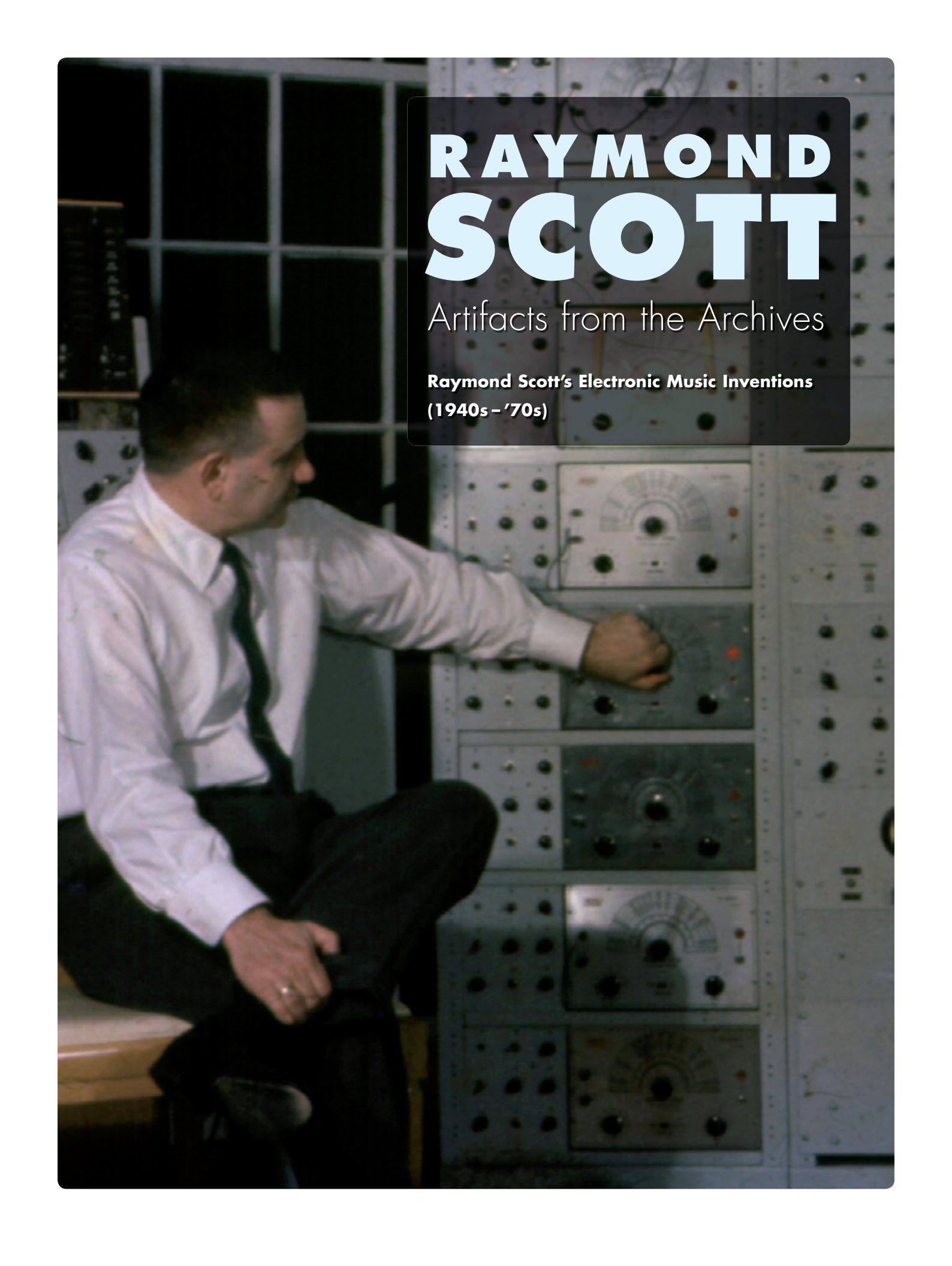


A photograph of Raymond Scott, a man in a white shirt and dark tie, sitting on a wooden bench and adjusting a large, complex electronic music synthesizer. The synthesizer is a tall, light-colored metal cabinet filled with numerous knobs, switches, and four large circular meters. The background is dark with a window grid.

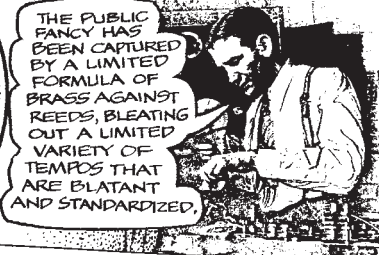
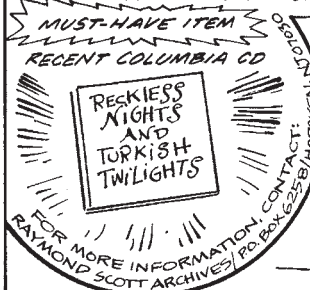
RAYMOND SCOTT

Artifacts from the Archives

Raymond Scott's Electronic Music Inventions
(1940s - '70s)

PULSE! Presents Musical LEGENDS of AMERICA

by JUSTIN GREEN
Thanks to Irwin Chusid



RAYMOND SCOTT

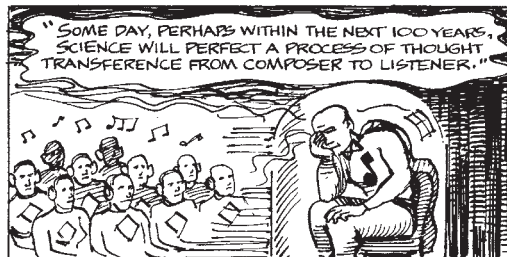
(Born Harry Warnow - 1908-1994)

THROUGHOUT A LONG, PRODUCTIVE CAREER, HE LED TWO LIVES:

PIANIST
COMPOSER
BAND LEADER

ENGINEER
INVENTOR
ELECTRIC MUSIC PIONEER

You've heard his merry melodies underscoring the antics of Bugs, Daffy, Porky and Elmer countless times since your childhood. These days, his eccentric recordings provide counterpoint to Ren & Stimpy. However, Raymond Scott never wrote a note of music for a cartoon in his life.



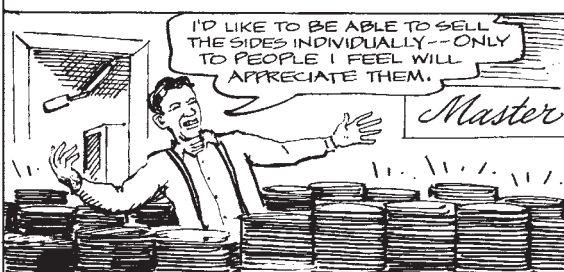
THOSE RECORDINGS THAT WE KNOW OF AS CARTOON SOUNDTRACKS, COMPOSED AND PERFORMED BETWEEN '37 & '39, WERE INTENDED AS AN IMPROVEMENT OF SWING MUSIC, WHICH SCOTT FOUND STAGNANT.

A STATEMENT MADE BY SCOTT IN '49 REVEALS AN IDEAL THAT HE STRIVED FOR THROUGHOUT HIS CAREER: THE ELIMINATION OF ALL OBSTACLES BETWEEN MUSICAL CONCEPTION AND EXECUTION.

HE WAS A HARSH TASKMASTER ON HIS SIX MEMBER "QUINTET," INSISTING THAT THEY MEMORIZE EXTENSIVE PASSAGES, WHICH HE ORIGINATED ON THE PIANO. THIS PERFECTIONISM RESULTED IN A DISTINCT SOUND THAT WAS A HUGE COMMERCIAL SUCCESS, BUT JAZZ PURISTS WERE CRITICAL OF SCOTT'S "SCREWY" MUSIC, WHICH DID NOT ENCOURAGE IMPROVISATION.



OVER THE YEARS, SCOTT TOOK MORE CONTROL OVER EVERY ASPECT OF HIS MUSIC. HE COMPOSED, ARRANGED, REHEARSED & TRAINED THE MUSICIANS, DID THE STUDIO ENGINEERING AND EVEN SUPERVISED THE SALES.

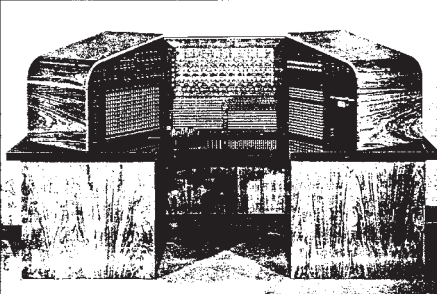


THE SUCCESS OF SCOTT'S FIRST JINGLE, "BE HAPPY, GO LUCKY," LAUNCHED A HIGHLY SUCCESSFUL SIDE CAREER IN PRODUCING MUSIC FOR COMMERCIALS, WHICH OFTEN EMPLOYED THE ELECTRONIC DEVICES HE WAS ACQUIRING AND BUILDING IN HIS LABORATORY.



SCOTT'S CROWNING ACHIEVEMENT WAS THE ELECTRONIUM - ONE OF THE FIRST APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN MUSIC COMPOSITION.

A COMPOSER (GUIDANCE CONTROL) ASKS THE ELECTRONIUM TO SUGGEST AN IDEA, THEME OR MOTIVE. HE LISTENS TO THESE ON A MONITOR SPEAKER. WHEN HAPPY WITH ONE OF THESE IDEAS, HE STOPS THE ELECTRONIUM AND STARTS RECORDING. FASTER, SLOWER, A NEW RHYTHM DESIGN, A HOLD, A PAUSE, A SECOND THEME, VARIATION, EXTENSION, ELONGATION, DIMINUTION, COUNTERPOINT, A CHANGE IN PHRASING, AN ORNAMENT, AD INFINITUM... WHATEVER THE COMPOSER REQUESTS, THE ELECTRONIUM ACCEPTS AND ACTS OUT HIS DIRECTIONS.



By '87, HE WAS COMPOSING ON A PERSONAL COMPUTER FROM HIS BED.





Introduction

This compendium of Raymond Scott artifacts and ephemera is a research supplement to the Basta Music albums *Three Willow Park*, *Manhattan Research Inc.*, and *Soothing Sounds for Baby*.

We have compiled, sequenced, and annotated documents and images which illuminate Scott's career trajectory in the field of electronic music.

While this collection is not intended to be read as a book (the patent disclosures and diagrams are extremely complex), there are many artifacts which the curiosity-seeker will find readable, enjoyable and informative. The contents represent but a small percentage of the documents housed in the LaBudde Department of Special Collections at the University of Missouri—Kansas City.

For deeper research, scholars are encouraged to contact the UMKC archives and arrange to visit the collection.

Editors: Irwin Chusid and Jeff Winner

Art Director: Piet Schreuders

Thanks: Gert-Jan Blom; Stuart Hinds and Kelly McEniry/UMKC LaBudde Department of Special Collections; Chuck Haddix/Marr Sound Archives; Marlies Dwyer; Karen Falk/Jim Henson Archives; Katie Raffa

MRI

Manhattan Research, Inc., the first compilation of Raymond Scott electronica (issued on BASTA in 2000), features 69 tracks (over two hours of music) spotlighting Scott's previously unreleased studio recordings from the 1950s-60s. These works feature such homebuilt Scott music machines as the Electronium, Clavivox, Circle Machine (early sequencer), Bandito the Bongo Artist, and more. The album includes soundtracks Scott recorded for pre-Muppet Jim Henson films. In 1946, Scott founded Manhattan Research Inc., billed as "Designers and Manufacturers of Electronic Music and Musique Concrète Devices and Systems." The original *MRI* package

featured a 144-page book that included photos, documents, and transcriptions of interviews with Scott colleagues, as well as with Scott's third wife, Mitzi. There are vinyl and CD reissue editions with abridged liner notes, as well as a digital release.



3WP

Three Willow Park: Electronic Music from Inner Space, 1961-1971 (released on BASTA in 2017) features over 60 previously unreleased recordings by Raymond Scott from the decade before he departed New York for Los Angeles in 1972 to work for Motown. Most tracks were recorded on devices Scott invented, and on *Three Willow Park* the "Motown Electronium" is publicly heard for the first time. Many of the tracks are beat-oriented proto-techno—recorded years before the 1970s explosion of electronic music and rhythms on the pop charts. Scott was a pioneer of taking strange electronic sounds and crafting them into appealing tunes. But *Three Willow Park* also features adventurous excursions into

electronic experimentalism. The 3-LP (and 2-CD) set, a companion to *Manhattan Research, Inc.*, includes a 24-page full-sized booklet with chronicles, photos, and memorabilia.



SSfB

Soothing Sounds for Baby features simple, rhythmic electronica recorded by Scott in 1963. *SSfB* was intended to serve as an "aural toy" during the "feeding, teething, play, sleep and fretful periods" of infants. It was "pleasantly stimulating," and would provide a "quieting" atmosphere of relaxation, warmth, and contentment. In 1975, Brian Eno's *Discreet Music* was released. Often cited as the cornerstone of the "Ambient" movement, Discreet Music sought "to induce calm and a space to think. [It] must be able to accommodate many levels of listening attention without enforcing one in particular." These ideas were later mixed with

dance beats, spawning such styles as ambient house, trance, techno, and trip-hop. *Soothing Sounds for Baby*, with many of the same qualities and purpose (albeit with a different audience), pre-dated *Discreet Music* by over a decade. Reissued on BASTA in 1997.



RSRw

Raymond Scott Rewired features three remix artists reconfiguring Scott. The Bran Flakes (Otis Fodder), Evolution Control Committee (TradeMark Gunderson), and Go Home Productions (Mark Vidler) were given hundreds of recordings owned by the Scott estate, in all genres, including unreleased material, spanning the 1930s to the 1980s. They were invited to have fun, keep it rhythmic, and make it percolate. Each chemist concocted six audio montages with new titles, and they collaborated on Scott's signature tune "Powerhouse." Approximately 250 sample sources were used in the construction of these 19 tracks. Those samples were edited, looped, flipped, and stretched; they were tweaked with

equalization, pitch-shifted, compressed, and subjected to all manner of digital cosmetology. Scott fans will recognize some passages, but in countless cases, the source recordings have been rendered unrecognizable. Released on BASTA in 2014.



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RAYMOND SCOTT

TIMELINE



1908 Born **Harry Warnow**, September 10, Brooklyn, NY



1921 Assembles his first "audio laboratory" at home, age 12.

1924 First professional job as pianist. Composes first tune, "Portrait of a Cow."

1927 Graduates from Brooklyn Technical High School.

1931 Graduates from New York's Institute for Musical Art (later renamed Juilliard).

1934 Hired as staff pianist for CBS Radio orchestra (conducted by his brother Mark).
Forms CBS band, the Instrumentalists, who perform Harry's original compositions on radio.
To shield identity as conductor's younger brother, reportedly picks name "Raymond Scott" out of a New York phone book.
Composes "Christmas Night in Harlem" (lyrics by Mitchell Parish), his first hit.



1935 Marries **Pearl Zimney** (daughter **Carolyn**; son **Stanley**).
Establishes studio, Universal Recording Company, Inc., and music publishing company, Circle Music, Inc.



1936 Performs regularly on CBS radio's *Saturday Night Swing Club*.
Forms first Raymond Scott Quintette, whose performance of "Twilight in Turkey" on *SNSC* makes band an overnight sensation.



1937 Signs contract with Master label.
Feb. 20: first RSQ studio date produces "Powerhouse," "The Toy Trumpet," "Minuet in Jazz," and "Twilight in Turkey."
RSQ continues to perform on *Saturday Night Swing Club*.
Scott signs contract with 20th Century Fox, moves to Hollywood with Quintette, performs and appears in several movies.



1938 RSQ performs "The Toy Trumpet" in *Rebecca of Sunnybrook Farm*, starring Shirley Temple and Bill "Bojangles" Robinson.
Scott leaves Hollywood and returns to New York with Quintette.
Hired as Music Director for CBS Radio.

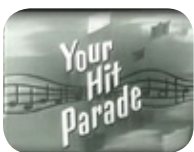


1939 Signs contract with Columbia Records in January to make new RSQ recordings.
Forms large dance orchestra, signs new Columbia agreement for Raymond Scott & His Orchestra; records for label in 1939 and 1940.

1940 Takes orchestra on tour (to finance his expanding electronics ventures).
Composes music for American Ballet Theatre.
Forms CBS radio band, the Novelteers. Performs "Silent Music" (a work consisting of no notes).



RSQ + S7



- 1941** RS and Orchestra perform on CBS radio. Forms another radio house band, the Captivators. George Pal animated "Puppetoon" titled *Rhythm in the Ranks* features Scott's "Toy Trumpet" in soundtrack.
- 1942** Breaks color barrier by forming the first racially-mixed network radio orchestra (including Ben Webster, Emmett Berry, Charlie Shavers, Cozy Cole, and others).
Forms first Secret Seven band.
Sells Circle Music publishing to Warner Bros.
Dorothy Collins, age 15, makes singing debut with Scott's orchestra.
- 1943** Warner Bros. music director Carl Stalling first adapts a Scott composition in a cartoon. For the next twenty years, Scott's melodies are "quoted" 140 times in 120 WB cartoons starring Bugs Bunny, Daffy Duck, Porky Pig, Road Runner, and others.
Forms CBS network band, the Sophisticators. Orchestra backs Frank Sinatra on network show *Broadway Bandbox*.
- 1944** Hosts and conducts CBS radio program, *The Raymond Scott Show*.
- 1945** Orchestra tours with new line-up.
Composition "Singing Down the Road" is used in the film *Bells of Rosarita* (starring Roy Rogers & Dale Evans).
Composes music for Broadway show, *Beggars Are Coming to Town*.
- 1946** Composes music for *Lute Song*, which opens on Broadway (starring Yul Brynner and Mary Martin); the show introduces one of Scott's most-recorded titles, "Mountain High, Valley Low."
Establishes electronic music corporation, Manhattan Research, Inc.
Files US Patent disclosures for electro-mechanical inventions, the "Orchestra Machine" and the "Talking Alarm Clock."
- 1947** Forms new band and tours.
- 1948** Invents electro-mechanical sound effects generator, later nicknamed "Karloff."
Forms a new Raymond Scott Quintet (again, six musicians).
RSQ (with singer Dorothy Collins) is hired as house band on CBS network radio show *Herb Shriner Time*.
Establishes Master Records label to release his own recordings.
- 1949** Records ten sides (five 10" discs), issued on Master label.
Composes themes for Hollywood film, *Not Wanted*.
Brother Mark Warnow, conductor on CBS radio's *Your Hit Parade*, dies of heart failure at age 49.
Raymond is hired to replace his brother as conductor.
- 1950** *Your Hit Parade* leaves CBS radio for NBC-TV, with Scott retained as conductor. His protégée, singer Dorothy Collins, is hired as featured vocalist.
Scott's *Suite for Violin and Piano*, his only "serious" work, premieres at Carnegie Hall on February 7.
Hollywood film, *The West Point Story* (with James Cagney & Doris Day) features Scott's "Toy Trumpet" in a tap dance scene.
Composes score for *Michael Todd's Peep Show*.
US Patent disclosure for "Automatic Scanning Radio" invention.
Raymond and Pearl are divorced.
- 1951** Continues conducting orchestra on *Lucky Strike's Your Hit Parade*.
Establishes commercial music company, The Jingle Workshop.
- 1952** Marries **Dorothy Collins** (two daughters, **Deborah** and **Elizabeth**).
Begins to develop electronic music device, the Clavivox, which later evolves into an early keyboard synthesizer.
Builds two of the world's first multi-track tape recorders (7 and 14 tracks respectively).



- 1953** Invents electro-mechanical musical “sequencer.”
Establishes soundtrack company, Raymond Scott Enterprises, Inc.
Files US Patent #2783311 for “Magnetic Recording Head Mounting Apparatus.” (Awarded in 1957.)
Files US Patent #2779826 for “Indexing and Selector Device for Magnetic Tape Recorders.” (Awarded in 1957.)
- 1954** Establishes Audivox record label to release his own recordings.
- 1955** “Flagging the Train to Tuscaloosa” used in Alfred Hitchcock film *The Trouble with Harry* (starring Shirley MacLaine & John Forsythe).
Meets young **Bob Moog** (later inventor of Moog synthesizers).
- 1956** Files US Patent #2871745 for the Clavivox, a “Keyboard Operated Electrical Musical Instrument.” (Awarded in 1959.)
- 1957** Invents film & soundtrack synchronization device, the “Videola.” NBC cancels *Lucky Strike’s Your Hit Parade*. (Program is revived on CBS in 1958 with Collins in the cast, while Scott pursues other projects.)
- 1958** Becomes A&R Director for Everest Records (produces singer Gloria Lynn’s debut album and auditions Bo Diddley). Records album *Rock & Roll Symphony*. Composes score for movie *Never Love A Stranger* (starring Steve McQueen). Suffers first of several heart attacks.
- 1959** Builds electronic music device, the “Circle Machine.”
Develops first version of automatic composition-performance device, the “Electronium.”
Files US Patent #2998939 for “Automatic Tape Transporting and Position Selecting Device.” (Awarded in 1961.)
Records LP *The Unexpected* by Raymond Scott & the Secret Seven, a line-up of jazz all-stars: Elvin Jones, Milt Hinton, Kenny Burrell, Eddie Costa, Sam “The Man” Taylor, Harry “Sweets” Edison, Wild Bill Davis, and “Toots” Thielemans.
- 1960** Establishes electronic music company, the World of Sound.
Composes score for movie *The Pusher*.
Invents two electronic music devices, the “Rhythm Synthesizer” and the “Pitch Sequencer.”
Performs with wife Dorothy Collins on NBC’s *Bell Telephone Hour*.
- 1961** Invents electronic music device, the “Juxtaposition Matrix.”
Establishes commercial soundtrack division, Electronic Audio Logos, Inc.
- 1962** Delivers lecture with slide/film show in Chicago detailing his electronic music inventions and their use to create soundtracks for radio & television. (Full transcription included here under “1962” section.)
Final usage of a Scott composition in a classic WB cartoon.
- 1963** Records three all-electronic proto-“ambient” LPs, *Soothing Sounds for Baby*, released on the Epic Records label.
Invents electronic music device “Bandito the Bongo Artist” (drum machine).
- 1965** Raymond and Dorothy Collins are divorced.
Moves to 3 Willow Park, Farmingdale (Long Island), where he lives and works.
Meets and begins to collaborate with Muppets-creator **Jim Henson**, producing electronic soundtracks for films and TV.
Invents “Automatic Rhythmic Keying Device for Electronic Keyboards.”
- 1966** Invents electronic “Serial Doorbell.” Is introduced to and begins dating **Mitzi Curtis**.
- 1967** Raymond and Mitzi are married in ceremony facilitated by Bob Moog.
Establishes electronic sound devices company, the Electronium Corporation of America, Inc.
Invents electronic “ambient” music devices, “The Fascination” and “The Participator.”
Produces a series of electronic sound-generating devices: telephone ringer, music box, jewelry, baby rattle, games, vending machines, others.

1968 Files US Patent #3587094 for "Electronic Audible Signaling Devices," which relates to the Electronium, Fascination, others. (Awarded in 1971.)
Invents electronic music devices the "Bassline Generator" and the "Synthesized Gong."
Bell & Howell references his 1959 US Patent #2998939. Suffers another heart attack.

1969 Invents electronic music device, the "Voice Modulator."
Establishes Nashville division of Raymond Scott Enterprises, managed by Tom Rhea.
Establishes optical electronics company, Electronic Transmission Systems, Inc.



1970 Composes and records corporate promotional album, *A Man Named Brown*, his final recording with human musicians.
Files US Patent #3684889 for "Optical System for Facsimile Scanners" (fax machine & scanning components, awarded in 1972).
Introduced to **Berry Gordy**, president of Motown Records, who places an order for an Electronium.
Honeywell Inc. references Scott's 1959 US Patent #2998939.



1971 Travels from New York to California to work under contract for **Motown** for a six-month period, which turns into a full-time position as Director of Electronic Music Research and Development.
Raymond and Mitzi relocate from Long Island to Van Nuys CA.

1972 Invents electronic music devices, the "Melody Maker" and the "Rhythm Guitar Simulator."
Suffers heart attack, undergoes bypass operation.

1973 Establishes electronic audio devices company, Raymond Scott Laboratories, Inc.
General Electronic references Scott's 1970 US Patent #3684889.



1974 Invents electronic music device, the "Musical Measurement Readout System."

1975 A.B. Dick Company references Scott's 1970 US Patent #3684889.

1976 Undergoes heart bypass surgery again.

1977 Retires from Motown.
IBM references Scott's 1953 US Patent #2779826.

1978–1986 Continues inventing, composing, and recording in home electronics lab.

1978 Attempts to market the "Musical Measurement Readout System."

1979 Suffers another heart attack. Undergoes physical therapy.

1980 Sony Corp. references Scott's 1953 US Patent #2779826 (magnetic tape mechanisms).

1981 General Signal Corp. references Scott's 1968 US Patent #3587094 (electronic audio circuitry).

1982 Xerox Corp. references Scott's 1970 US Patent #3684889 (optical scanning).
Atari Inc. references Scott's 1968 US Patent #3587094 (electronic audio circuitry).



1983 Undergoes triple heart bypass surgery.

1987 Records final electronic compositions on a computer.

1987–88 Suffers series of heart attacks and strokes. Afflicted with partial paralysis, Scott is unable to work or verbally communicate coherently.

1991 First CD of Scott's late 1930s Quintette music, *The Man Who Made Cartoons Swing: Powerhouse, Vol. 1*, issued on Stash label, produced by Irwin Chusid and Will Friedwald. (There is no Vol. 2.)



1992 *Reckless Nights and Turkish Twilights*, CD compilation of Scott's classic Quintette recordings 1937-39, released on Columbia, later by Basta Music, produced by Irwin Chusid (Hal Willner, executive producer). *The Ren & Stimpy Show* begins including Scott Quintette recordings in cartoons.



1994 **Raymond Scott** dies, February 8, age 85. Dorothy Collins dies, July 21, age 67. Scott's personal collection of recordings, documents, correspondence, photos, sheet music, and ephemera is donated to the University of Missouri—Kansas City.

1995 Mark Mothersbaugh of Devo purchases the (non-working) Motown Electronium. Basta Music is established in the Netherlands; first releases include Scott tribute album performed by the Beau Hunks Sextet, produced by Gert-Jan Blom.

1997 *Soothing Sounds for Baby* reissued on Basta Music, produced by Gert-Jan Blom.



2000 Music & book set, *Manhattan Research Inc.*, produced by Gert-Jan Blom and Jeff Winner, released by Basta Music. It is the first issue of Raymond Scott's previously unreleased electronic recordings from the 1950s and '60s.

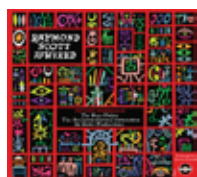
2001 Scott's first wife, **Pearl (Zimney) Winters** dies, age 90.



2002 *Microphone Music*, a 2-CD collection of unreleased RSQ recordings from 1937-39, issued on Basta Music (prod. by I.C.)

2008 *Ectoplasm*, CD of recordings by Scott's 1948-49 Quintet, released on Basta Music (prod. by I.C.)

2010 Scott's son, **Stan Warnow**, completes and exhibits documentary film *Deconstructing Dad* (co-producer: Jeff Winner).



2012 **Mitzi Scott** dies, age 93. Heirs of Raymond Scott establish Reckless Night Music LLC to administer the Scott estate. Scott's *Suite for Violin and Piano* is issued on Basta Music.

2014 *Raymond Scott Rewired*, mash-up project of Scott recordings is issued on Basta Music, with tracks mixed by the Bran Flakes, Evolution Control Committee, and Go Home Productions (prod. by I.C.)



2017 *Three Willow Park: Electronic Music from Inner Space, 1961-1971*, a collection of previously unreleased recordings, is released.

Gentlemen:

I have a story that may be of interest to you.

It is not widely known who invented the circuitry concept for the automatic sequential performance of musical pitches - now well known as a "sequencer."

I, however, do know who the inventor was - for it was I who first conceived and built the sequencer back in 1960.

This concept for my musical pitch sequencer was triggered by the introduction back in 1959 of the Wurlitzer Drum Machine called the Sideman - a rotating mechanical disc switching device that produced an electronically generated sequence of drum sounds. It immediately occurred to me - Why not build a device that would automatically sequence through a string of musical pitches?

Using thyratron tubes and relays I constructed my first "sequencer" by the spring of 1960.

With the introduction of Unijunction Transistors about '61,'62 I built my second "sequencer" this time with UJT's and relays.

It was around this time that I became acquainted with Bob Moog when I asked him to build for me a piano keyboard version of a theramin he had designed and published in a pop electronic magazine.

Incidentally, I may have owned the first polyphonic synthesizer - built for me - but designed and constructed by Bob Moog in '63 or '64.

It was also about this time that Bob Moog who visited me occasionally at my lab on Long Island was among the first to see and witness the performance of my UJT-Relay sequencer.

Around '64,'65 I decided to construct an all solid state version of my sequencer - this, however, was beyond me - so I asked Bob Moog to design it for me. He built a four stage model - all solid state - no relays. And, by the way, I believe he coined the word "sequencer" in titling the schematic for the unit.

To digress for a bit: During these early 60's I was so secretive about my development activities - perhaps neurotically so - that I was always reminding Bob - that he mustn't copy or reveal my sequencer work to anyone.

But, one way or another, a small number of people did get to witness a performance of my sequencer. They include:

'63,'64	Vladimir Ussefchevsky	Then Director of the Electronic Music Studio Columbia University
"	Mario Davidowsky	The present Director of the Electronic Music Studio Columbia University
"	Myron Schaffer (now deceased)	Director of the Electronic Music Studio Toronto University
'69	Herb Deutsch	Professor - Music Dept. at Hofstra University and author of "SYNTHESIZERS" (Alfred Publishing)
"	Morton Gould	Composer/Conductor President of ASCAP

Word, naturally, got around and in just a few months I heard about a sequencer other than my own - at the Toronto University Electronic Music Studio.

Shortly afterward I found out about a Buchla version, etc, etc.

Back to Bob Moog - he is a most honorable person. He steadfastly refrained from embodying my sequencer in his equipment line until the sheer pressure of so many manufacturers using the sequencer forced him to compete.

Yet, he used the simplest version, though he knew about my most advanced sequencer. Quite a gentleman, and a super talent besides.

RADIO MUSIC *of the* FUTURE



Photographs courtesy
Columbia Broadcasting System

Left, special microphone for bass fiddle gives steady, pounding beat of a powerhouse. Below, sea shell provides illusion of distance to trumpet

From the loudspeaker you first hear the beat of tom-toms apparently coming from a long way off. There is no resemblance of "fading in," the radio term for starting at a distance from the microphone and gradually

TONES unlike any ever heard before will flow from radio receivers when musicians reach an advanced stage in experiments whose purpose is the production of new sounds with the aid of the microphone, amplification and the mixing panel of the broadcast station's control room.

Composers of this music of the future necessarily will be engineer-musicians.

In the New York studios of the Columbia Broadcasting System, a young man who is both an engineer and a musician is creating something new in tones. If you dropped into the control room of the studios today you might hear his quintet rehearsing "Dinner Music for a Pack of Hungry Cannibals."

moving the instrument closer. Instead you get the impression that you are moving toward the sound. Next there is the sound of instruments strangely unlike any we know, playing a weird off-key melody that gives an impression of savages with crude, hand-made flutes and pipes. A wild cry that might echo through the jungle startles you and then a gurgling sound gives the effect of water boiling in a pot. The strange music clearly describes the scene, that of a cannibal orgy.

Raymond Scott, the young engineer-musician, tells how it is done:

"You're on a ship moving toward a desert island. You hear tom-toms a long way off. Through a spyglass may be seen can-



nibals gathered around a big, black pot, listening to their dinner concert.

"To get the effect of distance for the drums we placed a sea shell beside the microphone. When the drummer beats the tom-tom the sea shell picks it up on the microphone and gives it that hollow, far-away sound. As the music gets closer we turn off the sea-shell mike. Next we made our saxophone and clarinet sound like the mumblings of savages. We did this microphonically and musically. The distance the musicians stand from the mike was controlled to get the right dynamics. The weird music is the result of playing an F scale with a G flat in it, instead



Raymond Scott even gives the piano an ethereal tone. Top, trio playing in strange scale to give savage effect to music

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of straight F scale. By having our trumpet player blow an actual melody into a bucket of water, close to the mike, we got the boiling-water effect without sacrificing any of the melody. The sound was clearly audible even above the rest of the music, which was loud and furious. Under normal conditions the bubbling sound produced by merely blowing into water would not have been audible six feet away.

"Without the microphone the music wouldn't sound like anything, in fact you probably couldn't even hear many of these effects."

Scott has tried out everything that occurred to him that might evolve new sounds on the microphone. For instance, he spent hours recording the different sounds made when he rubbed the palms of

his hands across the rims of crystal glasses filled with varying quantities of water. Among other things he found that if the glasses were placed on the thick Manhattan telephone directory, he got a different sound than when they were on the thinner Queens phone book.

Experiments like these helped him evolve his theory of "creative acoustics," which he describes as simply the business of producing, by a knowledge of microphone technique, sounds that either do not exist or that would not exist if it were not for the mike.

Amplification is responsible for many of Scott's effects.

In a number called "Reckless Night on an Ocean Liner," the sound of water lapping against the side of the ship while gaiety reigns far up on



Blowing trumpet in water to suggest boiling water over air and, below, suggesting picture of dancing girls in an oriental square

"A" deck is achieved by placing a special microphone beside the cymbals while a double wire whisk is brushed over them. The sound cannot be heard above the noise of the festivities and gay music until the special mike is installed. Then you get the entire liquid effect without interfering with the rest of the music.

"Twilight in Turkey" is a selection which pictures an oriental square at dusk, with caravans lumbering by, dancing girls



Scott and his musicians and, right, wire whisk on cymbal makes noise of lapping water

whirling in the soft light and a snake charmer playing his flute. None of these sounds is specifically reproduced. Instead, they are suggested by skillful placing of the microphone. One musician removes the mouthpiece of his clarinet and plays a familiar oriental melody. The mike picks up a tone which is not a clarinet tone, but one very suggestive of the exotic quality of the music of flutes heard in a far eastern city. Another musician plays an ordinary New Year's noise maker and through the loudspeaker come the confused sounds of a crowd in the oriental city. A third musician manipulates two small cymbals fastened to the fingers of his right hand, while he plays the trumpet with his left, suggesting in tone the eastern dancing girls.

In "Power House," the problem was to suggest the constant whir of machinery,



the pound of the dynamo and the sound of hammers on steel. By actually humming into their instruments as they played, a droning murmur is produced in the loudspeaker. In the studio without the aid of the microphone it sounds like a confused mumble, instead of the rhythm of working machinery. The beat of the powerhouse is produced by placing a special microphone

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Radio Music of the Future

(Continued from page 693)

beside the bass fiddle. Without the mike the beat of the instrument is lost entirely in the other music. A particular way of beating on the rim of the snare drum with regular wooden sticks produces, in the loudspeaker, the sound of hammers clanging on steel.

With the coming of microphone music, it will be possible to create new tone colors in almost unlimited number. Not only can tones be amplified on the mixing panel of the control room, but they also can be changed. Desired elements of the tonal quality may be played up or down at will. Scott is already experimenting with such tone changes. One effect he expects to achieve is the creation of a pigmy band in sound. He will depict musically the dream of a child who goes to the pigmy land and joins a band. On the mixing panel Scott can extract from the full, open tone of the trumpet just those tiny, squeaky sounds that best suggest the instrument that a pigmy might play.

Scott also is experimenting with the piano, his own instrument. The tone familiar to our ears is that made by striking the keys, which cause little hammers to strike the strings. The attack of the hammers on the strings nearly always is audible in piano music, giving it a percussive effect not inherent in the tone itself. Divorced of the attack sound a piano tone is ethereal, disembodied, with a sense of great space about it. Pianists sometimes achieve it by skillful manipulation of the middle pedal. By placing a "dead" microphone beside the piano and then turning it on only after the keys have been struck, Scott is able to catch the ghost-like effect, adding still another tone color to music.



They See with Their Ears

By Selma Robinson

Raymond Scott composes and his brother, Mark Warnow, now, disposes through his swing band those musical miracles of the movies and radio

Above: Raymond Scott (born Harry Warnow) rehearses a new composition that his brother, Mark Warnow (left), will later conduct

THIS is a mad age. On every hand you hear of a mad hat, mad bull, mad fun, mad money. The madness of the Warnow brothers is something very special. Mark Warnow, one of radio's Big Ten orchestra conductors, has been known to settle himself back in a cab and give the driver his telephone number instead of his address. The other Warnow is Raymond Scott, composer, who, when he is lost in a musical mist, may pick his shoes off the floor, lace them meticulously, set them back under the bed, and proceed to go out the door in his stocking feet. Once, working out an intricate melody in his mind, he stopped at a drug counter, bought a package of mints, broke a lozenge off the roll and solemnly handed it to the clerk, while he tossed the dime into his mouth. This is not an escape from reality; it is merely shutting out the world while they get some work done.

Mark Warnow is probably the only conductor on record to follow his orchestra instead of leading it, as he did once when he discovered he had left his music at home. His brother kept seeing a girl he didn't like, only because her perfume appealed to him; when he found out the name of it, he stopped seeing her and wrote his "Perfume Suite" instead. Mark calls his radio orchestra "The Blue Velvet Orchestra" because his secretary wore a blue velvet blouse that delighted him.

Though Scott is in Hollywood and Mark is in New York, they talk to each other at least twice a week by long-distance phone, three quarters of an hour at a time, while Scott runs off a few bars of his latest opus for Mark to criticize. Raymond's music is their pet enthusi-

asm; Mark keeps a phonograph in his office at the Columbia Broadcasting Company and plays his brother's music full blast when he has nothing else to do—or even when he has. Scott admits his music is revolutionary, admits it with a strange, unaffected modesty, because he is so honestly detached about it. Stravinsky and Paul Whiteman, Duke Ellington and Cab Calloway are inclined to agree with him; Whiteman hopes to do a concert of his music some day soon.

Scott's number, *The Toy Trumpets*, is the climax of Shirley Temple's newest picture; his *War Dance for Wooden Indians* and *Twilight in Turkey* were also movie hits. His titles have a kind of crazy poetry: *Piano and Pistol Duet*, *The Girl with the Light Blue Hair*, *Square Dance for Eight Egyptian Mummies*, *Dinner Music for a Pack of Hungry Cannibals*, and so on—titles that are like strong drink: they make you groggy at first, and when you hear the music everything becomes beautifully clear. Raymond Scott's real name is Harry Warnow. But what's that to a man who calls his musical sextet the Raymond Scott Quintet simply because he likes the sound of it better?

The Gentle Art of Listening

Gertrude Stein once wrote a poem, "A rose is a rose is a rose is a rose," because she liked the sound the words made. The Warnow boys, too, see with their ears. They think with their ears, they judge with their ears. If a thing sounds pretty, it's pretty sound as far as they are concerned. If it doesn't, it's out and no amount of coaxing by movie executives, radio sponsors and phonograph companies can make them change their minds.

Raymond—even his own brother calls him that instead of Harry now—re-

hearses with his quintet as painstakingly and intensively as any classical string quartet might. Their movie contract with Twentieth-Century-Fox makes it possible for them to rehearse five hours a day, five days a week, a strenuous program, but one that has made the boys so sensitive to every mood and direction of their leader that he never writes down a single note for them to play. His retainer is a healthy one, but Darryl Zanuck is satisfied. One smash hit like Shirley Temple's song would justify any fee; besides, Mr. Zanuck has the privilege of sitting in on rehearsals, if he wants to, and listening to the boys go to town with the latest Scott's emulsion of sweet and hot. Brunswick, which sells records of Scott's music, signed him to a contract calling for twelve records a year and it gave him the right to veto any recording he does not consider fit to release. Raymond insisted on that, and surely there was no harm in it! But they had not counted on Scott's standard of perfection. He will make the twelve recordings all right; but so far he has permitted only four double-faced records to be released. Most orchestras recording for companies make two recordings to be on the safe side; Scott's men make half a dozen, a dozen, two dozen, if necessary. If he couldn't work it this way, he would cheerfully turn in his contract. So far, though they fuss and fume, nobody has asked him to. After all, composers whose records sell 250,000 copies don't grow on trees—and they keep on selling without a letup, regardless of season.

Scott's music is a language that has never been spoken before, complex, irresistible, provocative. Written primarily for mechanical recording and the radio, his music in its present form could not exist if there were no radio. If you've had anything to do with a microphone,

you know that the sounds you hear in the room are nothing like the same sounds over a microphone. Raymond got to work harnessing this difference to make a new kind of music. When he composes, he doesn't sit down like the traditional composer and write down little black notes on ruled paper. He composes on the phonograph, working out each passage with his quintet, playing a theme for the clarinetist, for the drummer, for the saxophonist until each can play it back perfectly. Then together the whole group plays while the recording machine gets it down in wax. Before a number is perfect enough to be released, there may be seventy-five recordings. Scott sends the best of these on to Mark to play, who grades them as a teacher might grade an examination paper—B-, 50% complete. When it is an unqualified A, 100% complete, it will be passed on to the public. For sheet-music sales, a specialist is called in to translate the music into black and white. Other composers, too, follow this method. An average composition takes a day to transcribe; Scott's complicated music takes almost a week.

Success Story in Outline

Both brothers are short, stocky and dark-haired. Scott was born in New York, twenty-eight years ago. Mark was born in Russia, nine years earlier. Their father was a violinist, the only Russian violinist who never played fiddle for the czar. They came to New York when Mark was six. When he was fifteen, he got his first job in a concert ensemble, playing at the old Waldorf-Astoria. He made his debut as a concert violinist at Town Hall; already he had an enviable musical record, having directed *Apple Blossoms* and an edition of the *Ziegfeld*

(Continued on page 33)

They See with Their Ears

Continued from page 22

Follies. For the past ten years he has been on the radio. His home at Kew Gardens is affectionately cluttered with children, cocker spaniels and music. His wife is a girl who lived on the next block from his in Brooklyn for thirteen years—but he didn't find that out until they met one night at a fire. In the restaurant where he eats, the waiters call him "Maestro" and he calls them "Maestro" right back. His admirers believe that he could coax music from a windowpane.

If Mark had not interfered, Raymond Scott would have gone on with his studies of the electric oscillator. But his big brother heard the boy's first composition, Metropolis, and bundled him off to the Institute of Musical Art for a thorough grounding in music. Scott's wife is Pearl Stevens, a pint of brunette glamor and beauty who looks like a perfume ad. Her husband's soldering irons, microphones and uncut records finally got her involved in the recording business until now her skill in mechanical recording is something that even Irving Berlin and Guy Lombardo talk about.

When the Warnows were kids, their house in Brooklyn used to look like something drawn by Rube Goldberg. Microphones hung all over the place. Wires trailed everywhere. Glasses of water, telephone directories, sounding forks—everything was part of the laboratory. Evenings the two brothers would stand glasses of water on the telephone directories, rub their hands over the tops of the glasses and record the differences that the sound made on the Brooklyn directory, on the thick Manhattan book and on the thinner one from Westchester. What they evolved Scott called "creative acoustics," the production of sounds that either do not exist at all to the naked ear or would not exist if it were not for the mike.

Engineering to Music

Scott is more than a composer; he is a brilliant pianist and a thoroughgoing engineer who has invented several recording devices now in use. Engineering is as much a part of his music as the notes themselves. It governs the production and quality of each note, and the position of his famous quintet and the instruments they use. What comes out of the microphone is what counts with Raymond Scott. Like a scientist mixing things in a test tube over a Bunsen burner, he will take familiar and unfamiliar instruments—so far he and his men have made music with sea shells, table tops, wire whisks and buckets of water as well as the conventional clarinet, trumpet, drum, saxophone, bass fiddle and piano. The unheard members of his orchestra are the mikes, two and three of them, so that they can pick up the most delicate nuances of sound.

Scott was a pianist in his brother's orchestra until the day when Columbia Broadcasting asked whether he could get together an orchestra for a blues singer. The men he selected for his quintet were "house men," in the standing orchestra maintained by the broadcasting company. Not one was stellar material. Though everybody said such an outfit couldn't last, the same six are still together, unchanged except for a single thing, the saxophonist's name—Scott asked Dave Harris to become Eric Hoex because it sounded nicer.

When he couldn't find music to measure up to his conception of what true radio music should be, Scott wrote his own. The quintet's first offering was something called Twilight in Turkey.

The title and the idea came to him while he was thumbing the National Geographic. Nobody who attended that première eighteen months ago is likely to forget it. Studio B was in total darkness, a violation of the fire laws, no doubt, but the very tops in showmanship. Out of the darkness there came a thin wailing note, barely masking a slow, suggestive thumping on the drums. Now and again a dancing girl's anklets tinkled. You could almost hear her eyelashes fluttering. There was a drone of voices in prayer. When it was over the audience rose to its feet and cheered. Fan mail poured in. Who was this man Scott? Where was he from? Where had he been all these years?

By Benefit of Microphone

There were more calls for Scott's music. He responded with Power House, which might have been called a tone poem except that it had the vitality and humor of true jazz. You could hear the wheels turning, hammering, clanging, a dynamo throbbing and the characteristic hum of a factory. What kind of instruments did he use? His drummer played on a cowbell and made a sound on the microphone of a sledge hammer on steel. The bass fiddle was the dynamo with a special microphone set to pick up sounds that otherwise would have been lost. And for that humming sound, the men made that by actually humming a low note in their throats as they played.

"None of these things could have been done without a microphone," Scott explains. "It's high time that composers realize that they can go into a special field; with the microphone to help them they can make it say things it has never said before, paint pictures, tell a story, thrill you."

Though his compositions would be classified as swing music, they have logic and continuity. Sheer virtuosity for its own sake is not substantial enough for him. The composition must go somewhere. Reckless Night on an Ocean Liner pictured a cruise liner leaving the dock. Down against the hold the water slapped softly, while four decks above, a noisy crowd was getting more and more festive. Johnny, the drummer, made the waves with a wire whisk on the cymbals and a microphone to pick up the sound without disturbing the balance of the other instruments.

Despite the concessions Hollywood makes to his methods, Scott hates the place. He hates being yessed. He'd rather be back in a place where, yes, they have no mañanas. In New York his brother or somebody will call him up and ask for a new number that must be done overnight. All night long he and his five men will toot and scrape and hammer away and, lo! the masterpiece will be ready before morning. In Hollywood, the telephone rings. They need a new number but they need it quick. "How soon?" Scott wants to know. "Oh, very soon," they tell him. "Immediately—certainly no later than six weeks," and he collapses again like a sick soufflé.

Back on Madison Avenue, where his brother and his friends are, they know that it's not madness in his method but method in his madness. They know that when, in the midst of a quiet talk or no talk at all he suddenly pops out with Consternation of a Cabdriver on Encountering a Fare or Yesterday's Ice Cubes, he is just trying out a new title on an audience in the same unexpected way you might hear them over the radio without build-up or introduction. For all of them are an ear-minded lot.



Collier's, July 23, 1938 (2/2)



MORSE

RAYMOND SCOTT

WHO IS NOTABLE FOR ECCENTRICITY AS WELL AS MUSICIANSHIP

"MUSIC to be played on the air," said Raymond Scott, "would sound better if written specifically for the microphone." A perfectly simple idea—so simple no one had thought of it before. Scott, engineer, pianist and composer, went ahead and wrote for the mike—*Powerhouse*, *Dinner Music for a Pack of Hungry Cannibals*, *Bumpy Weather over Newark*. His screwball titles, his six-man quintet (he pre-

ferred the euphony of "quintet"), his absent-minded habits are part of his success. Main credit goes to painstaking musicianship — he composes with a recording machine and as many as twenty records might be made before a piece is satisfactory. None of it is ever written down. Scott shocked classicists with *In an Eighteenth Century Drawing Room* and other jazz interpretations of the masters.

CORONET

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Coronet, August, 1940

TAKE William Saroyan. Add a generous helping of Barnum. Mix with equal parts Richard Strauss and Oscar Levant. Stir well with a syncopated beat. The result: Raymond Scott, the Gertrude Stein of Dada Jazz, warden of a new dance orchestra, and name on the label of two dozen madly titled, wacky-sounding disks.

Jazz pundits predict he will be 1941's number one dance-band sensation. He isn't so certain. Says it might be 1942. But certainly this Scott—Great Scott, to the Columbia Recording Company—one time Harry Warnow, who chose his professional name out of a phone book, is a press agent's natural.

He believes in exercising his mental muscles by doing unusual things. He suggests spoons in tones, does musical portraits of cows, fences, weeds, wrote a study on the feel of a thimble, a coin, the telephone. Overhearing a conversation about a bass player who enjoyed visiting undertaking establishments, he immediately penned *A Bass Player's Pleasure at Hearing Nothing in a Morgue*. He set Hollywood's hills to music by drawing their contour on the five-line staff and filling in notes on the outline. Jazz without a beat is his latest hobby. When asked what kind of rhythm it would have, he replied: "I don't know yet."

He owns a loud-speaker so large a shed had to be built to house it. In winter Scott wants girls to dance to his music swathed in rich fat furs, and their escorts to wear mahogany canes and wooden shoes. "That all helps the acoustics, absorbs the reverberations, makes the music crisp and solid, instead of boom-y and echo-y." He claims his best inspirations come to him on the Bronx Park Express when it roars into Times Square.

When he was a bachelor he spent his spare hours dialing numbers and asking for Rose. "You'd be surprised," he says, "how many times some one by the name of Rose came to the phone. I'd talk for a while and then ask if I could see the young lady. But they were all respectable and wouldn't take chances with a stranger. Finally, one day I was at a party and heard a group of people talking about a girl they knew. She sounded like my type, so I found out her telephone number, and the next day dialed her. I knew then I had to change my technique. 'You can't hang up,' I said. 'Why not?' she wanted to know. I switched on a recording I'd made of our conversation. When she heard it, I couldn't get her to hang up."

That was their introduction, and at last Raymond Scott succeeded in seeing the unknown lady on the other end of the telephone. After a walk in Brooklyn's Prospect Park they were married. "She's the one woman in five billion who could be married to me!" explains Scott. "She was

MELODY'S SCREWBALL

BY CARLETON SMITH



brought up on the music of the *Slumber Hour* program."

In addition to settling back in cabs, giving the driver his phone number instead of his address and telling him to look it up in the book, to demanding that his stooges do something at least once a month to make him laugh, to scribbling *Pretty Little Petticoat* when asked for his autograph, he is reported to have

been ejected from a Hollywood apartment hotel for insisting that his new maroon automobile be hoisted into the living room.

A cartoonist claimed that when writing scores he wears a cap *once owned by Mozart*. Interviews with him are frequently reported in the third person. "Raymond Scott," he pontificates, "can discuss his music more freely that way."

"Scott," says Scott, "is deeply interested in acoustical engineering. He studied engineering before he took up music. Now he makes experiments in tone. Creation, you know, is experiment plus the taste and understanding to know when you have got something. But none of Raymond Scott's pieces is written by himself, really. He doesn't compose notes—he composes sound-tone variations, and he has never found a way of indicating them on paper. To him, music is not a lot of notes written on paper. It's the way you play them."

"He has his musicians around him, and as a phrase for a certain instrument—say, the trumpet—occurs to him, he plays it on the piano until the trumpeter can repeat it properly. He does that with each instrument. Then, when the whole group has the thing down, it's recorded. Sometimes fifty, sixty records are made before one is O. K. Then somebody copies it from the record and the piece is published."

A Scott rehearsal finds Scott driving his men like a drill sergeant. He makes them work until they drop. Unreasonable, demanding, he's petty about details. In his quiet, inconsiderate way, he drives his musicians to desperation. They don't like to work for him: only four are left from the group he had six months ago.

Words are very important to him. "Words have sound," he says, "particularly names. I gave my advance agent the name of Susan Spratt—because that stops people. Take a trombone player whose name was Steve Smith. Now you don't call a man Smith when he plays a trombone with an open liquid tone the way Steve did. So I called him Owen Truex. Sometimes I even change my own name—to myself, of course—when I'm writing something that just doesn't sound as if it would be written 'by Raymond Scott.' What's funny about that? Think how perfectly the name Chopin fits his music. The whole thing would be ruined if the Nocturnes had a name like Joe Glutz on their title sheet."

Titles are Mr. Scott's stock in trade. Nocturnes, symphony, opus ten, concerto, symphonic poem, are too tame for him. He prefers: Duet for Pistol and Piano, Love Song to a Microphone, Reckless Night on Board an Ocean Liner, Dinner Music for a Pack of Hungry Cannibals, Swing, Swing Dear Mother-in-Law, On Gazing into the Inner Recesses of an Old Beer Bottle, Business Men's Bounce, Huckleberry Duck, Consternation of a Cab Driver on Meeting Up with a Fare, Siberian Sleigh Ride, Yesterday's Ice Cubes—any of which might well have originated in the composition class of your county insane asylum. What made Scott think of them he doesn't know. "Invite your readers to tell me why I call my theme Pretty Little Petticoat," he barks. "I've forgotten."

HE's made a record of everything he ever breathed. He was inventive and interested in acoustics

when he was a kid. He always hit everything in sight, dropped books, ash trays, knives, lump sugar to hear the sound. At nine he was so mood-conscious he arranged special lighting effects and practiced his scales in red, blue, green, and orange rooms. It took him six and a half years to graduate from high school because he was busy experimenting in the school's radio laboratory.

When he organized his new band and moved into the Sherman Hotel's Panther Room last August, all this—plus his experiments at Columbia Broadcasting and in Hollywood—helped. Moreover, he had earned several fortunes. His tunes were hits. Shirley Temple had taken his Toy Trumpet around the globe. He could command what he wanted. He was willing and able to pay for a band that could play sweet, swing, and Scott—Down Beat calls it "huckleberry" music. He set out to perfect the most remarkable orchestral machine in existence: a precision device, inspired, graceful, but most of all slightly "loused up"—or, as he says, "spoiled—not perfect like Kostelanetz's."

For six months he visited bands around the New York area, sitting and listening. "Scott wanted to find out exactly what tempos got the people on the floor to dance," he says. "Some of my music for the Quintet was popular, but it was for listening, not for dancing. A band must satisfy both requirements."

Upstairs, he has an engineer record what his band plays. Next day, while he showers and shaves, he plays the records over to catch details he might have missed in the excitement of facing a floor full of dancers. He is not satisfied with the results so far. "Our brass isn't right yet," he says, "but it is on its way. All musicians must be kept on their toes. When I audition a guy, I ask him what kind of music he hates most. Then I tell him to play it. If he has control and skill enough to do that—and do it well—he is for me."

He's still changing vocalists and experimenting with loud-speakers. "My idea is to have the vocalist sound as if she were whispering into the ear of every one in the room." To announce the titles of his tunes, he has descriptive cartoon slides drawn and flashed on a screen.

Meeting Scott, you're surprised. Thickset, stubby, swarthy, his chief trait is his adolescence. At moments he's neither aware of himself nor aware of the world. He's no windbag. Nor does he act like a mad screwball. He doesn't smoke or drink. He smiles seldom and often runs his hands through his shock of upstanding hair. If there's a piano around, he punctuates his remarks with chords. Brooklyn-born, he gives off that same eerie, out-of-the-world charm found in the Dodgers.

He thinks he's a genius, takes himself seriously, and is not affected by the criticism of jazz purists who say his music is full of razzle-dazzle, has too much hipper-dipper stuff.

His reputation as an eccentric annoys him. He claims he's changing, becoming less absent-minded. He says he doesn't give cab drivers his telephone number instead of his address, nor does he park his automobile in his apartment. "I tell people I do things like that and they believe me," he confesses. "Actually, I spend about ninety-eight per cent of my time thinking of music and two per cent relaxing and letting my mind run away with me."

His chief diversion is memory driving. He admits that after he makes a sharp turn he often goes back four or five times until he can drive around it with his eyes closed. He makes the men in his band do the same things with their parts. He likes them to be able to play in the dark. "The best thing we do now," says Scott, "is silent music. . . . It's demonstrated in our ten-minute version of Tuxedo Junction, five minutes of which are completely silent. But *what* silence!! Suddenly you become aware that we aren't playing, but you hear us. The aural memory of the music plus the boys' suggestive visual movements does it. It's *silent* music."

That sounds good but a little dubious. Mr. Scott isn't really as extraordinary as he'd like us to believe. His whimsy is that of a Messerschmitt and he enjoys putting on an act. But really he's a shrewd business executive operating a successful record company and a music-publishing firm as well as owning a band. It's merely that he has found it good business to be known as a screwball and to live up to the wacky quality in his music.

THE END



Liberty, January 18, 1941 (2/2)



For listening to records in his living room, Scott designed this custom amplifier cabinet system, which had a removable tray filled with water under the speakers, because, as his first wife Pearl explained, "he thought sound came over water in a more sonorous way."



From: Press Dept.
WILLIAM MORRIS AGENCY, Inc.

JAZZ AN ARTISTIC PROBLEM
TO BANDLEADER RAYMOND SCOTT

The Twentieth Century is always referred to as the age of science. But, until recently, modern American jazz remained outside the sphere of mathematical accuracy, drawing its inspiration largely from the emotions and ad-libbing improvisations of the musicians who played it.

Now, however, science has invaded the jazz field in the person of Raymond Scott, composer-bandleader, who brings his orchestra to _____ on _____. The up-and-coming idea man has already demonstrated that cold, precise methods can produce some of the hottest numbers in the world. Gifted both with musical imagination and an engineering habit of mind, Raymond feels that "for years dance band music and jazz has been surrounded by a lot of hokum." To him, the most important thing about jazz is having a good beat, and a happy, joyous sound. It stimulates the listener and makes him feel grand. But to say that the musician who produces or writes it has to drink, smoke marihuana or indulge in other peculiar antics to put him in the right mood is just silly. Jazz is a regular artistic problem like any other.

Many authorities have been loud in their praises of him as a pioneering, experimenter. They respect the sound technical skill developed at the Institute of Musical Art and watch with interest new techniques for music-making being

(more)

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developed in the elaborately-equipped laboratory in Scott's Westchester home.

His home laboratory is really something to see. Literally thousands of records line the walls--the composer hopes one day to have enough so that he can use them instead of wall paper. Thorough as he is at gathering together "anything of musical, technical or historical interest that has ever been recorded," the not-too-orderly jazzophile has never catalogued his huge collection in any way--with the result that finding a particular selection is often a mad treasure hunt in which the whole family joins.

Scott's most proud possessions are not records, however, but the awe-inspiring array of mechanical contraptions with which he makes and plays them. The laboratory has enough knobs and bolts in it to double as a stage set for a ~~Frankenstein~~ movie. When Raymond Scott still used his real name of Harry Warnow, he wanted to be an acoustical engineer--until famous brother Mark Warnow convinced him that his field was music. (The Raymond Scott monicker came out of the Manhattan telephone book--so that Harry wouldn't cash in on his brother's success.) At any rate, it seems to the observer that Raymond has managed to combine both careers--for many of the devices are his own inventions. And nobody's allowed to call them "gadgets," either--for to their owner the contrivances are scientific aids, essential to music-making in the modern world.

6461z

* * * * *

From: Press Dept.
WILLIAM MORRIS AGENCY, Inc.

RECORDINGS AID
RAYMOND SCOTT

Raymond Scott, who brings his dance band to

_____ on _____

explains that a musician can no longer sit and brood over his compositions in a quiet meadow, as he did in the old days. In radio particularly, music is a business requiring such speed-up tools as permanent recorders and "erasable" playback devices. Scott himself daydreams up new combinations of sound, then plays them right onto a record instead of sitting down and painstakingly writing them out. Assistants later transcribe the record into a score. Sometimes, too, he plays, sings or speaks composition to dictation men who write them down--thus compressing 120 hours of mechanical work into 15.

These techniques serve in developing the novel arrangements of popular dance tunes played by his band. When asked what makes his band different, the baton-wielder replies quite seriously that the boys are "terrific on purpose." Not only do they play in pitch, in tune and in time, but the maestro feels that they've taken the gold out of radio bands--they play "warm" as well as accurately.

No story on Raymond Scott would be complete without mentioning his passion for recordings. Ever since he started changing discs for customers in his father's music store, he's been thrilled by electrically-reproduced

(more)

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music. Now he boasts: "Every sound I make is recorded," and adds that phonograph records have a much greater nostalgic value than pictures. "Just think of listening to the very sounds you made five years ago!" He prefers well-balanced reproduction to "live" music, since with artistic distortion it is possible to enhance the original performance. But a well-balanced record in the Scott sense requires a staff of experts and expensive equipment beyond the perfectionist's private means, so the bandleader organized a commercial transcription company--just to take care of his own experiments properly.

* * * *

6461z

MANHATTAN RESEARCH INCORPORATED

OAKDALE, LONG ISLAND

P. O. BOX 743

DISCLOSURE FOR ORCHESTRA MACHINE.

This machine is a device incorporating a number of multiple sound track units, each of such units consisting of a cylinder or continuous loop on which all the notes of any particular instrument are recorded continuously and located on such a cylinder or loop side by side in accordance with the musical scale and means provided by a selective system to reproduce any one or a harmonic multiple of such a recorded medium.

When several of these recorded units are used in such a device they may be selected as would be the musical instruments in an orchestra and operated in conjunction with the reproducing system similar to that of an electric organ but giving musical reproduction of instruments rather than magnetically or electronically generated notes. The recording and reproducing system adapted for this device can either be film or magnetic tape. Each recorded track to be associated with its own reproducer.

The entire mechanical driving system may be so arranged that the reproducing speed may be varied in order to select any particular musical pitch.

Witnessed and understood
by me today

W. H. H. H. H.

Date

March 8-46

Inventor.

Raymond S. Scott

MANHATTAN RESEARCH INCORPORATED
OAKDALE, LONG ISLAND
P. O. BOX 743

DISCLOSURE OF TALKING ALARM CLOCK.

The following is a description of an idea comprising an alarm clock device, mechanically and electrically connected to and enclosed with a recording and reproducing system operated in conjunction with said alarm clock.

The purpose of such a device is to make it possible to speak into a microphone loud speaker unit and record information which will automatically be played back after the alarm has expired at the pre-set timing of the clock; in that way making it possible to record information before retiring and have such information reproduced as a reminder upon awakening the next morning. A pre-recorded music may precede or follow such recorded information. The same device may be used for business purposes where spoken information may be desirable at a certain pre-fixed time such as a reminder, etc., in which case, provisions should be made to disconnect the bell mechanism from the alarm release in the clock mechanism.

More specifically, such a device can be constructed by the use of a magnetic wire or tape recorder where the vehicle for the recorded sound track will be a medium for magnetically recording such sound on a magnetized substance which either may take form of wire or tape which can be automatically re-wound or operated as a continuous loop.

When the entire sound track has been released the device is so arranged that when the wire or tape is ready for a new recording the used track will be erased magnetically before entering the recording head again.

The entire system may be compactly housed in a case exposing clock dial, microphone speaker unit and push to talk button on the front of such a case.

Witnessed and understood
by me today.

H. H. H. H.

Date.

March 8-46

Inventor.

Raymond Scott

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No. 14

1947

Raymond Scott, Orchestra Leader, Composer, Once Interested In Electrical Engineering

By DONALD BYERS, '48

Raymond Scott's unmistakable smile of content could be seen recently in a local ballroom as dancers swayed in time to his lilting music. This inimitable beat probably comes from his admiration of Sibelius, a classical composer.

Scott, a calm, soft-voiced Brooklynite, is the second of his family to become a bandleader. His brother is Mark Warno, a well-known orchestra conductor.

Raymond Warno (his original name) went to Brooklyn Technical high school where he wanted to follow a course in electrical engineering. His favorite subject was physics. When asked his least-liked subject, he immediately responded, "all the rest!"

Raymond and brother Mark were amateur photographers, a good excuse for taking pictures of his English teacher, on whom he had a slight crush. He played piano for auditorium programs and school activities.

His desire to write music came spontaneously without outside inspiration. He attended a music conservatory after high school. Mr. Scott

plays the piano, for the most part, but has an "understanding knowledge" of many other instruments.

Scott has a unique method of writing music. While sweating over the ivories, his music is being recorded at the same time. This way he can play the notes back and after elaborating on this, compose a piece of music.

He considers the turning point in his career the act of assembling a little band. The name of this group was the "Raymond Scott quintet." He says that, to start in such a field as music, one does not need connections with other band leaders, but it does make advancement much faster. His choice as the most valuable instrument in an orchestra is the piano.

Versatile Mr. Scott has written over one hundred fifty songs with such, shall we say, original, titles as "New Year's Eve in a Haunted House" and "Dinner Music for a Pack of Hungry Cannibals," light titles as "The Toy Trumpet" and "Eighteenth Century Drawing Room" and others such as "Monkey See, Monkey Do," which is sung by Mary Martin in the New York production "Lute Song." His music is generally cheerful. His most recent composition is always his favorite.

He has two little Scotts in the family; neither one ready for music. Eventually, however, Poppa Scott expects them to enter the field.

By Paul Speagle

THE MAN, like a scientist gleefully examining the success of his latest experiment, chortled: "I have split the musical atom."

We looked around quickly, wondering if any foreign operatives had overheard this indiscreet admission. The bartender had a guilty look, but maybe that was because he had just short-measured a dry Martini. We turned back to our vis-a-vis.

"You've what?" we asked, not sure we had heard aright.

"I've split the musical atom. Go ahead—call me crazy, a dreamer, nuts. But I have made a great contribution to musical America. I have discovered the melody."

This boy-faced man, with the unruly hair and clothes to match, this Raymond Scott, this band-leader turned savant (or vice-versa), was smiling joyfully, but he meant every word he uttered.

"Okeh," we said, "so you've discovered the melody. Who hasn't?"

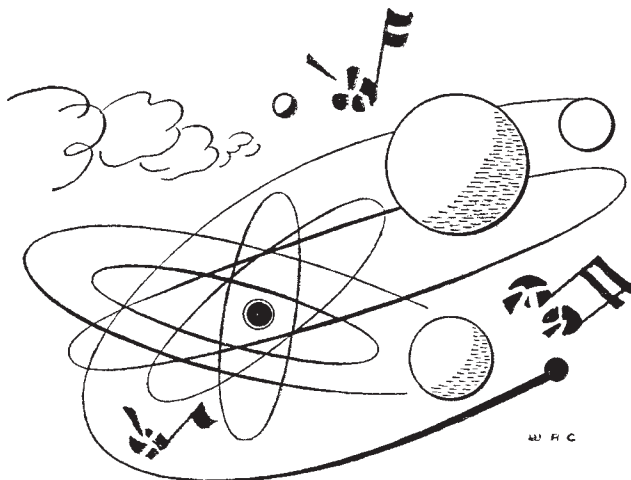
"NO, YOU DON'T seem to understand," he said, in a patient tone of voice. "Ten years ago I was convinced that what the world needed and wanted was highly imaginative music—the bizarre, the clever, the smart. That was when I was turning out things like 'Huckleberry Duck,' 'Dinner Music for a Pack of Hungry Cannibals'—you know the stuff."

We nodded and made a mental note of Scott's "bizarre" period.

"Then, about five years ago I

Radio Section

Splitting the Musical Atom ---and Infinitives



realized that the melody, if played with beauty, and grace and imagination could be the most wonderful kind of music in the world. That doesn't mean that I have ceased to care about the fantastic,

I think both of them can live together. And that's what I mean when I say that I have split the musical atom."

The curious thing about the conversation is that Ray Scott, who, incidentally, is now playing at the Palace Hotel, is absolutely sincere about his beliefs. He is a musical craftsman, a painstaking technician, a tireless composer. His only worry in life is that he won't be able to find enough musicians who feel as intensively about the creative side of the art as he does.

So what has this to do with radio?

WELL, Mr. Scott believes that modern-day orchestras should take full advantage of the scientific achievements in the realm of sound.

"When you listen to an orchestra over the radio today," he elaborated, "you don't get the full benefit of every instrument. I think this is wrong. And I think I have found the answer to it. I have a theory about placement of microphones which I am in the

process of developing. I'd rather not say too much about it right now because I want to be absolutely sure I'm on the right track."

Did he believe in the electrification of instruments?

"Absolutely, if by the amplification you can achieve a rounder, fuller, more expressive tone. In my humble opinion it is silly to look down one's nose at an electric steel guitar, for instance."

We expressed the feeling that Mr. Scott was playing right into the hands of sideshow artists like Phil Spitalny, with all this talk about melody and electrification. Mr. Scott reacted as if we had just hit him on the side of the face with a wet flounder.

"OH, NO!" It was a sound of anguish, rather than protest. "I didn't mean to give you that impression. This is a very personal subject with me. It is so personal that as soon as I feel I am financially able to do it I want to establish a Musical Research Center to explore these ideas of mine more thoroughly."

"It will be sort of a musical clinic to examine and try to correct the mistakes of musicians; to develop the use of sound in orchestral arrangements; to invent, if possible, new techniques."

"I'd like to be able to take motion pictures of musicians in action, and then run the film back so that they could trace their own mistakes—bad fingering, faulty lip-work, sloppy posture, all the things that contribute to poor playing."

There is one large fly in the ointment of Mr. Scott's plans. "I'm no business man," he ruefully admitted. "So it's going to take a little more time for me to get the dough to build this center of mine."

"But that's the goal I've set for myself—and I'm just stubborn enough to get there, or blow my topper in the attempt."



Raymond Scott with a wire recorder, circa 1948

news from: *m*usic artists associated

25 east jackson boulevard • chicago 4, illinois • WAbash 2-0116

SAMUEL M. DOLNICK, director



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9

Nothing is impossible in this atomic age. As a composer musician who has dabbled for twenty years in "sound acoustics", I wish the Einstiens of the world would focus their attention soon on the problem of accurate representation and reproduction of music.

When I began composing, I worked with the medium of radio and phonograph recording uppermost in my mind. First I couldn't find music to measure up to my conception of what true radio music should be. So I wrote "Twilight in Turkey" and "Powerhouse". Both offerings portrayed, as nearly as possible, exactly what their titles intimated. But none of the things I ~~had done~~ did during the years I was head of the music department of the Columbia Broadcasting System could have been done without a microphone. It's high time that composers realize that they can go into a special field; with a microphone to help them, they can say things they have never said before, paint pictures, tell a story, thrill you. The unheard members of any orchestra are the mikes.

As the years have gone by, I've had to graplle with even more pressing problems in an effort to get my exact musical meaning across. Ordinarily, a composer lets someone else arrange his music for him. I tried that...but I never found an arranger who didn't put something of himself into my music. So I began doing all the arranging myself. Then the human element of the individual musician began to intrude itself. I solved this problem as best I could by completely training and rehearsing the members of my orchestra myself. ~~THEY~~ Next, the engineers in recording studios and radio studios began setting up according tho their idea of how the music should sound and I was forced to take over complete control of the conditions under which I was to

record or broadcast.

Just lately I think I've managed to find away to solve all these problems and to present my music the way it sounds to me while it is still in my head.

I've begun my own recording company "Master Records." The music is composed and arranged by myself. The musicians are trained and rehearsed by myself. The whole process of recording is supervised by myself, and I'm selling the sides myself. Actually, I'd like to be able to sell the sides individually—only to people I feel will appreciate them.

There are limitations of course, in the records, but they come, I think, closest to bringing the exact idea across to the public,

Some day, perhaps within the next hundred years, science will perfect a process of thought transference from composer to listener. Only by allowing the listener to see into the mind of the composer can the true value of the music be approximated.

Devices already have been perfect to record the impulses of the brain. In the music of the future, the composer will sit alone on the concert stage and merely THINK his idealized conception of his music. His brain waves will be picked up by mechanical equipment and channelled directly into the minds of his hearers, thus allowing no room for distortion of the original idea. Instead of recordings of actual music sound, recordings will carry the brain waves of the composer directly to the mind of the listener

August 26, 1949.

H O T B O X

Be-bop and progressive jazz become "moldy-fig" when you are in the presence of Raymond Scott, composer, inventor and bandleader. Scott has been experimenting with musical sound in his electronic laboratory in New York City, off and on, for over ten years. He is now ready to announce his latest development called "Music Engineering" and to illustrate the same with his new Master Recordings.

Scott, the musician, and Scott, the engineer, have collaborated to develop a sound discovery demanding not only the harmony of the various musical instruments with each other, but also the harmony of the orchestral unit with microphones, recording studios, and even the recording discs.

Recently at the Blue Note in Chicago, Scott Scott made his initial demonstration to the press by playing four sides which were composed, arranged, engineered

and released by Scott on his own label, Master Records.

The titles are in the Scott tradition: Dedicatory Piece To The Cre
and Passengers of the First Experimental Rocket Express To The Moon, A Street Corner
in Paris , Bird Life In The Bronx , Ectoplasm, and Snake Woman. These are the first
Quintet records since 1938 when Powerhouse, Toy Trumpet, Twilight in Turkey, and others
were released, also on Master Records, then owned by Irving Mills. The latter discs have
become valuable collector's items.

The basis of Scott's theory is that a composer can only get his
creative contribution over to his listeners through a process of thought transference.
He believes, within reason when one thinks of the thoughts on the television possibility
a century ago, that in the music of the future, the composer will sit on the concert
stage and merely think his conception of his work. His thought waves will be picked up by
mechanical equipment and transferred into the minds of his hearers. Instead of
recordings of actual musical sound, recordings will carry the brain waves of the composer
direct to the minds of the listeners.

Although scientists are now working on apparatus enabling
experimenters to record the electrical impulses of the brain, the development of actual
thought transference is still in the offing. Scott feels he has found a method closely

approximating the above ideology. He starts with an idealized conception of his music. For instance, in Street Corner in Paris, he imagines that he is actually on that corner. The problem then is to get this conception to the listener with the least amount of distortion. It is a primary requisite that he score the music himself and ~~afterwards, by means of a~~ ~~the~~ coach the human medium of musicians, until he has achieved in them the most nearly perfect reproduction of his own thought.

Finally, in recording his work, the actual engineering must be undertaken ~~undertaken~~ by the composer. Physical considerations become of high importance. Scott finds that the size and shape of the recording room as well as the humidity and temperature affect the reproduction of particular conceptions. For one musical composition, he may require a large low ceilinged room, for another, a small comparatively high ceilinged studio is needed. A ~~comparatively~~ cold room is usually required, with the temperature for some individual tunes sometimes as low as 45 degrees. Some compositions require a very dry atmosphere, others can be heard ideally in extremely humid conditions.

The five sides listed above will each be backed by a standard popular number. The discs will spin at 78 rpm and will be on a vinylite plastic. Each label will include explanatory program notes and the price will be two dollars per record. Scott has turned down an offer from an unnamed major company to buy the sides at \$5,000 each as he feels a commercial company would spoil the artistic merit of the records.

AM UP OFF CANVAS VS. TV

Gobs of Jobs For Vauders On High Seas

40 Cruises, Lotsa Work

NEW YORK, Nov. 5.—Ship vaudeville which used to be the mainstay of the war and was capable of giving performers a lot of extra work is booming again. There are about 40 cruises set for the season of 1949-50, with each one spending on an average of \$5,000 for talent, or a total of about \$200,000.

The biggest talent buyer is still Nat Abramson, who operates the WOR Artist Bureau and hires seven to eight performers for as much as \$5 some odd ships working under charter to such travel agencies as Cooks, Raymond & Whitman, etc. present Abramson has 31 of the cruises set for the season.

Acts used on these trips stay away from the shore.

(See Gobs of Jobs on page 4)

Campuses Rally Against Steep Fees of Ork

CHICAGO, Nov. 5.—A rebellion against "exorbitant prices" for room and board, which shows signs of engulfing the 183 colleges and universities of the Association of College Unions (ACU), was inaugurated two weeks ago at University of Wisconsin, La Crosse, where students are protesting against the steep fees of the Ork.

(See Ork, Extra Journal on page 4)

Million Deal for MBS, Gillette In Long-Term Diamond Pact

NEW YORK, Nov. 5.—A deal set by broadcast Commissioner Harry Chandler, Frank White, Mutual (MBS) president, and Joe Spang, president of Gillette Razors, whereby Gillette will sponsor the radio coverage of the World Series for the next seven years, is to cost for the total of over \$1,000,000. The contract gives Gillette the annual inter-ship All-Star game.

Mutual and Gillette also were granted first refusal on the series in the future, giving them an opportunity to meet any bid from a competitor. This move followed a similar one over this year's series tele coverage. The National Broadcasting Company (See MBS, Gillette Trade on page 4)

That's Music the Kobblers Play, Says Melchior; Court Lets 'Em Go

By Jerry Weiler

NEW YORK, Nov. 5.—Assured by no less an authority than Lauritz Melchior that the sounds produced by the Krazy Kobbler are music, not noise, Magistrate John Starkey yesterday (4) exonerated the Krazy Kobbler of a charge of disturbing the peace.

The public viewers had been halted into mid-town court by Patrons William Gilroy, who apprehended them riding down Broadway in a hay wagon one day last week. They were giving out with their own peculiar brand of washboard-log-cowbell-whistle harmony, with a flock of toothsome wenchers aboard to lend visual tone to the venture.

Their personal rep, Hal Hapner, and MGM back Sam Handwerker, who

had arranged the affairs concertizing, could hardly have been less mortified by the arrest. They did let it leak out that the occasion for the junket was the opening of the Kobbler at the Island restaurant.

When the court case appeared in court yesterday, they were but- (See THAT'S MUSIC on page 12)

Senate Heat Is on To Let Color TV In

Sen. Johnson Leads Drive

WASHINGTON, Nov. 5.—Sen. Edwin C. Johnson (D., Colo.), chairman of the powerful Senate Interstate and Commerce Committee, declared this week that the Federal Communications Commission (FCC) is denying the color television issue would be justified in issuing "only general standards for the time being and letting the public decide which color system is best." Johnson said it would be content to let color broadcasts limited at first to a select

AM Winning Over Video's Threat of KO

Costs No. 1 of 5 Factors

NEW YORK, Nov. 5.—The terrific emphasis which has been placed on television in advertising and broadcasting circles for the past year has come to a definite end, according to agency and network executives, and therefore many trade observers are forecasting that "the swing is now back to radio." As a result, where eager heavier tele enthusiasts were freely forecasting radio's early doom not so long ago, the feeling now is "Screen radio is here to stay."

There are five major reasons advanced for the back-to-the-radio movement, plus several tributary reasons. Most of the reasons are economic, and involve hard dollars-and-cents thinking.

Big TV Cost Factor
Point 1 is the fabulous TV cost factor. Tele costs are skyrocketing, and despite its great reputation gain, tele is light years away from being a national medium. And when it (See AM Winning Over on page 12)

4A's After TV s, With or without SAG

12 Cities Nov. 10

NEW YORK, Nov. 5.—Execs of the Actors' and Artists' of Four A's this week decided that whatever the the current membership is to be held November 10 in New York, the country, the International Union will with its plan for setting up the Authority (TA), then enter into negotiations with the union to set up wages and conditions for entertainers on TV. This move is expected with or without the entire Screen Actors Guild who has refused to participate behind this strategy.

(See AFTER TV on page 4)

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Billboard Office, 1230 Broadway, N.Y. 10002. Phone BR 9-6000. Second-class postage paid at New York, N.Y., and at additional mailing offices. Postmaster: Send address changes in New York City to The Billboard, 1230 Broadway, N.Y. 10002. Outside New York City to The Billboard, 1230 Broadway, N.Y. 10002.

Video in Nitergy Will Carry Show To Patron's Table

DETROIT, Nov. 5.—Plans for a new system of chain or closed circuit television installation to present a stage or floor show simultaneously to all patrons in a night club were unveiled Wednesday by Raymond Scott, composer-conductor who has been fronting his own quintet at the London Chop House here. Designed initially for a night club installation, the system is readily adaptable to a theater or multiple hall or room installation of any type, and is complete. (See Video in Nitergy on page 42)

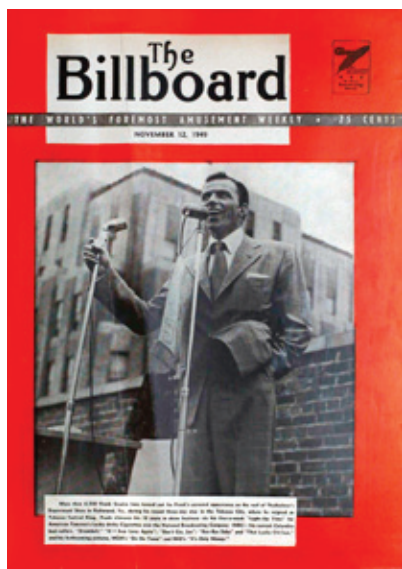
(Continued from page 3)

ceivably the modern visual counterpart of what the widespread introduction of public address systems was in sound two decades ago.

Scott's system is to install approximately 12 screens at strategic points thruout the London Chop House, trained upon the floorshow, so that there will be a constant view of the show from any table in the house, regardless of which way the patron may be facing. Nooks and seats behind columns thus become virtually as good as a ringside.

Cost of the installation being made by Owner Lester Gruber at the Chop House is estimated at \$25,000, with the system to be placed in service about January 1.

The chain video system is also designed, according to Scott, to facilitate introduction of guests in the audience and to widen the possibilities for audience participation type of presentations.



scottish fantasy

RAYMOND SCOTT has been a Boy Scout in Switzerland, has provided dinner music for a pack of hungry cannibals, watched twilight descend upon Turkey, taken a Siberian sleighride, spent Christmas Night in Harlem and New Year's Eve in a haunted house, sojourned in an eighteenth century drawing room and a powerhouse, serenaded the girl with the light blue hair, and memorialized that sad moment in jazz history when Cootie left the Duke. In the course of his musical adventures he has journeyed farther and farther from his native Brooklyn, projecting himself with not quite reckless abandon into such wilds of the unconscious as would fit comfortably within the grooves of a ten-inch record. Now, in the middle of the century, midway in the journey of his jesting life, he finds himself with the Hit Parade on his hands and his own record company in his head.

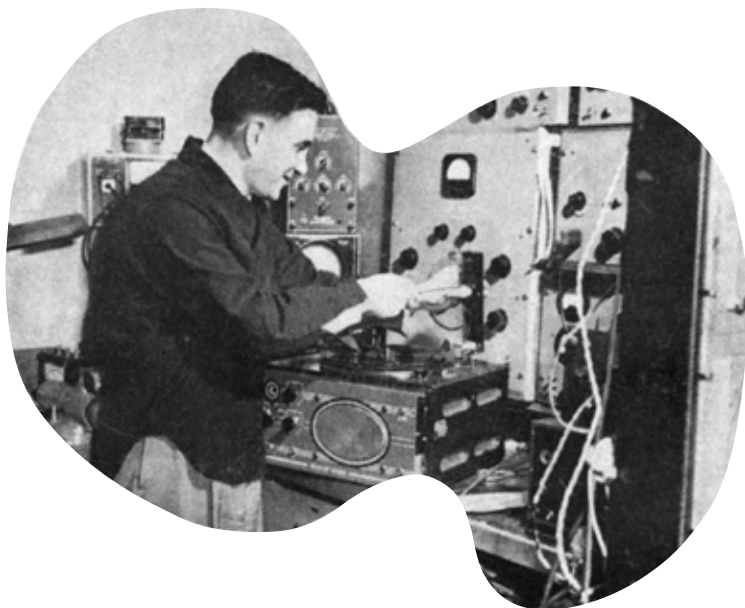
Walking around with a record company in his head shouldn't be too difficult for a man who has Boy-Scouted in Switzerland and ridden sleighs in Siberia. Raymond, however, is taking this latest jaunt more seriously than he took the others. He means business—there are taxes and musicians to pay and vinylite and studio time cost money. He also means art. The Hit Parade will help pay for the men and materials and keep the government from his door. The art will have to come from his hirsute head, whence the curious product, ten sides in all, released recently on Master Records, the only company in the business with literal headquarters.

The dark forest of Raymond Scott's unconscious accounts for five of the sides, which, as you shall see, are not all tenebrous.

There is, to begin with, a *Dedicatory Piece to the Crew and Passengers of the First Experimental Rocket Express to the Moon*, in which a speed of 25,000 miles per hour is reduced to dotted eighths and sixteenths and the roar of the outer atmosphere diminished to decibels within the human acousticon. Then there are portraits, of a Yosian watching *Bird Life in the Bronx*, of *A Street Corner in Paris*, of a *Snake Woman*, and finally some transplanted tissue, the epidermis of dreams and séances, *Ectoplasm*. Curiouser and curiouser, until the not quite reckless abandon is confined within familiar frames, *Sometimes I'm Happy*, *Dinah*, *Singing in the Rain*, *Tiger Rag* and *Song of India*. Here the forest lightens, the burden of extra-sensory perception is thrown over and Raymond the fun-loving Rover Boy takes charge. The second five, in one way or another, all evoke previous jazz eras, giving the well-known melodic lines their way, entrusting them to Dorothy Collins' dextrous voice, suggesting the original qualities of the tunes, allowing them their full quota of entertainment. And at last, not to let you forget whose head holds this record company, Dorothy shapes her voice into slide and bell and becomes a trombone in the *Song of India*, a lovely human sound after an instrumental one, just strange and convincing enough to sustain Raymond's identification of her contribution as "color X."

Of course you can't go to your nearest record store and buy these records; you've got to go right to headquarters. Lest you fear that means grappling with Raymond's flowing locks, the impresario has provided an easier address; his records, which are sold only through the mail, can be sent for at his nominal office, 147 West 46th Street, New York. As in all his affairs, there's a reason for this. Master records are the result of a painful series of experiments Raymond has conducted over the years, painful for himself and often for the participating musicians and engineers, whom he's nagged, ragged and bulldozed to produce better, cleaner sounds, an even tonal scale, a recording balance that accurately reproduces the music, and record surfaces that do not mangle the work of musician and engineer in the studio. His current set of discs represent, whatever their ultimate musical significance, a very high mark in American recording. Never have jazz sounds come through the phonograph so crisply, with such lifelike quality. Understandably, then, Raymond has reproduced his recent bouts with conscious and unconscious, with fantasy and frivolity, in a fine vinylite, packaged them in luxurious wrappers and marketed them in limited editions. Without altogether abandoning his puerile passions, Raymond is no longer a Boy Scout, in Brooklyn, Switzerland or Siberia. He's entered upon a serious career as recording musician, composer, engineer, and producer; he's undertaken to produce dinner music for a pack of hungry music-lovers. The first course tastes good.

—BARRY ULANOV.



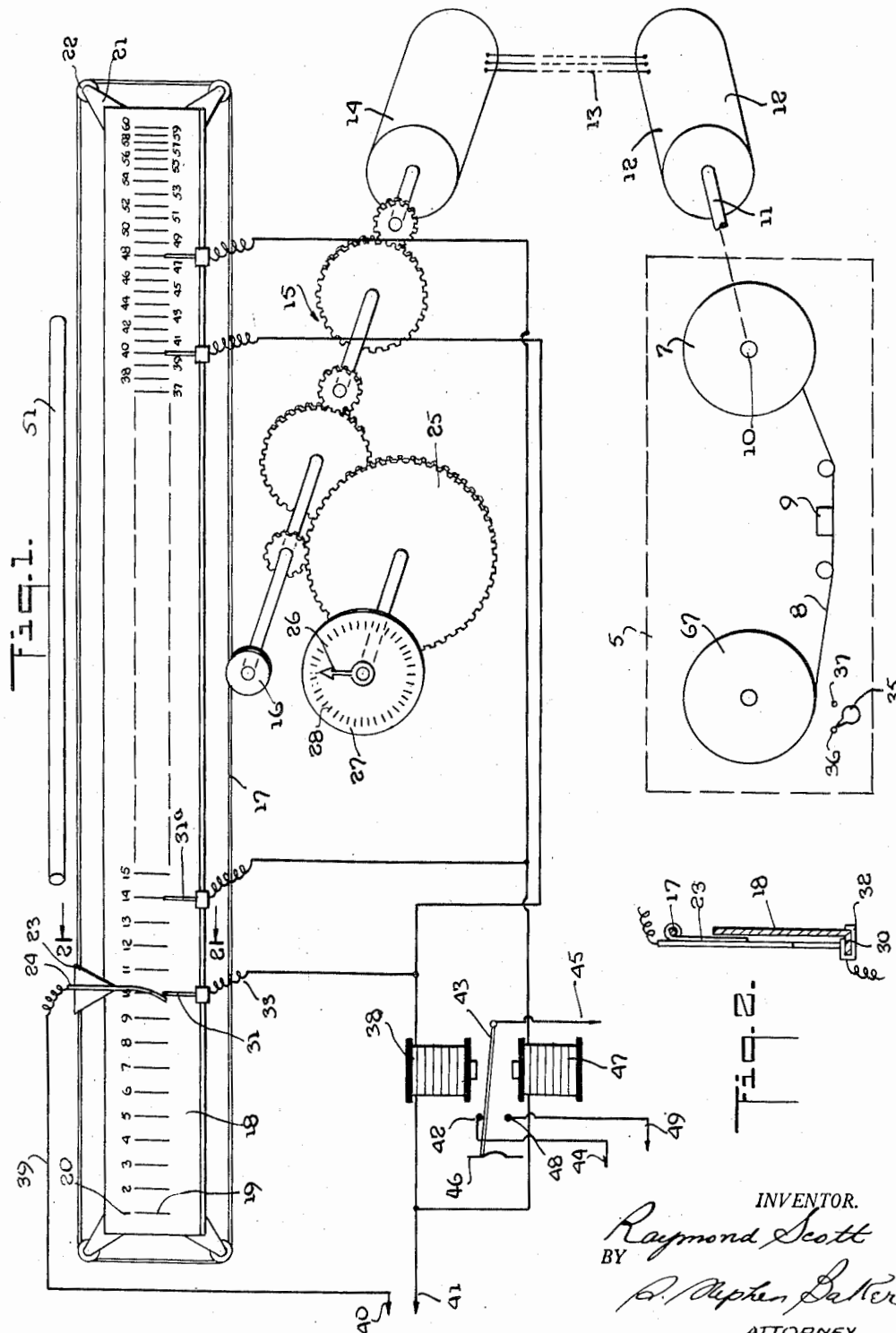
Jan. 29, 1957

R. SCOTT

2,779,826

INDEXING AND SELECTOR DEVICE FOR MAGNETIC TAPE RECORDERS

Filed Aug. 31, 1953



INVENTOR.
Raymond Scott
 BY *P. A. L. L. L.*
 ATTORNEY

1

2,779,826

INDEXING AND SELECTOR DEVICE FOR
MAGNETIC TAPE RECORDERS

Raymond Scott, Babylon, N. Y.

Application August 31, 1953, Serial No. 377,606

3 Claims. (Cl. 179—100.2)

This invention relates to a magnetic tape indexing and selector device to be used in conjunction with a magnetic tape recorder.

In one aspect of the invention, I provide a magnetic tape indicator which may be disposed adjacent to either the keyboard or the music rack of a conventional piano. The reason therefor is that a pianist, composer or other musician may note the position of the indicator while he is composing or the like so that he can correlate such action with the magnetic tape position. In such an arrangement, I have determined that the indicating scale or the like is preferably in rectilinear form so that the user is instantly aware of the relative position of any selection on the entire reel of tape. In other words, since the scale or the like is rectilinear, being in extended elongated form and completely exposed and visible to the user, he notes how much time he has on any particular reel at any point.

In connection with the above, I have provided a remote indicating device wherein an indicator travels along a rectilinear scale as the reel of tape unwinds. Indicia on the scale indicates the extent of such unwinding. According to my invention, such indicia comprises a series of spaced marks which gradually decrease their relative spacing as the load reel becomes unwound. In this way, the space between successive scale graduations is an accurate indication of time since a revolution of the load reel when it is fully loaded unwinds more tape than a revolution when it is near its end. Of course, the take-up reel acts in the reverse manner.

In combination with the above, I further provide movable selector pins which co-act electrically with the indicator for actuating the recording mechanism in a predetermined fashion. Thus, by pre-setting the selector pins in relation to the indicia, I cause an indicator pointer to effect electrical contact therewith at precise times so as to bring about certain electrical actions as will hereinafter be described.

