky-palace apartment houses with which our isle of Manhattan will bristle, the New Yorker of the future sits in twilight and out of the blue ether plucks his own music - the song of his day's work accomplished- the song of his sublimation. Escape- escape from the reality that always surrounds us with its contracting circle.

The musical thoughts that swell up in every human soul at evening. The musical impulse - mute through the centuries- articulate at last in every human creature.

Stretch out the hand, Command the ether . . . A high, thin note, swelling to grandeur? pulsates from the imagination of the man of the future. His strife, his sorrow, his overcoming, his longing and his love - he paints them on the sky!"

Statement by the conductor Leopold Stokowski

"I think great changes are coming in our Western music. It is only a question of a few years before we will have entirely new methods of tone production by electrical means.
Some of these new possibilitities have been demonstrated by the Russian Theremin.

I believe we shall have orchestras of these electric instruments. Thus will begin a new era in music, just as modern materials and methods of construction have produced a new era in architecture, of which the skyscraper is one phase.

These new electric instruments will demand great accuracy of ear on the part of the players. I believe our present day artists in the orchestras will soon be taking up these new electric instruments in addition to their present ones. They will retain the latter because all the marvelous wealth of music of the past must always be played by the instruments for which it was written, and only the music of the future will be played on the new electric instruments.

One wonderful feature of the new electric instruments is, or will be, that there is practically no technical difficulty in playing them. There will be no more long hours of practice every day. Electricity will do all the mechanical part.

The musician will give musicianship, interpretation, variety of tone-color and tone-volume and all the non-material side of music. Such things as quarter-tones, which are extremely difficult on our existing instruments, will be quite easy on the new ones.

Electrical methods of tone production are natural, after all, because electricity is, by its nature vibration, just as is music. Electrical methods of tone production will be wonderful for our radio and our phonographs. I believe someday great libraries of phonograph records will be built just as today we have great libraries of books. They will be invaluable for educational purposes, because they can be played at any time and so fit into the school program of work. Also, a phonograph record can be repeated as many times as necessary to illustrate and make quite clear any idea.

Bizarre as it may sound, the time is also coming, I believe, when we will fly to other planets and find other principles of music and beauty."

from *THE OPINION*, Chambersburg, Pa. 5/26/28

THE AELITA PROJECT

FILM CREDITS

A Mezhrabpom-Russ film release
Directed by Yakov Protazanov
Scenario by Fyodor Otsep & Alexei Faiko
(from novel by Alexei Tolstoi)
Photographed by Yuri Zhelyabuzhsky, E. Schoneman
Designed by Sergei Kozlovsky, Alexandra Exter,
Isaac Rabinovich, Victor Simov

CAST

Valentina Kuinzhi
Nikolai Tseretelli
Kontantin Eggert
Yulia Solntseva
Yuri Zavadsky
Igor Ilinsky
Nikolai Batalov

PLOT SUMMARY

(Not to be printed in any materials distributed to the audience)

The story of an engineer named Los who, tired of earthly miseries, and pursued for the murder of his wife, escapes to Mars on a flying machine of his own invention, accompanied by the detective investigating the murder and a good-hearted Red Army soldier. On Mars Los falls in love with the planet's ruler Aelita but is also imprisoned, enslaved, and involved in a revolution. In the end he is relieved to find that it has all been a dream- that he is safely back on his own formerly despised planet.

FILM COMMENT

Pioneer Russian film director Yakov Protazanov had been working away from Russia in Berlin & Paris since the 1917 revolution. *AELITA* was made after his return and, though the least important technically and socially of all of Protazanov's Russian films, it received more publicity abroad than any other Soviet film until *POTEMKIN*. It was fundamentally an "antique" film with use of new Constructivist stylization elements that he brought back from Berlin & Paris' art and theatre worlds. The stylized theatrical settings and costumes were used to telling effect in the Martian sequences by Alexandra Exter and Isaac Ratinovich. These have been considered by modern critics as more expressive in production stills than on the screen.

Protazanov is credited with preserving a kind of healthy simple folk-humor in Soviet films. *AELITA* contains robust comedic performances of Igor Ilinsky as the detective and Nikolai Batalov in his first film appearance playing the soldier.

Protazanov was not an innovator of the caliber of Eisenstein or Vertov, but he was the best of the Russian pioneer film-makers, an eclectic master of all the resources of the silent cinema, a fine if sometimes overindulgent director of actors, and the creator of a large body of work that enriched the Russian cinema almost from its beginning- civilized, intelligent, and courageous in its quiet assertion of human rather than commercial or doctrinaire values.

"PRODUCING MUSIC FROM THE AIR"
The Invention of the Theremin

DESCRIPTION OF THE INSTRUMENT

The theremin itself is housed in a wooden cabinet approximately eighteen inches wide and a twenty two inches deep. With its legs, it stands about three and a half feet high. The front is slanted to form a convenient music stand. A vertical pitch antenna rod is located in the upper right hand corner of the cabinet. A tubular loop for controlling volume emerges from the cabinet's left side. Tuning knobs and control switches are located on the lower part of the front of the cabinet.

