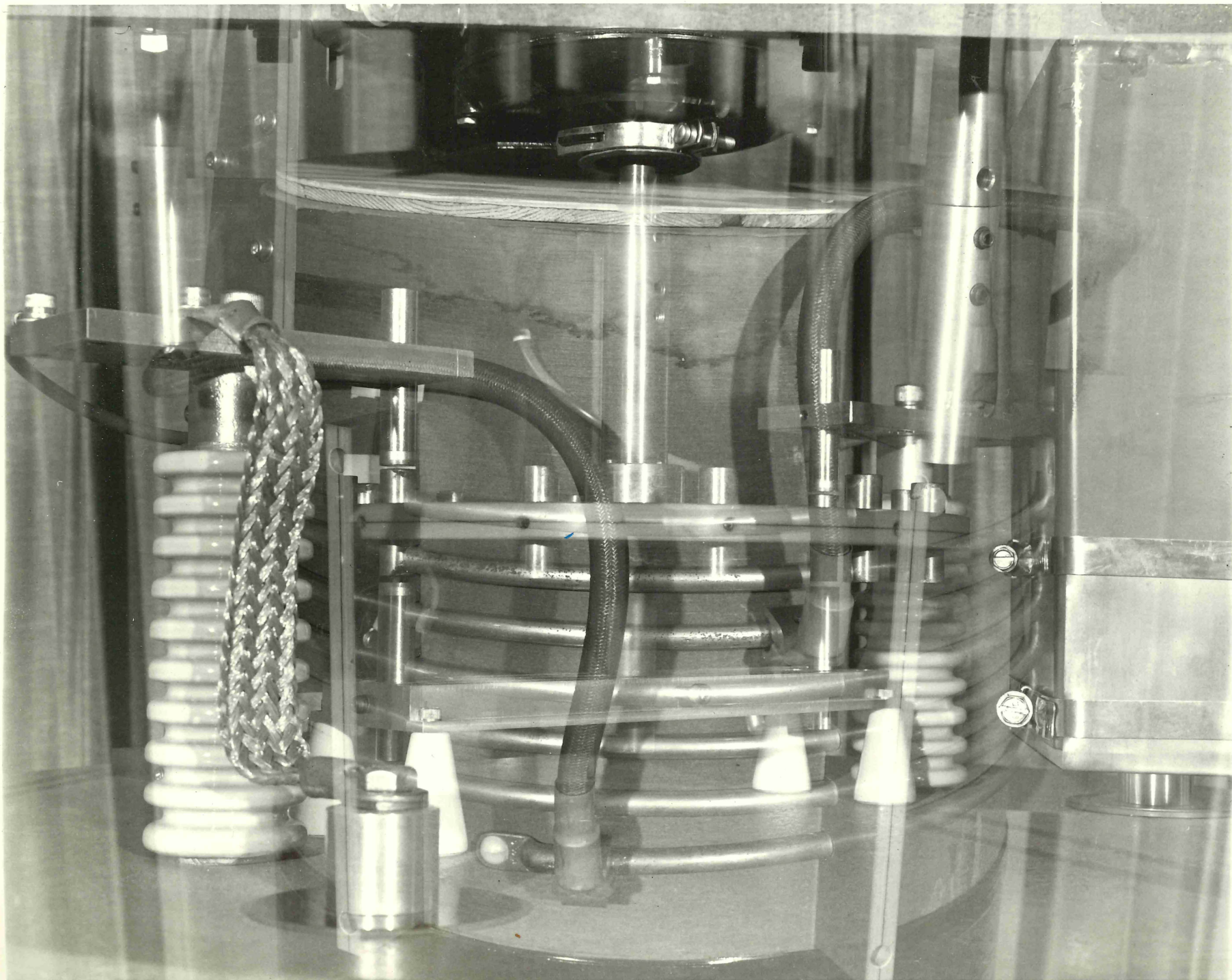
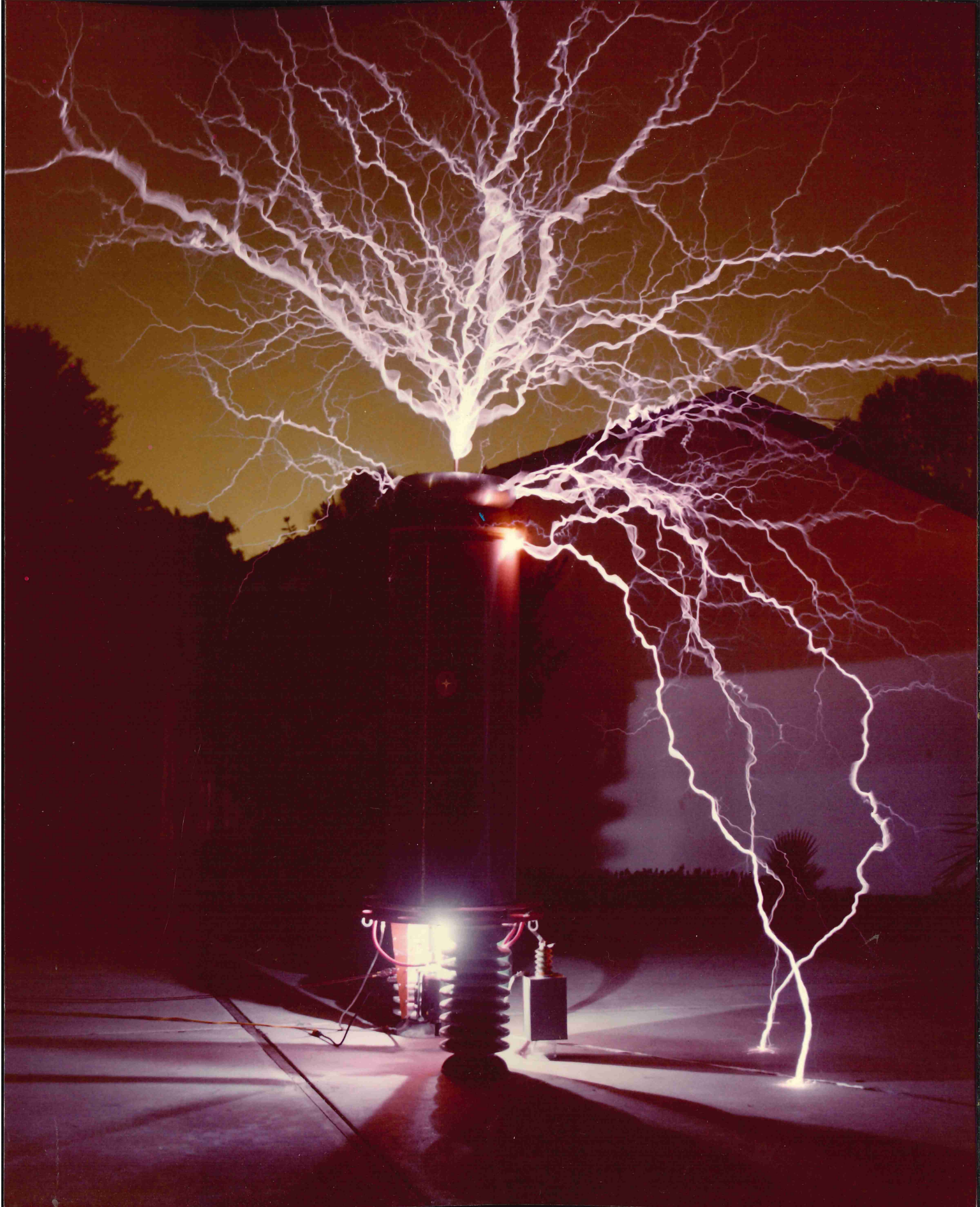


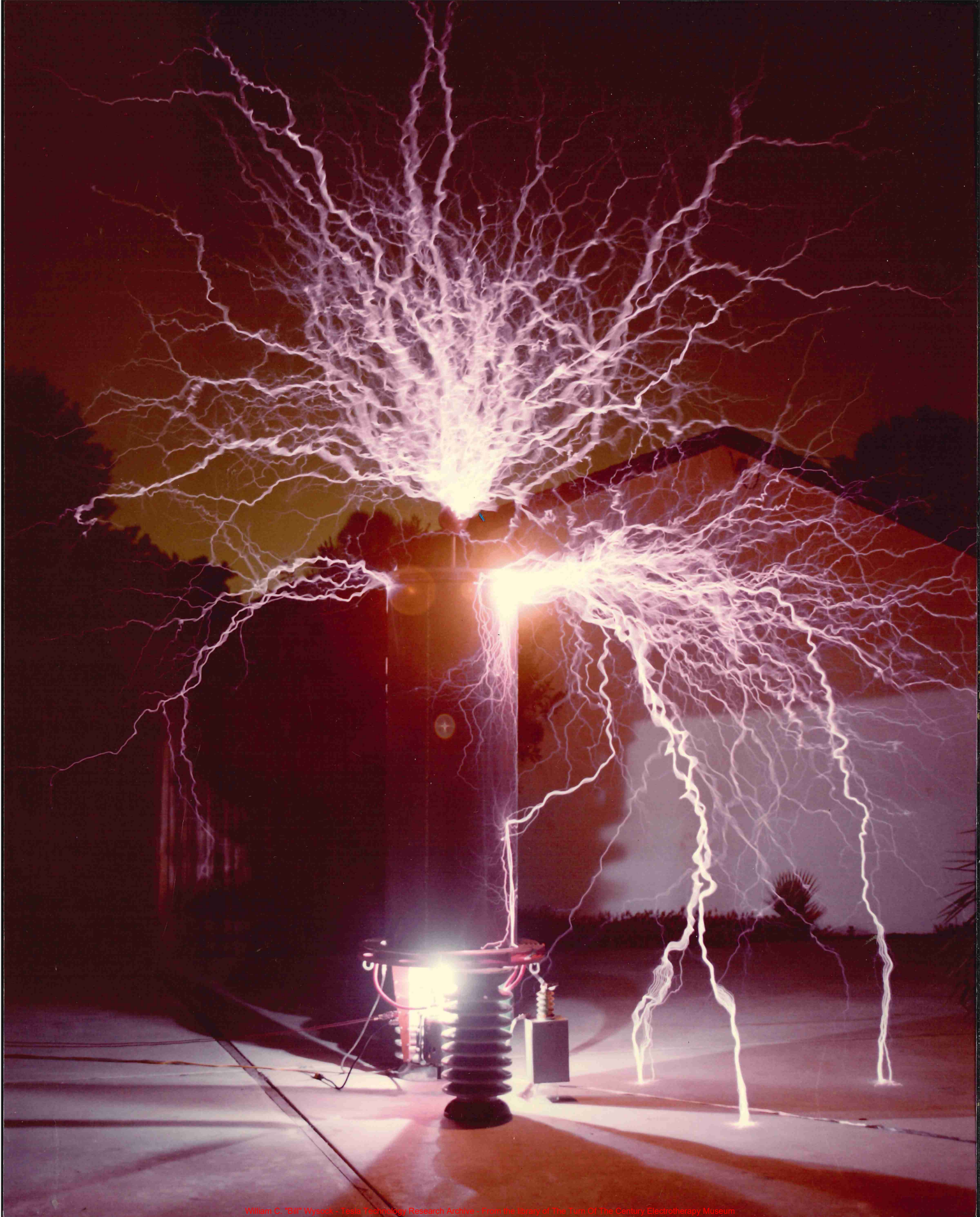


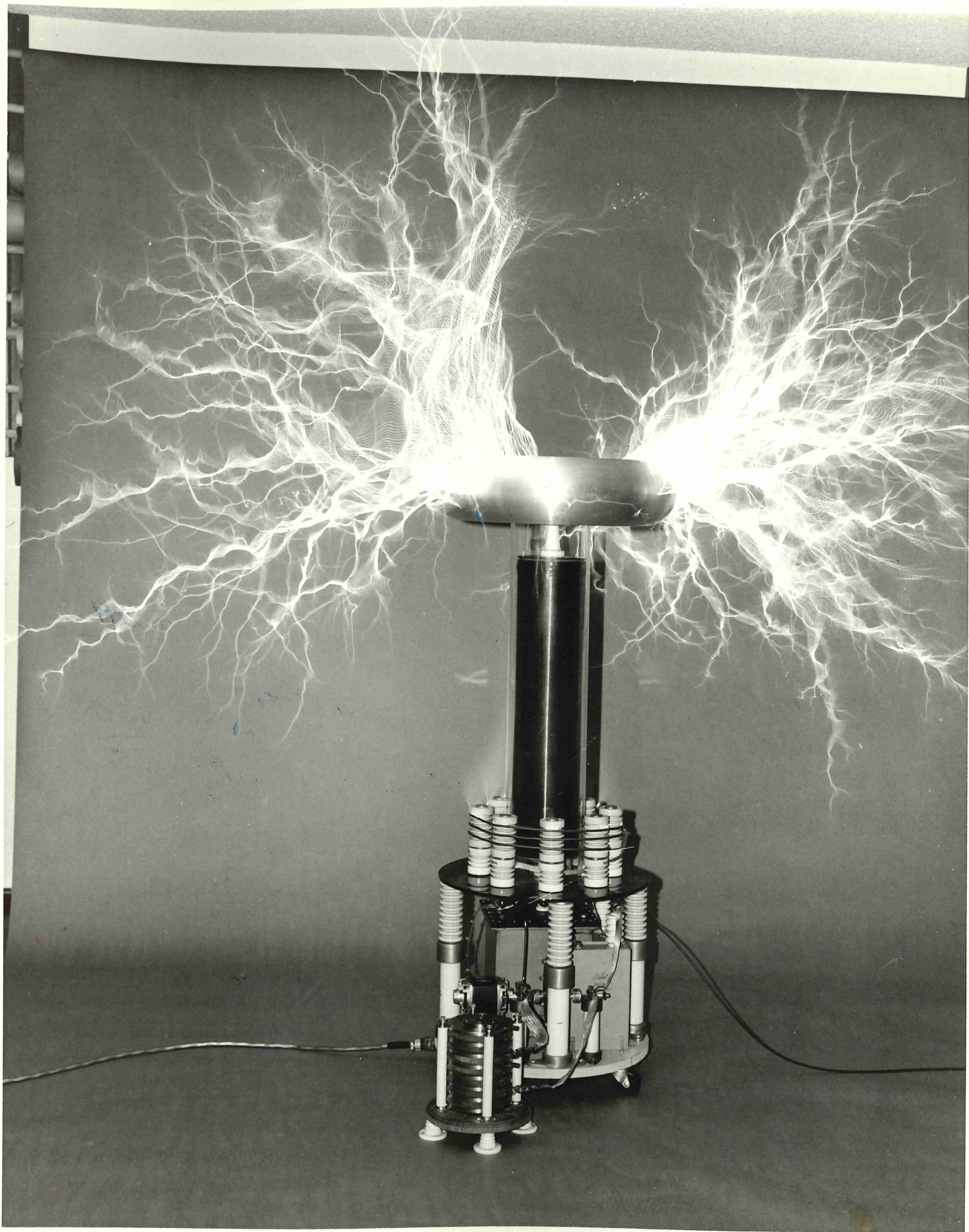
William C. "Bill" Wysock - Tesla Technology Research Archive - From the library of The Turn Of The Century Electrotherapy Museum











**PROFESSIONAL SOUND SYSTEMS
ULTRA HIGH VOLTAGE DIV.**

2527 Treelane Ave.
Monrovia, Ca 91016

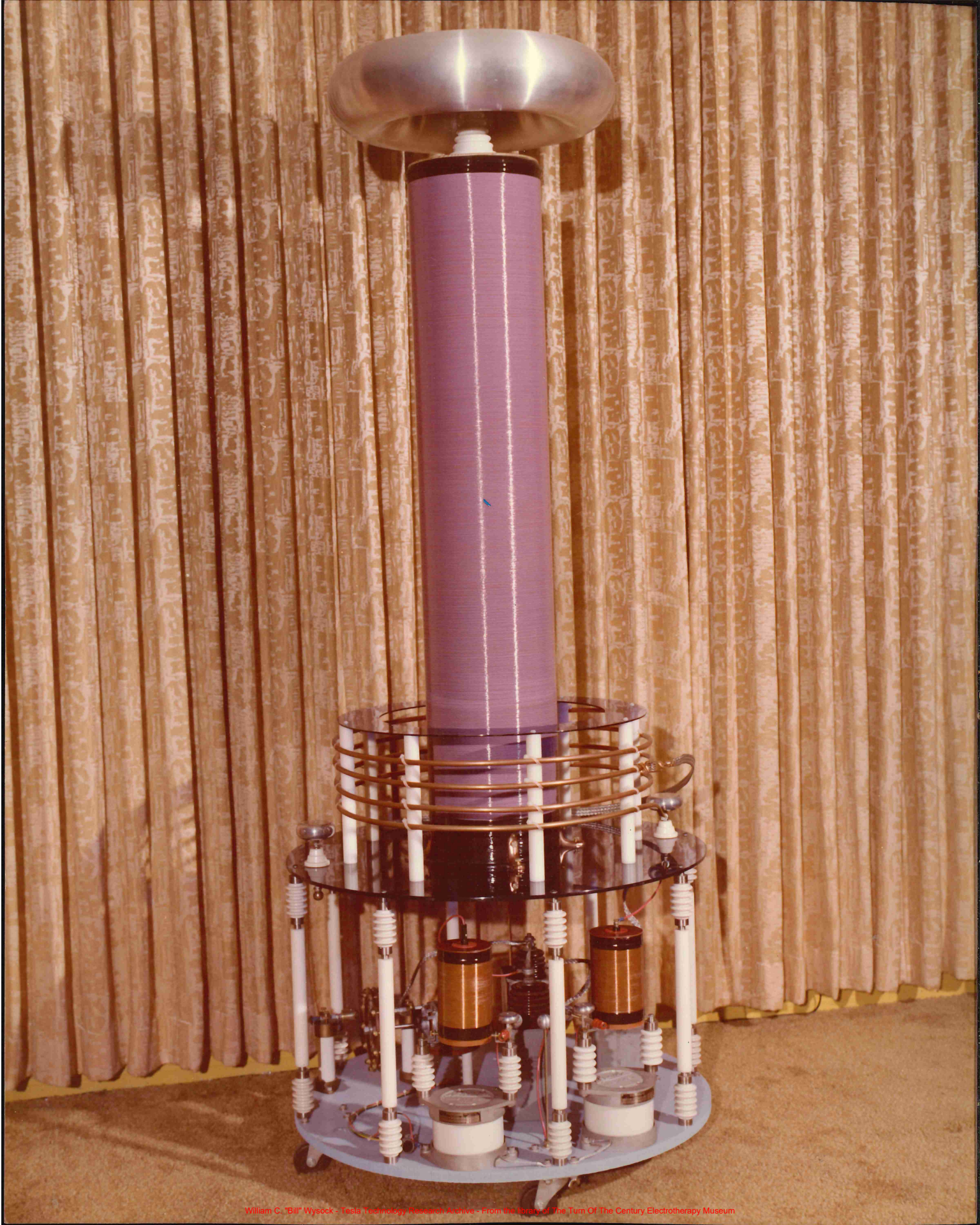
2527 TREELANE AVE.
MONROVIA, CA 91016
(213) 359-1373