The invention will further be understood from the following description and drawings in which:

Figure 1 is a diagrammatic view of an indicating and selecting system constructed according to my instant invention; and

Figure 2 is a cross-sectional view as taken along the lines 2—2 of Figure 1.

The device of the instant invention is used in conjunction with a tape recorder 5 having a load reel 6 and a take-up reel 7. The tape 8 is recorded upon a reproduces sounds in conjunction with recording and playback head 9 in a conventional manner. Motor means are employed to drive the reel 7 through the shaft 10 as will be understood and the tape 8 is drawn off the load reel 6.

The shaft 11 of a self-synchronous or so-called selsyn motor 12 is connected to the shaft 10 and the wires 13 carry the required electrical signals for causing the remote selsyn motor 14 to follow the mechanical action of shaft 11. A train of reducing gears 15 produces a rela-

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tively slow rotating movement of wheel or pulley 16 which drives cable 17. As an example, cable 17 may be wound around the grooved periphery of wheel 16 so that as wheel 16 is rotated, the cable 17 is caused to travel as hereinafter described.

The indicating scale 18 is of rectilinear form which may be extended over a length of two or three feet, if desired. It may be fabricated of any suitable material such as plastic or wood and is provided with indicia or lines 19 which are identified by numbers 20. The lines 19 have a greater relative spacing at one end of dial 18 than at the other end where they become crowded together. When the takeup reel begins its operation, the more widely spaced lines are employed as will be shown hereinafter.

Secured to the four corners of scale 18 are wings 21 which rotatably support grooved pulleys or rollers 22. Cable 17 rides in these rollers so that it is uniformly circumferentially spaced from the edges of scale 18. Secured to cable 17 is a triangular plate 23 which carries a flexible, metallic pointer 24. It will be recognized, therefore, that as the cable 17 revolves around the scale 18, the indicating plate 23 and the pointer 24 travel across the scale and the indicia thereof.

In the embodiment illustrated, the lines 19 are numbered 1 to 60. Such indicia is conveniently used for a reel of tape that unwinds in one hour since each line may indicate one minute. Inasmuch as it is also desirable to provide indications of less than one minute divisions, a gear 25 is driven from the train of gears 15 and such gear drives a pointer 26 which rotates once per minute. A dial or scale 27 having second markings 28 is provided so that the pointer 26 further subdivides each scale spacing into sixty divisions.

The device of the instant invention further provides means for automatically playing preselected recordings. Thus, scale 18 is formed with a flange 30 as illustrated in Figure 2 and a series of selector pins or contacts 31 are slidably maintained on the flange 30. Both ends of the flange are open so that the pins 31 may be conveniently applied or removed therefrom. Pins 31 are formed with a substantially U-shaped base 32 which slidably embraces the flange 30. The pins are formed of an electrical conducting material. Secured to base 32 are wires 33.

Pins 31 may be used to institute reproduction of a recorded piece or may stop such reproduction as when the selection is finished. The magnetic tape recorder 5 is of conventional operation and includes a high speed shuttle mechanism with a motor for driving the tape rapidly until a desired point is reached. Of course, such high speed shuttle mechanism is conventionally used for rewinding tape back to the load reel as will be understood.

While high speed shuttle mechanisms are conventional, a typical example thereof is described in the book "Elements of Magnetic Tape Recording" by A. C. Shaney, copyright 1950 by the Amplifier Corp. of America, New York, N. Y. (see page 64 and preceding pages). Similarly, conventional tape recorders include low or playing speed mechanisms with a low speed motor whereby the tape is driven at a relatively slower speed, i. e. anywhere from one and a half to approximately 15" per second. Of course, the different speeds may be achieved through the same motor by conventional regulating means.

In the schematic representation of apparatus 5, the switch 35 may be manually actuated to co-act with the high speed contact 36 or with the low speed or play contact 37. In accordance with the instant invention, however, I employ a solenoid 38 which is adapted to be energized by the wire 33 connected to the pin 31 and by the wire 39, such wires being connected to a suitable power source through terminals 40 and 41. Energization of solenoid 38 starts the low speed motor in order to produce low speed or playing operation independently

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of the switch 35. Thus, contact 42 is equivalent to the low speed contact 37 and when armature 43 effects contact therewith, the wires 44 and 45 which are connected to the low speed motor through a power source, serve to actuate the motor accordingly. Conventional switch arm locking means are provided to maintain the armature 43 against contact 42 so that the circuit remains closed until the armature is withdrawn therefrom. Such locking means may comprise a leaf spring member 46 having a central projection which holds the armature against either of its contacts.

A solenoid 47 is provided to withdraw armature 43 from contact 42 and to close a second circuit through contact 48. This establishes the high speed operation through wires 45 and 49, the spring 46 maintaining such high speed operation.

The operation of my invention may be understood from the foregoing description but such operation may be briefly summarized as follows:

A loaded reel or tape will be placed into position and the tape will be threaded onto the take-up reel 7. When the tape is being recorded upon, as by a microphone or the like, the pointer 24 travels across the rectilinear scale 18 from one end to the other. This gives the person who is recording the selection a complete, composite view of the recording action. At the same time, he may note the indicia markings which indicate the beginning or ends of compositions or any intermediate portion thereof in which he may be interested. The graduated series of markings enable him to pinpoint a selection with accuracy particularly in conjunction with the second or vernier indicating scale 27. As above stated, the indicating scale 18 may be mounted in parallel relationship with piano keys or across the music rack thereof. Thus, the player may conveniently consult the indexing device while he is playing the piano.

The fully extended, fully exposed, rectilinear scale is also useful in providing a "photographic" indication of the location of a particular selection. Thus, the operator may recall that a desired selection was located at one end or at some other portion of the scale so that he need not consult the index. I further provide an elongated fluorescent light 51 which extends parallel to the scale and illuminates it for the player's convenience.

It may be noted that when the load reel is fully unwound, any conventional means (presumably the high speed shuttle mechanism) may be employed to rewind the tape thereon and such means will automatically return the pointer 24 to its original position.

In employing the device of the instant invention as a selector, the pins 31 are set into place before the recorder action is commenced. The first pin 31 which is connected to the low speed solenoid 38 determines the playing of the first number while the second pin which I designate 31a, discontinues such slow speed operation and restores the recorder to high speed operation. For convenience, the pins 31 may be colored green, for example, while pins 31a may be colored red, the green pins being connected to the slow speed solenoid while the red pins are connected to the high speed solenoid. Assuming, for example, that the operator desires to play a recording which occurs between the tenth and the fourteenth lines, he will slide pin 31 up to the line 10 and will slide pin 31a up to the line 14. With the indicator pointer 24 at the zero position, the recorder 5 is initially set in high speed opera-

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tion and the indicator rapidly travels up to the line 10. It thereupon effects contact with selector pin 31 which commences the playing of the desired selection and this continues for four minutes or until the indicator pin 24 contacts selector pin 31a. At this time, high speed operation is restored.

Let us further assume that the next desired selection is between lines 40 and 48 and has been preselected. The indicator will thereupon rapidly travel to line 40 and, by the same action as above described, the second selection will be played. It will be evident that any number of selections may be thus played.

What is claimed is:

1. For use with a magnetic tape recorder having electrical mechanism for driving reels of tape at a high, shuttle speed, and at a low, playing speed, an indexing selector device, said device comprising a rectilinear scale having constantly exposed and visible indicia lines from one end of the scale to the other, an indicator pointer mounted for travel across the scale, means to actuate said indicator pointer from one end of the scale to the other, said actuating means being driven by the tape driving mechanism of said recorder, first and second sets of selector pins slidably mounted on said scale and positioned to be contacted by said indicator pointer as it travels across the scale, and electrical circuit means which is closed by the contact of said indicator pointer and said selector pins for operating said tape driving mechanism, said first set of selector pins controlling the low speed mechanism of said tape recorder through said electrical circuit means and said second set of selector pins controlling the high speed or shuttle mechanism thereof through said electrical circuit means.

2. The combination with a magnetic tape recorder having electrical mechanism for driving reels of tape at a high, shuttle speed, and at a low, playing speed, of an indexing selector device, said device comprising a rectilinear scale having constantly exposed and visible indicia lines from one end of the scale to the other, an indicator pointer mounted for travel across the scale, means to actuate said indicator pointer from one end of the scale to the other, said actuating means being driven by the tape driving mechanism of said recorder, first and second sets of selector pins slidably mounted on said scale and positioned to be contacted by said indicator pointer as it travels across the scale, and electrical circuit means which is closed by the contact of said indicator pointer and said selector pins for operating said tape driving mechanism, said first set of selector pins controlling the low speed mechanism of said tape recorder through said electrical circuit means and said second set of selector pins controlling the high speed or shuttle mechanism thereof through said electrical circuit means.

3. The combination according to claim 2 wherein said means to actuate said indicator pointer comprises a self-synchronous motor mechanism, one end of said motor mechanism being connected to said indicator pointer and the other end to said tape driving mechanism.

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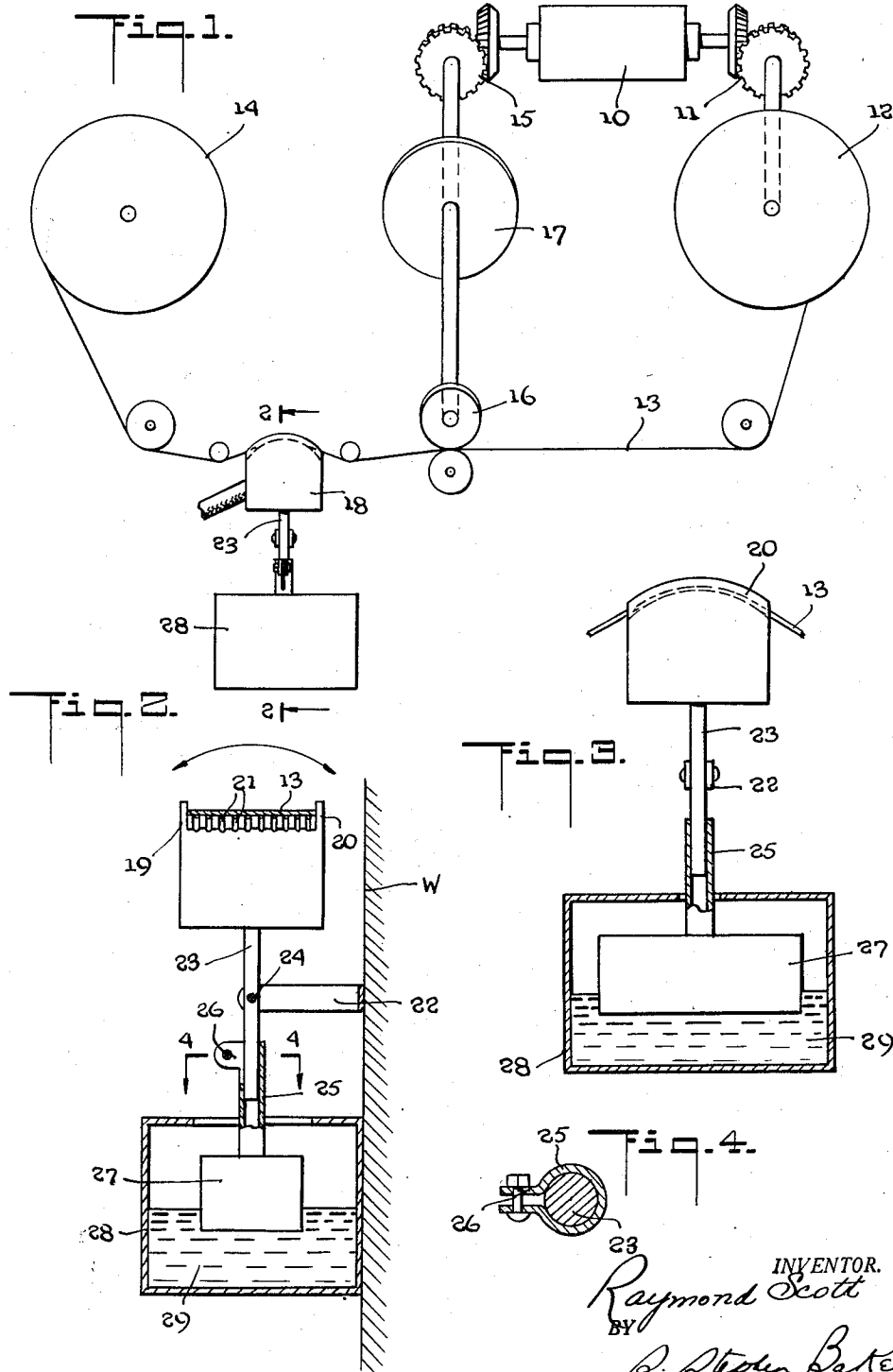
Feb. 26, 1957

R. SCOTT

2,783,311

MAGNETIC RECORDING HEAD MOUNTING APPARATUS

Filed Aug. 31, 1953



INVENTOR.
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 ATTORNEY

1

2,783,311

MAGNETIC RECORDING HEAD MOUNTING APPARATUS

Raymond Scott, Babylon, N. Y.

Application August 31, 1953, Serial No. 377,605

5 Claims. (Cl. 179—100.2)

This invention relates to magnetic tape recorder mechanism and more particularly to a magnetic tape recording or reproducing head.

The art of magnetic tape recording has developed to an extent where a large number of channels or tracks can be applied to magnetic tape. The tracks are parallel to each other and are normally adapted for carrying independent signals. Recording or reproduction of such signals is generally accomplished by supporting the tape in direct contact with the recording head. The recording head is formed with a plurality of spaced gaps which apply the signals to the tape in parallel tracks. Of course, it will be recognized that the tapes are of such a width as to permit the application of such spaced, parallel tracks thereon.

A particular defect in the operation of such multi-channel recording operations is the tendency toward lateral shifting or buckling of the tape on the recording head which supports it. This is particularly true because of the great width of multi-track tape relative to its thickness. The tape being so wide and thin has very little sturdiness and is so limp and weak that it is easily subject to physical distortion thereby causing disadvantages such as amplitude deviations and track shifting. Old or much used tape is even more subject to such action.

With the foregoing in mind, I have devised a magnetic recording head for multi-channel operation which is mounted so as to substantially eliminate the adverse effects of any lateral shift or displacement of the tape. This is effected by mechanism which causes the head to rock in response to any deviation of the running tape from a normal course so as to eliminate any relative lateral motion between the recording head and the tape. Obviously, therefore, this serves to correct the above mentioned defect since it is only relative movement between the tape and the head which causes such defect. The recording head is, pursuant to my invention, mounted on a rocking or floating pivot so as to respond to and compensate for lateral deviations of the tape. At the same time, I have recognized that different tape speeds or different types of tapes may bring about varying degrees of possible deviation and I have accordingly provided adjustable damping means for regulating the rocking sensitivity of the recording head.

The invention will further be understood from the following description and drawings in which:

Figure 1 is a diagrammatic view of a tape recording mechanism equipped with the invention of the instant application;

Figure 2 is an enlarged cross-sectional view as taken along the line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 2 but taken at 90° therefrom; and

Figure 4 is a cross-sectional view as taken along the line 4—4 of Figure 2.

The recorder is largely conventional insofar as the reels and driving mechanism are concerned. Thus, a power source 10 drives gears 11 which drive the take-up reel 12.

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The tape 13 is initially supplied in wound form on the load reel 14. Such tape may be of a width in the order of 1/2 to 3" or more. Gears 15 drive a capstan or the like 16 through a flywheel 17. Suitable guide rollers are employed as shown in Figure 1.

The recording head 18 comprises a housing wherein is contained the multi-channel circuit elements arranged in parallel rows. This housing is formed with side walls 19 and 20 which are arcuate at their upper ends and between which are formed a plurality of parallel gaps 21 over which the tape 13 lies. The arcuate upper ends of the side walls 19 and 20 extend higher than the gaps or tape thereon and thereby serve as guides for the running tape. However, notwithstanding the guide function of the side walls, the tape is found to shift laterally.

In Figure 1, the various elements of the recorder are illustrated as being secured to a vertical wall, the plane of the reels being parallel to that of the wall. This wall, designated by the letter W in Figure 2, may also serve to support the recording head for rocking action as will be described hereinafter. Thus, an arm 22 is secured to, and extending outwardly of wall W. Recording head 18 is provided with a downwardly depending shaft 23 which is connected by a pivot 24 to arm 22. If desired, pivot 24 may take the form of a universal joint such as a ball and socket.

Shaft 23 telescopes within a tube 25 in which it is adjustable through the ears 26. In order to produce the vertical adjustability, the ears may be loosened and the tube 25 slid upwardly or downwardly of shaft 23, whereupon the ears may be retightened. To the lower end of tube 25 is connected a counterbalance weight 27 which tends to maintain head 18 upright.

In accordance with the instant invention, I further employ the counterbalance 27 as a damping device. Thus, a tank 28 having liquid 29 receives the weight 27. This will obviously produce a damping action in that it will restrict the rocking motion of the head 18. It will further be recognized that the extent of such damping action will depend upon the degree of immersion of the weight in the liquid. This is adjusted in the manner described above, such action permitting the lowering or rising of the counterbalance weight 27 in liquid 29.

The invention will be understood from the foregoing description. Briefly, however, it may be pointed out that as the running tape 13 tends to waver or shift laterally, the pivot 24 automatically responds by causing the head to shift or follow accordingly in a direction perpendicular or transverse to the normal direction of tape travel and the head and tape thereby remain in proper contact. If the tape varies in thickness or other physical characteristics, it may also vary in its tendency to shift under these conditions and the counterbalance weight 27 may be adjusted vertically in order to regulate damping and consequent sensitivity.

The rocking head has another advantage in that it may be normally biased downwardly or counterclockwise from the position shown in Figure 2. This may be effected, for example, by making the left side of the weight 27 heavier than the right side as viewed in Figure 2. The purpose of thus biasing the head downwardly is to support tape against the side wall 19 even if the tape is not of a width to completely fill the space between the side walls 19 and 20. Thus, the side wall 19 will provide a reference support in the case of poorly cut or narrower tape.

What is claimed is:

1. In a magnetic tape recording apparatus, a recording-reproducing head having a planar top surface adapted to support magnetic tape travelling thereacross, and supporting means for said head, said supporting means compris-

1953

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ing a shaft depending from said recording head, an arm adapted to be secured to a support, and a pivot connecting said shaft to said arm for permitting motion of said head in a direction transverse to the direction of travel of the tape, said head being mounted on one end of said shaft, and a counterweight mounted on the other end of said shaft and adapted to maintain said head in an upright position.

2. An apparatus according to claim 1 and including a damping tank having a supply of liquid therein, said weight being disposed within said tank for at least partial immersion in said liquid.

3. An apparatus according to claim 2 and including means to adjust said weight vertically in respect to said liquid so as to vary the degree of immersion in said liquid.

4. For use in a magnetic tape recording apparatus, a recording-reproducing head having a planar top surface adapted to support magnetic tape travelling thereacross, upstanding side walls on said head on both sides of said

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planar top surface and between which the tape is supported, and supporting means for said head, said supporting means comprising a downwardly depending shaft one end of which is connected to said head, a pivot medially disposed on said shaft so that said shaft may be swingably connected to a support, and a counterweight connected to the other end of said shaft.

5. A device according to claim 4 and including a damping tank in which said counterweight is disposed, and means to adjust said weight vertically in said tank whereby the degree of immersion of said weight in a quantity of fluid in said tank may be adjusted.

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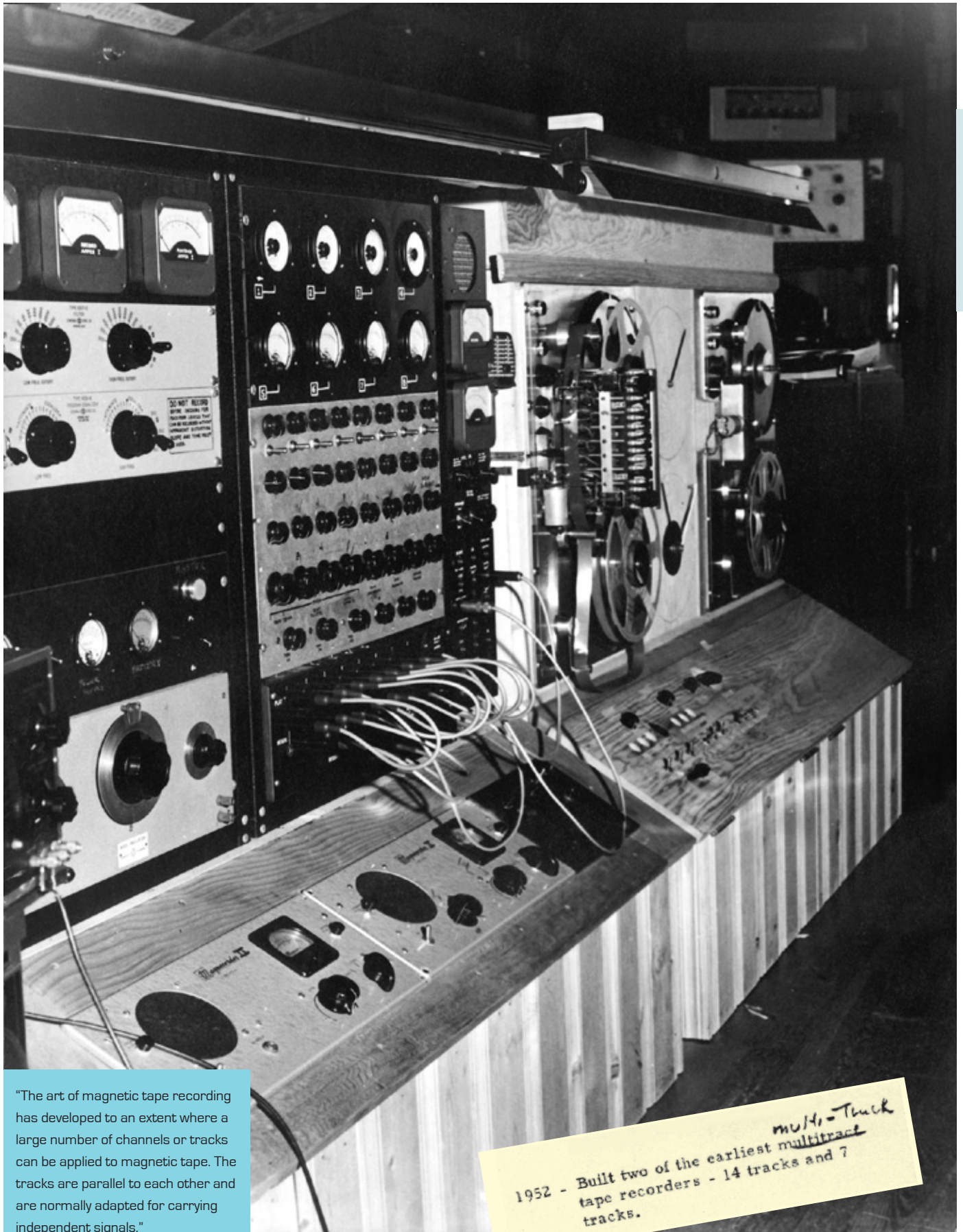
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1953



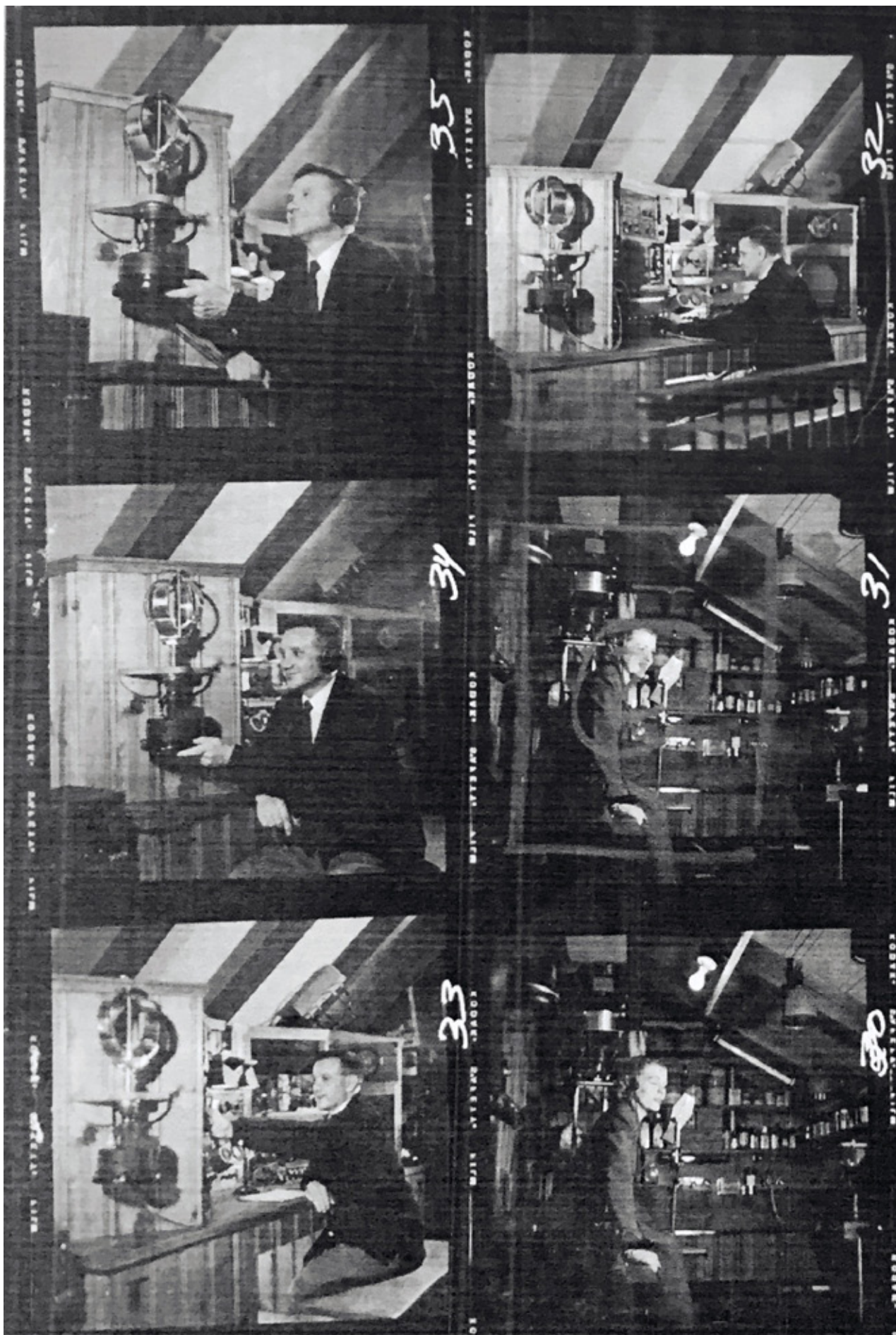
"The art of magnetic tape recording has developed to an extent where a large number of channels or tracks can be applied to magnetic tape. The tracks are parallel to each other and are normally adapted for carrying independent signals."

—**Raymond Scott**, 1953 (from his US Patent #2783311)

multi-Track
1952 - Built two of the earliest multitrack
tape recorders - 14 tracks and 7
tracks.



Contact sheets of shots taken for *LOOK* magazine by Arthur Rothstein, May 13th, 1954. (Library of Congress collection)





Scott's workshop, mid- to late-1950s



Scott with "Karloff" (L) and Clavivox (R) , mid- to late-1950s



Raymond Scott and his "Memory piano"



Dorothy Collins looks on as Raymond Scott poses in front of his "memory piano," September, 1955 (UPI photo)



"Singer Dorothy Collins of NBC-TV's 'Your Hit Parade' plays a duet on the organ with an eager pupil—her 18-month-old daughter, Deborah Scott." (Photo caption, April 29, 1956)

Feb. 3, 1959

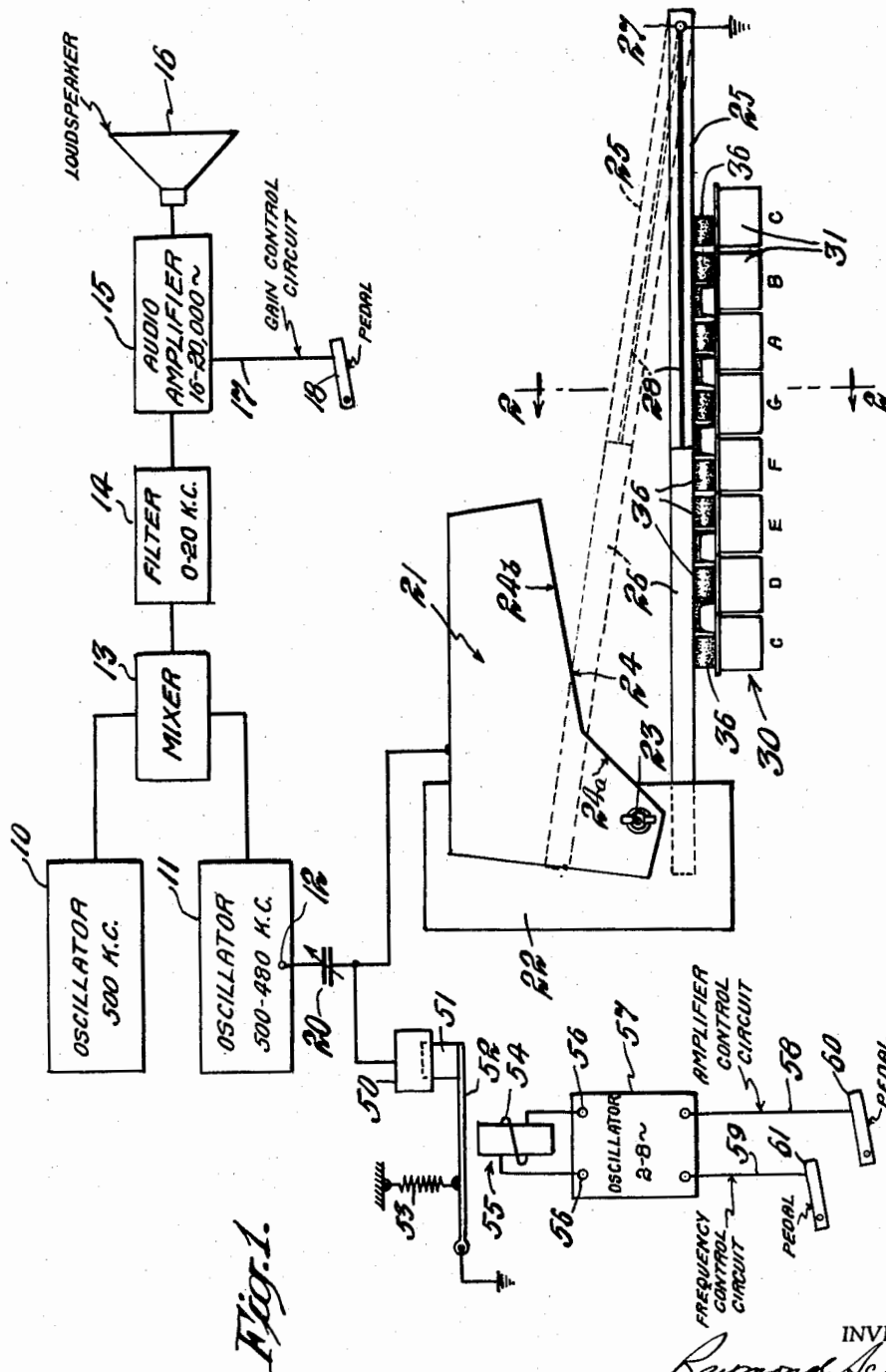
R. SCOTT

2,871,745

KEYBOARD OPERATED ELECTRICAL MUSICAL INSTRUMENT

Filed Dec. 20, 1956

2 Sheets-Sheet 1



INVENTOR.
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Feb. 3, 1959

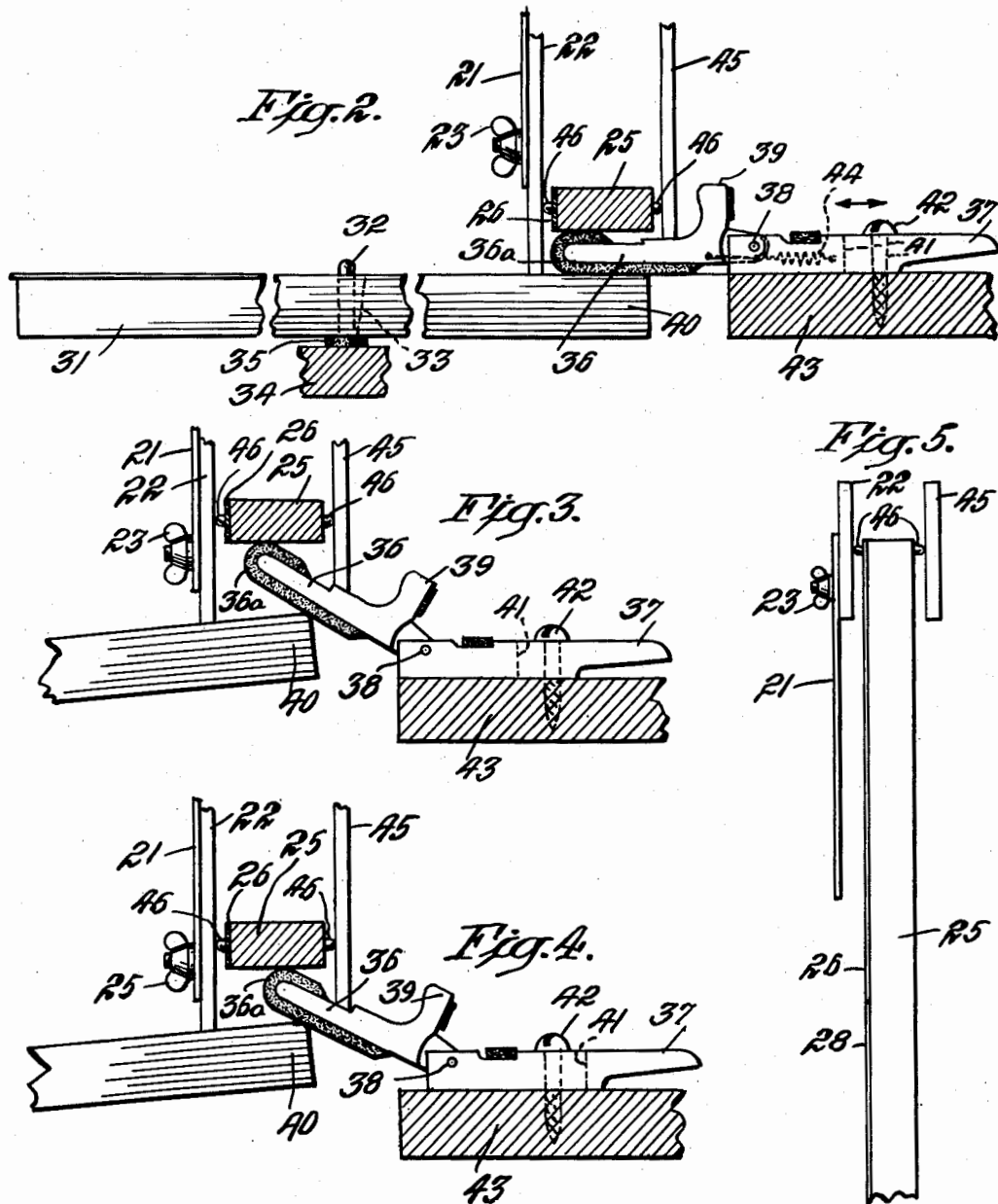
R. SCOTT

2,871,745

KEYBOARD OPERATED ELECTRICAL MUSICAL INSTRUMENT

Filed Dec. 20, 1956

2 Sheets-Sheet 2



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1

2,871,745

KEYBOARD OPERATED ELECTRICAL MUSICAL INSTRUMENT

Raymond Scott, Manhasset, N. Y.

Application December 20, 1956, Serial No. 629,505

15 Claims. (Cl. 84—1.25)

This invention relates to electronic musical instruments and more particularly to such an instrument operated by a keyboard of the piano type.

The invention provides a keyboard instrument of simple and reliable operation where a melody may be produced which smoothly and accurately slides in pitch from any note on the keyboard to any other note on the keyboard, whether higher or lower, without having to press any intervening notes. In general, the present musical instrument combines a tunable oscillator device of the type known as a "Theremin," as disclosed in U. S. Patent No. 1,661,058, with a piano keyboard in such a way as to provide positive control of the pitch of the emitted note.

The "Theremin" is played by slight variations in capacitance produced by moving one hand of the operator toward and away from a control electrode. The other hand may be used for volume control. The "Theremin," however, is extremely difficult to play. It is particularly difficult to obtain accurate pitch because extremely slight variations in the position of the hand of the operator will cause a particular note to sound off key. In fact, and although the "Theremin" has been known and greatly appreciated for more than 30 years, there are hardly more than about a half-dozen artists in the country who are capable of rendering satisfactory performances on the instrument.

With the foregoing in mind, the present invention provides a form of piano keyboard for pitch control of a "Theremin" instrument which is arranged to effect mechanical variations of predetermined magnitudes thus avoiding the inaccuracies of pitch which result when the instrument is played by body capacitance effects involving changes in the position of the hand of the artist. A particular advantage of my instrument is that each note is reached by smooth, sliding, predetermined ascents or descents, through predetermined increments of pitch, this action resulting in an extremely pleasing musical effect. Moreover, the gliding change from one note to another may be effected at varying rates at the will of the artist although the final pitch of the note is always true regardless of any particular technique or expression employed by the artist.

Adjustable means are further provided for individually mechanically tuning the particular note produced by each of the keys without affecting the over-all mechanical action of the instrument.

Additionally, means are provided for obtaining a controllable vibrato effect which is electro-mechanical so as to simulate and derive the benefit of manual operation while obtaining the advantages of electrically controlled precision. The combination of a gliding change in pitch with the vibrato of this invention produces musical effects of an unusual tonal quality.

Various objects, features and advantages of the invention will become apparent upon reading the following specification together with the accompanying drawing forming a part hereof.

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Referring to the drawing:

Figure 1 is a schematic diagram illustrating an embodiment of the invention;

Figure 2 is an enlarged fragmentary sectional view in elevation taken substantially along the line 2—2 of Figure 1;

Figure 3 is a fragmentary view similar to Figure 2 but illustrating the keyboard action;

Figure 4 is a view similar to Figure 3 but illustrating the tuning effect in mechanically shifting the keyboard members; and

Figure 5 is an enlarged fragmentary plan view illustrating a movable pitch control bar and guide means for the free end of the control bar.

Referring to Figure 1, there is shown an oscillator 10 of fixed frequency which may be 500 kilocycles, for example. There is also a tunable oscillator 11 which normally emits a frequency of 500 kilocycles, this frequency being reducible by increasing the capacitance between ground and a control terminal 12. The outputs of the oscillators 11 and 12 are connected to a heterodyne mixer 13. A filter 14 is connected to the output of the mixer 13 and passes frequencies in the audible range, up to 20 kilocycles, for example. The beat frequency between oscillators 10 and 11 which is produced in mixer 13, after passing through the filter 14 is applied to the input of an audio frequency amplifier 15. The output of the amplifier 15 is connected to a loudspeaker 16 which produces the audible note.

The amplifier 15 includes a gain control circuit illustratively indicated as a single line 17, the amplification of the amplifier 15 being varied by means of a foot pedal 18 connected to the gain control circuit 17. The pedal 18 may be arranged to operate a foot-controlled potentiometer (not shown), or may be otherwise connected to vary the amplification of the amplifier 15 in conventional manner. However, such means of amplification control is only representative of many suitable types. In fact, the well-known "Theremin" volume control is satisfactory, such control involving hand produced capacity changes which are used to control volume instead of pitch. I have determined that this action is not disadvantageous because precise control of volume is not critical while it certainly is so as regards pitch.

The frequency control terminal 12 of the oscillator 11 is connected as through an adjustable trimmer capacitor 20 to a stationary pitch control electrode 21 which is in the form of a flat plate insulated from ground and which is mounted on a supporting structure comprising a metal upright member 22 which for all practical purposes, is a part of the control electrode. The plate electrode 21 is secured to the upright 22 by a bolt comprising a wing nut 23 which serves to permit pivotal shifting of the position of electrode 21 for purposes of overall adjustment and tuning of the instrument.

The configuration of electrode 21 is not critical but, in the form shown, its lower edge 24 is inclined so that the electrode becomes gradually wider from bottom to top. This varies the capacitative reaction as will be shown hereinafter. In fact, edge 24 is shown to have two degrees of angularity or inclination, i. e., sections 24a and 24b, section 24b being flatter so as to effect greater capacity changes at the upper range of the instrument.

The capacitance to ground of the stationary, plate electrode 21 is varied by means of a movable control bar 25 which carries a grounded electrode 26. Preferably, the control bar 25 is formed of light material such as balsa wood. The grounded electrode 26 may be formed of aluminum foil secured to the bar although substantially any form of metal member such as a rod may be employed. The control bar 25 is of cantilever

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construction, being pivoted at 27, the pivot 27 being shown connected to ground. A conductor 28 connects the grounded pivot 27 to the grounded electrode 26.

The control bar 25 is arranged so that it may selectively move through predetermined angular displacements in a clockwise direction by means of the keys of a piano type keyboard designated generally as 30. Only a single octave is shown in the drawing although the finished instrument will of course comprise a greater range.

The piano keys for progressively higher notes are located progressively nearer to the pivot 27 so that the depression of a key corresponding to a high note produces a greater clockwise displacement of the control bar 25 than the depression of a key for a low note.

It will be seen from Figure 1 that the configuration of the control electrode 21 provides a greater effective area in proximity to the grounded electrode 26 when the control bar 25 is swung through a large angular displacement than when it is swung through a small angular displacement. This is because it is wider at its upper portion than at its lower portion. As the capacitance to ground of the control electrode 21 is increased, the frequency of oscillator 11 is correspondingly decreased. As a result, the beat frequency or difference frequency between the frequencies of the fixed frequency oscillator 10 and the variable frequency oscillator 11 increases and the note emitted by the loudspeaker 16 rises in pitch. This variation in capacitance to ground is extremely small. It is estimated that it need be only of the order of less than 10 micromicrofarads in order to cover the entire audible range of pitch. As in the conventional manually played "Theremin," the frequency varies continuously in changing from note to note and the note is sustained at the same intensity during changes in pitch except insofar as its volume may be varied by the artist.

In Figure 2 is illustrated means by which the angular displacement of the control bar 25 which is produced by the depression of each key may be individually adjusted for each key so that each key will produce a note of correct pitch when it is fully depressed. This is accomplished by the interaction of the keys and a series of individual fingers as will hereinafter be described.

The keys themselves are substantially conventional, each key comprising an elongated bar 31 which is pivoted intermediate its ends on an upright pin 32. The pin 32 fits somewhat loosely in a hole 33 in the key bar 31, the fit being just loose enough to permit pivotal movements of the key bar 31 but sufficiently close to maintain the key bar 31 longitudinally fixedly positioned. The pin 32 is mounted on a fixed supporting member 34 and a felt washer 35 underlies the key bar 31 to prevent noise.

A series of felt covered fingers 36 is arranged with each finger in engagement with the free end of one of the key bars 31. Each finger 36 is connected to a horizontally adjustable mounting block 37 by a pivot pin 38. The pivotal axis provided by the pivot pin 38 is spaced from and parallel to the pivotal axis of the key bar 31 which is provided by the upright pin 32. Near its pivoted end, the finger 36 is provided with an upright portion 39 which is arranged to engage the mounting block 37 and act as a stop for limiting clockwise movement of the finger 36. The free end portions of all of the fingers 36 are aligned in a common horizontal plane for reasons which will be explained hereinafter.

The pivotal movement of each key bar 31 is limited in conventional manner as in a standard piano keyboard. Accordingly, when a key is pressed to the limit of its travel, its free end 40 rises to a predetermined height and elevates the pivotally mounted finger 36. This in turn swings the control bar 25 upwardly as illustrated in Figure 3 and in broken lines in Figure 1.

This invention also includes a simple and effective individual tuning system which does not interfere with the normal operation of the instrument as will be shown

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hereinafter. Such tuning is accomplished by shifting the finger 36 axially or longitudinally so as to adjust the point along the finger at which it is engaged by the free end 40 of the key bar 31. For this purpose mounting block 37 of the finger 36 is provided with an elongated slot 41 through which a screw passes and secures the block 37 to a fixed supporting member 43.

When the screw 42 is loosened, the supporting block 37 may move axially in the longitudinal direction of the key bar 31 so that the free end 36a of finger 36 is moved nearer to or farther away from the free end 40 of the key bar 31. If the free end 36a is moved rearwardly so that it is closer to the free end 40 of the key bar 31, then the amount of angular displacement of the felt covered finger 36 will be decreased when the key bar 31 pivots to its limit of travel by depressing the key portion of the key bar 31. When the free end 36a is moved forwardly or to a more overlapping position on the free end 40, the amount of angular displacement of the felt covered finger 36 will be increased for the same upward movement of the free end 40. In other words, the free end 40 produces greatest angular displacement of the finger 36 when it is closest the pivot point 38 and it produces least displacement when it is closest the free end 36a. This is clearly illustrated in Figure 4 where the finger 36 is far less angularly displaced and the control bar lifted less because the free ends of the finger and key bar respectively are closer. The amount of angular displacement of the free end 36a of the felt covered finger 36 may thus be adjusted by varying the position of the pivot pin 38 relative to the free end 40 of its associated key bar 31. The desired adjustment may be retained by tightening the screw 42.

The free end 36a of each finger 36 engages the underside of the control bar 25 and lifts the control bar 25 when its associated key bar 31 is operated as illustrated in Figure 3. Accordingly, the adjustment of angular displacement of the finger 36 constitutes a tuning means since the greater such displacement, the greater the lift imparted to the control bar 25. The elevation of control bar 25 determines the pitch. Thus, the simple longitudinal adjustment of each finger 36 can be employed to effect individual tuning of the keys.

A particular advantage is derived by the above described tuning method in that the normal relationship of the free end 36a with the underside of the control bar remains completely unaffected and all the free ends 36a will remain in the same horizontal plane. Accordingly, the normal position of control bar 25 will be as shown in Figure 1 where it is resting flatly on all the fingers 36. It will be recognized that if the fingers 36 were at varying levels, the bar 25 would rest on the highest one and the others would have to rise before engaging the bar. Such lost motion would disturb proper operation of the instrument since the musician would not know how far to depress each key to sound the note. This is avoided by having all the fingers in horizontal alignment notwithstanding their tuning function.

In order to return finger 36 to a normally downward, horizontal position, the spring 44 extends between block 37 and finger 36. It is stressed when the finger 36 is elevated so that it tends to restore the finger to normal position.

Inasmuch as the spacing between the grounded electrode 26 and the stationary control electrode 21 must be carefully maintained, the free end of the control bar 25 is guided between the upright 22 and another upright 45. Headed pins 46 are carried by the free end of the control bar 25 and engage the confronting faces of the spaced uprights 22 and 45, the pins 46 being disposed at opposite sides of the control bar 25. The heads of the pins 46 serve to reduce friction. However, I have produced an embodiment which eliminates one of the pins 46 and its corresponding support 45. This has been done by making the control bar so light that it floats gracefully on

its pivot 27 and does not tend to quiver. Thus, a control bar of balsa wood was made 27 inches long and it weighed about 11 grams. This bar was guided only by one support.

The desirability of the instrument has been increased greatly by adding a vibrato or tremolo which is unusually effective. This is accomplished by simulating hand operation rather than by simply employing conventional electronic tremolos. I have discovered that tremolo is best produced by vibrating a condenser plate in proximity to a control electrode. This effectively reproduces conventional "Theremin" action but with precision, selectivity and effect that was not possible to achieve by the human hand.

As shown in Figure 1, a vibrato effect is provided by varying the capacitance to ground of an auxiliary control electrode 50 which is connected to terminal 12 of oscillator 11 through the trimmer capacitor 20 along with the main control electrode 21. The auxiliary electrode 50 cooperates with a movable grounded electrode. The grounded electrode 51 is mounted at the free end of a grounded electromagnet armature 52. A spring 53 urges the armature 52 to a fixed predetermined position from which it may be displaced by energizing the operating winding 54 of an electromagnet 55. The operating winding 54 of electromagnet 55 is connected to the output terminals 56 of a low frequency vibrato or tremolo oscillator 57. The frequency range of oscillator 57 may accordingly extend up to 20 cycles per second. The oscillator 57 is provided with an amplitude control circuit 58 and a frequency control circuit 59. The magnitude of the output voltage at the output terminals 56 of oscillator 57 may be varied by means of a foot pedal 60 connected to the output control circuit 58. Another foot pedal 61 which is connected to the frequency control circuit 59 is used to vary the output frequency of the oscillator 57 from its minimum to its maximum output frequency.

By means of the foot pedals 60 and 61, mechanical oscillations of controllable frequency and amplitude may be imparted to the movable grounded electrode 51 and these oscillations will produce slight variations in the pitch of any note being played. This rhythmic variation in pitch gives the desired vibrato effect.

Briefly, the operation of the instrument is essentially as follows:

The musician will depress selected keys successively to produce a tune. During such rendition, the control bar 25 will rise and fall depending on whether the notes are high or low. The high notes will produce a greater rise.

The successive notes will glide easily and pleasantly from one to another. Each note will rise or fall to the next one, resulting in a smooth and flowing rendition.

It will be observed that the rectilinear edge section 24b serves the higher notes of the range. The slope thereof is less steep than that of edge section 24a so that for like changes in the elevation of bar 25, more capacity change is realized. The greater capacity effects at the high frequencies may be further enhanced by thickening the upper end of plate 21 or bending it inwardly, these expedients simply bringing the plate 21 closer to the control bar electrode 26 and thus increasing capacity.

Volume will be controlled either by pedal 18 or by "Theremin" type volume control as explained above.

The tremolo is most important to maximum effectiveness. This may either be pre-set, or controlled during the rendition by operating pedal 61 while the amplitude thereof may be controlled by pedal 60.

While an electrostatic type of variable reactance frequency control device has been specifically disclosed for varying the frequency of oscillation of the oscillator, it is to be understood that other types of conventional variable reactance means may be substituted for controlling the pitch of the emitted note, said variable reactance means being provided with a mechanically displaceable

keyboard-controlled movable element for determining the frequency of oscillation as disclosed herein. Regardless of the type of frequency control device which may be employed, the frequency of oscillation will vary continuously during keyboard-controlled movement of the displaceable member from one position to another as when different keys are operated in sequence.

It will be apparent to those skilled in the art that changes and modifications may be made in the specific embodiments of the invention which have been herein shown and described without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A musical instrument comprising loudspeaker means for emitting an audible note, an oscillator of controllable frequency connected to energize said loudspeaker means for producing said note, said oscillator comprising a terminal for controlling the frequency of oscillation of said oscillator by variation of the capacitance to ground of said terminal, a fixed control electrode connected to said terminal, a movable grounded electrode cooperating with said control electrode for varying the pitch of said note by changes in the relative positions of said electrodes, a control bar by which said grounded electrode is carried, an end portion of said control bar being pivoted to supporting means for angular movement of said control bar, a keyboard comprising series of parallel elongated key bar members extending perpendicularly with respect to said control bar, and means individually interconnecting each of said key bar members and said control bar whereby those key bar members which are located nearer to said pivoted end portion of said control bar will produce greater angular displacements of said control bar than those of said key bar members which are more remote from said pivoted end portion.

2. A musical instrument according to claim 1 in which each of said key bar members is pivoted intermediate its ends and comprises a manually depressable key portion at one end and a free portion at its other end, and wherein said means interconnecting each key bar member with said control bar comprises a finger member interposed between said free end portion of each key bar member and said control bar.

3. A musical instrument according to claim 2 wherein each of said finger members is pivotally connected to supporting means, said pivotal connection including means for adjusting the distance between said pivotal connection and said free end portion of its associated key bar member.

4. A musical instrument according to claim 1 further comprising an auxiliary electrode connected to said terminal for producing changes in the frequency of oscillation of said oscillator independently of said control bar, a source of low frequency oscillations of controllable frequency and amplitude, an electromagnet connected for energization from said source of low frequency oscillations, a spring biased armature included in said electromagnet, said armature being displaceable in accordance with the frequency and amplitude of oscillation of said low frequency source, and a grounded electrode carried by said armature and cooperating with said auxiliary electrode for producing a tremolo effect.

5. A musical instrument according to claim 1 in which said control bar extends generally horizontally when none of said key bar members is operated, said grounded electrode extending along portions of said control bar which are spaced from said pivoted end portion thereof, said control electrode having an upper portion of increased area which cooperates with said grounded electrode in response to increased angular displacements of said control bar from said horizontal position.

6. A musical instrument according to claim 5 in which said upper portion of said control electrode is defined by a generally rectilinear edge which is less steeply inclined

than the corresponding edge of the lower portion of said control electrode.

7. A musical instrument of the class described, comprising an oscillator of controllable frequency, means connected to said oscillator for producing an audible note having a pitch determined by the frequency of oscillation of said oscillator, means connected to said oscillator and including an angularly movable control bar for varying the frequency of oscillation of said oscillator in accordance with the position of said control bar, a keyboard comprising a series of key bar members, all of said key bar members having free end portions aligned along said control bar in spaced relationship with respect thereto, and a series of pivotally mounted finger members each associated with one of said key bar members and interposed between said free end portion of its associated key bar member and said control bar, all of said finger members having free end portions which are aligned substantially in a common plane when none of said key bar members is operated, operation of any one of said key bar members causing one of said finger members to move said control bar to a predetermined position for causing said oscillator to oscillate at a frequency corresponding to the pitch of the note associated with the particular key bar which is operated.

8. A musical instrument as in claim 7 wherein said control bar is substantially horizontal when none of said key bar members is operated and in which said plane in which said free end portions of said finger members are aligned is a horizontal plane.

9. A musical instrument according to claim 8, in which the bottom surface of the free end portion of each finger member touches the free end portion of one of said key bar members, said control bar resting on the top surfaces of all of said free end portions of said finger members when none of said key bar members is operated.

10. A musical instrument according to claim 9 further comprising a return spring acting on each of said finger members for yieldingly urging it into its position of alignment in said horizontal plane.

11. A musical instrument of the class described, comprising loudspeaker means for producing an audible tone, an oscillator of controllable frequency connected to energize said loudspeaker means for generating said tone, electrostatic means connected to said oscillator for controlling the frequency of oscillation thereof, said electrostatic means including a physically movable electrode, a keyboard comprising a series of individually movable keys, a movable control member by which said movable electrode is carried, means operatively associated with each key and engageable with said control member upon operation of said associated key for imparting a predetermined displacement to said control member in response to said operation of said key to cause said oscillator to oscillate at a predetermined frequency for generating a tone of predetermined pitch, and auxiliary electrostatic means connected to said oscillator for producing supplemental variations in the frequency of oscillation thereof independently of said keyboard, said auxiliary electrostatic means including a further physically movable electrode, electromagnetic means for displacing said further movable electrode, and a source of low frequency, vibrato oscillations of controllable frequency and amplitude connected to energize said electromagnetic means for producing a tremolo effect.

12. A musical instrument of the class described, comprising loudspeaker means for producing an audible tone, an oscillator of controllable frequency connected to energize said loudspeaker means for generating said tone, electrostatic means connected to said oscillator for

controlling the frequency of oscillation thereof, said electrostatic means including a physically movable electrode, a keyboard comprising a series of individually movable keys, a movable control member by which said movable electrode is carried, means operatively associated with each key and engageable with said control member upon operation of said associated key for imparting a predetermined displacement to said control member in response to said operation of said key to cause said oscillator to oscillate at a predetermined frequency for generating a tone of predetermined pitch, and said electrostatic means comprising a further electrode in addition to said physically movable electrode, operation of any of said keys producing relative movement between said movable electrode and said further electrode, said electrodes being shaped to provide a greater change in capacitance therebetween for a predetermined amount of relative movement therebetween for displacements corresponding to the higher notes of the frequency range of said instrument than for the lower notes thereof.

13. A musical instrument of the class described, comprising an oscillator of controllable frequency and adapted to have a loudspeaker connected thereto to produce an audible note, said oscillator comprising a terminal for controlling the frequency of oscillation of said oscillator, a fixed control electrode connected to said terminal, a movable electrode cooperating with said control electrode for varying the pitch of said note by changes in the relative physical positions of said electrodes, a control bar by which said movable electrode is carried, a keyboard comprising a series of parallel, elongated key bar members extending perpendicularly with respect to said control bar, a series of finger members each associated with one of said key bar members, all of said finger members having free end portions which are aligned substantially in a common horizontal plane when none of said key bar members is operated, said control bar normally resting on all of said free end portions when none of said key bar members is operated, operation of any one of said key bar members causing one of said finger members to move said control bar to a predetermined position for causing said oscillator to oscillate at a frequency corresponding to the pitch of the note associated with the particular key bar which is operated.

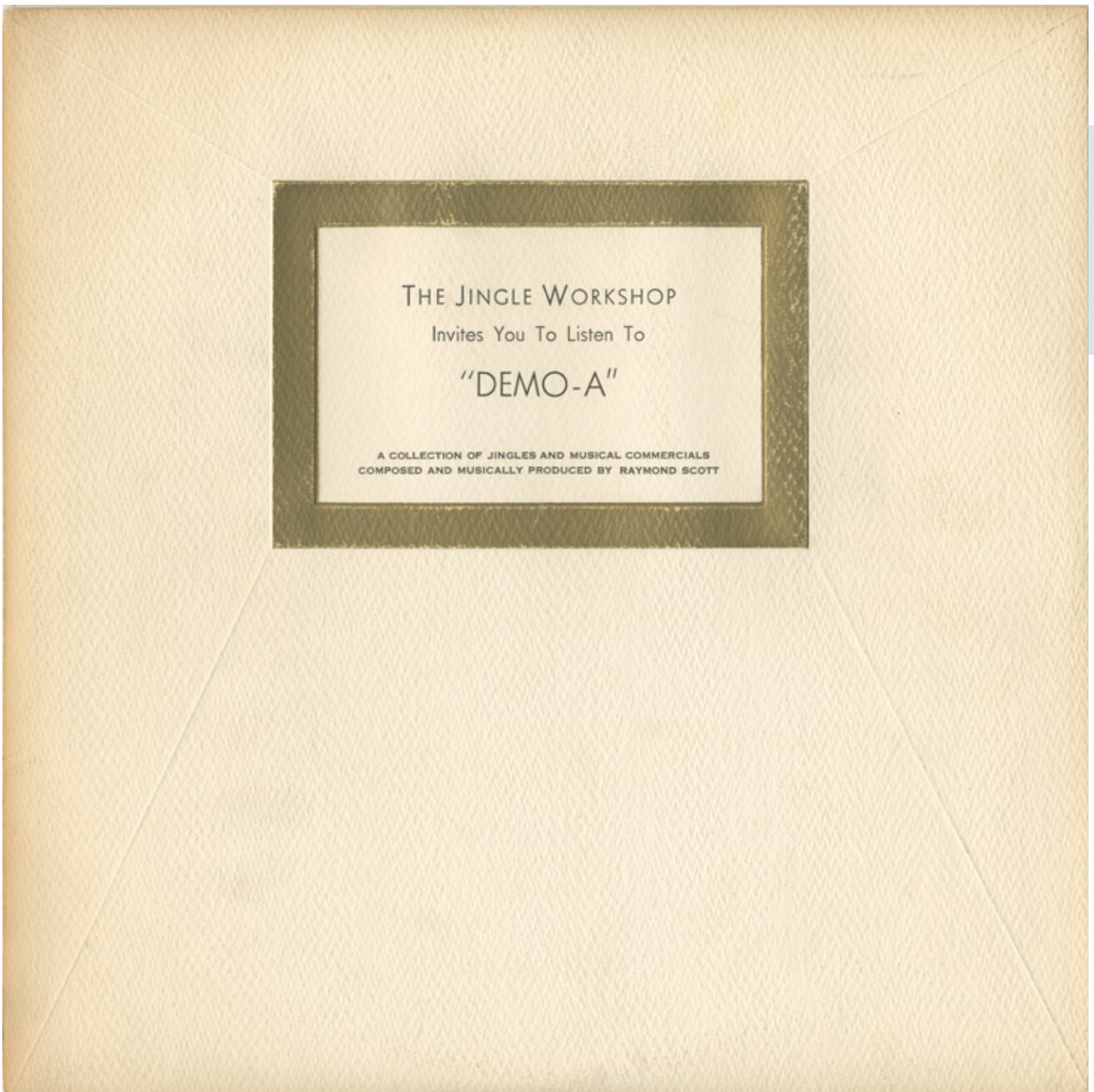
14. A musical instrument according to claim 13 and wherein said control bar is pivoted at one end thereof and is angularly movable about said pivot by said finger members, the finger members closer to said pivot producing a greater angular movement of said control bar than the finger members further away from said pivot.

15. A musical instrument according to claim 14 and wherein said key bar members have a free end which actuate the underside of said free end of said finger members, said finger members being adjustable along the longitudinal axis of said key bar members so as to vary the point at which said free end of said key bar members contact said free end of said finger members, said finger members being pivoted at their ends opposite to their free ends thereof whereby the extent of actuation of said finger members by said key bar members is controlled by said adjustment.

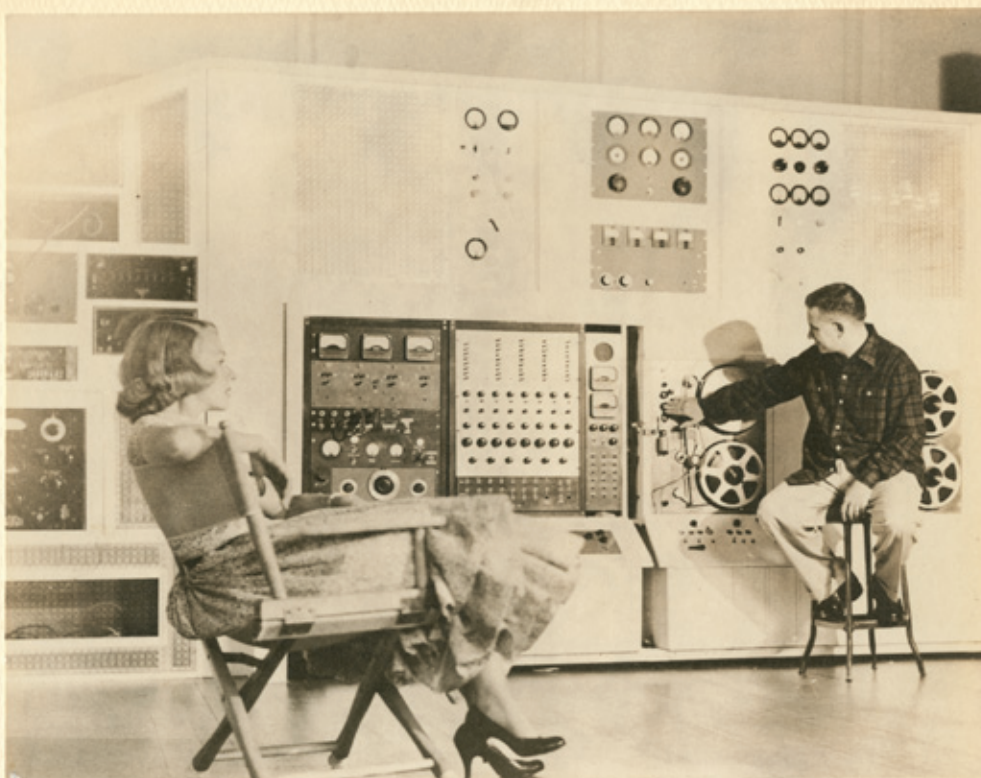
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While serving as orchestra conductor on TV's top-rated weekly program *Lucky Strike's Your Hit Parade* from 1950 to 1957, Scott launched a sideline business composing and recording advertising themes. That enterprise, "The Jingle Workshop," grew and became a primary focus in his post-YHP years. At some point, Scott compiled a selection of JW jingles — all acoustic, with real musicians, none electronic — and circulated a demo LP to attract new clients. It is unknown how many copies of this LP were pressed, or where they were distributed. While the album does not indicate the year of production, based on copyright records, all jingles listed except one date from 1954 to 1957. "Be Happy, Go Lucky," a theme song for YHP usually sung by Scott's then-wife Dorothy Collins, a star vocalist on the program, was copyrighted in 1951. By the late 1950s, Scott began to transition to electronic soundtracks. As his commercial jingle business evolved in the 1960s, he worked with fewer and fewer live musicians, relying primarily on his "circuit-based sidemen," thus rendering this demo LP little more than a historic artifact. Although titled "Demo-A," there does not appear to be a "Demo-B" or any subsequent compilations of Scott jingles.



THE JINGLE WORKSHOP recognizes the growing need for a thoroughly qualified, completely staffed musical organization, equipped to apply a combination of special talents and professional skills to the production of successful TV and Radio Jingles.

THE WORKSHOP feels that certain elements are vital to assure success in such a strongly competitive field:

First—the experience and ability to analyze and satisfy the individual needs of each product.

Second—the flair for brilliant, provocative, yet basically simple—composition of music and words.

Third—the talent for "exact touch" orchestration.

Fourth—the conducting skill to achieve a winning instrumental performance, perfectly balanced with vocal style and diction for proper product emphasis.

Fifth—the electronic 'know-how' to apply recording techniques and equipment with imagination.

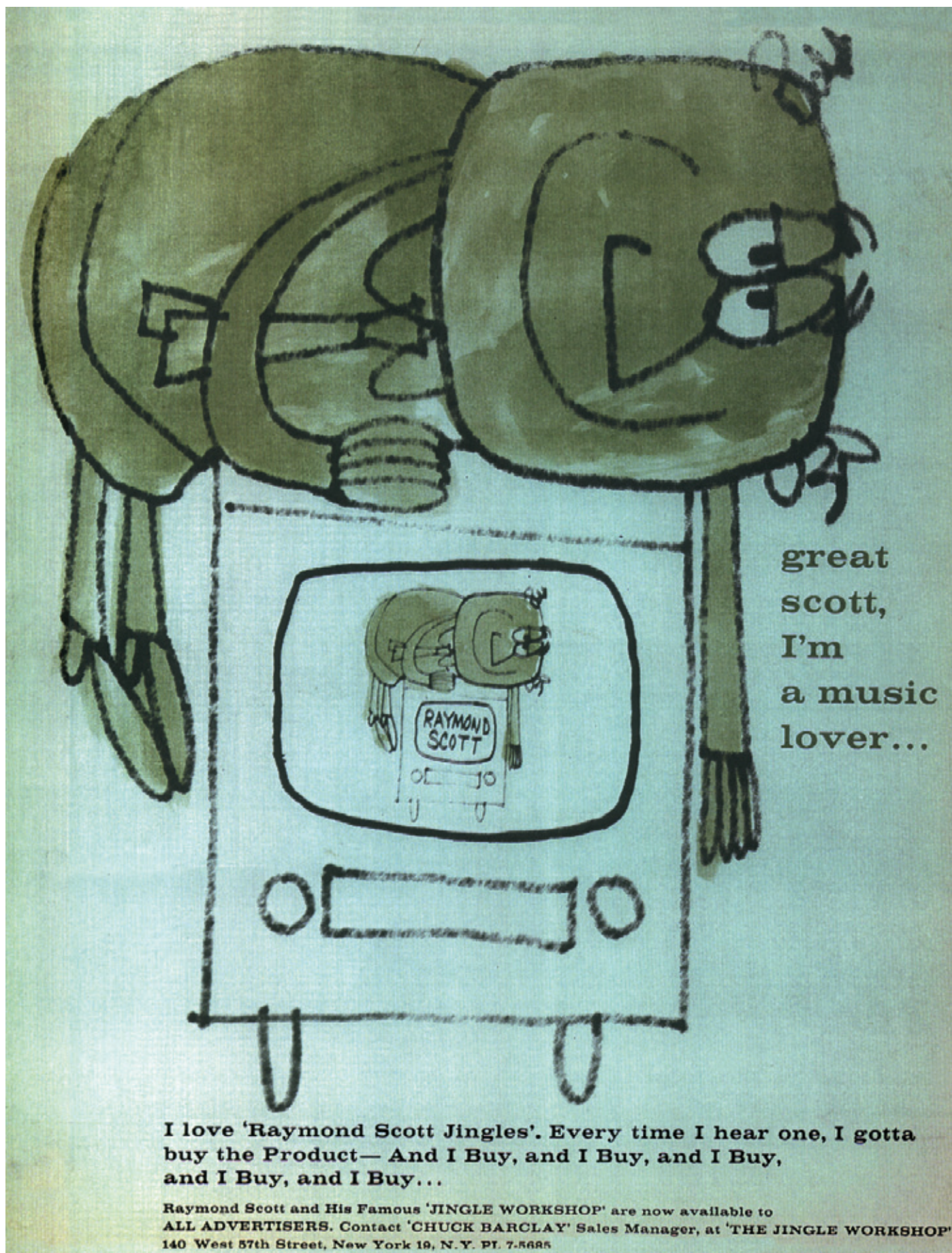
Sixth—the overall showmanship in taste and approach, to blend these many elements into an effective, expressive performance.

THE WORKSHOP sincerely believes that it has these aims in its operation, further

THE WORKSHOP would welcome the opportunity to discuss your individual needs—either for new commercials or for fresh, exciting productions of your existing jingles.

Call or Write—
THE JINGLE WORKSHOP—140 WEST 37TH STREET, NEW YORK 19, N. Y.
PLAZA 7-0480-86





Promotional one-sheet for Scott's commercial music company, The Jingle Workshop



Raymond Scott, Dorothy Collins and daughter.

RAYMOND SCOTT:

**“I want
the worst
possible sound.”**

There is a temptation to sound a great deal like *House and Gardens*, or some such magazine, in describing a trip to the home of Dorothy Collins and Raymond Scott. Just inspecting the high-fidelity equipment in their 32-room house, brings you into enough of the rooms to excite an attempt at describing how people can live gracefully and gratefully.

On the first floor, for example, there's the huge room devoted to the majority of the hi-fi equipment. In the basement, are approximately eight rooms in which there are huge stores of component parts and accessories (Scott says that there are over a million of them), a machine shop that is so well laid-out that it makes any machinist turn green with envy, a miscellaneous room which houses scrap and parts picked up by Raymond during the last twenty years, a woodworking shop, a photography lab, a raw material room, a radar lab and everything except a security guard.

Back again on the first floor — there's a piano, an organ, a tape recorder (which Raymond dictates into) and a Scott-invention, a memory piano.

On the second floor, besides all the bedrooms and nursery, are a ham-radio (with an accompanying 75-foot tower), a projection room and hi-fi speakers, through which music can be piped all around the house.

Yet, in all this seeming regard for fidelity, this is a house which is very much lived-in, with a kind of special regard for what people want and need. For all the perfection of sound available (and, in this, there is a parallel to the house itself), Ray is more interested in the music, in its “beauty, brightness and grooviness.”

Behind the double insulated sound doors just off the Scott living-room is one of the most elaborate sound enhancement music centers we've ever seen outside of a professional recording control room.

That phrase *Sound Enhancement* is Raymond Scott's and describes his sound set-up to a tee. Actually, Ray believes that the great advances in sound equipment and techniques of recording are fine, but for him the music is most important. So important, in fact, that if it (the music) stands up and still has a message after Ray deliberately distorts it, speeds it up, slows it down, takes out all the highs, all the lows; if the music he's written can stand this torture test, Raymond Scott feels then that the music is good; it stands on its own merit. If it doesn't stand up, then it's back to the piano for Ray for changes or even a whole new musical idea. Stereophonic sound, multiple track, echo or reverberation—all are fine, but to Raymond Scott the music is what really counts.

The business end of Ray's control room, contains his pride and joy, the seven-channel Ampex tape recorder which has given Ray an edge in this particular type of tape recorder for more than five years now. With this recorder, up to seven tracks of music or sound can be recorded and then all seven parts can be fed to the Standard Ampex mounted on the control panel to produce the final completed tape. All operations are push-button (solenoid operated). A disk recorder is also tied into Ray's system, as are playback turntables, AM-FM tuners plus TV sound; all can be recorded for off-the-air checks of Ray's music. Dorothy, too, finds all this equipment invaluable in checking her songs.

In one corner, we noticed a 15" Wharfedale speaker and a 12" Wharfedale mounted on a ¾" baffle board resembling a folding screen. We thought this was certainly most unorthodox in this age of the heavy, enclosed speaker enclosures. However, on hearing the pure musical sounds pouring forth from this speaker array, simply mounted, we were convinced that the speaker system at Raymond Scott's was great! No false base or boom—just clean sound.

METRONOME

We've all heard of 100 watt amplifiers but when Ray lit up his 1000-watt amplifier, which he uses for tape and disk recording purposes, we were floored. All this power is not needed, but because of it, about 2 or 3% more frequency response is made available. So, perfectionist Scott considers it necessary to his set-up.

In this same control room we spotted a very original piece of equipment. The Raymond Scott Memory Piano; idea being that Ray's daily improvisations at the keyboard would be electronically recorded on a tape loop and indexed so that whenever Scott wished he could dial back at random any day's work for further study. Invaluable for a composer and a conductor, however you slice it. However, as Ray informed us, the electronic problems were too complex to warrant further development. So, now, he uses a standard Revere tape recorder to do the very same thing. This recorder has a prominent spot right on top of the Scott concert grand piano in their living-room studio. In this large studio living-room, we also noticed a Hammond organ and the tiny celeste. Only one speaker was evident in their beautiful room, but we found that each room had a sound-source speaker which was tied into the main control room and panel described above.

Scott's interest in sound goes back a number of years. In fact, I have never seen so many electronic pieces of equipment in one spot in my entire life. In the basement, which has been completely re-designed, there were two huge rooms lined with steel filing cabinets and metal racks, neatly containing everything from the smallest resistor to some huge aircraft electronic bomb sights and Army and Navy surplus radio receivers. The reason for this huge stock according to Ray is that, by having just about anything he might need at hand,

valuable time is saved when he's fabricating a new electronic piece of equipment. This fabrication has led to patents for Scott which explains his most complete machine.

Ray is also a Ham radio operator, and, needless to say, this room is treated with the same Scott thoroughness, as are all the other rooms in the house. Organization seems to be Ray's operational slogan. A seventy-foot antenna tower completes the Ham radio set-up.

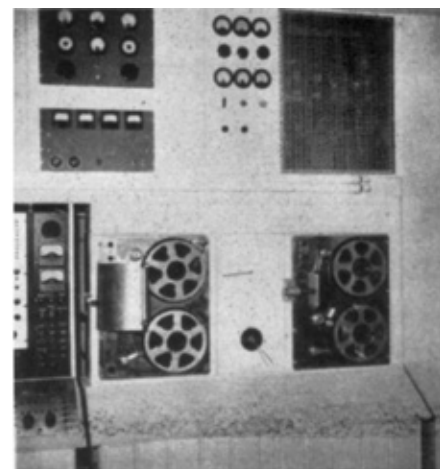
A woodworking shop, with complete power tools as well as a photo dark room, with complete photographic equipment, completes Scott's interests outside of music.

It was our impression that a great deal more thought, time and equipment has gone into that first room we mentioned—The Sound Control Room. The reason is quite simple: Raymond Scott is a musician, conductor and composer first last and always. The room compliments his creative interest.

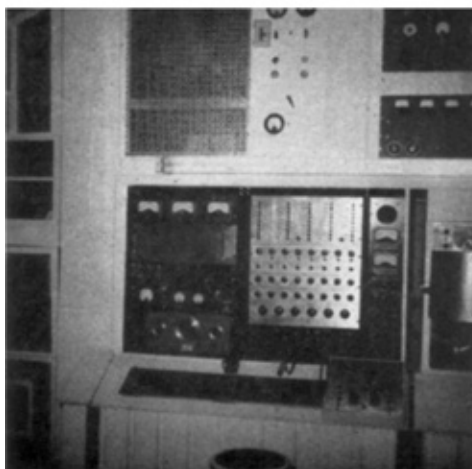
Raymond Scott has many of the qualities of a living legend. His interest in high-fidelity began almost twenty years ago, about the same time that he organized the Raymond Scott Quintet, which shook-up some of the music industry for the next several years, especially considering the titles which he affixed to original tunes—like *Dinner Music for a Pack of Hungry Cannibals*. At about the same time, he founded the Universal Recording Company, when he first became interested in microphones, but someone talked him out of the idea, for which he is now heartily sorry. Similarly, he has been collecting high-fidelity equipment for the past twenty years (as a matter of fact, he formed a dance band in 1939, just to make money to help defray the costs of his engineering lab;



At the right, Raymond Scott sits at the controls of his seven-channel hi-fi system.



Also on top row is a more full shot of the many-channeled Ampex, a conventional Ampex recorder and, at the top, right, a glimpse of his one thousand-watt amplifier, behind the panel.



Bottom row: another shot of the instrument panel; and, at the far right, another corner of the room—showing the disc recorder, assorted amplifiers, testing equipment of various kinds, a playback phonograph and, behind the left panel, testing speakers for the finished product—one a typical kitchen-radio speaker and the other a more conventional, hi-fi speaker.

actually Raymond started off with the intention of becoming an engineer). But, as he remarks, the business began to go into bad days just as he was making his start.

About ten years ago, however, there came a switch. "I lost my interest in hi-fi then," he says. "I had most of the things that people are raving about now, only I had them years ago. But, suddenly, the excitement went out of it; or, maybe, I began to realize that the excitement was something quite apart from the music. Music is really more important than the enhancing of it, even if that is a term which I used for my recording company. Exciting reproduction can confuse you. Now, I'm interested in how best to destroy that extra excitement.

"I'm convinced now that the ideal way to hear music is over the telephone—if the music has value, it will come through even that deliberate distortion; whereas, too excellent reproduction may very well take away from the wealth of the music itself. In other words, how can the listener be sure that he's not being entertained by the sound instead of enriched by the music.

"Of course, I enjoy this stuff; otherwise, it wouldn't be here. But I put stereophonic sound in this same dangerous category of adding to the music rather than just portraying it." To prove a number of points, Ray gave us practical demonstrations of sound as reproduced a number of different ways, using for the demonstration, the tape performance of his new suite, *A Yank in Europe*, recorded by Ted Heath and due in the record shops within a month or so, an interesting collection of musical sight-seeing from what we heard.

On the run, and between hi-fi talks, there were these additional comments: "Composition should be spontaneous—mine is—that gives you the changes and surprises that I want in my writing, what I call *my* music, some of which you might call jazz. It should be interesting and creative; then after that you go back to it and listen. If it's beautiful, then you can make your structural changes."



At the left is George Kluge, the high-fidelity editor of both *Jazz Today* and *The Metronome Yearbook*, as well as the author of five hi-fi stories in this issue. George comes by his enthusiasm for the highest fidelity in a novel, though logical manner. For fourteen years he has had a career in network radio, recording, motion pictures and television as an actor, working with such varied

characters as Jimmy Durante, Dave Garroway, Victor Borge and Hildegard, not to mention, just barely, that you've heard him on any number of soap operas, if that's your kick.

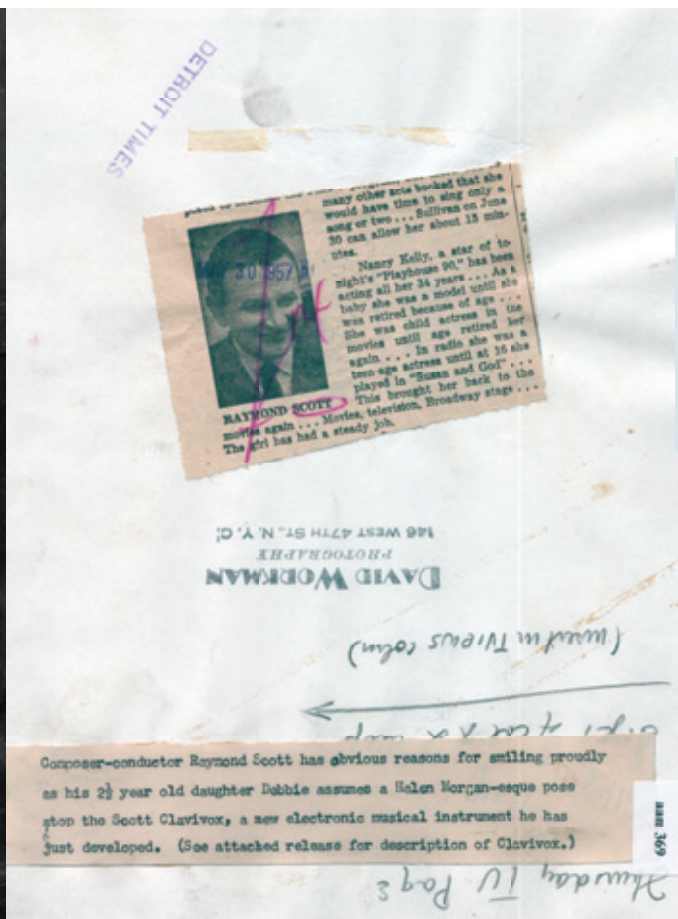
Concerned with media which was sound in its basic factor, even if not always musical sound, George became aware of the sound itself, first for himself, and, then, with sound for other people.

He discovered, much to his surprise, that many people in show business had inadequate sound systems in their homes, knew that they did, but really didn't know what to do about it. What George did about it was to form his own organization, *Broadcast Quality Sound*, which has as its sole purpose the creation in the home of the same (or close to the same) natural sound that his professional customers are used to hearing in the professional studios.

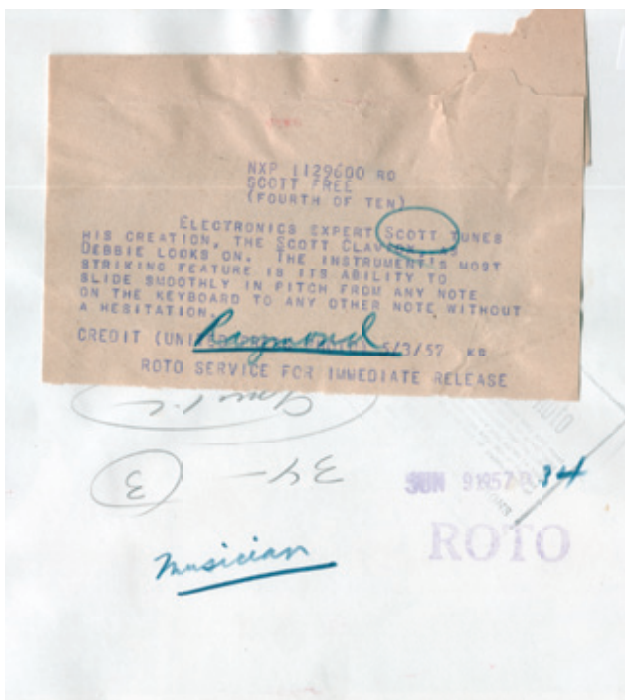
To this end, he labors mightily, mostly for professional people, but, from time to time, for those laymen who want the best that their money can bring, together with personal installation and a servicing plan. For us, he brings the practical experience of several fields into focus.

Below: Raymond Scott posing in front of his Ham-radio rig (outside the window is a 70-foot radio tower). At the right—Scott, again, in one section of his metal shop, looking at the newest model of his electronic piano.





Scott and Deborah (age 2) pose for press photos with the Clavivox, May, 1957 (Photos by David Workman)





Scott in his electronics workshop, North Hills, NY, c.1959

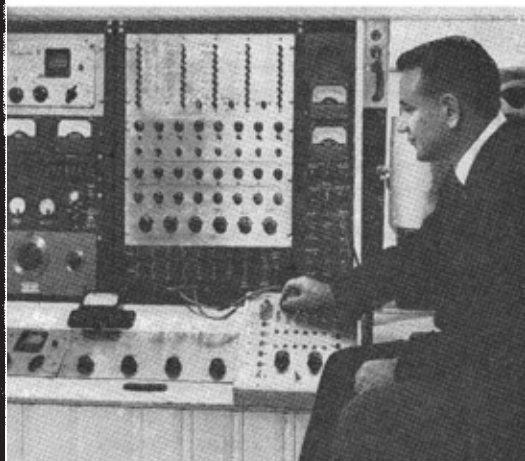
Raymond Scott: Electronics Enthusiast *Par Excellence*

By ALAN D. HAAS

The house where Raymond Scott and Dorothy Collins and their two children live is not a home—in any ordinary sense; it is a 32-room electronic labyrinth. A completely self-taught engineer, Raymond has filled many of the rooms with special electronic devices used in his composing and recording chores that have confounded experts in the field. The exact worth of all the electronic installations is a mystery, even to Raymond, but he estimates that he has a "couple of hundred thousand dollars" invested in the equipment . . .



Dorothy Collins records a new tune while hubby Raymond Scott works the dials. This room contains equipment which would do credit to any commercial recording studio. Both Dorothy and Raymond make test recordings in Raymond's studio before doing an actual recording.

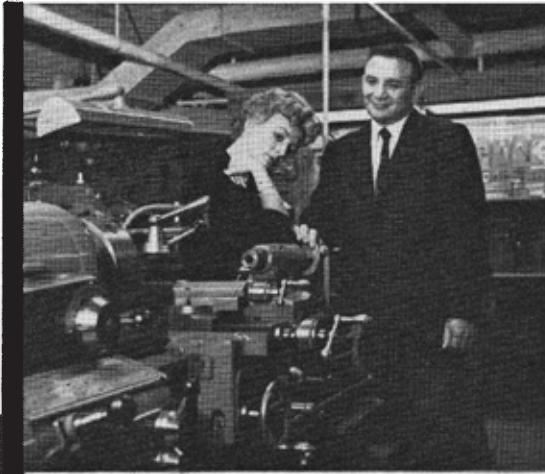


Raymond listens to the playback. Several tape recorders and complex control equipment allow him to make any type of stereo or monophonic recording.



Popular Mechanics, July, 1959 (1/2)

In his basement workshop (at right) Raymond has all the machinery necessary for building his sound equipment. Most of the units in his recording studio were designed and built in this workshop.



The "videola" (above) is one of Raymond's own inventions. He uses it to write musical scores for motion pictures. As the film is projected on the screen, he plays the accompanying music. The piano is recorded by the tape recorder shown at the left of the "videola."



What a junk box! One complete room in the basement is filled with nothing but cabinets full of spare parts. Raymond employs a full-time assistant to build and maintain his complex equipment.



July, 1959

All this and a ham, too! Raymond Scott spends many of his leisure hours communicating with his friends on the ham bands.

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Dorothy Collins makes test recording in husband Raymond Scott's home recording studio as Scott works dials

MUSICAL HOUSE FOR A MUSICAL FAMILY

By Alan D. Haas

THE HOUSE WHERE Composer Raymond Scott, Singer Dorothy Collins and their two children live in Manhasset, N. Y., is not a home in any ordinary sense. It is a 32-room musical labyrinth, and a testament to Scott's electronic genius.

A self-taught audio engineer, Scott has filled many of the rooms with electronic instruments that have confounded highly trained experts in his field. He uses them in his composing and recording chores.

Scott, who composes everything from musical scores for films to singing commercials, was formerly with "Hit Parade" where his wife still performs as a singer. Scott's creative talent for musical innovation has become well known through the Raymond Scott quintet, which has pioneered in unconventional sounds for more than a decade.

To create these sounds, Scott has developed some unusual electronic instruments which, along with a recording studio, a film projection room and a ham-radio setup,

make his home a musical showplace.

One of his instruments, called a "clavivox," is a piano-type keyboard instrument with two unusual features. First, it can slide smoothly in pitch from any note on the keyboard to any other without a break or hesitation. Secondly, it uses two foot pedals to make a humanlike vibrato control. It is said to be the only instrument that can produce this combination of effects, and very nearly duplicates the human voice.

For writing film scores, Scott has developed an instrument which he calls the "videola." From its place on top of the living-room piano, the mechanism operates a movie film in a projection room in another part of the house by remote control.

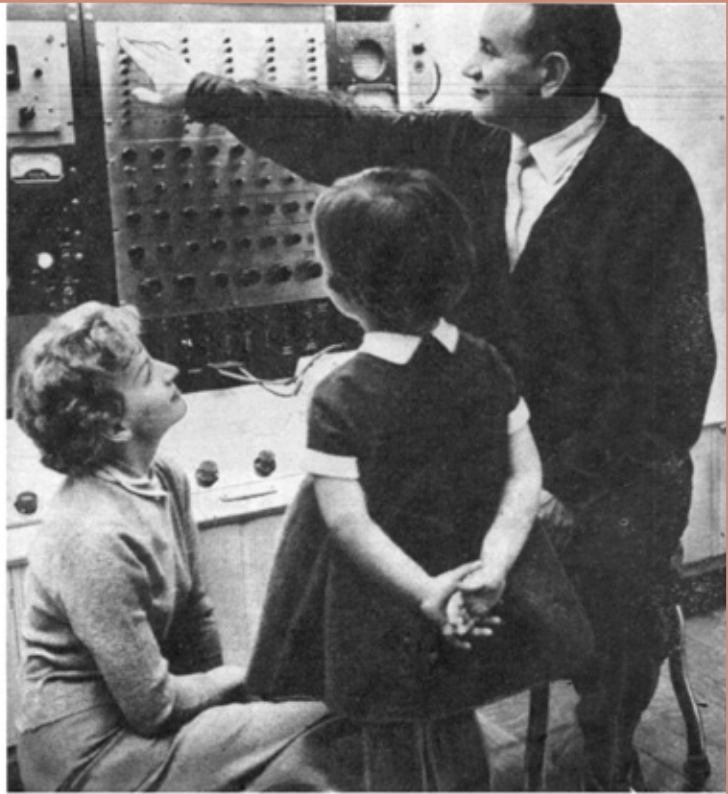
The movie is flashed on a television screen on the piano, so that Scott can watch the film as he composes appropriate music. A recording apparatus is hooked up to the videola, as well, so that he can stop, play back, listen, rub out and rewrite.

Scott also holds a patent on an automatic scanning radio, which tunes in on stations around the country and changes frequency by itself at any given interval, enabling him to catch most of the nation's disc-jockey shows in a brief span and find out what tunes are being played.

Among other instruments which Scott has developed are a device that automatically finds a selection in a particular recording tape and continues to repeat it as long as he wants it repeated, and a remote control instrument that enables him to make recorder selections from another part of the house.

Along with these special developments, Raymond's and Dorothy's mansion contains a completely equipped recording studio, a film-projection room and, in the basement, an immense workshop and storeroom, where all of the electronic innovations have been made.

In fact, Scott employs a full-time engineering assistant whose job it is to help build and maintain the equipment which he is constantly creating. The exact value of the electronic installations is unknown, but Scott estimates that it would cost him a "couple of



Dorothy and daughter Debbie listen as Scott explains the intricacy of equipment which he developed for his own needs

A Scott invention, the "clavivox" is a keyboard instrument that sounds quite similar to human voice



Another Scott specialty, the "videola" flashes movie film on TV screen to help musician write score





A ham-radio enthusiast, Scott has a complete radio unit for tuning in worldwide amateur broadcasts



Scott hears nation's hit tunes with automatic scanning radio that picks up stations around country

hundred thousand dollars" to replace them.

Scott's house has neither a hi-fi nor a stereophonic system because he thinks that "adequate modern-day reproduction" is all that is required. He believes that "in these days of elaborate high-fidelity installations,

there is too great an emphasis on the method of reproduction rather than what is being reproduced."

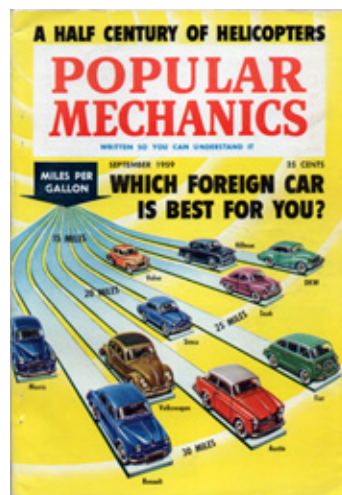
As might be expected, the Scott household, which includes Elizabeth, 1, Debbie, 4 and Dorothy, is filled literally with music. Dorothy can usually be found in the recording studio trying out a new tune, listening to a playback or trying to get her husband to explain what all the dials are for.