To play the theremin, the performer stands in front of the instrument, a little left of center. The feet are spread slightly to keep the body as motionless as possible. To determine the pitch of the instrument's tone, the player varies the distance between his right hand and the pitch antenna. When the instrument is properly tuned, the pitch goes from lower than two octaves below middle C when the player's right hand is back at his shoulder, to approximately 2 1/2 octaves below middle C when the player's hand barely touches the pitch antenna. To determine the loudness of the instrument's tone, the player varies the distance between his left hand and the middle of the volume antenna. Maximum loudness occurs when the hand is removed from the antenna; complete silence occurs when the hand is an inch or so from the loop.

The two antennae actually respond to all body movements. Therefore, it is necessary for the player to exert firm control over his body and head motions as well as his hand motions. The ability to stand motionless is absolutely essential. The thereminist must move his hands with incredible precision as well as speed if he wishes to play distinct notes with correct intonation. The theremin performer plays without the benefit of any tactile reference whatever. Unlike a violinist, who is in constant contact with the instrument's fingerboard, or a clarinetist whofeels the reed and keys, or even a singer who feels the vocal chords, the thereminist feels no shape or force as he moves from one pitch to another. He is constantly moving his hands, listening to the resulting pitch changes, then "trimming" the precise position of his hands to home in on the desired pitch and volume. The process is essentially one of continuous aural feedback.

HOW THE THEREMIN WORKS

A portion of the circuitry inside the theremin sets up low power, high frequency electromagnetic fields around the antennae. The player's hands alter the fields in proportion to how near they are to the antennae. The field alterations are magnified and then applied to change the pitch and volume of the instrument's tone. The description that follows is written for those who wish to understand the electronic principles underlying the pitch and volume control in the theremin.

The tone-producing portion of the circuitry is known as a beat frequency oscillator. It consists of two separate oscillating circuits which operate at frequencies well above the range of human hearing. One of these runs at fixed frequency of about 170 kilohertz (thousands vibrations per second), while the other would operate within the frequency range 168-170 kilohertz. This second, variable oscillator is connected to the pitch antenna through a very large inductor. The pitch antenna has a small capacitance to ground. The antenna and inductor form a series resonant circuit, the natural frequency of which is slightly below 168 kilohertz. The series resonant circuit "loads" the variable oscillator, pushing its frequency up to 170 kilohertz (when the instrument is properly tuned). The very small amount of hand capacitance added to the pitch antenna by the performer when he brings his right hand near the pitch antenna (less than one picofarad!) is enough to substantially lower the antenna circuit's resonant frequency, thereby "unloading" the variable oscillator and allowing its frequency to drop to 168 kilohertz. Thus, as the performer brings his right hand near the pitch antenna, the variable oscillator frequency drops

from 170 to 168 kilohertz, while the fixed oscillator signals and extracts the difference, or beat, frequency of 0 - 2 kilohertz. The beat frequency is within the range of human hearing, and spans a pitch range of greater than five octaves.

The volume control circuit also uses a series-resonant antenna circuit which is connected to a high frequency oscillator. In the RCA theremin, the high frequency energy flowing in the volume antenna inductor is actually used to heat the filament of a vacuum tube, which in turn passes current to the tone amplifier stage. As the left hand approaches the volume antenna, the resonant circuit is de-tuned, the tube's filament is heated less, the tube passes less current to the amplifier, and the volume of the tone decreases.

The waveshaping characteristics of the theremin bear special mention. A "textbook" beat frequency oscillator produces a pure sine waveform. Engineers regard the sine wave as "undistorted," and all other wave forms as "distorted." This is because non-sine waveforms contain extra frequencies called harmonics. Musically speaking however, high harmonic content is necessary for a rich, pleasing tone color. Prof. Theremin certainly recognized this requirement. The RCA theremin produces a "distorted" waveform that is remarkably similar in both shape and harmonic content to that of a bowed violin string! It is noteworthy indeed that Prof. Theremin, working in the 1920's without benefit of an oscilloscope, possessed such an understanding of acoustics and a mastery of his technology.

from Delos International, Inc. CD #1014
"The Art of the Theremin", copyright 1987

THE AELITA PROJECT

PROGRAM INFORMATION

AELITA

With live musical score by **Dennis James**
Performed by **The Theremin Trio**

Music for Martian scenes composed by **Miles Anderson**

AELITA

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from the novel by Alexei Tolstoy)
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Yuri Zavadsky
Igor Ilinsky
Nikolai Batalov

***AELITA*: The Return of the Repressed** by Ian Christie

Aelita was the first major cinema event of the Soviet era. Yet its hugely successful release in September 1924 provoked strong hostility in official circles and undying contempt among the young filmakers who would soon win world reputation for their radical "montage" school.

Aelita marked the return from exile of the prerevolutionary Russian cinema's most successful director, Yakov Protazanov, who had been working in Berlin and Paris since the 1917 revolution. He stayed to make the topical comedies and authentically popular melodramas that Soviet cinema desperately needed until the emergence of its own musical and patriotic genres in the mid-Thirties.