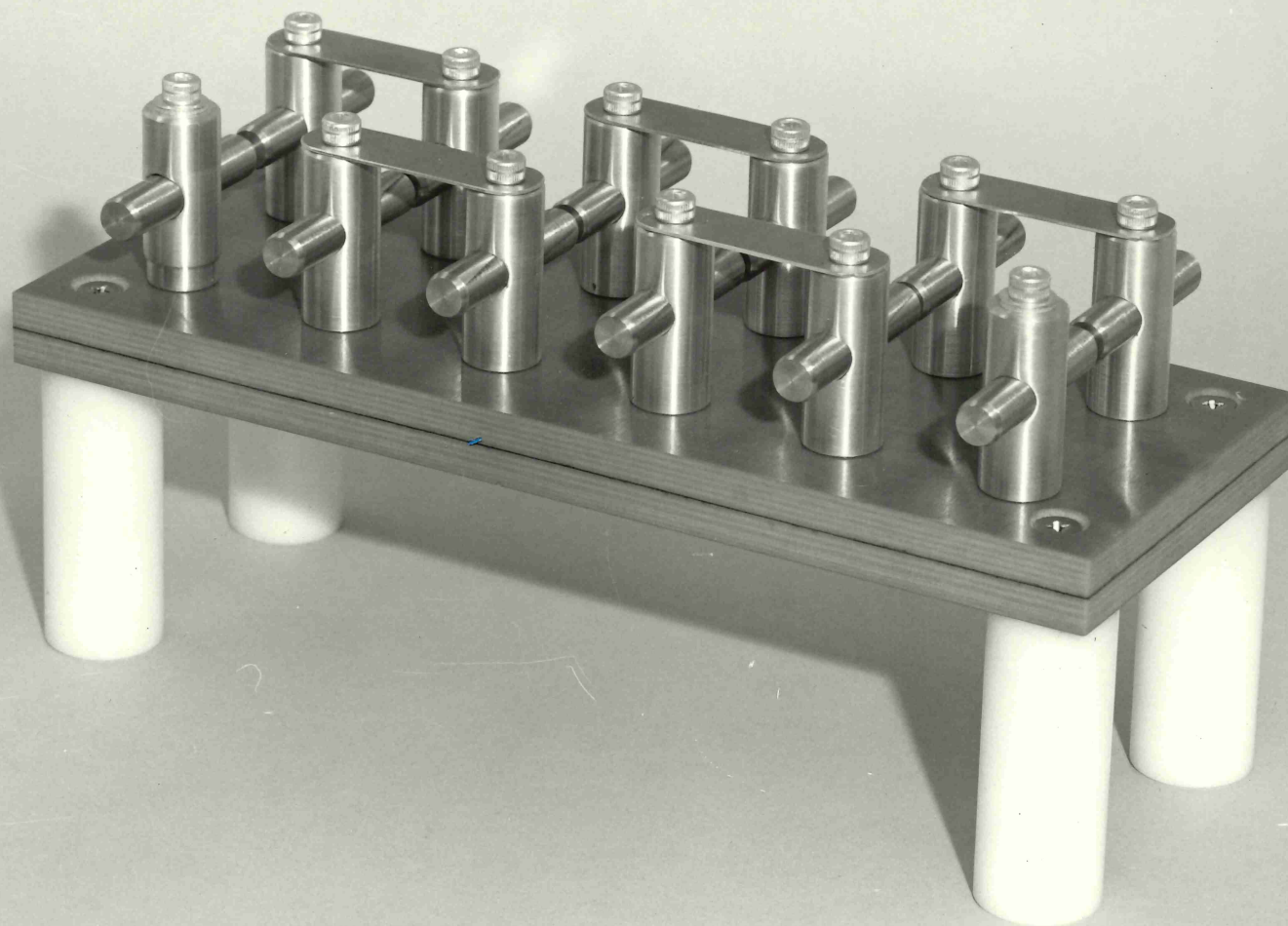
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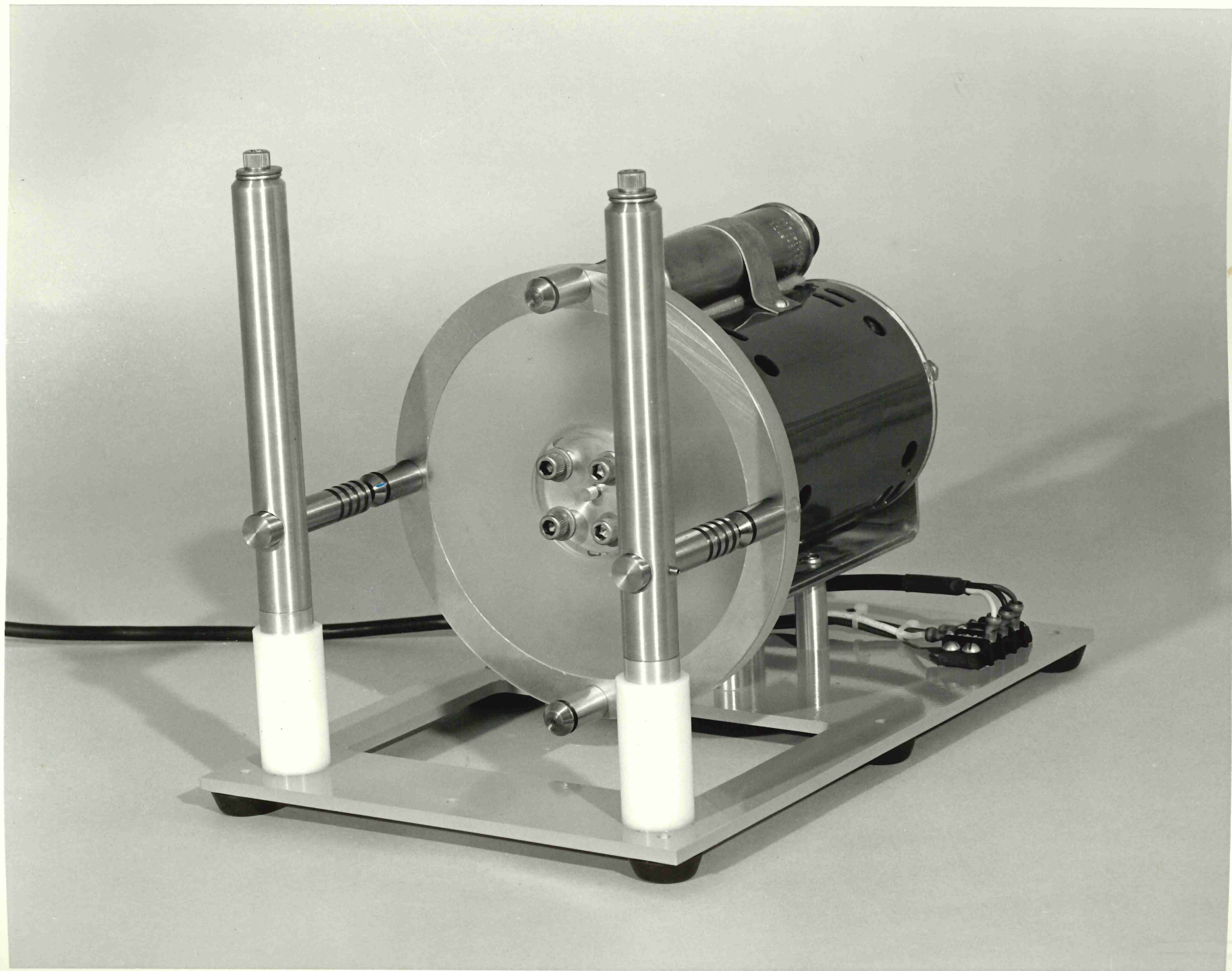
ULTRA HIGH VOLTAGE DIVISION

WILLIAM C. WY SOCK

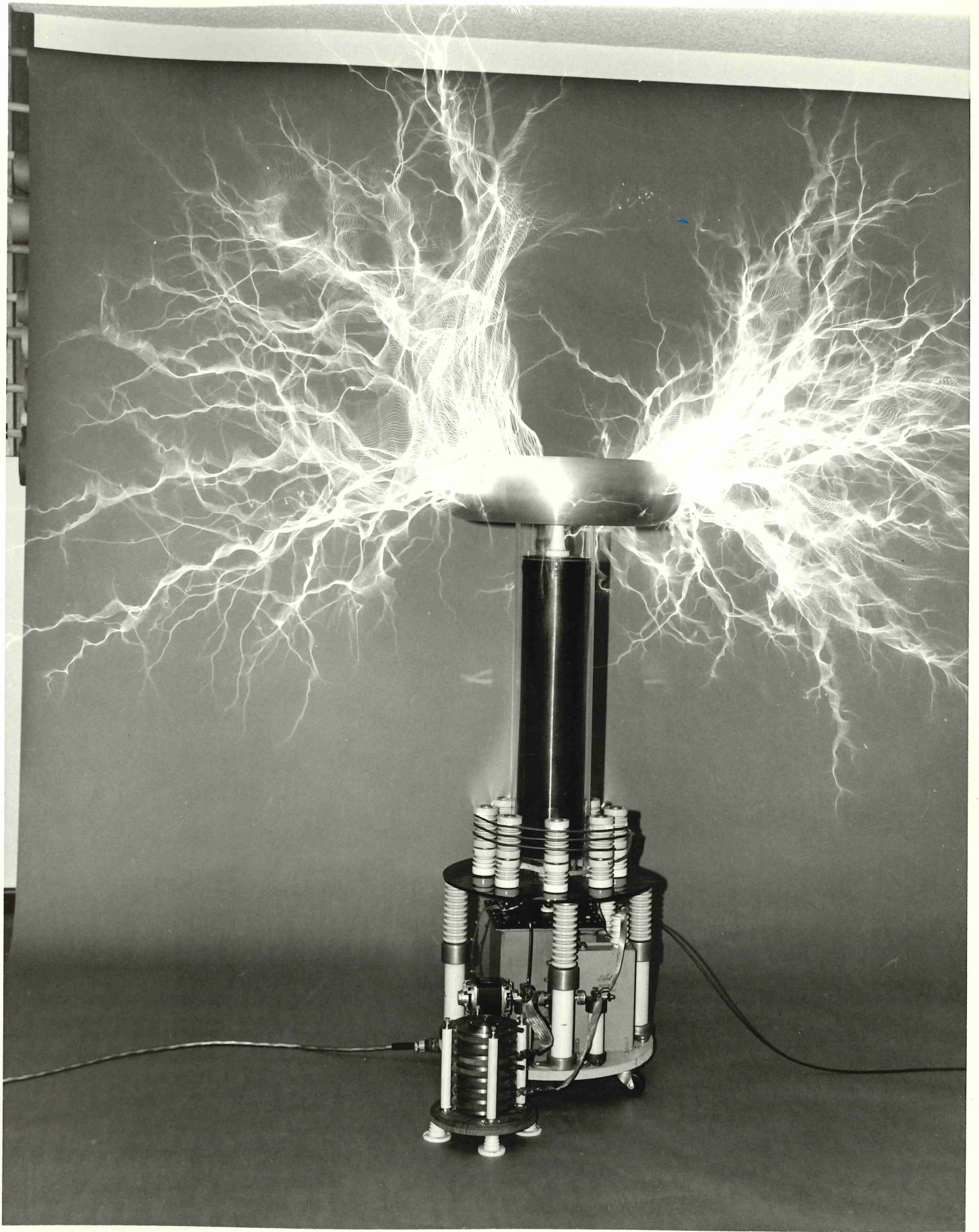
*MODEL 5 COIL
~ 48" SPARKS
2.5 KW INPUT*



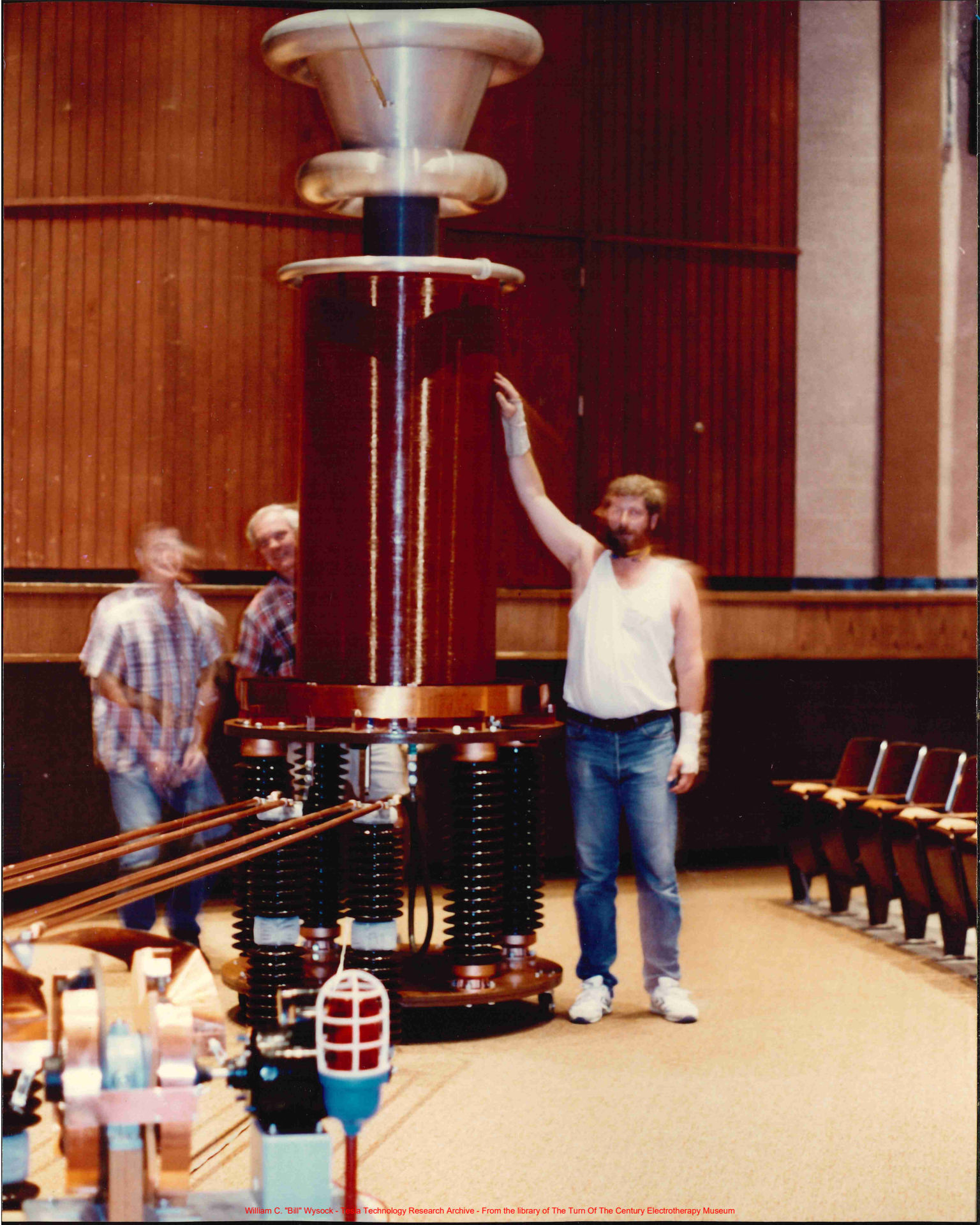




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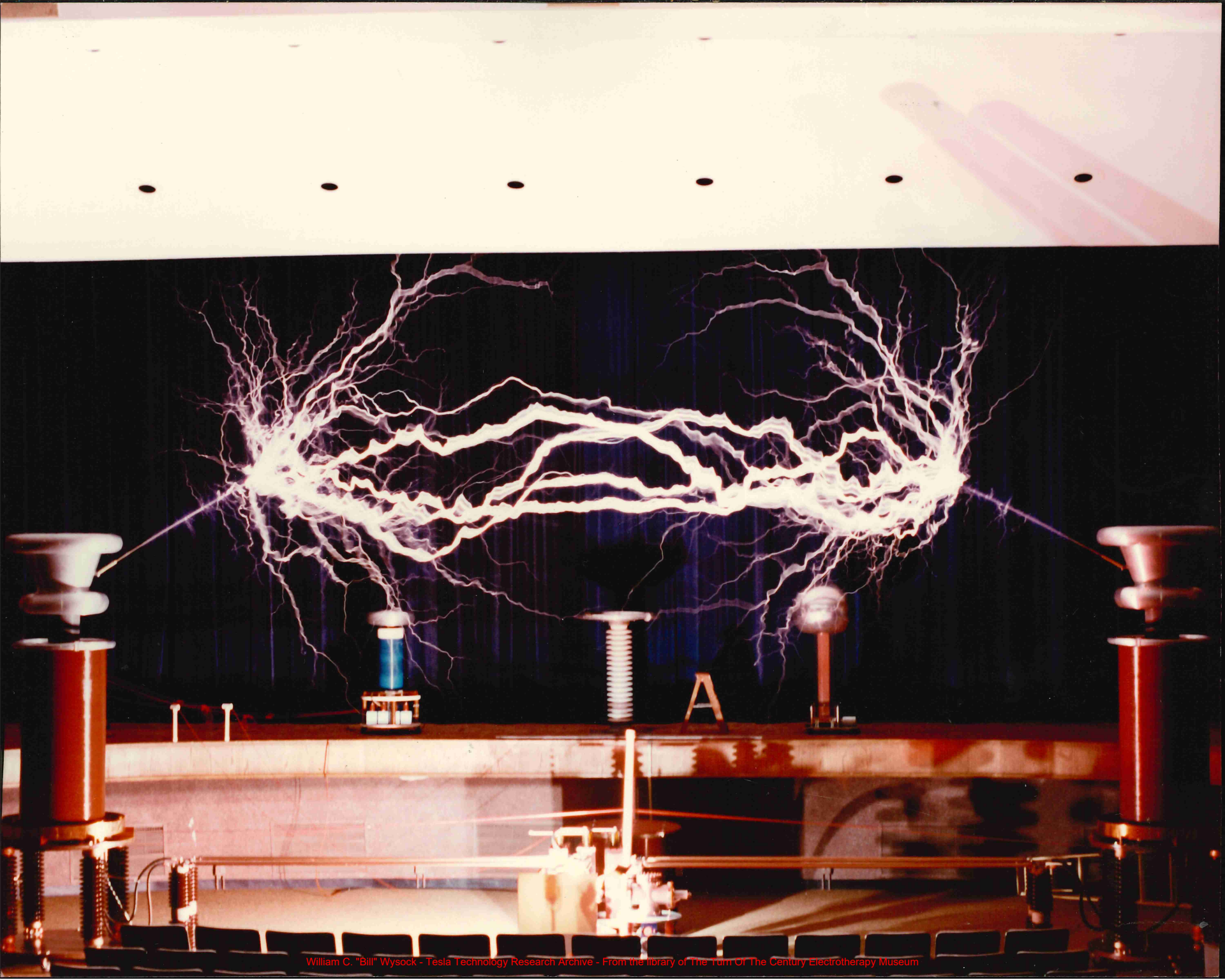