Despite her musical training, she confesses that she is mystified by a good part of the equipment which has turned her household into a conservatory of music. Debbie, already showing signs of following the family tradition, plays the piano remarkably well for her age. Elizabeth has not yet shown any preference for an instrument, but is rapidly developing into a good listener—she has very little choice.

Despite the many demands of their busy careers (Scott is writing a musical play along with producing television commercial jingles), Raymond and Dorothy have kept their family life alive, with music as the binding force. The Scotts are definitely in tune with each other. ★ ★ ★



Scott uses microscope to see that grooves are cut correctly on test record made in his home studio



Sept. 5, 1961

R. SCOTT

2,998,939

AUTOMATIC TAPE TRANSPORTING AND POSITION SELECTING DEVICE

Filed Oct. 16, 1959

FIG. 1

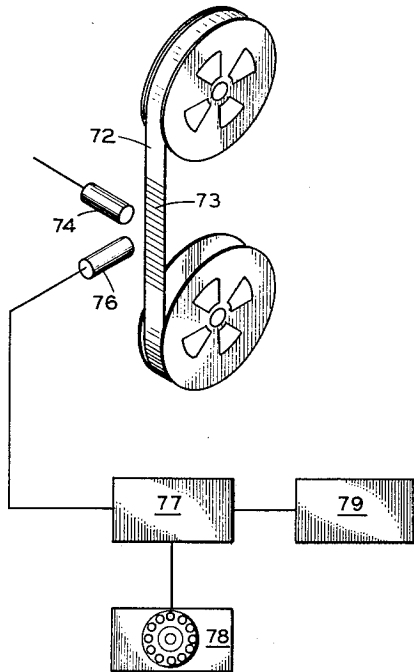
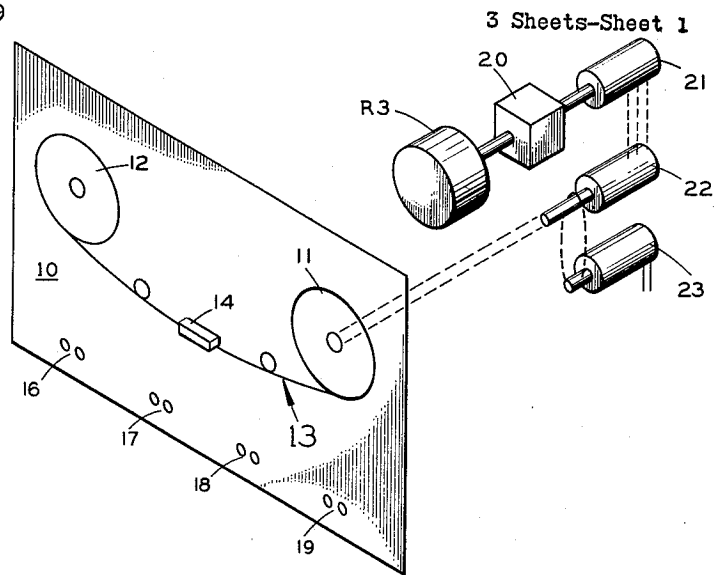


FIG. 4

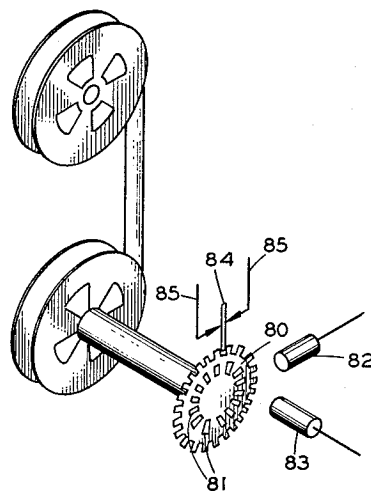


FIG. 5

INVENTOR.
RAYMOND SCOTT
BY *[Signature]*
ATTORNEY

Sept. 5, 1961

R. SCOTT

2,998,939

AUTOMATIC TAPE TRANSPORTING AND POSITION SELECTING DEVICE

Filed Oct. 16, 1959

3 Sheets-Sheet 2

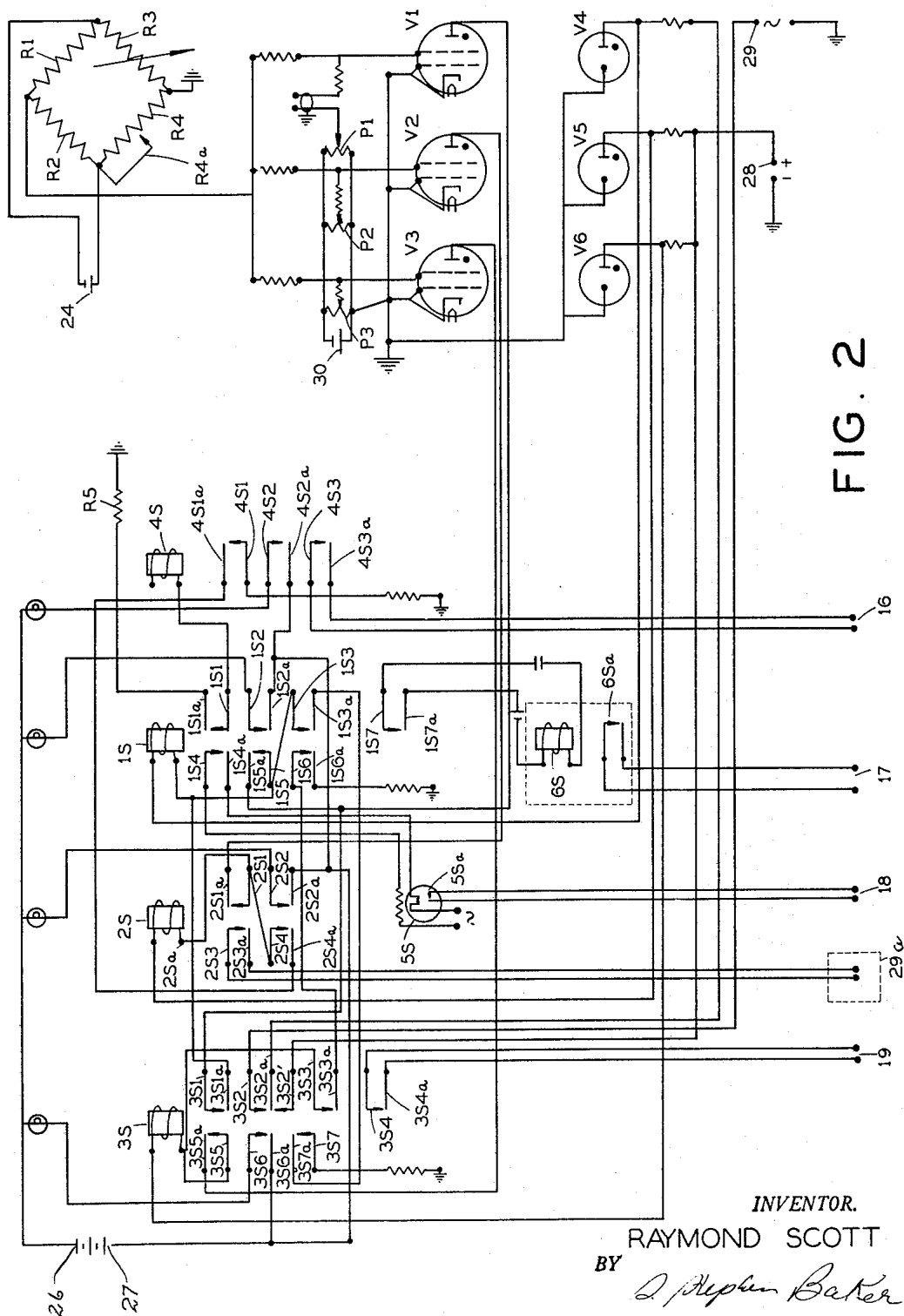


FIG. 2

INVENTOR.

RAYMOND SCOTT

BY

2 Stephen Baker

ATTORNEY

Sept. 5, 1961

R. SCOTT

2,998,939

AUTOMATIC TAPE TRANSPORTING AND POSITION SELECTING DEVICE

Filed Oct. 16, 1959

3 Sheets-Sheet 3

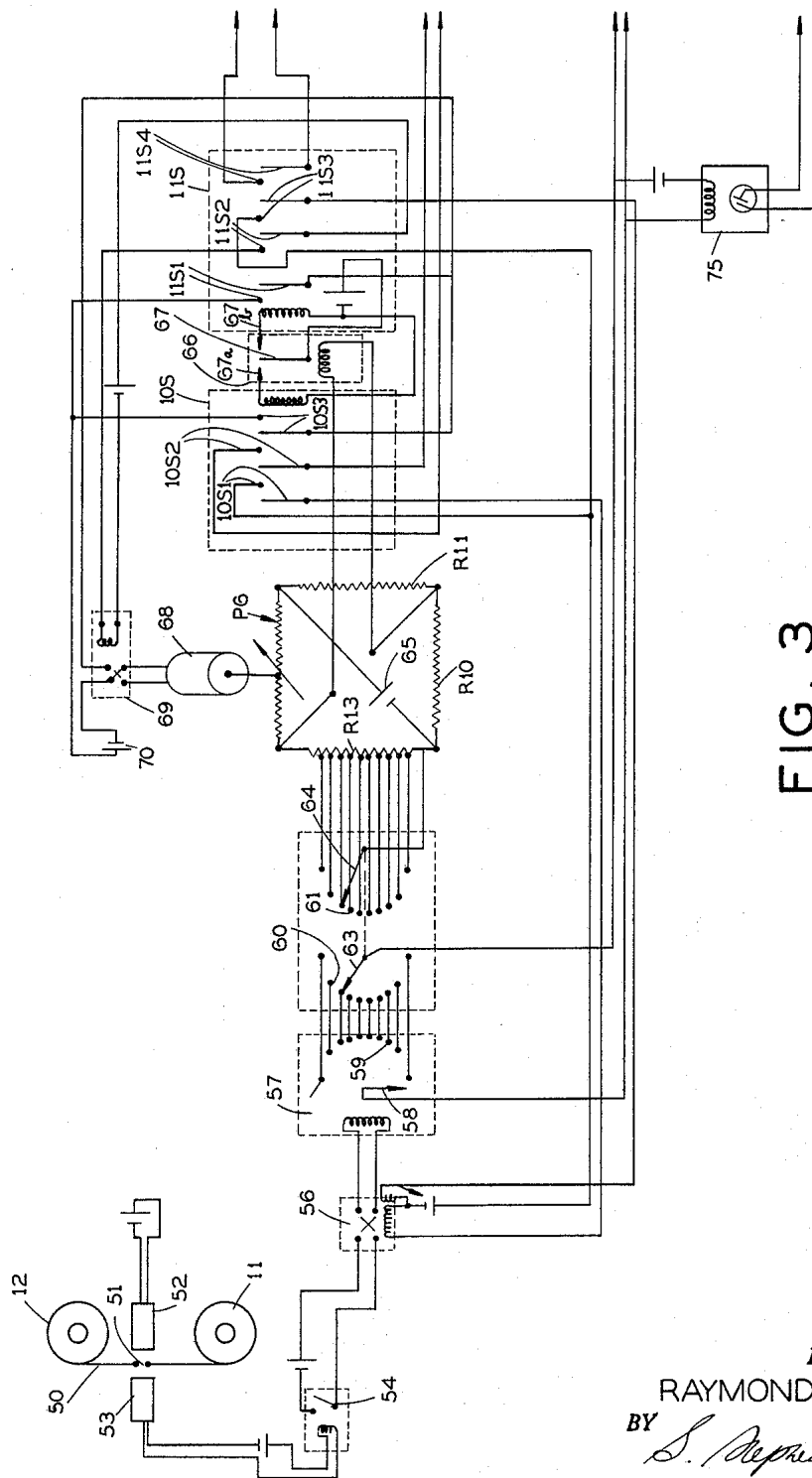


FIG. 3

INVENTOR.

RAYMOND SCOTT

BY *S. M. Baker*

ATTORNEY

1

2,998,939

**AUTOMATIC TAPE TRANSPORTING AND
POSITION SELECTING DEVICE**

Raymond Scott, Manhasset, N.Y.
(140 W. 57th St., New York, N.Y.)
Filed Oct. 16, 1959, Ser. No. 846,835
15 Claims. (Cl. 242—55.12)

The present invention relates generally to improvements in readout devices and it relates more particularly to an improved apparatus for automatically transporting a magnetic or other information carrying band or tape to any desired preselected point thereon and reading out or playing a selected portion of the tape.

The conventional automatic tape readout devices heretofore available are characterized by their high cost and complexity and the many problems which attend their use. It is not economical to employ such devices where cost is an important factor such as in juke boxes, radio broadcast studios, low cost automated machinery and in other applications where speed and accuracy are also desirable.

It is therefore a principal object of the present invention to provide an improved readout device.

Another object of the present invention is to provide and improved automatic tape readout device wherein the tape is automatically transported to any preselected point on the tape and a desired section thereof read out.

Still another object of the present invention is to provide an improved tape readout device in which the tape is rapidly advanced in a forward or reverse direction at a rapid speed and then advances at a normal playing speed.

A further object of the present invention is to provide a tape read out apparatus of the above nature which is rugged, simple and inexpensive and may be employed with the conventional tape transport deck.

The above and other objects of the present invention will become apparent from a reading of the following description taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a plan diagrammatic view of a conventional tape transport deck and certain associated components in accordance with the present invention;

FIGURE 2 is a schematic view of a circuit network embodying the present invention and employed with the apparatus illustrated in FIGURE 1;

FIGURE 3 is a schematic diagrammatic view of another embodiment of the present invention;

FIGURE 4 is a diagrammatic view of still another embodiment of the present invention; and

FIGURE 5 is a diagrammatic view of a further embodiment of the present invention.

In one sense the present invention contemplates an apparatus for automatically transporting a tape to any preselected point by generating a signal responsive to said preselected point and the relative position of the tape, actuating the tape transport mechanism to convey the tape in a direction in accordance with said signal and then advancing the tape in a forward direction at a normal playing speed. According to the preferred form of the present invention the tape is transported to a point trailing the preselected point at a rapid speed and is then advanced to the selected point at playing speed and the readout circuit is actuated upon said preselected point being reached. Several arrangements for achieving the above sequence will be hereinafter set forth.

Referring now to the drawings and more particularly to FIGURES 1 and 2 thereof which illustrate a preferred embodiment of the present invention the reference numeral 10 generally designates a conventional type tape transport deck which includes spindle supported take up and feed reels 11 and 12 respectively which store a length

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of recorded tape 13 and transport it past a pickup 14. The tape transport is selectively motor driven in the usual manner at a rapid wind, rapid rewind, and normal playing forward speeds and may also be stopped, shifting between speeds being effected only by way of an intervening stopping of the transport. The deck 10 is provided with rapid wind, stop, normal, forward, and rapid rewind pairs of terminals 16, 17, 18 and 19 respectively, the interconnection or pulsing of any pair effecting the corresponding actuation of the tape transport.

In order to generate a control signal in accordance with the relative positions of the tape 13 and the preselected point thereon, there is provided a bridge network including a pair of connected fixed resistor arms R1 and R2, between the ends of which are connected series connected control rheostat R3 and multitapped selector resistor R4. An arm R4a is associated with resistor R4 and varies the value thereof in stepped increments by shorting out selected portions. The arm of the rheostat R3 is mechanically connected by way of a speed reducing gear train to the shaft of a Selsyn synchronous receiver 21 which in turn is coupled to a Selsyn transmitter 22. The shaft of the Selsyn transmitter 22 is positively driven in synchronism with the take up reel 11 so that the resistance of the rheostat R3 varies in accordance with the position of the tape 13. A D.C. generator 23 is also driven in synchronism with the reel 11 to produce a voltage of a polarity corresponding to the direction of rotation of the reel 11 and a value in accordance with the speed thereof. A source of D.C. voltage 24 is connected between the outer ends of resistors R1 and R2, the control voltage being picked off at their junction point, the opposite corner of the bridge being grounded.

The principal control network includes three main solenoid actuated relays 1S, 2S and 3S and associated grid controlled gas discharge tubes V1, V2 and V3. It should be noted that the tubes V1, V2 and V3 are of the two grid type and that the normal control grids are connected to the cathodes which in turn are grounded and the second grids are employed as the control grids and will be hereinafter so designated. Actuated by the energized relay 1S are the normally closed contacts and arms 1S1 and 1S1a, and 1S5 and 1S5a and the normally open contacts and arms 1S2 and 1S2a, 1S3 and 1S3a, 1S4 and 1S4a, 1S6 and 1S6a, and 1S7 and 1S7a; actuated by the energized relay 2S are the normally closed contact and arm 2S1 and 2S1a and the normally open contacts and arms 2S2 and 2S2a, 2S3 and 2S3a and 2S4 and 2S4a; and actuated by the energized relay 3S are the normally closed contact and arms 3S2' and 3S2a, 3S5 and 3S5a and 3S7 and 3S7a and the normally open contacts and arms, 3S1 and 3S1a, 3S2 and 3S2a, 3S3 and 3S3a, 3S4 and 3S4a, and 3S6 and 3S6a.

The relay arm 1S1a is grounded through a resistor R5 and the contact 1S1 is connected through the solenoid of a relay 4S to a source of D.C. current. Actuated by the energized relay 4S are normally closed contact and arm 4S1 and 4S1a and normally open contacts and arms 4S2 and 4S2a, and 4S3 and 4S3a. The relay contact 1S2 is connected through a pilot lamp to a terminal 26 of a current source, the arm 1S2a being connected to the opposite terminal 27 thereof. The contact 1S3 is connected to the contact 1S5 and the arm 1S3a is connected by way of the relay arm and contact 3S7a and 3S7 and a dropping resistor to ground; the contact 1S4 and the arm 1S4a are connected in series with an energizing current source and the solenoid of a time delay relay 5S, the energized relay closing normally open contacts 5S1 which are connected to the normal forward speed terminals 18; the arm 1S5a is connected to the anode of tube V1 and to relay contact 3S1 and the contact 1S5 is connected to relay arm 3S1a and through

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the solenoid of relay 1S and a dropping resistor to relay arm 3S2a, the solenoid end of the resistor being grounded through a voltage regulator tube V4. The contact 1S6 is connected to relay arm 3S3a and the arm 1S6a is grounded through a resistor, and the contact and arm 1S7 and 1S7a are connected through a current source and a condenser to the solenoid of a relay 6S which is provided with momentarily closing contacts 6Sa connected to the deck stop terminals 17. The relay arm 2S1a is connected to the anode of tube V2 and contact 2S1 to contact 2S4 and solenoid terminals 2Sa of solenoid 2S, the other terminal thereof being connected by way of voltage regulator tube V5 to ground and by way of a resistor to the positive terminal 28 of a suitable voltage source, the negative terminal of which is grounded. The contact and arm 2S2 and 2S2a connect a pilot lamp to current terminals 26 and 27; contact and arm 2S3 and 2S3a are connected to a payout actuating means defining speaker actuating device or switch 29a or in series with the speaker, and the arm 2S4a is connected to ground by way of contact and arm 4S1 and 4S1a and a dropping resistor. The relay contact 3S2 is connected to a terminal 29 of an alternating current source the opposite terminal of which is grounded and the contact 3S2' is connected to the positive voltage terminal 28; contact 3S3 is connected to contact 3S5 and one terminal of the solenoid of relay 3S the other terminal of which is connected by way of a resistor to D.C. terminal 28 and is grounded through the voltage regulator tube V6, the contact and arm 3S4 and 3S4a are connected to the rewind terminals 19; the arm 3S5a is connected to the anode of tube V3, and the contact and arm 3S5 and 3S5a connect a pilot lamp to the current terminals 26 and 27.

The control grid of each of the tubes V1, V2 and V3 is connected by way of a limiting resistor to the junction of the fixed resistor arms R1 and R2. The control grid of the tube V1 is connected in series with a resistor and the generator 23 to the arms of a potentiometer P1, the control grid of tube V2 is connected through a resistor to the arm of a potentiometer P2 and the control grid of the tube V3 is connected by way of a resistor to the arm of a potentiometer P3. The resistance elements of the potentiometers P1, P2 and P3 are each connected across a bias voltage supply 30, the positive terminal of which is grounded.

The potentiometers P1, P2 and P3 are adjusted so that the control grids of tubes V1, V2 and V3 are at successively higher cut off bias voltages. The rheostat R3 and tapped resistor R4 and the associated voltage supply 24 are so correlated with the tape 13 and reel 11, and the tube bias voltages adjusted so that the voltage from the bridge network is sufficient to fire tube V1 only when the tape reaches a position trailing the point thereon selected by the arm R4a a predetermined amount and fires the tube V2 when the tape position trails the selected point a short distance or coincides therewith and fires the tube V3 when the tape is in advance of the preselected point by an increment corresponding to about a tap distance on resistor R4 and a playback sequence on the tape 13.

Considering now the operation of the apparatus described above, when the bridge resistor arm R4a is switched to a tap corresponding to a point on the tape in advance of the current position of the tape, the signal or voltage from the bridge applied to the tube control grids is insufficient to fire any of the tubes V1, V2 or V3. As a result, the relay 4S solenoid is energized by way of closed contact and arm 1S1 and 1S1a closing contacts and arms 4S2 and 4S2a to energize the corresponding pilot light and 4S3 and 4S3a to close terminals 16 and actuate the fast wind and open contact and arm 4S1 and 4S1a to prevent the holding of relay 2S. As the tape advances it correspondingly varies the rheostat R3 by means of the Selsyns 21 and 22 increasing the

bridge output voltage to a point sufficient to fire the tube V1, the cathode of which is grounded and the anode of which is connected by way of contact and arm 1S5 and 1S5a, relay 1S solenoid and contact and arm 3S2a and 3S2' to the voltage positive terminal 28. The relay 1S is thus actuated opening contact and arm 1S1 and 1S1a to deactivate relay 4S to return the associated contacts and arms to their original positions previously described, closing the pilot light energizing contacts 1S2 and 1S2a, closing the hold contacts 1S3 and 1S3a to ground the lower end of the relay 1S through contacts 3S7 and 3S7a thereby maintaining the relay 1S actuated, closing contacts 1S7 and 1S7a to actuate relay 6S and momentarily short the terminals 17 and stop the tape drive, close terminals 1S4 and 1S4a to actuate the time delay relay 5S which after about a two second delay shorts the deck terminals 18 to drive the tape 13 at forward playing speed, opening the contacts 1S5 and 1S5a to remove the plate voltage from the anode of tube V1 and closing contacts 1S6 and 1S6a to permit the holding of relay 3S. It is important to note that although the tube V1 is always in ready position it is only momentarily ionized since the energizing of the relay 1S opens the plate voltage circuit to the tube anode and actuates the relay hold contacts. This is a highly desirable feature since it maintains the stability of the tube and insures a substantially constant required firing voltage for the control with a minimum of drift.

The rheostat further varies with the advancing tape to increase the bridge output voltage to a point sufficient to fire tube V2 to energize the relay 2S solenoid by way of the closed contacts 2S1 and 2S1a. The actuation of the relay 2S opens the contacts 2S1 and 2S1a to remove the plate voltage from tube V2, close the pilot light energizing contacts 3S2 and 3S2a, closes the speaker energizing contacts 2S3 and 2S3a to effect the play back of the selected portion of the tape 13 and closes hold contacts 2S4 and 2S4a to ground the low end of the relay 2S solenoid through the contacts 4S1 and 4S1a. When the tape 13 reaches the end of the selection the bridge output fires tube V3 to actuate relay 3S to rewind the tape as will be hereinafter set forth, to its initial selected position and repeat the cycle. Any conventional selectively operated means may be provided to stop the tape upon reaching the end of the selected portion without effecting rewinding.

When the selected point on the tape 13 trails the current position of the tape the bridge output fires the three tubes V1, V2 and V3 to actuate the corresponding relays 1S, 2S and 3S. The actuation of relay 3S closes contacts 3S1 and 3S1a to connect the low end of the relay 1S solenoid to the anode of V1 although the solenoid 1S is actuated, closes contacts 3S2 and 3S2a and opens contacts 3S2a and 3S2' to switch the plate voltage of tube V1 from D.C. to A.C. so that the grid thereof is under continuous control, closes hold contacts 3S3 and 3S3a so that the low end of the relay 3S is grounded through closed contacts 1S6 and 1S6a, opens contacts 3S5 and 3S5a to open the circuit between the relay solenoid and tube V1 and remove the plate voltage therefrom, closes pilot light contacts 3S6 and 3S6a, opens contacts 3S7 and 3S7a which hold relay 1S and closes contacts 3S4 and 3S4a which shorts terminals 19 and actuates the tape rapid rewind. As the rheostat R3 reaches a point trailing the corresponding tape selected point, the tube V1 is extinguished by reason of its having an A.C. anode voltage and the bridge derived voltage being insufficient to fire the tube. The relay 1S is thus deactivated to open the contacts 1S6 and 1S6a to thereby deactivate the relay 3S and return it to its original position wherein the D.C. voltage is reapplied to tube V1 and the rewind contacts 3S4 and 3S4a are open and close contacts 1S1 and 1S1a and actuate the relay 4S to start the forward and play cycle in the manner previously set forth.

FIGURE 3 of the drawing illustrates another embodi-

ment of the present invention wherein the current position of the tape is determined by the counting of tape carried indicia and the position information is employed in a circuit to determine the required tape direction to reach a selected point. More particularly the tape 50 is transported by reels 11 and 12 on a deck 10 as in the previous embodiment and is provided with a series of spaced transparent spots 51 which trail each of the tape selections a predetermined distance. Directed toward one face of the tape 50 is a suitably energized light source 52 and disposed along the opposite face of the tape 50 is a photoelectric cell 53 which is energized by the light source 52 only when a transparent spot 51 is in registry therewith. The photoelectric cell 53 is connected by way of a current source to the solenoid of a sensitive relay 54 the normally open contacts of which are connected to the input terminals of a solenoid controlled reversing switch 56. The output terminals of the switch 56 are connected to the control terminals of a bidirectional stepping relay which includes an arm 58 and an associated plurality of contacts 59, the arm 58 being step advanced in accordance with the polarity of the pulse applied to the relay switch 57 as derived through the switch 56.

In order to effect the desired selection on the tape 50 there is provided a circuit network including a pair of ganged multitapped switches including separate sets of contacts 60 and 61 and mechanically coupled wiper arms 63 and 64 respectively associated therewith. The switch arms 63 and 64 are varied in unison in accordance with the desired selection and may be manually operated or automatically operated as by means of a telephone dial. Furthermore, each of the switch contacts 60 are connected to corresponding contacts 59 of the switch 57.

A bridge network includes a pair of adjacent fixed resistor arms R10 and R11 and an opposite pair of adjacent arms consisting of the resistor element of a potentiometer P6 and a variable multitapped resistor R13 the terminals of which are defined by an end of the resistance element thereof and the switch arm 64. The taps on the resistor R13 are connected to corresponding switch contacts 61. Connected to the remote ends of the bridge resistors R10 and R11 is a D.C. voltage source 65 and the opposite ends of the bridge network are connected to the control terminals of a polarized relay 66 which may be of the galvanometer type and includes an arm 67 and contacts 67a and 67b. The arm of the potentiometer P6 is controlled by a bidirectional motor 68 which is connected through a reversing switch 69 to a D.C. power source 70 as will be hereinafter set forth.

A pair of relays 10S and 11S have one terminal of each of their actuating solenoids connected to relay contacts 67a and 67b respectively and the other terminals connected through a current source to the relay arm 67. Thus an unbalance of the bridge will close either contact 67a or 67b depending on the direction of unbalance of the bridge to alternatively actuate the relay 10S or 11S. Associated with the relay 10S are normally open contact pairs 10S1, 10S2 and 10S3 and with the relay contact pair 11S1, 11S2, 11S3 and 11S4. One of the contacts 10S1 is connected to one terminal of one of the relay 56 solenoids, the other terminal of which is connected through a current source to the other contact 10S1 and one contact 11S3 and through the other switch 56 solenoid to the other contact 11S3. The contact pair 10S2 are connected across the deck rewind terminals 19 and the contact pair 10S3 are connected through the D.C. power supply to the input terminals of the reversing switch 69, the output terminals of which are connected to the motor 68 terminals. The contact pair 11S1 are connected in parallel with the contact pair 10S3, the contacts 11S2 are connected through a power supply to the switch 69 reversing solenoid; and the contacts 11S4 are connected across the fast forward deck terminals 16. The switch arms 58 and 63 are connected to respective deck stop

terminals 17 and through a power supply to the actuating solenoid of a time delay relay 75, the normally open contacts of which are connected to the playing speed deck terminals 18.

Considering now the operation of the apparatus last described and assuming that it is desired to play back a selection in advance of the current position of the tape the switch arms 63 and 64 are moved to the desired positions, the switch 64 unbalancing the bridge from its previously balanced position in a direction so that the output signal actuates the relay 66 to close contacts 67 and 67b, and actuates the relay 11S and close the associated relay contacts. Closed contacts 11S2 energize the switch 69 solenoid and closed contacts 11S1 connect the power supply 70 to the switch 69 terminals to slowly drive the motor 68 in a forward direction and with it the potentiometer P6 arm. The closed contacts 11S3 energize the corresponding switch 56 solenoid so that the relay 57 steps in a forward direction when actuated and the closed contacts 11S4 actuate the deck fast forward motion. As the tape 50 advances and successive transparencies 51 are brought into registry with the photoelectric cell 53, the relay 54 and switch 57 are correspondingly pulsed until the arm 58 is brought into engagement with a tap 59 corresponding with a selected tap 60 to short the stop terminals 18 to stop the reels and to actuate the relay 75 which a short time thereafter, about two seconds, shorts the deck forward play terminals 18 to initiate the play back of the desired tape selection. The potentiometer P6 arm is advanced until the bridge is balanced, corresponding to the current tape selected position to open the relays 66 and 11S and the associated contacts whereby to de-energize the motor 68, switch 56 solenoid and open terminals 16 and 19. It should be noted that the bridge assumes the position of the tape so as to control the tape direction upon a further selection. Thus the bridge acts as a direction sensing device.

When the selected point on the tape trails the current position of the tape, the bridge output actuates switch 66 solenoid to close contacts 67a and 67, actuating the relay 10S and closing the corresponding contacts. The closed contacts 10S1 reverses the switch 56 so that switch 57 steps in a backward direction; the closed contacts 10S2 shorts the rewind terminals 19 to rapidly rewind the tape and the closed contacts 10S3 energize the motor 68 in a reverse direction. The subsequent operation is then similar to that described above.

In FIGURE 4 of the drawing there is illustrated an apparatus in which the position of the tape is determined by counting light reflecting areas carried at predetermined spaced points on the tape. Specifically the tape 72 carries suitable light reflecting spots in areas 73 at regularly spaced positions along the tape. A light 74 and a photoelectric cell 76 are directed toward the tape 72 so that the cell 76 generates a pulse when in registry with a spot 73. The output of the cell 76 is counted by a bidirectional electronic counter 77 of any well-known type, the direction of which is controlled in any suitable manner by the direction of movement of the tape. The information derived from the counter 77 is then compared with information relating to the selected tape position as derived from a suitable device 78 and a signal generated and fed to the deck control device 79 which in turn controls the tape movement and playing in the manner of the earlier embodiments.

The apparatus illustrated in FIGURE 5 of the drawings employs a conventional recording tape without any modification thereof, the tape position being determined by marked disc 80 driven directly by or in synchronism with the take up reel. The disc 80 is provided with regularly circumferentially spaced light reflecting areas 81 and a serrated periphery. A light 82 and a photoelectric cell 83 are directed at the face of the disc 80 so that the rotating disc generates pulses which are derived from

the cell 83 and counted in any desired manner, for example in the fashion of the last described embodiments. The direction of counting is controlled by means of a resilient contact arm 84 whose free end engages the disc serrated edge and is swung into alternative engagement with one of a pair of oppositely disposed registering contacts 85. The arm 84 and contacts 85 are connected to the counting mechanism to vary the direction thereof to correspond to that of the tape. The counted pulses, which are an indication of the tape position may be employed in transporting the tape to a selected point in the manner described earlier.

It should be noted that the various control and counting stages described above may be interchanged and that other types of counting devices may be employed either mechanical, electromechanical or electronic.

While there have been described and illustrated preferred embodiments of the present invention it is apparent that numerous alterations, additions and omissions may be made without departing from the spirit thereof.

What is claimed is:

1. An improved apparatus for use with a tape transport device having a fast wind, a fast rewind and a slow forward control and for transporting said tape to a preselected point comprising means for generating a signal including a bridge network provided with a first resistor arm variable in accordance with said preselected point and a second resistor arm variable in accordance with the position of said tape, means responsive to said signal to alternatively actuate said fast wind or fast rewind control to transport said tape toward said preselected point and means actuating said slow forward control upon said tape reaching the vicinity of said preselected point.

2. An improved apparatus for use with a tape transport device having a fast wind, a fast rewind and a slow forward control and for transporting said tape to a preselected point comprising means for generating a signal including a bridge network provided with a first resistor arm variable in accordance with said preselected point and a second resistor arm variable in accordance with the position of said tape, means responsive to said signal to alternatively actuate said fast wind or said rewind control and means actuating said slow forward control upon said tape reaching a point trailing said preselected point a predetermined distance.

3. An improved apparatus in accordance with claim 2 wherein said forward control actuating means is responsive to said signal.

4. An improved apparatus in accordance with claim 2 including a payout actuating means actuated in response to said signal.

5. An improved apparatus for use with a tape transport device having a fast wind, a fast rewind and a slow forward control and for transporting said tape to a preselected point, a first relay for alternatively actuating said fast wind control and said slow forward control and having a first solenoid, a second relay for actuating a play out control and having a second solenoid, a third relay for actuating said fast rewind and including a third solenoid, first, second and third gas discharge tubes having output electrodes and control grids, a first voltage source, means connecting said tube output electrodes through said respective solenoids across said first voltage source, means for applying successively greater cut off bias voltages to said first, second and third control grids and means for applying a common input signal to said control grids in accordance with the relationship of said preselected point and the position of said tape, said signal being sufficient to fire said three tubes upon said tape position being in advance of said preselected point, to fire said first and second tubes only upon said tape position substantially coinciding with said preselected point, sufficient to fire only said first tube

upon the position of said tape trailing said preselected point a predetermined distance.

6. An improved apparatus for use with a tape transport device having a fast wind, a fast rewind and a slow forward control and for transporting said tape to a preselected point, a first relay for alternatively actuating said fast wind control and said slow forward control and having a first solenoid, a third relay for actuating a play out control and having a second solenoid, a third relay for actuating said fast rewind and including a third solenoid, first, second and third gas discharge tubes having output electrodes and control grids, a first voltage source, means connecting said tube output electrodes through said respective solenoids across said first voltage source means for applying successively greater cut off bias voltages to said first, second and third control grids and means for applying a common input to said control grids in accordance with the relationship of said preselected point and the position of said tape, said signal being sufficient to fire said three tubes upon said tape position being in advance of said preselected point, to fire said first and second tubes only upon said tape position substantially coinciding with said preselected point, sufficient to fire only said first tube upon the position of said tape trailing said preselected point a predetermined distance, said signal applying means including a bridge network having a first resistor arm variable in accordance with said preselected point and a second resistor variable in accordance with the position of said tape.

7. An improved apparatus in accordance with claim 6 including means for varying the bias on said control grid in accordance with the speed of movement of said tape.

8. An improved apparatus in accordance with claim 6 wherein at least one of said tube output terminals is connected to said voltage source through a corresponding relay solenoid by way of a first pair of normally closed contacts actuated by said relay and a second pair of normally open contacts actuated by said relay and connecting said solenoid to a source of energizing current.

9. An improved apparatus in accordance with claim 8 wherein said solenoid is connected to said energizing current source through said second contacts in series with a third pair of contacts actuated by another of said solenoids.

10. An improved apparatus in accordance with claim 6 including a second source of alternating current, and means alternatively connecting said first tube output terminals through said first solenoid to cross said first or second current sources and actuable by another of said relays.

11. An improved apparatus for use with a tape transport device having a fast wind, a fast rewind and a slow forward control and for transporting said tape to a preselected point, said tape carrying spaced indicia along the length thereof comprising means for sensing said indicia means responsive to said sensing for counting said indicia as said tape moves and accumulating said counts in accordance with the direction of movement of said tape, means generating a signal including a bridge network having a first variable resistor arm and a second rheostat arm and selectively operable means for adjusting the resistance of said first arm in accordance with said selected point and means automatically regulating the resistance of said second arm to balance said bridge and means alternatively actuating said rewind and wind controls in accordance with said signal.

12. An improved apparatus in accordance with claim 11 wherein said sensing means includes a light source and a photoelectric cell directed at said tape, said tape carried indicia varying the light reaching said cell.

13. An improved apparatus in accordance with claim 11 wherein said count accumulating means includes a bidirectional solenoid operated stepping switch actuated by said sensing means and means controlling the direction of said stepping in accordance with the direction of movement of said tape. 5

14. An improved apparatus in accordance with claim 11 wherein said control actuating means includes a pair of relays alternatively actuated in accordance with the same of the signal from said bridge. 10

15. An improved apparatus in accordance with claim

11 including means responsive to said counting means for actuating said slow forward control.

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Along Madison Avenue With Kaselow

New Electronic Sounds for Commercials

By Joseph Kaselow

A few days ago we journeyed out to music composer Raymond Scott's mansion in Manhasset on the trail of a device he invented that makes "new sounds" for radio and TV commercials. (You may think you've heard all there is, but you ain't heard nothin' yet.) Mr. Scott, a slight, soft-spoken, soft-eyed



KASELOW

man, greeted us at the door in shorts and open-necked sports shirt, and led us into an enormous sitting room where we sat down. When he spoke he was accompanied by a beep-swish sound coming from a room to the right that looked like it might be powering the Defense Department's DEW radar network.

"Writing a jingle or any lyric," he said right off, "is like writing a letter—particularly a love letter." (His wife is Dorothy Collins who is in Toronto doing "South Pacific"). "You must say it simply and with feeling. And you might also say I don't feel that writing jingles is cheapening. We're proud to be said to be writing jingles. Perhaps if you're just a jingle writer you might be a little embarrassed by it."

As most people know, Mr. Scott is not just a jingle writer. He started many years ago developing new and distinctive sounds in popular music. If you're pre-Presley you might recall "Twilight in Turkey," "Powerhouse," "Dinner Music for a Pack of Hungry Cannibals," "The Toy Trumpet" and, a personal favorite for this section, "Business Man's Bounce."

One-Word Key

He went on: "I can say, probably with a lot of bias—no, not with bias, because I believe it—that music develops what I call a satellite, or orbital, effect. It keeps going round and round in your mind and heart. The key to it all is in one word—love. People say, for instance, 'I love that tune.' The word crops up continually in his conversation."

As for the "new sound," it developed this way. Mr. Scott and his partners in the Jingle Work Shop, at 140 W. 57th St., took to heart that most reiterated request of ad agency men—"We don't want just another jingle." Mr. Scott, a creative electronic genius as well as a composer, considered this a challenge. (He's got some \$100,000 worth of electronics equipment stashed around the house and a full-time man turning his ideas into reality and keeping the stuff in shape.) Out of his imaginings came a device, as yet unnamed. (His sales manager calls it the "Karloff," which might give you an idea.)

On Sure Footing

Mr. Scott led us into the beep-swish room to show us his brain-child, and we felt a certain sense of security only because we were wearing rubber-soled shoes. Heart of the unit is a control panel with some hundred or so buttons and dials from which Scott can get an infinite number of rhythms and sound combina-

Slogan Fight: Bud Vs. Bugs

Anheuser-Busch, Inc., sought yesterday to obtain an injunction to enjoin Chemical Corp. of America from using the slogan, "Where There's a Life, There's Bugs." The injunction was requested in the United States District Court for the Northern District of Florida, Tallahassee division. The chemical company's slogan was for its product Freewax, a self-polishing floor wax that shines floors and kills bugs, too.

Anheuser-Busch sells Budweiser beer and uses the slogan, "Where There's a Life, There's Bud."

tions—treble, bass, beeping, swishing, honking—you name it and he'll come up with a reasonable facsimile. Sometimes he'll tie it in with another invention of his, the Clavivox, which is supposed to approximate the human voice in some of its phases.

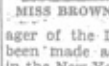
After demonstrating the device, Mr. Scott showed us through his electronics and working rooms (about seven or eight of them) downstairs. It may have been our imagination, but as we were leaving we could have sworn the Clavivox, off in the distance, was saying, "Let's stop spinning the wheels and get into high gear."

Field Notes: D. Robert Parman, a director and senior vice-president of Ted Bates & Co., has been elected chairman of the board of directors of the New York County chapter of the Multiple Sclerosis Society. Mr. Parman also is a member of the society's national board. . . . Sigmund Gottlob and his National Theatre and Concert Magazines will be exclusive ad representative for the souvenir magazine for the Royal Ballet's (formerly Sadler's Wells) 149-performance tour of the United States starting Sept. 11. . . . The New York Employing Printers Association added its 1,000th member yesterday at ceremonies in the association's headquarters, 461 Eighth Ave.

Agency Appointments: Five Pepsi-Cola bottling companies in the greater Boston area have appointed B. B. D. O., effective Aug. 1. The advertising agency handles the parent Pepsi company. . . . Pierce's Proprietaries, Inc., Buffalo, N. Y., to Kastor Hillon Chesley Clifford & Atherton, Inc., for Dr. Pierce's Golden Medical Discovery. The agency handled the account from 1950 to 1957, after which it was handled by the Mogul agency. Budget: \$250,000 plus.

. . . South Bend Tackle Co., Chicago, to Gourfain-Loeff, Inc.

Jobs: John Chapin has been named vice-president and manager of the Detroit office of Grant Advertising, Inc. Mr. Chapin, vice-president and account supervisor of the Electric Auto-lite Co. account, will continue to supervise Auto-lite advertising, in addition to his new duties.



MISS BROWN Myers B. Cather, former manager of the Detroit office, has been made account supervisor in the New York office, new national headquarters of the agency. . . . Robert S. Morley, formerly of Cunningham & Walsh, Inc., and Sam Tarricone, formerly of Benton & Bowles, Inc., to DeLoach, Clifford, Steers & Sheffield, Inc., as group supervisors in the media department. . . . Mary L. Brown has been named director of women's activities of Hill & Knowlton, Inc. Miss Brown, a poet and short-story writer, was director of publicity for the cosmetics division of Lever Brothers before joining Hill & Knowlton six years ago and formerly was account executive on the Occa-Cola account. . . . Louis A. Kennedy, associate copy director of Leo Burnett Co., Inc., and Raman W. Stults, administrative co-ordinator, have been named vice-presidents. . . . Thomas M. Vincent, former product manager of Colgate-Palmolive, to Ogilvy, Benson & Mather, Inc., as an account executive on Pepperidge Farm.

. . . Robert D. McLean, promoted to assistant to the national sales program-distillers Co. . . . E. Drew Rossell, former public affairs officer with the U. S. State Department, has opened new offices in West Islip as public relations consultant. . . . Leonard Mayem, formerly of Santa's Playthings, Inc., named director of market research of American Metal Specialties Corp., and head of a new department to

Russian Oil

(Continued from page 29)

headline-grabbing deals in Cuba and India. But she is also selling or bartering oil to Italy, the United Arab Republic, Germany, Finland, Sweden, France, Brazil, Uruguay, Japan and the United Kingdom.

Her biggest market is Italy where last year exports totaled 62,000 barrels daily or more than 12 per cent of Italian demand. There are growing fears in some oil circles that half of Italy's oil consumption may be furnished by the Russians in the not-too-distant future.

"The Oil & Gas Journal" summarizes the Russian export threat on already flooded world markets by noting "marketers are beginning to feel a little like the man with both feet caught in a bog when the first of a swarm of mosquitoes locates him and then buzzes off



Edward W. Ward

Celanese Plastics V.P.

Edward W. Ward has been named vice-president and director of marketing for Celanese Plastics Co., a division of Celanese Corp. of America. Frank B. Cameron has been appointed vice-president and manager of manufacturing.

Newspaper Notes: The Joint Committee on Newspaper Advertising of the American Association of Advertising Agencies and the American Newspaper Publishers Association has issued a new study designed to improve the quality of black-and-white reproduction in newspaper advertising, suggestions for preparing art

Reports

(Continued from page 29)

earnings for the first half slumped sharply to \$312,125 or 47 cents a share, on sales of \$98,995,752. This compares with first-half 1959 earnings of \$1,002,273, or \$1.51 a share, and sales of \$90,537,800.

American Potash & Chemical Corp. earned \$2,521,306, or \$1.11 a share, on sales of \$26,423,822 in the first half. In the corresponding period of 1959, net was \$2,539,748, or \$1.07 a share, and sales totaled \$27,715,232.

For the June quarter alone, net was \$1,342,987, or 57 cents a share, compared with \$1,427,715, or 60 cents a share. Sales were \$13,198,291, against \$15,047,319.

Stokely-Van Camp, Inc., reported for the fiscal year ended May 31 estimated net income of \$3,300,000, or \$1.46 a share, and sales of \$161,800,000. In the preceding fiscal year net was \$4,529,163, or \$2.21 a share, and sales were \$158,233,971.

work, engravings and duplicate printing material. The report replaces two reports, covering art work and plates, issued by the committee in 1948 and 1949. . . . Irvin S. Taubkin has been named promotion director of "The New York Times." Mark E. Senigo, assistant promotion manager, succeeds Mr. Taubkin as promotion manager.

Radio & TV Notes: Richard J. Raburn, director of accounting of NBC, has been appointed controller. . . . William C. Geiman has been promoted to the new post of director of program services of ABC-TV. . . . George Patrick, co-manager of daytime program services, and Richard A. Munroe, co-commercial co-ordinator, of Smith-Craft Corp., an independent TV syndicator, have been named at 69 Newbury St., Boston. Julian J. Smith, chairman of Smith-Craft Corp., is president of NRCA (NBC) has completed a survey of all 520 TV stations in the country which shows that 387 are equipped for network color. A total of 104 are equipped to originate local color, in some form, and stations equipped to re-broadcast network color cover areas with 98 per cent of the TV homes in the country.

Advertising Briefs: Ben B. Bliss Co., Inc., has moved to 574 Fifth Ave. . . . The Marketing Executives Club, (formerly Merchandising Executives) will hold a luncheon Thursday in the Lexington. Speaker: Stuart Watson, chairman of McCann-Erskine, Inc. Topic: "Marketing and the Marketing Organization."

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of top cattle, swine,
dairy and poultry
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Murray Hill 3-6161



Raymond & Dorothy with Les Paul & Mary Ford; promotional photo for their appearance on NBC's *Bell Telephone Hour*, January 1960.

In his 2011 book *Everyone Loves You When You're Dead*, author Neil Strauss wrote about visiting Raymond and Mitzi Scott in 1992. Because Scott had suffered several strokes, he could barely speak, so Strauss interviewed Mrs. Scott, and added this footnote: "During an interview with Les Paul, the musician who helped develop the electric guitar and popularize multi-track recording, I mentioned Raymond Scott and accidentally set him off on a tirade. Evidently, the two were rival innovators. 'He used to come to my house,' Paul snapped. 'He sure had some equipment though. I envied him.'"

THE RAYMOND SCOTT STORY

Though Raymond Scott is known to millions for his achievements in the field of music, few people know that parallel to his musical career he maintained an impressive electronic laboratory. Scott originally prepared for the field of engineering but when in the process of arranging to enroll at Brooklyn Polytech, his brother persuaded him to take advantage of his musical talent and study at the Juilliard of School of Music instead.

His interest in electronics, however, remained as intense as ever, and with the passing of the years, Scott found the time to develop a host of electronic devices.

CREATED:

The Raymond Scott Quintette - 1936.

Universal Recording Company - 1935 - sold studios, 1948
(one of the earliest instantaneous disc recording companies)

Circle Music, Inc. - 1935 - music publishing - sold to Warner Brothers, 1940.

Gateway Music, Inc. - 1940 - music publishing.

Manhattan Research, Inc. - organized 1949.

The World of Sound - Electronic Music Studio - 1960.

ASSOCIATIONS:

20th Century Fox: Five films with the Raymond Scott Quintette.

CBS: Musical Director, various periods - 1938 through 1960.

NBC: Conducted "Hit Parade" - Radio and TV - 1949 to 1958.

Columbia Records: Decca Records: Many recordings.

American Ballet Theatre: Composed "Ballet Quintette."

Broadway Musical: "Lute Song" with Mary Martin (composed musical score.)

U. S. and Canada Tours - with the Raymond Scott Orchestra in the 1940's.)

Chronicle compiled by Scott around 1960. Scott was attempting to "reinvent" himself. Having left TV's *Your Hit Parade* in 1957, he now wanted to produce electronic music. He was "known to millions" for his Quintette, big bands, radio orchestras, records, and conducting *Your Hit Parade*. But, the page claimed, "few people know that parallel to his musical career he maintained an impressive electronic laboratory." It's salesmanship, threading the past with the present (and by implication, the future). Some dates in the chronicle are erroneous (MRI was founded in 1946; his publishing was sold to Warner Bros. in 1942; we don't know why he claimed an association with CBS as late as 1960). The list seems to outline what Scott considered his most prominent achievements, but he is ready to transition into the field of electronic music and attract clients. It worked. He produced a commercial soundtrack for Vicks Cough Drops in 1960, and within the next five years his client roster included IBM, Ford, Jim Henson, Cola-Cola, General Motors, Ideal Toys, Hostess Twinkies, Domino Sugar, Nescafé, and others.

Commercials go off the beaten sound track

- **Inventor Raymond Scott produces a new machine for his radio/tv commercials firm, The Jingle Workshop**
- **Infinite musical-electronic combinations now give commercials production a brand new audio dimension**

For many years Raymond Scott was well-known as the musical director of *Your Hit Parade*. But lately Scott has been attracting a good deal of attention as the inventor of electronic equipment for musical effects. One of his machines, developed in the last few months, is capable of startling applications to radio/tv commercial production.

Since October 1960, commercials using Scott's electronic and musical effects have gone on the air for Vicks, Lever Bros., Alcoa, and Hamm's beer. Commercials for other advertisers are now being developed and will be broadcast shortly.

Scott's machine, actually a control console which selects, modifies, and combines sounds produced by the electric organ, by other musical instruments, and by electronic means, has 200 sound sources and is capable of quickly producing infinite and varied musical and electronic effects. Known affectionately as Karloff, the machine could only have been put together by a musician (such as Scott) who is also a devoted electronic inventor (such as Scott).

The development of the machine had its beginnings in the spring of this year when Carl Buffington, radio/tv director of Morse International, asked Scott to develop an unusual approach to a spot campaign.

Scott happens to have had a well-equipped electronic and machine shop in the basement of his Manhasset, L. I., home. He has had a full-time technician at work there for 11 years to realize some of his ideas.

What began as a hobby turned into a production device for radio/tv commercials. The electronic and musical equipment which Scott assembled to produce commercials for Vicks became the core of his present machine, a machine which is still growing. That's not all; Scott is ready to invent other musical-electronic machines or accessories as he needs them. His mechanical and electronic facilities, worth \$100,000, are a plant right on the premises of his home which shop and studio operators can envy.

Had Scott possessed only an electronic and mechanical talent, his invention might have passed unnoticed. But as a celebrated musician with so much experience in broadcasting and advertising, Scott's achievement as an inventor could not long be kept a secret. To date, representatives of 20 advertising agencies, three film producers, and one station group have journeyed out of Manhattan on the Long Island Expressway to Manhasset to visit Scott's musical-electronic laboratory.

Scott has already delivered com-

mercials for Vicks (Morse International), the Lever Bros. tablet detergent Vim (OBM), Alcoa (Ketchum, McCloud & Grove), and Hamm's Beer (Campbell-Mithun). He is currently working on station identifications for WQXI, Atlanta, an Esquire-Coronet station. Representatives of these clients and agencies who have made the journey to Manhasset to see Scott's invention include the following:

Morse International: Carl Buffington, radio/tv director; Campbell-Mithun: music copywriters Dick Wilson and Tom Shallbetter; OBM: Newt Mitzman, Chet Maxwell, and v.p. Dave McColl; JWT: Bill Gibbs, plus a large number of senior producers, animation directors, and copywriters; BBDO: v.p. Bernie Haber and commercials writers; Compton: Ruth Davis for Ivory, Martin Slattery, Ed Rizzo, Wes Eimmart for Sterling Drug, Marian Kraft, and senior v.p. Anderson Hewitt.

Also, Griswold-Eshleman of Cleveland: Ralph Borzi; Y&R: Bill Whitman; N. W. Ayer: Bill Demarest and Chuck Manno; McCann-Erickson: Hal Matthews and Beverly Smith; KM&G: Warren Rossell; L&N: Ed Flynn, Gene Robbins, Jim Harelson, and Shawn Morison; EWRR: Bill Thornhurst and Jack Schwartz; Gardiner: Jules Bass and Bill Byrne; C. W. Hoyt: Tom Lee; K&E: Harry

Stoddard and Frank Amy; FC&B: Gordon Kolvenbach; B&B: Roy Eaton and Norman Tabac, and D-F-S: Arnold Brown.

A Canadian visitor, Henry Karplus, radio/tv director of Reynolds-Reynolds and Co., Ltd., of Toronto, described Scott's achievement as "the commercial of the future."

Film producers who have made the visit to Manhasset to see the new device include Bert Hecht of Animation, Inc., Mel London of Wilding, and Joe Sperry, an independent producer and consultant.

The first broadcaster to find out for himself what Scott has been doing is Barry Sherman of the Esquire-Coronet station division.

"I've invented this—what should I call it—thing," says Scott, "but I don't want to feel tied to it. Advertisers are always looking for something new in commercials, and I've put together a way of getting endless special effects, new sounds, rhythms, moods. I think I have added one more instrument to the orchestra that can be used in commercials. But it's just that, one more instrument to go to, and not anything to replace mu-

sicians and voices. Some of these commercials work best with these special effects along with singers, musicians, or an announcer."

Scott is very reluctant to give his machine a name, since it is the musical talent using the machine as a tool, and not the machine itself, that really counts. Charles Barclay, manager of Scott's music commercials company, The Jingle Workshop, has suggested that it be called "audimation" since it does for audio what animation does for pictures. But some have confused "audimation" with "automation" and the word hasn't been accepted. The machine's unofficial nickname, Karloff, is the name of an actor.

The machine uses several other sources of sound. One is a Hammond electric organ. Others are electronic tone generators. Still others can be added if needed. A control panel directs pitch, timbre, intensity, tempo, accent, and repetition. It can select from an unlimited number of sources and make up infinite combinations and permutations.

The Manhasset behemoth, containing an electric organ, can do any-

thing the organ can do and virtually anything imaginable beginning with an organ. It can sound like a group of bongo drums. It can give impressions which suggest common noises. It can create the mood of musical tone-poems. And it can also take the advertiser's theme music and produce limitless emotional variations on it to suit a variety of musical styles—all, of course, if Scott is at the controls.

Compared to other musical-electronic effects methods, which rely heavily on playing tape off-speed or backwards in the fashion of modern "concrete music," Scott's approach is far less time-consuming and produces a much wider range of results. Compared to music from conventional sources, it is slower in development but faster in production. It is also slightly cheaper than ordinary music.

If Karloff doesn't become the accepted name for a process which mixes so many musical and electronic elements together and makes them stay together, perhaps someone might suggest that it be called Scott's Emulsion.

RAYMOND SCOTT'S COMMERCIALS MACHINE

Where the sound comes from: an electric organ, a Clavivox (another Scott invention), and electronic tone generators which are capable of producing any pitch that is selected.

What happens to the sound: it is given a basic rhythmic continuity by a rotating scanning device in which 200 elements can be combined in infinite permutations of pitch, tempo, meter, timbre, or special mood.

What the result is like: anything from a set of bongos to a full orchestra, from a whimsical pop and squeak to an evocative emotional background setting the scene of a commercial. Voices and other instruments which are used blend well in the final delivered commercial.

Who's using it: Vicks (Morse International), Vim of Lever Bros. (OBM), Alcoa (KM&G), Hamm's (C-M), and Coronet-Esquire station WQXI, Atlanta.



"Now here's a
musical team that's
in tempo with
the times..."

Say *Raymond Scott*

and *Dorothy Collins*

a most famous musical team themselves



"The amazing potentials of our modern electronic marvels—the Wurlitzer Electronic Piano and the Wurlitzer Side Man—open new ways for us to express ourselves musically!"

Wurlitzer Electronic Piano Pack-up luggage type portable or handsome console. Plays wherever there's an electric outlet. Earphones plug in for completely private playing or practice . . . stays in tune. A Raymond Scott personal favorite for composing and arranging.

Wurlitzer Side Man All electronic, automatic percussion ensemble. No tapes or records. Complete control over tempo and rhythm. Offers waltz, tango, western, fox trot plus 6 other rhythms. Cymbal, bass drum, brush, maracas, and others. Infinite tempo possibility. May be played manually. Portable.

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Designers and Manufacturers of Electronic Music and Musique Concrète Devices and Systems

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Designers and Manufacturers of Electronic Music and Musique Concrète Devices and Systems

MANHATTAN RESEARCH INC.

est. 1946

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Keyboard theremin*

Vibrato devices
(amplitude & frequency)

Audio spectrum filters

Circle generators*
(orig. sound producing source)

Pre-set program devices*

Amplitude followers

Signal peak triggers*

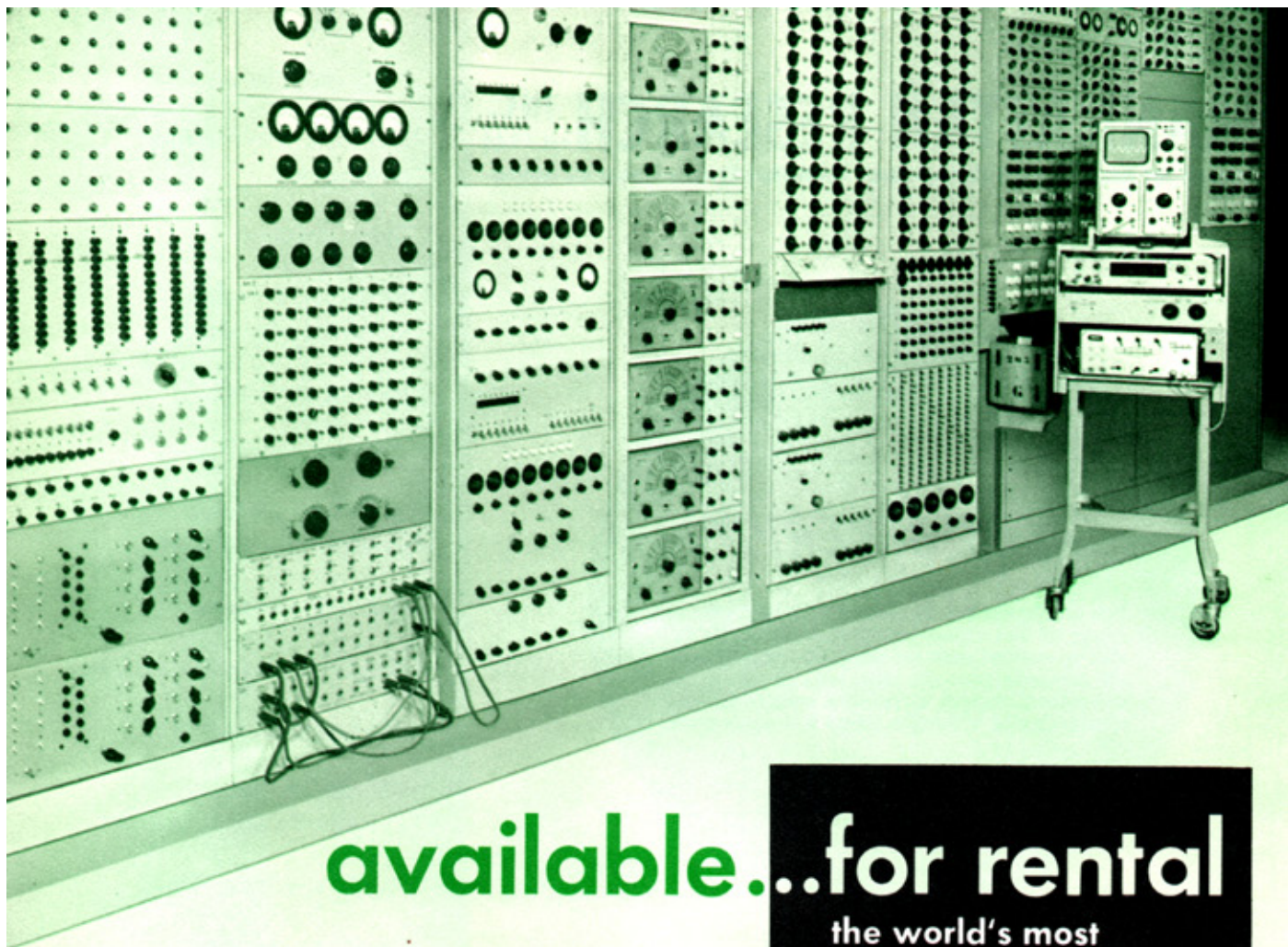
Chromatic electronic
drum generators*

Automatic signal repeaters

Electronic switches

Frequency dividers

1
9
6
1



available...for rental

RENTAL

Manhattan Research offers on an hourly basis, one of the world's most elaborate facilities for the creation of Electronic Music and Musique Concrète. In addition to both classic and original devices for sound generation and processing, the facility includes the Martenot, Ondioline, and a special modification of a Hammond organ. Nine recording channels on four tape machines are available as the recording medium. A skilled technician for guidance in the use of this equipment is included in the rental fee. For a detailed list of the devices in the system, see the reverse side.

SALES & SERVICE

For those who wish to build up their own facility, there is available a complete line of Electronic Music and Musique Concrète devices and systems. Details and listing are shown on the reverse side.

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Designers and Manufacturers of Electronic Music and Musique Concrète Devices and Systems

MANHATTAN RESEARCH INC.

est. 1946

the world's most
extensive facility
for the creation of...

**Electronic
Music
and
Musique
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presented by

**MANHATTAN
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Lecture on electronic music in commercials

In summer 1962, Scott delivered a lecture at the Advertising Age Creative Workshop in Chicago detailing his electronic music inventions and their application in radio and television commercial soundtracks. The presentation, which included slides and film clips, was taped in rehearsal by Scott at home. Below is a verbatim transcript of this recording.

LADIES and gentlemen, I'd like to start my talk on electronic music with a leap into the future—about 45 minutes that is, when one of you may be asking, “Well, how exactly would you define electronic music?” Well, *exactly*, there is no exact definition. The art is very young, even though way back in 1895 there was a demonstration of the first electric music machine. To me, the exciting beginning was an invention by a professor, Leon Theremin. I'm sure many of you recall the use of this instrument in the movie *Spellbound*, an audio experience that's pretty hard to forget. Here is a demonstration on tape of the Theremin. Very difficult to play, incidentally, but more about that later.

[Theremin demonstration]

Another type of electronic music activity is that devoted to the simulation by electronic means only of conventional musical instruments. Back in 1948, Hugh Le Caine, a gifted scientist and musician—Canadian, by the way—was able to achieve the following wonderful results. First, I'd like to play the opening clarinet solo from *Rhapsody in Blue*, simulated by means of tubes and other standard electronic components, with Mr. Le Caine at the controls.

[*Rhapsody in Blue* opening]

I'd like to say, the piano is real, the clarinet is strictly electronic.

Here the trumpet is simulated. Not only a trumpet, however, but that of Clyde McCoy and “Sugar Blues.”

[excerpt from “Sugar Blues”]

And now for the sound of strings. Here, Hugh Le Caine creates an impression of a neighborhood string quartet—a doctor, a lawyer, a grocer and a union official, who get together once a week to play their favorite quartet pieces. Electronic, again.

[excerpt from unidentified classical work]

And, mind you, all of this was accomplished back in 1948 by Mr. Le Caine. This exciting talent on his part to so wonderfully simulate the sound of conventional instruments electronically. *Musique concrète* is a name of another electronic sound activity, and flourishes very much in France—Paris, that is—but

now to some degree throughout other parts of the world. In *musique concrète*, the sources of sound are usually taken from life, picked up by a microphone, recorded on tape, very much tape edited. The scissors plays a very important part on this process. Then it's furthered processed in a great variety of electronic ways to provide frequently sensational, audacious, fascinating effects. And sometimes, downright puzzling. Decide for yourself by listening to an excerpt of a piece called “350-2” by Gordon Longfellow. Incidentally, the reason for this title is that, according to the record notes, that he used two #350 Ampex machines—and also, he's an engineer at Ampex. Well here it is, “350-2.”

[excerpt from “350-2” (Longfellow)]

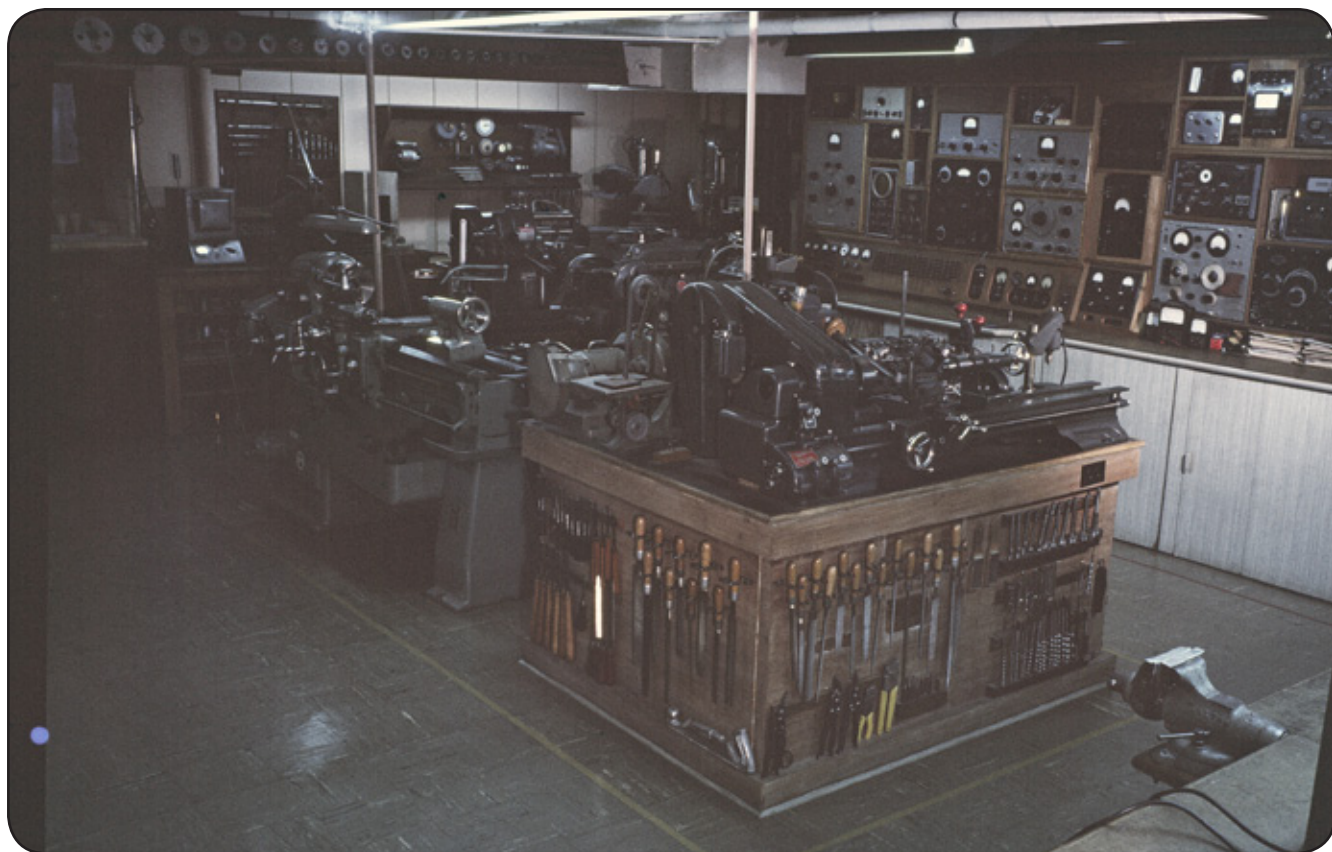
I said a little while ago that *musique concrète* is taken from life, and those were not electronic whines or sounds that you heard—those were a couple of vacuum cleaners. Next I'd like to play a short section of the music to the ballet *Electronics*, composed by Remi Gassmann, and produced this past season by the New York City Ballet Company. In this work, the electronic leanings are towards generating systems—modulating systems—actuated for the most part by keyboard-operated devices, plus multiple recording techniques, of course. Here is a short quote from *Electronics* by Remi Gassmann.

[excerpt from *Electronics*]

There are some additional schools of thought in the production of electronic music. But time not permitting, I guess I better get on with electronic music, and radio and television commercials.

About two years ago, Morse International came to us with a project. They needed a jingle for Vicks Medicated Cough Drops, but the specifications were, not just another spot. The air was just too crowded with musical commercials as it was, and a distinctive new sound had to be found.

That, ladies and gentlemen, was the trigger that got us started in this new area of electronic music in advertising. Because I had been a long time experimenter in electronics and had through the years assembled an electronic laboratory and model shop facility, I decided right then and there to go down—



stairs and to see what I could conjure up in the way of a new sound—an electronic sound for Vicks Cough Drops. Let me take you downstairs and show you these technical facilities—facilities we think important to the creation and constant development of an electronic music studio.

This room is used for the storage of component parts, and I take it we're supposed to have, oh, maybe a half million separate items or so, but we really don't know.

Here is the same shot, but with the cabinet doors open, so that you can gain a look, so to speak, as to what's really in there. This next shot is a close-up of one of our relay cabinets. You can't, incidentally, have too many relays. An electronic music studio wants to grow and grow and grow and grow, and relays get used up real fast.

Here is the metalworking shop, and electronic measuring equipment setup. There are three lathes, five drill presses, three kinds of welding, an electric furnace, and just about every other basic metalworking tool—for small things, that is. This, I suppose, could be described as a glorified Shopsmith, in that it's about twenty machine tools in one, but in reality a very beautiful machine. It's precise, in its many roles as any *[audiotape damaged for three seconds]* ...

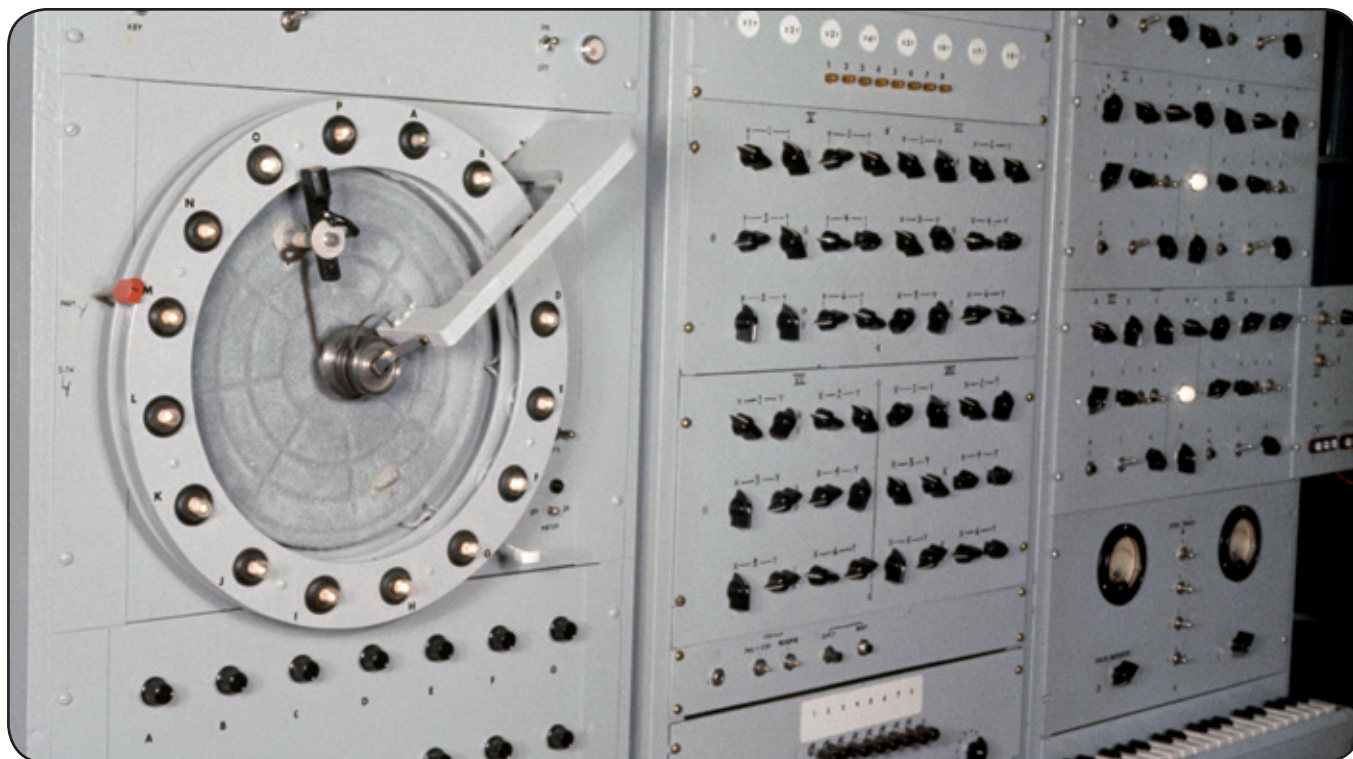
Here is the work bench, and above it, machine shop measuring tools—micrometers, calipers, and the like. Now, the electronic lab measuring equipment. We use this to help build, test and maintain the electronic circuitry involved in the kind of music and sounds we are here to talk about.

But now I'd like to take you upstairs to show you what we've been building with all of this equipment. This is the first version of our electronic music machine, the one used to create our earliest electronic spot—or semi-electronic spot, to be more exact. The singing voice you will hear in this next tape is not electronic—not at all. It's Dorothy's. Okay, Chuck—the tape.

[\[Vicks Medicated Cough Drops commercial jingle\]](#)

I'd better add—the cough is not electronic either. Incidentally, one of the things we've been working on is the problem of the family resemblance between the electric organ—sometimes called the electronic organ, and by Hammond, the electric organ—and electronic music effects, a resemblance that is taking place a lot less frequently in our more recent efforts.

You're looking now at the present version of the electronic music studio equipment. You see it has grown quite a bit, and from the looks of things, this



The Circle Machine

may be about one-tenth its size in a couple of years from now. The racks you see contain various generating systems, switching systems, modulators, keyers, filters, amplifiers, etcetera.

The Ferris Wheel-like device, at the left, is what we've named the Circle Machine. Here is a closer shot of the Circle Machine—an original development of ours, by the way. And now, a darker picture that will help me better explain how it works. The intensity of each light in the circle is individually adjustable. At the tip of the arm, which I don't think is too clear in this picture, there is a photocell. This cell is part of an electronic sound generating system, so adjusted, that the more light the cell sees, the higher the pitch of the sound produced. The cell also moves around in a circle at adjustable speeds. One of the controls above the circle of lights—and I guess you can't see that, or maybe you can in this picture—changes the pitch center of the complete cycle when required. As you can notice, there are many variable functions possible. Here's a tape demonstration of an electronic effect possible with the Circle Machine.

[\[Circle Machine demonstration #1\]](#)

Now the same effect, but at a higher pitch center—which doesn't, incidentally, change the speed.

[\[Circle Machine demonstration #2\]](#)

The next illustration takes advantage of the fact that the lights can be staggered in brightness—something like what's on the screen right now—and this kind of thing makes possible an effect of this type.

[\[Circle Machine demonstration #3\]](#)

I would like to demonstrate a practical use of the Circle Machine. Problem: Create a sound to go with the sequence in a TV spot in which a storage battery is dying because the electrolyte is rapidly evaporating, ending in a short circuit. This tape demonstration starts with a Circle Machine impression of a dying battery. To keep the sounds generic in this commercial, the Circle Machine is also used in a punctuation matter. Here is the entire soundtrack but without announce copy. Okay, Chuck.

[\[sound effects for Auto-Lite Sta-Ful battery commercial\]](#)

Now the complete TV commercial—the electronic score plus video and announce track so you can observe how the effects were integrated. The film is the Auto-Lite Sta-Ful battery commercial.

[\[Auto-Lite Sta-Ful battery commercial\]](#)

Here we are back at the electronic music studio. This is an instrument I developed some seven

years ago, called the Clavivox. Its purpose: to create a Theremin-like sound, but playable with a piano-style keyboard. The reason? The Theremin is just really too difficult to play. One plays it—or tries to play it—by moving one hand in front of the vertical bar for pitch. The other hand moves about a horizontal play for volume. There are supposed to be three people in the US who play it well. I know of only one—a dentist, Dr. Samuel Hoffman, of Hollywood. But to get back to the Clavivox—it works very well. You can smoothly glide in pitch from any note to any other note in this three octave range by merely pressing piano-style keys. And for vibrato, a pedal is pressed—lightly for a small degree of vibrato, deeper for deeper vibrato. To vary the vibrato speed, a knob is turned. The Clavivox does about everything a Theremin can do, and much more. But enough about that. Listen first to a demonstration of a Theremin-like phrase on the Clavivox while this still photograph remains on the screen.



[Clavivox demonstration #1]

If you noticed, there are no bumps between notes. There's this complete, wonderful legato that's possible with the Theremin, but so hard to control, and here it's just done by playing this like a piano. By the way, the Clavivox is a monophonic instrument, just a plain melody instrument.

Here are some of the new sounds possible on the Clavivox, in which you'll notice that now we can get different kinds of attacks that you can't possibly do on the Theremin.

[Clavivox demonstration #2]

As you probably noticed, there is no pitch ambiguity. The key is pressed for the chosen note and the pitch glide is at the speed the key is pressed. Here are some accurately controlled slower glides and pitch.

[Clavivox demonstration #3]

And that ends the ... *[noise in background]*— and that sound that Chuck made is coming up in this next generator. *[laughs]*

This is a shot of generator three. Generating systems are the heart—or is it the *hearts?*—of an electronic music studio, and furnish the raw materials from which all effects—musical and otherwise—are shaped. Here, for instance, are some spark and explosion sounds made possible by the generators behind these panels.

[sound effects]

Now, for a fluid demonstration of the different sounds available with the devices so far discussed, plus some additional electronic possibilities that we haven't talked about as yet.

[Auto-Lite commercial electronic music and sound effects]

The tape you've just heard is the electronic background score for the Auto-Lite sparkplug commercial that we referred to when we were working on it as the "Ford Family Spot."

We'd like to show you in combination the film with a background track and announce copy. And again, you'll have an opportunity to see how these effects work in conjunction with voice and video. The Auto-Lite Ford Family commercial.

[Auto-Lite commercial audio]

And so, you saw the combination of effects—heard the announce track, and saw the picture. When post-scoring television commercials, like, for instance, the one you just saw, a Moviola is a must in my opinion to integrate as effectively as possible, as accurately as possible, video, announce track and the background electronic score.



Scott's hand with a control panel of his own design; at left, details about operating tape decks



Scott and the "Videola"

As you probably noticed in the previous picture, we have installed a closed-circuit TV camera on the Moviola. The reason for this is that, as you work around the music studio, the swivel-type TV monitor enables you to observe pictures from all around the room. So regardless of where you are when manipulating controls to test certain effects, you can still see picture.

I thought you might be interested to see this additional use of closed-circuit TV for conventional music scoring. This was installed some five years ago. When one composes at the piano, the presence of the Moviola picture directly in front of you makes possible a really sensitive relationship between music and picture. Remote controls enable completely normal Moviola operation from the piano position. In addition, by the way, there is a provision for recording directly on the Moviola, in sync with the picture, a piano version of the intended orchestra score, both for artistic evaluation [*aside to Chuck: "sharpen it up"*], and timing purposes. But, I guess I'm digressing and I'd better get back.

This is the north side of the music studio and shows the recording facilities adjunct to the electronic music-generating equipment. Without tape, I guess there might never be the kind of electronic music the world will be gradually getting to know. Here too, there is much additional circuitry tied in with the requirements of electronic music scoring.



And now, our proudest achievement—our bubble machine. Maybe it does look like a [*unintelligible*] machine, come to think of it. But about the bubble machine, I'm kidding of course. But, really, it is a kind of bubble machine. Recently a producer of TV commercials came to us. Problem: we have a trumpet. It's covered with bubbles. It's playing a fanfare and has to sound as though it's playing underwater. Well, let me play a tape of what our bubble machine helped us produce in the way of a sound of a trumpet playing underwater. Here it is.

[\[Demonstration of trumpet underwater\]](#)

For comparison, here it is above water.

[\[Demonstration of clear trumpet\]](#)

And, for re-comparison, here it is underwater, again.

[\[Demonstration of trumpet underwater\]](#)

The producer then said, what would the entire orchestra sound like underwater? And I answered, that I had tried it and it was pretty wild. I didn't have it with me, so I couldn't play it for her. I brought it today, however, and thought maybe you'd get a kick out of listening to it. The entire orchestra, underwater.

[Demonstration of orchestra underwater]

That, ladies and gentleman, is our electromechanical addition to our electronic music studio for creating orchestral underwater sounds. Incidentally, you might be curious as to how the device works. There's—I don't think you can see it too clearly—but there's a spindle, there's an offset cam-like device at the bottom of this shaft, which contacts the tape, and the motor above it revolves, so as the tape is played, it's modulated by being pushed back and forth at different rates of speed and at different amplitudes, depending on the adjustments of the two black knobs. You can probably tell from these pictures that we took them—and we don't know how to take pictures.

You know, if one were to inaugurate a statistical examination of, let's say, a thousand radio or television commercials that use background music in one form or another, I'd guess that a majority of these that did use music used it sparingly in the form of punctuations, accents and small mood bits. Listen to this sampling of punctuations created in our electronic music studios. It is my opinion that this type of use will be electronic music's first important and widely used contribution to radio and television commercials. Here it is. These are not fragments of musical compositions, as I said they are stings and accents. You must try to imagine, to really get the benefit of this, bits of commercial copy in and around these accents and punctuations. See if you can imagine something to go along with these things as you're listening to it. So, go ahead Chuck and continue.

[Demonstration of various electronic music themes]

After we put together the tape you just heard, we called in an announcer friend of ours, "Bucky" Coslow. We said, "Listen to these electronic effects. We'll play them one at a time, and whatever they make you think of commercial-style, say it real spontaneous-like. We'll record them wild, and later we'll have a mix and see what happens."

We did just that—with one difference: the announce tape was edited, but before we got a

chance to sync it with the effects tape, it was run purely by accident at random against the effects tape. The effect on us was startling. Words and phrases that had no business showing up where they did against certain electronic effects took on a wonderfully convincing and attractive quality and seemed to indicate that electronic music for this purpose may turn out to have unusual vitality, conviction and atmosphere, plus a rather shocking flexibility. So here it is. Please ignore the accidental silences and bumps, because the happy accidents are, we think, worth it. Okay, Chuck.

[Montage of Coslow impromptu ad voiceovers against unrelated electronic music themes]

You know, we enjoyed this random experiment so much, we thought we'd try it again with a different random positioning of the tapes. So, here we go once more.

[Montage of Coslow impromptu ad voiceovers against unrelated electronic music themes]

Maybe the reason these effects are as attractive as they seem to us in these different juxtapositions is because we are as yet not preconditioned to the species of electronic music, and consequently our ears are ready to accept a more abstract marriage between the spoken word and electronic musical effects. But, regardless, we believe that possibilities are most exciting.

A few months ago, we were invited to do an electronic music score for an animated TV spot on behalf of County Fair Bread. The problem: create an electronic musical impression of a calliope playing "Where, Oh Where..."—in this case, "... is my County Fair Bread." Compose a man-in-a-white-suite-type theme for the central character, a slightly knocked-out magician. Put together a group of electronic impressions of typical animated cartoon sound effects. Here are the sounds we came up with. First, the calliope.

[demo of calliope effect]

Second, the theme developed for the magician, the man-in-a-white-suite theme, specially sought after for quite some time to get what we thought was right. Here it is.

[demo of electronic effects for magician]

Third, a few electronic impressions of typical animated cartoon sound effects.

[demo of animated cartoon sound effects]

And now the film—a wonderfully zany animated spot by Messrs. Ferro, Mogubgub, and Schwartz. A film that promises to be the success story of the year. Okay.

[\[audio of Country Fair Bread commercial\]](#)

And that's the County Fair Bread commercial that's causing so much talk back on the East Coast. In fact, what was a local bread in the Washington D.C. area is rapidly becoming regional. The excitement is great enough that maybe it'll even go further than that. So we're real pleased that we were part of this very, very imaginative spot.

Producers charged with the responsibility of finding “new clothes for valuable properties” will get a big assist out of electronic music. For here is another area in which this new sound must become important. The need to constantly refurbish the well-loved jingle, to constantly protect the large proprietary investment in it, will always be with us, and in my opinion the electronic music approach will rarely be surpassed for freshness, novelty and ear appeal. Listen to this electronic version of the famous Alka-Seltzer jingle “Ker-plunk Goes the Tablet.”

[\[Alka-Seltzer jingle\]](#)

We thought you might get a kick out of hearing just the background itself, and maybe play a kind of audience participation bit where you can imagine your jingle being played in front of this electronic background. Go ahead, Chuck.

[\[Alka-Seltzer jingle background\]](#)

Here's another phase of advertising music that electronic effects are especially suited to. Products that have an interesting technical background to talk about or are in themselves of a technical nature are especially suited to electronic scoring.

Take, for instance, a project we were engaged in some time ago. We were asked to develop for them a laboratory sound to be used as background in a scene depicting the development of their famous tablet detergent. The sound had to reflect the atmosphere of their scientific resources, but most of all had to have the feeling of sparkling white, crystal clear, clean as a whistle. Here are a few of the efforts—the effects—we arrived at during this project.

[\[Vim detergent ad sound effects\]](#)



I have rather a story of some interest here. The reaction of the agency and ours was exactly the same all the time, when in the process of choosing one. They felt it was too Balinese, we felt it was too Balinese. Well, here is the next one.

[\[electronic sound effects\]](#)

And here too, there was too much communication-style sound and we were in agreement to listen to the next one.

[\[different electronic sound effects\]](#)

We concurred that was not a mysterious laboratory scene. But here's the one that did become the choice because of its sparkly quality, the bell-like quality, etcetera. Listen to it.

[\[different electronic sound effects\]](#)

This was also one of our earliest, and one that we still hear on the air from time to time.

Another example, an excellent one, is the Bulova Accutron watch. For this product is not only technical, but electronic also. Listen to the results of this experimental approach for Accutron. Incidentally, the 360 cycle tuning fork tone that you will hear is amplified directly from the Accutron Watch.

[\[Bulova Accutron watch commercial soundtrack\]](#)

Now continuing in the industrial vein, some time ago we were handed this problem: what can you do with the number “nine” to create the atmosphere that shows impressive technological accomplishment with nine ingredients for top performance gasoline—the effect to serve as an audio logo to be used around Top Nine copy. Here is a series of experiments while working on a solution to this problem. First, the Clavivox alone in a nine-note row.

[\[Clavivox theme\]](#)

Now the rhythm of nine, but this time, as a miniature piece for impressionistic auto horns.

[sound effects]

Two groups of nine notes—but sounded together in contrary motion.

[sound effects]

Here next is a feeling of movement, a feeling of traveling, rather exciting, upon which is superimposed the original nine-note Clavivox theme.

[sound effects with Clavivox theme]

And finally, a modification of the one just heard—the same feeling of movement being better established, longer established, before the introduction of the nine Clavivox notes.

[sound effects with Clavivox theme extended]

To sum up: we have three filmed commercials to demonstrate the variety of end results possible with the aid of electronic music and effects. First, the original soundtrack, without video or announce copy, of the film you're about to see, so you can better, perhaps, notice the effects, and then we'll run the whole thing together.

[Ford Auto-Lite music bed and effects]

Incidentally, on the track you just heard, there were no keyboard performances, just the occasional pressing of buttons, or turning of switches. This is known in engineering circles as a coded performance, a prepared performance where things are set up and you just press a button and things just happen, without the RCA system of perforated tape, player piano-style. But let me go on.

Here is the entire combination—video and announce track added to the effect track you just heard. It's the Auto-Lite spot we refer to as "Wheels."

[Auto-Lite spark plugs soundtrack and voiceover]

Here next is a Nescafé of Canada commercial. Listen to some of the effects first out of context, which you will hear in the background of the film itself. First, an electronic impression of coffee beans pouring out of a bag.

[pouring coffee beans sound effect]

Now the dancing flames in a coffee toasting machine.



[coffee bean-toasting sound effect]

Here is the sound of toasting.

[toasting sound effect]

And now an impression of the sound of roasting.

[roasting sound effect]

To tie these effects together, an overall blanket of rhythm was used, strictly electronic. Listen to it.

[electronic rhythm bed]

A complete picture now, that is the complete picture, meaning the complete combination of picture, effect-track, and announcer for Nescafé of Canada.

[Nescafé of Canada commercial audio]

The third film in this closing group: an example of an electronic swinging background—without the use of any percussion-like instruments, by the way, electronic or otherwise. Electronic effects—but this time with a vocal group, no announce copy at all, and for once, the whole thing all together the first time.