Aelita is nominally based on a lurid Martian adventure story by Alexi Tolstoi (owing as much to Edgar Rice Burroughs as to Russian popular mysticism). The film could well be regarded as a critique or mockery of Tolstoi's dubious reworking of the Atlantis myth. In place of his heroic Russian expedition to a doomed Mars, Protazanov and his writers substituted a carnivalesque satire on the contemporary craze for rocketry and utopian 'other worlds'. The story's protagonist, Los, is no Bolshevik hero, but a neurotic intellectual who, amid the upheavals of the early Soviet era, projects his insecurity into a SciFi fantasy about a Princess of Mars.

The lavishly produced film was a feast for starved Soviet audiences, used to a diet of poverty-stricken agitational productions and battered copies of foreign imports. In many ways, *Aelita* belongs to the general European movement of the early Twenties which sought to counter Hollywood's dominance

with its own form of spectacle. This involved harnessing the fashionable new visual art styles: Expressionism, Post-Cubism, and Constructivism. Protazanov hired the leading Russian Constructivist artists Aleksandra Ekster and Isaac Rabinovich to create a 'Martian' look in costumes and decor.

Seen today, the portrayal of daily life under the emergency New Economic Policy introduced by Lenin in 1921 is at least as compelling as *Aelita's* Martian decor. Understood in its context, *Aelita* can tell us more about that heroic period of "the Soviet experiment" than many acknowledged masterpieces of the era. And with the addition of music, its spectacle can once again be appreciated as it was by the enthusiastic audiences of 1924.

The Theremin

was invented by the young Russian physicist Leon Theremin (Lev Sergevitch Termen) in 1920. It is played with the wave of a hand and was the first publicly sold electronic synthesizer. During the late '20s Theremin's demonstrations and performances drew standing room crowds throughout Europe and in the United States at concerts with such renowned ensembles as the Cleveland Orchestra, the Philadelphia Orchestra and the New York Philharmonic. Following its initial acceptance as a concert instrument it was featured in many Hollywood film scores throughout the 1940s and '50s including the popular mystery and science-fiction films *Spellbound, The Day the Earth Stood Still* and *The Thing*.

Leon Theremin's following statement from a 1928 interview serves as a model for the Soviet aspiration to marry art with technology:

> "This is not at all a plaything for me. It is much more a concrete proof, an incontestable demonstration, of my conception of the arts and the sciences. The two are but one to me. To prove that science can render the greatest services in the development of the arts and to demonstrate the fertility of intimate collaboration of the arts and sciences is my aim."

The Theremin Trio

Dennis James: keyboards and theremin
Miles Anderson: trombone, voice and electronics
Erica Sharp: 5-string electric violin and electronics

Dennis James is a professional silent film musician who has played a pivotal role in the international revival of silent films presented with live music. He began performing with film in the late 1960s and has formed his own production company, *Silent Film Concerts*, to present his musical score restorations, recreations and new compositions which tour internationally in solo presentations and with major symphony orchestras. He has toured with film stars Lillian Gish and Charles 'Buddy' Rogers, providing live accompaniment to revivals of their motion pictures. James has repeatedly been featured soloist for film festivals around the world and serves as American tour organist for the Munich Filmmuseum.

Miles Anderson is a trombonist and member of the new music duo (trom-bown). He was a member of the Los Angeles Philharmonic and San Francisco Symphony Orchestras, and was a founding member of the Los Angeles Brass Quintet. In addition to performing in the United States, he has toured in Mexico, Australia, New Zealand, Japan and Austria. Anderson also performs as a concert soloist and has several recordings to his credit.

Erica Sharp was a member of the San Francisco Symphony Orchestra for twenty years, and for ten years was concurrently a member of the San Francisco Opera Orchestra. As a member of (trom-bown), she performs utilizing the Aceto Violect, a 5-string electric violin. (trom-bown), based in Encinitas, California, uses electronic processing to transform the sound of traditional acoustic instruments.

THE AELITA PROJECT was organized under the auspices of Bruce Jenkins and the Walker Art Center who have also made its national tour possible. The world premiere performance was presented in Seattle, Washington on August 4, 1990 by the Henry Art Gallery in conjunction with the exhibition *Art Into Life: Russian Constructivism 1914-32*. The Walker Center and Henry Art Gallery have provided funding for research and the composition of the musical score.

The musicians wish to thank the following individuals and organizations whose inspiration and support have made this performance possible: Bruce Jenkins, Walker Art Center; Naum Kleiman, Moscow Cinematheque; Enno Patalas, Munich Filmmuseum; Edith Kramer, Pacific Film Archive; Gillian Anderson, Music Division, Library of Congress; Ian Christie, British Film Institute; Films stills division, Museum of Modern Art; Virko Baley, Las Vegas; Vyacheslav Artyomov, Moscow; Stephen C. Anderson, University of Kansas; Tamara Moats, Henry Art Gallery. Also special thanks and many rubles to Robert Moog. The 35mm archive print is provided courtesy of Gosfilmofund.

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