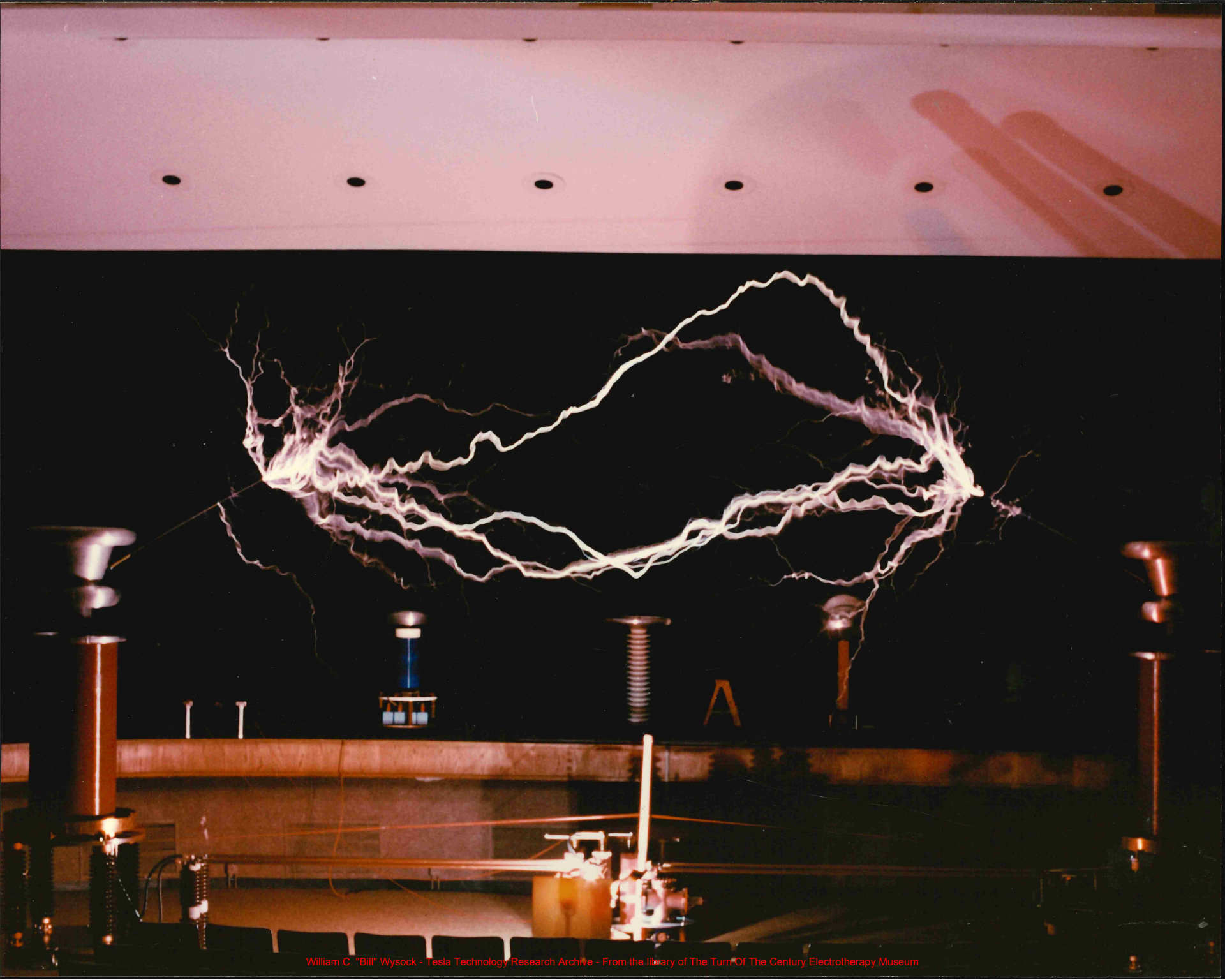


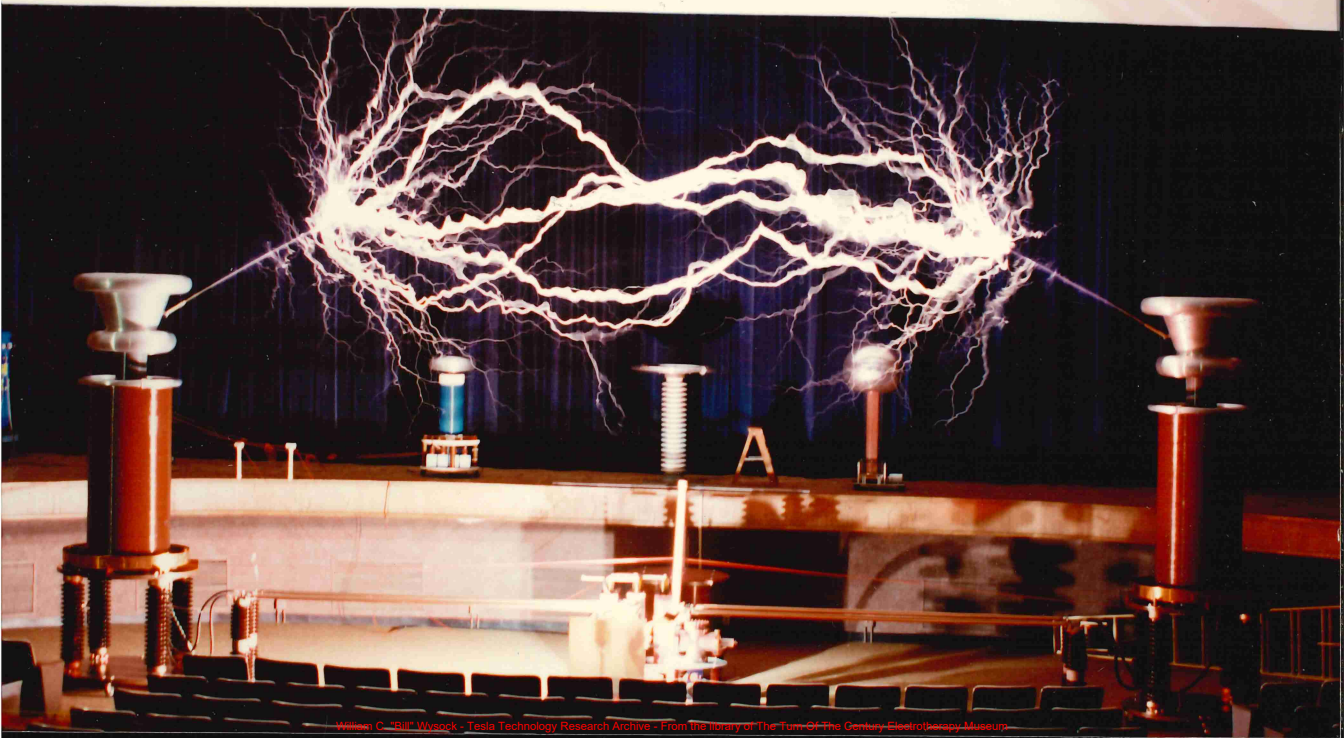




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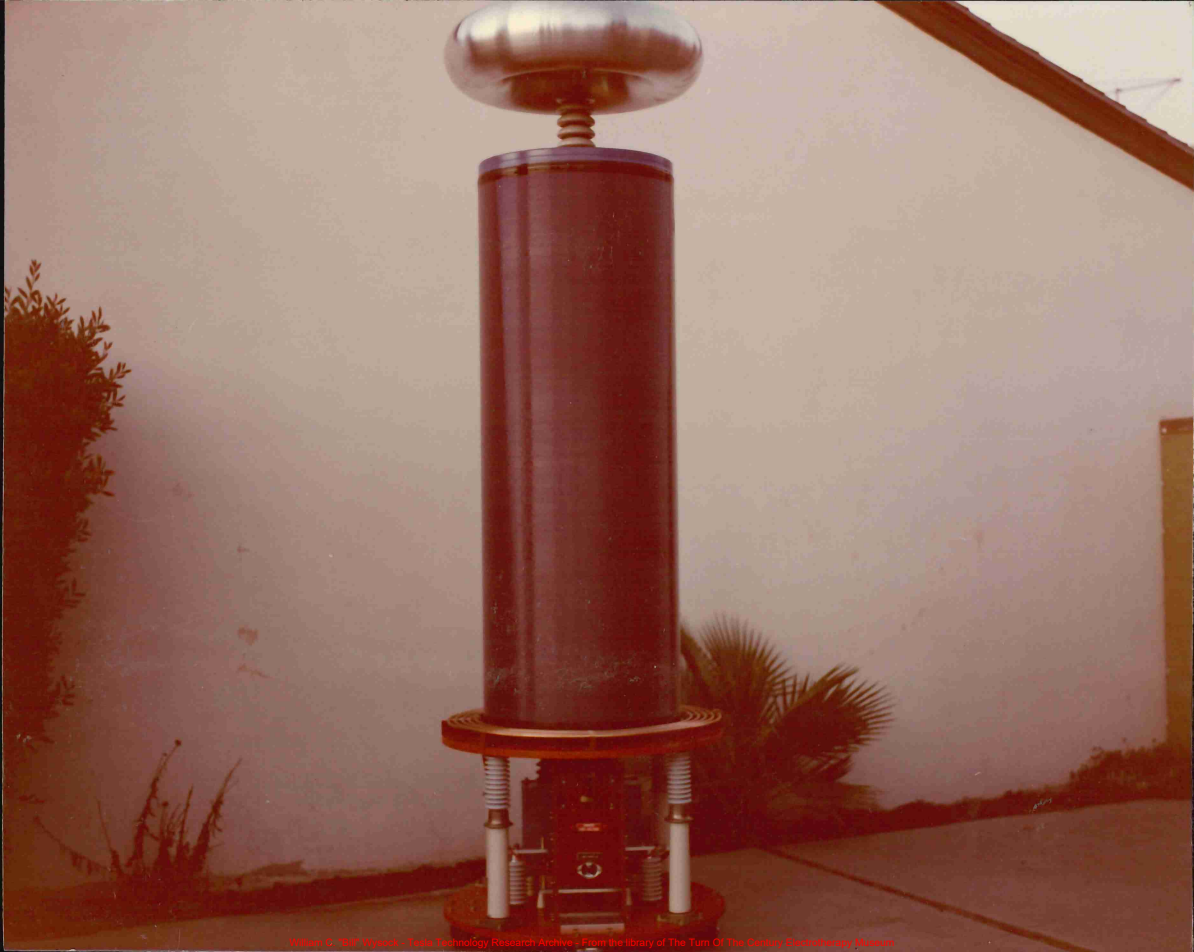


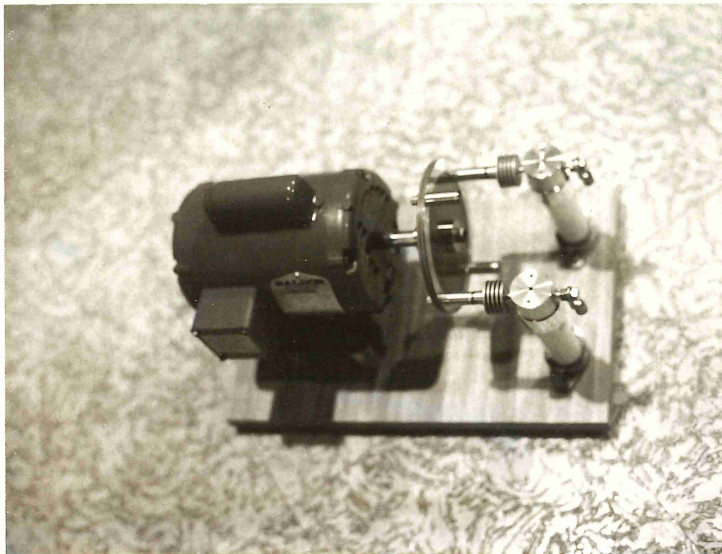


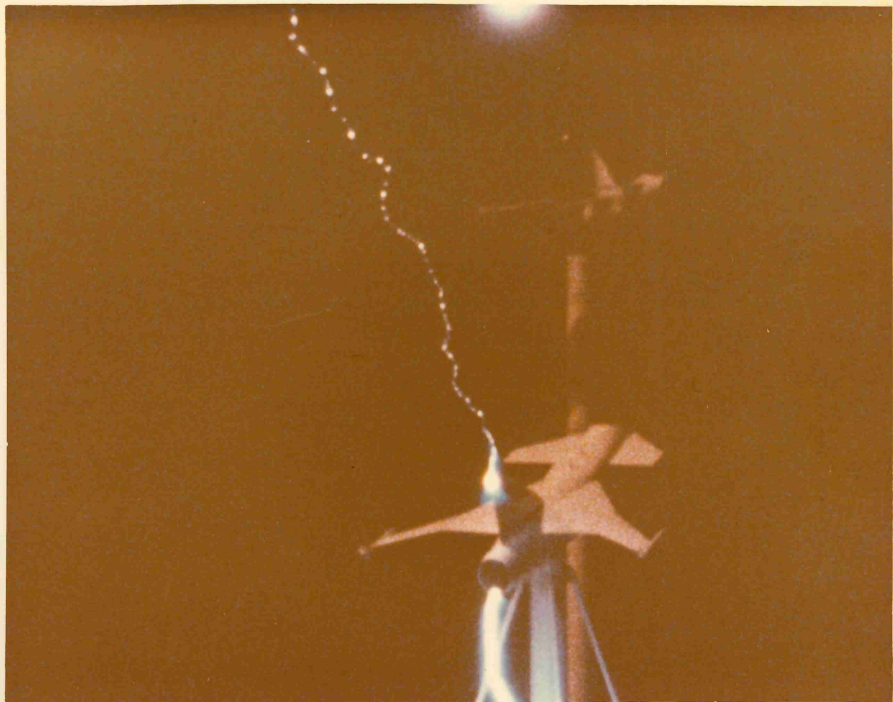




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William C. "Bill" Wysock - Tesla Technology Research Archive - From the library of The Turn Of The Century Electrotherapy Museum

1978

Ball Lightning

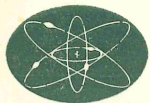
Formed while Testing

1/2 scale Model of F-16 Pilot-

Computer Control fighter Plane
for U S A F. Wendover AFB,
Utah 84083

(Composite Skin Aircraft)

Robert K. Golka



Golka Associates

ELECTRONIC CONSULTANTS

38 PARK STREET BROCKTON, MASSACHUSETTS 02401



Mr. Bill Wysock
4914 Baldwin Ave.
Temple City, Cal.
91780

Up & Coming

Computer Used To 'Move' Dirt At Nav Stations

SCOTT AFB, Ill. — The amount of grade-and-fill needed to help create the best signals from navigational aid stations is being determined by a computer plan here.

Tests being conducted by AF Communications Service's (AFCS) 1842d Electronics Engineering Group could save U.S. taxpayers money in earth-moving costs, AFCS said.

Project managers are using a computer system to determine the amount of earth that must be moved or added for the most efficient operation of instrument landing systems. Earth layout affects the strength of a station's generated navigational signal.

To insure the maximum accuracy of landing systems, it is necessary at times to grade and fill the surrounding area. "This method, particularly when the movement of several 100,000 cubic yards of dirt is necessary, is not only time-consuming, but extremely expensive," Jim Baggett said. Baggett is the project officer for the computer program.

The cost of moving dirt has climbed from 90 cents to more than \$5 a cubic yard in recent years, Baggett said.

With the use of the computer plan, a site can be "modeled" — mathematically built before the first yard of dirt is moved. Information on surface features, antenna heights, radio signals, flying runs and other data are fed, in different sets, to the computer. The impact these items have on radio bounce are computed.

The program in the computer then gradually shaves the hills and/or fills the hollows until the best signals are produced with the least projected amount of earth movement.

Colorful Radar

WASHINGTON — Say it in living color!

Such an idea is to be tested by the Federal Aviation Administration under a \$186,000 contract with the Raytheon Co.

The FAA intends to add more color to its radar displays to help air traffic controllers get a better reading on different information presented on their screens.

Four view displays will have color capabilities added for tests to be conducted at the FAA's air route traffic control center in Leesburg, Va., Raytheon said. Two multicolor displays will be delivered to the FAA's National Aviation Facilities Experimental Center in New Jersey.

The display systems will provide information in four colors — red, orange, yellow and green — rather than the single green now

used in the systems, the company said.

Here's what the colors will depict: red, navigation aids; orange, weather; yellow and green, aircraft data blocks. Yellow and green will provide controllers with the identity, altitude and other information on flights being handled.

Building Its Own

WASHINGTON — A former Pentagon official has told the House Armed Services Committee that NATO countries are serious about reducing their purchase of U.S. weapons systems.

Dr. Roger Shields, an economist and former Pentagon official, cited a decision by NATO countries to co-produce the advanced F-16 aircraft in Europe rather than buy it outright from the U.S.

According to Shields, the cost of European production is significantly more than the price of the aircraft off U.S. production lines. But, he told the committee, NATO members claimed it was worth it because of the technology transfer involved.

Shields said that NATO members look at the manufacturing of weapons in their countries as a means of promoting jobs and improving their economic health.

New Bomber Eyed

WASHINGTON — The FY 1980 defense budget is expected to contain funds to study the needs of a new manned penetrating bomber, an AF spokesman said.

The studies could lead to a successor to the B-1 bomber that was canceled by President Carter. Defense Department officials have said that a new bomber is needed — one different in design

Lightning Strikes Tested

By a Times Staff Writer

WASHINGTON — A "machine" used in the late 1890s has been duplicated near Hill AFB, Utah, in order to generate lightning strikes against aircraft.

Robert K. Golka, director for Project Tesla, told *Air Force Times* that the Tesla generator simulates the ball lightning strikes that aircraft can encounter in flight.

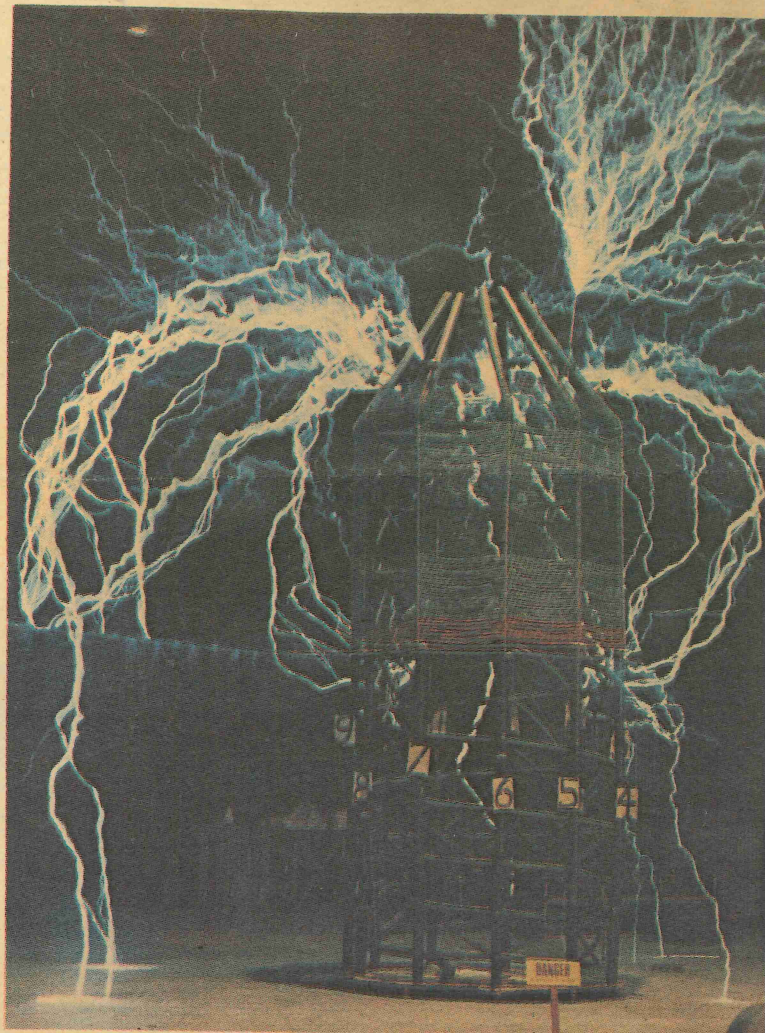
The idea, he added, is to determine ways to reinforce aircraft and their systems so that they can survive repeated lightning strikes. AF wants to determine aircraft "hardness," Golka said.

Golka, who has been working on the project for 10 years, traveled to Belgrade, Yugoslavia, in 1968 to learn more about the U.S.-conducted research of Nikola Tesla who invented various electric devices.

Ironically, Tesla's work was conducted in Colorado Springs, Colo., but his diary of 1899 was discovered by Golka in the Nikola Tesla Museum in Yugoslavia.

Golka said tests at the Wendover Auxiliary Airfield have been conducted mostly with aircraft models, but actual aircraft can and have been used. AF is inter-

ested in developing lightning protection for aircraft made with lightweight composite materials which can be penetrated by nature's electrical charges.



Lightning can cause composites

to explode, Golka said.

The Tesla generator takes about 100,000 watts to produce lightning bolts. It has been modified several times to make it as "original" as possible, Golka said.

The AV-8B flew for the first time at McDonnell Douglas Corp. facilities here recently. DoD officials said the AV-8B will more than double the payload or radius Marine pilots now experience with the craft's predecessor, the British Aerospace AV-8A Harrier.

Contracts

Hughes Aircraft Co., Calif., \$3.5 million for F-106A/B navigation system upgrade.
General Electric Co., Mass., \$3.1 million increase for J85-GE-21A engines.
Airborne Instruments Laboratory, N.Y., \$1.2 million for EF-111A aircraft ALQ-99 subassemblies.

TRW, Calif., \$3.6 million increase for Minuteman III retargeting capability updating.

TRW, Calif., \$1.7 million for Space and Missile Systems Organization operational flight test support.

TRW, Calif., \$1 million increase for Defense Satellite Communication System II antenna modifications and other work.

Ford Aerospace and Communications Corp., Calif., \$8.2 million for logistics support of AF Satellite Control Facility at Palo Alto, Calif., and other locations.

Rolls Royce Ltd., England, \$1.7 million for A-7 aircraft engine modification kits.

McDonnell Douglas Corp., Mo., \$1.9 million for F-15 radar data processor spare parts.

Geodynamics Corp., Calif., \$2 million for MX program technical assistance.

United Technologies Corp., Calif., \$6 million increase for Titan missile work.

Tektronix Inc., Ore., \$1.4 million for 100 megahertz oscilloscopes.

CG: Divorce No Cause for BAQ Hikes

By a Times Staff Writer

WASHINGTON — Service members' basic allowance for quarters should not be increased simply because they are divorced or separated from other service members and are paying child support, the U.S. Comptroller General has ruled.

The services apparently have been paying too much BAQ to some such members, the comptroller indicated in a recent decision (B-191617) designed to clarify some rules under which BAQ is paid.

BAQ is not payable to a member who lives in single-type government quarters and pays child support to a separated or divorced spouse who also is a service member, if that spouse has custody of

their child and is assigned to adequate family quarters.

BAQ at the "without-dependent" rate is payable to a member who does not have adequate single quarters when the estranged spouse has child custody and has adequate family government quarters, the comptroller said.

Under the services' pay and allowances system, all members must receive either adequate quarters or quarters allowances for themselves and their dependents.

When members married to members are separated or divorced, both retain their legal rights either to adequate quarters or to a quarters allowance, the comptroller said.

If the estranged spouse with child custody is furnished adequate family quarters, the other spouse is entitled either to single quarters or to a BAQ at the without-dependents rate, the comptroller said.

Some apparently have received BAQ at the with-dependent rate, the comptroller indicated.

The without-dependent rate is lower for all ranks. For example, an E-7 receives \$150.30 monthly at the without-dependent rate and \$231.90 at the with-dependent rate. An O-3 receives \$231.90 at the without-dependent rate and \$286.20 at the with-dependent rate.

BAQ entitlements are not related to the amount of alimony and child support paid by one member

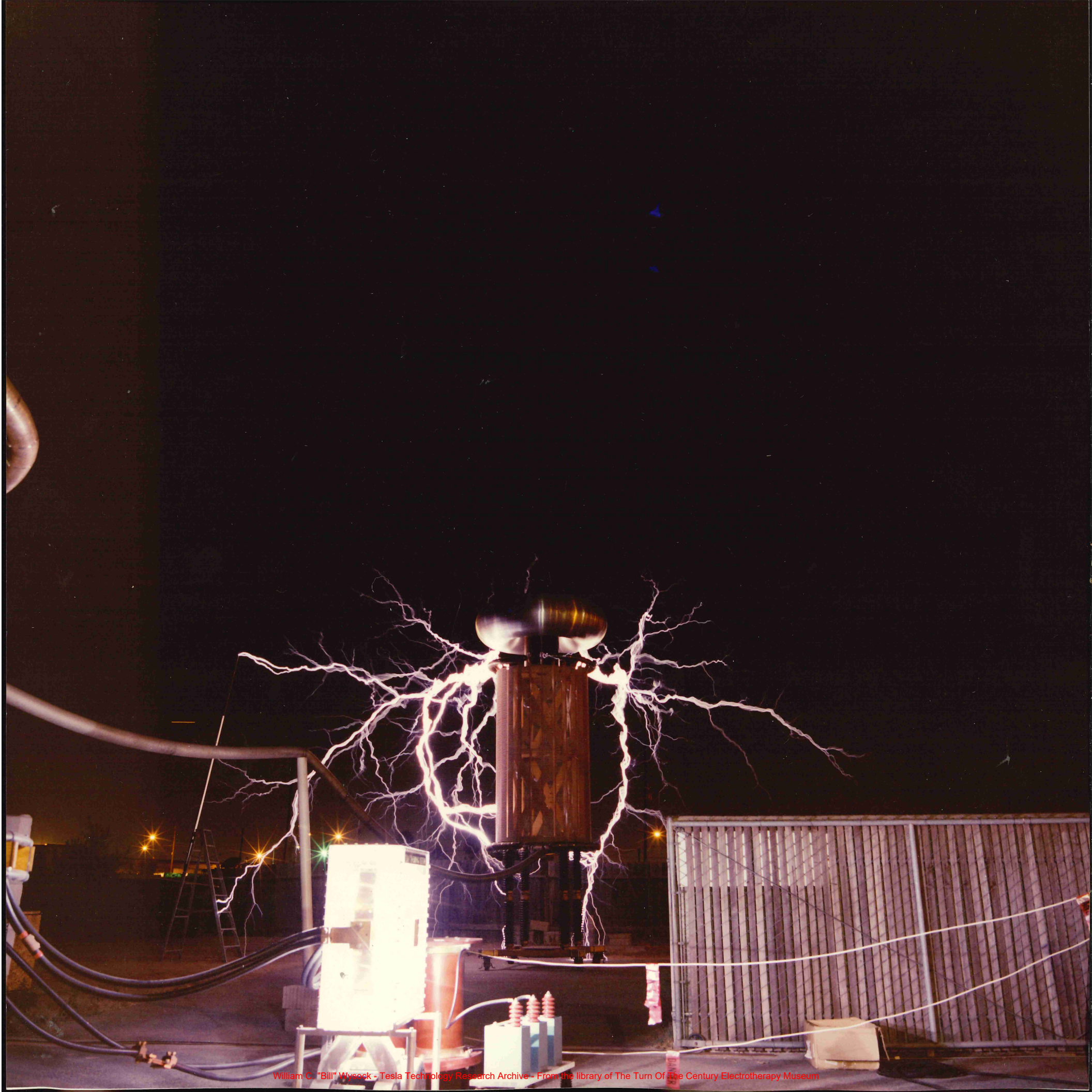
to his separated or divorced spouse who also is a member, the comptroller said.

In many cases, such payments are not reduced when the spouse with child custody is assigned base housing.

That means the estranged spouse with child custody may receive both full support payments — which presumably help pay housing expenses, among other things — plus "free" housing from the government.

It is the responsibility of members liable for such payments to have their support agreements adjusted when a spouse and child are furnished government quarters at no cost to either spouse, the comptroller said.