[Auto-Lite spark plug commercial audio]

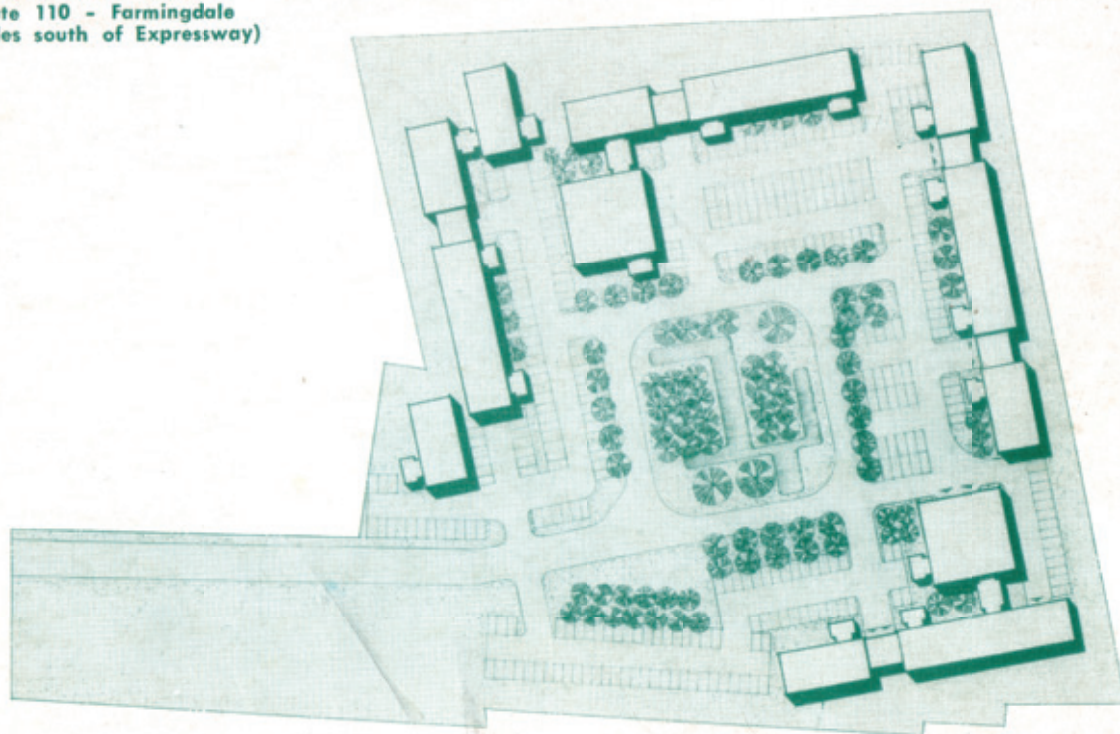
Ladies and gentlemen, we haven't been plugging Auto-Lite today, really. We just feel that we had a very happy experience in this [unintelligible] commercial we did for them some months ago, and we kind of—we enjoyed the experience very much. That's why you've seen quite a bit of Auto-Lite today. But, here we are at this 45 minute future-point I mentioned earlier, and if there are any questions or—

(TAPE ENDS)



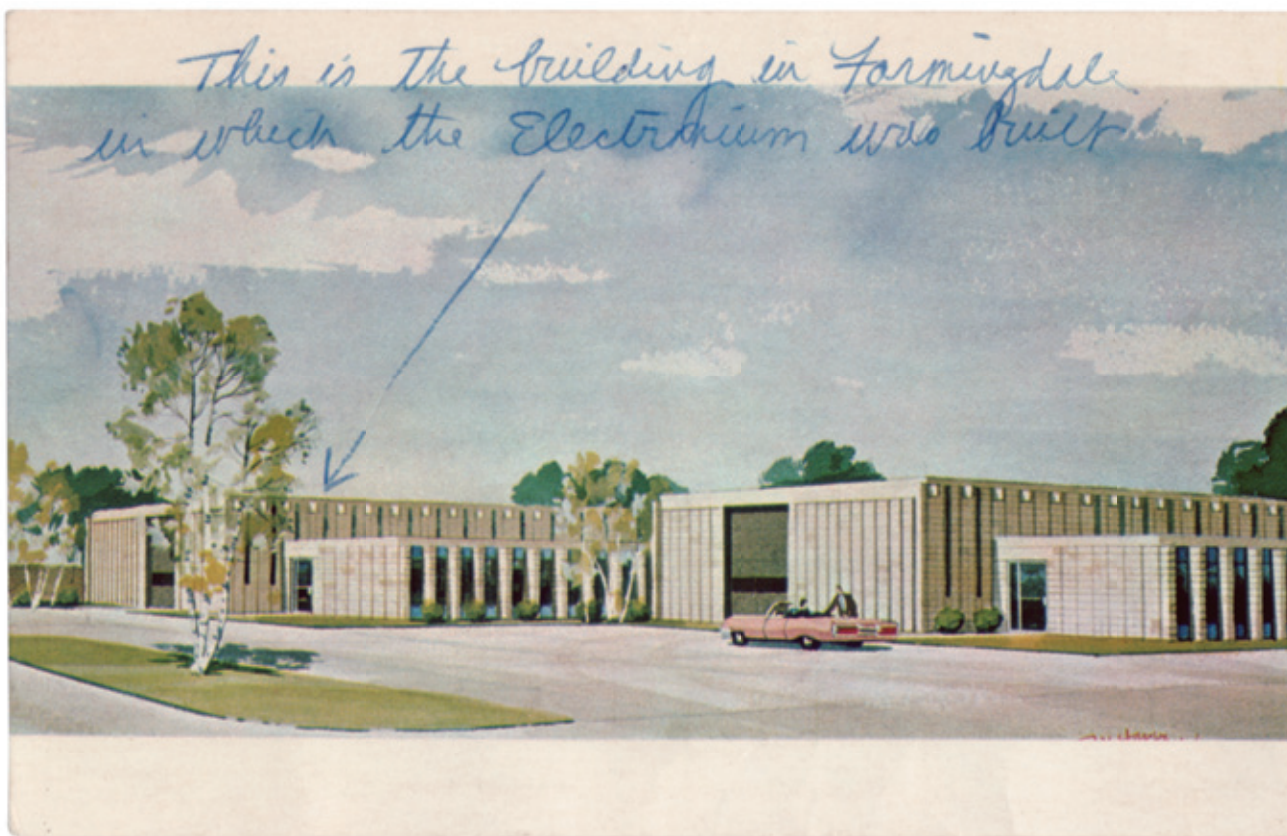
In 1963 Scott recorded three all-electronic proto-“ambient” LPs, *Soothing Sounds for Baby*, released on Epic Records (reissued by Basta with new covers in 1997). These LPs, largely overlooked upon original release, were gentle sonic companions designed to calm and delight infants. Scott’s pioneering and little-heard explorations of synthesized rhythmic minimalism and low-key ambience foreshadowed the subsequent work of Terry Riley, Phillip Glass, Kraftwerk and Brian Eno.

WILLOW PARK CENTER
Route 110 - Farmingdale
(2 miles south of Expressway)



75930

*This is the building in Farmingdale
in which the Electrium was built*



Artist's rendering of Three Willow Park Center, ca. 1965, with Mitzi Scott's handwriting (mid-1990s)



Views of Three Willow Park Center, circa 1965

designers and manufacturers of electronic music instrumentation



March 18, 1966

Mr. Raymond Scott
3 Willow Park Center
Farmingdale, New York

Dear Ray:

Enclosed are 150 circuit card holders and 2,000 crimp-on lugs. We didn't have 3,000 in stock but I sent you most of what we have.

Incidentally, the number of the lug setting tool is 90094.

We have just about everything in stock for your boards and we will have them out of here in two to two and a half weeks.

I will be seeing you soon.

Sincerely,

Bob
Bob Moog

sb

enclosures

P.S. : Package is being mailed separately.
Bob

R. A. MOOG CO., TRUMANSBURG, NEW YORK, 14886 ■ PHONE (607) 387-9200

Despite a 25-year age gap, synth pioneer Bob Moog and Raymond Scott had been friends since the mid-1950s, when Moog was a student at Columbia University. In the 1960s they occasionally conferred on technical aspects of Scott's musical inventions, and Moog's company supplied Scott with spare parts, hardware, and assembled components. Years later, Moog remarked that Scott "was in the forefront of developing [electronic music] technology, and he was in the forefront of using it commercially as a musician."



R. A. MOOG CO., TRUMANSBURG, NEW YORK, 14886 ■ PHONE (607) 387-9200

Mr. Raymond Scott
3 Willow Park Center
Farmingdale, New York

Date **December 23, 1966**
Our Order No. **7790**
Customer's Order No. **Verbal**
Terms **Net 10 Days**

INVOICE

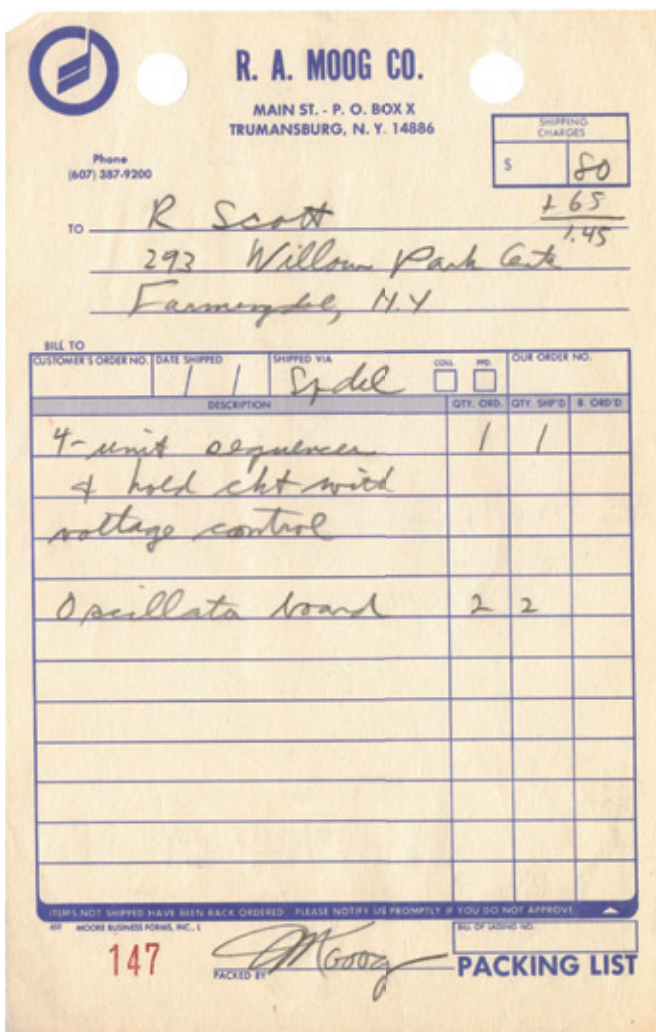
Design and building of random counter:

15 hours engineering time @\$10/hr	\$150.00
12 hours assembly time @\$4/hr	48.00
Parts for prototype	42.00
Spare & additional parts	37.35

	\$277.35
State sales tax - 2%	5.55

Total Due	\$282.90
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Invoice and packing list for goods and services provided to Scott by Bob Moog's R.A. Moog Company. Moog later recalled: "When I set up shop in upstate New York in 1964, that interested [Scott] because that meant we could make special little things for him. He would call frequently, and it went beyond a business relationship. My wife and I became fairly friendly with him, and he would talk about his personal life. [...] He used to come up to Trumansburg periodically to give me new assignments and check up on how our work was going. On one of those trips he told us about this wonderful woman he'd met, and on a later trip he brought Mitzi with him and they were married in Trumansburg by the local Justice of the Peace. We designed and built a lot of small circuits for him during the late 1960s. Scott was always very guarded about his current projects. I don't believe that he ever told me exactly what all the stuff we were designing and building for him was going to be used for."



SO YOU WANT \$50,000 TO BUILD A SAMPLE ELECTRONIUM?

Yes, I want \$50,000 because I feel that it will help me and the people associated with me to make millions.

A remarkable thing is happening in the music business - a wedding of music and electronics is about to take place - the ceremony hasn't been performed yet. And I want to perform the ceremony.

\$50,000 will enable me to build a second generation version of an instrument I call the Electronium. At present it is a gigantic room-full of equipment. I want to build a second generation version - that is miniature in size - no larger than a home electronic organ. With \$50,000 I can complete a second model, and complete it in a way that would provide us with a close-to-production version - and so enable us to get the financing necessary to really get in - and get out in front of this coming revolution in the field of musical instruments.

My general background and talent is such that I consider myself equipped better than anybody around to lead, in the musical technical area, a business group that could make millions by being first - first with the best idea - the Electronium. With a sample Electronium - beautiful to look at - exciting to listen to - private showings to financial people would get us all the money we will need to start production - and lead the renaissance in the field of musical instrument design and manufacture.

Fundraising letter on behalf of Scott's stage 2 Electronium. The intended recipients are unknown, and it is not known if this letter was even circulated.

TECHNICAL NOTES

1. Special control at Echolette. . . .in order to let previous phrase repeat out while last note of phrase is not reverberated - in order to bring phrase to close while previous part is repeating out.
2. Advertise in N. Y. Times when required, for model maker desiring to learn electronics.
3. Replace transformer in AC generator to get better sine waves.
4. Use AC generator on Echolette so repeat can be delayed in order to make time available for a many note phrase - before repeating sets in . . . experiment with recording when using Echolette at 7-1/2 IPS in order to make phrases easier to play (with AC generator to slow Echolette properly).
5. Work out different designs on manuscript paper showing different pyramids and other build-ups possible when using Echolette.
6. Should use, very effectively, tape editing to have a succession of pyramid-style patterns, while following the harmony of composition. This does away with the annoyance of unintentional dissonances continuing to reverberate.
7. Draw block diagram showing use of luminosity chamber with Bode keyer in order to try effecting a controlled degree of hangover from the luminosity chamber (this may actually not work). May be necessary to tape edit to get rid of continuing reverberation, and then adding overall reverberation when copying the tape edit portion.
8. Should consider remote control for damper control on luminosity chamber - to get rid of undesirable hangovers. Might try sitting right at the chamber in order to control damper effect.
9. A master keyboard idea - where one keyboard, with switching system, will control all available generators, either separately or all together at once - very much like the traditional theater organ. This is really a relay bank concept. This could also make possible an extraordinary chorus effect by controlling an array of pitch generators together.
10. Remember to experiment with capacitor pick up on plate echo.
11. Try non-physical, purely magnetic driving of plate with the luminosity driver.

TECHNICAL NOTES (Cont'd)

12. Could be desirable to install Hammond keyboard and Solovox keying system to make Ondeoline easier for the fingers - while also taking advantage of the keyer in the Solovox.
13. Don't forget about the cabinet pattern maker who works at Grummann and lives in Baldwin - friend of Mike Shane. He might be available for part time work.
14. Should call Ron Leslie of CBS.
15. Frequency shift idea. . . . might try tape running at 60" with extra capstan and play back head, right after regular capstan running slower with provision for tape loop getting larger - being directed into basket - so that a frequency shift downwards can be gotten using magnetic tape. Same idea - different way - would be using two different revolving heads on the top and bottom tracks of three-channel, 1/2" tape. Tape would not have to be slowed up or stored in this concept.
16. Should experiment with Echolette to see if it is possible to record ^{one} ~~or~~ pyramid pattern, and then record another positioning of suitable notes in different spectrum, using the same setting on the Echolette - then running both tapes together in sync. for a super-large combination of sounds.
17. Might try a method of modulating Echolette by feeding an additional symmetrical pulse to the motor in order to achieve another kind of modulation of the material being fed to the Echolette.
18. Should try the use of the Unacorder pedal on luminosity chamber, in order to resonate differently each tone in the phrase being made luminescent.

To Buy

Large socket wrench

Batteries for keyers

T 119 Lafayette Transformers

Small Clip on Lamp (Lafayette)

7 Position Dials

Searchlight

Set of Relay Tools

GE 93 Lamp for Desk Light

Minigator Clips

Microgator Clips

Heavy Duty Soldering Iron

Soldering Iron Cleaner

Technical Notes

Proper keying also depends on condition of contacts correct spacing and adjustment.

When push button pre-sets on Generator #5 don't work wire to arm of switch may have come off from relay.

Need to check Generator #4, keyer No. 3 - signal hangs on.

While able to improve sound of ~~rhythm~~ - rhythm keying by using storage scope to check 8 actual sounds on the same keyer - to ~~observe~~ observe the spacing and duration of each note. Seems to be more promising as a check on the steadiness of rhythm.

Dee-keyers work well as accent devices.

Need to try sound of luminosity chamber on a tape loop, or edit it into a suitable rhythm to be keyed for adding after beats in the rock style. Should experiment by keying other kinds of sounds for afterbeats, etc..... (rhythm on tape to be keyed, etc.).

Was able to get big improvement in signal to noise ration (sparks, etc.), by feeding maximum signal to keyers and in order to keep gain control on keyer low.

Should try microphone recording of relay sound with pitched rhythm - may be very attractive.

TECHNICAL NOTES - Nov 6, 1966

1. Rim shot Gen. DC pulses to filters etc - Resonant circuits.
2. Toy Grand Piano - Ken Cowan's office - for echo exp.
3. Keyboard Whisper Gen. - white noise and very sharp tuned circuits.
4. Attacks also very dependent on stiffness of blades and condition of contacts in all relays.
5. Spectrum modulation - Timer modulation of Albiss, so that while a note or chord is being held we hear the harmonic color of the note changing - by changing condensers across coil with Timer
6. Repeater modulation - so that the speed of the repeated notes could be changed.
7. Experiment with cymbal sound generation - Check Conn.
8. Provision for instantly changing from Repeater to held notes - for double and triple tonguing effects.
9. 14 KC device to record pulses with sig. for later keying of rhythm effects.
10. Start using Raytheon Light Resistors.
11. Vaseline idea on relay contacts.

TECHNICAL NOTES (Cont'd) 11/6/66

12. Overload investigation of different amps - for attractive effects. . .
Fet. pentodes - transistors.
13. Investigate and exp. with Phase vibrator - organ locks? - and try
Cascade phase circuit idea.
14. Cascade ring bridge mod. idea.
15. Should make feedback filters in Gen. 5 - available in min. jacks - to
use for other purposes.
16. Investigate possibility of all freq. osc. - RF Feedback? Super re-
generator? - infinite number of osc. - maybe a finite amount
of near osc. Q multipliers - tuned as required to key or harmonic
series one happens to be working in.
17. Build or put together FM headphone unit for monitoring while walking about.
18. Get rid of much hum in Plate echo by shutting of Electronic rock switch.
19. Transistor preamp at Plate echo device helps sig. to noise ratio very much.
20. Remember distilled water for Battery.
21. Spectrum control unit - rhythm keyed -- a complex single or chord or sound
is to 8 sub units - each is a different filter or echo device or some
kind of processor -- each unit is then sequentially keyed or however.

- 2 -

TECHNICAL NOTES (Cont'd) 11/6/66

22. Build rectifier wave shaper - and series (cascade) group of same freq. doubling etc. -- all mixed together with comb filters and the like - extracting fundamental again and again and wave shaping again and again - overall mixing at end.
23. Make accent unit to use when doing final mix - so accents can be added as required - or console provision for using one of keyers for this purpose.
24. To help get new tutti sounds -- exp. wave shaping of individual notes in an organ - rectifying, etc.
 - phase vibrating (cascade) ? - and other processing - then remixing.
25. Monophonic Programming Idea - wherein each note in the melody to be played is fed thru the Gen. 5 feedback filter so that each note is adjusted to the harmonic series of the chord it's in at that time - may sound most interesting.
 - the melody note could be the root of the harmonic series, or the Maj 7th or anything in the series.
 - the effect is that the melody is being 'shadowed' by a harmonic series of additional notes.

TECHNICAL NOTES (Cont'd) 11/6/66

26. Another monophonic processing idea, would be to use the ring modulator and then phase modulate the difference tones, after the comb filter - to this add vibrato - or other modulation to added notes only - and not original melody - or the inverse - vibrato the melody and not the difference tones.
27. Optical pianola roll on 16mm film projected on to bank of photo resistor cells.

COLOR NOTES - Dec. 5, 1966

1. When one line is complex - other very simple - 3, 4 lines, etc. - all very different to make clear - very contrasting - attack, level, phrasing, etc.
2. Good color is to have a different chord sequence on different machines, and to play them together in rhythmic sync. - but Random Chords.
3. Try exp. of playing melody in 3 octave or so range (harmonized) by using weights and tape editing.
4. Afterbeat chords - play backwards - might be good rhythm idea.
5. By arranging for Pressure Roller to be disengaged - speeds can be gotten with much more control by pressing play button on Prestos.
6. Effects that are 'still' - like a pedal or chord - pedal sound dull -
- but still okay as pad and not an effect.
7. Writing something out backwards and then performing to be played back backwards - might be a very worthwhile exp.
8. A simultaneous, pitchless attack, (very, very short) mixed with a pitched attack (longer) - mng might be very different - by dividing sig into two chords - (twin keyers) - but exaggerated like Solovox can be handled.

- 1 -

COLOR NOTES (Cont'd) 12/5/66

9. **Tape transpositions higher when subject has high harmonic content.**
- gets skinny.
10. **High tape transpositions (speed ups) sound best with lots of Flute on Hammond (in unison octave stuff) - - (really the two attack idea).**
11. **Try big capstan (80") on P I - to try much tape feedback to see what it does. Might be very interesting.**
12. **Interesting new color might ~~mt~~ be to feed Gen. I to Bode, to key in "piggy back" random operation of Gen. IV, etc.**
13. **Random pressing of buttons on trans. timer, gives nice patterns.**
14. **To get back lower pitch after tape speed ups - try dividing the speeded up subject down to desired low pitch.**
15. **A good way to get a different sound would be to separate one phrase in its component bits - playing one forward, one backward, etc.**

TECHNICAL NOTES - February 17, 1967

A 25 Microfarad electrolytic condenser from the input to the keyer on the card to ground, helps get rid of some of the clicks that come from the pulser - the pulse to keyer output of the small randomizer - also grounding the panel that the controls are on in this same, small randomizer unit helps get rid of some of the click too - maybe eventually shielding those leads - general shielding will help also.

(The written agreement that Charlie mentioned says: that any developments made by the employee while in the employ of the Company become the property of the Company - that was the first thing he said. . . the second thing he said was the secrets and plans of the Company will not be divulged.)

Grounding point on fixed uni-junction oscillator card marked with green arrow on the back of the card - that is, the card with the contacts on it, got rid of a lot of leakage without spoiling the triangular wave form.

Grounding the panel in the small randomizer experiment gets rid of that pulsing thing -- I may be able to get rid of even more by shielding the leads that come from the pulse output of the randomizer to the panel.

The typewriter idea - in which the keyboard for the participator instrument or some performance instrument will use regular typewriter keys - that is, actually derived from a typewriter - exactly the same as a standard typewriter - and when music is written - and when a part is written

- 1 -

TECHNICAL NOTES (Cont'd) 2/17/67

for the participator - then if a person can type he can play the part - the only thing he would have to learn to do is that he would have to learn or follow a kind of beat - - but, he would , let's say, press down E and then something else - and then something else - and the difference might be that he might be apt to press two or three things together - but if he knows where the keys are on a typewriter, he knows where the keys are here - and a lot more people can type than can play a keyboard instrument.

It seems definitely that the best way of getting rid of the sudden attack is to have it 200 mikes from the oscillator drive to ground thru about 5800? ohms - that is have that ~~hundred~~ hundred ohms series resistance first, and then have the couple of hundred mikes - and that makes the thing more effective - makes it fast or slow - fast means with a bump on top, and a bump on the bottom for that matter.

The series resistance - the series of the oscillator drive circuit and then the 200 mikes, might be rather interesting to have a dual pot so that as you decrease series resistance, or as you increase series resistance in order to get a - less of a bump and more of a glissando - you can at the same time increase ~~a~~ a resistance across the condenser so that it discharges faster. . . . might try that now experimentally.

Shorting the bass to ground of each one gives me a pulse of the output - if I then put a pulse on the. . . put 12 ^{volts} / ~~amps~~ on that point that's being fed

- 2 -

TECHNICAL NOTES (Cont'd) 2/17/67

- that is, if I put 12 volts back into the collector, I get a big pulse
 - but I get a pulse on the output of any stage if I put 12 volts to any collector - to any of the collectors of _____ transistor - and even though I am still measuring the output, I get the same pulse. . . I get a pulse - I get the same output whether I use the negative or positive pulses.

The Lafayette amplifier for the unit requires an isolated power supply. . . otherwise it's some kind of feed back within the power supply of the battery circuit.

If I use an emitter follower between the pulse output of the small randomizer - that is, that .01 condenser I believe - the disc - between the - an emitter follower between the pulse output and the keyer ~~ox~~ input, I get rid of the hangover tone and it's very, very soft.

Using the oscillator drive output of the small randomizer to feed one of the transistors that feeds one of the uni-junctions in the sequential timer is rather interesting -- instead of feeding it from the pot, that wire is taken off and goes to the air oscillator drive thru an 1100 ohm resistor, and it changes the amount of time that the thing is on - which is rather nice.

Lowering the overall pitch of the small randomizer with a little control on that _____ strip, increases the frequency with which there is a

TECHNICAL NOTES (Cont'd) 2/17/67

long period of on time for the relay - and the passages become longer.

Must remember the idea of applying some voltage directly to Terminal 4, in order to raise the mean level - overall mean pitch tessitura - by applying voltage at that point - also if I lower the general scale - the general pitch tessitura by lowering the voltage, by the small control in the little randomizer, then I'll need an additional amplifier to get enough voltage up to operate the one sequential stage in the timer.

Special Notes - Use of Controls On Panel. . . .

For Theremin-like lyrical effect, Glide One on maximum to left - that is, it is on past the switch point - then maximum to left, or minimum resistance. . .

Glide 2 is at 12 O'Clock - Knob B is on, but maximum (this is repeat of what I said before) is on, but maximum to the left past the switch point - Knob C is at 12 O'Clock. . .

Knob D at No. 3
Knob E maximum to the left
Knob F is at 2:30
Knob G maximum left
Knob H is at 1 O'Clock
Knob I is at 5 O'Clock

Switch One is to the right - which is off - Switch 2 is to the Left which is on.

The foregoing was for the Theremin-like, lyrical, legato effect.

Continuation of the same Theremin stuff. . .

Knob J at 5:30 - Knob K at 7:30 - Knob L at 7 O'Clock.

- 4 -

TECHNICAL NOTES (Cont'd) 2/17/67

Effect No. 2 Next - Short Notes, without much attack. . . .

Knob A, to suit volume - Glide One Off To Left, past switch point
 Knob C - makes no difference
 Knob D - on No. 2
 Knob E - maximum left
 Knob F - 2:30
 Knob G - maximum
 Knob N - at 9 O'Clock
 Knob I - at " "
 Knob J - at 6 O'Clock
 Knob K - 8 O'Clock
 Knob L - " "

These are short detached, notes with very little attack and a lot of atmosphere. . . switch I had No. 2 on.

Effect No. 3 - Is Staccado, Pearly Staccato Notes

Knob A - to suit volume
 Knob B - Left Off
 Knob C - automatically off
 Knob D - choice between 2 and 1 - start on 1 and switch to 1 occasionally to speed it up.
 Knob E - is off
 Knob F - at 1 O'Clock
 Knob G - at 4 O'Clock
 Knob H - at 9 O'Clock - that's vibrato which is external, incidentally
 Knob I - maximum left
 Knob J - at 8 O'Clock
 Knob K - " "

Must remember when using the legato lyrical effect, to add voltage to terminal point 4 in order not to get too wide skips in the melody - that is when we are using the Glide control at minimum for an easy legato.

An additional way to get control signals out of a small randomizer, would be to use the pulse output, as used for keying, and use that as a pulse source to charge the storage condenser. . . having two different storage circuits that charges - both adjusted to entirely different rates and fire at different times, we can get good effects.

TECHNICAL NOTES (Cont'd) 2/17/67

The attractive Bill Harris vibrato I mentioned some time ago - and I thought it was a saw tooth that was doing it - I think it's actually a sine wave - but the right speed in combination with the exactly right amplitude is what seems to do it.

In control G - I believe it is burnt out and we'll have to replace it. . . should put in series resistance too, but I can't completely close it up.

I need a control circuit so that when two things touch - when a circuit is completed - the circuit is completed gradually thru resistance - meaning it's as tho you turn a pot on - this is for the Glide Control - to be able to switch Glide Control in and out as required without a difference in pitch - so the charging condenser has to be charged slowly.

It seems as tho the way in which it might be necessarye to be able to alternate between glide effect and non-glide is that you can leave the glide effect by opening up a condenser in progress and there is no disturbing sound - however, when using the ~~M~~ glide effect and turning it on - even if you turn it on gradually tur a 10 Meg Ohm Resistor, you do hear the dip in in pitch - so it might be desirable to work out a circuit in which you can put the Glide in between phrases when it's silent - even tho you can leave it - so it would mean that you'd have to introduce it at a ~~opener~~ pause in the musical content.

- 6 -

TECHNICAL NOTES (Cont'd) 2/17/67

A good way to eliminate keying leakage would be to have the keyers separated and isolated.

It might be a good idea to provide a means if possible so when in Glide position as we're going up in pitch, the thing is normal, then the effectiveness is reduced because the Glides upward sound rather effective - the glides downward don't sound as good and take too long.

GATE NO. 1

A Gate that fires at an adjustable voltage after pulses totalize in a storage counter

This Gate supplied a random additional voltage to clock uni-junction in small randomizer to make faster.

This Gate shuts off when voltage in its storage counter drops below a pre-set level.

The voltage to be supplied to the clock will be whatever value a slow storage counter happens to be, but not above its normal level.

The slow storage counter is discharged when the above mentioned Gate drops out at its low preset level.

GATE NO. 2

1. Storage counter adds pulses - the adding rate is adjustable.
2. At a pre-set voltage, the Gate fires and furnished a random voltage between 12 and 18 volts - positive.
3. This Gate stays on a random time between about 300 to 2,000 milli-seconds.
4. 2 pair of relay contacts - also closed for this same period
5. When Gate goes off the operation starts all over again.

TECHNICAL NOTES (Cont'd) 2/17/67

GATE NO. 3

1. Storage counter adds pulses at an adjustable rate.
2. At pre-set voltage, Gate 5 (a) supplies random voltage - 12 to 18 volts, positive, (b) supplies voltage that rises from 12 to 18 volts at a steady slope - but the steepness of slope is a random event set when the gate opens.
3. 2 pair of relay contacts open - 2 pair of relay contacts close.

This Gate stays on a random 300 to 2,000 milli-seconds. Gate 3, incidentally is the idea for a universal type Gate for different control functions.

Problems To Be Solved:

1. Means for random switching between gliding mode and straight vibrato.
2. Means for increasing vibrato as the pace of the pitch tessitura is raised - and the inverse of the same - manual only required.
- X. NK. . . . random if somehow possible.
3. Means for a random step increase of voltage in the clock unijunction for a sudden appearance of a new, faster tempo in staccato passages.
4. Push-button method for switching manual between attractive modes - between attractive modes of operation.

An Idea:

Pulsing two small stepping switches by separate random generators and then arranging switching circuits of these switches in a coincidence circuit - so there is a kind of degree of randomness, even though we are using switches with step functions.

Preliminary Instructions -- "The Participator"

Participator I - Preliminary Instructions. . . .

This device, basically, is a modification of the Fascination Series of Instruments, in which controls have been added to the basic Fascination Instrument, so that in addition to the - in mentioned seeking circuitry that enables the Fascination series of instruments to make infinite patterns of sound 'happenings', the modifications are a series of controls so that all the randomly arrived at, or all the self arrived at sound patterns created by the original instrument are now, now the operator of the instrument can share in the nature of the things being created by the machine.

It is as though the operator of the machine - the person using the machine, is sharing in the nature of and choosing the nature of the sound inventions being arrived at by the circuitry - hence the name, The Participator. . . .

The Participator then, enables the user to participate in the self-seeking, sound invention - sound pattern invention circuitry of the heart of The Participator, and enables the person performing with these automatic circuits - or enables the person to perform a duet, so to speak, with the self-performing feature of the instrument

There are 26 controls in Participator I - - they're labeled as the diagram shows from A thru Z. The function of these controls is as follows.

PARTICIPATOR - I

Preliminary Instructions

Controls and Their Functions

A - Pitch Separator
 B - Volume
 C - AC Power Indicator
 D - Tone No. 1
 E - Tone No. 2
 F - Pitch Tessitura
 G - Decay
 H - Vibrato
 I - Glide 1
 J - Glide 2
 K - Continuous Pulse
 L - Speed 1
 M - Speed 2
 N - Attack
 O - Pitch Range
 P - Momentary Continuous Pulse
 Q - Power Switch
 R - Programmed Rhythm
 S - Pulse 1
 T - Pulse 2
 U - Random Spacing
 V - Master Rhythm
 W - Submaster 1
 X - " 2
 Y - " 3
 Z - " 4

Technical Notes - Cont'd - March 2, 1967

PARTICIPATOR - I

- PITCH KNIFE*
- A - Pitch Separation - (Can change in use I)
 - B - Volume
 - C - ~~Power Light (Shows Power is On)~~ AC power indicator
 - D - Tone No. 1
 - E - Tone No. 2
 - F - ~~Tessitura~~ - Pitch Tessitura
 - G - Decay
 - H - Vibrato
 - I - Glide 1
 - J - Glide 2
 - K - Continuous ~~th~~ pulse (Keep clock on continuously)
 - L - Speed 1
 - M - Speed 2
 - N - Attack
 - P* - ~~Momentary Continuous~~ Pulse
 - ~~D - Pitch Range (Should this be "P")~~
 - Q - Power Switch
 - R - ~~Pulse~~ Programmed Rhythm
 - S - Pulse I
 - T - II
 - U - ~~Random Spacing~~ - (change for Uni. I goes to only 1 in turn)
 - V - Master Tempo
 - W - Submaster 1
 - X - Submaster 2
 - Y - Submaster 3
 - Z - Submaster 4
- Randomly made by REMAINING TIMER UNIT*
- input*
- works by Osc Drive*
- goes to only 1 in turn*

To use the instrument the procedure is as follows:

1. Turn all controls completely counterclockwise
- Turn toggle switches D and E to the left.
- Turn B - which is the volume, completely counterclockwise
- Turn Q to the right - the power is now on. . .
- there will be a quiet light in pilot light C.

THE ELECTRONIUM CORPORATION DESIGNS "HAPPENING" DEVICES FOR
THE GENERAL PUBLIC.

Farmingdale, Long Island. March 1, 1967 -

A New, Varied and Inexpensive Line Of Electronic Music and Sound "Happening"
Devices Is Being Introduced here by The Electronium Corporation of America.

This group of devices now being tested and developed in the laboratories of The
Electronium Corporation is being readied for the Christmas Holidays this year,
and will consist of a line of eight different sound entertainment electronic units.

The "happening" devices, conceived and built by Raymond Scott, Vice President
in Charge of Development and Research, have been under proprietary study for
approximately five years. While the "happening" idea via electronic circuitry
is not new, Mr. Scott told a group of newsmen today, as far as is known no one
has offered the devices in the area of generated electronic music and sound to the
general public. . . ."it is a completely new consumer product - a natural for
sound lovers everywhere", Mr. Scott added.

THE FAMILY NEWS - the scotts -

10¢ - SUNDAY NIGHT - JULY-9-1967 - 10¢

FIGHT! EXTRA-EXTRA!

READ ALL ABOUT IT!

AP -

Today Mrs. R. Scott of Farmingdale, L.I. bumped her head of flowing curls. Mr. R. Scott only asked the present daughter, Liz (Cupid) if she was hurt. Mitzi, Mrs. Scott's 44, declared that R. Scott, 23, did not love her. No blows were exchanged.

Mr. + Mrs. S. Freeman were giving pep talks to the quarrel givers.

This fight was raised for Deepdale Hospital, with proceeds amounting to \$64.00

Weather - Cloudy with sunshine. High 74-75.

GIFTS ARE DISTRIBUTED today Miss Ruth Hagestead, 55, distributed to the Scotts.

(from Saturday Paper)

Mitzi hates Superman Record! Boo! Boo!

Guests Come to Factory

Lisa Van Brunt came over to the factory to spend the weekend with Liz...

Debbie (older daughter) spent the weekend at Susan Gallo's house.

Mitzi picks up her tears and bustles Liz and goes to see "THE ABSENT MINDED PROFESSOR" and "THE SHAGGY DOG!" Ray begged her not to go, but she felt she had to.

WE ARE

SOON

GOING

TO

THE EXPO

'67

IN

MON- TRE-

AL

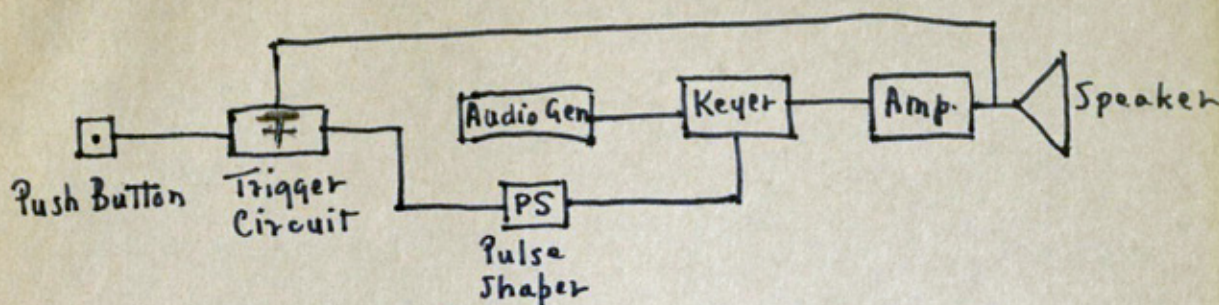
1967

1967



Photos by Jim Henson at Three Willow Park during recording session for a Bufferin pain relief medication commercial, 1967.
© Jim Henson Archives

Idea # 1 - for new sounds in Bell Like devices and other audible signalling sounds



1. Pressing button actuates Trigger Circuit I
2. Trigger emits pulse
3. PS shapes trigger pulse into desired shape for keyer purposes
4. Keyer further shapes trigger spike and provides desired decay.
5. Keyer also gates audio gen. into amp as it provides desired attack and decay characteristics.
6. Speaker reproduces gated and shaped sound of audio generator - through amplifier
7. Resultant sound may be likened to striking a bell or gong - once - with a mallet or hammer, etc.
8. Advantages over traditional method
 - a. Attack can be hard or soft - infinitely varied

Dict. 4/29/68
Raymond Scott

Raymond Scott
Inventor

Alfred W. Barber
May 2, 1968.

Idea 1 - Page 1. of 2

- b. Decay can be long or short - infinitely varied
- c. Pitch " " high or low - " "
- d. Harmonic spectrum - shaped in audio gen. as desired
- e. Volume as loud or soft as required.

Analogy with traditional method

Mallet - replaced by shaped pulse from trigger.

Gong or bell - replaced by audio gen - amp - speaker etc.

Addendum

Feedback from amp output to trigger is to disable trigger so that button isn't operative until signal has decayed to chosen point - for the one stroke effect.

Alfred W. Barber
May 2, 1968.

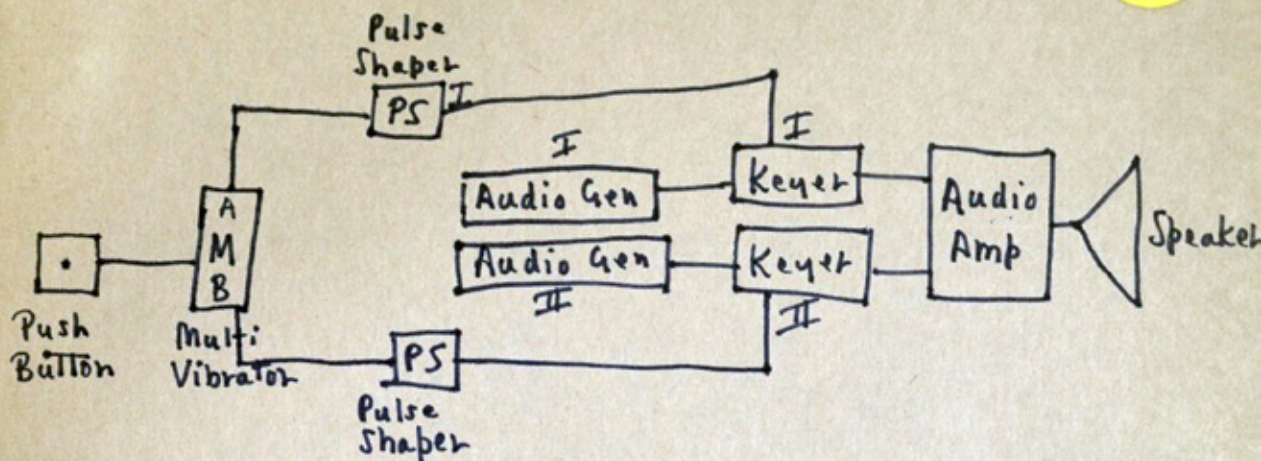
Dictated April 29, 1968 to Mathilde Scott

Raymond Scott
by Raymond Scott, Inventor

Idea 1 - Page 1 of 2

Idea #2 - A new sound in a Two Toned Bell Like Device
for any audio signalling purpose.

24



Dict. 4/29/68
Matthew Scott
Raymond Scott
Inventor

1. Pressing button turns on multivibrator
2. PS I shapes output A from M and triggers Keyer I
3. PS II shapes output B from M and triggers Keyer II
4. Both Keyers, individually, further shape trigger pulse into desirable attack and decay characteristics for both audio generators.
5. Both audio generators are therefore alternately keyed (gated) and then combined and amplified by "audio amp" - and made audible through speaker.

Advantages -

Same as a, b, c, d, e in Paragraph 8 of Idea 1.

Alfred W. Barber May 2, 1968

Idea 2 - Page 1. of 2

Analogy with traditional method -

Clapper replaced by multivibrators and pulse shapers and keyers.

The two bells replaced by audio generators, amplifier and speaker.



Two Tone
Traditional Bell

Alfred W. Barber
May 2, 1968.

Dictated April 29, 1968 to Mathilde Scott

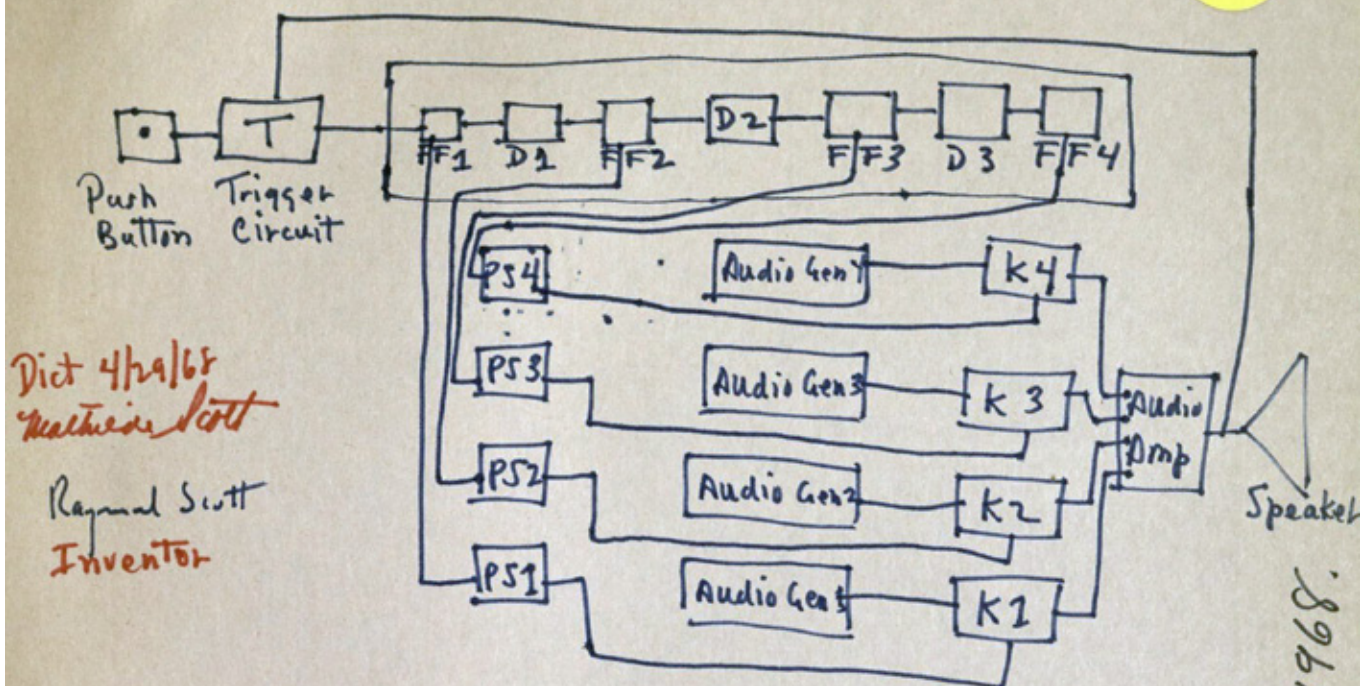
Raymond Scott
by Raymond Scott, Inventor

Idea 2 - Page 2 of 2

Idea # 3 - for New Sounds in Audible Signalling
Devices like Door Chimes, Dinner Bells,
Church Bells and others.

25-

1968



This invention is based on the sequential operation of a series of bell like or other series of audible sounds for signalling purposes, or whatever, where each sound is separately and sequentially operated - and held and/or decayed while the remaining sounds in the sequential series are actuated and held and/or decayed - as adjusted by the manufacturers or users - with the rhythm and speed of the sequential series of sounds adjustable

Alfred W. Barber May 2, 1968.

Idea 3 - Page 1 of 4

by setting of delay circuits D_1, D_2, D_3 -
Pitch, Tonal Spectrum, Attack and Decay
are also adjustable.

1. Pressing Push Button turns on ^{trigger} pulse That flips FF1.
2. Output pulse from FF1 is shaped by PSI (pulse shaper)
3. Further processed by K1 (keyer)
4. K1 turns on Audio Gen 1 - with chosen attack and decay.
5. Audio amp amplifies and speaker sounds it.
6. Output pulse from FF1 also turns on D_1 (delay circuit - "unijunction")
7. After chosen delay D_1 triggers FF2
8. Output pulse FF2 goes through same process as FF1 - keying on audio gen 2 - and triggers D_2
9. D_2 through FF3 then keys on audio gen 3
10. D_3 through FF4 then keys on audio gen 4
11. Might be easier to get proper sharp pulse from unijunctions than from processing FF outputs

Dict. 4/29/68
Raymond Scott
Inventor

Alfred W. Barber
May 2, 1968.

Idea 3 - Page 2 of 4

12. Audio voltage feedback from audio amp disables trigger circuit so that pressing the button does not trigger sequence again until last bit of decaying sound has faded out to desired point.

a. Maybe claims should include use for entertainment purposes

b. Could connect output pulse from FF4 to FF1 making for a ring counter-like effect, and provides another kind of new sound in audible signalling devices - a repetitive sequence of musical or other sounds.

Dict. 4/24/68
Raymond Scott

Raymond Scott, Inventor

Alfred W. Barber
May 2, 1968

Advantages - same as Paragraph 8 in Idea #1.

Analogy with Door Chimes - (for instance)

Hammer (clapper) in Door Chimes replaced by pulse generating means - FF1 - PS-1 - K1 - etc.

Metal Tube (chime) replaced by Audio Gen. Amp and Speaker.

There are many additional variants to all 3 Ideas - plus the one you already have - which I will call Idea 4

Idea 3 - Page 3 of 4

because it's more complex — but I guess we have
enough for now.

Dictated April 29, 1968 to Mathilde Scott

Raymond Scott
by Raymond Scott, Inventor

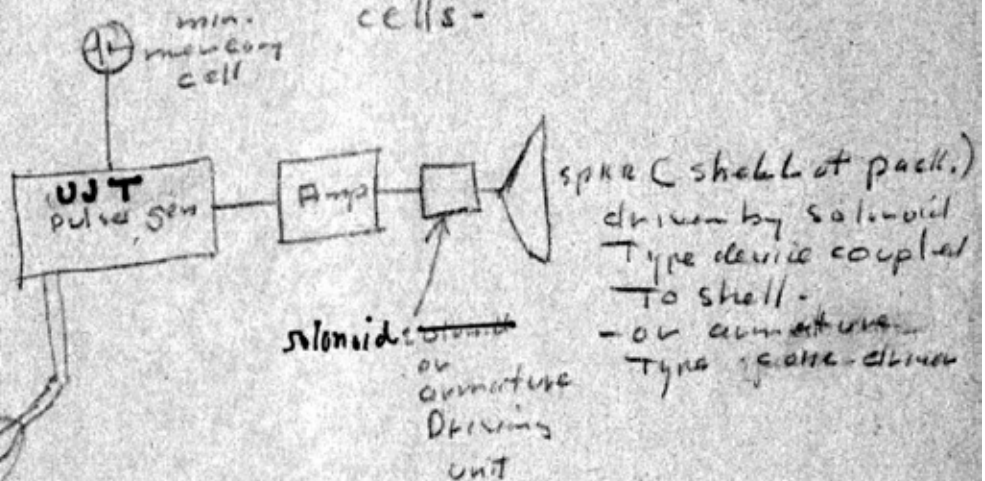
Alfred W. Barker
May 2, 1968.

1968

Idea 3 - Page 4 of 4

Electronic Baby Rattle

a device packaged like a traditional baby rattle but containing an ^{electro} pulse gen. that goes off and on and shifts freq. as it is being handled - with the output electromechanical coupled to the plastic ^{overall} package of the rattle - battery powered - ~~mini~~ ^{miniature} mecha. cells -



a glass vial like enclosure containing a suitable liquid of the correct resistance characteristic - so that when the rattle happens to

- be in one position - the pitch is ~~max~~ ^{max} highest
- in another - off - or low - or shifting in freq. as it's steadily changing position.

the output would be taken from B₁ (base 1) - in order to get high harmonic content

The two electrodes in the vial - would be series with the ~~charging~~ current to the ~~mech~~ on-off switch would be on the outside of the plastic ^{overall} ~~overall~~ rattle package

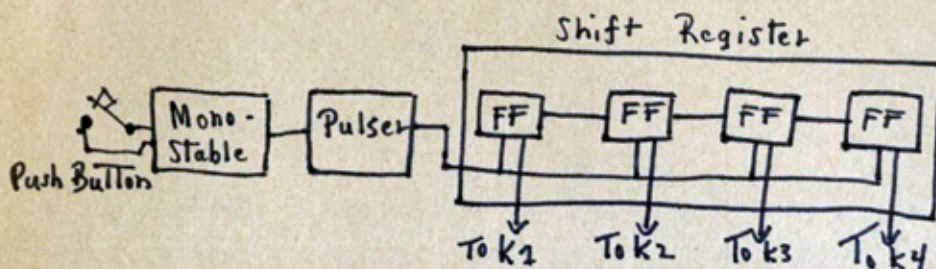
5/11/68
Raymond Scott
Witherby
Machery Scott

Three Additional Methods for Establishing a Sequence of required Keying Pulses

19

1968

#1



- Pressing push button triggers mono stable set to actuate pulser for required 4 pulse output.
- The first pulse delivers an output to Keyer #1
The second pulse delivers an output to Keyer #2
The third pulse delivers an output to Keyer #3
The fourth pulse delivers an output to Keyer #4

General Notes

- The original Idea #3 - was an automatic sequential Keyer string - permitting any desired delay between pulses - in addition to any chosen overall speed.
- Alternate #1 is restricted to fixed spacing between the pulses - but with any chosen overall speed.

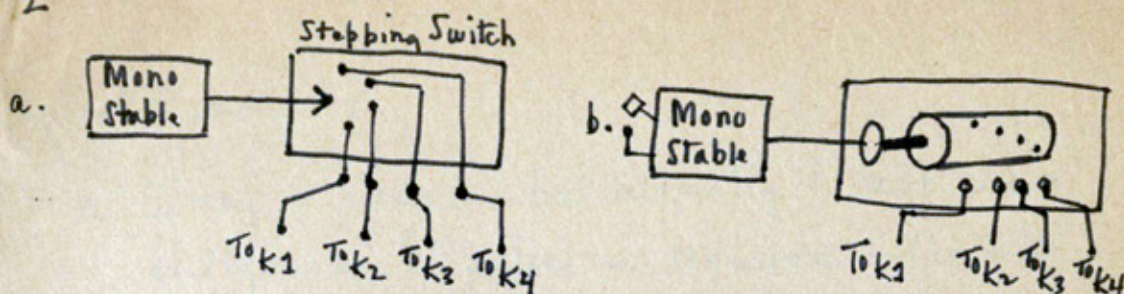
Dictated to Mathilde Scott 5/11/68
by Raymond Scott
Raymond Scott, Inventor

Alfred W. Barber
May 13, 1968.

Page 1 of 3

Three Alternate Methods - etc.

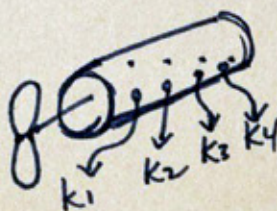
#2



- a. Pushing button triggers monostable to turn on self interrupting stepping switch that supplies a sequence of 4 pulses to Keyers K1, K2, K3, K4.
- b. Same idea but mono turns on motor to turn program drum that, with protrusions, actuates - in sequence - four switches that go to K1, K2, K3, K4.

#3

Same idea as 2b - but in this case the drum is hand powered - like the bell that was used for many years on apartment doors - where a butterfly-type handle was mounted on the apt. door - in the center about halfway up:



Dictated To Mathilde Scott 5/11/68

by Raymond Scott

Raymond Scott, Inventor

Page 2 of 3

Alfred W Barber
May 13, 1968

Three Alternate Methods - etc

General Comments

- a. I say 4 pulses - but actually I more correctly mean 'n' pulses as required - (in all disclosures)
- b. The mechanical type of sequential pulse producing devices don't seem important to me - but, am suggesting them "just in case".
- c. In addition #1, I mean the type of shift register - where with each pulse - the output shifts from FF to FF

Page 3 of 3

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May 13, 1968.

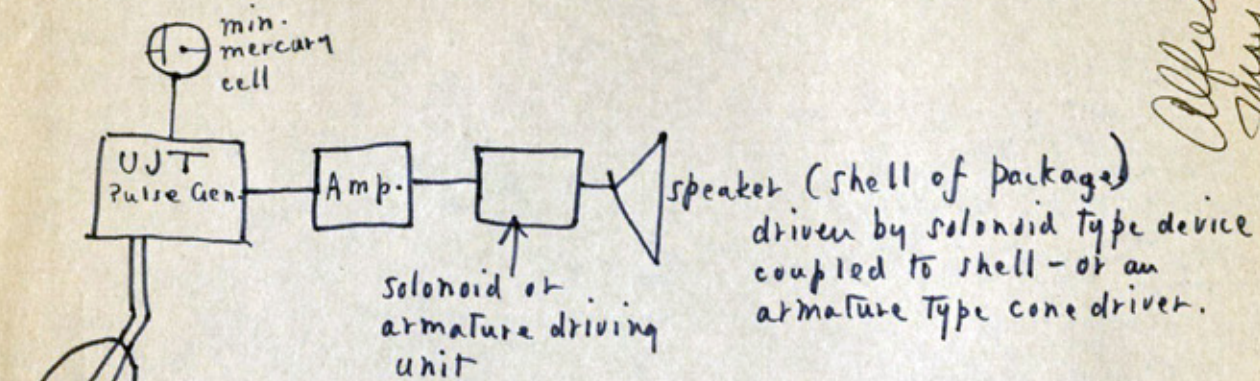
1968

Electronic Baby Rattle

22

A device packaged like a traditional baby rattle, but contains an audio pulse generator that goes off and on and shifts freq. as it is being handled - with the output electro mechanical coupled to the plastic overall package of the rattle - battery powered - miniature mercury cells.

Alfred W. Barber
May 17, 1968



a glass vial-like enclosure containing a suitable liquid of the correct resistance characteristic - so that when the rattle happens to be in one position - the pitch is highest - in another - off - or low - or shifting in frequency as it is steadily changing position.

The output would be taken from B1 (Base 1) in order to get high harmonic content. The two electrodes in the vial would be in series with the charging current to the emitter. An on-off switch would be on the outside of the plastic overall rattle package.

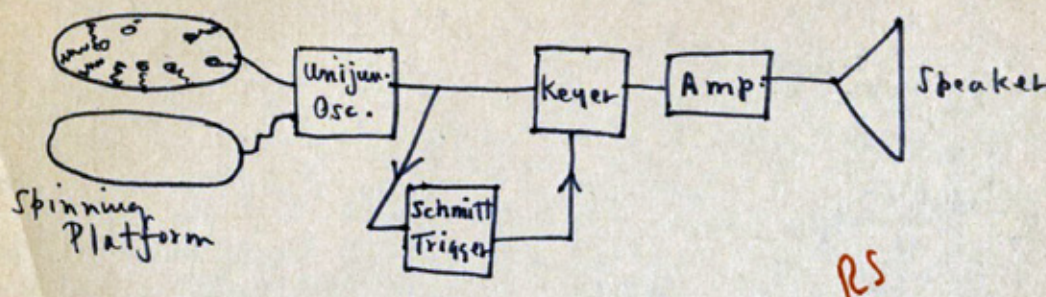
Dictated to Mathilde Scott May 13, 1968
by Raymond Scott
Raymond Scott, Inventor

SPIN - A - TUNE

21

Version I

A device about the size of a large pizza - spin any top on its surface and the top "spins out" a different tune for each travel pattern and repeats the same tune for the same pattern.



Alfred W. Barber
May 17, 1968

1. An ordinary top is spun on the SP
 - a. This platform consists of a conducting bottom plate - and a thin, flexible, fairly taut, non-conducting membrane about .02 of an inch above the bottom plate.
 - b. On this membrane there are a suitable number of conducting spots - each wired through a chosen, different value of printed resistor to a common rail around the periphery of this top membrane.
 - c. As desired, there can be several or many conducting spots connected to each resistor going to the rail.
2. When the top spins and travels around this membrane, the weight of the top causes the spot it happens to be on to touch the bottom plate and so turn on the UJT Osc. - The frequency is dependent on the resistance that the particular spot happens to be connected to.

Page 1 of 2

Spin - A - Tune

Version I

3. The audio tone emanating from The WT Osc. fires the Schmitt Trigger - which in turn provides the necessary pulse to gate on the Keyer - which properly shapes the attack and decay characteristic of the audio tone.
4. The amp. and speaker then sound the output of the keyer.

General Notes

- a. This version will produce the same frequency for the same spot the top is on.
- b. And the succession of tones always dependent on the pattern the top happens to make.
- c. The amount and size of dots to be determined experimentally for the most attractive all-over performance.

Alfred W. Barber
May 17, 1968

Dictated to Mathilde Scott 5/13/68

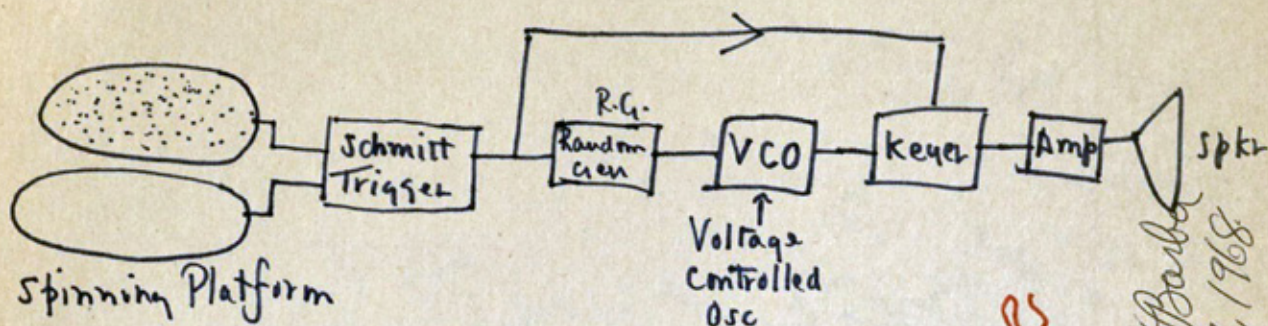
by Raymond Scott
Raymond Scott, Inventor

Page 2 of 2

SPIN - A - TUNE

Version II
Page 1 of 2

In this version the pattern of top travel has nothing to do with the sounds - but could be very interesting in a different way.



This invention works as follows:

1. An ordinary top is spun on the spinning platform.
 - a. This platform consists of a solid conducting bottom plate and .02 inches or so above it, there is a thin, flexible membrane with hundreds of protruding little pellets - embossed into the top membrane - and protruding downward.
 - b. As the top spins and travels around, the weight of the top causes a protruding pellet, when it's over it to fire the Schmitt Trigger.
2. The sharp pulse from the S.T. triggers the R.G. to a new random voltage.
3. The new random voltage shifts the VCO to a new audio freq.
4. The pulse from the ST also gates the keyer - which suitably shapes the attack and decay characteristic of the tune from the VCO.

Alfred D. Barber
May 17, 1968

1968

Version II

Page 2 of 2

5. Amp and Speaker sound it.

General Notes

- a. Instead of hundreds of pellets - many less - and larger in size could be built into the top membrane so that a succession of tones, fewer in number and each longer in duration would result.
- b. Instead of this top membrane idea - a grid of conducting material - built into a dielectric could be used for the bottom plate - and the metal tip of the top would act as a shorting element to fire the Schmitt Trigger.
- c. Though, in fact, there would be no relation between the pitch established and the position of the top - because when the top moved to another spot, the pitch would change.

Alfred W. Barber
May 17, 1968

Dictated to Mathilde Scott 5/13/68

by Raymond Scott
Raymond Scott, Inventor

BANDITO

The Bongo Artist

A device that automatically creates and performs bongo-like drum improvisations, an infinite variety of pitches, rhythms and colors - comparable to - and frequently more exciting than the most brilliant bongoist anywhere.

Alfred W. Barber
May 17, 1968.

Dictated to Mathilde Scott, May 15, 1968
by Raymond Scott
Raymond Scott, Inventor

Summary: Eight audio osc, all long pitched, bongo-like, are sequentially gated on by an eight stage sequential pulser; stage #1 keys osc #1, stage #2 keys osc #2 etc through 8. The gating circuits (keying) shaped to produce a bongo-like effect - The ESSP designed for a steady and adjustable tempo, and ring counter like, endlessly repeats the sequence of pulses.

Because, obviously the general effect would be mechanical and monotonous - the following provisions have been made:

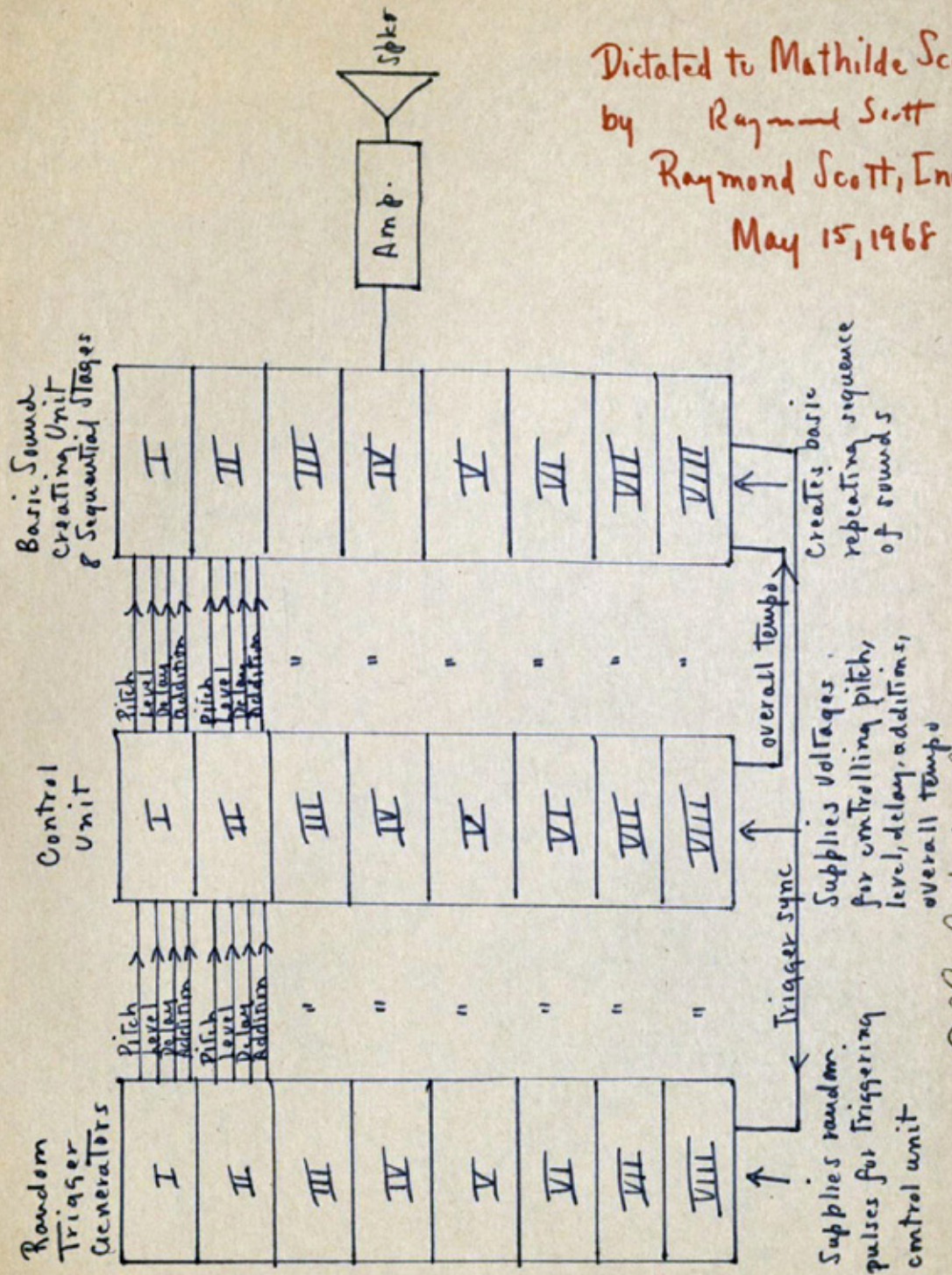
Means for occasionally, but randomly and attractively:

1. Changing the pitch of each of the eight bongo-like gated osc.
2. Changing the accent of each of the eight bongo-like gated osc.
3. Changing the rhythm of a couple, or a few or a whole string of these bongo-like osc. sounds
4. Sounding simultaneously a couple, or a few of the eight bongo-like osc. sounds
5. Changing subtly, or suddenly the speed of the overall tempo of the eight drum sounds

Alfred W. Barber^{RS}
May 17, 1968

Overall Block Diagram

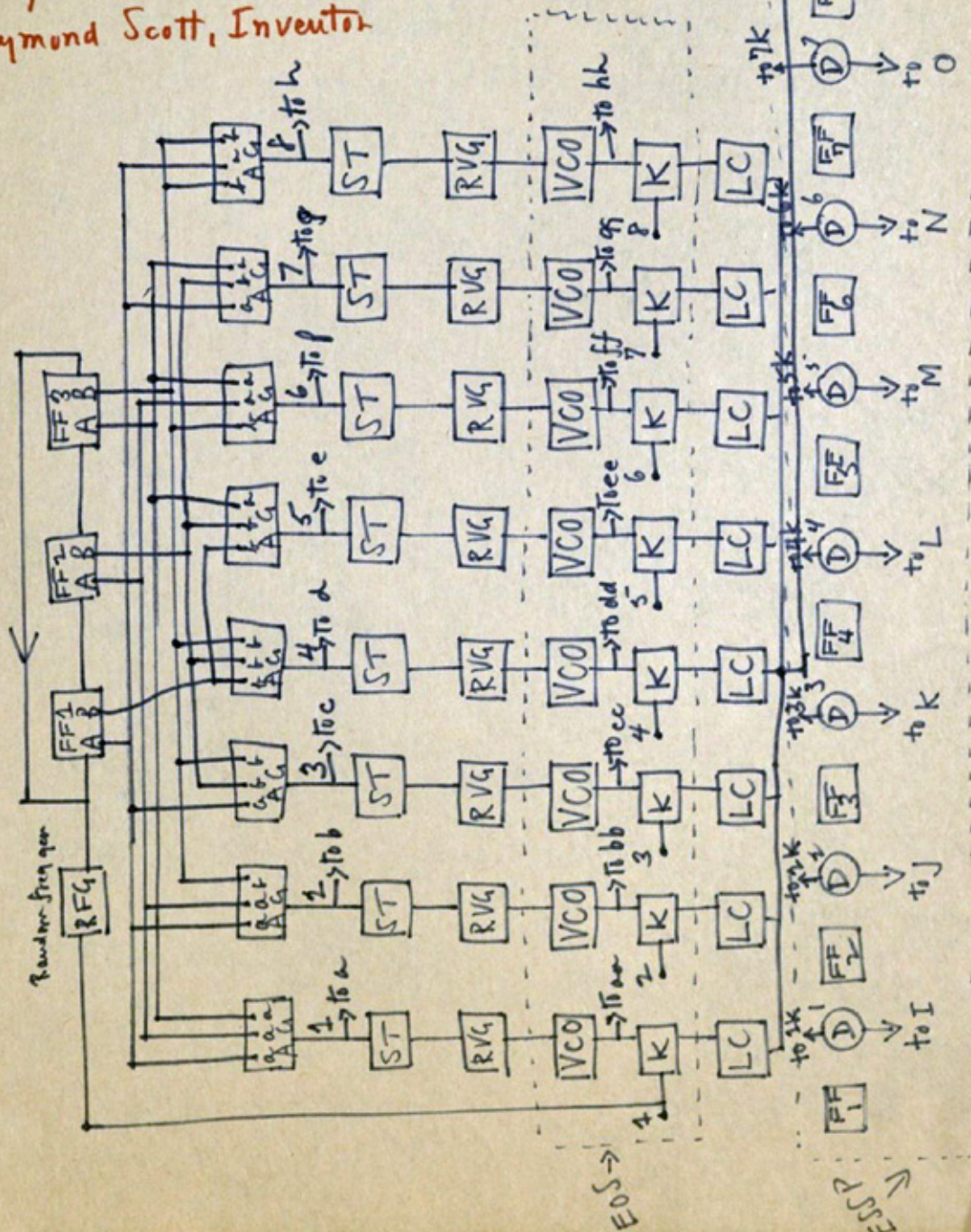
Dictated to Mathilde Scott
by Raymond Scott
Raymond Scott, Inventor
May 15, 1968



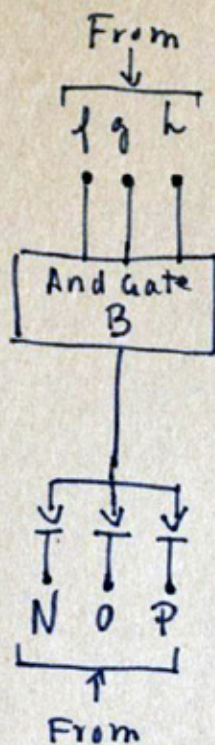
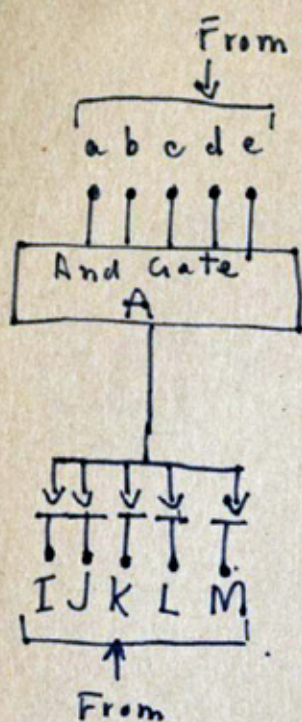
Alfred W. Barber
May 17, 1968.

Detailed Block Diagram

Dictated to Mathilde Scott May 15, 1968
by Raymond Scott
Raymond Scott, Inventor



Alfred W. Barber
May 17, 1968.



RS

Alfred W. Barber
May 17, 1968.

Circuit Operation

1. The Basic, monotonous, repetitive sound:

is produced by the eight stage sequential pulser (ESSP) operating ring counter-like - the pulse output of each stage gating one of the eight osc. in the block called E O S (eight osc. string).

In the ESSP (Eight Stage Sequential Pulser) Stage 1 triggers Stage 2, Stage 2 triggers Stage 3 etc through Stage 8 which feeds back to trigger Stage 1. As the sequence repeats, there is an output pulse from Stage 1 every 9 pulses (every cycle) - actually, then, an independent output pulse from each stage; every cycle, gates on through its associated keyer, each of the eight osc. in turn.

Alfred W. Barber
May 17, 1968.

2. To provide variety of pitch.

as an aid in avoiding monotony, the following circuit action takes place:

- a. The eight osc., as mentioned earlier, are of the voltage controlled type (VCO) the output of a separate random voltage generator (RVG) is made available at each of the eight osc (VCO) - for the purpose of pitch modulation. The RVG designed to generate a new steady state voltage only when triggered, fixes the frequency of its associated VCO and changes it only on command. Means for the occasional and random triggering of the VCO's are described next.

- b. As the block diagram indicates - The pulse output of Stage 1 also triggers RVG (random frequency generator) to a new freq. driving a divider string of flip flops. The FF string thereby now giving a new arrangement of outputs. Each of the eight possible arrangements of outputs is wired to a separate three input "and" gate. Each output from these 8 gates going on to trigger new circuit conditions. But first, pitch (freq.) conditioning.
- Since "And" gate #1 is connected through its Schmitt trigger (ST) to RVG #2 whenever "And" gate #2 fires - a random event - it triggers RVG I to a new voltage that modulates VCO I to a new frequency. Similarly "And" gate #II may occasionally fire and change the frequency of VCO II etc. for the remaining eight VCO's.

To review - once every cycle (each ninth pulse) the divider string of FF may show a new arrangement of outputs - causing any one of the VCO's, at random, to change frequency. Circuitry, not shown, is used to limit freq. excursions to the desired range.

2. To provide variety of accents (levels)

The same general idea as explained above, but now we take each - randomly arrived at new voltage appearing at the outputs of the RVG's and use them to set new amplitude levels in LC (level control) circuits before being mixed in the final amplifying stages. RVG I output controls LC II rather than I so that a change in pitch of VCO I is not always accompanied by a change of level out of VCO I. And RVG II controls LC III and so on down the line.

Incidentally, different functions are shown as different blocks, but will frequently be built into existing circuits.

3. To provide a variety of rhythms and flourishes

The same general idea as above - but now, instead of using the appearance of an output at just one of the

1968

Alfred W. Barber
May 17, 1968

K)

"And" gates, the outputs of gates I, II, III, IV, V (a, b, c, d, e, in block diagram) are connected in turn to a "5" input And gate, so that a more seldom arrived at control voltage is available for rhythm control.

A description of the Rhythm Control Circuit follows:

The Eight Stage Sequential Pulse consists of Bistable FF - WT Delay Circuit - Bistable FF - WT Delay Circuit - etc. When this chain is started FF I is flipped - charging WT osc I which fires and flips FF II - charging WT osc II which fires - flips FF III charging WT osc III etc, etc, etc. Incidentally, each WT when fired also flips back the preceding FF. The circuitry used in these WT osc. is such that an external voltage can be injected to speed up (or slow down) the charging rate and thus affect speed and rhythm control by delay or speed up of that particular WT circuit. Because, as indicated in the block diagram, the output of the "5" input And gate is connected to injection points I, J, K, L, M - whenever the "5" input gate fires, the additional injected voltage speeds up that particular group of WT circuits and a flourish takes place. If it lasts awhile the sound appears as a change in rhythm.

Similarly "And gate B" offers a three note flourish - creating a different effect and a different rhythm possibility.

In a production model, the number and variety of these conditioning gates could be any amount - to be determined experimentally. It is to be remembered that pitch and level changes are continuing to take place concurrently with rhythm shifts and flourishes.

Alfred W. Barber
May 17, 1968

4. To provide - for variety - the simultaneous sounding of a couple or a few of these bongo-like osc. tones.

An additional group of 'And gates', not shown, will be used - for random periods - to parallel at intermittent, and random times - a couple or several of the inputs to the keying circuits - so that gating one keyer will excite another or others.

5. To provide - for variety - a subtle, gradual change in the overall tempo - slower or faster - or a sudden change in the overall tempo.

An additional group of 'And gates', not shown, will be used to change the charging rates of all VJT osc. simultaneously and thereby affect the overall tempo - at random times, and for random periods.

Alfred W. Barker
May 17, 1968.

Dictated to Mathilde Scott May 15, 1968

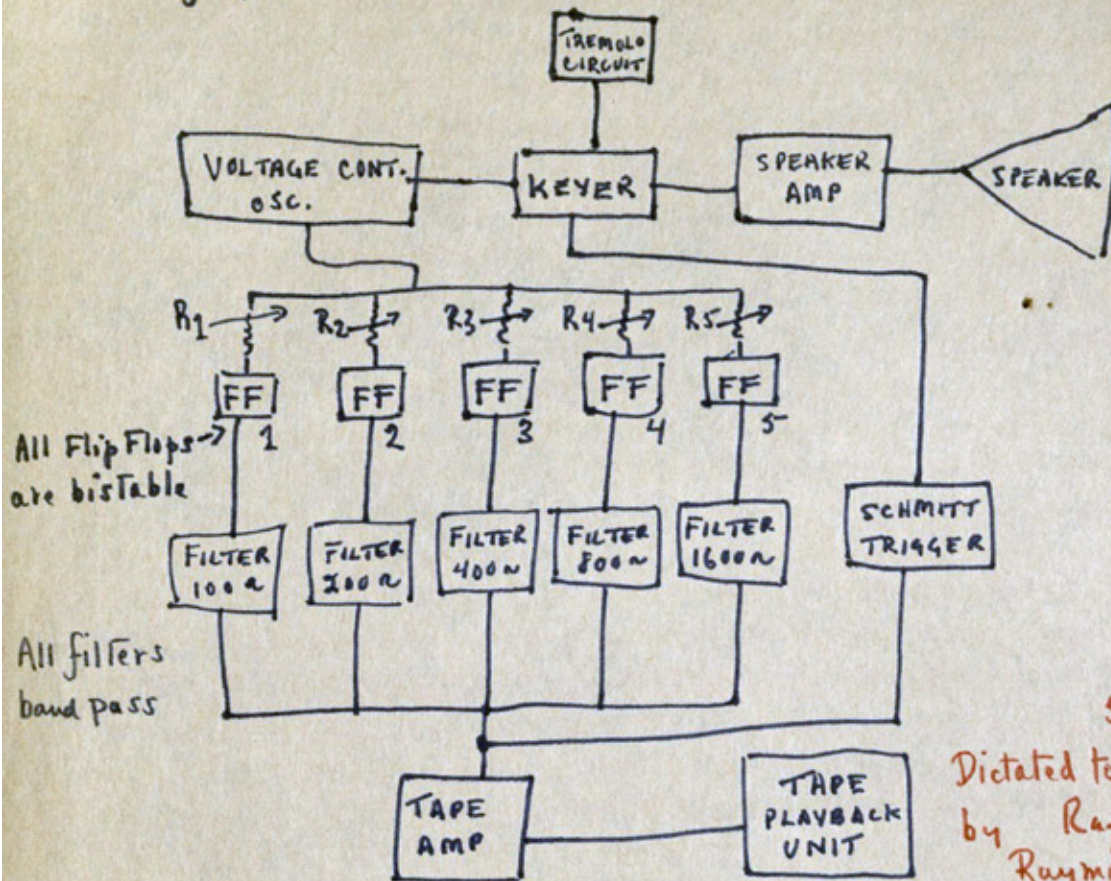
by Raymond Scott

Raymond Scott, Inventor

ELECTRONIC Music Box

20

PAGE 1 of 4



Alfred D. Barber
May 17, 1968.

5/13/68

Dictated to Mathilde Scott
by Raymond Scott
Raymond Scott,
Inventor

1. A five frequency code is used, recorded on a Philips cassette type of tape mechanism - and works as follows:
 - a. When, for instance, only a 100 ~ tone is present - bistable FF1 turns on, supplying 12 units to R1, adjusted to develop a discreet current/voltage controlling the VCO sounding a chosen frequency (pitch).
 - b. When both 100 ~ and 200 ~ are present both FF1 and FF2 turn on - and the currents through both R1

1.

Page 2 of 4

and R_2 provide a new voltage that in turn controls the VCO to the new pitch.

- c. Similarly, any combination of these five tones would create a different-chosen-frequency output from the VCO.

2. Also, the appearance of any single tone or combination of tones goes from the output of the tape amp to actuate the Keyer - with attack and decay circuits adjustable and preset by the manufacturer.

- a. When a fresh attack is indicated a slight gap (silence) on the tape would permit the Schmitt Trigger to again actuate the Keyer.

3. Another way of keying (not shown on block diagram) — and perhaps much more flexible — would be to have a sixth tone on the Tape (3200 Hz) for keying only.

- a. Then this sixth tone could be a sharp pulse — or a longer pulse — or continuous, as required by the nature of the music — the Schmitt Trigger, for this method, would not be used.

- b. This method, however, would require rectification of the sixth tone, so that, in its continuous state, it would provide DC for holding the Keyer on.

4. Since the Electronic Music Box, in this form, is a

Alfred W. Barber
May 17, 1968

Page 3 of 4

monophonic melody instrument and, therefore, not capable of sounding more than one note at a time — the tremolo circuit (amplitude modulator) is used to provide a mandolin-like effect — especially useful when a note is being held — or slowly decaying — this to provide more interest.

a. Again, it might be advantageous to have a seventh tone, for keying on the tremolo circuit, exactly as required.

5. The function of the speaker amplifier and speaker is self-evident.

Alfred W. Barber
May 17, 1968
RS

Advantages

1. The traditional average music box is mostly limited to the repetition of a short program of simple diatonic music — The Electronic Music Box can play as much as a 45-minute medley of Gershwin depending on the type of cassette used.
2. The traditional average music box presents a frozen program — with The Electronic Music Box — snap in another cassette — or reverse it — and the program is changed.
3. The traditional average music box has the familiar music box sound — the Electronic Music Box

Page 4 of 4

retains the tinkly quality - but adds a new dimension
- the excitement of the electronic music sound of today.

4. The traditional average music box is hand wound - the Electronic Music Box operates on batteries, rechargeable with an AC plug.

5. The traditional average music box has been around for centuries - the Electronic Music Box is a new, contemporary, glamor product.

Alfred W. Barber
May 17, 1968

General Notes

1. The physical size of the Electronic Music Box will approximate that of the Norelco and similar portable cassette recorders.

2. A good question would be - "If you're starting with a cassette tape playback unit to begin with - why not record this Electronic Music Box sound on the tape, and just play it?"

Because there is a striking difference between recorded sound and gated, virgin, direct oscillator sounds - without noise, flutter and other distortion products.

Dictated to Mathilde Scott, 5/13/68

by Raymond Scott

Raymond Scott, Inventor

4.

1968

[72]	Inventor	Raymond Scott 3 Willow Park Center, Huntington, N.Y.
[21]	Appl. No.	742,118
[22]	Filed	June 7, 1968
[45]	Patented	June 22, 1971

3,284,796	11/1966	Borsattino et al.....	340/384
3,346,857	10/1967	Cromer, Jr.	340/384 X

Primary Examiner—John W. Caldwell
Assistant Examiner—Michael Slobasky
Attorney—Alfred W. Barber

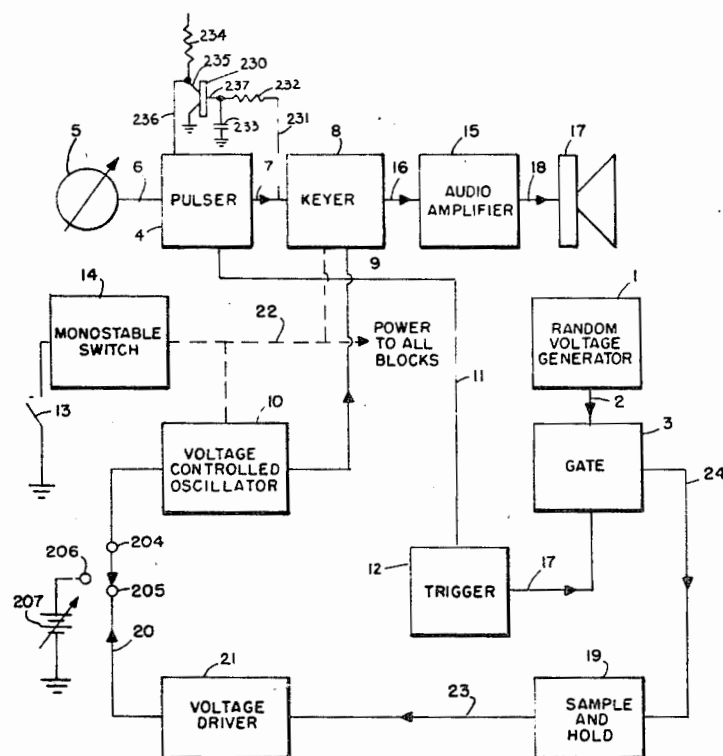
[54] **ELECTRONIC AUDIBLE SIGNALLING DEVICES**
6 Claims, 9 Drawing Figs.

[52] U.S. Cl. 340/384
[51] Int. Cl. G08b 3/00
[50] Field of Search 340/384 E

[56] **References Cited**
UNITED STATES PATENTS

3,254,336	5/1966	Campbell	340/384
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ABSTRACT: Electronic audible signal devices such as doorbells, buzzers, beepers, telephone bells, school bells, bicycle bells, sirens, signaling bells in general and signalling devices in general are provided by novel combinations of random voltage generators, voltage controlled tone generators, pulsers, triggers, pulse shapers, keyers, audio generators, delay devices, amplifiers and loudspeakers.



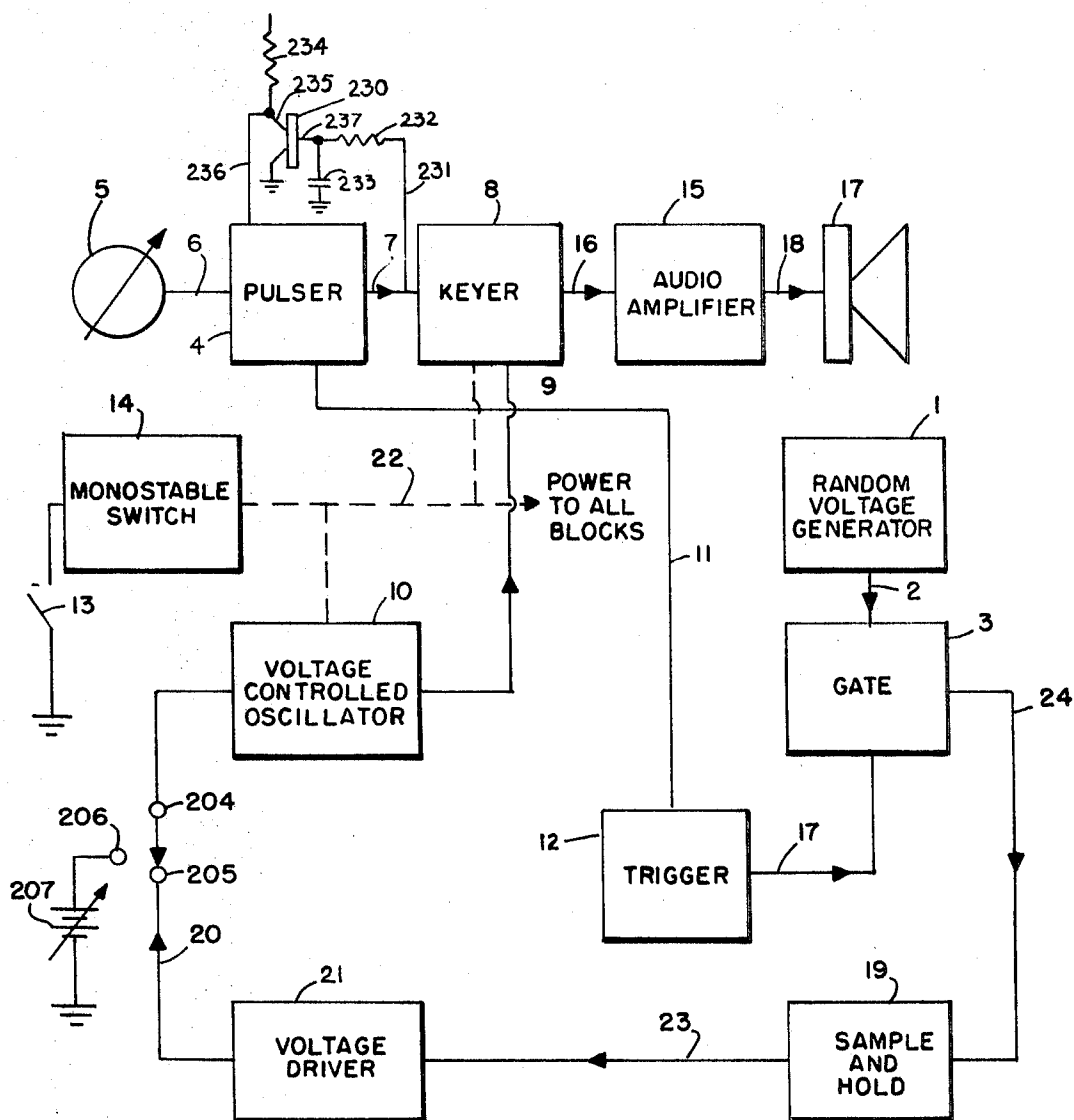


FIG 1

INVENTOR.

RAYMOND SCOTT

BY

Alfred W. Barber

ATTORNEY

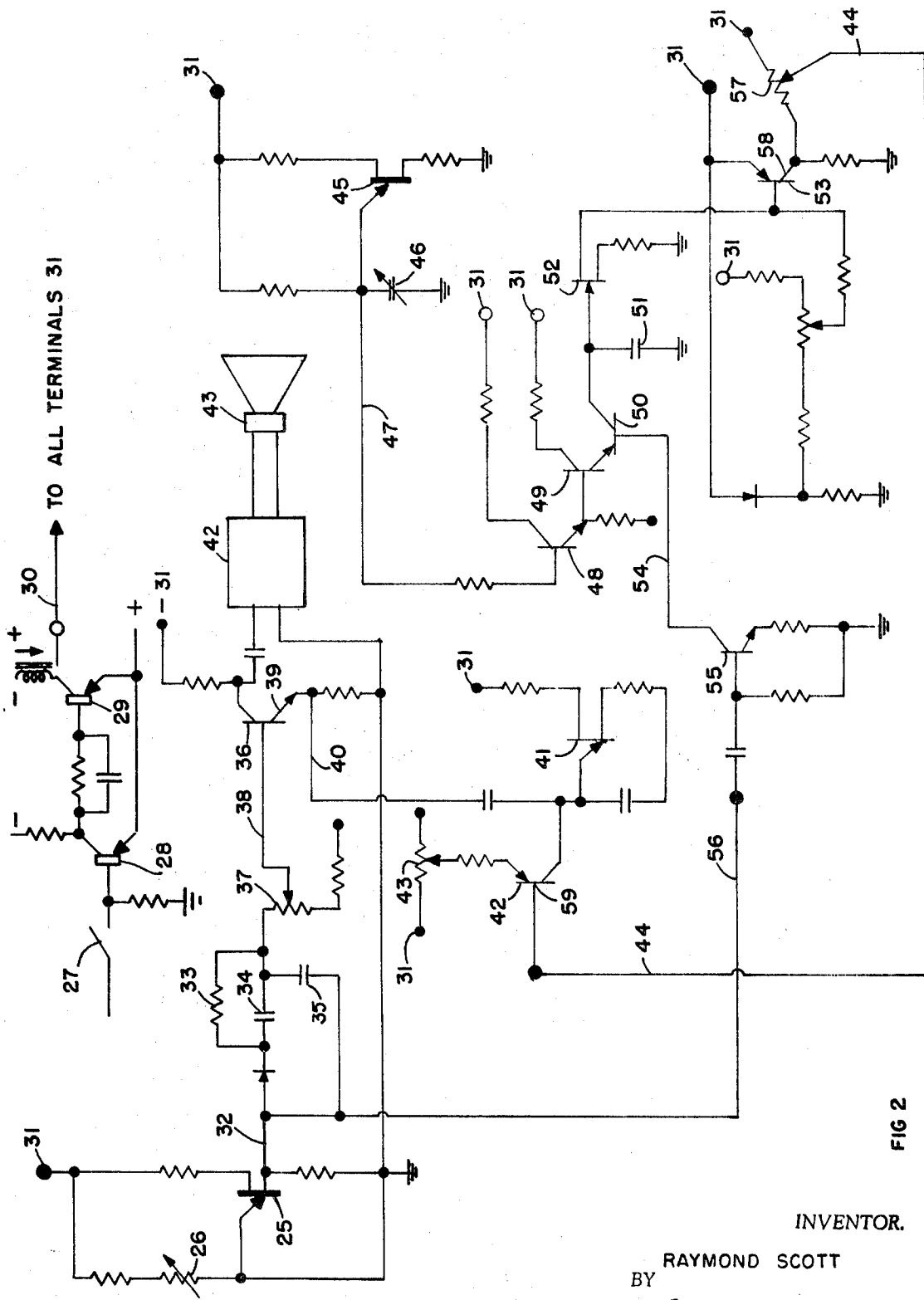


FIG 2

INVENTOR.