William C. "Bill" Wysock - Tesla Technology Research Archive - From the library of The Turn Of The Century Electrotherapy Museum



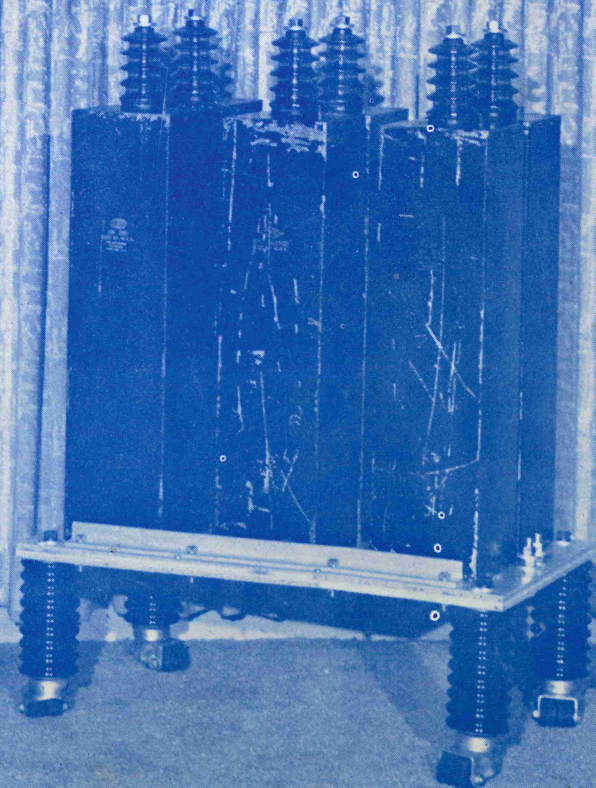
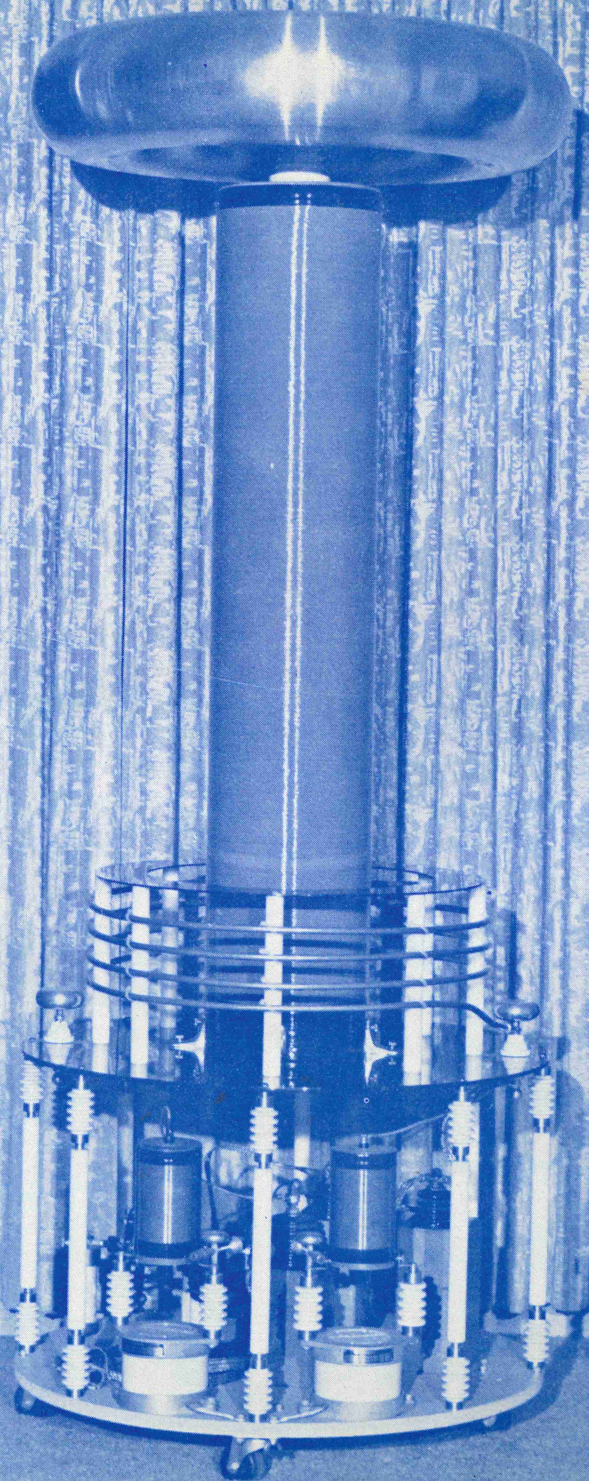
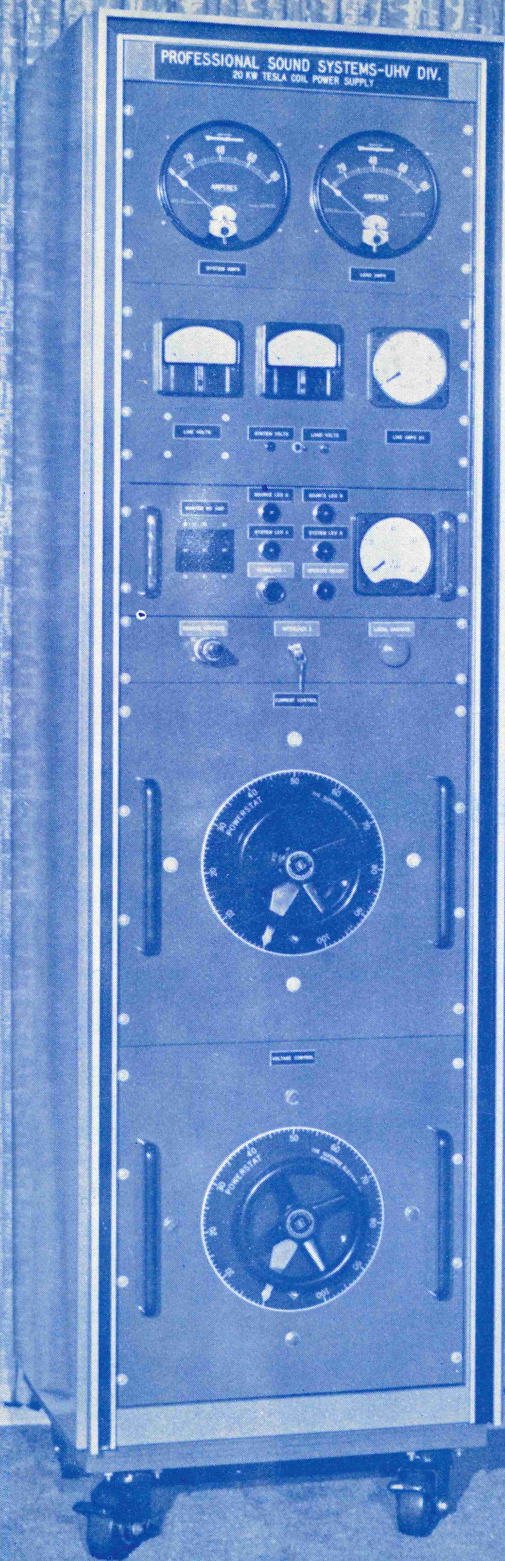


THIS SIDE UP

**PROFESSIONAL
SOUND
SYSTEMS**

UHV DIVISION

TESLA COILS for EXPERIMENTS and RESEARCH



HISTORY BEHIND THE PRODUCT

The Tesla Coil, invented by the Yugoslav/American Inventor Nikola Tesla, just prior to the turn of the century, opened a new field of technology to the electrical world.

Since then, Tesla Coils have been built in many configurations. They have found useful application as a source of extreme high voltage in early attempts to split the atom in the 1930's. Also, Tesla Coils were used to simulate lightning surges on specimen power transmission lines in many leading high voltage research laboratories throughout industrial nations of the world. Tesla Coils became an expected attraction at most science fairs and school open houses. Most recently, since 1973, an extremely large Tesla Coil is employed at Wendover, Utah as an effort to generate Ball Lightning Phenomena. Other efforts in different parts of the world are also now emerging.

In one form or another, Tesla Coils are utilized today in many areas of industry, medicine, as well as the amateur electrical experimenter's corner. In the case of the latter, many magazine articles and even some construction kits have appeared on the market occasionally. Typically, all of these plans and kits gave inefficient performances and were usually offered to the perspective buyer in only one basic form.

Today, with an increasing interest in Tesla's Coil, there arises a growing need for a variety of coil configurations based on modern componentry of high efficiency and superior design. Professional Sound Systems-Ultra High Voltage Division is meeting this challenge.

A COMPANY WITH A CONCEPT

Professional Sound Systems, a diversified engineering, manufacturing, and consulting firm was founded in 1975, and has now entered the field of ultra high voltage with a complete line of Tesla Coils. Prior to the formalizing of the organization more than a decade of research and development was expended perfecting various prototype coils. Much knowledge and experience was gained from this period of involvement.

Professional Sound Systems — UHV Division has integrated this expertise as a basis for a total engineering concept, and is now able to offer for the first time anywhere, a variety of Tesla Coils of high-end design, uncompromising quality and efficiency, at a moderate cost.

Ten standard models are available ranging from small experimenter's types up to large laboratory apparatus. Model 10, for example, is a 20 KVA input, 5 Megavolt output coil and is capable of discharges up to 15 feet in length.

Carefully selected — hand assembled components insure the highest quality. Custom designed circuitry features long life expectancy, maximum system protection and operator safety.

Engineering breakthroughs in critical design areas have resulted in decreased system cost while improving performance and versatility.

This brochure is intended to introduce you to various products in our new line. Data sheets on models not shown in this brochure are soon to be available on request. Individual components and customer service is also available. Please call or write:

PROFESSIONAL SOUND SYSTEMS

4914 Baldwin Ave., Temple City, CA. 91780 (213) 442-2120

PROFESSIONAL SOUND SYSTEMS

4914 BALDWIN AVE. • TEMPLE CITY, CA 91780 • (213) 442-2120

PROFESSIONAL SOUND SYSTEMS — UHV DIVISION

All components and Tesla Coil models manufactured and sold by Professional Sound Systems — UHV Division are warranted against defects in material and workmanship.

The buyer assumes all responsibility for the safe and proper use of any component(s) and/or system(s) purchases from Professional Sound Systems — UHV Division. It is understood that in many Tesla Coil components and system models sold by Professional Sound Systems — UHV Division, A Potentially LETHAL SHOCK HAZARD EXISTS AND EXTREME CARE AND CAUTION MUST BE EMPLOYED AT ALL TIMES.

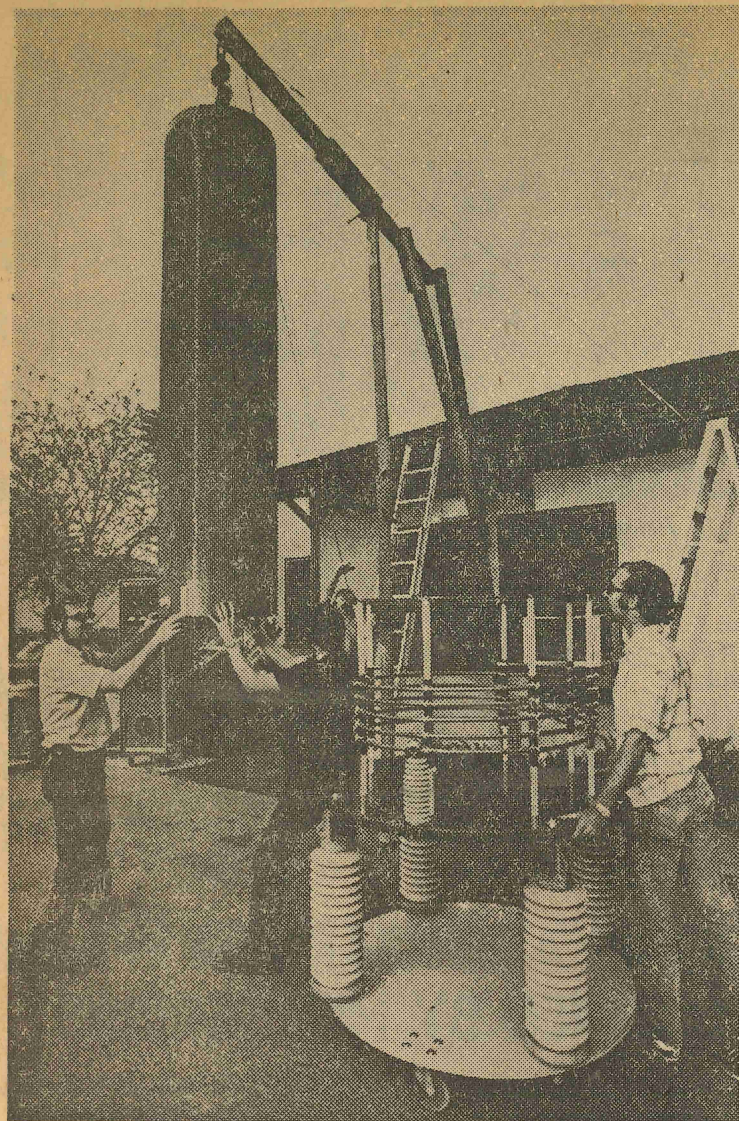
Additional Information on various Tesla Coil models and components are available from Professional Sound Systems.

Please — serious inquiries only.

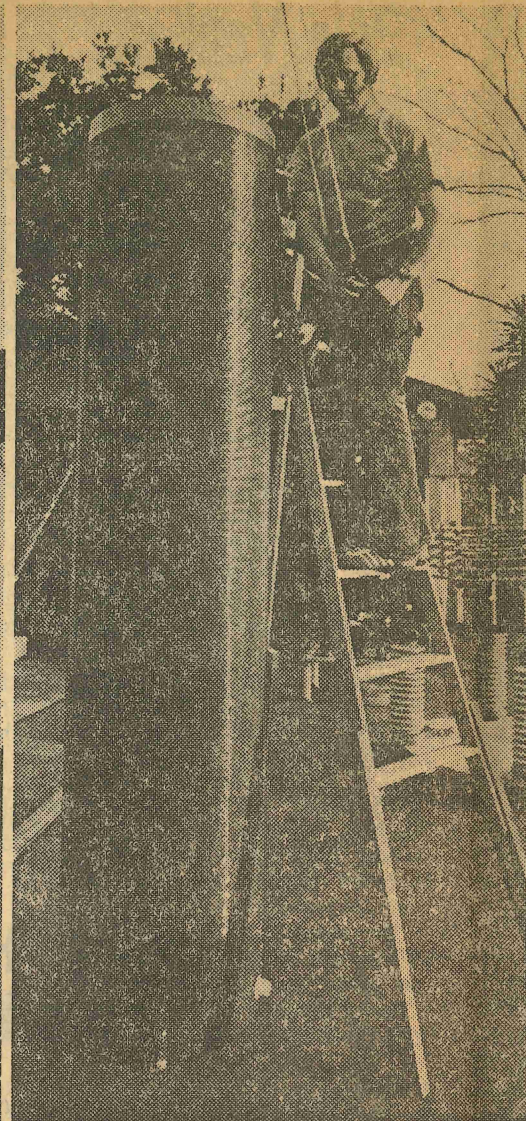
Prices, terms, and delivery schedules available on request and subject to change without notice.

BACK COVER

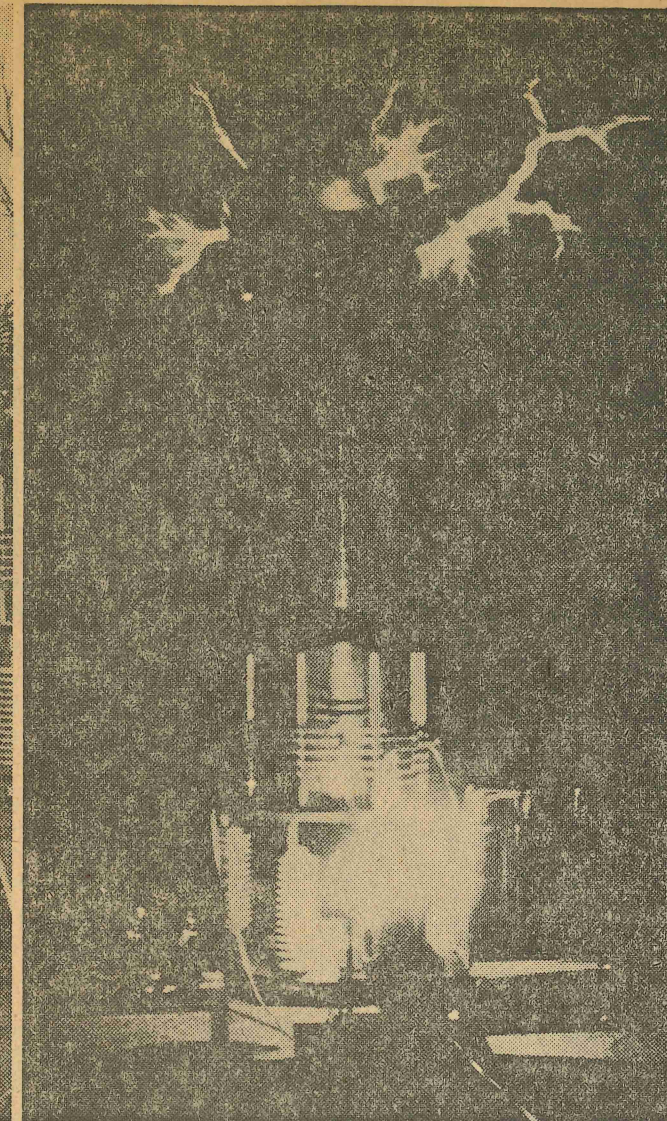
Pictured from left to right are a prototype 20 KVA Power supply currently being used for a Model 10 Tesla Coil, Model 7 Tesla Coil base unit with 30" diameter toroid discharge electrode, capable of discharges up to 8 feet long at 8 KVA input, and an experimental capacitor bank, currently being used with a prototype of Model 10 Tesla Coil.



WATT-AGE—Bill Wysock of Temple City is determined to light up his life—and everybody else's—with the man-made lightning he creates on Tesla coil in his driveway. As Wysock adjusts the wire,



left, his friends, from left, Ron Rockwell, Dave Jennings and Jim Shaffer help him set up the contraption. It takes several hours to assemble the coil and at one point, Wysock climbs a ladder,



center, to get closer to his subject. The 14-foot coil is the 10th and largest that Wysock has built. It has produced 17-foot-long sparks, some of which look like those coming from the coil at right.

Times photos by Joel P. Lugavere

Lightning Experimenter Seeks Bigger, Better Bolts

Enthusiast Follows in Steps of Inventor, Hunts New Energy

BY MAYERENE BARKER
Times Staff Writer

As a young boy, Bill Wysock was so fascinated by lightning that he would run out into the rain just to catch a glimpse of it.

"The bigger the bolt the better," recalled Wysock.

Today, at 29, Wysock not only still chases lightning bolts but makes his own in the driveway of his Temple City home.

He creates man-made lightning with a Tesla coil, a high frequency transformer of electric current. The 14-foot-tall coil in his driveway is the 10th and largest that Wysock has built.

A year in the making, the coil has produced lightning "sparks" 17 feet long during Wysock's driveway experiments.

"I'm still searching for the spark that satisfies," Wysock

Los Angeles Times

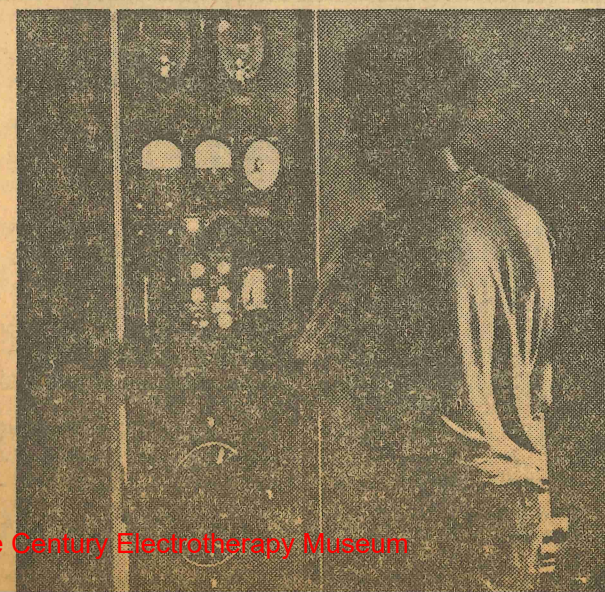
San Gabriel Valley

S PART VII

THURSDAY, MAY 3, 1979

"He's an electronics genius," said one boy to his friend as they watched. "He made that whole thing, you know."

Wysock, a graduate of Arcadia High School and Pasadena City College, did electronics work during a hitch in the Army. But that is the extent of his formal edu-



Seven School Reorganizing Plans Ready

Numerous Closings Among Proposals of Pasadena Committee

BY LEE AUSTIN
Times Staff Writer

PASADENA—Seven plans, calling for school closures and reorganization of district facilities, will be presented next week by the District Staff-Community Planning Committee to the Board of Education.

The district is faced with reorganizing because of declining enrollment and economy. However, as in any proposal affecting Pasadena students, integration is a factor.

Some of the plans advocate selling or leasing several of the schools proposed for closure. One plan proposes selling the north section of the Education Center, the district's administration building, along with the adjacent McKinley Junior High School.

Every school except Roosevelt School of the Handicapped would be affected by the plans, either by realignment of their grades, switching to a special or regular school or closure.

This is expected to stir widespread reaction among parents and school personnel, especially those whose schools are proposed for closure. Even before the committee's plans were made final, 23 members of Audubon School's staff registered their protest against closure to the school board. Five of the plans call for Audubon to be closed.

Other schools proposed for closure in the various plans are Field, Jackson, Linda Vista, McKinley Elementary, Noyes, Sierra Mesa, McKinley Junior High, Washington Junior High and Wilson Junior High.

The plans also tag Don Benito, Hale and Loma Alta schools for possible closure.

Appointed by the Board of Education, the 32-member committee, headed by Peter Hagen, district research director, completed the plans last week after nine study sessions which started Feb. 26.

The committee consisted of school and district staff personnel, parents and others.

The plan will be discussed at a community meeting conducted by the PTA Council on May 12, from 9 a.m. to 1 p.m. in the Holliston Avenue Methodist Church.

The contemplated reorganization of the district's schools stems from the need to reorganize because of De-

However, he has conducted the experiment with his latest and largest Tesla coil only five times since it was completed a year ago.

One reason is that it takes 1½ hours and at least three assistants to get the coil and its generator set up and ready to make lightning.

Friends Dick Aurandt, Glendale; Jim Shaffer, South Gate; Ron Rockwell, Orange and Dave Jennings, Arcadia, assisted Wysock at his latest test.

"A Tesla devotee will travel any distance to see an experiment," Aurandt said. "And on a Saturday night, too."

When the experiment started, neighbors gathered and passing motorists stopped and watched. Soon, a small crowd of spectators surrounded the driveway.

"The non-technically minded are awed at the spectacle," Wysock said. "It is so extraordinary."

The electrical discharges turned out by the coil are "almost an art form," he added. "I can't describe their beauty."

Although the experiment began about 6 p.m., Wysock and his friends were still at it at 10 this particular night.

"I'm self-taught," he said. "To do that you have to have incentive and curiosity. I don't know about the genius part."

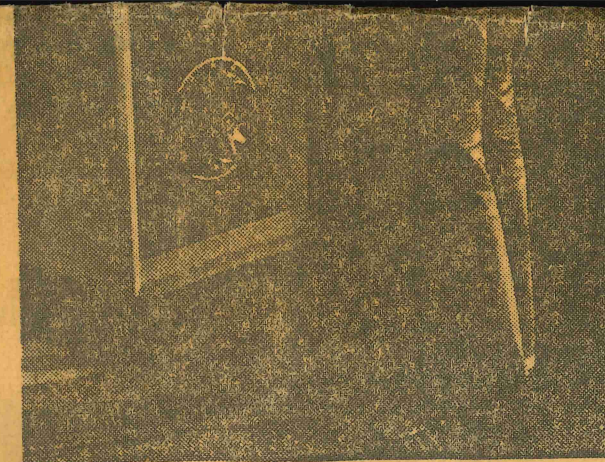
During his experiments, Wysock is friendly to curiosity-seekers but takes every possible safety precaution.

The sparks are "absolutely lethal," Wysock emphasized. But he always tells the curious about Nikola Tesla, the coil's inventor. One of his goals is to make Tesla better known.

Tesla, an electrician and inventor who emigrated to the United States from Croatia in 1884, worked briefly for Thomas A. Edison, then went off on his own to invent, in addition to the coil named for him, an induction motor, such as the one that operates a washing machine; alternating current (AC) transmission of electricity; a wireless communications system and a system of wireless electric power transmission.

To Wysock, who built his first Tesla coil at age 9, Tesla is an unsung hero whose name should be as widely known

Please Turn to Page 6



COUNTDOWN—Wysock adjusts controls of Tesla coil in preparation for home-made light show.

tinuing enrollment decline. The district's 24,195 enrollment is projected to decrease by 750 to 800 students next year.

Mrs. Reynolds told committee members to recommend alternatives which would "maximize the use of district facilities and staff . . . in times of declining enrollments and fiscal restraints."

Developed by subcommittees and individual members of the committee, the plans are divided into four short-range ones for the new school year in September and three long-range proposals with a September, 1980 target.

They offer a variety of choices for the board.

Supt. Verdelle Reynolds said she would make her recommendations at the regular Tuesday board meeting

Please Turn to Page 6

Pasadena Police Win Fight for Workout Room

BY BERT MANN
Times Staff Writer

PASADENA—The Police Officers Assn. has been given the right to use an exercise room in the police headquarters building.

The Board of City Directors by a 4 to 3 vote authorized the use of the room where several months ago the 160-member association had installed, at its own expense, a \$6,000 Universal exercise machine. The machine includes a pulley system of weights with slant boards and other devices designed to improve muscle condition.

But after the machine was installed, the city attorney's office ruled that it could not be used on city property on the grounds that the city could be liable for injuries suffered during its use.

But Director William Bogaard won majority support for a proposal that the association be allowed to use the room for a one-year trial period.

At the same time, Bogaard's proposal stipulated that only off-duty sworn officers who are under the supervision of a gymnasium instructor should be allowed to use the equipment.

Conditions also imposed are that no loose weights or barbell equipment will be allowed in the exercise room and that the police association provide liability insurance.

Director Donald F. Yokaitis, who was among those opposed to Bogaard's proposal, said he thought it was "irresponsible on the part of the

Please Turn to Page 4

ARSON SUSPECTED

School Records Survive \$350,000 School Fire

BY MIKE WARD
Times Staff Writer

WEST COVINA—If vandals set fire to the administration building at West Covina High School to destroy school records, they failed.

But they succeeded in wrecking offices, ruining school trophies, knocking out the bell system that summons students to class and creating damage tentatively estimated at \$350,000.

West Covina police Det. Dan Leonard said the cause of Monday's fire has not been determined, but arson is suspected. A \$500 reward for infor-

mation leading to the conviction of those responsible is being offered through We-TIP, an organization that funnels information from anonymous sources to investigators.

The arson theory was reinforced police said, by the discovery that vandals had broken into a woodshop classroom and a trailer housing a career opportunities program. Papers were scattered on the floor. Tools taken from the shop were found on the campus grounds.

Leonard said investigators believe the break-ins and fire may be connected but have no evidence yet to support their theory.

Much of the administration building was burned before firemen arrived. Police called firemen after officers responded to a burglar alarm at the school at 12:31 a.m. when flames were seen shooting from the building.

The fire was confined to the administration building, destroying the offices of the principal and other administrators and the nursing and attendance offices.

Leonard said the school records were in a fireproof wall vault protected by concrete and steel.

He said the loss that can't be replaced is the many trophies earned by students and the school. "West Covina is one of the outstanding high schools in Southern California in athletics," Leonard said, "and many of its major achievement awards were de-

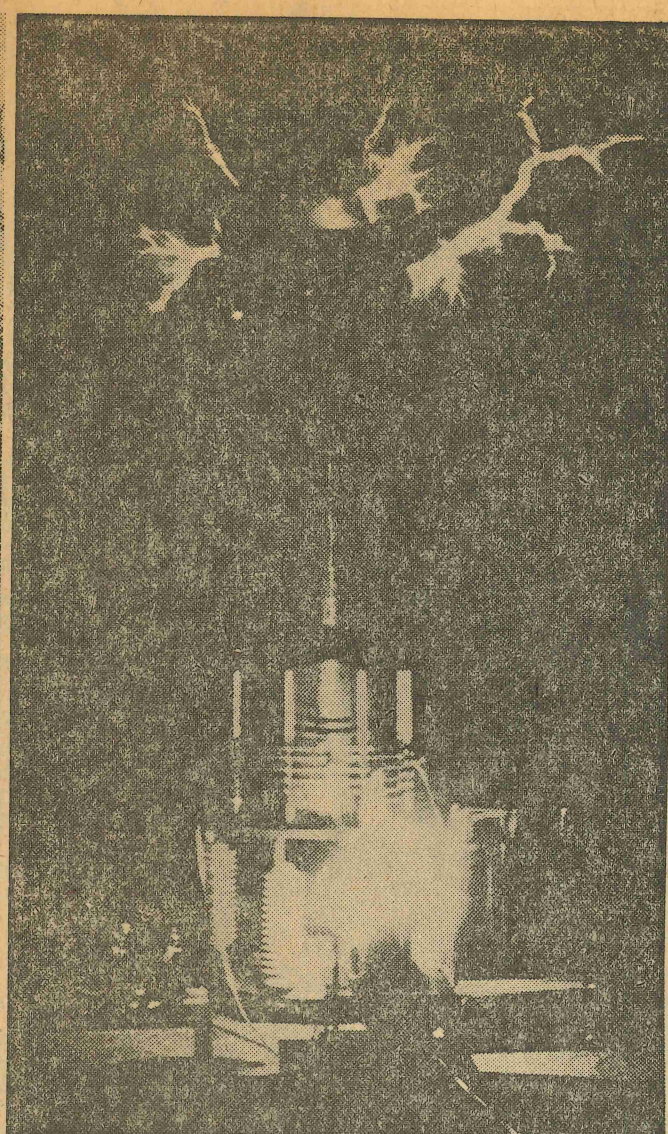
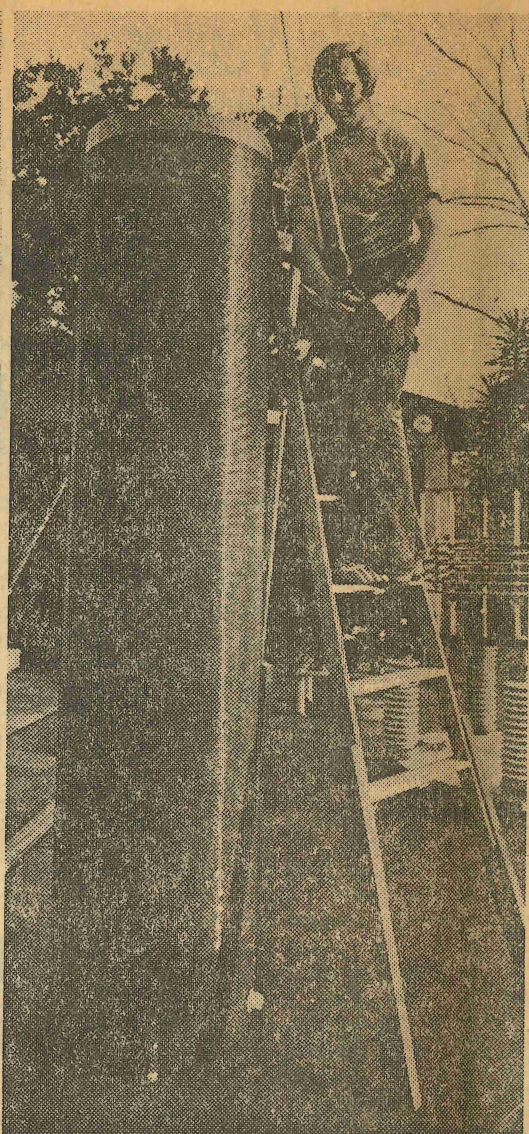
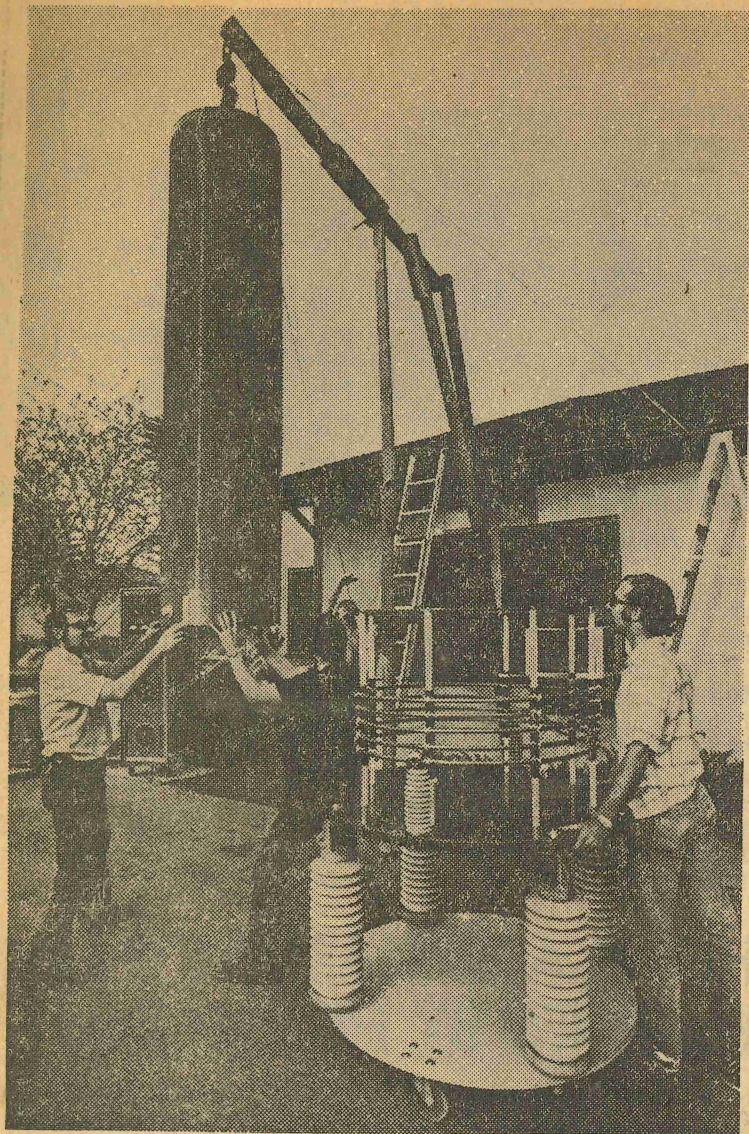
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HURRY, HURRY—Students at West Covina High School scurry back to classes at the ring of Victory Bell by Larry Thorne, dean of students. Bell

replaces a class bell system destroyed when the school's administration building was damaged by fire. Damage was estimated at \$350,000.

Times photo by Al Markado



WATT-AGE—Bill Wysock of Temple City is determined to light up his life—and everybody else's—with the man-made lightning he creates on Tesla coil in his driveway. As Wysock adjusts the wire,

left, his friends, from left, Ron Rockwell, Dave Jennings and Jim Shaffer help him set up the contraption. It takes several hours to assemble the coil and at one point, Wysock climbs a ladder,

center, to get closer to his subject. The 14-foot coil is the 10th and largest that Wysock has built. It has produced 17-foot-long sparks, some of which look like those coming from the coil at right.

Times photos by Joel P. Lugavere

Lightning Experimenter Seeks Bigger, Better Bolts

Enthusiast Follows in Steps of Inventor, Hunts New Energy

BY MAYERENE BARKER
Times Staff Writer

As a young boy, Bill Wysock was so fascinated by lightning that he would run out into the rain just to catch a glimpse of it.

"The bigger the bolt the better," recalled Wysock.

Today, at 29, Wysock not only still chases lightning bolts but makes his own in the driveway of his Temple City home.

He creates man-made lightning with a Tesla coil, a high frequency transformer of electric current. The 14-foot-tall coil in his driveway is the 10th and largest that Wysock has built.

A year in the making, the coil has produced lightning "sparks" 17 feet long during Wysock's driveway experiments.

"I'm still searching for the spark that satisfies," Wysock said. "I'm always trying to make a longer one."

However, he has conducted the experiment with his latest and largest Tesla coil only five times since it was completed a year ago.

One reason is that it takes 1½ hours and at least three assistants to get the coil and its generator set up and ready to make lightning.

Friends Dick Aurandt, Glendale; Jim Shaffer, South Gate; Ron Rockwell, Orange and Dave Jennings, Arcadia, assisted Wysock at his latest test.

"A Tesla devotee will travel any distance to see an experiment," Aurandt said. "And on a Saturday night, too."

When the experiment started, neighbors gathered and passing motorists stopped and watched. Soon, a small crowd of spectators surrounded the driveway.

"The non-technically minded are awed at the spectacle," Wysock said. "It is so extraordinary."

The electrical discharges turned out by the coil are "almost an art form," he added. "I can't describe their beauty."

Although the experiment began about 6 p.m., Wysock and his friends were still at it at 10 this particular night.

Los Angeles Times

San Gabriel Valley

S PART VII

THURSDAY, MAY 3, 1979

"He's an electronics genius," said one boy to his friend as they watched. "He made that whole thing, you know."

Wysock, a graduate of Arcadia High School and Pasadena City College, did telecommunications work during a hitch in the Army. But that is the extent of his formal education.

"I'm self-taught," he said. "To do that you have a motive incentive and curiosity. I don't know about the genius part."

During his experiments, Wysock is friendly to curiosity-seekers but takes every possible safety precaution.

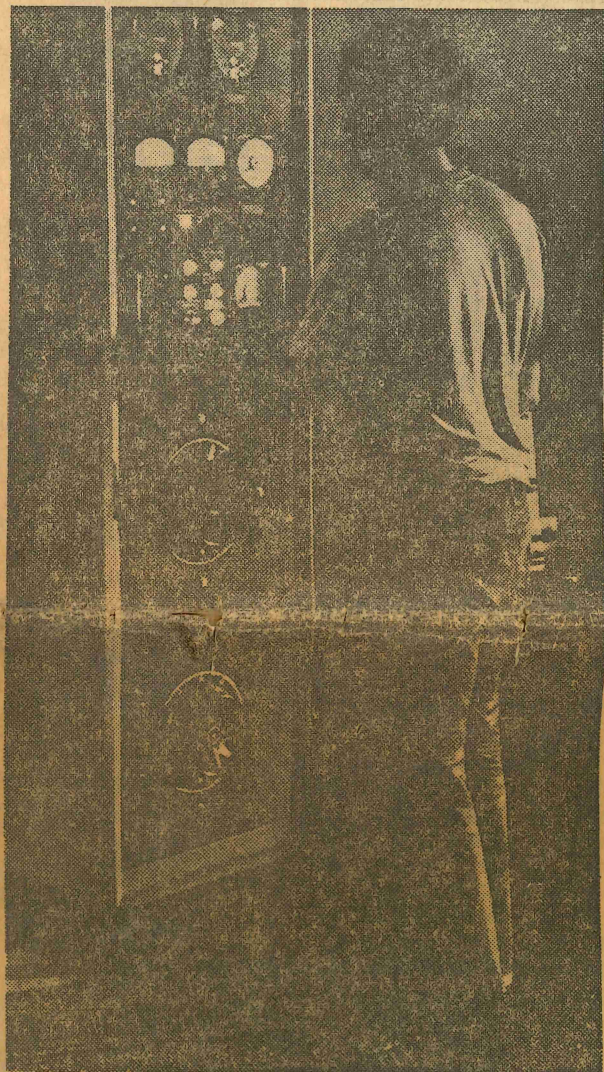
The sparks are "absolutely lethal," Wysock emphasized.

But he always tells the curious about Nikola Tesla, the coil's inventor. One of his goals is to make Tesla better known.

Tesla, an electrician and inventor who emigrated to the United States from Croatia in 1884, worked briefly for Thomas A. Edison, then went off on his own to invent, in addition to the coil named for him, an induction motor, such as the one that operates a washing machine; alternating current (AC) transmission of electricity; a wireless communications system and a system of wireless electric power transmission.

To Wysock, who built his first Tesla coil at age 9, Tesla is an unsung hero whose name should be as widely known

Please Turn to Page 6



COUNTDOWN—Wysock adjusts controls of Tesla coil in preparation for home-made light show.

Pasadena Police Win Fight for Workout Room

BY BERT MANN
Times Staff Writer

PASADENA—The Police Officers' Association has been given the right to use an exercise room in the police headquarters building.

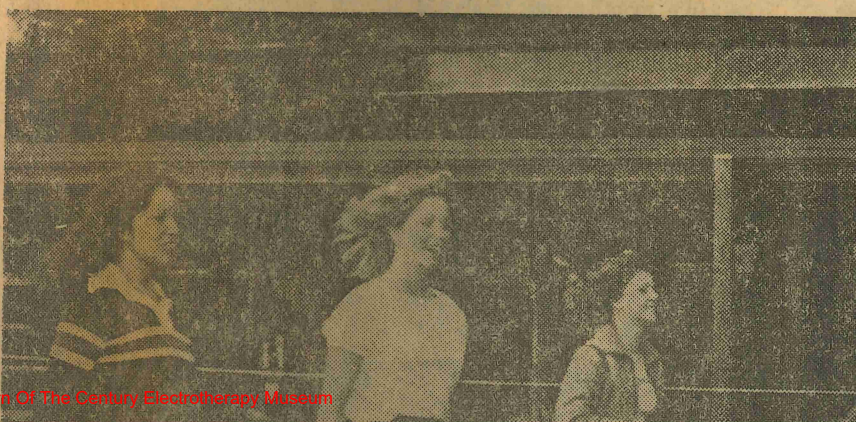
ARSON SUSPECTED

School Records Survive \$350,000 School Fire

BY MIKE WARD
Times Staff Writer

WEST COVINA—If vandals set fire to the administration building at West Covina High School to destroy school records, they failed.

mation leading to the conviction of those responsible is being offered through We-TIP, an organization that funnels information from any-





Ed Mark Walters in the Rio Hondo College production of "The Emperor's New Clothes." The production will be presented both Saturday and Sunday, May 5 and 6.

SCHOOL DISTRICT PLANS

However, one long-range plan, a freedom of choice option if students desire to attend a school other than the one to which they are assigned. Two of the plans provide for a skills center or a vocational type school for children in secondary grades. However, the committee voted unanimously at its last meeting to recommend establishing a skills center at McKinley Junior High School in September in cooperation with the city and Pasadena City College. The fundamental schools and the alternative school would be continued through their locations would be changed in several of the plans. One plan calls for changing Blair High School to a fundamental seventh through 12th grade school. Another would offer alternative secondary school students academic classes Blair along with its regular ninth through 12th grades. And Marshall fundamental school classes would be able to use Pasadena High School's facilities in a third plan. Another plan calls for utilization of existing schools for multi-purpose use in the community instead of selling or leasing them. It would convert the schools or parts of them to child care centers and community meeting places. Two plans would relocate the district's administrative offices, now at

the Education Center, to Hale School or to other schools.

Four plans were developed by subcommittees headed by William Bibbiani, district research department evaluator; Scott Marshall, continuation high school staff member; Jimmie Charles, Eliot Junior High School vice principal, and Charles Parcell, Blair High School principal. The other three plans were designed by three committee members, Mrs. Martha Guth, PTCA Council president; Mrs. Kyle Crist, fundamental school reading teacher, and Frank Hardinge, who has been active in school matters.

Pending are recommendations for changes by two other committees.

One is a 20-member committee appointed by U.S. Dist. Judge Manuel Real, who ordered the school district to integrate in 1970. It is a key committee because Real holds legal jurisdiction over the district.

Committee Chairman Warren Ettinger, a former municipal judge, plans to have the committee's recommendations ready by May 11.

The other committee was furthered by Hickambottom shortly after his election. Committee chairman, the Rev. Kent D. Lawrence of the Westminster Presbyterian Church, expects the community-based group will have recommendations for the school board by mid-June.

RECORDS SURVIVE

Continued from First Page

destroyed." John Sweat, dean of students, said classes have continued as usual because no classrooms were damaged. But, he said, there are inconveniences. The fire destroyed the bell system that summons students to class, so the school's victory bell is used to announce the beginning and end of class periods. Teachers have supplemented the victory bell by ringing hand bells. Supt. Donald Todd said the architect who designed the administration building has estimated the structural loss at \$250,000. The loss in furnishings and equipment is still undetermined, he said. Leonard said police and fire investigators based their total damage figure of \$350,000 on rough estimates by insurance investigators. Sweat said this is the first major damage from fire of vandalism since the school was opened 22 years ago. However, the district's other high school, Edgewood, suffered \$500,000 damage in 1972 when fire destroyed

its media center.

Another West Covina school, Orangewood, also was damaged Monday night by vandals who broke 90 windows. Todd estimated the replacement cost at \$1,800.

The investigation into the high school fire is being carried out jointly by the police and fire departments, with assistance of arson investigators from other Valley cities.

FESTIVITIES

Continued from 4th Page

\$15 a person. A happy hour will begin at 6 p.m., dinner will be served from 7 to 9 p.m., and there will be dancing and folklorico entertainment until 1 a.m.

Sunday, May 6, a touring mariachi group from Mexico City, La Tribu de la Paz, will perform in a 1 p.m. concert on the grounds of Pacific Oaks College at 5 Westmoreland Place in Pasadena. Refreshments will be served and admission will be \$2 a family.

ENERGY HUNTER

Continued from First Page

for his inventions as Edison, Alexander Graham Bell or Samuel Morse.

"Tesla helped lay the foundation for modern technology," he said. "The (television) picture tube, for example, is a direct descendant of Tesla's high voltage, high energy coil."

"Engineering schools here have little in their curriculum about Tesla. In Europe, he is required study. I hope someday he will be in this country."

Wysock said Tesla became a rival of Edison after he left the latter's employ.