RAYMOND SCOTT
BY

Alfred W. Barber
ATTORNEY

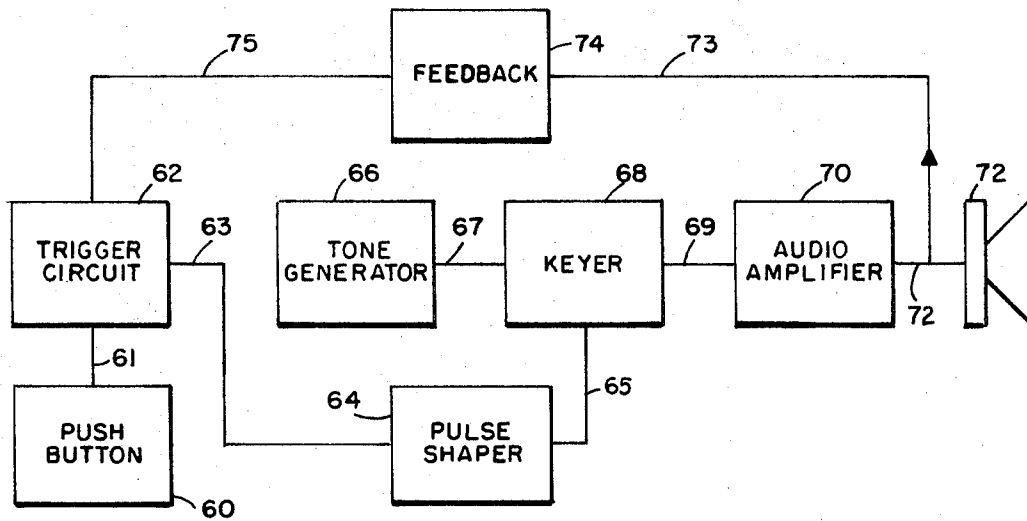


FIG 3

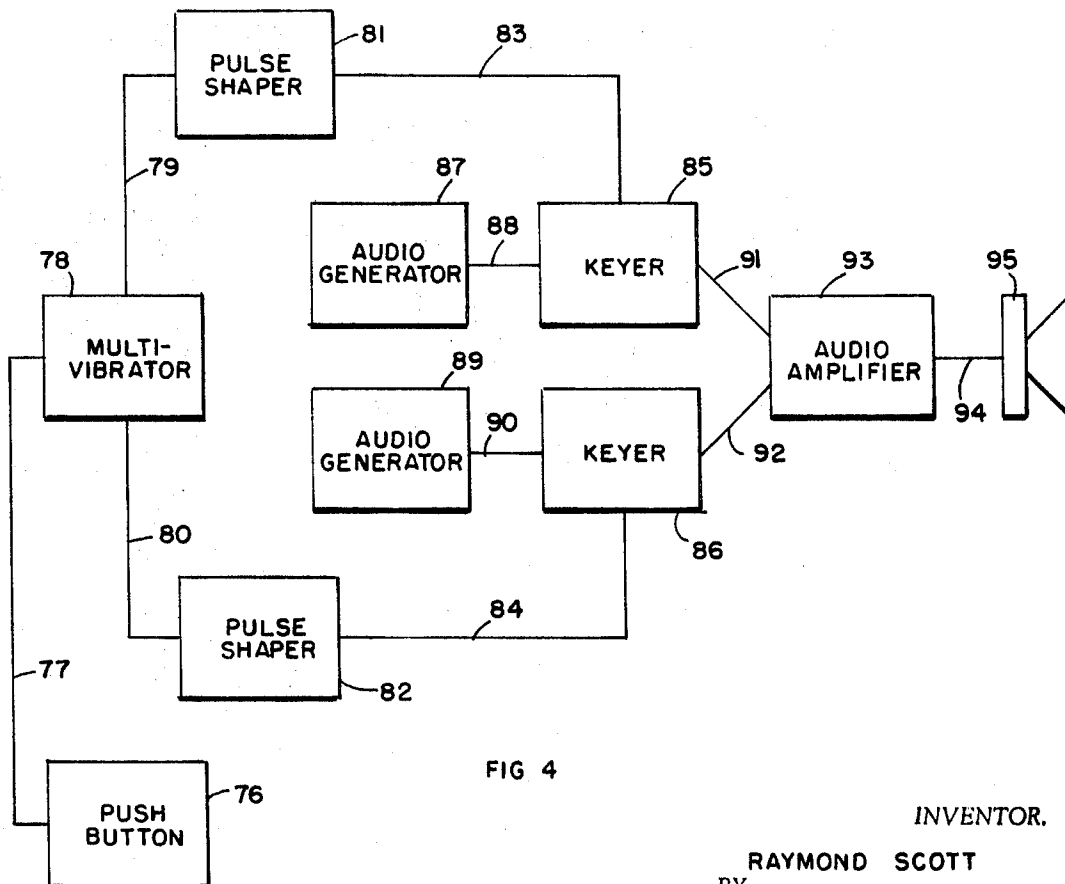


FIG 4

INVENTOR.

RAYMOND SCOTT

BY

Alfred W. Barber
ATTORNEY

1968

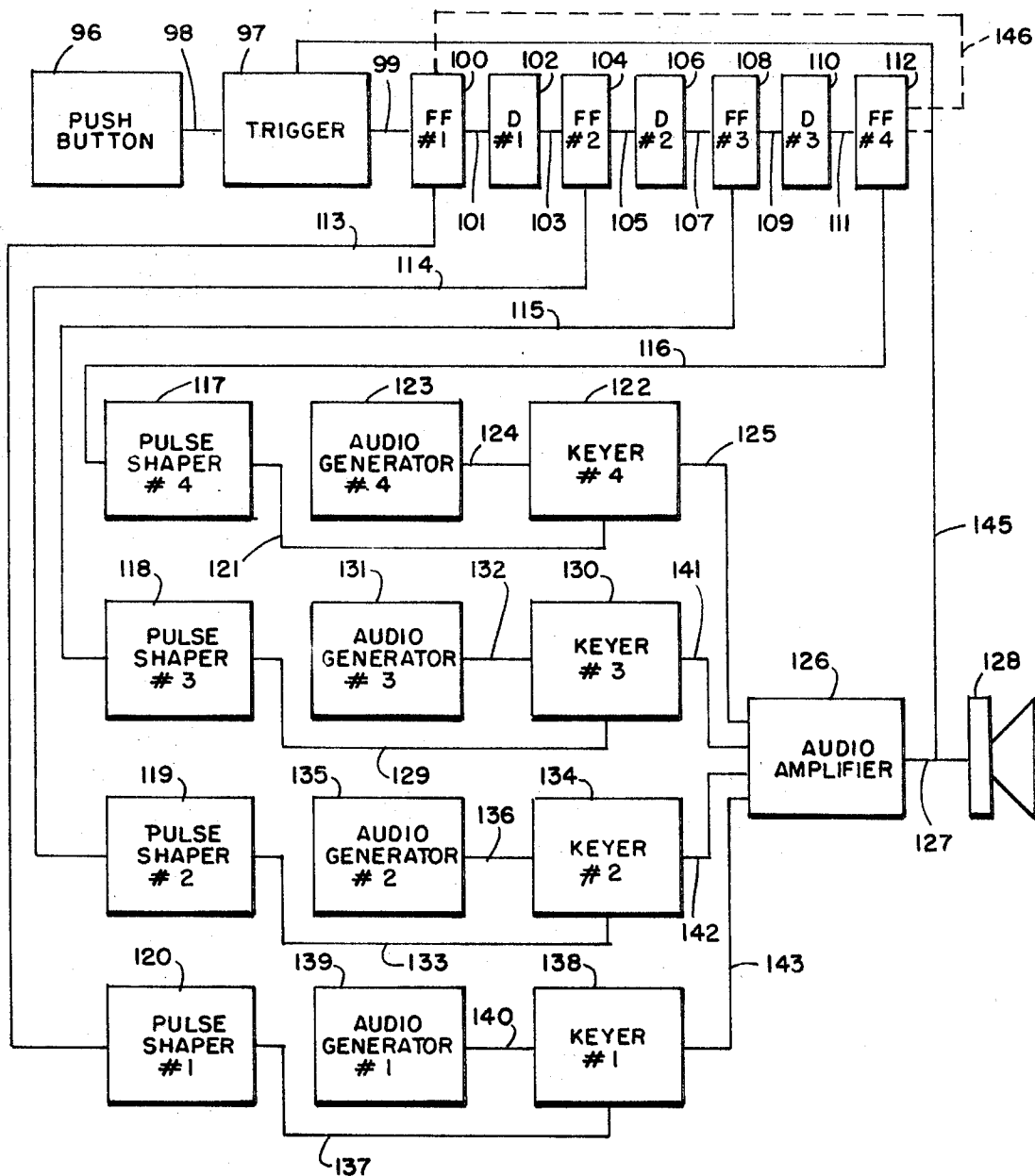


FIG 5

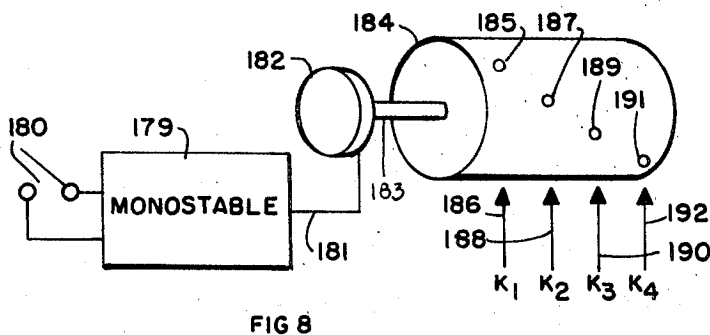
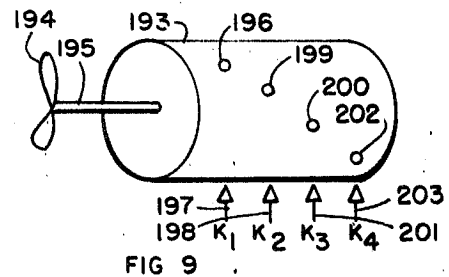
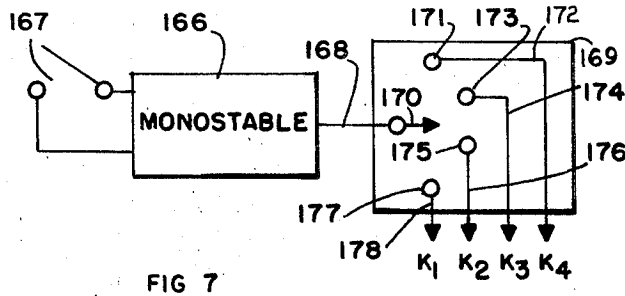
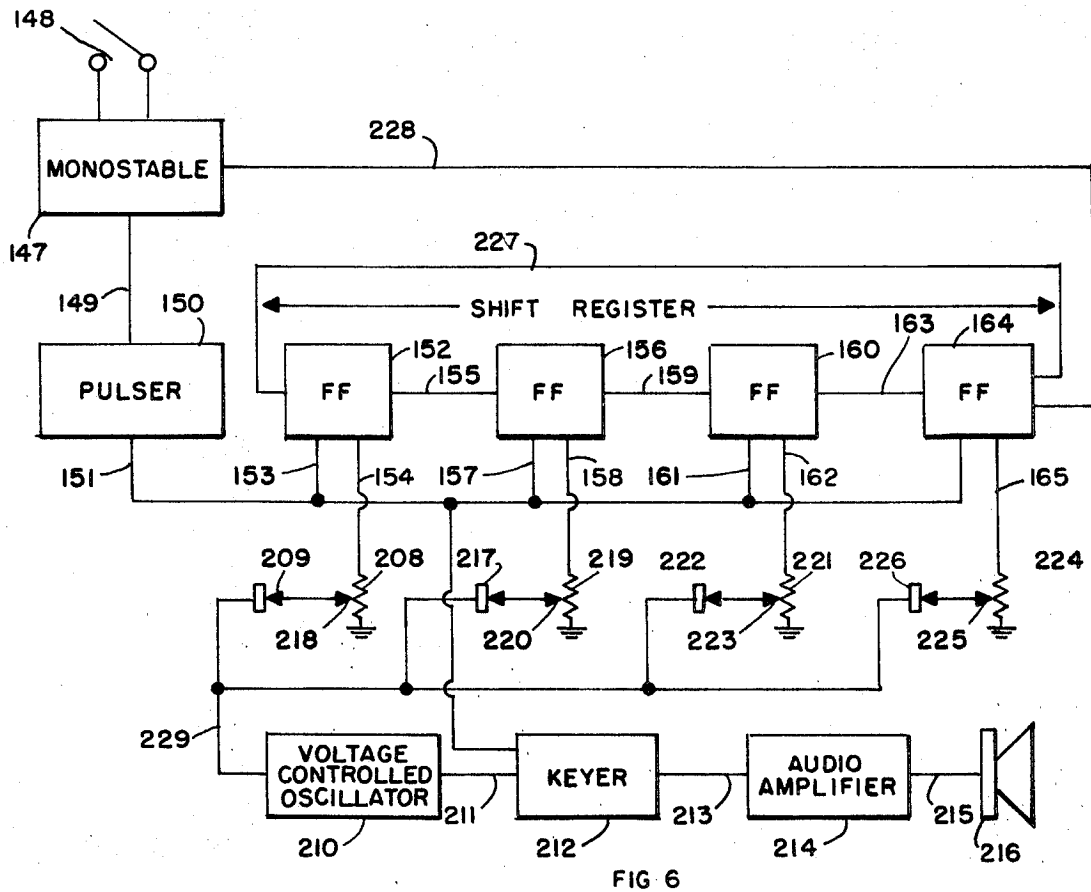
INVENTOR.

RAYMOND SCOTT

BY

Alfred W. Barber

ATTORNEY



INVENTOR.

RAYMOND SCOTT

BY

Alfred W. Barber
ATTORNEY

ELECTRONIC AUDIBLE SIGNALLING DEVICES

BACKGROUND OF THE INVENTION

1. Field of the Invention

Class 340Communications, Electrical and subclass 393audible, combined or plural (e.g. manual and electrical, bell and buzzer).

2. Description of Prior Art

Prior art devices have included electromechanical bells generally including a metal bell stroked by an electrically driven clapper. Such bells have been programmed as by means of a punched tape or similar means for initiating or programming the stroking of the bell.

When considered in the light of the concepts in accordance with the present inventions, these prior art electromechanical devices are relatively inflexible and limited in performance. The mechanical bell, for example, emits only one tone so that for a wide range of tones a large number of bells would be required. There are many other limitations as well, such as the mechanical clapper, which has a natural period limiting the rate at which the bell may be struck. The volume is also an inherent characteristic of the bell which can be changed only slightly as by stroking more or less vigorously.

SUMMARY

The present invention comprises a completely electronic bell system except for the initiation pushbutton and the loudspeaker output transducer. The clapper is simulated by pulsers and triggers; the bell tone and characteristic by tone generators and pulse shapers; and the acoustical output by loudspeaker transducers. However, the electronic bells and buzzers in accordance with the present invention are far more flexible and versatile than the former electromechanical devices. The characteristics which were inherent in the rigid bell are not only widely variable but are under complete electronic control or are completely random as the operator or user chooses. Mechanical limitations of speed tone, loudness, pitch and other characteristics are completely eliminated and overcome in accordance with the present invention. Thus, new concepts applications and capabilities are provided, many not considered previously.

A wide range of signaling devices are provided with tone, pitch, attack, decay and other characteristics variable in practically unlimited variety. The extent of variation and character of various signaling devices in accordance with the present invention will be clearly understood from the detailed description of the invention given below in connection with the various figures of the drawing.

In the Drawing:

FIG. 1 is a block diagram of one form of the present invention.

FIG. 2 is a detailed schematic circuit diagram of the form of the invention shown in FIG. 1.

FIG. 3 is a block diagram of a modified form of the present invention.

FIG. 4 is a block diagram of another form of the present invention.

FIG. 5 is a block diagram of still another form of the present invention.

FIG. 6 is a block diagram of a modified form of a portion of the form of the invention shown in FIG. 5.

FIGS. 7, 8 and 9 are still further modified forms of a portion of the form of the invention shown in FIG. 5.

FIG. 1 is a block diagram of one form of the present invention. Operation of the device is initiated by closing a switch such as momentary contact pushbutton 13 is connected to trigger monostable switch 14 which applies, for a predetermined period of time (depending on the constants of the monostable switch), energizing voltage to the system rendering all of the other blocks operative for this period of time. When the system has thus been energized, the sequence of operations described below is started.

FIG. 1 then operates with a voltage controlled oscillator 10 producing a tone which is applied to keyer 8 over line 9. Pulser 4 rate controlled by a suitable rate control device 5 connected over line 6 turns keyer 8 on and off over line 7. Keyer 8 in going on passes tone signals from oscillator 10 over line 16 to audio amplifier 15 and the amplified tones are applied over line 18 to a suitable transducer such as loudspeaker 17. At the same time random voltage generator 1 is activated and starts generating a varying voltage such as, for example, a series of ramp voltages. These varying voltages are applied over line 2 to gate 3. Gate 3 when opened by a pulse from trigger 12 over line 17 applies a momentary voltage to sample and hold 19 over line 24. Trigger 12 is activated by pulses from pulser 4 over line 11. Sample and hold 19 receives a voltage from gate 3 which depends on the point in the cycle of random generator 1 at which gate 3 is opened by trigger pulses from trigger 12. This received voltage is held until the next sample is taken through gate 3. This held voltage is applied to voltage driver 21 over line 23 where a corresponding driver voltage is produced suitable for controlling voltage controlled oscillator 10 over line 20. This voltage applied from driver 21 causes the frequency or tone of oscillator 10 to assume a new value which in turn is emitted over loudspeaker 17. Thus, at each pulse from pulser 4, a new tone is produced and emitted and this new tone is randomly determined by the instantaneous voltage gate by gate 3 from random voltage generator 1. The rate at which the tones are changed and emitted is determined by the pulse rate of pulser 4 which in turn is determined by the setting of pulse rate control 5. The number of pulses of tone emitted or the length of time during which they are emitted for each closure of pushbutton switch 13 depends on the time constants of monostable switch 22 since when switch 22 opens, the system stops all activity.

In order to operate the device with a steady pitch (but adjustable) a switch 204, 205, 206 is provided for switching the frequency control of voltage controlled oscillator 10 from the random voltage generator to an adjustable voltage source 207.

An interesting and unusual effect can be provided if the power to pulser 4 is supplied through transistor 230 operated as a level detector or pulse counting switch. Pulses from line 7 over line 231 and through integrating resistor 232 serve to charge capacitor 233. Power to pulser 4 is supplied from line 33 through resistor 234 connected to collector 235 and over line 236. When capacitor 233 has been charged to the conduction point of base 237, collector 235 conducts dropping voltage through resistor 234 and lowering the voltage over line 236 to pulser 4 causing it to stop pulsing. As capacitor 233 discharges, the collector rises and pulser 4 starts to generate pulses again. The object is to prevent a monotonous sound being produced from steady closure of pushbutton 13.

FIG. 2 is a schematic circuit diagram of a circuit suitable for use in the system shown in FIG. 1 and described above. The corresponding FIG. 1 numerals are shown in parentheses. The pulser (4) is shown as a unijunction oscillator employing unijunction transistor 25 and having a frequency controlled by variable resistor 26 (5). Pulses are applied to the keyer, transistor 36 (8) through a pulse shaping network including resistor 33 and capacitors 34 and 35 and a gain control 37 over lead 38. The voltage controlled oscillator employing unijunction transistor 41 (10) and a frequency control dynamic resistor supplied by transistor 42 and controlled by the setting of potentiometer 43 and the voltage supplied over line 44. The tone or signal from oscillator 41—42 is applied to keyer 36 over lead 40 to emitter 39. The keyed tone is applied to amplifier 42 (15) and in turn to loudspeaker 43 (17). The random generator is a unijunction oscillator employing unijunction transistor 45 (1) and having suitable frequency control means such as variable capacitor 46. The ramp voltages generated by this oscillator are applied over lead 47 (2) and through emitter follower transistors 48 and 49 to gate transistor 50 (3). Gate 50 is closed by a signal over line 54 (17) which in turn is derived from pulser 25 over lead 56 (11)

and through trigger transistor 55 (12). When gate 50 is closed the instantaneous voltage from random generator 45 is applied to a sample and hold device such as capacitor 51 connected to field effect transistor 52 (19). This voltage sample is applied through a voltage driver transistor 53 (21) over collector 58 and potentiometer 57 to line 44 (20) back to base 59 of the frequency control transistor 42 of voltage controlled oscillator 41 (10). Each time pulser 25 generates a pulse a new frequency is thus generated in a randomly determined manner.

The sequence described above is initiated by actuating a monostable switch comprising transistors 28 and 29 (14) by closing a suitable switch such as pushbutton 27 (13) and applying energizing voltage over lead 30 (22) to the bias terminals 31 of the pulser, keyer and so on forming the complete circuit as described above.

Details of the operation of the individual circuits pulser, keyer and so on have not been supplied since these are all well-known devices individually operating in a conventional manner. The invention resides rather in the novel combination and interconnection of these devices to provide new, useful and unobvious results.

To review briefly, the operator presses button 27 (13) energizing the system and initiating the sequence of operation. Bursts of tone are produced, each pulse producing a new random pitch until the monostable switch resets and shuts the system off. The next time the button is pressed another sequence of entirely different tones is produced and so on indefinitely. The average pitch of the tones can be changed by adjusting potentiometer 43, the tonal increments can be changed by controls 46 and 57 and the rate of production of tone bursts can be changed by adjusting variable resistors 26.

FIG. 3 is a modified form of the present invention shown in block diagram form. When pushbutton 60 is pressed, a circuit is closed over line 61 actuating trigger circuit 62 which in turn emits a pulse over line 63 to pulse shaper 64. Pulse shaper 64 shapes the received pulse into the desired shape for keyer purposes and passes it over line 65 to keyer 68. Keyer 68 further shapes the received pulse and gate line from tone generator 66 received over line 67 into audio amplifier 70 over line 69 providing desired attack and decay characteristics. Speaker 72 receiving the amplified signals over line 71 reproduces the gated and shaped sounds from amplifier 70. The resultant sound may be likened to striking a bell or gong once with a mallet, hammer or other suitable device. The attack can be infinitely varied by variations in the trigger, pulse shaper and keyer circuits. It can be long or short also with infinite variations. The pitch of the sound can be high or low or anything in between. The harmonic spectrum can be shaped as desired in the audio generator. Volume can be loud or soft as required by adjustment of the gain of the audio amplifier. The analogy with conventional bells will be evident since the mallet is represented by the shaped pulse from the trigger and the gong or bell is replaced by the audio or tone generator, audio amplifier and speaker. Feedback over line 73, through feedback device 74 and over line 75 to the trigger circuit provides means for disabling the trigger, so that the pushbutton is inoperative until the signal on line 71 has decayed to a chosen point in order to achieve a one stroke effect.

FIG. 4 is another form of the present invention shown in block diagram form. This is a two-bell form in which pushbutton 76 closes a circuit over line 77 to activate multivibrator 78. Multivibrator 78 alternately sends pulses over lines 79 and 80 to pulse shapers 81 and 82. These pulse shapers in turn send pulses over lines 83 and 84 to keyers 85 and 86 which gate signals from audio generators 87 and 89 over lines 88 and 90 with the desired attack and decay characteristics for each. The gated signals are fed over lines 91 and 92 to combine in audio amplifier 93. The amplified bell-tone signals are fed over line 94 to speaker 95 for audible reproduction. This system is analogous to two bells with a single clapper. The bell tones are determined by the frequencies to which the audio generators 87 and 89 are adjusted. The attack and decay

characteristics are determined by the pulse shapers and keyer characteristics. The rate of striking is determined by the period of multivibrator 78.

FIG. 5 is still another form of the present invention shown in block diagram form. This form provides for sequential operation of a simulated series of bell like or other audible signaling sounds, each tone or sound being held and/or decayed individually and by independently adjustable hold and decay means. Thus, pitch, tonal spectrum, attack and decay are individually adjustable. Pressing pushbutton 96 closes a circuit over line 98 turning on trigger 97 sending a pulse over line 99 to flip-flop 100. Flip-flop 100 sends a pulse out over line 113 to pulse shaper 120 which passes a shaped pulse to keyer 138 over line 137 where it is processed even further and passes tone signals from audio generator 139 over line 140 to provide tone signals with chosen attack and decay characteristics over line 143 to audio amplifier 126 and from there over line 127 to speaker 128.

Output pulses from flip-flop 100 are also applied over line 101 to delay device 102, which may be any suitable time delay device, such as a unijunction transistor ramp generator, the output of which is applied over line 103 to the second flip-flop 104 causing it to generate a pulse. The output pulse from this second flip-flop 104 is similarly conveyed over line 114 to a second pulse shaper 119, and from there over line 133 to keyer 134 controlling tones from audio generator 135 over line 136 to audio amplifier 126 over line 142. The characteristics of this second tone burst is determined in pitch by audio generator 135 and in timing by delay device 102 and in attack and decay characteristics by pulse shaper 119 and keyer 134.

Similarly, any desired number of additionally delayed pitch and shape determined tone bursts or bell-like tones can be provided. Two additional are provided as shown in FIG. 5, one after delay in delay device 106 over lines 105 and 107, flip-flop 108 over line 115, pulse shaper 118 over line 129 to keyer 130, controlling tones from audio generator 131 over lines 132 and 141 to audio amplifier 126 and speaker 128; and another after further delay in delay device 110 over lines 109 and 111 to flip-flop 112 and over line 116 to pulse shaper 117, line 121 to keyer 122 controlling tones from audio generator 123 over lines 124 and 125 to amplifier 126 and speaker 128. Feedback over line 145 from audio amplifier output line 127 (or the last flip-flop in the chain 112) may be used to prevent retriggering trigger 97 until the sequence has been completed. An additional feedback over line 146 can be used to produce a ring counter effect in which the sequence is automatically repeated.

FIG. 6 shows in block diagram form a modified means for providing the switching sequence used in the multiple tone device of FIG. 5. Only the portion of the system is shown for generating the sequence of pulses to be applied to the keyers, either directly or through pulse shapers. In this modification monostable trigger 147 is activated by switch (pushbutton) 148 and over line 149 turns on pulser 150. The output of pulser 150 is applied to line 151 and distributed to a shift register comprising flip-flops 152, 156, 160 and 164 over lines 151, 153, 157 and 161. Interconnections 155, 159 and 163 are provided so that the flip-flops will trigger in sequence producing pulses successively over lines 154, 158, 162 and 165 to potentiometers 208, 219, 221 and 224 respectively. Predetermined portions of the output pulses appearing across these potentiometers are selected by adjustable arms 218, 220, 223, and 225 and in turn applied through isolating diodes 209, 217, 222 and 226 and line 229 to voltage controlled oscillator 210. Thus, predetermined but adjustable tones in a repeated pattern are produced and applied over line 211 to keyer 212. Keyer 212 is keyed from pulser 150 over common line 151 and feeds the sequence of tones in sequence over line 213 to amplifier 214 and in turn over line 215 to speaker 216.

FIG. 7 is a further modification of the pulse sequence generator in which the monostable 166 actuated by pushbutton 167 energizes a stepping switch 169 over line 168 and pro-

vides a sequence of switch closures between movable common contact 170 and a sequence of fixed contacts 171, 173, 175 and 177 providing circuits to a series of keyers (or interposed pulse shapers) over leads 172, 174, 176 and 178 respectively.

FIG. 8 is a still further modification with monostable 179 actuated by switch 180 and starting a suitable means for driving contact drum 184 such as motor 182 connected over line 181 and driving drum shaft 183. Drum 184 carries a series of contacts 185, 187, 189 and 191 providing sequenced circuit closure to keyer lines 186, 188, 190 and 192 respectively.

FIG. 9 is still another modification in which a series of contacts 196, 199, 200 and 202 are carried by drum 193 and providing a sequence of keyer circuit closures over lines 197, 198, 201 and 203 respectively. Drum 193 may be turned to provide the keyer circuit closure sequence by hand as by means of a hand key 194 connected to drum 193 by shaft 195.

While the forms of the invention shown in FIG. 5 through 9 provide a sequence of four, any desired number may be used, four having been chosen merely for purposes of illustration. A number of ways have been shown for generating the sequence of pulses but many other ways will be apparent to those skilled in the art and in keeping with the spirit and scope of the invention.

While various forms of the present invention have been shown and described, many modifications will be apparent to those skilled in the art and within the spirit and scope of the invention as set forth, in particular, in the appended claims.

I claim:

1. In a signalling device the combination of:

a plurality of tone generators;

an audio amplifier;

a speaker coupled to said audio amplifier;

a plurality of keyers for applying tones from said tone generators to said amplifier;

a switch operated pulse generator for generating a series of pulses to actuate said keyers;

and time delay means coupled between said pulse generator and said keyers for supplying actuating signals to said keyers in sequence at predetermined intervals of time.

2. A signalling device as set forth in claim 1;

wherein said time delay means is adapted to provide different time intervals between said keyer actuating signals.

3. A signalling device as set forth in claim 1;

wherein said time delay means include unijunction transistor oscillator means.

4. A signalling device as set forth in claim 1;

wherein said time delay means includes a shift register for providing a plurality of timed output pulses to said keyers.

5. A signalling device as set forth in claim 1;

and means for modifying said pulse generating means in response to continued closure of said switch.

6. A signalling device as set forth in claim 1 and including; a low frequency random voltage generator coupled to said tone generators for controlling the frequencies of said tone generators.

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Simple Tuneful Signalling Device

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Page 2 of

Figure A

Invented by *Raymond Scott* 7/2/68
Drawn and typed by *Mathew Scott* 7/3/68
Witnessed by: *S. Edwin Piller, B.E.E.* 3 July '68

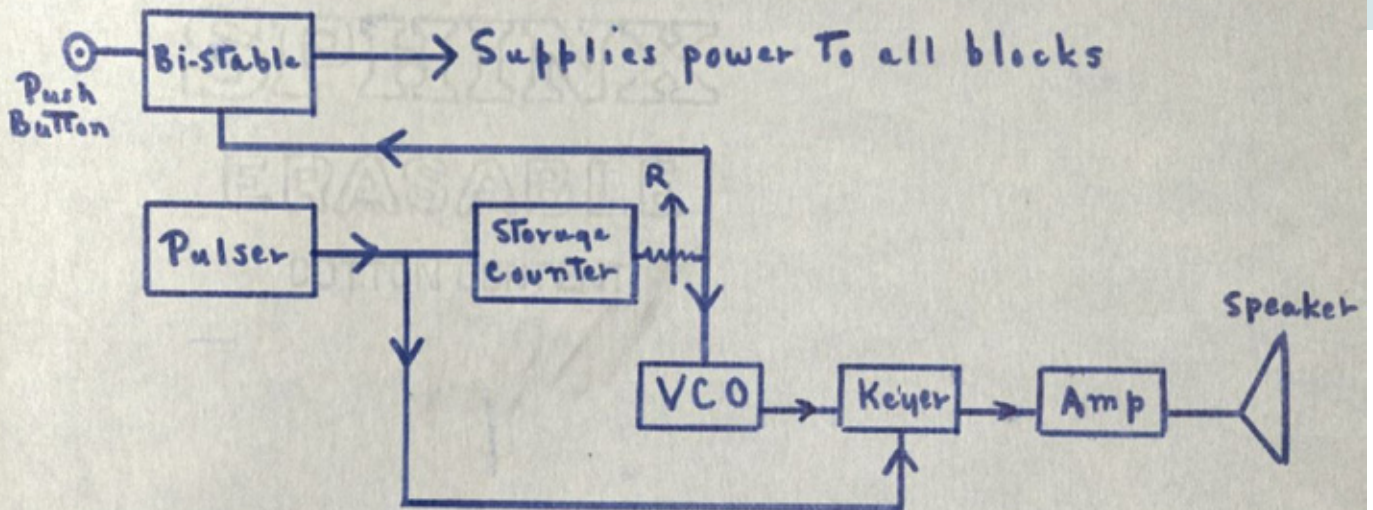
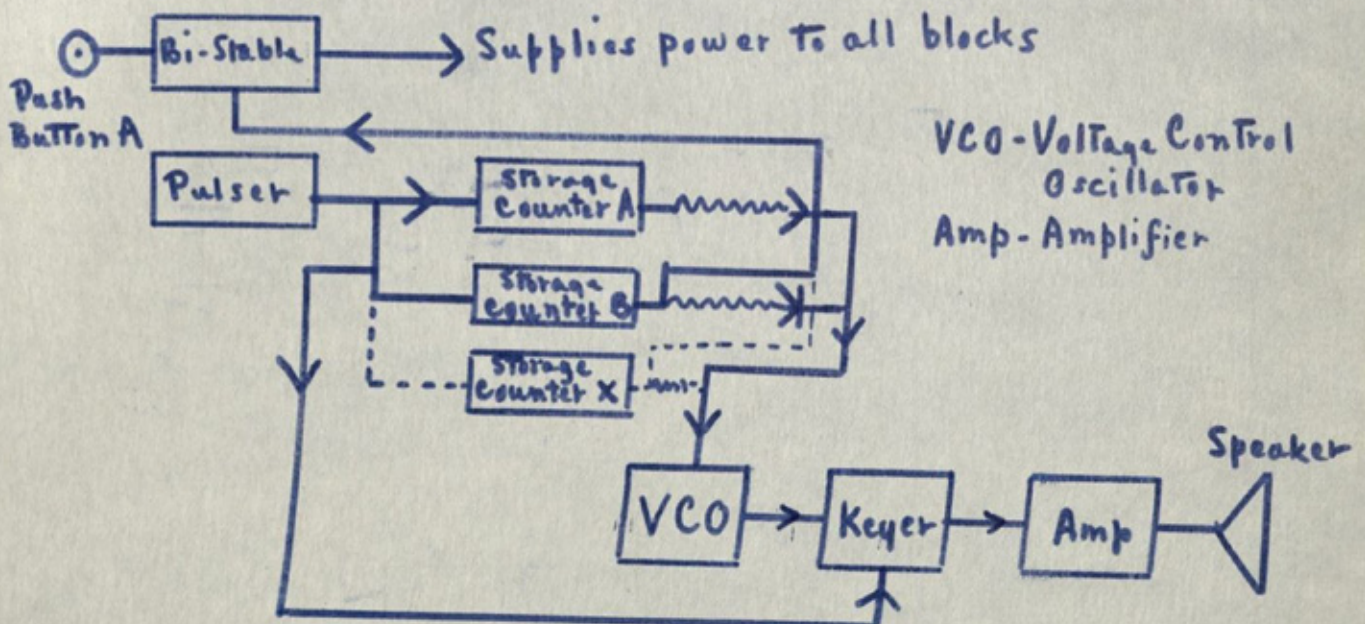


Figure B Three Pitch - or "N" Pitch Version



Simple Tuneful Signalling Device

Page 2 of 3

In Figure A - Two Pitch Version

1. Pressing push button A triggers bi-stable to supply power to all blocks.
2. Pulser starts to emit pulses.
 - a. Each pulse gates the keyer and permits the VCO, preset to a chosen pitch, to sound through the amp-speaker.
 - b. These same pulses start to be counted in the storage counter.
 - c. At the chosen preset (adjustable) count, there is an output from the storage counter.
 - d. A desired current is taken from this output via R to develop a suitable voltage to control the VCO to a desired second pitch.
3. The output from the storage counter is fed back to the bi-stable to turn it off - stop power - and so shut off the signal cycle.

SUMMARY

This arrangement, then, makes it possible to automatically perform a two pitch ^{Tune} tone - and because the storage counter is easily adjustable, the first pitch can be reiterated a chosen number of times - "pulses" - then climaxed, for instance, by the single higher pitch - which occurs as the last note - since the output of the storage counter also shuts off the device.

Witnessed, read and understood - S. Edwin Piller 3 July 1968

Simple Tuneful Signalling Device

Page 3 of 3

Figure B - Three Pitch - or "N" Version

1. The operation of this version is an extension of the operation explained for Figure A -

But now:

- a. Two or "N" storage counter are used - and each continuing storage counter adjusted to fire at a later time.
- b. So that the opening series of pulses sounds the original preset VCO pitch.
- c. The first storage counter when triggered controls the VCO to the second pitch.
- d. The second storage counter when triggered controls the VCO to the third pitch.
- e. And so on to the "Nth" storage counter.
- f. The last storage counter ~~is~~, in this three or more pitch version - is where a feedback voltage is picked off to shut off the bi-stable that controls the power to all blocks.

Invented by

Raymond Scott 7/2/68

Drawn and typed by

Mathilde Scott 7/3/68

Witnessed by:

S. Edwin Piller, B.E.E., 3 July 1968

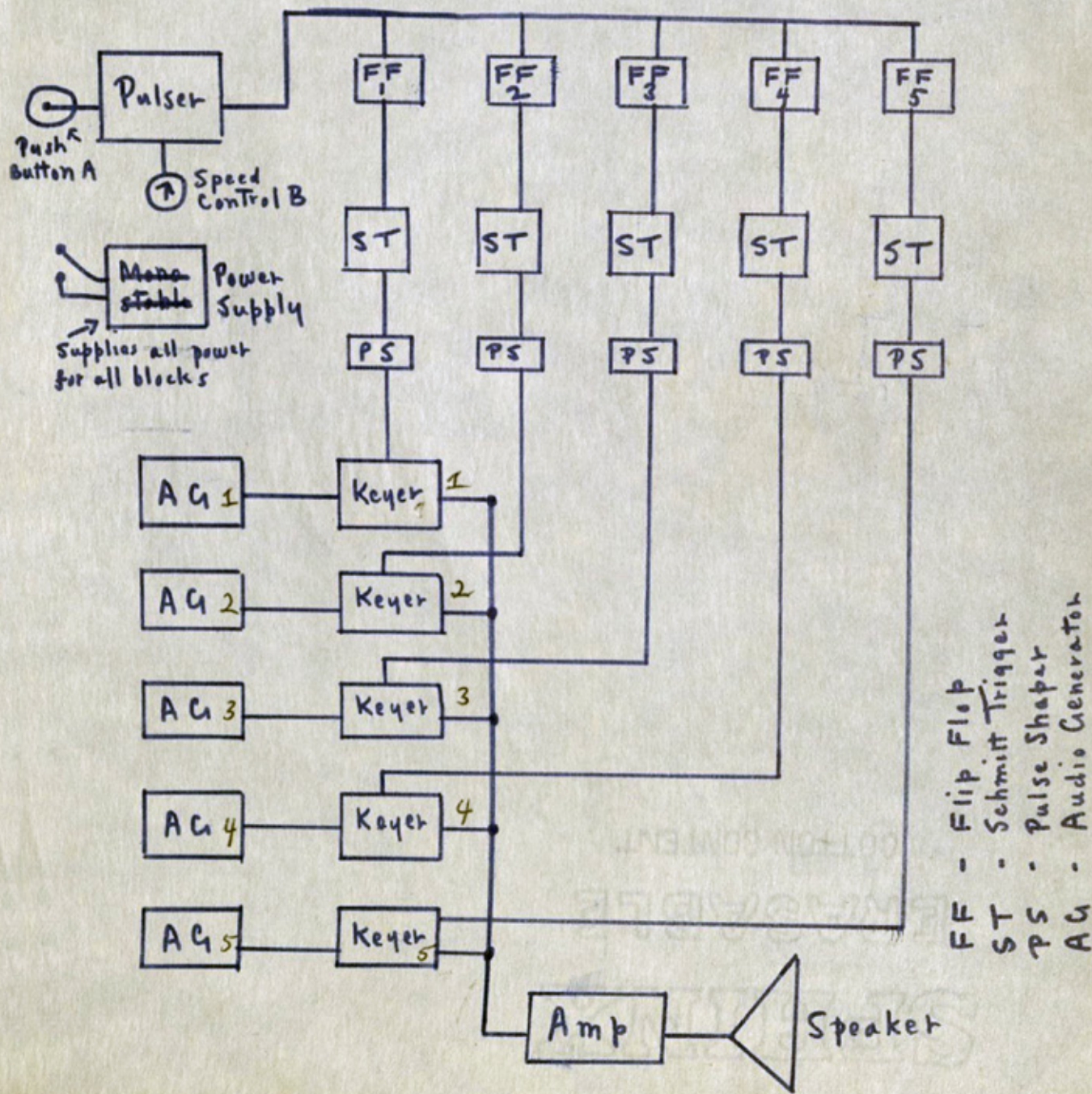
Automatic Arpeggio-like Chord Producing Device

- an electronic musical instrument that produces musical harmonies in the style of a guitar, harp, piano and other polyphonic instruments.

12

Page 1 of 3

Invented by *Raymond Scott* 6/30/68
 Drawn and typed by *Mathew Scott* 7/2/68
 Witnessed by: *S. Edwin Piller, B.E.E., 3 July 1968*



Automatic Arpeggio-Like Chord Producing Device

Page 2 of 3

1. Pushing button turns on all power to blocks.
2. Pulser starts to emit pulses at an adjustable rate - for instance, at about 100 mill. sec. - like a strum on a guitar.
3. First pulse turns on FF1, which supplies an output to ST1 - then shaped by PS1, then gates K1, which permits AG1 to sound through to amp-speaker. This tone holds and slowly decays as shaped by PS1 and K1.
4. Second pulse turns on FF2, which supplies an output to ST2 - then shaped by PS2, then gates K2, which permits AG2 to sound through to amp-speaker. This tone holds and slowly decays as shaped by Ps2 and K2.
5. Third, fourth and fifth pulse - same idea - the effect then is an electronic analog of strumming style, passing one's thumb, or pick, over the strings on a guitar - or playing one note after the other with fingers on a harp or piano or any other monophonic instrument.
7. Changing the tuning of the AG's would use a 96 button frequency readjusting system similar to the Hammond chord organ.

Invented by

Drawn and typed by

Witnessed by:

6/30/68

7/2/68

Mythene Scott
S. Edwin Piller 3 July 1968

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9
6
8

Automatic Arpeggio-Like Chord Producing Device

Page 3 of 3

ADDENDUM

1. Each time push button A is pressed, the pulser emits a train of four equally spaced pulses - the timing of these pulses adjustable by control B. Four pulses in this example because there are four FF's being used - actually 'n' number of flip-flops and, therefore, a similar 'n' number of pulses could be used.
2. An additional pulser could also be used to "press" push button A automatically and at a fixed tempo - creating then an automatic "guitar-like" rhythm musical instrument - the required chord changes to be made by the performer pressing the necessary button at beginnings of pulse trains - the buttons being the 96 button chord changing circuitry, somewhat similar to the Hammond chord organ 96 button system.

Invented by

Drawn and typed by

Witnessed by:

Raymond Scott

6/30/68

Matthew Scott

7/2/68

S. Edwin Peller

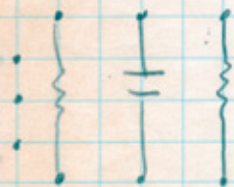
3 July 1968



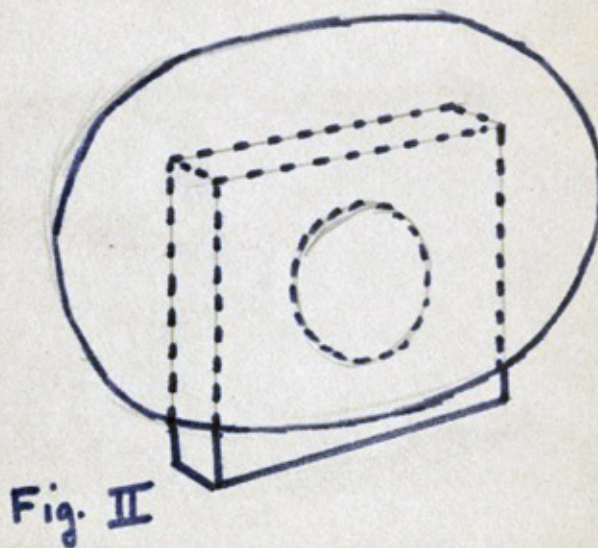
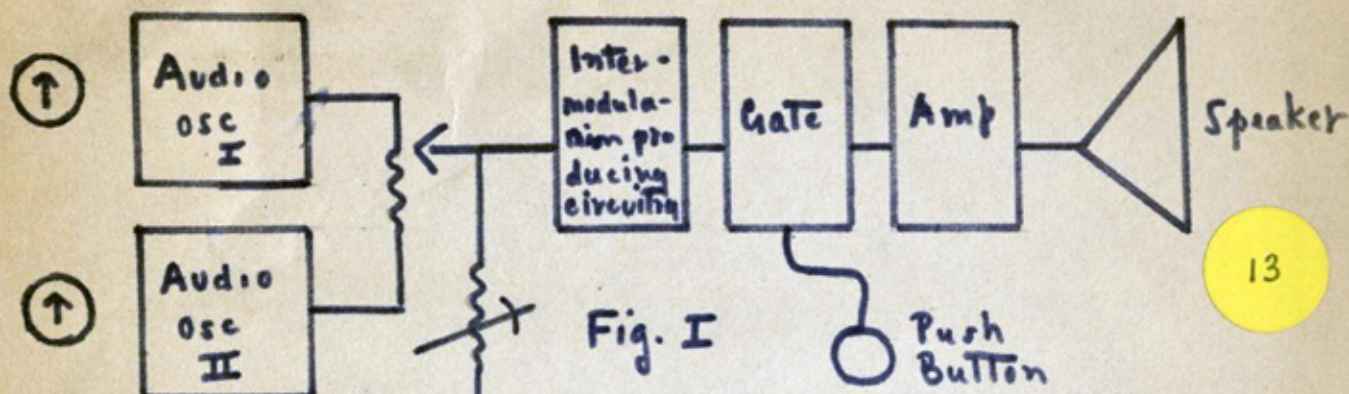
14 Sept 268

Electroni

Design Ideas section



Electronic Audible Signal Device - imitative of a Chinese song, fully adjustable to imitate other types of bells, chimes, songs and the like, in addition to the creation of novel and unfamiliar effects.



Invented by Raymond Scott 10/28/68
 Drawn by Emathia Scott 10/28/68
 Witnessed by Jesse B. Davis 10/28/68

Alfred W. Barber
 Oct. 31, 1968

6X21 FL 14

ELECTRONIC AUDIBLE SIGNAL DEVICE - IMITATIVE OF A CHINESE GONG - fully adjustable to imitate other types of bells, chimes, gongs and the like, in addition to the creation of novel and unfamiliar effects.

Theory of Operation

Audio oscillators I, II and III are adjusted to a chosen combination of frequencies - suitably mixed together via R1 and R2 so that when they emerge from the combined intermodulation producing circuitry - and the gating block - the three oscillator frequencies and their intermodulation products produce a frequency spectrum and an envelope shape that provide a sound imitative of a Chinese gong - or any other bell, chime or gong-like device depending on the choice of variables - frequencies, mixture, degree of intermodulation and the attack, duration, and decay characteristics of the amplitude modulation envelope. Three oscillator source frequencies are indicated, but two or any number could also be used to provide other imitative and novel sounds.

In order to provide greater overall effectiveness - the loud speaker arrangement is as follows (Fig. II).

- a. A large metal disc or metal-appearing disc or object, hanging over the aperture in the baffle adds visual impact to the imitative sound of the Chinese gong. The metallic nature of the produced sound seems to be much enhanced by the metallic looking object.
- b. The disc or other object also provides diffusion and additional resonances.
- c. A decorative touch is added by the presence of the metallic like disc or object, and is considered important.

Invented by Raymond Scott 10/28/68

Typed by Mathilde Scott 10/28/68

Witnessed by Jesse B. Davis 10/28/68

Alfred W. Barber
Oct. 31, 1968.

THE MARKET POTENTIAL.

\$ 449,000,000 - Total

The Market Potential comprises the categories of the high fidelity man who's crazy about sound - the phonograph record buyer who likes music - the fellow who likes the novelty of a player-piano - the man who wants a piano around - the man who enjoys playing the electric organ.

The Hi-Fidelity Buyer

\$ 192,000,000

Why should he buy it?

Because the man who owns high fidelity equipment is frequently such a nut about sound reproduction, . . . the fact that in the Electronium he has available to him an 'original source' of sound - not recorded on tape - not a disc - this can be made very exciting to him.

The advertising argument is that, finally, he doesn't need to put up with the loss of effectiveness that takes place in recording - on both tape and disc . . . and now he can exploit the full capabilities of his hi-fi speaker and amplifying equipment without the distortion and loss inherent in the recording process. The point will be carefully made that there is no tape, no disc - just the original sound - intact. To take full advantage of the 'original sound' concept the Electronium will use the Elipson Speaker System, famous for its astonishingly natural reproduction.

The Electric Organ Owner

\$ 72,000,000

The person who likes the electric organ - likes to play around - to feel creative - enjoys pushing the tabs - getting different sounds. Because the Electronium is essentially a kind of organ, he is an interested prospect to begin with - and since the Electronium offers such an infinity of new sounds, the creative pleasure becomes so intense for the player - that the electric organ enthusiast may possibly become the fastest growing sales area.

The Piano and Player-Piano Purchaser

\$ 41,000,000

The piano, as a home instrument, has been around many years - and in the early 1920's the player-piano was sensational and sold in the millions. The need the player-piano fulfilled was that you could either play it yourself or take advantage of an outstanding performance by a famous pianist who would perform on the same instrument.

- 1 -

Scott gauges the "market potential" of the projected consumer version of his Electronium. The intended recipients are unknown, and it is not known if this appeal was even circulated. How Scott arrived at the projected dollar figures is also a mystery. (1/2)

It's time for history to repeat itself. Time for an electronic instrument - that one can either play - or insert a 'cartridge' type player roll - and have it perform automatically - but in a dramatic, contemporary 'new sound' way - with an exciting 'plus'.

- for while the Electronium is performing - automatically - the user can adjust the controls - and experience a genuine creative thrill - by changing, at will, the style of accompaniment - the rhythms - the color of the sounds, etc.

The Educational Field

\$ 101,000,000

Music Schools, Colleges with Music Departments, etc., could find much need for the Electronium because of its usefulness in the teaching of harmony and rhythm. The programming feature of the Electronium would make it possible to actually listen to a student's homework assignment by inserting the prepared (student's) paper tape on which he has worked out his lesson.

Discotheques and Off-Beat Night Clubs

\$ 14,000,000

The need for interesting and unusual entertainment devices, would also provide a significant sales outlet in these areas.

Waiting Rooms and Lounges in Theaters, Airports, etc. \$ 29,000,000

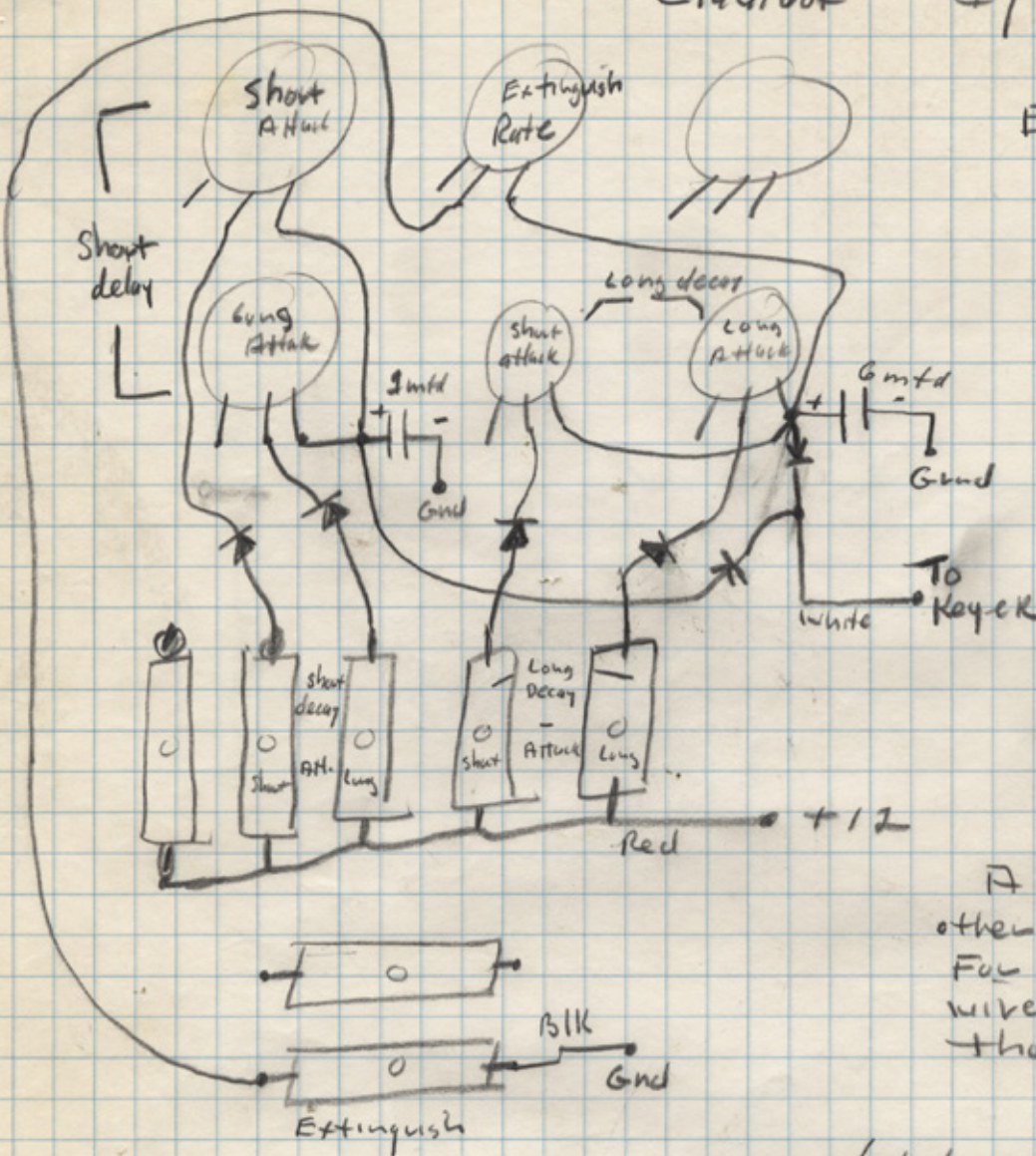
Here too, periods of waiting could be made more pleasant - even exciting - with an Electronium available where people would enjoy being creative, experimenting with the override controls - while listening to an automatic performance by the Electronium.

Amusement Parks - Fairs

- and many other public gathering places would find the Electronium - a fascinating attraction.

1/4/69

Experimental
Expression
Controls.



Label positions:

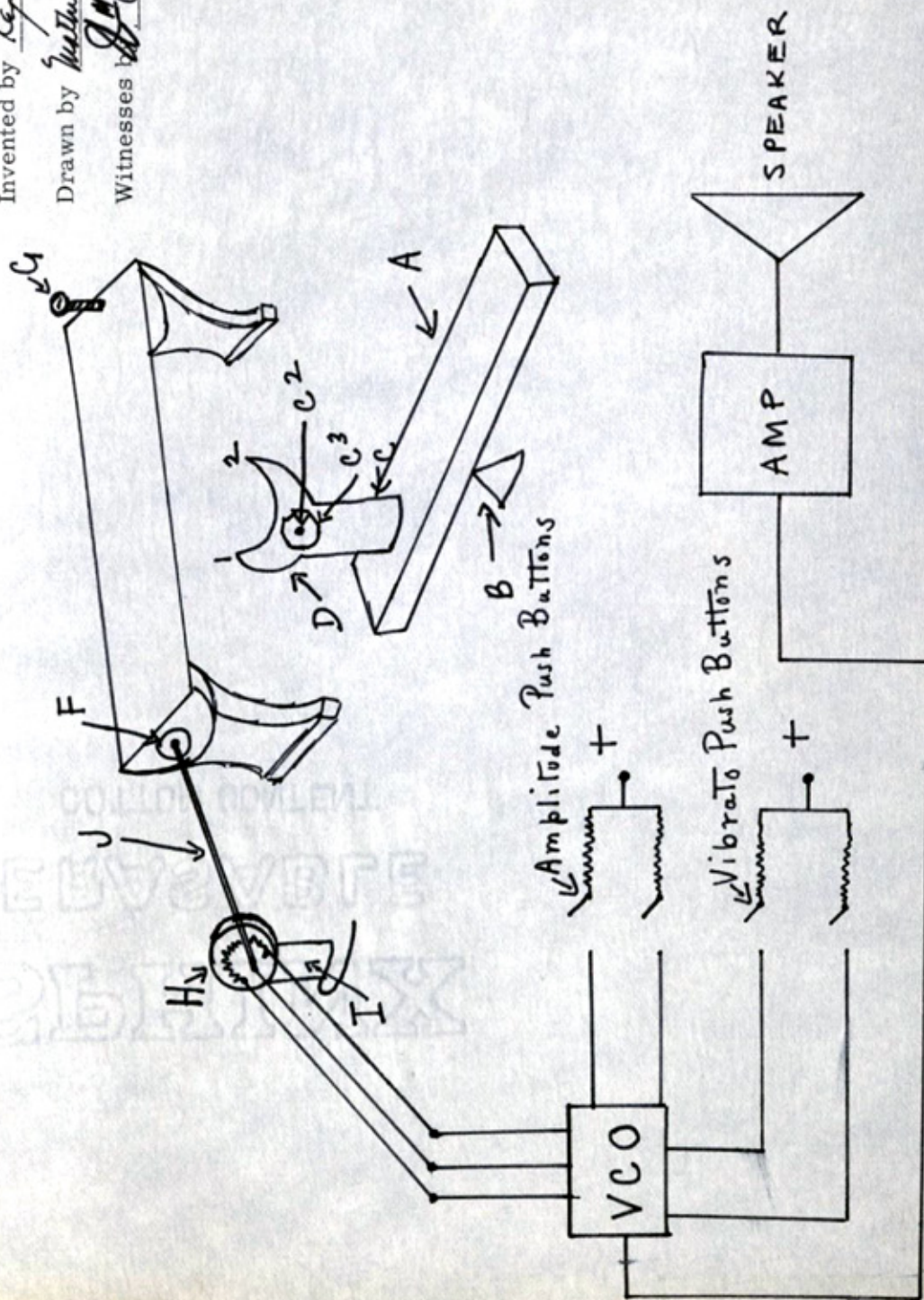
T. D.

1. Mount Cond Semitels on Panel
2. Mix Cond^{PO3} TO Contacts on Cards
- 3.

A KEYBOARD THERAMIN

Invented by Raymond Scott 1/12/69
 Drawn by Arthur Scott 1/12/69
 Witnesses by J. H. M. Smith 1/12/69

16



A KEYBOARD THERAMIN

The theramin, perhaps the first electronic instrument, continues to fascinate many people, although but a few have ever been able to master it, so difficult has it been to play. This disclosure shows the use of a standard piano style keyboard in conjunction with electronic circuitry to achieve the important theramin characteristics - sliding smoothly in pitch from any note to any other - without any break - and an infinite variety of pitch vibrato effects - the use of the keyboard removes the most enormous obstacle in playing the theramin - good pitch control. To move one's hand in free space - and to get to know where to stop for the note one wants, takes the rarest talent - plus many years of relentless practice.

But with the use of this keyboard control, all one needs to do is press down any note and the pitch slides to the new frequency. Fast, If the key is pressed down quickly - slow, if the key is pressed down slowly - and when the key bottoms and is held down, the new pitch is fixed - and stays fixed - for the period it is held down. Vibrato and attack-decay is achieved with a series of buttons for the left hand.

THEORY

Potentiometer H is used as a transducing element to control the pitch of a voltage controlled OSC (VCO).

It is coupled via shaft J to plate E which is free to rotate around its bearings F and F1 - when E is rotated it causes pot H to change its angular position and thus causes the VCO to assume a new frequency.

Plate E is so arranged with a series of piano key mechanisms that when a key is pressed down it causes the plate E to assume a preset angular position as established by the following tuning procedure:

1. Piano style key A is pressed down.
2. Because it is pivoted at fulcrum point B, post C with a 'v' shaped member D moves upwards.
3. D is pivoted at point C2 - with provision for tightening and loosening with nut C3.
4. When tuning the instrument nut C3 is loosened and D is free to move around its pivot C2.
5. Then when D moves up it engages plate E.
6. Plate E is free to rotate around its bearings F and F1.
7. For tuning it has 'freezing' screw G.
8. When tuning, screw G is tightened - plate E is frozen.
9. When D moves up it meets plate E and because D is in a free to move condition, it pivots until points 1 and 2 are in firm contact with plate E.
10. Nut C3 is now tightened - to freeze D.

Raymond Scott 1/12/69
1. J. Plushkin 1/12/69

A Keyboard Theramin

11. If plate E (via G) is made free to move, pressing the key down will cause D to come up and engage plate E and when firmly pressed will cause E to assume the angle established by tightening D into position when it was engaged to meet E in E's frozen position.
12. The tuning procedure then is to freeze plate E at that angle that caused pot H to control the VCO to, for instance, A440 - and then press down the A440 key - with D loose - so the angle established by the frozen plate E causes the loosened D to establish the same angle - so that when D is tightened and E loosened - pressing key A440 sets the plate E - and consequently pot H to sound A440 - and similarly for the remaining keys in the keyboard.
13. The present embodiment of this disclosure uses three octaves (37 keys) middle C to C three octaves above.
14. It is intended for the right hand to play the piano keys and the left hand to control a group of buttons and switches to set the volume, attack-decay, vibrato and vibrato requirements.

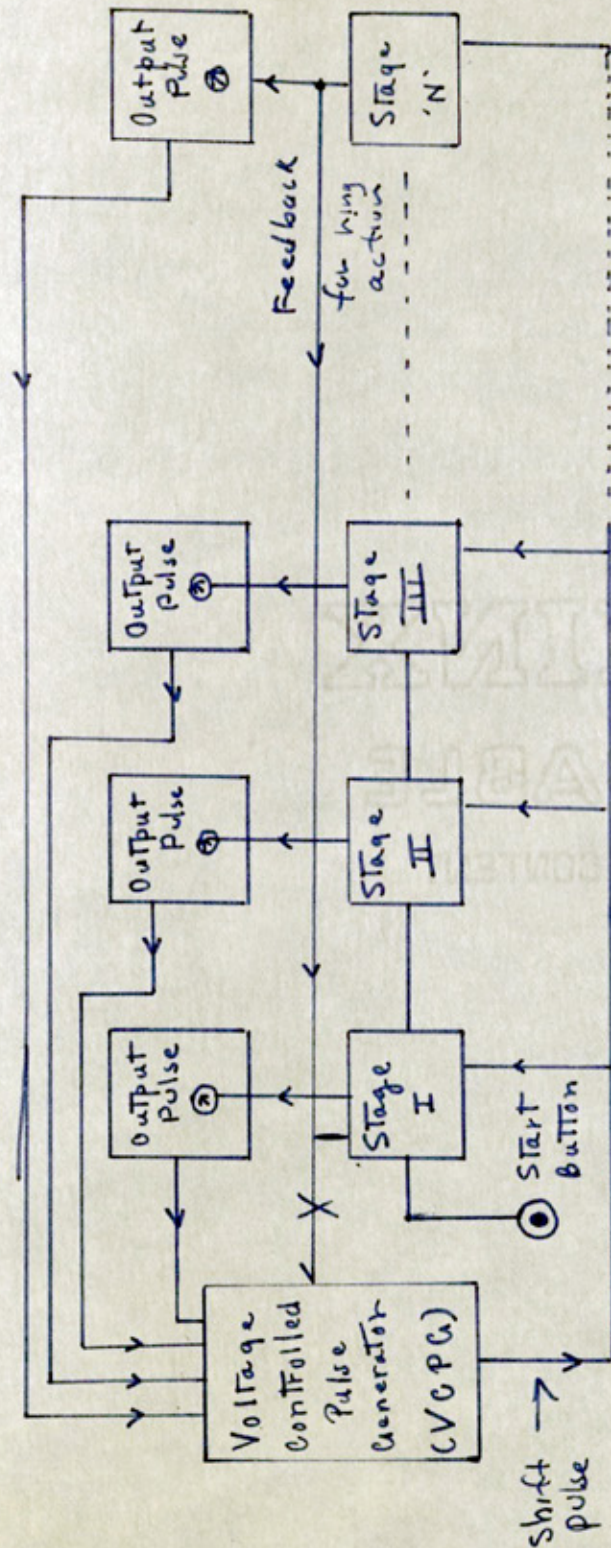
Invented by Raymond Scott 1/12/69

Drawn by Michael Scott 1/12/69

Witnessed by John Alexander 1/12/69

Read and understood John Alexander

Invented by Raymond Scott 2/20/69
 Drawn by Matthew Scott 2/20/69
 Witnessed by Alan W. Entenman 2/20/69



A Simple Pattern Generator with adjustable preset delays between pulses - for the generation of musical rhythms in electronic music instruments - or any other sequential timing requirements in general control circuitry.

A Simple Pattern Generator - with adjustable, preset delays between pulses - for the generation of musical rhythms in electronic music instruments - or any other sequential timing requirements in general control circuitry.

This invention can be described as a Shift Register - with preset time delays between shift pulses - via feedback from each shift stage output to a Voltage-Controlled Shift Pulse Generator - for use in creating Pulse Patterns - wherein the periods between pulses are adjustable and preset - or readjustable as required by way of programming circuitry.

Theory of Operation

- a. Start button, when actuated, turns on Stage I. Stage I can be a flip flop, SCR, neon, or any other bi-stable circuit in a shift register chain.
- b. A voltage from Stage I output - adjustable via control 'a' is fed back to the VCPG - this voltage controls the frequency of VCPG - so, for instance, a two volt feedback - adjusts VCPG to 1 PPS - consequently, the first shift pulse (after one second) turns off Stage I and turns on Stage II.
- c. A chosen voltage via control 'b' is fed back from Stage II to the VCPG - for instance - 3 volts, this time. The frequency becomes 2 PPS - the next shift pulse now occurs in 1/2 second - Stage II turns off and Stage III turns on.
- d. Stage III - adjusted to feedback 4 volts - causes the VCPG to operate at 4 PPS and - hence to the next shift pulse occurs in .25 seconds - etc, etc, through "N" stages.
- e. The output pulses are not only useful for establishing a different shift pulse frequency, but are also valuable to trigger other events at each pulse output - like frequency changes, amplitude changes and any other control function desired - by picking off - from these outputs - any desired voltage levels.

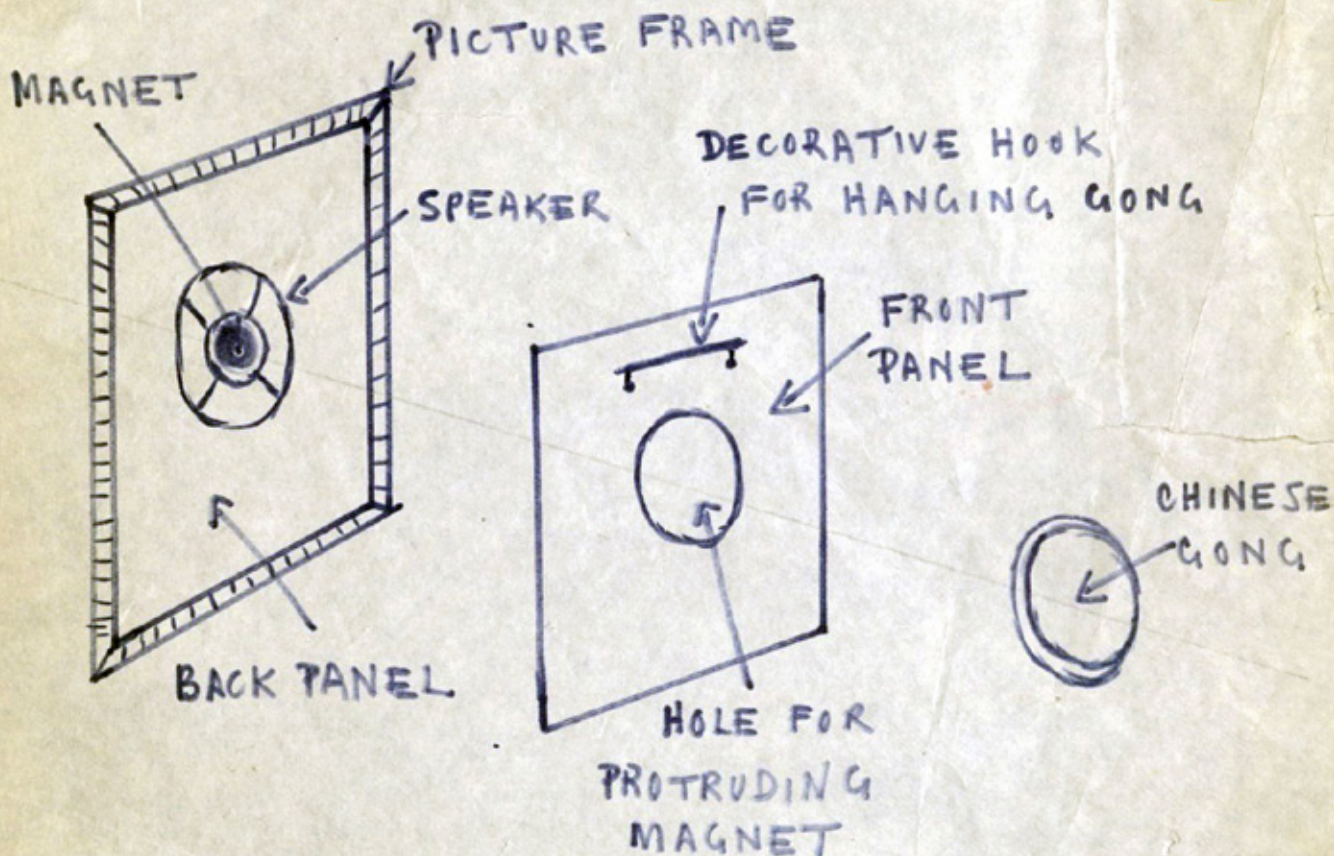
Invented by *Raymond Scott* 2/20/69

Typed by *Matthew Scott* 2/20/69

Witnessed by *Alan W. Entenman* 2/20/69

Read & Under stood *Alan W. Entenman*

A PACKAGE DESIGN for an electronically synthesized
CHINESE GONG or other bell, gong or audible
signalling device.



Invented by Raymond Scott 4/3/69

Drawn by Matthew Scott 4/3/69

Witnessed by [Signature] 4/4/69

A PACKAGE DESIGN for an electronically synthesized CHINESE GONG or other bell, gong or audible signalling device.

The design idea here is in the area of 'assemblage art' - wherein within the confines of a picture frame - instead of a painting, photograph or other graphic art depicting a Chinese gong - an actual Chinese gong or replica - is hung in the picture area of the frame.

Likewise, a ship's bell, or replica, suggestive of the intended sound could be placed in the picture area of the frame.

The speaker placement in this disclosure is also considered important . . . in that the front of the speaker (the cone) is mounted on the rear panel . . . and the rear part of the speaker - the magnet - protrudes out of the front . . . the protrusion being covered by the depth of the Chinese Gong.

The advantage here - is that a slim profile is retained for the entire package - (assemblage).

Likewise, the concave side of a section of a ship's bell or other device, replicas included, could also cover the protruding magnet portion of the speaker.

Invented by Raymond Scott 4/3/69

Witnessed by

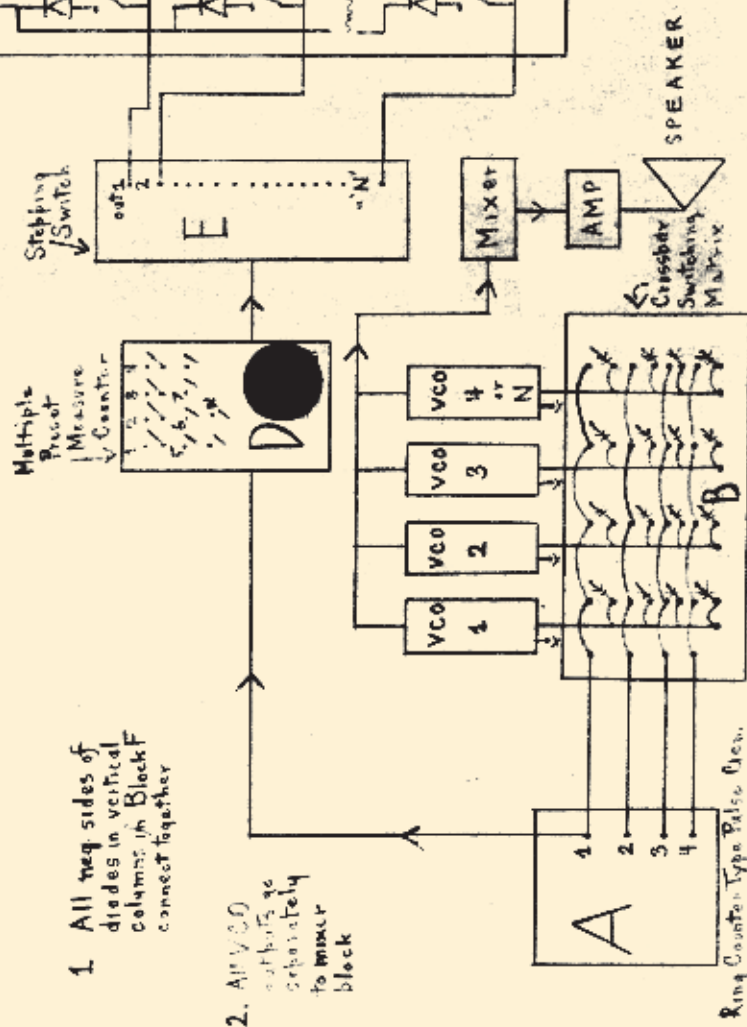
Typed by

Guathier Scott 4/3/69



Two designs for the Chinese Gong, circa 1969

Electronic Musical Instrument for the Generation of Polyphonic Rhythm Structures, Automatically Performed - Plus the Automatic Performance of a Preset Program - the Program Easily Set Up and Modified, as required, by the User - with Provision for the Instant Aural Examination of Different Sequential Juxtapositions and Parallel Groupings of the Programmed Events.



Invented by:

Drawn by:

Read and understood: Olan W. E. Farman 9/12/69

1969

ELECTRONIC MUSICAL INSTRUMENT FOR THE GENERATION OF POLYPHONIC RHYTHM STRUCTURES, AUTOMATICALLY PERFORMED - PLUS THE AUTOMATIC PERFORMANCE OF A PRESET PROGRAM - THE PROGRAM EASILY SET UP AND MODIFIED, AS REQUIRED, BY THE USER - WITH PROVISION FOR THE INSTANT AURAL EXAMINATION OF DIFFERENT SEQUENTIAL JUXTAPOSITIONS AND PARALLEL GROUPINGS OF THE PROGRAMMED EVENTS.

The system operates as follows:

BLOCK A

is a musical measures generator - in computer language, a clock.

This clock is a ring counter-like pulse generator - and is adjustable in that it can be set to generate a sequence of, for instance, sixteen discreet pulses per cycle. This cycle continually repeats for the duration of the program.

In music terms, let us consider that Block A has been equated with its sixteen pulses to 4/4 time - in that the first pulse is the start of 1/4 time value, the fifth pulse the start of the second 1/4 note, the ninth the start of the third 1/4 and the thirteenth the start of the fourth 1/4 note. The thought here is that in choosing sixteen pulses per musical measure (cycle) we have available sixteen notes (pulses) per measure should we want 1/16th notes or 1/8th notes, etc.

If the musical piece (program) were to have no notes shorter than a 1/4 note, then we could have set Block A (pulse generator) to four pulses per cycle (four beats, 1/4 notes, per measure.)

The block diagram presents a four pulse per cycle example.

BLOCK B

This block is a matrix of switches in a cross bar arrangement. The purpose of this matrix is to enable the user to find, experimentally, that juxtaposition of pitches in a polyphonic rhythmic structure, or other contrapuntal events, that is appealing or useful and of his choice. He can, for instance, on the first pulse (the first 1/4 note) key on any one of the four VCO's in Block C - or any combination of these VCO's, or all. Likewise, the second pulse in column 2 can actuate any combination of VCO's . . . through column 4.

This cross bar switching system enables the instant aural examination of all possible sequential juxtapositions - and parallel combinations of the four VCO's - as explained earlier. The number of VCO's in a given arrangement is arbitrary - ditto, the number of pulses per cycle (beats per musical measure.) It follows that the number of cross bar switching points would depend on the maximum of VCO's and pulses per cycle available.

Scott, R. - 9/12/69

Raymond Scott 9/12/69

1.

BLOCK C

This block contains four or any chosen number of voltage controlled audio oscillators - (VCO's) - and are keyed on by the pulses originating in the pulse (measure) generator Block A. The choice of the sequential positioning of these VCO's may be arrived at experimentally via the cross bar switching system - as explained above. The method by which these VCO's are voltage controlled to different preset, programmed frequencies, will be described in the Block F section.

BLOCK D

In music terms, this block counts measures (cycles). The number of measures equating with the number of times the 16 pulses have been repeated as a group. As shown in the block diagram, this counter is actuated every time Pulse 1 is emitted (once each cycle, in accordance with its position in the 16 pulses train.) Pulse 1 equates with the first beat in a musical measure.

The counter is of the preset type - and somewhat special - in that it can be preset to any combination of numbers within its range (even every number.)

Let us suppose that a program for a harmonic musical accompaniment is being set up - and that it has been decided for the harmony to change with the beginning of the third measure, the fifth measure and the seventh. The first two measures staying with the starting choice of harmony.

For this set up, Block C switches #1, #3, #5 and #7 would be pushed 'on' so that this measure counter could emit a pulse with the starts of measures #1, #3, #5 and #7. The explanation of the manner in which the harmony is caused to follow the program is explained next.

BLOCK E

This block is essentially a stepping switch - in that each pulse moves the switch one position onward. With the beginning of this eight measure harmonic accompaniment piece - at the start of the first measure (measure 1) (pulse 1 - first cycle) a positive DC potential appears at output #1. With the start of measure 2, the stepping switch output potential stays on output point #1. It does not move to output point #2 because Block D (the measure counting block) had been set to deliver pulses only with the beginning of measures 1, 3, 5 and 7. Block E will move to its next output (output point 2) only upon receipt of the next pulse with the beginning of measure #3. Therefore, Block E, the stepping switch block, will move to its next output point after its initial output on #1, only with the beginnings of measure #3, then measure #5 and then measure #7.

Raymond Scott 9/12/69

Raymond Scott 9/12/69

BLOCK F

When a start button (not shown) is pressed, the pulse generator turns on and its first output pulse causes the measure counter to emit an output pulse that triggers on a positive DC potential to output point 1 on Block E. This positive potential connects to HL 1 (horizontal line 1), and, as shown in the diagram, feeds this line 'N' number of six bit binary switch groups - each six bit group in turn controls a digital to analog converter (DA converter) to supply the required voltage to control the VCO's to any of 64 semitones in the standard will tempered chromatic scale.

Each switch group, then, through its DA converter controls its related VCO to that frequency programmed in advance by way of previous manual adjustment of the switches in these groups and for those measures previously preset at the switches in the measure counting block, Block C.

In review, then

when the start button is pressed Pulse 1 causes the measure counting Block C to emit pulse #1 which in turn energizes HL 1 which sets, through the DA converters, with their switch groups the VCO's programmed to their preset, programmed in advance, frequencies.

And with the start of the third measure Block E now energizes Horizontal Line 2 (HL 2) to set the VCO's to a new set of preset, programmed in advance, frequencies.

Likewise, the start of the fifth measure Block E energizes HL 3 to set the VCO's to a new set of frequencies.

Similarly, the start of the 7th measure energizes HL 4 to set up the next program of new frequencies.

ADDENDUM

1. The diodes in Block F are for isolating the different switch groupings.
2. For the sake of simplicity in concept presentation a manually operated switch memory system is shown but any state of the art random access or other computer memory technologies can be used together with standard addressing tactics.
3. Also, the stepping switch circuitry would also a choice of any of the current standard shift register techniques in logic use.

Raymond Scott 9/12/69

3.

Raymond Scott 9/12/69

4. The pulses from the pulse generator are shown as keying pulses - but in practice would use pulse shaping techniques as required for the envelope shapes desired when sounding the VCO audio oscillators.
5. As mentioned previously the number of pulses per measure, the capacity of the measure counter, the number of VCO's (and DA converters) and the size of the cross bar switching matrix are all arbitrary and can be any size required.
6. This disclosure relates, as an example, to the usefulness of the combination of circuitry shown for the programming of a harmonic rhythmic accompaniment. However, this same circuitry is equally useful for the purposes of event generation and would be equally valuable in the programming of other combinations of events, whether melodic phrases, harmonized or not, non-pitched percussive sounds and for the instant aural examination of the different sequential juxtapositions and parallel combinations quickly and easily aurally sampled by way of the cross bar switching circuitry.
7. By using a shift register type pulse generator for the generation of the required pulse train - and then using a voltage controlled pulse generator - so that the frequency of shifting could be varied - and then by picking off a chosen control voltage from each stage in the register - to feed back to the voltage controlled shift pulse generator so as to vary its frequency - a chosen separate time delay - can then be available between all pulses. This idea is described in more detail in a previous disclosure.

Invented by:

Raymond Scott 9/12/69

Typed by:

Scott, Sept 2/12/69

Witnessed, read and understood _____

ELECTRONIC MUSICAL INSTRUMENT CAPABLE
OF GENERATING AUTOMATIC MUSICAL PER-
FORMANCES - ACCORDING TO A PRESET DIG-
ITAL PROGRAM - ON MAGNETIC TAPE OR
OTHER MEMORY - THE PROGRAM INPUT IN-
FORMATION TO BE FED IN MANUALLY VIA
A STANDARD ORGAN TYPE KEYBOARD.

PART 1

A METHOD OF FEEDING INTO TAPE MEMORY A DIGI-
TALLY CODED PROGRAM - VIA THE MANUAL USE OF
A STANDARD ORGAN TYPE KEYBOARD.

THEORY OF OPERATION

1. On the keyboard K, a three note chord is pressed and held. Keys 2, 4 and 6.
2. An 'or' gate A now emits and holds - an output.
3. Output of A starts sequencing stepping switch - SS.
4. Output point 1 on SS turns on with this initial command from A.
5. Output point 1, turning on, turns on Gate 1.
6. If Key 1 were down, Gate 1 would now permit the six bit diode matrix switching network to be energized by the code being delivered by Keyboard Line 1.
7. However, Key 1 is not on, therefore the six bit receiving register R doesn't toggle onto any of its 64 patterns.
8. Gate 1 was 'on' for one millisecond - the stepping switch design calling for a sequential sweeping speed of 64 milliseconds per cycle (total sweep.)
9. At the start of the second millisecond Gate 2 turns on. Because Key 2 is down, Gate 2 permits Key Line 2 to energize Matrix D.
10. The wired-in code from Key Line 2 now toggles the appropriate pattern of '1' s onto the six bit receiving register R.
11. Since output Gate 1 through 64 also drive 64 input 'or' Gate B, Gate 2, turning on, causes Gate B to also have an output - after a slight delay in Block C - the output from Gate B turns on Gate F to permit pulses from Shift Pulse Generator E to shift out the pulse pattern in Register R, on to the Accumulation Register H.
13. At three milliseconds, Gate 3 turns on, since SS is now in its third sequential position.
14. Key Line 3, however, not being pressed on - there is no output emanating from Gate 3.

15. Therefore, the diode matrix D is not receiving anything from Key Line 3.
 - nothing toggles in Register R
 - B has no input, Gate F is not on
 - no shift pulse emanates from E
16. At this point, note that R is clear - that H has 'six bits' of information (one word) - information that had been furnished via Key Line 2 - when it had been on.
17. To repeat, then, when Gate 3 was opened - nothing changed.
18. At the fourth millisecond Gate 4 is turned on by SS.
19. Because Key Line 4 is on (Key 4 pressed down) - Key Line 4, through Matrix D, toggles R to Key Line 4's pattern.
20. And again Gate B went on causing F to go on, permitting pulses from E to shift Register R out onto Register H.
21. The first six bits, originally stored in FF1 through 6, shift down to 7 through 12 - as the new six bits come in.
22. To repeat, the same pulses that shift R 'out' - also shift the first six bits down the line in H to their new positions of 7 through 12.
23. When Gate 5 comes on (fifth millisecond) - Key 5, not being pressed down - then nothing happens.
24. When Gate 6 turns on, Key 6 being pressed down - the 'on' cycle takes place all over again - and H accumulates the new six bits, as the previously accumulated bits move down the line.
25. Etc. through the entire sweep cycle - .
26. Now that the accumulator register is filled with those words brought out by the sampling sweep circuitry - the next step is to empty the words onto the tape.
27. When SS gets to output point 65 (the final output) it turns on Gate 65 which flips bi-stable I.
28. Bi-stable I, in its flipped state, now holds SS from sweeping - at the same time, the flipped state turns on Gate F to start shifting the pulses in Accumulator Register H down the line towards the output Flip Flop (FF72).

29. When this pulse pattern arrives at FF72 it now leads out from 72 to be recorded on to the moving recording medium (tape).
30. This same output point at FF72 is coupled back to bi-stable I through Counting Block J.
31. When Counting Block J counts six '0's in a row - showing that H is now empty - this Counting Block J flips Bi-stable I to its original condition so that SS can start its sequential action again.
32. Now SS is ready to start its second sequential sweep - and will, as long as a key is pressed down. Should the sweeping cycle arrive back to its #1 point, and there is no key pressed down, the sweep will stop and hold at the #1 point - until the cycle is triggered again because of a key or keys being pressed down.
33. This sequential sweeping, then, continues or resumes, whenever a key or keys are down- to send the coded memory information along through R and H onto the tape.

ADDENDUM

- A. A magnetic tape memory system is the first choice for program storage - because it automatically provides a time base - and economically provides a high bit storage capacity.

- B. For clarification

The first event to take place - not mentioned earlier is that the tape memory be put into the record mode and the Start Button pressed. The tape to remain in constant motion during the ensuing description of operation - the constant, steady tape movement provides the 'real time' time base for the programmed digital information, to be fed into the machine.

- C. With the memory tape constantly moving - at a constant speed - an automatic 'real time' time is provided - in that - in periods of no information from the keyboard - say, a one second void - the tape still moves ahead - and this one second, which equates with a one second rest in the musical information being programmed - is correctly recorded on the moving memory tape as a one second void or, in musical terms, a one second rest.

Similarly, if a key or keys, are held for a half second - or whatever - that particular coded information stays present - in the moving tape memory - for that half second.

Part II of this disclosure will explain how this programmed information will be used to automatically generate a musical performance.

Invented by Raymond Scott 10/17/69

Typed by Mathilde Scott 10/17/69

Read and understood by Chormen
Cheseroff October 17, 1969.

2

A POLYPHONIC ELECTRONIC MUSICAL INSTRUMENT, CONTROLLED BY MEANS OF A STANDARD ORGAN TYPE KEYBOARD, WITH INDIVIDUAL VOLTAGE CONTROLLED AUDIO TONE GENERATORS FOR EACH NOTE - EACH GENERATOR HAVING ITS OWN WAVE SHAPING CIRCUITRY - WITH ALL WAVE SHAPING CIRCUITS CAPABLE OF SIMULTANEOUS MODIFICATION AND CONTROL - VIA SOLID STATE SWITCHING CIRCUITS - THESE SWITCHING CIRCUITS DIGITALLY CONTROLLED BY MEANS OF A MANUALLY OPERATED PUSH BUTTON MATRIX.

This disclosure relates to a polyphonic electronic musical instrument with a two octave (twenty five note) keyboard and has the following features:

1. The tone generators are voltage controlled with a separate Voltage Controlled Audio Tone Generator (VCO) for each note.
2. Each VCO has its own wave shaping circuitry - circuitry that actually changes the structure of a wave - as against the use of audio filtering techniques.
3. The control elements of the wave shaping circuitry (WS) are electrically ganged together - by means of solid state circuitry - so that one manual control, simultaneously, modifies all these control elements.
4. Automatic, periodic, 'spectrum' modulation is provided for changing the characteristics of the individual wave shaping circuitry.
5. Envelope controlled, wave shape modulation is also available - with a control voltage derived from a pair of contacts on each key - a modulation envelope is generated that will slowly or as quickly as required, change the wave shape emanating from each VCO.
6. An individual vibrato oscillator is provided for each VCO to effect a dissimilarity - for each VCO - of vibrato amplitude and speed - to achieve a greater warmth of tone.
7. The keying system is semi-automatic in that each keying block is a one shot multi (monostable) - with variable 'on' times - and quick recovery characteristics - so that in performance - short attack times, impossible to achieve via pure finger and hand control, are easily produced - the attack being initiated by the performer and then the monostables taking over - to effect the short attack time - and as the block diagram indicates, the control inputs to the twenty five keying blocks - are ganged together with a master control available at the main panel.

1.

Raymond Scott
10/17/69
RS

RS 10/17/69
RS 10/17/69

The use of independent monostable circuitry, in a keying block for each note - in a polyphonic electronic musical instrument is considered unique.

8. Range and pitch capability:

Another feature is the inclusion of circuitry for switching the two octave range of the instrument into any two octave portion of the ordinarily audible frequency spectrum - about 15Hz to 20Hz - thus easily effecting a performance transposition into any key - without the performer requiring the ability to transpose at all.

This transposition feature makes the instrument useful anywhere from the "highest soprano" to the lowest "double bass" range.

9. Automatic performance circuitry:

a. Trills and tremolos

automatic trill and tremolo
single notes, double notes or
chord trills
any interval size is possible
a wide range of trilling speeds

b. Chromatic, continuous pitch Glissandos

single note, double notes, chords
automatically controlled
manually controlled
many speeds
any size interval

Invented by

Raymond Scott 10/17/69

Typed by

Mathew Scott 10/17/69

Read and understood by Norman Gersenoff 10/17/69

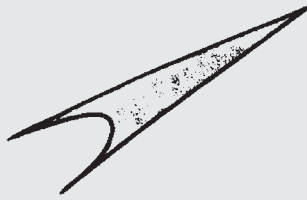


1969

SOUND: Below, clockwise from 12: Orbitone AM/FM stereo cassette recorder, plus two spherical speakers, by Panasonic, \$229.95, atop a pair of Rectilinear III speakers, by Rectilinear, \$558. Portable AM/FM radio, by Toshiba, \$49.95. Combination AM/FM stereo receiver and cassette recorder, comes with a pair of speakers, by Scott, \$299.95. Thorens TD-150 turntable, complete with Rabco SL-8 tonearm and Shure V-15 Type II cartridge, from Rabco, \$314. Combination oscilloscope and oscillator for testing an FM receiver, by Kenwood Electronics, \$200. Mini-Phone with folding mouthpiece, from Hobi, \$59.98. AM/FM radio with acoustic speaker, by Sony, \$114.95. AM/FM and Stereo 8 player operates on A.C./D.C., plugs into car's lighter, by Weltron, \$129.95. Micro 87 stereo cassette player/recorder with speakers, by Ampex, \$219.95. Transmitting adapter beams radio and TV audio signals to headphone set, by Hitachi, \$29.95. Opposite page, clockwise from 12: Pair of color cube speakers, by Fairfax, \$59.90 each, atop Circa 707 coffee-table console that houses AM/FM and Dual turntable, by Electrohome, \$549.50. AM/FM clock radio cassette, by Consolidated Merchandising, \$129.95. **Raymond Scott Clavivox, a keyboard instrument that sounds like a theremin, by RSE, \$1275.** Eight-track stereo tape player for car, by Gibbs, \$135. Phone-Mate 700 answering unit, by Tron Tech, \$249.95. AM/FM stereo receiver with twin speakers, by Craig, \$129.95.



Playboy magazine, December, 1969



ARROW ADVERTISING AGENCY

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NEW PRODUCT Release

SCOTT CLAVIVOX

A new electronic musical instrument was announced today by RSE, Inc. of Farmingdale, Long Island. Named after its inventor, Raymond Scott, the well known composer-conductor, the Scott Clavivox is a proprietary keyboard version of a theramin - forerunner of all electronic music devices. According to a company spokesman, "The unforgettable, hypnotic sound of the theramin is finally available, in a practical, easy-to-play form. Although invented almost four decades ago, the theramin never achieved the popularity it deserved - because of the enormous difficulty of playing it in tune. Our new instrument solves that problem."

The Scott Clavivox features an exclusive piano type keyboard that makes possible, when desired, a controllable, continuous pitch glissando - from any note to any other - with a real theramin sound - yet perfectly in tune. And as easy to play as one finger piano.