"Edison was a proponent of direct current (DC) for electrical transmission," he said. "Tesla won out over Edison in a court case known as the 'War of the Currents.' The court ruled that AC was more economical than DC. It was a little-known victory."

Shortly after his court victory, Tesla sold the patents of his inventions to George Westinghouse, a Tesla backer and another Edison rival. Tesla also had been backed financially by John Jacob Astor and J.P. Morgan.

Wysock said Tesla died virtually unknown and penniless in 1943 at the age of 87.

Wysock, an electronics researcher for a large government-owned company, the Aerospace Corp., is attempting, in his spare time, to carry on Tesla's work as well as increase public appreciation of his inventions.

Wysock said when Tesla invented his coil, he created a new source of energy which has remained unperfected.

"The coil generates energy so that when you hold up a light bulb while it is operating, the bulb will light up," Wysock said. "It is a form of wireless energy of which Tesla was trying to produce in large quantities."

"The theory is that without wire, energy is radiated from a large coil. Then, you would tune in any amount of power you wanted. You could even transmit power to needy areas overseas. It is a nonpollutant type of energy discovered prior to 1900."

What Wysock eventually would like to do is to produce a long enough spark of man-made lightning, intense enough to produce ball lightning—large circular flames

Please Turn to Page 8

THE FACE CLINIC

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we're not miracle workers

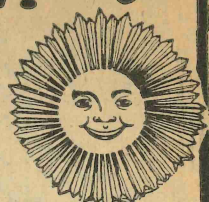
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A 10-year class reunion of San Gabriel High School's class of 1969 will be held Saturday, May 5, at the Quiet Cannon Country Club in Montebello. The cost of \$20 a person will include a buffet dinner and dancing. Reservations may be made at the school.

PASADENA—Assemblyman William H. Ivers (R-La Canada) will host a town hall meeting for senior citizens Friday, May 4, at 2 p.m. at the Senior Center, 85 E. Holly St.

WEST COVINA—A rummage sale is planned by United Methodist Women of United Methodist Church, Azusa and Cameron Aves., on Friday, May 4, from 9 a.m. to 2 p.m. and Saturday, May 5, from 9 a.m. to noon.

ARCADIA—"Time and Eternity," a film exploring the principles of relativity, will be screened at 6 p.m. Sunday, May 6, in the Arcadia Friends Church, 5705 N. Lenore Ave.

ALHAMBRA—An exhibit and sale of antique postcards and paper collectibles will be held from 10 a.m. to 5 p.m. Sunday, May 6, in Alhambra Masonic Temple, 9 W. Woodward Ave. Wheelchair access will be provided. Admission is \$1, or 75 cents for senior citizens.

PASADENA—A fashion show, luncheon and boutique is planned by United Methodist Women of St. James United Methodist Church at 11:30 a.m. Saturday, May 5, at the church, 2033 E. Washington Blvd.

ARCADIA—The Sisterhood of Temple Shaarei Tikvah will present its annual fund-raising "Dine-Around" beginning at 7 p.m. Saturday, May 5. The progressive dinner will end with dessert and dancing at the home of new Arcadia school board member Paul Friedman. Reservations, at \$15 a person, are at the temple.

SAN MARINO—The Roundtable group for singles will sponsor a stress management workshop Sunday, May 6, from 1 to 4:30 p.m. at 1941 San Gabriel Blvd.

Continued from 6th Page

that appear only in intense electrical storms.

"Tesla accidentally produced ball lightning," Wysock said. "Because of its intensity, it is possible to produce the vast quantities of wireless energy necessary for an alternate energy source."

Wysocki's love affair with the Tesla coil began when he first saw one at the age of 9 at Griffith Park Observatory. His interest was further sparked by an article about Tesla coils in *Popular Electronics* magazine.

It was then that he built his first coil which produced 1½-inch sparks. His later coils displayed around the living room of his home, which he shares with his wife, Lynn, and infant son. A poster of Tesla adorns the wall.

Wysock's coils are various sizes and are numbered according to the minimum size spark they produce.

"I would build one, then another," Wysock said. "Then, I would want to build one still bigger."

"Model 5 is the most popular. It is often used in educational demonstrations and at museums. With some modification, it is used in industry for generating fertilizing plants. It really is an economical means of generating extremely high voltage."

Wysock has sold several of his coils to museums and educational institutions. He hopes to sell others for research.

"For example, the Tesla coil is being used in a research project to find out why lightning strikes airplanes," Wysock said. "No one has ever tried to manufacture and sell a line of Tesla coils before. But I'm giving it a try."

Other modern-day uses for the Tesla coil are for special effects in the movies such as in the Frankenstein monster films. It was last used in "The Young Frankenstein."

dergarten classes will be held at the city's five elementary schools from 9 to 11 a.m. and from 1 to 3 p.m. today and Friday, May 4. Children's birth certificates and immunization records are required.

PASADENA—Open house will be held from 2 to 5 p.m. Sunday, May 6, at the Pasadena Humane Society, 361 S. Raymond Ave. The society will be presented a \$1,000 check from the Kennel Club of Pasadena to be used for its spaying and neutering programs.

HACIENDA HEIGHTS—Dr. Antony M. Gamley will be installed pastor of Shepherd of the Valley United Presbyterian Church in a service at the church at 3 p.m. Sunday, May 6. Dr. J. Albert Smith, founding pastor of the church and senior pastor of First Presbyterian Church of Alhambra, will give the sermon.

ARCADIA—A new series of classes in personal development will begin Saturday, May 5, at the Personal Growth Center of Santa Anita Church, 226 W. Colorado. Subjects range from Divine Science principles to disco dancing. Reservations are suggested.

ALTADENA—Friends of the Public Library will present a concert by the Steed Woodwind Quintet on Friday, May 4, at 7:30 p.m. at the library, 600 E. Mariposa St. The event is free to the public.

SIERRA MADRE—The annual carnival of the Community Nursery School will be Saturday, May 5, from 10 a.m. to 4 p.m. at Sierra Vista Park. The event, free to the public, will include games, pony rides, boutiques and refreshments.

PASADENA—Singer Gwendolyn Lytle will perform as part of the Fine Arts Series of First Congregational Church, 464 E. Walnut St., Sunday, May 6, at 3 p.m. General admission is \$3.

PASADENA—A free performance by the Pasadena Youth Symphony Orchestra will be Sunday, May 6, at 3:30 p.m. at the Civic Auditorium.

Citrus College will hold a photo day Saturday, May 5, from 10 a.m. to 3 p.m. for amateur and professional photographers to take pictures on campus. Models from a local agency, antique and new cars, trucks and motorcycles will be available for photographers' use.

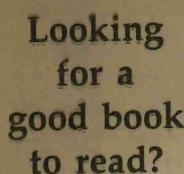
MONTEREY PARK—The annual law day luncheon of the San Gabriel Valley Bar Assn. will be held at noon Friday, May 4, at Luminarias restaurant, 3500 Ramona Blvd.

Rita Catholic Church, Baldwin and Grandview Aves., Siera Madre.

COVINA—The Assistance League of East San Gabriel Valley will hold an open house at its Learning Center, 626 E. San Bernardino Road, on Saturday, May 5, from 11 a.m. to noon. The center's purpose is to assist children who have learning disabilities.

TEMPLE CITY—Members of Creative Arts will hold an open house for the public Sunday, May 6, from 11 a.m. to 4 p.m. and Monday, May 7, from 10 a.m. to 2 p.m. at Live Oak Park.

PASADENA—The Pasadena Humane Society, 361 S. Raymond Ave., will observe the beginning of "Be Kind to Animals Week" with its annual open house from 2 to 5



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Book Review
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William C. "Bill" Wysock - Tesla Technology Research Archive - From the library of The Turn Of The Century Electrotherapy Museum

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Richard G. Aurandt 1

The Griffith Observatory's Tesla Coil

The Tesla Coil exhibited in the Hall of Science at the Griffith Observatory, was constructed in the 1920's by Earl Ovington. It is reported that Mr. Ovington built the coil for ^{presentations} use on the vaudeville stage, a common use for Tesla Coils during that period. The coil as it appears in the 'Hall of Science' is really only half of the original Ovington outfit. That is, the complete unit was two coils butted together at their bases with their axis in a horizontal plane rather than vertically oriented in which case the spark jumped from one end to the other, a spark in excess of eight feet. A double ended coil ^{with a midpoint ground} is a half wave coil whereas the single ended ^{resonator} is a quarter wave coil.

Mr. Ovington was an associate of Dr. Fredrick F. Strong, and together they collaborated on the construction and ^{application} use of high frequency high potential medical equipment. The coil was given to Dr. Strong by Mr. Ovington who then, in 1937, donated the facility to the Griffith Observatory.

In its half wave double ended configuration it was too large to be set up in the available space. Thus it was necessary to separate the coil into two quarter wave resonators and set one of them up as a single ended vertical unit; this arrangement sometimes referred to as an Oudin (~~Maurice A. Oudin, M.S.E.E.~~) coil or resonator.

The preparation of the coil as it is seen was done under the direction of Mr. Leon Hall, technical director of the observatory at its inception. Mr. Hall with the assistance of Mr. Kenneth Strickfaden, an authority on all types of high frequency high potential equipment, ^{Tesla coils in particular} set the coil up in the observatory basement as two independent quarter wave units looking at one another, again producing a spark over eight feet long. In the arrangement just ~~described~~ ^{mentioned}, each coil (~~quarter wave section~~) had its own primary winding. The primaries were so connected as to require only one capacitor bank, spark gap and 60 hertz high voltage transformer. Unfortunately, as previously stated, the available display location was only large enough for one of the quarter wave coils and its associated primary. Thus the other secondary and its primary were stored away for ~~spare~~ ^{use} to be used when the demonstration unit was in need of service. This turned out to be a wise decision as at some point between 1937 and 1951 the lower four inches of the demonstration coil's secondary burned out and was replaced with the spare unit. The coil now on display had a similar failure at the top, but was able to be salvaged by the removal of a few top turns.

Again in 1951, the secondary with the damaged lower section was borrowed by the Moody Institute of Science. The damaged lower secondary

turns were removed, reducing the secondary length from 49" to 45", in the remaining 4" space a six turn primary of rubber covered power line (industrial) cable having a diameter of one half inch was wound; the winding of the primary and secondary on the same form is a standard configuration in high frequency coil design. The coil was then connected with a 0.2 mfd capacitor, a synchronous rotary spark gap, three of the five primary turns and a 17,200 volt 10.4 KVA transformer. When the coil was first tried it drew over 100 amps at 117,000 Hz but the spark from the coil was well over nine feet in length. While this may seem impossible, a spark ~~over~~ ^{double} the coil's length, a well designed coil can easily ~~break down~~ ^{break down} twice its length if enough power is made available to it. That is, if a coil is correctly tuned, the high potential gradient exists only from end to end, a uniform voltage distribution does not ~~occur~~ ^{not occur} from turn to turn but ~~instead~~ ^{instead} follows a sine curve along the total quarter wave length of the secondary wire. It is for this reason that high frequency inductances of the single layer type often have their last 20% stretched out in the case of cylindrical coils or the coils shaped as a cone thus providing more turns per unit length of wire at the ungrounded end.

4

Tesla, in his early work (1890's) realized the non-linearity of the voltage gradient along the secondary coil and compensated for it by winding the primary and 80% of the secondary on a large cylindrical form and the last 20% on a smaller elevated cylinder.

Mr. Ovington elected to employ the conical (tapered) coil form and constructed them (two) like a wooden barrel, that is, of several wooden disks per cone. Starting at the bottom with one of 36" in diameter and ending at the top with one 18" one. These disks are placed along a wooden dowel 48" long. The disks were then covered with wooden strips 49" hypotenuse by $\frac{1}{8}$ " thick, tapering from 4" at one end to 2" at the other. The top and bottom of the cones was then provided with a turn of $\frac{1}{2}$ round wooden moulding for winding termination and cosmetic appearance.

The winding itself consists of 400 turns of 18 gauge rubber covered stranded wire. Since the outside diameter of the insulation is ^{approximately} $\frac{1}{16}$ " of an inch, the winding is not space wound as is typically done when enameled wire is used. The winding, for physically protective reasons, was then covered with a layer of $\frac{3}{16}$ " twine, much like a small rope. This surface was then given a coat of red glyptol, a finish frequently used for electrical equipment where high voltage insulation is important. Before leaving the secondary winding it would be well to point out that the frequency of the coil will be in wave length, four times the actual secondary wire (not cone or coil) length in meters—that is, to say, the secondary winding is a $\frac{1}{4}$ wave antenna coiled up.

The actual wavelength is slightly longer than the wire length as a result of the capacity introduced in the secondary by its being wound into a coil but using the wire length as a $\frac{1}{4}$ wave measure, very close estimates can be derived regarding the primary inductance and capacitance.

The balance of the circuit consists of a primary coil, a primary capacitor, spark gap, transformer, and line filter.

The primary coil consists of 10 turns of $\frac{3}{16} \times \frac{3}{4}$ " copper ribbon spirally wound radiating out from the base of the secondary cone; roughly three turns of this winding are used to obtain resonance with the secondary. Ten turns were wound as it was not absolutely certain the value of the original capacitor and too many turns was safer than too few.

The capacitors provided with the coil were large Leyden jars, approximately 8" in diameter by 18" tall. Eight of these jars gave a capacity of around .125 ufd which was a fairly good match for the power available. These jars were supported in a wooden frame similar to a "GIANT" test tube rack. The coil came ^{with} extra jars as apparently Mr. Ovington knew what was to come when he designed the outfit. As suggested, over the years, the Leyden jars broke down (punctured) and were one by one, consumed.

Hence the capacitor is now a glass plate stack of 60 copper plates, 14" by 15", separated by $\frac{3}{16}$ " window glass. As to the electrical quality of the window glass as compared with what may have been "quartz" in the Leyden jars, a standard dielectric ^{used} commercial Leyden jars used for spark radio transmitting ^{equipment} and other high frequency high voltage applications at the start of the century, there is some uncertainty.

The capacity of the glass stack is approximately .117 uf and since $\frac{3}{16}$ " glass plates (.187") are employed at 200-250 volts per mil the ~~can~~ dielectric should stand ~~approximately~~ 37.4-40.8 KV's, an adequate safety margin since it is charged with only 10,000 volts rms (14,000 Vp).

The spark gap used with the Griffith coil is a non synchronous (does not rotate in step with the 60 hertz supply line frequency), Marconi type, that is, a revolving disk with axially oriented electrodes placed around its periphery rotates between two stationary electrodes, thus as the disk revolves ~~and~~ electrode on the disk comes in between the two stationary electrodes providing two small spark gaps which then ^{be} broken down by the transformer voltage. There are 14 electrodes ^{equally spaced} on a 12" bakelite disk. The rotary as well as the stationary electrodes are $\frac{3}{8}$ " in diameter and

Tungsten tipped. When a moving electrode is in line with the stationary electrodes a total of $\frac{1}{8}$ " spacing exists.

It is frequently thought that in some way the rotary gap is involved with the frequency (wavelength) at which the coil operates, this is not exactly true. The frequency of oscillation is dictated by the L/C (Inductance/Capacitance) ratio as needed to resonate with the secondary ^{winding}, the rotary, or for that matter, whatever type of spark is used does, indeed, influence the wave shape produced by the oscillator winding. The wave shape has a significant effect on the appearance and sound of the spark. If the primary circuit is charged with a D.C. rather than an A.C. (60 hertz) source, the rate at which the rotary gap interrupts the primary current will be the only audible ~~sound~~ ^{frequency} in the spark.

The rotary gap's greatest advantage over other types is its self cleaning and cooling qualities, desirable characteristics where high power and frequent operation is called for.

The transformer is a 10,000 volt 2 KVA (KVA - kilovoltamp - is a term used in AC circuits where inductances are involved as kW - kilowatt is used for AC + DC circuits having only resistance) unit manufactured by the Reinhardt Transformer Co., it is of the high reactance type, for spark oscillator service.

It was originally manufactured as a 20,000 volt unit with a midpoint ground but had been internally reconnected for 10,000 volts at twice the current (200 milamps) with one end grounded.

Because ~~the~~ transformer being used to excite a spark gap oscillator is subjected to short circuit conditions each time the spark gap breaks down or when the capacitor is completely discharged it must either be a high reactance (self limiting) type or have its input or output limited by chokes or resistances, the chokes being preferable.

The capacity of the primary transformer is 2KVA as a good "rule of thumb" in Tesla Coil design is to use 500 VA (.5KVA) for every foot of spark needed. The location in the Hall of Science provides for a four foot ^{approximately ~~one~~ one million volts} spark, thus 2KVA is adequate. The .5KVA/foot ratio is based on how bright the spark (current) against how long the spark (potential) and the ratio indicated produces a "good looking" spark for what ever length is chosen. This number only applies to well designed coils where good electrical considerations as well as good construction materials are employed.

The bottom line is electrical 'Q' (quality factor); all phases of the circuit, especially the high frequency circuitry must have the highest 'Q' possible.

Resistance is the negative aspect where 'Q' is concerned in inductors — as little as possible is the way to high 'Q' since 'Q' is the ratio of inductive reactance to resistance. A 'Q' of 10 or more is said to be good. The same holds true for the interconnecting cables, although in their case you want as little as possible of both resistance and reactance so a minimum of power will be dissipated in the interconnections. Since high frequencies flow on the surface of conductors, where high currents are involved, as in the primary circuit, large surface areas are desirable to permit the skin effect to handle the power with little resistance. It is for this reason that high power commercial facilities have their ~~interconnecting~~ circuitary, ~~where it is exposed to atmosphere~~ silver plated as silver was one of the lowest oxide resistances, and in the case of the capacitors, they are best oil immersed or in some way sealed from the air lest they not be equipped with silver plated plates; ~~In the case of the capacitor~~, the air also deposits a film on the exposed insulating surfaces which brings resistance in the form of surface leakage into the circuit.

The kVA rating of the transformer is again ^{product} a ratio of its voltage ^{times} to its current it is well to point out that you only need enough voltage

to ^{breakdown} the spark gap and drive as much current as possible through the primary inductance. Since a capacitor's volume goes up by the square of the increase in voltage it is desirable to hold the transformer between 7-10KV and increase the current to increase the KVA for greater spark length.

The line filter ~~for the~~ is placed in the primary of the 60 hertz transformer and is composed of series inductances and shunt capacitances to ground. The function of this filter is to prevent any transients from finding their way back into the building wiring in so doing breaking down insulation and causing serious damage in general.

A frequently asked question concerning the lightning like (appearance only) spark coming from a Tesla Coil is ones ability to allow the spark to jump to him or stand on the coil (bare foot) and have the spark jump from his finger tips. These effects and many more were classic stage show performances starting back at the turn of the century. It must be remembered, that the "skin effect" of high frequency currents is what makes this possible and as the coil gets bigger the wavelength gets longer and so the depth of penetration becomes greater - this permits the current to effect

more nerve endings and since the power level in big coils is greater to effect these nerve endings in a more unpleasant fashion. ^{When} doing stunts of this sort with big coils the demonstrator should not be grounded or especially when standing on a coil allow the spark to jump to ground as in either of these two cases the circuit is complete and logically greater currents will flow frequently causing ones muscles to react in a violent manner. When experimenting with a coil even as small as a few hundred volt amps lethal conditions may be encountered since although the power available may not electrocute a person it doesn't take much to stop the heart from electric shock. ~~Also when high power outfits (over 1kVA) are~~ It should also be remembered that if there is a fair amount of current in the spark it is not recommended to receive the spark on the bare skin as this typically results in "Radio Frequency" burns; again the nerve endings are effected and R.F. burns ^{may} take a long time to heal. Thrills on the finger tips ~~to or~~ ~~not~~ some metal object held in the hand is the way to perform effects of this sort. Also, it is sometimes thought, that ones hair will stand on end, but since you are being charged with alternating current, your body takes on no net charge of ~~any~~ ~~near~~ a magnitude sufficient

to cause this effect. To make one's hair stand on end the person must be charged with high voltage direct current obtained from an electrostatic generator (Van de Graaff) or a d.c. power supply. The Griffith coil is frequently mistaken for a Van de Graaff as it also has a ball on top but for different reasons. The Van de Graaff generator's ball is the capacitance ~~which~~ where the high potential is gradually accumulated where the Tesla Coil's ball is a series capacitance which improves the 'Q' of the secondary winding.

Stunts of the type discussed could not be safely done at the observatory due to the physical layout of the coils location, that is to say, ~~that~~ the walls are too close. If the power to the coil was cut down to a level where the spark could not reach the wall it would be feasible to produce these effects safely but much of the spectacle would be lost.

At this point I would like to close by thanking those persons, who without their help this article would not have been possible.

In alphabetical order:

The Staff of the Griffith Observatory

Part:

Dr. C. Clemenshaw (Director)

Mr. Leon Hall

Present

Robb Hanson

Kim Johnson

Dr. E.C. Krupp (Director)

John Lofdahl

Wayne Nelson

Bret Paul

John Sepikas

my personal associates

Ed Angell and Janice Newmark (Lexington Set Shop)

Lydia Hammond

Dr. Victor Hymowitz

James T. Shaffer

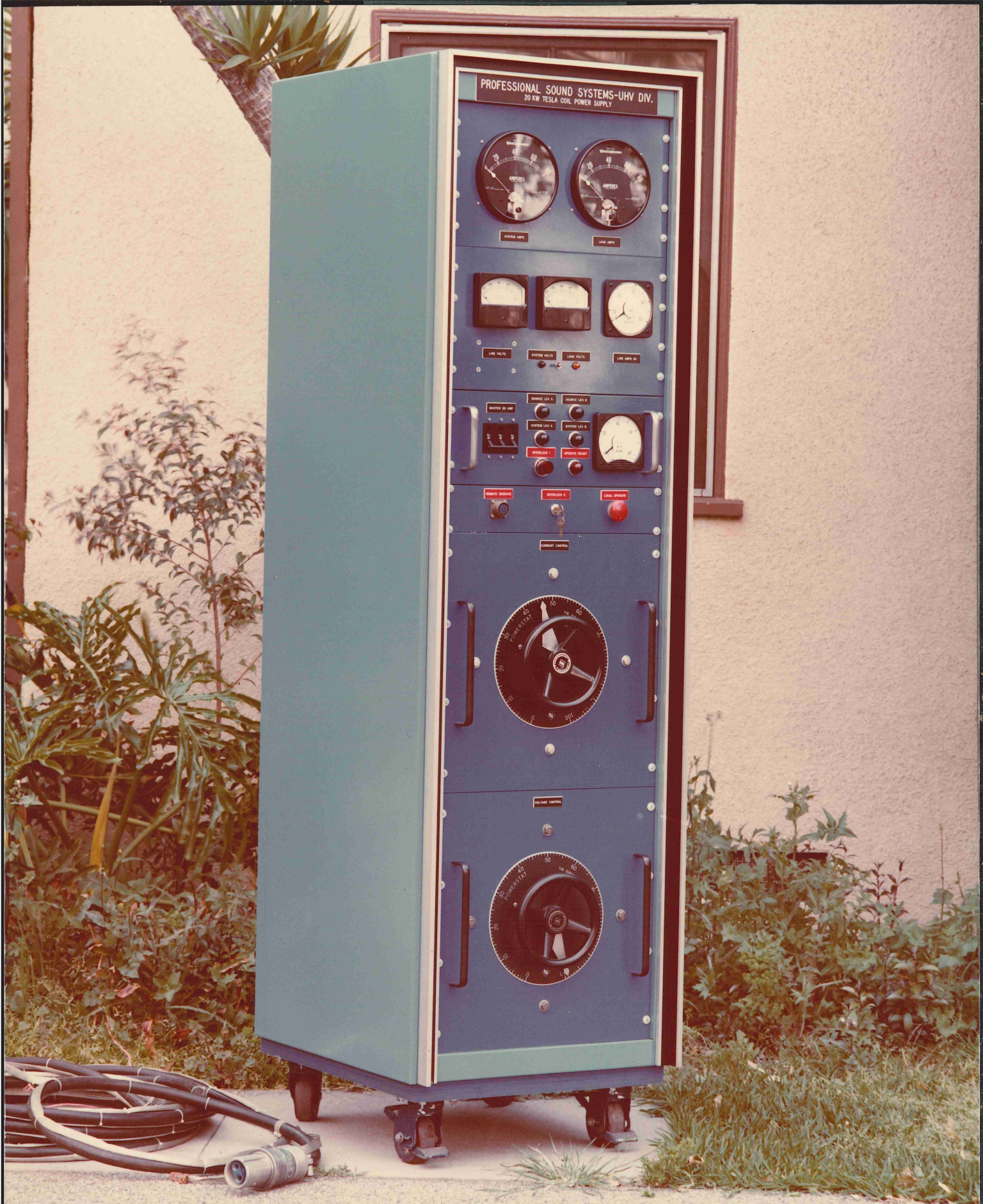
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and publications

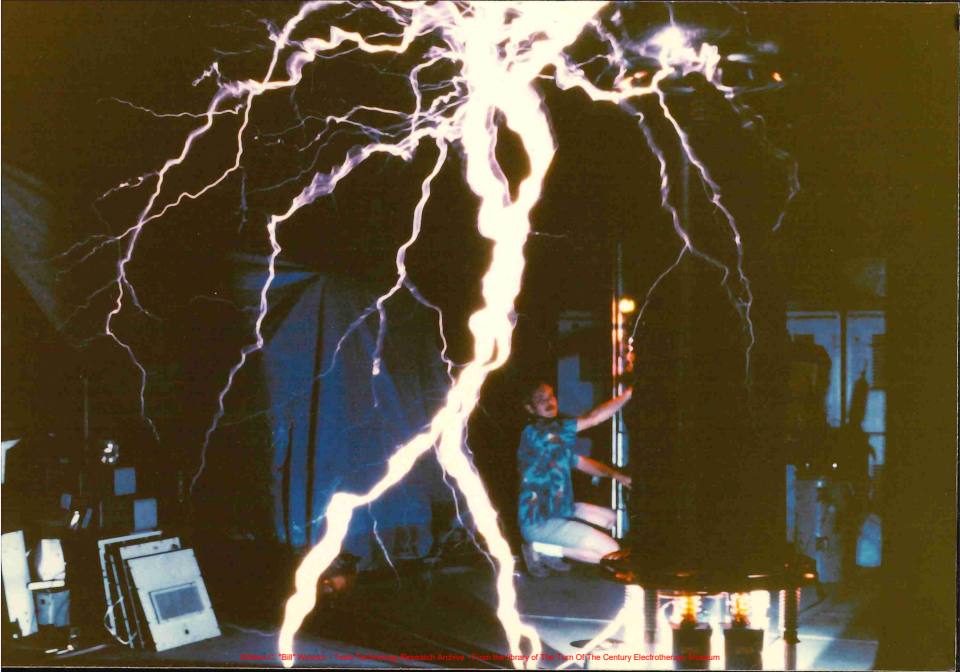
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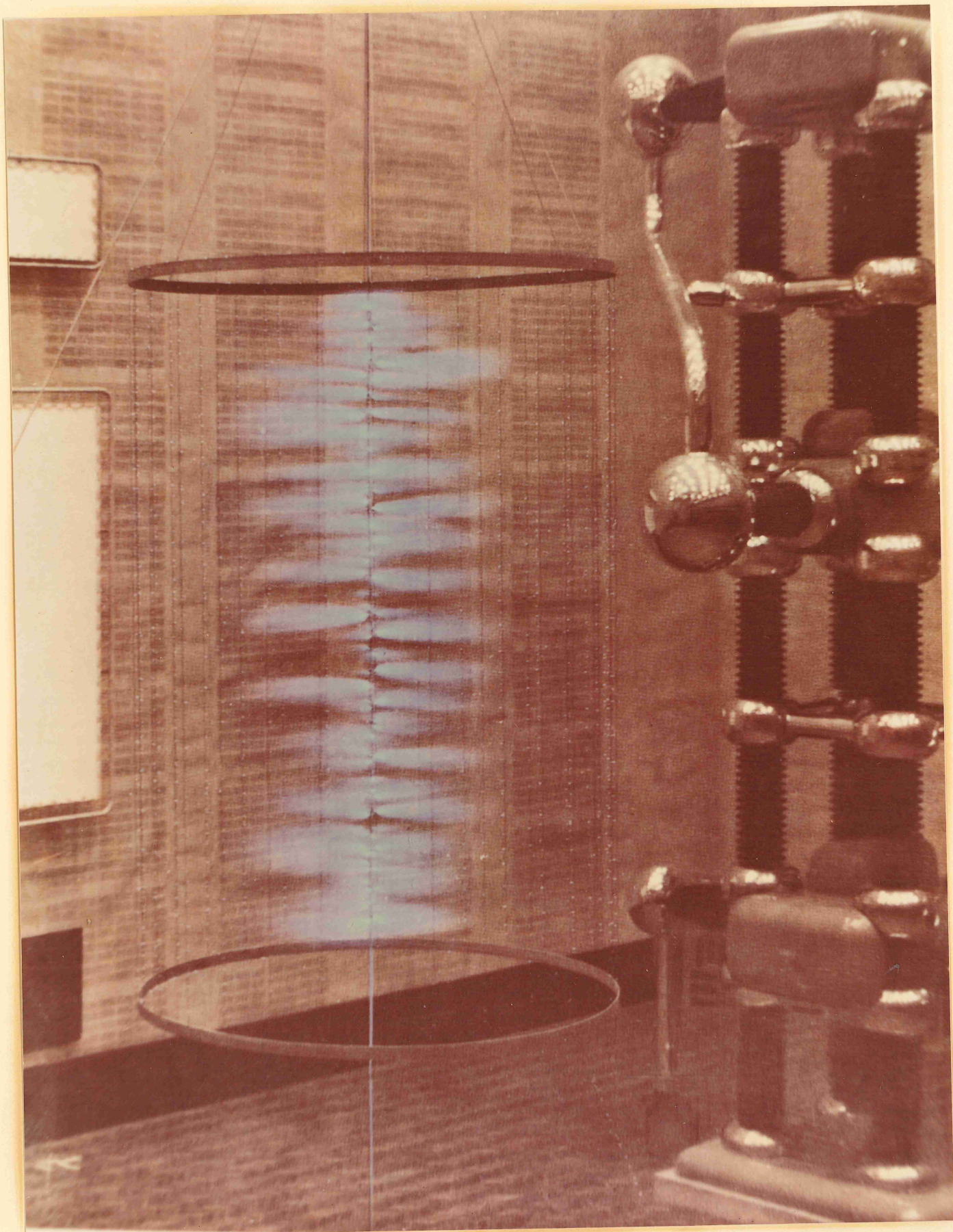
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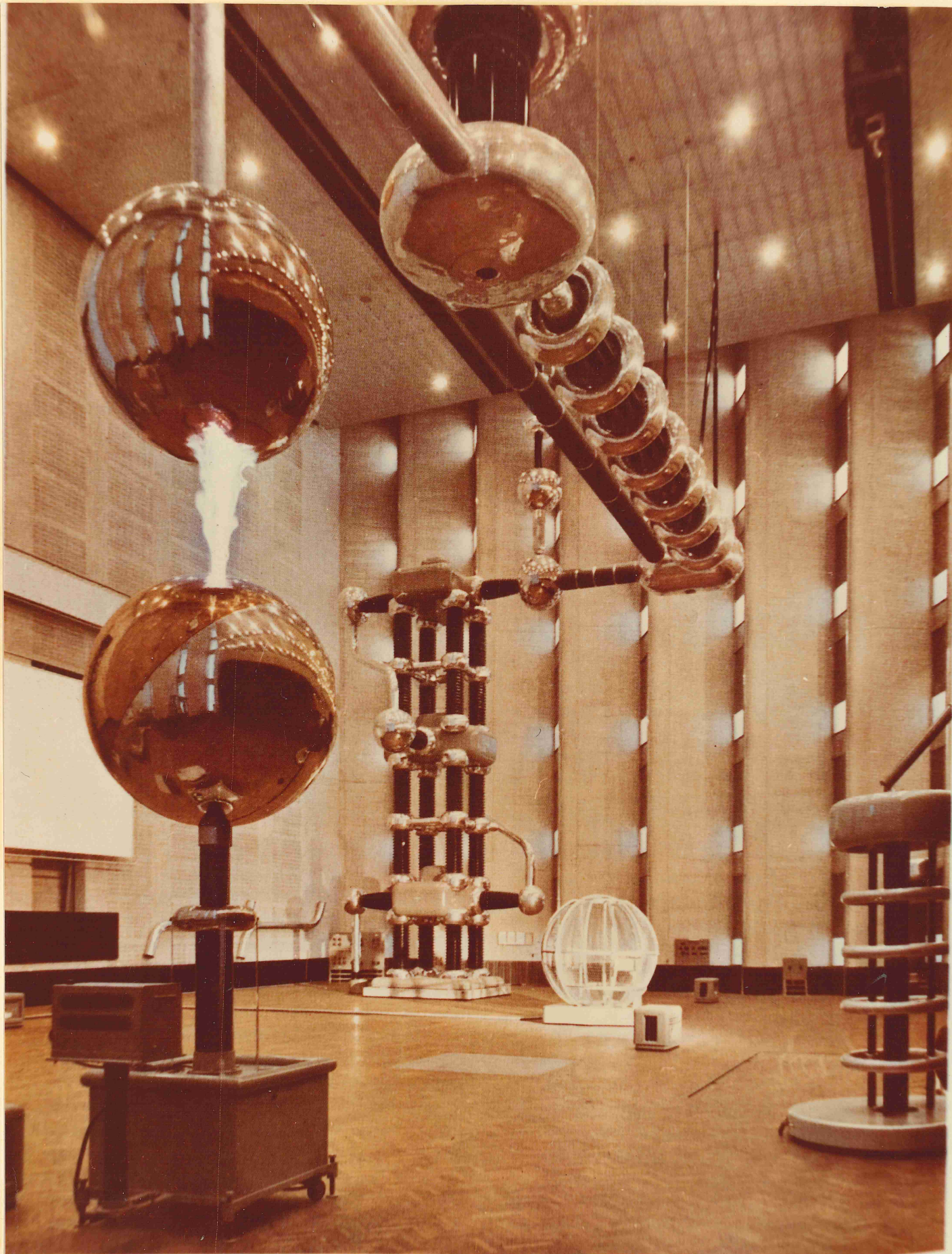


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W. Wallace
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Ben F. Waple
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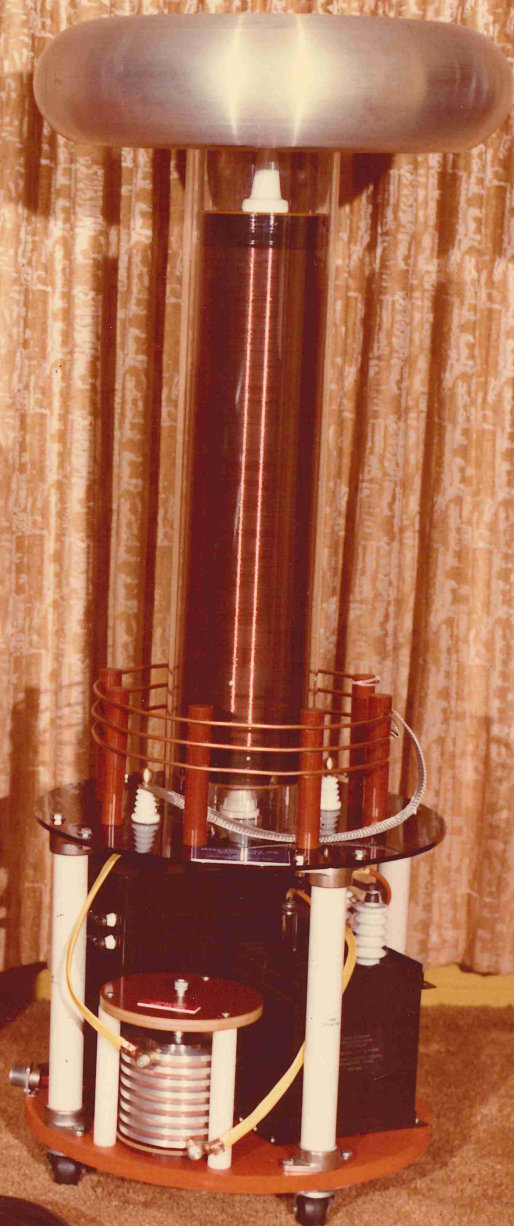
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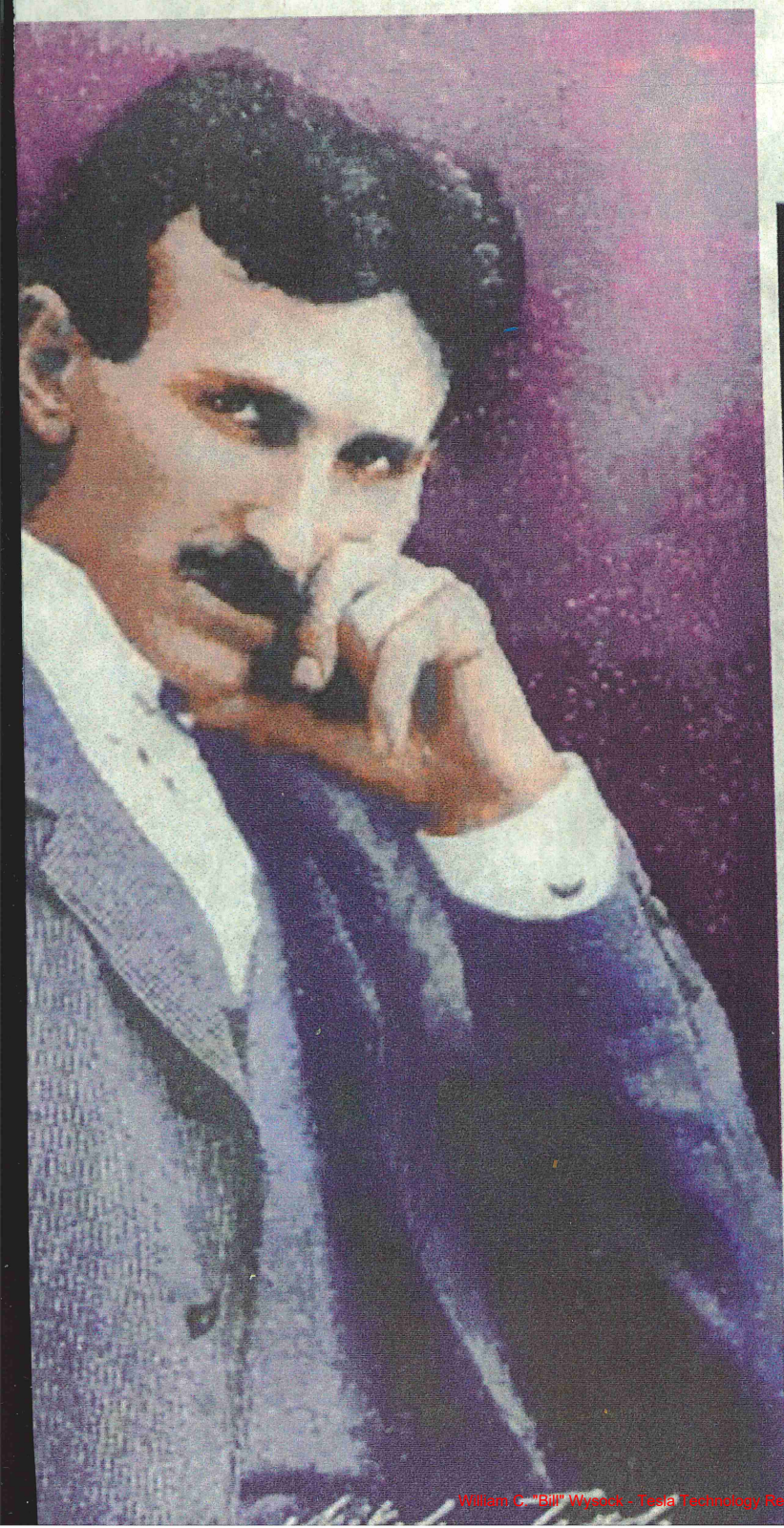
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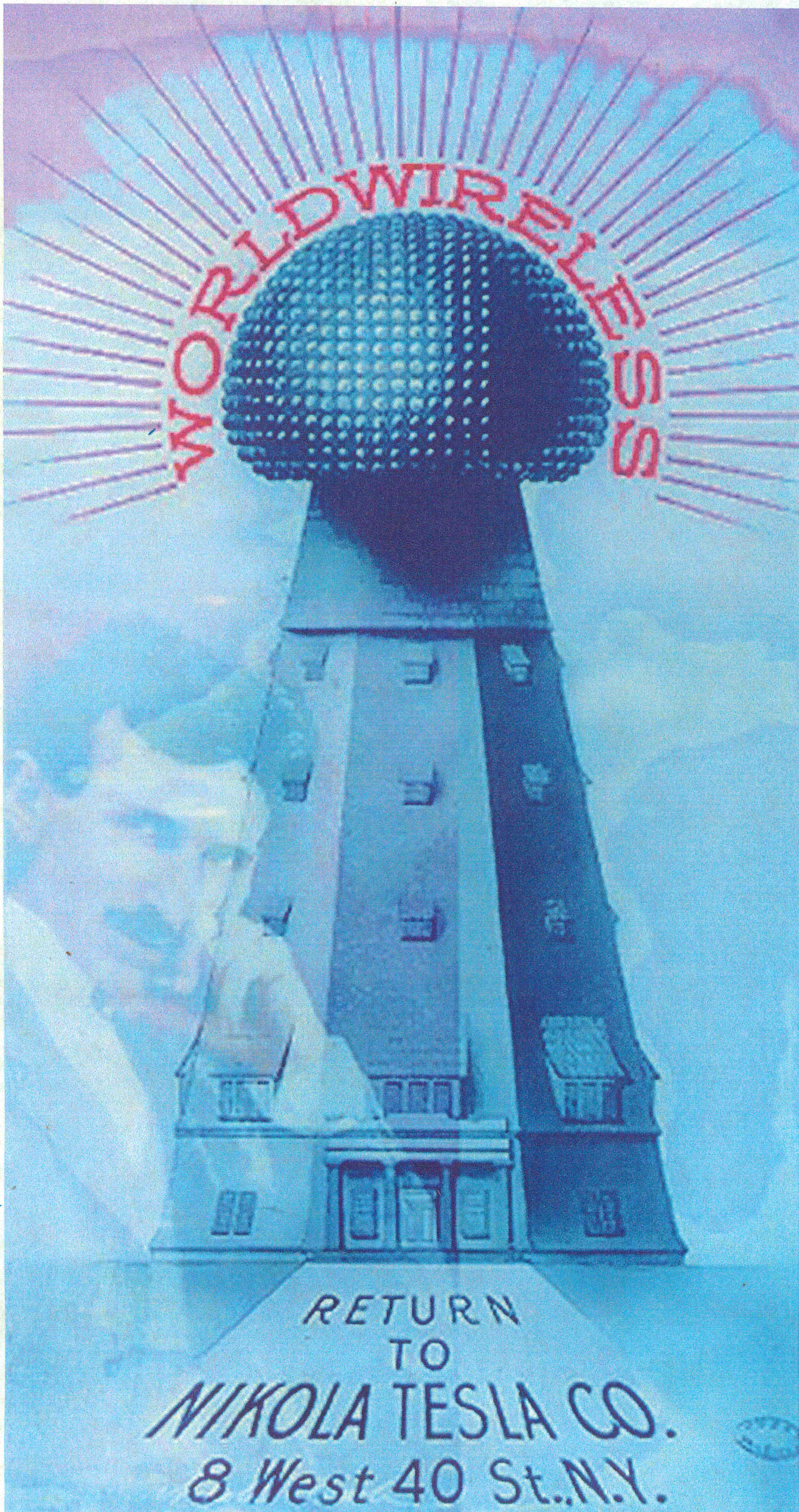
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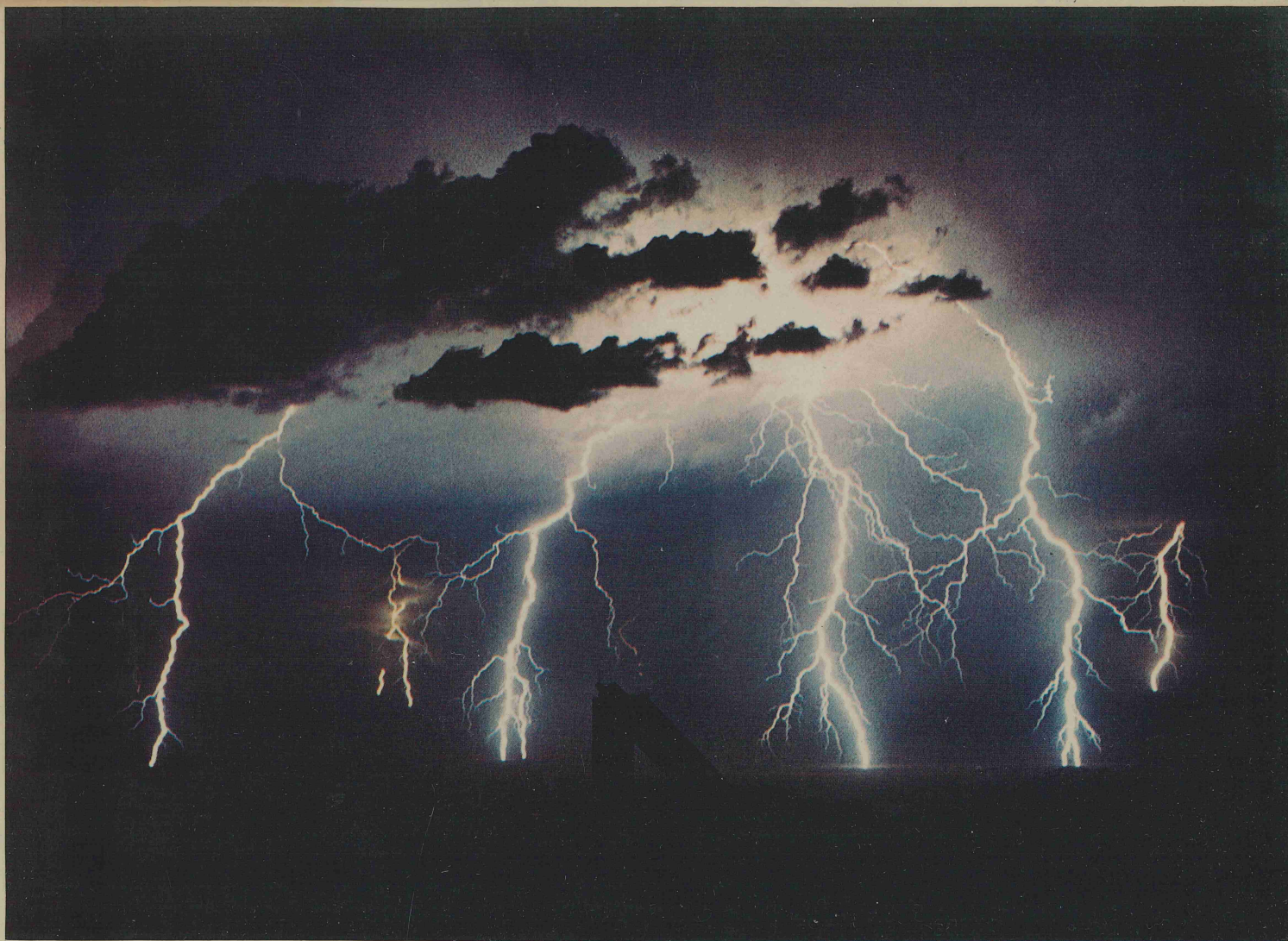