Present indications are that the Scott Clavivox will be used on movie and TV sound stages, in contemporary rock groups, for radio and TV commercial production, in electronic music studios and other new sound experiences.

RSE, Inc.
3 Willow Park Center
Farmingdale, N. Y. 11735

516-293-8888

CREATIVE ADVERTISING • COMPLETE MARKETING PROGRAMS • SALES PROMOTION • PUBLIC RELATIONS

1
9
6
9



Press release for the Scott Clavivox, 1969 (2/6)

PRELIMINARY INFORMATION

THE SCOTT CLAVIVOX

The Scott Clavivox is most readily described as a keyboard theramin. It is an electronic musical instrument, melody only, and uses a special piano type keyboard with which it is possible to glide from any pitch to any other. After the initial note is depressed - depressing a higher key - slowly - produces an upward pitch glissando to the desired higher note - slowly. Depress it quickly - and the glissando is rapid. Likewise, depressing a lower key produces a downward pitch glissando to the chosen lower note. These pitch glissandos can be as slow or as fast as required - depending on how the key is depressed. When the key bottoms, the correct pitch is established and fixed. Incidentally, the keys, unlike a piano, are never struck - only depressed.

Range:

Any three octave span within a seven octave range.
These seven octaves comprise the first C on the piano to the last C (standard 88.)

Automatic Transposition:

An automatic transposition knob makes it possible to shift the overall pitch of the instrument up to a major third, higher or lower - enabling a degree of automatic transposition.

Vibrato:

Two vibrato control knobs offer individual adjustment of vibrato speed and intensity.

Tone Color:

A three position switch with an accompanying tone control offers a choice of flute-like, reed-like, and string-like colors. These colors are not intended to be imitative - just something like the mentioned instruments.

Speaker-Amplifier:

A built in speaker and 3 watt amplifier supplies adequate volume for private performance.

Outputs:

Four outputs are provided: high and low level - high impedance - high and low level - low impedance - for driving public performance amplifier-speakers, or for connection to recording mixing consoles.

Power:

Line operated - 115v ac.

Weight:

45 lbs. approx. - without legs.

Size:

27 in. wide x 21 in. deep x 10 in. high - not including legs.

Price:

\$1275.00

Delivery:

8 - 10 weeks.

IF IT'S A NEW SOUND YOU REQUIRE, THEN YOU NEED
THE RAYMOND SCOTT CLAVIVOX

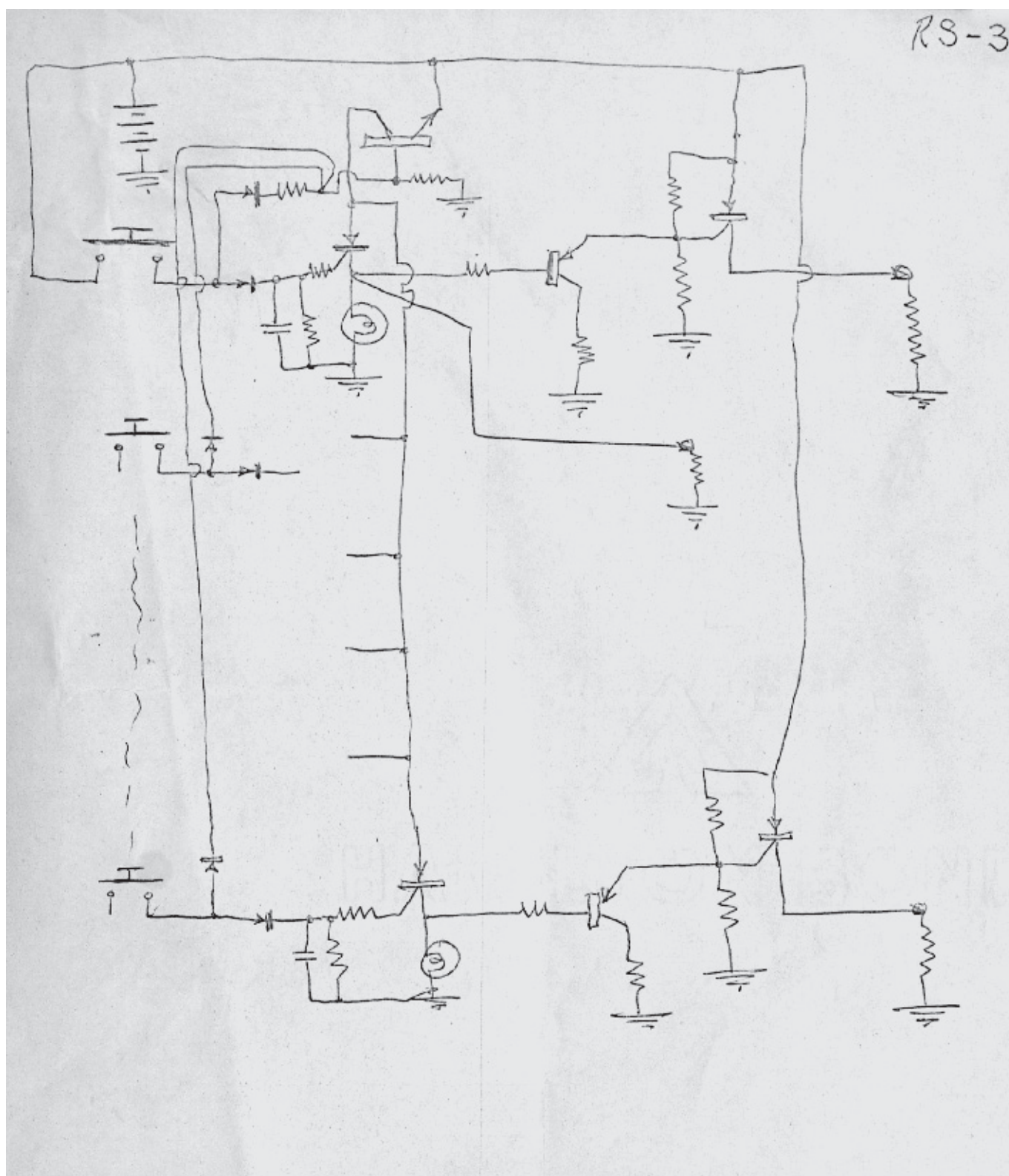
For those who need new sounds -

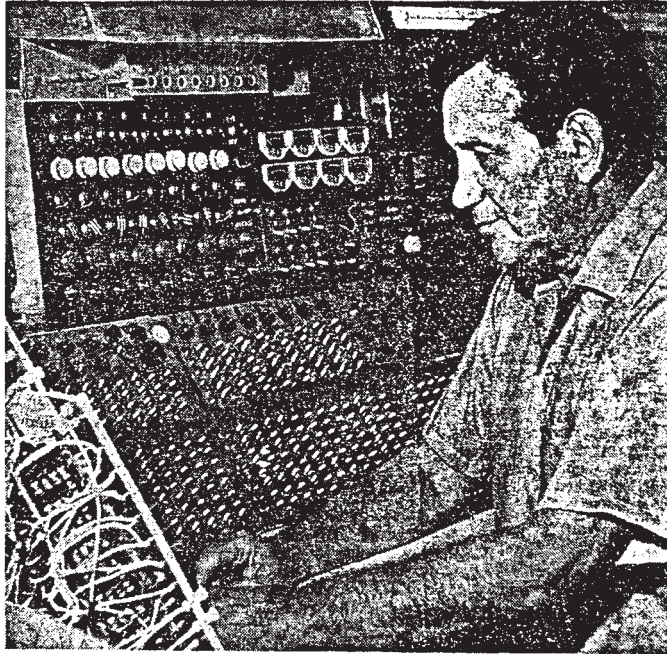
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A demo tape is available - there is a \$1.00 handling charge

Raymond Scott Enterprises, 3 Willow Park Center, Farmingdale, New York 11735





Raymond Scott with his electric music-maker, the electronium.

Raymond Scott, Now Ller, Composes With 'Electronium'

In the 1940s and 50s bandleader Raymond Scott was a familiar face in American households, performing with his quintet and broadcasting the weekly radio-TV "Hit Parade" show. Now a long Island resident, he's hoping to earn a reputation by pressing buttons.

Scott hasn't abandoned show business. The buttons he presses are part of an electronic instrument he's been developing for 10 years that can perform and "compose" those increasingly popular collections of unearthly sounds known as electronic music.

The instrument is called an electronium, and although it produces music, it looks more like the instrument panel of a space capsule than anything else. Scott flicks switches on rows of buttons as lights flash and the entire panel glows with an orange light.

He does all this in a studio in Farmingdale. Scott is an East Meadow resident.

It's unlike any other musical instrument, according to Scott. It can't be used to play any existing piece of music. "It will perform its own creations only," he explains.

A MACHINE WITH a built-in ego? That's not the case, says Scott. His device was built not only to perform but to "compose" music, guided by a human being. The electronium has no keyboard, unlike most electronic musicmakers; it consists of buttons and switches that produce, with the aid of assorted transistors, wires and other electronic components, either a sound or a progression of sounds or a beat.

There's no way to prepare music for the electronium, and know how it will sound so the "musician" familiarizes himself with the effects of each button and presses them in a pattern that produces something resembling a melody. Unless the musician remembers the buttons he's pushed, he can't reproduce the music.

"It'll never take the place of traditional composing," admits Scott, but the electronium does have its advantages. "Instead of spending three months composing a ballet you can do it in two hours," he claims. A composer can sit down and hear instantly the music he is creating,

changing it when he pleases with little effort.

* * *

SCOTT SAYS THE instrument could be a boon to the movie industry. Scores that take months normally to compose could be done in days, he believes, and the results would be comparable to a traditional score.

The music "is not necessarily melodic in a traditional way," notes Scott. It consists of a melange of simple sounds and beats, electronically superimposed upon each other to create the effect of an orchestra or band performing.

After 10 years of working to develop the device, Scott has begun to concentrate his efforts now on composing electronic music for—and with—it. He also is in the early stages of planning a commercial model of the device which could be used either professionally, or, in a simpler model, as a home instrument.

The home model probably would sell for roughly \$1,000, or around the price paid for a good home organ.

Scott thinks the electronium will be widely used in rock circles as well.

DEVELOPING ELECTRONIC equipment and composing music that is partially created by a machine is a departure from Scott's past.

In addition to hosting the Hit Parade show, which achieved immense popularity, he led the Ray Scott Quintet for a number of years during the Big Band era. He composed the score for a 1946 Broadway show, "Lute Song" starring Mary Martin.

His ex-wife, singer Dorothy Collins, regularly joined him on the Hit Parade show.

In the 30s he and his quintet played the music for, and appeared in, several Hollywood films, including Shirley Temple's "Rebecca of Sunny Brook Farm" and "Ali Baba Goes to Town." In the late 30s he composed a ballet for the American Ballet Co.

But for the past 10 years it's been nothing but transistors and tape recorders for Scott.

The ex-bandleader says that electronic music is going to be something big in the future, and he's happy to be involved in the creation of something he says "is going to fit everywhere" before long.

From a Long Island paper,
circa 1969-70

b **4** *F der #35*

5 4 6 56
45 4 46 456
36 356 3 35
2 345 34 346
25 3456 26
246 256 24
2456 245 23
235 236 2356
2345 234 2346
16 1 23456
156 14 15

13 145 14 146
135 1456 136
1346 1356 134
13456 1345 12
125 126 1256
1245 124 1246 12456
1236 123 1235
12356 1234 12346
12345 123456

b A
b c b F
D G A E b G H
b B

Handwritten musical score for a piece in G major. The score is written on a treble and bass staff. The treble staff begins with a treble clef and a key signature of one sharp (F#). The bass staff begins with a bass clef and a key signature of one sharp (F#). The score is divided into two systems by a double bar line. The first system contains measures 1 through 6, and the second system contains measures 7 through 9. The notation includes various chords and accidentals, with some notes marked with 'b' (flat) and 'F' (sharp). The score is written in a cursive, handwritten style.

A recording entitled "Idea #35" is featured on the 2017 Raymond Scott electronica compilation *Three Willow Park*. We have no idea if this handwritten "score" reflects the recording.

- [54] **OPTICAL SYSTEM FOR FACSIMILE SCANNERS AND THE LIKE**
- [72] Inventors: **Edmund F. Priessnetz**, Baldwin;
Raymond Scott, Huntington, both of
N.Y.
- [73] Assignee: **Electronic Transmission Systems,
Inc.**, New York, N.Y.
- [22] Filed: **Feb. 11, 1970**
- [21] Appl. No.: **10,416**

Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 754,773, Aug.
23, 1968, abandoned.
- [52] U.S. Cl. **250/216**, 178/7.6, 250/219 FR,
250/239
- [51] Int. Cl. **H01j 5/16**
- [58] Field of Search. 178/7.6; 250/219 FR, 219 Q,
250/217, 211, 202, 203, 239, 220, 216;
35/35 A; 235/61.11 R

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Primary Examiner—James W. Lawrence

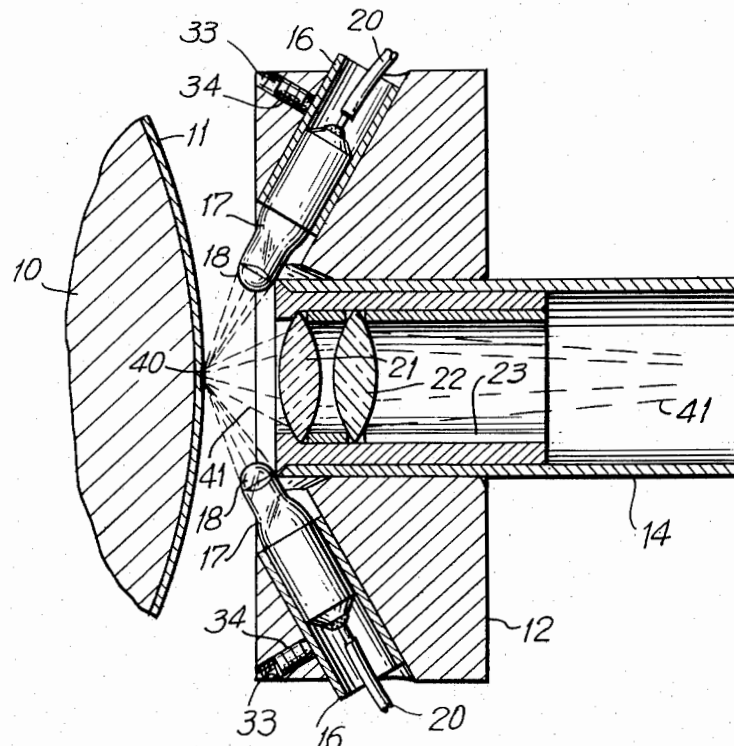
Assistant Examiner—D. C. Nelms

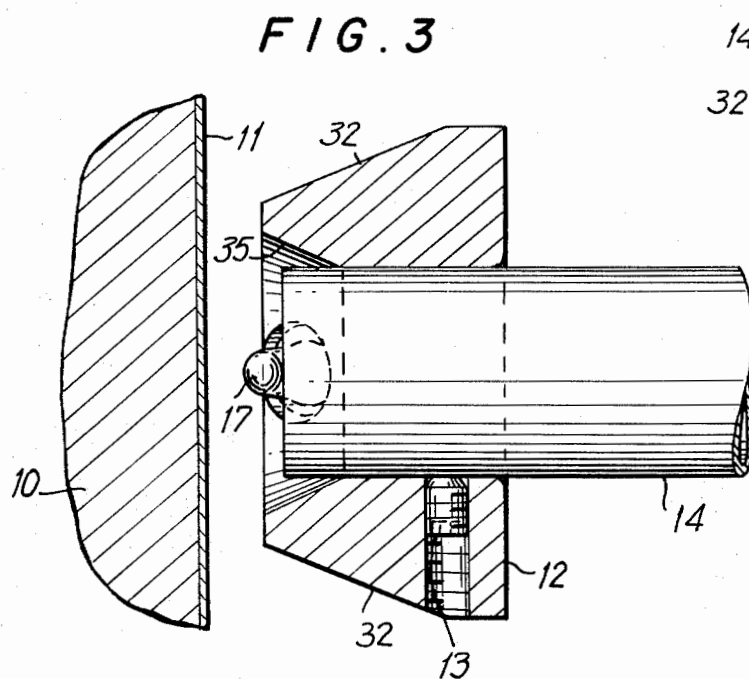
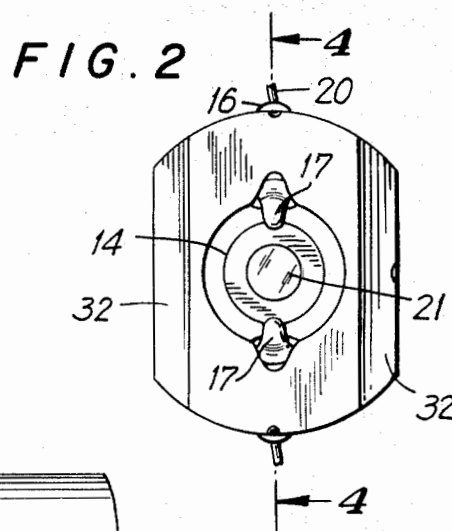
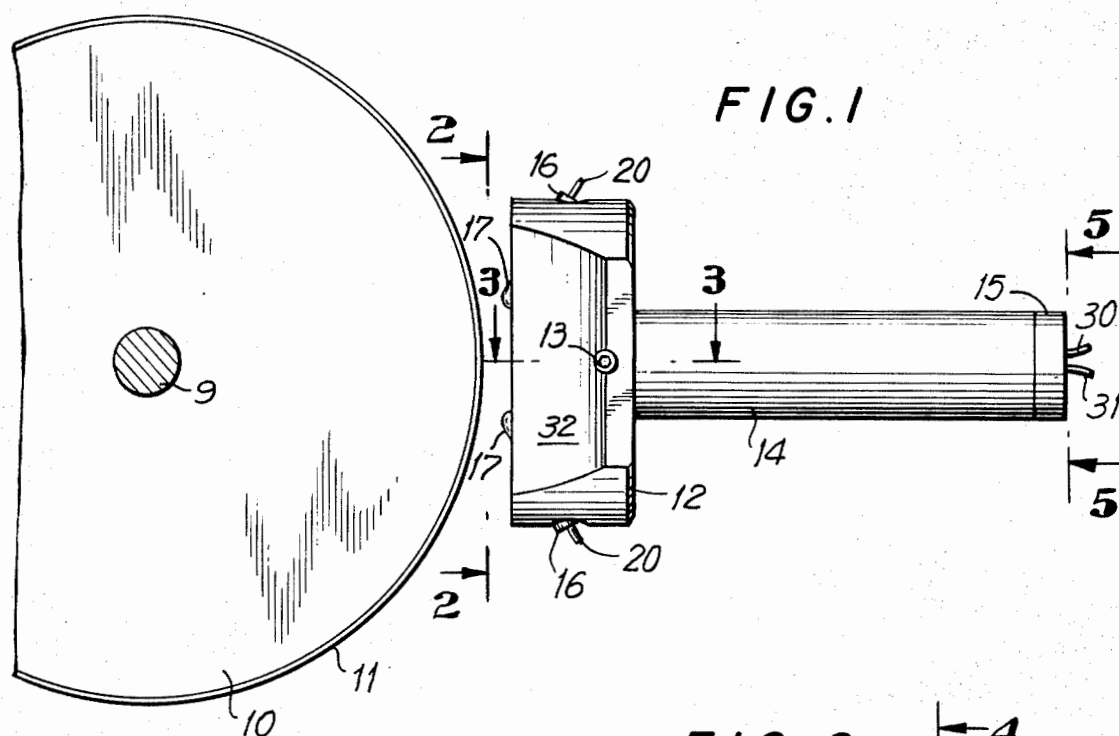
Attorney—Allison C. Collard

[57] ABSTRACT

A simplified and effective optical system for facsimile scanners and the like wherein a plurality of prefocussed lamps illuminate the scanning spot and a coaxial lens system directs the reflected light through an aperture disposed in front of a photo-electric device for producing an electrical signal in response to changes in contrast of the scanning spot.

6 Claims, 6 Drawing Figures





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BY *Allison C. Pollard*
ATTORNEY

FIG. 4

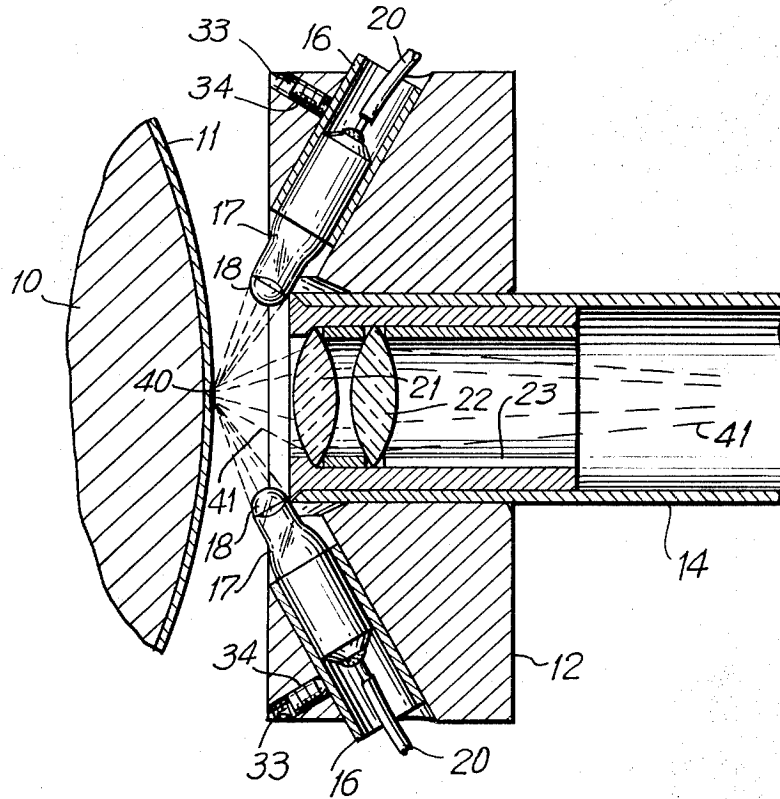


FIG. 5

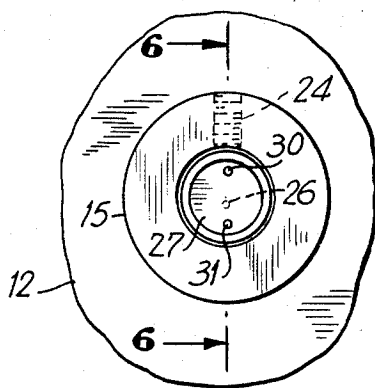
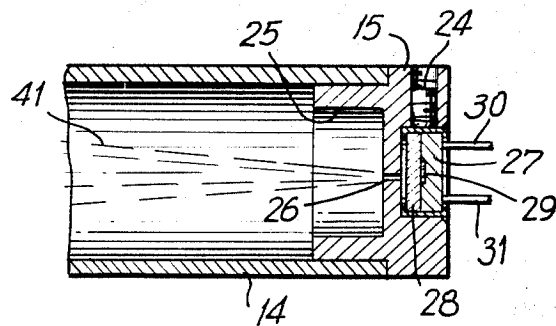


FIG. 6



INVENTORS
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BY *Allison C. Calland*
ATTORNEY

OPTICAL SYSTEM FOR FACSIMILE SCANNERS AND THE LIKE

This application is a continuation-in-part of application Ser. No. 754,773, filed on Aug. 23, 1968 now abandoned.

This invention relates to a simplified and efficient optical system for facsimile scanners and the like for illuminating the scanning spot and producing an electrical signal responsive to the contrast of that spot.

More specifically, this invention relates to a simplified and efficient optical system for facsimile scanners wherein a plurality of prefocussed lamps are directed adjacent to and illuminate the scanning spot so that a coaxial lens system will direct the reflected light through a suitable aperture to an efficient photo-electric detector.

Conventional optical systems for facsimile scanners and the like have generally been complicated, physically massive, and relatively expensive. Generally, the light from a single high voltage lamp has been focussed on the scanning area by a relatively long focal length lens, and the reflected light has been picked up by similar lens system. Prior to the introduction of solid state circuitry, it was necessary for these high voltage lamps to produce a high intensity light directed on a scanning spot so that a photo-electric cell could receive a sufficient amount of light through a relatively long focal length lens in order to detect information on a scanning spot. The heat generated by the high intensity lamp, and the large focussing lens required, prevented attempts to package the optical system into smaller spaces.

Accordingly, the present invention provides a simple, inexpensive optical system for facsimile scanners which eliminates the need for any long focal length lenses since the system of the invention utilizes lamps having their own prefocussed lenses integrally formed on the end of the lamp. The lens is cast into the end of the bulb in the form of a very short focussed, high speed lens. The result is that a high intensity spot can be produced at a short distance without the aid of prisms, mirrors or other lenses. By directing a plurality of such prefocussed bulbs about an axis passing through the scanning spot, a high intensity illumination of the scanning spot area is possible. The reflected light from the scanning spot is then directed through a pair of short focal length, convex lenses which are mounted adjacent to each other within a lens column having its optical axis directed to the scanning spot. At the opposite end of the lens column, the reflected light is focussed into a small aperture which serves as a mask over the light sensitive surface of a photo-electric device. In one embodiment of the invention, the aperture is slightly offset from the optical center of the lens column so as to permit the photo-electric device to be initially adjusted by rotating it around the optical center to achieve improved resolution and focus. The preferred embodiment of the invention utilizes two prefocussed flashlight bulbs directed to the scanning spot and a sensitive CdS type photo cell for detecting the reflected image from the scanning spot. Because of the low heat dissipation of the lamps and their relatively small size, the entire optical system according to the present invention, has been significantly reduced in size with respect to conventional optical systems resulting in substantial savings in cost.

It is therefore an object according to the present invention to provide an optical system for facsimile scanners and the like utilizing a plurality of prefocussed lamps to illuminate the scanning spot.

It is another object according to the present invention to provide a simplified and efficient optical system for facsimile scanners and the like which has been significantly reduced in size over conventional optical systems.

It is still a further object according to the present invention to provide an optical system for facsimile scanners and the like which is simple in design, inexpensive in cost, and reliable in operation.

Other objects and features of the present invention will become apparent from the following detailed description considered in connection with the accompanying drawings which disclose the embodiments of the invention. It is to be understood, however, that the drawings are designed for the purpose of illustration only and not as a definition of the limits of the invention.

In the drawings, wherein similar reference characters denote similar elements throughout the several views:

FIG. 1 is a side plan view of a simplified scanner showing the optical system according to the present invention;

FIG. 2 is a cross-sectional view taken along section 2-2 of FIG. 1;

FIG. 3 is a cross-sectional view taken along section 3-3 of FIG. 1;

FIG. 4 is a cross-sectional view taken along section 4-4 of FIG. 2;

FIG. 5 is a cross-sectional view taken along section 5-5 of FIG. 1; and

FIG. 6 is a cross-sectional view taken along section 6-6 of FIG. 5.

Referring to FIGS. 1-4, there is shown the inventive optical system for the scanner wherein the scanning drum 10 is pivotably mounted on axis 9 and includes a sheet of information 11 secured to the surface of drum 10 for rotational movement in front of the optical system. The optical system includes a modified cylindrical-shaped bezel 12 having a hollow tubular cylindrical column 14 disposed through the axis of bezel 12 terminating within its conical opening 35 facing information 11. Bezel 12 additionally includes set screw 13 disposed normal to the longitudinal axis of the bezel for frictionally engaging the outside surface of lens column 14, thereby permitting slidable adjustment of column 14 within the bezel. On at least two opposite sides of conically-shaped surface 35 are provided cylindrically-shaped passageways for accommodating tubular bushings 16 having their axes directed for convergence on a single spot on the surface of sheet 11, hereinafter referred to as scanning spot 40. Cylindrically-shaped bushings 16 are retained within bezel 12 by means of set screws 34 threadably coupled through holes 33 in the body of bezel 12, and in engagement with the outer surface of bushings 16. Frictionally retained within each of bushings 16 is a lamp 17 having a prefocussed lens 18 integrally cast on the end portions of its glass envelope. Electrical energy supplied to bushings 16, and through conductors 20 connected to the other terminals of the lamps will illuminate the filaments of the lamps. After the lamps are turned on, set screws 34 may be loosened to permit sleeves 16 and lamps 17

retained therein to be properly positioned so that the light passing through lenses 18 will be focussed on scanning spot 40. The reflected light 41 from scanning spot 40 will pass through converging lenses 20 and 21 which are mounted in cylindrical sleeve 23 held adjacent to the end of column 14. Lenses 21 and 22 are short focal length lenses so that the presence of lens 22 mounted almost immediately behind lens 21 causes the reflected light rays 41 to diverge slightly and focus adjacent to aperture 26 formed in cap 15 which is secured on the end of column 14 as shown in FIGS. 5 and 6. End cap 15 includes a cylindrical flange 25 having a reduced diameter with respect to the internal diameter of tubular column 14 so that it will frictionally fit on the end of column 14. Behind aperture 26 is a photo-electric device consisting of a selenium type photo cell having a protective transparent lens 28 and a rectangularly-shaped photo sensitive area 29 disposed behind lens 28 within its body 27. A pair of electrical terminals 30 and 31 produce an output signal proportional to the illumination of sensitive area 29. A set screw 24 threadably engaged to cap 15 retains photo cell 27 from any movement within cap 15.

In an actual embodiment of the optical system of the invention, lamps 17 are type 253 X of Chicago Miniature Lamp Company, having a voltage of 2.5 volts and a rated life of 10,000 hours of operation. Photo cell 27 is a Clairex type CL 707 H, CdS photoconductive cell. Lenses 21 and 22 are Jaeger type, three-element convex lenses having a focal length of 25 mm., a diameter of 12 mm, and f 0.9 speed. The center of lens 21 is mounted approximately 0.5 inch from scanning spot 40, and the front face of lens 22 is mounted approximately 0.001-0.002 inch from the back face of lens 21 along a common optical axis. Aperture 26 is approximately 3.5 inches from the back face of lens 22, and offset 0.015 inch from the optical axis of the lens column. The diameter of aperture 26 is approximately 0.026 inch.

Bezel 12 and bushings 16 are preferably constructed from conductive material such as metal to accommodate electrical illumination of lamps 17. Bezel 12 is also provided with a black, non-reflective finish to prevent undesirable reflections from the scanning spot from affecting the response of cell 27.

In setting up the optical system of the present invention, it is recommended that various adjustments be made to the various components of the system prior to its operation. Lamps 17 may be rotated within bushings 16 in order that the filaments of the lamp be disposed parallel upon one another when striking the scanning spot 40. The holes in which bushings 16 are disposed may be made slightly eccentric so that the bushings, containing lamps 17, can be rotated in order to further improve the alignment of the illumination upon scanning spot 40. Moreover, bushings 16 containing lamps 17 may be advanced inward or retarded outwardly with respect to scanning spot 40 to further focus the light onto the image.

Bezel 12 which contains the lamp assembly may also be advanced or withdrawn from the scanning spot in order to effect the proper alignment of the illumination. Bezel 12 may also be rotated about the optical axis, if required.

Cylindrical column 14 which contains lenses 21 and 22, may be linearly advanced or retarded within bezel 12, rotated about the optical axis in order to accomplish the focusing of the reflected image from scanning spot 40 through the lenses to aperture 46, which is slightly offset from the optical axis. Moreover, cylindrical cap 15 may also be rotated with respect to lens column 14 to permit further adjustment of aperture 26 with respect to the reflected image. Photocell 27 which contains the rectangularly shaped photosensitive area 29 may also be pivoted with respect to cap 15 in order to improve the sensitivity of detection of the reflected image.

The optical system of the subject invention, having all of the above described adjustments available within its construction, has been found to provide a superior facsimile reproduction having at least 10 distinct shades of grey on the reproduced copy. Moreover, due to the improved sensitivity of the optical system of the invention, it has been found that material containing data having all colors can be faithfully reproduced without loss of intensity or image.

While only a few embodiments of the present invention have been shown and described, it will be understood that many changes and modifications may be made thereunto without departing from the spirit and scope of the invention.

What is claimed is:

1. An optical system for scanning information, comprising:

a mounting bezel,

a lens column, mounted on said bezel and disposed concentric with the axis thereof, and having an aperture provided in one end;

at least two pre-focused illumination lamps, each having a lens integrally formed on its end, for focusing converging illumination on a scanning spot on the information;

a pair of convex lenses, having their axes directed at the information being scanned, and disposed coaxially adjacent one another within said lens column, so that the focal point of said lenses is disposed adjacent said aperture in said lens column, for focusing light reflected from the scanning spot on the information in said aperture; and

a photoconductive cell, disposed behind said aperture in said lens column, responsive to light focused in said aperture by said convex lenses for producing an electrical signal in response to changes in the reflected light corresponding to changes in the scanned information, and wherein said illumination lamps are slidably disposed within said bezel on opposite sides of said lens column, and are directed toward the information being scanned; and wherein said lens column is slidably disposed within said bezel so that the distance between said lens column and the information being scanned is adjustable by sliding said lens column in said bezel.

2. The optical system as recited in claim 1, further comprising a cap, slidably and rotatably disposed in the end of said lens column furthest from the information being scanned, said aperture being disposed in said cap offset from the optical axis of said lens column.

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3. The optical system as recited in claim 2, wherein said convex lenses are three-element convex lenses.

4. The optical system as recited in claim 2, wherein said photoconductive cell is a CdS photocell.

5. The optical system as recited in claim 2, wherein said bezel further comprises a pair of cylindrical bores for slidably receiving said illumination lamps, and means for adjustable securing said lamps within said

bores.

6. The optical system as recited in claim 2, wherein said cap further comprises a mounting recess disposed behind said aperture for receiving said photoconductive cell, and means for adjustable securing said photoconductive cell within said cap.

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RAYMOND SCOTT CLAVIVOX

CAN SOUND 'SOMETHING' LIKE:

- ☐ A VOCALIST, NOT A VOICE
- ☐ A CLARINETIST, NOT A CLARINET
- ☐ A TROMBONIST, NOT A TROMBONE
- ☐ A VIOLINIST, NOT A VIOLIN
- ☐ ETC., ETC.
- ☐ PLUS A GREAT VARIETY OF SPECIAL EFFECTS, GROWLS, SWOOPS, BRASS LIKE SCREAMS



THE NEWEST ELECTRONIC MUSIC INSTRUMENT— SOUNDS LIKE A HUMAN PERFORMANCE

THE FIRST KEYBOARD INSTRUMENT ON WHICH IT IS POSSIBLE TO SLIDE IN PITCH, AT A CONTROLLABLE RATE, FROM ANY NOTE TO ANY OTHER, WITHOUT THE USE OF ADDITIONAL CONTROLS.

VISIT FARMINGDALE FOR AN IN-PERSON DEMONSTRATION. CONTACT PRISCILLA JONES AT 516-293-8888 OR WRITE:

RAYMOND SCOTT ENTERPRISES
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RAYMOND SCOTT CLAVIVOX

RAYMOND SCOTT CLAVIVOX

the keyboard electronic musical instrument capable of sliding in pitch from any note to any other—

SOUNDS LIKE A HUMAN PERFORMANCE.

RANGE: Any selectable three octave portion of an eight octave range—starting one octave below the lowest C to the highest C on the standard 80 note piano. The instrument is monophonic.

TONE COLOR: Different combinations of the controls make possible a great variety of tone colors and special effects—useful for super legato melody playing—obligatos, pedal points, smooth bass lines. Special effects include growls—swoops—brass like screams, etc. Variants of the four wave shapes most frequently used in electronic music are available—sine, sawtooth, triangle and square.

PERFORMANCE: An expression control center for the left hand makes for sensitive and dynamic musical performances. The right hand plays the notes and the left hand controls the expression.

LEFT HAND: Four levers, marked hard attack, soft attack, extinguish and vibrato are directly under the first four fingers of the left hand. This finger tip control helps to achieve a high degree of expression.

RIGHT HAND: After the initial key is depressed—depressing a higher key—slowly—produces an upward pitch glissando to the desired note—slowly. Depress it quickly—and the glissando is rapid. Likewise, a lower key produces a downward pitch glissando to the lower chosen note. These pitch glissandos can be as slow or fast as required, depending on how the key is depressed. When the key bottoms, the correct pitch is established and fixed. As needed, the pitch glissando can be made imperceptible by a very rapid depression of a key. Detached and staccato notes are achieved by the use of the left hand manipulation of the attack and extinguish controls.

VIBRATO: Controls are provided for varying both speed and intensity. At the expression control center, the vibrato lever, directly under the thumb, enables vibrato to be added only when desired—a phrase, a note—or part of a note.

OUTPUT: Plugs Into Any Musical Instrument Amplifier-Speaker.

DESCRIPTION

Weight—38 lbs. (approx.)

Size—27" wide x 21" deep x 10" high (not including legs. The legs are detachable.)

Power—Line operated 115 V a/c.

THOMAS L. RHEA
2810 WESTWOOD AVENUE
NASHVILLE, TENNESSEE 37212

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IDEA FOR ELECTRONIC MUSICAL INSTRUMENT, ORGAN-LIKE,
BUT CONSIDERED UNIQUE IN CONCEPT, IN THAT THE SOUND
OF SAID INSTRUMENT IS ORCHESTRAL IN NATURE, RATHER THAN
THE SOUND OF THE ELECTRONIC, PIPE, OR REED ORGAN.

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The theory is as follows: That this instrument be so designed, that for instance if a Bach two-part invention were performed on it, the right-hand part could be assigned the sound of the oboe; the left-hand part, the sound of a clarinet.

Similarly, in a three-part invention, the top part could be a flute, the middle part oboe, the bottom part clarinet. In a four-part fugue, the top part could be flute, the second part oboe, the third clarinet, the fourth bassoon.

In a musical composition, constructed with ~~max~~ many chordal progressions, with the chords arranged with the same number of voices for each part, then the first note on the top could be one choice of instrument, and a different instrumental color assigned to each sequentially lower-pitched note in the chord.

The circuitry for accomplishing the above procedures would be as follows: For instance, perhaps fifty times per second, the keyboard would be sequentially "interrogated" by a shift register mechanism to establish which depressed key is first, second, third, fourth, at any given moment. Tabs on the instrument would then make it possible for the performer to preset the circuitry so that the first depressed note would always be assigned, for instance, the sound of the flute, the second, for instance, the sound of the oboe, etc., for the number of different parts being used in that particular section of the musical composition.

In summation then, the circuitry is repetitively, sequentially, many times per second, checking to see which note is highest in pitch, which is second highest, etc. in order that the different notes are assigned the instrument sounds decided upon.

It is planned to use voltage-controlled oscillators, among others, so that the highest pitch depressed key is assigned its own oscillator, and stays with it for the duration of the section being played. Likewise the second highest-pitch key, the third, fourth, etc., all have their own oscillators which stay with them.

It is felt that this conception is unique, and that this instrument sounds orchestral, rather than organ-like because the different component musical lines are being performed by different and exclusively assigned instrumental colors.

Conceived April 14, 1970 by:

Witnessed and Understood by:

Raymond Scott

Philip C. Enham
4/14/70

4/14/70 Holland W. Bennett

'Artistic Collaboration Between Man and Machine' is the subject of an experimental music creation program - one we have been engaged in for more than ten years. There is now a working model - it is called the Raymond Scott Electronium.

The Electronium - when guided by a composer - is capable of the instantaneous composition - and performance - of musical works. A sixty minute tone poem-like piece could take but sixty minutes to compose - completely performed - instead of weeks, months, sometimes years. The complete 'composition-performance' is in the form of an ordinary magnetic tape recording - with the sound of the performance frequently closer to that of the symphony orchestra and wind ensemble than it is to the sound of electronically generated tones.

METHOD OF OPERATION:

A composer "asks" the Electronium to 'suggest' an idea - theme - motive - whatever. He listens to these on a monitor speaker. When happy with one of the ideas, he stops the Electronium, puts the magnetic tape recorder into the record mode and starts recording. The start button for the Electronium is now also pressed and the composition is underway.

Say the opening theme is just about over, the composer (guidance control) decides that, as the first step in the development of this theme - he wishes to repeat it, but in a higher key - he pushes the appropriate button. Or, perhaps, he wants to modify the theme somewhat in its new, transposed, higher key - for instance, to widen some of the intervals . . . he turns another knob. Whatever the composer needs . . . to continue the development of the piece, it is but necessary for him to convey his wishes to the Electronium - by manipulating the appropriate controls.

. . . faster, slower, a new rhythm design, a hold, a pause, a second theme, variation, an extension, elongation, diminution, counterpoint, a change in phrasing, an ornament . . . ad infinitum . . . whatever the composer requests, the Electronium accepts and acts out his directions.

The above is, of course, a simplification of the compose-perform mechanism - for, in reality, the machine's response to guidance control is,

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in its details - unpredictable - so that a kind of joint effort takes place - in that the Electronium adds to the composer's thoughts, and a duet relationship is set up between man and machine.

The nature of the sounds produced is simple or complex - monophonic, polyphonic - the rhythm designs modest or extraordinarily inventive - but, most of all, the machine is capable of a seemingly inexhaustible palette of musical sounds and colors, rhythms and harmonies.

One engineer-musician describes the RS Electronium as a Music Structure Generator . . . in that it creates musical structures . . . to be shaped and reshaped by guidance control (the composer) . . . as he directs it here and there into different designs and developments.

The company feels that there is much life, action, direction, warmth of feeling and attractiveness in the sound designs generated - and that 'Machine Powered Instantaneous Musical Composition and Performance' via the RS Electronium could be an exciting new ingredient in the creation of 'electron' music scores for films, radio, television and records.

Raymond Scott Enterprises
Tel: 516-293-8888

3 Willow Park Center
Farmingdale, New York 11735.

Addendum:

1. The Raymond Scott Electronium is not a synthesizer - there is no keyboard - and it cannot be used for the performance of existing music. The instrument is designed solely for the simultaneous and instantaneous composition-performance of musical works.
2. The frequency of switch and knob use depends upon the nature of the music being composed, but, on the average, is about once every three to five seconds.

LOU LEVY MUSIC CO., INC.

INTER-OFFICE MEMO

DATE

TO

FROM

SUBJECT

COPY TO

Maybe
by sending
him some
of his own
compositions
he'd do them
on the new
device
L.H.

Raymond Scott Emerges With The Electronium, A Do-It-Itself Machine

Raymond Scott, veteran maestro of the swing era who was among the pioneers in souping up the sound of recorded music via multiple tracking, is back on the music scene with a new device, the Electronium, on which he has been working for the past 10 years.

The Electronium is neither a conventional instrument nor an electronic synthesizer. It is more like a futuristic parlay of an electronic organ and a self-starting robot. Whatever it is, Scott is planning to market the device either through direct sale to schools or on a time-sharing basis similar to computer plans.

Unlike synthesizers, like the Moog, which is essentially a performing machine, the Electronium is a composing machine. Notes come cascading out of the Electronium when the switch is turned on and the person at the controls then can steer it by means of switches which determine pitch, dynamics, counterpoint, etc. In Scott's working model at his Farmingdale, L.I., studios, there are several hundred switches by which the machine can be controlled.

The Electronium has a built-in tape machine which can record whatever the machine is turning out. A composer working on the Electronium can fiddle with the switches until he gets a desired theme or effect and then repeat it for the tape machine. In this way, he can build up a whole composition.

Scott said it was far from being a conventional way of composing since the machine is collaborating on its own every step of the way.

Scott himself has composed several works on the Electronium, including a piece in the style of Stravinsky, a ballet and a futuristic pop-rock opus.

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1970

Lou Levy was a legendary independent music publisher, who was associated with Sammy Cahn, Bob Dylan, Bobby Darin, Connie Francis, Les Paul, and countless others. He supplied Sinatra with "Strangers in the Night" and published the first US hit by the Beatles, "I Want to Hold Your Hand." He created Lou Levy Music Co., Inc. in 1968 after he left as head of MCA Music (now Universal Music), who purchased his vast music publishing company, Leeds Music. Although he did not control Raymond Scott's publishing, Levy sent this interesting suggestion to a colleague, that "maybe by sending [Scott] his own compositions he'd do them on the new device." Had Levy read the article more closely, he would have realized that the Electronium was a "composing device," not an instrument for performing existing works.

THIS DISCLOSURE RELATES TO AN INVENTION CALLED

'ELECTRONIC JEWELRY ".

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The idea is based on the fact that since the use of precious stones, gems, minerals and other ingredients that sparkle, glisten, radiate, reflect, etc., etc. has been one of the principal ingredients in the making of jewelry - historically speaking - both the precious variety and the costume type - a new and unique addition to the generation of sparkling radiant effects would be the use of light emitting diodes - used singly or in a multiple fashion alone or together with precious stones or imitations thereof in different designs as the state of the jewelry art practices today - and has been practicing for many centuries.

This invention suggests the use of light emitting diodes especially of the very miniature variety, say bead style, that are, for instance, 1/16th of an inch in the overall diameter or less, that the use of these very tiny light sources and the attractive sparkling ruby light generated by these diodes will make possible a degree of radiance in jewelry not before available.

The fact that these light emitting diodes can be powered by hearing aid style batteries, the size of small wafers, 1/2" and less in diameter and 1/4" and less in thickness coupled with the fact that diodes can operate on approximately one and one half volts and fifteen mils together with the practicability of operating these diodes in parallel and with the very low current consumption - namely, about 15 mils, makes possible, for the first time a unique approach to the creation of jewelry like objects with self radiating qualities.

Embodiment No: 1

This could be a lady's bracelet and a bit thick on the under side to house a two of these disc type hearing aid batteries; and then the ornamental design itself could be created out of precious or imitation stones with suitably spaced for artistic reasons a light emitting diode here and there depending on the artistic taste of the designer.

Embodiment No: 2

For instance, a lady's ring with a circle of real or imitation stones and in the center is the light emitting diode and from the ring is a very miniature decorative connecting wire that slips between the fingers and up to the wrist into an ornamental bracelet style battery holder so that the center of the ring would have this light emitting diode with its sparkling ruby color and a little switch would be employed on the ornamental bracelet that would house the disc battery.

Raymond Scott 7/2/70

Mathilde Scott 7/2/70

Joseph J. Daniels 7/2/70

Holland W. Bennett 7/2/70

1.

Additional Embodiments:

Similarly, then, brooches, earrings, necklaces, bracelets and hair pins and all manner of women's jewelry and men's jewelry and other ornamental types of jewelry, not necessarily worn could be decorated with the use of these light emitting diodes.

Additional important points:

The reasons for the unique attractiveness of jewelry built with light emitting diodes is as follows:

- a. the sparkling radiance is present whether there is light present or not - for instance, in the theatre and in the evening outdoors, light is not necessary - to be reflected by the jewelry because of the diode's self radiating quality.
- b. even in daylight, the intensity available in the light emitting diode can be seen above the ambient light situations commonly found.
- c. the advantages of the long life span available in light emitting diodes would make replacement or repair of the jewelry involved as infrequent as standard precious or imitation type jewelry.

Invented by Raymond Scott 7/2/70

Typed by Matthew Scott 7/2/70

Witnessed by Read and understood Joseph F. Daniels 7/2/70

Witnessed by Read and understood Holland W Bennett 7/2/70

Witnessed by _____

ADDENDUM:

- a. while only ruby glowing diodes are referred to, any other available color light emitting diodes could be used.
- b. for the earring idea embodiment - batteries for same could be located behind the ear as is sometimes done for hearing aids.
- c. one of the necklace embodiments, though expensive, could be a string of light emitting diodes - similar to a string of pearls - with the miniature power pack arranged to be worn behind the neck - where a clasp generally would be.
- d. another embodiment would be the jewel like decorated lady's purse - frequently used for formal evening wear. Here, too, a design of light emitting diodes could be used to enhance the sparkling effects usually available in this type of evening wear purse.
- e. though the date of invention, typing and witnessing are indicated on Page 2 of this disclosure - the actual date of conception was the evening of Thursday, June 26, 1970. It was in the afternoon of this day that the first diodes MV50 were purchased from Schweber Electronics and it was late that night - about ten o'clock - that I got to hooking them up. When I saw the unusually attractive point source of ruby like light - that is when I got the idea. It was during the ensuing weekend that I mentioned the idea to Norman Nesenoff, who said, "Oh, I guess you really can't patent the idea - you could only patent a circuit for it." Later during the week I mentioned the idea to Werner Schulz, who said he had thought of something like that some time ago and was going to use neon lamps. Then, on Wednesday night, July 1, 1970, Philip Erhorn was present at the time the disclosure was being typed. At first, he was going to wait and sign it, but then he had to go. Earlier the same evening, Joe Daniels was here and I told him about the idea and he said he had a very good place to try to sell it. It was about four o'clock the same afternoon that Al Barber called - I told him about the idea, remarking that I didn't think it was patentable - he said for me never to draw a conclusion myself about patents - he thought the idea was patentable.

Invented by: Raymond Scott 7/2/70

Typed by: Matthew Scott 7/2/70

1. ELECTRONIC MUSICAL INSTRUMENT FOR THE GENERATION OF POLYPHONIC RHYTHM STRUCTURES, AUTOMATICALLY PERFORMED - PLUS THE AUTOMATIC PERFORMANCE OF A PRESET PROGRAM - THE PROGRAM EASILY SET UP AND MODIFIED, AS REQUIRED, BY THE USER - WITH PROVISION FOR THE INSTANT AURAL EXAMINATION OF DIFFERENT SEQUENTIAL JUXTAPOSITIONS AND PARALLEL GROUPINGS OF THE PROGRAMMED EVENTS.

5 pgs.

Date: 9/12/69 typed text, block diagram
Wit: Alan W. Entenmann and Norman Nesenoff

2. A POLYPHONIC MUSICAL INSTRUMENT CONTROLLED BY MEANS OF A STANDARD ORGAN TYPE KEYBOARD, WITH INDIVIDUAL VOLTAGE CONTROLLED AUDIO TONE GENERATORS FOR EACH NOTE - EACH GENERATOR HAVING ITS OWN WAVE SHAPING CIRCUITRY - WITH ALL WAVE SHAPING CIRCUITS CAPABLE OF SIMULTANEOUS MODIFICATION AND CONTROL - VIA SOLID STATE SWITCHING CIRCUITS - THESE SWITCHING CIRCUITS DIGITALLY CONTROLLED BY MEANS OF A MANUALLY OPERATED PUSH BUTTON MATRIX.

3 pgs.

Date: 10/17/69 typed text, block diagram
Wit: Norman Nesenoff

3. IDEA FOR ELECTRONIC MUSICAL INSTRUMENT, ORGAN-LIKE, BUT CONSIDERED UNIQUE IN CONCEPT, IN THAT THE SOUND OF SAID INSTRUMENT IS ORCHESTRAL IN NATURE, RATHER THAN THE SOUND OF ELECTRONIC, PIPE OR REED ORGAN.

1 pgs.

Date: 4/14/70 typed text, no diagram
Wit: Philip C. Erhorn and Holland W. Bennett

4. SUPPLEMENT TO THE DISCLOSURES TITLED "ELECTRONIC MUSICAL INSTRUMENT FOR THE GENERATION OF POLYPHONIC RHYTHM STRUCTURES, AUTOMATICALLY PERFORMED - PLUS THE AUTOMATIC PERFORMANCE OF A PRESET PROGRAM - THE PROGRAM EASILY SET UP AND MODIFIED, AS REQUIRED BY THE USER - WITH PROVISION FOR THE INSTANT AURAL EXAMINATION OF DIFFERENT SEQUENTIAL JUXTAPOSITIONS AND PARALLEL GROUPINGS OF THE PROGRAMMED EVENTS.

4 pgs.

Date: 4/13/70 typed text, block diagram
Wit: Holland W. Bennett

5. MONOPHONIC CHORUS EFFECT ELECTRONIC MUSICAL INSTRUMENT, IN WHICH A GREAT PLURALITY OF INDEPENDENT VOLTAGE CONTROLLED AUDIO TONE GENERATORS ARE EXCLUSIVELY TUNED TO THE SAME FREQUENCY - ALL SIMULTANEOUSLY SHIFTED TO THE SAME NEW FREQUENCY BY A SINGLE CONTROL VOLTAGE EMANATING FROM AN ORGAN TYPE KEYBOARD, (OR OTHER CONTROL METHOD) - IN ORDER TO PROVIDE A MONOPHONIC CHORUS EFFECT OF ANY DESIRED SIZE, DEPENDING ON THE NUMBER OF INDEPENDENT VCO'S USED.

3 pgs. Date: 10/17/69 typed text, block diagram
Wit: Norman Nesenoff

6. ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING AUTOMATIC MUSICAL PERFORMANCES - ACCORDING TO A PRESET DIGITAL PROGRAM - ON A MAGNETIC TAPE OR OTHER MEMORY - THE PROGRAM INPUT INFORMATION TO BE FED IN MANUALLY VIA A STANDARD ORGAN TYPE KEYBOARD.

6 pgs. Date: 10/17/69 typed text, block diagram
Wit: Norman Nesenoff

7. A SIMPLE PATTERN GENERATOR WITH ADJUSTABLE PRESET DELAYS BETWEEN PULSES - FOR THE GENERATION OF MUSICAL RHYTHMS IN ELECTRONIC MUSIC INSTRUMENTS - OR ANY OTHER SEQUENTIAL TIMING REQUIREMENTS IN GENERAL CONTROL CIRCUITRY.

2 pgs. Date: 2/20/69 typed text, block diagram
Wit: Alan W. Entenmann

8. INSTANTANEOUS, AUTOMATIC MELODY COMPOSING AND PERFORMING MACHINE.

13 pgs. typed texts, block diagrams for all six versions

Version 1.	6/14/68	Wit: Martin J. Sandler
Version 2.	6/14/68	Wit: Martin J. Sandler
Version 3.	6/14/68	Wit: Martin J. Sandler
Version 4.	6/14/68	Wit: Martin J. Sandler
Version 5.	6/14/68	Wit: Martin J. Sandler
Version 6.	6/15/68	Wit: Martin J. Sandler

INDEX - RAYMOND SCOTT DISCLOSURES - as of JULY 4, 1970. III.

1970

9. SIMPLE TUNEFUL SIGNALLING DEVICE

3 pgs. Date: 7/2/68 typed text, block diagram
Wit: S. Edwin Piller

10. AUTOMATIC MELODY PERFORMING DEVICE, EASILY SET FOR ANY ARRANGEMENT OF PITCHES AND RHYTHM.

4 pgs. Date: 6/30/68 typed text, block diagram
Wit: S. Edwin Piller

11. INSTANTANEOUS AUTOMATIC RANDOM CHORD PROGRESSION DEVICE

4 pgs. Version 1. Date: 6/30/68 typed text, block diagram
Wit: S. Edwin Piller

12. AUTOMATIC ARPEGGIO-LIKE CHORD PRODUCING DEVICE

3 pgs. Date: 6/30/68 typed text, block diagram
Wit: S. Edwin Piller

13. ELECTRONIC AUDIBLE SIGNAL DEVICE - IMITATIVE OF A CHINESE GONG - FULLY ADJUSTABLE TO IMITATE OTHER TYPES OF BELLS, CHIMES, GONGS AND THE LIKE, IN ADDITION TO THE CREATION OF NOVEL AND UNFAMILIAR EFFECTS.

2 pgs. Date: 10/28/68 typed text, block diagram
Wit: Jesse B. Davis and Alfred W. Barber

14. A PACKAGE DESIGN FOR AN ELECTRONICALLY SYNTHESIZED CHINESE GONG OR OTHER BELL, GONG OR AUDIBLE SIGNALLING DEVICE.

2 pgs. Date: 4/3/69 typed text, block diagram
Wit: Werner R. Schulz

15. AUDIBLE INDICATOR

3 pgs. Date: 9/14/68 typed text, block diagram
Wit: Arthur Shifrin and Jeffrey Adler (?)

INDEX - RAYMOND SCOTT DISCLOSURES - as of JULY 4, 1970. IV.

1970

16. A KEYBOARD THERAMIN

3 pgs.

Date: 1/12/69 typed text, block diagram
Wit: William Alexander

17. A SIMPLE KEYBOARD ELECTRONIC MUSICAL INSTRUMENT FOR SLIDING
FROM ONE FIXED PITCH TO ANOTHER - VIA PIANO STYLE KEY SWITCHES.

1 pg.

Date: 6/3/69 handwritten text and diagram
Wit: Norman Nesenoff

18. PULSE MODULATION ELECTRONIC AUDIBLE SIGNALLING DEVICE

4 pgs.

Date: 5/23/68 hand printed text
Wit: Alfred W. Barber

19. THREE ADDITIONAL METHODS FOR ESTABLISHING A SEQUENCE OF REQUIRED
KEYING PULSES.

3 pgs.

Date: 5/13/68 hand printed text, diagram
Wit: Alfred W. Barber

20. ELECTRONIC MUSIC BOX

4 pgs.

Date: 5/13/68 hand printed text, diagram
Wit: Alfred W. Barber

21. SPIN-A-TUNE

4 pgs.

Date: 5/13/68 hand printed text, diagram
Wit: Alfred W. Barber

22. ELECTRONIC BABY RATTLE

1 pg.

Date: 5/13/68 hand printed text, diagram
Wit: Alfred W. Barber

23. IDEA #1. - FOR NEW SOUNDS IN BELL LIKE DEVICES AND OTHER AUDIBLE
SIGNALLING SOUNDS.

2 pgs.

Date: 4/29/68 hand printed text, diagram
Wit: Alfred W. Barber

4.

24. IDEA #2 - A NEW SOUND IN A TWO TONED BELL LIKE DEVICE FOR ANY AUDIO
SIGNALLING PURPOSE.

2 pgs. Date: 4/29/68 hand printed text, diagram
Wit: Alfred W. Barber

25. IDEA #3 - FOR NEW SOUNDS IN AUDIBLE SIGNALLING DEVICES LIKE DOOR
CHIMES, DINNER BELLS, CHURCH BELLS AND OTHERS.

4 pgs. Date: 4/29/68 hand printed text, diagram
Wit: Alfred W. Barber

26. BANDITO THE BONGO ARTIST

9 pgs. Date: 5/15/68 hand printed text, diagram
Wit: Alfred W. Barber

27. SEASCAPE WITH ACCOMPANYING SOUND SCORE

1 pg. Date: 7/8/70 typed text
Wit: Holland Bennett

28. A UNIQUE KIND OF TELEPHONE BELL

2 pgs. Date: 7/8/70 typed text
Wit: Holland Bennett and Joseph L. Daniels

29. ASH TRAY WITH ACCOMPANYING ELECTRONIC MUSIC SCORE

1 pg. Date: 7/8/70 typed text
Wit: Holland Bennett and Joseph L. Daniels

30. ELECTRONIC JEWELRY

3 pgs. Date: 7/2/70 typed text
Wit: Joseph L. Daniels and Holland W. Bennett

The idea here is that functional objects could be made more decorative; and decorative objects could be decoratively enhanced by the use of accompanying electronic music or sounds, random or programmed.

Embodiment No. 1.

A suitable cut glass ash tray is placed on a coaster-like object (with built in miniature speaker.) The circuitry derived from one of my devices called "Instantaneous Automatic Melody Composition and Performance Device" is connected to this miniature speaker and this same circuitry is adjusted via its conditioning controls to produce a tinkling version of its ever changing pitch patterns.

The cut glass ash tray being tinkly in appearance and the tinkling electronic sounds make for a good marriage of visual and audible to provide a decorative atmosphere . . . in this case functional . . . because of the ash tray.

Embodiment No. 2.

A lady's jewel case is placed on a decorative pedestal - or miniature stage - or base and within this support a miniature speaker together with the above mentioned circuitry is included to provide a background score of these ever changing random pitch or sound patterns.

Embodiment No. 3.

Similarly, statuettes, porcelain and china-like figures and other novel-like objects can be made more decorative by placement on a pedestal from which emanates a fitting pattern of pitches and sounds.

Additional Embodiments.

Likewise, then, these miniature speakers random circuitry combinations could be used with cocktail glasses, flower vases, cigarette boxes, candy dishes, name plates on desks, clocks, centerpieces, large murals in public buildings, desk sets, inkwells, calendars and alarm clocks.

The circuitry for all these embodiments to be derived from my Instantaneous Automatic Melody Composition and Performance Machine disclosure.

Invented by: Raymond Scott 7/8/70

Typed by: Matilde Scott July 8, 1970

Witnessed by: Rod and Unclustod Holland Band July 10, 1970

Witnessed by: _____

The idea is that instead of the telephone sounding as it commonly does - when a call comes in - this new device performs a tune of the customer's choice . . . with the sound light, charming and in the style of electronic music. For instance, 'Yankee Doodle' could be performed by the device when somebody calls. If the telephone is not picked up at this point, the tune is repeated, but transposed to a higher key. If, again, the phone is not picked up, the tune repeats again, and in a higher key once more. Once again, if the phone is not answered, the tune repeats higher yet, until the calling party stops calling or the phone is answered. The device will be programmed at the point of manufacture and will be available in a wide choice of tunes.

Theory of Operation:

TUNE IS INITIALLY STARTED

The pickup coil, which is placed in close proximity to the telephone line is used to pick up the field generated by the ringing current. This potential is properly conditioned and used to trigger the one shot delay release block. The output of the 'one shot' block is now used to turn on the bistable block. This same 'one shot' block has a delay circuit built into it, so that it stays on for the duration of the telephone ring, plus the duration of a period slightly longer than the pause between rings, so as not to cause a false shut off between rings. When the bistable block triggers on, the output enables the pulse generator portion of the automatic melody circuitry to start delivering its stream of pulses to the melody bell circuitry. The automatic melody circuitry then performs the tune the circuitry was programmed for, and through its amplifier and speaker sounds this succession of programmed pitches that form the chosen melody. Refer to my disclosure on the "Automatic Melody Performing Device" for details.

PITCH TRANSPOSITION

The "Automatic Melody Performing Device" circuitry, as its block diagram indicates, consists in part of a succession of stages in a shift register. When 'N' stage delivers an output potential, which emanates from point D in the melody bell block, this potential shifts the transpose shift register block one position. The output of the shift register block is a voltage that is used to raise the voltage input to the VCO in the automatic melody block so as to raise the pitch of the tune that is set up in the automatic melody circuitry to a semi-tone higher. Every time, then, that the shift register in the automatic melody block completes a cycle and reaches its stage 'N', the trans-

Written Scott 7/16/70
 Read and Understood Holland Bennett July 19, 1970

Raymond Scott 7/8/70

pose shift register moves again to its next stage and feeds increasingly higher voltage to raise the pitch of the VCO the automatic melody block once again. In this way, each new cycle of the tune's performance emanating from the automatic block is in a higher key than the preceding one.

SHUT OFF CIRCUITRY WHEN TELEPHONE IS PICKED UP

When the phone is picked up, or the caller hangs up, the ringing current ceases. The one shot block, however, because of its delay circuitry will continue to show an output potential until some milliseconds after the next ringing current should have been received. The reason for this is to keep the device from shutting off between rings. Then, after these milliseconds, since there is no additional ring current potential, the one shot output potential ceases. However, the automatic bell circuitry continues to operate and go around its cycle. When 'N' stage goes on, as the block diagram indicates, the potential from 'N' stage geeds the And gate block. The And gate block now shows an output that is fed to the shut off trigger in the bistable block and the bistable output goes to ground - the pulse circuitry stops, and the automatic melody bell circuitry stops sounding its programmed tune. Another output from the bistable block will be available (not shown) to turn power on and off. The And gate thus assures that the tune will always be completed before shut off. This feature, however, will be optional. If the And gate were not used, power for all blocks would shut off when the phone was picked up.

Invented by: Raymond Scott 7/8/70

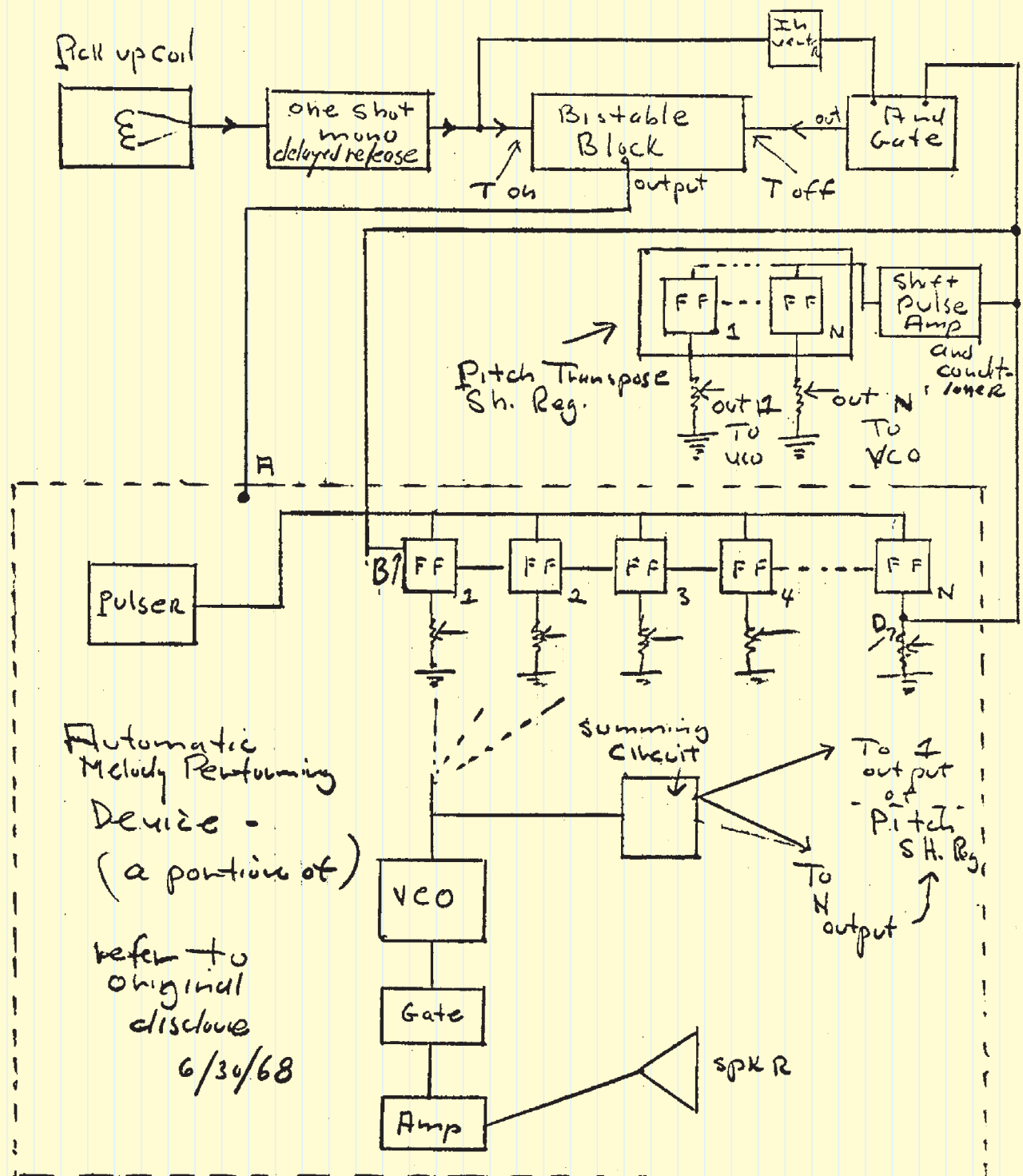
Typed by: Marlene Scott July 8, 1970

Witnessed by: Read and Henderson Richard Bennett July 10, 1970

Witnessed by: _____

Witnessed by: _____

A UNIQUE KIND OF TELEPHONE BELL



Invented by: Raymond Scott 7/8/70

Witnessed by: Read and Underwood Holbert Burnett July 10, 1970

Witnessed by: _____

SEASCAPE WITH ACCOMPANYING SOUND SCORE

The idea here is that a reproduction of a famous painting, for example, a seascape, is incorporated over the picture area of a picture frame-like design - mounted on a pedestal or easel, and in this case the Instantaneous Automatic Composing Performing Machine (this time with new conditioning circuitry) adjusted to synthesize a randomly changing panorama of surf, breaker and wind sounds - these sounds emanating from a slim speaker behind the picture.

Embodiment No. 2.

Similarly, for a picture of a jungle scene, the conditioning circuits would be designed to synthesize a randomly changing mixture of bird calls, insect noises and other wild life sounds.

Embodiment No. 3.

For an abstract psychedelic-like painting, the conditioning circuits would provide the randomly changing panorama of abstract musical and non-musical 'psychedelic sounds.'

Embodiment No. 4.

A picture, for instance, of the moon landing would now have the same circuitry, but the conditioning circuits would provide randomly changing panorama of space-like sounds. The circuitry for producing randomly changing events are derived from my patent application titled "Electronic Audible Signalling Devices" and from my disclosure titled "An Instantaneous Automatic Melody Composing and Performance Machine."

Invented by: Raymond Scott 7/8/70

Typed by: Matilde Scott July 8, 1970

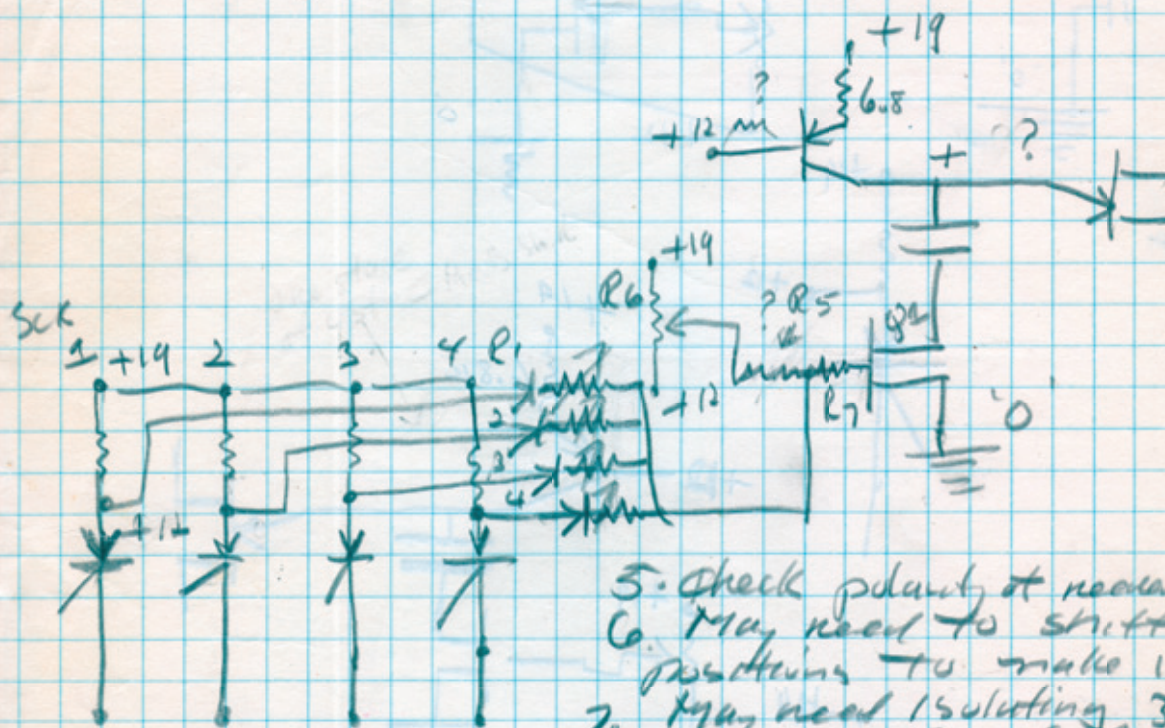
Witnessed by: Read and Understood by Holland Bennett July 10, 1970

Witnessed by: _____

Witnessed by: _____

8/5/70
 (I)

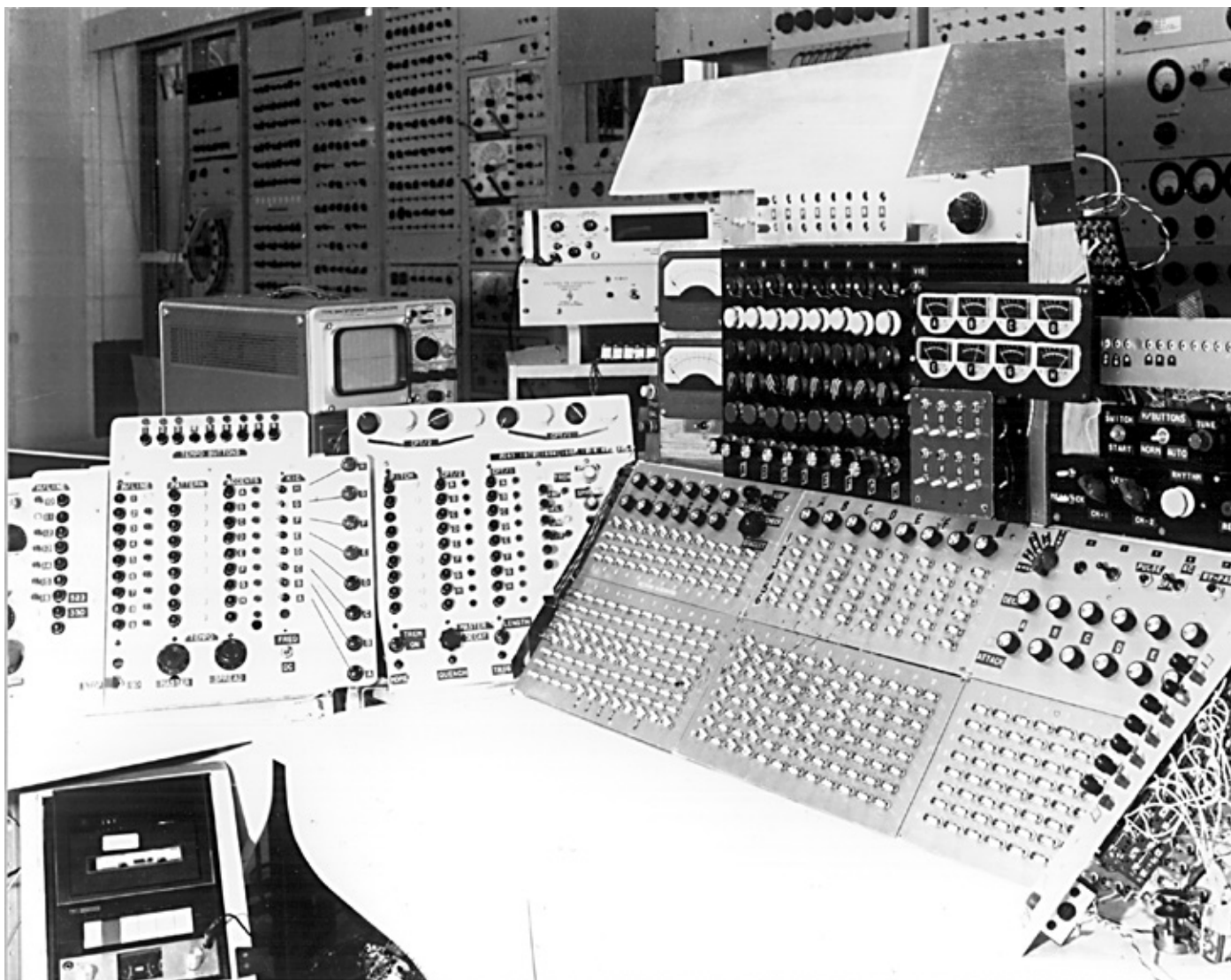
Sketch - Melody Bell Transposition Unit
 Fet as variable Res. in series
 with WIT osc. cpx.
 Melody Bell Transposition Shift Reg.



5. Check polarity of normal FET
6. May need to shift level positions to make work
7. May need isolating 370's to break from SCR 1, 2, 3, 4

theory:

1. R_6 is set so that Q_1 (FET) is at a suitable bias. (may not need R_7)
2. When SCR 1 goes on, and anode is +12 this should short circuit to +12 the potential going to gate of FET - and so increase channel Res. of FET to raise pitch
3. Adj R_1 chooses pitch - like R_2, R_3, R_4
4. May need to check to see if SCR 1, 2, 3, 4 should have +7 to lead ground - to properly ground voltage to FET



The Electronium Mk1 in 1970, before Scott encased it in cabinetry (see 1971 photo).
Lower left: digital data storage cassette recorder for capturing "performance" output.



PHOTO DAVID GASH

A Cockpit of Dreams

by Michèle Wood

[Raymond] Scott said: "I want the Electronium to be a beautiful instrument, to have a special sort of feeling, like a Steinway. Not to look like a Steinway, of course, but to have that sense of elegance and beauty. And I want it to have the feeling of driving, a steering machine, a cockpit of dreams."

xxThe home of the Electronium is Raymond Scott Enterprises, located in a long, one story cement block building in an industrial park in Farmingdale, Long Island.

xxAt the reception desk is Scott's pert, redheaded third wife Mitzi, a former dancer and pianist. In the next room, girls at long tables thread circuitboards with colored wires, humming to Muzak as they work.

xxA second room is a heavy-duty machine

shop. In the third room sits the Electronium.

xxSmall colored lights blink silently. Scott says the machine is thinking. If you can believe that, you can believe Scott's assertion that, together with a human operator, the machine composes music which can then be recorded on tape.

xx"It's like inventing the typewriter," says Scott, "only the typewriter furnishes the plot *and* reads the result in its own voice. You specify the form and structure, but the details are the machine's. If you like what the machine does but want a different key or tempo, you push the appropriate button. For the talented and trained person, the Electronium will give a most comprehensive performance."

xxScott already has an order for a \$100,000 version of the machine from a

buyer who wishes to remain anonymous. ("Which is a shame," says Scott, "I was hoping to get some publicity from it.")

xx Eventually he hopes to market \$1200 versions for private enjoyment or public performance. He feels it will be excellent for TV and film scoring.

xx Meanwhile, he and the Electronium (Scott always gives the machine equal billing) have composed numerous pieces including a "classical" *Iceberg Theme*, *The Wild Piece*—aka *String Piece* ("my super Stravinsky") and *Take Me to Your Violin Teacher*.

xx This last one is about the arrival on earth of beings from another world where violin playing is the supreme art.

xx It shows, if anything, that the Electronium picks up styles adroitly.

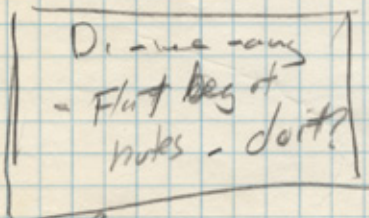
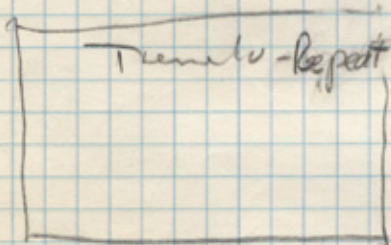
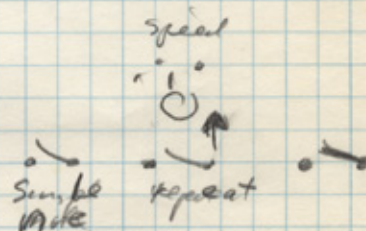
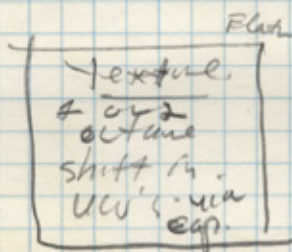
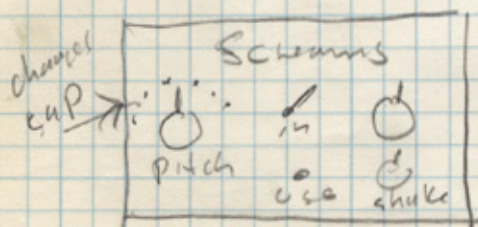
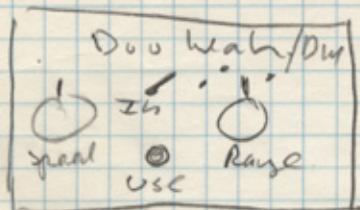
Excerpted from *The Swing Era: Vintage Years of Humor*, Time-Life Records, 1971

9/6/70

(F)

Special Effects List of Ideas

for Clav — and Electronium;

To create melody
against slow moody
big chords.

Idea - Try octave shift
by setting one H line
so all notes are for
instance the first A in the Bass
Clav - then by clatching that
H line from another, set to an
cmg? th average for instance,
- the average would jump up
an octave & the cmg? average
would be got up according to
what was already on the first
H line.

Idea
for do it
- short scream
plus pitch shift up
after start?

September 12, 1970.

Mr. Berry Gordy
Motown Records
6464 Sunset Blvd.
Hollywood, Calif. 90028.

Dear Mr. Gordy,

Your visit with us here in Farmingdale was most memorable.
Enjoyed meeting you and your people - enjoyed demonstrating
the equipment for you - enjoyed your reactions.

Two items -

Contacted Don Foster, the engineer we talked about. He'll get
in touch with you soon.

Preparing a detailed description of the special R. S. Electronium
we'll be building for you - will mail within three days.

Regards to all.

Sincerely,

Raymond Scott

RS:pj

THE RAYMOND SCOTT ELECTRONIUM

CONFIDENTIAL INFORMATION

THE RAYMOND SCOTT ELECTRONIUM

"EXHIBIT A"

THE RAYMOND SCOTT ELECTRONIUM

IN A SPECIAL DESIGN FOR MR. BERRY GORDY

The Electronium is an instantaneous music composition/performance machine intended to be useful in several ways . . . as a stimulant to the imagination . . . as a collaborative composing machine (when guided by a creative person) . . . as an instrument capable of extraordinarily spectacular automatic musical performances. This particular design will feature capabilities beyond the state of the art and will include the following:

1. TWELVE TONE GENERATORS

- a. We will refer to the tone generators figuratively as orchestral instruments. There will be twelve instruments (tone generators). These electronic instruments, however, will have the unusual capability of doubling in every sound. For instance each, a piccolo, each, a tuba each, most anything . . . but not really. For it is more interesting to be 'something like' than to be the real, familiar thing.
- b. Range: Each instrument will have a range of 6 1/3 octaves from the lowest note on the piano to C above the treble cleff.
- c. Vibrato: Each instrument will be capable of generating its' own vibrato. This is an attractive feature because it's like people in an orchestra. The ensemble is more interesting when everybody vibrates or doesn't vibrate in his own way.
- d. Plunger Effects: Each instrument will be capable of its own plunger (boo-wah) effects, reminiscent of the sounds originally pioneered by Duke Ellington's brass instrumentalists. Useful even on sounds which are not brass-like, ordinarily not possible.
- e. Dynamics: Each instrument will be capable, as needed, of soft attacks, hard attacks, crescendos, decrescendos - whatever.
- f. Tone Control: Each instrument will have its own tone controls - to change the sound as required - through a wide spectrum of colors.

9/14/70

2. **'STEERING' CONTROL CENTER** - about 240 buttons and associated 'on'lights - tightly organized to be convenient for the fingers. Different vertical rows of these buttons will perform the following functions:
 - a. **Pattern Generator:** The use of the pattern generator can be likened to the arranger/composer who, on paper, says, 'you play on the first beat and you play on the second, nobody on the third, now, the five of you play on the fourth beat, etc.' On the pattern generator, then, by flipping switches, the different instruments in this 'orchestra' can be directed as required.
 - b. **Time Signatures:** This can be likened to when the arranger/composer decides to write something in 3/4 meter or 2/4 or 4/4 or whatever. The time signature possibilities are 12, or less, of any musical value. Let's say 12/4, 11/4, 10/4, any value needed. Press a button and you can instantly shift from 3/4 to 4/4 to 7/4, etc. This is one of the reasons why, when creating very modern concert music, it's so easy and so fast . . . just press a button.
 - c. **Accents:** With this row of buttons it is possible to accent any of the instruments on any of the beats - or a group of instruments at the same time . . . on any desired beat, with the pattern of these accents repeating as long as the button is not cancelled.
 - d. **Kic Buttons:** Provide a tremendously biting accent completely different from the previous variety. Available on any beat, as before - any instrument.
 - e. **Kic Buttons - Momentary:** To switch in Kics - momentarily - by use of one's fingers - feeling it.
 - f. **Kic Knobs:** These knobs make it possible to control the degree of any particular kic.
 - g. **Accent Knobs:** Make it possible to control the amount of accent - very pronounced, softer, etc.
 - h. **Pitch Transposition:** This row of buttons offers the opportunity to instantaneously transpose material you're working with higher or lower.
 - i. **Counterpoint I - Random:** This row makes it possible to choose any of the twelve instruments to create a contrapuntal line against the remaining instruments.

- j. Counterpoint II - Random: This row makes it possible to have another instrument create a second contrapuntal line against the musical design.
- k. Counterpoint III - Restricted: This row creates a counterpoint of notes restricted to a certain squareness, so as not to be too wild.
- l. Counterpoint IV - Restricted: These buttons make it possible to have a second instrument create and perform a second contrapuntal line - again restricted.
- m. Counterpoint: Up-Down: This toggle switch makes it possible to change the direction that a random counterpoint may be taking, and to do this at will. A flip of the switch and direction changes.
- n. Automatic Random Pitch Transposition: Pressing this button makes possible unexpected transpositions of whatever instruments are performing at the time.
- o. Tempo Buttons: Choose any of ten predetermined tempos. Additional adjustment of tempo knob A provides any in-between tempos that may be required.
- p. Pattern Generator Presets: Choose previously arrived at choice pattern generator settings - that could be very attractive again - and in a new way, with a fresh choice of instruments.
- q. H Line (Manual): These buttons enable the selection, as required of any of twenty different chord harmonies put into the H Line memory.
- r. H Line Juxtaposition System: These buttons are activated when using the machine to compose, i. e. when looking for unusually interesting successions of musical phrases.
- s. Pattern Generator Juxtaposition: Used when composing. The experimental pressing of different buttons in these rows make it possible to frequently find things that are uniquely interesting and inventive.
- t. Pattern Generator Preset: These buttons enable us to quickly find a rhythm variation that could be very attractive and useful at a certain moment in the piece we are working on.
- u. Pattern Generator Reversal: This combination of switch and buttons enable us to reverse the direction of a particular phrase - gives the impression of a phrase being played backwards - frequently useful.

- v. Tremolo: Three buttons enable us to introduce a tremolo. One button is 'momentary', one button is 'on', one button is 'off'. Two knobs vary the width and speed.
- w. Master Decay: Two knobs give control of how long all the instruments playing at a given moment sustain after the notes start - somewhat like the sustain pedal on a piano.
- x. Staccato Control: This button enables changing the nature of the performance from very sustained to staccato. Another knob adjusts the desired degree of staccato. A series of toggle switches enable us to select which of the twelve notes we desire to make staccato - we can make just two of them staccato and leave the rest sustained - or all staccato and one sustained, etc.
- y. Counterpoint Variation - Random (I and II): With these controls the nature of the random counterpoint being created can be varied. This is a group of three controls. There are two of these groups; one for Counterpoint I and the other for Counterpoint II.
- z. Automatic, Programmed Performance: Makes possible the automatic performance of a completed rhythm track, one that goes through twenty, thirty, forty or more changes of harmony . . . runs three or four, five or even ten minutes . . . and yet, with a bit of practice will take no more than ten to fifteen minutes to set up the entire routine - (from the time a choice rhythm idea was decided upon.) In addition, the automatic, programmed performance feature makes possible rhythm variations as required . . . in order to avoid the monotony of a rhythm pattern repeating for too long.

3. ADDITIONAL CONTROL AREAS

- a. Pitch Panel: Where each of the twelve instruments can be set to any desired pitch - when looking to find unusually attractive harmony patterns - melodic phrases - and other musical designs.
- b. H Line Panel: A temporary memory - where a pattern worked out on the pitch panel can be stored for use when needed.
- c. Automatic Performance Panel: This is where the set up is made for automatic performance of the programmed material.
- d. Memory Bank Panel: Contains the controls necessary to interrogate both the permanent and semi-permanent memories in order to retrieve, as needed, the desired 'steering' information.

- e. Master Pattern Control: Provides dramatic over-all control of any existing patterns - and can create flashy flourishes and surprising changes in the rhythm designs.
- f. Variations Panel: Where variations in the placement of accents, kicks, counterpoints, staccatos can be set up as needed.

**ESSENTIAL DIFFERENCES BETWEEN THE STANDARD ELECTRONIUM
AND THIS NEW SPECIAL DESIGN.**

For Mr. Gordy

Standard Electronium

- | | |
|--|---|
| 1. Toggle switches - with lights | 1. Slide switches - without lights |
| 2. Electronic switching via silent buttons - no mechanical noise. | 2. Mechanical button switching - noisy. |
| 3. 12 Tone Generators (instruments). | 3. 8 Instruments |
| 4. Individual vibrato for each of the 12 instruments. | 4. The same single vibrato for all 8 instruments. |
| 5. Plunger effects generator | 5. None |
| 6. Two restricted counterpoint generators. | 6. None |
| 7. An electronic counter for ease in tuning. | 7. None |
| 8. 'Steering' Control Center
240 buttons (approx.) | 8. 90 buttons |
| 9. Computer Type Memory System
1000 x's more powerful than the simple memory. | 9. Simple memory |
| 10. A ten minute automatic performance capability without repetition. | 10. 20 second maximum automatic performance. |
| 11. H Line juxtaposition system | 11. None |
| 12. Pattern generator juxtaposition | 12. None |

TAKE SHEET

1. **Clavivox Demo**
2. **Pink Lemonade - short version**
3. **Pan Am Experiments (second leader)**
4. **Clav. - Stardust Bits**

September 15, 1970.

Mr. Berry Gordy
Motown Records
6464 Sunset Blvd.
Hollywood, Calif. 90028.

Dear Mr. Gordy,

Attached to this letter is a detailed description of the Electronium being planned along the lines that we discussed.

I am most excited about this project. The opportunity to build as elaborate an Electronium as possible is a stimulating and happy one. With your approval, the Electronium will be only as elaborate as it can be useful, exciting, and elegant.

Now that I have ~~ppt~~ put down on paper the capabilities your Electronium will have . . . the price is \$23,500. This does not include a console or listening equipment (speakers, amplifiers, etc.) The plan is to deliver it as a desk model, to be fitted into your studio facility.

The terms of this agreement are \$10,000 in advance . . . \$5,000 when about 3/4 complete . . . the remainder upon delivery. Delivery is promised within 120 days.

A contingency fund of up to \$4,000 is also required - should the costs of some of the new and original circuitry run higher than anticipated. Contingency money, if needed, will be billed for separately.

A letter of acceptance and a check will get us started immediately. If there are any questions or additional thoughts, please call.

With best regards,

Sincerely,

Raymond Scott

RS:pj

October 7, 1970

Motown Record Corporation
of California, Inc.
6464 Sunset Blvd.
Penthouse
Hollywood, California

ATTN: Mr. Berry Gordy, Jr., President

Gentlemen:

This will constitute the agreement between you and us as follows:

1. We hereby agree to sell to you and to manufacture, deliver and install at your premises in Los Angeles, California, custom designed table or desk model of electronic equipment known as the Raymond Scott Electronium, all in accordance with and as detailed in the special plans and capabilities attached hereto, marked "Exhibit A" and incorporated herein, which specially designed electronic equipment shall be hereafter referred to as "the Electronium".
2. You agree to pay as the purchase price for the Electronium the sum of \$23,500.00 payable as follows:
 - a. \$10,000.00 upon execution of this agreement.
 - b. \$5,000.00 when we certify to you that 3/4 of the work necessary to complete manufacture of the Electronium has been finished.
 - c. \$8,500.00 upon delivery and completed installation of the Electronium.

The purchase price does not include a console or listening equipment such as speakers and amplifiers.

3. It is mutually agreed that you shall establish a contingency fund of not more than \$4,000.00 and if any costs of the new and original circuitry exceed the amount currently estimated, then we shall send you full and complete statements showing such increased costs and you agree to pay same from such contingency fund. However, we agree to use our best efforts and endeavors to complete, deliver and install the Electronium for the purchase price stated in paragraph 2 hereinabove without resort to the contingency fund.