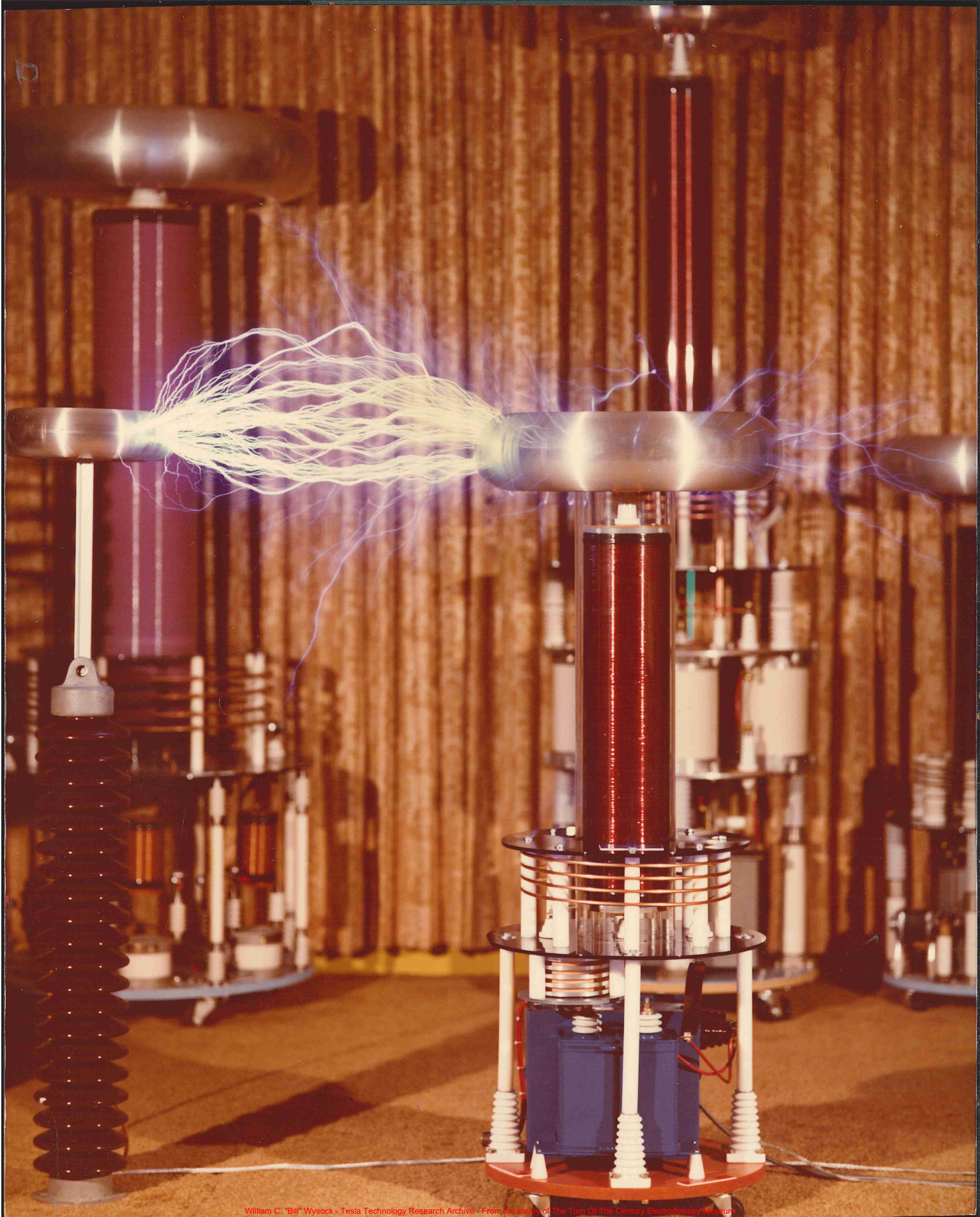


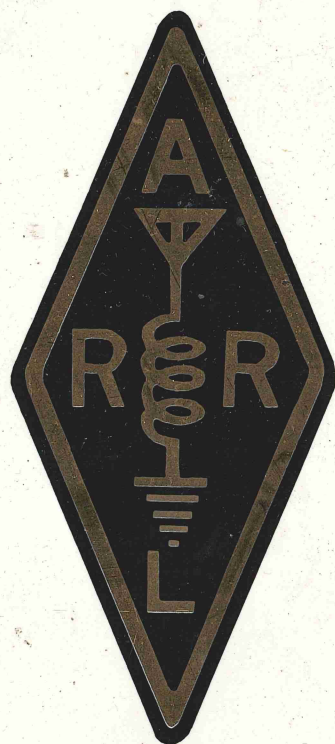
To Bill Wysock
Best Wishes Jeff Behrny 99



To Bill Wysock with
Best Regards
Jeff Balsem 1999





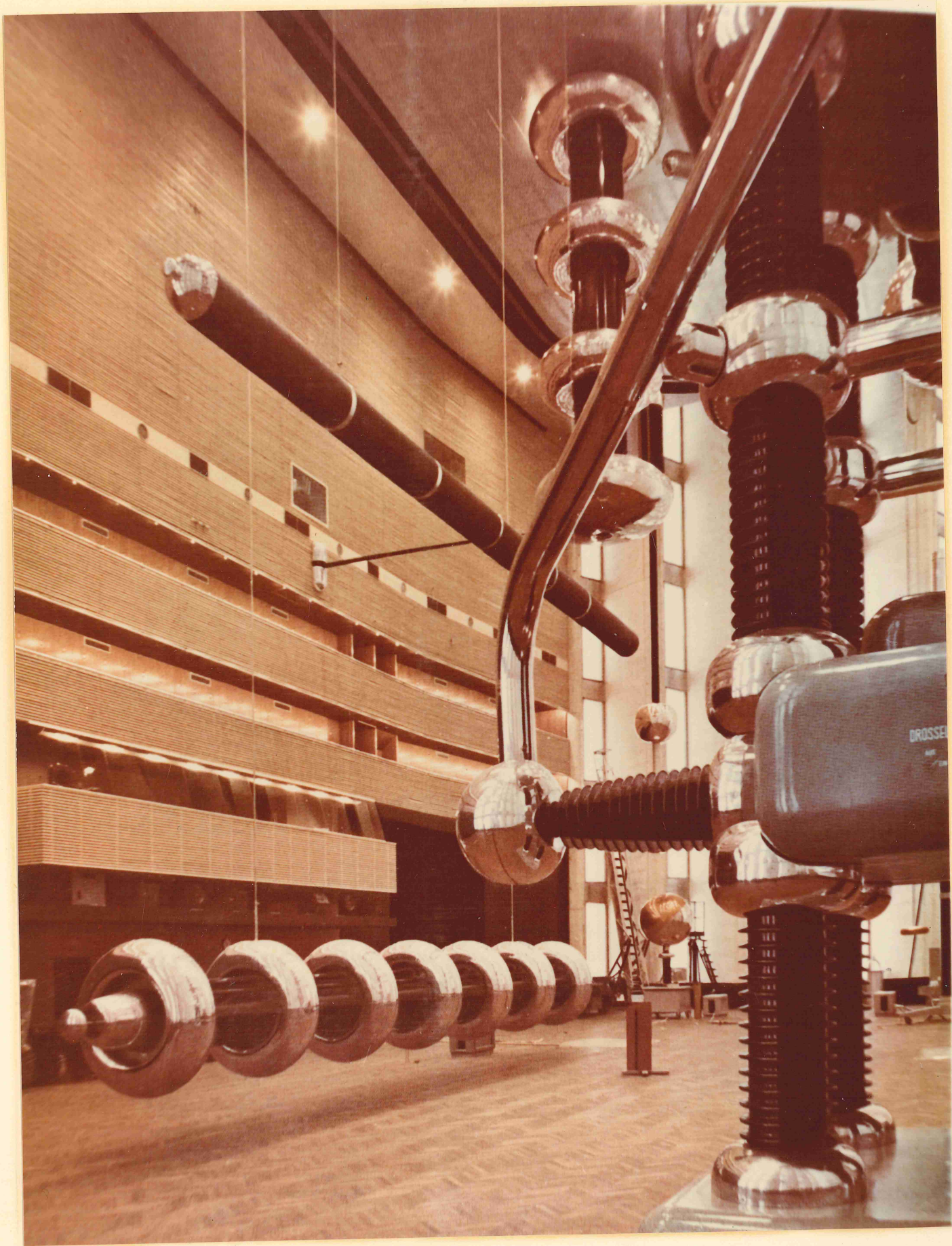


WILLIAM C. WYSOCK

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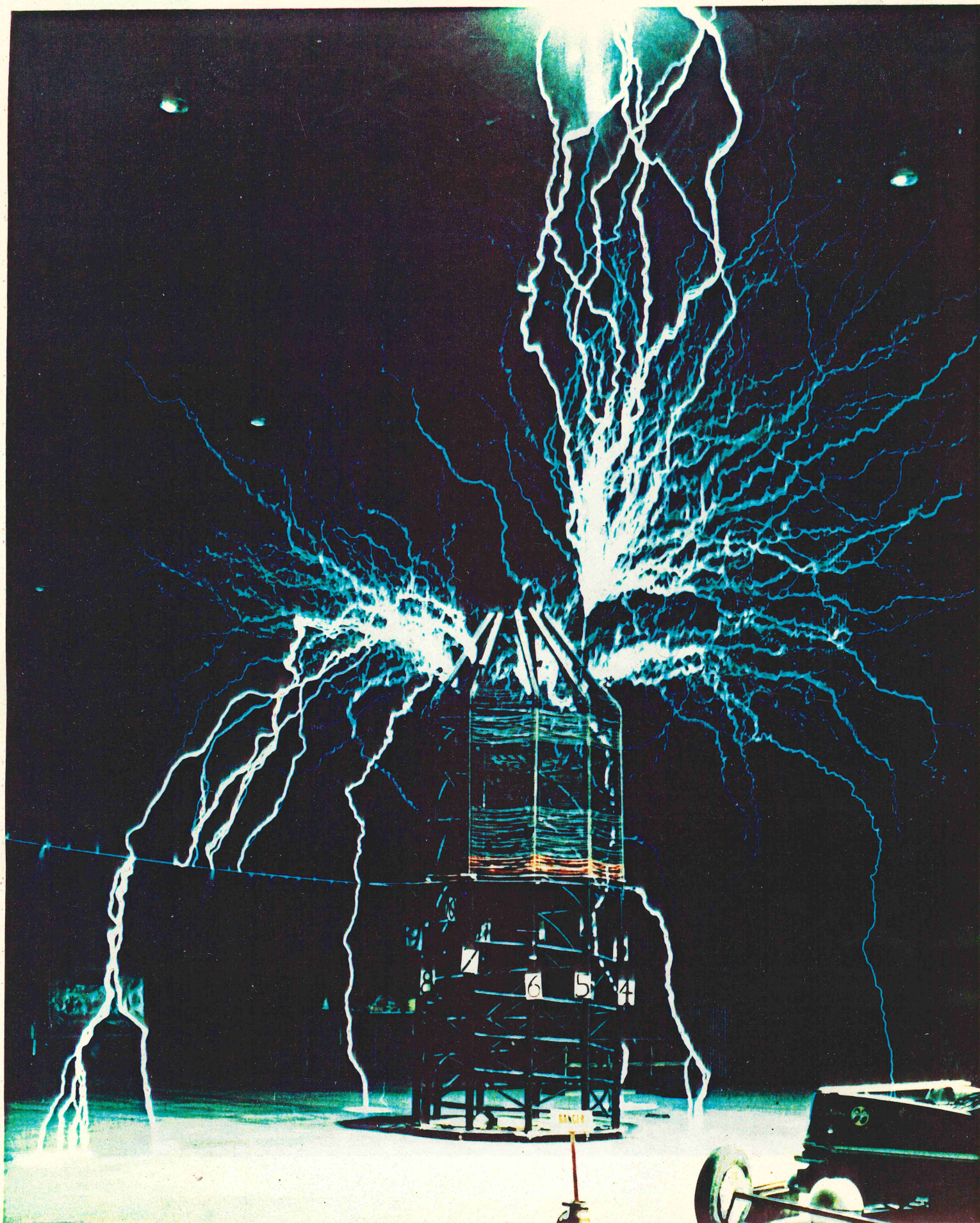
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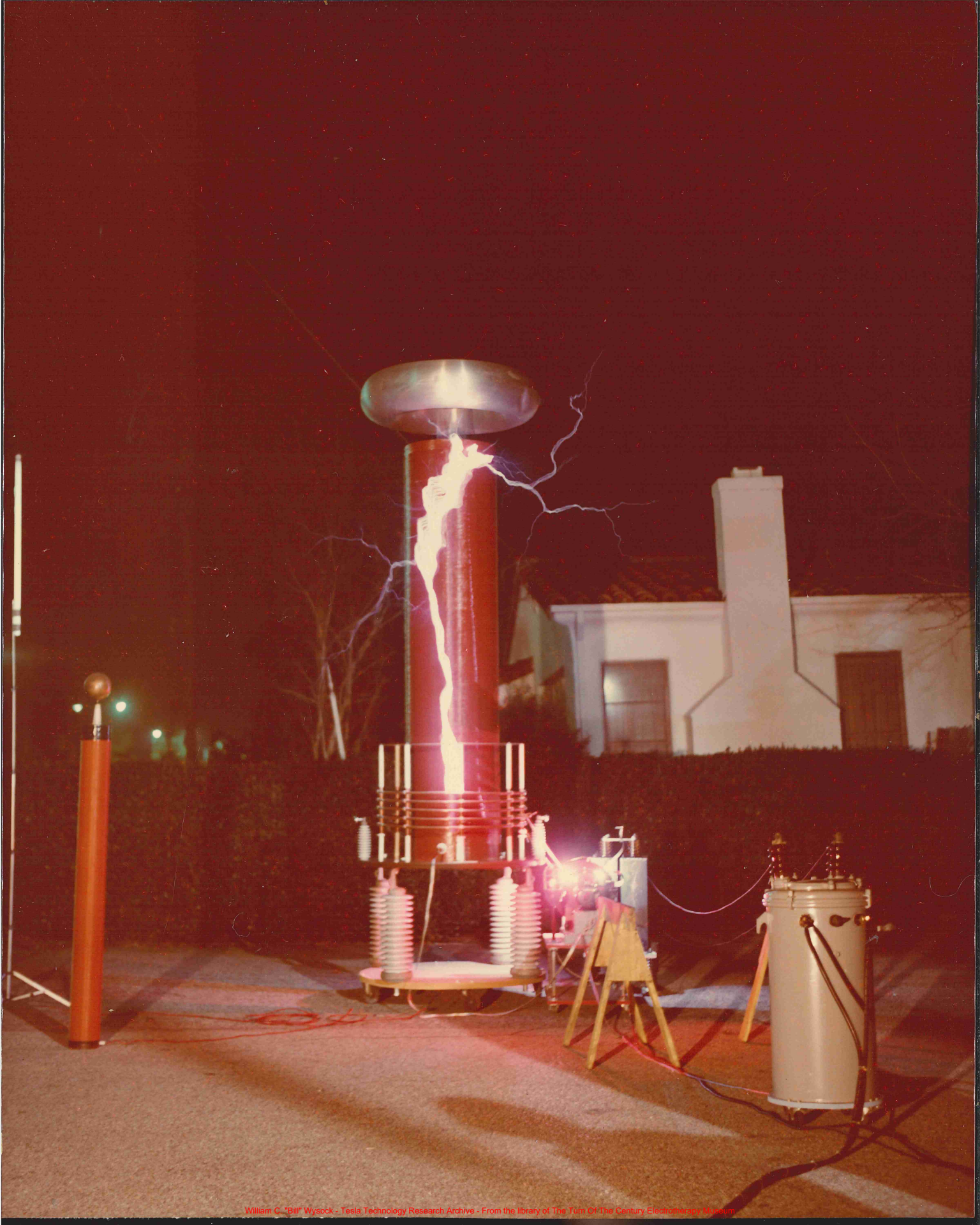


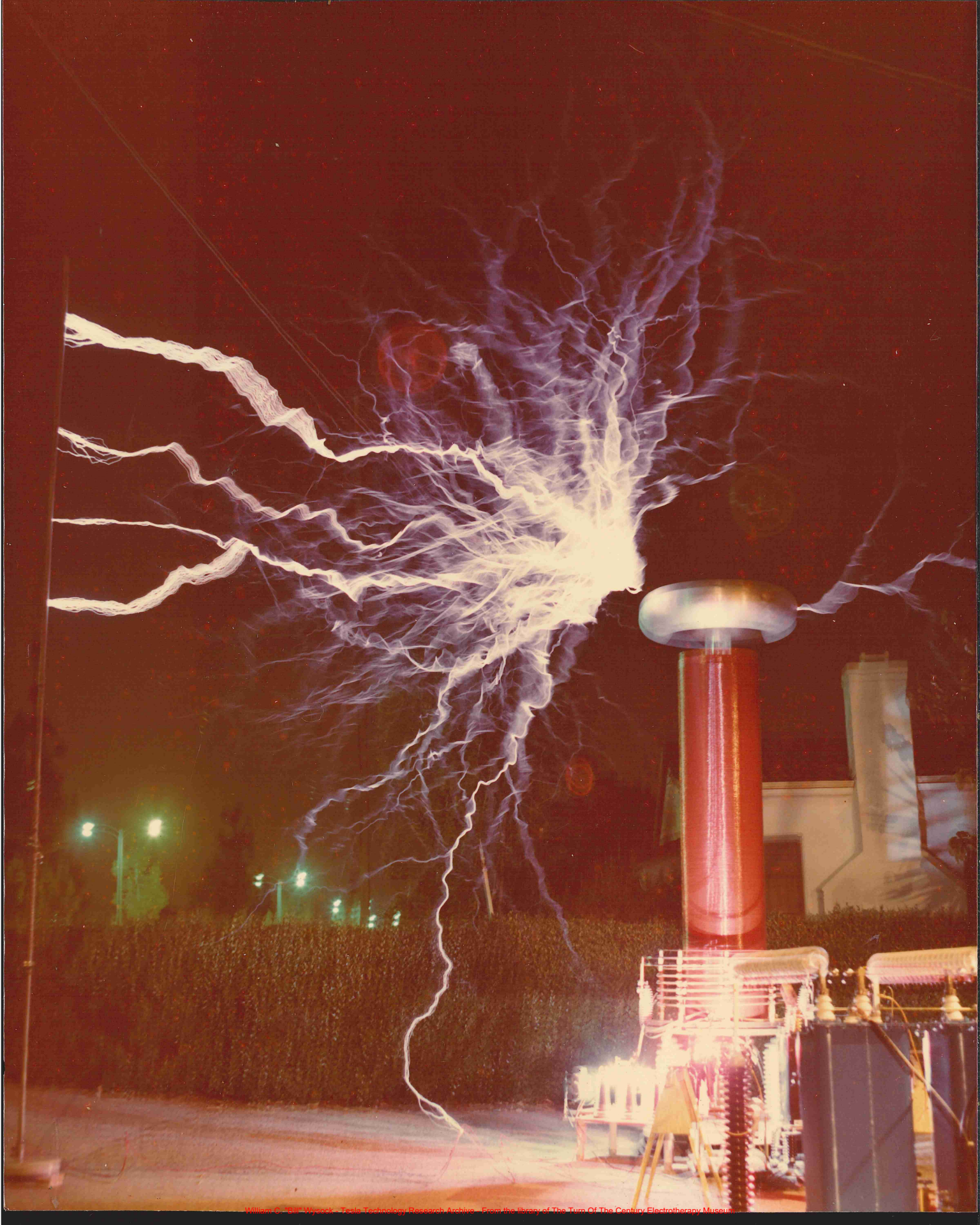
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