4. We hereby agree that the Electronium will be completed, delivered and installed at the place designated by you in Los Angeles, California within 120 days from the date hereof, subject to force majeure and acts beyond our control. Time is the essence of this agreement.

5. In consideration of the amounts payable by you to us hereunder, we hereby represent and warrant to you as follows:

a. The Electronium as finally delivered and installed will operate and perform in good workable order and in a manner similar to the model which has heretofore been shown and demonstrated by us to you, and at a cost not to exceed \$27,500.00.

b. The Electronium will be made of good materials and in a first class workmanlike manner and of the kind and quality of instruments as designated and specified in "Exhibit A".

c. We have the right to enter into this agreement and perform all of our obligations hereunder and that the Electronium, when delivered and installed in accordance with your instructions, shall not be subject to any security interest, lien or other encumbrance and that upon such delivery and installation, the Electronium will be free of claims of any third person by way of patent infringement or otherwise.

d. That at any time within a period of one (1) year from the date of installation of the Electronium, should any failure to comply with the specifications designated in "Exhibit A" appear or if there shall be any defects in material or workmanship in any part or parts of the Electronium, upon notice by you to us, we shall immediately correct any such defects and supply and replace any and all necessary parts at our sole cost and expense.

e. At all times hereafter, we agree to maintain service facilities and personnel at reasonable cost to render prompt, efficient and complete service necessary to insure the normal operation of the Electronium after the expiration of the one (1) year warranty period.

f. We shall indemnify and save you harmless against all loss, costs, damages, judgements, settlements and expenses, including reasonable counsel fees, which may be suffered, made or incurred by you arising out of any breach or alleged breach of any representations, warranties, understandings, or agreements made by us under this agreement.

6. Since the Electronium sold under this agreement is to be specially manufactured by us for you and is not readily available on the open market, and since the Electronium is for use in your company operation, any failure to deliver the Electronium on time may result in damages to you which may be difficult to ascertain with certainty, and in lieu thereof, we agree that if delivery and installation is not completed at the time specified, we shall have a period of thirty (30) days after written notice from you, and if delivery and installation is not then completed, you shall have the right to demand repayment of all monies heretofore paid by you to us.

7. The risk of loss of the Electronium shall pass to you only at the time when it is installed and in working order at your premises in Los Angeles, California.

8. For a period of two (2) weeks (or longer if you shall request) after installation has been completed, we agree to provide, at no additional cost to you, the services of Mr. Raymond Scott, who shall be available to render such instruction for your personnel as you may request regarding the use and operation of the Electronium. In connection therewith, you agree to pay Mr. Scott's living expenses in an amount not to exceed \$50.00 per day during the period he renders such services.

If the foregoing is in accordance with your understanding and agreement, please sign in the space indicated below for your signature.

Sincerely,

RAYMOND SCOTT ENTERPRISES, INC.

By Raymond Scott, Pres.

AGREED AND ACCEPTED:

MOTOWN RECORD CORPORATION
OF CALIFORNIA, INC.

Cam By Berry Gordy, Jr., President



5TH TWELFTH STREET • DETROIT, MICHIGAN 48226 • TRIMLY 14027

No. 473319

(CONSIGNOR)
FROM Allen Klein - Motown Record Corp.
ADDRESS 6464 Sunset Blvd. Penthouse
CITY Hollywood, California 90028

(CONSIGNEE)
TO Mr. Raymond Scott
ADDRESS No 3 Willow Park Center
CITY Farmingdale, New York 11735

BY ☒ **DECLARED VALUE/LIMITATION OF LIABILITY STATEMENT:**
ADDED AND INSURING TO BE NOT MORE THAN THE VALUE STATED IN THE SHIPPING TARIFFS FOR EACH POINT OF ORIGIN. CHARGES ARE ADDED, UNLESS A LOWER VALUE IS DECLARED AND APPLICABLE CHARGES PAID THEREON.

\$ 550.00

DOOR TO DOOR ☒ AIRPORT TO DOOR ☐ DOOR TO AIRPORT ☐

PREPAID ☒ COLLECT ☐

NO. PCS.	DESCRIPTION OF PIECES AND CONTENT	RATE	WEIGHT	WEIGHT - RATE CHARGE	PICK-UP CHARGE	DELIVERY CHARGE	EXCESS VALUE CHARGE	CHARGES ADVANCED	CONSIGNOR'S C.O.D.	C.O.D. FEE	ACCESSORIAL CHARGES	TELEPHONE, TELEGRAPH OR TELETYPE CHARGES	TOTAL CHARGES
1	envelope		1										

SPECIAL INSTRUCTIONS:
 AUTHORIZED BY:
 DIMENSIONS: X X X CU. WT.

IT IS MUTUALLY AGREED THAT THE GOODS HEREIN DESCRIBED ARE ACCEPTED IN APPARENT GOOD ORDER (EXCEPT AS NOTED) FOR TRANSPORTATION AS SPECIFIED HEREIN, SUBJECT TO GOVERNING CLASSIFICATIONS AND TARIFFS IN EFFECT AS OF THE DATE HEREON WHICH ARE FILED IN ACCORDANCE WITH LAW. SAID CLASSIFICATIONS AND TARIFFS, COPIES OF WHICH ARE AVAILABLE FOR INSPECTION BY THE PARTIES HERETO, ARE HEREBY INCORPORATED INTO AND MADE A PART OF THIS CONTRACT.

AIR WAYBILL:
 PREPARED BY: _____ DATE: _____
 RECEIVED IN GOOD ORDER AND CONDITION

DATE 10/7/70 TIME 1700

SIGN HERE
 CONSIGNEE: _____ DATE: _____
 BY: _____ TIME: _____

1970



MOTOWN RECORD CORPORATION OF CALIFORNIA, INC.

October 7, 1970

Mr. Raymond Scott
 Raymond Scott Enterprises
 No 3 Willow Park Center
 Farmingdale, New York 11735

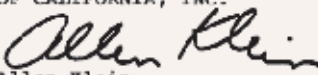
Dear Mr. Scott:

In accordance with our telephone conversation, I enclose herewith four copies of the agreement between Motown Record Corporation of California and your Company providing for the manufacture, delivery and installation of the Electronium in accordance with the special design requested by Mr. Gordy.

If the agreement meets with your approval, please sign all copies and return them to me by air express. Thereafter, they will be executed on behalf of Motown and a fully executed copy of the agreement will be returned to you with the initial payment of \$10,000.00.

Many thanks for your cooperation.

Sincerely,

 MOTOWN RECORD CORPORATION
 OF CALIFORNIA, INC.

 Allen Klein
 Attorney

AK/sak
 enclosures

Cover letter for execution copies of 1970 Motown agreement, with delivery receipt

October 8, 1970.

Mr. Allen Klein
Motown Record Corporation
6464 Sunset Blvd.
Hollywood, Calif. 90028.

Dear Allen,

The contract is fine with me - and, incidentally, beautifully prepared. All four copies are signed and enclosed.

Looking forward to seeing you within four months.

Sincerely,

Raymond Scott

RS:pj



MOTOWN RECORD CORPORATION OF CALIFORNIA, INC.

October 13, 1970

Mr. Raymond Scott
Raymond Scott Enterprises
no 3 Willow Park Center
Farmingdale, New York 11735

Dear Mr. Scott:

In accordance with our telephone conversation, I am enclosing MRCC's check # 164 in the amount of \$10,000.00 dated October 13, 1970 pursuant to the agreement between Motown Record Corporation of California, Inc. and your Corporation.

As soon as Mr. Gordy is available, copies of the agreement will be executed and a fully executed copy will be returned to you.

Best regards.

Sincerely,

MOTOWN RECORD CORPORATION
OF CALIFORNIA, INC.

Allen Klein
ALLEN KLEIN
Attorney

AK/sk
enclosure (1)

November 9, 1970.

Mr. Berry Gordy
Motown Records
6464 Sunset Blvd.
Hollywood, Calif. 90028

Dear Mr. Gordy,

As you requested, I instructed my publicity people to cancel plans for a press release concerning the Gordy Electronium - also to avoid verbally publicizing same. In my daily business and social contacts, when the subject comes up, it's exciting to talk about the fabulous instrument we're building for you. If you wish, however, I will henceforth cool it as regards conversation about your Electronium.

Production of the Gordy Electronium is continuing at an around the clock pace. The project is an extremely ambitious one and, when completed, the instrument will be, and continue to be, for a long time, an exciting experience for all of us.

Sincerely,

Raymond Scott

RS:pj

November 25, 1970.

TO: Mr. Berry Gordy
Motown Record Corporation
6464 Sunset Blvd.
Hollywood, Calif. 90028

ATTENTION: Mr. Allen Klein

RE: The RS Electronium

Additional funds from contingency required for
the completion of the 'steering control center.' \$3,500.00

Note:

The concept of acoustically silent switching for the steering control panel and assembly - with its 264 buttons, 240 lamps, 720 transistors, 480 diodes was unusually difficult to design and produce - and required more than three times the engineering and production time scheduled in our projection.



November 30, 1970.

Mr. Berry Gordy
Motown Record Corporation
6464 Sunset Blvd.
Hollywood, Calif. 90028

Dear Mr. Gordy,

Excitement continues to run high here in anticipation of completion of your Electronium - to use, to listen to, to look at. I am very happy with the way the instrument ~~is~~ shaping up. Back at the lab, we are working long and hard - and we're proud of the workmanship and design going into your Electronium.

With best wishes,

Sincerely,

Raymond Scott

RS:pj

Dear Mr. Klein,

I'm happy that we began our work schedule by tackling, among others, the most complex of the units making up the Electronium - the 'Steering Control Center'. For, as anticipated, this was one of the areas that did require an unusual concentration of time and energy ~~to solve many problems.~~

Attached to this letter is a request for funds from contingency.

Because time is of the essence, and funds, too, your prompt attention to this request would be most appreciated.

The feeling of anticipation and excitement here is as great as ever - for we think we really are on to something - for Motown ~~is going to own an instrument enormously useful and stimulating to~~ *will be the proud owner of* ~~and not existing anywhere else.~~ *His creative people.*

With best wishes,

November 30, 1970.

Mr. Allen Klein
Motown Record Corporation
6464 Sunset Blvd.
Hollywood, Calif. 90028

Dear Mr. Klein,

I'm happy that we began our work schedule by tackling, among others, the most complex of the units making up the Electronium - the 'Steering Control Center.' For, as we had somewhat anticipated, this was one of the areas that did require an unusual concentration of time and energy.

Attached to this letter is a request for funds from contingency.

Because time is of the essence, and funds, too, your prompt attention to this request would be most appreciated.

The feeling of anticipation and excitement here is as great as ever - for we know we really are on to something - and that Motown will be the proud owner of an extraordinary instrument, enormously useful and stimulating to its creative people.

With best wishes,

Raymond Scott

RS:pj

RAYMOND SCOTT

electronic music devices

December 18, 1970.

Mr. Berry Gordy
Motown Record Corporation
6464 Sunset Blvd.
Hollywood, Calif. 90028

Dear Mr. Gordy,

The pleasure of achievement continues here at our laboratory in Farmingdale. Your Electronium is coming along beautifully.

With completion in sight, here are a few matters that require your consideration.

As agreed, the Electronium will be delivered in a desk top version for installation into your studio facilities. When you were here, you saw an artist's rendering of a saucer-shaped console concept for the Electronium. You expressed interest in the design.

Question: Would you care to have us build this saucer-shaped design and then deliver the Electronium completely installed in its own console?

The Electronium will be patched through one of your studio consoles, not only to use its speaker system, but so that echo can be added as required to any or all of its twelve independent tone generators.

Question: Would you be interested in having echo capability built directly into the Electronium - eliminating the need for patching through a studio console? Twelve separate echo units, one for each tone generator, would be an exciting idea - all the echo units physically within the console of the Electronium.

You mentioned that you might build a special studio around the Electronium. Should you decide to do this, an installation of twelve speakers in a twelve channel system, one speaker for each instrument (tone generator) would be wonderfully effective. Incidentally, twelve Altec Lansing Voice of the Theatre speakers, with six dual Mackintosh amplifiers would be completely out of sight.

PIONEER &
DEVELOPED

rhythm
synthesizer
1960

pitch
sequencer
1960

portamento
keyboard
1959

juxtaposition
matrix
1961

serial
doorbell
1965

synthesized
chinese gong
1968

RAYMOND SCOTT ENTERPRISES INC • no 3 willow park center, farmingdale, new york 11735 • telephone 516-293-8888

You mentioned that you might build a special studio around the Electronium. Should you decide to do this, an installation of twelve speakers in a twelve channel system, one speaker for each instrument (tone generator) would be wonderfully effective. Incidentally, twelve Altec Lansing Voice of the Theatre speakers, with six dual Mackintosh amplifiers would be completely out of sight.

Question: Would you like us to design an "Electronium Intimate Theatre Studio" based on your thoughts and including this twelve speaker idea?

With time of the essence, getting back to me quickly would be helpful.

With best wishes,

Sincerely,

Raymond Scott

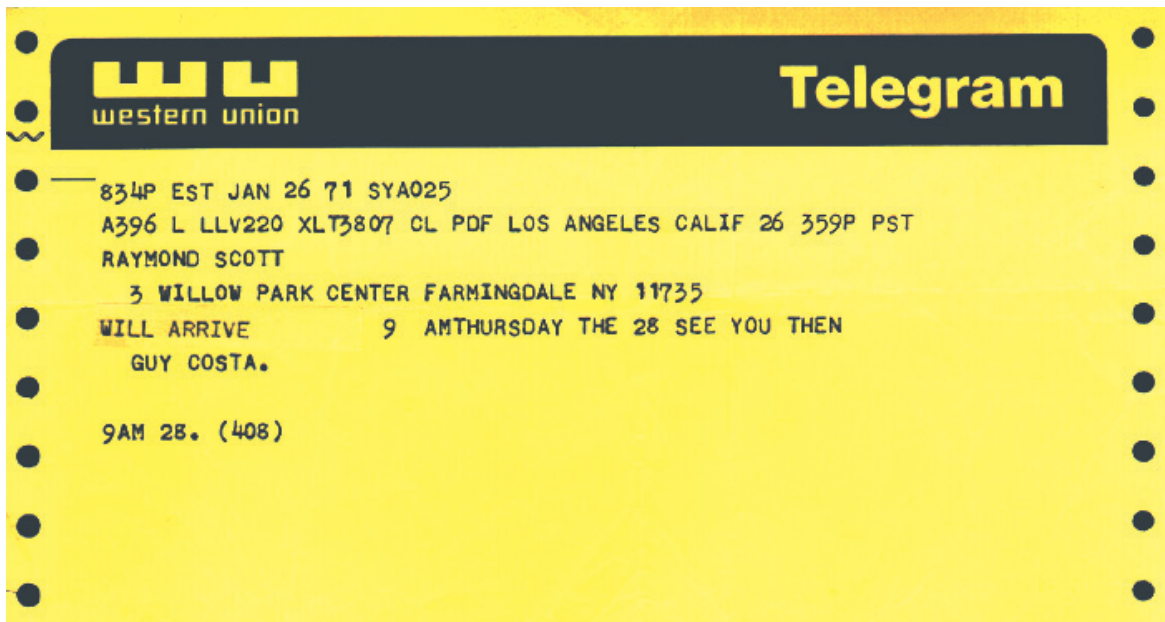
RS:pj

P. S. A sketch of a proposed concept for the Electronium studio is enclosed.



1970

The Motown Electronium, ca. 1970



1971

It would be fair to assume that Guy Costa was traveling from L.A. to Farmingdale in January 1971 (per the telegram) to view the status of Scott's work in developing the Electronium for Costa's Motown boss, Berry Gordy. We know from an eyewitness account that the Electronium's wood cabinetry was built on Long Island (rather than after Scott relocated to L.A. in 1972), so it's a reasonable assumption that the device as pictured here is more or less what Costa saw when he arrived at Scott's Three Willow Park workshop.

EMPLOYMENT AGREEMENT

This agreement is executed as of the _____ day of _____, 1971, between Motown Record Corporation, 6464 Sunset Boulevard, Los Angeles, California 90028 (herein called "Company") on its behalf and on behalf of its subsidiaries, affiliates and divisions, and Raymond Scott, 3 Willow Park Center, Framingdale, New York 11735 (herein called "Employee").

Employee has acquired certain training, skill and experience in a field of activity in which Company is interested, said field of activity being electronic engineering, research and design of electronic equipment and related fields and more particularly the application of the aforesaid fields to the music and recording industry; and

Employee has heretofore developed, manufactured and delivered to Company certain custom designed electronic equipment known as the Raymond Scott Electronium (herein called the "Electronium") which, among other things, has the capacity of generating and producing music when manipulated by an operator.

Company is desirous of obtaining the services of Employee as an employee-for-hire to work in California or at such other places as Company shall designate, and Employee is

willing to render such services in accordance with the terms and conditions hereinafter set forth.

Now, therefore, it is agreed between the parties as follows:

1. Employee is hereby employed by Company to aid and assist Company as hereinafter specified in connection with the operation of the Electronium and such other work in connection therewith that the parties shall decide between them, and Employee agrees to furnish Company with the full benefit of his knowledge, skill and experience as to all questions, problems and other requests made by Company and Employee will respond to such questions, problems and requests and will give Company such advice, opinions and suggestions relative thereto as he is able and to the best of his ability. Employee will do such work, make such investigations and perform such experiments as shall be requested by Company, and as he shall deem necessary in order to aid and assist Company in connection with the design and development of certain electronic equipment as requested by Company (whether or not connected with the Electronium), including design techniques, manufacturing processes, creative ideas (musical or otherwise), concepts, innovations, and adaptations relating thereto.

Specifically, Employee agrees to:

(a) Design and install the "Melody Maker" and "Rhythm Generator" on the Electronium and make such modifications as are required in the contents of the "Base Generator" and "H" lines presently installed in the Electronium;

(b) Conduct instructional and training programs for Company's Director of Studio Facilities with respect to the operation of the Electronium;

(c) Train a "pilot" or operator for the Electronium and conduct an instructional and training program in California for this person with respect to the operation of the Electronium. Company shall have the final right of approval of such "pilot" or operator;

(d) Establish a program after consultation with and approval by Company which will expose to Company's creative personnel the material (musical or otherwise) developed by the Electronium;

(e) Establish a production schedule for and supervise the coupling of either or both Electronium developed music to existing music tracks owned by Company, or the addition of tracks to new music.

2. In connection with his obligations to be performed hereunder, Employee will report to and receive assignments from Mr. Berry Gordy or his designee who shall represent Company hereunder and who is authorized to assign duties to Employee.

3. (a) Company shall make available to Employee such of its facilities as are reasonably required by Employee in the performance of his obligations as described herein.

Employee agrees to devote such of his time as shall be necessary to carry out his assignments as explained herein or as set forth by Company and as shall be consistent with the provisions

of this agreement. Any and all information provided to Employee in connection with this agreement shall be considered to be confidential and Employee agrees to hold such information in the strictest confidence, and further agrees to make no disclosures to any party regarding the nature and extent of his services performed for Company hereunder without Company's prior written permission.

(b) At all times during the course of his employment and thereafter, Employee will hold in the strictest confidence and not disclose to any person, firm or corporation, any information, manufacturing technique, process, formula, development or experimental work, work in process, business trade secret, or any other secret or confidential matter relating to the Electronium, the products created therefrom, or the products, sales or business of Company, or its divisions or subsidiary corporations.

4. The term of employment pursuant to this agreement shall be for an initial period of one (1) year commencing as of December 1, 1971. In addition, Employee hereby grants to Company two (2) separate options to renew and extend the term of employment for an additional period of one (1) year each, on the same terms and conditions as are applicable during the initial period of this Agreement. Said options may be exercised by Company by written notice thereof to Employee not less than thirty (30) days prior to the expiration of the then current period. Employee agrees to give Company at least fifteen (15) days written notice prior to the time that the applicable option notice from Company is due.

5. As consideration for the services to be rendered by Employee as described herein and for the ownership by Company of all musical material generated on or by the Electronium by Employee, Company shall pay Employee compensation at the rate of Twenty Thousand Dollars (\$20,000.00) per year during the term of said employment, which compensation shall be payable in weekly installments in the same manner as is Company's practice in compensating its other employees (and which compensation shall be subject to deductions for state, federal and other applicable taxes). Company shall also pay any out-of-the-ordinary expenses incurred by Employee hereunder, provided Company has given its prior written approval to incurring such expenses.

6. As additional consideration for the employment of Employee, Employee agrees as follows:

↓ (a) He will fully and promptly disclose to Company any and all inventions, discoveries, developments, improvements or trade secrets which he may solely or jointly conceive, develop, or reduce to practice, or cause to be conceived, developed or reduced to practice, during the time which he is engaged by Company and which relate to any electronic equipment designed or developed for Company.

↓ (b) At the time of the termination of this Agreement, he will deliver to Company, and will not keep in his possession or deliver to anyone else, any and all drawings, blueprints, notes, memoranda, specifications, devices, documents, or any other material relating to the Electronium or other matters referred to herein.

(c) (1) All information, creative product, notes and other work product developed and generated by Employee relating to the Electronium, and more especially the production of music thereupon and thereby during the provision of services contemplated by this agreement, and all copies thereof, shall become and remain the sole property of Company, and shall be delivered to Company as and when developed.

(c) (2) In this connection, all musical compositions created and/or produced by Employee during the term hereof on the Electronium as a writer or as a producer (as such terms are generally known and understood in the music recording industry) shall be deemed to have been created by the Employee as an employee-for-hire, and for purposes of copyright Company shall be the "author" thereof and shall be entitled to register such musical compositions in its own name, and shall own all rights of whatsoever kind or nature in such compositions.

7. (a) It is understood and agreed that Employee's services hereunder are non-exclusive to Company and Employee shall have the right to accept employment with other parties, provided, however, that Company shall have first call on Employee's services and any assignments for any other party accepted by Employee shall be subject to the terms of this Agreement and shall not be such as to conflict or interfere with or prevent Employee from fully rendering services to Company hereunder. Employee shall keep Company advised of any such offers or assignments received by him

from other parties and Company shall have the right at all times during the term hereof to secure the exclusive services of Employee by exercising its right of first call on the Employee's services and by the payment to Employee of an amount equal to the amount of any bona-fide offer by any such party.

(b) Company shall have the right of first negotiation and the first option at all times during the term of this Agreement to purchase or otherwise acquire from Employee the ownership of Raymond Scott Enterprises ("RSE"), or the ownership of any patent, invention, discovery or device relating to the Electronium which is owned by Employee. Employee shall immediately inform Company in writing of his receipt of offers from third parties to purchase RSE and/or any patent, invention, discovery or device relating to the Electronium, and Company shall have the sole and exclusive option for a period of forty-five (45) days after its receipt of said notice to purchase the aforementioned property at a price mutually agreeable to Employee and Company. During such forty-five (45) day period, the parties hereto shall negotiate in good faith to establish a reasonable and fair purchase price for the property sought to be purchased by Company. Company shall notify Employee of its election to purchase any of the properties mentioned hereby by notice in writing during such forty-five (45) day period. In the event that Company shall fail to so notify Employee with the forty-five (45) day period, Employee shall

be free to sell any such properties to third parties, except that Employee shall not offer any of such properties for sale to third parties at a price lower than that offered to Company without first offering such price to Company (in which event Company's right of first negotiation and its option to purchase shall be revived on the same terms and according to the same procedures as described in this Paragraph 7).

8. Company shall have the right to assign this Agreement to any parent, subsidiary or affiliate of Company and to any company acquiring all or substantially all of the assets of Company and to the surviving company in the event of a merger or consolidation to which Company is a party.

9. Company shall have the right, but not the obligation, to purchase, at its sole expense, whatever life, accident and health insurance covering Employee as a key employee for the benefit of Company, which Company in its sole discretion, may desire. Employee agrees to cooperate with Company in obtaining this insurance, including the completion and execution of all applications and forms and the undertaking of any physical examinations as may be required.

10. This Agreement is subject to termination as follows:

(a) If during the term of this Agreement either party is in material breach of this Agreement, then the other party may, in addition to any other remedy available at law or in equity, after fifteen (15) days' notice to the party in breach requesting that the same be cured, and if the same

has not been cured, terminate this Agreement. Material breach by Employee shall include the failure, refusal or neglect to perform his services as required by Company hereunder to the full limit of his ability, or if Employee should violate or be charged with the violation of any law which tends to subject Employee or Company to any hatred, ridicule, contempt or scandal.

(b) If Employee shall become unable to perform the duties required of him pursuant to this Agreement, for six (6) consecutive weeks or ten (10) weeks in the aggregate during any year of the term hereof by reason of illness or other physical incapacity, Company shall have the right to terminate Employee's employment at any time after the expiration of said six (6) or ten (10) week period by giving Employee one (1) week's written notice after the expiration of said period.

11. This Agreement shall be governed by and construed under the laws of the State of California applicable to contracts executed and fully to be performed therein. Nothing herein shall be deemed to violate any law contrary to which the parties have no legal right to contract. In the event of any conflict between any provision hereof and any such law, the latter shall prevail, but in such event the applicable provision or provisions hereof shall be deemed modified and curtailed only to the extent necessary to eliminate such conflict, and as so modified and curtailed, this Agreement shall continue in full force and effect.

12. Employee represents and warrants that any product, materials, devices, inventions and discoveries, whether

musical or otherwise, delivered to Company by Employee during the term of this Agreement shall be wholly original with him and shall not violate or infringe any rights (including but not limited to infringement of copyright) whatsoever of any persons, firms, corporations, or other entities. Employee agrees to indemnify and hold Company harmless from any and all damages, suits, claims and losses suffered by Company (including reasonable attorneys fees), by reason of the breach by Employee of any representations and warranties made by him to Company hereunder.

13. This writing constitutes the entire agreement of the parties with respect to the subject matter hereof. There are no representations, warranties, conditions or obligations except as herein specifically provided. Any waiver, amendment, modification or termination hereof must be in writing, signed by both parties. A waiver in one instance shall not be deemed to be a continuing waiver or a waiver in any other instance. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, representatives, successors and assigns. Any notice herein provided for, or which either party may desire to give to the other, shall be in writing and shall be given by sending same by certified or registered mail to the party to be served at the address set forth on page 1 of this Agreement, or to such other address as either of the parties may furnish in writing to the other.

IN WITNESS WHEREOF, the parties hereto have
executed this Agreement as of the day and year first above
written.

MOTOWN RECORD CORPORATION

By _____
(Employer)

Raymond Scott
(Employee)

February 13, 1971.

Mr. Berry Gordy
Motown Recording Studios
8425 Melrose
Los Angeles, Calif. 90069.

Att: Mr. Guy Costa

Dear Mr. Gordy,

Now that we are deep into the experience of building your Electronium, I find that the estimate of the time and funds required was overly optimistic. Unusual emphasis on the elaborate, both in concept and in its details now suggests that the proposal should have called for a six months delivery schedule and a price closer to more than twice the figure quoted.

I find little comfort that, traditionally, it has been impossible to project accurately the cost of the first of anything - i. e. a first elaborate Electronium. Yet, to achieve the planned performance capabilities, careful checkout and continued optimization of the many original and unique circuitries is a must.

Our experience to date indicates the following:

1. That the time schedule for the production of the Gordy type Electronium should have been at least six months.
2. That we've been building an elaborate, highly original, complex electronic machine that will need to be priced at above \$70,000 the next time around.

We find ourselves in a predicament -

The excitement we felt at the opportunity to build an especially elaborate Electronium for you - spontaneously caused us to restrict all other income-producing activities - so absorbing and demanding did this project become. The entire operation here continues to be devoted exclusively to this special project.

May I ask for the following?

Eight additional weeks with completion projected for April 15th.

An additional \$15,000 - \$7,500 now and \$7,500 to be added to the final payment at the time of installation.

Your cooperation and understanding would be so much appreciated.

Back at the lab, your Electronium is starting to ~~say~~ its first few words and the sounds are wonderful and exciting.

With best wishes,

Sincerely,

Raymond Scott

RAYM
ONDS
COTT

electronic music devices

1
9
7
1

copy

PIONEERED &
DEVELOPED

rhythm
synthesizer
1960

pitch
sequencer
1960

portamento
keyboard
1959

juxtaposition
matrix
1961

serial
doorbell
1966

synthesized
chinese gong
1968

July 27, 1971.

Dear Al,

It was a thrill to see the patent issued and looking so great
- appreciate so much your sending me a copy.

The Electronium is completed and will be here, operating,
for five days starting 'this Sunday' - then to Hollywood.

Would like for us to get together before then - so you can
experience the machine - and to talk.

With best regards,

Raymond Scott

RAYMOND SCOTT ENTERPRISES INC • no 3 willow park center, farmingdale, new york 11735 • telephone 516-293-8888

Berry Gordy Electronium Expenses - with weekly totals

10/5/70	Equitable Blue Print	1.47	
	Total	1.47	
10/19/70	Equitable Blue Print	2.71	
10/19/70	Emery Air Freight	11.45	
10/20/70	Frank Products	79.20	
10/20/70	Hamilton - Avnet	37.20	
10/20/70	Schweber Electronics	268.95	
10/21/70	Kelvin Electronics	70.20	
10/21/70	Mura Corporation	108.00	
10/21/70	Aims Photo	44.10	
10/23/70	Adam Metal Supply	69.97	
10/20/70	Equitable Blue Print	11.34	
	Total	704.59	
10/26/70	Mura Corporation	10.80	
10/26/70	Equitable Blue Print	9.20	
10/26/70	Wescom	48.10	
10/27/70	Aresco	22.30	
10/29/70	Arrow Electronics	1200.00	
10/29/70	Jules J. Bressler, Inc.	420.00	
	Total	2414.99	
10/29/70	Equitable Blue Print	14.86	
10/29/70	Lafayette Electronics	18.74	
11/2/70	Federal Machinery	7.05	
11/3/70	Equitable Blue Print	16.81	
11/4/70	Wescom	..44	
11/4/70	Aresco	15.30	
11/5/70	Aresco	29.65	
11/6/70	Schweber Electronics	11.06	
11/6/70	Semiconductor Specialists	19.90	
11/10/70	Adam Metal Supply	21.36	
11/10/70	Vero Electronics	17.00	
11/10/70	Negri's Camera Shop	1.15	
11/10/70	Wolly's Hardware	1.30	
11/11/70	Equitable Blue Print	13.10	
11/12/70	Aresco	11.70	
	Total	2615.54	

11/17/70	Wolly's Hardware	2. 52
11/19/70	Philip A. Hunt Chemical Corp.	41. 75
11/19/70	Adam Metal Supply	20. 03
11/19/70	Aresco	4. 73
11/19/70	Edlie Electronics	161. 68
11/19/70	Monarch Electronics	2. 15
11/19/70	Frank Products	24. 00
	Total	2872. 40
11/20/70	Equitable Blue Print	17. 59
11/20/70	Nassau Chromium Plating	10. 00
11/23/70	Cavac Tool Co.	13. 00
11/25/70	Equitable Blue Print	18. 59
	Total	2931. 58
11/30/70	Monarch Electronics	3. 31
11/30/70	Wolly's Hardware	3. 13
12/3/70	Wolly's Hardware	5. 63
12/4/70	Wolly's Hardware	3. 13
	Total	2946. 78
12/7/70	Aresco	4. 00
12/7/70	Equitable Blue Print	14. 80
12/8/70	Tronic Plating	36. 00
12/11/70	Schweber Electronics	15. 00
	Total	3016. 68
12/14/70	Wescom	32. 73
12/17/70	Frank Products	25. 08
12/17/70	Schweber Electronics	31. 64
12/17/70	Romax	13. 65
12/17/70	Aresco	8. 40
12/18/70	Equitable	20. 88
	Total	3149. 06
12/21/70	Lafayette Radio Electronics	17. 84
12/22/70	Engelhard Industries	66. 25
12/23/70	Edlie Electronics	177. 19
12/23/70	Mura Corp.	34. 35
12/23/70	Powertec	26. 40
12/24/70	Equitable Blue Print	38. 00
	Total	3506. 09
12/28/70	Powertec	52. 55
12/31/70	Wescom	35. 37
	Total	3594. 01

1/4/71	Powertec Electronics	92.40
1/5/71	Lafayette Radio Electronics	71.56
1/6/71	Equitable Blue Print	12.60
1/6/71	Lafayette Radio Electronics	12.85
1/7/71	McCrory's	4.00
1/7/71	Wolly's Hardware	4.16
1/7/71	Negri's Camera Shop	.58
	Total	3792.16
1/15/71	Powertec	92.40
	Total	3884.56
1/20/71	Aresco Corporation	20.40
1/23/71	Lafayette Radio Electronics	5.30
1/25/71	Wescom	14.23
1/26/71	Powertec	92.85
1/26/71	Edlie Electronics	4.95
1/26/71	Arrow Electronics	70.16
1/29/71	Emery Air Freight	20.74
	Total	4113.19
2/1/71	Lafayette Radio Electronics	4.25
	Total	4117.44
2/9/71	Abbott Electronics	2.70
	Total	4120.14
2/26/71	Kahgan Sales	17.90
	Total	4138.04
3/4/71	Zeus Components	42.25
3/4/71	Arrow Electronics	550.25
3/4/71	Conklin Lumber	34.74
	Total	4765.28
3/8/71	TSS Components Corp.	1.67
2/26/71	Schweber Electronics	11.08
3/11/71	Wolly's Hardware	11.91
3/12/71	Wolly's Hardware	6.80
	Total	4796.74
3/19/71	Lafayette Radio Electronics	5.20
3/19/71	J. B. M. Precision	30.00
	Total	4831.94

3/24/71	Schweber Electronics	77.00
3/25/71	Kahgan Sales	105.43
3/25/71	Arrow Electronics	128.76
3/26/71	Nassau Chromium Plating	15.00
3/26/71	Total	5158.13
3/30/71	Sykes Datatronics	1014.54
3/30/71	Mid Island Computer Graphics	2.10
3/30/71	Mallory	13.50
3/31/71	Kahgan Sales	4.15
3/31/71	Lafayette Radio Electronics	17.84
4/1/71	Cabinet Makers of Locust Valley	250.00
4/2/71	Atec Corporation	256.00
4/3/71	Harrison Electronics	2.57
4/3/71	Total	6718.83
4/3/71	Harrison Electronics	8.12
4/7/71	Conklin Lumber	6.18
4/7/71	Norman's Stationery	3.43
4/7/71	Total	6736.56
4/15/71	Mid Island Computer	4.20
4/15/71	Brush 'n' Palette Shop	16.06
4/15/71	Lafayette Radio Electronics	14.67
4/17/71	Romax Tool Company	9.91
4/17/71	Arrow Electronics	8.36
4/17/71	Total	6789.76
4/22/71	H. T. Herbert	8.48
4/22/71	Arrow Electronics	411.19
4/22/71	Total	7209.43
4/27/71	Frank Products	15.60
4/27/71	Total	7225.03
5/3/71	Kahgan Components Corp.	42.29
5/3/71	Zeus Components	78.25
5/3/71	Conklin Lumber	3.05
5/3/71	Schweber Electronics	37.54
5/6/71	Equitable Blue Print	16.38
5/6/71	Total	7402.54
5/28/71	Schweber Electronics	13.54
5/29/71	Schweber Electronics	14.04
5/29/71	Total	8552.51

5/8/71	H. T. Herbert	20.75	
5/10/71	Industrial Utilities	6.52	
5/10/71	Powertec	109.22	
5/11/71	Lafayette Radio Electronics	12.50	
5/11/71	Frank Products	15.60	
5/12/71	Conklin Lumber	27.22	
5/12/71	Nassau Chromium Plating	12.00	
5/14/71	Kahgan Components	101.49	
5/14/71	Schweber Electronics	15.75	
5/14/71	Thunderbolt Consultants	150.00	
5/22/71	Cabinet Makers of Locust Valley	122.50	Total
5/23/71	Arrow Electronics	134.75	
5/19/71	Lafayette Radio Electronics	15.00	
5/20/71	Lafayette Radio Electronics	7.18	
5/20/71	Wolly's Hardware	3.83	
5/22/71	Arrow Electronics	7863.85	Total
5/27/71	Wolly's Hardware	11.14	
5/22/71	Harrison Radio	8.12	
5/24/71	Mid-Island Computer Graphics	2.10	
5/24/71	Kahgan Components	11.00	
	Total	7885.07	
6/3/71	Wescom	20.53	
	Total	7905.60	
6/8/71	Equitable Blue Print	4.61	
6/10/71	Wolly's Hardware	7914.74	Total
6/10/71	Harrison Radio	3.50	
	Total	7918.45	
6/15/71	Edlie Electronics	8.64	
6/15/71	Cabinet Makers of Locust Valley	725.00	
6/15/71	Arrow Electronics	834.53	
6/16/71	Cramer Electronics	10.00	
6/17/71	T.H. Supply	18.80	
6/18/71	Equitable Blue Print	1.91	
	Total	9517.33	
6/23/71	Beseme Products	5.60	
		9522.93	
6/28/71	Schweber Electronics	15.54	
6/29/71	Schweber Electronics	14.04	
		9552.51	

7/6/71	H. T. Herbert	10.75
7/7/71	Brush 'n' Palette Shop	2.65
		<u>9565.91</u>
7/19/71	Tektronix	36.15
7/20/71	Buy Rite Hardware	6.17
7/21/71	Powertec	47.57
7/21/71	Buy Rite Hardware	2.49
7/22/71	Liberty Electric	7.72
7/22/71	Sykes Datatronics	71.62
7/22/71	Cabinet Makers of Locust Valley	122.00
7/23/71	Arrow Electronics	184.76
		<u>10,044.39</u>
7/26/71	Edlie Electronics	7.20
7/26/71	Arrow Electronics	2.80
7/27/71	Wolly's Hardware	11.14
7/29/71	Cramer Electronics	11.50
7/29/71	Arrow Electronics	3.99
		<u>10,081.02</u>
12/4/70		<u>480.00</u>
		3631.50
12/11/70		<u>422.25</u>
		4254.75
12/18/70		<u>557.00</u>
		4811.75
12/25/70		<u>363.00</u>
		5174.75
12/31/70		<u>417.60</u>
		5592.35
1/8/71		<u>507.50</u>
		6100.85
1/15/71		<u>347.97</u>
		6448.82
1/22/71		<u>446.75</u>
		6895.57
1/29/71		<u>854.00</u>
		7749.57

LABOR EXPENSES

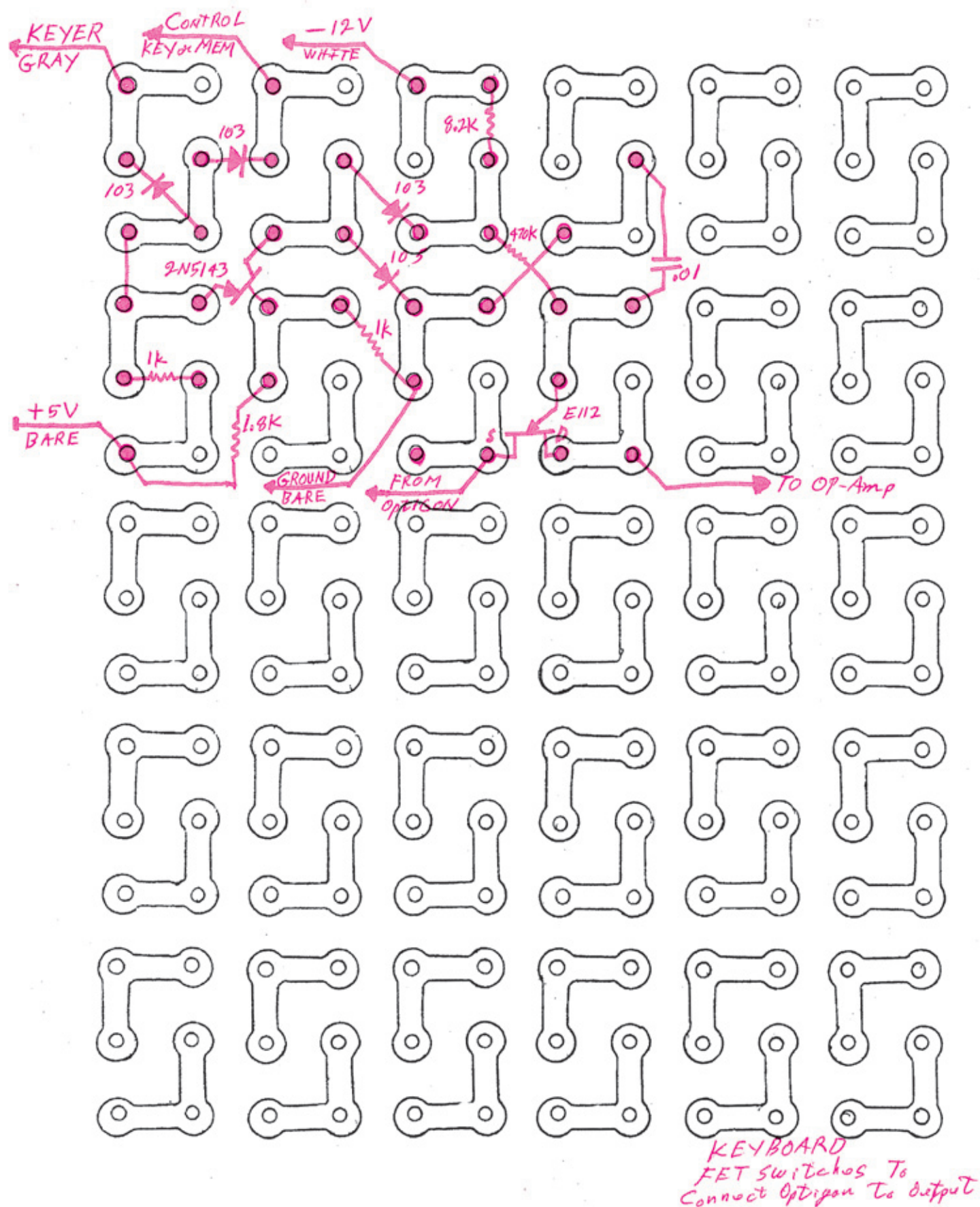
10/24/70	490.00
10/30/70	455.00
Total	945.00
11/7/70	717.00
Total	1662.00
11/13/70	725.00
Total	2387.00
11/20/70	706.50
Total	3093.50
11/27/70	288.00
Total	3381.50
12/4/70	450.00
Total	3831.50
12/11/70	423.25
Total	4254.75
12/18/70	557.00
Total	4811.75
12/25/70	568.00
Total	5379.75
12/31/70	417.50
Total	5797.25
1/9/71	507.50
Total	6304.75
1/15/71	347.67
Total	6652.42
1/22/71	445.75
Total	7098.17
1/29/71	850.00
Total	7948.17

2/5/71		570.00
	Total	8518.17
2/12/71		325.00
	Total	8843.17
2/19/71		270.00
	Total	9113.17
2/26/71		300.00
	Total	9413.17
3/5/71		160.00
	Total	9573.17
3/12/71		291.50
	Total	9864.67
3/20/71		629.00
	Total	10493.67
3/27/71		541.00
	Total	11034.67
4/3/71		835.00
	Total	11869.67
4/10/71		580.75
		12,450.42
4/17/71		568.38
		13,018.80
4/24/71		504.38
		13,523.18
4/30/71		552.50
		14,065.78
5/7/71		573.06
		14,648.74
5/14/71		470.43
		15,119.17
5/21/71		371.18
		15,490.35

5/28/71		416. 06
	Total	<u>15,906. 41</u>
6/4/71		447. 50
	Total	<u>16,353. 91</u>
6/11/71		470. 63
	Total	<u>16,824. 54</u>
6/18/71		1,023. 43
	Total	<u>17,847. 97</u>
6/25/71		533. 43
		<u>18,381. 40</u>
7/2/71		669. 06
		<u>19,050. 46</u>
7/9/71		235. 50
		<u>19,285. 56</u>
7/16/71		356. 18
		<u>19,642. 14</u>
7/23/71		782. 42
		<u>20,424. 56</u>
7/30/71		277. 87
		<u>20,702. 43</u>

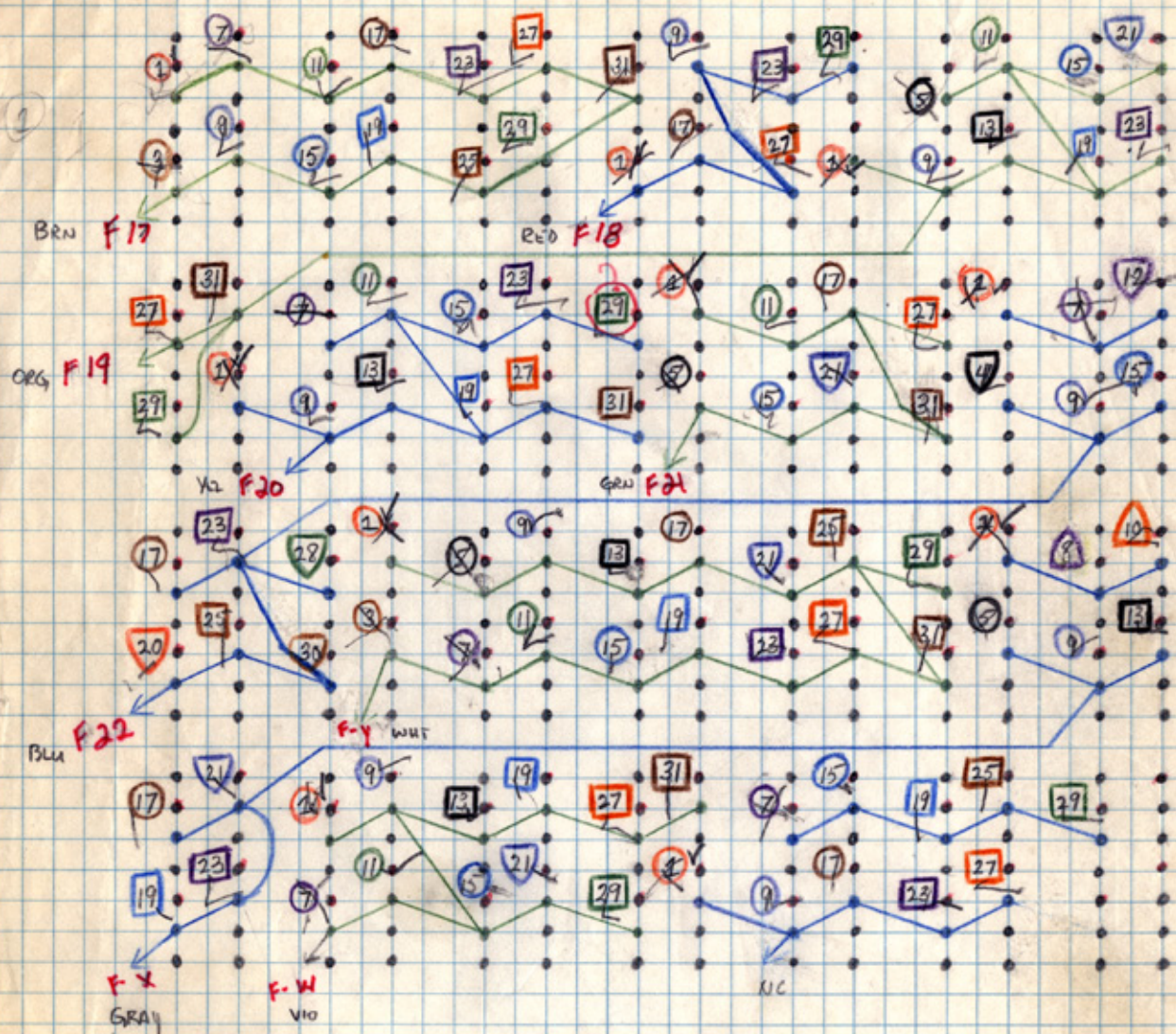
Total	7/30/71
Supplies	10,081. 02
Labor	<u>20,702. 43</u>
	30,783. 45

List of expenses incurred in building the Electronium (9/9)



Keyboard Field-Effect Transistors switches to connect Optigan to output, circa 1971.
The Optigan was an electronic keyboard instrument designed for the consumer market.

Pattern Extracting Matrix Card - 3/10/71



All outputs are connected to OR, and go to a 3K resistor.
 - This is the combined OC output (Serial pulse pattern).

Each enabling gate string group, green and blue, goes
 To a finger-to-be-tuned analog ST CLK (TTL) computer.

All similar numbered red dots are wired together.

Each number goes to the same number in the
 group of pulse outputs coming from the 32 bit
 portion of the 48 bit Tempo clock Sh. Reg.

SUGGESTED CHANGES AND ADDITIONS

based on thoughts verbalized by
Mr. Gordy, Guy Costa and R. Scott

1. Add a Melody Generator - to follow Rah Rah Routines.
2. Change structures of Preset Chords - to those needed for Rah Rah Routines.
3. Add an Afterbeat Generator - to provide instant afterbeats, and simultaneously, other contemporary drum rhythms.
4. Provide a Random Rah Rah Harmony Replacement Gen. - to sync with Melody Gen.
5. Find and train a suitable 'pilot' for the Electronium - to act as Mr. Gordy's interface with the instrument.
6. Organize an Intensive Creativity Program - based on the use of the Electronium.

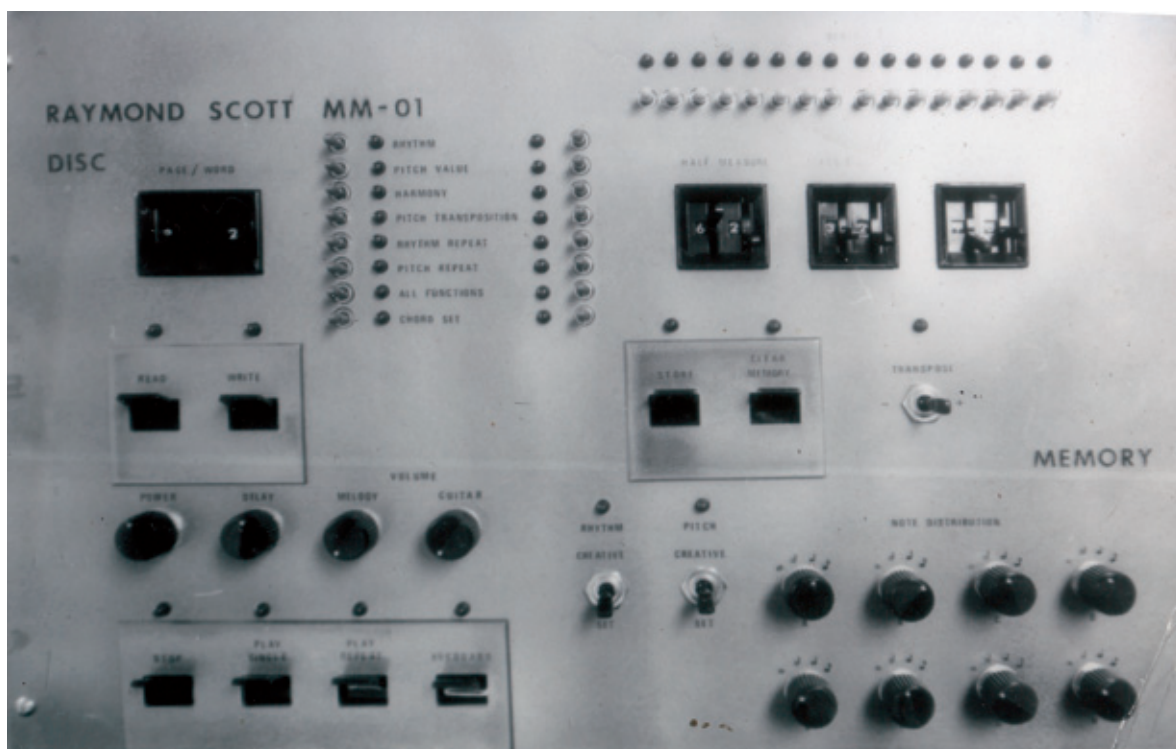
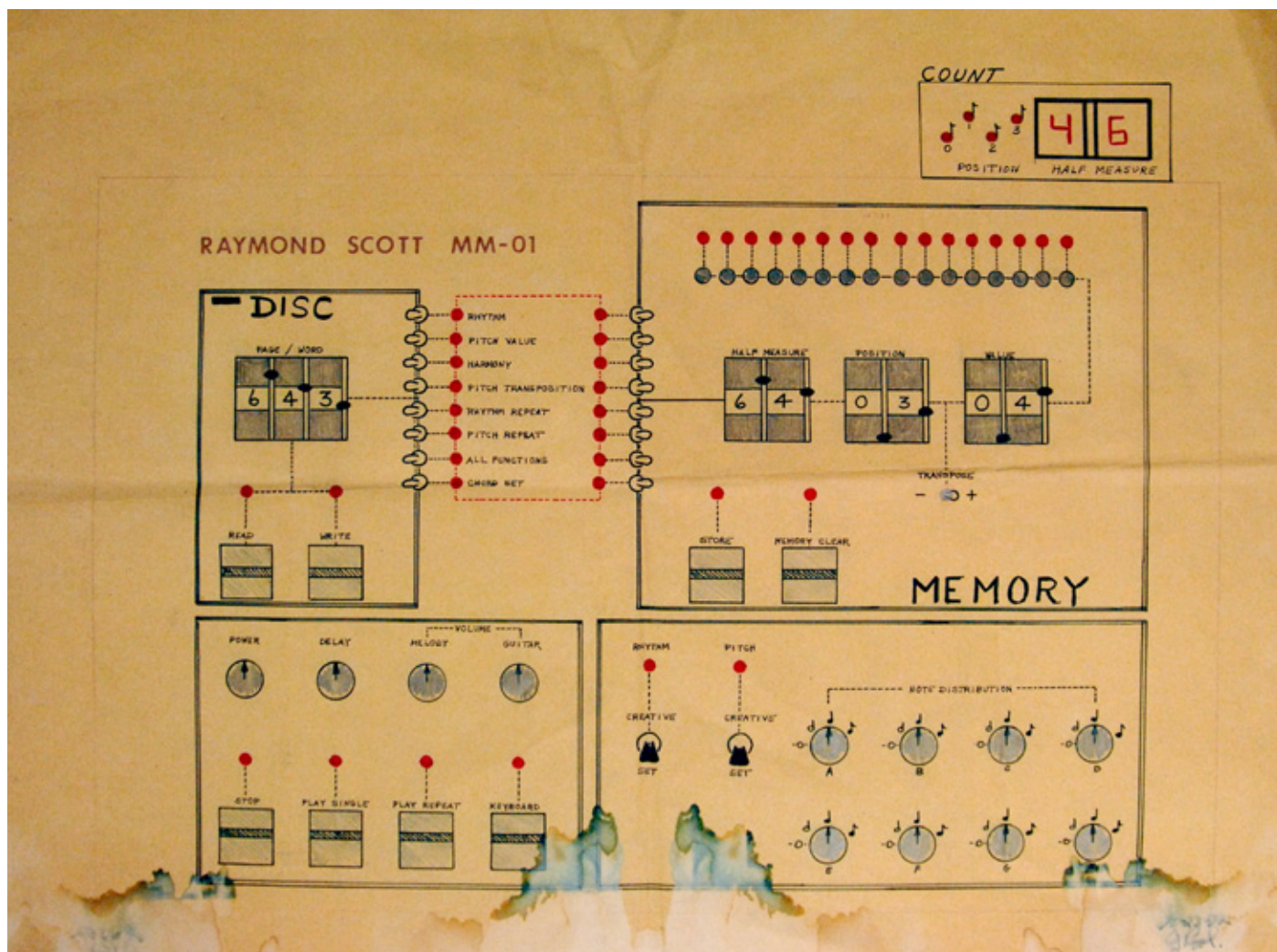
For Instance:

- a. Two hours daily - of automatically created and taped Melody Gen. • Rah Rah Tunes - will be scanned for moments of exceptional interest - then edited out for examination by Mr. Gordy.
- b. The creation, daily, of one (or more) unusually attractive rhythm tracks. - The best of these from time to time will be experimentally combined with live performers - to check attractiveness. (Rah Rah Routines will be the bases of these tracks).
- c. Another experiment would be writing these Electronium ideas into a conventional contemporary group - to check a predicted usefulness.
- d. A continuing search for original and attractive ornaments, flourishes, and other sounds - to provide nuance and mood to conventionally produced records. Here, also, experiments to check usefulness will be made by overdubbing these ornaments, etc., into existing record product.

Estimate

Additions to the Gordy Electronium

1.	Half size console, contour fitting, traditional walnut - screened ventilation areas.	2500.00
2.	Keyboard, three octaves, digital design, with sample and hold and interface circuitry.	1250.00
3.	Four additional sets of LED indicators 1. Duplication of pattern generator, red LED's on left side of console. 2. A set of green LED's adjacent to red pattern generator indicators - to show duration of keying pulses. 3. Duplication of green LED's on left side of console. 4. A set of twelve LED's to indicate individual tone generator volume levels - with separate thresh- hold controls. The above four sets of additional indicators - buffers, amplifiers, installation - plugs, receptacles, harnes- sing - and design.	950.00
4.	Pan facility - as discussed - with provision for echo send and return.	450.00
Total		5150.00



Design drawing and photo of the Raymond Scott Melody Maker MM-01, circa 1972

MELODY MAKER

Memory Loading Manually

Addressing

1. Togs:

All memory address inputs will have 'or' gate inputs.

One set will go as circuited, the other will join a common address bus.

The common address bus will go to the outputs of 4 'or' gates.

One set of inputs to these 'or' gates will be togs. These togs are now the manual means for addressing all the memories on the 'address bus.'

The other set will go to the outputs of Counter 12.

2. Two Push Buttons:

Two buttons will be used to enable Counter 12 to a desired output - for addressing the 'address bus.'

One button will sequence Counter 12 rapidly to the area of a desired address - the second button will increment Counter 12 to the exact address.

A digital readout will be provided to indicate the address Counter 12 is at.

Push buttons with digital readout may make it easier than togs, to program or make selective changes.

Writing

1. All memory write inputs are bussed in . Except RPIM.

Enable buttons will determine which chip at a time will be written into.
(One at a time only.)

Decoders and gates will be used for enabling as needed - to (finally) assist in Auto Loading from tape of selected programs.

APPROACHES

1. Random choice of notes in the chromatic scale - with random choice of note values.
2. Ditto, with modal scales.
3. Melody notes derived from the sequence of chords in a standard 32 measure harmony sequence - derived from classic pop songs - random choice of notes within and friendly to these chords.
4. Weighted frequency of occurrence of certain chord notes. This weighting scheme can also be used to provide a choice of tessitura.
5. Weighted frequency of occurrence of note values - eighth, quarter, half, whole notes.
6. Weighted frequency of occurrence of rest values - eighth, quarter, half, whole notes.
7. Standard harmony routine synced with rhythm of a standard melody
i.e. Embraceable You with Embraceable You rhythm of melody.

Additional Juxtapositions

1. Standard tune harmony plus rhythm of different tune

"	"	"	"	mix of rhythms from both tunes
"	"	"	"	random slight variation of same
"	"	"	"	or other standard rhythm

Most pop melodies are based on the modified repetition of an opening phrase - both pitch and rhythm.

1. a melody generator that would repeat a randomly created opening phrase would be desirable.
 2. a sequential pitch transposition would also be useful.
 3. another desirable ingredient would be that at measures like 7 and 8, a tonic-like note would hold. Many pop songs have this characteristic.
 4. note that not only is the pitch pattern to be repeated, but the rhythm pattern as well.
- its, increments the 10 X 8
Rhythm Control Memory.

Theory - Block III

1. Divide by 2 IC, creates 2 pulses a musical measure.
2. This output increments Counter 1, twice a measure.
3. Counter 1 binary outputs, sequentially address the 64 X 4 RAM timing memory, therefore provides four outputs to be used for control signals - not for addressing, but for incrementing and switching, from any of 64 timing nodes as needed, D output for incrementing Counter 2, C for incrementing the Harmony Control Counter in Block IV, B for write/read enable in the Rhythm Pattern Memory, A, misc.
4. Counter 2, via its binary outputs, increments the 16 X 8 Rhythm Control Memory. cleared before use, each of the 16 rows from 00000000 to 11111111.
5. Rhythm Control Memory is used to tell Rhythm Pattern Memory where to jump back and read something again - then where to skip forward to read or write at another address, etc. It does this by preloading (or loading?) the wanted address. The beat (pulse) these actions take place is determined by the programming of the Timing Memory. The Timing Memory says 'when' to do something, the Rhythm Control Memory says 'what' and 'where' to do something. needs to be made to sequentially enable the succeeding memory unit when passing from one unit to the 2nd, to the 3rd, to the 4th.

6. Output B of the Timing Memory is a combination of 'when' and 'what'. When a '0' it will always enable read, when a '1' it will enable write, at the address it happens to be at. Address = pulse (measure count) position.
7. Counter 3, which sequentially addresses the Rhythm Pattern Memory Reg. is incremented by the Tempo CK, continuously, but via the Rhythm Control Memory, it is reset now and then to different addresses. The outputs of Counter 3, follow these data load instructions, and 'instantly' resumes sequential addressing - the period length of reset determined by the 'when' and 'what' memories.
8. The Rhythm Pattern Memory is being continuously sequentially addressed by Counter 3. Because the Rhythm Pattern Memory and Counter are cleared before use, each Rhythm Pattern Memory address is left with a '0', unless at particular addresses the write input was enabled. Write is enabled when a CK pulse coincides with a Random Generator output pulse.
9. Timing Memory is 4 - Tri State 16 X 4 in cascade. The 4 address inputs are bussed together. The 4 write inputs are bussed together. The read outputs are bussed together. Provision needs to be made to sequentially enable the succeeding memory unit when passing from one unit to the 2nd, to the 3rd, to the 4th.

Perhaps a 7 bit Counter could do it. When the 5th bit comes on, it enables unit 2, the 6 bit unit - unit 3, then 5 anded with 6, for unit 4.

THEORY

1. Continuous eighth note pulses are used to increment an addressing counter.
2. As the counter goes from 0 to 255 it is sequentially addressing the 256 addresses in the 256 x I rhythm pattern memory register.
3. Before each use the memory will be cleared.
4. When a cycle of addressing is started, the circuitry will be so arranged that when there is 'no' pulse from the Random Rhythm Pulse Generator, that particular address will remain when 'read' a '0'. But, when a pulse appears it will enable the write line of the memory unit and each address, at the time of coincidence with a pulse will write a 'I' into that particular address.
5. To restate: When a pulse (random) is present, it will write a I in coincidence with whatever address is present and the data of the address, at that moment, will be left with a 'I'.
6. At the end of the preset program selected number of pulses (measures), the performance part of the circuitry will now be triggered by the random rhythm pattern, just recorded in the 256 x I memory.

RHYTHM PATTERN MEMORY 1Theory

1. Continuous eighth note pulses are used to increment an addressing counter.
2. As the counter goes from 0 to 255 it is sequentially addressing the 256 addresses in the 256xI rhythm pattern memory register.
3. Before each use the memory will be cleared.
4. When a cycle of addressing is started, the circuitry will be so arranged that when there is 'no' pulse from the Random Rhythm Pulse Generator, that particular address will remain when 'read' a '0'. But, when a pulse appears it will enable the write line of the memory unit and each address, at the time of coincidence with a pulse will write a 'I' into that particular address.
5. To restate: When a pulse (random) is present, it will write a I in coincidence with whatever address is present and the data of the address, at that moment, will be left with a 'I'.
6. At the end of the preset program selected number of pulses (measures), the performance part of the circuitry will now be triggered by the random rhythm pattern, just recorded in the 256 x I memory.

RHYTHM PATTERN MEMORY 2

7. This will be accomplished by the programmed jumpback (resetting) of the 256 x I memory to the start address of the section just recorded. Now, the read outputs of the 256 x I register are used as Rhythm Pattern pulses to trigger a repetition of the rhythm pattern just recorded.

At the end of the block diagram will indicate that only one gate enable input at a time can see a '1' coming from the 8 input card gates outputs M6, 7, 8, and 9.

An 8 input NAND gate has an output only as follows:

Argument

M10 is a 3, to 1 of 8 decoder.

It is sequentially addressed by Counter 2 (M11).

At random times, Counter 2 (M11) receives a random burst of high frequency signal - this signal - originates at M3 and is gated on only when there is an output from M4 (AO1 gates).

An output from M4, steady state, orders a short pulse out of the one shot or enable gate M3 - 1 so that a high frequency burst is sent on to increment Counter 2, whose outputs sequentially come through all eight addresses of the $\frac{1}{2}$ 154 decoder - and so in turn sequentially enabling each decoder output.

RANDOM RHYTHM GEN - MAKES POSSIBLE A RANDOM APPEAR-
ANCE OF ♩ , ♩ , ♩ , ♩ NOTES. FREQUENCY OF APPEARANCE
OF EACH NOTE VALUE CONTROLLABLE BY WEIGHTING CIRCUITRY.

Available at Counter 1 (M1) outputs A, B, C and D are the following note values: A - ♩ , B - ♩ , C - ♩ , D - ♩ .

These 4 outputs go to one each of the four wide AOI gates (M4). Examination of the block diagram will indicate that only one gate enable input at a time can see a '1' coming from the 8 input nand gates outputs M6, 7, 8, and 9.

An 8 input nand gate has an output only as follows:

Argument

M10 is a 3, to 1 of 8 decoder. *Octal decoder*
It is sequentially addressed by Counter 2 (M11).

At random times, Counter ¹⁵ 2 (M11) receives a random vurst of high frequency signal - this signal - originates at M3 and is gated on only when there is an output from M4 (AOI gates).

An output from M4, steady state, orders a short pulse out of the one shot to enable gate M3 - 1 so that a high frequency burst is sent on to increment Counter ¹⁵ 2, whose outputs sequentially sweep through all eight addresses of the $\frac{1}{2}$ 154 decoder - and so in turn sequentially enabling each decoder output.

Wave form of Tempo clock vs. output of Counter 15. and Counter 14.

RANDOM RHYTHM GEN - MAKES POSSIBLE A RANDOM APPEAR-
ANCE OF ♩, ♪, ♫, |o|, NOTES. FREQUENCY OF APPEARANCE
OF EACH NOTE VALUE CONTROLLABLE BY WEIGHTING CIRCUITRY.

Because the high frequency burst is a squared version of random noise pulses, originating as a noise source in M2, (noise diode and op amp) then squared by the one shot M3 - the output pulse will always be of indeterminate frequency.

With this sequence of events, each trigger burst forces Counter 2 to a new random frequency, therefore a new random output in the 154 decoder will be enabled.

May need a start button to get a first output from the A01 gates.

Frequency of appearance of certain note values depends on where rotary switches SW 1-8 are set. For instance, if all eight switches were set on #1 position, only whole notes would emanate. All on #4, all ♩ notes.

The weighting then, is determined by how many switches call for the same note.

May need to use CK phase choices to prevent race-like conditions.

THEORY OF REPETITION OF RANDOM PITCHES

1. Each 4 bit word in the theme is sequentially recorded in the random pitch memory unit - with each address triggered by the succeeding pulse in the random rhythm pulse train.
2. After each new address in the pitch memory register is established, a 'microsec' later, the write line is enabled - so as to write (into that address) the data word of that moment - for that address.
3. At the end of the programmed number of pulses worth of measure time - the repetition of the just recorded random pulse train, is now used to enable, for performance, the sequence of 4-bit data words (pitches) just recorded.
4. At the end of the 'repeat performance' using the recorded rhythm pulses and pitches words from their respective memories, the operation resumes in accordance with the preset program in the different memory registers - especially the rhythm control memory register.

c. This counter control saves using a 2nd & 3rd Rhythm Control Memory Register (Instruction register).

d. If it turns out that 128 X 1 is enough for Rhythm Instruction Memory, then the 8th bit in the 16 X 1 Rhythm Control Memory could be used for read/write enable.

e. Otherwise, will need extra memory bits 16 X 9 bits (bottomed 8 bits)

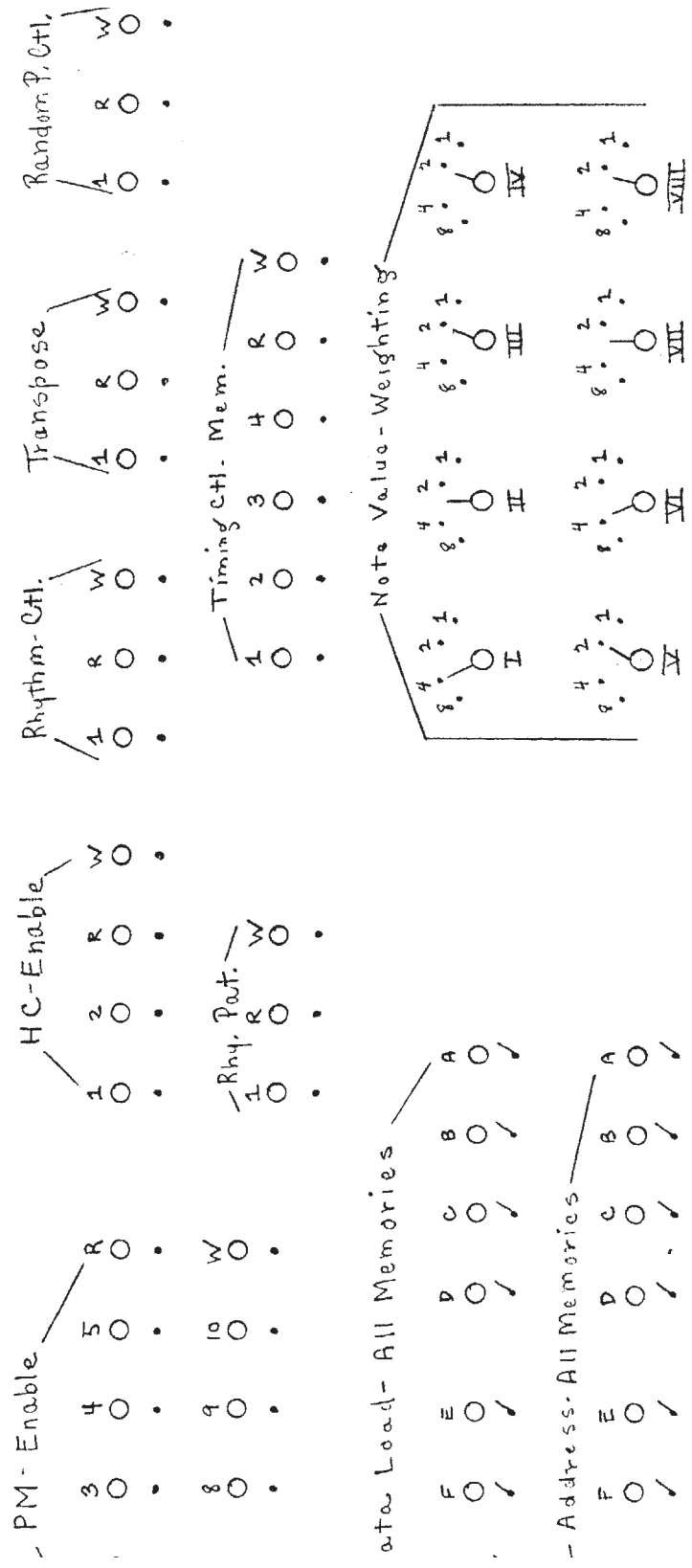
RELATIONSHIP BETWEEN RHYTHM CONTROL MEMORY
AND RHYTHM PATTERN MEMORY

Theory

1. Each Tempo CK pulse (♩ note) increments a 256 X 1 RAM (Rhythm Pattern Memory) and when the Tempo CK is coincident with an output pulse from the Random Rhythm Gen, a 1 is recorded at the address of coincidence.
2. The Rhythm Pattern Memory is used to record in its memory the patterns of melody rhythm being created - but, in accordance with instructions from Rhythm Control Memory, will 'play' a previously recorded section as planned - and then resume recording as instructed.
3. a. Random Pattern Memory is always being incremented with each ♩ note.
- b. At certain measure counts Rhythm Control Memory will reset RPM by clearing its counter, or preloading its counter to a skip or jump back.
- c. This counter control saves using a 256 X 8 Rhythm Control Memory Register (instruction register).
- d. If it turns out that 128 X 1 is enough for Rhythm Pattern Memory, then the 8th bit in the 16 X 8 Control Memory could be used for read/write enable.
- e. Otherwise, will need extra memory bit 16 X 9 RAM (outboard? unit?)

MELODY GENERATOR-FINAL VERSION

PANEL LAYOUT



PM → Pitch Memory
 HC → Harmony Control
 RC → Rhythm Control
 TR → Transpose
 RPiC → Random Pitch Control
 RPC → Rhythm Pattern Control
 TCM → Timing Control Memory

M1

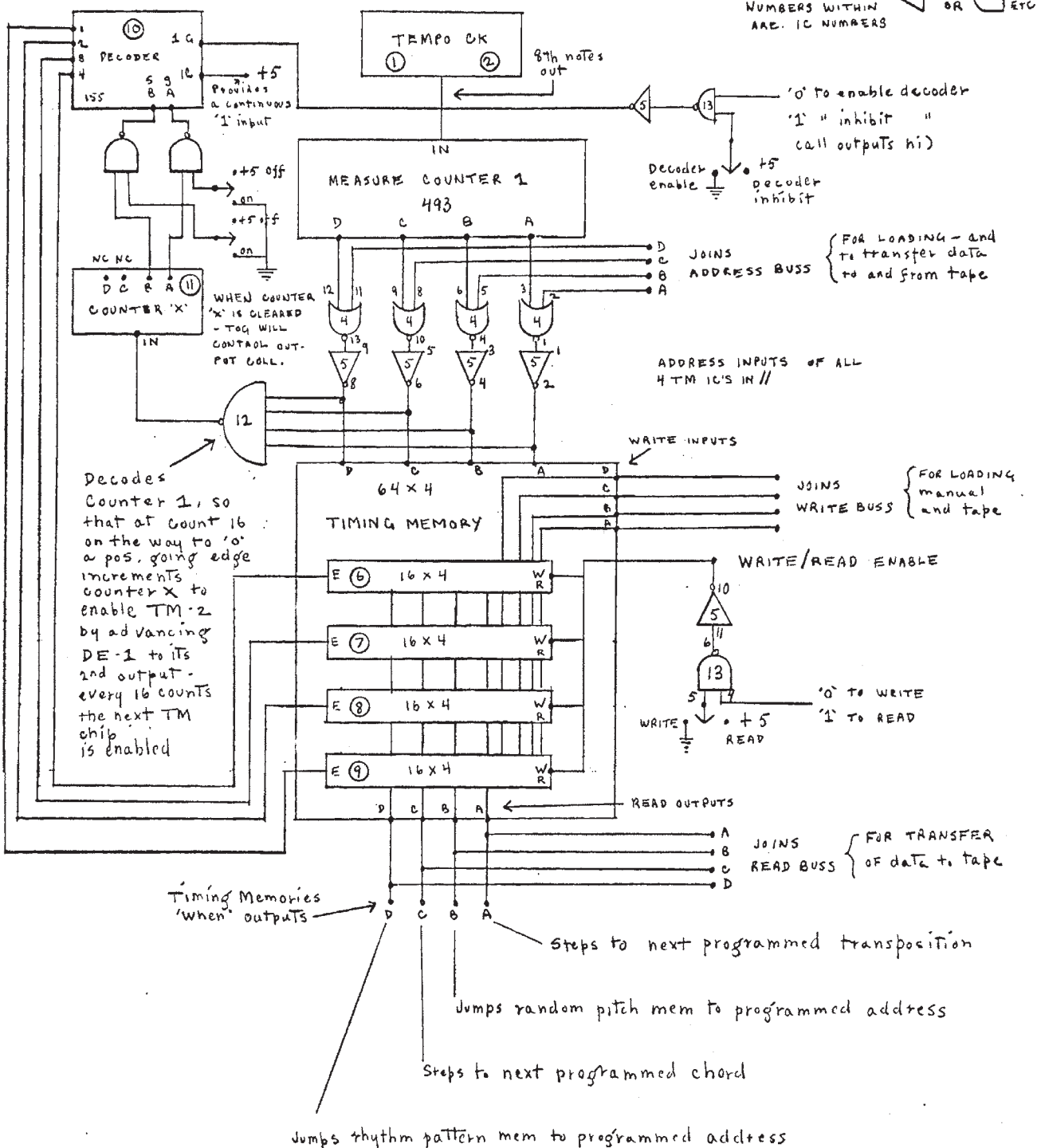
MELODY GENERATOR - FINAL VERSION.

M2

BLOCK I - Tempo CK, Timing Memory, Decoder

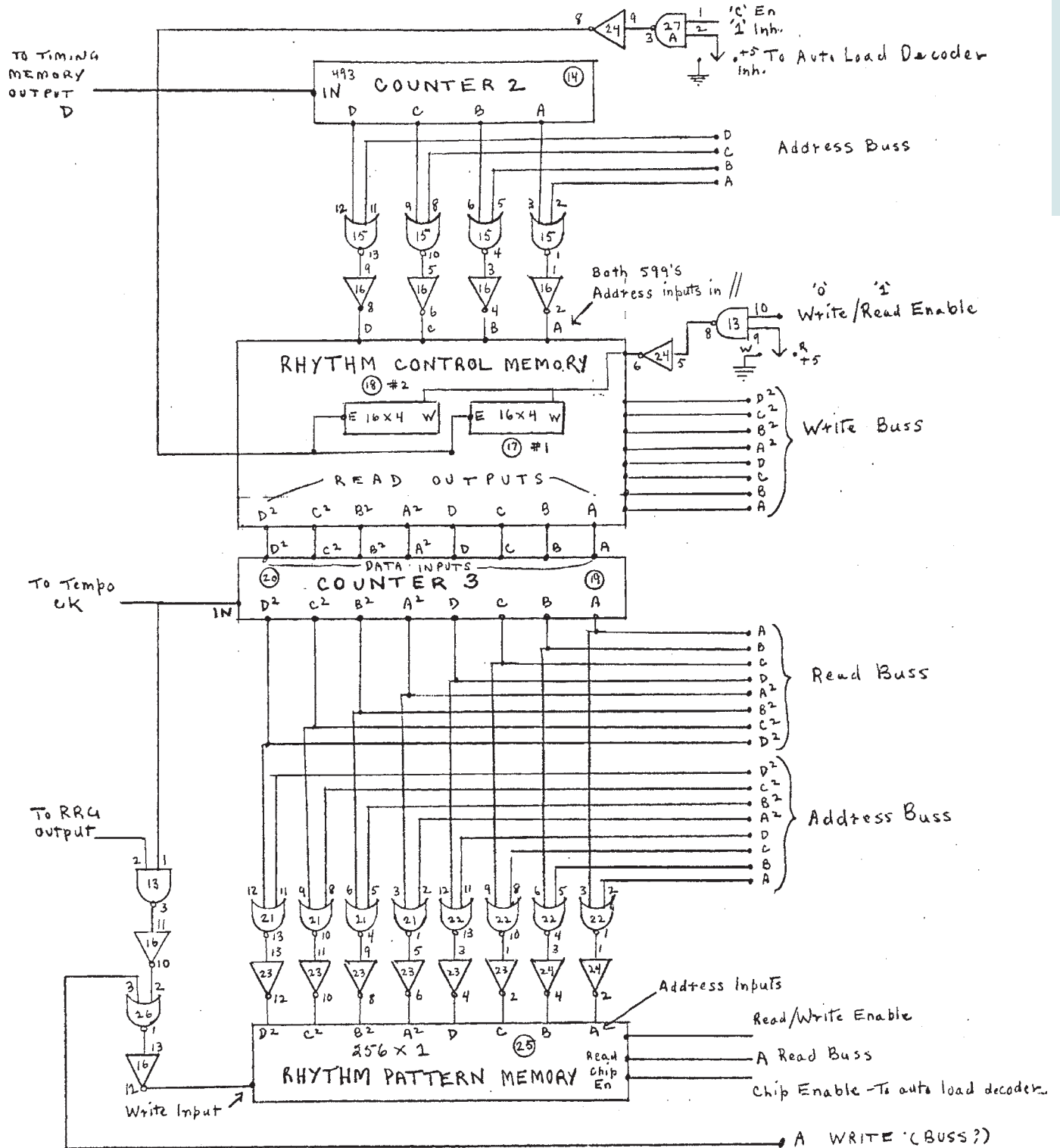
NUMBERS IN ○ ARE IC NUMBERS

NUMBERS WITHIN ◁ OR ▷ ETC ARE IC NUMBERS



Wiring diagram, Melody Generator (final version), 1972 (2/10)

BLOCK II - Rhythm Pattern Memory, Rhythm Control Memory, etc.



Wiring diagram, Melody Generator (final version), 1972 (3/10)

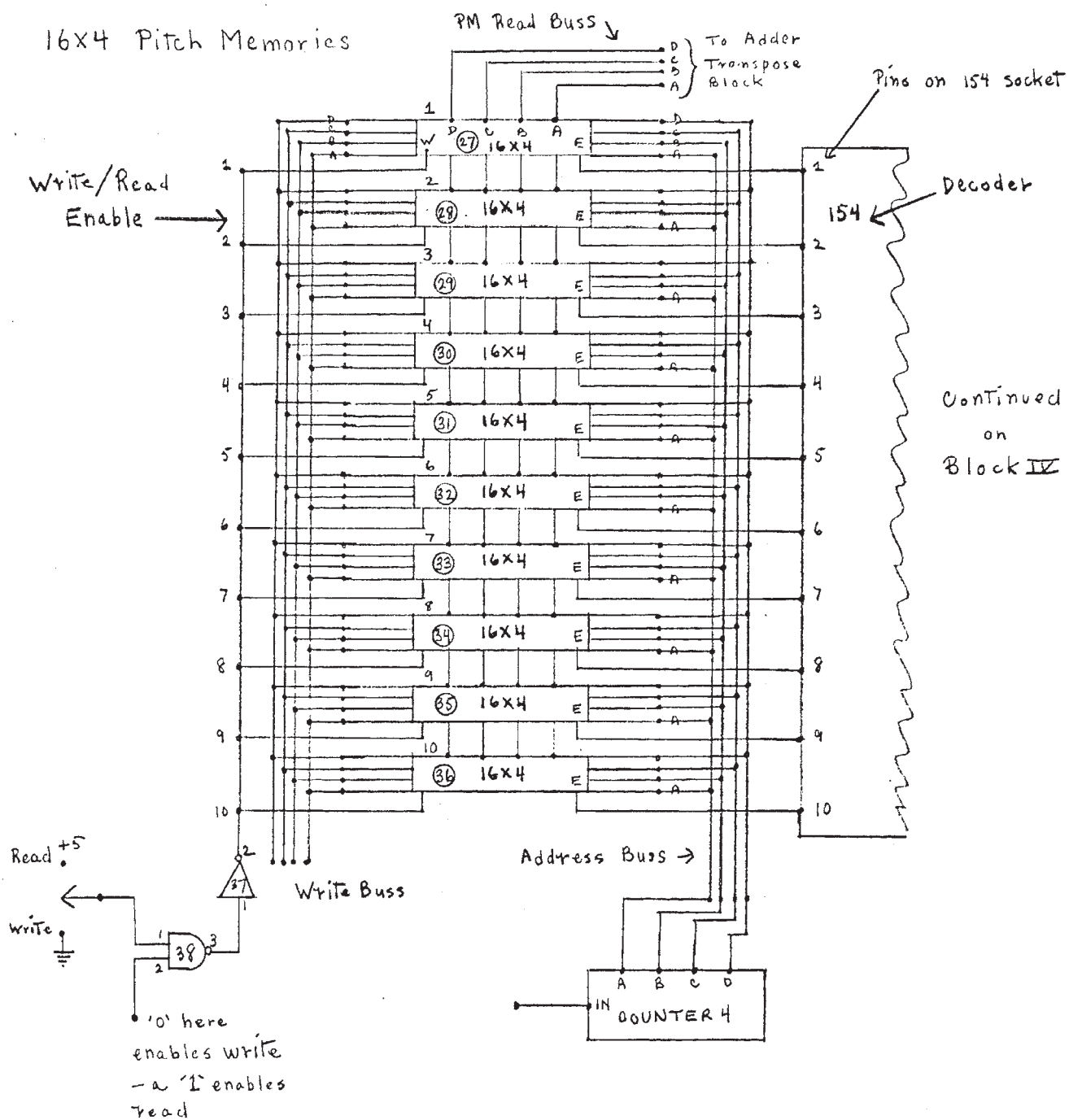
MELODY GENERATOR - FINAL VERSION

(M4)

BLOCK III

10 PITCH MEMORIES

10 16x4 Pitch Memories



M5

Numbers in $\bigcirc$ are IC numbers

Chip 1 & 2 write
inputs are in //

Wiring diagram, Melody Generator (final version), 1972 (5/10)

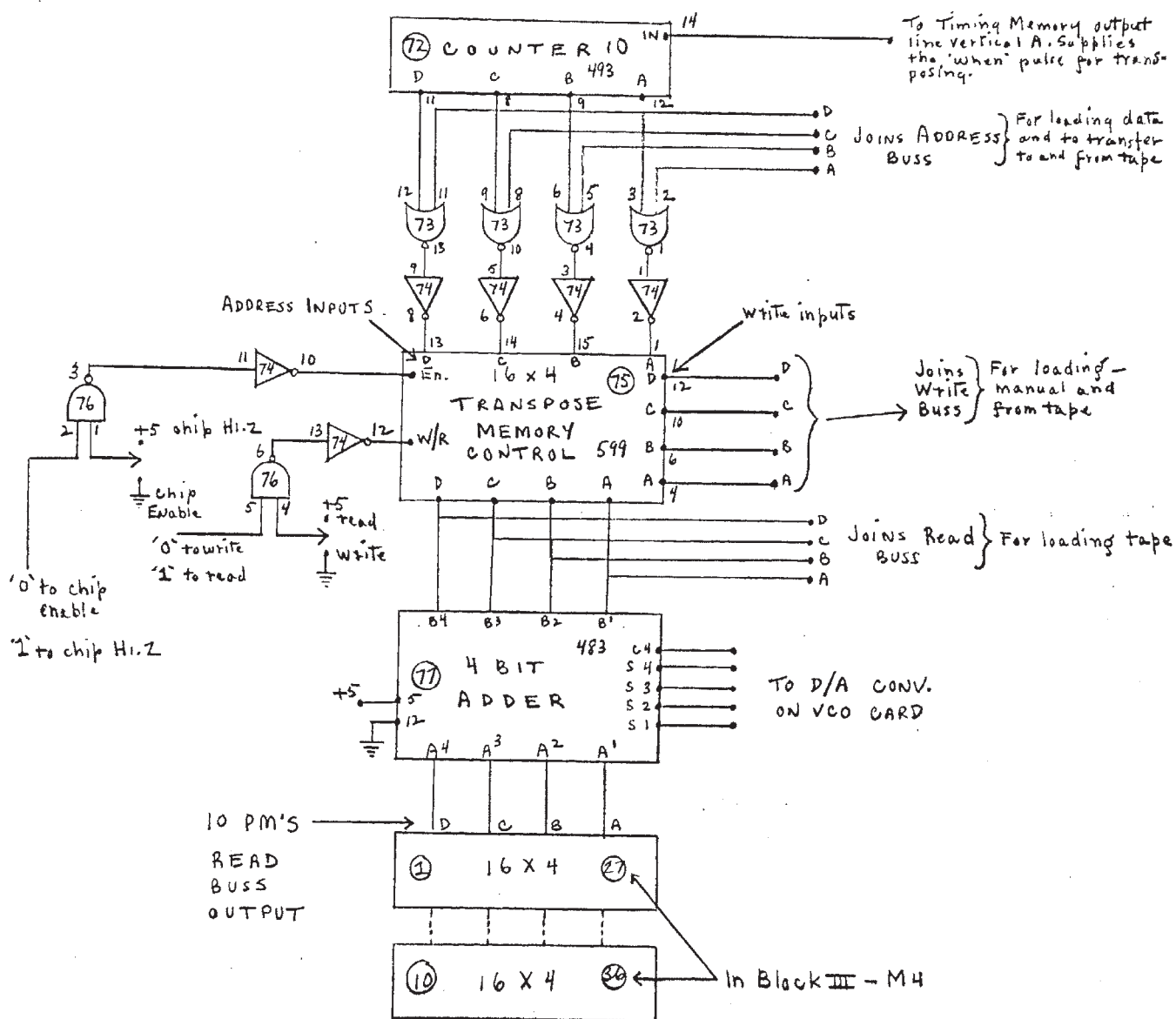
M6



MELODY GENERATOR - FINAL VERSION

(M7)

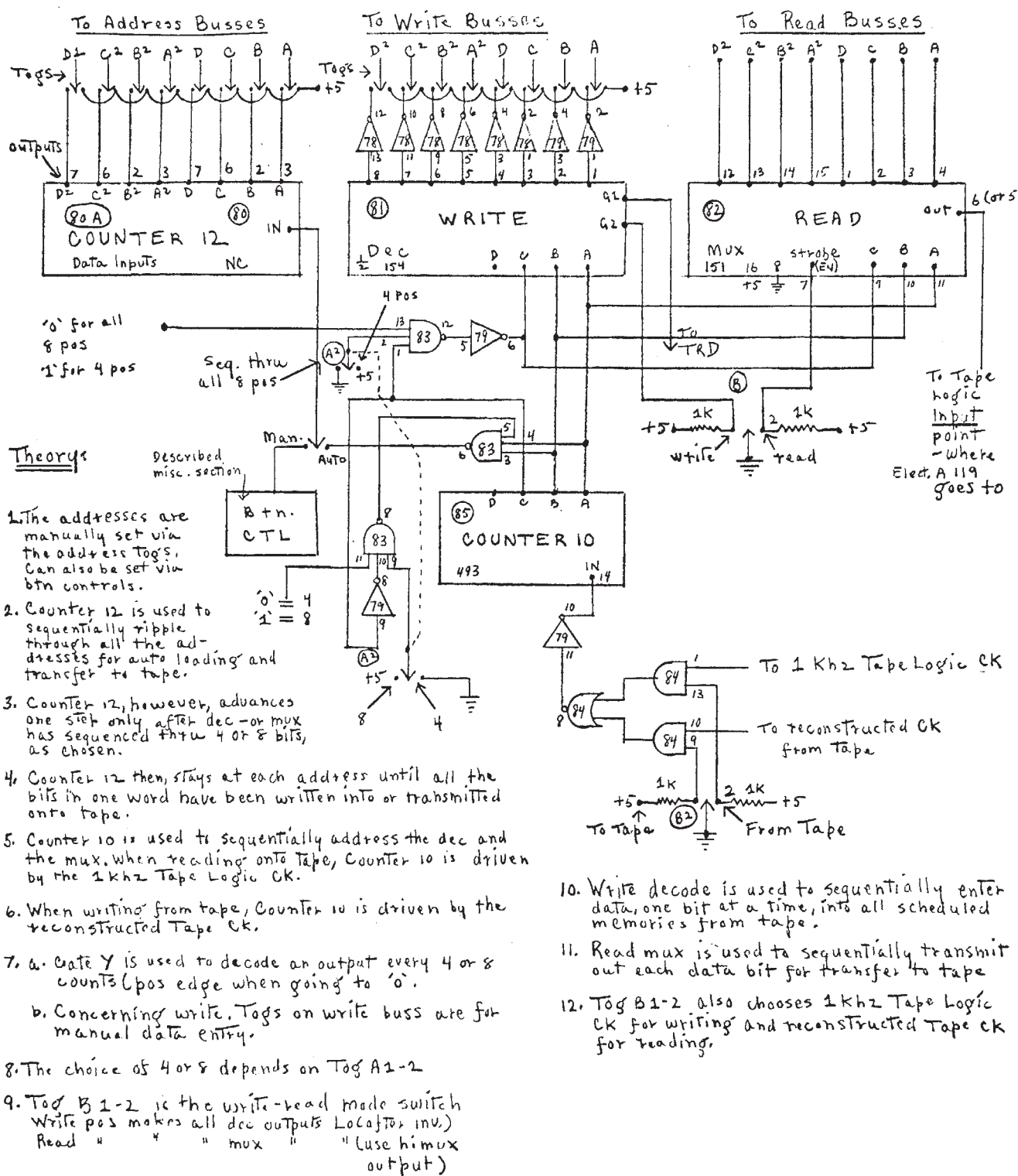
BLOCK VI Transpose Control Memory, Adder etc



Wiring diagram, Melody Generator (final version), 1972 (7/10)

BLOCK VII Automatic Memory and Tape Loading via Serial Techniques

1972



Wiring diagram, Melody Generator (final version), 1972 (8/10)

BLOCK VIII - Sequential Enabling of the 7 Memories, with Common Address, Write and Read Busses

Theory: Makes use of a decoder to sequentially enable each of 7 memories. When the first memory has been completely scanned, a completion signal is used to advance the 'Next Memory Enable Decoder' to its second output. Its Output #2 enables the second memory. A completion signal advances the NMED to enable the third memory - etc. There may be some bugs, because of the mult. // bussing of addresses, write and read lines. All counters are momentarily cleared between passes.

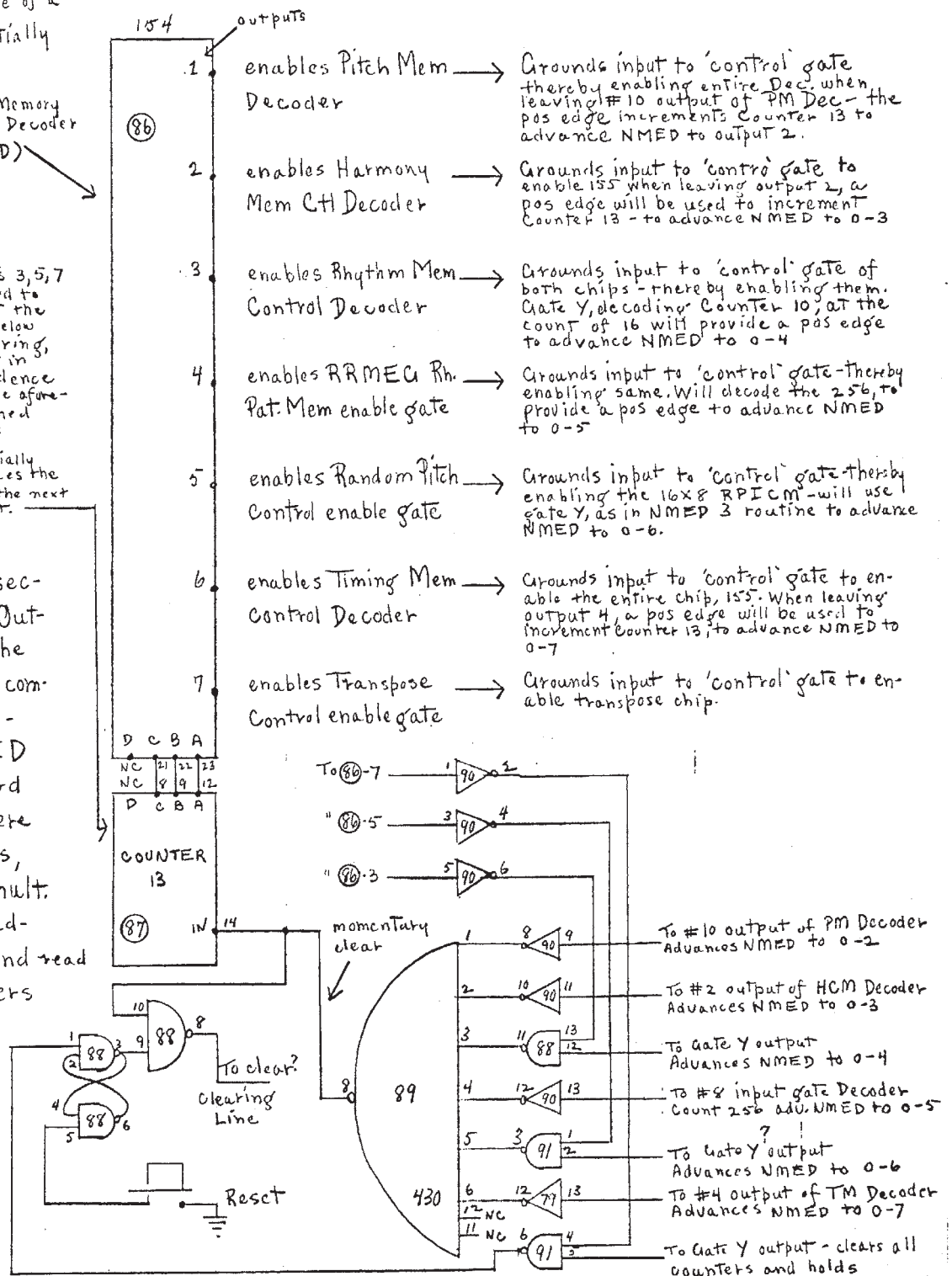
Next Memory Enable Decoder (NMED)

Outputs 3, 5, 7 are used to prevent the gates below from firing, except in coincidence with the aforementioned outputs

Sequentially advances the 154 to the next output.

Decoder to its second output. Its Output #2 enables the second memory. A completion signal advances the NMED to enable the third memory - etc. There may be some bugs, because of the mult. // bussing of addresses, write and read lines. All counters are momentarily cleared between passes.

Note: IC #12 not required as yet.



Wiring diagram, Melody Generator (final version), 1972 (9/10)



RAYMOND SCOTT – ARTIFACTS FROM THE ARCHIVES

1973

INSTANTANEOUS
MUSIC
COMPOSITION
PERFORMANCE
MACHINES

RAYMOND SCOTT LABORATORIES

PIONEERED &
DEVELOPED

rhythm
synthesizer
1960

pitch
sequencer
1960

portamento
keyboard
1959

juxtaposition
matrix
1961

serial
doorbell
1966

synthesized
chinese gong
1968

bass line
generator
1971

melody
maker
1972

rhythm guitar
simulator
1972

Raymond Scott Laboratories
14549 Valerio Street
Van Nuys, California 91405



INSTANTANEOUS
MUSIC
COMPOSITION
PERFORMANCE
MACHINES

RAYMOND SCOTT LABORATORIES

Irwin Chusid
607 Adams Street
Hoboken, N.J. 07030

14549 Valerio St. • Van Nuys, California 91405

RAYMOND SCOTT LABORATORIES 14549 Valerio St. • Van Nuys, California 91405 • (213) 782-1990

"Raymond Scott Laboratories" stationery, circa 1973

MOTOWN RECORD CORPORATION
INTER-OFFICE MEMO

THE MOTOWN SOUND



TO **GUY COSTA**
FROM **RAYMOND SCOTT**
SUBJECT **AN ELECTRONIUM ALBUM IDEA**

PROPOSAL

DATE February 18, 1973

After much experiment directed towards the development of hand operated cueing procedures to effect the following:

- a. The addition of new material - on a second track - to precede a previously recorded first track, exactly in sync - for sometimes it will be necessary to add an intro, a special effect, etc.
- b. The continuation of a track 'in progress', for example: the first minute of a bass line has been completed - with work now required to extend the bass line so that it runs the 3 minutes plus, or whatever.
- c. The recording of a third track - say, a fill in track - with new musical materials to be added at various but exact measure points in order to sync, as needed, with previously recorded musical events.
- d. The recording of a fourth track, a harmony pad track with perhaps 3 or 4 different 'held harmony' sections - each section to be added at an exact measure point - to sync as planned with other parts.
- e. etc, etc, the addition of new materials, on new tracks - as needed - and in sync with previously recorded materials.

Experience indicates the following:
that because of the switching functions required, the timing tolerances are so tight that hand operation is not practical.

I propose, then, that automatic control circuitry be added to the Electronium - to precisely initiate the functions listed above. A brief description of the necessary circuitry is listed below.

When Recording:

At an exact beat, in a specified measure, within about + 25 milliseconds, the following sequential switching procedures are required.

1
9
7
3

PROPOSAL

February 16, 1973

After much experiment directed towards the development of hand operated cueing procedures to effect the following:

- a. The addition of new material - on a second track - to precede a previously recorded first track, exactly in sync - for sometimes it will be necessary to add an intro, a special effect, etc.
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- e. etc, etc, the addition of new materials, on new tracks - as needed - and in sync with previously recorded materials.

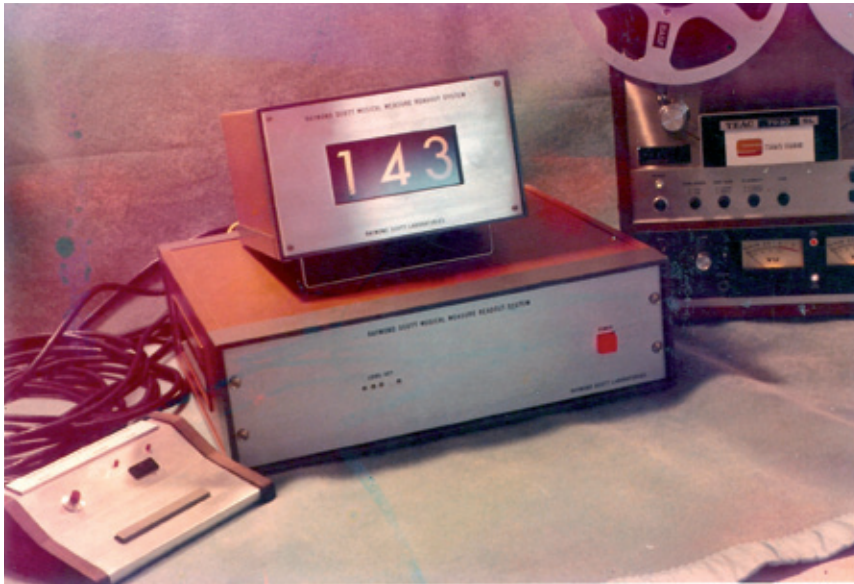
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When Recording:

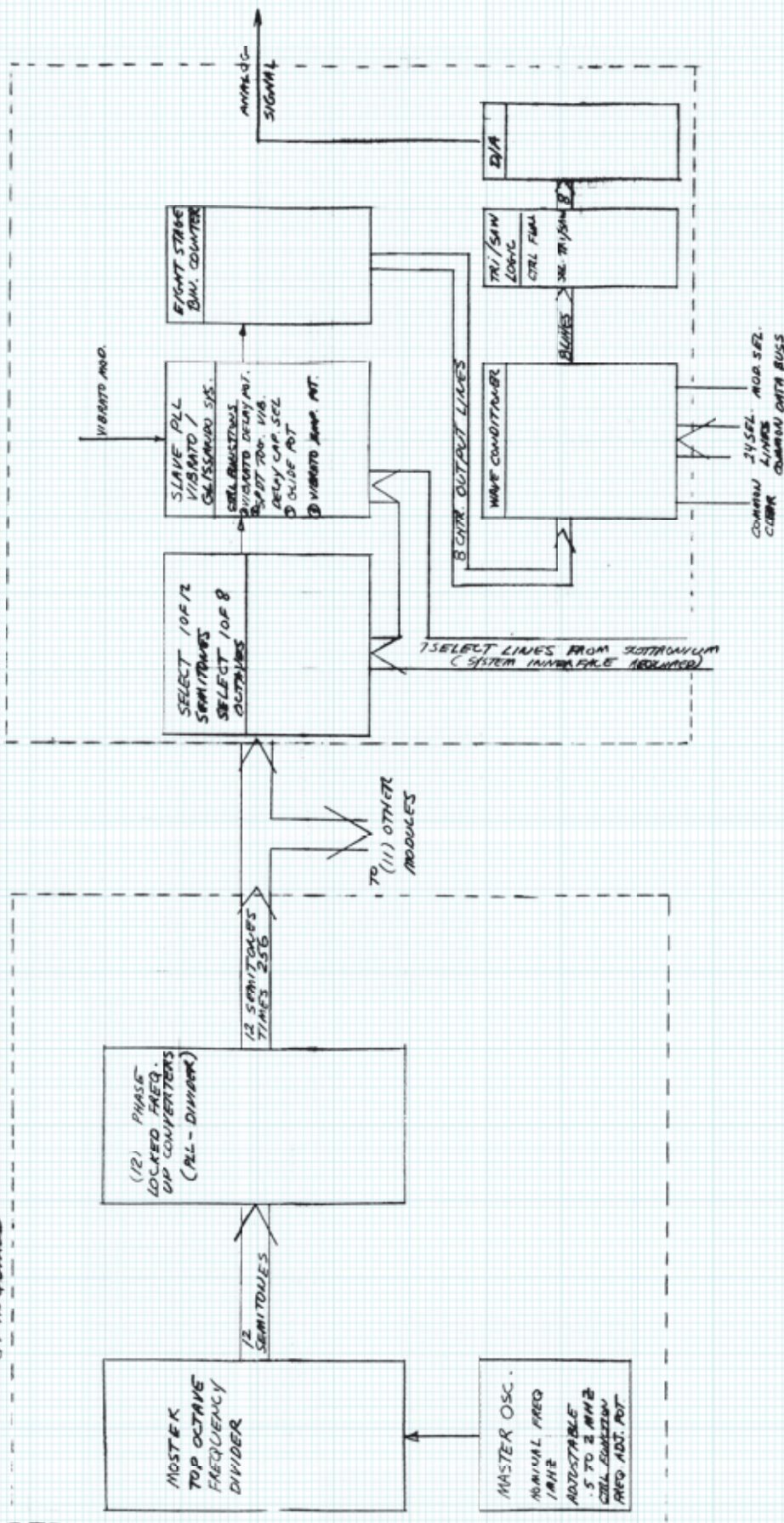
At an exact beat, in a specified measure, within about + 25 milliseconds, the following sequential switching procedures are required.



Prototype of the Raymond Scott Musical Measure Readout System, May, 1973

PITCH REFERENCE FOR ALL
TONE MODULES
(1) REQUIRED

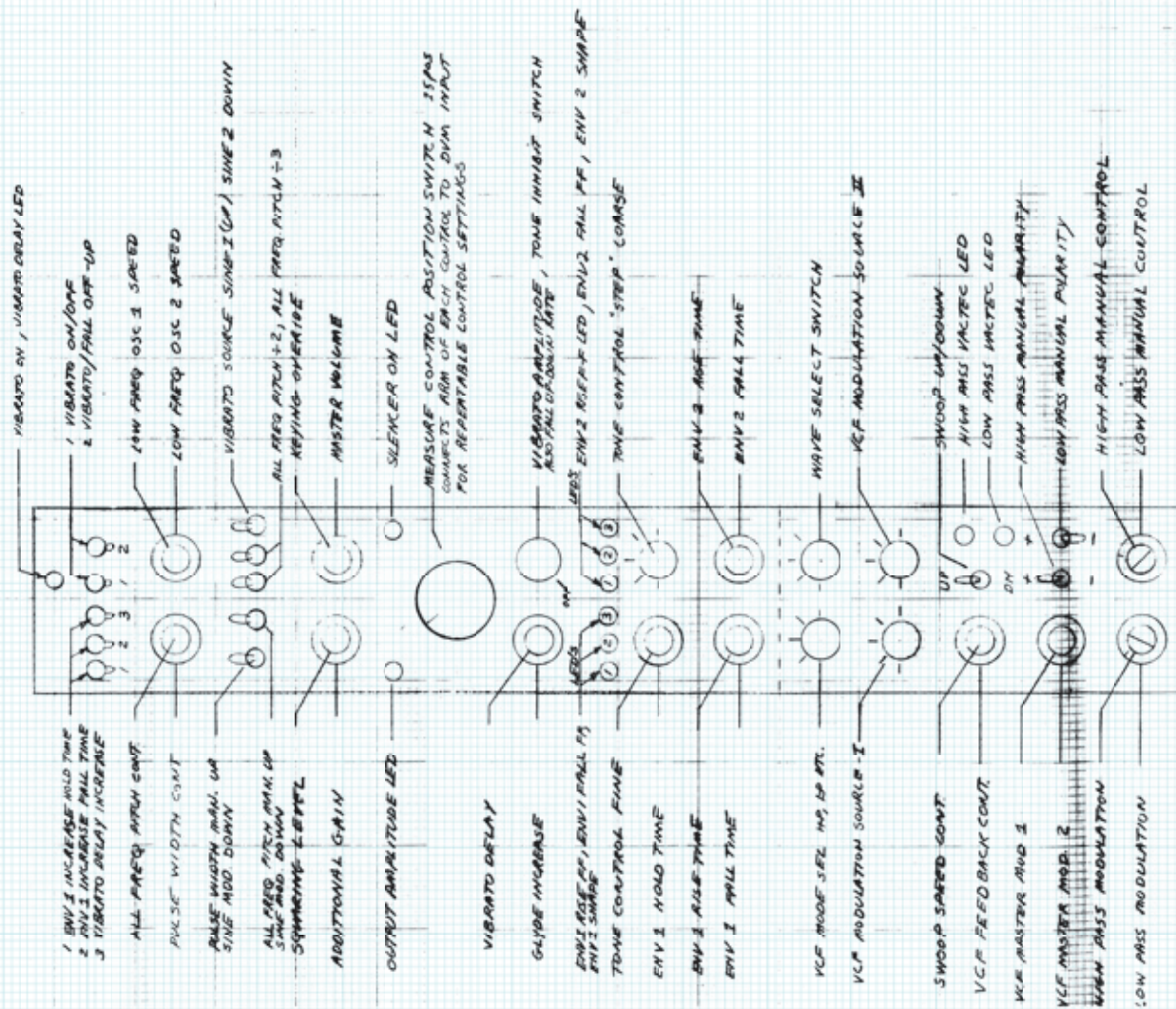
PITCH SELECTION
(12) REQUIRED



SYSTEM, TONE

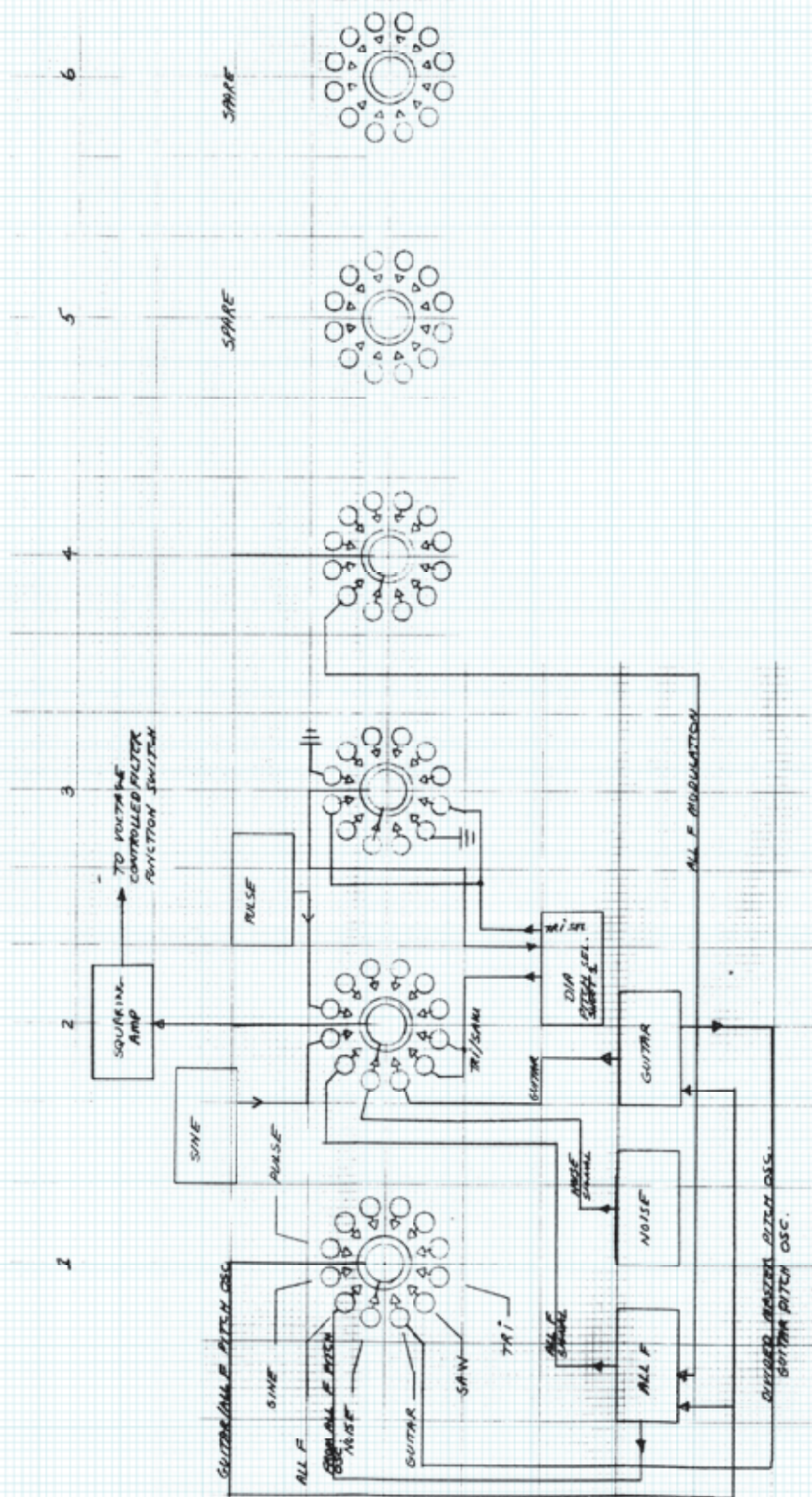
1974





MODULE PANEL CONCEPT

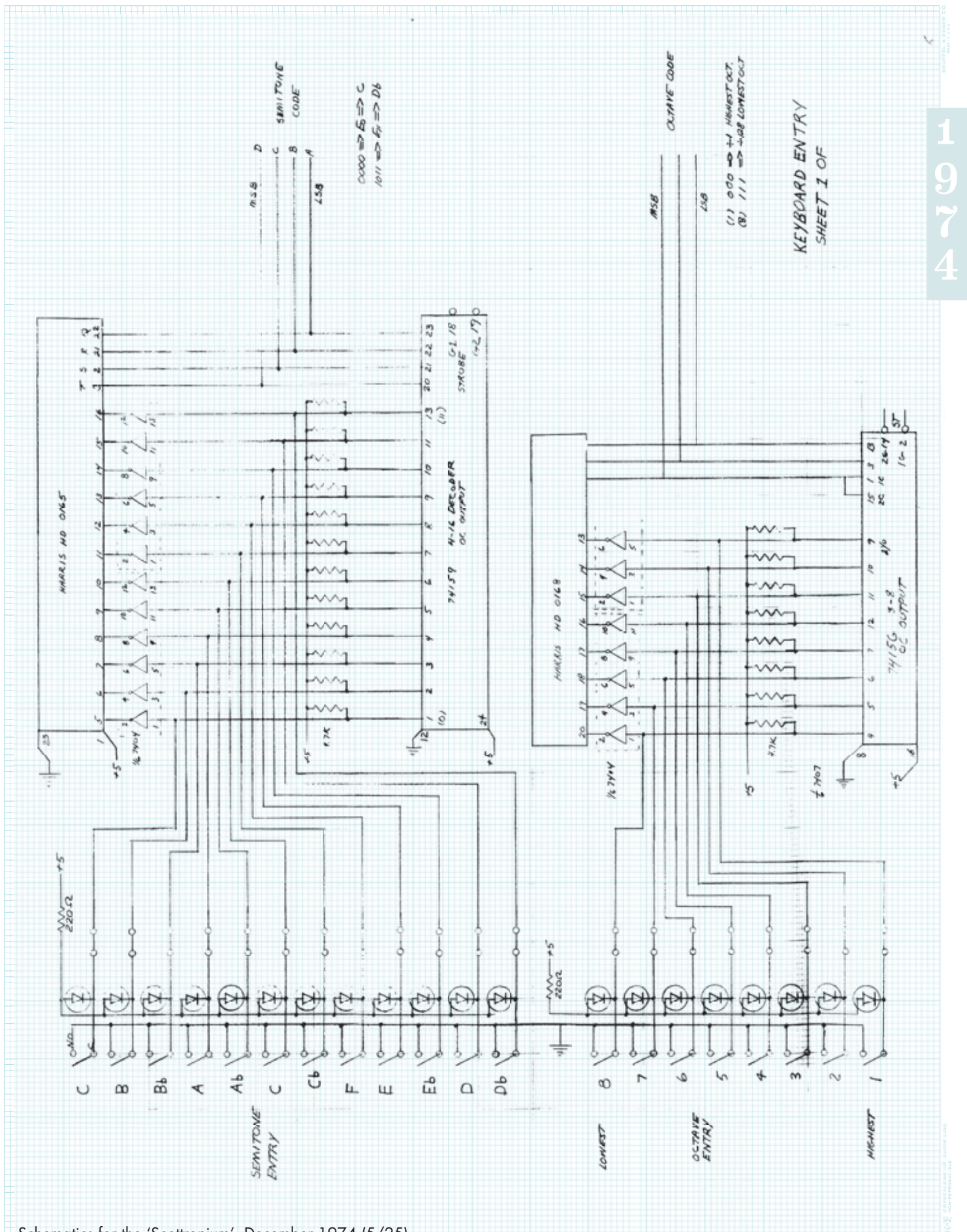
SCALE APPROX. 1 TO 1



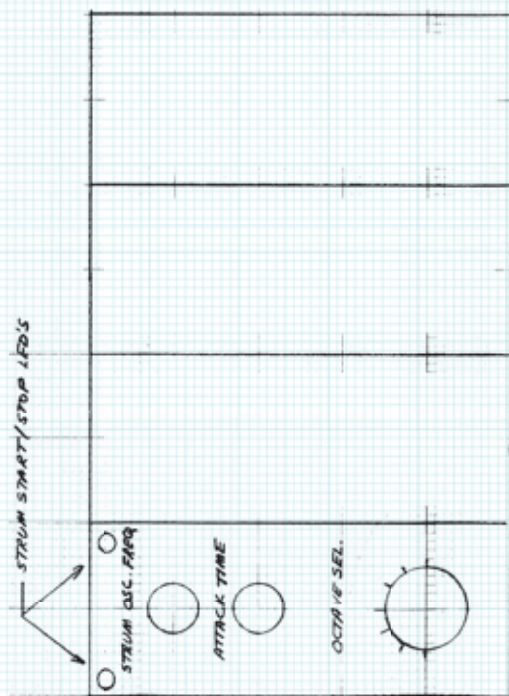
WAVE SELECTOR SWITCH

1974

Schematics for the 'Scottronium', December 1974 (4/25)



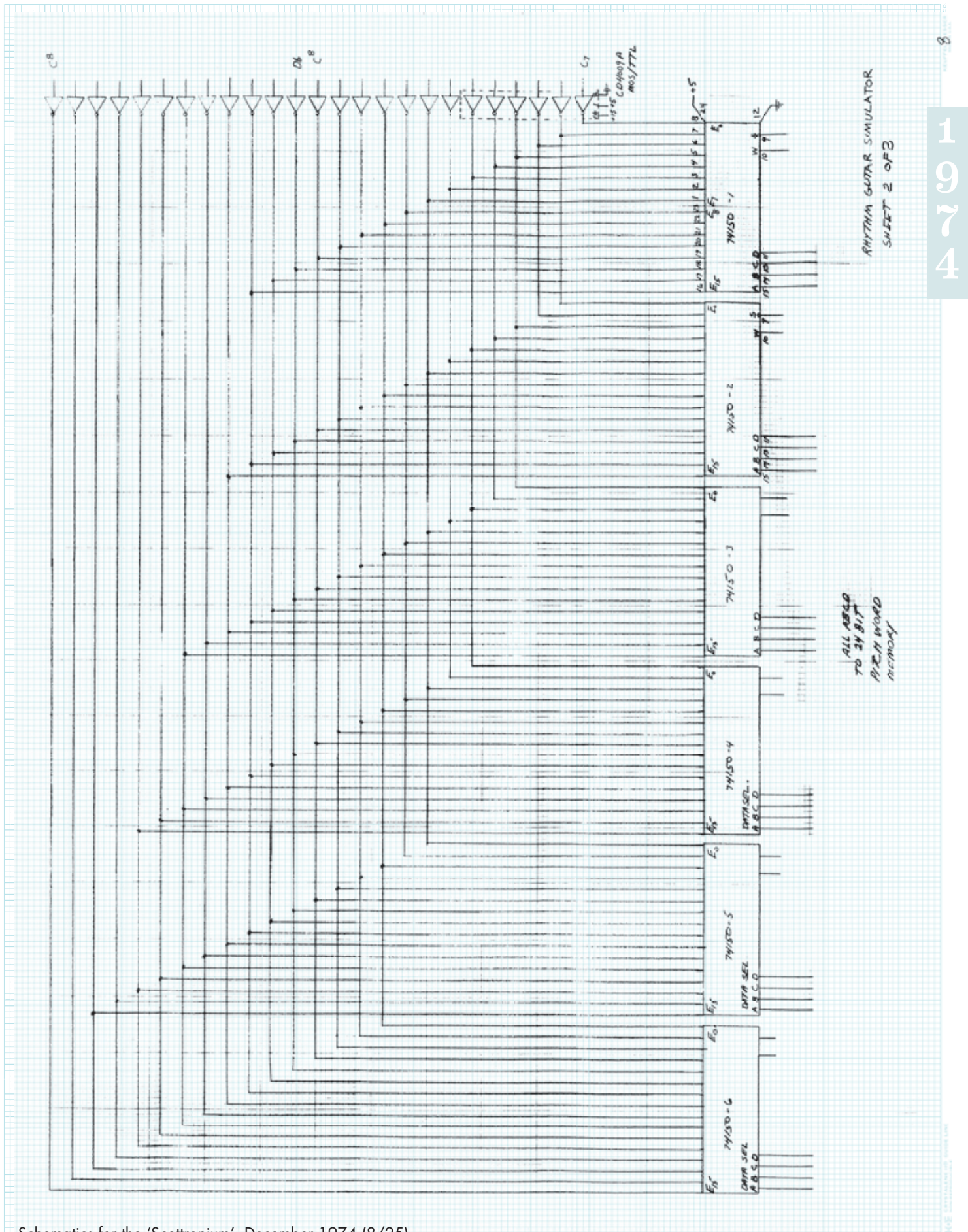
Schematics for the 'Scottronium', December 1974 (5/25)



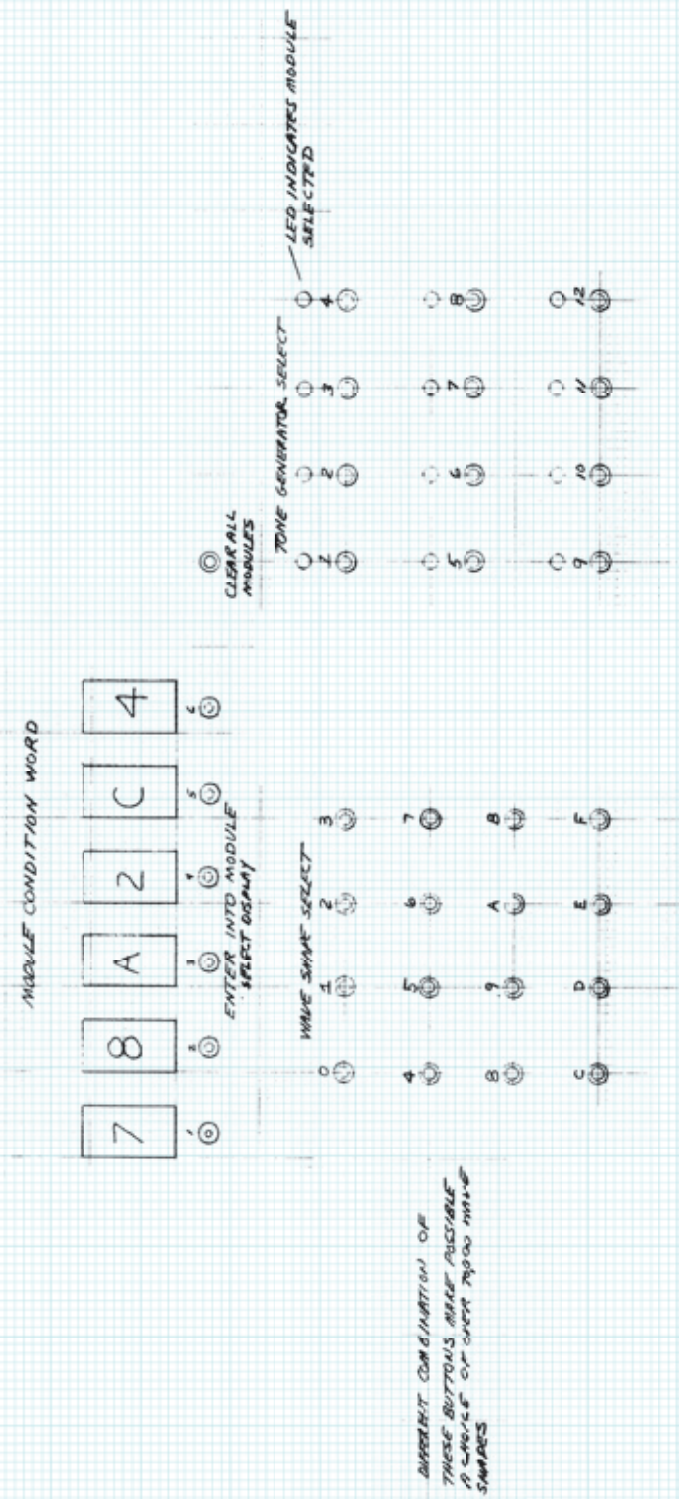
CONTROL PANEL FOR
EACH RHYTHM GUITAR

1974

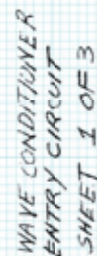
6



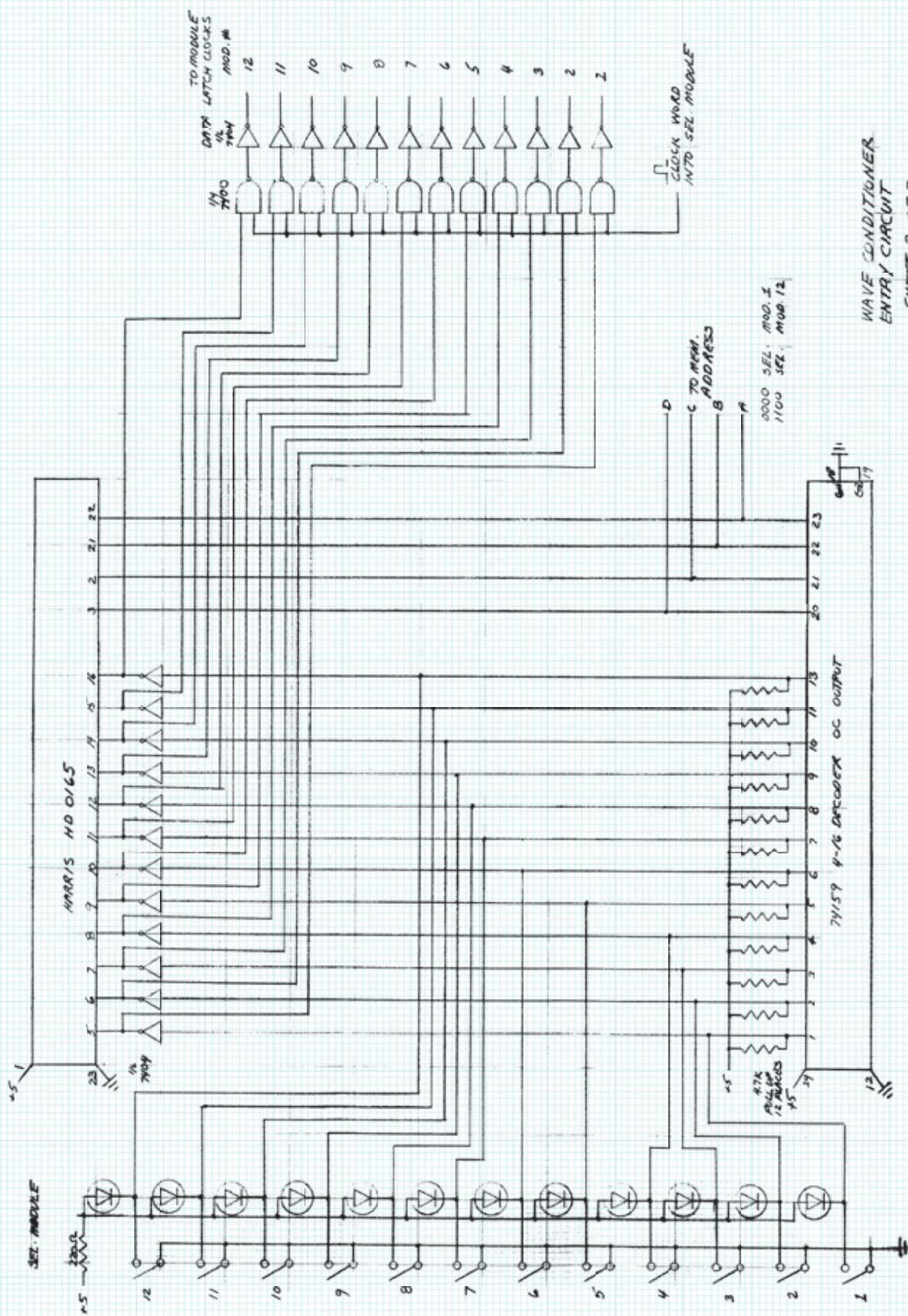
Schematics for the 'Scottronium', December 1974 (8/25)



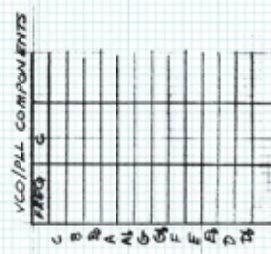
Schematics for the 'Scottronium', December 1974 (10/25)



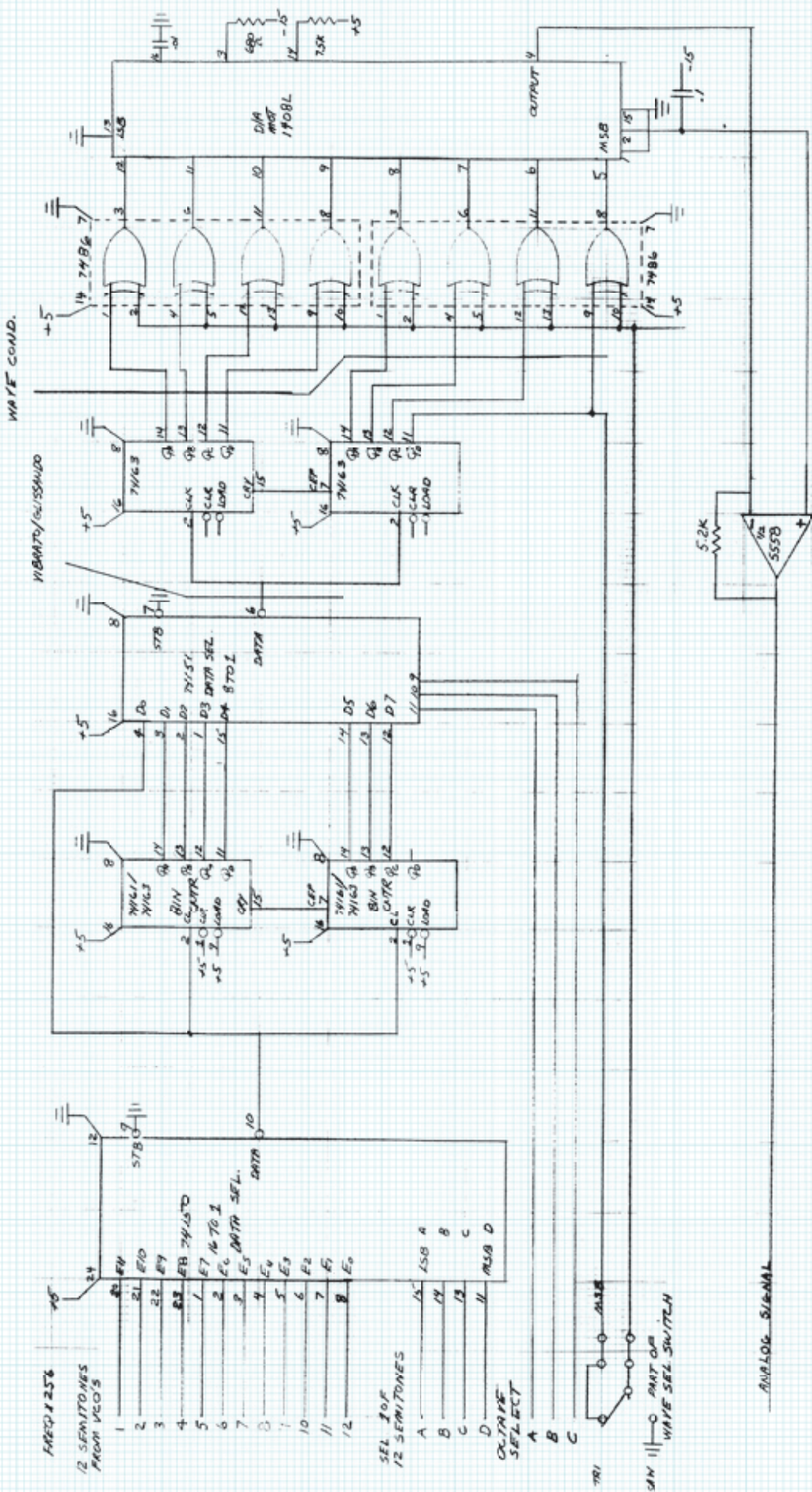
RAYMOND SCOTT – ARTIFACTS FROM THE ARCHIVES



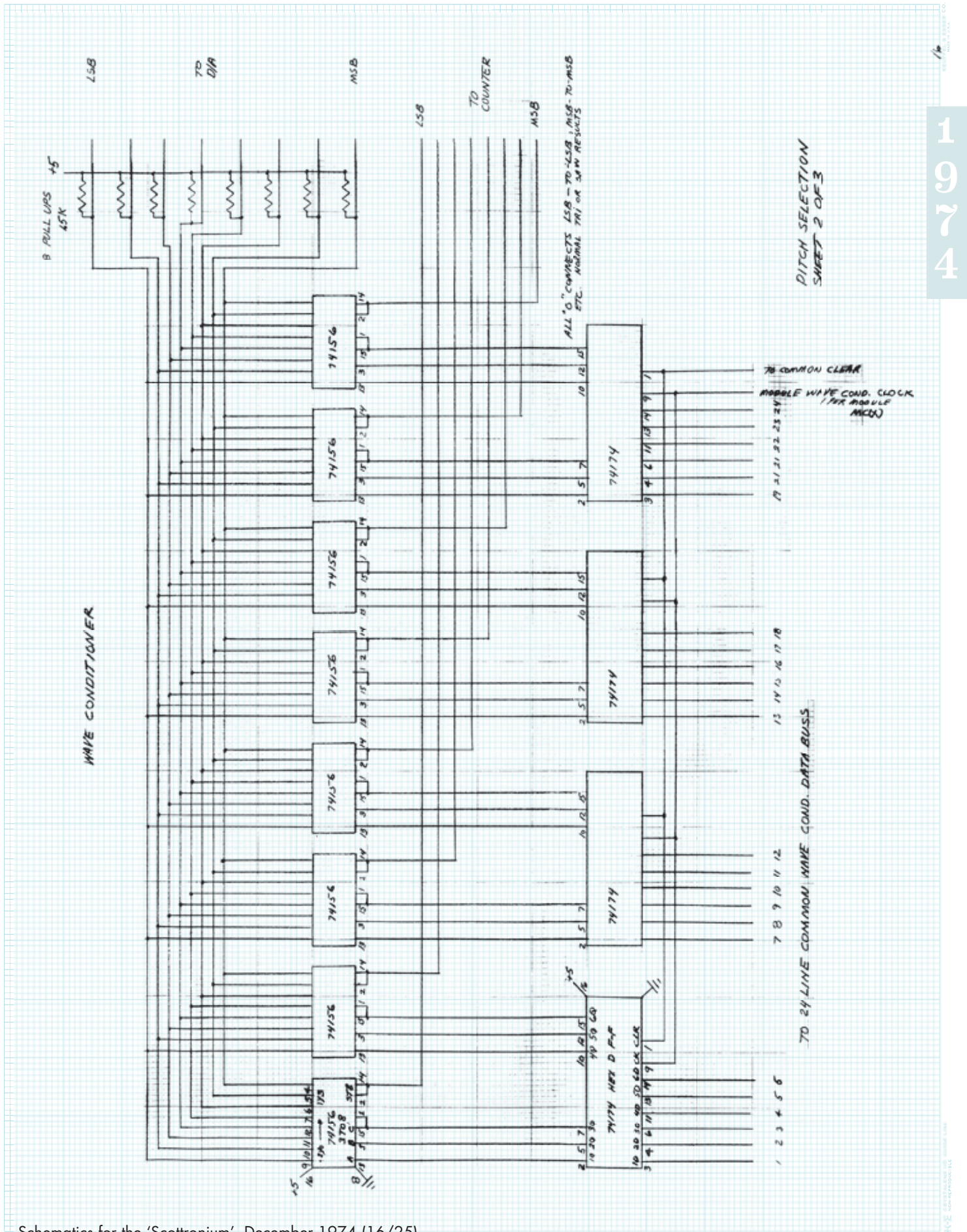
Schematics for the 'Scottronium', December 1974 (12/25)



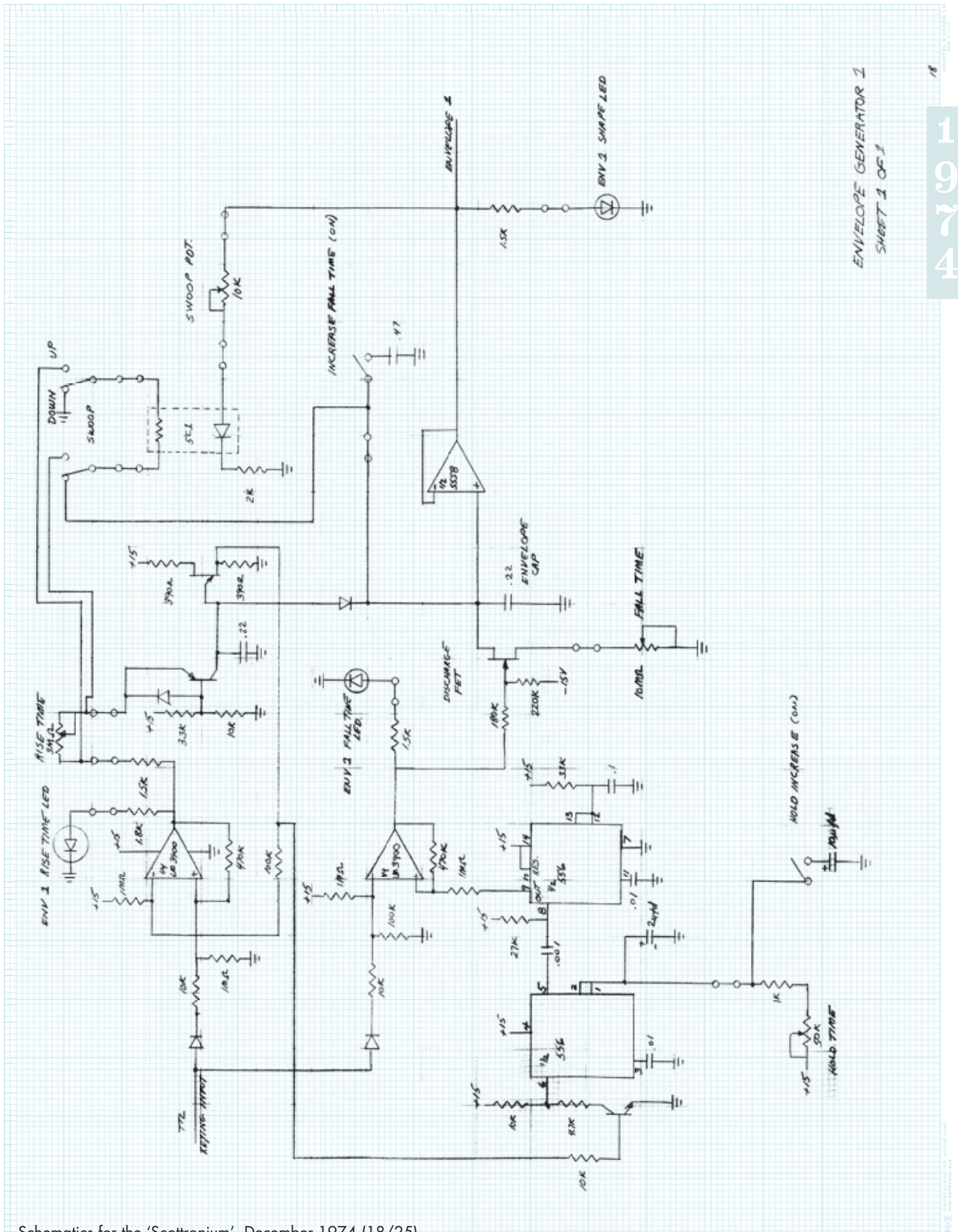
TOP OCTAVE



Schematics for the 'Scottronium', December 1974 (15/25)

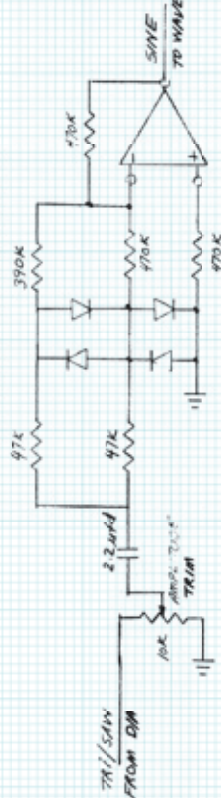


Schematics for the 'Scottronium', December 1974 (16/25)

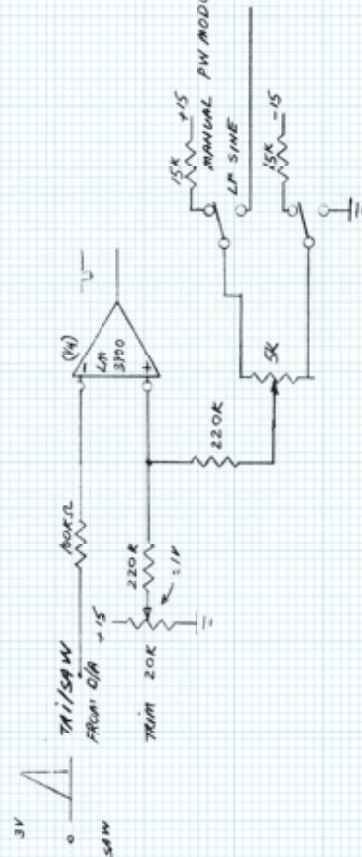


Schematics for the 'Scottronium', December 1974 (18/25)

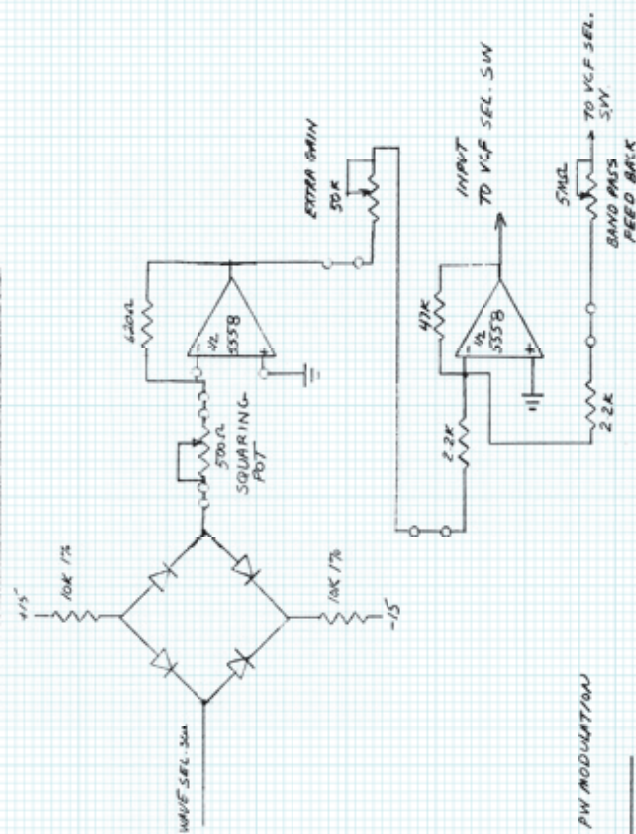
SINE WAVE CONDITIONER



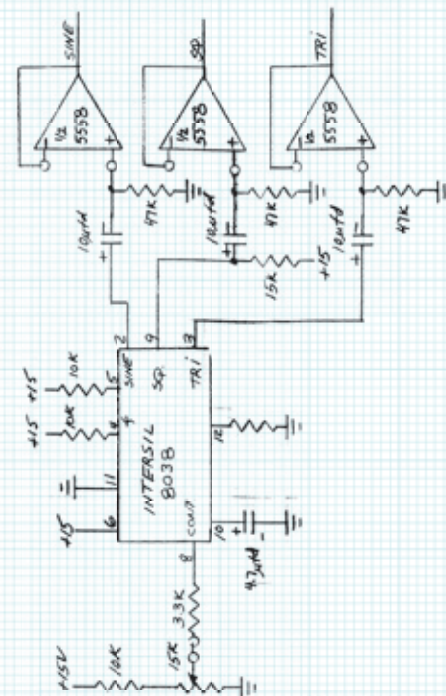
VARIABLE PULSE WIDTH CONTROLLER



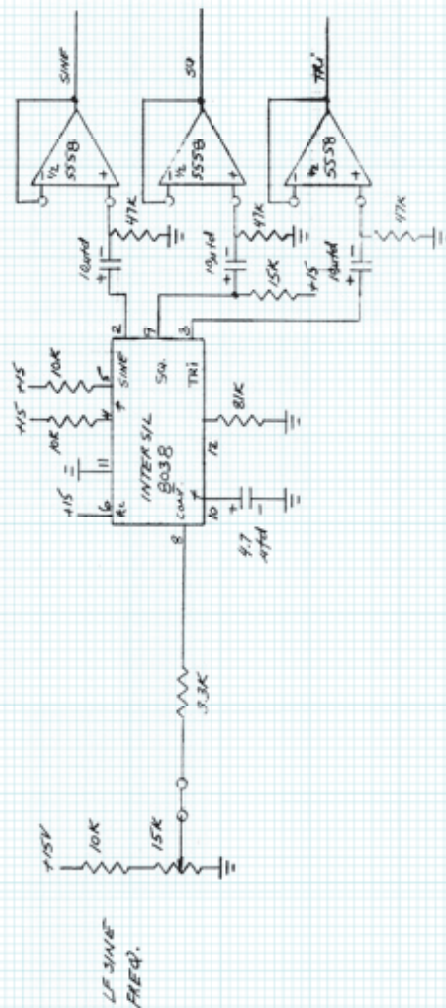
ADJUSTABLE SQUARING CIRCUIT



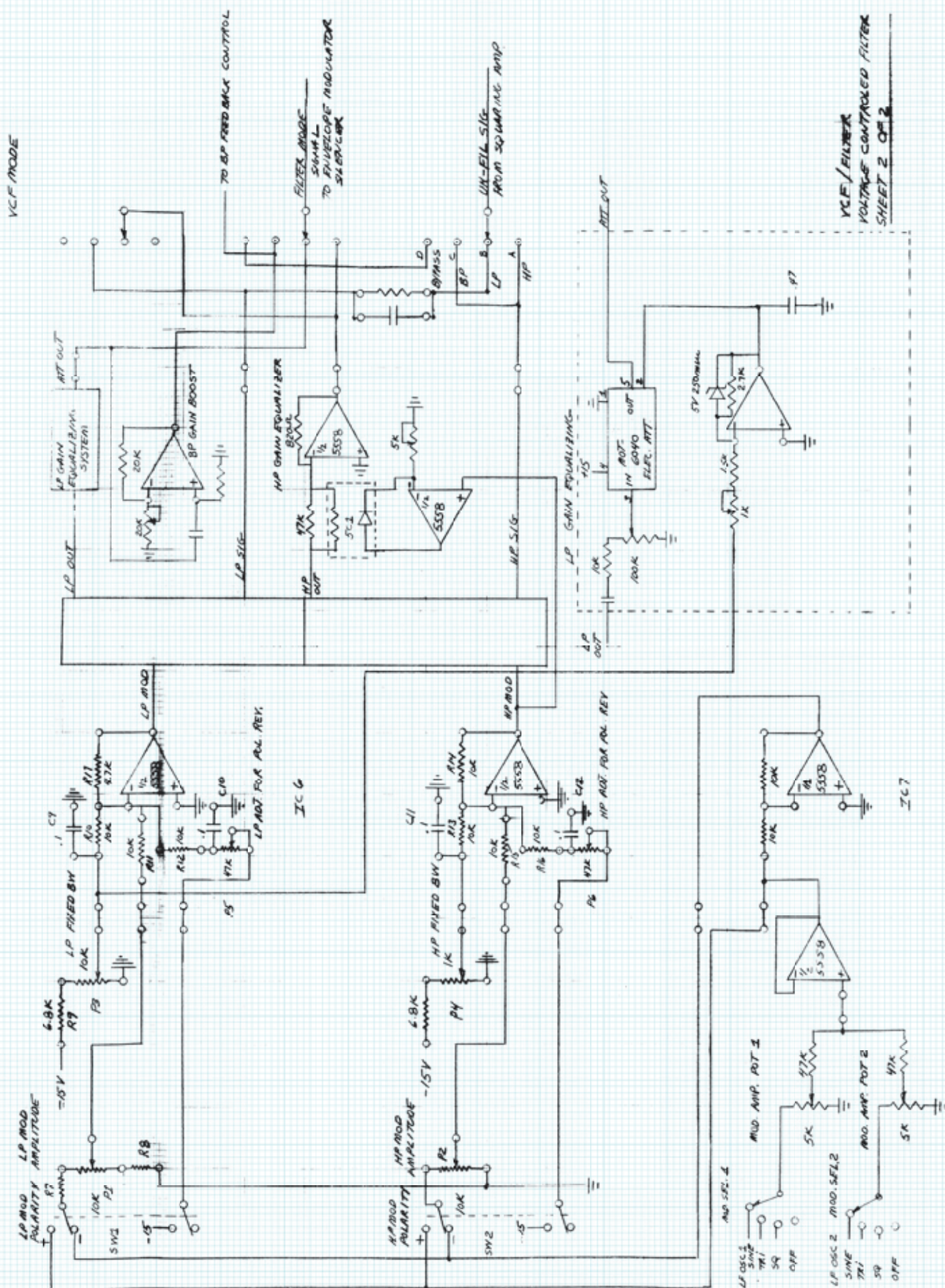
LOW FREQUENCY SINE OSC. #2 - HZ GROUP



LOW FREQUENCY SINE OSC. #1 - HZ GROUP

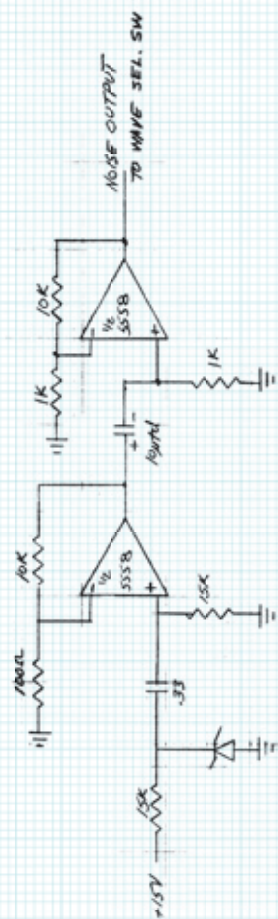


VCF MODE



VCF/FILTER
VOLTAGE CONTROLLED FILTER
SHEET 2 OF 2

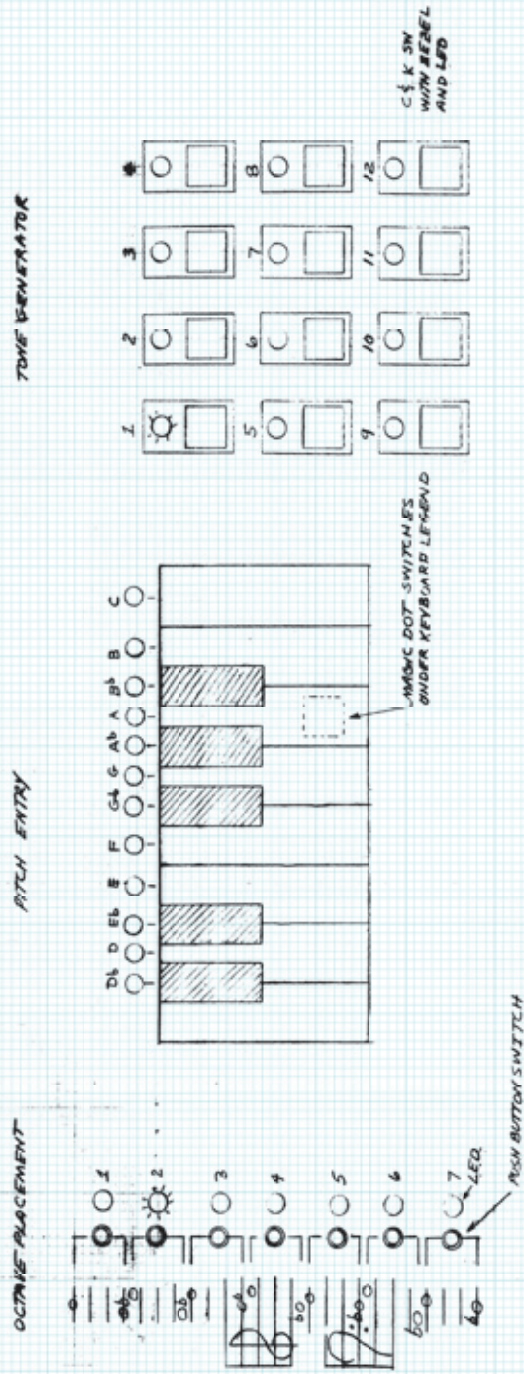
Schematics for the 'Scotttronium', December 1974 (23/25)



RANDOM NOISE GEN
SHEET 1 OF 1

1974

24



KEYBOARD PITCH ENTRY

Schematics for the 'Scottronium', December 1974 (25/25)

MOTOWN MEMORANDUM



TO: *Ray Scott*
 FROM: W. L. Burdsal, Jr.
 SUBJECT: ATTACHED PROPERTY RECEIPT

DATE: June 12, 1975

Our inventory records indicate that you have the equipment in your possession that is listed on the attached Property Receipt(s).

Please verify the equipment shown and sign the receipt(s). Then, retain copy two (pink copy) for your records and return the original and all other copies to this office.

Thank you for your cooperation, and if you have any questions concerning this procedure, please call extension 321.

Thank You,

W. L. Burdsal, Jr.
 W. L. Burdsal, Jr.
 Director of Administration

WLB/kp

1975



MOTOWN PROPERTY RECEIPT

The Company owned equipment described below has been checked out to:

EMPLOYEE NAME	RAY SCOTT RESIDENCE			DIVISION	MANUFACTURING
DEPARTMENT	RECORDING STUDIO			COMPANY	MRC
TYPE OF EQUIPMENT	MODEL NUMBER	SERIAL NUMBER	ORIGINAL COST		
REMX TAPE RECORDER	A77	T1535			

I acknowledge receipt of the above equipment and I agree to exercise my best efforts to safeguard this property and will use it according to recommended operating instructions, in a lawful manner. Upon termination from the Company, or at the request of the Company at any time, I agree to surrender the above listed Company property to an authorized Motown representative. In case the above listed property is lost or stolen while in my possession, I further agree to notify the Personnel Department immediately.

OUT 2/3/75 DATE 2/3/75 SIGNATURE OF EMPLOYEE CHECKING OUT EQUIPMENT LISTED ON THIS SHEET. *Raymond Scott*

IN _____ DATE _____ SIGNATURE OF EMPLOYEE CHECKING IN EQUIPMENT LISTED ON THIS SHEET.

Comments: _____

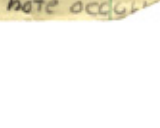
Signed Original & Copy 1
Employee Personnel Folder

Copy 2
Employee

Copy 3
Purchasing Dept.

Copy 1 Returned to Employee
When Equipment Turned In

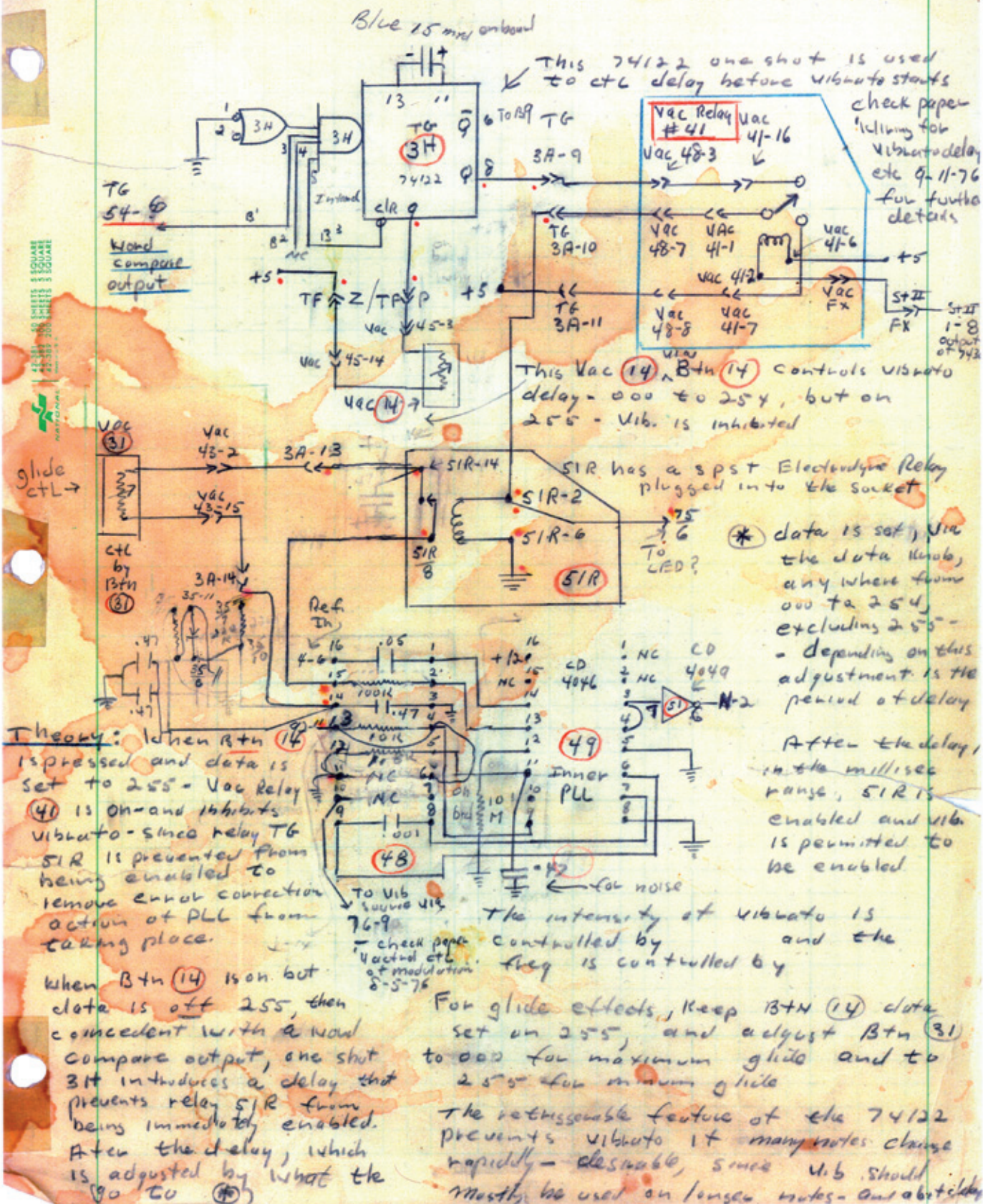
MR 204 3-75 1M



(337)

Vibrato Circuit - Corrected: Complete 12-9-76

1976



A SHORT FORM RESUME

My background is twofold - musical and technical

CBS Musical Director
 The Raymond Scott Quintette
 Hit Parade Conductor
 Composer of the Mary Martin Musical "Lute Song"
 Columbia Recording Artist
 ASCAP Composer - - - 200 + Copyrights
 Movie Scores - composed and performed

Synchronously throughout the above activities

Maintained an Electronic Development Laboratory
 Designed and owned one of New York City's earliest
 Independent Recording Studios
 Designed and owned one of New York City's earliest
 Independent Electronic Music Studios
 Six U.S. Patents
 Scores of Disclosures
 Developed many Electronic Music Devices

Why would someone as accomplished and famous as Raymond Scott need a resume? Although undated, our best guess is that Scott compiled this shortly before or after he left Motown in 1977. By then, he was no longer famous, having been out of the public spotlight for over 15 years. In that decade and a half, pop music and the industry around it had been revolutionized, and Scott had almost no involvement. He was off by himself, working in the lab, a reclusive musical scientist.

The resume contains no mention of Motown, for good reason: he was under a sort of "gag order" — Motown contractually prohibited Scott from publicizing the nature of his employment lest their fans think that Motown's instrumental stylings were being performed by "Mo-bots." In addition, from a commercial standpoint, Scott's work at Motown proved unsuccessful. When he left the company, he was, for the first time in his life, unemployed. He was long out of the record business, led no band, had no clients, and his royalty stream was dwindling. Having been industrious and filled with ideas his entire life, Scott could not simply retire. He wanted and needed a "job." He did not find one.

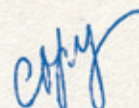


In the late 1960s, Scott recorded electronic adaptations of several of his late 1930s jazz "Quintette" hits by playing a keyboard over Electronium rhythm beds. (These can be heard on the albums *Manhattan Research Inc.* and *Three Willow Park.*) Shortly thereafter, he began working for Motown, and these recordings were set aside. After Scott retired from the company in 1977, he attempted to regenerate interest in the possibilities of the Electronium by circulating these decade-old recordings. We believe this cassette dates from 1978, since cassettes, particularly those with Dolby noise reduction, were not consumer staples before 1972 when Scott joined Motown. By 1978, cassettes (with Dolby options) were a common format for circulating music demos.

INSTANTANEOUS
MUSIC
COMPOSITION
PERFORMANCE
MACHINES

RAYMOND SCOTT LABORATORIES

May 25, 1980



Mr. Dan Mather
1236 W. Racine Street
Bellingham, Washington 98225

Dear Mr. Mather,

Thank you for your interest in my career. Please excuse the delay in my response. However, I have always been a procrastinator when it comes to writing letters.

After I left "Your Hit Parade" I devoted my time to electronic music. Electronics had always been a hobby of mine and I now combined my musical interest with my electronic hobby to create electronic musical backgrounds for TV commercials.

Since I was not satisfied with the electronic musical instruments available to me, I then went into creating the instruments which would produce the sounds and effects I wanted. This was a most enjoyable and rewarding period of my life and I still work at it occasionally, although I am now retired.

I hope that this bit of information will be helpful to you in producing your program and that it has not arrived too late for your purposes.

Sincerely,

Raymond Scott

RS:ms

PIONEERED &
DEVELOPED

rhythm
synthesizer
1960

pitch
sequencer
1960

portamento
keyboard
1959

juxtaposition
matrix
1961

serial
doorbell
1966

synthesized
chinese gong
1968

bass line
generator
1971

melody
maker
1972

rhythm guitar
simulator
1972

RAYMOND SCOTT LABORATORIES 14549 Valerio St. • Van Nuys, California 91405 • (213) 782-1990

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TOM RHEA

ELECTRONIC PERSPECTIVES

Raymond Scott's Clavivox & Electronium

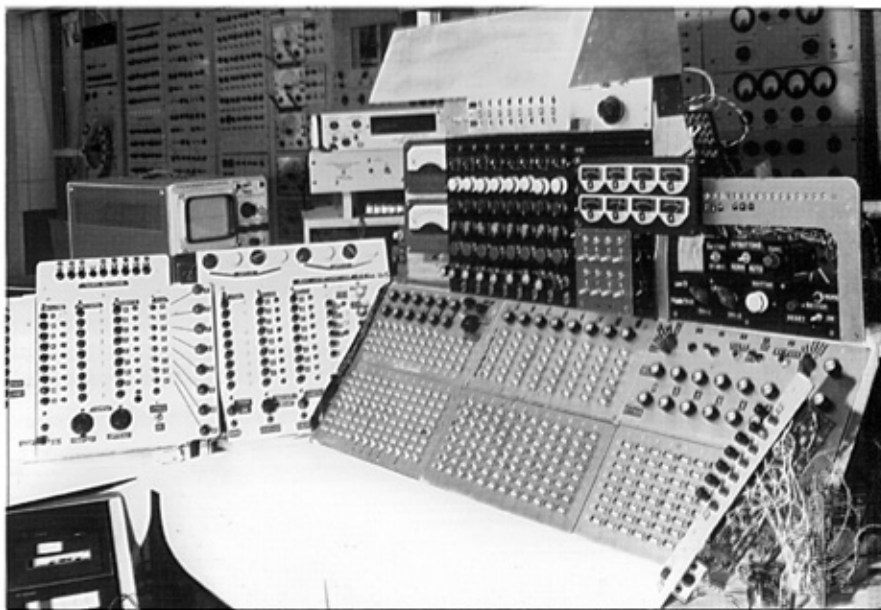
MANY PEOPLE WILL recall Raymond Scott as a musical lion of the Big Band era. He originated the Raymond Scott Quintette (1936), which appeared in five films. He was musical director for CBS, conductor of the NBC *Hit Parade* radio and TV shows (1949-1958), and composer of hit songs. During the '40s he toured the U.S. and Canada with his own band.

Less well known are Scott's achievements in the design of electronic musical instruments. During the late '40s he founded Manhattan Research, one of the most elaborate facilities for the creation of electronic music and *musique concrète* (tape recorder music). Many of the devices that he built for that studio anticipated modules found on today's synthesizers. For example, Scott had an early trigger delay device, variable envelope shapers, variable waveshape generators, preset programming devices, and sequencers for ordering sound events. During the '50s and '60s, Scott was among the first to produce electronic music for commercials.

More recently, Scott developed a performance keyboard called the *Clavivox* and a huge composer's machine called the *Electronium*. Details of these instruments reveal Scott's understanding of the distinctions between performance and composition. The *Clavivox* had a keyboard, sophisticated performance control devices, and a unique portamento (glide) capability. The *Electronium*, on the other hand, was "programmed" using knobs and switches, and actuated by a single microswitch!

The *Clavivox* could be thought of as a Theremin under keyboard control, a synthesizer that allows real-time control of glide by the performer. It was this unique type of glide, or portamento, that gave the *Clavivox* its unique human quality — a clear departure from most electronic keyboards, with their discrete pitch or uniform-rate glide. But technical difficulties in the design led to its downfall. Portamento was indeed controlled by the performer — mechanically, by a system elegant in concept but difficult in construction. At the back end of each key was a peg that came into contact with a vane given a helical twist (like a spiral staircase laid on its side; a "spiral" staircase, since it occupies three dimensions, not two, is really *helical* — not spiral). Because of that helical twist, each key made contact at a different position along the vane, acting to rotate the vane to a unique position. If two keys were depressed, they would act like a seesaw — as one is depressed the other must rise. Obviously, the *Clavivox* was monophonic. At the end of the vane was a piece of film "smoked" in a continuous gradation. The film interrupted a light source falling on a photoelectric cell. A key was depressed to its bottom; a vane rotated to a unique angle; a film of variable opacity moved in front of a photoelectric cell. This controlled pitch.

In performance, one could control glide rate by first depressing a key, then bringing another key's peg into contact with the internal vane, and then shifting force from the first key to the second. It was a variable-rate seesaw. It worked fine — for a while. Then problems in



The *Electronium* (in foreground).

mechanical tolerances began to show up, and tuning would be affected. This judgment comes from firsthand experience; for a brief time during the '70s I was Raymond Scott's *Clavivox* demonstrator and sales agent!

Other features were far more successful — worthy of imitation today. The left-hand controller comprised four flat "keys" played by the thumb and first three fingers. They governed "hard attack, soft attack, extinguish, and vibrato (off/on)." "Extinguish" allowed the performer to stop the sound abruptly during performance — to produce, for instance the "dot" of "doo-dot doo-dot!" These expression keys and the glide scheme were Scott's way of giving the *Clavivox* some of the capabilities that a monophonic voice *must have* to be successful: vibrato control, pitch nuance and portamento, and phrasing capability.

As Raymond Scott said, "... the *Electronium* is not played; it is guided." Scott worked on this composer's machine during the decade of the '60s. In May 1970 he introduced a completed version that described how the system is used:

A composer "asks" the *Electronium* to "suggest" an idea — theme — motive — whatever. He listens to these on a monitor speaker. When happy with one of the ideas, he stops the *Electronium*, puts the magnetic tape recorder into the record mode and starts recording. The start button for the *Electronium* is now also pressed and the composition is underway.

Say the opening theme is just about over, the composer (guidance control) decides that, as the first step in the development of the theme — he wishes to repeat it, but in a higher key — he pushes the appropriate button. Or perhaps, he wants to modify the theme somewhat in its new, transposed, higher key — for instance, to widen some of the intervals... he turns another knob. Whatever the composer needs... to continue the development of the piece, it is but necessary

for him to convey his wishes to the *Electronium* — by manipulating the appropriate controls.

... faster, slower, a new rhythm design, a hold, a pause, a second theme, variation, an extension, elongation, diminution, counterpoint, a change in phrasing, an ornament... ad infinitum... whatever the composer requests, the *Electronium* accepts and acts out his directions.

Scott reveals his viewpoint about how *specific* he feels one must be when making music. He goes on to say, "... the machine's response to guidance control is — in its details — unpredictable — so that a kind of joint effort takes place — in that the *Electronium* adds to the composer's thoughts, and a duet relationship is set up between man and machine." Scott's non-numerical approach puts him more in the mainstream of music making — intuitive manipulation of sound elements — even though the means of manipulation is non-traditional.

Raymond Scott's musicianship caused him to make fundamental distinctions between an *instrument* such as the *Clavivox*, and a system for interacting with sound — the *Electronium*. There are lessons to be learned in what Scott did in years past.

Perhaps it would be fruitful to discard the word "synthesizer." Then designers would have to think about what kind of music their sound-maker is going to produce — and the characteristics of the people whom they intend to use it. And those who use such soundmakers might have to sharpen their aesthetic as well. Better electronic musical instruments and more useful compositional systems might result if we didn't have the catchall "synthesizer" label to describe such diverse things. A word that can mean so many things can mean hardly anything at all. Nowadays everyone seems to know what a "synthesizer" is, and what it "does." Too bad. Vistas unimagined are vistas unrealized. ■

Beautiful Little Butterfly by Raymond Scott ①

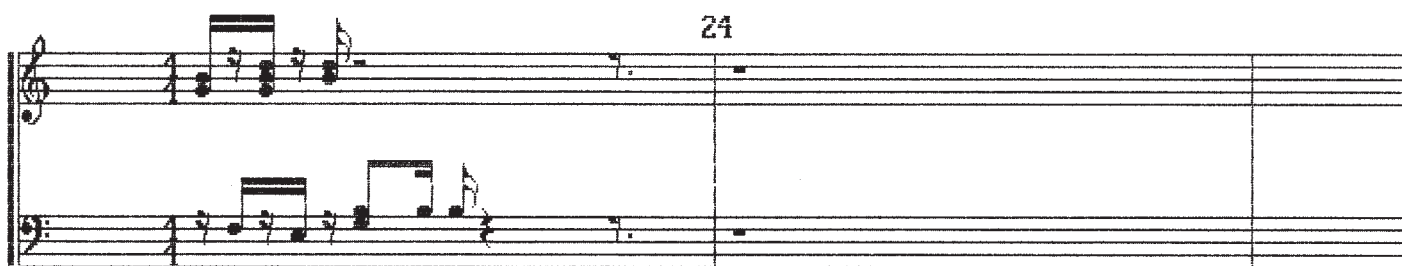
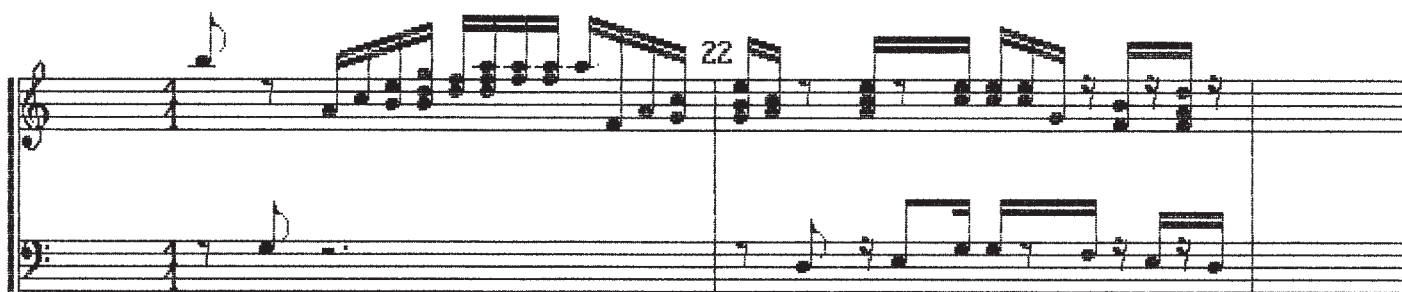
The image displays a handwritten musical score for the piece "Beautiful Little Butterfly" by Raymond Scott. The score is written on five systems, each consisting of a piano (treble) staff and a bass (bass) staff. The music is in 4/4 time, indicated by the '4' in the top left of the first system. The notation includes various musical symbols such as notes, rests, and dynamic markings. Measure numbers 2, 4, 6, 8, and 10 are clearly marked above the piano staves. The handwriting is in black ink on white paper. A vertical blue bar with the year '1987' is positioned on the right side of the page.

1987

In his final productive years (the mid-1980s) before a debilitating stroke in 1987, Scott was composing with computers using a MIDI interface. He created dozens of works, which were recorded on cassette—some with titles, some without. He also generated sheet music for these (as yet unpublished) works. According to an assistant who worked with Scott in these waning years, "Beautiful Little Butterfly" was his final composition. (1/3)

The image displays a musical score for the piece "Beautiful Little Butterfly" (2/3). The score is written for piano and is organized into five systems, each consisting of a treble and bass staff. The key signature is one sharp (F#), and the time signature is 3/4. The first system begins with a treble staff containing a series of chords and a bass staff with a simple accompaniment. The second system continues the melody in the treble staff, with the bass staff providing harmonic support. The third system features a more complex treble staff with many beamed chords, while the bass staff remains relatively simple. The fourth system shows a continuation of the treble melody, with the bass staff adding more rhythmic detail. The fifth system concludes the piece with a final treble staff melody and a bass staff accompaniment. Measure numbers 12, 14, 16, 18, and 20 are clearly marked above the treble staves.

"Beautiful Little Butterfly" (2/3)



OBITUARIES**Raymond Scott, 85, a Composer
For Cartoons and the Stage, Dies**

By WILLIAM GRIMES

Raymond Scott, a jazz composer, pianist, band leader and inventor whose music found its way into dozens of Warner Brothers cartoons, died yesterday in the Country Villa Sheraton Nursing Home in North Hills, Calif. He was 85 and lived in Van Nuys, Calif.

The cause was pneumonia, said Irwin Chusid, the director of the Raymond Scott Archives in Hoboken, N.J.

Mr. Scott, whose original name was Harry Warnow, was born in Brooklyn to Russian immigrants. His father was an amateur violinist who owned a music shop. Mr. Scott played piano from an early age but planned to study engineering at Brooklyn Polytechnic Institute. His older brother, Mark, a violinist and conductor, steered him to the Institute of Musical Art (later renamed the Juilliard School) by offering to pay his tuition and buying him a Steinway grand piano.

Songs of Quirky Humor

After graduating from the institute in 1931, he was hired as a pianist for the CBS Radio Orchestra, which his brother conducted. When not performing, he composed quirky comic tunes, with evocative musical effects, like "New Year's Eve in a Haunted House," "Dinner Music for a Pack of Hungry Cannibals" and "War Dance for Wooden Indians."

In late 1936, he changed his name to Raymond Scott and formed a six-man jazz group (he insisted on calling it a quintet) that performed his compositions and achieved considerable popularity for two years. In the 1940's Mr. Scott led several of his own orchestras.

In 1943, Carl Stalling, the music director of Warner Brothers, began incorporating Mr. Scott's evocative mu-

sic into the "Looney Tunes" and "Merrie Melodies" cartoons. His quintet's music from the late 30's is now used as background music for "The Ren and Stimpy Show" on Nickelodeon.

Mr. Scott composed the music for the 1946 Broadway show "Lute Song," composed and performed music for films, and led the band on the television program "Your Hit Parade" from 1950 to 1957.

Early Synthesizer

In the late 1940's, he turned his hand to inventing electronic instruments, such as the Karloff, a machine that imitated sounds like kitchen noises, the sizzle of a frying steak, or a cough. Another of his inventions was the Clavivox, a keyboard instrument that imitated the sound of the human voice. He also created an early version of the synthesizer.

In the 1970's, Berry Gordy Jr., who had seen some of Mr. Scott's electronic instruments, hired him to head the electronic music division of Motown Records. After retiring in 1977, Mr. Scott continued to experiment with electronic instruments.

His best-known compositions were recently released by Columbia on "The Music of Raymond Scott: Reckless Nights and Turkish Twilights."

Mr. Scott's first two marriages, to Pearl Winters and the singer Dorothy Collins, ended in divorce.

He is survived by his third wife, Mitzi; three daughters, Carolyn Makover of Fairfield, Conn., Deborah Studebaker of Los Angeles, and Elizabeth Adams of Watervliet, N.Y.; a son, Stanley, of Mamaroneck, N.Y., and 10 grandchildren.



Associated Press
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George Sauer;
Former Official



Composer, Musical Innovator Raymond Scott Dies At Age 85

■ BY PAUL VERNA

NEW YORK—Composer, inventor, performer, and musical trailblazer Raymond Scott died Feb. 8 at age 85, leaving behind an estimable legacy of recordings and rare instruments.

Scott is best known for his eccentric late-'30s jazz vignettes, which received massive exposure when Warner Bros. music director Carl Stalling used them throughout his scores for the studio's pioneering Bugs Bunny, Daffy Duck, Roadrunner, and Porky Pig cartoons.

Ironically, these quirky sextet pieces—with such appropriately zany titles as "Dinner Music For A Pack Of Hungry Cannibals" and "Reckless Night On Board An Ocean Liner"—were never intended for use in the cartoons. However, they have become so closely linked with Warner Bros.

animation that they are often classified as "cartoon jazz."

Scott was no less a pioneer in instrument design than he was in the creation of music. He anticipated such technological advances as the synthesizer, sequencer, multitrack recorder, sampler, drum machine, and radio-station scanner with inventions that performed many of the same functions as those machines, only years earlier.

Scott also was a prolific composer of music for films, commercials, and TV shows, and served as pianist for the CBS Radio Orchestra and for his own Quintette (actually a six-member ensemble). He later led the house band on the popular "Your Hit Parade" radio show of the late '40s and '50s.

Scott recently came to public attention when a team of fans and archivists, led by Raymond Scott Archives director Irwin Chusid, launched a project to restore his voluminous recorded works, which have been stored under adverse conditions at the late artist's Van Nuys, Calif., estate (Billboard, Dec. 18, 1993).

Because Scott suffered a series of crippling strokes in his waning years, he was unable to care for these recordings, which consisted chiefly of fragile and irreplaceable acetate discs. Furthermore, Scott's aversion

to writing his music on paper heightened the archival significance of these "recorded manuscripts."

Under Chusid's supervision, the Scott collection will be transferred this spring to the Marr Archives at the University of Missouri, Kansas City, where it will be cleaned, sleeved, catalogued, and made available to scholars and fans. Scott's widow, Mitzi Scott, is cooperating closely with the project.

The scope and diversity of this restoration committee reflects Scott's far-reaching influence on the intelligentsia of the music and film worlds. Among the names on the board are Devo co-founder Mark Mothersbaugh, veteran journalist Mr. Bonzai, noted producer Hal Willner, author/jazz historian Will Friedwald, Mix magazine editor David M. Schwartz, Warner Bros. veteran Lee Herschberg, synth pioneer Robert Moog, David Harrington of the Kronos Quartet, Andy Partridge of XTC, avant-garde clarinetist Don Byron, film critic Leonard Maltin, WNYC personality David Garland, musician/entrepreneur Henry Rollins, and "Ren & Stimpy Show" creative director Bob Camp, who uses Scott music frequently on the Nickelodeon cartoon series.

Scott was born Harry Warnow in Brooklyn Sept. 10, 1908, according to Chusid's liner notes for "The Music Of Raymond Scott: Reckless Nights And Turkish Twilights," a 1992 Columbia compilation of Scott music.

Harry's musical gifts were sufficiently apparent at a young age to convince his older brother, Mark Warnow, then conductor of the CBS Radio Orchestra, to pay Harry's tuition to the Institute Of Musical Art—now Juilliard—and buy him a Steinway. Upon graduation in 1931, Harry joined the CBS orchestra and changed his name to Raymond Scott to avert accusations of favoritism.

Scott's oddball compositions received a lukewarm reception at CBS, prompting him to start his own performing unit, the misleadingly named "Raymond Scott Quintette." From 1937-1939, the short-lived outfit recorded the music that, in 1943, would make its way onto the Warner Bros. cartoons.

In the early '40s Scott moved on to a big-band format, and he later wrote prolifically for commercials, films, TV, and the stage, often using Doro-

thy Collins as his featured singer. He married Collins following his divorce in 1950 from his first wife, Pearl Zimney.

In the '50s and '60s, Scott started the Audivox and Master labels and worked as A&R director for Everest Records, all the while indulging his passion for electronic instruments.

The artist married Mitzi Curtis in 1967, a few years after he and Collins were divorced. In the early '70s, the Scotts moved from North Hills, N.Y., to Los Angeles, where Scott headed the electronic music research department at Motown Records, a position from which he retired in 1977. From that time until his first stroke a decade later, Scott remained active as a composer of experimental music and an electronic instrument maker.

Scott is survived by Mitzi Scott; three daughters, Carolyn Makover, Deborah Studebaker, and Elizabeth Adams; a son, Stanley; and 10 grandchildren.



SCOTT

Billboard

Raymond Scott Inventory March 1994	titles	volumes
print/manuscript items		
books	35	24
scores	83	84
band arrangements	13	13
music folios (more than 1 piece per folio)	20	20
sheet music	284	284
music manuscripts	264	264
newspaper, magazine articles	97	97
letters	73	73
poems/lyrics	81	81
record books/planners/diaries	4	4
misc. electronic music equip. material	296	296
miscellaneous printed items	61	61
photographic material		
photographs	1061	1061
slides	47	47
non-print		
audio cassettes:		
60 min.	11	11
90 min.	14	14
120 min.	46	46
cleaner cassette	1	1
10" open reel tape	617	617
7" open reel tape	111	111
5" open reel tape	15	15
12" metal mothers	16	16
16" instantaneous metal discs	400	400
12" metal	70	70
10" metal	39	39
7" metal	1	1
16" glass base discs	265	265
12" glass base acetates	313	313
10" glass base	59	59
12" acetate	704	704
10" metal acetate	11	11
10" acetate	138	138
10" test pressing	11	11
LP test pressing	1	1
12" LPs	447	492
10" LPs	8	8
10" 78s	52	92
12" 78s	7	7
7" 45rpm discs	15	26
7" 45 rpm EPs	2	2
GRAND TOTAL:	5793	5879



"I didn't like public appearances. I was meant to be an engineer."
— Raymond Scott, 1942